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April 5, 2017

Ms. Karen Lumino
US EPA, Region 1
Office of Site Remediation and Restoration
CT Superfund Section
5 Post Office Square, Suite 100
Mailcode OSRR07-4
Boston, MA 02109

Subject: **Solvents Recovery Service of New England Inc. Superfund Site**
Southington, Connecticut
Annual State of Compliance Report #8

Dear Ms. Lumino:

Pursuant to Section 62.e of the Consent Decree (CD) for the Remedial Design/Remedial Action at the Solvents Recovery Service of New England, Inc. Superfund Site entered on March 26, 2009 by the United States District Court for the District of Connecticut in connection with Civil Actions No. 3:08cv1509 (SRU) and No. 3:08cv1504 (WWE), and in accordance with Section VIII.B of the Statement of Work (SOW) attached to the CD as Appendix B, enclosed please find Annual State of Compliance Report No. 1.

This report covers the period from October 31, 2015 through October 30, 2016, and is submitted on behalf of the Respondents to the CD.

Please contact me if you have any questions.

Sincerely,

Bruce Thompson
Project Coordinator

Enclosure

cc: Shannon Pociu, CTDEEP
SRSNE Executive Committee

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Solvents Recovery Service of New England, Inc. Superfund Site

Southington, CT

Annual State of Compliance Report # 8

October 31, 2015 through October 31, 2016

de maximis, inc.

April 2017

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A. Introduction

On October 30, 2008, the United States Environmental Protection Agency (USEPA) lodged a Consent Decree (CD) with the United States District Court for the District of Connecticut in connection with Civil Actions No. 3:08cv1509 (SRU) and No. 3:08cv1504 (WWE). The CD was entered by the Court on March 26, 2009. The CD addresses Remedial Design/Remedial Action (RD/RA) activities for the Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site in Southington, Connecticut (Site). Appendix B to the CD is a Statement of Work (SOW) that defines the required RD/RA activities and deliverables.

Section VIII.B of the SOW requires the Settling Defendants to submit an Annual State of Compliance Report one year after lodging of the CD and annually thereafter, to USEPA for approval or modification, after reasonable opportunity for review and comment by Connecticut Department of Energy and Environmental Protection (CTDEEP). Section 62.e of the CD requires a demonstration of the amounts of the Rolling Oversight Cost Cap and the Available Balance. This ***Annual State of Compliance Report #8*** (report) has been prepared on behalf of the SRSNE Site Group, an unincorporated association of Settling Defendants to the CD, to address these CD and SOW requirements. This report documents Site activities during the period of October 31, 2015 through October 30, 2016 (the “reporting period”).

As specified in SOW Section VIII.B, this report includes a comprehensive evaluation of all monitoring required by this SOW, including, but not limited to:

- compliance with the Performance Standards of the Hydraulic Containment and Treatment System and Severed Plume;
- Institutional Controls;
- construction, operation and maintenance;
- habitat restoration;
- hydraulic containment;
- the Memorandum of Agreement with Southington Water Department / Town of Southington; and
- groundwater monitoring program, including monitored natural attenuation.

Also required in the report is an assessment of the progress being made towards achieving the Performance Standards, as well as recommendations for changes to any monitoring program to address deficiencies identified during the evaluation. Proposals for reductions in monitoring, along with justifications, are provided as appropriate.

B. Background

The SRSNE Site is located on approximately 14 acres of land along Lazy Lane in Southington, Hartford County, Connecticut, approximately 15 miles southwest of the city of Hartford (Figure 1). The physical setting of the Site – including the regional geology, overburden geology, bedrock geology, hydrogeology, groundwater use and classification, drainage, and surface water use and classification – is summarized below. This information is also described in detail in prior report submittals, including the *Remedial Investigation Report* (Blasland, Bouck & Lee, Inc. [BBL] 1998) and the *Feasibility Study Report* (BBL and USEPA 2005), and the *Remedial Design Work Plan (RDWP)* (ARCADIS, November 2010).

The SRSNE Site includes portions of several properties/areas that are referred to within the RDWP consistent with terminology established in prior Site-related documents. These properties/areas include the former SRSNE Operations Area, the former Boston & Maine railroad right-of-way, the former Cianci Property, and the Town of Southington Well Field Property (Town Well Field Property). These areas are shown on Figure 2, and further described below:

- **Former SRSNE Operations Area:** The former SRSNE Operations Area comprises approximately 2.5 paved acres on a 3.7-acre lot South of Lazy Lane in the Quinnipiac River basin approximately 600 feet west of the Quinnipiac River channel. This is the area where SRSNE historically performed solvent recovery and related operations. The Operations Area is bordered on the east (downhill) by an abandoned railroad right-of-way and the former Cianci Property; to the north by commercial businesses; to the west (uphill) by private property; and to the south by private property, the Connecticut Light & Power (CL&P) electrical transmission line easement, and the Town Well Field Property.

- **Railroad Right-of-Way:** The railroad right-of-way is an approximately 50-foot wide corridor running north-south that separates the former Operations Area (to the west) from the former Cianci Property (to the east). The railroad was historically owned and operated by Boston & Maine, but is presently abandoned and the rails have been removed. CT DEP purchased the right-of-way in this area in support of extending the Farmington Canal Heritage Trail, a rails-to-trails greenway, from New Haven to the Massachusetts border (draft *Preliminary Reuse Assessment* [USEPA 2003]).

- **Former Cianci Property:** The former Cianci Property is a 10-acre parcel located immediately east of the Operations Area and railroad right-of-way. The Quinnipiac River borders the eastern edge of the former Cianci Property. Lazy Lane is to the north, and the Town Well Field Property borders the property to the south.

- **Town Well Field Property:** The Town Well Field Property consists of approximately 28 acres of undeveloped land south of the former Cianci Property and southeast of the Operations Area. The well field is bounded to the east by the Quinnipiac River and to the south by the Quinnipiac River and Curtiss Street. The railroad right-of-way and the Delahunty Property border the western perimeter of the well field. The CL&P easement runs northwest-southeast through the northern portion of the Town Well Field Property.

Town Production Wells No. 4 and 6 are approximately 2,000 and 1,400 feet south of the SRSNE Property, respectively. The Quinnipiac River divides the area between Wells No. 4 and 6. Production Well No. 6 is accessible using dirt roads originating from Lazy Lane or Curtiss Street, while Well No. 4 is only accessible from Curtiss Street. Production Well No. 4 was installed in August 1965 and provided drinking water to the Town of Southington from July 1966 to December 1977. Production Well No. 6 was installed in April 1976 and was pumped from May through October 1978, May through July 1979, and March 1980. Both wells have been inactive since that time.

Within these areas, “the Site” includes areas where Site-related constituents have come to be present in soil (including wetland soil) and groundwater at concentrations exceeding SOW-specified cleanup levels. This includes observed and interpreted non-aqueous phase liquid- (NAPL-) containing areas, impacted soils in the Operations Area, railroad right-of-way, and Cianci Property, and areas of impacted groundwater in both the overburden and bedrock zones. These areas, shown on Figures 3A (overburden) and 3B (bedrock), are generally described as follows:

- **Overburden NAPL Area:** This is the area where NAPL has been observed or inferred to exist in overburden soils based on the findings of prior investigations. The estimated extent of the Overburden NAPL Area includes portions of the Operations Area, the railroad right-of-way, and a portion of the Cianci Property, as shown on Figure 3A. This area has been further delineated in the northwest corner of the former Operations Area as component of the pre-design investigations referenced in the RDWP.

- **Overburden Groundwater Area:** The Overburden Groundwater Area is the portion of the Site where dissolved volatile organic compounds (VOC) concentrations in the overburden aquifer exceed cleanup goals. While the overburden groundwater is typically considered in three zones (each approximately one-third of the saturated thickness), the composite extent of this area (based on *Feasibility Study Report* [BBL and USEPA 2005] data) is depicted on Figure 3A. The overburden groundwater VOC plume extends south to the Town Well Field Property. The extent of the overburden groundwater area, particularly to the east of the Quinnipiac River, is subject to further assessment and delineation as part of the investigations referenced in the RDWP.

- **Bedrock NAPL Area:** The Bedrock NAPL Area is the area where NAPL has been observed or is inferred to exist based on prior site investigations. This includes a majority of the former SRSNE Operations Area and Cianci Property, as shown on Figure 3B.

- **Bedrock Groundwater Area:** This includes the portion of the Site where dissolved VOC concentrations in the bedrock aquifer exceed groundwater cleanup goals (based on *Feasibility Study Report* [BBL and USEPA 2005] data). The bedrock groundwater VOC plume extends south into the central portion of the Town Well Field Property, represented in figures 10 and 11 in Attachment 3 the *Draft 2016 MNA report* (ARCADIS, November 2016)

- **Severed Plume:** The portion of the affected groundwater zone that is outside the groundwater capture zone of the Non-Time-Critical Removal Action 1 (NTCRA 1) and NTCRA 2 extraction systems (described below), which contains Site-related constituents (primarily VOCs) above detectable levels is referred to as the severed plume. The approximate location and extent of the severed plume is shown on Figure 3A.

Other key Site features referenced include the Hydraulic Containment and Treatment System (HCTS). The HCTS consists of the on-site groundwater treatment system and the two groundwater extraction systems described as follows:

- **NTCRA 1 Groundwater Extraction System:** The NTCRA 1 groundwater extraction system (“NTCRA 1 system”) is located within the NTCRA containment area on the Cianci Property east of the Operations Area (Figure 4). It consists of a steel sheet pile wall through the overburden to the top of bedrock, and 12 overburden groundwater extraction wells (RW-1 through RW-12) west (formerly upgradient) of the sheet pile wall. Groundwater is extracted from the wells to maintain hydraulic gradient reversal across the sheet pile wall. This system was installed in 1995 pursuant to Administrative Order on Consent (AOC) I-94-1045, effective October 4, 1994. Pumping from the NTCRA 1 system was initiated in July 1995.

  In December of 2009, *de maximis* submitted a letter to the Agencies summarizing changes to the NTCRA-1 Demonstration of Compliance Plan (DCP) as a result of the abandonment of monitoring well CPZ-9 (one of the ten NTCRA I compliance monitoring points) and decommission of recovery wells RW-5 and RW-6. Monitoring well abandonment activities at the site have been undertaken in accordance with Attachment N of the RDWP.

  On October 31, 2016, *de maximis* submitted a memorandum to the Agencies requesting modifications of operations and monitoring of the NCTRA-1, these modifications include taking low yielding NCTRA-1 extraction wells out of service while still maintaining reversal of gradient and continuing to monitor water levels.

NTCRA 2 Groundwater Extraction System: The NTCRA 2 groundwater extraction system (“NTCRA 2 system”) consists of three overburden extraction wells (RW-13, RW-

14 and RW-15) and one bedrock extraction well (RW-1R) just north of the CL&P easement (Figure 4). These wells were installed pursuant to AOC 1-97-1000, effective February 18, 1997, and began operating in 1999, 2007, 2014 and 2001, respectively. The supplemental Groundwater Recovery Well (RW-15) was installed in October 2014. The additional recovery well was installed to ensure that target flow (30 gpm) and the overburden target zone recovery in NCTRA 2 will continue to be maintained. This extraction well cluster is located in the Town Well Field Property north of the CL&P easement.

In 2016, the average combined NTCRA 1 and NTCRA 2 groundwater extraction systems pumping rate was 37.8 gallons per minute. The capture zones created by the NTCRA 1 and 2 groundwater extraction systems are shown on Figure 3A (overburden) and Figure 3B (bedrock). The operation of the combined NTCRA 1 and NTCRA 2 systems has successfully contained the overburden and bedrock VOC plumes, creating the severed plume within the Town Well Field Property. Approximately 19,970,000 gallons of groundwater were extracted, treated and discharged during this monitoring period.

On-site Groundwater Treatment System: The combined operations of the extraction systems and the treatment facility were previously referred to as the "NTCRA 1 and NTCRA 2 Groundwater Extraction and Treatment System" or "NTCRA 1/2 Groundwater System." Following entry of the CD, continued operation of the NTCRA 1/2 Groundwater System became part of the ROD-specified remedial approach for groundwater, and the system is now referred to as the HCTS (SOW Section V.A).

Groundwater extracted from the NTCRA 1 and 2 systems is treated on site with a process that was originally constructed as part of the NTCRA 1 system (Figure 4). The groundwater extracted by the NTCRA-1 and 2 containment systems is pumped directly to the groundwater treatment facility. The treatment system consists of the following unit processes: metals pretreatment, filtration, ultraviolet oxidation (UV), and granular activated carbon adsorption. Vapor phase carbon adsorption is also used to capture contaminants that volatize during treatment. The system precipitates and extracts metals, reduces suspended solids, and destroys and captures volatile organic contaminants. Treated water is discharged to the Quinnipiac River in accordance with the Revised Connecticut Department of Environmental Protection (CTDEP) Substantive Requirements for Discharge of Pre-Treated Groundwater issued 6 November 1995. Approximately 18,000 pounds of VOCs have been removed from the groundwater since system startup.

C. Site Operational History

The SRSNE facility began operations in Southington in 1955 (ATSDR 1992). From approximately 1955 until the facility’s closure in 1991, spent solvents were received from customers and distilled to remove impurities, and the recovered solvents were returned to the customer or sold to others for reuse. Based on a partial record of materials processed at the SRSNE facility (excluding pre-1967 operations files, which were destroyed in a fire), SRSNE handled in excess of 41 million gallons of waste solvents, fuels, paints, etc. Additional details regarding the operational history are provided in the *Remedial Investigation Report* (BBL 1998).

D. Regulatory Status

The SRSNE Site was added to the National Priorities List (NPL) on September 8, 1983. Since that time USEPA and the State of Connecticut have implemented a variety of enforcement, regulatory and response actions, culminating with the issuance of the Proposed Plan and Record of Decision (ROD) in September 2005. After issuing the ROD, the USEPA and SRSNE Site Group negotiated the terms of the CD.

Key regulatory milestones in the recent history of the Site, based on lists included on USEPA's project website (USEPA 2009) and in the fact sheet USEPA developed in support of the 2005 Proposed Plan (USEPA 2005b), are as follows:

Regulatory Milestone	Year
USEPA adds the Site to the NPL; SRSNE signs a consent decree with USEPA to install a groundwater recovery system and store/manage hazardous waste on site.	1983
USEPA and the State of Connecticut take enforcement action to require cleanup of the facility operations and the property.	1983-1988
USEPA initiates the Remedial Investigation for the Site, conducting three phases of investigation that are presented in a four-volume report (HNUS 1994).	1990
SRSNE operations cease.	1991
USEPA conducts a Time-Critical Removal Action to remove contaminated soils from the railroad grade drainage ditch and to remove some chemicals stored at the property to an off-site location.	1992
USEPA and the SRSNE Group enter into an Administrative Order on Consent (AOC) for Removal Action to construct and operate a pump and treat system to contain the principally contaminated overburden groundwater (the NTCRA 1 work). Other work conducted under this AOC included the construction of a mitigation wetland in the northeast corner of the Cianci Property, implementation of a full-scale phytoremediation study within the NTCRA 1 sheet pile wall, and extension of public water to three buildings adjacent to the Site.	1994
USEPA issues an Action Memorandum for a second NTCRA (NTCRA 2) to hydraulically contain VOC-impacted bedrock groundwater down gradient of the NTCRA 1 system.	1995
USEPA and the SRSNE Site Group enter into a second AOC for Removal Action and Remedial Investigation/Feasibility Study (RI/FS) to expand the groundwater containment system and complete site investigations. Work under this AOC resulted in the completion of the Site RI/FS, implementation of NTCRA 2, and the decontamination, demolition and removal of the remaining buildings and tanks from the Operations Area.	1996
SRSNE Site Group operates groundwater controls in the overburden and bedrock aquifers, completes remedial investigations, and conducts feasibility studies.	1996 - 2004
USEPA issues the Proposed Plan in June and holds two public meetings; the public	2005

comment period runs from June through August.	
USEPA issues the ROD for the Site, which describes the final remedy.	2005
SRSNE Site Group continues operation of the NTCRA 1 and 2 hydraulic containment and treatment systems	2005-2008
USEPA and SRSNE Site Group sign CD to implement the RD/RA activities.	2008
SRSNE Site Group continues operation of HCTS	2008 - present
Court enters CD; Remedial Design work initiated.	2009
Annual Report #1	2009
1st Five Year Review Report	2010
USEPA issues Remedial Design Work Plan Approval	2010
USEPA issues approval of PIPP 100% Design and RAWP	2010
Initiated Pre-ISTR Preparation Plan Construction Activities	2010
EPA, CTDEEP and SRSNE Site Group hold open house for public at Site	2010
Annual Report #2	2010
ISTR Conceptual Design Approval	2011
Approval of ISTR 100% Wellfield Design	2011
Annual Report #3	2011
Institutional Control Plan revisions based on March 2012 comments and May 2012 meeting	2012
Approval of the use of Hydro sleeve for interim sampling	2012
Approval for low flow screen length	2012
Completed delineation of extent of groundwater contamination	2012
Completed Pre-ISTR Preparation Plan Construction Activities	2012
Annual Report #4	2012
Initiated ISTR construction	2013
EPA, CTDEEP and SRSNE Site Group hold open house for public at Site	2013
Annual Report #5	2013
Approval of the 100% design ISTR Work Plan	2014
Issuance of final Memorandum of Agreement	2014
Submittal of the Supplemental Containment Action Plan	2014
ISTR initiated	2014
Approval of Technical Work Plan for NTCRA supplemental Recovery Well (RW-15)	2014
Installation of RW-15	2014
Annual Report #6	2015
ISTR completed	2015
Approval of ISTR Completion/Remedial Action Completion Report	2015
Revised Conceptual Site Model (CSM)	2015
2nd Five Year Review Report	2015
Annual Report #7	2016
Draft RCRA CAP 100% RD and RAWP report	2016
RCRA CAP 100% RD and RAWP report	2016
Approval of RCRA CAP 100 RD and RAWP Report	2016
Commence RCRA Cap Construction	2016

E. Selected Remedy

The overall purpose of RD/RA activities is to design and implement the selected remedial approach for the Site. The selected remedy, developed by combining components of different alternatives for source control and management of migration to obtain a comprehensive approach for Site remediation, was described in the ROD. Key elements are summarized as follows:

- Treat waste oil and solvents – where present as NAPL in the subsurface in the overburden aquifer (i.e., the Overburden NAPL Area) – using in-situ thermal treatment. Completed 2015 as described in the *In-Situ Thermal Remediation Construction Completion Report (de maximis,* September 2015)

Following in-situ thermal treatment, cap the former SRSNE Operations Area. The cap will be low-permeability and multi-layered and is to be designed, constructed, and maintained to meet the requirements of Resource Conservation and Recovery Act (RCRA) Subtitle C. As described in the "*Re-use of Excavated Material from Railroad Right of Way for ISTR Area Fill"* memorandum (*de maximis, in*c., April 29, 2010), soils excavated from the Rail Road Right of Way will be incorporated as fill material in the Thermal Treatment Zone (TTZ). Excavation of soil in a specific portion of the former railroad right-of-way to a depth of 4 feet – followed by backfill to match surrounding grade –will meet the direct exposure criteria (DEC) and pollutant mobility criteria (PMC) requirements of the Connecticut Remediation Standard Regulations with the understanding that an Activity and Use Limitation (ELUR) would subsequently be established for this area.

- Excavate soils exceeding cleanup levels from certain discrete portions of the former Cianci Property. The estimated limits of soil removal on the former Cianci Property (five discrete excavation areas) are shown on Figure G-1 of the *Post-Excavation Confirmatory Sampling Plan* (Attachment G to the RDWP); these limits were subject to modification based on additional sampling proposed as part of remedial design. Provided that concentrations of polychlorinated biphenyls (PCBs) did not warrant off-site disposal, soils excavated from the former Cianci Property (and from other areas excavated outside the cap limits as part of other RD/RA activities) may be relocated to the former SRSNE Operations Area for placement beneath the cap.

- Capture and treat (on site) groundwater in both the overburden and bedrock aquifers that exceeds applicable federal drinking water standards and risk-based levels. This will be achieved through continued operation, maintenance, and modification (as needed) of the HCTS.

- Monitored natural attenuation of the groundwater plume outside the capture zones (i.e., the severed plume, shown on Figure 3A of the RDWP) that exceeds cleanup levels.

- Monitor natural degradation of constituents in the groundwater plume inside the capture zones and within the Bedrock NAPL Area (shown on Figure 3B of the RDWP).

- Implement institutional controls (i.e., Environmental Land Use Restrictions) to minimize the potential for human exposure to Site-related constituents in the subsurface soils and to prohibit activities that might affect the performance or integrity of the cap.

- Monitor groundwater and maintain the cap over the long term.

F. Performance Standards

Section IV of the SOW establishes Performance Standards for the various affected media at the SRSNE Site. It also establishes Performance Standards for other aspects of the RD/RA, including subsurface NAPL in the overburden and bedrock aquifers, performance of the multi-layer cap, hydraulic containment and treatment, the severed plume, habitat restoration, environmental monitoring, and institutional controls. These non-media-specific Performance Standards are summarized and addressed (to the extent applicable at this point in the RD/RA process) in the various task-specific work plans summarized in the RDWP.

Performance Standards for soil, wetland soil, and groundwater have been reviewed and compared to the current applicable USEPA and CTDEP standards and guidance. Based on this review, it was concluded that none of the USEPA or CTDEP criteria for Site-related constituent have been revised since the ROD was issued. However, the CTDEP has published a lower detection limit for 1,2,4-trichlorobenzene in water (0.5 micrograms per liter [ug/L] rather than the prior value of 2 ug/L). Because the detection limit is the cleanup level for groundwater (discussed below), this modification is noted on the copy of Table L-1 from the ROD that is provided as Appendix 1 to the RDWP. No other modifications were warranted to Tables L-1 or L-2 of the ROD to reflect current published guidance and standards.

The RD/RA SOW requires a soil investigation be conducted after implementation of in situ thermal treatment to re-assess the size of the area to be capped. That sampling needs to determine the background concentrations of 2,3,7,8-tetrachlorodibenzo-pdioxin,or “2,3,7,8-TCDD”, calculated as “toxic equivalents” or (TEQ), which are the sum of seventeen 2,3,7,8-substitute dioxin and furan congeners multiplied by their respective Toxic Equivalency Factors. In Table L-2 of the ROD, EPA and CTDEEP agreed that the cleanup level for 2,3,7,8-TCDD TEQ (“dioxin”) would be “the lower of the EPA policy for residential sites (0.001mg/kg) and the background concentration which will be determined based on future field study, or another concentration consistent with the CT RSRs, but not lower than background.”

Background dioxin sampling was performed in 2010, and results found very low background levels. This suggested use of a risk-based clean up level, rather than trying to meet background. Accordingly, a draft "white paper" proposing an alternative dioxin clean up level was submitted to the Agencies on September 16, 2014, EPA provided comments and a revised memo with response to comments was submitted on December 30, 2014The "white paper" proposed 50 part per trillion (ppt) soil clean up level that is consistent with EPA's residential soil standard, and was also derived using the CTDEEP RSR process to determine direct exposure and leaching based criteria. EPA approved the proposed dioxin soil cleanup level of 50 ppt on March 30, 2015. However, the 50ppt dioxin clean up level did not satisfy CTDEEP RSR criteria. An alternative risk based recreational cleanup soil level of 34 ppt was calculated and proposed to CTDEEP on February 5, 2016. This proposed cleanup level was approved on March 11, 2016. Additional soil delineation was performed and approximately 1,110 cubic yards of soil, along the railroad grade at the south end of the site, will be excavated and place under the cap.

G. Summary of Activities Completed This Reporting Period

A summary of activities completed during this reporting period is provided within the attached Table 1.

H. Updated Schedule

An updated project schedule is included as Attachment 1 to this report.

I. Hydraulic Containment & Treatment System Operations and Maintenance

The HCTS achieved compliance during this reporting period with the Demonstration of Compliance Requirements (see Attachment B to the SOW). Details of the operation are provided as Attachment 2 to this report.

The HCTS includes 10 groundwater extraction wells within the NTCRA 1 Containment Area and four downgradient groundwater extraction wells that were originally installed, operated and monitored as part of NTCRA 2. In combination, the NTCRA 1- and NTCRA 2-area extraction wells are all components of the HCTS. For clarity, they are still referred to as NTCRA 1 and NTCRA 2 extraction wells to differentiate the extraction locations and operational histories.

The NTCRA 1 containment system was installed and began operating in 1995. The system includes an approximately 700-foot-long sheet pile wall that extends through the overburden to the top of bedrock, and overburden groundwater extraction wells just west of the sheet pile wall. The purpose for the NTCRA 1 system was to physically and hydraulically control the highest concentrations of dissolved VOCs in overburden groundwater migrating downgradient from the former SRSNE Operations Area. The original NTCRA 1 system had twelve overburden extraction wells. Two wells (RW-5 and RW-6) were abandoned in 2011 during preparation for thermal treatment system construction. Groundwater extraction rates from the NTCRA 1 wells since 1995 have typically been in the range of 5 to 15 gallons per minute (gpm), combined. Groundwater pumped from the wells is treated using metals pre-treatment, ultraviolet oxidation, and carbon polish, and then discharged to the Quinnipiac River. In addition to hydraulically controlling overburden groundwater, the NTCRA 1 overburden extraction wells produce a hydraulic response in the shallow bedrock, indicating that the overburden and shallow bedrock are hydraulically connected in this area.

The NTCRA 2 system was installed to hydraulically control bedrock groundwater downgradient of the interpreted NAPL zones in overburden and bedrock. A pumping test of well RW-13 during the FS indicated that this overburden well – which is screened from the middle overburden to the top of bedrock – has a significant hydraulic influence in the shallow bedrock and even the deep bedrock. Because the overburden and bedrock are hydraulically connected in the Town Well Field Property, and the natural groundwater flow direction is upward from bedrock to overburden in that area, the NTCRA 2 system hydraulically controls overburden and bedrock groundwater. A summary of the NTCRA 2 extraction wells is as follows:

- RW-13 began operation in July 1999 – it extracts groundwater from the middle and deep overburden with a screened interval from 35 to 75 feet bgs, and typically operates between 10 and 25 gpm.

- RW-14 began operation in October 2007 – it extracts groundwater from the middle and deep overburden with a screened interval from 31 to 71 feet bgs, and typically operates between 10 and 25 gpm.

- RW-1R began operation in September 2001 – it extracts groundwater from the shallow and deep bedrock with an open-bedrock interval from 82 to 271 feet bgs. In spite of its long open interval, well RW-1R has historically produced approximately 0.1 gpm or less.

- RW-15 was began operation in October 2014 – it also extracts groundwater from the middle and deep overburden, between 30 and 72 feet bgs, and typically operates between 20 and 30 gpm

The addition of well RW-15 provided additional pumping capacity and is expected to allow two of the three overburden NTCRA 2 extraction wells to operate continuously, even when the third well is undergoing maintenance.   Groundwater pumped from the NTCRA 2 wells is also treated at the UV-OX treatment system that was constructed as part of NTCRA 1. With the exception of sporadic power outages and system maintenance, the HCTS operates nearly continuously. Weston Solutions, which operates the system, estimates that the HCTS operates over 99% of the time. The average combined pumping rates in 2016 were approximately 31.6 gpm from the NTCRA 2 extraction wells.

Map views and cross-sections to demonstrate hydraulic containment in accordance with EPA guidance from January 2008 entitled *A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems* (EPA/600/R-08/003) are provided in Figures 7 through 11 of the 2014 -*Groundwater Sampling and Monitored Natural*

Attenuation Report (ARCADIS, 2014) . These figures depict groundwater elevation contours measured on June 9, 2014), and generalized overburden and bedrock capture zone boundaries for the NTCRA 2 extraction wells, which are now part of the HCTS. The estimated capture zone boundaries are based on a combination of measured water level data, historical and recent groundwater modeling results and stagnation point calculations presented in the FS Report (BBL and USEPA, May 2005; Appendix A), and updated VOC concentration data at select monitoring wells (collected in June 2014). Groundwater flow directions based on the June 2014 data are consistent with previously derived groundwater flow directions. The figures indicate that groundwater in all five hydro stratigraphic units converges in the vicinity of the Quinnipiac River, and zones of potentiometric depression were observed in the vicinity of the hydraulic containment and treatment system (HCTS) extraction wells.

Concentrations of dissolved VOCs extracted by the NTCRA 1 system, and consequently its mass removal rate, have declined from 1995 to the present. The overall decrease indicates source zone attenuation due to continued dissolution of NAPL, degradation in the dissolved phase and the completion of in-situ thermal remediation. Concentrations of VOCs pumped by the NTCRA 2 wells have also declined steadily in recent years.

VOCs above Action Levels (the more stringent of the USEPA Maximum Contaminant Levels [MCLs] or Connecticut Class GA Groundwater Protection Criteria [GWPC]) are generally contained within the previously estimated containment boundary of the hydraulic containment and treatment system (HCTS).

The SOW calls for “optimizing” the groundwater treatment system once groundwater conditions stabilize after in-situ thermal treatment. Temperatures and concentrations are currently being monitored and data indicates a decline in groundwater VOC concentration within the NTCRA 1 area due to ISTR. Conditions are expected to stabilize in 2017.

A review of the current influent data concluded that concentrations are below that required for discharge to the Publically Owned Treatment Works (POTW) under a CTDEEP General Permit. The Town of Southington to reviewed the influent data and conditionally agreed to allowed connect to the POTW as an industrial customer.

A formal request for this change was submitted to the Agencies on October 30, 2015. Concern was expressed by CTDEEP regarding 1,4-dioxin levels in the discharge, for which the state had not established a surface water standard. As a condition of granting the discharge permit the CTDEEP required four rounds of 1,4-dioxin sampling at the treatment system effluent, at the influent, midpoint and discharge of the POTW and in the Quinnipiac River at the POTW discharge. Four rounds were collected and the data was submitted to CTDEEP on February 8, 2016 and CTDEEP agreed with the connection on February 22, 2016. However, on March 6, 2016 additional concerns were raised about the possible presence of per-fluorinated compounds in the SRSNE discharge. CTDEEP requested analysis of per-fluorooctanoic acid (PFOA) and per-fluorooctyl sulfonate (PFOS) and there precursor compounds. Samples were collected at the NTCRA 1 & 2 influents in April 2016 and results confirmed the presence on PFOA/PFOS compounds. Further discussions with the agencies prompted a round of sampling at the POTW, in the Quinnipiac River, and of the SRSNE influent and effluent. These results were submitted to the Agencies on April 17, 2016. On September 12, 2016 CTDEEP decided that at that point in time they did not have enough information regarding PFAS to allow the change from onsite treatment to the connection of the POTW.

J. Institutional Controls / Access Agreements

Institutional controls in the form of deed restrictions are already in place on the Operations Area and Cianci Properties that prohibit all uses except for those associated with environmental response actions, as further described in CD paragraph 26. No additional institution controls were implemented during this reporting period. In 2010, the SRSNE Site Group took control of the Voting Trusts that control the Operations Area Property and the Cianci Property, respectively, which allows the implementation of additional institutional controls on those properties when appropriate. Additional institutional controls will be implemented pursuant to the Institutional Control Plan that has been developed as required by SOW Section V.B.7. The Institutional Control Plan was revised and resubmitted in May 2013 to address comments received in December 2011 and May 2012 meeting. The revised plan includes the use of groundwater modeling to evaluate properties where future pumping may cause migration of the plume. The properties included in this “buffer zone” will be controlled with an ordinance through the local Health Department, a process that has been used by the Town of Southington in recent years. A conference call between representatives of EPA, CTDEEP, CT AG and the SRSNE Site Group on July 18, 2013 was held to discuss the IC Plan. On August 10, 2015 a meeting was held with the CT AG and CTDEEP to determine path forward with the IC Plan. In October 2015, CTDEEP requested the IC plan be revised to include the updated Environmental Land Use Restrictions that was revised in 2014 and a revised plan has been submitted. A meeting was held with the Agencies on November 2, 2015 to discuss final comments on the IC Plan and the IC Plan will be completed once final comments are received from CTDEEP.

Access agreements were needed to conduct RD activities obtained from four (4) property owners during this reporting period. Access was granted to six properties in 2009; negotiations for access to the remaining four properties were obtained during 2010.

K. Explanation of Significant Differences

EPA provided a Public Notice in August 2016, for the proposed publication of an Explanation of Significant Differences (ESD). Pursuant to Section 117(c) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. § 9617(c), and the National Contingency Plan, 40 C.F.R. § 300.435(c)(2)(i), if EPA determines that the remedial action to be undertaken at a site differs significantly from the Record of Decision (ROD) for that site, EPA shall publish an ESD and the reasons such changes are being made. According to 40 C.F.R. § 300.435(c)(2)(i), and EPA guidance (OSWER Directive 9200.1-23-P, July 1999), an ESD, rather than a ROD amendment, is appropriate where the adjustments being made to the ROD are significant but do not fundamentally alter the remedy with respect to scope, performance or cost.

The ESD will describe three minor modifications to the formal cleanup plan presented in the 2005 ROD. These changes are:

- A smaller engineered cap area- the original cap design included the former SRSNE operations area and along a section of the railroad grade. During PIPP construction the soils along the railroad grade to be capped were excavated and placed in the in the former operations area. The excavated area was backfilled with clean soil. As a result the final footprint of the area to be capped is smaller than originally designed.

- Soil dioxin cleanup level-EPA approved a risk based dioxin cleanup level of 50ppt. This level was based on sampling performed at the site from 2010 through 2016. This level is lower than what was considered for the 2005 ROD and consistent with policies and requirements of the EPA.

- Modification of Hydraulic Containment System-EPA agrees that concentrations of contaminants in the Site groundwater are low enough that onsite treatment is no longer required. EPA has approved the request to change from onsite treatment to discharge to the Southington Water Pollution Control Authority provided all requirements of the Connecticut Discharge of Groundwater Remediation Wastewater to a Sanitary Sewer are met, and CT DEEP issues the permit.

EPA has determined that the changes to the ROD provided in this ESD are significant but do not fundamentally alter the overall remedy for the Solvents Recovery Service of New England Superfund (SRSNE) Site with respect to scope, performance or cost and therefore will be properly issued. This ESD is expected to be issued in November 2016.

L. Construction, Operation and Maintenance Activities

HCTS operations and maintenance are discussed above in Section I. In situ thermal remediation was performed between May 2014 and March 2015, removing an estimated 210,000 kilograms (kg) of NAPL mass. During operation, ISTR operational parameters were monitored to assess operational performance and treatment progress. This included soil temperature, sub-surface vacuum levels, VOC mass extracted and extraction rate, vapor stream flammability, energy usage, and caustic usage. In addition to monitoring the ISTR operational performance, soil and groundwater sampling were also performed to assess the treatment progress. Groundwater samples were collected from seven monitoring wells (ISTR-1 through -7) located within the thermal treatment area. Samples were collected before heating commenced, and monthly during ISTR. Sampling included "progress" soil sampling performed by TerraTherm to confirm treatment progress and to help evaluate when each treatment Phase was ready for the final confirmation sampling. In total, 60 confirmation soil samples were collected from 28 locations within the Phase I area, and 83 confirmation soil samples were collected from 32 locations within the Phase II area (including supplemental samples collected by TerraTherm after initial samples from certain areas did not achieve Interim NAPL Cleanup Levels). These data were used to support shutdown in the Phase I and Phase II areas, and the associated data were used to demonstration of Attainment of INCL's. Additional details can be found in the In-Situ Thermal Remediation Construction Completion Report (*de maximis*, September 2015)

Post-thermal treatment groundwater monitoring events have been conducted in three times per year since the completion of ISTR in February 2015 for select monitoring wells in the NTCRA 1 area. During these events groundwater samples and temperatures were collected. Initial results from these the monitoring events indicate generally decreasing COC concentrations and moderately to strongly reducing conditions in groundwater in the NTCRA 1 area. Samples and temperatures will continue to be collected and evaluated on a triannual basis until temperatures return to the pre-thermal levels, which is expected to occur in 2017.

The RCRA Cap 100% Design and the RCRA Cap Remedial Action Work Plan (RAWP) was approved on October 18, 2016. Implementation of the work included in the plan will begin in November 2016 Additional details can be found in Section E and in the RCRA Cap 100% Design and the RCRA Cap RAWP (Arcadis, October 2016)

M. Habitat Restoration

No habitat restoration activities were conducted during this reporting period. A pre-remediation assessment of the types, extent and condition of existing habitats on site was conducted in June 2009 pursuant to RDWP Attachment H (Habitat Restoration Work Plan). Additional details are included in the RCRA Cap 100% Design document and the RCRA Cap RAWP (Arcadis, October 2016).

N. Memorandum of Agreement (MOA) with Southington Water Department / Town of Southington

A draft MOA was prepared during the Annual Report #1 reporting period as required by SOW Section V.B.3. This draft MOA was submitted for EPA review on September 16, 2009 and resubmitted based upon EPA comments on June 23, 2010. EPA provided further comments on the MOA on October 28, 2011. The revised MOA was provided for further EPA review on November 15, 2011. EPA issued the final MOA on September 15, 2014. Execution of the MOA triggered finalization and submittal of the Supplementary Containment Action Plan (SCAP). The SCAP sets forth the process the Group would undertake to enhance containment of groundwater in the event SWD re-starts pumping from the Town Well Field Property. The revised SCAP was submitted on October 13, 2014, and approved by EPA on November 7, 2014.

O. Groundwater Monitoring Program

A comprehensive groundwater monitoring program was scoped in the *Monitoring Well Network Evaluation and Groundwater Monitoring Program* (Work Plan; Attachment N to the Remedial Design Work Plan [RDWP]; ARCADIS 2010). A summary of the planned sampling frequency is provided in the attached Table N-1 from the RDWP. The first comprehensive groundwater sampling event occurred during May/June 2010 which supported the first Five-Year Review, submitted in 2010. This sampling event provided data for the draft 1st Monitored Natural Attenuation Report which was submitted in September 2010.

The second comprehensive groundwater sampling event was performed in June 2014 and included sampling of groundwater at 129 monitoring wells for analysis of volatile organic compounds (VOCs), 1,4-dioxane, target analyte list (TAL) metals, and/or MNA parameters in support of the USEPA’s Five-Year Review. In support of the 2nd Five Year Review a revised Conceptual Site Model (CSM) was presented in April 2015. The updated CSM included an overview of site history and physical setting, remedial actions, hydrogeology, lateral and vertical groundwater plume extent, groundwater quality trends, mass removal, and progress toward groundwater remedial goals.
The 2nd Five Year Review was issued by EPA on September 24, 2015.

Figures 2 through 6 of the draft 2016 Groundwater Sampling and Monitored Natural Attenuation Report (MNA) show the locations of former Interim Monitoring and Sampling (IMS) wells that were used to monitor the VOC plume between the completion of the RI and the issuance of the ROD. These wells have the most complete data sets and concentration trends at these wells are presented in Figures 13 through 17 of the Draft 2016 MNA Report). Middle overburden well MW-03 (Figure 14-Draft 2016 MNA Report) and shallow bedrock well MW-127C (Figure 16-Draft 2016 MNA Report) are the only monitoring wells south of the Connecticut Light & Power (CL&P) easement that contained VOC concentrations above the Interim Cleanup Levels (ICLs) before the start-up of the NTCRA 2 system, but they declined to below the ICLs following NTCRA 2 system start up. As shown on Figures 13 through 17 of the Draft 2016 MNA Report, the VOC concentration trends at the former IMS wells south of the CL&P Easement are generally declining or have too many samples with no detected VOCs to support trend analysis.

In accordance with *Monitoring Well Network Evaluation and Groundwater Monitoring Program,* the 2016 annual groundwater sampling event was performed in June 2016 and included sampling of groundwater at 37 monitoring wells. The 2016Groundwater Sampling and Monitored Natural Attenuation Report (Attachment 3) summarizes the 2016 groundwater sampling events and presents the results and interpretation of data collected in support of MNA as a remedy for groundwater that contains Site related constituents of concern (COCs) at concentrations exceeding acceptable risk levels or regulatory limits. Sampling results are discussed below:

VOCs above Action Levels (the more stringent of the USEPA Maximum Contaminant Levels [MCLs] or Connecticut Class GA Groundwater Protection Criteria [GWPC], i.e., drinking water standards) are contained within the previously estimated capture zone boundary of the hydraulic containment and treatment system (HCTS). None of the wells within the severed plume (i.e., wells with historical COC concentrations above Action Levels downgradient of the HCTS capture zone boundary) had COC concentrations above Action Levels during the 2014 through 2016 groundwater monitoring events.

Tetrachloroethene (PCE) and trichloroethene (TCE) were detected at middle overburden monitoring well PZO-2M at concentrations of 6.3 micrograms per liter (µg/L) and 3.43 µg/L respectively, in the June 2016 sample. The PCE concentration is above the Action Level of 5.0 µg/L, while the TCE concentration has dropped below the Action Level of 5.0 µg/L (previously above the Action Level in 2013 and 2014). PCE was first detected above the Action Level at this well in June 2013, while TCE was first detected above the Action Level in June 2012.

PCE and TCE were detected at deep bedrock monitoring well MW-1003DR at concentrations of 3.2 µg/L and 39.2 µg/L, respectively, in the June 2016 sample. The PCE concentration dropped below the Action Level of 5.0 µg/L starting in June 2014, while the TCE concentration is above the Action Level of 5.0 µg/L (and was previously above the Action Level in 2013, 2014 and 2015). PCE and TCE were first detected above the Action Level at this well in June 2013. Concentrations of both compounds have continued to decline relative to the 2013 results.

TCE was also detected at monitoring well MW-1002R at a concentration of 0.662 µg/L below the Action Level of 5 µg/L. The only detection of TCE above Action Levels at this well occurred in June 2015.

As noted in the 2012 MNA Report (Arcadis 2013), total VOC concentrations at shallow bedrock monitoring well P-11A increased notably between 2011 (583 µg/L) and 2012 (approximately 26,400 µg/L). This well is located within the bedrock NAPL zone initially delineated during the Remedial Investigation (RI; Blasland, Bouck & Lee, Inc. [BBL] June 1998), and more recently refined (based on additional data from the RD/RA activities) in the *Groundwater Conceptual Site Model Update* (Arcadis 2015). This well is also located within the HCTS capture zone. The total VOC concentration in June 2016 was significantly lower (4,527 µg/L) than in June 2012, though concentrations remain elevated above most pre-June 2012 values. VOC concentrations at this well will continue to be monitored as part of future sampling events.

PCE, TCE, and 1,1-dichloroethene (1,1-DCE) were detected at monitoring well DN-3 at concentrations (13.0, 13.9, and 17.5 µg/L, respectively) above Action Levels (5.0, 5.0, and 7.0 µg/L, respectively). These are the first detections of VOCs above Action Levels at monitoring well DN-3 since MNA monitoring began in 2010.

Two post-thermal treatment monitoring events were performed in March and July 2016, in accordance with SOW Sections IV.B.5.d and e. Results indicate that total VOC concentrations have decreased by one to three orders of magnitude in eight of the ten “N” wells (relative to the initial comprehensive sampling event conducted in 2010). Some rebound of total VOC concentrations has been observed for MWL-304 and TW-08A, although July 2016 total VOC concentrations are lower than previous sampling events. Total VOC concentrations at two other wells (TW-08B and TW-08D) have remained stable over this period.

Results from Bio-Trap® sampling with QuantArray-Chlor and QuantArray-Petro analyses at two Non-Time-Critical Removal Action (NTCRA) 1 locations indicate increased diversity in the microbial population relative to pre-treatment conditions. These results continue to suggest that anaerobic biodegradation processes dominate in the thermal treatment area, but also indicate a strong potential for aerobic co-metabolism of chlorinated volatile organic compounds (CVOCs) and aerobic metabolism of petroleum hydrocarbons if conditions become more favorable for these processes in the future. In addition, Bio-Trap® samplers were deployed at 14 monitoring wells for analysis of 1,4-dioxane and tetrahydrofuran (THF) biodegradation potential. Results indicate potential for metabolic 1,4-dioxane and THF biodegradation at a subset of monitoring wells sampled (CPZ-6A, MW-907M, and MW-502) and potential for cometabolic biodegradation at each of the 14 monitoring well sampled. This potential for 1,4-dioxane and THF biodegradation is based on the detection of the functional genes needed to mediate aerobic and cometabolic biodegradation.

The MNA Report fulfills the requirement set forth in Section VII.A.2 of the SOW and the reporting approach outlined in the MNA Plan presented as Attachment L to the RDWP (Arcadis 2009). The MNA Report presents results of an evaluation of the effectiveness of MNA as a remedial measure for COCs in groundwater in the Site. As an extension of the prior evaluations (presented in the 2010 through 2015 MNA Reports), this evaluation considers groundwater monitoring results from the June 2016 annual groundwater monitoring event for VOCs and TAL metals at a subset of monitoring wells and presents: an evaluation of current concentration trends for total VOCs in groundwater at select monitoring locations; initial evaluation of post-thermal treatment data at the 10 “N” wells; estimates of bulk attenuation rates for total VOCs in groundwater; and HCTS COC mass extraction rates with time.

Results of these evaluations indicated:

- Detected concentrations of VOCs above Action Levels are contained within the estimated capture zone boundary of the HCTS.

- Groundwater total VOC concentrations are generally declining or remaining stable with time throughout the Site groundwater COC plume.

- Estimated bulk VOC attenuation rates were comparable to attenuation rates for individual COCs presented in the Feasibility Study (FS) (BBL and USEPA 2005).

- Compliance monitoring data from the HCTS indicate generally stable COC mass extraction rates from the early 2000s to 2013 with a decline in COC mass extraction rates observed starting in 2014.

These results support continued use of MNA as a remedy for COCs in Site groundwater.

P. Groundwater Containment and Treatment Optimization Studies

No optimization studies were conducted during this reporting period.

Q. Costs Incurred this Reporting Period

Paragraph 62 of the CD sets forth "Additional Provisions Regarding Settling Defendants' Payments of U.S. Oversight Costs and State Oversight Costs." Pursuant to this paragraph, an interest bearing "Oversight Costs Payment Subaccount" of the Remedial Trust Account was established on April 27, 2009, in the amount of $5,700,000. The balance in this subaccount at the end of October 2016 was $ 5,884.426.
. Other defined terms in this paragraph include:

- "Rolling Oversight Cap" – defined as 15% of the total costs incurred by the Settling Defendants in performing the Work through the end of each Oversight Billing Period.
- "Available Balance" equals the Rolling Oversight Cap less the sum of all Settling Defendants prior payments for U.S Oversight Cost and State Oversight Costs.

Paragraph 62.e of the CD states that the Settling Defendants shall have the burden of calculating annually the Rolling Oversight Cap and Available Balance. The following table summarizes annually the Rolling Oversight Cap and Available Balance:

Reporting Period	Total Amount incurred (A)	Rolling Oversight Cap Amount (B)	Oversight Costs Paid During Reporting Period (C)	Available Rolling Oversight Cap Amount
Annual Report #1	$1,880,301	$282,045	$0	$282,045
Annual Report #2	$3,446,824	$517,024	$84,290	$714,778

Annual Report #3	$4,037,109	$605,566	$30,887	$1,289,458
Annual Report #4	$1,421,795	$213,269	$39,939	$1,462,788
Annual Report #5	$3,726,911	$559,037	$18,963	$2,002,861
Annual Report #6	$6,618,780	$992,817	$41,320	$2,954,358
Annual Report #7	$5,152,682	$772,902	$40,673	$3,686,587
Annual Report #8	$1,031,480	$154,722	$47,959	$3,793,350
Totals:	$27,315,882	$4,097,382	$256,073	$3,841,309

* Cost Revised based on Trustee expenditure updates

In May 2016, EPA approved a permanent funding level of $1,000,000 for the future oversight cost sub-account, transfer of the remainder of the account to the RD/RA Trust, and that future oversight costs would be paid from the RD/RA Trust.

Future annual reports will provide costs incurred, but will not provide a rolling oversight calculation.

R. References

BBL. 1998. *Remedial Investigation Report*. June 1998.

BBL. 2005. Interim Monitoring and Sampling Report No. 13. January 6, 2005.

BBL and USEPA. 2005. *Feasibility Study Report*. Solvents Recovery Service of New England, Inc. Superfund Site, Southington, Connecticut. May 2005.

Halliburton NUS (HNUS) Environmental Corporation. 1994. Final *Remedial Investigation Report: Remedial Investigation/Feasibility Study, SRSNE Site, Southington, Connecticut*. May 1994.

Hubert, J.F., Reed, A.A., Dowdall, W.L., and Gilchrist, M.J. 1978. Guide to the Mesozoic Redbeds of Central Connecticut. State Geological and Natural History Survey of Connecticut, Department of Environmental Protection. Guidebook No. 4.

La Sala, Jr. A. M. 1961. Surficial Geology of the Southington Quadrangle, Connecticut. United States Geological Survey Map GQ-146.

Mazzaferro, D.L. 1975. Contour Map of the Bedrock Surface, Southington Quadrangle, Connecticut. United States Geological Survey (USGS) Map MF-660A.

Rogers, J. 1985. Bedrock Geological Map of Connecticut. Connecticut Geological and Natural History Survey in Cooperation with the U.S. Geological Survey.

Southington Water Department. Town of Southington Water Works Map. January 1997.

United States District Court for the District of Connecticut. 2008. Consent Decree Regarding Solvents Recovery Service of New England, Inc. Superfund Site. August 29, 2008.

USEPA. 1986. *Superfund Remedial Design and Remedial Action Guidance*, OSWER Directive 9355.0-4A. June 1986.

USEPA. 1989. Inspection Report: Solvents Recovery Service of New England. February 1-2, 1989.

USEPA. 1995a. *Remedial Design/Remedial Action Handbook.* OSWER Directive 9355.0-04B. June 1995.

USEPA. 1995b. *Guidance for Scoping the Remedial Design.* OSWER Directive 9355.0-43. March 1995.

USEPA. 1998. Approach for Addressing Dioxin in Soil at CERCLA and RCRA Sites. OSWER Directive 9200.4-26. April 1998.

USEPA. 2003. Draft *Preliminary Reuse Assessment*. September 2003.

USEPA. 2005a. Record of Decision Summary, Solvents Recovery Service of New England, Inc. (SRSNE) Site, Southington, Connecticut. September 2005.

USEPA. 2005b. Solvents Recovery Service of New England, Inc. Superfund Site, Southington, CT. Proposed Plan Fact Sheet, May 2005. Available at: http://www.epa.gov/region01/superfund/sites/srs/229296.pdf.

USEPA. 2009. USEPA's project website for the Solvents Recovery Service of New England, Inc. Superfund Site. Accessed February 24, 2009. http://www.epa.gov/region01/superfund/sites/srs.

ARCADIS, 2009. Draft Project Operations Plans for the Solvents Recovery Service of New England, Inc. Superfund Site. April 2009.

Acronyms and abbreviations used in this Annual Report and associated attachments:

1,1-DCE	1,1-dichloroethene
1,1,1-TCA	1,1,1-trichloroethane
1,2-DCA	1,2-dichloroethane
2,3,7,8-TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
ALEP	Action Level Exceedance Plan
AOC	Administrative Order on Consent
AQC	Air Quality Control System
ARARs	Applicable or Relevant and Appropriate Requirements
ATSDR	Agency for Toxic Substance and Disease Registry
B&M	Boston & Maine
BACT	Best Available Control Technology
BBL	Blasland, Bouck & Lee, Inc.
bgs	below ground surface
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
BTU	British Thermal Unit
°C	degrees Celsius
CA	chloroethane
CBYD	Call Before You Dig
cc	cubic centimeter
cDCE	cis-1,2-dichloroethene
CD	Consent Decree
CEMS	Continuous Emissions Monitoring System
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
CH_4	methane
CL&P	Connecticut Light & Power
CO_2	carbon dioxide
COCs	Constituents of Concern
CT	carbon tetrachloride
CTDEP	Connecticut Department of Environmental Protection
CTDPH	Connecticut Department of Public Health
CVOCs	Chlorinated Volatile Organic Compounds
CWA	Clean Water Act
DCE	dichloroethene
DCM	dichloromethane
DCP	Demonstration of Compliance Plan
ddms	*de maximis* Data Management Solutions
DHC	Dehalococcoides
DNAPL	dense non-aqueous phase liquid
DO	dissolved oxygen
DQA	Data Quality Assessment
DQOs	Data Quality Objectives

DRE	Destruction/Removal Efficiency
DRO	Diesel Range Organics
EISB	Enhanced In-Situ Bioremediation
ELUR	Environmental Land Use Restriction
ESD	Explanation of Significant Differences
°F	degrees Fahrenheit
$Fe(OH)_3$	ferrous hydroxide
f_{oc}	fraction of solid organic carbon in soil
FS	Feasibility Study
FSP	Field Sampling Plan
PMC	Pollutant Mobility Criteria applicable to designated Class “GA” groundwater areas
GAC	granular activated carbon
GCTEOS	Groundwater Containment and Treatment Evaluation and Optimization Study
gpm	gallons per minute
GRO	Gasoline Range Organics
GWPC	Groundwater Protection Criteria
GWTF	Groundwater Treatment Facility
H	Henry’s Law Constant
H_2	hydrogen
H_2O	water
H_2S	hydrogen sulfide
HAP	hazardous air pollutant
HCl	hydrochloric acid
HCTS	Hydraulic Containment and Treatment System
HDPE	High-Density Polyethylene
HLVs	Hazard Limiting Values
HZ	Heated Zone
ID	inner diameter
IFT	interfacial tension
IMS	Interim Monitoring and Sampling
IQAT	Independent Quality Assurance Team
IRIS	Integrated Risk Information System
ISTD	In-Situ Thermal Desorption
ISTR	In-Situ Thermal Remediation
J&E	Johnson & Ettinger
K_d	soil-water partition coefficient
kg	kilogram
K_{oc}	chemical-specific organic carbon partition coefficient
LAER	Lowest Achievable Emission Rate
lbs	pounds
LNAPL	light non-aqueous phase liquid
MAROS	Monitoring and Remediation Optimization System
MASC	Maximum Allowable Stack Concentration
MCLs	Maximum Contaminant Levels

MCLG	Maximum Contaminant Level Goal
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MIBK	4-methyl-2-pentanone (methyl isobutyl ketone)
mL	milliliter
MNA	Monitored Natural Attenuation
MOA	Memorandum of Agreement
N_2	nitrogen
NA	Natural Attenuation
NAPL	non-aqueous phase liquid
ng/L	nanograms per liter
NH_4^+	ammonia
NOAA	National Oceanic and Atmospheric Administration
NO_2^-	nitrite
NO_3^-	nitrate
NSR	New Source Review
NTCRA	Non-Time-Critical Removal Action
O_2	oxygen
O&M	Operations and Maintenance
OD	outer diameter
OH^-	hydroxyl radical
OIS	On-Site Interceptor System
OMM	Operation, Maintenance and Monitoring
ONOGU	Observed NAPL in the Overburden Groundwater Unit
ORP	oxidation-reduction potential
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste and Emergency Response
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PCDDs	polychlorinated dibenzo-p-dioxins
PCDFs	polychlorinated dibenzofurans
PCE	tetrachloroethylene
PCR	Polymerase Chain Reaction
PEL	Permissible Exposure Limit
PFD	process flow diagram
PID	photoionization detector
PIPP	Pre-ISTR Preparation Plan
PLC	Programmable Logic Controller
POP	Project Operations Plan
ppb	parts per billion
PPE	personal protective equipment
ppm	parts per million
PSD	Prevention of Significant Deterioration
psig	pounds per square inch, gauge
PVC	polyvinyl chloride
QAPP	Quality Assurance Project Plan

R^2	correlation coefficient
RAOs	Response Action Objectives
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RDWP	Remedial Design Work Plan
RD/RA	Remedial Design/Remedial Action
Redox	Reduction-Oxidation
RDEC	Residential Direct Exposure Criteria
RH	Relative Humidity
RI	Remedial Investigation
ROD	Record of Decision
RSRs	Remediation Standard Regulations
SAP	Sampling and Analysis Plan
SCAP	Supplemental Containment Action Plan
SCM	Site Conceptual Model
SO_4^{2-}	sulfate
SOP	Standard Operating Procedure
SOW	Statement of Work
SPLP	Synthetic Precipitation Leaching Procedure
SRSNE	Solvents Recovery Service of New England, Inc.
SSO	Site Safety Officer
SVOCs	semi-volatile organic compounds
SWD	Southington Water Department
SWPC	Surface Water Protection Criteria
TAL	Target Analyte List
TCE	trichloroethylene
TCH	thermal conduction heating
TCLP	Toxicity Characteristic Leaching Procedure
TEFs	Toxic Equivalency Factors
TEQ	Toxic Equivalence Quotient
TEX	Toluene, Ethylbenzene and Xylenes
TSCA	Toxic Substances Control Act
TTZ	thermal treatment zone
ug/L	micrograms per liter
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UV	ultraviolet
VC	vinyl chloride
VI	Vapor Intrusion
VOC	volatile organic compound
WHO	World Health Organization

Tables

Table 1

Summary of Activities Completed

October 30, 2008-October 31, 2016

TABLE 1.0
Summary of Activities Completed
October 31, 2010 through October 30, 2016

Document Name / Activity	Author(s)	Date Submitted	Date Approved	Type
Final RDWP and POP	ARCADIS	11/19/2010	pending	Deliverable under SOW
Response to Comments on ISTR Conceptual Design	TerraTherm	12/3/2010	7/7/2011	Deliverable under SOW
Annual State of Compliance Report #2	de maximis	12/20/2010	pending	Deliverable under SOW
PIPP Winter Stabilization Plan	de maximis	12/30/2010	pending	Deliverable under SOW
Vapor Intrusion Technical Memorandum	EPA	10/27/2010	1/19/2011	Conditional Approval
Data Comparison - Groundwater Sampling Techniques	ARCADIS	1/4/2011	N/A	Technical Memorandum
Updates to Existing MODFLOW Groundwater Flow Model	ARCADIS	1/5/2011	N/A	Technical Memorandum
Data Comparison - Groundwater Sampling Techniques	ARCADIS	2/10/2011	N/A	Technical Memorandum
Draft Institutional Controls Plan	de maximis/ARCADIS	2/18/2011	pending	Deliverable under SOW
Comments on Response to Comments on ISTR Conceptual Design	EPA	3/2/2011	7/7/2011	EPA comments
PIPP Sheetpile Wall Extension Design	ARCADIS	3/21/2011	4/22/2011	Deliverable under SOW
Data Comparison - HydraSleeve vs. Low-Flow Groundwater Sampling Techniques	ARCADIS	3/22/2011	N/A	Technical Memorandum
Response to Comments on Response to Comments on ISTR Conceptual Design	TerraTherm	4/6/2011	7/7/2011	Deliverable under SOW
Bedrock Outcrop Study	ARCADIS	4/20/2011	N/A	Technical Memorandum
Supplementary Vapor Intrusion Technical Memorandum	ARCADIS	6/6/2011	pending	Deliverable under SOW
Bedrock Modeling Memorandum	ARCADIS	6/6/2011	N/A	Technical Memorandum
Comments on Vapor Intrusion Technical Memorandum	EPA	6/15/2011	pending	EPA comments
ISTR Conceptual Design Approval	EPA	7/7/2011	7/7/2011	Approval
Technical Memorandum - Proposed Use of Hydrasleeve Sampling	ARCADIS	7/8/2011	7/8/2011	Technical Memorandum
Approval of ISTR 100% Wellfield Design	EPA	9/23/2011	9/23/2011	EPA Approval
Comments on Draft Memorandum of Agreement with Town and Southington Water Department	EPA	10/28/2011	pending	EPA comments
Annual State of Compliance Report #3	de maximis	1/12/2012	pending	Deliverable under SOW
Screen Volume Purge vs lowflow groundwater metholds	de maximis	5/11/2011	5/21/2012	Approval
Submittal for the use of hydrosleeve during interim sampling events	de maximis	1/4/2011	6/12/2012	Approval
Annual State of Compliance Report #4	de maximis	1/3/2013	pending	Deliverable under SOW
PIPP Completion Report	ARCADIS	4/3/2013	N/A	Technical Repot
Revised Institutional Controls Plan	de maximis / ARCADIS	5/21/2013	pending	Deliverable under SOW
Revised Draft ISTR work plan and POP	TerraTherm	7/8/2013	pending	Deliverable under SOW
Comments on revised Draft ISTR Work Plan and POP	EPA/CTDEEP	9/30/2013	N/A	EPA /CTDEEP comments
Response to EPA and CTDEEP comments on revised DRAFT ISTR Work Plan and POP	de maximis	10/26/2013	pending	Deliverable under SOW
Annual State of Compliance Report #5	de maximis	3/3/2013	pending	Deliverable under SOW
Annual State of Compliance Report #6	de maximis	3/4/2014	pending	Deliverable under SOW
Approval of In Situ Thermal Remediation Final (100%) Design	de maximis	7/10/2014	4/18/2014	Deliverable under SOW
Revised Supplemental Containment Action Plan	de maximis	10/13/2014	11/5/2014	Deliverable under SOW
Draft In-Situ Thermal Remediation Construction Completion Report	de maximis	4/6/2015	N/A	Deliverable under SOW
Comments on Draft In-Situ Thermal Remediation Construction Completion Report	EPA/CTDEEP	9/10/2015	N/A	EPA /CTDEEP comments
Revised Conceptual Site Model	de maximis	4/29/2015	pending	Deliverable under SOW
Draft Soil Sampling Plan – SIP Delineation and Additional Dioxin Characterization	de maximis/ARCADIS	6/30/2015	N/A	
Final Soil Sampling Plan – SIP Delineation and Additional Dioxin Characterization	de maximis	8/24/2015	8/24/2015	
Final In-Situ Thermal Remediation Construction Completion Report	de maximis	9/18/2015	9/22/2015	Deliverable under SOW
2nd Five Year Review	EPA	9/24/2015	9/24/2015	
Treatment System Optimization Request	de maximis	10/30/2015	pending	
Annual State of Compliance Report #7	de maximis	3/20/2016	pending	Deliverable under SOW
RCRA CAP 100% RD and RAWP report	de maximis/ARCADIS	3/31/2016	N/A	Deliverable under SOW
Comments on RCRA CAP 100% RD and RAWP report	EPA	4/20/2016		EPA Comments
Final RCRA CAP 100% RD and RAWP Report	de maximis/ARCADIS	9/28/2016	10/19/2016	Deliverable under SOW
Annual State of Compliance Report #7	de maximis	3/20/2016	pending	Deliverable under SOW

Table 2

N-1

Groundwater Monitoring Network and Sampling Events

Table N-1.
Groundwater Monitoring Network and Sampling Events
SRSNE Superfund Site, Southington, CT

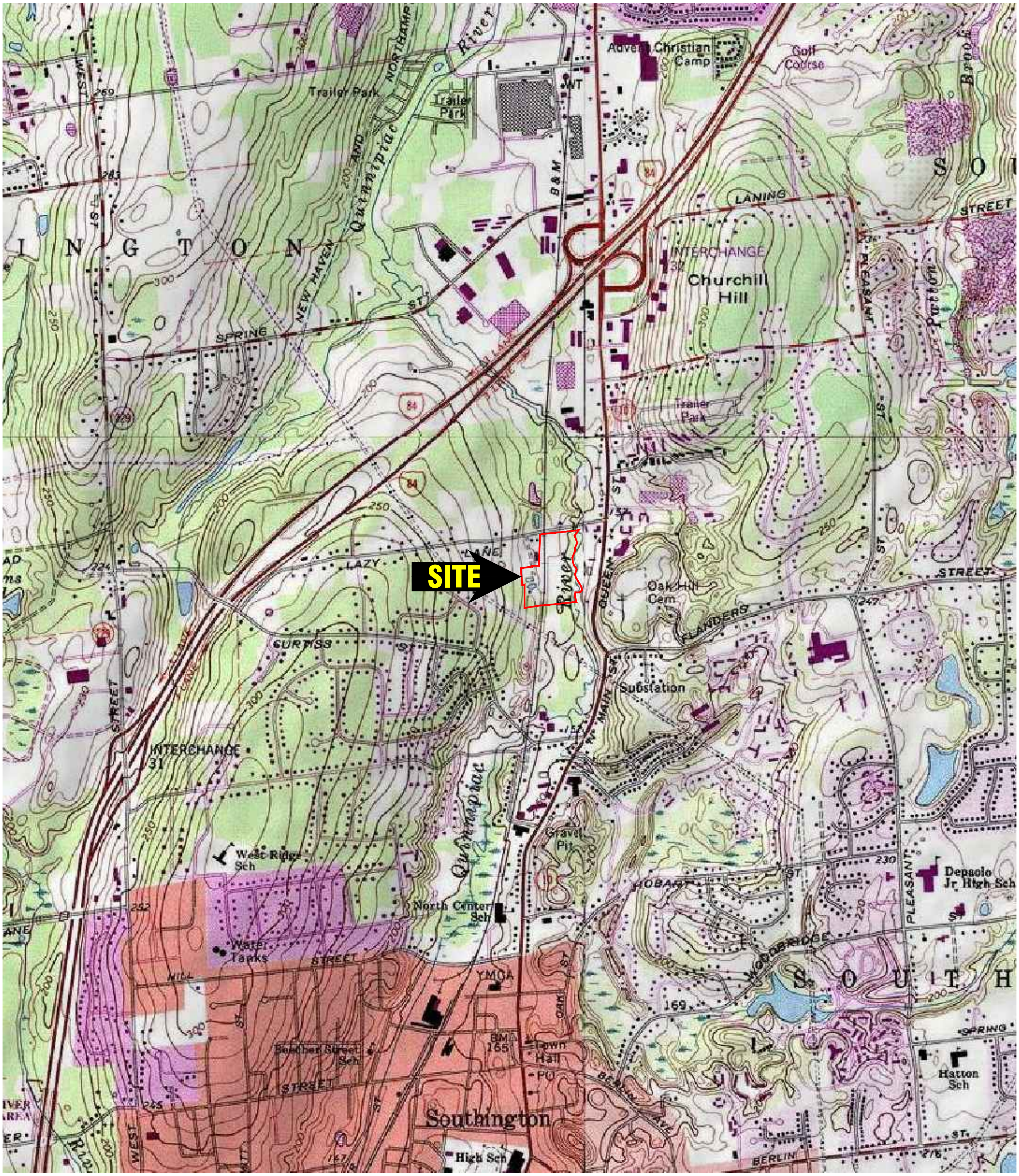
Well Group	# Wells	Sampling Period	Sampling Frequency	Analytical Parameters
"C" wells	83	first comprehensive event	1 event	VOCs, alcohols, 1,4-dioxane, TAL metals, PAHs, PCBs
"R" wells	30			VOCs, alcohols, 1,4-dioxane, TAL metals, PAHs, PCBs, MNA parameters
"N" wells	10			VOCs, alcohols, 1,4-dioxane, TAL metals, PAHs, PCBs, MNA parameters
"M" wells	5			TAL metals, MNA parameters (background)
"B" wells	3			TAL metals (background)
"C" wells	83	subsequent comprehensive events	every 5 years	VOCs, 1,4-dioxane, TAL metals
"R" wells	30			VOCs, 1,4-dioxane, TAL metals, MNA parameters
"N" wells	10			VOCs, 1,4-dioxane, TAL metals, MNA parameters
"M" wells	5			TAL metals, MNA parameters
"B" wells	3			TAL metals
"R" wells	30	after first comprehensive event	annual	VOCs
			biennial	MNA parameters
"M" wells	5	after first comprehensive event	annual	TAL metals (background)
			biennial	MNA parameters (background)
"B" wells	3	after first comprehensive event	annual	TAL metals (background)
"N" wells - overburden	8	before thermal treatment	biennial	VOCs, MNA parameters
		during thermal treatment	annual	VOCs, MNA parameters
		after thermal, before equilibrium	3x / year	VOCs, MNA parameters
		after equilibrium	annual	VOCs
			biennial	MNA parameters
"N" wells - bedrock	2	before thermal treatment	annual	VOCs, MNA parameters
		during thermal treatment	annual	VOCs, MNA parameters
		after thermal, before equilibrium	3x / year	VOCs, MNA parameters
		after equilibrium	annual	VOCs
			biennial	MNA parameters
"W" wells	35	all comprehensive events	every 5 years	Water levels only - during all comprehensive events

Notes:

1) biennial = once every two years

VOCs = Volatile Organic Compounds
TAL = Target Analyte List
PAHs = Polycyclic Aromatic Hydrocarbons
PCBs = Polychlorinated Biphenyls
MNA = Monitored Natural Attenuation

Figures



SOURCE: TOPO!
QUAD: MERIDEN, CT
DATE: 1992

0 2000' 4000'
GRAPHIC SCALE

SRSNE SUPERFUND SITE
SOUTHINGTON, CONNECTICUT

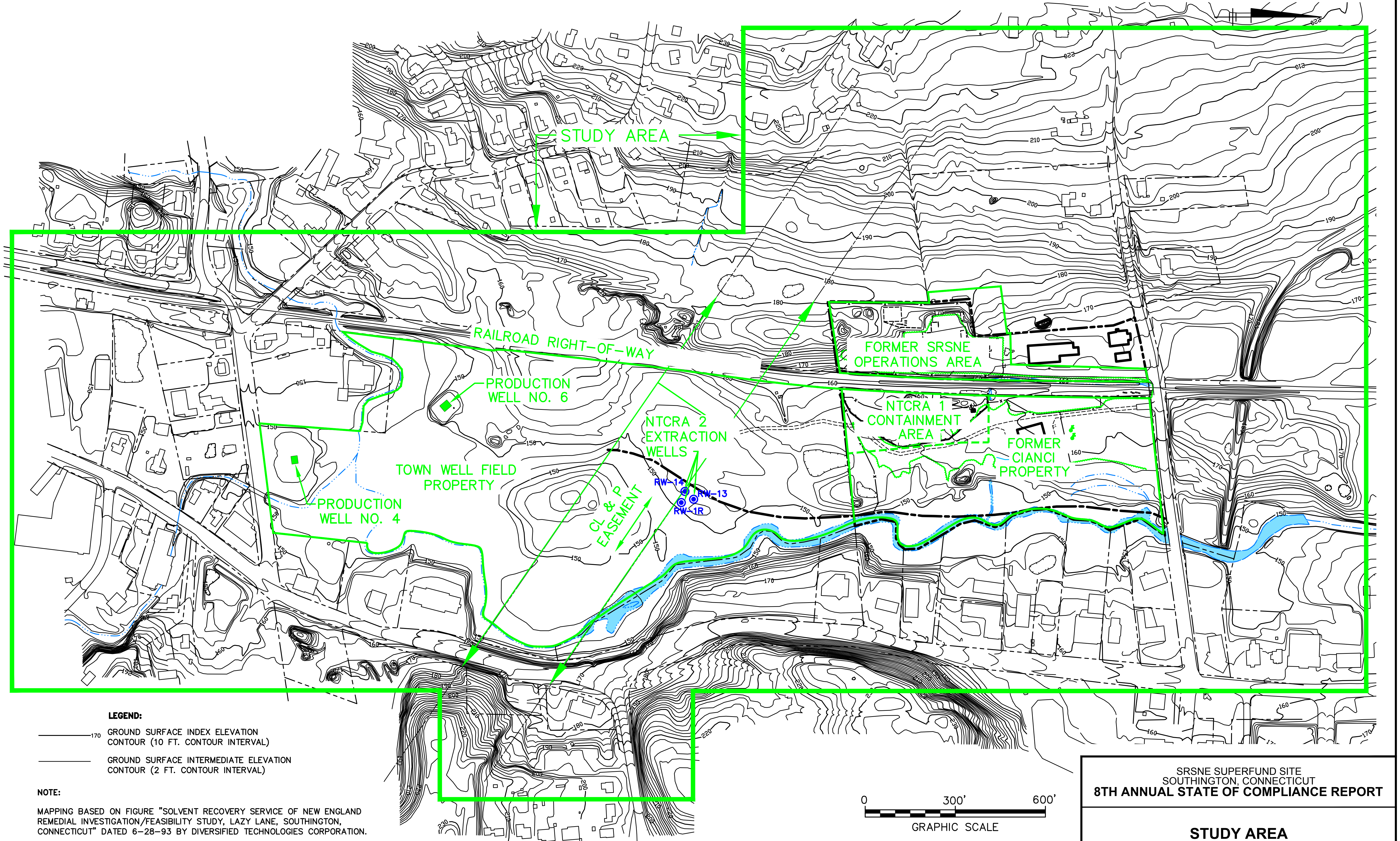
8TH ANNUAL STATE OF COMPLIANCE REPORT

SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

CITY: MANCHESTER DIV/GROUP: ENVCAD DB: B.SMALL PM: TM:
G:\ENVCAD\Manchester\ACT\B0054634\0001\00100\8th Annual Report\Site Location Map.dwg LAYOUT: 1 SAVED: 3/23/2016 11:13 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 3/29/2017 10:11 AM BY: SMALL, BRIAN



LEGEND:

——170	GROUND SURFACE INDEX ELEVATION CONTOUR (10 FT. CONTOUR INTERVAL)
——	GROUND SURFACE INTERMEDIATE ELEVATION CONTOUR (2 FT. CONTOUR INTERVAL)

NOTE:

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.

0 300' 600'
GRAPHIC SCALE

SRSNE SUPERFUND SITE
SOUTHINGTON, CONNECTICUT
8TH ANNUAL STATE OF COMPLIANCE REPORT

STUDY AREA

ARCADIS Design & Consultancy for natural and built assets

FIGURE
2

CITY: SYRACUSE, NY GROUP: ENVCAD DB: P. LISTER, R. BASSETT, P. LISTER PM: M. GEFELL TR: R. STEVENSON LYR: ON=*;OFF=REF
G:\ENVCAD\Manchester\ACT\B0054634\0001\00100\8th Annual Report\54634B02.DWG LAYOUT: 2 SAVED: 3/23/2016 11:08 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 3/29/2017 10:11 AM BY: SMALL, BRIAN
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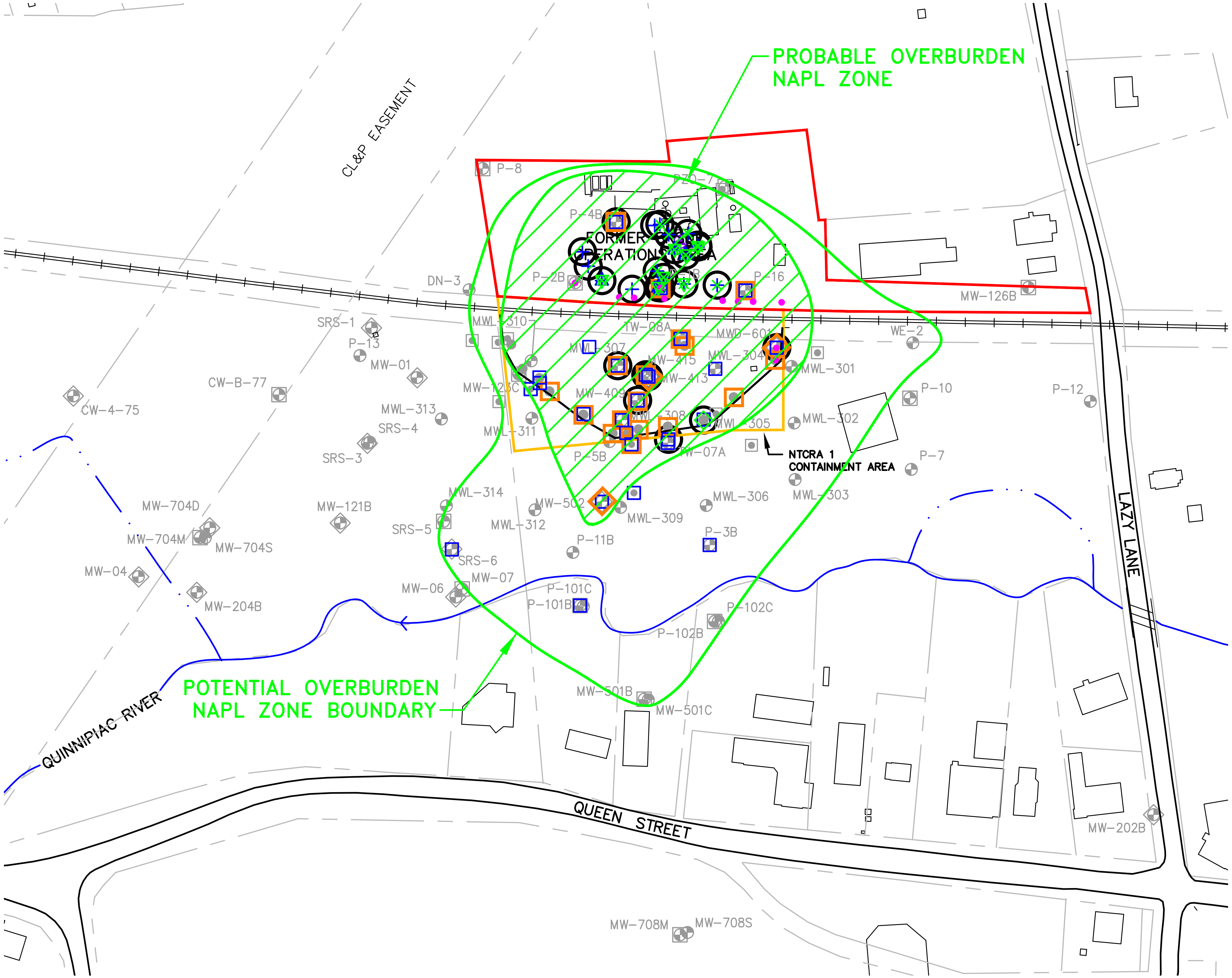
54634X02



LEGEND:

○	SATURATED SOIL AND/OR GROUND-WATER SAMPLING LOCATION WITH VOCs DETECTED >10% OF EFFECTIVE SOLUBILITY (MATHEMATICAL AND/OR EMPIRICAL EVALUATION)
□	GROUND-WATER SAMPLING LOCATION WITH VOCs DETECTED >1% OF EFFECTIVE SOLUBILITY (MATHEMATICAL EVALUATION)
◇	GROUND-WATER SAMPLE WITH VOCs DETECTED >1% OF EMPIRICAL SOLUBILITY
□	GROUND-WATER SAMPLING LOCATION WITH ALCOHOLS DETECTED
●	OTHER LOCATIONS WHERE NAPL VISUALLY OBSERVED, OR IDENTIFIED BY SHEEN OR POSITIVE HYDROPHOBIC DYE TEST
+	SOIL SAMPLE WITH VOCs DETECTED >10% OF EFFECTIVE SOLUBILITY CALCULATED IN PORE WATER (MATHEMATICAL EVALUATION)
△	SOIL SAMPLE WITH VOCs DETECTED >100% OF EFFECTIVE SOLUBILITY CALCULATED IN PORE WATER (MATHEMATICAL EVALUATION)
×	SOIL SAMPLE WITH VOCs DETECTED >10% OF EMPIRICAL SOLUBILITY CALCULATED IN PORE WATER
▽	SOIL SAMPLE WITH VOCs DETECTED >100% OF EMPIRICAL SOLUBILITY CALCULATED IN PORE WATER
⊕	VADOSE SOIL SAMPLE WITH VOCs DETECTED >100% OF EMPIRICAL SOLUBILITY CALCULATED IN PORE WATER
MW-704S ◐	SHALLOW OVERBURDEN MONITORING WELL
P-10 ◐	MIDDLE OVERBURDEN MONITORING WELL
MW-121B ◇	DEEP OVERBURDEN MONITORING WELL
●	NTCRA 1 EXTRACTION WELL
▣	NTCRA 1 COMPLIANCE PIEZOMETER

NOTE:

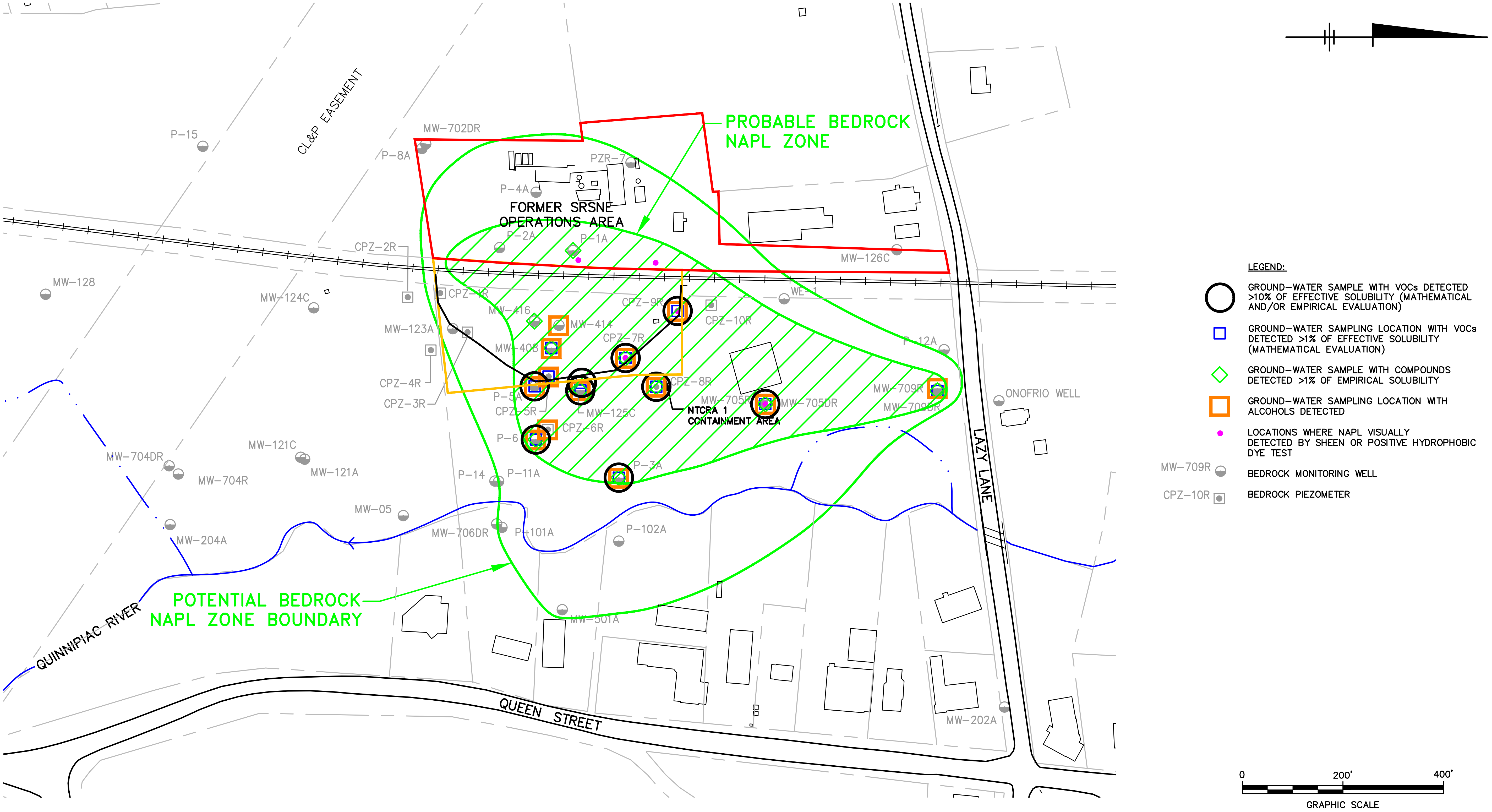
1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

SRSNE SUPERFUND SITE
SOUTHINGTON, CONNECTICUT
8TH ANNUAL STATE OF COMPLIANCE REPORT

ESTIMATED NAPL-ZONE BOUNDARY IN OVERBURDEN

ARCADIS Design & Consultancy for natural and built assets

FIGURE
3A



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.

SRSNE SUPERFUND SITE
SOUTHINGTON, CONNECTICUT
8TH ANNUAL STATE OF COMPLIANCE REPORT

ESTIMATED NAPL-ZONE BOUNDARY IN BEDROCK

ARCADIS Design & Consultancy for natural and built assets

FIGURE
3B

CITY: SYRACUSE DIV/GROUP: ENVCAD DB: PGL LAF GMS LD:(Opt) PIC: G. CAMERON PM: J. HOLDEN TM: J. HOLDEN LYR: ON=*;OFF=*REF*, |CONCRETE, |FLOODPLAIN
G:\ENVCAD\Manchester\ACT\B0054634\0001\00100\8th Annual Report\54634G04.DWG LAYOUT: 4 SAVED: 3/23/2016 11:04 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 3/29/2017 10:12 AM BY: SMALL, BRIAN
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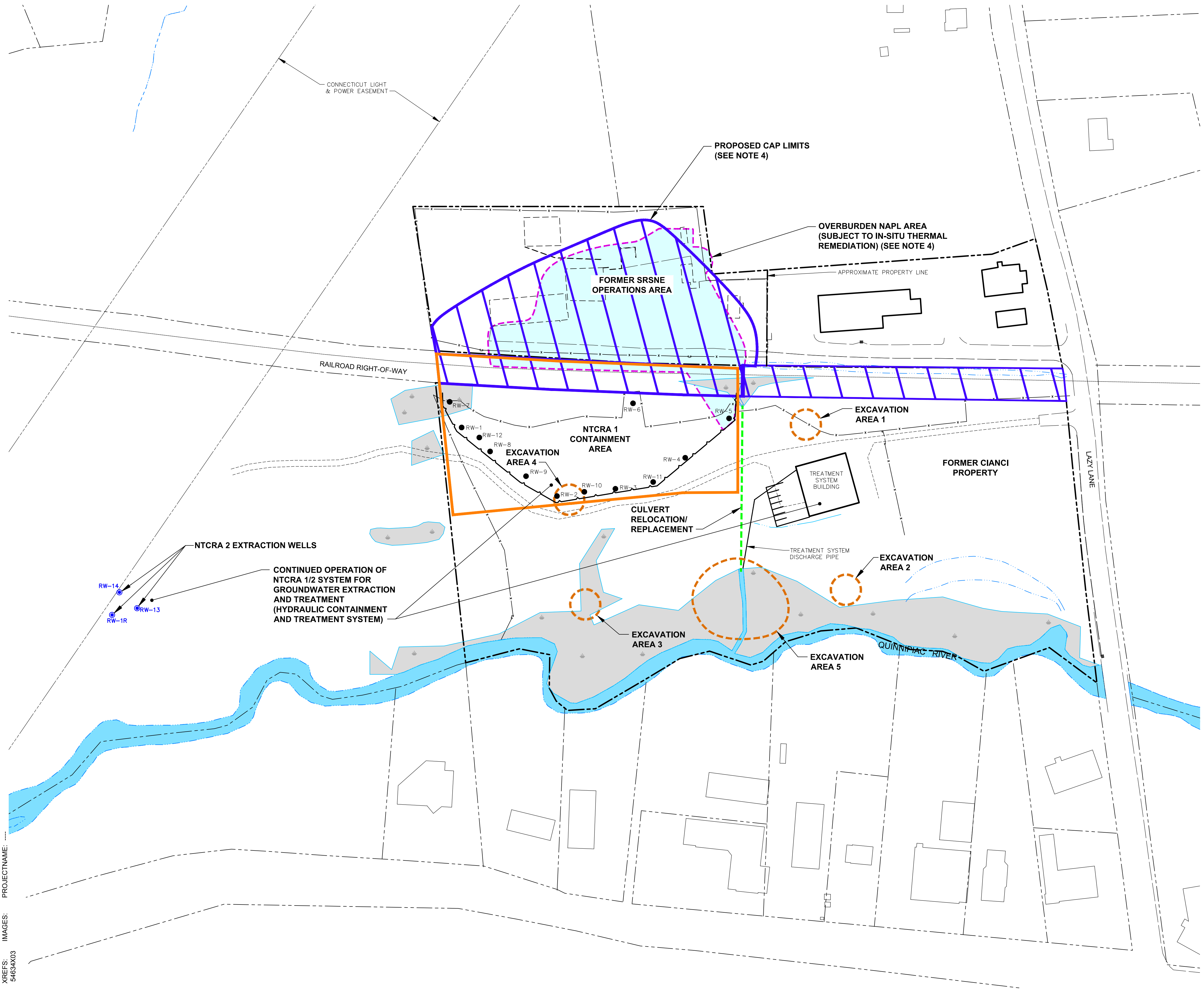


LEGEND:

- PROPERTY LINE
- PROPERTY LINE – ADJOINER
- BUILDING
- BUILDING – ADJOINER
- FORMER BUILDING
- RAILROAD
- ROAD
- GRAVEL ROAD
- DRAINAGE SWALE
- RIVER
- EASEMENT
- CHAINLINK FENCE
- AREA OF DISCRETE SOIL REMOVAL ON FORMER CIANCI PROPERTY (SEE NOTE 4)
- SHEETPILE
- WETLAND
- RW-1● NTCRA 1 OVERBURDEN EXTRACTION WELL

NOTES:

1. SITE PLAN TAKEN FROM DIVERSIFIED TECHNOLOGIES CORP., 556 WASHINGTON AVE., NORTH HAVEN, CT, DATED 6/93. TOPOGRAPHY REPORTED TO HAVE BEEN DIGITIZED FROM TOWN OF SOUTHINGTON TOPOGRAPH MAPS G–7, G–8, G–9; PHOTOGRAPHY DATED NOV. 1978, SCALE: 1"=100'. PROPERTY LINES REPORTED TO HAVE BEEN DIGITIZED AND LOT NUMBERS TAKEN FROM "PROPERTY MAP, TOWN OF SOUTHINGTON" MAPS 134 & 147, SCALE: 1"=100' BY DIVERSIFIED TECHNOLOGIES CORPORATION.
2. BENCHMARK #1 IS AT ELEVATION 164.03. PK NAIL; S'LY SIDE; POLE #9049.
3. WETLAND AREAS WERE TAKEN FROM THE FINAL REMEDIAL INVESTIGATION REPORT (HNUS 1994).
4. THE LIMITS OF REMEDIAL ACTIVITIES ARE PRELIMINARY AND ARE SUBJECT TO CONFIRMATION/MODIFICATION BASED ON REMEDIAL DESIGN ACTIVITIES.

0 80' 160'
GRAPHIC SCALE

SRSNE SUPERFUND SITE
SOUTHINGTON, CONNECTICUT
8TH ANNUAL STATE OF COMPLIANCE REPORT

PLANNED REMEDIAL ACTIVITIES

ARCADIS Design & Consultancy for natural and built assets

FIGURE
4

Attachments

Attachment 1

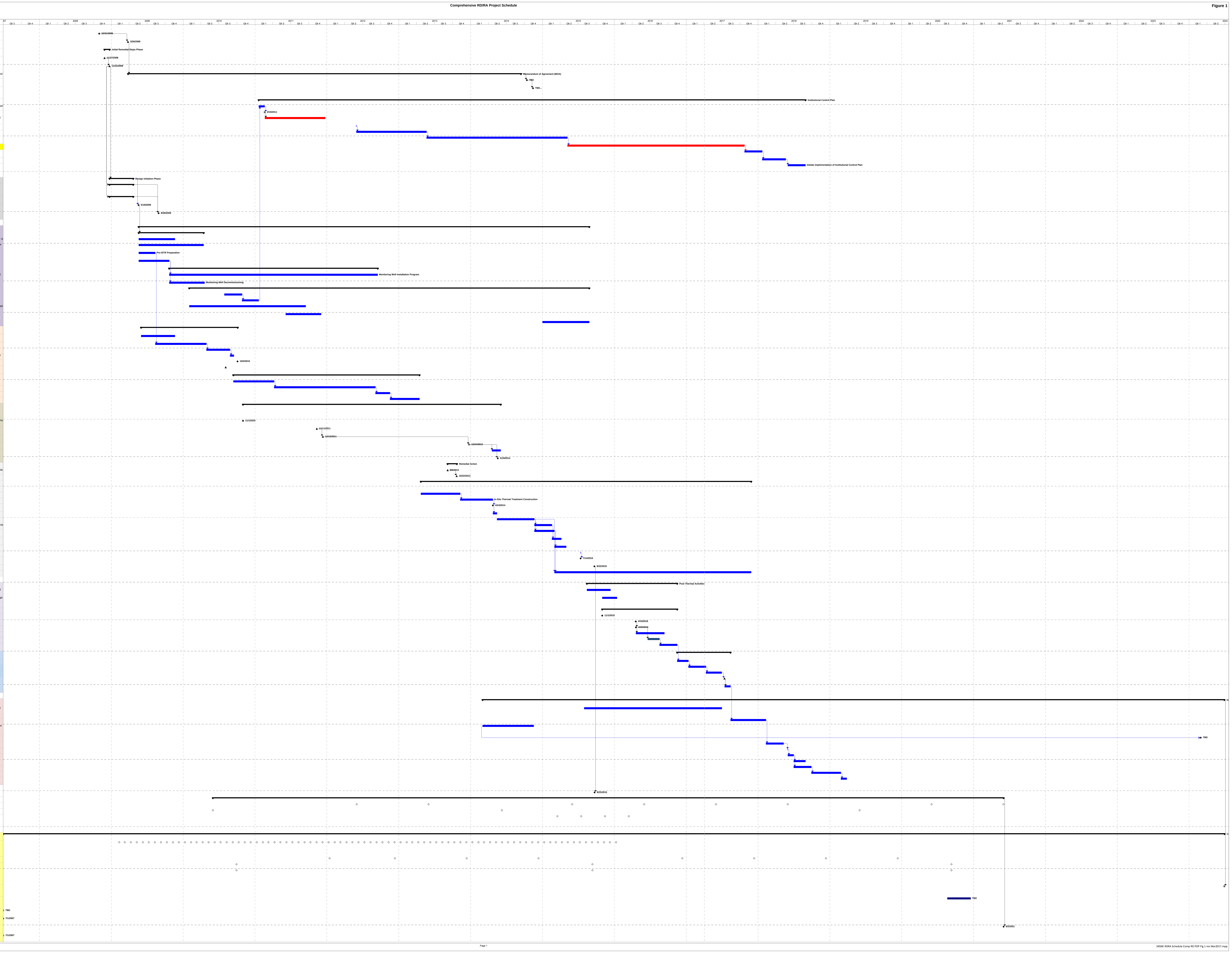
Project Schedule

de maximis, inc.

Comprehensive RD/RA Project Schedule

Figure 1

ID	Deliverable/Activity	Trigger	Time Frame	SOW Sections	Start Date	Finish Date	Duration	Predecessors	Notes/Status
0	**RDRA Schedule**				**Sun 7/1/07**	**Fri 6/28/24**	**6208 da...**		
1	**Lodging of the Consent Decree**				Fri 10/31/08	Fri 10/31/08	1 day		
2	**Entry of the CD**				Thu 3/26/09	Thu 3/26/09	1 day	1	
3	**Initial Remedial Steps Phase**	EPA Approval of Contractors		**V.B**	Thu 11/27/08	Mon 12/22/08	26 days		
4	**Notification of Supervising Contractor/Project Coordinator**	Lodging of the CD	Satisfied in the draft SOW.	**V.B.1**	Thu 11/27/08	Thu 11/27/08	1 day		
5	**Notification/Selection of a Remedial Design Contractor**	Lodging of the CD	Notification/Selection of a Remedial Design Contractor	**V.B.2**	Mon 12/22/08	Mon 12/22/08	1 day	4	
6	**Memorandum of Agreement (MOA)**	Entry of the CD.	Within 180 days of Entry of CD	**V.B.3**	Fri 3/27/09	Sat 9/13/14	1997 days	**2**	Drafts provided to EPA; latest
10	**Supplemental Containment Action Plan**	EPA Approval of MOA	Within 30 days of signed MOA.	**V.B.5**	Tue 10/14/14	Tue 10/14/14	1 day	9FS+30 days,6	
11	**Implementation of Supplemental Containment Action Plan (TBD)**	Upon notification by EPA, and consistent with the terms of the Memorandum of Agreement	As specified by EPA.	**V.B.6**	Fri 11/14/14	Fri 11/14/14	1 day	10FS+30 days	
12	**Institutional Control Plan**	Completion of Vapor Intrusion Study	Within 30 days of completion of Vapor Intru	**V.B.7**	**Thu 1/20/11**	**Wed 8/29/18**	**2779 days**		
13	Develop Institutional Control Plan	Completion of Vapor Intrusion Study	Within 30 days of completion of Vapor Intru		Thu 1/20/11	Fri 2/18/11	30 days	62	triggered by initial VI, not add'l
14	Submit Institutional Control Plan				Sat 2/19/11	Sat 2/19/11	1 day	13	
15	Agency Review and Comment On Institutional Control Plan				Sun 2/20/11	Fri 12/23/11	307 days	14	Agency comments 12/23/11
16	IC Meeting				Tue 5/29/12	Tue 5/29/12	1 day		
17	Revised Institutional Control Plan				Wed 5/30/12	Tue 5/21/13	357 days	16	5/21/13 submittal
18	Revised Institutional Control Plan #2				Wed 5/22/13	Thu 5/7/15	716 days	17	latest version to agencies 5/21/13
19	Agency Review and Comment				Fri 5/8/15	Mon 10/23/17	900 days	18	target date for approval?
20	Revised IC Plan #3	Agency comments; revised regulations; changed conditions			Tue 10/24/17	Sun 1/21/18	90 days	19	
21	Agency Review and Approval				Mon 1/22/18	Mon 5/21/18	120 days	20	
22	Initiate Implementation of Institutional Control Plan		Within ten (10) days of receipt of EPA's approval or modification of the INSTITUTIONAL CONTROL PLAN	**V.B.8**	Fri 6/1/18	Wed 8/29/18	90 days	21FS+10 days	
23									
24	**Design Initiation Phase**			**V.C**	Tue 12/23/08	Tue 4/21/09	120 days?	**5**	
25	**Remedial Design Work Plan (RDWP)**	EPA approval of RD Contractor.	Within one hundred twenty (120) days of receipt of EPA's written notice of authorization to proceed	**V.C.1**	Tue 12/23/08	Tue 4/21/09	120 days?	**5SS**	
42	**Remedial Design Project Operations Plan (POP)**	EPA approval of RD Contractor.	Within 120 days of EPA approval.	**V.C.2**	Tue 12/23/08	Tue 4/21/09	120 days	**5SS**	
48	**Agency Review and Comment on Accelerated Pre Design Studies**				Tue 5/19/09	Tue 5/19/09	1 day?	24	
49	**Agency Review and Comment on Remedial Design Work Plan and POP**				Sat 8/29/09	Sat 8/29/09	1 day?	42FS+30 days,25	
50									
51	**Pre-Design Studies**				Wed 5/20/09	Wed 8/26/15	2290 days?		
52	**Accelerated Pre-Design Studies**				**Wed 5/20/09**	**Wed 4/14/10**	**330 days**	**48**	
53	Overburden NAPL Delineation Study			**V.C.1.a**	Wed 5/20/09	Thu 11/19/09	184 days	26	11/19/09 to EPA; approved 12
54	Habitat Restoration Study			**V.C.1.h**	Wed 5/20/09	Wed 4/14/10	330 days	33	rpt included with 100% PIPP design
55	Pre-ISTR Preparation				Wed 5/20/09	Tue 8/11/09	84 days	39	PIPP approved by EPA 8/11/09
56	Groundwater Monitoring Well Network Evaluation			**V.C.1.m**	Wed 5/20/09	Wed 10/21/09	155 days	40	submitted 10/21/09
57	**Groundwater Pre-design Studies**				**Thu 10/22/09**	**Sat 9/15/12**	**1060 days**		
58	Monitoring Well Installation Program			IV.B.5.a	Thu 10/22/09	Sat 9/15/12	1060 days	56	last well installed Sept 2012
59	Monitoring Well Decommissioning			IV.B.5.a	Thu 10/22/09	Mon 4/19/10	180 days	56	
60	**Vapor Intrusion Study**			**V.C.1.k**	**Mon 2/1/10**	**Wed 8/26/15**	**2033 days?**		
61	Initial VI Study				Thu 7/29/10	Tue 10/26/10	90 days		memo to EPA 10/26/10
62	USEPA Review and Approval				Wed 10/27/10	Wed 1/19/11	85 days	61	EPA approved 1/19/11
63	Follow-up Groundwater Sampling Round	6 Months Following Initial Sampling Event			Mon 2/1/10	Thu 9/15/11	592 days?		4 rounds conducted; last Sept 2011
64	Revised Vapor Intrusion Study				Mon 6/6/11	Fri 12/2/11	180 days		Last memo 12/2/11; Approved by EPA 5/14/12
65	Supplemental Vapor Intrusion Study	EPA Request			Thu 1/1/15	Wed 8/26/15	238 days?		memo dated 8/26/15
66	**Pre-ISTR Detailed Design (PIPP)**	EPA approval or modification of Conceptual Design.	Within 90 days of notice by EPA.	**V.E.1**	Mon 6/1/09	Mon 10/4/10	491 days		
67	NAPL Delineation Investigation Report				Mon 6/1/09	Thu 11/19/09	172 days		rpt submitted 11/19/09
68	Pre-ISTR Design Report			**V.E.1.h,i**	Wed 8/12/09	Wed 4/28/10	260 days	55	
69	USEPA Review and Conditional Approval			**V.E.1.i**	Thu 4/29/10	Thu 8/26/10	120 days	68	
70	Response to Final Comments				Fri 8/27/10	Wed 9/15/10	20 days	69	response submitted 9/15/10
71	Final "For Construction" Drawings				Mon 10/4/10	Mon 10/4/10	1 day		
72	**Technical Information Meeting**	Submittal of 100% Design.		**V.E.2**	Thu 8/5/10	Thu 8/5/10	1 day		estimated date
73	**PIPP Construction Activities**				**Mon 9/13/10**	**Mon 4/15/13**	**946 days**		
74	Initial PIPP Work				Mon 9/13/10	Thu 4/7/11	207 days		
75	Break For Fiber Optic Relocation				Fri 4/8/11	Mon 9/3/12	515 days	74	reloc completed 8/1/12
76	Complete PIPP Work				Tue 9/4/12	Fri 11/16/12	74 days	75	
77	PIPP Completion Report				Sat 11/17/12	Mon 4/15/13	150 days	76	Rpt submitted April 2013
78	**ISTR Design Process**	EPA approval or modification of RD Work Plan.	Within 120 days of EPA approval that necessary pre-design studies to be described in the RD Work Plan are complete.	**V.D.1**	Mon 11/1/10	Mon 6/2/14	1310 days?		
79	"75%" Design Package (including ISTR-related RDWP studies)			**V.C.1.b,d,e** **V.D.1.a**	Mon 11/1/10	Mon 7/18/11	260 days		Initial design submittal to EPA July 2011
80	Technical Information Meeting			**V.D.3**	Fri 11/11/11	Fri 11/11/11	1 day		estimated date
81	Rounds of Submittals and EPA Review/Comment				Mon 12/12/11	Mon 12/23/13	743 days	80FS+30 days	Upload Revised Design 12/23/13
82	USEPA Review, Comments, Responses				Tue 12/24/13	Fri 4/18/14	116 days	81	approved 4/18/14
83	Final Design Reports Submitted, including O&M Plan, RA POP, ERP				Sat 4/19/14	Mon 6/2/14	45 days	82	Date of TT uploads?
84	Technical Information Meeting				Mon 5/19/14	Mon 5/19/14	1 day?	82FS+30 days	confirm actual date?
85	**Remedial Action**	EPA approval or modification of the F	Within 120 days of notice by EPA.	**VI**	Fri 9/6/13	Tue 10/22/13	47 days		
86	Pre-construction Conference(s)	EPA approval or modification of Final	Within 30 days of notice by EPA.	**VI.C**	Fri 9/6/13	Fri 9/6/13	1 day		date of EPA/DEEP mtg at site
87	Pre-construction Public Meeting(s)	EPA approval or modification of Final	Within 45 days of notice by EPA.	**VI.D**	Tue 10/22/13	Tue 10/22/13	1 day	86FS+45 days	9/7/13
88	**ISTR**	**EPA approval or modification of Fi**	**Within 60 days of notice by EPA.**	**VI.E**	**Tue 4/23/13**	**Sun 11/26/17**	**1679 days?**		
89	Meetings During Construction	Start of Construction	Weekly during construction	VI.F	Tue 4/23/13	Tue 4/23/13	1 day?	90SS	
90	Wellfield Installation				Tue 4/23/13	Fri 11/8/13	200 days		
91	In-Situ Thermal Treatment Construction				Sat 11/9/13	Wed 4/23/14	166 days	90	
92	Thermal Final Construction Inspection	Within 60 days of notice by Settling Defendants.		**VI.G**	Thu 4/24/14	Thu 4/24/14	1 day?	91	EPA/DEP on site 4/24/14
93	Shakedown/Testing				Thu 4/24/14	Wed 5/14/14	21 days	91	
94	Implementation of Thermal Treatment				Thu 5/15/14	Fri 11/21/14	190 edays		Start 5/15/14
95	Soil Sampling and Data Evaluation				Fri 11/21/14	Tue 2/17/15	89 days	94	2 phases, plus multiple rounds
96	Additional Operation of Thermal Treatment System (if required)				Fri 11/21/14	Mon 3/2/15	102 days	94	shutdown on 3/2/15
97	Demonstration of Completion		Documented request for shutdown and rationale	N/A	Wed 2/18/15	Mon 4/6/15	48 days	95	final submitted 4/6/15
98	Demobilize				Tue 3/3/15	Fri 5/1/15	60 days	96	
99	Final Construction Inspection				Mon 7/13/15	Mon 7/13/15	1 day?		
100	Submit Construction Completion Report (Draft and Final)	Draft within 30 days of Final Construction Inspection.	Within 30 Days	**VI.H**	Tue 7/14/15	Fri 9/18/15	67 days	99	submitted 9/18/15
101	Agency Approval of Completion Report				Tue 9/22/15	Tue 9/22/15	1 day?		
102	Time to Achieve Equilibrium	ISTR shutdown	initial estimate 2 yrs; revised based on data		Tue 3/3/15	Sun 11/26/17	1000 days	94,96	
103									
104	**Post Thermal Activities**				Sat 8/15/15	Tue 11/15/16	459 days		
105	Soil Investigation (SIP)	After In-Situ Thermal to re-assess the size of the area to be capped		**V.C.i**	Sat 8/15/15	Sat 12/12/15	120 days		SIP summary memo Dec'15
106	Vapor Control System Evaluation	After In-Situ Thermal to determine whether (or not) a vapor control system is needed below the cap.		**V.C.j**	Sun 11/1/15	Thu 1/14/16	75 days		Included with design package
107	**Soil & RCRA C Cap Design**				**Sun 11/1/15**	**Tue 11/15/16**	**381 days**		
108	Draft Design Package				Sun 11/1/15	Thu 3/31/16	152 days		
109	Technical Information Meeting				Tue 4/19/16	Tue 4/19/16	1 day		sched for 4/19/16
110	Agency Review/Comments				Wed 4/20/16	Sat 6/18/16	60 days	109	
111	Address Comments and Finalize Design				Wed 4/20/16	Sun 9/11/16	145 days	109	
112	Contractor Procurement				Sun 6/19/16	Wed 8/17/16	60 days	110	
113	USEPA Approvals and Contractor Pre-Mobilization				Thu 8/18/16	Tue 11/15/16	90 days	112	
114	**Soil & RCRA C Cap Construction (incl Cianci soils, dioxin soils, and NTCRA 1 area)**				**Wed 11/16/16**	**Sun 8/13/17**	**271 days**		
115	Field Construction				Wed 11/16/16	Wed 1/11/17	57 days	113	
116	Winter Shutdown				Thu 1/12/17	Mon 4/10/17	89 days	115	
117	Field Construction (cont)				Tue 4/11/17	Thu 6/29/17	80 days	116	
118	Final Construction Inspection	Settling Defendants conclude construction complete.	Within 60 days of notice by Settling Defendants.	**VI.G**	Fri 7/14/17	Fri 7/14/17	1 day	117FS+14 days	target date
119	Prepare/ Submit Construction Completion Report				Sat 7/15/17	Sun 8/13/17	30 days	118	
120									
121	**Groundwater Containment & Treatment Evaluation & Optimization Study (GCTEOS)**			**V.C.4**	**Mon 3/3/14**	**Thu 6/27/24**	**3770 days?**		
122	Change to POTW Discharge (Proposal, POTW sampling, permit application, HCTS modifications)				Sat 8/1/15	Fri 6/30/17	700 days		8/1/15 start, 10/30/15 sewer discharge proposal; December 2015 POTW sampling; 3/16-3/17 PFAS; rest estimated
123	GCTEOS	Completion of ISTR and capping		**V.C.4**	Mon 8/14/17	Fri 2/9/18	180 days	119	
124	Optimization Studies	Need to upgrade system due to parts limitations; possible need to address in cap design	As directed by the EPA, or proposed by the Settling Defendants, no less frequently than every 10 years	**V.C.6**	Mon 3/3/14	Mon 11/17/14	260 days		reflects timing of constructed wetland eval
125	Additional Optimization Study(ies) (TBD)			**V.C.6**	**Thu 2/29/24**	**Thu 6/27/24**	**120 days**	**24SS+3650 days**	
126	Draft Design for HCTS Modifications				Sat 2/10/18	Thu 5/10/18	90 days	123	
127	Technical Information Meeting				Thu 5/31/18	Thu 5/31/18	1 day?	126FS+20 days	
128	Agency Review/Comments				Fri 6/1/18	Sat 6/30/18	30 days	127	
129	Address Comments and Finalize Design				Sun 7/1/18	Wed 8/29/18	60 days	128	
130	Contractor Procurement				Sun 7/1/18	Fri 9/28/18	90 days	128	
131	HCTS Modifications				Sat 9/29/18	Mon 2/25/19	150 days	130	
132	Prepare/ Submit Construction Completion Report				Tue 2/26/19	Wed 3/27/19	30 days	131	
133									
134	**Commence Operation and Maintenance**	EPA approval or modification of Cons	Immediately upon notice by EPA.	**VI.I**	Wed 9/23/15	Wed 9/23/15	1 day	101	
135	**Compliance Monitoring (CM)**			**VII.B**	Tue 6/1/10	Tue 6/1/21	4019 days		
136	**Annual Groundwater Sampling Event**				**Wed 6/1/11**	**Tue 6/1/21**	**3654 days**		
146	**"Comprehensive" Sampling Events**				**Tue 6/1/10**	**Sat 6/1/19**	**3288 days**		
150	**Sampling "N" Wells during Equilibrium Period (events outside equi period coincide with annual)**				**Wed 3/18/15**	**Wed 3/15/17**	**729 days**		
158									
159	**Compliance Reporting**			**VIII**	Sun 7/1/07	Fri 6/28/24	6208 days?		
160	**Monthly Progress Reports**	**Lodging of the CD.**	**On the 10th day following lodging and monthly thereafter until approval of final Construction Compl Rpt.**	**VIII.A**	**Tue 2/10/09**	**Tue 11/14/17**	**3200 days**		
257	**Annual State of Compliance Reports**	**One Year After the Lodging of the (**	**Annually**	**VIII.B**	**Thu 4/15/10**	**Thu 12/12/19**	**3529 days**		
269	**Five Year Review Reports**	**Five Years after the date of the Rec**	**Every Five years**	**VII.A.D**	**Wed 9/29/10**	**Thu 9/10/20**	**3635 days**		
273	**Compliance Monitoring (CM) Work Plan Evaluation(s) (part of 5-year reviews)**	**No less frequently than once after implementation of the excavation and capping component, and long-term groundwater containment and treatment system.**	**As part of the five-year reviews.**	**VII.B.3**	**Wed 9/29/10**	**Thu 9/10/20**	**3635 days**		
277	**Interim Remedial Action Report**	EPA determination that long-term groundwater containment and treatment system is operational and functional.	Within 90 days of notice by EPA.	**VIII.C**	Fri 6/28/24	Fri 6/28/24	1 day	121	
278	**Determination of Background Metals in Groundwater (TBD)**	Compliance with Interim Cleanup Levels for Groundwater.	No sooner than 365 days prior to submittal of Demonstration of Compliance Report.	**VIII.E**	Thu 8/20/20	Wed 12/16/20	119 days		
279	**Demonstration of Compliance Report (TBD)**	Compliance with cleanup levels.	As demonstrated by Settling Defendants.	**VIII.F**	Sun 7/1/07	Sun 7/1/07	1 day?		
280	**Risk Assessment**			**IV.A.1**	Sun 7/1/07	Sun 7/1/07	1 day		
281	**Site Closure (TBD)**				Wed 6/2/21	Wed 6/2/21	1 day?	135	
282	**Summary of Cost Information (TBD)**	Compliance with cleanup levels.	As demonstrated by Settling Defendants.	VIII.G	Sun 7/1/07	Sun 7/1/07	1 day?		



Attachment 2

Hydraulic Containment and Treatment System, Annual Demonstration of Compliance Report No.8, October 31, 2015 through October 30, 2016

Hydraulic Containment and Treatment System Annual Demonstration of Compliance Report
No. 8

31 October 2015
Through
30 October 2016

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

Prepared for:

SRSNE PRP Group

Prepared by:

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Glastonbury, CT 06033
(860) 368-3200

February 2017

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Title

LIST OF ACRONYMS

BBL	Blasland, Bouck & Lee, Inc.
CTDEEP	Connecticut Department of Energy & Environmental Protection
DCP	Demonstration of Compliance Plan
DCR	Demonstration of Compliance Report
EPA	United States Environmental Protection Agency
ft	feet
gpm	gallons per minute
HCTS	Hydraulic Containment and Treatment System
NTCRA	Non-Time-Critical Removal Action
O&M	operations and maintenance
SOW	Statement of Work
SRSNE	Solvents Recovery Service of New England, Inc.
UV	ultraviolet oxidation
VFD	Variable Frequency Drive
VOC	volatile organic contaminants
WESTON®	Weston Solutions, Inc.

SECTION 1

INTRODUCTION

1. INTRODUCTION

This Demonstration of Compliance Report (DCR) was prepared by Weston Solutions, Inc. (WESTON®) on behalf of the Solvents Recovery Service of New England, Inc. (SRSNE) Site Group. The DCR documents the effectiveness of the Non-Time-Critical Removal Action No. 1 and 2 (NTCRA-1 and NTCRA-2) hydraulic containment and treatment system at the SRSNE Superfund Site in Southington, Connecticut. This DCR has been prepared and submitted in accordance with Section VII, Paragraph G of the Remedial Design/Remedial Action Statement of Work (SOW) that accompanied the Record of Decision (ROD) for the site. The data presented in this DCR were obtained in accordance with the United States Environmental Protection Agency (EPA) approved Demonstration of Compliance Plans (DCP) for NTCRA-1 and NTCRA-2 (Blasland, Bouck & Lee (BBL), June 1995 and November 1999, respectively). The data acquisition schedule, reporting, and evaluation requirements for this and future DCRs were described in these DCPs.

This is the eighth annual DCR prepared following lodging of the Consent Decree in 2008, and reflects performance data collected from the period of October 31, 2015 through October 31, 2016. This DCR follows 60 previously submitted DCRs prepared initially on a quarterly basis and changed to annual submissions in 2003.

1.1 NTCRA-1 BACKGROUND

The NTCRA-1 hydraulic containment system is installed in the containment area (Figure 1A), which was defined in the NTCRA-1 DCP The containment system originally included an array of 12 overburden groundwater extraction wells (RW-1 through RW-12) and a downgradient barrier (steel sheet piling) that hydraulically and physically contains overburden groundwater leaving the SRSNE operations area.

The pre-design investigation results and the designs of the hydraulic barrier wall, extraction wells, and treatment system are described in detail in the NTCRA-1 *100% Groundwater Containment and Treatment System Design Report* (*100% Design Report*, BBL, January 1994). The NTCRA-1 system was constructed between February and July 1995 and brought online in accordance with the EPA-approved schedule on 19 July 1995.

The NTCRA-1 hydraulic containment and monitoring network remained as originally constructed until November 2009, when specific recovery wells, monitoring wells, and piezometers were abandoned in accordance with the Monitoring Well Network Evaluation, included as Attachment N to the *Remedial Design Work Plan* (Arcadis, April 2009). EPA was notified that the abandoned wells and piezometers would be removed from the NTCRA-1 monitoring program and DCP on 1 November 2009 (WESTON, December 2009). The second annual DCR (31 October 2009 to 30 October 2010) summarizes the recovery wells, monitoring wells, and piezometers abandoned under this program and the rationale for abandonment of each well. As indicated in the second annual DCR, abandonment of the targeted monitoring wells and piezometers was performed in November and December 2009, with exception to former recovery wells RW-5 and RW-6. These recovery wells were permanently taken out of service in November 2009, but not abandoned until December 2010.

As a result of the recovery well abandonment activities discussed above, the NTCRA-1 containment system now consists of ten overburden groundwater extraction wells (RW-1 through RW-4, and RW-7 through RW-12).

1.2 NTCRA-2 BACKGROUND

The NTCRA-2 hydraulic containment system is installed south (hydraulically downgradient) of the NTCRA-1 containment area (Figure 1A), as shown in the NTCRA-2 DCP. The NTCRA-2 containment area encompasses the majority of the northern portion of the Town of Southington's well field property and includes the shallow and deep bedrock, extending to a depth of 100 feet (ft) below the top of bedrock in the northern portion of this property (Figure 1A). Further upgradient (north), the NTCRA-2 containment area extends over 170 ft below the top of bedrock and over 200 ft below ground surface (BBL, November 1999).

The NTCRA-2 hydraulic containment system initially included two groundwater extraction wells (RW-13 and RW-1R) that, in combination with the NTCRA-1 containment system, contain bedrock groundwater migrating from the SRSNE operations area (Figure 1A). The design of the overburden and bedrock extraction wells RW-13 and RW-1R are described in the NTCRA-2 *100% Design Report* (BBL, November 1999). Overburden recovery well RW-13 has been on-line since 14 July 1999, and bedrock recovery well RW-1R has been operating since 5 September 2001.

A third groundwater extraction well (RW-14) was added to the NTCRA-2 containment system (Figure 1A) to further enhance long-term hydraulic containment of the overburden and bedrock groundwater in the NTCRA-2 well field. The design of the additional overburden extraction well is described in the RW-14 *Completion Report* (WESTON, November 2007). This overburden recovery well has been operating since 24 September 2007.

A fourth groundwater extraction well (RW-15) was also added to the NTCRA-2 well field to provide additional redundancy and ensure NTCRA-2 performance objectives can be maintained with one NTCRA-2 overburden recovery well out of service in the future. The design of the additional overburden extraction well is described in the RW-15 *Completion Report* (WESTON, January 2015). This overburden recovery well has been operating since 12 November 2014. As part of the well installation work, a second electrical service was extended to the NTCRA-2 well field and one of the two installed spare NTCRA-2 forcemains was connected to RW-15 and placed into service. As part of the forcemain extension, a valve vault was installed between the NTCRA-2 wells and the treatment system. The valve vault allows for selection of which forcemain will be used to convey groundwater to the Hydraulic Containment and Treatment System (HCTS). It is also equipped with cleanouts to allow for maintenance on each active forcemain.

1.3 GROUNDWATER TREATMENT SYSTEM

The groundwater extracted by the NTCRA-1 and -2 containment systems is pumped directly to the groundwater treatment facility (Figure 1A). The treatment system consists of: influent equalization, metals pretreatment, filtration, ultraviolet oxidation (UV), and granular activated carbon adsorption. Vapor phase carbon adsorption is also used to capture contaminants that volatize during treatment. The system precipitates and extracts metals, reduces suspended solids, and destroys and captures volatile organic compounds (VOC). Treated water is discharged to the Quinnipiac River in accordance with the Connecticut Department of Energy & Environmental Protection (CTDEEP) *Revised Substantive Requirements for Discharge of Pre-Treated Groundwater* issued 6 November 1995.

1.4 REPORT ORGANIZATION

Section 2 of this report summarizes the acquisition and evaluation of field data used to verify the effectiveness of the hydraulic containment and treatment system, and Section 3 provides an overview of operations and maintenance (O&M) activities conducted at the site during this O&M period.

SECTION 2

DATA ACQUISITION AND RESULTS

2. DATA ACQUISITION AND RESULTS

The data required to demonstrate the effectiveness of the hydraulic containment and treatment system were obtained in the form of hydraulic head measurements from wells and piezometers installed in the area of the containment system, flow measurements from the extraction well array, treatment system flow rates, and analytical results.

2.1 NTCRA-1 CONTAINMENT SYSTEM MONITORING

The satisfactory performance of the NTCRA-1 containment system is verified through two reversal-of-gradient tests that determine whether groundwater flow is controlled by the system. These tests are demonstrated by comparing hydraulic head measurements at several monitoring locations. The specific wells and piezometers used for these comparisons are discussed in Subsections 2.1.1 and 2.1.2. The gradient tests are:

- **Reversal of Gradient Test No. 1 (RGT-1)**: Confirms that overburden groundwater east and downgradient of the operations area is flowing in the direction of the groundwater extraction wells.

- **Reversal of Gradient Test No. 2 (RGT-2)**: Confirms that overburden groundwater flow is reversed and maintained in the direction of the groundwater extraction wells within the area enclosed by the hydraulic divide installed adjacent to the hydraulic containment system. RGT-2 is more crucial to a demonstration of compliance as it requires that overburden groundwater elevations within the barrier are at least 0.3 ft lower than those outside the wall in NTCRA-1.

2.1.1 RGT-1 Results

To confirm that overburden groundwater east and downgradient of the operations area and within the containment area is flowing in the direction of the groundwater extraction wells, hydraulic head measurements were collected at the following overburden wells/piezometers located in the vicinity of the groundwater containment system:

- Extraction Wells RW-1 through RW-4 and RW-7 through RW-12
- Monitoring Wells MW-415, MWL-304, MWL-305, MWL-307, and MWL-308

Overburden groundwater elevations were also measured at the following wells to assess the hydraulic response in the area between the hydraulic barrier wall and the Quinnipiac River:

- Monitoring Wells MWL-302, MWL-306, MWL-309, MWL-311, and TW-7A.

Monthly overburden hydraulic head data measured at the specified wells and compliance monitoring points from 31 October 2015 through 30 October 2016 are presented in Table 1. The resulting groundwater contour maps are presented as Figures 1A through 12A. The contours indicate the horizontal hydraulic gradient between the SRSNE operations area and the extraction wells was eastward toward the extraction wells, fulfilling RGT-1.

The vertical hydraulic gradient between the overburden and bedrock in the vicinity of the hydraulic containment system is also evaluated to confirm satisfactory recovery well operation. Groundwater elevations were compared between bedrock well MW-416 and the adjacent overburden well MWL-307 on the same dates. This comparison indicates that the vertical component of the hydraulic gradient between the bedrock and the overburden was generally downward from the overburden to the bedrock within the containment area.

Hydraulic head data is also compared at overburden compliance piezometers CPZ-1, CPZ-3, CPZ-5, CPZ-7, and CPZ-9 and adjacent bedrock piezometers CPZ-1R, CPZ-3R, CPZ-5R, CPZ-7R, and CPZ-9R. Monitoring indicates that the gradient was generally upward from the bedrock to the overburden in the vicinity of the pumping wells and the hydraulic barrier wall throughout the period covered by this DCR.

2.1.2 RGT-2 Results

To confirm that groundwater flow is reversed and maintained in the direction of the groundwater extraction wells, hydraulic head measurements were collected weekly at eight fully penetrating overburden compliance piezometers (CPZ-1, 2A, 3, 4A, 5, 6, 7, and 8). Compliance piezometers CPZ-9 and -10were removed from RGT-2 when CPZ-9 was abandoned in December 2009. As stated in the DCP, the hydraulic gradient is considered reversed and inward across the hydraulic barrier wall when the hydraulic head data measured at each compliance piezometer located inside the hydraulic barrier wall (CPZ-1, CPZ-3, CPZ-5, and CPZ-7) is at least 0.3 ft lower than the head measured at the corresponding compliance piezometer located outside the hydraulic barrier wall (CPZ-2A, CPZ-4A, CPZ-6, and CPZ-8, respectively).

Based on weekly hydraulic head measurements, the required 0.3-ft head differential was achieved in all four pairs (CPZ-1/CPZ-2A, CPZ-3/CPZ-4A, CPZ-5/CPZ-6, and CPZ-7/CPZ-8) for 25 of the 52 weekly monitoring rounds during the monitoring period. Compliance piezometer pairs CPZ-5/CPZ-6 and CPZ-7/CPZ-8 met the 0.3-ft head differential during the entire monitoring period. Compliance piezometer pairs CPZ-1/2A and CPZ-3/CPZ-4A did not achieve the required 0.3-ft differential on 19 and 27 weekly gauging rounds, respectively, during the monitoring period. Table 2 provides a summary of RGT-2 test results and highlights the weeks the required head differential was not maintained between CPZ-1/2A and CPZ-3/4A.

The cause of the loss of hydraulic gradient reversal at compliance pair CPZ-1/2A and CPZ-3/4A is believed to be a result of excessively dry site conditions due to low precipitation, and a substantial localized elevation decrease in the overburden water table outside of the sheet pile wall. This same loss of hydraulic gradient reversal has been documented in prior DCR reports when excessively dry conditions have occurred. In addition, compliance piezometers CPZ-1 and CPZ-3, which are located on the inside of the hydraulic barrier wall, have poor hydraulic connectivity to the adjacent recovery wells (RW-7 and RW-12, respectively). The distance from each piezometer to the closest recovery well is less than 11 ft, and the recovery wells have very little drawdown influence on the groundwater elevation in the piezometer.

As discussed in the last Annual DCR (No. 7), well redevelopment occurs when groundwater recovery performance has diminished or head differential is out of compliance. Recovery wells

(RW-1, 7, 8, 9, and 12) underwent redevelopment in July and August 2015. The remaining five NTCRA-1 recovery wells (RW-2, 3, 4, 10, and 11) were redeveloped in November 2015. Historically, redevelopment activities are successful in improving groundwater extraction production; however, they have not been successful in improving hydraulic connectivity to the nearby piezometers and hydraulic gradient reversal during dry conditions. The November redevelopment work was not successful in improving hydraulic connectivity and hydraulic gradient remained out of compliance until precipitation raised the groundwater levels outside the containment area (see table below).

To verify the continuity of gradient reversal, daily hydraulic head measurements are also recorded by a data logger at compliance piezometers CPZ-5 and CPZ-6. These measurements are collected in 8-hour intervals or three times a day. These measurements demonstrated compliance for the entire monitoring period. A hydrograph of the data logger measurements from compliance pair CPZ-5 and CPZ-6 is presented as Figure 13 for the monitoring period.

A summary of NTCRA-1 non-compliance occurrences between 31 October 2015 and 30 October 2016 is presented below, along with an explanation of the cause and corrective measures taken in response to the non-compliance issue.

NTCRA-1 – Non-Compliance Summary – 31 October 2015 to 30 October 2016

Dates & (No. of Days)	Cause	Corrective Actions
31 October 2015 to 12 January 2016 (64 days)	Hydraulic gradient reversal between compliance piezometers CPZ-3/4A was not maintained. For portions of each period compliance piezometers CPZ-1/2A may also not have demonstrated hydraulic gradient reversal.	No corrective action. Root cause is believed to be excessively dry site conditions due to low precipitation, and a substantial localized elevation decrease in the overburden water table outside of the sheet pile wall. Compliance was restored when rain increased the overburden water table.
19 January to 7 February 2016 (20 days)		
12-25 July 2016 (14 days)		
2 August to 25 October 2016 (85 days)		

2.2 NTCRA-2 CONTAINMENT SYSTEM MONITORING

The satisfactory performance of the NTCRA-2 hydraulic containment system is verified through two containment tests that compare hydraulic head measurements in NTCRA-2. The specific locations used for hydraulic head comparisons are presented in Subsections 2.2.1 and 2.2.2. The containment tests are:

- **Containment Test Part 1 (CT-1)**: Confirms that within the NTCRA-2 containment area, bedrock groundwater east and downgradient of the operations area is flowing in the direction of the hydraulic containment system.
- **Containment Test Part 2 (CT-2)**: Confirms that bedrock groundwater flow downgradient of the NTCRA-2 extraction system within the containment area is reversed and maintained in the direction of the hydraulic containment system.

2.2.1 CT-1 Results

To confirm that VOC-impacted bedrock groundwater east and downgradient of the operations area and within the containment area is flowing in the direction of the extraction wells, hydraulic head measurements were obtained at the following pairs of wells/piezometers located upgradient of the hydraulic containment system:

- Shallow bedrock – MW-704R and MW-121A
- Deep Bedrock – MW-704DR and MW-705DR

The hydraulic gradient is considered to be towards the extraction wells when the hydraulic head measured at the shallow (MW-704R) and deep (MW-704DR) bedrock monitoring wells, located adjacent to extraction wells RW-13, RW-1R, RW-14, and RW-15, is lower than hydraulic head measurements at wells MW-121A and MW-705DR, respectively.

Monthly rounds of hydraulic head data measurements collected from 31 October 2015 to 30 October 2016 are presented in Table 1. The resulting contour maps for shallow bedrock and deep bedrock monitoring wells and piezometers are presented as contours on Figures 1B through 12B and Figures 1C through 12C, respectively. The contours indicate that groundwater flow in the shallow and deep bedrock is inward toward the NTCRA-2 extraction wells, fulfilling Containment Test Requirement No.1.

2.2.2 CT-2 Results

To confirm that bedrock groundwater flow downgradient of the extraction system within the containment area is reversed and maintained in the direction of the extraction wells, hydraulic head measurements were obtained at the following locations:

- Shallow bedrock – MW-704R, MW-204A, PZR-2R, and PZR-4R
- Deep Bedrock – MW-704DR, PZR-2DR, and PZR-4DR

The hydraulic gradient is considered reversed and inward toward the containment area when the hydraulic head measured at the shallow and deep bedrock monitoring wells MW-704R and MW-704DR, which are located adjacent to extraction wells RW-13, RW-1R, RW-14, and RW-15, is lower than the hydraulic head measurements at the remaining shallow and deep bedrock monitoring wells and piezometers listed above. Measurements taken at these locations are presented in Table 1 and as groundwater contours in Figures 1B through 12B and 1C through 12C.

To verify the continuity of gradient reversal, daily hydraulic head measurements are recorded via a data logger at the following locations:

- Shallow bedrock – MW-704R and PZR-2R
- Deep Bedrock – MW-704DR and PZR-2DR

Daily hydraulic head measurements indicated that the NTCRA-2 containment system met CT-2 for the entire monitoring period.

Hydrographs of the data logger measurements obtained for shallow and deep bedrock compliance points between 31 October 2015 and 30 October 2016 are included as Figures 14A and 14B, respectively.

2.3 TREATMENT SYSTEM MONITORING

HCTS influent and effluent flow measurements and laboratory analytical data were obtained during the monitoring period. The analytical and flowl data are presented and discussed in Subsections 2.3.1 and 2.3.2, respectively.

2.3.1 HCTS Influent and Effluent Analytical Data

Samples of groundwater treatment system influent and effluent were collected twice per month and analyzed for metals, VOCs, alcohols, and total suspended solids. For the process effluent, the first round each month was also analyzed for total polychlorinated biphenyls. Once every quarter, additional effluent samples were collected and tested for dioxins/furans. Analytical results from the influent and effluent sampling are summarized in Tables 3 and 4, respectively. In Table 4, the effluent sampling results are compared with the discharge limits established by CTDEP in the Substantive Requirements for Discharge, dated 6 November 1995. As shown in Table 4, the treatment system effluent water quality was below discharge limits for the monitoring period.

In addition to the analyses discussed previously, effluent samples were collected and submitted for acute and chronic toxicity analysis in January, April, July, and October 2016. The submitted effluent samples passed the acute and chronic toxicity test for both Daphnia Pulex and fathead minnows. This data is submitted to CT DEEP on a quarterly basis.

To collect additional data concerning the presence of 1,4-dioxane in the groundwater treated via the HCTS, process influent and effluent was also monitored quarterly for this compound during the monitoring period. Currently, no discharge limit exists for 1,4-dioxane. Quarterly sample results for the year are presented below.

SRSNE - 1,4-Dioxane Sampling Summary		
Date	**Influent (ppb)**	**Effluent (ppb)**
5-Jan-2016	38	16
5-Apr-2016	39	34
5-Jul-2016	42	24
4-Oct-2016	26	17

Notes:
ppb – parts per billion

2.3.2 HCTS Influent and Effluent Flow Data

The influent and effluent flow rates of the groundwater treatment system were each recorded continuously using an in-line totalizing flow meter and strip chart recorder. The NTCRA-1 and NTCRA-2 recovery wells ran continuously throughout the monitoring period, with the exception of minor shutdowns during maintenance, individual recovery well failures, or HCTS alarm shutdowns.

Approximately 19,970,000 gallons of groundwater were extracted, treated, and discharged during the monitoring period. Refer to Table 5 for a summary of influent and effluent flow rates and totals. Throughout the period covered in this report, the system treated and discharged an average of 37.8 gallons per minute (gpm).

SECTION 3

HYDRAULIC CONTAINMENT AND TREATMENT SYSTEM (HCTS) OPERATIONS AND MAINTENANCE SUMMARY

3. HYDRAULIC CONTAINMENT AND TREATMENT SYSTEM (HCTS) OPERATIONS AND MAINTENANCE SUMMARY

The HCTS O&M summary is divided into two sections. Subsection 3.1 highlights the major O&M-related activities performed between 31 October 2015 and 30 October 2016, and Subsection 3.2 discusses O&M issues that are on-going or anticipated during future activities at the site.

3.1 OPERATIONS AND MAINTENANCE SUMMARY

The following briefly describes highlighted HCTS O&M activities or capital improvements conducted during the reporting period.

1. **November 2015 – NTCRA-1 Recovery Well Redevelopment**: Recovery wells RW-1, 7, 8, 9, and 12 were redeveloped to maintain satisfactory recovery well performance.

2. **December 2015 and October 2016 – NTCRA-2 Well Redevelopment**: **and Maintenance**: All three NTCRA-2 Overburden Recovery wells (RW-13, 14, and 15) were redeveloped in order to maintain target NTCRA-2 flows of 30 gpm.

3. **NTCRA-1 Recovery Well Maintenance**: In addition to NTCRA-1 redevelopment work, the following NTCRA-1 Recovery Well maintenance was performed during the monitoring period.

   - November 2015 – The recovery well pump in RW-7 was removed and replaced with a clean pump end to maintain acceptable yield.

   - December 2015 – The recovery well pump in RW-4 was removed and replaced with a clean pump end to maintain acceptable yield. The motor starter and electrical distribution equipment at RW-7 were replaced because of damage caused by rodents.

   - March 2016 – The recovery well motor and control fuse were replaced to restore operation of RW-3. The pump in RW-7 was also replaced with a clean pump end to maintain acceptable yield.

   - April 2016 – The recovery well pumps in RW-4 and RW-11 were removed and replaced with clean pumps to maintain acceptable yield.

   - May 2016 – NTCRA-1 Level Control Upgrades: The switch type level controls in the NTCRA-1 recovery wells require frequent cleaning and maintenance to maintain acceptable performance. Several years back, the level controls for Recovery Well RW-2 were upgraded with a new transducer-type level controller that has reduced maintenance and improved reliability. As a result, three additional recovery wells (RW-7, 11, and 12) were upgraded to transducer-type level controls in May 2016.

- June 2016 - The recovery well pump in RW-4 was removed and replaced with a clean pump end to maintain acceptable yield. All four level switches and the level controller required replacement at RW-1 in order to restore its operation.

- September 2016 – The motor starter and control fuses were replaced to restore operation of RW-9.

4. **NTCRA-2 Well Maintenance**: In addition to NTCRA-2 well redevelopment, the following NTCRA-2 recovery well maintenance was performed:

   - November 2015 – The pumps in Recovery Wells RW-13 and -14 were removed and replaced with clean pumps to maintain acceptable yield from each well. The flow meter for RW-15 was cleaned to restore the performance and flow at this well.

   - December 2015 – RW-15 stopped operating. The motor was replaced to restore the pump operation to normal.

   - January 2016 – RW-13 – The recovery well pump was removed and replaced with a clean pump to maintain acceptable yield. During the replacement work, a damaged motor lead was repaired.

   - February 2016 – The level transducer stopped working at Recovery Well RW-13. It was replaced to restore pump operation to normal.

   - March 2016 – The flow meter in Recovery Well RW-1R stopped working and was replaced to restore operation to normal. Also, Recovery Well RW-14 was vandalized, requiring both vault piping and the level transducer to be replaced to restore operations to normal.

   - May 2016 – The pumps in Recovery Wells RW-13, -14, and -15 were removed and replaced with clean pumps to maintain acceptable yield from each well.

   - August 2016 – The pumps in Recovery Wells RW-13, -14, and -15 were removed and replaced with clean pumps to maintain acceptable yield from each well.

   - September 2016 – The pumps in Recovery Wells RW-13 and -14 were removed and replaced with clean pumps to maintain acceptable yield from each well.

5. **April 2016 – GAC Feed Pump Variable Frequency Drive (VFD)**: The VFD for this pump failed in March. After confirmation that it could not be repaired, a new replacement VFD was installed.

6. **May 2016 – Sludge Transfer Pump – P-901**: The pump was removed from service and the diaphragms were replaced to restore its operation.

7. **June 2016 – HCTS Effluent pH sensor**: The HCTS effluent pH sensor was not working properly. The salt bridge was replaced to restore its operation to normal.

8. **June 2016 – Gravity Pipe Cleaning**: In order to maintain acceptable treatment system hydraulic throughput, WESTON cleaned the metals precipitation gravity piping. All gravity piping between the clarifier feed tank and sand filter was cleaned during the event.

9. **June 2016 – Equalization Tank and Oxidation Feed Tank Mixer Cleaning**: The water levels in each tank were lowered and their respective mixers cleaned as part of scheduled preventive maintenance to ensure continued satisfactory operation.

10. **June 2016 – Clarifier Feed, Flash Mix and Flocculation Tanks and Mixer Cleaning**: Each tank was dewatered and manways removed to gain access to the tanks and mixers. Settled solids and scale were removed from both the tanks and mixers. Approximately one drum of solids was removed from the three tanks during the maintenance event.

11. **June 2016 – Primary Liquid Phase Carbon Replacement**: The activated carbon in both primary carbon vessels (2,000 pounds each) was replaced with new carbon. The spent carbon was removed and recycled by Carbon Filtration Systems, Inc.

12. **September 2016 – Clarifier Feed Pump P-100**: The pump seal was leaking and subsequently replaced to restore its operation.

13. **September 2016 – Secondary Liquid Phase Carbon Replacement**: The activated carbon in both secondary carbon vessels (2,000 pounds each) was replaced with new carbon. The spent carbon was removed and recycled by Carbon Filtration Systems, Inc.

14. **Ultraviolet Oxidation System**: The following summarizes the major maintenance performed on the UV equipment during the monitoring period:

    - Five (5) UV lamps were replaced during the reporting period. All lamps were removed or replaced due to failure, excessive amperage draw, or excessive hours.

    - Five (5) quartz tubes were replaced during the reporting period.

During the monitoring period, no additional UV reactor circuits failed. At the end of this monitoring period, UV-1 has 8 of 12 functional reactor circuits, and UV- 2 has 6 of 12 functional circuits.

During the monitoring period, Calgon Carbon Corporation, who is the UV equipment manufacturer, notified WESTON that they were going to discontinue offering replacement parts for the older Perox-Pure UV units (models used onsite) in September 2016. For the short term, SRSNE has purchased extra replacement parts and placed them into inventory. WESTON estimates approximately 2 years of additional operation could likely be achieved if operations and parts replacement conditions remain consistent with recent usage rates.

3.2 FUTURE HCTS OPERATIONS AND MAINTENANCE ACTION ITEMS

- Future long-term water treatment upgrades and alternate discharge options have been and continue to be considered for the site. Following the thermal remedial action, a significant decline in influent VOC loading has been observed from NTCRA-1 extraction system. This loading rate decline, along with potential changes to the NTCRA-1 extraction system, will require consideration for these studies.

- WESTON will continue to evaluate the overall HCTS and make recommendations for process improvements or modifications in the coming year. These recommendations will be summarized in the monthly O&M HCTS report submissions.

SECTION 4

REFERENCES

4. REFERENCES

Arcadis. 2009. *Remedial Design Work Plan*. April.

BBL. 1994. *100% Groundwater Containment and Treatment System Design Report*. January.

BBL. 1995. NTCRA-1 Demonstration of Compliance Plan (DCP). June

BBL. 1999. NTCRA-2 DCP. November

CTDEEP (Connecticut Department of Energy & Environmental Protection). 1995. *Revised Substantive Requirements for Discharge of Pre-Treated Groundwater*. November.

WESTON. 2007. *RW-14 Completion Report*. November.

WESTON. 2009. NTCRA-1 DCP Modifications. December.

WESTON. 2015. RW-15 *Completion Report*. January.

FIGURES

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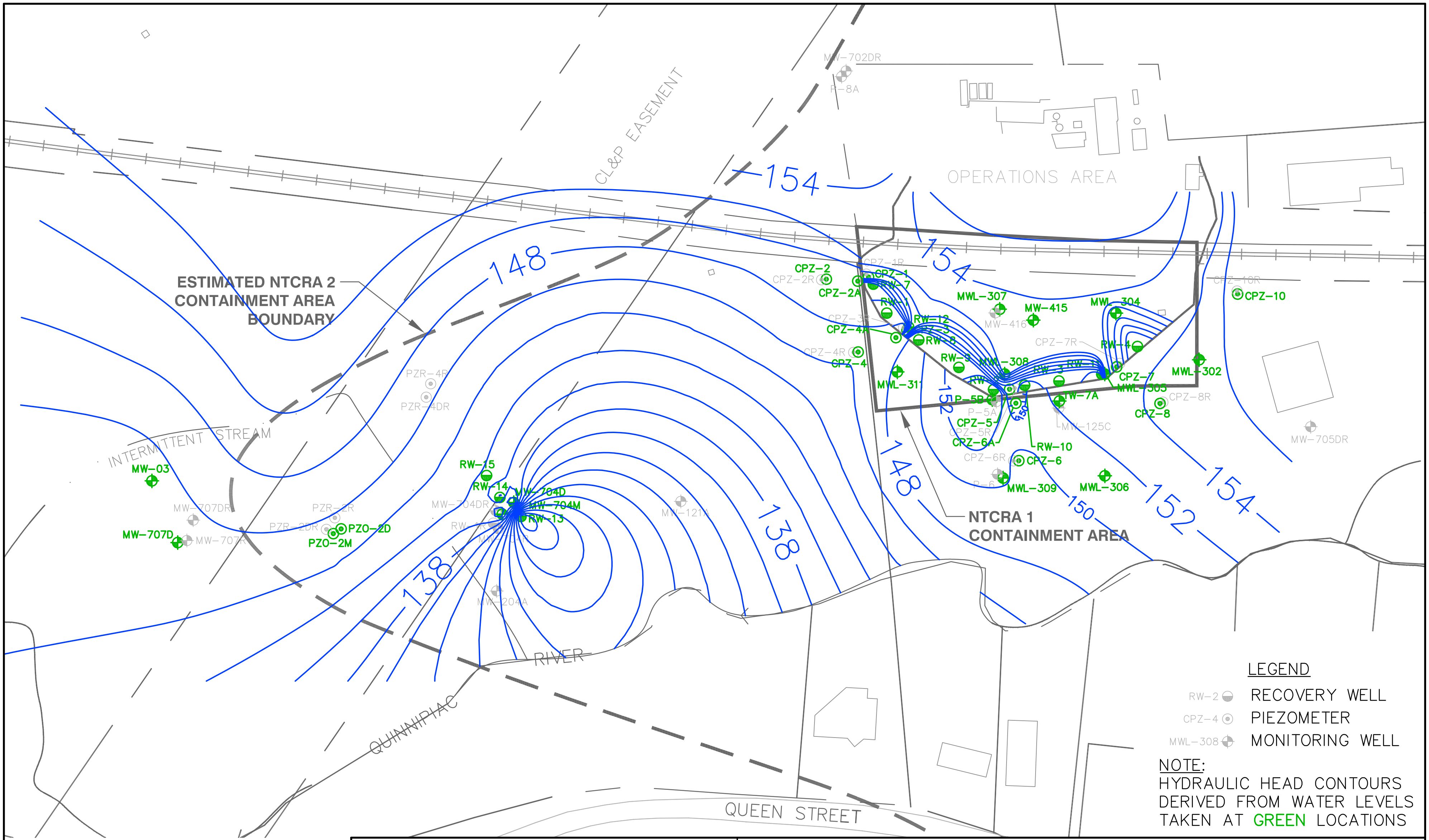

LEGEND

RW-2 ◒ RECOVERY WELL

CPZ-4 ◉ PIEZOMETER

MWL-308 ⊕ MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS DERIVED FROM WATER LEVELS TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE
200 100 0 100 200
APPROXIMATE SCALE IN FEET

OVERBURDEN
HYDRAULIC HEAD CONTOURS
NOVEMBER 28, 2015

SRSNE
SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS
CONCORD NEW HAMPSHIRE

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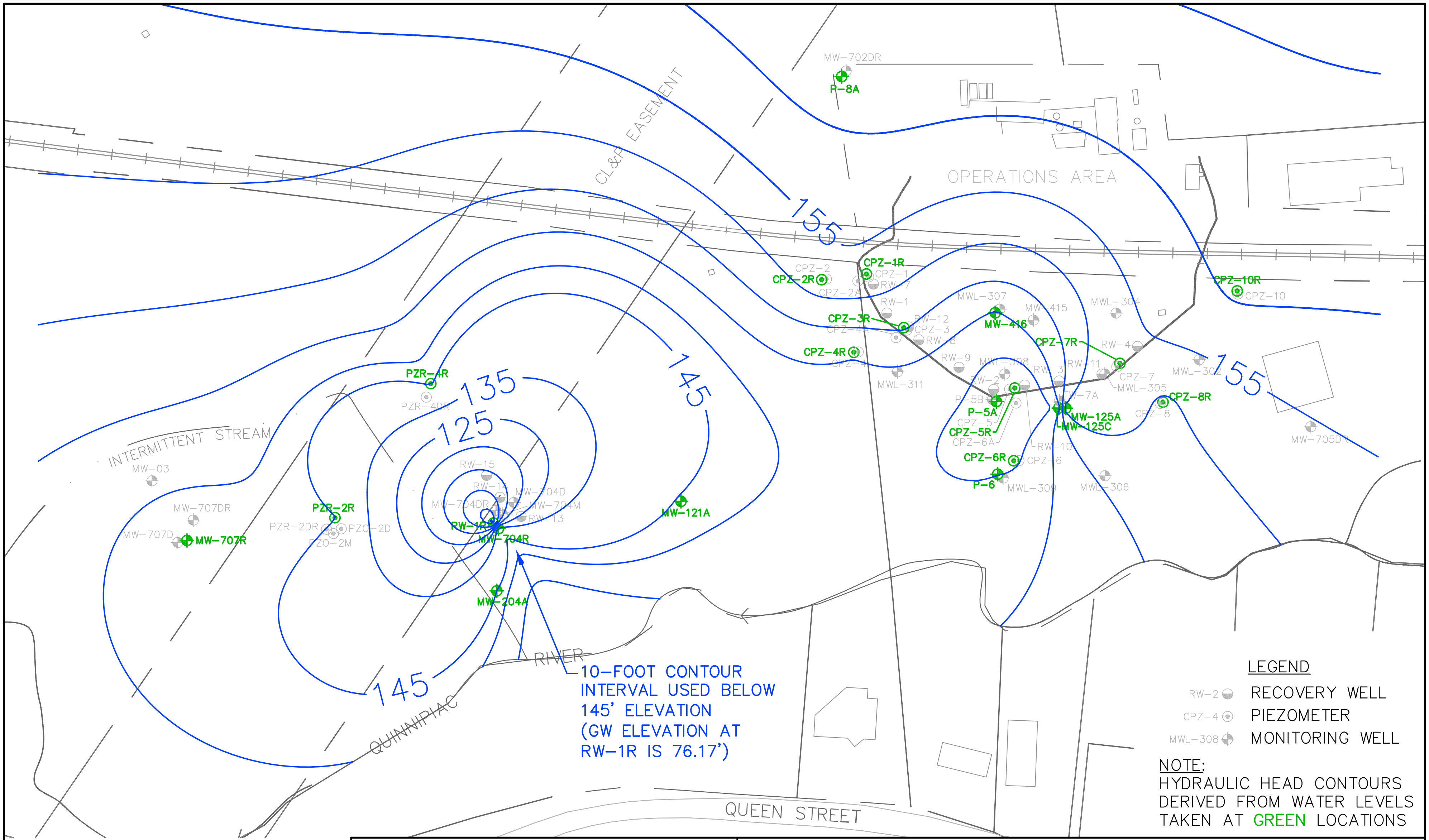

10-FOOT CONTOUR
INTERVAL USED BELOW
145' ELEVATION
(GW ELEVATION AT
RW-1R IS 76.17')

LEGEND

RW-2 ⊖	RECOVERY WELL
CPZ-4 ⊙	PIEZOMETER
MWL-308 ⊕	MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE

200 100 0 100 200

APPROXIMATE SCALE IN FEET

SHALLOW BEDROCK
HYDRAULIC HEAD CONTOURS
NOVEMBER 28, 2015

SRSNE
SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS

CONCORD NEW HAMPSHIRE

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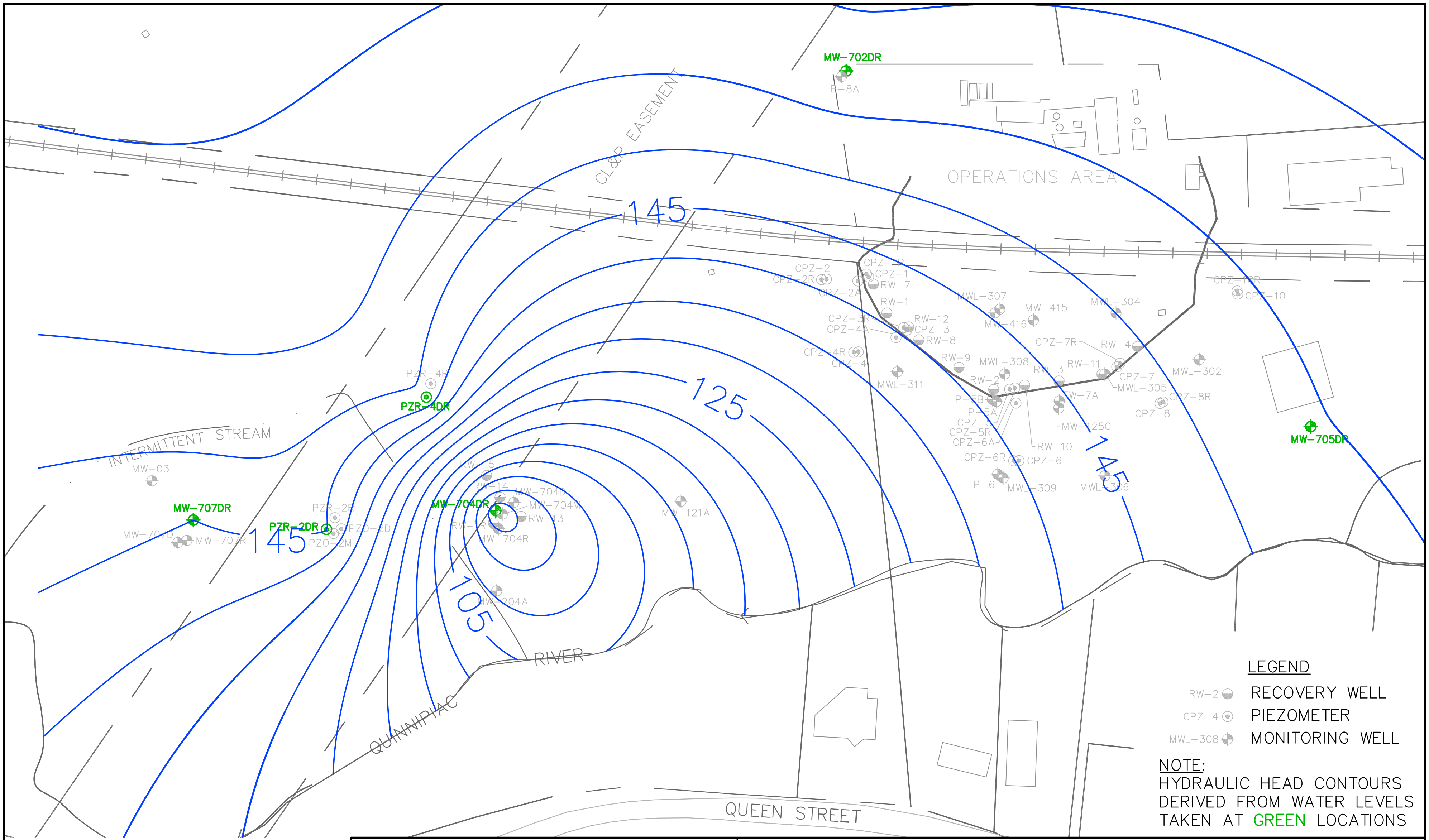

NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE

200 100 0 100 200

APPROXIMATE SCALE IN FEET

DEEP BEDROCK
HYDRAULIC HEAD CONTOURS
NOVEMBER 28, 2015

SRSNE
SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS

CONCORD NEW HAMPSHIRE

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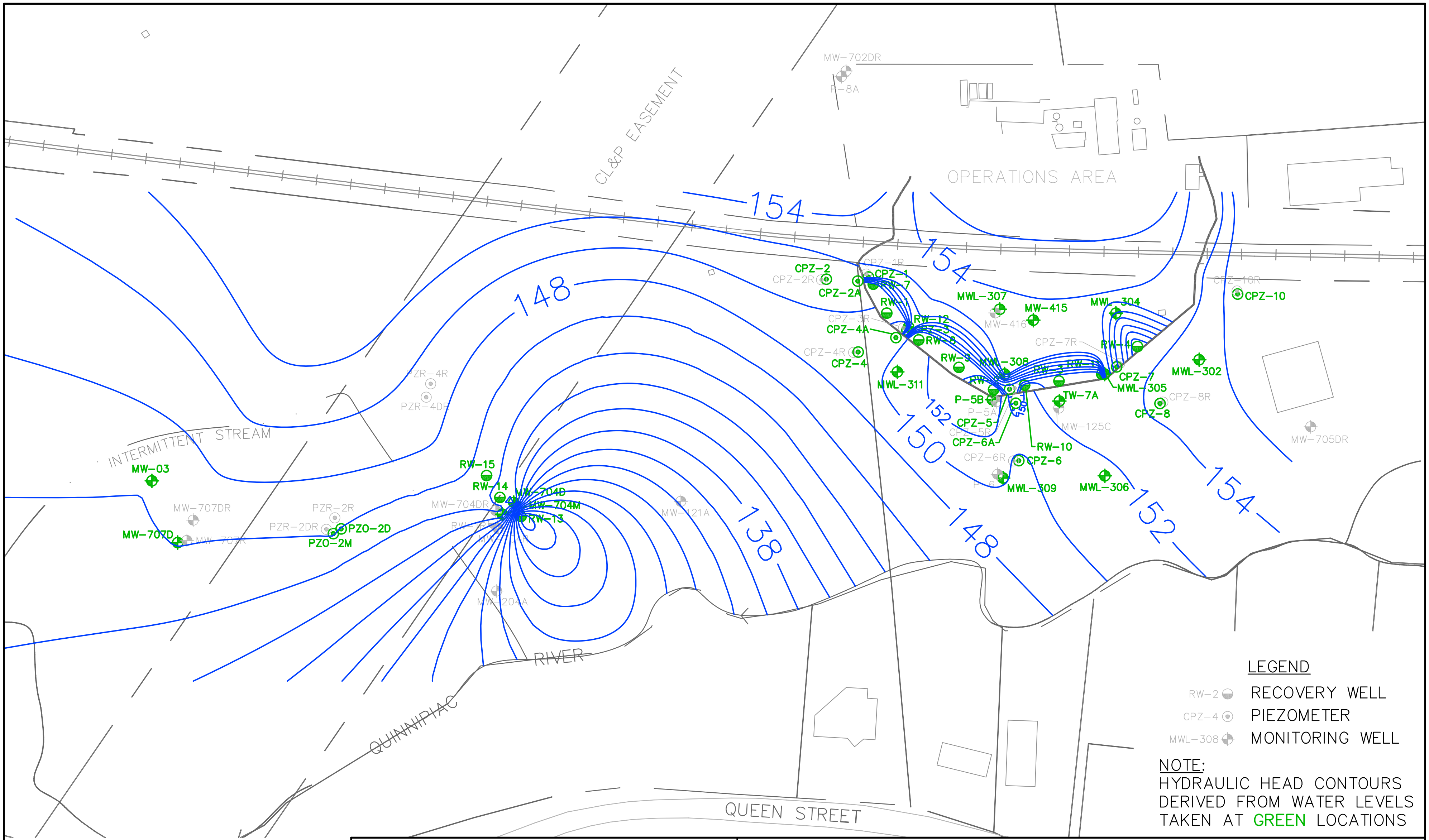
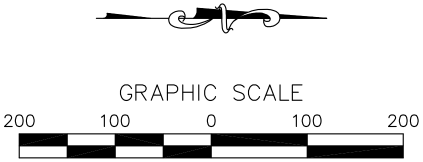


LEGEND

RW–2 ◒	RECOVERY WELL
CPZ–4 ⊙	PIEZOMETER
MWL–308 ⊕	MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS



GRAPHIC SCALE

APPROXIMATE SCALE IN FEET

OVERBURDEN
HYDRAULIC HEAD CONTOURS
DECEMBER 28, 2015

SRSNE
SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS

CONCORD NEW HAMPSHIRE

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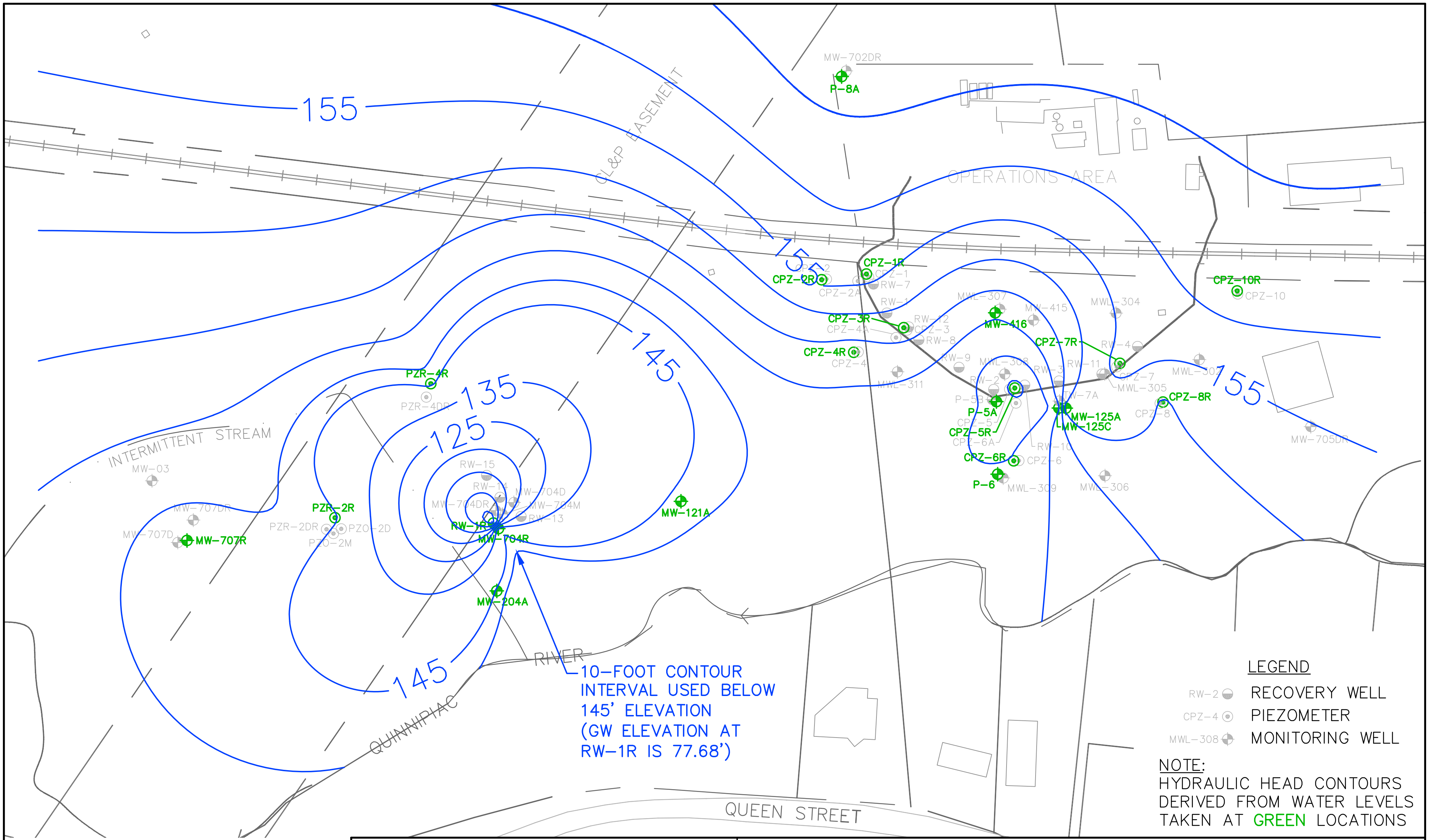

LEGEND

RW-2 ◒ RECOVERY WELL
CPZ-4 ⊙ PIEZOMETER
MWL-308 ⊕ MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS DERIVED FROM WATER LEVELS TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE

200 100 0 100 200

APPROXIMATE SCALE IN FEET

SHALLOW BEDROCK HYDRAULIC HEAD CONTOURS DECEMBER 28, 2015

SRSNE
SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS

CONCORD NEW HAMPSHIRE

DRAWN BEG	DATE JAN 2016	DES. ENG.	DATE	W.O. NO. 13056.001.021
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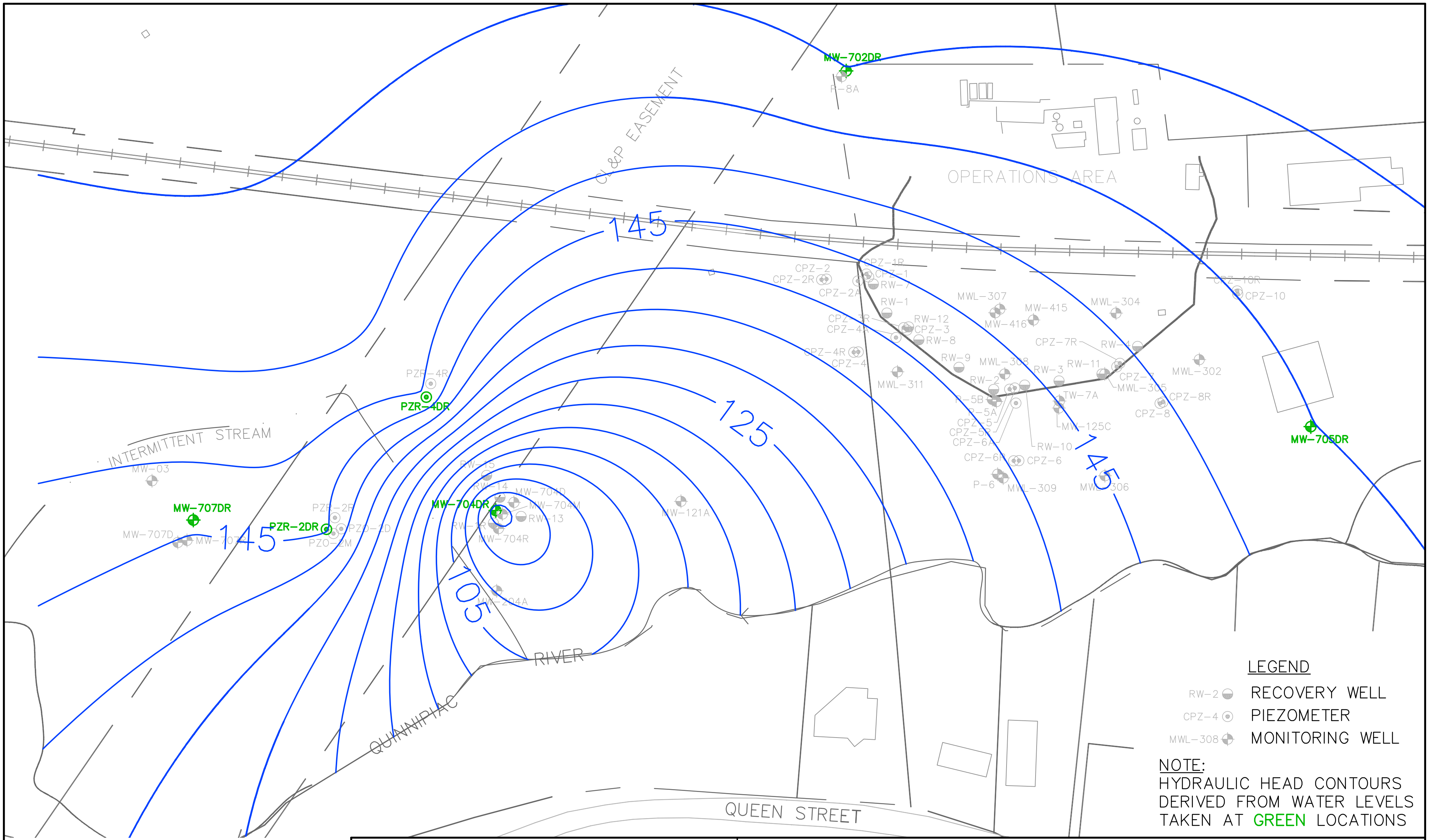

LEGEND

RW–2 ⊖	RECOVERY WELL
CPZ–4 ◎	PIEZOMETER
MWL–308 ⊕	MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE
200 100 0 100 200
APPROXIMATE SCALE IN FEET

DEEP BEDROCK
HYDRAULIC HEAD CONTOURS
DECEMBER 28, 2015

SRSNE
SOUTHINGTON, CONNECTICUT

CONCORD NEW HAMPSHIRE

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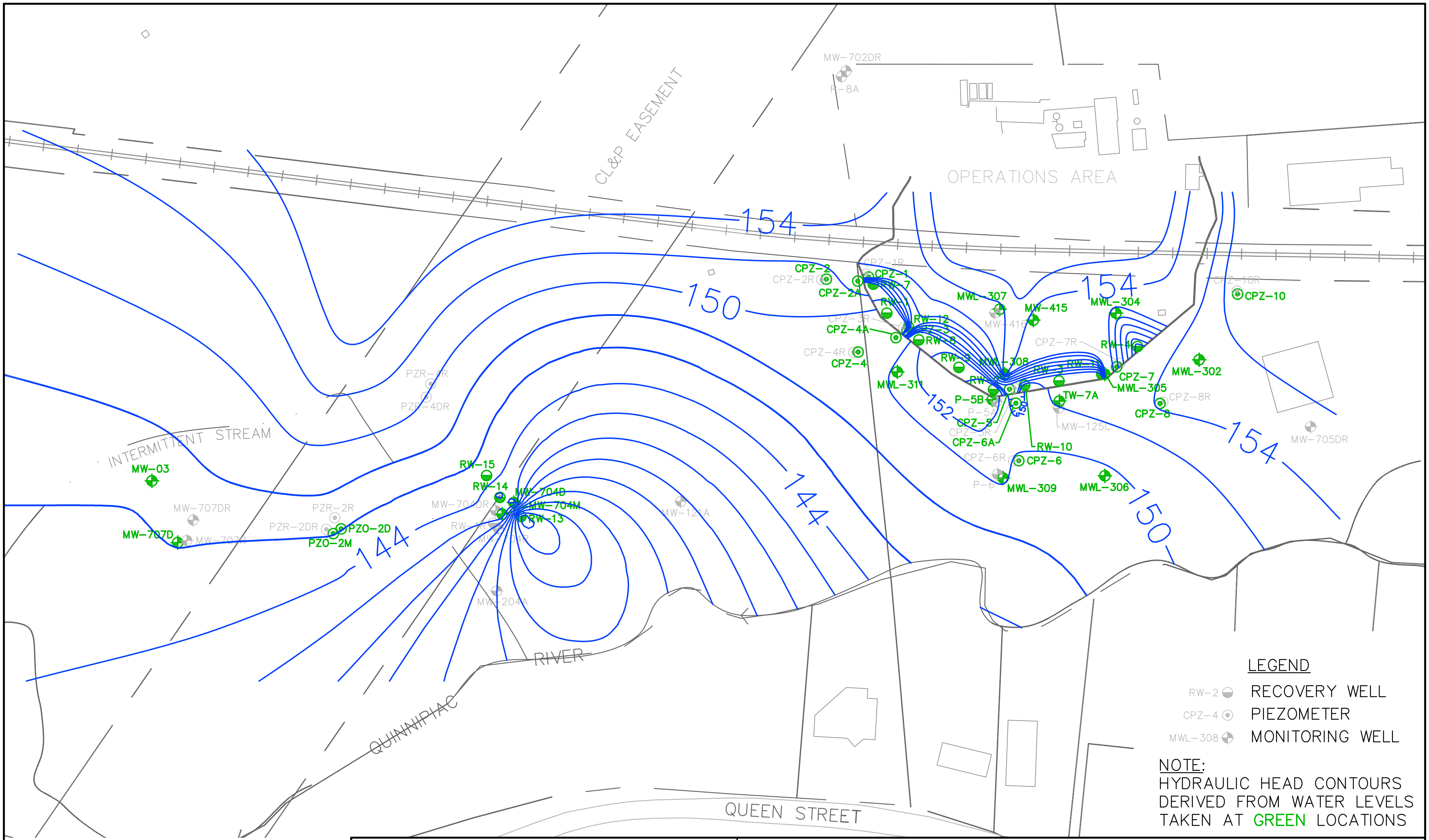

LEGEND

RW-2 ⊖	RECOVERY WELL
CPZ-4 ⊙	PIEZOMETER
MWL-308 ⊕	MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE
200 100 0 100 200
APPROXIMATE SCALE IN FEET

OVERBURDEN
HYDRAULIC HEAD CONTOURS
JANUARY 27, 2016

SRSNE
SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS

CONCORD NEW HAMPSHIRE

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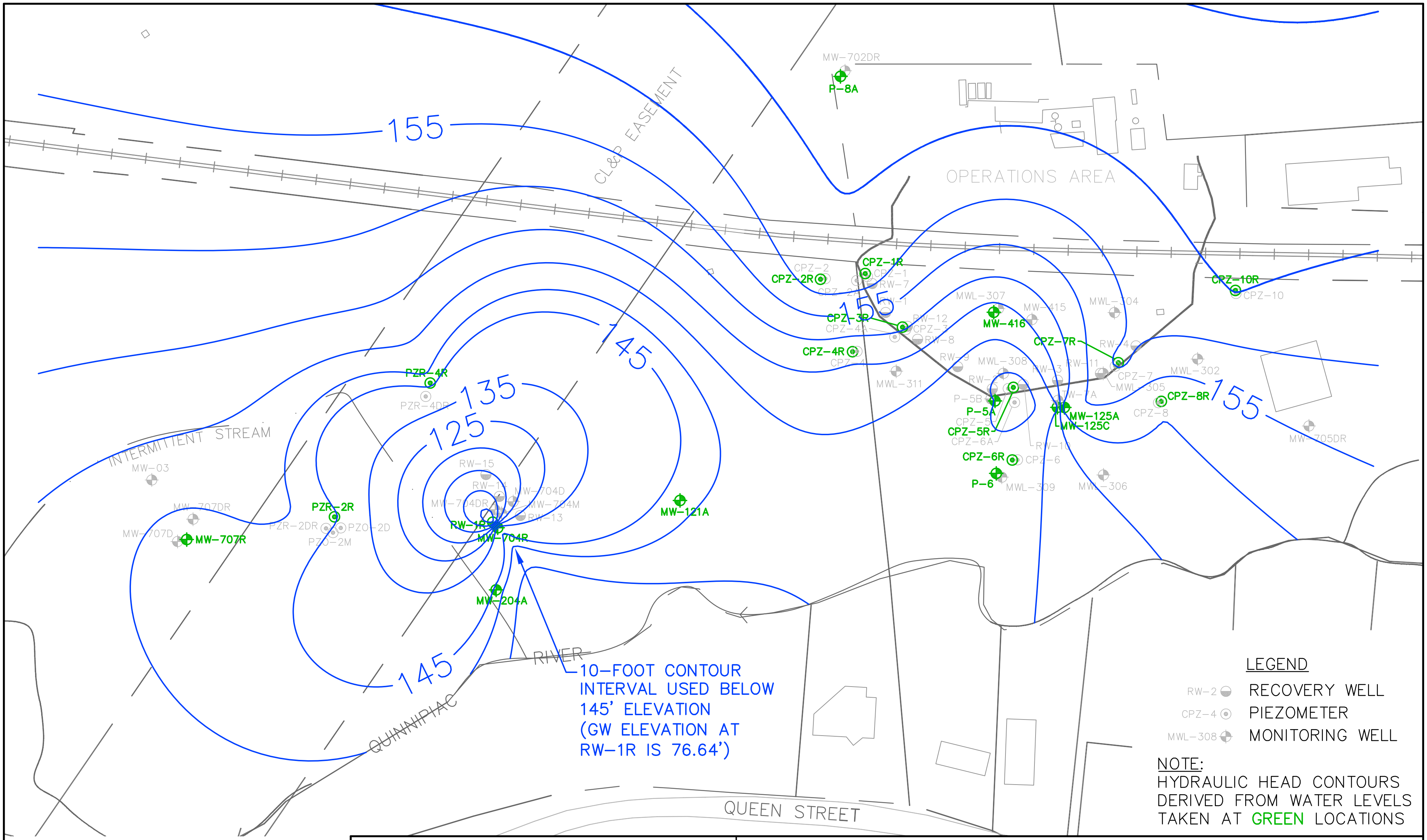

10-FOOT CONTOUR
INTERVAL USED BELOW
145' ELEVATION
(GW ELEVATION AT
RW-1R IS 76.64')

LEGEND

RW-2 ◒	RECOVERY WELL
CPZ-4 ⊙	PIEZOMETER
MWL-308 ⊕	MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE
200 100 0 100 200
APPROXIMATE SCALE IN FEET

SHALLOW BEDROCK
HYDRAULIC HEAD CONTOURS
JANUARY 27, 2016

SRSNE
SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS
CONCORD NEW HAMPSHIRE

DRAWN BEG	DATE FEB 2016	DES. ENG.	DATE	W.O. NO. 13056.001.021
CHECKED	DATE	SCALE AS SHOWN	REVISION	FIGURE NO. 3B

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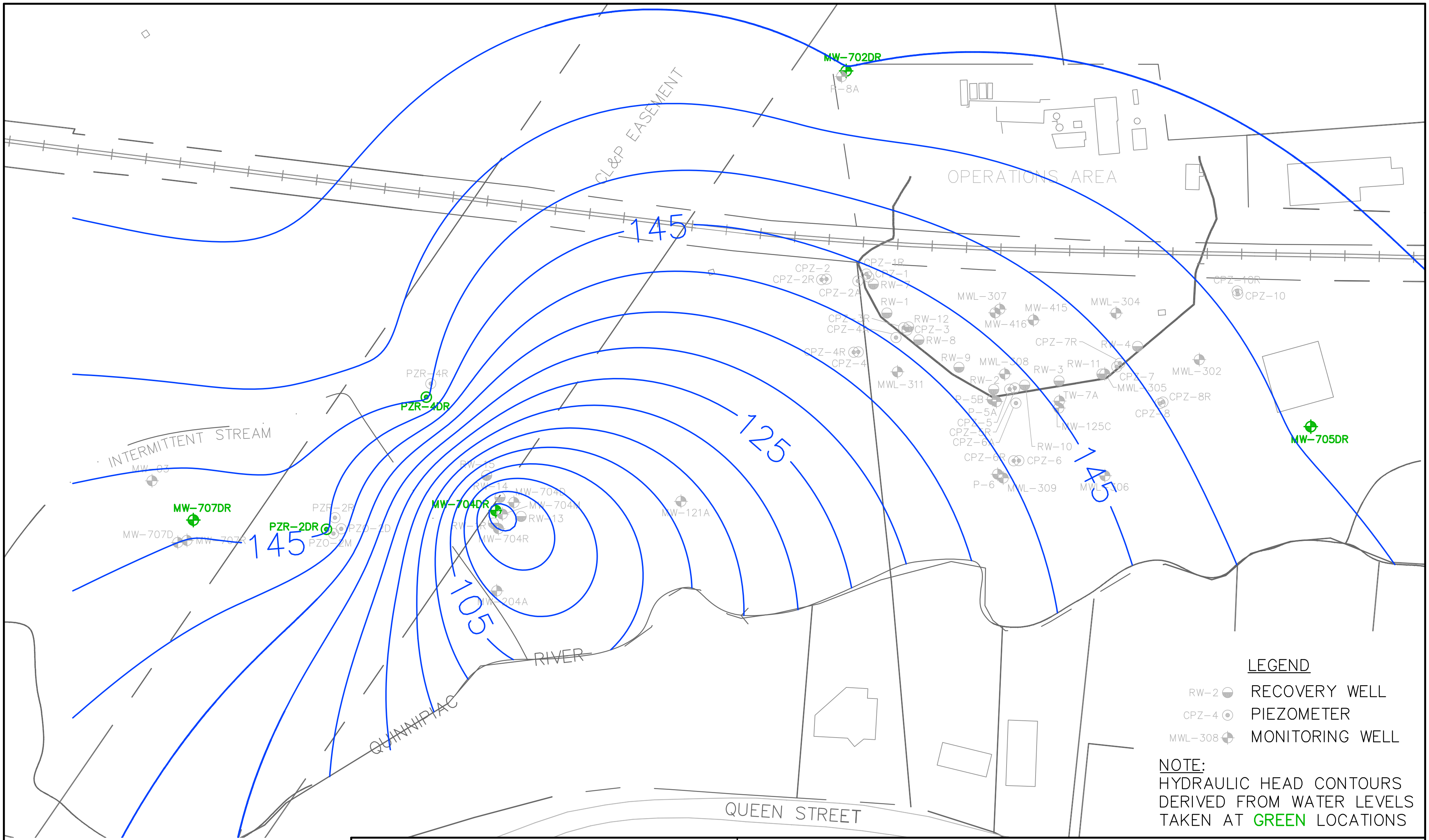

LEGEND

RW-2 ⊖ RECOVERY WELL

CPZ-4 ◎ PIEZOMETER

MWL-308 ⊕ MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE

200 100 0 100 200

APPROXIMATE SCALE IN FEET

DEEP BEDROCK
HYDRAULIC HEAD CONTOURS
JANUARY 27, 2016

SRSNE
SOUTHINGTON, CONNECTICUT

CONCORD NEW HAMPSHIRE

DRAWN BEG	DATE FEB 2016	DES. ENG.	DATE	W.O. NO. 13056.001.021
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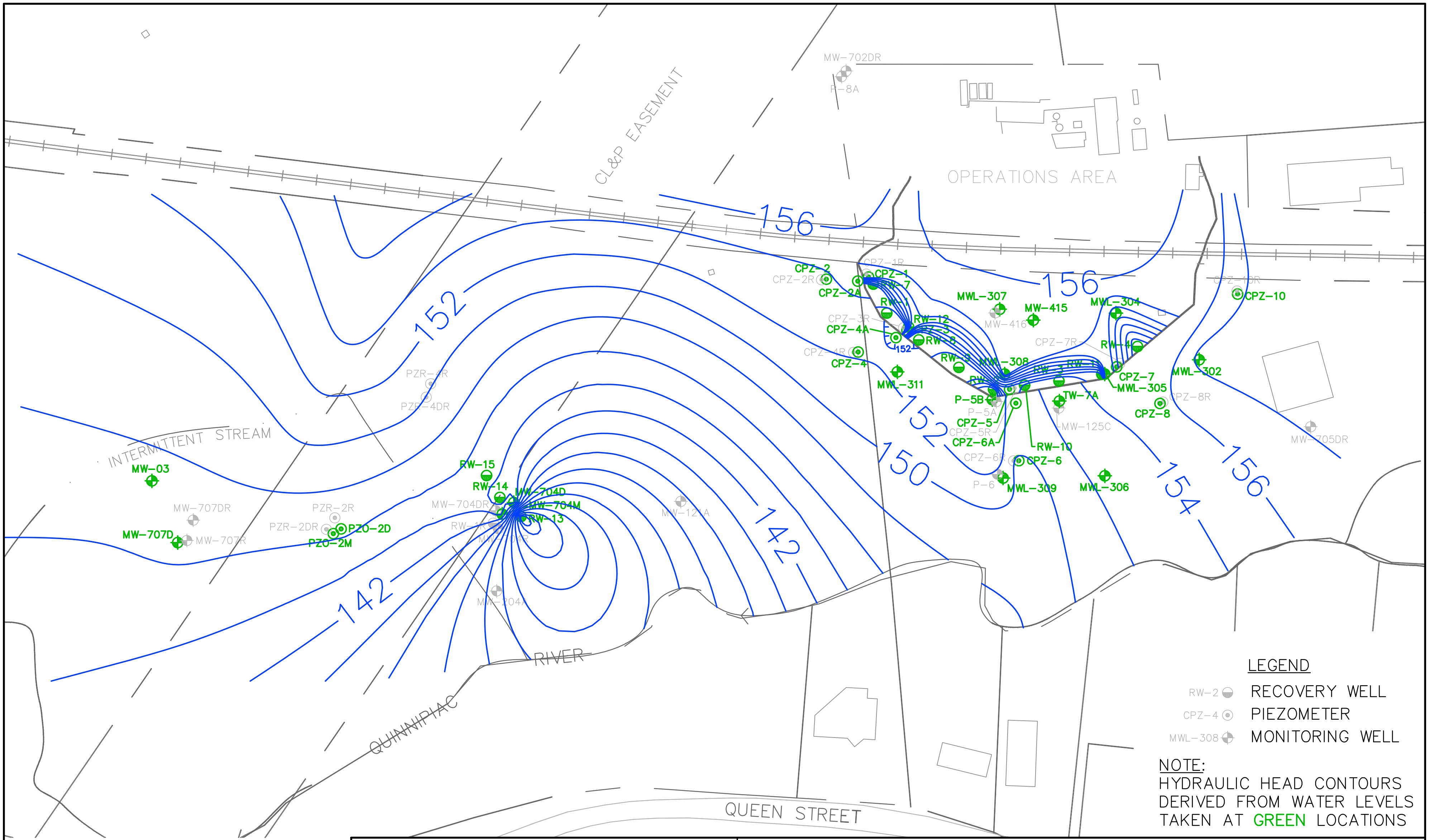

NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE
200 100 0 100 200
APPROXIMATE SCALE IN FEET

OVERBURDEN
HYDRAULIC HEAD CONTOURS
FEBRUARY 25, 2016

SRSNE
SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS

CONCORD NEW HAMPSHIRE

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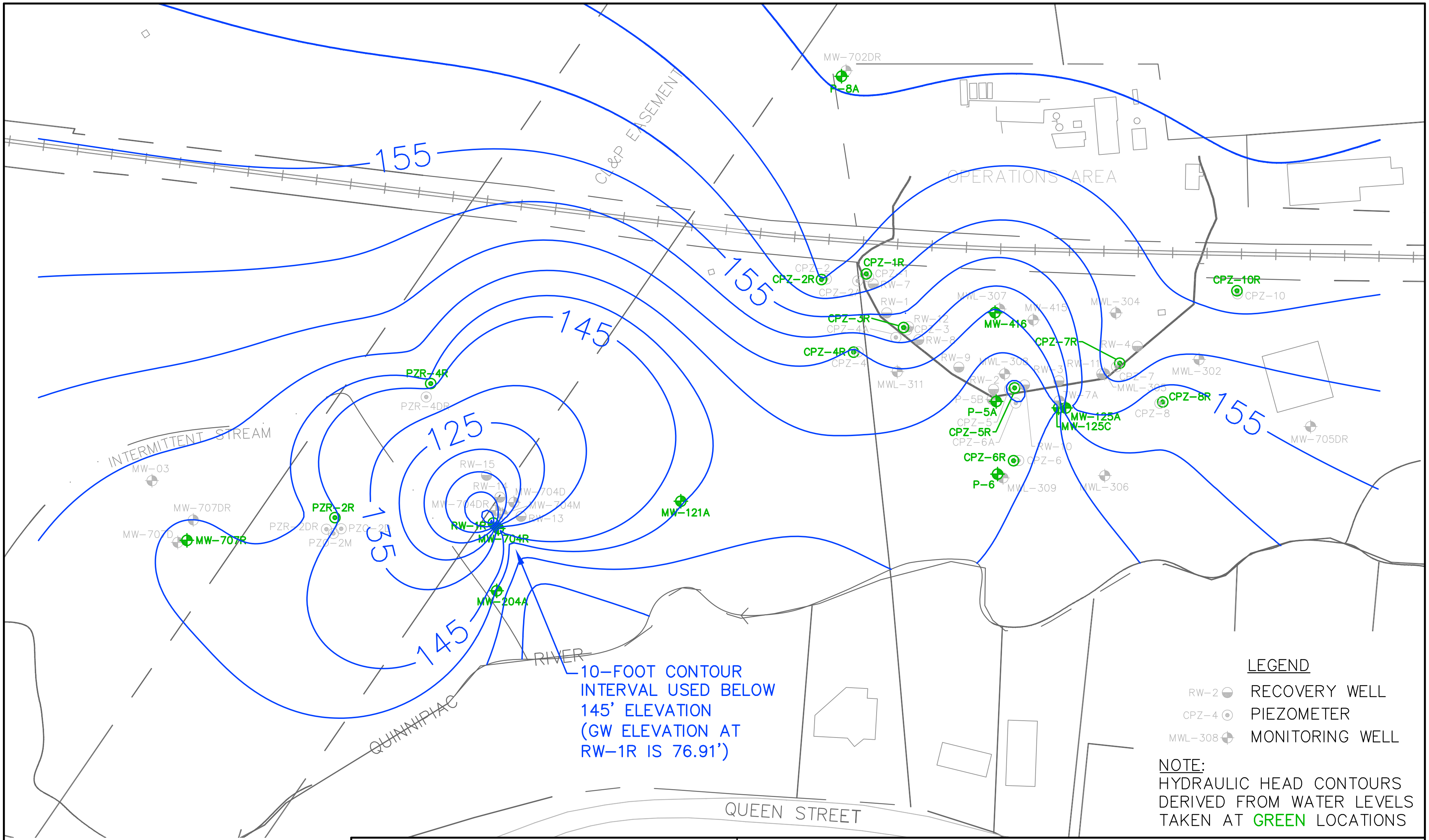
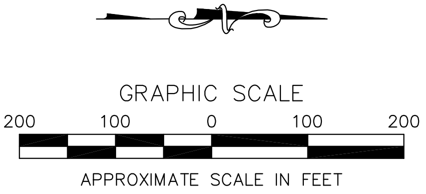


10-FOOT CONTOUR INTERVAL USED BELOW 145' ELEVATION (GW ELEVATION AT RW-1R IS 76.91')

LEGEND

RW-2 ◒ RECOVERY WELL
CPZ-4 ⊙ PIEZOMETER
MWL-308 ⊕ MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS DERIVED FROM WATER LEVELS TAKEN AT GREEN LOCATIONS



SHALLOW BEDROCK
HYDRAULIC HEAD CONTOURS
FEBRUARY 25, 2016

SRSNE
SOUTHINGTON, CONNECTICUT

CONCORD
NEW HAMPSHIRE

DRAWN BEG	DATE MAR 2016	DES. ENG.	DATE	W.O. NO. 13056.001.021
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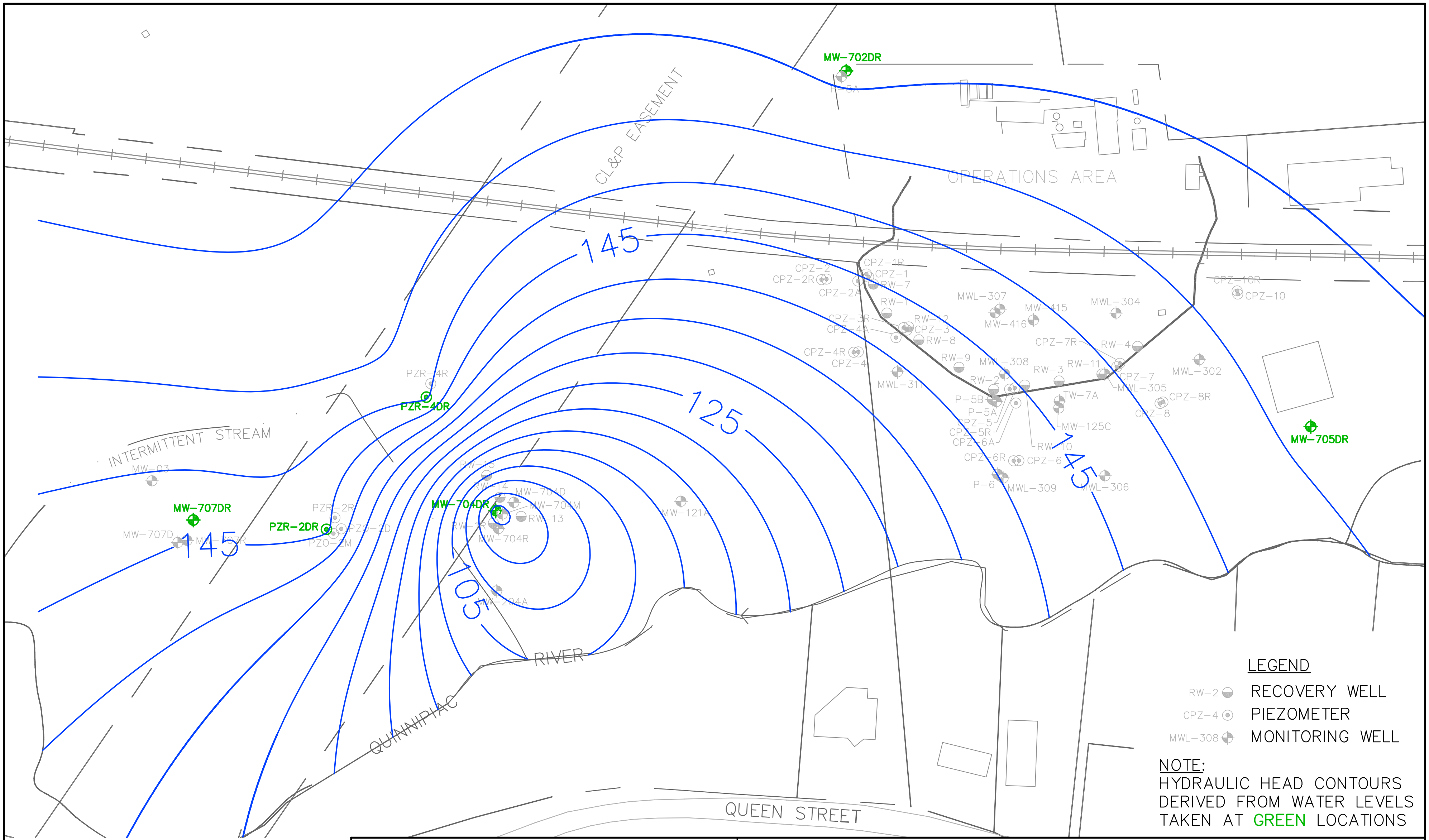


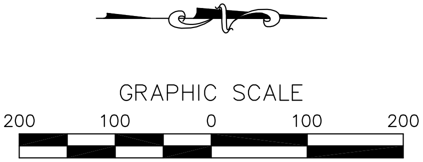
LEGEND

RW-2 ⊖ RECOVERY WELL

CPZ-4 ⊙ PIEZOMETER

MWL-308 ⊕ MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS



GRAPHIC SCALE

APPROXIMATE SCALE IN FEET

DEEP BEDROCK
HYDRAULIC HEAD CONTOURS
FEBRUARY 25, 2016

SRSNE
SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS

CONCORD NEW HAMPSHIRE

DRAWN BEG	DATE MAR 2016	DES. ENG.	DATE	W.O. NO. 13056.001.021
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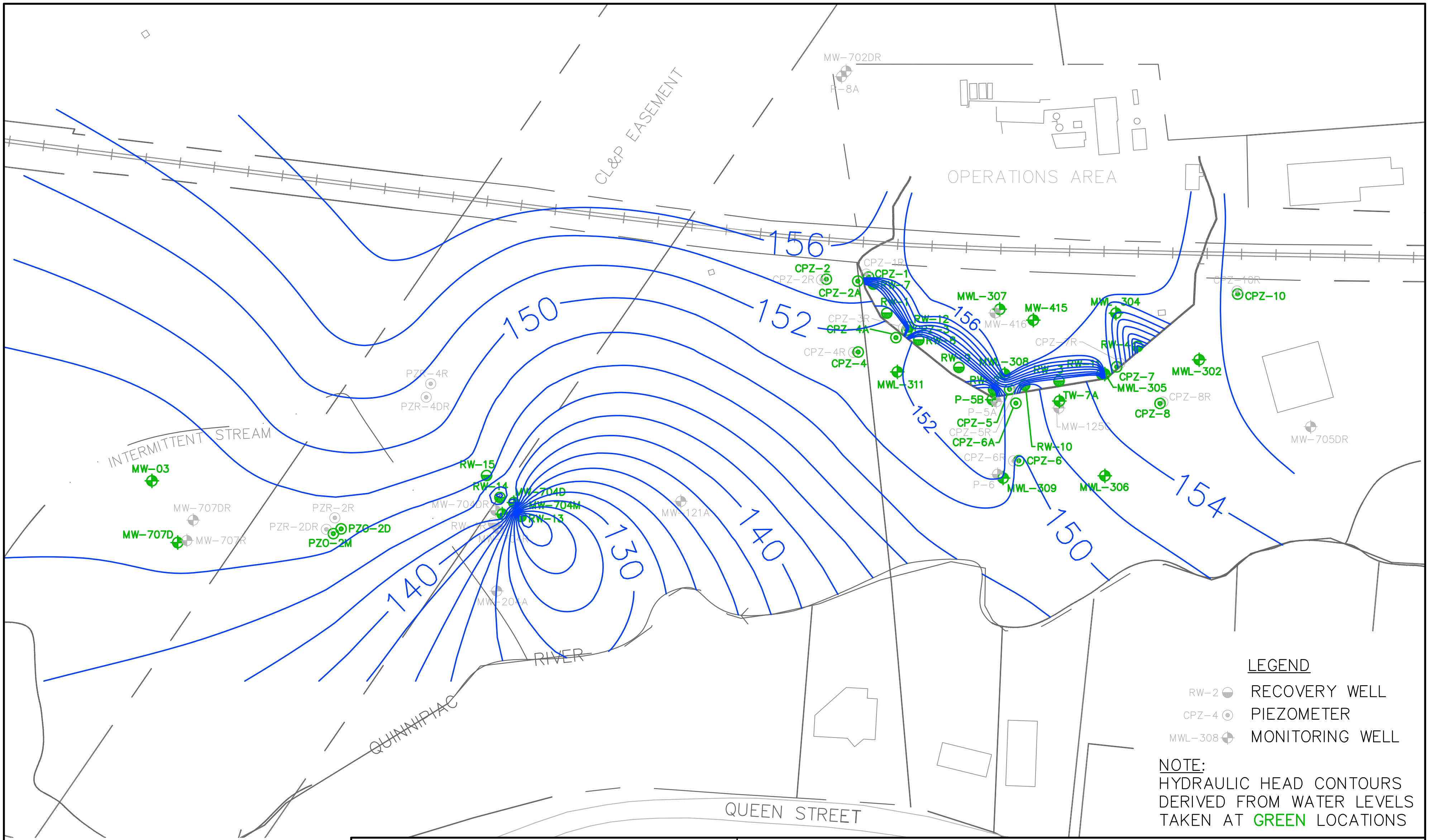

LEGEND

RW-2 ⊖ RECOVERY WELL
CPZ-4 ◎ PIEZOMETER
MWL-308 ⊕ MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS DERIVED FROM WATER LEVELS TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE

200 100 0 100 200

APPROXIMATE SCALE IN FEET

OVERBURDEN
HYDRAULIC HEAD CONTOURS
MARCH 30, 2016

SRSNE
SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS

CONCORD NEW HAMPSHIRE

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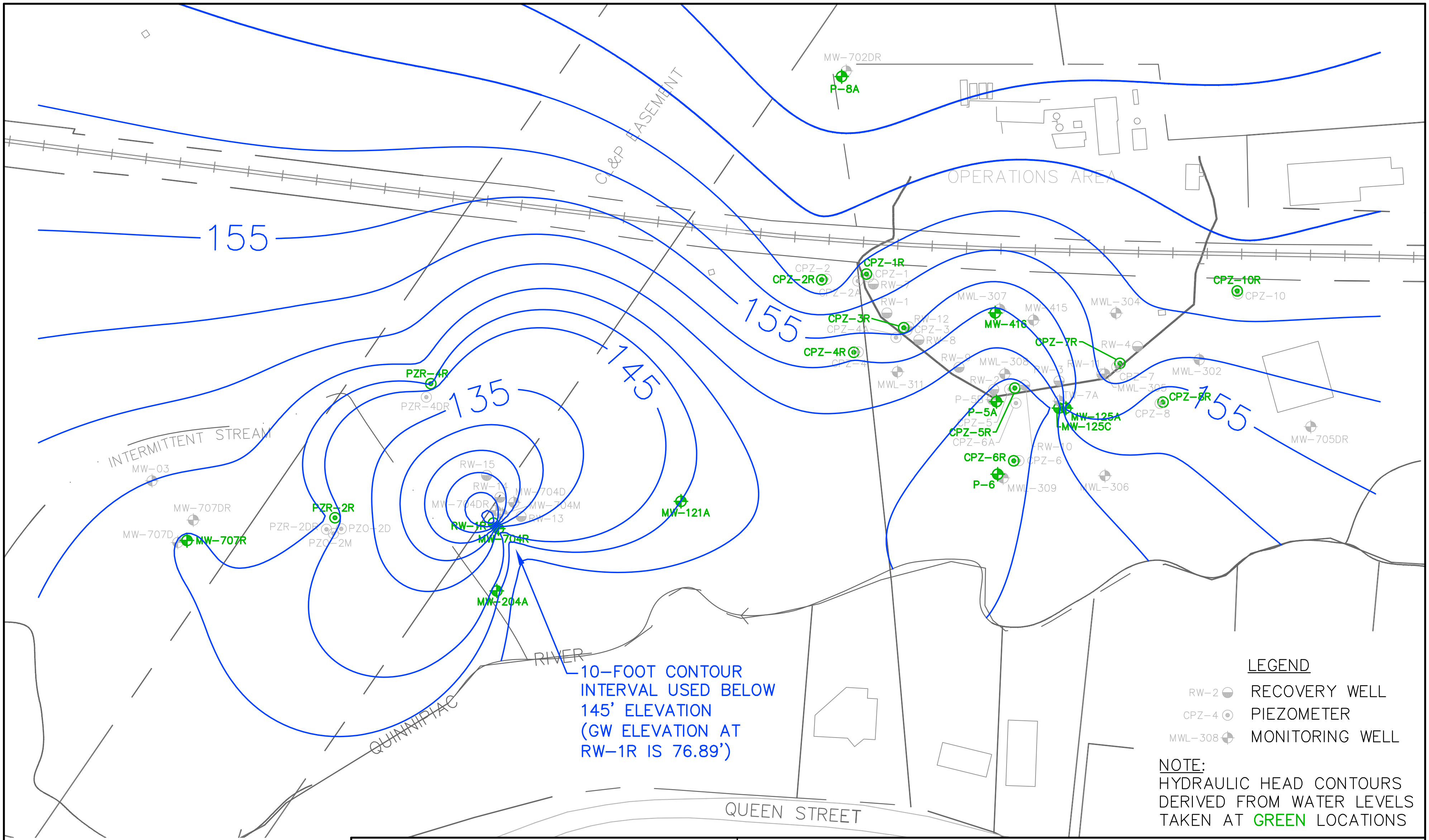

LEGEND

RW-2 ◒	RECOVERY WELL
CPZ-4 ⊙	PIEZOMETER
MWL-308 ⊕	MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS DERIVED FROM WATER LEVELS TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE

200 100 0 100 200

APPROXIMATE SCALE IN FEET

SHALLOW BEDROCK HYDRAULIC HEAD CONTOURS MARCH 30, 2016

WESTON SOLUTIONS

CONCORD NEW HAMPSHIRE

SRSNE
SOUTHINGTON, CONNECTICUT

DRAWN BEG	DATE APR 2016	DES. ENG.	DATE	W.O. NO. 13056.001.021
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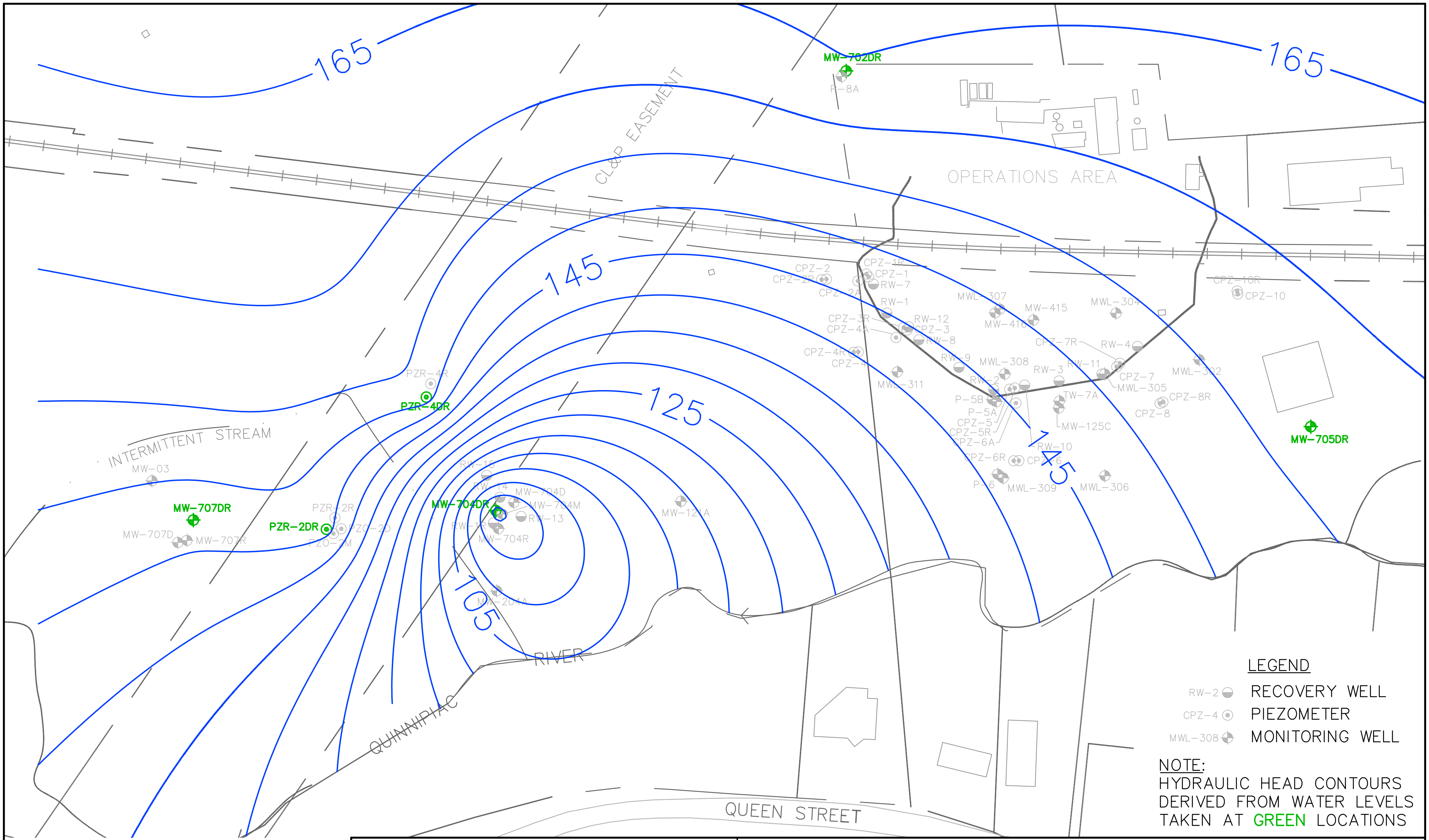


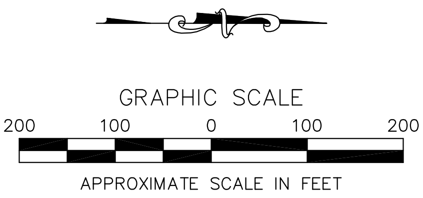
LEGEND

RW-2 ◒ RECOVERY WELL

CPZ-4 ◎ PIEZOMETER

MWL-308 ⊕ MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS



DEEP BEDROCK
HYDRAULIC HEAD CONTOURS
MARCH 30, 2016

SRSNE
SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS

CONCORD NEW HAMPSHIRE

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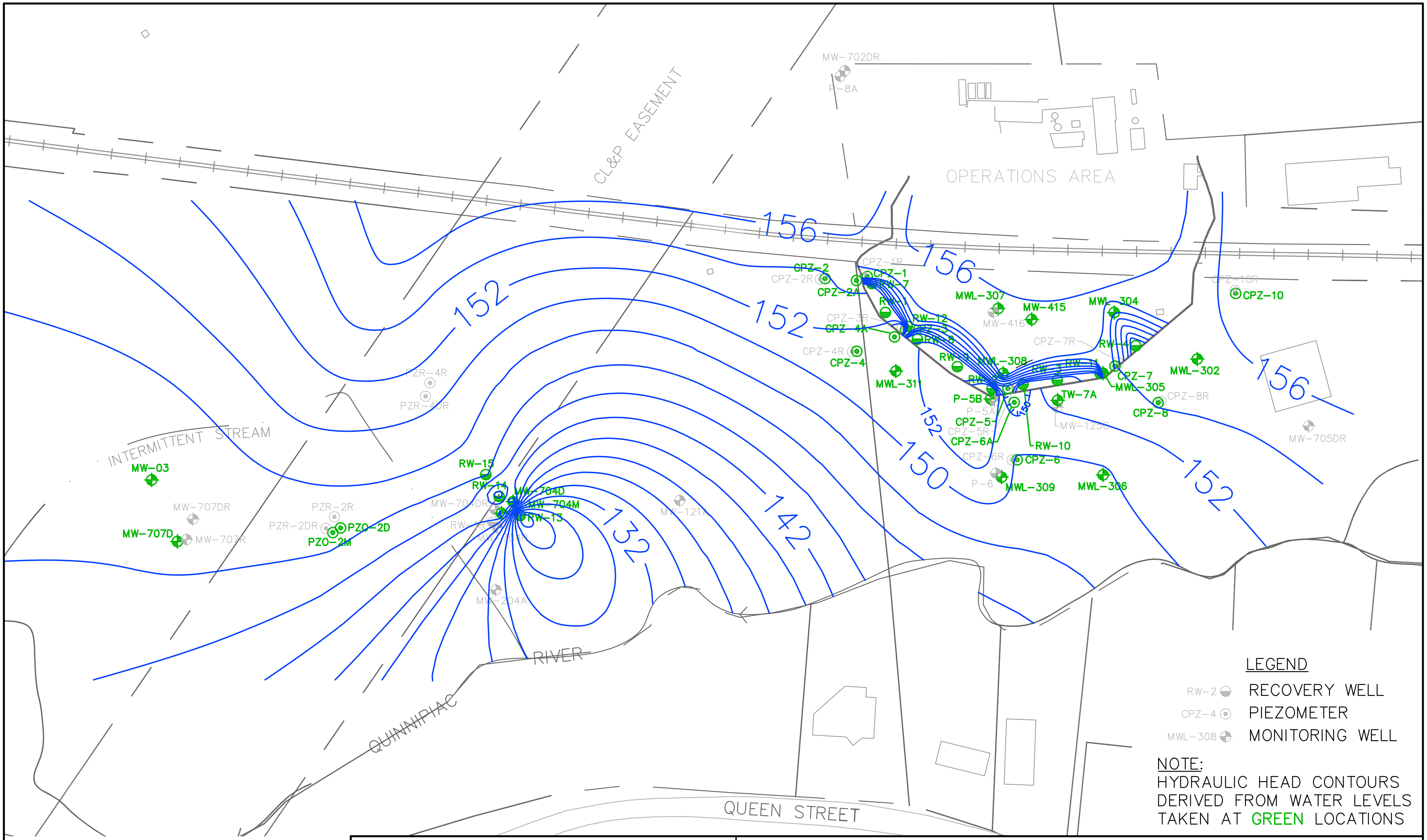

LEGEND

RW-2 ◒	RECOVERY WELL
CPZ-4 ⊙	PIEZOMETER
MWL-308 ⊕	MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS DERIVED FROM WATER LEVELS TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE

200 100 0 100 200

APPROXIMATE SCALE IN FEET

OVERBURDEN
HYDRAULIC HEAD CONTOURS
APRIL 27, 2016

SRSNE
SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS

CONCORD NEW HAMPSHIRE

DRAWN BEG	DATE MAY 2016	DES. ENG.	DATE	W.O. NO. 13056.001.021
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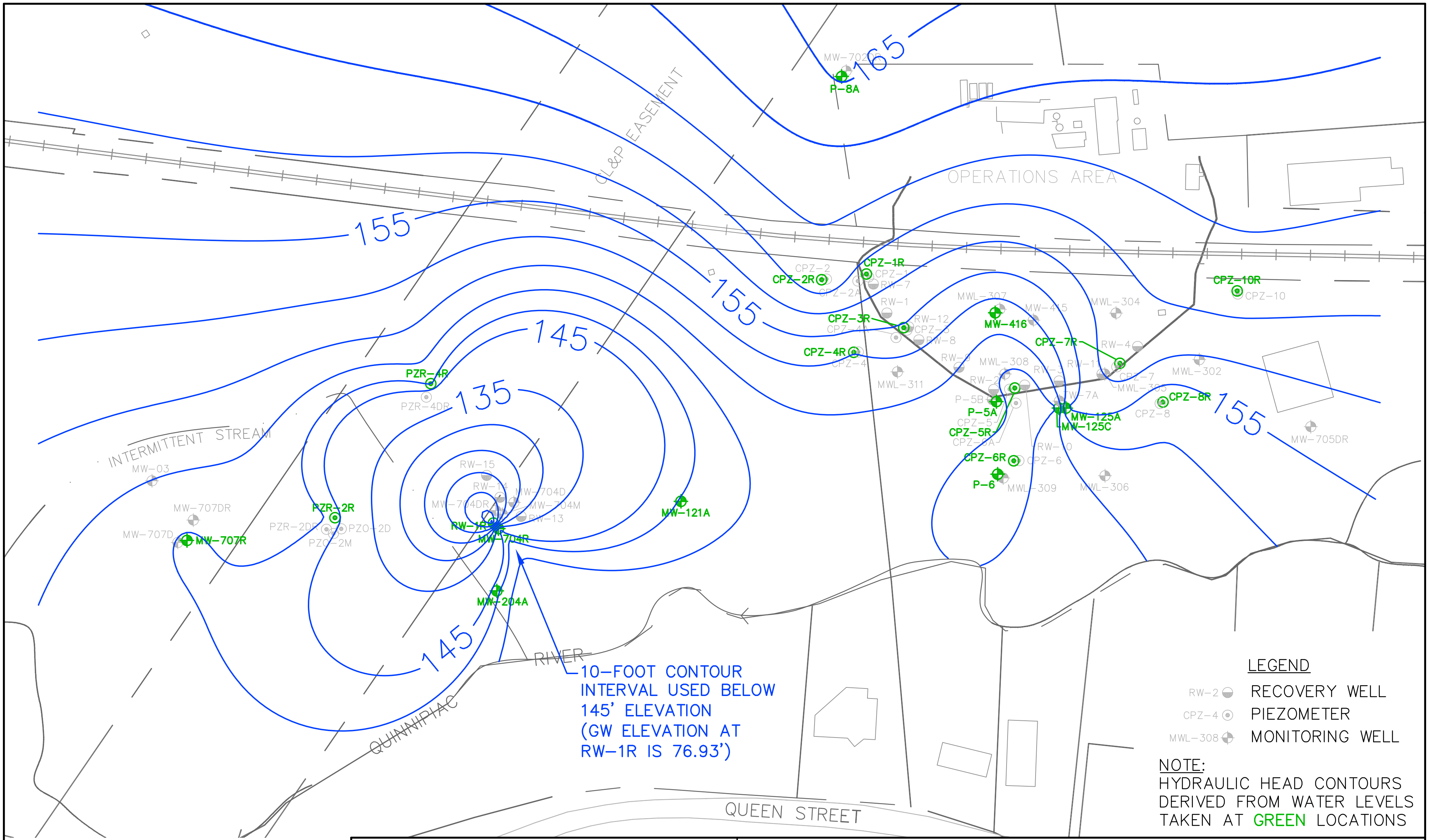

10-FOOT CONTOUR INTERVAL USED BELOW 145' ELEVATION (GW ELEVATION AT RW-1R IS 76.93')

LEGEND

RW-2 ◒	RECOVERY WELL
CPZ-4 ⦿	PIEZOMETER
MWL-308 ⊕	MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS DERIVED FROM WATER LEVELS TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE
200 100 0 100 200
APPROXIMATE SCALE IN FEET

SHALLOW BEDROCK HYDRAULIC HEAD CONTOURS APRIL 27, 2016

SRSNE
SOUTHINGTON, CONNECTICUT

CONCORD NEW HAMPSHIRE

DRAWN BEG	DATE MAY 2016	DES. ENG.	DATE	W.O. NO. 13056.001.021
CHECKED	DATE	SCALE AS SHOWN	REVISION	FIGURE NO. 6B

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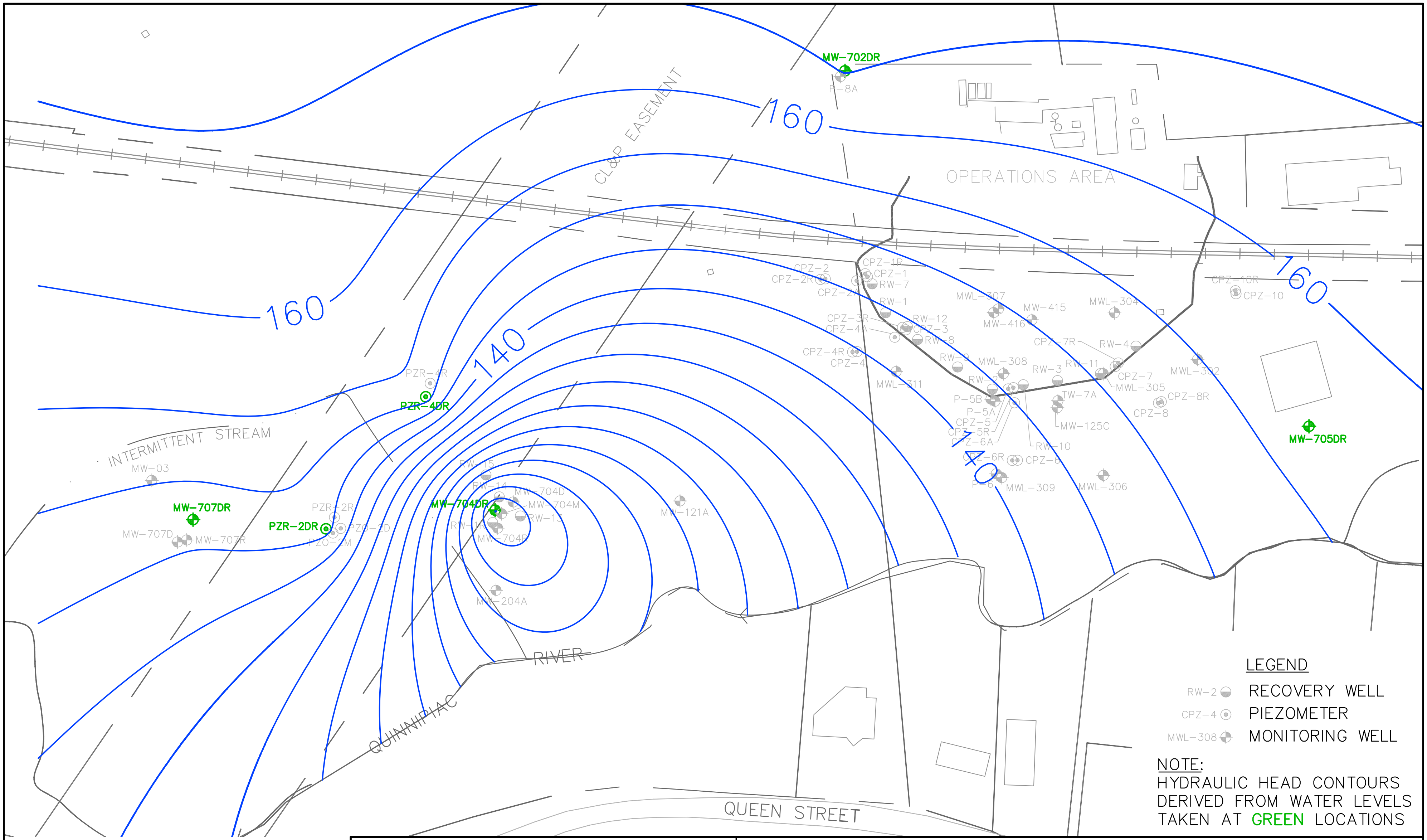

LEGEND

RW-2 ◒	RECOVERY WELL
CPZ-4 ⊙	PIEZOMETER
MWL-308 ⊕	MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE
200 100 0 100 200
APPROXIMATE SCALE IN FEET

DEEP BEDROCK
HYDRAULIC HEAD CONTOURS
APRIL 27, 2016

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CONCORD NEW HAMPSHIRE

DRAWN BEG	DATE MAY 2016	DES. ENG.	DATE	W.O. NO. 13056.001.021
CHECKED	DATE	SCALE AS SHOWN	REVISION	FIGURE NO. 6C

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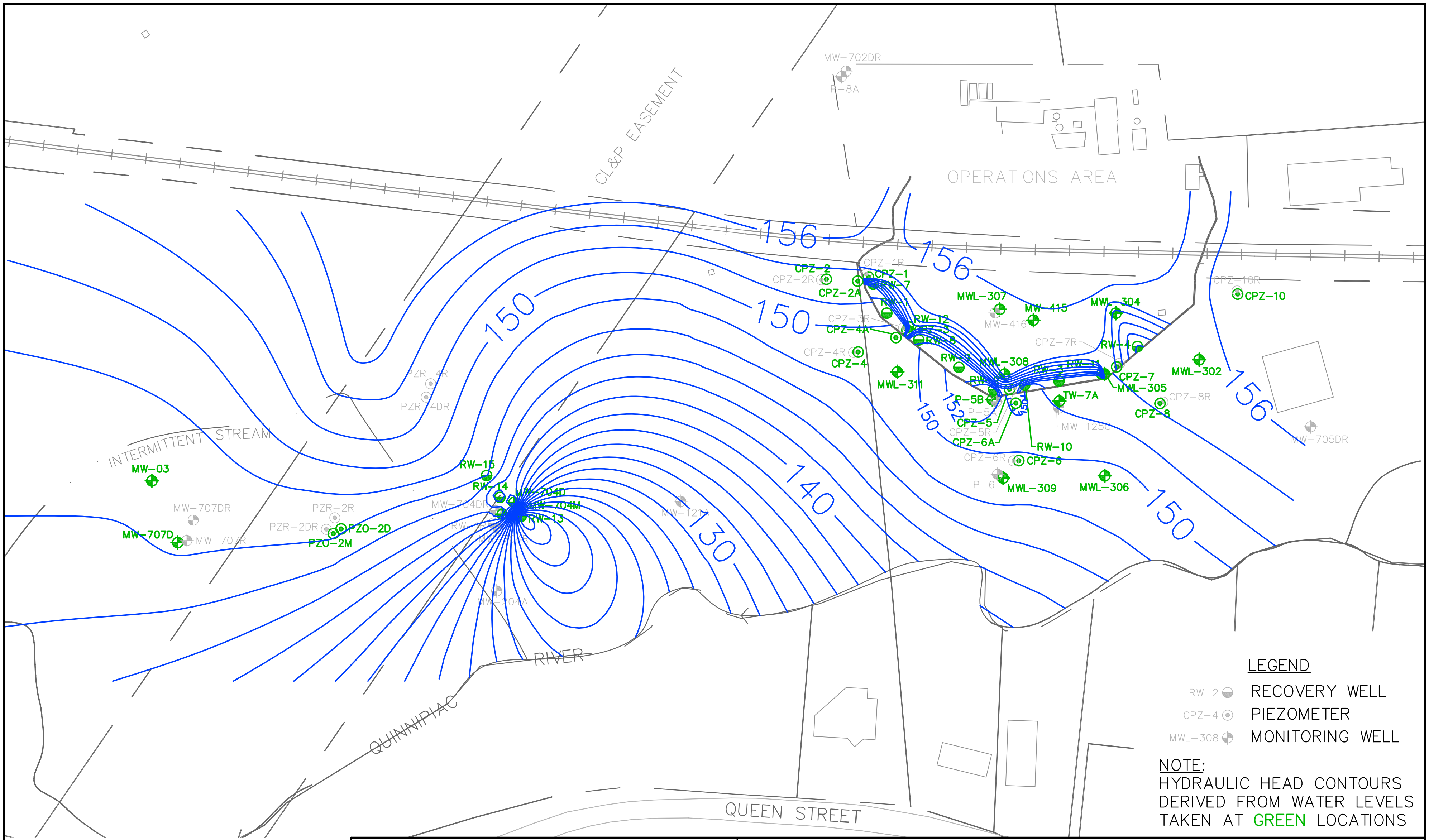

LEGEND

RW-2 RECOVERY WELL

CPZ-4 PIEZOMETER

MWL-308 MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE
200 100 0 100 200
APPROXIMATE SCALE IN FEET

OVERBURDEN
HYDRAULIC HEAD CONTOURS
MAY 26, 2016

SRSNE
SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS

CONCORD NEW HAMPSHIRE

DRAWN BEG	DATE JUN 2016	DES. ENG.	DATE	W.O. NO. 13056.001.021
CHECKED	DATE	SCALE AS SHOWN	REVISION	FIGURE NO. 7A

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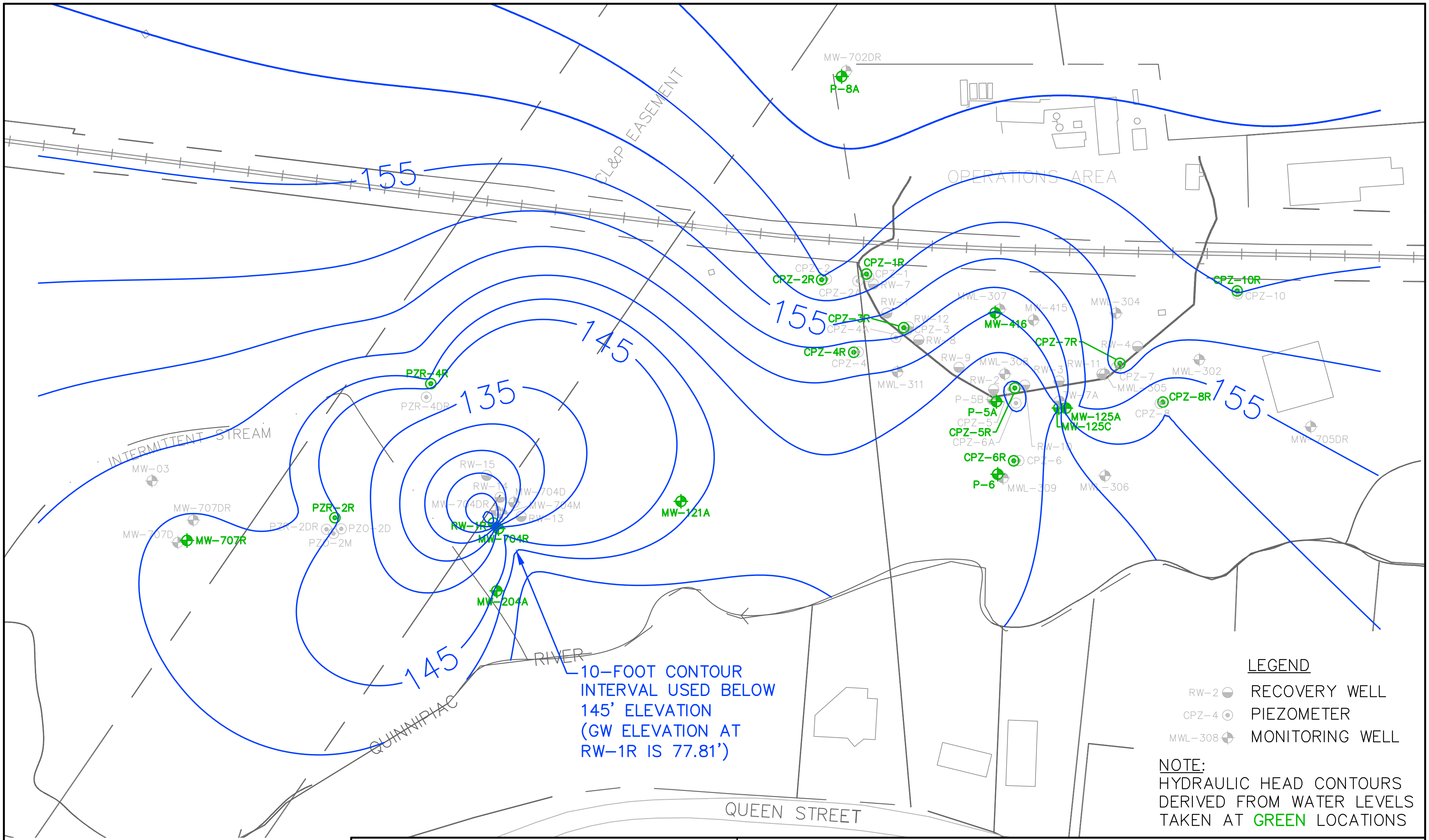

LEGEND

RW-2 ◒ RECOVERY WELL
CPZ-4 ⊙ PIEZOMETER
MWL-308 ⊕ MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS DERIVED FROM WATER LEVELS TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE
200 100 0 100 200
APPROXIMATE SCALE IN FEET

SHALLOW BEDROCK HYDRAULIC HEAD CONTOURS MAY 26, 2016

SRSNE
SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS
CONCORD NEW HAMPSHIRE

DRAWN BEG	DATE JUN 2016	DES. ENG.	DATE	W.O. NO. 13056.001.021
CHECKED	DATE	SCALE AS SHOWN	REVISION	FIGURE NO. 7B

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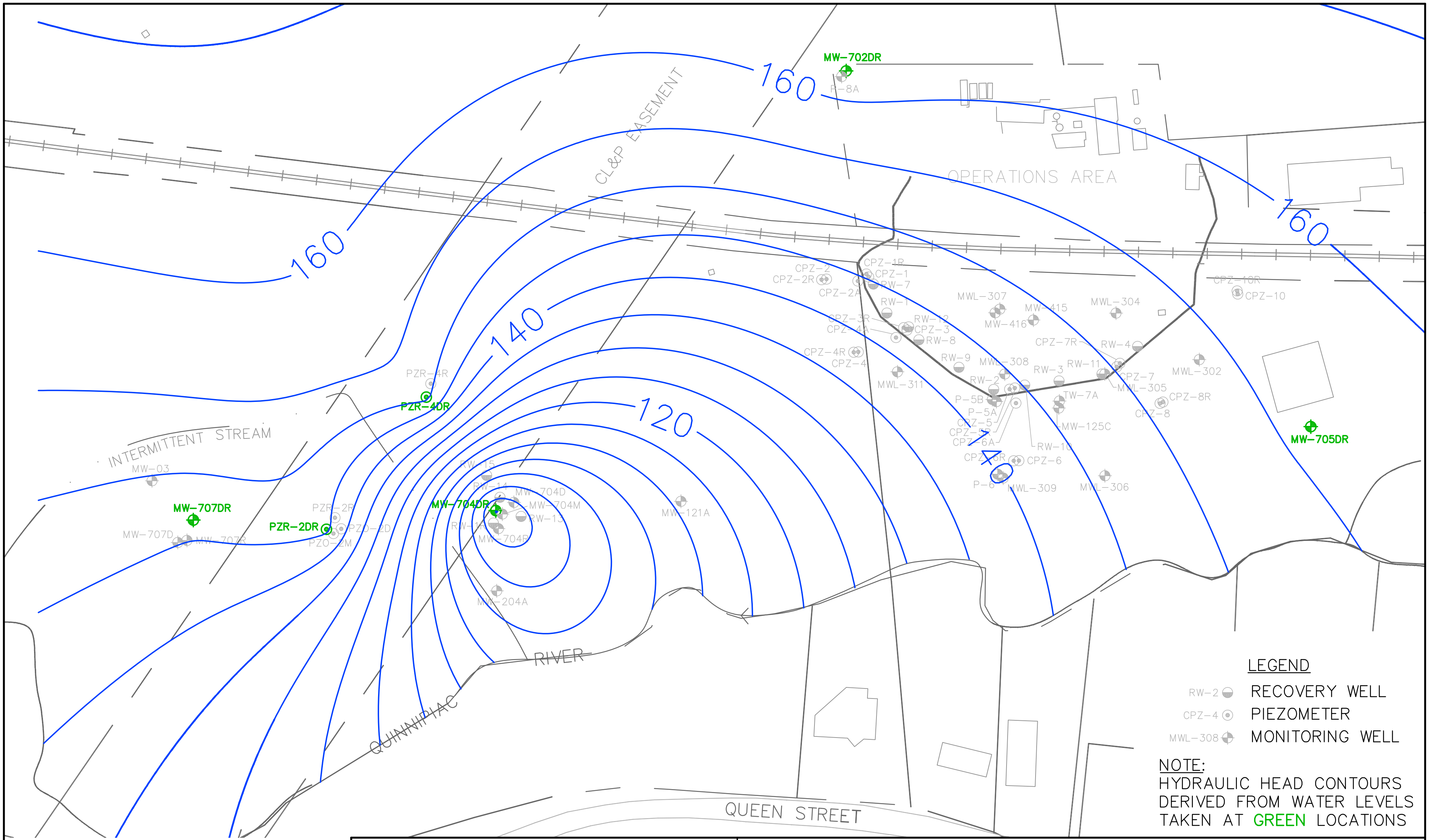
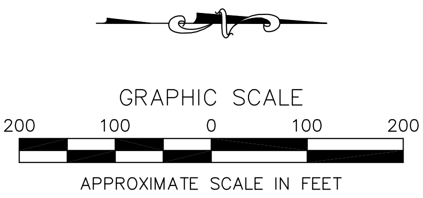


NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS



DEEP BEDROCK
HYDRAULIC HEAD CONTOURS
MAY 26, 2016

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NEW HAMPSHIRE

DRAWN BEG	DATE JUN 2016	DES. ENG.	DATE	W.O. NO. 13056.001.021
CHECKED	DATE	SCALE AS SHOWN	REVISION	FIGURE NO. 7C

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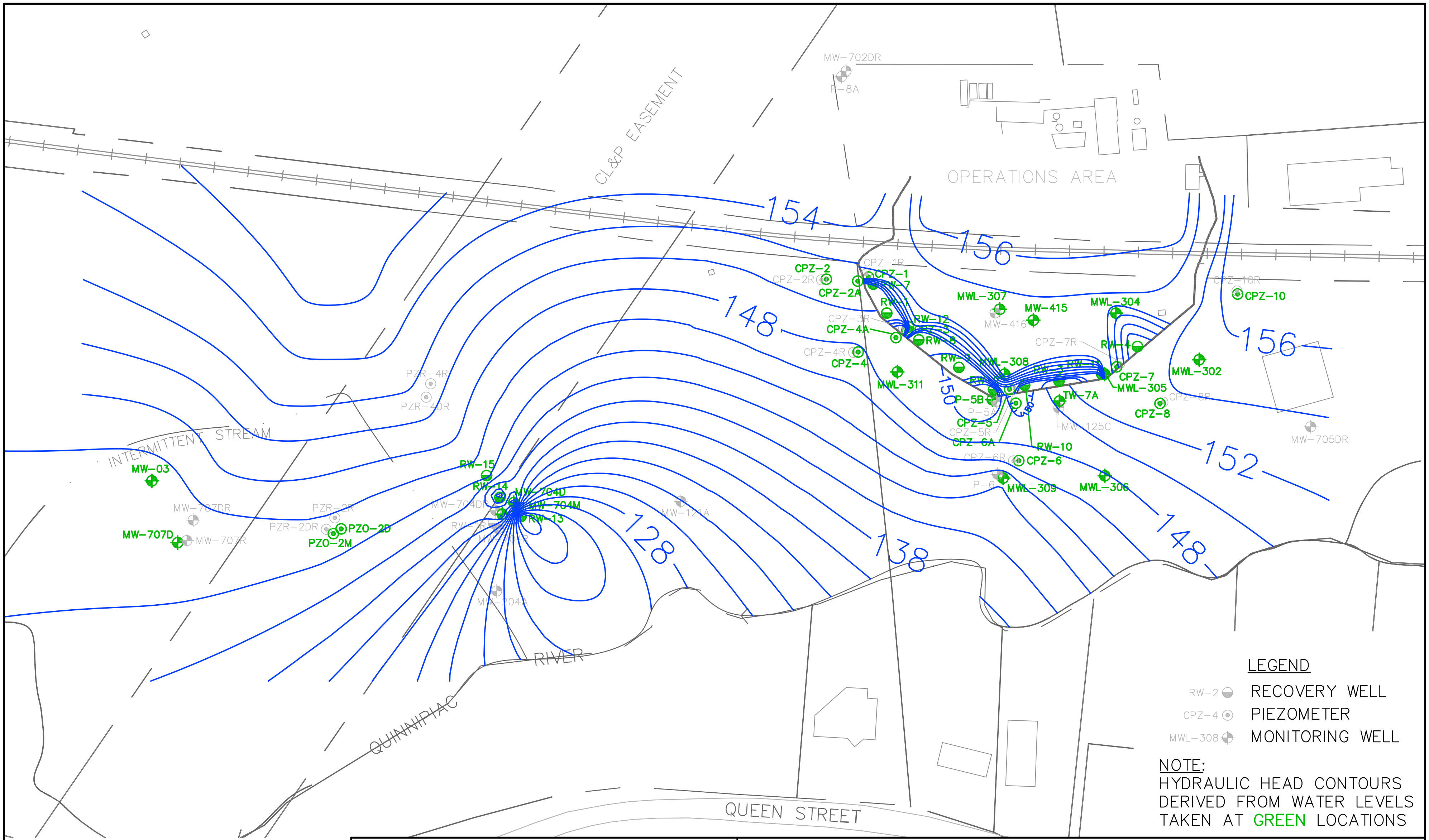

LEGEND

RW-2 ◒ RECOVERY WELL

CPZ-4 ⊙ PIEZOMETER

MWL-308 ⊕ MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE

200 100 0 100 200

APPROXIMATE SCALE IN FEET

OVERBURDEN
HYDRAULIC HEAD CONTOURS
JUNE 28, 2016

SRSNE
SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS

CONCORD NEW HAMPSHIRE

DRAWN	DATE	DES. ENG.	DATE	W.O. NO.
BEG	JUL 2016			13056.001.021
CHECKED	DATE	SCALE	REVISION	FIGURE NO.
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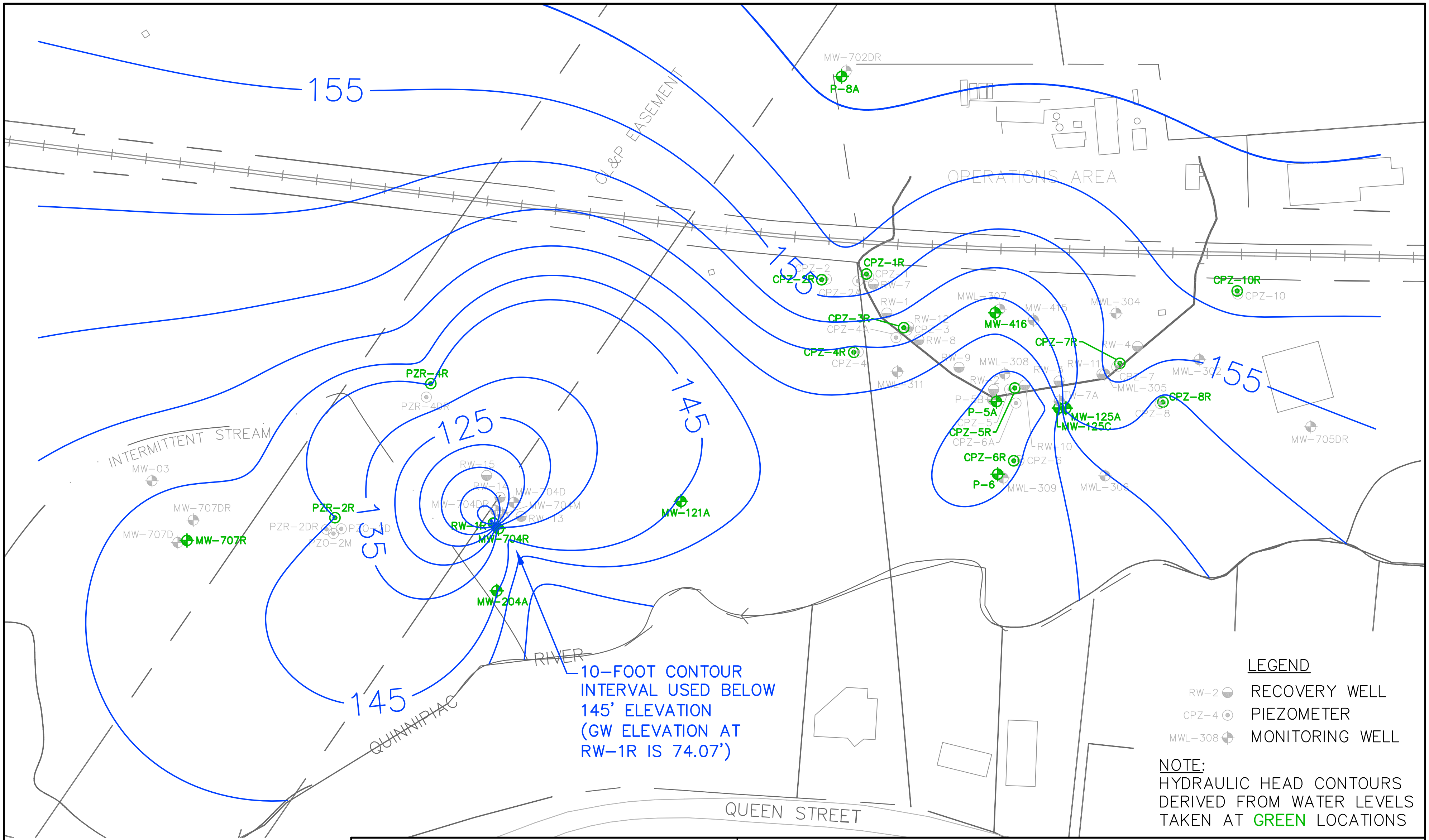

10-FOOT CONTOUR INTERVAL USED BELOW 145' ELEVATION (GW ELEVATION AT RW-1R IS 74.07')

LEGEND

RW-2	RECOVERY WELL
CPZ-4	PIEZOMETER
MWL-308	MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS DERIVED FROM WATER LEVELS TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE

200 100 0 100 200

APPROXIMATE SCALE IN FEET

SHALLOW BEDROCK HYDRAULIC HEAD CONTOURS JUNE 28, 2016

SRSNE
SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS

CONCORD NEW HAMPSHIRE

DRAWN	DATE	DES. ENG.	DATE	W.O. NO.
BEG	JUL 2016			13056.001.021
CHECKED	DATE	SCALE	REVISION	FIGURE NO.
		AS SHOWN		8B

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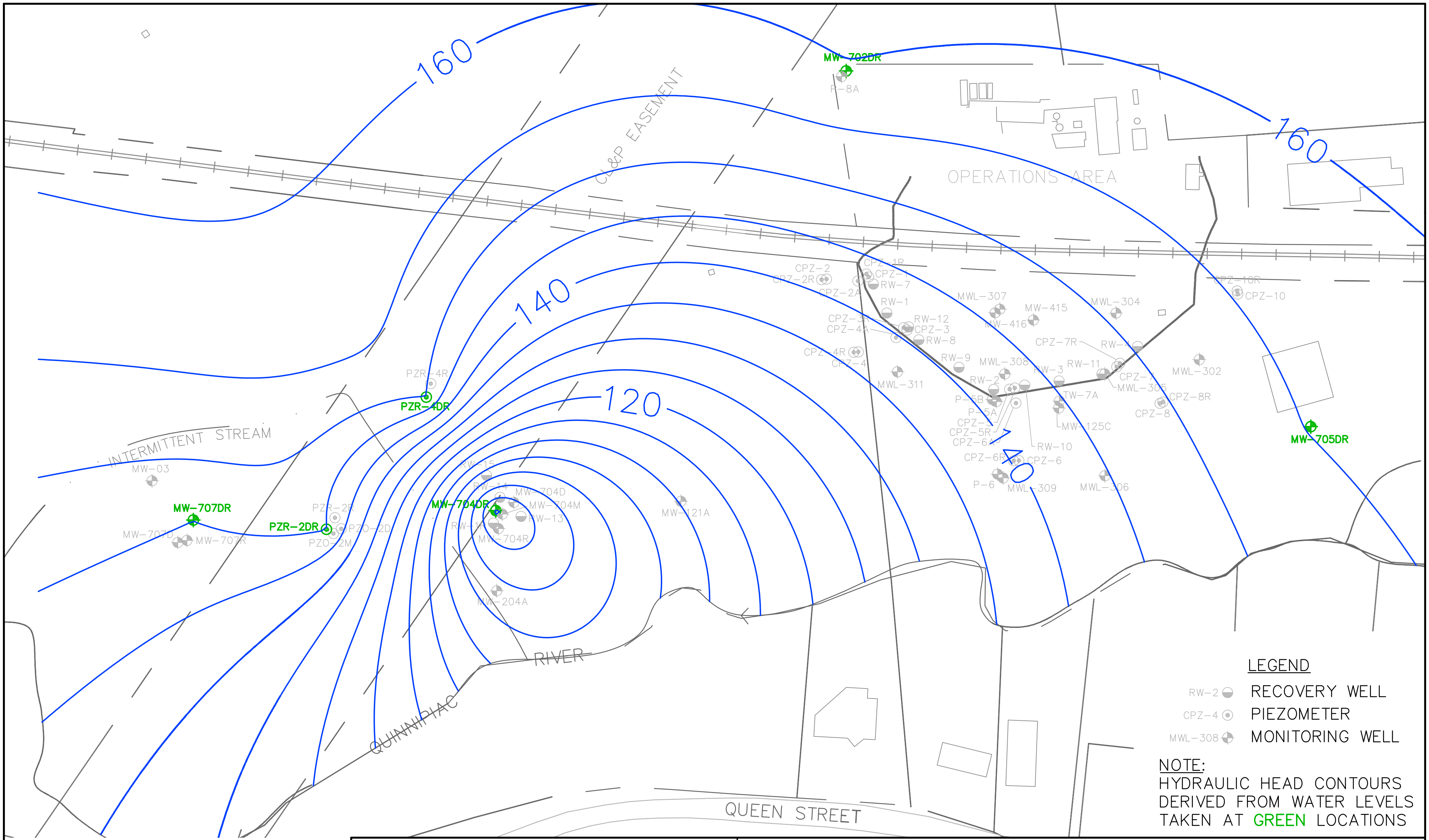

LEGEND

RW-2 ◒ RECOVERY WELL

CPZ-4 ⊙ PIEZOMETER

MWL-308 ⊕ MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS DERIVED FROM WATER LEVELS TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE

200 100 0 100 200

APPROXIMATE SCALE IN FEET

DEEP BEDROCK HYDRAULIC HEAD CONTOURS JUNE 28, 2016

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SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS

CONCORD NEW HAMPSHIRE

DRAWN	DATE	DES. ENG.	DATE	W.O. NO.
BEG	JUL 2016			13056.001.021
CHECKED	DATE	SCALE	REVISION	FIGURE NO.
		AS SHOWN		8C

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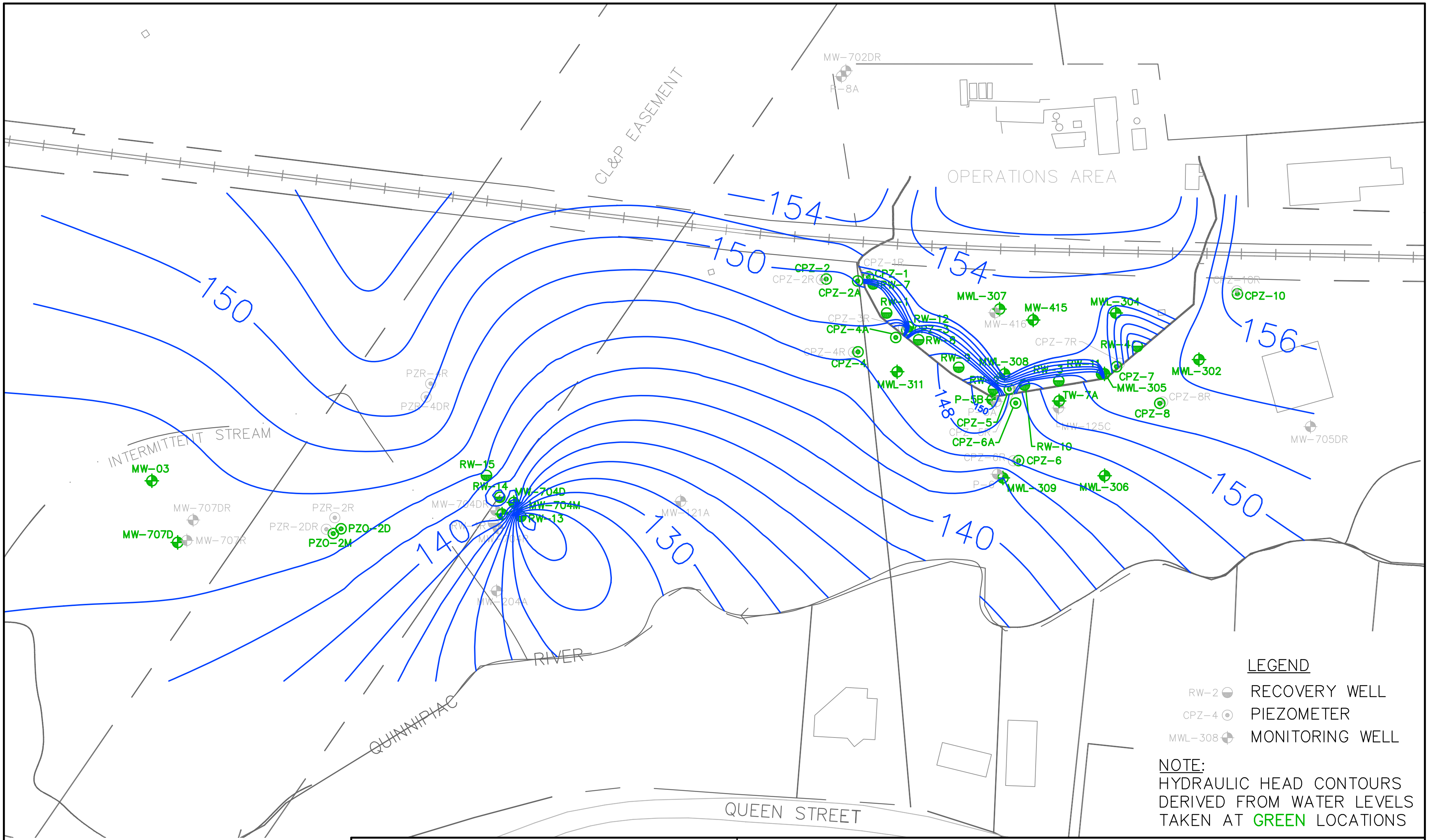


LEGEND

RW-2 ◒ RECOVERY WELL

CPZ-4 ⊙ PIEZOMETER

MWL-308 ⊕ MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE
200 100 0 100 200
APPROXIMATE SCALE IN FEET

OVERBURDEN
HYDRAULIC HEAD CONTOURS
JULY 26, 2016

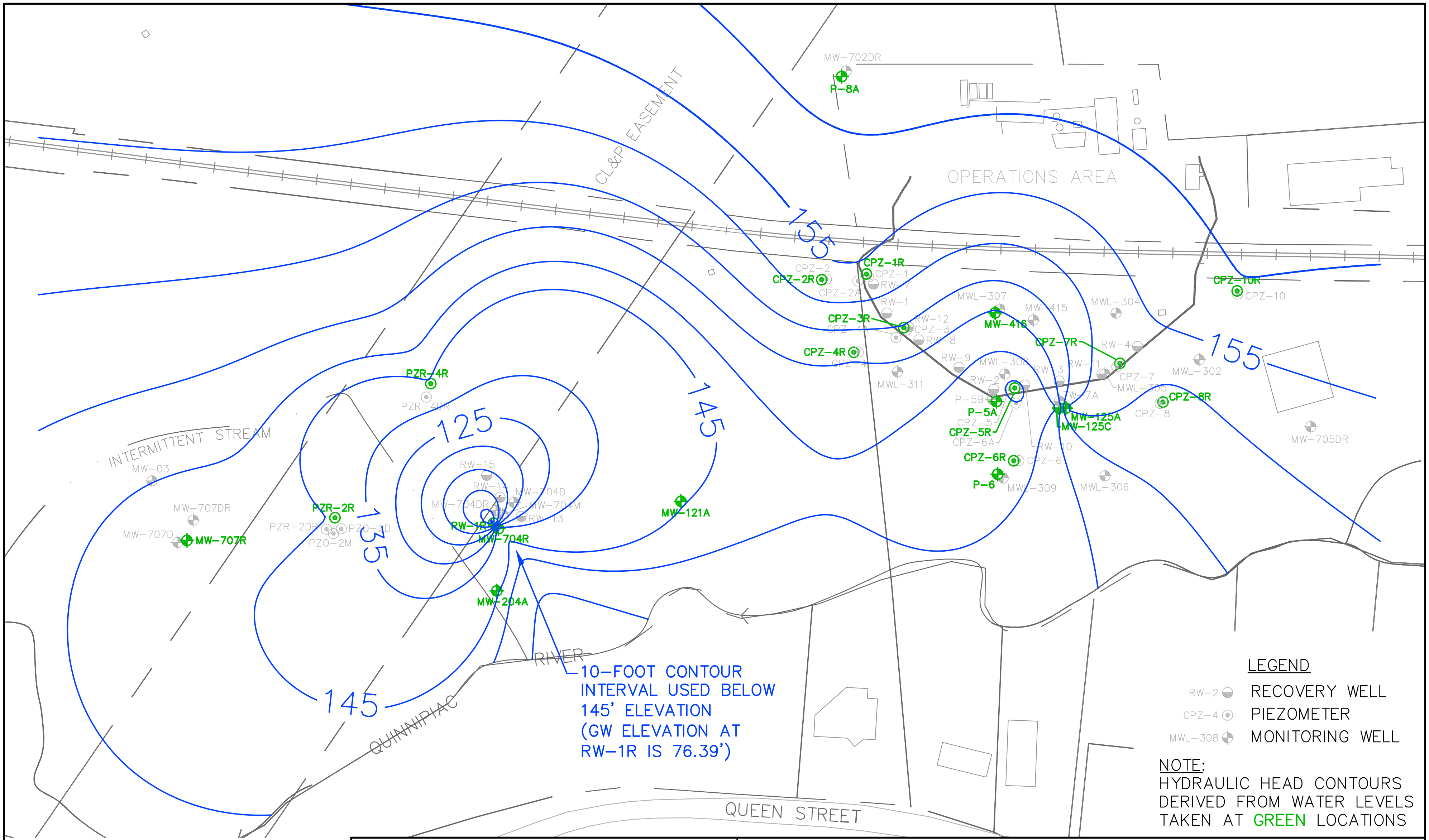
SRSNE
SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS

CONCORD NEW HAMPSHIRE

DRAWN BEG	DATE AUG 2016	DES. ENG.	DATE	W.O. NO. 13056.001.021
CHECKED	DATE	SCALE AS SHOWN	REVISION	FIGURE NO. 9A

DRAFT

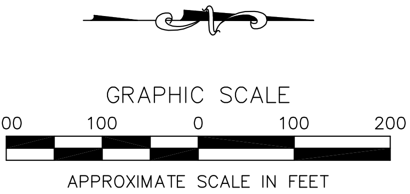


10-FOOT CONTOUR
INTERVAL USED BELOW
145' ELEVATION
(GW ELEVATION AT
RW-1R IS 76.39')

LEGEND

RW-2 ◓	RECOVERY WELL
CPZ-4 ⊙	PIEZOMETER
MWL-308 ⊕	MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS

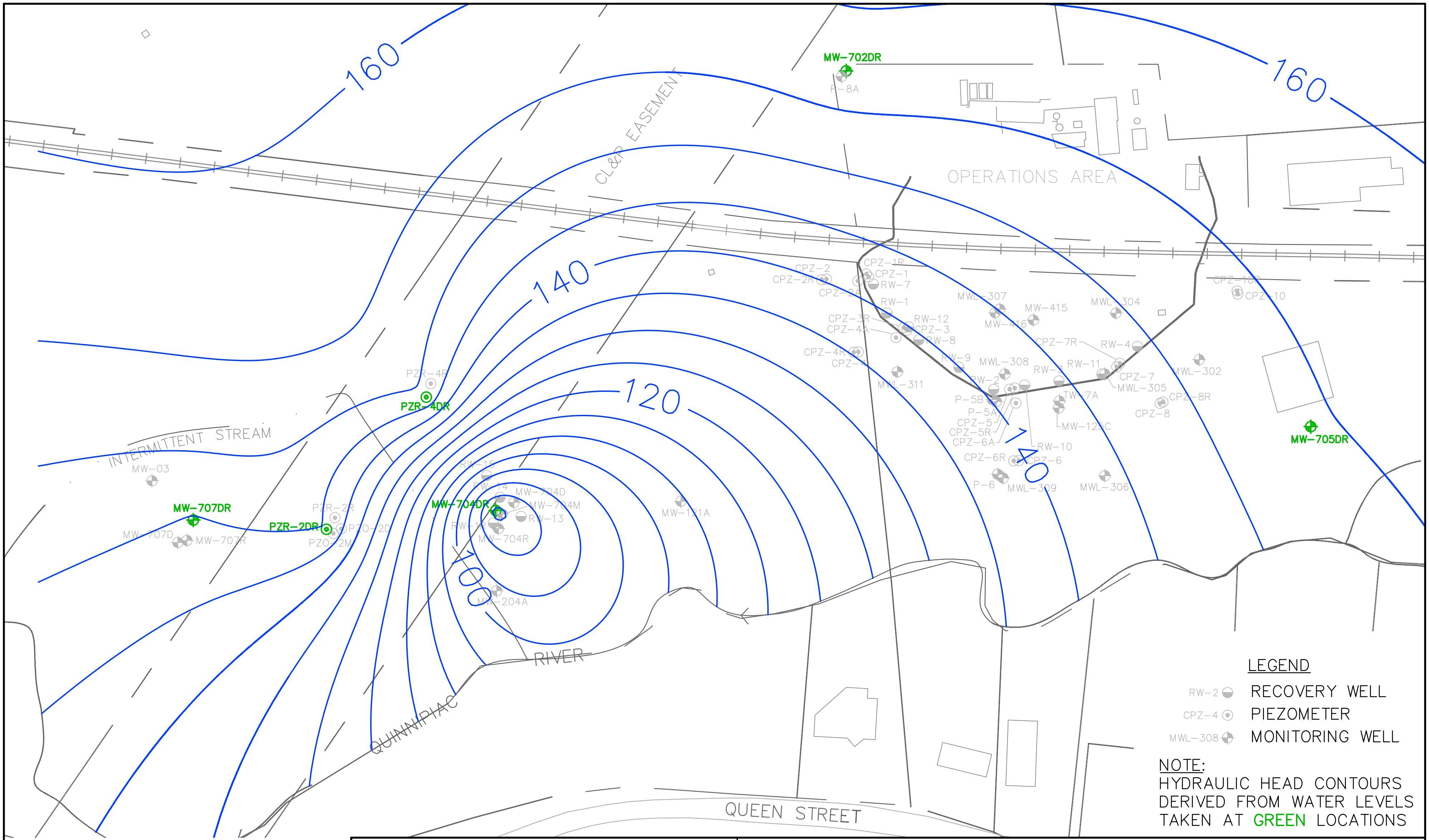


SHALLOW BEDROCK
HYDRAULIC HEAD CONTOURS
JULY 26, 2016

SRSNE
SOUTHINGTON, CONNECTICUT

CONCORD NEW HAMPSHIRE

DRAWN BEG	DATE AUG 2016	DES. ENG.	DATE	W.O. NO. 13056.001.021
CHECKED	DATE	SCALE AS SHOWN	REVISION	FIGURE NO. 9B



NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE

200 100 0 100 200

APPROXIMATE SCALE IN FEET

DEEP BEDROCK
HYDRAULIC HEAD CONTOURS
JULY 26, 2016

SRSNE
SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS

CONCORD NEW HAMPSHIRE

DRAWN BEG	DATE AUG 2016	DES. ENG.	DATE	W.O. NO. 13056.001.021
CHECKED	DATE	SCALE AS SHOWN	REVISION	FIGURE NO. 9C

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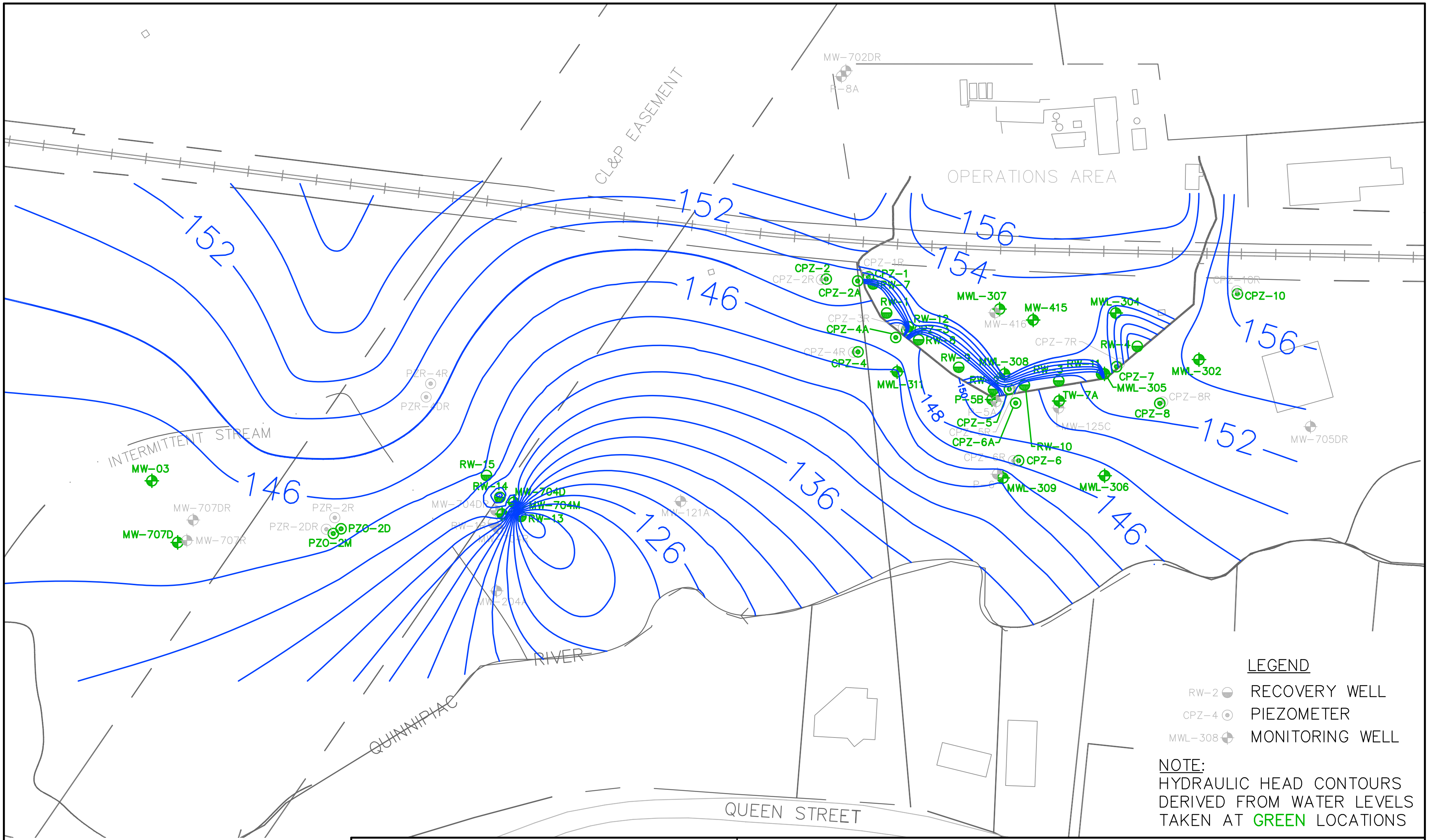

NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE
200 100 0 100 200
APPROXIMATE SCALE IN FEET

OVERBURDEN
HYDRAULIC HEAD CONTOURS
AUGUST 30, 2016

SRSNE
SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS

CONCORD NEW HAMPSHIRE

DRAWN BEG	DATE SEP 2016	DES. ENG.	DATE	W.O. NO. 13056.001.021
CHECKED	DATE	SCALE AS SHOWN	REVISION	FIGURE NO. 10A

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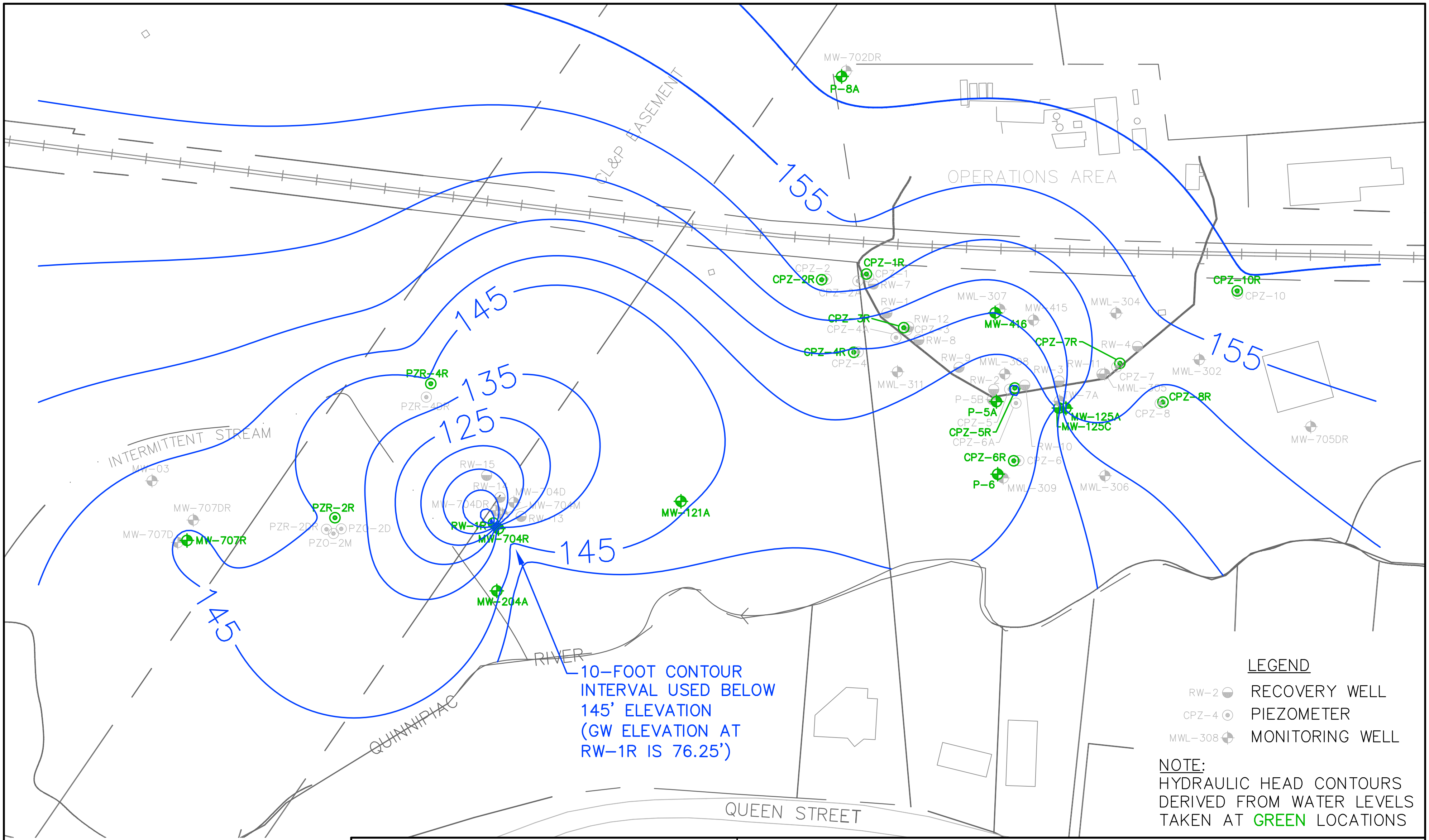

LEGEND

RW-2 ◓ RECOVERY WELL

CPZ-4 ⊙ PIEZOMETER

MWL-308 ⊕ MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE

200 100 0 100 200

APPROXIMATE SCALE IN FEET

SHALLOW BEDROCK HYDRAULIC HEAD CONTOURS AUGUST 30, 2016

SRSNE
SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS

CONCORD NEW HAMPSHIRE

DRAWN BEG	DATE SEP 2016	DES. ENG.	DATE	W.O. NO. 13056.001.021
CHECKED	DATE	SCALE AS SHOWN	REVISION	FIGURE NO. 10B

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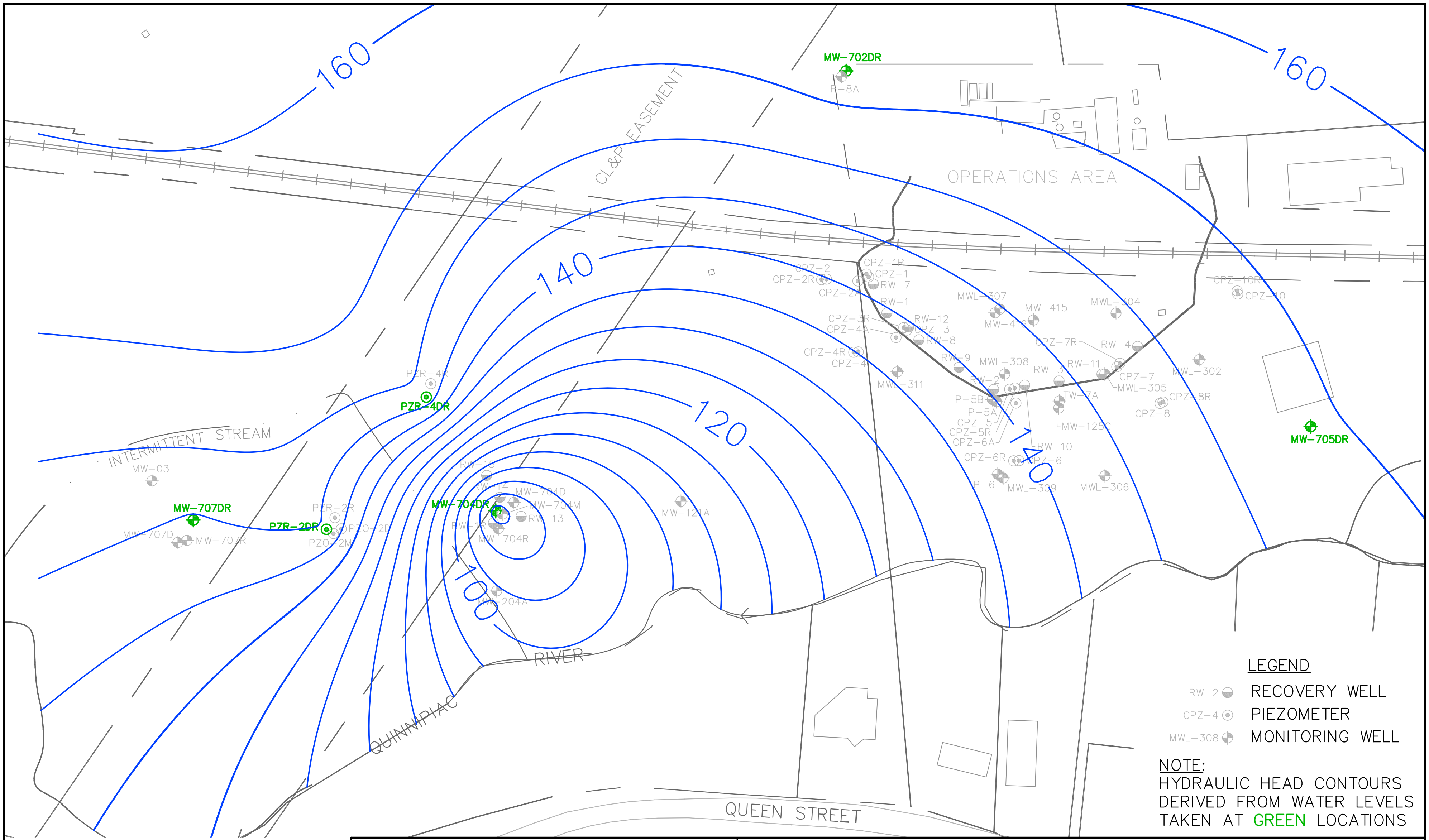

LEGEND

RW-2 ⊖	RECOVERY WELL
CPZ-4 ⊙	PIEZOMETER
MWL-308 ⊕	MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE
200 100 0 100 200
APPROXIMATE SCALE IN FEET

DEEP BEDROCK HYDRAULIC HEAD CONTOURS AUGUST 30, 2016

SRSNE
SOUTHINGTON, CONNECTICUT

CONCORD NEW HAMPSHIRE

DRAWN BEG	DATE SEP 2016	DES. ENG.	DATE	W.O. NO. 13056.001.021
CHECKED	DATE	SCALE AS SHOWN	REVISION	FIGURE NO. 10C

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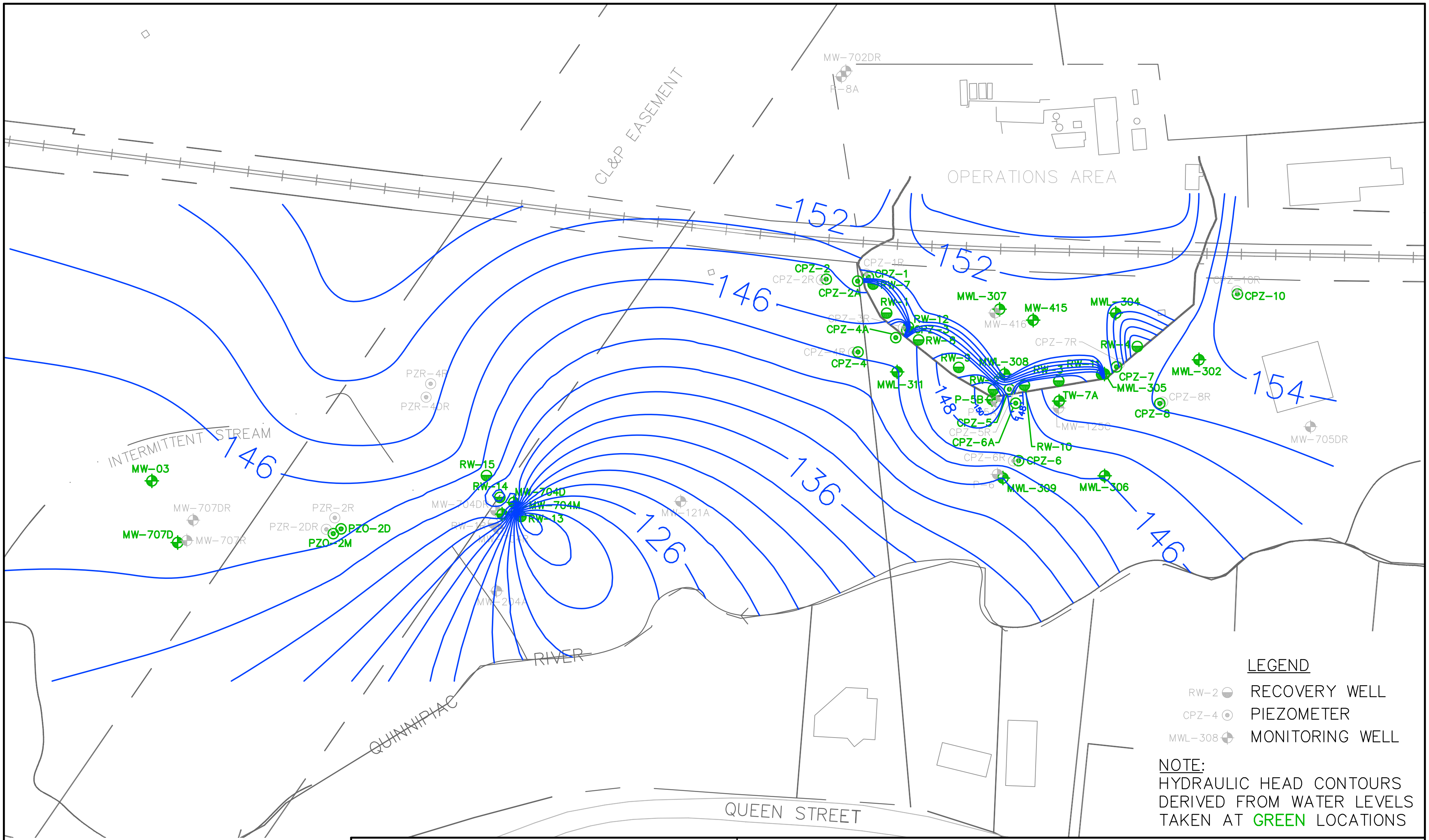


LEGEND

RW-2 ◒ RECOVERY WELL

CPZ-4 ⊙ PIEZOMETER

MWL-308 ⊕ MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE
200 100 0 100 200
APPROXIMATE SCALE IN FEET

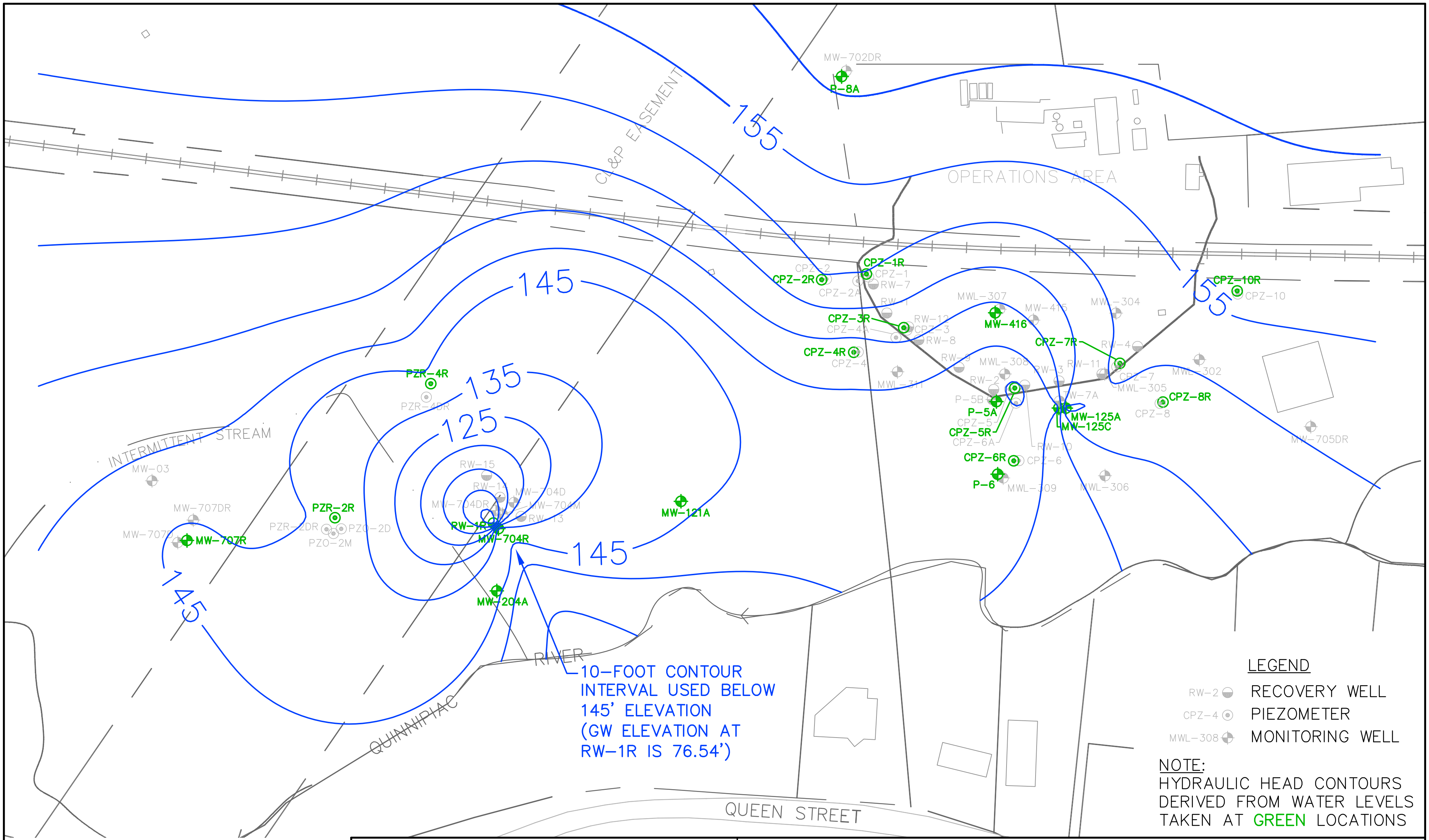
OVERBURDEN
HYDRAULIC HEAD CONTOURS
SEPTEMBER 30, 2016

SRSNE
SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS
CONCORD NEW HAMPSHIRE

DRAWN BEG	DATE OCT 2016	DES. ENG.	DATE	W.O. NO. 13056.001.021
CHECKED	DATE	SCALE AS SHOWN	REVISION	FIGURE NO. 11A

DRAFT



10-FOOT CONTOUR
INTERVAL USED BELOW
145' ELEVATION
(GW ELEVATION AT
RW-1R IS 76.54')

LEGEND

RW-2 ◓ RECOVERY WELL
CPZ-4 ◎ PIEZOMETER
MWL-308 ⊕ MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE
200 100 0 100 200
APPROXIMATE SCALE IN FEET

SHALLOW BEDROCK
HYDRAULIC HEAD CONTOURS
SEPTEMBER 30, 2016

SRSNE
SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS
CONCORD NEW HAMPSHIRE

DRAWN	DATE	DES. ENG.	DATE	W.O. NO.
BEG	OCT 2016			13056.001.021
CHECKED	DATE	SCALE	REVISION	FIGURE NO.
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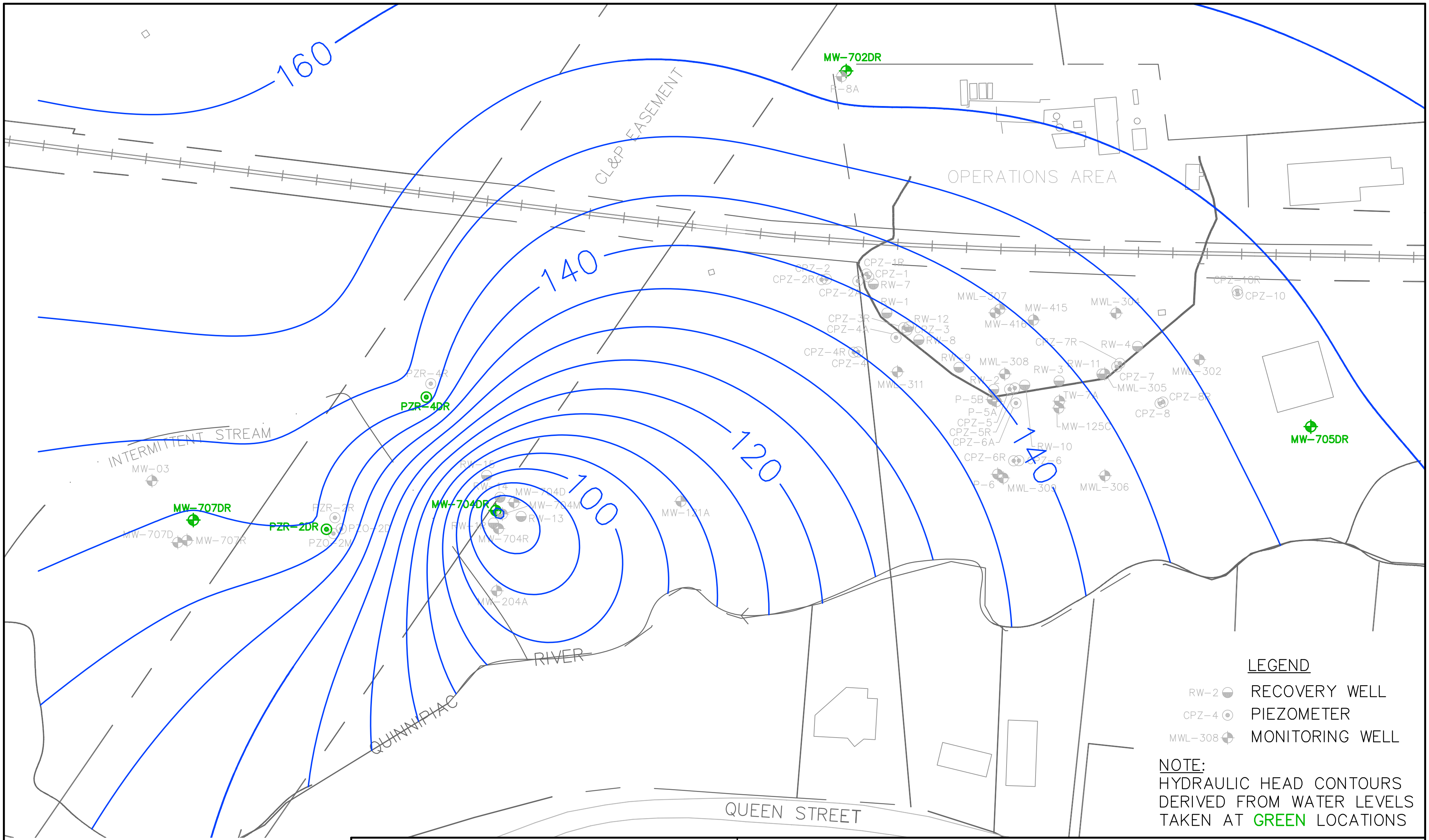

LEGEND

RW-2 ◒ RECOVERY WELL

CPZ-4 ◉ PIEZOMETER

MWL-308 ⊕ MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE
200 100 0 100 200
APPROXIMATE SCALE IN FEET

DEEP BEDROCK
HYDRAULIC HEAD CONTOURS
SEPTEMBER 30, 2016

SRSNE
SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS

CONCORD NEW HAMPSHIRE

DRAWN BEG	DATE OCT 2016	DES. ENG.	DATE	W.O. NO. 13056.001.021
CHECKED	DATE	SCALE AS SHOWN	REVISION	FIGURE NO. 11C

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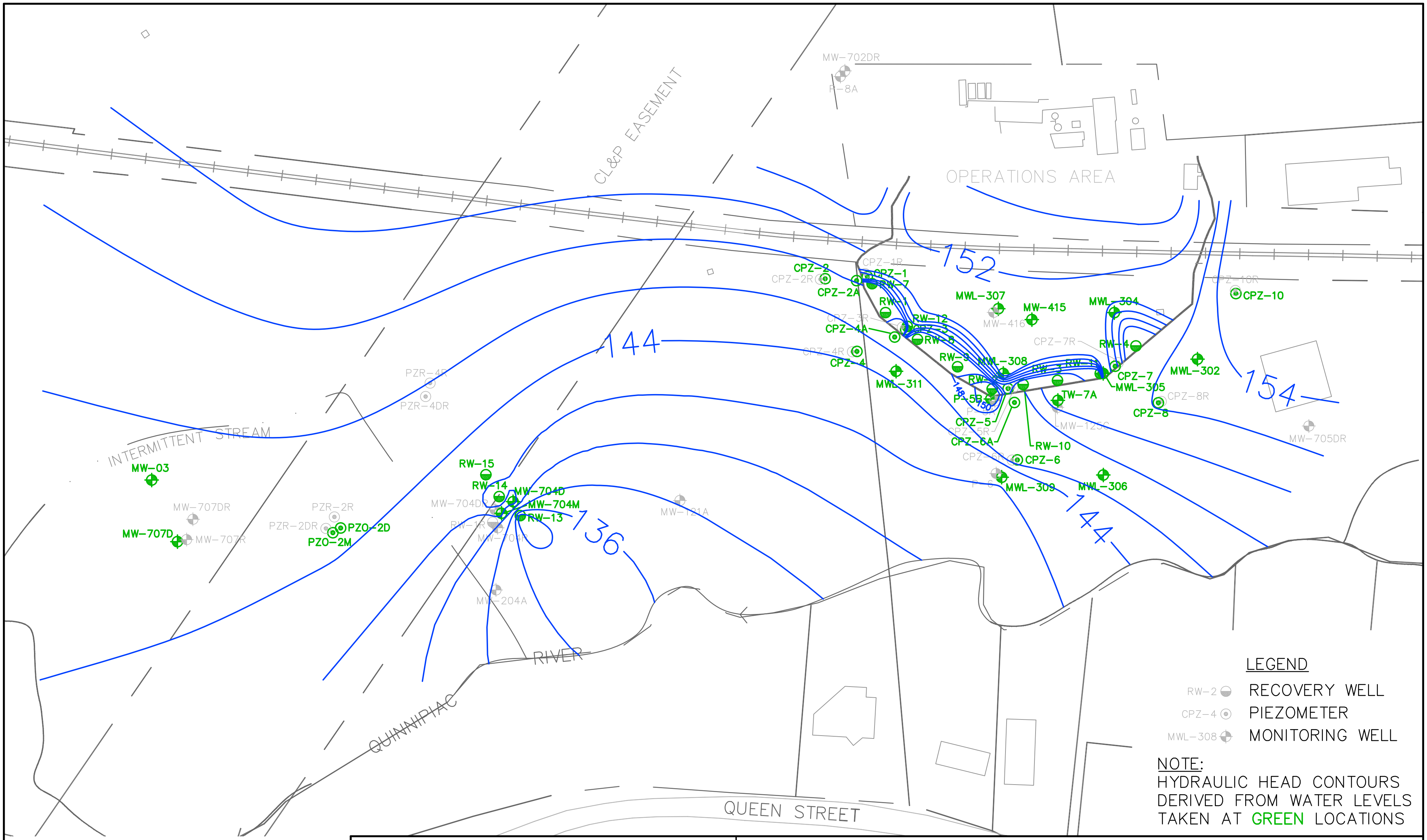
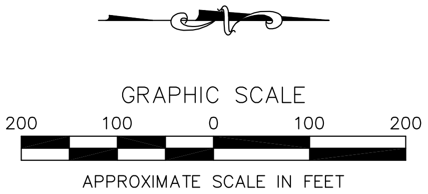


NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS



OVERBURDEN
HYDRAULIC HEAD CONTOURS
OCTOBER 26, 2016

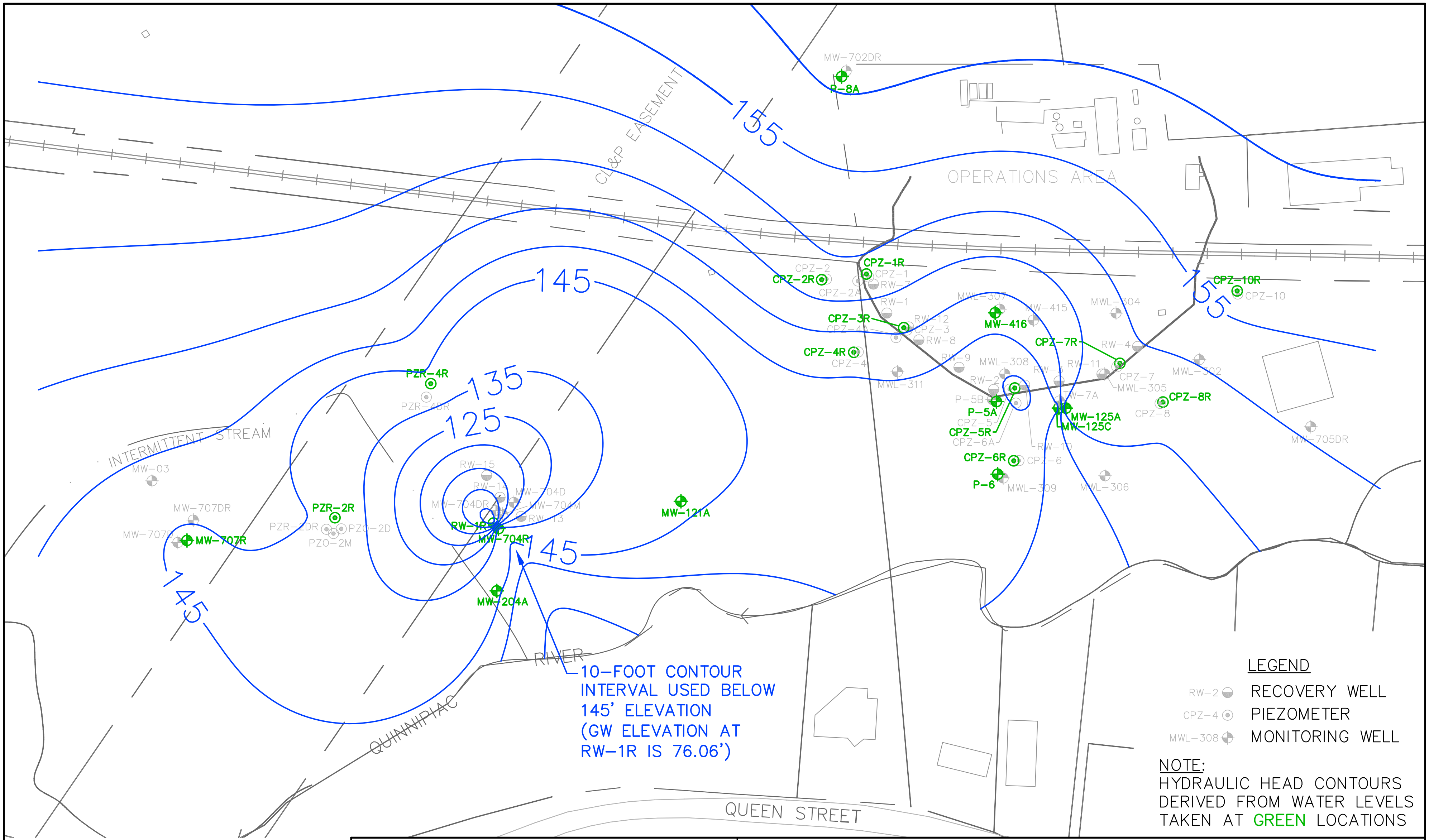
SRSNE
SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS

CONCORD NEW HAMPSHIRE

DRAWN	BEG	DATE	NOV 2016	DES. ENG.		DATE		W.O. NO.	13056.001.021
CHECKED		DATE		SCALE	AS SHOWN	REVISION		FIGURE NO.	12A

DRAFT



10-FOOT CONTOUR
INTERVAL USED BELOW
145' ELEVATION
(GW ELEVATION AT
RW-1R IS 76.06')

LEGEND

RW-2 ◒ RECOVERY WELL
CPZ-4 ⊙ PIEZOMETER
MWL-308 ⊕ MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE
200 100 0 100 200
APPROXIMATE SCALE IN FEET

SHALLOW BEDROCK
HYDRAULIC HEAD CONTOURS
OCTOBER 26, 2016

SRSNE
SOUTHINGTON, CONNECTICUT

CONCORD NEW HAMPSHIRE

DRAWN BEG	DATE NOV 2016	DES. ENG.	DATE	W.O. NO. 13056.001.021
CHECKED	DATE	SCALE AS SHOWN	REVISION	FIGURE NO. 12B

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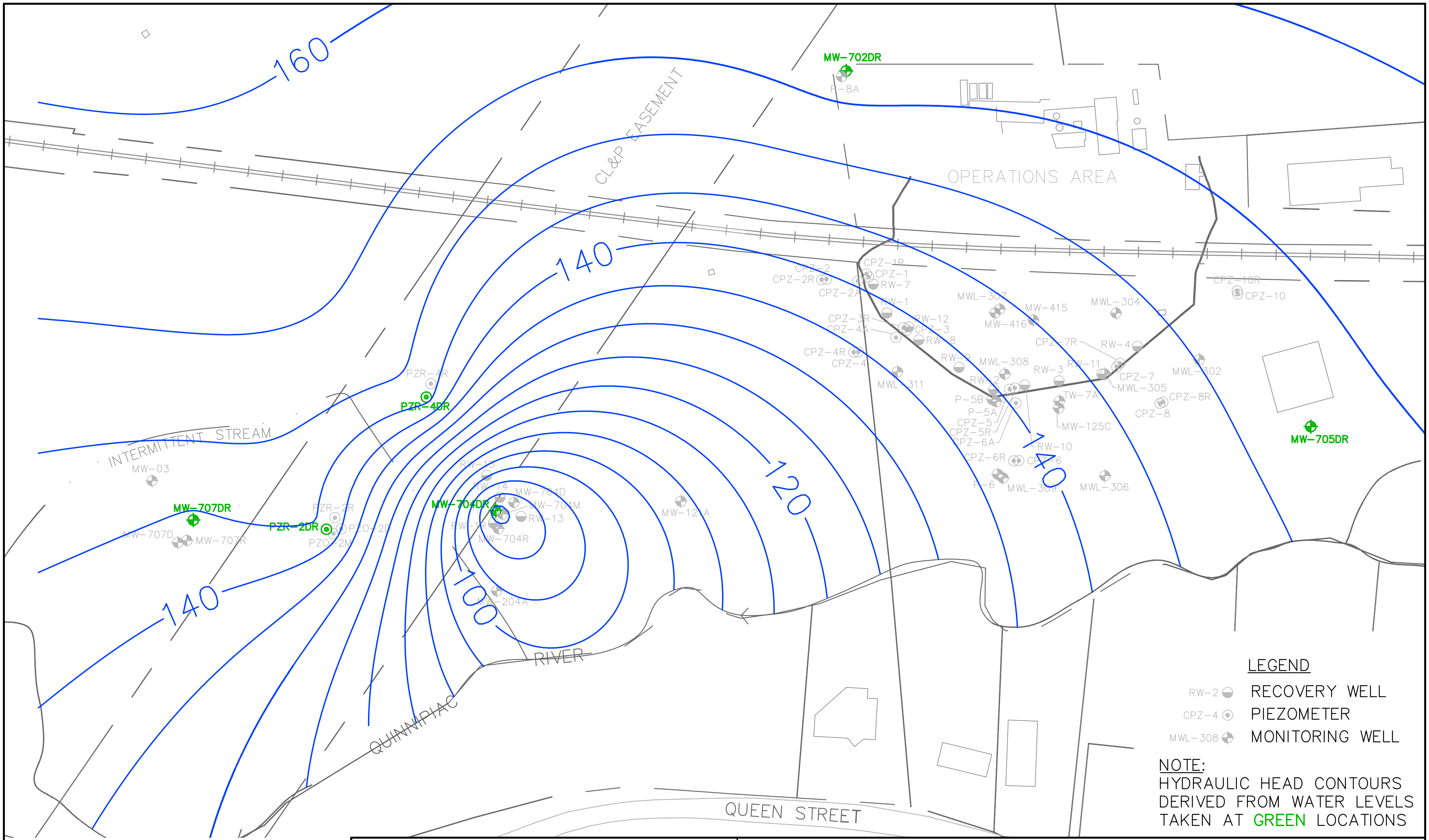


LEGEND

RW-2 ◒ RECOVERY WELL

CPZ-4 ⊙ PIEZOMETER

MWL-308 ⊕ MONITORING WELL

NOTE:
HYDRAULIC HEAD CONTOURS
DERIVED FROM WATER LEVELS
TAKEN AT GREEN LOCATIONS

GRAPHIC SCALE

200 100 0 100 200

APPROXIMATE SCALE IN FEET

DEEP BEDROCK
HYDRAULIC HEAD CONTOURS
OCTOBER 26, 2016

SRSNE
SOUTHINGTON, CONNECTICUT

WESTON SOLUTIONS

CONCORD NEW HAMPSHIRE

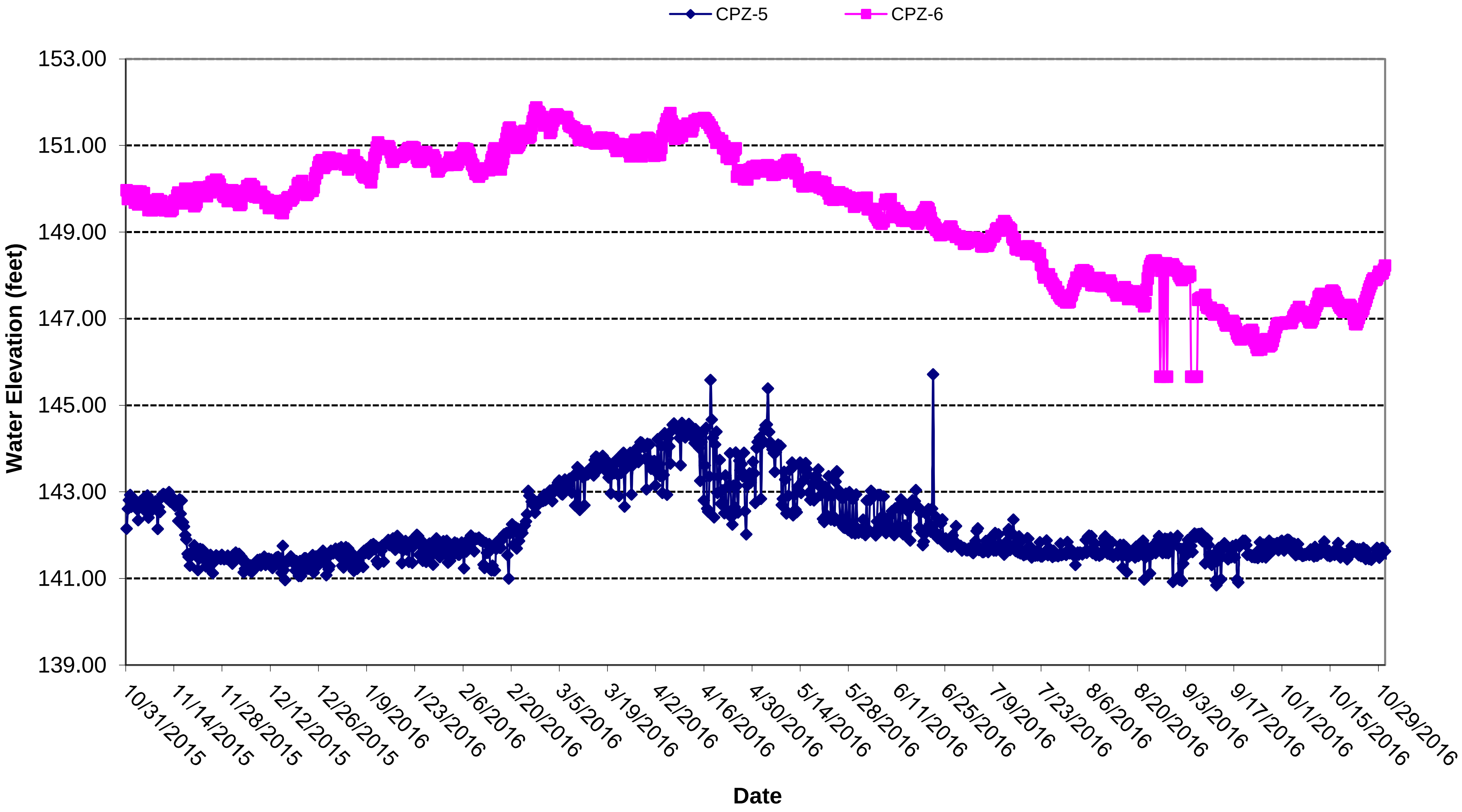
DRAWN BEG	DATE NOV 2016	DES. ENG.	DATE	W.O. NO. 13056.001.021
CHECKED	DATE	SCALE AS SHOWN	REVISION	FIGURE NO. 12C

DRAFT

FIGURE 13

31 Oct. 2015 through 30 Oct. 2016

Hydraulic Gradient Between CPZ-05 and CPZ-06
NTCRA-1 Overburdern Compliance Pair



DRAFT

FIGURE 14A

31 Oct. 2015 through 30 Oct. 2016

Hydraulic Gradient Between MW-704R and PZR-2R
NTCRA-2 Shallow Bedrock Compliance Pair

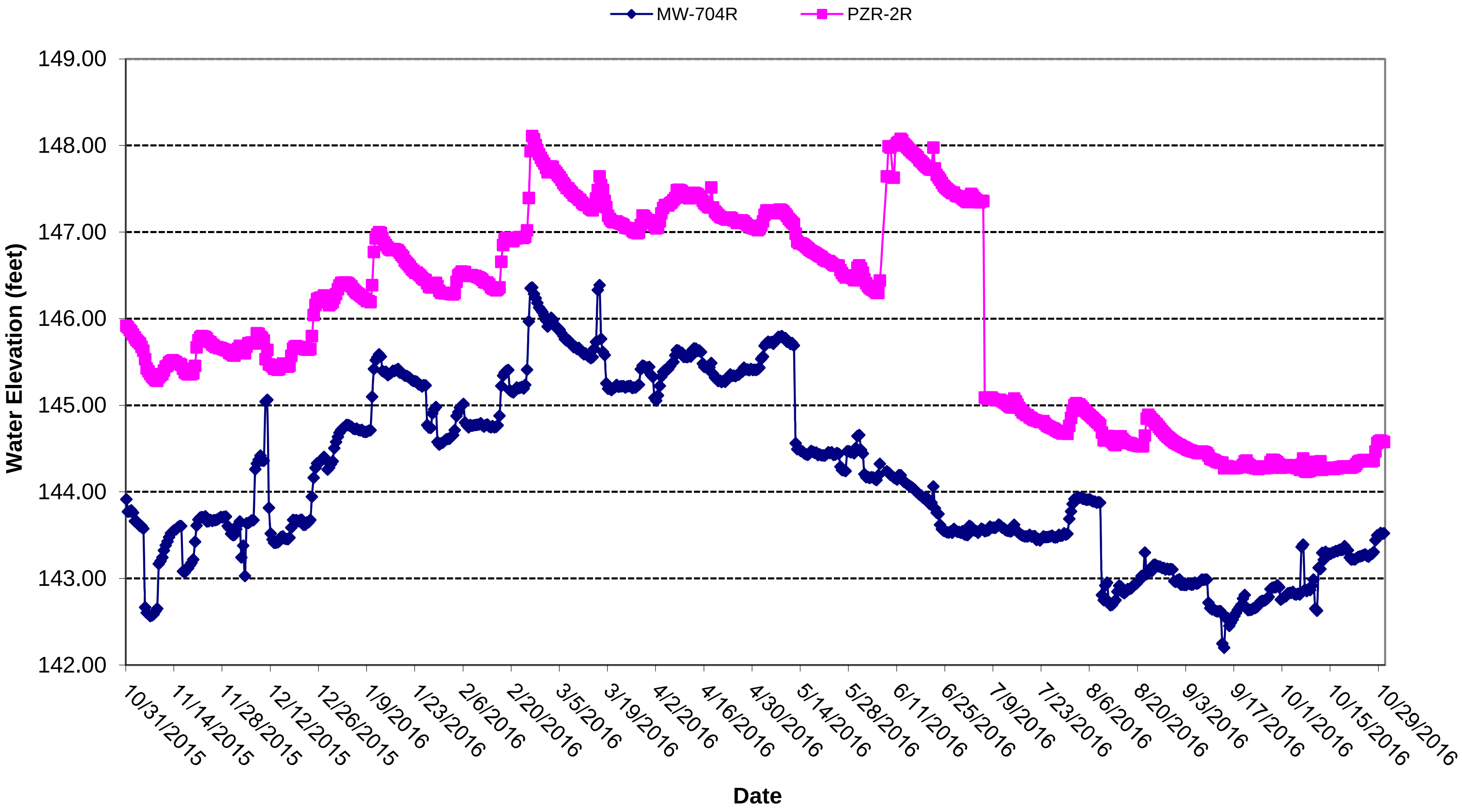


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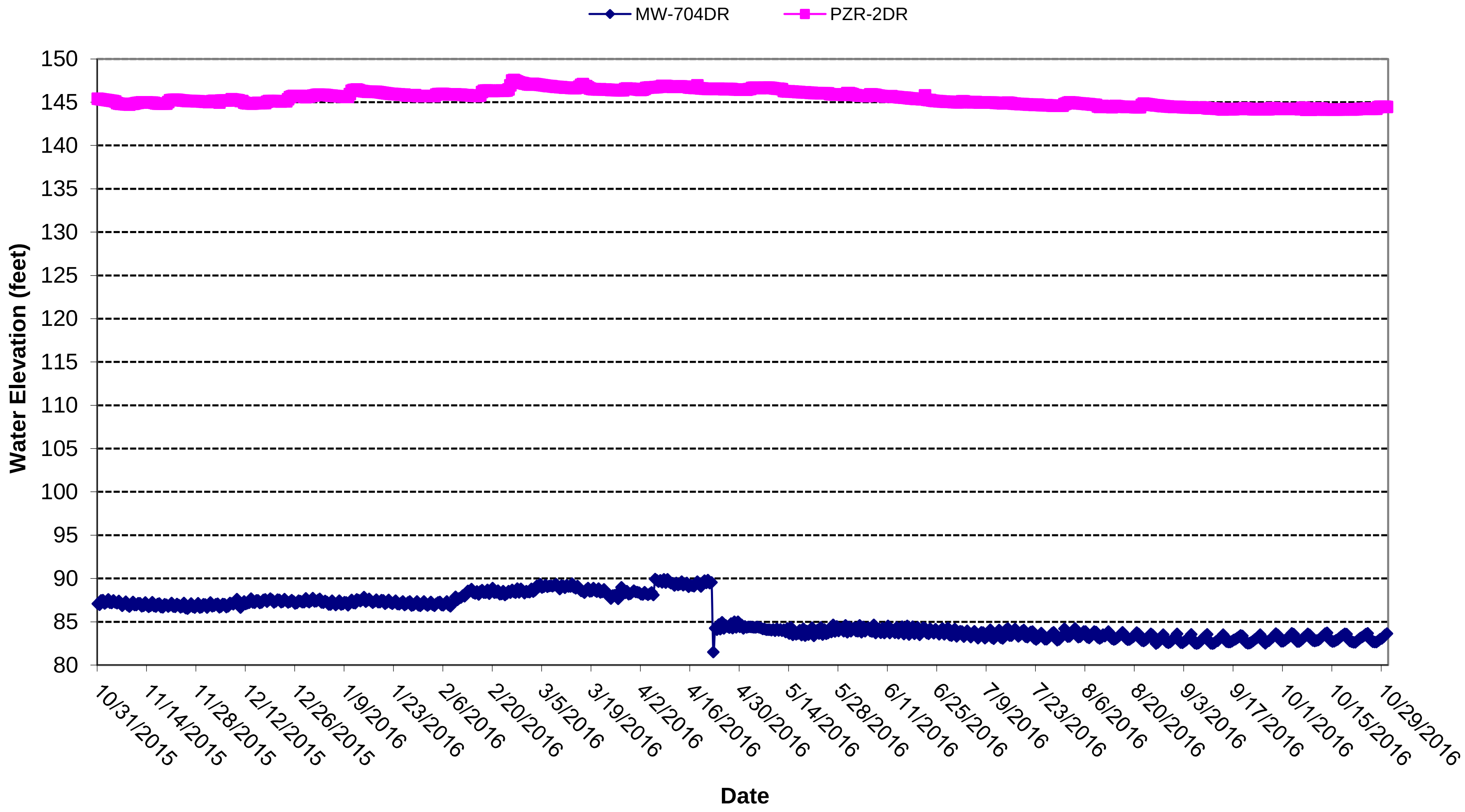
FIGURE 14B

31 Oct. 2015 through 30 Oct. 2016

Hydraulic Gradient Between MW-704DR and PZR-2DR
NTCRA-2 Deep Bedrock Compliance Pair



TABLES

TABLE 1
Hydraulic Head Measurements End of Month Gauging

Measuring Location	Location Elevation	28-Nov-15		28-Dec-15		27-Jan-16		25-Feb-16	
		Depth to Water	*Water Elevation*	*Depth to Water*	*Water Elevation*	*Depth to Water*	*Water Elevation*	*Depth to Water*	*Water Elevation*
CPZ-1	159.64	9.80	149.84	9.15	150.49	7.79	151.85	7.61	152.03
CPZ-1R	161.12	6.80	154.32	5.52	155.60	3.03	158.09	2.99	158.13
CPZ-2	158.64	9.31	149.33	8.11	150.53	6.68	151.96	5.36	153.28
CPZ-2A	158.82	9.08	149.74	7.95	150.87	6.52	152.30	3.99	154.83
CPZ-2R	160.97	6.79	154.18	5.56	155.41	2.70	158.27	1.92	159.05
CPZ-3	159.21	10.85	148.36	10.03	149.18	9.70	149.51	8.81	150.40
CPZ-3R	160.70	9.54	151.16	8.70	152.00	7.42	153.28	6.19	154.51
CPZ-4	158.80	12.51	146.29	10.04	148.76	9.50	149.30	6.62	152.18
CPZ-4A	159.44	12.11	147.33	11.19	148.25	10.08	149.36	8.22	151.22
CPZ-4R	158.76	9.54	149.22	8.73	150.03	7.21	151.55	8.11	150.65
CPZ-5	158.68	17.51	141.17	18.66	140.02	18.02	140.66	17.90	140.78
CPZ-5R	158.30	13.42	144.88	14.11	144.19	12.55	145.75	12.03	146.27
CPZ-6	154.48	5.40	149.08	5.29	149.19	5.03	149.45	4.98	149.50
CPZ-6A	158.05	8.83	149.22	8.51	149.54	8.30	149.75	7.22	150.83
CPZ-6R	154.39	7.68	146.71	7.31	147.08	6.80	147.59	6.03	148.36
CPZ-7	159.40	10.38	149.02	9.75	149.65	8.70	150.70	8.39	151.01
CPZ-7R	158.58	3.80	154.78	3.07	155.51	1.22	157.36	0.00	158.58
CPZ-8	160.11	5.99	154.12	5.88	154.23	6.01	154.10	5.71	154.40
CPZ-8R	160.62	7.97	152.65	7.80	152.82	7.58	153.04	7.22	153.40
CPZ-10	163.44	6.31	157.13	6.17	157.27	6.14	157.30	6.01	157.43
CPZ-10R	162.98	5.65	157.33	4.98	158.00	3.90	159.08	3.10	159.88
MW-121A	152.96	7.60	145.36	7.07	145.89	6.71	146.25	6.09	146.87
MW-125A	157.87	3.42	154.45	3.20	154.67	3.21	154.66	2.99	154.88
MW-125C	156.30	8.79	147.51	8.49	147.81	8.11	148.19	7.66	148.64
MW-204A	150.78	5.72	145.06	5.37	145.41	5.03	145.75	3.41	147.37
MW-415	160.75	7.92	152.83	7.48	153.27	6.78	153.97	5.90	154.85
MW-416	159.98	11.08	148.90	10.70	149.28	9.84	150.14	9.31	150.67
MW-704D	150.98	6.42	144.56	6.09	144.89	5.70	145.28	5.50	145.48
MW-704M	152.34	8.42	143.92	8.06	144.28	7.78	144.56	7.37	144.97
MW-704R	153.23	9.53	143.70	9.07	144.16	8.62	144.61	8.48	144.75
MW-704DR	152.84	66.02	86.82	65.18	87.66	65.82	87.02	64.96	87.88
MW-705DR	160.99	6.48	154.51	6.12	154.87	5.07	155.92	4.54	156.45
MWL-302	161.60	6.96	154.64	6.83	154.77	6.95	154.65	3.02	158.58
MWL-304	159.90	10.10	149.80	9.90	150.00	9.09	150.81	8.01	151.89
MWL-305	159.01	6.86	152.15	6.92	152.09	6.22	152.79	5.42	153.59
MWL-306	155.39	4.81	150.58	3.82	151.57	6.35	149.04	3.09	152.30
MWL-307	159.14	6.44	152.70	6.15	152.99	5.36	153.78	4.42	154.72
MWL-308	158.63	5.31	153.32	5.03	153.60	4.61	154.02	4.22	154.41
MWL-309	155.20	3.59	151.61	3.32	151.88	3.72	151.48	3.60	151.60
MWL-311	157.33	8.46	148.87	6.33	151.00	7.01	150.32	3.85	153.48
P-5A	157.61	11.01	146.60	10.80	146.81	10.60	147.01	9.33	148.28
P-5B	158.39	5.06	153.33	4.89	153.50	5.49	152.90	5.11	153.28
P-6	153.78	6.80	146.98	6.59	147.19	6.18	147.60	5.22	148.56
PZR-2R	153.78	8.60	145.18	8.05	145.73	7.87	145.91	7.68	146.10
PZR-2DR	154.67	9.39	145.28	9.12	145.55	9.01	145.66	8.81	145.86
PZR-4R	153.72	8.29	145.43	7.81	145.91	7.41	146.31	7.04	146.68
PZR-4DR	152.73	4.02	148.71	3.38	149.35	1.90	150.83	1.81	150.92
RW-1	157.61	17.66	139.95	17.60	140.01	18.18	139.43	17.66	139.95
RW-2	156.49	21.95	134.54	21.70	134.79	21.83	134.66	22.80	133.69
RW-3	157.35	17.11	140.24	18.31	139.04	18.96	138.39	17.91	139.44
RW-4	158.21	15.68	142.53	16.66	141.55	16.70	141.51	16.08	142.13
RW-7	157.09	15.82	141.27	17.03	140.06	17.01	140.08	17.01	140.08
RW-8	156.95	17.90	139.05	17.93	139.02	18.32	138.63	18.66	138.29
RW-9	156.72	18.10	138.62	18.12	138.60	18.86	137.86	18.03	138.69
RW-10	156.13	17.96	138.17	18.52	137.61	19.02	137.11	17.98	138.15
RW-11	157.82	18.04	139.78	18.80	139.02	19.06	138.76	18.12	139.70
RW-12	158.36	20.61	137.75	20.08	138.28	19.84	138.52	20.02	138.34
RW-13	151.64	34.55	117.09	34.18	117.46	27.60	124.04	30.60	121.04
RW-14	151.71	14.73	136.98	9.40	142.31	10.86	140.85	9.58	142.13
RW-15	151.28	9.72	141.56	6.24	145.04	6.04	145.24	6.51	144.77
RW-1R	149.77	73.60	76.17	72.09	77.68	73.13	76.64	72.86	76.91
TW-7A	158.72	6.67	152.05	6.58	152.14	6.40	152.32	5.90	152.82
MW-702DR	181.38	23.10	158.28	21.50	159.88	21.53	159.85	20.03	161.35
P-8A	181.26	23.18	158.08	21.37	159.89	21.40	159.86	20.06	161.20
MW-707D	156.09	10.30	145.79	10.00	146.09	9.99	146.10	9.61	146.48
MW-707R	156.01	10.51	145.50	10.16	145.85	10.01	146.00	9.66	146.35
MW-707DR	156.80	11.81	144.99	11.21	145.59	11.01	145.79	10.87	145.93
PZ-02D	154.14	8.56	145.58	8.20	145.94	8.08	146.06	7.61	146.53
PZ-O2M	154.77	9.06	145.71	8.71	146.06	8.68	146.09	8.50	146.27
MW-3	153.79	8.03	145.76	7.77	146.02	7.71	146.08	7.44	146.35
MW-708R	224.95	75.09	149.86	77.11	147.84	77.20	147.75	77.18	147.77
MW-708DR	224.19	75.90	148.29	76.80	147.39	76.94	147.25	76.80	147.39
PZ-906DR	155.85	4.60	151.25	7.37	148.48	6.90	148.95	4.31	151.54

TABLE 1
Hydraulic Head Measurements End of Month Gauging

Measuring Location	Location Elevation	30-Mar-16		27-Apr-16		26-May-16		28-Jun-16	
		Depth to Water	*Water Elevation*	*Depth to Water*	*Water Elevation*	*Depth to Water*	*Water Elevation*	*Depth to Water*	*Water Elevation*
CPZ-1	159.64	5.39	154.25	6.50	153.14	7.52	152.12	8.48	151.16
CPZ-1R	161.12	2.92	158.20	2.94	158.18	2.97	158.15	4.81	156.31
CPZ-2	158.64	4.50	154.14	4.70	153.94	6.00	152.64	7.68	150.96
CPZ-2A	158.82	4.15	154.67	4.28	154.54	5.60	153.22	7.09	151.73
CPZ-2R	160.97	0.51	160.46	0.50	160.47	2.02	158.95	4.71	156.26
CPZ-3	159.21	11.29	147.92	10.88	148.33	10.98	148.23	11.36	147.85
CPZ-3R	160.70	5.18	155.52	5.81	154.89	7.12	153.58	8.61	152.09
CPZ-4	158.80	7.50	151.30	8.02	150.78	9.19	149.61	10.96	147.84
CPZ-4A	159.44	8.77	150.67	8.99	150.45	9.90	149.54	11.08	148.36
CPZ-4R	158.76	5.41	153.35	5.70	153.06	6.72	152.04	8.24	150.52
CPZ-5	158.68	15.21	143.47	16.24	142.44	16.77	141.91	17.41	141.27
CPZ-5R	158.30	10.01	148.29	11.08	147.22	11.92	146.38	12.58	145.72
CPZ-6	154.48	4.54	149.94	4.91	149.57	5.20	149.28	6.61	147.87
CPZ-6A	158.05	7.58	150.47	8.41	149.64	8.93	149.12	9.58	148.47
CPZ-6R	154.39	5.92	148.47	6.00	148.39	6.71	147.68	7.68	146.71
CPZ-7	159.40	7.29	152.11	7.51	151.89	7.51	151.89	8.82	150.58
CPZ-7R	158.58	0.00	158.58	0.00	158.58	0.80	157.78	2.60	155.98
CPZ-8	160.11	5.61	154.50	5.79	154.32	6.00	154.11	6.26	153.85
CPZ-8R	160.62	7.04	153.58	7.28	153.34	7.61	153.01	8.14	152.48
CPZ-10	163.44	5.91	157.53	6.02	157.42	6.08	157.36	6.33	157.11
CPZ-10R	162.98	2.73	160.25	2.87	160.11	3.91	159.07	5.21	157.77
MW-121A	152.96	5.92	147.04	5.79	147.17	6.58	146.38	7.71	145.25
MW-125A	157.87	2.36	155.51	2.78	155.09	3.07	154.80	3.82	154.05
MW-125C	156.30	6.99	149.31	7.28	149.02	7.73	148.57	8.61	147.69
MW-204A	150.78	4.34	146.44	4.29	146.49	5.01	145.77	5.95	144.83
MW-415	160.75	4.33	156.42	5.26	155.49	6.21	154.54	7.60	153.15
MW-416	159.98	7.42	152.56	8.21	151.77	9.11	150.87	10.13	149.85
MW-704D	150.98	4.95	146.03	4.91	146.07	5.66	145.32	6.80	144.18
MW-704M	152.34	7.01	145.33	6.90	145.44	8.09	144.25	8.90	143.44
MW-704R	153.23	7.91	145.32	7.87	145.36	9.13	144.10	9.82	143.41
MW-704DR	152.84	64.39	88.45	68.19	84.65	68.25	84.59	68.53	84.31
MW-705DR	160.99	3.81	157.18	3.82	157.17	4.61	156.38	5.72	155.27
MWL-302	161.60	6.62	154.98	6.81	154.79	6.88	154.72	7.05	154.55
MWL-304	159.90	6.70	153.20	7.41	152.49	8.41	151.49	9.79	150.11
MWL-305	159.01	4.39	154.62	5.27	153.74	5.72	153.29	6.78	152.23
MWL-306	155.39	3.07	152.32	5.58	149.81	6.73	148.66	7.97	147.42
MWL-307	159.14	2.97	156.17	3.90	155.24	4.85	154.29	6.04	153.10
MWL-308	158.63	2.36	156.27	3.29	155.34	4.38	154.25	5.36	153.27
MWL-309	155.20	3.22	151.98	4.23	150.97	5.45	149.75	12.98	142.22
MWL-311	157.33	5.35	151.98	6.52	150.81	7.60	149.73	9.18	148.15
P-5A	157.61	9.03	148.58	7.41	150.20	10.05	147.56	10.92	146.69
P-5B	158.39	4.75	153.64	5.85	152.54	6.20	152.19	6.81	151.58
P-6	153.78	5.48	148.30	5.40	148.38	6.08	147.70	7.10	146.68
PZR-2R	153.78	7.11	146.67	7.17	146.61	7.75	146.03	8.72	145.06
PZR-2DR	154.67	8.09	146.58	8.04	146.63	8.79	145.88	9.58	145.09
PZR-4R	153.72	6.36	147.36	6.39	147.33	7.07	146.65	8.28	145.44
PZR-4DR	152.73	0.32	152.41	0.51	152.22	1.49	151.24	2.78	149.95
RW-1	157.61	17.81	139.80	17.12	140.49	18.12	139.49	16.88	140.73
RW-2	156.49	22.63	133.86	22.29	134.20	21.80	134.69	24.20	132.29
RW-3	157.35	19.18	138.17	18.18	139.17	18.07	139.28	21.60	135.75
RW-4	158.21	16.60	141.61	15.45	142.76	12.21	146.00	14.20	144.01
RW-7	157.09	15.96	141.13	15.88	141.21	16.60	140.49	16.50	140.59
RW-8	156.95	17.03	139.92	16.94	140.01	16.80	140.15	16.60	140.35
RW-9	156.72	18.09	138.63	18.22	138.50	18.36	138.36	17.74	138.98
RW-10	156.13	18.66	137.47	18.09	138.04	18.90	137.23	18.77	137.36
RW-11	157.82	17.98	139.84	17.66	140.16	18.26	139.56	18.75	139.07
RW-12	158.36	20.03	138.33	21.90	136.46	19.87	138.49	22.61	135.75
RW-13	151.64	32.04	119.60	30.05	121.59	43.06	108.58	34.78	116.86
RW-14	151.71	13.60	138.11	14.05	137.66	15.01	136.70	18.11	133.60
RW-15	151.28	4.42	146.86	4.85	146.43	5.03	146.25	6.30	144.98
RW-1R	149.77	72.88	76.89	72.84	76.93	71.96	77.81	75.70	74.07
TW-7A	158.72	5.78	152.94	6.01	152.71	6.31	152.41	6.80	151.92
MW-702DR	181.38	16.81	164.57	16.16	165.22	18.91	162.47	21.78	159.60
P-8A	181.26	16.70	164.56	16.08	165.18	18.82	162.44	21.77	159.49
MW-707D	156.09	9.35	146.74	9.35	146.74	9.66	146.43	10.48	145.61
MW-707R	156.01	9.27	146.74	9.30	146.71	9.90	146.11	10.71	145.30
MW-707DR	156.80	10.29	146.51	10.31	146.49	10.85	145.95	11.75	145.05
PZ-02D	154.14	7.51	146.63	7.37	146.77	7.87	146.27	8.81	145.33
PZ-O2M	154.77	7.81	146.96	7.87	146.90	8.38	146.39	9.29	145.48
MW-3	153.79	7.08	146.71	7.12	146.67	7.53	146.26	8.29	145.50
MW-708R	224.95	76.93	148.02	75.80	149.15	75.83	149.12	76.58	148.37
MW-708DR	224.19	76.80	147.39	75.84	148.35	75.90	148.29	76.87	147.32
PZ-906DR	155.85	3.94	151.91	6.24	149.61	6.33	149.52	5.91	149.94

TABLE 1

Hydraulic Head Measurements End of Month Gauging

Measuring Location	Location Elevation	26-Jul-16		30-Aug-16		30-Sep-16		26-Oct-16	
		Depth to Water	*Water Elevation*	*Depth to Water*	*Water Elevation*	*Depth to Water*	*Water Elevation*	*Depth to Water*	*Water Elevation*
CPZ-1	159.64	10.03	149.61	10.26	149.38	10.99	148.65	11.96	147.68
CPZ-1R	161.12	6.46	154.66	7.18	153.94	8.20	152.92	8.68	152.44
CPZ-2	158.64	9.01	149.63	9.90	148.74	10.71	147.93	11.06	147.58
CPZ-2A	158.82	8.79	150.03	9.68	149.14	10.50	148.32	10.80	148.02
CPZ-2R	160.97	6.46	154.51	7.21	153.76	8.11	152.86	8.65	152.32
CPZ-3	159.21	12.90	146.31	11.58	147.63	12.09	147.12	13.80	145.41
CPZ-3R	160.70	9.82	150.88	10.96	149.74	10.83	149.87	11.38	149.32
CPZ-4	158.80	12.35	146.45	13.42	145.38	13.97	144.83	14.12	144.68
CPZ-4A	159.44	12.30	147.14	12.80	146.64	13.47	145.97	13.39	146.05
CPZ-4R	158.76	9.41	149.35	9.99	148.77	10.77	147.99	11.13	147.63
CPZ-5	158.68	18.41	140.27	18.02	140.66	18.01	140.67	18.31	140.37
CPZ-5R	158.30	13.97	144.33	13.58	144.72	13.80	144.50	14.25	144.05
CPZ-6	154.48	7.83	146.65	6.99	147.49	8.93	145.55	8.09	146.39
CPZ-6A	158.05	10.18	147.87	9.89	148.16	10.63	147.42	10.71	147.34
CPZ-6R	154.39	8.41	145.98	8.61	145.78	9.02	145.37	9.04	145.35
CPZ-7	159.40	9.90	149.50	9.71	149.69	10.23	149.17	10.31	149.09
CPZ-7R	158.58	3.99	154.59	4.24	154.34	5.21	153.37	5.82	152.76
CPZ-8	160.11	6.66	153.45	6.49	153.62	7.11	153.00	7.40	152.71
CPZ-8R	160.62	8.64	151.98	8.56	152.06	9.13	151.49	9.56	151.06
CPZ-10	163.44	6.90	156.54	6.72	156.72	7.73	155.71	8.34	155.10
CPZ-10R	162.98	6.11	156.87	6.13	156.85	7.29	155.69	7.09	155.89
MW-121A	152.96	8.19	144.77	8.40	144.56	8.70	144.26	8.78	144.18
MW-125A	157.87	4.58	153.29	3.90	153.97	4.65	153.22	4.85	153.02
MW-125C	156.30	9.21	147.09	9.18	147.12	9.71	146.59	9.92	146.38
MW-204A	150.78	6.18	144.60	6.40	144.38	6.62	144.16	6.61	144.17
MW-415	160.75	8.46	152.29	8.48	152.27	9.08	151.67	9.61	151.14
MW-416	159.98	11.18	148.80	10.99	148.99	11.68	148.30	12.28	147.70
MW-704D	150.98	6.97	144.01	7.19	143.79	7.29	143.69	7.52	143.46
MW-704M	152.34	8.90	143.44	9.12	143.22	9.28	143.06	9.48	142.86
MW-704R	153.23	9.88	143.35	10.22	143.01	10.32	142.91	10.11	143.12
MW-704DR	152.84	69.41	83.43	70.00	82.84	69.16	83.68	69.95	82.89
MW-705DR	160.99	6.62	154.37	6.74	154.25	7.48	153.51	8.04	152.95
MWL-302	161.60	7.31	154.29	7.15	154.45	7.79	153.81	8.10	153.50
MWL-304	159.90	10.81	149.09	10.75	149.15	11.35	148.55	11.87	148.03
MWL-305	159.01	7.96	151.05	7.90	151.11	8.68	150.33	8.91	150.10
MWL-306	155.39	8.71	146.68	8.45	146.94	9.33	146.06	8.29	147.10
MWL-307	159.14	6.90	152.24	6.95	152.19	7.61	151.53	8.26	150.88
MWL-308	158.63	6.36	152.27	6.35	152.28	7.01	151.62	7.76	150.87
MWL-309	155.20	13.20	142.00	13.00	142.20	13.20	142.00	13.18	142.02
MWL-311	157.33	10.73	146.60	13.50	143.83	13.90	143.43	13.10	144.23
P-5A	157.61	11.67	145.94	11.71	145.90	11.90	145.71	11.60	146.01
P-5B	158.39	7.31	151.08	6.70	151.69	7.39	151.00	7.08	151.31
P-6	153.78	7.60	146.18	7.79	145.99	8.39	145.39	8.48	145.30
PZR-2R	153.78	9.13	144.65	9.35	144.43	9.62	144.16	9.59	144.19
PZR-2DR	154.67	10.01	144.66	10.12	144.55	10.48	144.19	10.45	144.22
PZR-4R	153.72	8.97	144.75	9.13	144.59	9.57	144.15	9.59	144.13
PZR-4DR	152.73	3.91	148.82	4.51	148.22	5.15	147.58	5.51	147.22
RW-1	157.61	17.06	140.55	17.55	140.06	16.89	140.72	16.94	140.67
RW-2	156.49	22.20	134.29	21.94	134.55	22.31	134.18	22.03	134.46
RW-3	157.35	18.44	138.91	19.08	138.27	19.36	137.99	18.27	139.08
RW-4	158.21	16.70	141.51	15.62	142.59	16.30	141.91	15.99	142.22
RW-7	157.09	15.15	141.94	16.34	140.75	16.80	140.29	17.01	140.08
RW-8	156.95	16.82	140.13	17.09	139.86	16.68	140.27	17.50	139.45
RW-9	156.72	16.96	139.76	17.60	139.12	18.24	138.48	18.57	138.15
RW-10	156.13	18.60	137.53	17.44	138.69	18.23	137.90	17.88	138.25
RW-11	157.82	16.90	140.92	16.96	140.86	18.12	139.70	17.66	140.16
RW-12	158.36	23.31	135.05	20.52	137.84	20.36	138.00	19.94	138.42
RW-13	151.64	31.96	119.68	37.20	114.44	36.78	114.86	18.04	133.60
RW-14	151.71	16.78	134.93	17.94	133.77	16.86	134.85	11.52	140.19
RW-15	151.28	7.46	143.82	7.55	143.73	7.83	143.45	8.21	143.07
RW-1R	149.77	73.38	76.39	73.52	76.25	73.23	76.54	73.71	76.06
TW-7A	158.72	7.38	151.34	7.09	151.63	7.85	150.87	7.90	150.82
MW-702DR	181.38	23.30	158.08	23.70	157.68	23.81	157.57	23.83	157.55
P-8A	181.26	23.32	157.94	23.78	157.48	23.82	157.44	23.80	157.46
MW-707D	156.09	10.80	145.29	10.93	145.16	11.15	144.94	11.09	145.00
MW-707R	156.01	10.89	145.12	11.32	144.69	11.52	144.49	11.50	144.51
MW-707DR	156.80	12.18	144.62	12.34	144.46	12.65	144.15	12.62	144.18
PZ-02D	154.14	9.15	144.99	9.34	144.80	9.65	144.49	9.61	144.53
PZ-O2M	154.77	9.74	145.03	9.90	144.87	10.20	144.57	10.16	144.61
MW-3	153.79	8.60	145.19	8.78	145.01	8.97	144.82	8.89	144.90
MW-708R	224.95	76.70	148.25	76.81	148.14	76.90	148.05	77.03	147.92
MW-708DR	224.19	76.93	147.26	77.02	147.17	77.28	146.91	77.31	146.88
PZ-906DR	155.85	5.71	150.14	5.85	150.00	6.03	149.82	6.09	149.76

TABLE 2 DRAFT

31 October 2015 through 30 October 2016

Weekly NTCRA-1 Compliance Piezometer Pair Summary

Date	CPZ-1/CPZ-2A	CPZ-3/CPZ-4A	CPZ-5/CPZ-6	CPZ-7/CPZ-8
02-Nov-15	0.32	-1.12	7.25	5.48
09-Nov-15	0.12	-1.34	7.03	4.73
16-Nov-15	0.13	-1.27	7.11	5.44
28-Nov-15	-0.10	-1.03	7.91	5.10
01-Dec-15	-0.22	-0.98	8.49	4.33
08-Dec-15	-0.30	-0.33	8.78	4.44
14-Dec-15	-0.02	-0.89	8.50	4.38
21-Dec-15	0.32	-1.16	8.33	5.59
28-Dec-15	0.38	-0.93	9.17	4.58
05-Jan-16	0.40	-0.86	8.11	4.79
13-Jan-16	1.08	0.32	9.05	3.77
19-Jan-16	0.63	-0.10	8.93	4.01
27-Jan-16	0.45	-0.15	8.79	3.40
01-Feb-16	0.38	-0.36	8.69	3.43
08-Feb-16	0.87	0.33	7.92	3.34
16-Feb-16	1.15	0.32	8.18	3.78
25-Feb-16	2.80	0.82	8.72	3.39
01-Mar-16	1.67	0.57	8.69	2.91
08-Mar-16	0.88	0.93	8.59	2.97
18-Mar-16	1.26	3.03	7.03	2.57
23-Mar-16	0.69	2.58	7.18	2.73
30-Mar-16	0.42	2.75	6.47	2.39
08-Apr-16	0.58	3.63	6.91	2.99
15-Apr-16	0.57	0.84	7.34	2.94
19-Apr-16	1.27	2.82	7.21	1.95
27-Apr-16	1.40	2.12	7.13	2.43
02-May-16	1.31	2.28	7.33	2.65
09-May-16	1.13	1.85	7.16	2.79
16-May-16	0.47	1.42	6.46	3.08
26-May-16	1.10	1.31	7.37	2.22
02-Jun-16	0.97	0.53	6.97	2.99
06-Jun-16	1.07	1.75	6.97	3.49
13-Jun-16	0.63	0.98	7.00	2.92
20-Jun-16	0.46	0.34	7.26	2.99
28-Jun-16	0.57	0.51	6.60	3.27
05-Jul-16	0.33	0.46	7.17	3.51
12-Jul-16	0.25	0.02	7.29	3.47
20-Jul-16	0.13	-0.60	6.87	4.26
26-Jul-16	0.42	0.83	6.38	3.95
02-Aug-16	0.15	-0.33	6.38	4.10
10-Aug-16	-0.07	-0.76	5.95	3.89
15-Aug-16	0.33	-0.93	6.48	4.10
23-Aug-16	-0.01	-0.92	6.32	4.11
30-Aug-16	-0.24	-0.99	6.83	3.93
07-Sep-16	0.19	-1.20	7.00	3.79
15-Sep-16	-0.42	-1.03	6.42	3.96
20-Sep-16	-0.33	-1.23	5.07	3.66
30-Sep-16	-0.33	-1.15	4.88	3.83
04-Oct-16	-0.32	-1.19	4.99	3.79
10-Oct-16	-0.27	-0.53	5.60	4.24
20-Oct-16	-0.11	-0.84	5.74	2.98
26-Oct-16	0.34	0.64	6.02	3.62

Highlighted Cells - are weeks that the 0.30-foot hydraulic gradient reversal standard for a specific Compliance Piezometer Pair was not maintained during weekly gauging.

Table 3

November 2015

SRSNE HCTS - Influent Results

Parameter/ Concentration (mg/L)	Sample Dates	
	11/5/2015	11/19/2015
A. ORGANIC PARAMETERS		
Volatile Organic Compounds	*(mg/L)*	*(mg/L)*
Trichloroethene (mg/L)	<0.01	<0.01
Tetrachloroethene (mg/L)	<0.01	<0.01
Toluene (mg/L)	0.48	0.05
Ethylbenzene (mg/L)	0.16	0.02
Xylenes, Total (mg/L)	0.18	0.02
Vinyl chloride (mg/L)	0.04	<0.01
1,1-Dichloroethene (mg/L)	<0.01	<0.01
Tetrahydrofuran (mg/L)	<0.50	<0.50
1,2-Dichloroethene[1] (mg/L)	0.05	<0.01
1,2-Dichloroethane (mg/L)	<0.01	<0.01
1,1,1-Trichloroethane (mg/L)	<0.01	<0.01
1,1,2-Trichloroethane (mg/L)	<0.01	<0.01
Methylene chloride (mg/L)	<0.01	<0.01
Styrene (mg/L)	<0.01	<0.01
Alcohols		
Ethanol (mg/L)	<5.0	<5.0
Methanol (mg/L)	<5.0	<5.0
2-Butanol (sec-Butanol) (mg/L)	<5.0	<5.0
2-Propanol (Isopropanol) (mg/L)	<5.0	<5.0
Ketones		
Acetone (mg/L)	<0.50	<0.50
2-Butanone (Methyl Ethyl Ketone) (mg/L)	<0.50	<0.50
4-Methyl-2-pentanone (Methyl Isobutyl Ketone) (mg/L)	<0.50	<0.50
Total VOCs[2]	**0.91**	**0.09**
B. INORGANIC PARAMETERS		
Metals		
Copper, Total (mg/L)	<0.01	<0.01
Iron, Total (mg/L)	2.43	10.6
Lead, Total (mg/L)	<0.005	<0.005
Nickel, Total (mg/L)	<0.05	<0.05
Zinc, Total (mg/L)	<0.05	<0.05

NOTES:

mg/L = Milligrams per liter unless otherwise noted.

[1] = 1,2-Dichloroethene represents total cis and trans 1,2-Dichloroethene.

[2] = Total VOCs is the total sum of detected compounds (mg/l)

Table 3

December 2015

SRSNE HCTS - Influent Results

Parameter/ Concentration (mg/L)	Sample Dates	
	12/3/2015	12/17/2015
A. ORGANIC PARAMETERS		
Volatile Organic Compounds	*(mg/L)*	*(mg/L)*
Trichloroethene (mg/L)	<0.01	<0.01
Tetrachloroethene (mg/L)	<0.01	<0.01
Toluene (mg/L)	0.19	<0.01
Ethylbenzene (mg/L)	0.09	<0.01
Xylenes, Total (mg/L)	0.11	<0.01
Vinyl chloride (mg/L)	0.02	<0.01
1,1-Dichloroethene (mg/L)	<0.01	<0.01
Tetrahydrofuran (mg/L)	<0.50	<0.50
1,2-Dichloroethene[1] (mg/L)	0.02	<0.01
1,2-Dichloroethane (mg/L)	<0.01	<0.01
1,1,1-Trichloroethane (mg/L)	<0.01	<0.01
1,1,2-Trichloroethane (mg/L)	<0.01	<0.01
Methylene chloride (mg/L)	<0.01	<0.01
Styrene (mg/L)	<0.01	<0.01
Alcohols		
Ethanol (mg/L)	<5.0	<5.0
Methanol (mg/L)	<5.0	<5.0
2-Butanol (sec-Butanol) (mg/L)	<5.0	<5.0
2-Propanol (Isopropanol) (mg/L)	<5.0	<5.0
Ketones		
Acetone (mg/L)	<0.50	<0.50
2-Butanone (Methyl Ethyl Ketone) (mg/L)	<0.50	<0.50
4-Methyl-2-pentanone (Methyl Isobutyl Ketone) (mg/L)	<0.50	<0.50
Total VOCs[2]	**0.43**	**0**
B. INORGANIC PARAMETERS		
Metals		
Copper, Total (mg/L)	<0.01	<0.01
Iron, Total (mg/L)	3.26	2.78
Lead, Total (mg/L)	<0.005	<0.005
Nickel, Total (mg/L)	<0.05	<0.05
Zinc, Total (mg/L)	<0.05	<0.05

NOTES:
mg/L = Milligrams per liter unless otherwise noted.
[1] = 1,2-Dichloroethene represents total cis and trans 1,2-Dichloroethene.
[2] = Total VOCs is the total sum of detected compounds (mg/l)

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Table 3

January 2016

SRSNE HCTS - Influent Results

Parameter/ Concentration (mg/L)	Sample Dates	
	1/5/2016	**1/21/2016**
A. ORGANIC PARAMETERS		
Volatile Organic Compounds	*(mg/L)*	*(mg/L)*
Trichloroethene (mg/L)	<0.01	<0.01
Tetrachloroethene (mg/L)	<0.01	<0.01
Toluene (mg/L)	0.17	0.36
Ethylbenzene (mg/L)	0.06	0.15
Xylenes, Total (mg/L)	0.08	0.19
Vinyl chloride (mg/L)	0.04	0.05
1,1-Dichloroethene (mg/L)	<0.01	<0.01
Tetrahydrofuran (mg/L)	<0.50	<0.50
1,2-Dichloroethene[1] (mg/L)	0.04	0.04
1,2-Dichloroethane (mg/L)	<0.01	<0.01
1,1,1-Trichloroethane (mg/L)	<0.01	<0.01
1,1,2-Trichloroethane (mg/L)	<0.01	<0.01
Methylene chloride (mg/L)	<0.01	<0.01
Styrene (mg/L)	<0.01	<0.01
Alcohols		
Ethanol (mg/L)	<5.0	<5.0
Methanol (mg/L)	<5.0	<5.0
2-Butanol (sec-Butanol) (mg/L)	<5.0	<5.0
2-Propanol (Isopropanol) (mg/L)	<5.0	<5.0
Ketones		
Acetone (mg/L)	<0.50	<0.50
2-Butanone (Methyl Ethyl Ketone) (mg/L)	<0.50	<0.50
4-Methyl-2-pentanone (Methyl Isobutyl Ketone) (mg/L)	<0.50	<0.50
Total VOCs[2]	**0.39**	**0.79**
B. INORGANIC PARAMETERS		
Metals		
Copper, Total (mg/L)	<0.01	<0.01
Iron, Total (mg/L)	10.1	17.9
Lead, Total (mg/L)	<0.005	<0.005
Nickel, Total (mg/L)	<0.05	<0.05
Zinc, Total (mg/L)	<0.05	<0.05

NOTES:
mg/L = Milligrams per liter unless otherwise noted.
[1] = 1,2-Dichloroethene represents total cis and trans 1,2-Dichloroethene.
[2] = Total VOCs is the total sum of detected compounds (mg/l)

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Table 3

February 2016

SRSNE HCTS - Influent Results

Parameter/ Concentration (mg/L)	Sample Dates	
	2/4/2016	2/18/2016
A. ORGANIC PARAMETERS		
Volatile Organic Compounds	*(mg/L)*	*(mg/L)*
Trichloroethene (mg/L)	<0.01	0.001
Tetrachloroethene (mg/L)	<0.01	<0.001
Toluene (mg/L)	0.46	0.083
Ethylbenzene (mg/L)	0.16	0.037
Xylenes, Total (mg/L)	0.24	0.047
Vinyl chloride (mg/L)	0.11	0.052
1,1-Dichloroethene (mg/L)	<0.01	<0.001
Tetrahydrofuran (mg/L)	<0.50	<0.050
1,2-Dichloroethene[1] (mg/L)	0.10	0.077
1,2-Dichloroethane (mg/L)	<0.01	<0.001
1,1,1-Trichloroethane (mg/L)	<0.01	0.001
1,1,2-Trichloroethane (mg/L)	<0.01	<0.001
Methylene chloride (mg/L)	<0.01	<0.001
Styrene (mg/L)	<0.01	<0.001
Alcohols		
Ethanol (mg/L)	<5.0	<5.0
Methanol (mg/L)	<5.0	<5.0
2-Butanol (sec-Butanol) (mg/L)	<5.0	<5.0
2-Propanol (Isopropanol) (mg/L)	<5.0	<5.0
Ketones		
Acetone (mg/L)	<0.50	<0.050
2-Butanone (Methyl Ethyl Ketone) (mg/L)	<0.50	<0.050
4-Methyl-2-pentanone (Methyl Isobutyl Ketone) (mg/L)	<0.50	<0.050
Total VOCs[2]	**1.07**	**0.30**
B. INORGANIC PARAMETERS		
Metals		
Copper, Total (mg/L)	<0.01	<0.01
Iron, Total (mg/L)	11.9	10.3
Lead, Total (mg/L)	<0.005	<0.005
Nickel, Total (mg/L)	<0.05	<0.05
Zinc, Total (mg/L)	<0.05	<0.05

NOTES:

mg/L = Milligrams per liter unless otherwise noted.

[1] = 1,2-Dichloroethene represents total cis and trans 1,2-Dichloroethene.

[2] = Total VOCs is the total sum of detected compounds (mg/l)

Table 3

SRSNE HCTS - Influent Results

Parameter/ Concentration (mg/L)	Sample Dates	
	3/3/2016	3/17/2016
A. ORGANIC PARAMETERS		
Volatile Organic Compounds	*(mg/L)*	*(mg/L)*
Trichloroethene (mg/L)	0.002	0.001
Tetrachloroethene (mg/L)	<0.001	<0.001
Toluene (mg/L)	0.145	0.180
Ethylbenzene (mg/L)	0.067	0.072
Xylenes, Total (mg/L)	0.085	0.093
Vinyl chloride (mg/L)	0.077	0.102
1,1-Dichloroethene (mg/L)	0.002	0.002
Tetrahydrofuran (mg/L)	<0.050	<0.050
1,2-Dichloroethene[1] (mg/L)	0.111	0.164
1,2-Dichloroethane (mg/L)	<0.001	<0.001
1,1,1-Trichloroethane (mg/L)	<0.001	<0.001
1,1,2-Trichloroethane (mg/L)	<0.001	<0.001
Methylene chloride (mg/L)	<0.001	<0.001
Styrene (mg/L)	<0.001	<0.001
Alcohols		
Ethanol (mg/L)	<5.0	<5.0
Methanol (mg/L)	<5.0	<5.0
2-Butanol (sec-Butanol) (mg/L)	<5.0	<5.0
2-Propanol (Isopropanol) (mg/L)	<5.0	<5.0
Ketones		
Acetone (mg/L)	<0.050	<0.050
2-Butanone (Methyl Ethyl Ketone) (mg/L)	<0.050	<0.050
4-Methyl-2-pentanone (Methyl Isobutyl Ketone) (mg/L)	<0.050	<0.050
Total VOCs[2]	**0.49**	**0.61**
B. INORGANIC PARAMETERS		
Metals		
Copper, Total (mg/L)	<0.01	0.01
Iron, Total (mg/L)	5.97	8.80
Lead, Total (mg/L)	<0.005	<0.005
Nickel, Total (mg/L)	<0.05	<0.05
Zinc, Total (mg/L)	<0.05	<0.05

NOTES:

mg/L = Milligrams per liter unless otherwise noted.

[1] = 1,2-Dichloroethene represents total cis and trans 1,2-Dichloroethene.

[2] = Total VOCs is the total sum of detected compounds (mg/l)

SRSNE HCTS - Influent Results

Parameter/ Concentration (mg/L)	Sample Dates	
	4/5/2016	4/19/2016
A. ORGANIC PARAMETERS		
Volatile Organic Compounds	*(mg/L)*	*(mg/L)*
Trichloroethene (mg/L)	0.001	<0.001
Tetrachloroethene (mg/L)	<0.001	<0.001
Toluene (mg/L)	0.124	0.139
Ethylbenzene (mg/L)	0.046	0.055
Xylenes, Total (mg/L)	0.062	0.070
Vinyl chloride (mg/L)	0.051	0.050
1,1-Dichloroethene (mg/L)	<0.001	<0.001
Tetrahydrofuran (mg/L)	<0.050	<0.050
1,2-Dichloroethene[1] (mg/L)	0.044	0.077
1,2-Dichloroethane (mg/L)	<0.001	<0.001
1,1,1-Trichloroethane (mg/L)	<0.001	<0.001
1,1,2-Trichloroethane (mg/L)	<0.001	<0.001
Methylene chloride (mg/L)	<0.001	<0.001
Styrene (mg/L)	<0.001	<0.001
Alcohols		
Ethanol (mg/L)	<5.0	<5.0
Methanol (mg/L)	<5.0	<5.0
2-Butanol (sec-Butanol) (mg/L)	<5.0	<5.0
2-Propanol (Isopropanol) (mg/L)	<5.0	<5.0
Ketones		
Acetone (mg/L)	<0.050	<0.050
2-Butanone (Methyl Ethyl Ketone) (mg/L)	<0.050	<0.050
4-Methyl-2-pentanone (Methyl Isobutyl Ketone) (mg/L)	<0.050	<0.050
Total VOCs[2]	**0.33**	**0.39**
B. INORGANIC PARAMETERS		
Metals		
Copper, Total (mg/L)	<0.01	<0.01
Iron, Total (mg/L)	5.48	16.7
Lead, Total (mg/L)	<0.005	<0.005
Nickel, Total (mg/L)	<0.05	<0.05
Zinc, Total (mg/L)	<0.05	<0.05

NOTES:
mg/L = Milligrams per liter unless otherwise noted.
[1] = 1,2-Dichloroethene represents total cis and trans 1,2-Dichloroethene.
[2] = Total VOCs is the total sum of detected compounds (mg/l)

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Table 3

May 2016

SRSNE HCTS - Influent Results

Parameter/ Concentration (mg/L)	Sample Dates	
	5/6/2016	5/19/2016
A. ORGANIC PARAMETERS		
Volatile Organic Compounds	*(mg/L)*	*(mg/L)*
Trichloroethene (mg/L)	<0.001	0.001
Tetrachloroethene (mg/L)	<0.001	<0.001
Toluene (mg/L)	0.213	0.036
Ethylbenzene (mg/L)	0.093	0.014
Xylenes, Total (mg/L)	0.146	0.018
Vinyl chloride (mg/L)	0.158	0.008
1,1-Dichloroethene (mg/L)	0.002	<0.001
Tetrahydrofuran (mg/L)	<0.050	<0.050
1,2-Dichloroethene[1] (mg/L)	0.263	0.008
1,2-Dichloroethane (mg/L)	<0.001	<0.001
1,1,1-Trichloroethane (mg/L)	0.003	<0.001
1,1,2-Trichloroethane (mg/L)	<0.001	<0.001
Methylene chloride (mg/L)	<0.001	<0.001
Styrene (mg/L)	<0.001	<0.001
Alcohols		
Ethanol (mg/L)	<5.0	<5.0
Methanol (mg/L)	<5.0	<5.0
2-Butanol (sec-Butanol) (mg/L)	<5.0	<5.0
2-Propanol (Isopropanol) (mg/L)	<5.0	<5.0
Ketones		
Acetone (mg/L)	<0.050	<0.050
2-Butanone (Methyl Ethyl Ketone) (mg/L)	<0.050	<0.050
4-Methyl-2-pentanone (Methyl Isobutyl Ketone) (mg/L)	<0.050	<0.050
Total VOCs[2]	**0.88**	**0.09**
B. INORGANIC PARAMETERS		
Metals		
Copper, Total (mg/L)	<0.01	<0.01
Iron, Total (mg/L)	7.80	2.67
Lead, Total (mg/L)	<0.005	<0.005
Nickel, Total (mg/L)	<0.05	<0.05
Zinc, Total (mg/L)	<0.05	<0.05

NOTES:

mg/L = Milligrams per liter unless otherwise noted.

[1] = 1,2-Dichloroethene represents total cis and trans 1,2-Dichloroethene.

[2] = Total VOCs is the total sum of detected compounds (mg/l)

Table 3

June 2016

SRSNE HCTS - Influent Results

Parameter/ Concentration (mg/L)	Sample Dates	
	6/2/2016	6/16/2016
A. ORGANIC PARAMETERS		
Volatile Organic Compounds	*(mg/L)*	*(mg/L)*
Trichloroethene (mg/L)	<0.001	<0.01
Tetrachloroethene (mg/L)	<0.001	<0.01
Toluene (mg/L)	0.235	0.23
Ethylbenzene (mg/L)	0.109	0.02
Xylenes, Total (mg/L)	0.142	0.16
Vinyl chloride (mg/L)	0.091	0.15
1,1-Dichloroethene (mg/L)	<0.001	<0.01
Tetrahydrofuran (mg/L)	<0.050	<0.50
1,2-Dichloroethene[1] (mg/L)	0.092	0.27
1,2-Dichloroethane (mg/L)	<0.001	<0.01
1,1,1-Trichloroethane (mg/L)	<0.001	<0.01
1,1,2-Trichloroethane (mg/L)	<0.001	<0.01
Methylene chloride (mg/L)	<0.001	<0.01
Styrene (mg/L)	<0.001	<0.01
Alcohols		
Ethanol (mg/L)	<5.0	<5.0
Methanol (mg/L)	<5.0	<5.0
2-Butanol (sec-Butanol) (mg/L)	<5.0	<5.0
2-Propanol (Isopropanol) (mg/L)	<5.0	<5.0
Ketones		
Acetone (mg/L)	<0.050	<0.50
2-Butanone (Methyl Ethyl Ketone) (mg/L)	<0.050	<0.50
4-Methyl-2-pentanone (Methyl Isobutyl Ketone) (mg/L)	<0.050	<0.50
Total VOCs[2]	**0.67**	**0.83**
B. INORGANIC PARAMETERS		
Metals		
Copper, Total (mg/L)	0.07	<0.01
Iron, Total (mg/L)	46.5	2.93
Lead, Total (mg/L)	<0.005	<0.005
Nickel, Total (mg/L)	<0.05	<0.05
Zinc, Total (mg/L)	<0.05	<0.05

NOTES:

mg/L = Milligrams per liter unless otherwise noted.

[1] = 1,2-Dichloroethene represents total cis and trans 1,2-Dichloroethene.

[2] = Total VOCs is the total sum of detected compounds (mg/l)

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Table 3

July 2016

SRSNE HCTS - Influent Results

Parameter/ Concentration (mg/L)	Sample Dates	
	7/5/2016	7/14/2016
A. ORGANIC PARAMETERS		
Volatile Organic Compounds	*(mg/L)*	*(mg/L)*
Trichloroethene (mg/L)	<0.001	<0.001
Tetrachloroethene (mg/L)	<0.001	<0.001
Toluene (mg/L)	0.070	0.167
Ethylbenzene (mg/L)	0.031	0.076
Xylenes, Total (mg/L)	0.042	0.119
Vinyl chloride (mg/L)	0.033	0.073
1,1-Dichloroethene (mg/L)	<0.001	<0.001
Tetrahydrofuran (mg/L)	<0.050	<0.050
1,2-Dichloroethene[1] (mg/L)	0.029	0.114
1,2-Dichloroethane (mg/L)	<0.001	<0.001
1,1,1-Trichloroethane (mg/L)	<0.001	0.002
1,1,2-Trichloroethane (mg/L)	<0.001	<0.001
Methylene chloride (mg/L)	<0.001	<0.001
Styrene (mg/L)	<0.001	<0.001
Alcohols		
Ethanol (mg/L)	<5.0	<5.0
Methanol (mg/L)	<5.0	<5.0
2-Butanol (sec-Butanol) (mg/L)	<5.0	<5.0
2-Propanol (Isopropanol) (mg/L)	<5.0	<5.0
Ketones		
Acetone (mg/L)	<0.050	<0.050
2-Butanone (Methyl Ethyl Ketone) (mg/L)	<0.050	<0.050
4-Methyl-2-pentanone (Methyl Isobutyl Ketone) (mg/L)	<0.050	<0.050
Total VOCs[2]	**0.21**	**0.55**
B. INORGANIC PARAMETERS		
Metals		
Copper, Total (mg/L)	<0.01	<0.01
Iron, Total (mg/L)	12.9	0.73
Lead, Total (mg/L)	<0.005	<0.005
Nickel, Total (mg/L)	<0.05	<0.05
Zinc, Total (mg/L)	<0.05	<0.05

NOTES:

mg/L = Milligrams per liter unless otherwise noted.

[1] = 1,2-Dichloroethene represents total cis and trans 1,2-Dichloroethene.

[2] = Total VOCs is the total sum of detected compounds (mg/l)

Table 3

SRSNE HCTS - Influent Results

Parameter/ Concentration (mg/L)	Sample Dates	
	8/4/2016	8/16/2016
A. ORGANIC PARAMETERS		
Volatile Organic Compounds	*(mg/L)*	*(mg/L)*
Trichloroethene (mg/L)	<0.001	<0.001
Tetrachloroethene (mg/L)	<0.001	<0.001
Toluene (mg/L)	0.098	0.078
Ethylbenzene (mg/L)	0.045	0.037
Xylenes, Total (mg/L)	0.066	0.054
Vinyl chloride (mg/L)	0.028	0.019
1,1-Dichloroethene (mg/L)	<0.001	<0.001
Tetrahydrofuran (mg/L)	<0.050	<0.050
1,2-Dichloroethene[1] (mg/L)	0.014	0.009
1,2-Dichloroethane (mg/L)	<0.001	<0.001
1,1,1-Trichloroethane (mg/L)	<0.001	<0.001
1,1,2-Trichloroethane (mg/L)	<0.001	<0.001
Methylene chloride (mg/L)	<0.001	<0.001
Styrene (mg/L)	<0.001	<0.001
Alcohols		
Ethanol (mg/L)	<5.0	<5.0
Methanol (mg/L)	<5.0	<5.0
2-Butanol (sec-Butanol) (mg/L)	<5.0	<5.0
2-Propanol (Isopropanol) (mg/L)	<5.0	<5.0
Ketones		
Acetone (mg/L)	<0.050	<0.050
2-Butanone (Methyl Ethyl Ketone) (mg/L)	<0.050	<0.050
4-Methyl-2-pentanone (Methyl Isobutyl Ketone) (mg/L)	<0.050	<0.050
Total VOCs[2]	**0.25**	**0.20**
B. INORGANIC PARAMETERS		
Metals		
Copper, Total (mg/L)	<0.01	<0.01
Iron, Total (mg/L)	29.2	13.8
Lead, Total (mg/L)	<0.005	<0.005
Nickel, Total (mg/L)	<0.05	<0.05
Zinc, Total (mg/L)	<0.05	<0.05

NOTES:

mg/L = Milligrams per liter unless otherwise noted.

[1] = 1,2-Dichloroethene represents total cis and trans 1,2-Dichloroethene.

[2] = Total VOCs is the total sum of detected compounds (mg/l)

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Table 3

SRSNE HCTS - Influent Results

Parameter/ Concentration (mg/L)	Sample Dates	
	9/1/2016	9/15/2016
A. ORGANIC PARAMETERS		
Volatile Organic Compounds	*(mg/L)*	*(mg/L)*
Trichloroethene (mg/L)	<0.001	<0.001
Tetrachloroethene (mg/L)	<0.001	<0.001
Toluene (mg/L)	0.065	0.020
Ethylbenzene (mg/L)	0.034	0.012
Xylenes, Total (mg/L)	0.050	0.019
Vinyl chloride (mg/L)	0.013	0.012
1,1-Dichloroethene (mg/L)	<0.001	<0.001
Tetrahydrofuran (mg/L)	<0.050	<0.050
1,2-Dichloroethene[1] (mg/L)	0.006	0.006
1,2-Dichloroethane (mg/L)	<0.001	<0.001
1,1,1-Trichloroethane (mg/L)	<0.001	<0.001
1,1,2-Trichloroethane (mg/L)	<0.001	<0.001
Methylene chloride (mg/L)	<0.001	<0.001
Styrene (mg/L)	<0.001	<0.001
Alcohols		
Ethanol (mg/L)	<5.0	<5.0
Methanol (mg/L)	<5.0	<5.0
2-Butanol (sec-Butanol) (mg/L)	<5.0	<5.0
2-Propanol (Isopropanol) (mg/L)	<5.0	<5.0
Ketones		
Acetone (mg/L)	<0.050	<0.050
2-Butanone (Methyl Ethyl Ketone) (mg/L)	<0.050	<0.050
4-Methyl-2-pentanone (Methyl Isobutyl Ketone) (mg/L)	<0.050	<0.050
Total VOCs[2]	**0.17**	**0.07**
B. INORGANIC PARAMETERS		
Metals		
Copper, Total (mg/L)	<0.01	<0.01
Iron, Total (mg/L)	14.4	12.9
Lead, Total (mg/L)	<0.005	<0.005
Nickel, Total (mg/L)	<0.05	<0.05
Zinc, Total (mg/L)	<0.05	<0.05

NOTES:

mg/L = Milligrams per liter unless otherwise noted.

[1] = 1,2-Dichloroethene represents total cis and trans 1,2-Dichloroethene.

[2] = Total VOCs is the total sum of detected compounds (mg/l)

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Table 3

October 2016

SRSNE HCTS - Influent Results

Parameter/ Concentration (mg/L)	Sample Dates	
	10/4/2016	10/20/2016
A. ORGANIC PARAMETERS		
Volatile Organic Compounds	*(mg/L)*	*(mg/L)*
Trichloroethene (mg/L)	<0.001	0.004
Tetrachloroethene (mg/L)	<0.001	<0.001
Toluene (mg/L)	0.010	0.158
Ethylbenzene (mg/L)	0.004	0.108
Xylenes, Total (mg/L)	0.005	0.169
Vinyl chloride (mg/L)	0.007	0.056
1,1-Dichloroethene (mg/L)	<0.001	<0.001
Tetrahydrofuran (mg/L)	<0.050	<0.050
1,2-Dichloroethene[1] (mg/L)	0.003	0.032
1,2-Dichloroethane (mg/L)	<0.001	<0.001
1,1,1-Trichloroethane (mg/L)	<0.001	<0.001
1,1,2-Trichloroethane (mg/L)	<0.001	<0.001
Methylene chloride (mg/L)	<0.001	<0.001
Styrene (mg/L)	<0.001	<0.001
Alcohols		
Ethanol (mg/L)	<5.0	<5.0
Methanol (mg/L)	<5.0	<5.0
2-Butanol (sec-Butanol) (mg/L)	<5.0	<5.0
2-Propanol (Isopropanol) (mg/L)	<5.0	<5.0
Ketones		
Acetone (mg/L)	<0.050	<0.050
2-Butanone (Methyl Ethyl Ketone) (mg/L)	<0.050	<0.050
4-Methyl-2-pentanone (Methyl Isobutyl Ketone) (mg/L)	<0.050	<0.050
Total VOCs[2]	**0.03**	**0.53**
B. INORGANIC PARAMETERS		
Metals		
Copper, Total (mg/L)	<0.01	<0.01
Iron, Total (mg/L)	15.4	10.4
Lead, Total (mg/L)	<0.005	<0.005
Nickel, Total (mg/L)	<0.05	<0.05
Zinc, Total (mg/L)	<0.05	<0.05

NOTES:

mg/L = Milligrams per liter unless otherwise noted.

[1] = 1,2-Dichloroethene represents total cis and trans 1,2-Dichloroethene.

[2] = Total VOCs is the total sum of detected compounds (mg/l)

Table 4

November 2015

SRSNE HCTS - Effluent Results

Parameter/ Concentration (mg/L)	Substantive Requirement Discharge Limits	Sample Dates	
		11/5/2015	11/19/2015
A. ORGANIC PARAMETERS			
Volatile Organic Compounds	*(mg/L)*	*(mg/L)*	*(mg/L)*
Trichloroethene (mg/L)	**0.973**	<0.001	<0.001
Tetrachloroethene (mg/L)	**0.106**	<0.001	<0.001
Toluene (mg/L)	**4.000**	<0.001	<0.001
Ethylbenzene (mg/L)	**1.000**	<0.001	<0.001
Xylenes, Total (mg/L)	**0.500**	<0.001	<0.001
Vinyl chloride (mg/L)	**4.500**	<0.001	<0.001
1,1-Dichloroethene (mg/L)	**0.058**	<0.001	<0.001
Tetrahydrofuran (mg/L)	**0.500**	<0.050	<0.050
1,2-Dichloroethene[1] (mg/L)	**5.000**	0.019	0.018
1,2-Dichloroethane (mg/L)	**0.250**	<0.001	<0.001
1,1,1-Trichloroethane (mg/L)	**4.000**	<0.001	<0.001
1,1,2-Trichloroethane (mg/L)	**0.250**	<0.001	<0.001
Methylene chloride (mg/L)	**15.000**	<0.001	<0.001
Styrene (mg/L)	**0.500**	<0.001	<0.001
Alcohols			
Ethanol (mg/L)	**20.0**	<5.0	<5.0
Methanol (mg/L)	**10.0**	<5.0	<5.0
2-Butanol (sec-Butanol) (mg/L)	**30.0**	<5.0	<5.0
2-Propanol (Isopropanol) (mg/L)	**10.0**	<5.0	<5.0
Ketones			
Acetone (mg/L)	**35.0**	<0.050	<0.050
2-Butanone (Methyl Ethyl Ketone) (mg/L)	**10.0**	<0.050	<0.050
4-Methyl-2-pentanone (Methyl Isobutyl Ketone) (mg/L)	**2.0**	<0.050	<0.050
Total VOCs[2]		**0.019**	**0.018**
B. INORGANIC PARAMETERS			
Metals	*(mg/L) or (g/day)*	*(mg/L) or (g/day)*	*(mg/L) or (g/day)*
Copper, Total (g/day)[3]	**15.8 g/day**	<0.01 mg/l or <2.04 g/day	<0.01 mg/l or <2.04 g/day
Iron, Total (mg/l)	**5.0**	0.61	0.24
Lead, Total (g/day)[3]	**3.2 g/day**	<0.005 mg/l or <1.02 g/day	<0.005 mg/l or <1.02 g/day
Nickel, Total (mg/l)	**0.5**	<0.05	<0.05
Zinc, Total (g/day)[3]	**40.3 g/day**	<0.05 mg/l or <10.19 g/day	<0.05 mg/l or <10.19 g/day
OTHER			
Hydrogen Peroxide (mg/L)	**1.0**	0.2	0.2
Total PCBs (µg/L)	**NL**	<1	NS
pH (s.u.)	**6.0 - 9.0 s.u.**	6.59	6.59
Total Suspended Solids (mg/L)	**30**	<1	<1
Dioxins (pg/L)	**NL**	NS	NS
Furans (pg/L)	**NL**	NS	NS

NOTES:

1 = 1,2-Dichloroethene represents total cis and trans 1,2-Dichloroethene.

2 = Total VOCs is the total sum of detected compounds (mg/l)

3 = Inorganic results reported in grams per day are based on average monthly effluent flow

NL = no limit specified.

NS = not sampled (total PCBs analysis required monthly; dioxin/furan analysis required quarterly).

mg/L = Milligrams per liter

µg/L = micrograms per liter

pg/L = picograms per liter

g/day = grams per day

s.u. = Standard pH units

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Table 4

December 2015

SRSNE HCTS - Effluent Results

Parameter/ Concentration (mg/L)	Substantive Requirement Discharge Limits	Sample Dates	
		12/3/2015	12/17/2015
A. ORGANIC PARAMETERS			
Volatile Organic Compounds	*(mg/L)*	*(mg/L)*	*(mg/L)*
Trichloroethene (mg/L)	**0.973**	<0.001	<0.001
Tetrachloroethene (mg/L)	**0.106**	<0.001	<0.001
Toluene (mg/L)	**4.000**	<0.001	<0.001
Ethylbenzene (mg/L)	**1.000**	<0.001	<0.001
Xylenes, Total (mg/L)	**0.500**	<0.001	<0.001
Vinyl chloride (mg/L)	**4.500**	<0.001	<0.001
1,1-Dichloroethene (mg/L)	**0.058**	<0.001	<0.001
Tetrahydrofuran (mg/L)	**0.500**	<0.050	<0.050
1,2-Dichloroethene[1] (mg/L)	**5.000**	0.013	0.016
1,2-Dichloroethane (mg/L)	**0.250**	<0.001	<0.001
1,1,1-Trichloroethane (mg/L)	**4.000**	<0.001	<0.001
1,1,2-Trichloroethane (mg/L)	**0.250**	<0.001	<0.001
Methylene chloride (mg/L)	**15.000**	<0.001	<0.001
Styrene (mg/L)	**0.500**	<0.001	<0.001
Alcohols			
Ethanol (mg/L)	**20.0**	<5.0	<5.0
Methanol (mg/L)	**10.0**	<5.0	<5.0
2-Butanol (sec-Butanol) (mg/L)	**30.0**	<5.0	<5.0
2-Propanol (Isopropanol) (mg/L)	**10.0**	<5.0	<5.0
Ketones			
Acetone (mg/L)	**35.0**	<0.050	<0.050
2-Butanone (Methyl Ethyl Ketone) (mg/L)	**10.0**	<0.050	<0.050
4-Methyl-2-pentanone (Methyl Isobutyl Ketone) (mg/L)	**2.0**	<0.050	<0.050
Total VOCs[2]		**0.013**	**0.016**
B. INORGANIC PARAMETERS			
Metals	*(mg/L) or (g/day)*	*(mg/L) or (g/day)*	*(mg/L) or (g/day)*
Copper, Total (g/day)[3]	**15.8 g/day**	<0.01 mg/l or <2.03 g/day	<0.01 mg/l or< 2.03 g/day
Iron, Total (mg/l)	**5.0**	0.27	0.68
Lead, Total (g/day)[3]	**3.2 g/day**	<0.005 mg/l or <1.01 g/day	<0.005 mg/l or < 1.01 g/day
Nickel, Total (mg/l)	**0.5**	<0.05	<0.05
Zinc, Total (g/day)[3]	**40.3 g/day**	<0.05 mg/l or <10.13 g/day	<0.05 mg/l or< 10.13 g/day
OTHER			
Hydrogen Peroxide (mg/L)	**1.0**	0.2	0.2
Total PCBs (µg/L)	**NL**	<1	NS
pH (s.u.)	**6.0 - 9.0 s.u.**	6.59	6.71
Total Suspended Solids (mg/L)	**30**	1	<1
Dioxins (pg/L)	**NL**	NS	NS
Furans (pg/L)	**NL**	NS	NS

NOTES:

1 = 1,2-Dichloroethene represents total cis and trans 1,2-Dichloroethene.

2 = Total VOCs is the total sum of detected compounds (mg/l)

3 = Inorganic results reported in grams per day are based on average monthly effluent flow

NL = no limit specified.

NS = not sampled (total PCBs analysis required monthly; dioxin/furan analysis required quarterly).

mg/L = Milligrams per liter

µg/L = micrograms per liter

pg/L = picograms per liter

g/day = grams per day

s.u. = Standard pH units

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Table 4

January 2016

SRSNE HCTS - *Effluent Results*

Parameter/ Concentration (mg/L)	Substantive Requirement Discharge Limits	Sample Dates	
		1/5/2016	1/21/2016
A. ORGANIC PARAMETERS			
Volatile Organic Compounds	*(mg/L)*	*(mg/L)*	*(mg/L)*
Trichloroethene (mg/L)	**0.973**	<0.001	<0.001
Tetrachloroethene (mg/L)	**0.106**	<0.001	<0.001
Toluene (mg/L)	**4.000**	<0.001	<0.001
Ethylbenzene (mg/L)	**1.000**	<0.001	<0.001
Xylenes, Total (mg/L)	**0.500**	<0.001	<0.001
Vinyl chloride (mg/L)	**4.500**	<0.001	<0.001
1,1-Dichloroethene (mg/L)	**0.058**	<0.001	<0.001
Tetrahydrofuran (mg/L)	**0.500**	<0.050	<0.050
1,2-Dichloroethene[1] (mg/L)	**5.000**	0.014	0.013
1,2-Dichloroethane (mg/L)	**0.250**	<0.001	<0.001
1,1,1-Trichloroethane (mg/L)	**4.000**	<0.001	<0.001
1,1,2-Trichloroethane (mg/L)	**0.250**	<0.001	<0.001
Methylene chloride (mg/L)	**15.000**	<0.001	<0.001
Styrene (mg/L)	**0.500**	<0.001	<0.001
Alcohols			
Ethanol (mg/L)	**20.0**	<5.0	<5.0
Methanol (mg/L)	**10.0**	<5.0	<5.0
2-Butanol (sec-Butanol) (mg/L)	**30.0**	<5.0	<5.0
2-Propanol (Isopropanol) (mg/L)	**10.0**	<5.0	<5.0
Ketones			
Acetone (mg/L)	**35.0**	<0.050	<0.050
2-Butanone (Methyl Ethyl Ketone) (mg/L)	**10.0**	<0.050	<0.050
4-Methyl-2-pentanone (Methyl Isobutyl Ketone) (mg/L)	**2.0**	<0.050	<0.050
Total VOCs[2]		**0.014**	**0.013**
B. INORGANIC PARAMETERS			
Metals	*(mg/L) or (g/day)*	*(mg/L) or (g/day)*	*(mg/L) or (g/day)*
Copper, Total (g/day)[3]	**15.8 g/day**	<0.01 mg/l or <2.04 g/day	<0.01 mg/l or <2.04 g/day
Iron, Total (mg/l)	**5.0**	0.06	0.05
Lead, Total (g/day)[3]	**3.2 g/day**	<0.005 mg/l or <1.02 g/day	<0.005 mg/l or <1.02 g/day
Nickel, Total (mg/l)	**0.5**	<0.05	<0.05
Zinc, Total (g/day)[3]	**40.3 g/day**	<0.05 mg/l or <10.19 g/day	<0.05 mg/l or <10.19 g/day
OTHER			
Hydrogen Peroxide (mg/L)	**1.0**	0.2	0.2
Total PCBs (µg/L)	**NL**	<1	NS
pH (s.u.)	**6.0 - 9.0 s.u.**	6.67	6.67
Total Suspended Solids (mg/L)	**30**	<1	<1
Dioxins (pg/L)	**NL**	<37	NS
Furans (pg/L)	**NL**	<52	NS

NOTES:

1 = 1,2-Dichloroethene represents total cis and trans 1,2-Dichloroethene.

2 = Total VOCs is the total sum of detected compounds (mg/l)

3 = Inorganic results reported in grams per day are based on average monthly effluent flow

NL = no limit specified.

NS = not sampled (total PCBs analysis required monthly; dioxin/furan analysis required quarterly).

mg/L = Milligrams per liter

µg/L = micrograms per liter

pg/L = picograms per liter

g/day = grams per day

s.u. = Standard pH units

Table 4

SRSNE HCTS - Effluent Results

Parameter/ Concentration (mg/L)	Substantive Requirement Discharge Limits	Sample Dates	
		2/4/2016	2/18/2016
A. ORGANIC PARAMETERS			
Volatile Organic Compounds	*(mg/L)*	*(mg/L)*	*(mg/L)*
Trichloroethene (mg/L)	**0.973**	<0.001	<0.001
Tetrachloroethene (mg/L)	**0.106**	<0.001	<0.001
Toluene (mg/L)	**4.000**	<0.001	<0.001
Ethylbenzene (mg/L)	**1.000**	<0.001	<0.001
Xylenes, Total (mg/L)	**0.500**	<0.001	<0.001
Vinyl chloride (mg/L)	**4.500**	<0.001	<0.001
1,1-Dichloroethene (mg/L)	**0.058**	<0.001	<0.001
Tetrahydrofuran (mg/L)	**0.500**	<0.050	<0.050
1,2-Dichloroethene[1] (mg/L)	**5.000**	0.015	0.017
1,2-Dichloroethane (mg/L)	**0.250**	<0.001	<0.001
1,1,1-Trichloroethane (mg/L)	**4.000**	<0.001	<0.001
1,1,2-Trichloroethane (mg/L)	**0.250**	<0.001	<0.001
Methylene chloride (mg/L)	**15.000**	<0.001	<0.001
Styrene (mg/L)	**0.500**	<0.001	<0.001
Alcohols			
Ethanol (mg/L)	**20.0**	<5.0	<5.0
Methanol (mg/L)	**10.0**	<5.0	<5.0
2-Butanol (sec-Butanol) (mg/L)	**30.0**	<5.0	<5.0
2-Propanol (Isopropanol) (mg/L)	**10.0**	<5.0	<5.0
Ketones			
Acetone (mg/L)	**35.0**	<0.050	<0.050
2-Butanone (Methyl Ethyl Ketone) (mg/L)	**10.0**	<0.050	<0.050
4-Methyl-2-pentanone (Methyl Isobutyl Ketone) (mg/L)	**2.0**	<0.050	<0.050
Total VOCs[2]		**0.015**	**0.017**
B. INORGANIC PARAMETERS			
Metals	*(mg/L) or (g/day)*	*(mg/L) or (g/day)*	*(mg/L) or (g/day)*
Copper, Total (g/day)[3]	**15.8 g/day**	<0.01 mg/l or <2.14 g/day	<0.01 mg/l or <2.14 g/day
Iron, Total (mg/l)	**5.0**	0.12	0.10
Lead, Total (g/day)[3]	**3.2 g/day**	<0.005 mg/l or <1.07 g/day	<0.005 mg/l or <1.07 g/day
Nickel, Total (mg/l)	**0.5**	<0.05	<0.05
Zinc, Total (g/day)[3]	**40.3 g/day**	<0.05 mg/l or <10.68 g/day	<0.05 mg/l or <10.68 g/day
OTHER			
Hydrogen Peroxide (mg/L)	**1.0**	0.2	0.2
Total PCBs (µg/L)	**NL**	<1	NS
pH (s.u.)	**6.0 - 9.0 s.u.**	6.63	6.72
Total Suspended Solids (mg/L)	**30**	<1	<1
Dioxins (pg/L)	**NL**	NS	NS
Furans (pg/L)	**NL**	NS	NS

NOTES:

1 = 1,2-Dichloroethene represents total cis and trans 1,2-Dichloroethene.

2 = Total VOCs is the total sum of detected compounds (mg/l)

3 = Inorganic results reported in grams per day are based on average monthly effluent flow

NL = no limit specified.

NS = not sampled (total PCBs analysis required monthly; dioxin/furan analysis required quarterly).

mg/L = Milligrams per liter

µg/L = micrograms per liter

pg/L = picograms per liter

g/day = grams per day

s.u. = Standard pH units

Table 4

March 2016

SRSNE HCTS - Effluent Results

Parameter/ Concentration (mg/L)	**Substantive Requirement Discharge Limits**	**Sample Dates**	
		3/3/2016	**3/17/2016**
A. ORGANIC PARAMETERS			
Volatile Organic Compounds	*(mg/L)*	*(mg/L)*	*(mg/L)*
Trichloroethene (mg/L)	**0.973**	<0.001	<0.001
Tetrachloroethene (mg/L)	**0.106**	<0.001	<0.001
Toluene (mg/L)	**4.000**	<0.001	<0.001
Ethylbenzene (mg/L)	**1.000**	<0.001	<0.001
Xylenes, Total (mg/L)	**0.500**	<0.001	<0.001
Vinyl chloride (mg/L)	**4.500**	0.001	0.002
1,1-Dichloroethene (mg/L)	**0.058**	<0.001	<0.001
Tetrahydrofuran (mg/L)	**0.500**	<0.050	<0.050
1,2-Dichloroethene[1] (mg/L)	**5.000**	0.018	0.022
1,2-Dichloroethane (mg/L)	**0.250**	<0.001	<0.001
1,1,1-Trichloroethane (mg/L)	**4.000**	<0.001	<0.001
1,1,2-Trichloroethane (mg/L)	**0.250**	<0.001	<0.001
Methylene chloride (mg/L)	**15.000**	<0.001	<0.001
Styrene (mg/L)	**0.500**	<0.001	<0.001
Alcohols			
Ethanol (mg/L)	**20.0**	<5.0	<5.0
Methanol (mg/L)	**10.0**	<5.0	<5.0
2-Butanol (sec-Butanol) (mg/L)	**30.0**	<5.0	<5.0
2-Propanol (Isopropanol) (mg/L)	**10.0**	<5.0	<5.0
Ketones			
Acetone (mg/L)	**35.0**	<0.050	<0.050
2-Butanone (Methyl Ethyl Ketone) (mg/L)	**10.0**	<0.050	<0.050
4-Methyl-2-pentanone (Methyl Isobutyl Ketone) (mg/L)	**2.0**	<0.050	<0.050
Total VOCs[2]		**0.019**	**0.024**
B. INORGANIC PARAMETERS			
Metals	*(mg/L) or (g/day)*	*(mg/L) or (g/day)*	*(mg/L) or (g/day)*
Copper, Total (g/day)[3]	**15.8 g/day**	<0.01 mg/l or <2.25 g/day	<0.01 mg/l or <2.25 g/day
Iron, Total (mg/l)	**5.0**	0.64	<0.05
Lead, Total (g/day)[3]	**3.2 g/day**	<0.005 mg/l or <1.12 g/day	<0.005 mg/l or <1.12 g/day
Nickel, Total (mg/l)	**0.5**	<0.05	<0.05
Zinc, Total (g/day)[3]	**40.3 g/day**	<0.05 mg/l or <11.24 g/day	<0.05 mg/l or <11.24 g/day
OTHER			
Hydrogen Peroxide (mg/L)	**1.0**	0.2	<0.2
Total PCBs (µg/L)	**NL**	<1	NS
pH (s.u.)	**6.0 - 9.0 s.u.**	6.71	6.66
Total Suspended Solids (mg/L)	**30**	<1	<1
Dioxins (pg/L)	**NL**	NS	NS
Furans (pg/L)	**NL**	NS	NS

NOTES:

1 = 1,2-Dichloroethene represents total cis and trans 1,2-Dichloroethene.

2 = Total VOCs is the total sum of detected compounds (mg/l)

3 = Inorganic results reported in grams per day are based on average monthly effluent flow

NL = no limit specified.

NS = not sampled (total PCBs analysis required monthly; dioxin/furan analysis required quarterly).

mg/L = Milligrams per liter

µg/L = micrograms per liter

pg/L = picograms per liter

g/day = grams per day

s.u. = Standard pH units

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Table 4

April 2016

SRSNE HCTS - Effluent Results

Parameter/ Concentration (mg/L)	**Substantive Requirement Discharge Limits**	**Sample Dates**	
		4/5/2016	**4/19/2016**
A. ORGANIC PARAMETERS			
Volatile Organic Compounds	*(mg/L)*	*(mg/L)*	*(mg/L)*
Trichloroethene (mg/L)	**0.973**	<0.001	<0.001
Tetrachloroethene (mg/L)	**0.106**	<0.001	<0.001
Toluene (mg/L)	**4.000**	<0.001	<0.001
Ethylbenzene (mg/L)	**1.000**	<0.001	<0.001
Xylenes, Total (mg/L)	**0.500**	<0.001	<0.001
Vinyl chloride (mg/L)	**4.500**	0.007	0.008
1,1-Dichloroethene (mg/L)	**0.058**	<0.001	<0.001
Tetrahydrofuran (mg/L)	**0.500**	<0.050	<0.050
1,2-Dichloroethene[1] (mg/L)	**5.000**	0.028	0.043
1,2-Dichloroethane (mg/L)	**0.250**	<0.001	<0.001
1,1,1-Trichloroethane (mg/L)	**4.000**	<0.001	<0.001
1,1,2-Trichloroethane (mg/L)	**0.250**	<0.001	<0.001
Methylene chloride (mg/L)	**15.000**	<0.001	<0.001
Styrene (mg/L)	**0.500**	<0.001	<0.001
Alcohols			
Ethanol (mg/L)	**20.0**	<5.0	<5.0
Methanol (mg/L)	**10.0**	<5.0	<5.0
2-Butanol (sec-Butanol) (mg/L)	**30.0**	<5.0	<5.0
2-Propanol (Isopropanol) (mg/L)	**10.0**	<5.0	<5.0
Ketones			
Acetone (mg/L)	**35.0**	<0.050	<0.050
2-Butanone (Methyl Ethyl Ketone) (mg/L)	**10.0**	<0.050	<0.050
4-Methyl-2-pentanone (Methyl Isobutyl Ketone) (mg/L)	**2.0**	<0.050	<0.050
Total VOCs[2]		**0.035**	**0.051**
B. INORGANIC PARAMETERS			
Metals	*(mg/L) or (g/day)*	*(mg/L) or (g/day)*	*(mg/L) or (g/day)*
Copper, Total (g/day)[3]	**15.8 g/day**	<0.01 mg/l or <2.22 g/day	<0.01 mg/l or <2.22 g/day
Iron, Total (mg/l)	**5.0**	<0.05	<0.05
Lead, Total (g/day)[3]	**3.2 g/day**	<0.005 mg/l or <1.11 g/day	<0.005 mg/l or <1.11 g/day
Nickel, Total (mg/l)	**0.5**	<0.05	<0.05
Zinc, Total (g/day)[3]	**40.3 g/day**	<0.05 mg/l or <11.12 g/day	<0.05 mg/l or <11.12 g/day
OTHER			
Hydrogen Peroxide (mg/L)	**1.0**	0.2	0.2
Total PCBs (µg/L)	**NL**	<1	NS
pH (s.u.)	**6.0 - 9.0 s.u.**	6.68	6.67
Total Suspended Solids (mg/L)	**30**	<1	<1
Dioxins (pg/L)	**NL**	<36	NS
Furans (pg/L)	**NL**	<51	NS

NOTES:

1 = 1,2-Dichloroethene represents total cis and trans 1,2-Dichloroethene.

2 = Total VOCs is the total sum of detected compounds (mg/l)

3 = Inorganic results reported in grams per day are based on average monthly effluent flow

NL = no limit specified.

NS = not sampled (total PCBs analysis required monthly; dioxin/furan analysis required quarterly).

mg/L = Milligrams per liter

µg/L = micrograms per liter

pg/L = picograms per liter

g/day = grams per day

s.u. = Standard pH units

Table 4

May 2016

SRSNE HCTS - Effluent Results

Parameter/ Concentration (mg/L)	**Substantive Requirement Discharge Limits**	**Sample Dates**	
		5/6/2016	**5/19/2016**
A. ORGANIC PARAMETERS			
Volatile Organic Compounds	*(mg/L)*	*(mg/L)*	*(mg/L)*
Trichloroethene (mg/L)	**0.973**	<0.001	<0.001
Tetrachloroethene (mg/L)	**0.106**	<0.001	<0.001
Toluene (mg/L)	**4.000**	<0.001	<0.001
Ethylbenzene (mg/L)	**1.000**	<0.001	<0.001
Xylenes, Total (mg/L)	**0.500**	<0.001	<0.001
Vinyl chloride (mg/L)	**4.500**	0.005	0.001
1,1-Dichloroethene (mg/L)	**0.058**	<0.001	<0.001
Tetrahydrofuran (mg/L)	**0.500**	<0.050	<0.050
1,2-Dichloroethene[1] (mg/L)	**5.000**	0.044	0.030
1,2-Dichloroethane (mg/L)	**0.250**	<0.001	<0.001
1,1,1-Trichloroethane (mg/L)	**4.000**	<0.001	<0.001
1,1,2-Trichloroethane (mg/L)	**0.250**	<0.001	<0.001
Methylene chloride (mg/L)	**15.000**	<0.001	<0.001
Styrene (mg/L)	**0.500**	<0.001	<0.001
Alcohols			
Ethanol (mg/L)	**20.0**	<5.0	<5.0
Methanol (mg/L)	**10.0**	<5.0	<5.0
2-Butanol (sec-Butanol) (mg/L)	**30.0**	<5.0	<5.0
2-Propanol (Isopropanol) (mg/L)	**10.0**	<5.0	<5.0
Ketones			
Acetone (mg/L)	**35.0**	<0.050	<0.050
2-Butanone (Methyl Ethyl Ketone) (mg/L)	**10.0**	<0.050	<0.050
4-Methyl-2-pentanone (Methyl Isobutyl Ketone) (mg/L)	**2.0**	<0.050	<0.050
Total VOCs[2]		**0.049**	**0.031**
B. INORGANIC PARAMETERS			
Metals	*(mg/L) or (g/day)*	*(mg/L) or (g/day)*	*(mg/L) or (g/day)*
Copper, Total (g/day)[3]	**15.8 g/day**	0.01 mg/l or 2.15 g/day	<0.01 mg/l or <2.15 g/day
Iron, Total (mg/l)	**5.0**	<0.05	0.05
Lead, Total (g/day)[3]	**3.2 g/day**	<0.005 mg/l or <1.08 g/day	<0.005 mg/l or <1.08 g/day
Nickel, Total (mg/l)	**0.5**	<0.05	<0.05
Zinc, Total (g/day)[3]	**40.3 g/day**	<0.05 mg/l or <10.75 g/day	<0.05 mg/l or <10.75 g/day
OTHER			
Hydrogen Peroxide (mg/L)	**1.0**	0.2	0.2
Total PCBs (µg/L)	**NL**	<1	NS
pH (s.u.)	**6.0 - 9.0 s.u.**	6.72	6.68
Total Suspended Solids (mg/L)	**30**	<1	<1
Dioxins (pg/L)	**NL**	NS	NS
Furans (pg/L)	**NL**	NS	NS

NOTES:

1 = 1,2-Dichloroethene represents total cis and trans 1,2-Dichloroethene.

2 = Total VOCs is the total sum of detected compounds (mg/l)

3 = Inorganic results reported in grams per day are based on average monthly effluent flow

NL = no limit specified.

NS = not sampled (total PCBs analysis required monthly; dioxin/furan analysis required quarterly).

mg/L = Milligrams per liter

µg/L = micrograms per liter

pg/L = picograms per liter

g/day = grams per day

s.u. = Standard pH units

Table 4

SRSNE HCTS - Effluent Results

Parameter/ Concentration (mg/L)	Substantive Requirement Discharge Limits	Sample Dates	
		6/2/2016	6/16/2016
A. ORGANIC PARAMETERS			
Volatile Organic Compounds	*(mg/L)*	*(mg/L)*	*(mg/L)*
Trichloroethene (mg/L)	**0.973**	<0.001	<0.001
Tetrachloroethene (mg/L)	**0.106**	<0.001	<0.001
Toluene (mg/L)	**4.000**	<0.001	<0.001
Ethylbenzene (mg/L)	**1.000**	<0.001	<0.001
Xylenes, Total (mg/L)	**0.500**	<0.001	<0.001
Vinyl chloride (mg/L)	**4.500**	0.001	0.002
1,1-Dichloroethene (mg/L)	**0.058**	<0.001	<0.001
Tetrahydrofuran (mg/L)	**0.500**	<0.050	<0.050
1,2-Dichloroethene[1] (mg/L)	**5.000**	0.031	0.034
1,2-Dichloroethane (mg/L)	**0.250**	<0.001	<0.001
1,1,1-Trichloroethane (mg/L)	**4.000**	<0.001	<0.001
1,1,2-Trichloroethane (mg/L)	**0.250**	<0.001	<0.001
Methylene chloride (mg/L)	**15.000**	<0.001	<0.001
Styrene (mg/L)	**0.500**	<0.001	<0.001
Alcohols			
Ethanol (mg/L)	**20.0**	<5.0	<5.0
Methanol (mg/L)	**10.0**	<5.0	<5.0
2-Butanol (sec-Butanol) (mg/L)	**30.0**	<5.0	<5.0
2-Propanol (Isopropanol) (mg/L)	**10.0**	<5.0	<5.0
Ketones			
Acetone (mg/L)	**35.0**	<0.050	<0.050
2-Butanone (Methyl Ethyl Ketone) (mg/L)	**10.0**	<0.050	<0.050
4-Methyl-2-pentanone (Methyl Isobutyl Ketone) (mg/L)	**2.0**	<0.050	<0.050
Total VOCs[2]		**0.032**	**0.036**
B. INORGANIC PARAMETERS			
Metals	*(mg/L) or (g/day)*	*(mg/L) or (g/day)*	*(mg/L) or (g/day)*
Copper, Total (g/day)[3]	**15.8 g/day**	0.02 mg/l or 4.14 g/day	<0.01 mg/l or <2.07 g/day
Iron, Total (mg/l)	**5.0**	<0.05	<0.05
Lead, Total (g/day)[3]	**3.2 g/day**	<0.005 mg/l or <1.03 g/day	<0.005 mg/l or <1.03 g/day
Nickel, Total (mg/l)	**0.5**	<0.05	<0.05
Zinc, Total (g/day)[3]	**40.3 g/day**	<0.05 mg/l or <10.35 g/day	<0.05 mg/l or <10.35 g/day
OTHER			
Hydrogen Peroxide (mg/L)	**1.0**	0.2	0.2
Total PCBs (µg/L)	**NL**	<1	NS
pH (s.u.)	**6.0 - 9.0 s.u.**	6.64	6.74
Total Suspended Solids (mg/L)	**30**	2	<1
Dioxins (pg/L)	**NL**	NS	NS
Furans (pg/L)	**NL**	NS	NS

NOTES:

1 = 1,2-Dichloroethene represents total cis and trans 1,2-Dichloroethene.

2 = Total VOCs is the total sum of detected compounds (mg/l)

3 = Inorganic results reported in grams per day are based on average monthly effluent flow

NL = no limit specified.

NS = not sampled (total PCBs analysis required monthly; dioxin/furan analysis required quarterly).

mg/L = Milligrams per liter

µg/L = micrograms per liter

pg/L = picograms per liter

g/day = grams per day

s.u. = Standard pH units

Table 4

July 2016

SRSNE HCTS - Effluent Results

Parameter/ Concentration (mg/L)	Substantive Requirement Discharge Limits	Sample Dates	
		7/5/2016	7/14/2016
A. ORGANIC PARAMETERS			
Volatile Organic Compounds	*(mg/L)*	*(mg/L)*	*(mg/L)*
Trichloroethene (mg/L)	**0.973**	<0.001	<0.001
Tetrachloroethene (mg/L)	**0.106**	<0.001	<0.001
Toluene (mg/L)	**4.000**	<0.001	<0.001
Ethylbenzene (mg/L)	**1.000**	<0.001	<0.001
Xylenes, Total (mg/L)	**0.500**	<0.001	<0.001
Vinyl chloride (mg/L)	**4.500**	<0.001	<0.001
1,1-Dichloroethene (mg/L)	**0.058**	<0.001	<0.001
Tetrahydrofuran (mg/L)	**0.500**	<0.050	<0.050
1,2-Dichloroethene[1] (mg/L)	**5.000**	0.017	0.015
1,2-Dichloroethane (mg/L)	**0.250**	<0.001	<0.001
1,1,1-Trichloroethane (mg/L)	**4.000**	<0.001	<0.001
1,1,2-Trichloroethane (mg/L)	**0.250**	<0.001	<0.001
Methylene chloride (mg/L)	**15.000**	<0.001	<0.001
Styrene (mg/L)	**0.500**	<0.001	<0.001
Alcohols			
Ethanol (mg/L)	**20.0**	<5.0	<5.0
Methanol (mg/L)	**10.0**	<5.0	<5.0
2-Butanol (sec-Butanol) (mg/L)	**30.0**	<5.0	<5.0
2-Propanol (Isopropanol) (mg/L)	**10.0**	<5.0	<5.0
Ketones			
Acetone (mg/L)	**35.0**	<0.050	<0.050
2-Butanone (Methyl Ethyl Ketone) (mg/L)	**10.0**	<0.050	<0.050
4-Methyl-2-pentanone (Methyl Isobutyl Ketone) (mg/L)	**2.0**	<0.050	<0.050
Total VOCs[2]		**0.017**	**0.015**
B. INORGANIC PARAMETERS			
Metals	*(mg/L) or (g/day)*	*(mg/L) or (g/day)*	*(mg/L) or (g/day)*
Copper, Total (g/day)[3]	**15.8 g/day**	<0.01 mg/l or <2 g/day	<0.01 mg/l or <2 g/day
Iron, Total (mg/l)	**5.0**	<0.05	0.09
Lead, Total (g/day)[3]	**3.2 g/day**	<0.005 mg/l or <1 g/day	<0.005 mg/l or <1 g/day
Nickel, Total (mg/l)	**0.5**	<0.05	<0.05
Zinc, Total (g/day)[3]	**40.3 g/day**	<0.05 mg/l or 10.01 g/day	<0.05 mg/l or 10.01 g/day
OTHER			
Hydrogen Peroxide (mg/L)	**1.0**	0.2	<0.2
Total PCBs (µg/L)	**NL**	<1	NS
pH (s.u.)	**6.0 - 9.0 s.u.**	6.71	6.71
Total Suspended Solids (mg/L)	**30**	<1	1
Dioxins (pg/L)	**NL**	<50	NS
Furans (pg/L)	**NL**	<51	NS

NOTES:

1 = 1,2-Dichloroethene represents total cis and trans 1,2-Dichloroethene.

2 = Total VOCs is the total sum of detected compounds (mg/l)

3 = Inorganic results reported in grams per day are based on average monthly effluent flow

NL = no limit specified.

NS = not sampled (total PCBs analysis required monthly; dioxin/furan analysis required quarterly).

mg/L = Milligrams per liter

µg/L = micrograms per liter

pg/L = picograms per liter

g/day = grams per day

s.u. = Standard pH units

Table 4

August 2016

SRSNE HCTS - Effluent Results

Parameter/ Concentration (mg/L)	**Substantive Requirement Discharge Limits**	**Sample Dates**	
		8/4/2016	**8/16/2016**
A. ORGANIC PARAMETERS			
Volatile Organic Compounds	*(mg/L)*	*(mg/L)*	*(mg/L)*
Trichloroethene (mg/L)	**0.973**	<0.001	<0.001
Tetrachloroethene (mg/L)	**0.106**	<0.001	<0.001
Toluene (mg/L)	**4.000**	<0.001	<0.001
Ethylbenzene (mg/L)	**1.000**	<0.001	<0.001
Xylenes, Total (mg/L)	**0.500**	<0.001	<0.001
Vinyl chloride (mg/L)	**4.500**	<0.001	<0.001
1,1-Dichloroethene (mg/L)	**0.058**	<0.001	<0.001
Tetrahydrofuran (mg/L)	**0.500**	<0.050	<0.050
1,2-Dichloroethene[1] (mg/L)	**5.000**	0.013	0.009
1,2-Dichloroethane (mg/L)	**0.250**	<0.001	<0.001
1,1,1-Trichloroethane (mg/L)	**4.000**	<0.001	<0.001
1,1,2-Trichloroethane (mg/L)	**0.250**	<0.001	<0.001
Methylene chloride (mg/L)	**15.000**	<0.001	<0.001
Styrene (mg/L)	**0.500**	<0.001	<0.001
Alcohols			
Ethanol (mg/L)	**20.0**	<5.0	<5.0
Methanol (mg/L)	**10.0**	<5.0	<5.0
2-Butanol (sec-Butanol) (mg/L)	**30.0**	<5.0	<5.0
2-Propanol (Isopropanol) (mg/L)	**10.0**	<5.0	<5.0
Ketones			
Acetone (mg/L)	**35.0**	<0.050	<0.050
2-Butanone (Methyl Ethyl Ketone) (mg/L)	**10.0**	<0.050	<0.050
4-Methyl-2-pentanone (Methyl Isobutyl Ketone) (mg/L)	**2.0**	<0.050	<0.050
Total VOCs[2]		**0.013**	**0.009**
B. INORGANIC PARAMETERS			
Metals	*(mg/L) or (g/day)*	*(mg/L) or (g/day)*	*(mg/L) or (g/day)*
Copper, Total (g/day)[3]	**15.8 g/day**	<0.01 mg/l or <1.91 g/day	<0.01 mg/l or <1.91 g/day
Iron, Total (mg/l)	**5.0**	0.09	0.15
Lead, Total (g/day)[3]	**3.2 g/day**	<0.005 mg/l or <0.96 g/day	<0.005 mg/l or <0.96 g/day
Nickel, Total (mg/l)	**0.5**	<0.05	<0.05
Zinc, Total (g/day)[3]	**40.3 g/day**	<0.05 mg/l or <9.57 g/day	<0.05 mg/l or <9.57 g/day
OTHER			
Hydrogen Peroxide (mg/L)	**1.0**	<0.2	<0.2
Total PCBs (µg/L)	**NL**	<1	NS
pH (s.u.)	**6.0 - 9.0 s.u.**	6.65	6.68
Total Suspended Solids (mg/L)	**30**	2	<1
Dioxins (pg/L)	**NL**	NS	NS
Furans (pg/L)	**NL**	NS	NS

NOTES:

1 = 1,2-Dichloroethene represents total cis and trans 1,2-Dichloroethene.

2 = Total VOCs is the total sum of detected compounds (mg/l)

3 = Inorganic results reported in grams per day are based on average monthly effluent flow

NL = no limit specified.

NS = not sampled (total PCBs analysis required monthly; dioxin/furan analysis required quarterly).

mg/L = Milligrams per liter

µg/L = micrograms per liter

pg/L = picograms per liter

g/day = grams per day

s.u. = Standard pH units

Table 4

SRSNE HCTS - Effluent Results

Parameter/ Concentration (mg/L)	Substantive Requirement Discharge Limits	Sample Dates	
		9/1/2016	9/15/2016
A. ORGANIC PARAMETERS			
Volatile Organic Compounds	*(mg/L)*	*(mg/L)*	*(mg/L)*
Trichloroethene (mg/L)	**0.973**	<0.001	<0.001
Tetrachloroethene (mg/L)	**0.106**	<0.001	<0.001
Toluene (mg/L)	**4.000**	<0.001	<0.001
Ethylbenzene (mg/L)	**1.000**	<0.001	<0.001
Xylenes, Total (mg/L)	**0.500**	<0.001	<0.001
Vinyl chloride (mg/L)	**4.500**	<0.001	<0.001
1,1-Dichloroethene (mg/L)	**0.058**	<0.001	<0.001
Tetrahydrofuran (mg/L)	**0.500**	<0.050	<0.050
1,2-Dichloroethene[1] (mg/L)	**5.000**	0.010	0.009
1,2-Dichloroethane (mg/L)	**0.250**	<0.001	<0.001
1,1,1-Trichloroethane (mg/L)	**4.000**	<0.001	<0.001
1,1,2-Trichloroethane (mg/L)	**0.250**	<0.001	<0.001
Methylene chloride (mg/L)	**15.000**	<0.001	<0.001
Styrene (mg/L)	**0.500**	<0.001	<0.001
Alcohols			
Ethanol (mg/L)	**20.0**	<5.0	<5.0
Methanol (mg/L)	**10.0**	<5.0	<5.0
2-Butanol (sec-Butanol) (mg/L)	**30.0**	<5.0	<5.0
2-Propanol (Isopropanol) (mg/L)	**10.0**	<5.0	<5.0
Ketones			
Acetone (mg/L)	**35.0**	<0.050	<0.050
2-Butanone (Methyl Ethyl Ketone) (mg/L)	**10.0**	<0.050	<0.050
4-Methyl-2-pentanone (Methyl Isobutyl Ketone) (mg/L)	**2.0**	<0.050	<0.050
Total VOCs[2]		**0.010**	**0.009**
B. INORGANIC PARAMETERS			
Metals	*(mg/L) or (g/day)*	*(mg/L) or (g/day)*	*(mg/L) or (g/day)*
Copper, Total (g/day)[3]	**15.8 g/day**	<0.01 mg/l or <1.91 g/day	<0.01 mg/l or <1.91 g/day
Iron, Total (mg/l)	**5.0**	0.11	0.08
Lead, Total (g/day)[3]	**3.2 g/day**	<0.005 mg/l or <0.96 g/day	<0.005 mg/l or <0.96 g/day
Nickel, Total (mg/l)	**0.5**	<0.05	<0.05
Zinc, Total (g/day)[3]	**40.3 g/day**	<0.05 mg/l or <9.57 g/day	<0.05 mg/l or <9.57 g/day
OTHER			
Hydrogen Peroxide (mg/L)	**1.0**	<0.2	<0.2
Total PCBs (µg/L)	**NL**	<1	NS
pH (s.u.)	**6.0 - 9.0 s.u.**	6.70	6.71
Total Suspended Solids (mg/L)	**30**	<1	3
Dioxins (pg/L)	**NL**	NS	NS
Furans (pg/L)	**NL**	NS	NS

NOTES:

1 = 1,2-Dichloroethene represents total cis and trans 1,2-Dichloroethene.

2 = Total VOCs is the total sum of detected compounds (mg/l)

3 = Inorganic results reported in grams per day are based on average monthly effluent flow

NL = no limit specified.

NS = not sampled (total PCBs analysis required monthly; dioxin/furan analysis required quarterly).

mg/L = Milligrams per liter

µg/L = micrograms per liter

pg/L = picograms per liter

g/day = grams per day

s.u. = Standard pH units

Table 4

October 2016

SRSNE HCTS - Effluent Results

Parameter/ Concentration (mg/L)	Substantive Requirement Discharge Limits	Sample Dates	
		10/4/2016	10/20/2016
A. ORGANIC PARAMETERS			
Volatile Organic Compounds	*(mg/L)*	*(mg/L)*	*(mg/L)*
Trichloroethene (mg/L)	**0.973**	<0.001	<0.001
Tetrachloroethene (mg/L)	**0.106**	<0.001	<0.001
Toluene (mg/L)	**4.000**	<0.001	<0.001
Ethylbenzene (mg/L)	**1.000**	<0.001	<0.001
Xylenes, Total (mg/L)	**0.500**	<0.001	<0.001
Vinyl chloride (mg/L)	**4.500**	<0.001	<0.001
1,1-Dichloroethene (mg/L)	**0.058**	<0.001	<0.001
Tetrahydrofuran (mg/L)	**0.500**	<0.050	<0.050
1,2-Dichloroethene[1] (mg/L)	**5.000**	0.008	<0.001
1,2-Dichloroethane (mg/L)	**0.250**	<0.001	<0.001
1,1,1-Trichloroethane (mg/L)	**4.000**	<0.001	<0.001
1,1,2-Trichloroethane (mg/L)	**0.250**	<0.001	<0.001
Methylene chloride (mg/L)	**15.000**	<0.001	<0.001
Styrene (mg/L)	**0.500**	<0.001	<0.001
Alcohols			
Ethanol (mg/L)	**20.0**	<5.0	<5.0
Methanol (mg/L)	**10.0**	<5.0	<5.0
2-Butanol (sec-Butanol) (mg/L)	**30.0**	<5.0	<5.0
2-Propanol (Isopropanol) (mg/L)	**10.0**	<5.0	<5.0
Ketones			
Acetone (mg/L)	**35.0**	<0.050	<0.050
2-Butanone (Methyl Ethyl Ketone) (mg/L)	**10.0**	<0.050	<0.050
4-Methyl-2-pentanone (Methyl Isobutyl Ketone) (mg/L)	**2.0**	<0.050	<0.050
Total VOCs[2]		**0.008**	**0**
B. INORGANIC PARAMETERS			
Metals	*(mg/L) or (g/day)*	*(mg/L) or (g/day)*	*(mg/L) or (g/day)*
Copper, Total (g/day)[3]	**15.8 g/day**	<0.01 mg/l or <1.96 g/day	<0.01 mg/l or <1.96 g/day
Iron, Total (mg/l)	**5.0**	0.09	0.10
Lead, Total (g/day)[3]	**3.2 g/day**	<0.005 mg/l or <0.98 g/day	<0.005 mg/l or <0.98 g/day
Nickel, Total (mg/l)	**0.5**	<0.05	<0.05
Zinc, Total (g/day)[3]	**40.3 g/day**	<0.05 mg/l or <9.8 g/day	<0.05 mg/l or <9.8 g/day
OTHER			
Hydrogen Peroxide (mg/L)	**1.0**	<0.2	<0.2
Total PCBs (µg/L)	**NL**	<1	NS
pH (s.u.)	**6.0 - 9.0 s.u.**	6.76	6.84
Total Suspended Solids (mg/L)	**30**	<1	5
Dioxins (pg/L)	**NL**	<36	NS
Furans (pg/L)	**NL**	<51	NS

NOTES:

1 = 1,2-Dichloroethene represents total cis and trans 1,2-Dichloroethene.

2 = Total VOCs is the total sum of detected compounds (mg/l)

3 = Inorganic results reported in grams per day are based on average monthly effluent flow

NL = no limit specified.

NS = not sampled (total PCBs analysis required monthly; dioxin/furan analysis required quarterly).

mg/L = Milligrams per liter

µg/L = micrograms per liter

pg/L = picograms per liter

g/day = grams per day

s.u. = Standard pH units

TABLE 5

31 October 2015 through 30 October 2016

Influent and Effluent GWCT System Flow Data Summary

Date	**Influent Flow Summary (NCTRA 1 and 2 Combined)**			**NCTRA-1 Flow Summary**	**NCTRA-2 Flow Summary**			**Effluent Flow Summary (NTCRA 1 and 2 Combined)**		
	Total Cumulative Flow (gallons)	*Total Flow Since Previous (gallons)*	*Avg. Rate Since Prev. (GPM)*	*Avg. Rate Since Prev. (GPM)*	*Total Cumulative Flow (gallons)*	*Total Flow Since Previous (gallons)*	*Avg. Rate Since Prev. (GPM)*	*Total Cumulative Flow (gallons)*	*Total Flow Since Previous (gallons)*	*Avg. Rate Since Prev. (GPM)*
10/30/2015	287,733,000				163,491,710			304,037,000		
11/29/2015	289,286,000	1,553,000	35.9	2.9	164,920,210	1,428,500	33.1	305,652,000	1,615,000	37.4
12/30/2015	290,867,000	1,581,000	35.4	2.9	166,372,410	1,452,200	32.5	307,312,000	1,660,000	37.2
1/29/2016	292,399,000	1,532,000	35.5	4.2	167,722,410	1,350,000	31.3	308,927,000	1,615,000	37.4
2/29/2016	294,061,000	1,662,000	37.2	5.8	169,124,410	1,402,000	31.4	310,676,000	1,749,000	39.2
3/31/2016	295,850,000	1,789,000	40.1	9.7	170,481,010	1,356,600	30.4	312,517,000	1,841,000	41.2
4/29/2016	297,512,000	1,662,000	39.8	9.7	171,738,110	1,257,100	30.1	314,221,000	1,704,000	40.8
5/31/2016	299,232,000	1,720,000	37.3	5.8	173,191,410	1,453,300	31.5	316,039,000	1,818,000	39.5
6/30/2016	300,804,000	1,572,000	36.4	4.6	174,565,310	1,373,900	31.8	317,679,000	1,640,000	38.0
7/31/2016	302,410,000	1,606,000	36.0	4.2	175,982,510	1,417,200	31.7	319,318,000	1,639,000	36.7
8/31/2016	303,972,000	1,562,000	35.0	3.7	177,377,710	1,395,200	31.3	320,885,000	1,567,000	35.1
9/30/2016	305,462,000	1,490,000	34.5	3.3	178,724,110	1,346,400	31.2	322,402,000	1,517,000	35.1
10/31/2016	307,057,000	1,595,000	35.7	2.9	180,188,310	1,464,200	32.8	324,007,000	1,605,000	36.0
Yearly Averages (1)			**36.6**	**5.0**			**31.6**			**37.8**
Cumulative Totals:	**307,057,000**	**19,324,000**			**180,188,310**	**16,696,600**		**324,007,000**	**19,970,000**	

Notes:

1: The average yearly flows are calculated by dividing the total cumulative annual flow by the duration in minutes.

Attachment 3

2016 Groundwater Sampling and Monitored Natural Attenuation Report

DRAFT

SRSNE Site Group

2016 GROUNDWATER SAMPLING AND MONITORED NATURAL ATTENUATION REPORT

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

Southington, Connecticut

November 2016

DRAFT

Disclaimer: *This document is a DRAFT document prepared by the Settling Defendants under a government Consent Decree. This document has not undergone formal review by the U.S. Environmental Protection Agency (EPA) and CT Department of Energy and Environmental Protection (DEEP). The opinions, findings, and conclusions, expressed are those of the author and not those of the EPA or the CT DEEP.*

2016 GROUNDWATER SAMPLING AND MONITORED NATURAL ATTENUATION REPORT

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

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SRSNE Site Group

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B0054634.0001.02200

Date:

November 2016

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C. Post-Thermal Treatment Trend Graphs

D. 2016 Microbiological Survey Technical Memorandum

EXECUTIVE SUMMARY

This *2016 Groundwater Sampling and Monitored Natural Attenuation Report* (MNA Report) was prepared to address certain requirements of the Statement of Work (SOW) for the Remedial Design/Remedial Action (RD/RA) activities at the Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site in Southington, Connecticut (Site). Specifically, this report summarizes the 2016 groundwater sampling event performed in accordance with the *Monitoring Well Network Evaluation and Groundwater Monitoring Program* (Work Plan; Attachment N to the Remedial Design Work Plan [RDWP]; Arcadis 2010b), and presents the results and interpretation of data collected in support of MNA as a remedy for groundwater that contains Site-related constituents of concern (COCs) at concentrations above risk levels or regulatory limits. Monitored natural attenuation is a component of the overall remedial strategy for Site groundwater as described in the United States Environmental Protection Agency's (USEPA's) 2005 Record of Decision (ROD) for the Site.

In accordance with the Work Plan, the 2016 annual groundwater sampling event was performed in June 2016 and included sampling of groundwater at 37 monitoring wells for analysis of volatile organic compounds (VOCs), target analyte list (TAL) metals, and/or MNA parameters, as indicated in the Work Plan. These wells were also sampled for the full suite of potential site-related constituents in 2014 as part of the second "comprehensive" event in support of the 2015 Second Five Year Review (USEPA 2015).

The June 2016 results indicate that:

- VOCs above Action Levels (the more stringent of the USEPA Maximum Contaminant Levels [MCLs] or Connecticut Class GA Groundwater Protection Criteria [GWPC], i.e., drinking water standards) are contained within the estimated capture zone boundary of the hydraulic containment and treatment system (HCTS). None of the wells within the severed plume (i.e., wells with historical COC concentrations above Action Levels downgradient of the HCTS capture zone boundary) had COC concentrations above Action Levels during the 2014 through 2016 groundwater monitoring events.
- Tetrachloroethene (PCE) and trichloroethene (TCE) were detected at middle overburden monitoring well PZO-2M at concentrations of 6.3 micrograms per liter (μg/L) and 3.43 μg/L, respectively, in the June 2016 sample. The PCE concentration is above the Action Level of 5.0 μg/L, while the TCE concentration is below the Action Level of 5.0 μg/L (previously above the Action Level in 2013 and 2014). PCE was first detected above the Action Level at this well in June 2013, while TCE was first detected above the Action Level in June 2012.
- PCE and TCE were detected at deep bedrock monitoring well MW-1003DR at concentrations of 3.2 μg/L and 39.2 μg/L, respectively, in the June 2016 sample. The PCE concentration dropped below the Action Level of 5.0 μg/L starting in June 2014, while the

TCE concentration is above the Action Level of 5.0 μg/L (and was previously above the Action Level in 2013, 2014, and 2015). PCE and TCE were first detected above the Action Level at this well in June 2013. Concentrations of both compounds have continued to decline relative to the 2013 results.

- TCE was detected at monitoring well MW-1002R at a concentration (0.662 μg/L) below the Action Level of 5 μg/L. The only detection of TCE above the Action Level at this well occurred in June 2015.
- As noted in the 2012 MNA Report, total VOC concentrations at shallow bedrock monitoring well P-11A increased notably between 2011 (583 μg/L) and 2012 (approximately 26,400 μg/L). This well is located within the bedrock NAPL zone initially delineated during the Remedial Investigation (RI; Blasland, Bouck & Lee, Inc. [BBL] June 1998), and more recently refined (based on additional data from the RD/RA activities) in the *Groundwater Conceptual Site Model Update* (Arcadis 2015). This well is also located within the HCTS capture zone. The total VOC concentration in June 2016 was significantly lower (4,527 μg/L) than in June 2012, though concentrations remain elevated above most pre-June 2012 values. VOC concentrations at this well will continue to be monitored as part of future sampling events.
- PCE, TCE, and 1,1-dichloroethene (1,1-DCE) were detected at monitoring well DN-3 at concentrations (13.0, 13.9, and 17.5 μg/L, respectively) above Action Levels (5.0, 5.0, and 7.0 μg/L, respectively). These are the first detections of VOCs above Action Levels at monitoring well DN-3 since MNA monitoring began in 2010.

This report also summarizes the two post-thermal treatment monitoring events performed in March and July 2016, in accordance with SOW Sections IV.B.5.d and e. Results indicate that total VOC concentrations have decreased by one to three orders of magnitude in eight of the ten "N" wells (relative to the initial comprehensive sampling event conducted in 2010). Some rebound of total VOC concentrations has been observed for MWL-304 and TW-08A, although July 2016 total VOC concentrations are lower than previous sampling events. Total VOC concentrations at two other wells (TW-08B and TW-08D) have remained stable over this period.

Results from Bio-Trap® sampling with QuantArray-Chlor and QuantArray-Petro analyses at two Non-Time-Critical Removal Action (NTCRA) 1 locations indicate increased diversity in the microbial population relative to pre-treatment conditions. These results continue to suggest that anaerobic biodegradation processes dominate in the thermal treatment area, but also indicate a strong potential for aerobic cometabolism of chlorinated volatile organic compounds (CVOCs) and aerobic metabolism of petroleum hydrocarbons if conditions become more favorable for these processes in the future. In addition, Bio-Trap® samplers were deployed at 14 monitoring wells for analysis of 1,4-dioxane and tetrahydrofuran (THF) biodegradation potential. Results indicate potential for metabolic 1,4-dioxane and THF biodegradation at a subset of monitoring wells sampled (CPZ-6A, MW-907M, and MW-502) and potential for cometabolic biodegradation at each of the 14 monitoring well sampled. This potential for 1,4-dioxane and THF biodegradation is based on the detection of the functional genes needed to mediate aerobic and cometabolic biodegradation.

This MNA Report fulfills the requirement set forth in Section VII.A.2 of the SOW and the reporting approach outlined in the MNA Plan presented as Attachment L to the RDWP (Arcadis 2009). This MNA Report presents results of an evaluation of the effectiveness of MNA as a remedial measure for COCs in groundwater in the Site. As an extension of the prior evaluations (presented in the 2010 through 2015 MNA Reports), this evaluation considers groundwater monitoring results from the June 2016 annual groundwater monitoring event for VOCs and TAL metals at a subset of monitoring wells and presents: an evaluation of current concentration trends for total VOCs in groundwater at select monitoring locations; initial evaluation of post-thermal treatment data at the 10 “N” wells; estimates of bulk attenuation rates for total VOCs in groundwater; and HCTS COC mass extraction rates with time.

Results of these evaluations indicated:

- Detected concentrations of VOCs above Action Levels are contained within the estimated capture zone boundary of the HCTS.
- Groundwater total VOC concentrations are generally declining or remaining stable with time throughout the Site groundwater COC plume.
- Estimated bulk VOC attenuation rates were comparable to attenuation rates for individual COCs presented in the *Feasibility Study* (FS) (BBL and USEPA 2005).
- Compliance monitoring data from the HCTS indicate generally stable COC mass extraction rates from the early 2000s to 2013 with a decline in COC mass extraction rates observed starting in 2014.

These results support continued use of MNA as a remedy for COCs in Site groundwater.

1 INTRODUCTION

1.1 Purpose

This *2016 Groundwater Sampling and Monitored Natural Attenuation Report* (MNA Report) was prepared on behalf of the Solvents Recovery Service of New England, Inc. (SRSNE) Site Group, an unincorporated association of Settling Defendants to a Consent Decree (CD), to address certain requirements of the Statement of Work (SOW) for the Remedial Design/Remedial Action (RD/RA) at the SRSNE Superfund Site in Southington, Connecticut (Site) (Figure 1). The CD was lodged on October 30, 2008 with the United States District Court for the District of Connecticut in connection with Civil Actions No. 3:08cv1509 (SRU) and No. 3:08cv1504 (WWE) and was entered by the Court on March 26, 2009.

This MNA Report presents the results and evaluation of data collected during the June 2016 annual groundwater monitoring event conducted in accordance with the Remedial Design Work Plan (RDWP), the MNA Plan (Attachment L to the RDWP [Arcadis 2009]), and in fulfillment of the requirements of the SOW (Section IV.B.5.f). This report also presents the results and evaluation of data collected during the two 2016 post-thermal treatment groundwater monitoring events conducted in accordance with SOW Sections IV.B.5.d and e. These events are to be conducted three times per year until equilibrium is restored (i.e., groundwater temperatures return to approximately pre-thermal temperatures). Thermal treatment was completed in early March 2015, and post-thermal monitoring events were performed in March, July, and October/November 2015; and in March and July 2016. The third 2016 post-thermal monitoring event is scheduled for November 2016.

Section VII.A.2 of the SOW requires the submittal of annual MNA Reports as part of the Annual State of Compliance Reports. MNA is a component of the overall remedial strategy set forth for the Site in the Record of Decision (ROD) (United States Environmental Protection Agency [USEPA] 2005) for groundwater containing Site-related constituents of concern (COCs) at concentrations exceeding acceptable risk levels or regulatory limits.

1.2 Scope

In accordance with the *Monitoring Well Network Evaluation and Groundwater Monitoring Program* (Work Plan; Attachment N to the RDWP [Arcadis 2010b]), the 2016 annual groundwater sampling event was performed in June 2016 and included sampling of groundwater from 30 “R”, 4 “M”, and 3 “B”-designated monitoring wells. Post-thermal treatment groundwater sampling events included 10 “N”-designated monitoring wells. As further described in Section 3.1, the letter designations generally pertain to the locations, monitoring scope, and sampling frequency of monitoring wells.

In addition to the above SOW-required sampling events, a microbial survey was conducted in 2016. Bio-Trap® samplers were deployed at two monitoring wells to evaluate the post-thermal treatment microbial community relative to the pre-thermal treatment community and at 14 monitoring wells to evaluate the presence and abundance of bacteria that can biodegrade 1,4-dioxane. Some of these bacteria are also able to biodegrade tetrahydrofuran (THF). A discussion of the results of the microbiological survey is included in Section 4.2.

MNA refers to the reliance on natural attenuation (NA) processes, within the context of a carefully controlled and monitored site cleanup approach, to achieve site-specific remediation objectives within a time frame that is reasonable compared to that offered by more active methods. Natural attenuation is the reduction in mass or concentration of COCs in groundwater over time or distance from the source of the impact due to naturally occurring processes. Attenuation processes include nondestructive physical processes (e.g., advection, dilution, dispersion, volatilization, dissolution, and sorption) and destructive chemical and biological processes.

The MNA remedy at the Site applies to the groundwater and non-aqueous phase liquid (NAPL) and addresses the following areas of the Site, in accordance with the SOW:

- Groundwater and saturated glacial deposits (gravel, sand, silt and clay) in the "Overburden Groundwater" unit that contain COC concentrations above acceptable risk levels or regulatory criteria; and
- Groundwater and fractured rock in the "Bedrock Groundwater" unit that contain COC concentrations above acceptable risk levels or regulatory criteria.

COCs in overburden and bedrock groundwater are monitored as part of the MNA remedy. The Site COCs include VOCs such as chlorinated ethenes and ethanes, ketones, aromatic compounds, and 1,4-dioxane; TAL metals; semi-volatile organic compounds (SVOCs); and polychlorinated biphenyls (PCBs). Only VOCs (including 1,4-dioxane), metals, and/or MNA parameters were analyzed during the June 2016 annual event. During the post-thermal treatment sampling events (March and July 2016) only VOCs (including 1,4-dioxane during the March 2016 event) and MNA parameters (discussed below) were analyzed.

In addition to monitoring COC concentrations, the MNA Plan specifies long-term monitoring of a suite of geochemical parameters ("MNA parameters") to confirm geochemical evidence of NA and to verify that biochemical processes continue to support COC degradation in Site groundwater. The MNA parameters monitored at the Site include anions (sulfate, chloride, nitrate, nitrite), total organic carbon (TOC), iron (ferric, ferrous), divalent manganese, light hydrocarbons (methane, ethane, ethene), dissolved oxygen (DO), oxidation/reduction potential (ORP), pH, alkalinity, and temperature.

1.3 Document Organization

The remainder of this MNA Report is organized into the following sections:

- **Section 2 – Annual Groundwater Sampling Event – 2016:** summarizes the groundwater sampling activities performed in June 2016 and evaluates the data.
- **Section 3 – Post-Thermal Treatment Groundwater Sampling:** summarizes the groundwater sampling activities performed in March and July 2016 and evaluates the data.
- **Section 4 – Additional Sampling:** presents the non-SOW-required sampling conducted in June 2016, and evaluates the data.
- **Section 5 – MNA Background:** describes the MNA performance monitoring program at the Site, including the Site conceptual model, MNA remedy, and performance standards.
- **Section 6 – Performance Monitoring:** describes the MNA performance monitoring program at the Site, including monitoring locations, parameters, frequency and objectives.
- **Section 7 – MNA Evaluation:** evaluates Site data based on results from the June 2016 annual sampling event, and discusses the analysis of performance monitoring data, including the data quality assessment process, data interpretation approach, and statistical procedures.
- **Section 8 – Summary:** presents a summary of conclusions from the MNA evaluation and provides recommendations for action.
- **Section 9 – References:** lists the references cited within this MNA Report.

2 ANNUAL GROUNDWATER SAMPLING EVENT – 2016

2.1 Scope of Work

The 2016 annual groundwater sampling event was conducted to satisfy the requirements of SOW Section IV.B.5.f, which includes annual monitoring of VOCs and biennial (i.e., every two years) monitoring of MNA parameters at a select subset of monitoring wells in the overburden and bedrock aquifers. The sampled wells are in the area outside the NTCRA 1 sheet pile wall and referred to as “R” wells. VOCs and MNA parameters were analyzed during this annual event.

In addition to the SOW-required sampling, the background monitoring wells – referred to as the “M” and “B” wells – were sampled for TAL metals. As outlined in SOW Section VIII.F, Interim Cleanup Levels (ICLs) for metals need to be established prior to submittal of the Demonstration of Compliance Report. To that end, metals will be analyzed on an annual basis to establish a dataset sufficient for determining the appropriate background metals concentrations at the Site.

In total, 49 monitoring wells were sampled as part of the June 2016 monitoring event; 37 wells as part of the SOW-required sampling and 12 wells voluntarily. Of the 37 SOW-required wells, 20 were sampled using HydraSleeve^{TM} samplers and 17 were sampled using low-flow methods. All monitoring wells sampled voluntarily were done so using HydraSleeve^{TM} samplers.

In addition to the sampling discussed above, Bio-Trap$^{®}$ samplers were voluntarily (i.e., not SOW-required) deployed at 16 monitoring wells. The analyses performed on these samples are summarized in Sections 3 and 4.

2.2 Summary of Field Activities

The 2016 annual groundwater sampling event was conducted June 6 through 10, 2016. Procedures used for gauging and sampling the 17 monitoring wells using low-flow methods were consistent with those outlined in the *Summary of Initial (2010) Comprehensive Groundwater Sampling Event* (Arcadis January 2011a). HydraSleeves^{TM} were used to collect samples from 20 of the 37 wells, consistent with the approach proposed in a memorandum dated July 7, 2011, and approved by the USEPA in a letter dated May 21, 2012. In summary, the approved HydraSleeve^{TM} sampling approach included the following conditions:

- Used for “routine” samples collected for tracking changes and trends in the groundwater over time. It does not apply to samples collected for specific decision points such as evaluating remedy protectiveness for five-year reviews, capture zone analysis, confirming results of modeling, risk assessments, etc.

- To be used only for sampling of VOCs and MNA parameters.

- Used for any well that has been given an “R” or “N” designation and that contains one or more constituents at a concentration greater than or equal to ten times the ICL, or, is located within the hydraulic capture zone.

Samples were submitted to Alpha Analytical (Alpha) of Westborough, Massachusetts, for analysis of VOCs, TAL Metals, and/or MNA parameters; dissolved gases were analyzed at Pace Analytical (Pace) in Pittsburgh, Pennsylvania. A tabular summary of the sampling event is provided below:

SOW Section	Well Group	# of Wells Intended		# of Wells Sampled		Analytical Parameters
		LF	HS	LF	HS	
IV.B.5.f	“R”	10	20	10	20	VOCs MNA Parameters
VIII.F	“M”	5	--	4	--	TAL Metals MNA Parameters
IV.B.5.f	“B”	3	--	3	--	TAL Metals

LF – Wells sampled using low-flow method

HS – Wells sampled using HydraSleeve^{TM} samplers

There was one deviation from the intended scope. "M" monitoring well MW-901D was not sampled due to insufficient water in this overburden well (i.e., dry) at the time of sampling.

Monitoring well locations in each of the five hydrostratigraphic zones are shown on Figures 2 through 6. Field sampling forms and equipment calibration logs from the sampling event are included in Appendices A and B, respectively.

2.3 Results

Groundwater analytical results from the June 2016 annual groundwater monitoring event are provided in Table 1 (VOCs), Table 2 (TAL metals), and Table 3 (MNA parameters). Groundwater data were validated consistent with the procedures outlined in the *Summary of Initial (2010) Comprehensive Groundwater Sampling Event* (Arcadis January 2011a). Any qualifiers and/or modifications made via the validation process are reflected in the tables.

2.3.1 Groundwater Elevations

Synoptic groundwater elevation measurements are only collected during five-year comprehensive monitoring events, and therefore were not collected during the June 2016 groundwater monitoring event. Groundwater elevation data from the most recent comprehensive event (June 2014) were included in the *2014 Groundwater Sampling and Monitored Natural Attenuation Report* (Arcadis 2014).

2.3.2 VOCs

Groundwater VOC concentrations from the June 2016 groundwater monitoring event are provided in Table 1. Groundwater VOC concentrations were compared against USEPA Maximum Contaminant Levels (MCLs) and Connecticut Class GA Groundwater Protection Criteria (GWPC), with the lower of the two criteria, referred to as the "Action Level", used as the criterion for the comparison for each VOC. The Action Levels are intended to be protective of groundwater that could be used for drinking water purposes. Groundwater VOC concentrations that exceeded their respective Action Levels are highlighted in Table 1. For comparison, the ICLs specified in Table L-1 of the ROD (USEPA 2005) are also listed in Table 1.

Concentrations of VOCs greater than Action Levels are contained within the estimated capture zone boundary of the Hydraulic Containment and Treatment System (HCTS).

Tetrachloroethene (PCE) and trichloroethene (TCE) were detected at middle overburden monitoring well PZO-2M at concentrations of 6.3 micrograms per liter (μg/L) and 3.43 μg/L, respectively, in the June 2016 sample. The PCE concentration is above the Action Level of 5.0 μg/L, while the TCE concentration remains below the Action Level of 5.0 μg/L (previously above the Action Level in 2013 and 2014). PCE was first detected above the Action Level at this well in June 2013, while TCE was first detected above the Action Level in June 2012.

PCE and TCE were detected at deep bedrock monitoring well MW-1003DR at concentrations of 3.2 μg/L and 39.2 μg/L, respectively, in the June 2016 sample. The PCE concentration has been below the Action Level of 5.0 μg/L since June 2014, while the TCE concentration is above the Action Level of 5.0 μg/L. PCE and TCE were first detected above the Action Level at this well in June 2013.

TCE was detected at monitoring well MW-1002R at a concentration (0.662 μg/L) below the Action Level of 5 μg/L. The only detection of TCE above the Action Level at this well occurred in June 2015.

PCE, TCE, and 1,1-dichloroethene (1,1-DCE) were detected at monitoring well DN-3 at concentrations (13.0, 13.9, and 17.5 μg/L, respectively) above Action Levels (5.0, 5.0, and 7.0 μg/L, respectively). These are the first detections of VOCs above Action Levels at monitoring well DN-3 since MNA monitoring began in 2010.

As noted in the 2012 MNA Report, total VOC concentrations at shallow bedrock monitoring well P-11A increased notably between 2011 (583 µg/L) and 2012 (approximately 26,400 µg/L). This well is located within the bedrock NAPL zone initially delineated during the Remedial Investigation (RI; Blasland, Bouck & Lee, Inc. [BBL] June 1998), and more recently refined (based on additional data from the RD/RA activities) in the *Groundwater Conceptual Site Model Update* (Arcadis 2015). This well is also located within the HCTS capture zone. The total VOC concentration in June 2016 increased to approximately 4,527 µg/L from 1,803 µg/L in June 2015, but is less than 9,461 µg/L detected in June 2014. VOC concentrations at this well will continue to be monitored as part of future sampling events.

VOC Plume Delineation

Data from the 2014-2016 groundwater monitoring events were used to update the VOC plume maps, originally presented in the *Summary of Initial (2010) Comprehensive Groundwater Sampling Event* (Arcadis January 2011a), for each of the five hydrostratigraphic units. Using the approach that was initially presented in the RI (BBL June 1998), groundwater VOC results (the most recent data available at each well) were used to derive VOC regulatory exceedance ratios by dividing detected concentrations of VOCs by the lower of the federal standard (MCL) or the state standard (GWPC), which are the ARARs-based "Action Levels"; these generally represent drinking water standards. An exceedance ratio value greater than 1.0 indicates that the detected VOC concentration exceeded the Action Level. Exceedance ratio values less than 1.0 indicate that the detected VOC concentrations were less than the Action Level. The highest (and in some cases, the two highest) VOC exceedance ratio(s) for each well, and the specific compound associated with each ratio, are summarized for each hydrostratigraphic unit on Figures 7 through 11, and these regulatory exceedance ratios were used to delineate groundwater with VOCs above Action Levels. VOCs greater than Action Levels are contained within the estimated capture zone boundary of the Hydraulic Containment and Treatment System (HCTS).

2.3.3 SVOCs and PCBs

SVOC data are only collected in conjunction with five-year comprehensive monitoring events, and PCB data were only collected during the initial comprehensive event; therefore, SVOCs and PCBs were not included in the June 2016 groundwater monitoring event. Previously collected SVOC and PCB data were evaluated in the *Monitored Natural Attenuation Report* (Arcadis September 2010a) and the *2014 Groundwater Sampling and Monitored Natural Attenuation Report* (Arcadis 2014).

2.3.4 TAL Metals

Groundwater concentrations of TAL metals during the June 2016 groundwater monitoring event are summarized in Table 2. Groundwater TAL metals concentrations were compared against the Action Levels (i.e., the lower of the MCLs and GWPCs; note that there are no Action Levels for dissolved metals). ICLs have not yet been developed for metals in groundwater because they are a function of background concentrations, which are to be established in the future based on background sampling performed through that time.

Two wells had total metals concentrations above their respective Action Levels, as noted below:

- MW-126B – Manganese (Mn)
- MW-209B – Barium (Ba), Cobalt (Co), Lead (Pb), and Mn

Both monitoring wells are upgradient, background wells located north and west, respectively, of the former Operations Area of the SRSNE Site.

2.3.5 MNA Parameters

Concentrations and distributions of electron acceptors, electron donors, and byproducts of microbially mediated reactions are evaluated to verify the types of geochemical and biodegradation processes active in Site groundwater. Concentrations of MNA parameters during the June 2016 comprehensive groundwater monitoring event are provided in Table 3. In general, MNA parameter concentrations in June 2016 were similar to MNA parameter concentrations for the 2010 and 2014 comprehensive sampling events (Arcadis 2010a and Arcadis 2014, respectively) demonstrating that groundwater geochemical conditions have not changed substantially over the past 6 years.

2.3.6 1,4-Dioxane

Although 1,4-dioxane was not a SOW-required parameter for this sampling event, several wells were analyzed for 1,4-dioxane in conjunction with the Bio-Trap® sampling. Measured 1,4-dioxane concentrations are summarized in Table 4 and ranged from 2.4 J to 2,400 J μg/L. Results are discussed in more detail in Section 4.2.

3 POST-THERMAL TREATMENT GROUNDWATER SAMPLING

3.1 Scope of Work

As described in SOW Sections IV.B.5.d and e, groundwater monitoring is required at a select subset of monitoring wells in the overburden and bedrock in the area between the former Boston and Maine railroad tracks and the NTCRA 1 sheetpile wall (i.e., the “N” wells), with different sampling frequencies during different stages of the RD/RA process.

With the completion of in-situ thermal remediation (ISTR) on March 2, 2015, triannual (i.e., three times per year) sampling is being conducted until groundwater temperatures return to approximate pre-thermal conditions. Sampling events were conducted in March and July 2016, and the third triannual event is anticipated to occur in November 2016. Analysis for 1,4-dioxane is not part of the post-thermal treatment monitoring program, but was voluntarily added to the analyte list for the March 2016 samples. Additionally, Bio-Trap® samplers were deployed at two wells (ISTR-1 and ISTR-5) in the thermal treatment area on April 25, 2016 and retrieved on June 2, 2016. QuantArray-Chlor and QuantArray-Petro analyses were applied to assess the post-thermal treatment subsurface microbial community in comparison with the pre-treatment (baseline) microbiological survey conducted in 2014 (Arcadis 2014). Results of this evaluation are summarized in Section 3.3.

As discussed below, groundwater temperatures are also being monitored at selected well locations as a basis for assessing the migration of heated groundwater from the thermal treatment zone, and to assess the point at which temperatures have returned to baseline conditions (which will trigger the completion of the triannual “N” well sampling).

3.2 Summary of Field Activities

During each monitoring event, wells were sampled using HydraSleeves™, except for TW-08B in March and July 2016. During a previous sampling event, it was determined that a portion of the well casing was bent and that HydraSleeve™ deployment was not feasible for TW-08B. As a result, TW-08B has been sampled using standard low-flow procedures since July 2015.

Samples were submitted to Alpha for analysis of VOCs, 1,4-dioxane (March 2016 only), and MNA parameters.

Temperature Datalogging

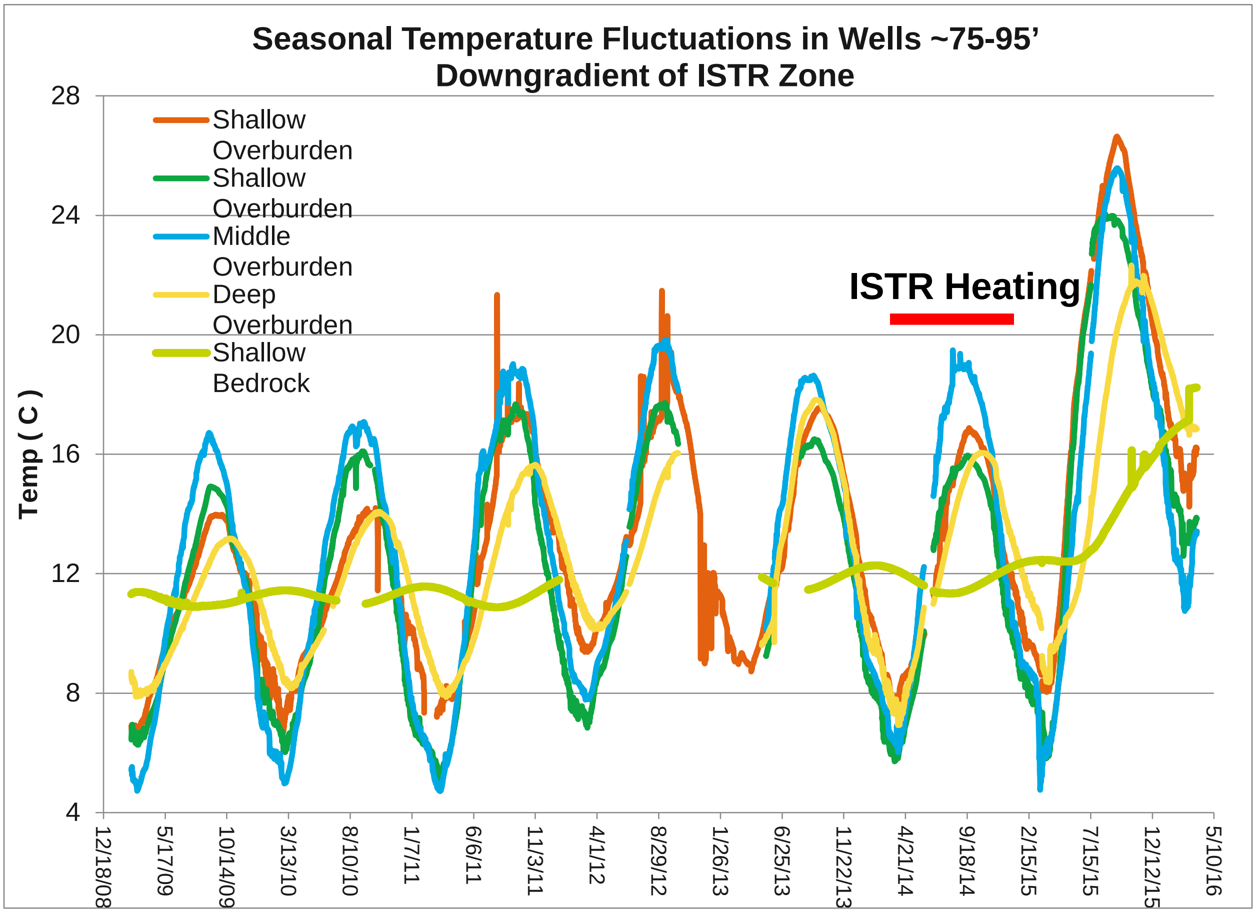
Temperature data have been recorded with dataloggers at the following five “N” wells every 12 hours since February 2009: shallow overburden wells MWL-304 and MWL-307; middle overburden well MW-415; deep overburden well MW-413; and shallow bedrock well MW-416. These wells are approximately 75 to 95 feet downgradient of the thermal treatment zone (TTZ).

Manual Temperature Measurements

Temperature data have been measured monthly since July 2015 using a downhole temperature probe at middle overburden well TW-08A, deep overburden well TW-08B, and shallow bedrock well TW-08D, which are at the downgradient edge of the TTZ (Figure 12).

3.3 Results

Pre-ISTR temperatures at the continuously monitored wells were between approximately 5ºC and 20ºC, and fluctuated seasonally by approximately 1ºC in the shallow bedrock up to 12ºC in the shallow overburden. As shown on the following chart, temperatures in each of these wells increased 5º to 6ºC in each of the wells once the thermal treatment was complete and a lag time allowed for movement of the heated water to the downgradient area.



These data indicate that groundwater temperatures have not returned to pre-ISTR conditions, thus sampling of "N" wells continues on a triennial basis. Temperature datalogging will continue at these five wells until such time that they indicate a return to baseline conditions (or until they are no longer available for monitoring because some will be affected by the planned Resource Conservation and Recovery Act [RCRA] cap construction activities). Once temperature data indicate a return to pre-ISTR levels, the SRSNE Site Group will make a demonstration to the USEPA and request a reduced sampling frequency for these wells in accordance with the approved monitoring program.

VOC concentrations for post-thermal treatment groundwater samples are provided in Table 5. Relative to the initial comprehensive sampling event in 2010, total VOC concentrations have decreased by one to three orders of magnitude in six out of the 10 “N” wells sampled. Of those six, two (MW-415 and MWL-307) have partially rebounded, but remain at least two orders of magnitude below the 2010 concentrations. MW-415 and MW-307 had lower total VOC concentrations in July 2016 compared with the previous three monitoring events (MW-415) and previous two monitoring events (MW-307). Total VOC concentrations at two other wells (MWL-304 and TW-08A) initially decreased, but have returned nearly to the measured 2010 concentrations. In both cases, however, the composition of total VOCs comprises primarily daughter products (namely vinyl chloride [VC]), indicating that robust degradation processes continue. Finally, total VOC concentrations in the other two wells (TW-08B and TW-08D) have remained stable over the monitoring period. Trend graphs depicting total VOC concentration trends in the “N” wells are included in Appendix C.

Groundwater samples were collected at the “N” wells in June 2014, approximately four weeks after the start of Phase 1 heating upgradient of these wells but before the first indications of warming associated with the TT remedy. Thus, June 2014 data are considered the baseline condition for evaluation of ISTR-related groundwater changes. Sampling events at the “N” wells in March and July 2016 provide a basis of comparison versus the baseline data from June 2014. All 10 “N” wells indicated lower total VOC concentrations in July 2016 compared to June 2014. Nine of the 10 “N” wells indicate total VOC concentration decreases of between 22% and 99%. The only exception is a 9% decrease at shallow bedrock well MW-416 where total VOC concentrations were 870 and 653 μg/L in April and June 2016, respectively. Based on the combined results from all 10 “N” wells, total VOC concentrations have declined by an average of 62% relative to baseline conditions.

Note also that changes in VOC concentrations between June 2014 and June 2016 varied for different compound groups:

- Halogenated VOCs – average concentration decrease of 68%
- Aromatic VOCs – average concentration decrease of 38%
- Ketones – general decrease; ketones were only detected at MW-415, MW-902D, TW-08B

These results indicate that source removal achieved by ISTR resulted in substantial decreases in VOC concentrations in groundwater during and following the thermal treatment period.

MNA parameter concentration results are provided in Table 6. As described in Attachment N to the RDWP (Arcadis 2010b), groundwater MNA parameters were selected to confirm dominant biotransformation processes, evaluate the potential for continued transformation of COCs, and identify zones of dominant geochemical conditions. In general, MNA parameter results indicate moderately to very strongly reducing (i.e., manganese and iron reducing, sulfate reducing, and methanogenic) conditions in the NTCRA 1 area, except for shallow bedrock well MW-416, which indicates mildly reducing conditions. This interpretation of MNA parameter results is based on dissolved iron and manganese concentrations greater than 1,000 μg/L, sulfate concentrations less than 20 mg/L, and methane concentrations greater than 100 μg/L at most locations sampled during post-thermal treatment groundwater sampling. TOC concentrations were greater than 5 mg/L at most locations indicating sufficient organic carbon to support microbial populations. At most locations, concentrations of alkalinity, chloride, iron, manganese, TOC, ethane, ethene, and methane increased between the March 2015 and July 2016 post-thermal treatment monitoring events, suggesting microbial populations also increased during this time. Results from Bio-Trap® sampling with QuantArray-Chlor and QuantArray-Petro analyses (see Section 4) indicate increased diversity in the microbial population relative to pre-treatment conditions. These results continue to suggest that anaerobic biodegradation processes dominate in the thermal treatment area, but also indicate a strong potential for aerobic cometabolism of chlorinated volatile organic compounds (CVOCs) and aerobic metabolism of petroleum hydrocarbons if conditions become more favorable for these processes in the future. These results demonstrate robust microbial activity in the NTCRA 1 area groundwater downgradient from the thermal treatment area.

1,4-dioxane concentrations for the October 2015 and March 2016 post-thermal treatment groundwater samples are summarized in Table 7. Concentrations of 1,4-dioxane varied between October 2015 (6.48 to 160 μg/L) and March 2016 (8.9 to 310 μg/L) with some locations showing a decrease and other locations showing an increase in 1,4-dioxane concentrations. However, for most locations 1,4-dioxane concentrations have a similar order of magnitude for the two events. One exception was TW-08A which had 1,4-dioxane concentrations of 27.6 and 310 mg/L for November 2015 and March 2016, respectively. These results for TW-08A are consistent with previous 1,4-dioxane results of 41 μg/L in May 2010 and <600 μg/L in June 2014.

The third and final post-thermal treatment groundwater sampling event of 2016 was conducted on November 3-4, 2016. Results from this event will be evaluated as part of the 2017 MNA Report.

4 ADDITIONAL SAMPLING

4.1 Summary of Field Activities

In addition to the SOW-required sampling described above in Sections 2 and 3, Bio-Trap® samplers were deployed in the following 14 monitoring wells between April 22 and 25, 2016, for analysis of 1,4-dioxane biodegradation potential:

CPZ-6
CPZ-6A
MW-03
MW-502
MW-704D
MW-704DR
MW-707R
MW-907DR
MW-907M
MW-908D
P-101A
P-6
PZO-2D
PZO-204M

A duplicate Bio-Trap® sampler was deployed at monitoring well MW-704DR. Each of the Bio-Trap® samplers were retrieved on June 2, 2016, resulting in an incubation period of between 38 and 41 days (relative to the laboratory's recommended minimum incubation period of 30 days). Bio-Trap® samplers were submitted to Microbial Insights for analysis of the following DNA CENSUS gene targets:

- Dioxane monooxygenase (DXMO), and aldehyde dehydrogenase (ALDH) – to evaluate the presence and abundance of bacteria capable of metabolic biodegradation of 1,4-dioxane (and THF).
- Soluble methane monooxygenase (SMMO), propane monooxygenase (PPO), ring hydroxylating toluene monooxygenase (RMO), ring hydroxylating toluene monooxygenase 2 (RDEG), and phenol hydroxylase (PHE) – to evaluate the presence and abundance of bacteria capable of cometabolic biodegradation of 1,4-dioxane (and potentially THF).

Additionally, groundwater samples were analyzed for concentrations of 1,4-dioxane, THF, and MNA parameters at monitoring wells not already part of the annual sampling event.

4.2 Results

For the 14 wells included in the additional sampling scope, detected 1,4-dioxane concentrations ranged from 4.3 J to 2,400 J μg/L and detected THF concentrations ranged from 2.12 J to 5,290 J μg/L (Tables 1 and 4). Bio-Trap® sampling results are discussed in detail in Appendix D. In summary, these results indicate potential for metabolic 1,4-dioxane and THF biodegradation at a subset of monitoring wells sampled (CPZ-6A, MW-907M, and MW-502) and potential for cometabolic biodegradation at each monitoring well sampled. This potential is based on the detection of the functional genes needed to mediate these processes. However, the enzymes encoded by these genes are all dependent on DO. It is likely that, under the reducing to strongly reducing site geochemical conditions, DO needed for these biodegradation processes is limited. Although low-levels of DO likely limit 1,4-dioxane biodegradation by known pathways, even a small amount of DO may stimulate activity. Additional lines of evidence are needed to firmly establish if 1,4-dioxane biodegradation is occurring. These lines of evidence may include monitoring of 1,4-dioxane concentration trends over time, and a messenger ribonucleic acid (mRNA) survey to establish if the genes of interest are being expressed. As presented in the *Groundwater Conceptual Site Model Update* report (Arcadis 2015), trend analysis results demonstrate concentrations of 1,4-dioxane and THF in Site groundwater are generally stable to decreasing with time.

5 NA BACKGROUND

An MNA remedy requires a strong scientific basis supported by appropriate monitoring. When properly employed, MNA is an effective remedy – based on thorough analysis of site-specific data – to understand, monitor, predict, and document COC transport and NA processes.

5.1 Site Conceptual Model

For any MNA remedy to succeed, it is important to understand the Site Conceptual Model (SCM). The SCM combines available site information into a comprehensive picture of the nature and extent of the COCs and the processes controlling their transport and fate in the environment. The level of site characterization necessary to support a comprehensive evaluation of MNA can be more detailed than that needed to support active remediation.

The SCM, including information regarding the Site operational history, regulatory status, geology, hydrogeology, and surface water hydrology, and the distribution and mass of COCs in Site groundwater, including delineation of NAPL zones and dissolved-phase groundwater plume, and VOC mass estimates, was originally provided in Section 2 of the RDWP (Arcadis 2009) to fulfill the requirements set forth in the SOW, Section V.C.1.l.

A Draft SCM Update was prepared in April 2015 (Arcadis 2015) to reflect additional data collected and changes in Site conditions since completion of the RI (BBL 1998) and Feasibility Study (FS; BBL and USEPA 2005).

The MNA conceptual model for the Site may be described in terms of source condition, dissolved plume stability, and NA processes, and is summarized as follows:

Source Condition: The source of groundwater-quality impacts was extensively characterized during the RI (BBL 1998) and FS (BBL and USEPA 2005), and consists of zones containing NAPL in overburden soils and bedrock. The NAPL is a complex mixture of chlorinated and other solvents. The NAPL zones in overburden soils and bedrock contain mixtures of dissolved NAPL-related chlorinated ethenes, ethanes, and methanes, as well as aromatic hydrocarbons, ketones, phthalates, ethers, furan, and alcohols. These NAPL zones are currently hydraulically contained by the NTCRA 1 sheet-pile wall and overburden groundwater extraction wells and the NTCRA 2 overburden and bedrock extraction wells. Upon entry of the CD, the NTCRA 1 and NTCRA 2 systems became known as the HCTS. The NAPL zones have formed a dissolved-phase chemical plume that has been severed by the HCTS. The Overburden NAPL zone historically contained most of the Site VOC mass, but *in situ* thermal remediation was performed in this zone between May 2014 and March 2015, removing an estimated 210,000 kilograms (kg) of NAPL mass. This greatly diminished the source zone upgradient of the NTCRA 1 sheet-pile wall.

Dissolved Plume Stability: The dissolved-phase chemical plumes in overburden and bedrock groundwater within the source area are stable and are likely shrinking in time due to the combination of hydraulic containment and active *in situ* biodegradation processes in groundwater within the capture zone of the HCTS. *In situ* biodegradation processes within the capture zone of the HCTS were characterized as “robust” in the FS (BBL and USEPA 2005). The dissolved-phase chemical plume in overburden and bedrock groundwater in the severed portion of the plume, beyond the capture zone of the HCTS, are generally shrinking with time due to the combination of hydraulic containment of the higher concentration portions of the dissolved-phase chemical plume and NA processes. Total dissolved-phase VOC concentration trends in groundwater within the HCTS capture zone boundary and the severed plume indicate statistically significantly decreasing concentration trends. None of the wells representative of the severed plume (i.e., wells with historical COC concentrations above Action Levels downgradient of the HCTS capture zone) indicated COC concentrations above drinking-water-based standards during the 2014 through 2016 groundwater monitoring events.

<u>NA Processes</u>: Natural attenuation processes that have contributed to plume stabilization and shrinkage within the overburden and bedrock include *in situ* abiotic and biodegradation reactions, sorption to aquifer solids, flow path mixing, and matrix diffusion. Reductive dechlorination is a prominent removal mechanism that continues to operate at the Site, as demonstrated by the production of cis-1,2-dichloroethene (cDCE); VC; 1,1-dichloroethane (1,1-DCA); ethene, ethane, and chloride, which are dechlorination (i.e., “breakdown”) products of tetrachloroethene (PCE); TCE; and 1,1,1-trichloroethane (TCA). There is also potential for anaerobic oxidation reactions that remove cDCE, VC, and ethene by oxidation to carbon dioxide (CO_2). In addition, microbial population survey results indicate robust communities capable of both full reductive dechlorination to innocuous end products, and also aerobic cometabolism of chlorinated compounds, at 11 of 12 monitoring locations evaluated using QuantArray-Chlor methodology (Arcadis 2015). In addition, microorganisms capable of degrading aromatic compounds were detected at two locations where the QuantArray-Petro analysis was conducted (Arcadis 2015).

A detailed description of the SCM is provided in the *Groundwater Conceptual Site Model Update* (Arcadis 2015).

5.2 Selection of MNA Remedy

Due to the demonstrated efficacy of NA for treating COCs in Site groundwater, MNA was included as a component of several remedial alternatives evaluated in the FS (BBL and USEPA 2005). Based on evaluations presented in the FS, the USEPA selected MNA as a component of the remedial approach for the Site.

The ROD for the Site was issued by the USEPA in September 2005 (USEPA 2005). The selected remedy consists of MNA of the groundwater plume, including:

- Groundwater outside the capture zone of the HCTS until groundwater cleanup levels are achieved;

- Groundwater within the capture zone of the HCTS until groundwater cleanup levels are achieved; and
- Groundwater in the NAPL area of the overburden and bedrock aquifers, until groundwater cleanup levels are achieved.

5.3 Identified Data Gaps

The SOW identified two data gaps associated with implementing the MNA remedy component at the Site. The identified data gaps and the strategies used for addressing them are as follows:

- *Incomplete plume delineation in the severed plume*. This data gap has been addressed by the installation and sampling of additional groundwater monitoring wells near the eastern edge of the severed plume, east of the Quinnipiac River and in the CL&P easement as presented in the *Monitoring Well Network Evaluation and Groundwater Monitoring Program* (Attachment N to the RDWP) and subsequent discussions with USEPA. In addition to the new plume delineation wells installed prior to the start of the May–June 2010 comprehensive groundwater sampling (including MW-903S, MW-903M, MW-903D, MW-903R, PZ-903DR, MW-904S, MW-904D, MW-906M, MW-906D, MW-906R, PZ-906DR, and MW-910S), three other well clusters (MW-1001M/MW-1001R, MW-1002DR/MW-1002R and MW-1003DR/MW-1003R) have been installed to address this data gap. Delineation of the downgradient extent of the plume is shown on Figures 7 through 11.
- *Long-term monitoring data demonstrating the effectiveness of MNA as a remedy component*. This data gap is being addressed through the preparation, submittal, approval, and implementation of the MNA Plan.

5.4 Objectives of MNA Performance Monitoring

The MNA Plan, in conjunction with the *Monitoring Well Network Evaluation and Groundwater Monitoring Program* (Attachment N to the RDWP), describes the monitoring and analysis steps required to meet the following objectives of MNA performance monitoring, as specified in Section VII.A.1 of the SOW:

- Complete the delineation of COCs in groundwater in three dimensions;
- Assess the temporal and spatial variations in groundwater chemistry and geochemistry;
- Assess the progress in meeting the long-term remedial goal of groundwater restoration throughout the Site to its natural quality; and
- Evaluate the effectiveness of institutional controls.

Based on the results of MNA performance monitoring, decisions related to the MNA program, described in detail in the MNA Plan, may include:

- Continuation of the performance monitoring program without change.
- Continuation of the performance monitoring program with action.
- Modification of the institutional controls.

5.5 Performance Standards

The remedial action is being implemented in compliance with applicable or relevant and appropriate requirements (ARARs) identified in the ROD (USEPA 2005). These requirements include compliance with performance standards for the affected groundwater, soil and wetland soil, and for NAPL. The following subsections discuss performance standards applicable to MNA and the means for demonstrating compliance with these standards.

5.5.1 MNA-Related Performance Standards

Performance standards pertaining to MNA at the Site, as set forth in the SOW, are described in detail in the MNA Plan for Groundwater, NAPL outside of the Overburden NAPL Area, and the Severed Plume.

5.5.2 Demonstration of Compliance Report

As specified in Section VIII.G of the SOW, a Demonstration of Compliance Report will be prepared in accordance with the evaluation procedures defined in 40 CFR Section 264.97 when groundwater COC concentrations have remained below the ICLs for three consecutive years as outlined in 40 CFR Section 264.96(c). If the USEPA, after reasonable opportunity for review and comment by the Connecticut Department of Energy and Environmental Protection (CT DEEP), approves the Demonstration of Compliance Report and agrees that the ICLs have been achieved, a risk assessment of residual groundwater conditions will be performed.

6 MNA PERFORMANCE MONITORING

6.1 Introduction

The MNA Plan specified the performance monitoring program for Site groundwater as it relates to the MNA component of the remedy, while Section IV.B.5 of the SOW set forth requirements for an environmental monitoring program to be implemented to evaluate the performance of the HCTS and the overall effectiveness of the Site remedy, including the MNA component. These groundwater MNA monitoring requirements were summarized in the MNA Plan.

The following subsections describe the MNA program monitoring locations, monitoring frequency, monitoring parameters, and data quality objectives (DQOs) designed to meet the environmental monitoring program requirements set forth in Section IV.B.5 of the SOW. Groundwater monitoring is conducted to monitor changes in groundwater COC concentrations, changes in plume size and shape, and the effectiveness of NA processes in reducing concentrations of COCs in groundwater. Groundwater samples from June 2016 were collected in accordance with the monitoring frequency outlined in the MNA Plan and represent the most recent dataset utilized for this MNA evaluation.

6.2 Groundwater Performance Monitoring Locations

Groundwater performance monitoring locations were chosen to provide robust, three-dimensional coverage of COCs in overburden and bedrock groundwater at the Site, with monitoring well cluster locations providing vertical assessment of COC concentrations and groundwater geochemistry. Monitoring locations were identified in the *Monitoring Well Network Evaluation and Groundwater Monitoring Program* (Attachment N to the RDWP) and are shown on Figures 2 through 6 of this MNA Report.

In accordance with the SOW, selected MNA monitoring locations include upgradient (background) sampling locations, in-plume sampling locations (HCTS capture zones and severed plume), side-gradient sampling locations outside of plume areas, and downgradient locations. Monitoring locations are designated by well groups (e.g., “N”) to define the purpose of each sampling location. Well group designations that are relevant to MNA monitoring are summarized in the MNA Plan and shown on Figures 2 through 6.

6.3 MNA Monitoring Parameters

The primary classes of data included in the MNA monitoring program are: Site-specific groundwater COCs; groundwater MNA parameters; groundwater hydraulic information; and HCTS COC mass removal estimates. Each of these primary data classes is described below.

Site-specific COCs were identified during Site investigations and risk assessment and are required to be addressed by the response actions set forth in the ROD (USEPA 2005). Site-specific COCs for groundwater include selected VOCs, 1,4-dioxane, TAL metals, SVOCs, and PCBs.

Groundwater MNA parameters were selected to confirm dominant biotransformation processes, evaluate the potential for continued transformation of COCs, and identify zones of dominant geochemical conditions. These parameters include: iron (ferric and ferrous), divalent manganese, light hydrocarbons (methane, ethane, ethane), alkalinity, chloride, nitrate–nitrogen, nitrite–nitrogen, pH, sulfate and TOC. In addition to laboratory-analyzed MNA parameters, the following MNA parameters are collected as field measurements: pH, DO, ORP, and temperature.

The hydraulic parameter of interest is groundwater elevation. Groundwater elevations are characterized in all five groundwater depth zones, and provide a basis to assess the horizontal and vertical components of hydraulic gradients that control three-dimensional migration of COCs. Synoptic groundwater elevation measurements are only collected in conjunction with five-year comprehensive monitoring events, and therefore were not collected during the June 2015 groundwater monitoring event.

Estimates of groundwater COC mass removal from the HCTS, obtained as part of the compliance monitoring program for the HCTS operations, are used to evaluate potential trends in COC mass removal from the HCTS and can be used to evaluate future efficacy of groundwater remedies, including MNA.

6.4 Monitoring Frequency

Monitoring frequencies were designed to meet requirements of the environmental monitoring program set forth in Section IV.B.5 of the SOW and are summarized in the MNA Plan. Detailed monitoring frequency information is provided in the *Monitoring Well Network Evaluation and Groundwater Monitoring Program* (Attachment N to the RDWP). Any proposed changes to the long-term monitoring program will be submitted as part of the Annual State of Compliance Report(s).

6.5 MNA Monitoring Objectives

The MNA performance monitoring program set forth in the MNA Plan was designed to evaluate the MNA monitoring objectives listed below (USEPA 1999; USEPA 2004) and described in detail in the MNA Plan.

- Provide timely warning of potential impact to receptors.
- Detect changes in plume size/concentration.
- Determine temporal variability of data.
- Detect changes in geochemistry that warn of potential changes in COC attenuation.

- Yield data necessary to reliably evaluate progress toward COC reduction objectives.

6.6 Data Quality Objectives

The DQO process is a systematic planning tool based on the scientific method that is used to establish criteria for data quality and to develop data collection designs (USEPA 1994). The DQOs for the data described in this MNA Report are provided in the *Quality Assurance Project Plan* (QAPP; [Rev. 2] Arcadis 2012b; Attachment C to the RD Project Operations Plan [POP]).

7 MNA EVALUATION

This section evaluates the effectiveness of the MNA program based on the data collected through June 2016. Data analysis, interpretation and reporting methods were completed in accordance with the following regulatory guidance documents:

- *Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water* (USEPA 1998)
- *Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites* (USEPA 1999)
- *Performance Monitoring of MNA Remedies for VOCs in Ground Water* (USEPA 2004)

In general, data interpretation included:

- Placing the MNA performance monitoring data in the context of time, location, sampling and analytical methods.
- Applying appropriate statistical tests to detect changes and trends in COC concentrations, and attainment of remedial objectives.

These data interpretation methods and results are presented in the following sections.

7.1 Total VOC Concentration Trends

Data collected during previous sampling events (RI and Interim Monitoring Sampling [IMS] events) and presented in the MNA Plan and the 2010-2015 MNA reports indicate an overall decline in groundwater COC concentrations with time, supporting the selection of MNA as a remedial measure for COCs in groundwater at the Site. This section builds upon results of the previous MNA evaluations discussed in detail in the MNA Plan and the preceding MNA reports (2010 through 2015). Included in this section are a discussion of concentration trends for total VOCs in groundwater at select monitoring locations, estimates of bulk attenuation rates for total VOCs in groundwater at locations with decreasing concentration trends, and presentation of COC mass extraction rates and cumulative mass removal for the HCTS.

7.1.1 Trend Analysis

The final IMS Report (BBL 2005) compared groundwater VOC concentrations reported in the RI with concentrations measured at 25 IMS locations during the April 2005 (final) IMS event. Trend analyses were updated using total VOC concentration data collected at 21 IMS monitoring locations (within the NTCRA 2 portion of the HCTS, the severed plume, and the interior of the VOC plume) during the RI, IMS program, and groundwater sampling events between 2010 and 2015. These trend analyses have been updated with total VOC concentrations from the June 2016 annual groundwater monitoring event. The trend results are summarized in Table 6.

Because only 13 of the monitoring locations with long-term time-concentration data sets were sampled during the June 2016 sampling event, only those trend analyses were updated. However, the previous trend results for wells that were not sampled in June 2016 are also included in Table 6. Results of the 2016 trend analyses are similar to the results of the trend analyses conducted in 2010 through 2015, which indicated that most of the IMS monitoring locations had statistically significant decreasing total VOC concentration trends.

Groundwater total VOC concentrations plotted versus time were updated for the 13 IMS monitoring locations that were sampled during the June 2015 biennial groundwater sampling event (Figures 13 through 17). As shown on the figures, total VOC concentrations are generally declining or stable at all groundwater depth intervals, consistent with previous results.

Non-parametric Mann-Kendall and Sen's slope trend analyses and parametric linear regression trend analyses were conducted to evaluate trend direction and statistical significance of the groundwater total VOC concentration trends at the Site. The Mann-Kendall test provides a yes/no determination for the existence of a slope that is significantly different from zero, while the Sen's slope test provides an estimate of the value for the slope. The linear regression test estimates slope and confidence level and quantifies how well the data correlate to the estimated trend line. Trend analyses were conducted with natural log (ln) normalized total VOC concentrations using all three test methods for all sampling locations.

A 90% confidence level with a corresponding p-value less than or equal to 0.10 was used to determine statistical significance for the trend analyses. Mann-Kendall and linear regression trend results with p-values greater than 0.10 were not considered to be statistically significant. The trend direction was defined as decreasing if total VOC concentrations decreased with time (negative slope), and increasing if total VOC concentrations increased with time (positive slope); however, the trend was not considered significant unless the relationship for the test was significant at a confidence level of 90%. For the linear regression analysis, the correlation coefficient, or R^2, is a measure of how well the linear regression fits the data. Values close to 1 are considered a good fit, while R^2 values close to 0 are considered to be a poor fit.

Results of the trend analyses indicate significant decreasing total VOC concentration trends at 19 of the 21 monitoring locations (11 of the 13 wells sampled in June 2016) based on the Mann-Kendall and/or the linear regression test. The Sen's slope test indicates 17 (12 from June 2016) significant decreasing total VOC concentration trends of the 21 monitoring locations analyzed. Statistically significant decreasing total VOC concentration trends at monitoring well MW-707DR were found over the abbreviated evaluation period (from April 2004 through June 2016) by all three evaluation methods. Therefore, this well has been included in the tally of decreasing trends, although total VOC concentrations continue to show a statistically significant increase (linear regression and Mann-Kendall) when the full period (between December 1996 and June 2016) is considered.

Monitoring wells sampled in June 2016 that indicate statistically significant decreasing total VOC concentration trends with linear regression and/or Mann-Kendall analysis include P-13, P-101C, MW-03, MW-205B, P-101B, MW-502, MW-704D, MW-127C, MW-704DR, MW-706DR, and at MW-707DR over the abbreviated evaluation period (Table 6). Although total VOC concentration trends at P-13 and MW-502 are statistically significantly decreasing over the full evaluation period, it should be noted that concentrations at these wells have recently shown an increase and subsequent decrease in total VOC concentrations. Specifically, at P-13, total VOC concentrations increased between May 2010 and June 2013, and decreased between June 2013 and June 2016. At MW-502, total VOC concentrations increased between May 2010 and June 2014, and decreased during the June 2015 and June 2016 sampling events. Concentrations of total VOCs at both monitoring wells are well below historical maxima for each location.

Monitoring well P-11A had a statistically significant increasing total VOC concentration based on linear regression analysis, primarily due to an elevated total VOC concentration of 26,400 μg/L detected during the June 2012 monitoring event. No trend was identified by Mann-Kendall and Sen’s slope analyses. Total VOC concentrations at P-11A have decreased by approximately 80% since June 2012.

MW-707DR, indicates a significant increasing total VOC concentration trend based on the Mann-Kendall, Sen’s slope, and linear regression trend tests using data between December 1996 and June 2016. The maximum total VOC concentration measured at MW-707DR was 18 μg/L (April 2000) and 29% of the historical samples have been below detection for all VOC constituents, indicating generally low concentrations of VOCs in groundwater at this location. The total VOC concentration measured at MW-707DR in June 2016 was 2.0 μg/L. Linear regression, Mann-Kendall, and Sen’s slope trend tests were also performed over an abbreviated period using total VOC concentrations from April 2004 to June 2016, to exclude the previous monitoring events in which VOC concentrations were below detection limits. Since April 2004, total VOC concentrations indicate a statistically significant decreasing concentration trend, indicating that groundwater quality is improving at this monitoring location.

7.1.2 Total VOC Attenuation Rate

Results from the linear regression and Sen’s slope analyses were used to estimate attenuation rates for total VOCs in groundwater at the Site. Attenuation rates were calculated in accordance with the USEPA guidance document on determining first-order attenuation rate constants for MNA studies (USEPA 2002). Following this guidance, the natural log of COC groundwater concentration versus time was used and a best-fit linear regression line was generated for total VOC concentrations for each monitoring location that had a statistically significant decreasing total VOC concentration trend. Slopes derived from the Sen’s slope test were also used to estimate attenuation rates. The slope of the linear regression line and the slope from the Sen’s slope test provide estimates of the total VOC attenuation rate constant (k_{point}) in groundwater at the respective monitoring locations.

$$k_{point} = [\text{slope of best-fit regression line}]$$

The half-life ($t_{1/2}$) for total VOC concentrations in groundwater was estimated for each sampling location from the equation:

$$t_{1/2} = 0.693 / k_{point}$$

> where: 0.693 is the negative of the natural log of 0.5 (half of the starting total VOC concentration).

Estimated half-life values for total VOCs in groundwater range from 605 to 5,336 days (1.7 to 14.6 years) based on linear regression results and from 592 to 6,477 days (1.6 to 17.7 years) based on Sen's slope results. These estimated half-life values for total VOC concentrations compare well with literature values of attenuation rates presented for individual compounds in Appendix H of the FS (BBL and USEPA 2005) and indicate that COC concentrations in groundwater are attenuating.

7.2 Estimate of COC Mass Flux in Groundwater

As part of the compliance monitoring program, COC mass extraction rates and cumulative mass removal are monitored for the HCTS. With the exception of the severed plume and incidental discharge to surface water, the HCTS captures the entire dissolved phase groundwater COC plume at the Site. Therefore, the HCTS COC mass removal rates and cumulative mass removal data represent the total mass flux for the dissolved phase COC groundwater plume and can be used to monitor changes in groundwater total dissolved-phase COC mass flux with time.

Total VOC mass removal rates and cumulative mass removal for the HCTS were plotted for the July 1995 to June 2015 time period (Figure 18). Mass removal rates are expressed in units of pounds per day (lbs/day) and the cumulative mass removal is expressed in units of pounds. Mass removal rates have ranged between about 0.1 to 10 pounds per day and are generally declining since 1995. The overall decline in mass removal rate indicates a general decline in dissolved VOC concentrations in the water pumped by the former NTCRA 1 extraction wells. The total mass of VOCs removed by the HCTS between system startup in 1995 and June 2015 is approximately 18,000 pounds. The mass of COCs removed via the HCTS is small compared with the estimated mass removal that is occurring via *in situ* degradation. As described in detail in the FS (BBL and USEPA 2005) and summarized in the MNA Plan (Arcadis November 2010), the quantity of TCE and degradation products being biodegraded *in situ* was calculated to be approximately 17,000 to 41,000 pounds per year within the NTCRA 1 area alone.

The mass extraction data will continue to be collected as part of the HCTS compliance monitoring program and will be periodically evaluated as part of the MNA performance monitoring program.

7.3 Distribution of VOCs in NAPL and Groundwater

An assessment of the distribution of select VOCs in NAPL and groundwater samples was conducted as part of the 2010 comprehensive MNA report to gain insight into how VOC distributions in NAPL and Site groundwater varied by location and with time. VOCs evaluated in the assessment included:

- Chlorinated ethenes (PCE, TCE, cDCE, 1,1-dichloroethene [1,1-DCE], and VC).
- Chlorinated ethanes (TCA, 1,1-DCA, and chloroethane [CA]).
- Ketones (2-butanone [MEK], 4-methyl-2-pentanone [MIBK], and acetone).
- Toluene, ethylbenzene, and xylenes (TEX).
- Methylene chloride, styrene, THF, and 1,4-dioxane.

Data used for assessment of distribution of VOCs in NAPL and groundwater were presented in the 2010 comprehensive MNA report. The assessment concluded that NAPL samples were composed primarily of PCE, TCE, TCA, TEX, methylene chloride, and styrene, with lesser contributions from cDCE, 1,1-DCE, and 1,1-DCA. Ketones generally were not detected in NAPL samples. 1,4-dioxane was not analyzed for these samples. Overall, the results indicated that the detected groundwater constituents are generally consistent with NAPL constituents, except for ketones. The general absence of detectable ketones in the NAPL samples likely relates to the elevated detection levels associated with the NAPL samples.

Molar VOC concentration plots were also presented in the 2010 comprehensive MNA report were updated following the June 2014 comprehensive sampling event, and were included in the 2014 MNA Report. In general, constituent concentrations in groundwater were greatest in the NTCRA 1 area with consistently decreasing primary constituent (e.g., TCE, TCA, ketones, and TEX) concentrations observed in directions downgradient from the NTCRA 1 area. These results clearly demonstrate degradation of parent compounds in groundwater.

Groundwater molar VOC concentration plots for select groundwater monitoring locations with samples collected during multiple sampling events illustrate that some locations have clear declining concentration trends for most or all constituents. Shifts in the relative distribution of chlorinated VOCs (CVOCs) towards greater proportions of daughter products to parent demonstrate ongoing degradation of CVOCs in Site groundwater.

In summary, molar concentration plots of select CVOCs provide a means for readily comparing the distribution of COC concentrations in Site groundwater with distance from the source area, as well as with depth and with time at discrete locations.

7.4 Evaluation of Monitoring Objectives

7.4.1 Evaluation of Changes in Environmental Conditions that May Reduce Efficiency of MNA

MNA data will be used to evaluate potential changes in environmental conditions that may reduce the efficiency of MNA. Currently, the only anticipated environmental changes that may reduce the efficiency of MNA are within the capture zone of the Site NTCRA 1 groundwater containment system due to the addition of heat and removal of electron donors during *in situ* thermal treatment of the Overburden NAPL Area. The thermal treatment remedy was conducted between May 2014 and March 2015. As described in Section 3, two post-thermal treatment groundwater monitoring events were conducted in March and July 2015 for select monitoring wells in the NTCRA 1 area. Initial results from these two monitoring events indicate generally decreasing COC concentrations and moderately to strongly reducing conditions in groundwater in the NTCRA 1 area. The 2016 MNA Report and future MNA Reports will assess potential effects on MNA efficiency due to thermal treatment in the Overburden NAPL Area. Specifically, VOC and MNA parameter concentration data for the post-thermal treatment time period will be compared to results from the pre-thermal treatment time period to see what changes in VOC and MNA parameter concentrations may be attributable to the thermal remedy.

Changes in the composition and availability of electron donors with time may affect the efficiency of NA. As electron donors, such as ketones, aromatic compounds, and alcohols are consumed, the efficiency of NA may decline. As noted in the 2010 comprehensive MNA report, alcohols are currently only minimally detected in Site groundwater. As concentrations of these readily available electron donors decline, other electron donor sources may be available to support continued NA of COCs in Site groundwater. Other potential electron donor sources include natural organic matter in the aquifer matrix, natural organic matter in groundwater, as well as recycling of microbial biomass. The efficiency of NA for remediation of COCs in Site groundwater will continue to be monitored via the MNA remedial program using techniques set forth in the MNA Plan and in this MNA Report including, but not limited to:

- Defining changes in the VOC regulatory plume boundaries, including exceedance of MCLs and GWPC as well as exceedance of ICLs.
- Evaluation of COC concentration trends with time.
- Assessment of changes in the distribution of COCs, especially ketones, alcohols, and aromatic compounds.
- Continued monitoring of groundwater redox conditions.

If changes in the efficiency of NA result in a loss of effectiveness of MNA as a remedy for COCs in Site groundwater, contingencies will be considered, as described in the MNA Plan.

7.4.2 Evaluation of Potentially Toxic and/or Mobile Transformation Products

Potentially toxic transformation products include regulated chemical intermediates, such as cDCE, 1,1-DCE, 1,1-DCA, CA, and VC, and regulated transition metals (e.g., manganese and arsenic). Locations with concentrations of cDCE, 1,1-DCE, 1,1-DCA, CA, VC that exceed MCLs or GWPC are within the overburden and bedrock groundwater capture zone boundary. With the exception of total manganese in upgradient/background monitoring well MW-126B (1,446 μg/L), and several total metals in upgradient/background monitoring well MW-209B, metals detected in groundwater samples collected in June 2016 did not exceed Action Levels (Table 2).

7.4.3 Evaluation of Plume Stability

In terms of plume stability, a dissolved-phase chemical plume in groundwater may be characterized as a:

- Shrinking plume, in which the plume volume decreases through time.
- Stable plume, in which the plume volume does not change through time.
- Growing plume, in which the plume volume increases through time.

In general, shrinking plumes are indicated by decreasing chemical concentrations through time, growing plumes may be indicated by increasing or stable chemical concentrations through time, and stable plumes are indicated by plume volume estimates that do not change significantly through time. Currently available long-term monitoring data demonstrate that the plume of COCs in Site groundwater is generally shrinking or stable.

7.4.4 Evaluation of No Unacceptable Impacts to Downgradient Receptors

Groundwater and surface water monitoring data collected during the RI and the IMS program indicate that there are no potential impacts to downgradient receptors. The water supply wells within the Town Well Field Property are dormant and are beyond the zone of COC concentrations in groundwater that are above drinking water standards. Therefore, there are no receptors within the vicinity of the groundwater plume with COC concentrations above drinking water standards. Monitoring of surface water in the Quinnipiac River demonstrated that surface water is not impacted by the Site COC-impacted groundwater plume. Monitoring of groundwater within the Town Well Field will continue as part of the MNA program.

7.4.5 Evaluation of New Releases of COCs

Evaluation of new releases of COCs is not needed because potential sources of new releases have been removed from the Site, the former source area is located within the capture zone of the HCTS, and the Overburden NAPL Area (also within the capture zone) has been remediated via *in situ* thermal remediation.

7.4.6 Evaluation of Institutional Controls

The draft *Institutional Control Plan* (IC Plan), which is a remedial design submittal required by Section V.B.7 of the SOW, was initially submitted to the USEPA in February 2011. Based on comments received and further coordination with the regulatory agencies, a revised draft IC Plan was provided to the USEPA in May 2013. It describes the proposed scope and monitoring program associated with institutional controls to be implemented at the Site. Once the IC Plan is approved and institutional controls are established, any observed or pending changes in land or resource uses or ownership (e.g., property ownership change, housing developments, and well installations) will be evaluated in view of their current and possible future impact on the effectiveness of the institutional controls and the performance monitoring operations.

7.4.7 COC Mass Flux / Mass Reduction

COC mass flux and mass reduction can be conservatively evaluated by monitoring groundwater COC mass recovery from the HCTS. Because extraction of groundwater COCs by the HCTS does not account for the mass of COCs degraded *in situ*, this method of estimating mass reduction provides a minimum estimate of mass reduction. With the exception of the severed plume and de minimis discharges to surface water immediately adjacent to the river, the Site-related groundwater plume is essentially contained within the HCTS capture zone. As a result, the groundwater extracted via the HCTS represents the majority of the mass flux of COCs within the plume. Groundwater extraction rate and COC concentration information collected periodically during system operation, maintenance and monitoring (OMM) activities as part of the compliance monitoring program for the HCTS will be used to evaluate changes in COC mass flux with time. As shown on Figure 18, COC mass extraction rates declined from 1995 to the early 2000s, and were relatively stable between the early 2000s and 2013. Concentrations dropped somewhat in 2014 due to system modifications associated with ISTR preparation and implementation (including shutdown of multiple NTCRA 1 area extraction wells). Concentrations dropped further in 2015 and 2016 due to reduced source contribution in the NTCRA 1 area due to ISTR implementation.

7.5 Contingency Measures

An evaluation of contingency measures will be performed if progress in meeting long-term groundwater restoration goals is inadequate, as determined by the USEPA. While the specific measures to be undertaken may depend on several factors (e.g., the nature, location, apparent source, or timeframe at which the inadequacy is identified), examples of possible contingency measures are provided in the MNA Plan. Any contingency measure considered will first be approved by USEPA, in consultation with CT DEEP, prior to implementation.

8 SUMMARY

The 2016 annual groundwater monitoring event was conducted in June 2016, and included the sampling of 37 monitoring wells for VOCs or TAL metals. Results from the annual event indicate that:

- VOCs above Action Levels (the more stringent of the USEPA MCLs or Connecticut Class GA GWPC, i.e., drinking water standards) are contained within the estimated capture zone boundary of the HCTS. None of the wells within the severed plume (i.e., wells with historical COC concentrations above Action Levels downgradient of the HCTS capture zone boundary) had COC concentrations above Action Levels during the 2014 through 2016 groundwater monitoring events.
- PCE and TCE were detected at middle overburden monitoring well PZO-2M at concentrations of 6.3 μg/L and 3.43 μg/L, respectively, in the June 2016 sample. The PCE concentration is above the Action Level of 5.0 μg/L, while the TCE concentration is below the Action Level of 5.0 μg/L (previously above the Action Level in 2013 and 2014). PCE was first detected above the Action Level at this well in June 2013, while TCE was first detected above the Action Level in June 2012.
- PCE and TCE were detected at deep bedrock monitoring well MW-1003DR at concentrations of 3.2 μg/L and 39.2 μg/L, respectively, in the June 2016 sample. The PCE concentration dropped below the Action Level of 5.0 μg/L starting in June 2014, while the TCE concentration is above the Action Level of 5.0 μg/L (and was previously above the Action Level in 2013, 2014, and 2015). PCE and TCE were first detected above the Action Level at this well in June 2013. Concentrations of both compounds have continued to decline relative to the 2013 results.
- TCE was detected at monitoring well MW-1002R at a concentration (0.662 μg/L) below the Action Level of 5 μg/L. The only detection of TCE above the Action Level at this well occurred in June 2015.
- As noted in the 2012 MNA Report, total VOC concentrations at shallow bedrock monitoring well P-11A increased notably between 2011 (583 μg/L) and 2012 (approximately 26,400 μg/L). This well is located within the bedrock NAPL zone initially delineated during the Remedial Investigation (RI; BBL June 1998), and more recently refined (based on additional data from the RD/RA activities) in the *Groundwater Conceptual Site Model Update* (Arcadis 2015). This well is also located within the HCTS capture zone. The total VOC concentration in June 2016 was approximately 80% lower (4,527 μg/L) than in June 2012, though concentrations remain elevated above most pre-June 2012 concentrations. VOC concentrations at this well will continue to be monitored as part of future sampling events.

- PCE, TCE, and 1,1-dichloroethene (1,1-DCE) were detected at monitoring well DN-3 at concentrations (13.0, 13.9, and 17.5 μg/L, respectively) above Action Levels (5, 5, and 7 μg/L, respectively). These are the first detections of VOCs above Action Levels at monitoring well DN-3 since MNA monitoring began in 2010.

This report also summarizes the two post-thermal treatment monitoring events performed in March and July 2016, in accordance with SOW Sections IV.B.5.d and e. Results indicate that total VOC concentrations have decreased by one to three orders of magnitude in eight of the ten “N” wells (relative to the initial comprehensive sampling event conducted in 2010). Some rebound of total VOC concentrations has been observed for MWL-304 and TW-08A, although July 2016 total VOC concentrations are lower than previous sampling events. Total VOC concentrations at two other wells (TW-08B and TW-08D) have remained stable over this period.

Results from Bio-Trap® sampling with QuantArray-Chlor and QuantArray-Petro analyses at two NTCRA 1 locations indicate increased diversity in the microbial population relative to pre-treatment conditions. These results continue to suggest that anaerobic biodegradation processes dominate in the thermal treatment area, but also indicate a strong potential for aerobic cometabolism of CVOCs and aerobic metabolism of petroleum hydrocarbons if conditions become more favorable for these processes in the future. In addition, Bio-Trap® samplers were deployed at 14 monitoring wells for analysis of 1,4-dioxane and THF biodegradation potential. Results indicate potential for metabolic 1,4-dioxane and THF biodegradation at a subset of monitoring wells sampled (CPZ-6A, MW-907M, and MW-502) and potential for cometabolic biodegradation at each of the 14 monitoring well sampled. This potential for 1,4-dioxane and THF biodegradation is based on the detection of the functional genes needed to mediate aerobic and cometabolic biodegradation.

Section 5 presents results of an evaluation of the effectiveness of MNA as a remedial measure for COCs in groundwater in the Site. As an extension of the prior evaluations (presented in the 2010 through 2015 MNA Reports), this evaluation considers groundwater monitoring results from the June 2016 annual groundwater monitoring event for VOCs and TAL metals at a subset of monitoring wells and presents: an evaluation of current concentration trends for total VOCs in groundwater at select monitoring locations; initial evaluation of post-thermal treatment data at the 10 “N” wells; estimates of bulk attenuation rates for total VOCs in groundwater; and HCTS COC mass extraction rates with time.

Results of these evaluations indicated:

- Detected concentrations of VOCs above Action Levels are contained within the estimated capture zone boundary of the HCTS.
- Groundwater total VOC concentrations are generally declining or remaining stable with time throughout the Site groundwater COC plume.

- Estimated bulk VOC attenuation rates were comparable to attenuation rates for individual COCs presented in the FS (BBL and USEPA 2005).
- Compliance monitoring data from the HCTS indicate generally stable COC mass extraction rates from the early 2000s to 2013 with a decline in COC mass extraction rates observed starting in 2014.

These results support continued use of MNA as a remedy for COCs in Site groundwater.

9 REFERENCES

Arcadis. 2009. *Draft Remedial Design Work Plan*. Solvents Recovery Service of New England, Inc., Southington, Connecticut. April 2009.

Arcadis. 2010a. *Monitored Natural Attenuation Report*. Solvents Recovery Service of New England, Inc. Southington, Connecticut. September 2010.

Arcadis. 2010b. *Monitoring Well Network Evaluation and Groundwater Monitoring Program*. Solvents Recovery Service of New England, Inc. Southington, Connecticut. November 2010.

Arcadis. 2011a. *Summary of Initial (2010) Comprehensive Groundwater Sampling Event*. January 2011.

Arcadis. 2012b. *Quality Assurance Project Plan* (Rev. 2). Solvents Recovery Service of New England, Inc. Southington, Connecticut. August 2012.

Arcadis. 2014. *2014 Groundwater Sampling and Monitored Natural Attenuation Report*. September 2014.

Arcadis. 2015. *Groundwater Conceptual Site Model Update*. April 2015.

BBL. 1998. *Remedial Investigation Report*. Solvents Recovery Service of New England, Inc., Southington, Connecticut. June 1998.

BBL. 2005. *Interim Monitoring and Sampling Report No. 14*. June 2005.

BBL and USEPA. May 2005. Draft Feasibility Study, Solvents Recovery Service of New England, Inc., Southington, Connecticut.

USEPA. 1994. Guidance for the Data Quality Objectives Process. EPA/600/R-96/055 September 1994.

USEPA. 1998. Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water. EPA/600/R-98/128.

USEPA. 1999. Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites. USEPA OSWER Directive 9200.4-17P. April 1999.

USEPA. 2002. Calculation and Use of First-Order Rate Constants for Monitored Natural Attenuation Studies. EPA/540/S-02/500, National Risk Management Research Laboratory, Office of Research and Development, Cincinnati, OH. November 2002.

USEPA. 2004. Performance of Monitoring of MNA Remedies for VOCs in Ground Water. EPAl600R-041027, April 2004.

USEPA. 2005. EPA Superfund Record of Decision: Solvents Recovery Service Of New England, Southington, CT. EPA/ROD/R01-05/008, EPA ID: CTD009717604. September 2005.

USEPA. 2015. Five-Year Review Report for Solvents Recovery Service of New England, Inc. Superfund Site Hartford County, Connecticut. September 2015.

TABLES

Table 1 – VOCs – Annual Groundwater Sample Results – June 2016
Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site
Southington, Connecticut

				Sample Location	CPZ-4A		CPZ-6		CPZ-6A		CPZ-8R		DN-3		MW-03		MW-1002DR		MW-1002R		MW-1003DR		MW-1003R		MW-121B	
				Sample Date	6/6/2016		6/6/2016		6/10/2016		6/7/2016		6/7/2016		6/9/2016		6/6/2016		6/6/2016		6/6/2016		6/6/2016		6/7/2016	
				Field Sample ID	CPZ-4A-HS-06062016		CPZ-6-HS-06062016		CPZ-6A-HS-06102016		CPZ-8R-HS-06072016		DN-3-HS-06072016		MW-03-06092016		MW-1002DR-HS-06062016		MW-1002R-HS-06062016		MW-1003DR-HS-06062016		MW-1003R-HS-06062016		MW-121B-HS-06072016	
				Well Group	R		C		C		R		C		R		R		R		R		R		R	
				HydroStratZone(s)	SOB, MOB		MOB		MOB, DOB		SBR		DOB		MOB		DBR		SBR		DBR		SBR		DOB	
Analyte	**CAS No.**	**Unit**	**Action Level**	**ICL**																						
VOCs																										
1,1,1,2-Tetrachloroethane	630-20-6	ug/L	1	0.5	0.5	U	--	--	0.5	U	1000	U	0.5	U	0.5	U	2.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,1-Trichloroethane	71-55-6	ug/L	200	0.5	0.5	U	--	--	0.5	U	1000	U	**54.7**	--	0.5	U	2.5	U	0.5	U	**0.587**	--	0.5	U	0.5	U
1,1,2-Trichloroethane	79-00-5	ug/L	5	0.5	0.75	U	--	--	0.75	U	1500	U	0.75	U	0.75	U	3.75	U	0.75	U	0.75	U	0.75	U	0.75	U
1,1-Dichloroethane	75-34-3	ug/L	70	0.5	**1.21**	--	--	--	0.75	U	1500	U	**4.25**	--	0.75	U	3.75	U	0.75	U	**0.373**	J	0.75	U	0.75	U
1,1-Dichloroethene	75-35-4	ug/L	7	0.5	**0.397**	J	--	--	0.5	U	**1550**	--	**17.5**	--	0.5	U	**4.15**	--	0.5	U	0.5	U	0.5	U	0.5	U
1,2,4-Trichlorobenzene	120-82-1	ug/L	70	2	2.5	U	--	--	2.5	U	5000	U	2.5	U	2.5	U	12.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2-Dichlorobenzene	95-50-1	ug/L	600	0.5	2.5	U	--	--	**0.397**	J	5000	U	2.5	U	2.5	U	12.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2-Dichloroethane	107-06-2	ug/L	1	0.5	0.5	U	--	--	0.5	U	1000	U	0.5	U	0.5	U	2.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,4-Dichlorobenzene	106-46-7	ug/L	75	0.5	2.5	U	--	--	2.5	U	5000	U	2.5	U	2.5	U	12.5	U	2.5	U	2.5	U	2.5	U	2.5	U
2-Butanone (MEK)	78-93-3	ug/L	400	5	5	U	--	--	5	U	10000	U	5	U	5	U	25	U	5	U	5	U	5	U	5	U
2-Hexanone	591-78-6	ug/L	140	5	5	U	--	--	5	U	10000	U	5	U	5	U	25	U	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone (MIBK)	108-10-1	ug/L	350	5	5	U	--	--	5	U	10000	U	5	U	5	U	25	U	5	U	5	U	5	U	5	U
Acetone	67-64-1	ug/L	700	5	18.4	U	--	--	5	U	10000	U	**2.87**	J	5	U	25	U	5	U	9.73	U	5	U	5	U
Benzene	71-43-2	ug/L	1	0.5	**1.43**	--	--	--	**30.4**	--	**370**	J	0.5	U	0.5	U	2.5	U	**0.17**	J	**0.713**	--	**0.16**	J	**4.09**	--
Bromomethane	74-83-9	ug/L	9.8	0.5	1	U	--	--	1	U	2000	U	1	U	1	U	5	U	1	U	1	U	1	U	1	UJ
Carbon disulfide	75-15-0	ug/L	700	0.5	5	U	--	--	5	U	10000	U	5	U	5	U	25	U	**1.1**	J	**2**	J	**2.68**	J	5	U
Carbon tetrachloride	56-23-5	ug/L	5	0.5	0.5	U	--	--	0.5	UJ	1000	U	0.5	U	0.5	UJ	2.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U
Chlorobenzene	108-90-7	ug/L	100	0.5	**0.747**	--	--	--	**15.9**	--	1000	U	0.5	U	0.5	U	2.5	U	0.5	U	0.5	U	0.5	U	**4.52**	--
Chloroethane	75-00-3	ug/L	12.1	0.5	**13.8**	--	--	--	**96.2**	--	2000	U	1	U	1	U	5	U	1	U	1	U	1	U	**14.4**	--
Chloroform	67-66-3	ug/L	6	0.5	0.75	U	--	--	0.75	U	1500	U	0.75	U	0.75	U	3.75	U	**0.174**	J	0.75	U	0.75	U	0.75	U
Chloromethane	74-87-3	ug/L	2.7	0.5	2.5	U	--	--	2.5	U	5000	U	2.5	U	2.5	U	12.5	U	2.5	U	**0.267**	J	2.5	U	2.5	U
cis-1,2-Dichloroethene	156-59-2	ug/L	70	0.5	**1.24**	--	--	--	0.5	U	**167000**	--	**52.4**	--	0.5	U	**35.5**	--	0.5	U	**0.298**	J	**0.594**	--	0.5	U
Ethylbenzene	100-41-4	ug/L	700	0.5	0.5	U	--	--	**137**	--	**5670**	--	0.5	U	0.5	U	2.5	U	0.5	U	**0.51**	--	0.5	U	0.5	U
Hexachlorobutadiene	87-68-3	ug/L	0.45	0.45	0.6	U	--	--	0.6	U	1200	U	0.6	U	0.6	U	3	U	0.6	U	0.6	U	0.6	U	0.6	U
Methylene chloride	75-09-2	ug/L	5	0.5	5	U	--	--	5	U	10000	U	5	U	5	U	25	U	5	U	5	U	5	U	5	U
Naphthalene	91-20-3	ug/L	280	0.5	2.5	U	--	--	**2.81**	--	5000	U	2.5	U	2.5	U	12.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Styrene	100-42-5	ug/L	100	0.5	1	U	--	--	1	U	2000	U	1	U	1	U	5	U	1	U	1	U	1	U	1	U
Tetrachloroethene	127-18-4	ug/L	5	0.5	0.5	U	--	--	0.5	U	**15400**	--	**13**	--	0.5	U	**18.1**	--	0.5	U	**3.2**	--	0.5	U	0.5	U
Tetrahydrofuran	109-99-9	ug/L	4.6	0.5	**21.4**	--	**164**	--	**981**	--	10000	U	5	U	**4.51**	J	25	U	5	U	5	U	5	U	**34.3**	--
Toluene	108-88-3	ug/L	1000	0.5	0.75	U	--	--	**7.03**	--	**33300**	--	0.75	U	0.75	U	3.75	U	**0.218**	J	**5.44**	--	**0.51**	J	0.75	U
trans-1,2-Dichloroethene	156-60-5	ug/L	100	0.5	0.75	U	--	--	**0.331**	J	1500	U	0.75	U	0.75	U	3.75	U	0.75	U	0.75	U	0.75	U	0.75	U
trans-1,3-Dichloropropene	10061-02-6	ug/L	0.5	0.5	0.5	U	--	--	0.5	U	1000	U	0.5	U	0.5	U	2.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Trichloroethene	79-01-6	ug/L	5	0.5	**1.39**	--	--	--	0.5	U	**145000**	--	**13.9**	--	0.5	U	**530**	--	**0.662**	--	**39.2**	--	**0.79**	--	0.5	U
Vinyl chloride	75-01-4	ug/L	2	0.5	**1.13**	--	--	--	1	U	**4810**	--	1	U	1	U	5	U	1	U	1	U	1	U	1	U
Xylenes, Total	1330-20-7	ug/L	530	0.5	**1.66**	--	--	--	**149**	--	**13300**	--	1	U	1	U	5	U	1	U	**1.78**	J	1	U	**0.486**	J

Notes:

U = Analyte not detected above the laboratory reporting limit
J = Analyte result is estimated
ug/L = micrograms per liter
VOCs = volatile organic compounds
Action Level = the lower of the USEPA Maximum Contaminant Level (MCL) and the Connecticut Class GA Groundwater Protection Criteria (GWPC)
ICL = Interim Cleanup Level based on Table L-1 from Record of Decision Summary, September 2005
Bold = Analyte detected above the laboratory reporting limit
Shaded Cell = Analyte detected above the Action Level
SOB = Shallow Overburden
MOB = Middle Overburden
DOB = Deep Overburden
SBR = Shallow Bedrock
DBR = Deep Bedrock

Table 1 – VOCs – Annual Groundwater Sample Results – June 2016
Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site
Southington, Connecticut

				Sample Location	MW-121C		MW-121M		MW-124C		MW-127C		MW-205B		MW-502		MW-704D		MW-704DR		MW-704M		MW-705DR		MW-706DR	
				Sample Date	6/10/2016		6/7/2016		6/6/2016		6/6/2016		6/10/2016		6/6/2016		6/6/2016		6/6/2016		6/7/2016		6/7/2016		6/7/2016	
				Field Sample ID	MW-121C-HS-06102016		MW-121M-HS-06072016		MW-124C-06062016		MW-127C-06062016		MW-205B-HS-06102016		MW-502-HS-06062016		MW-704D-HS-06062016		MW-704DR-HS-06062016		MW-704M-06072016		MW-705DR-HS-06072016		MW-706DR-HS-06072016	
				Well Group	R		R		R		R		C		R		R		R		R		R		R	
				HydroStratZone(s)	SBR		MOB		SBR		SBR		MOB		DOB		DOB		DBR		MOB		DBR		DBR	
Analyte **VOCs**	**CAS No.**	**Unit**	**Action Level**	**ICL**																						
1,1,1,2-Tetrachloroethane	630-20-6	ug/L	1	0.5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	500	U	10	U
1,1,1-Trichloroethane	71-55-6	ug/L	200	0.5	0.5	U	0.5	U	**4.74**	--	**1.46**	--	0.5	U	0.5	U	0.5	U	**0.483**	J	0.5	U	**23700**	--	10	U
1,1,2-Trichloroethane	79-00-5	ug/L	5	0.5	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	750	U	15	U
1,1-Dichloroethane	75-34-3	ug/L	70	0.5	0.75	U	0.75	U	**2.06**	--	**4.85**	--	0.75	U	0.75	U	0.75	U	**1.69**	--	0.75	U	750	U	15	U
1,1-Dichloroethene	75-35-4	ug/L	7	0.5	0.5	U	0.5	U	**6.02**	--	**1.86**	--	0.5	U	0.5	U	0.5	U	**0.508**	--	0.5	U	**3420**	--	**21.1**	--
1,2,4-Trichlorobenzene	120-82-1	ug/L	70	2	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2500	U	50	U
1,2-Dichlorobenzene	95-50-1	ug/L	600	0.5	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	**0.285**	J	2.5	U	2.5	U	2.5	U	2500	U	50	U
1,2-Dichloroethane	107-06-2	ug/L	1	0.5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	500	U	10	U
1,4-Dichlorobenzene	106-46-7	ug/L	75	0.5	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	**0.213**	J	2.5	U	2.5	U	2.5	U	2500	U	50	U
2-Butanone (MEK)	78-93-3	ug/L	400	5	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	**36700**	--	100	U
2-Hexanone	591-78-6	ug/L	140	5	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5000	U	100	U
4-Methyl-2-pentanone (MIBK)	108-10-1	ug/L	350	5	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	**34200**	--	100	U
Acetone	67-64-1	ug/L	700	5	5	U	5	U	5.58	U	5	U	5	U	8.47	U	5	U	5	U	5	U	**3440**	J	100	U
Benzene	71-43-2	ug/L	1	0.5	**4.48**	--	**0.43**	J	0.5	U	0.5	U	0.5	U	**60.3**	--	0.5	U	**0.572**	--	0.5	U	**528**	J	10	U
Bromomethane	74-83-9	ug/L	9.8	0.5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1000	U	20	U
Carbon disulfide	75-15-0	ug/L	700	0.5	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5000	U	100	U
Carbon tetrachloride	56-23-5	ug/L	5	0.5	0.5	UJ	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U	500	UJ	10	U
Chlorobenzene	108-90-7	ug/L	100	0.5	**4.53**	--	**0.608**	--	0.5	U	0.5	U	0.5	U	**22.7**	--	**1.92**	--	**0.434**	J	**1.92**	--	500	U	10	U
Chloroethane	75-00-3	ug/L	12.1	0.5	**13**	--	**5.65**	--	1	U	1	U	1	U	**52**	--	**8**	--	**5.78**	--	**0.796**	J	1000	U	20	U
Chloroform	67-66-3	ug/L	6	0.5	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	**415**	J	15	U
Chloromethane	74-87-3	ug/L	2.7	0.5	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2500	U	50	U
cis-1,2-Dichloroethene	156-59-2	ug/L	70	0.5	0.5	U	0.5	U	**8.31**	--	**1.9**	--	0.5	U	0.5	U	0.5	U	**0.752**	--	**0.264**	J	**28300**	--	**260**	--
Ethylbenzene	100-41-4	ug/L	700	0.5	**0.413**	J	0.5	U	0.5	U	0.5	U	0.5	U	**131**	--	0.5	U	0.5	U	0.5	U	**3660**	--	10	U
Hexachlorobutadiene	87-68-3	ug/L	0.45	0.45	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U	600	U	12	U
Methylene chloride	75-09-2	ug/L	5	0.5	5	U	5	U	5	U	5	U	5	U	**0.345**	J	5	U	5	U	5	U	**16800**	--	**21.9**	J
Naphthalene	91-20-3	ug/L	280	0.5	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	**1.24**	J	2.5	U	2.5	U	2.5	U	2500	U	50	U
Styrene	100-42-5	ug/L	100	0.5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	**1030**	--	20	U
Tetrachloroethene	127-18-4	ug/L	5	0.5	0.5	U	0.5	U	**0.777**	--	0.5	U	0.5	U	0.5	U	0.5	U	**0.882**	--	0.5	U	**34100**	--	**85.7**	--
Tetrahydrofuran	109-99-9	ug/L	4.6	0.5	**79.1**	--	**8.35**	--	5	U	5	U	5	U	**3740**	--	**3.47**	J	**2.12**	J	**3.18**	J	5000	U	100	U
Toluene	108-88-3	ug/L	1000	0.5	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	**7.44**	--	0.75	U	0.75	U	0.75	U	**43400**	--	**63.5**	--
trans-1,2-Dichloroethene	156-60-5	ug/L	100	0.5	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U	750	U	15	U
trans-1,3-Dichloropropene	10061-02-6	ug/L	0.5	0.5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	500	U	10	U
Trichloroethene	79-01-6	ug/L	5	0.5	0.5	U	0.5	U	**3.69**	--	**0.896**	--	**0.685**	--	**0.313**	J	0.5	U	**21.3**	--	0.5	U	**559000**	--	**2330**	--
Vinyl chloride	75-01-4	ug/L	2	0.5	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	**505**	J	20	U
Xylenes, Total	1330-20-7	ug/L	530	0.5	**0.592**	J	1	U	1	U	1	U	1	U	**141**	--	1	U	1	U	1	U	**8730**	--	20	U

Notes:

U = Analyte not detected above the laboratory reporting limit
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ug/L = micrograms per liter
VOCs = volatile organic compounds
Action Level = the lower of the USEPA Maximum Contaminant Level (MCL) and the Connecticut Class GA Groundwater Protection Criteria (GWPC)
ICL = Interim Cleanup Level based on Table L-1 from Record of Decision Summary, September 2005
Bold = Analyte detected above the laboratory reporting limit
Shaded Cell = Analyte detected above the Action Level
SOB = Shallow Overburden
MOB = Middle Overburden
DOB = Deep Overburden
SBR = Shallow Bedrock
DBR = Deep Bedrock

Table 1 – VOCs – Annual Groundwater Sample Results – June 2016
Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site
Southington, Connecticut

Sample Location					MW-707DR		MW-707M		MW-707R		MW-707S		MW-707S		MW-907D		MW-907DR		MW-907M		MW-908D		MWL-309		P-101A	
Sample Date					6/9/2016		6/6/2016		6/6/2016		6/6/2016		6/6/2016		6/6/2016		6/6/2016		6/6/2016		6/6/2016		6/7/2016		6/6/2016	
Field Sample ID					MW-707DR-06092016		MW-707M-HS-06062016		MW-707R-HS-06062016		DUP-GW-06062016-#1		MW-707S-HS-06062016		MW-907D-HS-06062016		MW-907DR-HS-06062016		MW-907M-HS-06062016		MW-908D-HS-06062016		MWL-309-06072016		P-101A-HS-06062016	
Well Group					R		C		C		C		C		R		R		R		C		R		C	
HydroStratZone(s)					DBR		MOB		SBR		SOB		SOB		DOB		DBR		MOB		DOB		SOB		SBR	
Analyte	**CAS No.**	**Unit**	**Action Level**	**ICL**																						
VOCs																										
1,1,1,2-Tetrachloroethane	630-20-6	ug/L	1	0.5	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	250	U	0.5	U	--	--	0.5	U	0.5	U
1,1,1-Trichloroethane	71-55-6	ug/L	200	0.5	**0.272**	J	0.5	U	**0.38**	J	0.5	U	0.5	U	0.5	U	**961**	--	0.5	U	--	--	0.5	U	**0.336**	J
1,1,2-Trichloroethane	79-00-5	ug/L	5	0.5	0.75	U	0.75	U	0.75	UJ	0.75	U	0.75	U	0.75	U	375	U	0.75	U	--	--	0.75	U	0.75	U
1,1-Dichloroethane	75-34-3	ug/L	70	0.5	**1.02**	--	0.75	U	**0.614**	J	0.75	U	0.75	U	0.75	U	375	U	0.75	U	--	--	**5.98**	--	**2.66**	--
1,1-Dichloroethene	75-35-4	ug/L	7	0.5	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	**293**	--	0.5	U	--	--	0.5	U	0.5	U
1,2,4-Trichlorobenzene	120-82-1	ug/L	70	2	2.5	U	2.5	U	2.5	UJ	2.5	U	2.5	U	2.5	U	1250	U	2.5	U	--	--	2.5	U	2.5	U
1,2-Dichlorobenzene	95-50-1	ug/L	600	0.5	2.5	U	2.5	U	2.5	UJ	2.5	U	2.5	U	**0.253**	J	1250	U	**0.431**	J	--	--	2.5	U	2.5	U
1,2-Dichloroethane	107-06-2	ug/L	1	0.5	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	250	U	0.5	U	--	--	0.5	U	0.5	U
1,4-Dichlorobenzene	106-46-7	ug/L	75	0.5	2.5	U	2.5	U	2.5	UJ	2.5	U	2.5	U	**0.278**	J	1250	U	**0.524**	J	--	--	2.5	U	2.5	U
2-Butanone (MEK)	78-93-3	ug/L	400	5	5	U	5	U	5	UJ	5	U	5	U	5	U	2500	U	5	U	--	--	5	U	5	U
2-Hexanone	591-78-6	ug/L	140	5	5	U	5	U	5	UJ	5	U	5	U	5	U	2500	U	5	U	--	--	5	U	5	U
4-Methyl-2-pentanone (MIBK)	108-10-1	ug/L	350	5	5	U	5	U	5	UJ	5	U	5	U	5	U	2500	U	5	U	--	--	5	U	5	U
Acetone	67-64-1	ug/L	700	5	5	U	5	U	5	UJ	5	U	5	U	5	U	2500	U	5	U	--	--	5.52	U	5.32	U
Benzene	71-43-2	ug/L	1	0.5	**0.284**	J	0.5	U	**0.807**	J	0.5	U	0.5	U	**22.2**	--	250	U	**45**	--	--	--	0.5	U	**2.96**	--
Bromomethane	74-83-9	ug/L	9.8	0.5	1	U	1	U	1	UJ	1	U	1	U	1	U	500	U	1	U	--	--	1	UJ	1	U
Carbon disulfide	75-15-0	ug/L	700	0.5	5	U	5	U	5	UJ	5	U	5	U	5	U	2500	U	5	U	--	--	5	U	**1.69**	J
Carbon tetrachloride	56-23-5	ug/L	5	0.5	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U	250	U	0.5	U	--	--	0.5	U	0.5	U
Chlorobenzene	108-90-7	ug/L	100	0.5	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	**11.5**	--	250	U	**22.7**	--	--	--	0.5	U	**0.83**	--
Chloroethane	75-00-3	ug/L	12.1	0.5	1	U	1	U	1	UJ	1	U	1	U	**41.5**	--	500	U	**94.7**	--	--	--	1	U	1	U
Chloroform	67-66-3	ug/L	6	0.5	0.75	U	0.75	U	0.75	UJ	0.75	U	0.75	U	0.75	U	375	U	0.75	U	--	--	0.75	U	0.75	U
Chloromethane	74-87-3	ug/L	2.7	0.5	2.5	U	2.5	U	2.5	UJ	2.5	U	2.5	U	2.5	U	1250	U	2.5	U	--	--	2.5	U	2.5	U
cis-1,2-Dichloroethene	156-59-2	ug/L	70	0.5	**0.379**	J	0.5	U	**0.366**	J	0.5	U	0.5	U	0.5	U	**1340**	--	0.5	U	--	--	**0.705**	--	**0.279**	J
Ethylbenzene	100-41-4	ug/L	700	0.5	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	**552**	--	**0.22**	J	--	--	0.5	U	0.5	U
Hexachlorobutadiene	87-68-3	ug/L	0.45	0.45	0.6	U	0.6	U	0.6	UJ	0.6	U	0.6	U	0.6	U	300	U	0.6	U	--	--	0.6	U	0.6	U
Methylene chloride	75-09-2	ug/L	5	0.5	5	U	5	U	5	UJ	5	U	5	U	5	U	2500	U	**0.431**	J	--	--	5	U	5	U
Naphthalene	91-20-3	ug/L	280	0.5	2.5	U	2.5	U	2.5	UJ	2.5	U	2.5	U	2.5	U	**453**	J	**1.04**	J	--	--	2.5	U	2.5	U
Styrene	100-42-5	ug/L	100	0.5	1	U	1	U	1	UJ	1	U	1	U	1	U	500	U	1	U	--	--	1	U	1	U
Tetrachloroethene	127-18-4	ug/L	5	0.5	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	**6540**	--	0.5	U	--	--	0.5	U	0.5	U
Tetrahydrofuran	109-99-9	ug/L	4.6	0.5	5	U	5	U	5	UJ	5	U	5	U	**226**	--	2500	U	**2670**	--	**3.32**	J	5	U	**3.48**	J
Toluene	108-88-3	ug/L	1000	0.5	0.75	U	0.75	U	0.75	UJ	0.75	U	0.75	U	0.75	U	**4790**	--	**0.485**	J	--	--	0.75	U	0.75	U
trans-1,2-Dichloroethene	156-60-5	ug/L	100	0.5	0.75	U	0.75	U	0.75	UJ	0.75	U	0.75	U	0.75	U	375	U	0.75	U	--	--	0.75	U	0.75	U
trans-1,3-Dichloropropene	10061-02-6	ug/L	0.5	0.5	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	250	U	0.5	U	--	--	0.5	U	0.5	U
Trichloroethene	79-01-6	ug/L	5	0.5	0.5	U	0.5	U	**1.04**	J	0.5	U	0.5	U	**0.28**	J	**66700**	--	**1.58**	--	--	--	**0.258**	J	**0.294**	J
Vinyl chloride	75-01-4	ug/L	2	0.5	1	U	1	U	1	UJ	1	U	1	U	1	U	500	U	1	U	--	--	1	U	**1.88**	--
Xylenes, Total	1330-20-7	ug/L	530	0.5	1	U	1	U	1	UJ	1	U	1	U	**0.618**	J	**1610**	J	**3**	J	--	--	1	U	1	U

Notes:

U = Analyte not detected above the laboratory reporting limit
J = Analyte result is estimated
ug/L = micrograms per liter
VOCs = volatile organic compounds
Action Level = the lower of the USEPA Maximum Contaminant Level (MCL) and the Connecticut Class GA Groundwater Protection Criteria (GWPC)
ICL = Interim Cleanup Level based on Table L-1 from Record of Decision Summary, September 2005
Bold = Analyte detected above the laboratory reporting limit
Shaded Cell = Analyte detected above the Action Level
SOB = Shallow Overburden
MOB = Middle Overburden
DOB = Deep Overburden
SBR = Shallow Bedrock
DBR = Deep Bedrock

Table 1 – VOCs – Annual Groundwater Sample Results – June 2016
Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site
Southington, Connecticut

				Sample Location	P-101B		P-101C		P-11A		P-13		P-6		PZO-204M		PZO-2D		PZO-2D		PZO-2M		PZR-2R		PZR-5R	
				Sample Date	6/8/2016		6/6/2016		6/7/2016		6/7/2016		6/7/2016		6/7/2016		6/8/2016		6/8/2016		6/6/2016		6/9/2016		6/6/2016	
				Field Sample ID	P-101B-06082016		P-101C-HS-06062016		P-11A-HS-06072016		P-13-06072016		P-6-HS-06072016		PZO-204M-HS-06072016		DUP-GW-06082016-#1		PZO-2D-06082016		PZO-2M-HS-06062016		PZR-2R-06092016		PZR-5R-HS-06062016	
				Well Group	R		R		R		R		C		C		R		R		R		R		C	
				HydroStratZone(s)	MOB		SOB		SBR		SOB		SBR		MOB		DOB		DOB		MOB		SBR		SBR	
Analyte	**CAS No.**	**Unit**	**Action Level**	**ICL**																						
VOCs																										
1,1,1,2-Tetrachloroethane	630-20-6	ug/L	1	0.5	0.5	U	0.5	U	5	U	0.5	U	--	--	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,1-Trichloroethane	71-55-6	ug/L	200	0.5	0.5	U	0.5	U	5	U	**2.74**	--	--	--	--	--	0.5	U	0.5	U	**0.202**	J	0.5	U	**1.98**	--
1,1,2-Trichloroethane	79-00-5	ug/L	5	0.5	0.75	U	0.75	U	7.5	U	0.75	U	--	--	--	--	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U
1,1-Dichloroethane	75-34-3	ug/L	70	0.5	**0.612**	J	**3.37**	--	7.5	U	**0.878**	--	--	--	--	--	0.75	U	0.75	U	0.75	U	0.75	U	**6.99**	--
1,1-Dichloroethene	75-35-4	ug/L	7	0.5	0.5	U	0.5	U	**19.6**	--	**0.396**	J	--	--	--	--	0.5	U	0.5	U	0.5	U	0.5	U	**5.3**	--
1,2,4-Trichlorobenzene	120-82-1	ug/L	70	2	2.5	U	2.5	U	25	U	2.5	U	--	--	--	--	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2-Dichlorobenzene	95-50-1	ug/L	600	0.5	2.5	U	2.5	U	25	U	2.5	U	--	--	--	--	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,2-Dichloroethane	107-06-2	ug/L	1	0.5	0.5	U	0.5	U	5	U	0.5	U	--	--	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,4-Dichlorobenzene	106-46-7	ug/L	75	0.5	2.5	U	2.5	U	25	U	2.5	U	--	--	--	--	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
2-Butanone (MEK)	78-93-3	ug/L	400	5	5	U	5	U	50	U	5	U	--	--	--	--	5	U	5	U	5	U	5	U	5	U
2-Hexanone	591-78-6	ug/L	140	5	5	U	5	U	50	U	5	U	--	--	--	--	5	U	5	U	5	U	5	U	5	U
4-Methyl-2-pentanone (MIBK)	108-10-1	ug/L	350	5	5	U	5	U	50	U	5	U	--	--	--	--	5	U	5	U	5	U	5	U	5	U
Acetone	67-64-1	ug/L	700	5	5	U	5	U	50	U	5	U	--	--	--	--	5	U	5	U	5	U	5	U	5	U
Benzene	71-43-2	ug/L	1	0.5	**3.47**	--	**1.97**	--	**23.3**	--	0.5	U	--	--	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromomethane	74-83-9	ug/L	9.8	0.5	1	U	1	U	10	UJ	1	U	--	--	--	--	1	U	1	U	1	U	1	U	1	UJ
Carbon disulfide	75-15-0	ug/L	700	0.5	5	U	5	U	50	U	5	U	--	--	--	--	5	U	5	U	5	U	5	U	5	U
Carbon tetrachloride	56-23-5	ug/L	5	0.5	0.5	U	0.5	U	5	U	0.5	U	--	--	--	--	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U
Chlorobenzene	108-90-7	ug/L	100	0.5	**1.34**	--	**0.926**	--	**5.22**	--	0.5	U	--	--	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloroethane	75-00-3	ug/L	12.1	0.5	**6.44**	--	1	U	**22.9**	--	1	U	--	--	--	--	1	U	1	U	1	U	1	U	1	U
Chloroform	67-66-3	ug/L	6	0.5	0.75	U	0.75	U	7.5	U	0.75	U	--	--	--	--	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U
Chloromethane	74-87-3	ug/L	2.7	0.5	2.5	U	2.5	U	25	U	2.5	U	--	--	--	--	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
cis-1,2-Dichloroethene	156-59-2	ug/L	70	0.5	0.5	U	**1**	--	**2860**	--	**1.38**	--	--	--	--	--	**0.2**	J	**0.232**	J	0.5	U	0.5	U	**3.98**	--
Ethylbenzene	100-41-4	ug/L	700	0.5	0.5	U	0.5	U	**246**	--	0.5	U	--	--	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Hexachlorobutadiene	87-68-3	ug/L	0.45	0.45	0.6	U	0.6	U	6	U	0.6	U	--	--	--	--	0.6	U	0.6	U	0.6	U	0.6	U	0.6	U
Methylene chloride	75-09-2	ug/L	5	0.5	5	U	5	U	50	U	5	U	--	--	--	--	5	U	5	U	5	U	5	U	5	U
Naphthalene	91-20-3	ug/L	280	0.5	2.5	U	2.5	U	25	U	2.5	U	--	--	--	--	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Styrene	100-42-5	ug/L	100	0.5	1	U	1	U	**7**	J	1	U	--	--	--	--	1	U	1	U	1	U	1	U	1	U
Tetrachloroethene	127-18-4	ug/L	5	0.5	0.5	U	0.5	U	**30.9**	--	**0.537**	--	--	--	--	--	0.5	U	0.5	U	**6.3**	--	0.5	U	0.5	U
Tetrahydrofuran	109-99-9	ug/L	4.6	0.5	**2.36**	J	**4.69**	J	**45.9**	J	5	U	**5290**	J	**15.1**	--	5	U	5	U	5	U	5	U	5	U
Toluene	108-88-3	ug/L	1000	0.5	0.75	U	0.75	U	**259**	--	0.75	U	--	--	--	--	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U
trans-1,2-Dichloroethene	156-60-5	ug/L	100	0.5	0.75	U	0.75	U	**2.11**	J	0.75	U	--	--	--	--	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U
trans-1,3-Dichloropropene	10061-02-6	ug/L	0.5	0.5	0.5	U	0.5	U	5	U	0.5	U	--	--	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Trichloroethene	79-01-6	ug/L	5	0.5	0.5	U	**0.268**	J	**49.8**	--	**0.502**	--	--	--	--	--	**0.953**	--	**1.05**	--	**3.43**	--	0.5	U	**0.88**	--
Vinyl chloride	75-01-4	ug/L	2	0.5	1	U	**4.19**	--	**806**	--	1	U	--	--	--	--	1	U	1	U	1	U	1	U	1	U
Xylenes, Total	1330-20-7	ug/L	530	0.5	**0.378**	J	1	U	**149**	--	1	U	--	--	--	--	1	U	1	U	1	U	1	U	1	U

Notes:

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VOCs = volatile organic compounds
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ICL = Interim Cleanup Level based on Table L-1 from Record of Decision Summary, September 2005
Bold = Analyte detected above the laboratory reporting limit
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SOB = Shallow Overburden
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DOB = Deep Overburden
SBR = Shallow Bedrock
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Table 2 – Metals – Annual Groundwater Sample Results – June 2016
Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site
Southington, Connecticut

Sample Location				MW-126B		MW-126C		MW-126C		MW-209A		MW-209A		MW-209B		MW-701DR		MW-901R		P-12	
Sample Date				6/7/2016		6/9/2016		6/9/2016		6/8/2016		6/9/2016		6/9/2016		6/8/2016		6/8/2016		6/7/2016	
Field Sample ID				MW-126B-06072016		DUP-GW-06092016-#1		MW-126C-06092016		MW-209A-06082016		MW-209A-06092016		MW-209B-06092016		MW-701DR-06082016		MW-901R-06082016		P-12-06072016	
Well Group				M		B		B		B		B		B		M		M		M	
HydroStratZone(s)				MOB		SBR		SBR		SBR		SBR		DOB		DBR		SBR		SOB	
Analyte **Metals (6020)**	**CAS No.**	**Unit**	**Action Level**																		
Aluminum (Dissolved)	7429-90-5	ug/L	--	**2.92**	J	9	U	16	U	--	--	**6.34**	J	**326**	--	**8.01**	J	**20.5**	--	**86.5**	--
Aluminum (Total)	7429-90-5	ug/L	--	**7.57**	J	**17.9**	--	**17.3**	--	**10.3**	--	--	--	**1940**	--	**33.2**	--	**191**	--	**1510**	--
Antimony (Dissolved)	7440-36-0	ug/L	--	2	U	2	U	2	U	--	--	2	U	2	U	2	U	1.028	U	2	U
Antimony (Total)	7440-36-0	ug/L	6	2	U	2	U	2	U	2	U	--	--	2	U	2	U	2	U	2	U
Arsenic (Dissolved)	7440-38-2	ug/L	--	0.5	U	0.5	U	0.5	U	--	--	0.5	U	0.5	U	**1.201**	--	0.5	U	0.5	U
Arsenic (Total)	7440-38-2	ug/L	10	**0.1602**	J	0.5	U	0.5	U	**0.2684**	J	--	--	**4.33**	--	**1.331**	--	0.8041	U	**0.4326**	J
Barium (Dissolved)	7440-39-3	ug/L	--	**553.4**	--	**432.4**	--	**507.1**	--	--	--	**295.8**	--	**234.5**	--	**101.3**	--	**313.5**	J	**223.4**	--
Barium (Total)	7440-39-3	ug/L	1000	**588**	--	**472.2**	--	**484.7**	--	**302.8**	--	--	--	**1161**	--	**101.8**	--	**328.5**	J	**227.4**	--
Beryllium (Dissolved)	7440-41-7	ug/L	--	0.5	U	0.5	U	0.5	U	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Beryllium (Total)	7440-41-7	ug/L	4	0.5	U	0.5	U	0.5	U	0.5	U	--	--	**2.547**	--	0.5	U	0.5	U	0.5	U
Cadmium (Dissolved)	7440-43-9	ug/L	--	0.0516	U	0.5	U	0.5	U	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Cadmium (Total)	7440-43-9	ug/L	5	0.5	U	0.5	U	0.5	U	0.5	U	--	--	**0.6337**	--	0.5	U	0.5	U	0.5	U
Chromium (Dissolved)	7440-47-3	ug/L	--	1	U	0.5	U	0.5	U	--	--	0.5	U	0.5	U	1.116	U	0.5	U	0.5026	U
Chromium (Total)	7440-47-3	ug/L	--	1	U	1	U	1	U	1	U	--	--	**23.19**	--	1.158	U	1	U	2.038	U
Cobalt (Dissolved)	7440-48-4	ug/L	--	**0.1824**	J	0.5	U	0.5	U	--	--	0.5	U	**0.4303**	J	0.5	U	0.5	U	**0.09**	J
Cobalt (Total)	7440-48-4	ug/L	10	**0.2042**	J	**0.0901**	J	**0.0868**	J	0.5	U	--	--	**12.08**	--	0.5	U	**0.0802**	J	**1.018**	--
Copper (Dissolved)	7440-50-8	ug/L	--	5	U	1	U	1	U			1	U	2.673	U	**0.6794**	J	1	U	**2.885**	J
Copper (Total)	7440-50-8	ug/L	1300	5	U	1	U	1	U	5	U	--	--	**36.15**	--	**0.9126**	J	1	U	**2.237**	J
Iron (Dissolved)	7439-89-6	ug/L	--	50	U	50	U	50	U	--	--	50	U	**425**	--	50	U	**37.6**	J	**113**	--
Iron (Total)	7439-89-6	ug/L	--	**19.6**	J	**19**	J	**22.3**	J	**13.4**	J	--	--	**16000**	--	**27**	J	**94**	--	**1680**	--
Lead (Dissolved)	7439-92-1	ug/L	--	1	U	1	U	1	U	--	--	1	U	**1.593**	--	1	U	**0.2062**	J	1	U
Lead (Total)	7439-92-1	ug/L	15	1	U	1	U	1	U	1	U	--	--	**21.88**	--	**0.1304**	J	**0.7278**	J	**0.7789**	J
Manganese (Dissolved)	7439-96-5	ug/L	--	**1185**	--	1	U	2.25	U	--	--	**1.016**	--	**47.96**	--	2.26	U	**4.879**	--	**8.699**	B
Manganese (Total)	7439-96-5	ug/L	500	**2036**	--	**2.326**	--	**2.798**	--	**5.236**	--	--	--	**888.6**	--	1.795	U	**25.86**	--	**45.47**	--
Nickel (Dissolved)	7440-02-0	ug/L	--	8.786	U	2	U	2	U	--	--	2	U	2	U	1	U	2	U	1.634	U
Nickel (Total)	7440-02-0	ug/L	100	10.76	U	2	U	2	U	1	U	--	--	**28.91**	--	1	U	2	U	2.317	U
Silver (Dissolved)	7440-22-4	ug/L	--	0.5	U	0.5	U	0.5	U	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Silver (Total)	7440-22-4	ug/L	36	0.5	U	0.5	U	0.5	U	0.5	U	--	--	0.5	U	0.5	U	0.5	U	0.5	U
Thallium (Dissolved)	7440-28-0	ug/L	--	0.5	U	0.5	U	0.5	U	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Thallium (Total)	7440-28-0	ug/L	2	0.5	U	0.5	U	0.5	U	0.5	U	--	--	**0.2578**	J	0.5	U	0.5	U	0.5	U
Vanadium (Dissolved)	7440-62-2	ug/L	--	5	U	**0.6514**	J	**0.8307**	J	--	--	**1.614**	J	**1.622**	J	**8.141**	--	**0.9674**	J	**1.04**	J
Vanadium (Total)	7440-62-2	ug/L	50	5	U	**0.9774**	J	**0.8084**	J	**2.008**	J	--	--	**29.95**	--	**8.162**	--	**1.94**	J	**4.377**	J
Zinc (Dissolved)	7440-66-6	ug/L	--	10	U	10	U	10	U	--	--	**2.597**	J	**3.416**	J	10	U	10	U	**5.804**	J
Zinc (Total)	7440-66-6	ug/L	5000	10	U	10	U	10	U	10	U	--	--	**69.63**	--	10	U	10	U	**7.83**	J

Notes:

U = Analyte not detected above the laboratory reporting limit
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B = Analyte was found in an associated blank, as well as in the sample
ug/L = micrograms per liter
Action Level = the lower of the USEPA Maximum Contaminant Level (MCL)
and the Connecticut Class GA Groundwater Protection Criteria (GWPC)
Bold = Analyte detected above the laboratory reporting limit
Shaded Cell = Analyte detected above the Action Level
SOB = Shallow Overburden
MOB = Middle Overburden
DOB = Deep Overburden
SBR = Shallow Bedrock
DBR = Deep Bedrock

Table 3 – MNA Parameters – Annual Groundwater Sample Results – June 2016
Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site
Southington, Connecticut

Sample Location			CPZ-4A		CPZ-6		CPZ-8R		MW-03		MW-1002DR		MW-1002R		MW-1003DR		MW-1003R		MW-121B	
Sample Date			6/6/2016 0:00		6/9/2016 0:00		6/7/2016 0:00		6/9/2016 0:00		6/6/2016 0:00		6/6/2016 0:00		6/6/2016 0:00		6/6/2016 0:00		6/7/2016 0:00	
Field Sample ID			CPZ-4A-HS-06062016		CPZ-6-HS-06092016		CPZ-8R-HS-06072016		MW-03-06092016		MW-1002DR-HS-06062016		MW-1002R-HS-06062016		MW-1003DR-HS-06062016		MW-1003R-HS-06062016		MW-121B-HS-06072016	
Well Group			R		C		R		R		R		R		R		R		R	
HydroStratZone(s)			SOB, MOB		MOB		SBR		MOB		DBR		SBR		DBR		SBR		DOB	
Analyte **MNA**	**CAS No.**	**Unit**																		
Alkalinity	ALK	mg/L	**187**	--	**330**	--	**124**	--	**119**	--	**64.9**	--	**27.6**	--	**562**	--	**27**	--	**220**	--
Chloride	16887-00-6	mg/L	**36**	--	**41.8**	--	**91**	--	**17.5**	--	**560**	--	**950**	--	**243**	--	**143**	--	**46.1**	--
Iron (Dissolved)	7439-89-6	ug/L	**20000**	J	**790**	J	**140**	--	**42.4**	J	50	U	50	U	50	U	**200**	J	**3400**	--
Manganese (Dissolved)	7439-96-5	ug/L	**3890**	--	**1450**	J	**346**	--	**113**	--	10	U	**91.1**	J	10	U	**42.5**	--	**2430**	--
Nitrate as N	14797-55-8	mg/L	0.1	U	0.1	U	**0.019**	J	**0.055**	J	0.1	U	**0.067**	J	**0.047**	J	**0.026**	J	0.1	U
Nitrite as N	14797-65-0	mg/L	**0.012**	J	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	**0.143**	--	0.05	U	0.05	U
Sulfate	14808-79-8	mg/L	**31.2**	--	**4.12**	--	**26.5**	--	**0.358**	J	**275**	--	**704**	--	**96**	--	**904**	--	1	U
Total Organic Carbon	TOC	mg/L	**3.5**	J	**3.8**	J	**7.7**	J	**16**	J	**2.6**	J	**0.66**	J	**12**	J	**1**	J	**3.7**	J
Ethane	74-84-0	ug/L	**120**	--	**260**	--	**0.89**	--	**0.3**	--	**5**	--	**0.071**	J	**0.18**	J	**0.24**	--	**250**	--
Ethene	74-85-1	ug/L	**9.7**	--	**1.4**	--	**59**	--	**0.071**	J	**0.19**	J	**2.6**	--	**2.1**		**1.9**	--	**0.035**	J
Methane	74-82-8	ug/L	**8300**	--	**25000**	--	**160**	--	**14**	--	**66**	--	**0.94**	J	**2.2**	--	**1.3**	--	**8000**	--

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in the sample
ug/L = micrograms per liter
mg/L = milligrams per liter
Bold = Analyte detected above the laboratory reporting limit
Shaded Cell = Analyte detected above the Action Level
SOB = Shallow Overburden
MOB = Middle Overburden
DOB = Deep Overburden
SBR = Shallow Bedrock
DBR = Deep Bedrock

Table 3 – MNA Parameters – Annual Groundwater Sample Results – June 2016
Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site
Southington, Connecticut

		Sample Location	MW-121C		MW-121M		MW-124C		MW-126B		MW-127C		MW-502		MW-701DR		MW-704D		MW-704DR	
		Sample Date	6/7/2016 0:00		6/7/2016 0:00		6/6/2016 0:00		6/7/2016 0:00		6/6/2016 0:00		6/6/2016 0:00		6/8/2016 0:00		6/6/2016 0:00		6/6/2016 0:00	
		Field Sample ID	MW-121C-HS-06072016		MW-121M-HS-06072016		MW-124C-06062016		MW-126B-06072016		MW-127C-06062016		MW-502-HS-06062016		MW-701DR-06082016		MW-704D-HS-06062016		MW-704DR-HS-06062016	
		Well Group	R		R		R		M		R		R		M		R		R	
		HydroStratZone(s)	SBR		MOB		SBR		MOB		SBR		DOB		DBR		DOB		DBR	
Analyte	**CAS No.**	**Unit**																		
MNA																				
Alkalinity	ALK	mg/L	**200**	--	**83.6**	--	**131**	--	**99.9**	--	**121**	--	**357**	--	**91.1**	--	**131**	--	**44**	--
Chloride	16887-00-6	mg/L	**48**	--	**21.9**	--	**25.6**	--	**76.7**	--	**28.3**	--	**127**	--	**8.86**	--	**19.7**	--	**35.6**	--
Iron (Dissolved)	7439-89-6	ug/L	**1800**	--	**2300**	--	50	U	50	U	**57**	J	**13000**	J	50	U	**550**	J	**70**	J
Manganese (Dissolved)	7439-96-5	ug/L	**2630**	--	**4940**	--	**2**	J	**1185**	--	**53.2**	--	**1900**	--	2.26	U	**2790**	--	**84.4**	--
Nitrate as N	14797-55-8	mg/L	**0.026**	J	0.1	U	**1.48**	--	**0.28**	--	**1.62**	--	0.1	U	**0.73**	--	0.1	U	**0.084**	J
Nitrite as N	14797-65-0	mg/L	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U
Sulfate	14808-79-8	mg/L	**8.17**		**3.44**	--	**36.6**	--	**16.5**	--	**18.1**	--	1	U	**65.3**	--	**1.96**	--	**862**	--
Total Organic Carbon	TOC	mg/L	**3.3**	J	**1.6**	J	**0.59**	J	**2.9**	J	**0.82**	J	**12**	J	**0.71**	J	**1.6**	J	**1.2**	J
Ethane	74-84-0	ug/L	**160**	--	**4.2**	--	**0.0057**	J	0.1	U	**0.0058**	J	**170**	--	0.1	U	**66**	--	**4.5**	--
Ethene	74-85-1	ug/L	**0.73**	--	**0.051**	J	**0.0074**	J	**0.01**	J	**0.012**	J	**14**	--	0.1	U	**0.08**	J	**0.075**	J
Methane	74-82-8	ug/L	**5900**	--	**56**	--	**0.24**	J	**2**	--	**1.5**	--	**21000**	--	**0.042**	J	**1900**	--	**210**	--

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mg/L = milligrams per liter
Bold = Analyte detected above the laboratory reporting limit
Shaded Cell = Analyte detected above the Action Level
SOB = Shallow Overburden
MOB = Middle Overburden
DOB = Deep Overburden
SBR = Shallow Bedrock
DBR = Deep Bedrock

Table 3 – MNA Parameters – Annual Groundwater Sample Results – June 2016
Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site
Southington, Connecticut

Sample Location			MW-704M		MW-705DR		MW-706DR		MW-707DR		MW-901R		MW-907D		MW-907DR		MW-907M		MW-908D	
Sample Date			6/7/2016 0:00		6/7/2016 0:00		6/7/2016 0:00		6/9/2016 0:00		6/8/2016 0:00		6/6/2016 0:00		6/6/2016 0:00		6/6/2016 0:00		6/9/2016 0:00	
Field Sample ID			MW-704M-06072016		MW-705DR-HS-06072016		MW-706DR-HS-06072016		MW-707DR-06092016		MW-901R-06082016		MW-907D-HS-06062016		MW-907DR-HS-06062016		MW-907M-HS-06062016		MW-908D-HS-06092016	
Well Group			R		R		R		R		M		R		R		R		C	
HydroStratZone(s)			MOB		DBR		DBR		DBR		SBR		DOB		DBR		MOB		DOB	
Analyte	**CAS No.**	**Unit**																		
MNA																				
Alkalinity	ALK	mg/L	**134**	--	**79.1**	--	**19.9**	--	**89.1**	--	**87.2**	--	**236**	--	**13.4**	--	**323**	--	**196**	--
Chloride	16887-00-6	mg/L	**19.5**	--	**48.3**	--	**16.9**	--	**87.4**	--	**28.9**	--	**59.8**	--	**71.3**	--	**129**	--	**10.1**	--
Iron (Dissolved)	7439-89-6	ug/L	**490**	--	50	U	**24**	J	**43.8**	J	**37.6**	J	**6700**	--	50	U	**6500**	J	**2500**	J
Manganese (Dissolved)	7439-96-5	ug/L	**2220**	--	10	U	**44.7**	--	**98.5**	J	**4.879**	--	**2740**	--	**37.6**	--	**3420**	--	**1280**	J
Nitrate as N	14797-55-8	mg/L	0.1	U	**0.116**	--	**0.072**	J	0.1	U	**1.05**	--	0.1	U	0.1	U	0.1	U	0.1	U
Nitrite as N	14797-65-0	mg/L	0.05	U	**0.044**	J	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U
Sulfate	14808-79-8	mg/L	**2.2**	--	**134**	--	**895**	--	**76.8**	--	**8.84**	--	**4.9**	--	**1220**		1	U	**17.1**	--
Total Organic Carbon	TOC	mg/L	**1.4**	J	**74**	J	**0.9**	J	**4**	J	**0.8**	J	**5**	J	**0.91**	J	**13**	J	**2.7**	J
Ethane	74-84-0	ug/L	**18**	--	**3.6**	--	--	--	**0.068**	J	**0.0068**	J	**250**	--	**0.058**	J	**250**	--	**26**	--
Ethene	74-85-1	ug/L	**0.07**	J	**11**	--	--	--	**0.5**	--	**0.008**	J	**0.68**	--	**0.24**	--	**0.21**	--	**0.022**	J
Methane	74-82-8	ug/L	**1700**	--	**110**	--	--	--	**19**	--	**1.3**	--	**11000**	--	**1.7**	--	**17000**	--	**1100**	--

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ug/L = micrograms per liter
mg/L = milligrams per liter
Bold = Analyte detected above the laboratory reporting limit
Shaded Cell = Analyte detected above the Action Level
SOB = Shallow Overburden
MOB = Middle Overburden
DOB = Deep Overburden
SBR = Shallow Bedrock
DBR = Deep Bedrock

Table 3 – MNA Parameters – Annual Groundwater Sample Results – June 2016
Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site
Southington, Connecticut

		Sample Location	MWL-309		P-101A		P-101B		P-101C		P-11A		P-12		P-13		P-6		PZO-2D	
		Sample Date	6/7/2016 0:00		6/10/2016 0:00		6/8/2016 0:00		6/6/2016 0:00		6/7/2016 0:00		6/7/2016 0:00		6/7/2016 0:00		6/9/2016 0:00		6/8/2016 0:00	
		Field Sample ID	MWL-309-06072016		P-101A-HS-06102016		P-101B-06082016		P-101C-HS-06062016		P-11A-HS-06072016		P-12-06072016		P-13-06072016		P-6-HS-06092016		DUP-GW-06082016-#1	
		Well Group	R		C		R		R		R		M		R		C		R	
		HydroStratZone(s)	SOB		SBR		MOB		SOB		SBR		SOB		SOB		SBR		DOB	
Analyte **MNA**	**CAS No.**	**Unit**																		
Alkalinity	ALK	mg/L	**231**	--	**158**	--	**180**	--	**109**	--	**161**	--	**71.8**	--	**115**	--	**398**	--	**83.3**	--
Chloride	16887-00-6	mg/L	**71**	--	**34.5**	--	**26**	--	**15**	--	**70.6**	--	**52.9**	--	**10.6**	--	**219**	--	**15.3**	--
Iron (Dissolved)	7439-89-6	ug/L	**190**	--	**350**	--	**980**	--	**590**	--	**730**	--	**113**	--	50	U	**9200**	J	50	U
Manganese (Dissolved)	7439-96-5	ug/L	**339**	--	**517**	--	**960**	--	**1250**	--	**2200**	--	**8.699**	B	**2**	J	**3320**	J	10	U
Nitrate as N	14797-55-8	mg/L	**0.153**	--	0.1	U	0.1	U	**0.038**	J	**0.035**	J	**0.39**		**1.13**	--	0.1	U	**1.06**	--
Nitrite as N	14797-65-0	mg/L	0.05	U	0.05	U	0.05	U	**0.013**	J	0.05	U	0.05	U	**0.01**	J	**0.011**	J	0.05	U
Sulfate	14808-79-8	mg/L	**5.24**	--	**8.35**	--	**7.75**	--	**12.7**		**45.4**	--	**13.1**	--	**8.39**	--	**0.201**	J	**11.5**	--
Total Organic Carbon	TOC	mg/L	**1.9**	J	**1.8**	J	**1.4**	J	**0.65**	J	**3.1**	J	**1.9**	J	**0.49**	J	**21**	J	**0.38**	J
Ethane	74-84-0	ug/L	**0.011**	J	**270**	--	**160**	--	**69**	--	**450**	--	0.1	U	0.1	U	**280**	--	0.1	U
Ethene	74-85-1	ug/L	**0.017**	J	**9.4**	--	0.1	U	**0.5**	--	**160**	--	**0.012**	J	**0.0063**	J	**1.1**	--	**0.0052**	J
Methane	74-82-8	ug/L	**0.96**	--	**3600**	--	**3800**	--	**340**	--	**6800**	--	**0.046**	J	**0.16**	J	**24000**	--	**0.16**	J

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in the sample
ug/L = micrograms per liter
mg/L = milligrams per liter
Bold = Analyte detected above the laboratory reporting limit
Shaded Cell = Analyte detected above the Action Level
SOB = Shallow Overburden
MOB = Middle Overburden
DOB = Deep Overburden
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DBR = Deep Bedrock

Table 3 – MNA Parameters – Annual Groundwater Sample Results – June 2016
Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site
Southington, Connecticut

Sample Location			PZO-2D		PZO-2M		PZR-2R	
Sample Date			6/8/2016 0:00		6/6/2016 0:00		6/9/2016 0:00	
Field Sample ID			PZO-2D-06082016		PZO-2M-HS-06062016		PZR-2R-06092016	
Well Group			R		R		R	
HydroStratZone(s)			DOB		MOB		SBR	
Analyte	**CAS No.**	**Unit**						
MNA								
Alkalinity	ALK	mg/L	**82.4**	--	**98**	--	**67.1**	--
Chloride	16887-00-6	mg/L	**15**	--	**7.11**	--	**16.6**	--
Iron (Dissolved)	7439-89-6	ug/L	50	U	50	U	50	U
Manganese (Dissolved)	7439-96-5	ug/L	10	U	10	U	**10.6**	J
Nitrate as N	14797-55-8	mg/L	**1.02**	--	**0.138**	--	**0.706**	--
Nitrite as N	14797-65-0	mg/L	0.05	U	0.05	U	0.05	U
Sulfate	14808-79-8	mg/L	**10.6**	--	**7.19**	--	**41.2**	--
Total Organic Carbon	TOC	mg/L	**0.36**	J	**0.68**	J	**2.7**	J
Ethane	74-84-0	ug/L	0.1	U	0.2	U	**0.076**	J
Ethene	74-85-1	ug/L	**0.0054**	J	**0.012**	J	**0.057**	J
Methane	74-82-8	ug/L	**0.13**	J	**0.12**	J	**11**	--

Notes:

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B = Analyte was found in an associated blank, as well as in the sample
ug/L = micrograms per liter
mg/L = milligrams per liter
Bold = Analyte detected above the laboratory reporting limit
Shaded Cell = Analyte detected above the Action Level
SOB = Shallow Overburden
MOB = Middle Overburden
DOB = Deep Overburden
SBR = Shallow Bedrock
DBR = Deep Bedrock

Table 4 – 1,4-Dioxane – Annual Groundwater Sample Results – June 2016
Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site
Southington, Connecticut

			Sample Location	CPZ-6		CPZ-6A		DN-3		MW-03		MW-205B		MW-502		MW-704D	
			Sample Date	6/6/2016		6/10/2016		6/7/2016		6/9/2016		6/10/2016		6/6/2016		6/6/2016	
			Field Sample ID	CPZ-6-HS-06062016		CPZ-6A-HS-06102016		DN-3-HS-06072016		MW-03-06092016		MW-205B-HS-06102016		MW-502-HS-06062016		MW-704D-HS-06062016	
			Well Group	C		C		C		R		C		R		R	
			HydroStratZone(s)	MOB		MOB, DOB		DOB		MOB		MOB		DOB		DOB	
Analyte	**CAS No.**	**Unit**	**Action Level**														
1,4-Dioxane	123-91-1	ug/L	20	**400**	--	**750**	J	**2.4**	J	**6.48**	--	**3**	J	**1900**	J	**150**	J

			Sample Location	MW-704DR		MW-707M		MW-707R		MW-707S		MW-707S		MW-907DR		MW-907M	
			Sample Date	6/6/2016		6/6/2016		6/6/2016		6/6/2016		6/6/2016		6/6/2016		6/6/2016	
			Field Sample ID	MW-704DR-HS-06062016		MW-707M-HS-06062016		MW-707R-HS-06062016		DUP-GW-06062016-#1		MW-707S-HS-06062016		MW-907DR-HS-06062016		MW-907M-HS-06062016	
			Well Group	R		C		C		C		C		R		R	
			HydroStratZone(s)	DBR		MOB		SBR		SOB		SOB		DBR		MOB	
Analyte	**CAS No.**	**Unit**	**Action Level**														
1,4-Dioxane	123-91-1	ug/L	20	**49**	J	3	UJ	**4.3**	J	3	UJ	3	UJ	1500	U	**1900**	--

			Sample Location	MW-908D		P-101A		P-6		PZO-204M		PZO-2D		PZO-2D		PZR-5R	
			Sample Date	6/6/2016		6/6/2016		6/7/2016		6/7/2016		6/8/2016		6/8/2016		6/6/2016	
			Field Sample ID	MW-908D-HS-06062016		P-101A-HS-06062016		P-6-HS-06072016		PZO-204M-HS-06072016		DUP-GW-06082016-#1		PZO-2D-06082016		PZR-5R-HS-06062016	
			Well Group	C		C		C		C		R		R		C	
			HydroStratZone(s)	DOB		SBR		SBR		MOB		DOB		DOB		SBR	
Analyte	**CAS No.**	**Unit**	**Action Level**														
1,4-Dioxane	123-91-1	ug/L	20	**35**	--	**93**	J	**2200**	J	**950**	J	**4.19**	--	**4.01**	--	3	UJ

Notes:

U = Analyte not detected above the laboratory reporting limit
J = Analyte result is estimated
ug/L = micrograms per liter
Action Level = the lower of the USEPA Maximum Contaminant Level (MCL) and the Connecticut Class GA Groundwater Protection Criteria (GWPC)
Bold = Analyte detected above the laboratory reporting limit
Shaded Cell = Analyte detected above the Action Level
SOB = Shallow Overburden
MOB = Middle Overburden
DOB = Deep Overburden
SBR = Shallow Bedrock
DBR = Deep Bedrock

Table 5 – Post-Thermal Treatment Groundwater Sample Results – VOCs

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

Sample Location					MW-413		MW-413		MW-413		MW-413		MW-413		MW-413		MW-415		MW-415		MW-415		MW-415		MW-415	
Sample Date					3/18/2015		3/18/2015		7/17/2015		10/23/2015		3/11/2016		7/19/2016		3/18/2015		7/17/2015		10/23/2015		3/11/2016		7/19/2016	
Field Sample ID					DUPLICATE-GW-03182015		MW-413-HS-03182015		MW-413-HS-07172015		MW-413-HS-10232015		MW-413-HS-03112016		MW-413-HS-07192016		MW-415-HS-03182015		MW-415-HS-07172015		MW-415-HS-10232015		MW-415-HS-03112016		MW-415-HS-07192016	
Well Group					N		N		N		N		N		N		N		N		N		N		N	
HydroStratZone(s)					DOB		DOB		DOB		DOB		DOB		DOB		MOB		MOB		MOB		MOB		MOB	
Analyte	**CAS No.**	**Unit**	**Action Level**	**ICL**																						
VOCs																										
1,1,1,2-Tetrachloroethane	630-20-6	ug/L	1	0.5	50	U	20	U	10	U	25	U	50	U	50	U	0.5	U	0.5	U	5	U	5	U	0.5	U
1,1,1-Trichloroethane	71-55-6	ug/L	200	0.5	50	U	20	U	10	UJ	25	U	50	U	50	U	0.5	U	**1.13**	J	5	U	5	U	0.5	U
1,1,2-Trichloroethane	79-00-5	ug/L	5	0.5	75	U	30	U	15	U	37.5	U	75	U	75	U	0.75	U	0.75	U	7.5	U	7.5	U	0.75	U
1,1-Dichloroethane	75-34-3	ug/L	70	0.5	**23.7**	J	**20.9**	J	**11.8**	J	37.5	U	**45.4**	J	**23.5**	J	0.75	U	**4.78**	J	**14.4**	--	**9.08**	--	**14.7**	--
1,1-Dichloroethene	75-35-4	ug/L	7	0.5	50	U	20	U	10	UJ	25	U	50	U	50	U	0.5	U	**0.864**	J	5	U	5	U	0.5	U
1,2,4-Trichlorobenzene	120-82-1	ug/L	70	2	250	U	100	U	50	U	125	U	250	U	250	U	2.5	U	2.5	U	25	U	25	U	**0.54**	J
1,2-Dichlorobenzene	95-50-1	ug/L	600	0.5	250	U	100	U	50	U	125	U	250	U	250	U	2.5	U	2.5	U	25	U	25	U	2.5	U
1,2-Dichloroethane	107-06-2	ug/L	1	0.5	50	U	20	U	10	U	25	U	50	U	50	U	0.5	U	0.5	U	5	U	5	U	0.5	U
1,4-Dichlorobenzene	106-46-7	ug/L	75	0.5	250	U	100	U	50	U	125	U	250	U	250	U	2.5	U	2.5	U	25	U	25	U	2.5	U
2-Butanone (MEK)	78-93-3	ug/L	400	5	886	U	340	U	**1090**	J	**164**	J	500	U	500	U	5	U	**44.3**	J	50	U	50	U	**2.9**	J
2-Hexanone	591-78-6	ug/L	140	5	500	U	200	U	100	U	250	U	500	U	500	U	5	U	5	U	50	U	50	U	5	U
4-Methyl-2-pentanone (MIBK)	108-10-1	ug/L	350	5	500	U	200	U	**128**	J	250	U	500	U	500	U	5	U	**4.32**	J	50	U	50	U	5	U
Acetone	67-64-1	ug/L	700	5	10000	UJ	4000	UJ	**2120**	J	**348**	J	500	U	500	U	100	UJ	**97.5**	J	**50.7**	J	**52.1**	--	**8.67**	--
Benzene	71-43-2	ug/L	1	0.5	**17.5**	J	**17.5**	J	10	U	**16.9**	J	**41.6**	J	**27.5**	J	0.5	U	0.5	U	**8.05**	--	**9.04**	--	**6.83**	--
Bromomethane	74-83-9	ug/L	9.8	0.5	100	U	40	U	20	UJ	50	U	100	U	100	U	1	U	1	UJ	10	U	10	U	1	U
Carbon disulfide	75-15-0	ug/L	700	0.5	500	U	200	U	100	U	250	U	500	U	500	U	**0.607**	J	5	U	**4.64**	J	50	U	5	U
Carbon tetrachloride	56-23-5	ug/L	5	0.5	50	U	20	U	10	U	25	U	50	U	50	U	0.5	U	0.5	U	5	U	5	U	0.5	U
Chlorobenzene	108-90-7	ug/L	100	0.5	**45.6**	J	**44.1**	--	**13.7**	--	25	U	50	U	50	U	0.5	U	0.5	U	5	U	5	U	0.5	U
Chloroethane	75-00-3	ug/L	12.1	0.5	**73.5**	J	**66.7**	--	**4.01**	J	**24.7**	J	100	U	100	U	1	U	**2.16**	--	**8.54**	J	10	U	**1.88**	--
Chloroform	67-66-3	ug/L	6	0.5	75	U	30	U	15	U	37.5	U	75	U	75	U	0.75	U	0.75	U	7.5	U	7.5	U	0.75	U
Chloromethane	74-87-3	ug/L	2.7	0.5	250	U	100	U	50	U	125	U	250	U	250	U	2.5	U	2.5	U	25	U	25	U	2.5	U
cis-1,2-Dichloroethene	156-59-2	ug/L	70	0.5	50	U	20	U	**69.2**	J	**14.9**	J	50	U	**64.3**	--	**0.586**	--	**57.1**	J	**2.24**	J	**5.61**	--	**9.79**	--
Ethylbenzene	100-41-4	ug/L	700	0.5	**1210**	--	**1220**	--	**504**	J	**514**	--	**917**	--	**630**	--	0.5	U	3.13	UJ	**59.4**	--	**74.6**	--	**17.5**	--
Hexachlorobutadiene	87-68-3	ug/L	0.45	0.45	60	U	24	U	12	U	30	U	60	U	60	U	0.6	U	0.6	U	6	U	6	U	0.6	U
Methylene chloride	75-09-2	ug/L	5	0.5	500	U	200	U	100	U	250	UJ	500	U	500	U	5	U	**0.766**	J	50	UJ	50	U	**0.476**	J
Naphthalene	91-20-3	ug/L	280	0.5	250	U	100	U	50	U	**31.9**	J	250	U	250	U	2.5	U	2.5	U	25	UJ	25	U	**1.91**	J
Styrene	100-42-5	ug/L	100	0.5	100	U	40	U	20	U	50	U	100	U	100	U	1	U	1	U	**3.82**	J	**7.56**	J	**1.11**	--
Tetrachloroethene	127-18-4	ug/L	5	0.5	50	U	20	U	10	UJ	25	U	50	U	50	U	0.5	U	0.5	UJ	5	U	5	U	0.5	U
Tetrahydrofuran	109-99-9	ug/L	4.6	0.5	**125**	J	**114**	J	**55.1**	J	**43**	J	500	U	**86.1**	J	5	U	**3.04**	J	**24.3**	J	**79.6**	--	**24.6**	--
Toluene	108-88-3	ug/L	1000	0.5	**3900**	--	**3870**	--	1330	UJ	**1800**	--	**4190**	--	**2360**	--	0.75	U	15.8	UJ	**379**	--	**590**	--	**52.3**	--
trans-1,2-Dichloroethene	156-60-5	ug/L	0.5	0.5	75	U	30	U	**4.92**	J	**47.8**	--	75	U	75	U	0.75	U	**1**	--	**134**	--	**172**	--	**5.6**	--
trans-1,3-Dichloropropene	10061-02-6	ug/L	5	0.5	50	U	20	U	10	U	25	U	50	U	50	U	0.5	U	0.5	U	5	U	5	U	0.5	U
Trichloroethene	79-01-6	ug/L	2	0.5	50	U	20	U	10	U	25	U	50	U	50	U	0.5	U	**0.674**	--	5	U	5	U	0.5	U
Vinyl chloride	75-01-4	ug/L	530	0.5	100	U	40	U	**49.7**	J	**8.13**	J	**36.3**	J	**33.5**	J	**0.203**	J	**11.8**	J	**55.5**	--	**1950**	--	**9.02**	--
Xylenes, Total	1330-20-7	ug/L	--	--	**2780**	--	**2870**	--	1100	UJ	**1020**	--	**1990**	--	**1520**	--	1	U	7	UJ	**49.9**	--	**141**	--	**29.4**	--
Halogenated VOCs Total	THVO	ug/L	--	--	**142.8**	--	**131.7**	--	**153.33**	--	**127.43**	--	**81.7**	--	**121.3**	--	**0.789**	--	**80.274**	--	**218.5**	--	**2144.25**	--	**45.026**	--
Non-Halogenated VOCs Total	TNHVO	ug/L	--	--	**7907.5**	--	**7977.5**	--	**3842**	--	**3862.9**	--	**7138.6**	--	**4537.5**	--	0	--	**146.12**	--	**547.05**	--	**866.74**	--	**117.6**	--
Total Volatile Organics L-1 GW	TVO	ug/L	100	0.5	**8175.3**	--	**8223.2**	--	**4050.43**	--	**4033.33**	--	**7220.3**	--	**4744.9**	--	**1.396**	--	**229.434**	--	**794.49**	--	**3090.59**	--	**187.226**	--

Notes:
- **U** = Analyte not detected above the laboratory reporting limit
- **J** = Analyte result is estimated
- **ug/L** = micrograms per liter
- **VOCs** = volatile organic compounds
- **Action Level** = the lower of the USEPA Maximum Contaminant Level (MCL) and the Connecticut Class GA Groundwater Protection Criteria (GWPC)
- **ICL** = Interim Cleanup Level based on Table L-1 from Record of Decision Summary, September 2005
- **Bold** = Analyte detected above the laboratory reporting limit
- **Shaded Cell** = Analyte detected above the Action Level
- **SOB** = Shallow Overburden
- **MOB** = Middle Overburden
- **DOB** = Deep Overburden
- **SBR** = Shallow Bedrock
- **DBR** = Deep Bedrock

Table 5 – Post-Thermal Treatment Groundwater Sample Results – VOCs
Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site
Southington, Connecticut

Sample Location					MW-416		MW-416		MW-416		MW-416		MW-416		MW-902D		MW-902D		MW-902D		MW-902D		MW-902D		MW-902M	
Sample Date					3/18/2015		7/17/2015		10/23/2015		3/11/2016		7/19/2016		3/18/2015		7/17/2015		10/23/2015		3/11/2016		7/19/2016		3/18/2015	
Field Sample ID					MW-416-HS-03182015		MW-416-HS-07172015		MW-416-HS-10232015		MW-416-HS-03112016		MW-416-HS-07192016		MW-902D-HS-03182015		MW-902D-HS-07172015		MW-902D-HS-10232015		MW-902D-HS-03112016		MW-902D-HS-07192016		MW-902M-HS-03182015	
Well Group					N		N		N		N		N		N		N		N		N		N		N	
HydroStratZone(s)					SBR		SBR		SBR		SBR		SBR		DOB		DOB		DOB		DOB		DOB		MOB	
Analyte	**CAS No.**	**Unit**	**Action Level**	**ICL**																						
VOCs																										
1,1,1,2-Tetrachloroethane	630-20-6	ug/L	1	0.5	2.5	U	1.25	U	2.5	U	5	U	0.5	U	10	U	10	U	50	U	12.5	U	25	U	50	U
1,1,1-Trichloroethane	71-55-6	ug/L	200	0.5	**66.9**	--	**45.1**	J	**42**	--	5	U	0.5	U	10	U	10	UJ	50	U	12.5	U	25	U	50	U
1,1,2-Trichloroethane	79-00-5	ug/L	5	0.5	3.75	U	**0.414**	J	3.75	U	7.5	U	0.75	U	15	U	15	U	75	U	18.8	U	37.5	U	75	U
1,1-Dichloroethane	75-34-3	ug/L	70	0.5	**18.5**	--	**14.6**	J	**15.4**	--	**16.6**	--	**10.8**	--	**81.2**	--	**64.2**	J	**27.8**	J	18.8	U	37.5	U	**21.2**	J
1,1-Dichloroethene	75-35-4	ug/L	7	0.5	**38.7**	--	**30.7**	J	**34**	--	**42**	--	**32.3**	--	10	U	10	UJ	50	U	12.5	U	25	U	50	U
1,2,4-Trichlorobenzene	120-82-1	ug/L	70	2	12.5	U	6.25	U	12.5	U	25	U	2.5	U	50	U	50	U	250	U	62.5	U	125	U	250	U
1,2-Dichlorobenzene	95-50-1	ug/L	600	0.5	12.5	U	6.25	U	12.5	U	25	U	2.5	U	50	U	50	U	250	U	62.5	U	125	U	250	U
1,2-Dichloroethane	107-06-2	ug/L	1	0.5	2.5	U	1.25	U	2.5	U	5	U	0.5	U	10	U	10	U	50	U	12.5	U	25	U	50	U
1,4-Dichlorobenzene	106-46-7	ug/L	75	0.5	12.5	U	6.25	U	12.5	U	25	U	2.5	U	50	U	50	U	250	U	62.5	U	125	U	250	U
2-Butanone (MEK)	78-93-3	ug/L	400	5	25	U	12.5	U	25	U	50	U	5	U	205	U	**47.8**	J	**1090**	--	**162**	--	**111**	J	504	U
2-Hexanone	591-78-6	ug/L	140	5	25	U	12.5	U	25	U	50	U	5	U	100	U	100	U	500	U	125	U	250	U	500	U
4-Methyl-2-pentanone (MIBK)	108-10-1	ug/L	350	5	25	U	12.5	U	25	U	50	U	5	U	100	U	100	U	500	U	125	U	250	U	500	U
Acetone	67-64-1	ug/L	700	5	500	UJ	12.5	U	25	UJ	50	U	5	U	20000	UJ	200	UJ	**1720**	J	**189**	--	250	U	10000	UJ
Benzene	71-43-2	ug/L	1	0.5	2.5	U	1.25	U	2.5	U	5	U	**0.373**	J	**9.3**	J	10	U	**21**	J	**31.1**	--	**29.3**	--	**23.4**	J
Bromomethane	74-83-9	ug/L	9.8	0.5	5	U	2.5	UJ	5	U	10	U	1	U	20	U	20	UJ	100	U	25	U	50	U	100	U
Carbon disulfide	75-15-0	ug/L	700	0.5	25	U	12.5	U	**1.87**	J	50	U	5	U	**89.9**	J	**227**	--	**99.6**	J	125	U	250	U	500	U
Carbon tetrachloride	56-23-5	ug/L	5	0.5	2.5	U	1.25	U	2.5	U	5	U	0.5	U	10	U	10	U	50	U	12.5	U	25	U	50	U
Chlorobenzene	108-90-7	ug/L	100	0.5	2.5	U	1.25	U	2.5	U	5	U	0.5	U	10	U	**5.9**	J	**22**	J	12.5	U	25	U	50	U
Chloroethane	75-00-3	ug/L	12.1	0.5	**1.32**	J	2.5	U	5	U	10	U	1	U	**172**	--	**35.4**	--	**537**	--	**63.2**	--	**24.1**	J	**1920**	--
Chloroform	67-66-3	ug/L	6	0.5	3.75	U	1.88	U	3.75	U	7.5	U	**0.319**	J	15	U	15	U	75	U	18.8	U	37.5	U	75	U
Chloromethane	74-87-3	ug/L	2.7	0.5	12.5	U	6.25	U	12.5	U	25	U	2.5	U	50	U	50	U	250	U	62.5	U	125	U	250	U
cis-1,2-Dichloroethene	156-59-2	ug/L	70	0.5	**361**	--	**320**	J	**373**	--	**537**	--	**396**	--	**263**	--	10	UJ	50	U	12.5	U	**12.4**	J	50	U
Ethylbenzene	100-41-4	ug/L	700	0.5	2.5	U	1.25	UJ	2.5	U	5	U	0.5	U	**878**	--	**367**	J	**1570**	--	**691**	--	**446**	--	**2650**	--
Hexachlorobutadiene	87-68-3	ug/L	0.45	0.45	3	U	1.5	U	3	U	6	U	0.6	U	12	U	12	U	60	U	15	U	30	U	60	U
Methylene chloride	75-09-2	ug/L	5	0.5	25	U	12.5	U	25	UJ	50	U	5	U	**6.52**	J	100	U	500	UJ	125	U	**17.1**	J	**38**	J
Naphthalene	91-20-3	ug/L	280	0.5	12.5	U	6.25	U	12.5	UJ	25	U	2.5	U	**8.71**	J	50	U	250	UJ	**23.2**	J	125	U	**26.1**	J
Styrene	100-42-5	ug/L	100	0.5	5	U	2.5	U	5	U	10	U	1	U	20	U	20	U	100	U	**18.2**	J	50	U	100	U
Tetrachloroethene	127-18-4	ug/L	5	0.5	**12.6**	--	**9.92**	J	**10.8**	--	**13.7**	--	**10.8**	--	**7.85**	J	10	UJ	50	U	12.5	U	25	U	50	U
Tetrahydrofuran	109-99-9	ug/L	4.6	0.5	25	U	**7.52**	J	**7.5**	J	50	U	**6.19**	--	**87.7**	J	**77**	J	**179**	J	**85.8**	J	250	U	**139**	J
Toluene	108-88-3	ug/L	1000	0.5	3.75	U	1.88	UJ	3.75	U	7.5	U	0.75	U	**1990**	--	1510	UJ	**5790**	--	**2870**	--	**1560**	--	**6060**	--
trans-1,2-Dichloroethene	156-60-5	ug/L	0.5	0.5	3.75	U	**0.734**	J	3.75	U	7.5	U	0.75	U	**8.54**	J	**5.11**	J	**16.7**	J	**62.4**	--	**18.1**	J	75	U
trans-1,3-Dichloropropene	10061-02-6	ug/L	5	0.5	2.5	U	1.25	U	2.5	U	5	U	0.5	U	10	U	10	U	50	U	12.5	U	25	U	50	U
Trichloroethene	79-01-6	ug/L	2	0.5	**244**	--	**199**	--	**212**	--	**241**	--	**178**	--	10	U	10	U	50	U	12.5	U	25	U	50	U
Vinyl chloride	75-01-4	ug/L	530	0.5	**3.15**	J	**4**	J	**10.7**	--	**20.1**	--	**18**	--	**592**	--	20	UJ	100	U	25	U	50	U	100	U
Xylenes, Total	1330-20-7	ug/L	--	--	5	U	2.5	UJ	5	U	10	U	1	U	**1500**	--	710	UJ	**2520**	--	**1180**	--	**864**	--	**1250**	--
Halogenated VOCs Total	THVO	ug/L	--	--	**746.17**	--	**624.468**	--	**697.9**	--	**870.4**	--	**646.219**	--	**1139.82**	--	**110.61**	--	**603.5**	--	**167**	--	**71.7**	--	**2005.3**	--
Non-Halogenated VOCs Total	TNHVO	ug/L	--	--	0	--	0	--	0	--	0	--	**0.373**	--	**4377.3**	--	**414.8**	--	**12711**	--	**5123.1**	--	**3010.3**	--	**9983.4**	--
Total Volatile Organics L-1 GW	TVO	ug/L	100	0.5	**746.17**	--	**631.988**	--	**707.27**	--	**870.4**	--	**652.782**	--	**5694.72**	--	**829.41**	--	**13593.1**	--	**5375.9**	--	**3082**	--	**12127.7**	--

Notes:
U = Analyte not detected above the laboratory reporting limit
J = Analyte result is estimated
ug/L = micrograms per liter
VOCs = volatile organic compounds
Action Level = the lower of the USEPA Maximum Contaminant Level (MCL)
and the Connecticut Class GA Groundwater Protection Criteria (GWPC)
ICL = Interim Cleanup Level based on Table L-1 from Record of Decision
Summary, September 2005
Bold = Analyte detected above the laboratory reporting limit
Shaded Cell = Analyte detected above the Action Level
SOB = Shallow Overburden
MOB = Middle Overburden
DOB = Deep Overburden
SBR = Shallow Bedrock
DBR = Deep Bedrock

Table 5 – Post-Thermal Treatment Groundwater Sample Results – VOCs
Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site
Southington, Connecticut

Sample Location					MW-902M		MW-902M		MW-902M		MW-902M		MWL-304		MWL-304		MWL-304		MWL-304		MWL-304		MWL-307		MWL-307	
Sample Date					7/17/2015		10/23/2015		3/11/2016		7/19/2016		3/18/2015		7/17/2015		10/22/2015		3/11/2016		7/19/2016		3/18/2015		7/17/2015	
Field Sample ID					MW-902M-HS-07172015		MW-902M-HS-10232015		MW-902M-HS-03112016		MW-902M-HS-07192016		MWL-304-HS-03182015		MWL-304-HS-07172015		MWL-304-HS-10222015		MWL-304-HS-03112016		MWL-304-HS-07192016		MWL-307-HS-03182015		MWL-307-HS-07172015	
Well Group					N		N		N		N		N		N		N		N		N		N		N	
HydroStratZone(s)					MOB		MOB		MOB		MOB		SOB		SOB		SOB		SOB		SOB		SOB		SOB	
Analyte	**CAS No.**	**Unit**	**Action Level**	**ICL**																						
VOCs																										
1,1,1,2-Tetrachloroethane	630-20-6	ug/L	1	0.5	20	U	25	U	2.5	U	0.5	U	0.5	U	1.25	U	5	U	1	U	0.5	U	0.5	U	2.5	U
1,1,1-Trichloroethane	71-55-6	ug/L	200	0.5	20	UJ	25	U	2.5	U	0.5	U	0.5	U	**7.35**	J	5	U	1	U	0.5	U	**1.08**	--	2.5	UJ
1,1,2-Trichloroethane	79-00-5	ug/L	5	0.5	30	U	37.5	U	3.75	U	0.75	U	0.75	U	1.88	U	7.5	U	1.5	U	**0.842**	--	0.75	U	3.75	U
1,1-Dichloroethane	75-34-3	ug/L	70	0.5	**26.1**	J	**12.9**	J	3.75	U	**1.6**	--	**13.3**	--	**88.5**	J	**31.5**	--	**13.6**	--	**10.7**	--	**4.2**	--	**2.91**	J
1,1-Dichloroethene	75-35-4	ug/L	7	0.5	20	UJ	25	U	2.5	U	0.5	U	**1.29**	--	1.25	UJ	5	UJ	1	U	**1.61**	--	0.5	U	2.5	UJ
1,2,4-Trichlorobenzene	120-82-1	ug/L	70	2	100	U	125	U	12.5	U	**0.436**	J	2.5	U	6.25	U	25	U	**1.02**	J	**0.705**	J	2.5	U	12.5	U
1,2-Dichlorobenzene	95-50-1	ug/L	600	0.5	100	U	125	U	12.5	U	**0.557**	J	2.5	U	**1.18**	J	**2.6**	J	**2.16**	J	**1.04**	J	2.5	U	12.5	U
1,2-Dichloroethane	107-06-2	ug/L	1	0.5	20	U	25	U	2.5	U	0.5	U	0.5	U	1.25	U	5	U	1	U	0.5	U	0.5	U	2.5	U
1,4-Dichlorobenzene	106-46-7	ug/L	75	0.5	100	U	125	U	12.5	U	**0.228**	J	2.5	U	6.25	U	25	U	**0.861**	J	**0.504**	J	2.5	U	12.5	U
2-Butanone (MEK)	78-93-3	ug/L	400	5	200	U	250	U	25	U	5	U	5	U	12.5	U	50	U	10	U	5	U	5	U	**113**	J
2-Hexanone	591-78-6	ug/L	140	5	200	U	250	U	25	U	5	U	5	U	12.5	U	50	U	10	U	5	U	5	U	**21.6**	J
4-Methyl-2-pentanone (MIBK)	108-10-1	ug/L	350	5	200	U	250	U	25	U	5	U	5	U	12.5	U	50	U	10	U	5	U	5	U	**257**	J
Acetone	67-64-1	ug/L	700	5	200	U	**74**	J	25	U	5	U	100	UJ	16.2	UJ	**21.4**	J	**4.45**	J	**7**	--	100	UJ	133	U
Benzene	71-43-2	ug/L	1	0.5	20	U	**15.6**	J	**9.99**	--	**4.25**	--	**3.31**	--	26.2	U	**35.5**	--	**43.7**	--	**17.7**	--	**0.169**	J	5.49	U
Bromomethane	74-83-9	ug/L	9.8	0.5	40	UJ	50	U	5	U	1	U	1	U	2.5	UJ	10	UJ	2	U	1	U	1	U	5	UJ
Carbon disulfide	75-15-0	ug/L	700	0.5	200	U	250	U	25	U	5	U	5	U	**4.11**	J	50	UJ	10	U	5	U	**2.06**	J	25	U
Carbon tetrachloride	56-23-5	ug/L	5	0.5	20	U	25	U	2.5	U	0.5	U	0.5	U	1.25	U	5	U	1	U	0.5	U	0.5	U	2.5	U
Chlorobenzene	108-90-7	ug/L	100	0.5	20	U	25	U	2.5	U	**1.24**	--	0.5	U	1.25	U	**2.81**	J	1	U	0.5	U	0.5	U	2.5	U
Chloroethane	75-00-3	ug/L	12.1	0.5	**1970**	--	**1640**	--	**601**	--	**86.2**	--	1	U	2.5	U	**27.2**	--	**33.4**	--	1	U	**1.12**	--	**5.59**	--
Chloroform	67-66-3	ug/L	6	0.5	30	U	37.5	U	3.75	U	0.75	U	0.75	U	1.88	U	7.5	U	1.5	U	0.75	U	0.75	U	3.75	U
Chloromethane	74-87-3	ug/L	2.7	0.5	100	U	125	U	12.5	U	2.5	U	2.5	U	6.25	U	25	U	5	U	2.5	U	2.5	U	12.5	U
cis-1,2-Dichloroethene	156-59-2	ug/L	70	0.5	**15.2**	J	25	U	2.5	U	**2.07**	--	**209**	--	**22**	J	**2.48**	J	1	U	**389**	--	**17.5**	--	**55.3**	J
Ethylbenzene	100-41-4	ug/L	700	0.5	**1620**	J	**942**	--	**504**	--	**49.1**	--	**0.323**	J	**161**	J	**217**	--	**352**	--	**124**	--	**12.4**	--	47.5	UJ
Hexachlorobutadiene	87-68-3	ug/L	0.45	0.45	24	U	30	U	3	U	0.6	U	0.6	U	1.5	U	6	U	1.2	U	0.6	U	0.6	U	3	U
Methylene chloride	75-09-2	ug/L	5	0.5	**41.6**	J	250	UJ	**7.41**	J	**0.895**	J	5	U	12.5	U	50	U	10	U	**0.307**	J	5	U	25	U
Naphthalene	91-20-3	ug/L	280	0.5	100	U	125	UJ	**8.23**	J	**3.75**	--	2.5	U	6.25	U	25	U	**2.73**	J	**2.67**	--	**0.377**	J	12.5	U
Styrene	100-42-5	ug/L	100	0.5	40	U	50	U	5	U	1	U	1	U	2.5	U	10	U	2	U	1	U	1	U	**2.23**	J
Tetrachloroethene	127-18-4	ug/L	5	0.5	20	UJ	25	U	2.5	U	0.5	U	**0.412**	J	1.25	UJ	5	U	1	U	0.5	U	**0.477**	J	2.5	UJ
Tetrahydrofuran	109-99-9	ug/L	4.6	0.5	**133**	J	**109**	J	**48.6**	--	**21.5**	--	**3.65**	J	**12.8**	--	**9.87**	J	**12.3**	--	**10.7**	--	**1.29**	J	**106**	J
Toluene	108-88-3	ug/L	1000	0.5	3890	UJ	**2810**	--	**29.3**	--	**13.8**	--	**6.1**	--	**333**	J	**800**	--	**95.4**	--	**146**	--	**52.1**	--	267	UJ
trans-1,2-Dichloroethene	156-60-5	ug/L	0.5	0.5	30	U	37.5	U	**5.77**	--	**2.27**	--	**3.01**	--	**5.26**	--	7.5	U	**0.948**	J	**1.62**	--	**2.85**	--	**3.07**	J
trans-1,3-Dichloropropene	10061-02-6	ug/L	5	0.5	20	U	25	U	2.5	U	0.5	U	0.5	U	1.25	U	5	U	1	U	0.5	U	0.5	U	2.5	U
Trichloroethene	79-01-6	ug/L	2	0.5	20	U	25	U	2.5	U	0.5	U	**0.353**	J	**1.18**	J	5	U	1	U	0.5	U	**0.288**	J	2.5	U
Vinyl chloride	75-01-4	ug/L	530	0.5	**22.9**	J	**17**	J	5	U	**3.51**	--	**224**	--	**106**	J	10	U	2	U	**563**	--	**3.44**	--	**74.6**	J
Xylenes, Total	1330-20-7	ug/L	--	--	1030	UJ	**696**	--	**494**	--	**76.9**	--	**4.24**	--	193	UJ	**388**	--	**640**	--	**234**	--	**40.7**	--	42.8	UJ
Halogenated VOCs Total	THVO	ug/L	--	--	**2075.8**	--	**1669.9**	--	**622.41**	--	**102.756**	--	**451.365**	--	**231.47**	--	**66.59**	--	**54.719**	--	**971.998**	--	**31.332**	--	**143.7**	--
Non-Halogenated VOCs Total	TNHVO	ug/L	--	--	**1620**	--	**4537.6**	--	**1037.29**	--	**144.05**	--	**13.973**	--	**494**	--	**1461.9**	--	**1135.55**	--	**528.7**	--	**105.369**	--	**391.6**	--
Total Volatile Organics L-1 GW	TVO	ug/L	100	0.5	**3828.8**	--	**6316.5**	--	**1708.3**	--	**268.306**	--	**468.988**	--	**742.38**	--	**1542.01**	--	**1202.569**	--	**1511.398**	--	**140.051**	--	**641.3**	--

Notes:
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- **J** = Analyte result is estimated
- **ug/L** = micrograms per liter
- **VOCs** = volatile organic compounds
- **Action Level** = the lower of the USEPA Maximum Contaminant Level (MCL) and the Connecticut Class GA Groundwater Protection Criteria (GWPC)
- **ICL** = Interim Cleanup Level based on Table L-1 from Record of Decision Summary, September 2005
- **Bold** = Analyte detected above the laboratory reporting limit
- **Shaded Cell** = Analyte detected above the Action Level
- **SOB** = Shallow Overburden
- **MOB** = Middle Overburden
- **DOB** = Deep Overburden
- **SBR** = Shallow Bedrock
- **DBR** = Deep Bedrock

Table 5 – Post-Thermal Treatment Groundwater Sample Results – VOCs
Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site
Southington, Connecticut

				Sample Location	MWL-307		MWL-307		MWL-307		TW-08A		TW-08A		TW-08A		TW-08A		TW-08A		TW-08B		TW-08B		TW-08B	
				Sample Date	10/23/2015		3/11/2016		7/19/2016		3/18/2015		7/17/2015		10/22/2015		3/11/2016		7/19/2016		3/18/2015		7/17/2015		10/22/2015	
				Field Sample ID	MWL-307-HS-10232015		MWL-307-HS-03112016		MWL-307-HS-07192016		TW-08A-HS-03182015		TW-08A-HS-07172015		TW-08A-HS-10222015		TW-08A-HS-03112016		TW-08A-HS-07192016		TW-08B-HS-03182015		TW-08B-HS-07172015		DUP-1-10222015	
				Well Group	N		N		N		N		N		N		N		N		N		N		N	
				HydroStratZone(s)	SOB		SOB		SOB		MOB		MOB		MOB		MOB		MOB		SBR		SBR		SBR	
Analyte	**CAS No.**	**Unit**	**Action Level**	**ICL**																						
VOCs																										
1,1,1,2-Tetrachloroethane	630-20-6	ug/L	1	0.5	2.5	U	12.5	U	10	U	0.5	U	20	U	10	U	100	U	25	U	500	U	1000	U	2500	U
1,1,1-Trichloroethane	71-55-6	ug/L	200	0.5	2.5	U	12.5	U	10	U	0.5	U	20	UJ	10	U	100	U	25	U	500	U	**4000**	J	2500	U
1,1,2-Trichloroethane	79-00-5	ug/L	5	0.5	3.75	U	18.8	U	15	U	0.75	U	30	U	15	U	150	U	37.5	U	750	U	1500	U	3750	U
1,1-Dichloroethane	75-34-3	ug/L	70	0.5	**6.06**	--	**17.3**	J	**7.55**	J	0.75	U	30	UJ	15	U	**92.1**	J	**57**	--	750	U	**2280**	J	3750	U
1,1-Dichloroethene	75-35-4	ug/L	7	0.5	2.5	U	12.5	U	10	U	**0.407**	J	**38.6**	J	**120**	--	**142**	--	25	U	**2330**	--	**1830**	J	2500	UJ
1,2,4-Trichlorobenzene	120-82-1	ug/L	70	2	**2.33**	J	62.5	U	50	U	**0.58**	J	100	U	50	U	500	U	125	U	2500	U	5000	U	12500	U
1,2-Dichlorobenzene	95-50-1	ug/L	600	0.5	12.5	U	62.5	U	50	U	2.5	U	100	U	50	U	500	U	125	U	2500	U	5000	U	12500	U
1,2-Dichloroethane	107-06-2	ug/L	1	0.5	2.5	U	12.5	U	10	U	0.5	U	20	U	10	U	100	U	25	U	500	U	1000	U	2500	U
1,4-Dichlorobenzene	106-46-7	ug/L	75	0.5	12.5	U	62.5	U	50	U	2.5	U	100	U	50	U	500	U	125	U	2500	U	5000	U	12500	U
2-Butanone (MEK)	78-93-3	ug/L	400	5	**121**	--	**52.8**	J	100	U	52	U	**1600**	J	**399**	--	1000	U	250	U	6890	U	10000	U	25000	U
2-Hexanone	591-78-6	ug/L	140	5	**8.43**	J	125	U	100	U	5	U	200	U	100	U	1000	U	250	U	5000	U	10000	U	25000	U
4-Methyl-2-pentanone (MIBK)	108-10-1	ug/L	350	5	**279**	--	125	U	100	U	**19.5**	--	**240**	J	**277**	--	1000	U	250	U	5000	U	10000	U	25000	U
Acetone	67-64-1	ug/L	700	5	**277**	J	**108**	J	100	U	100	UJ	2050	UJ	564	U	1000	U	250	U	100000	UJ	10000	U	25000	U
Benzene	71-43-2	ug/L	1	0.5	**13.6**	--	**35.6**	--	**24.8**	--	**1.07**	--	20	U	**26.7**	--	100	U	**42.2**	--	**497**	J	1000	U	2500	U
Bromomethane	74-83-9	ug/L	9.8	0.5	5	U	25	U	20	U	1	U	40	UJ	20	UJ	200	U	50	U	1000	U	2000	UJ	5000	UJ
Carbon disulfide	75-15-0	ug/L	700	0.5	**38.3**	--	125	U	100	U	5	U	**27.3**	J	**23**	J	1000	U	250	U	5000	U	10000	U	25000	UJ
Carbon tetrachloride	56-23-5	ug/L	5	0.5	2.5	U	12.5	U	10	U	0.5	U	20	U	10	U	100	U	25	U	500	U	1000	U	2500	U
Chlorobenzene	108-90-7	ug/L	100	0.5	2.5	U	12.5	U	10	U	**0.294**	J	20	U	10	U	100	U	25	U	500	U	1000	U	2500	U
Chloroethane	75-00-3	ug/L	12.1	0.5	**20.1**	--	25	U	20	U	1	U	40	U	20	U	200	U	50	U	**890**	J	**558**	J	5000	U
Chloroform	67-66-3	ug/L	6	0.5	3.75	U	18.8	U	15	U	0.75	U	30	U	15	U	150	U	37.5	U	750	U	1500	U	3750	U
Chloromethane	74-87-3	ug/L	2.7	0.5	12.5	U	62.5	U	50	U	2.5	U	100	U	50	U	500	U	125	U	2500	U	5000	U	12500	U
cis-1,2-Dichloroethene	156-59-2	ug/L	70	0.5	**2.93**	--	12.5	U	**5.18**	J	**34.8**	--	**3330**	J	**6840**	--	**7850**	--	25	U	**381000**	--	**289000**	J	**289000**	--
Ethylbenzene	100-41-4	ug/L	700	0.5	**129**	--	**353**	--	**148**	--	**25.3**	--	178	UJ	**503**	--	**1000**	--	**802**	--	**3990**	--	3140	UJ	**3640**	--
Hexachlorobutadiene	87-68-3	ug/L	0.45	0.45	3	U	15	U	12	U	0.6	U	24	U	12	U	120	U	30	U	600	U	1200	U	3000	U
Methylene chloride	75-09-2	ug/L	5	0.5	25	UJ	125	U	100	U	5	U	200	U	100	U	1000	U	250	U	**917**	J	**872**	J	25000	U
Naphthalene	91-20-3	ug/L	280	0.5	**6.87**	J	**9.67**	J	50	U	**1.29**	J	100	U	**15.2**	J	500	U	125	U	2500	U	5000	U	12500	U
Styrene	100-42-5	ug/L	100	0.5	**5.69**	--	**38.5**	--	**9.73**	J	**1.93**	--	**16.7**	J	**30.1**	--	**109**	J	**37.5**	J	**390**	J	2000	U	5000	U
Tetrachloroethene	127-18-4	ug/L	5	0.5	2.5	U	12.5	U	10	U	**0.424**	J	20	UJ	10	U	100	U	25	U	**7200**	--	**6120**	J	**6630**	--
Tetrahydrofuran	109-99-9	ug/L	4.6	0.5	**69.4**	--	**126**	--	**58.4**	J	**3.88**	J	**61.8**	J	100	U	1000	U	**67**	J	5000	U	10000	U	25000	U
Toluene	108-88-3	ug/L	1000	0.5	**448**	--	**1890**	--	**616**	--	**54.5**	--	1000	UJ	**2700**	--	**4060**	--	**3430**	--	**44900**	--	38300	UJ	**40000**	--
trans-1,2-Dichloroethene	156-60-5	ug/L	0.5	0.5	**62.4**	--	**170**	--	**18.3**	--	**0.362**	J	**63.2**	--	**805**	--	**458**	--	**42.2**	--	750	U	1500	U	3750	U
trans-1,3-Dichloropropene	10061-02-6	ug/L	5	0.5	2.5	U	12.5	U	10	U	0.5	U	20	U	10	U	100	U	25	U	500	U	1000	U	2500	U
Trichloroethene	79-01-6	ug/L	2	0.5	2.5	U	12.5	U	10	U	**1.86**	--	20	U	10	U	100	U	25	U	**159000**	--	**136000**	--	**165000**	--
Vinyl chloride	75-01-4	ug/L	530	0.5	**2.42**	J	**432**	--	20	U	**76.8**	--	**472**	J	**740**	--	**11800**	--	**8880**	--	**16000**	--	**12000**	J	**12200**	--
Xylenes, Total	1330-20-7	ug/L	--	--	**173**	--	**779**	--	**306**	--	**19.4**	--	423	UJ	**1100**	--	**2130**	--	**1800**	--	**9030**	--	7560	UJ	**8710**	J
Halogenated VOCs Total	THVO	ug/L	--	--	**108.8**	--	**667.47**	--	**40.76**	--	**118.747**	--	**3920.5**	--	**8550.3**	--	**20451.1**	--	**9016.7**	--	**567727**	--	**452660**	--	**472830**	--
Non-Halogenated VOCs Total	TNHVO	ug/L	--	--	**1449.03**	--	**3218.4**	--	**1094.8**	--	**119.77**	--	**1840**	--	**5005.7**	--	**7190**	--	**6074.2**	--	**58417**	--	0	--	**52350**	--
Total Volatile Organics L-1 GW	TVO	ug/L	100	0.5	**1665.53**	--	**4011.87**	--	**1193.96**	--	**242.397**	--	**5849.6**	--	**14143**	--	**27641.1**	--	**15157.9**	--	**626144**	--	**452660**	--	**527090**	--

Notes:

U = Analyte not detected above the laboratory reporting limit
J = Analyte result is estimated
ug/L = micrograms per liter
VOCs = volatile organic compounds
Action Level = the lower of the USEPA Maximum Contaminant Level (MCL) and the Connecticut Class GA Groundwater Protection Criteria (GWPC)
ICL = Interim Cleanup Level based on Table L-1 from Record of Decision Summary, September 2005
Bold = Analyte detected above the laboratory reporting limit
Shaded Cell = Analyte detected above the Action Level
SOB = Shallow Overburden
MOB = Middle Overburden
DOB = Deep Overburden
SBR = Shallow Bedrock
DBR = Deep Bedrock

Table 5 – Post-Thermal Treatment Groundwater Sample Results – VOCs
Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site
Southington, Connecticut

Sample Location					TW-08B		TW-08B		TW-08B		TW-08B		TW-08B		TW-08D		TW-08D		TW-08D		TW-08D		TW-08D		TW-08D	
Sample Date					10/22/2015		3/11/2016		3/11/2016		7/20/2016		7/20/2016		3/18/2015		7/17/2015		7/17/2015		10/22/2015		3/11/2016		7/19/2016	
Field Sample ID					TW-08B-10222015		DUP-GW-03112016		TW-08B-03112016		DUP-07202016-#1		TW-08B-HS-07202016		TW-08D-HS-03182015		DUP-GW-07172015		TW-08D-HS-07172015		TW-08D-HS-10222015		TW-08D-HS-03112016		TW-08D-HS-07192016	
Well Group					N		N		N		N		N		N		N		N		N		N		N	
HydroStratZone(s)					SBR		SBR		SBR		SBR		SBR		DOB		DOB		DOB		DOB		DOB		DOB	
Analyte	**CAS No.**	**Unit**	**Action Level**	**ICL**																						
VOCs																										
1,1,1,2-Tetrachloroethane	630-20-6	ug/L	1	0.5	2500	U	1000	U	1000	U	5000	U	5000	U	250	U	25	U	250	U	500	U	500	U	50	U
1,1,1-Trichloroethane	71-55-6	ug/L	200	0.5	2500	U	1000	U	1000	U	5000	U	5000	U	250	U	25	UJ	**894**	J	500	U	500	U	50	U
1,1,2-Trichloroethane	79-00-5	ug/L	5	0.5	3750	U	1500	U	1500	U	7500	U	7500	U	375	U	37.5	U	375	U	750	U	750	U	75	U
1,1-Dichloroethane	75-34-3	ug/L	70	0.5	3750	U	1500	U	1500	U	7500	U	7500	U	375	U	**103**	J	**407**	J	750	U	750	U	**695**	--
1,1-Dichloroethene	75-35-4	ug/L	7	0.5	2500	UJ	**2840**	--	**2620**	--	5000	U	**2480**	J	**640**	--	**60.7**	J	**261**	J	**1290**	J	**546**	--	**682**	--
1,2,4-Trichlorobenzene	120-82-1	ug/L	70	2	12500	U	5000	U	5000	U	25000	U	25000	U	1250	U	125	U	1250	U	2500	U	2500	U	250	U
1,2-Dichlorobenzene	95-50-1	ug/L	600	0.5	12500	U	5000	U	5000	U	25000	U	25000	U	1250	U	125	U	1250	U	2500	U	2500	U	250	U
1,2-Dichloroethane	107-06-2	ug/L	1	0.5	2500	U	1000	U	1000	U	5000	U	5000	U	250	U	25	U	250	U	500	U	500	U	50	U
1,4-Dichlorobenzene	106-46-7	ug/L	75	0.5	12500	U	5000	U	5000	U	25000	U	25000	U	1250	U	125	U	1250	U	2500	U	2500	U	250	U
2-Butanone (MEK)	78-93-3	ug/L	400	5	25000	U	10000	U	10000	U	50000	U	50000	U	2500	U	250	U	2500	U	5000	U	5000	U	500	U
2-Hexanone	591-78-6	ug/L	140	5	25000	U	10000	U	10000	U	50000	U	50000	U	2500	U	250	U	2500	U	5000	U	5000	U	500	U
4-Methyl-2-pentanone (MIBK)	108-10-1	ug/L	350	5	25000	U	10000	U	10000	U	50000	U	50000	U	2500	U	250	U	2500	U	5000	U	5000	U	500	U
Acetone	67-64-1	ug/L	700	5	25000	U	10000	U	10000	U	50000	U	**20400**	J	50000	UJ	250	U	2500	U	5000	U	5000	U	500	U
Benzene	71-43-2	ug/L	1	0.5	2500	U	1000	U	1000	U	5000	U	5000	U	**79.9**	J	25	U	250	U	**174**	J	500	U	**25.5**	J
Bromomethane	74-83-9	ug/L	9.8	0.5	5000	UJ	2000	U	2000	U	10000	U	10000	U	500	U	50	UJ	**156**	J	1000	UJ	1000	U	100	U
Carbon disulfide	75-15-0	ug/L	700	0.5	25000	UJ	10000	U	10000	U	50000	U	50000	U	2500	U	250	U	2500	U	5000	UJ	5000	U	500	U
Carbon tetrachloride	56-23-5	ug/L	5	0.5	2500	U	1000	U	1000	U	5000	U	5000	U	250	U	25	U	250	U	500	U	500	U	50	U
Chlorobenzene	108-90-7	ug/L	100	0.5	2500	U	1000	U	1000	U	5000	U	5000	U	250	U	25	U	250	U	500	U	500	U	50	U
Chloroethane	75-00-3	ug/L	12.1	0.5	5000	U	2000	U	2000	U	10000	U	10000	U	500	U	50	U	500	U	1000	U	1000	U	100	U
Chloroform	67-66-3	ug/L	6	0.5	3750	U	1500	U	1500	U	7500	U	7500	U	375	U	37.5	U	375	U	750	U	750	U	75	U
Chloromethane	74-87-3	ug/L	2.7	0.5	12500	U	5000	U	5000	U	25000	U	25000	U	1250	U	125	U	1250	U	2500	U	2500	U	250	U
cis-1,2-Dichloroethene	156-59-2	ug/L	70	0.5	**299000**	--	**326000**	--	**309000**	--	**342000**	--	**303000**	--	**80600**	--	**7360**	J	**32300**	J	**86100**	--	**34500**	--	**25000**	--
Ethylbenzene	100-41-4	ug/L	700	0.5	**3760**	--	**4110**	--	**4050**	--	**2480**	J	**2840**	J	**3440**	--	123	UJ	1740	UJ	**3610**	--	**2310**	--	**1510**	--
Hexachlorobutadiene	87-68-3	ug/L	0.45	0.45	3000	U	1200	U	1200	U	6000	U	6000	U	300	U	30	U	300	U	600	U	600	U	60	U
Methylene chloride	75-09-2	ug/L	5	0.5	25000	U	**1060**	J	**1070**	J	50000	U	50000	U	2500	U	250	U	2500	U	5000	U	5000	U	**31.7**	J
Naphthalene	91-20-3	ug/L	280	0.5	12500	U	5000	U	5000	U	25000	U	25000	U	1250	U	125	U	1250	U	2500	U	2500	U	250	U
Styrene	100-42-5	ug/L	100	0.5	5000	U	**1100**	J	**1070**	J	10000	U	10000	U	500	U	50	U	500	U	1000	U	1000	U	100	U
Tetrachloroethene	127-18-4	ug/L	5	0.5	**7270**	--	**8600**	--	**7440**	--	**4900**	J	**3840**	J	**201**	J	**28.9**	J	**198**	J	500	U	500	U	50	U
Tetrahydrofuran	109-99-9	ug/L	4.6	0.5	25000	U	10000	U	10000	U	50000	U	50000	U	2500	U	250	U	2500	U	5000	U	5000	U	500	U
Toluene	108-88-3	ug/L	1000	0.5	**41000**	--	**46200**	--	**42900**	--	**36700**	--	**33800**	--	**15200**	--	652	UJ	7490	UJ	**21600**	--	**7510**	--	**5840**	--
trans-1,2-Dichloroethene	156-60-5	ug/L	0.5	0.5	3750	U	1500	U	1500	U	7500	U	7500	U	375	U	37.5	U	375	U	750	U	750	U	75	U
trans-1,3-Dichloropropene	10061-02-6	ug/L	5	0.5	2500	U	1000	U	1000	U	5000	U	5000	U	250	U	25	U	250	U	500	U	500	U	50	U
Trichloroethene	79-01-6	ug/L	2	0.5	**172000**	--	**205000**	--	**178000**	--	**138000**	--	**130000**	--	250	U	25	U	250	U	**427**	J	500	U	50	U
Vinyl chloride	75-01-4	ug/L	530	0.5	**12800**	--	**11000**	--	**11200**	--	**9280**	J	**10400**	--	**3140**	--	**185**	J	**1100**	J	**9100**	--	**710**	J	**1960**	--
Xylenes, Total	1330-20-7	ug/L	--	--	**8910**	J	**9390**	--	**9400**	--	**3890**	J	**13800**	J	**7930**	--	304	UJ	4170	UJ	**9050**	--	**4470**	--	**2910**	--
Halogenated VOCs Total	THVO	ug/L	--	--	**491070**	--	**555600**	--	**510400**	--	**494180**	--	**449720**	--	**84581**	--	**7737.6**	--	**35316**	--	**96917**	--	**35756**	--	**28368.7**	--
Non-Halogenated VOCs Total	TNHVO	ug/L	--	--	**53670**	--	**59700**	--	**56350**	--	**43070**	--	**70840**	--	**26649.9**	--	0	--	0	--	**34434**	--	**14290**	--	**10285.5**	--
Total Volatile Organics L-1 GW	TVO	ug/L	100	0.5	**544740**	--	**615300**	--	**566750**	--	**537250**	--	**520560**	--	**111230.9**	--	**7737.6**	--	**35316**	--	**131351**	--	**50046**	--	**38654.2**	--

Notes:

U = Analyte not detected above the laboratory reporting limit
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ug/L = micrograms per liter
VOCs = volatile organic compounds
Action Level = the lower of the USEPA Maximum Contaminant Level (MCL)
and the Connecticut Class GA Groundwater Protection Criteria (GWPC)
ICL = Interim Cleanup Level based on Table L-1 from Record of Decision
Summary, September 2005
Bold = Analyte detected above the laboratory reporting limit
Shaded Cell = Analyte detected above the Action Level
SOB = Shallow Overburden
MOB = Middle Overburden
DOB = Deep Overburden
SBR = Shallow Bedrock
DBR = Deep Bedrock

Table 6 – Post-Thermal Treatment Groundwater Sample Results – MNA Parameters
Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site
Southington, Connecticut

		Sample Location	MW-413		MW-413		MW-413		MW-413		MW-413		MW-413		MW-415		MW-415		MW-415		MW-415		MW-415	
		Sample Date	3/18/2015 0:00		3/18/2015 14:30		7/17/2015 11:10		11/23/2015 10:00		3/11/2016 11:50		7/19/2016 10:45		3/18/2015 14:45		7/17/2015 11:45		11/23/2015 10:15		3/11/2016 12:10		7/19/2016 11:15	
		Field Sample ID	DUPLICATE-GW-03182015		MW-413-HS-03182015		MW-413-HS-07172015		MW-413-HS-11232015		MW-413-HS-03112016		MW-413-HS-07192016		MW-415-HS-03182015		MW-415-HS-07172015		MW-415-HS-11232015		MW-415-HS-03112016		MW-415-HS-07192016	
		Well Group	N		N		N		N		N		N		N		N		N		N		N	
		HydroStratZone(s)	DOB		DOB		DOB		DOB		DOB		DOB		MOB		MOB		MOB		MOB		MOB	
Analyte	**CAS No.**	**Unit**																						
MNA																								
Alkalinity	ALK	mg/L	**345**	J	**345**	J	**438**	--	**291**	--	**276**	--	**373**	--	**27.8**	J	**63.2**	--	**266**	--	**426**	--	**479**	--
Chloride	16887-00-6	mg/L	**84.1**	--	**81.2**	--	**740**	--	**219**	--	**349**	--	**629**	--	**1.22**	--	**225**	--	**129**	--	**439**	--	**262**	--
Iron (Dissolved)	7439-89-6	ug/L	**37**	J	**71000**	--	**180000**	--	**62000**	J	**72000**	--	**92000**	--	**34**	J	**22000**	J	**13000**	J	**19000**	--	**4600**	--
Manganese (Dissolved)	7439-96-5	ug/L	**282**	--	**15200**	--	**39700**	J	**11400**	J	**14800**	--	**19600**	--	**284**	--	**4160**	J	**2080**	J	**3660**	--	**5170**	--
Nitrate as N	14797-55-8	mg/L	0.5	UJ	0.5	UJ	0.1	U	0.1	U	**0.139**	--	**0.115**	--	**0.142**	J	0.04	U	0.1	U	**0.052**	J	0.1	U
Nitrite as N	14797-65-0	mg/L	**0.097**	--	**0.114**	--	**0.148**	--	**0.053**	--	**0.068**	--	**0.065**	--	0.05	U	**0.07**	--	**0.021**	J	**0.017**	J	0.05	U
Sulfate	14808-79-8	mg/L	**0.207**	J	**0.099**	J	**3.54**	--	**2.97**	--	**0.09**	J	1	U	**7.09**	--	**33.6**	--	**26.2**	--	**6.54**	--	**1.02**	--
Total Organic Carbon	TOC	mg/L	**220**	J	**220**	J	**490**	J	**87**	J	**54**	--	**95**	--	**1.4**	J	**16**	J	**46**	J	**100**	--	**63**	--
Ethane	74-84-0	ug/L	**200**	--	**230**	--	**220**	--	**680**	--	**1600**	--	**2500**	--	0.015	U	**0.11**	J	**18**	--	**100**	--	**230**	--
Ethene	74-85-1	ug/L	**1900**	J	**2200**	J	**140**	--	**2.3**	--	**2600**	--	**1**	--	0.054	U	**4.8**	--	**91**	--	**340**	--	**3.2**	--
Methane	74-82-8	ug/L	**2000**	--	**2300**	--	**3000**	J	**14000**	--	**21000**	--	**13000**	--	0.3	UJ	**42**	J	**1200**	--	**4300**	--	**4500**	--

Notes:

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mg/L = milligrams per liter
Bold = Analyte detected above the laboratory reporting limit
SOB = Shallow Overburden
MOB = Middle Overburden
DOB = Deep Overburden
SBR = Shallow Bedrock
DBR = Deep Bedrock

Table 6 – Post-Thermal Treatment Groundwater Sample Results – MNA Parameters
Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site
Southington, Connecticut

		Sample Location	MW-416		MW-416		MW-416		MW-416		MW-416		MW-902D		MW-902D		MW-902D		MW-902D		MW-902D		MW-902M	
		Sample Date	3/18/2015 15:12		7/17/2015 14:17		11/23/2015 11:15		3/11/2016 14:30		7/19/2016 8:50		3/18/2015 15:43		7/17/2015 13:40		11/23/2015 11:00		3/11/2016 13:45		7/19/2016 12:45		3/18/2015 16:03	
		Field Sample ID	MW-416-HS-03182015		MW-416-HS-07172015		MW-416-HS-11232015		MW-416-HS-03112016		MW-416-HS-07192016		MW-902D-HS-03182015		MW-902D-HS-07172015		MW-902D-HS-11232015		MW-902D-HS-03112016		MW-902D-HS-07192016		MW-902M-HS-03182015	
		Well Group	N		N		N		N		N		N		N		N		N		N		N	
		HydroStratZone(s)	SBR		SBR		SBR		SBR		SBR		DOB		DOB		DOB		DOB		DOB		MOB	
Analyte	**CAS No.**	**Unit**																						
MNA																								
Alkalinity	ALK	mg/L	**107**	J	**112**	--	**108**	--	**104**	--	**110**	--	**168**	J	**173**	--	**433**	--	**381**	--	**459**	--	**321**	J
Chloride	16887-00-6	mg/L	**11.5**	--	**15.1**	--	**15.3**	--	**12.6**	--	**16.7**	--	**74.3**	--	**65**	--	**776**	--	**656**	--	**682**	--	**151**	--
Iron (Dissolved)	7439-89-6	ug/L	**38**	J	**100**	--	**32**	J	50	U	**300**	--	**37000**	--	**36000**	--	**210000**	J	**150000**	--	**140000**	--	**48000**	--
Manganese (Dissolved)	7439-96-5	ug/L	**7.8**	J	**29.7**	--	17.9	UJ	**4.3**	J	**145**	--	**7040**	--	**5940**	--	**33400**	J	**23800**	--	**24700**	--	**9880**	--
Nitrate as N	14797-55-8	mg/L	**0.554**	J	**0.675**	--	**0.64**	--	**0.659**	--	**0.775**	--	0.5	UJ	0.1	U	0.1	U	**0.077**	J	0.1	U	0.5	UJ
Nitrite as N	14797-65-0	mg/L	0.05	U	0.05	U	**0.026**	J	0.05	U	0.05	U	0.072	U	0.057	U	**0.154**	--	**0.127**	--	**0.106**	--	**0.09**	--
Sulfate	14808-79-8	mg/L	**97.6**	--	**85**	--	**90.7**	--	**80.4**	--	**73.4**	--	**0.529**	J	**30.2**	--	**4.63**	--	**0.054**	J	1	U	1	U
Total Organic Carbon	TOC	mg/L	**1.9**	J	1.4	UJ	**0.8**	J	**0.81**	J	**0.8**	J	**56**	J	**64**	J	**270**	J	**100**	--	**130**	--	**85**	J
Ethane	74-84-0	ug/L	0.18	U	**0.027**	J	**0.45**	--	**0.39**	--	**0.32**	--	**7.6**	--	**5.2**	--	**110**	--	**1100**	--	**900**	--	**780**	--
Ethene	74-85-1	ug/L	0.084	U	0.2	U	**0.54**	--	**0.53**	--	**0.33**	--	**1300**	J	**980**	--	**1600**	--	**61**	--	**36**	--	**640**	--
Methane	74-82-8	ug/L	**4.9**	J	1.6	UJ	**55**	--	**38**	--	**29**	--	**290**	--	**280**	J	**12000**	--	**22000**	--	**13000**	n	**21000**	--

Notes:

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Table 6 – Post-Thermal Treatment Groundwater Sample Results – MNA Parameters
Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site
Southington, Connecticut

Sample Location			MW-902M		MW-902M		MW-902M		MW-902M		MWL-304		MWL-304		MWL-304		MWL-304		MWL-304		MWL-307		MWL-307	
Sample Date			7/17/2015 12:20		11/23/2015 10:30		3/11/2016 14:00		7/19/2016 11:45		3/18/2015 12:27		7/17/2015 8:50		11/23/2015 9:00		3/11/2016 12:20		7/19/2016 9:15		3/18/2015 15:15		7/17/2015 14:55	
Field Sample ID			MW-902M-HS-07172015		MW-902M-HS-11232015		MW-902M-HS-03112016		MW-902M-HS-07192016		MWL-304-HS-03182015		MWL-304-HS-07172015		MWL-304-HS-11232015		MWL-304-HS-03112016		MWL-304-HS-07192016		MWL-307-HS-03182015		MWL-307-HS-07172015	
Well Group			N		N		N		N		N		N		N		N		N		N		N	
HydroStratZone(s)			MOB		MOB		MOB		MOB		SOB		SOB		SOB		SOB		SOB		SOB		SOB	
Analyte	**CAS No.**	**Unit**																						
MNA																								
Alkalinity	ALK	mg/L	**300**	--	**318**	--	**284**	--	**314**	--	**108**	J	**374**	--	**295**	--	**295**	--	**306**	--	**69.8**	J	**219**	--
Chloride	16887-00-6	mg/L	**108**	--	**139**	--	**282**	--	**161**	--	**2840**	--	**417**	--	**119**	--	**116**	--	**114**	--	**18.5**	--	**984**	--
Iron (Dissolved)	7439-89-6	ug/L	**31000**	--	**30000**	J	**47000**	--	**24000**	--	**7800**	--	**64000**	--	**53000**	J	**62000**	--	**49000**	--	**11000**	--	**23000**	--
Manganese (Dissolved)	7439-96-5	ug/L	**6450**	--	**6380**	J	**9450**	--	**6060**	--	**16100**	--	**12200**	--	**11900**	J	**14500**	--	**12100**	--	**4130**	--	**6540**	--
Nitrate as N	14797-55-8	mg/L	0.034	U	**0.024**	J	**0.098**	J	**0.04**	J	**0.21**	J	0.1	U	0.1	U	**0.137**	--	**0.066**	J	0.1	UJ	0.1	U
Nitrite as N	14797-65-0	mg/L	0.05	U	**0.03**	J	**0.043**	J	**0.016**	J	**0.05**	--	0.055	U	**0.022**	J	**0.062**	--	**0.021**	J	0.05	U	0.05	U
Sulfate	14808-79-8	mg/L	**8.9**	--	**2.39**	--	**2.74**	--	1	U	**19.9**	--	**20.7**	--	**4.09**	--	**0.422**	J	**0.674**	J	**12.8**	--	**2.7**	--
Total Organic Carbon	TOC	mg/L	**56**	J	**41**	J	**48**	--	**34**	--	**6.8**	J	**22**	J	**27**	J	**24**	--	**22**	--	**11**	J	**230**	J
Ethane	74-84-0	ug/L	**590**	--	**920**	--	**790**	--	**180**	--	**2.8**	--	**99**	--	**1300**	--	**1800**	--	**780**	--	**2**	--	**0.23**	--
Ethene	74-85-1	ug/L	**870**	--	**12**	--	**2.6**	--	**21**	--	**200**	--	**1100**	--	**620**	--	**22**	--	**290**	--	**100**	--	**25**	--
Methane	74-82-8	ug/L	**14000**	J	**13000**	--	**22000**	--	**5200**	--	**1400**	--	**1900**	J	**10000**	--	**10000**	--	**4600**	n	**110**	--	**2100**	J

Notes:
U = Analyte not detected above the laboratory reporting limit
J = Analyte result is estimated
ug/L = micrograms per liter
mg/L = milligrams per liter
Bold = Analyte detected above the laboratory reporting limit
SOB = Shallow Overburden
MOB = Middle Overburden
DOB = Deep Overburden
SBR = Shallow Bedrock
DBR = Deep Bedrock

Table 6 – Post-Thermal Treatment Groundwater Sample Results – MNA Parameters
Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site
Southington, Connecticut

Sample Location			MWL-307		MWL-307		MWL-307		TW-08A		TW-08A		TW-08A		TW-08A		TW-08A		TW-08B		TW-08B		TW-08B	
Sample Date			11/23/2015 11:30		3/11/2016 14:15		7/19/2016 13:30		3/18/2015 13:54		7/17/2015 10:05		11/23/2015 9:45		3/11/2016 10:15		7/19/2016 10:15		3/18/2015 13:22		7/17/2015 12:00		11/23/2015 0:00	
Field Sample ID			MWL-307-HS-11232015		MWL-307-HS-03112016		MWL-307-HS-07192016		TW-08A-HS-03182015		TW-08A-HS-07172015		TW-08A-HS-11232015		TW-08A-HS-03112016		TW-08A-HS-07192016		TW-08B-HS-03182015		TW-08B-HS-07172015		DUPLICATE-GW-11232015	
Well Group			N		N		N		N		N		N		N		N		N		N		N	
HydroStratZone(s)			SOB		SOB		SOB		MOB		MOB		MOB		MOB		MOB		SBR		SBR		SBR	
Analyte	**CAS No.**	**Unit**																						
MNA																								
Alkalinity	ALK	mg/L	**425**	--	**560**	--	**614**	--	**85.8**	J	**255**	--	**301**	--	**254**	--	**318**	--	**250**	J	**236**	--	**241**	--
Chloride	16887-00-6	mg/L	**780**	--	**950**	--	**452**	--	**70**	--	**630**	--	**221**	--	**230**	--	**370**	--	**195**	--	**182**	--	**182**	--
Iron (Dissolved)	7439-89-6	ug/L	**78000**	J	**21000**	--	**12000**	--	**4500**	--	**78000**	--	**33000**	J	**32000**	--	**40000**	--	**11000**	--	**4900**	--	**4300**	J
Manganese (Dissolved)	7439-96-5	ug/L	**18400**	J	**10200**	--	**8650**	--	**1470**	--	**18500**	--	**7350**	J	**7840**	--	**9900**	--	**7880**	--	**4980**	--	**4370**	J
Nitrate as N	14797-55-8	mg/L	**0.05**	--	**0.054**	J	**0.02**	J	0.1	UJ	0.1	U	**0.176**	--	**0.083**	J	**0.087**	J	0.5	UJ	0.1	U	**0.023**	J
Nitrite as N	14797-65-0	mg/L	**0.063**	--	**0.02**	J	0.05	U	0.05	U	**0.086**	--	**0.056**	--	**0.035**	J	**0.036**	J	0.05	U	0.05	U	**0.027**	J
Sulfate	14808-79-8	mg/L	**10.2**	--	**0.541**	J	**0.229**	J	**16.1**	--	**4.9**	--	**4.93**	--	**0.282**	J	**1.52**	--	**1.68**	--	**1.79**	--	**5.62**	--
Total Organic Carbon	TOC	mg/L	**120**	J	**210**	--	**110**	--	**23**	J	**320**	J	**87**	J	**57**	--	**64**	--	**24**	J	**26**	J	**31**	J
Ethane	74-84-0	ug/L	**270**	--	**290**	--	**790**	--	**1.3**	--	**0.49**	--	**12**	--	**86**	--	**12**	--	**66**	--	**58**	--	**68**	--
Ethene	74-85-1	ug/L	**790**	--	**1400**	--	**0.64**	--	**14**	--	**35**	--	**98**	--	**380**	--	**3000**	--	**1900**	J	**1600**	J	**1300**	--
Methane	74-82-8	ug/L	**12000**	--	**12000**	--	**9200**	--	**9100**	--	**1100**	J	**7900**	--	**9200**	--	**7900**	--	**2700**	--	**2000**	J	**2200**	--

Notes:

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mg/L = milligrams per liter
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SOB = Shallow Overburden
MOB = Middle Overburden
DOB = Deep Overburden
SBR = Shallow Bedrock
DBR = Deep Bedrock

Table 6 – Post-Thermal Treatment Groundwater Sample Results – MNA Parameters
Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site
Southington, Connecticut

Sample Location			TW-08B		TW-08B		TW-08B		TW-08B		TW-08B		TW-08D		TW-08D		TW-08D		TW-08D		TW-08D		TW-08D	
Sample Date			11/23/2015 14:00		3/11/2016 0:00		3/11/2016 10:45		7/20/2016 0:00		7/20/2016 11:10		3/18/2015 12:48		7/17/2015 0:00		7/17/2015 9:22		11/23/2015 9:30		3/11/2016 11:00		7/19/2016 9:45	
Field Sample ID			TW-08B-11232015		DUP-GW-03112016		TW-08B-03112016		DUP-07202016-#1		TW-08B-HS-07202016		TW-08D-HS-03182015		DUP-GW-07172015		TW-08D-HS-07172015		TW-08D-HS-11232015		TW-08D-HS-03112016		TW-08D-HS-07192016	
Well Group			N		N		N		N		N		N		N		N		N		N		N	
HydroStratZone(s)			SBR		SBR		SBR		SBR		SBR		DOB		DOB		DOB		DOB		DOB		DOB	
Analyte	**CAS No.**	**Unit**																						
MNA																								
Alkalinity	ALK	mg/L	**241**	--	**263**	--	**256**	--	**251**	--	**259**	--	**146**	J	**232**	--	**134**	--	**192**	--	**144**	--	**191**	--
Chloride	16887-00-6	mg/L	**185**	--	**176**	--	**178**	--	**178**	--	**179**	--	**61.1**	--	**186**	--	**50.5**	--	**75.4**	--	**47.9**	--	**61.9**	--
Iron (Dissolved)	7439-89-6	ug/L	**4500**	J	**3800**	--	**4000**	--	**4700**	--	**5100**	--	**5100**	--	**5200**	--	**3300**	--	**5100**	J	**1800**	--	**1900**	--
Manganese (Dissolved)	7439-96-5	ug/L	**4500**	J	**4640**	--	**4580**	--	**4040**	--	**4210**	--	**3200**	--	**4940**	--	**2210**	--	**3540**	J	**1820**	--	**2020**	--
Nitrate as N	14797-55-8	mg/L	**0.023**	J	**0.022**	J	0.1	U	0.1	U	0.1	U	0.5	UJ	0.019	U	0.1	U	0.1	U	0.1	U	0.1	U
Nitrite as N	14797-65-0	mg/L	0.05	U	**0.012**	J	**0.01**	J	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U	0.05	U
Sulfate	14808-79-8	mg/L	**6.02**	--	**1.42**	--	**1.3**	--	**1.12**	--	**1.45**	--	**1.78**	--	**1.99**	--	**0.973**	J	**2.64**	--	**1.2**	--	**0.27**	J
Total Organic Carbon	TOC	mg/L	**28**	J	**23**	--	**23**	--	**21**	--	**22**	--	**8.2**	J	**26**	J	**5.1**	J	**23**	J	**5.6**	--	**16**	--
Ethane	74-84-0	ug/L	**62**	--	**70**	--	**80**	--	**61**	--	**59**	--	**64**	--	**14**	--	**17**	--	**32**	--	**13**	--	**17**	--
Ethene	74-85-1	ug/L	**1200**	--	**960**	--	**1100**	--	**850**	--	**850**	--	**680**	--	**150**	--	**180**	--	**240**	--	**88**	--	**140**	--
Methane	74-82-8	ug/L	**2000**	--	**2100**	--	**2500**	--	**2100**	--	**1900**	--	**1400**	--	**270**	J	**340**	J	**1300**	--	**500**	--	**820**	--

Notes:

U = Analyte not detected above the laboratory reporting limit
J = Analyte result is estimated
ug/L = micrograms per liter
mg/L = milligrams per liter
Bold = Analyte detected above the laboratory reporting limit
SOB = Shallow Overburden
MOB = Middle Overburden
DOB = Deep Overburden
SBR = Shallow Bedrock
DBR = Deep Bedrock

Table 7 – Post-Thermal Treatment Groundwater Sample Results – 1,4-Dioxane
Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site
Southington, Connecticut

			Sample Location	MW-413		MW-413		MW-415		MW-415		MW-416		MW-416		MW-902D		MW-902D		MW-902M		MW-902M		MWL-304	
			Sample Date	10/23/2015 9:45		3/11/2016 11:50		10/23/2015 9:00		3/11/2016 12:10		10/23/2015 10:40		3/11/2016 14:30		10/23/2015 10:15		3/11/2016 13:45		10/23/2015 10:00		3/11/2016 14:00		10/22/2015 14:45	
			Field Sample ID	MW-413-HS-10232015		MW-413-HS-03112016		MW-415-HS-10232015		MW-415-HS-03112016		MW-416-HS-10232015		MW-416-HS-03112016		MW-902D-HS-10232015		MW-902D-HS-03112016		MW-902M-HS-10232015		MW-902M-HS-03112016		MWL-304-HS-10222015	
			Well Group	N		N		N		N		N		N		N		N		N		N		N	
			HydroStratZone(s)	DOB		DOB		MOB		MOB		SBR		SBR		DOB		DOB		MOB		MOB		SOB	
Analyte	**CAS No.**	**Unit**	**Action Level**																						
1,4-Dioxane	123-91-1	ug/L	20	**28.6**	--	300	U	**13.5**	--	**58**	--	**6.48**	--	30	U	**70.2**	--	**170**	--	**41.7**	--	**36**	--	**11.2**	--

			Sample Location	MWL-304		MWL-307		MWL-307		TW-08A		TW-08A		TW-08B		TW-08B		TW-08B		TW-08B		TW-08D		TW-08D	
			Sample Date	3/11/2016 12:20		10/23/2015 11:00		3/11/2016 14:15		10/22/2015 15:20		3/11/2016 10:15		10/22/2015 0:00		10/22/2015 11:50		3/11/2016 0:00		3/11/2016 10:45		10/22/2015 15:00		3/11/2016 11:00	
			Field Sample ID	MWL-304-HS-03112016		MWL-307-HS-10232015		MWL-307-HS-03112016		TW-08A-HS-10222015		TW-08A-HS-03112016		DUP-1-10222015		TW-08B-10222015		DUP-GW-03112016		TW-08B-03112016		TW-08D-HS-10222015		TW-08D-HS-03112016	
			Well Group	N		N		N		N		N		N		N		N		N		N		N	
			HydroStratZone(s)	SOB		SOB		SOB		MOB		MOB		SBR		SBR		SBR		SBR		DOB		DOB	
Analyte	**CAS No.**	**Unit**	**Action Level**																						
1,4-Dioxane	123-91-1	ug/L	20	**8.9**	--	**64.5**	--	**160**	--	**27.6**	--	**310**	J	**160**	--	**140**	--	**138**	--	**131**	--	**51.7**	--	3000	U

Notes:

U = Analyte not detected above the laboratory reporting limit
J = Analyte result is estimated
ug/L = micrograms per liter
Action Level = the lower of the USEPA Maximum Contaminant Level (MCL)
and the Connecticut Class GA Groundwater Protection Criteria (GWPC)
Bold = Analyte detected above the laboratory reporting limit
Shaded Cell = Analyte detected above the Action Level
SOB = Shallow Overburden
MOB = Middle Overburden
DOB = Deep Overburden
SBR = Shallow Bedrock

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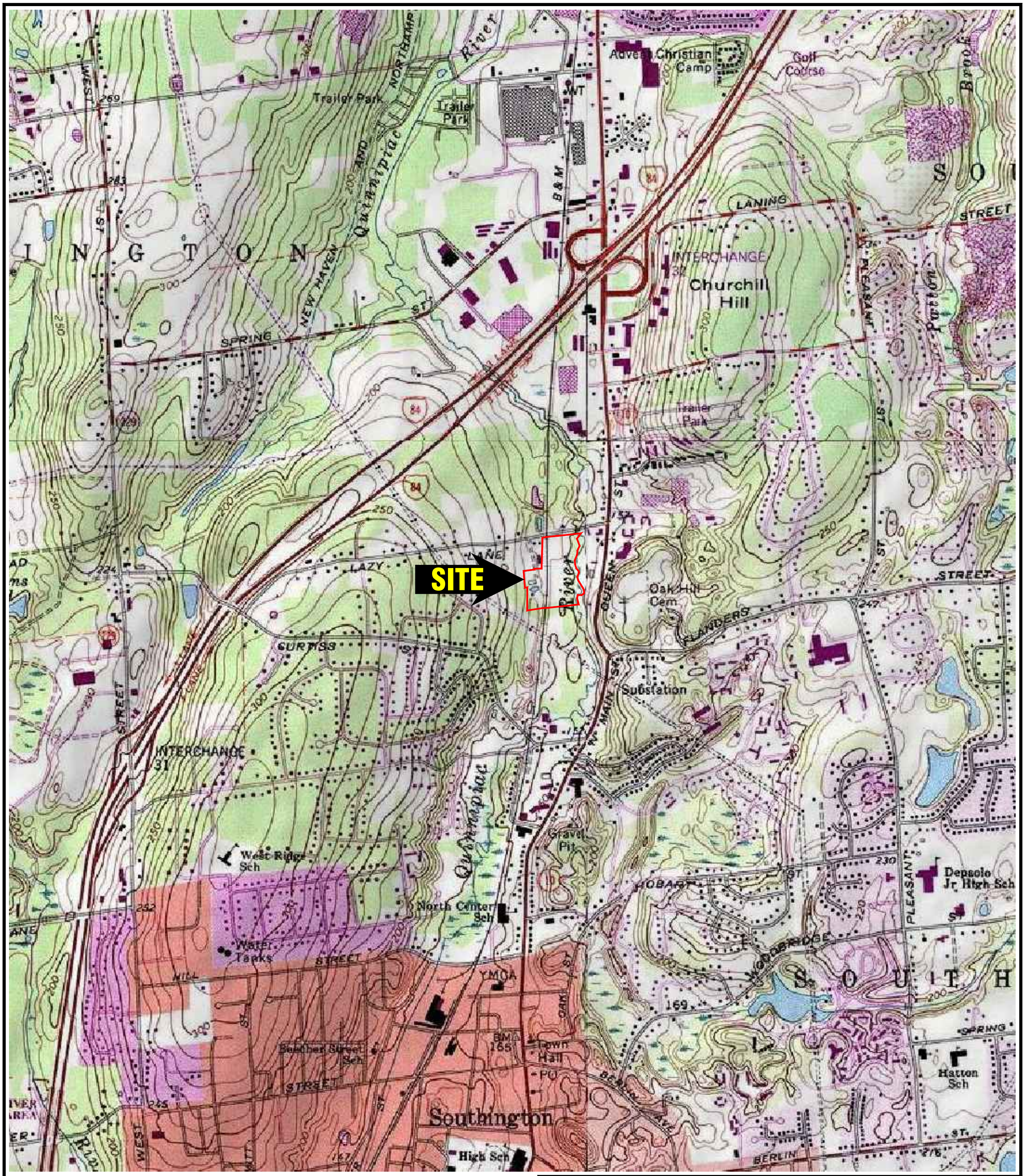
Table 8 - Statistical Summary of Groundwater Total VOC Concentration Trends
Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site
Southington, Connecticut

		Data Range					Linear Regression Analysis						Mann-Kendall Analysis			Sen's Slope Analysis	
Well	**Constituent**	**Minimum Concentration (µg/L)**	**Maximum Concentration (µg/L)**	**Percent of Data Below Laboratory Minimum Detection Limit**	**Start Date**	**End Date**	**Correlation Coefficient, R^2**	**p-value of Correlation**	**Estimated Attenuation Half-life (days)**	**Trend Direction (slope of trend line)**	**Trend Significant?**	**Comments**	**p-value of Correlation**	**Trend Direction**	**Trend Significant?**	**Estimated Attenuation Half-life (days)**	Trend Direction
Shallow Overburden Wells																	
P-13	Total VOCs	2.4	69	0	3/28/1995	6/7/2016	0.47	<0.001	2,762	Decreasing	Yes		<0.001	Decreasing	Yes	2,390	Decreasing
MWL-312	Total VOCs	<0.5	49	72	3/27/1995	6/10/2014	0.17	0.09	1,936	Decreasing	Yes	72% of results below detection	0.050	Decreasing	Yes	NA	No Trend
P-101C	Total VOCs	8.0	479	0	3/27/1995	6/6/2016	0.78	<0.001	1,837	Decreasing	Yes		<0.001	Decreasing	Yes	1,824	Decreasing
Middle Overburden Wells																	
MW-03	Total VOCs	0.31	120	5	12/5/1996	6/9/2016	0.31	0.007	1,661	Decreasing	Yes		0.012	Decreasing	Yes	1,474	Decreasing
MW-205B	Total VOCs	<0.5	24	11	3/23/1995	6/10/2016	0.49	0.001	1,594	Decreasing	Yes		0.001	Decreasing	Yes	1,540	Decreasing
P-101B	Total VOCs	1	187,400	0	3/27/1995	6/8/2016	0.79	<0.001	605	Decreasing	Yes		<0.001	Decreasing	Yes	592	Decreasing
MW-127B	Total VOCs	<0.5	22	11	3/23/1995	6/11/2014	0.33	0.01	1,648	Decreasing	Yes		0.018	Decreasing	Yes	1,777	Decreasing
MW-501B	Total VOCs	1.8	65	0	3/24/1995	6/11/2014	0.50	<0.001	1,369	Decreasing	Yes		<0.001	Decreasing	Yes	1,118	Decreasing
Deep Overburden Wells																	
MW-204B	Total VOCs	<0.5	87	17	3/28/1995	6/9/2014	0.21	0.05	1,703	Decreasing	Yes		0.001	Decreasing	Yes	924	Decreasing
MW-502	Total VOCs	630	118,160	0	3/21/1995	6/6/2016	0.86	<0.001	NA	Decreasing	Yes		<0.001	Decreasing	Yes	1,650	Decreasing
MW-704D	Total VOCs	7	665	0	12/18/1996	6/6/2016	0.18	0.05	3,210	Decreasing	Yes		0.033	Decreasing	Yes	3,647	Decreasing
MW-707D	Total VOCs	<0.5	21	50	12/6/1996	6/9/2016	0.002	0.85	NA	No Trend	No	50% of results below detection	0.500	No Trend	No	NA	No Trend
Shallow Bedrock Wells																	
MW-127C	Total VOCs	9.85	147	0	3/23/1995	6/6/2016	0.69	<0.001	2,854	Decreasing	Yes		<0.001	Decreasing	Yes	3,150	Decreasing
MW-128	Total VOCs	2.2	15	0	3/23/1995	6/11/2014	0.62	<0.001	2,966	Decreasing	Yes		<0.001	Decreasing	Yes	2,390	Decreasing
MW-204A	Total VOCs	0.9	682	0	3/28/1995	6/9/2014	0.62	<0.001	872	Decreasing	Yes		<0.001	Decreasing	Yes	762	Decreasing
MW-501A	Total VOCs	9	118	0	3/24/1995	6/11/2014	0.85	<0.001	1,795	Decreasing	Yes		<0.001	Decreasing	Yes	1,690	Decreasing
P-11A	Total VOCs	223	26,400	0	3/27/1995	6/7/2016	0.14	0.08	NA	Increasing	Yes	Changed from decreasing in 2011	0.376	No Trend	No	NA	No Trend
Deep Bedrock Wells																	
MW-703DR	Total VOCs	<0.5	8.0	76	12/9/1996	6/10/2014	0.005	0.79	NA	No Trend	No	76% of results below detection	0.401	No Trend	No	NA	No Trend
MW-704DR	Total VOCs	11	455	0	12/17/1996	6/6/2016	0.56	<0.001	2,815	Decreasing	Yes		<0.001	Decreasing	Yes	3,238	Decreasing
MW-706DR	Total VOCs	2,079	11,240	0	12/10/1996	6/7/2016	0.40	0.002	5,336	Decreasing	Yes		0.021	Decreasing	Yes	6,477	Decreasing
MW-707DR	Total VOCs	<0.5	18	29	12/30/1996	6/9/2016	0.13	0.08	NA	Increasing	Yes	29% of results below detection	0.087	Increasing	Yes	NA	NA
MW-707DR(2)	Total VOCs	1.31	16.86	0	4/20/2004	6/9/2016	0.42	0.02	2,379	Decreasing	Yes	Using data starting in April 2004	0.017	Decreasing	Yes	1,798	Decreasing

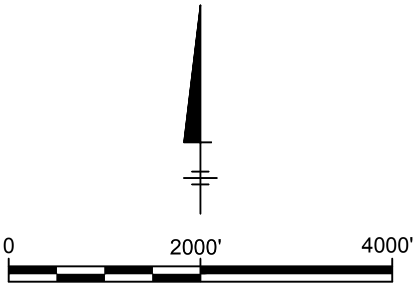
Notes and Assumptions:
µg/L = micrograms per liter
NS = no significant trend
NA = not applicable due to increasing trend or non-significant trend
Statistically significant trend defined as p-value less than or equal to 0.1.

FIGURES

CITY: MANCHESTER DIV/GROUP: ENVCAD DB: B.SMALL PM: TM: LAYOUT: 1 SAVED: 2/26/2016 4:06 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 9/14/2016 4:20 PM BY: SMALL, BRIAN
G:\ENVCAD\Manchester\ACT\B0054634\0001\02200\2016 MNA\Site Location Map.dwg



SOURCE: TOPO!
QUAD: MERIDEN, CT
DATE: 1992



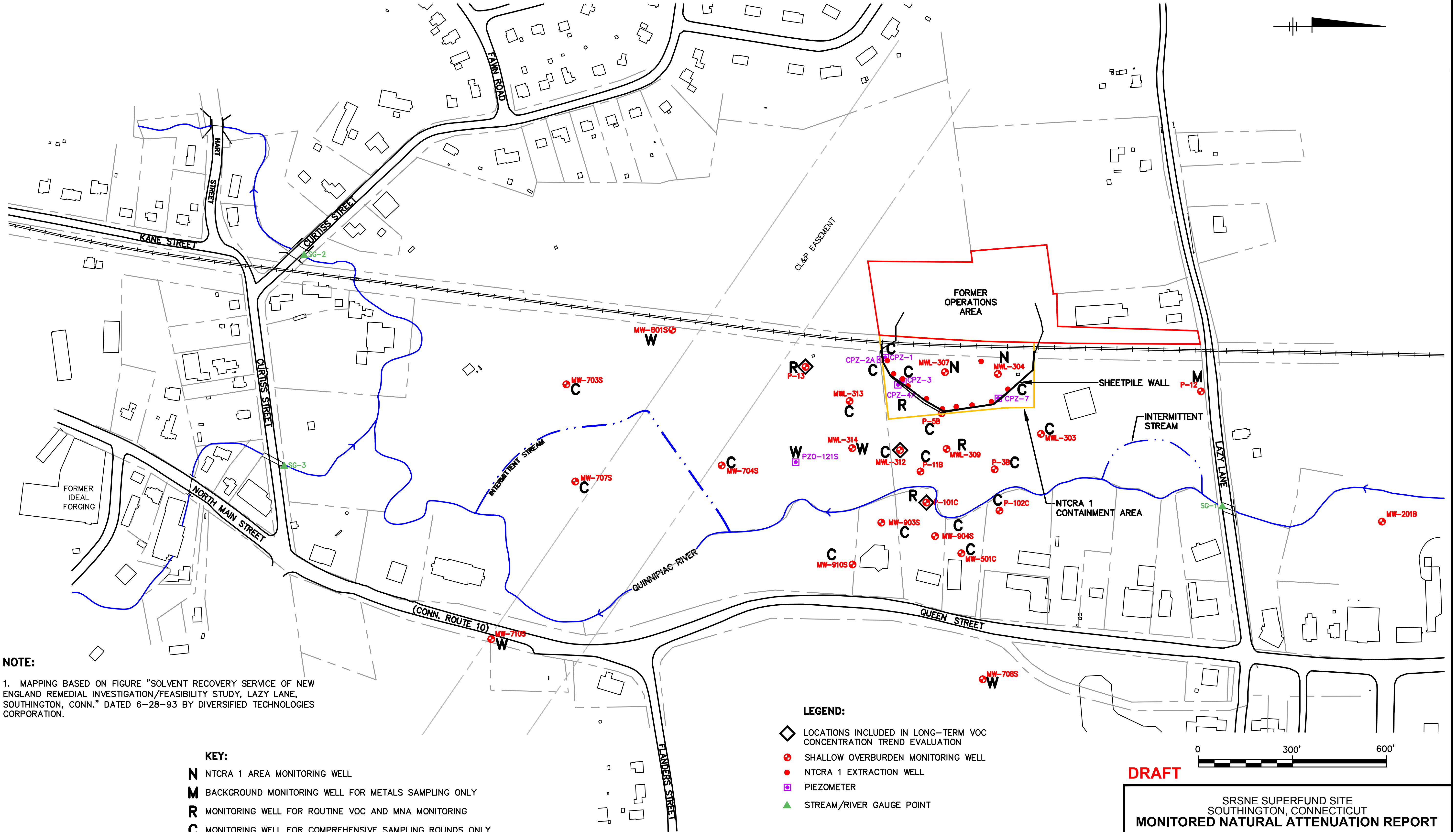
GRAPHIC SCALE

SRSNE SUPERFUND SITE
SOUTHINGTON, CONNECTICUT
MONITORED NATURAL ATTENUATION REPORT

SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1



NOTE:

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

KEY:

N	NTCRA 1 AREA MONITORING WELL
M	BACKGROUND MONITORING WELL FOR METALS SAMPLING ONLY
R	MONITORING WELL FOR ROUTINE VOC AND MNA MONITORING
C	MONITORING WELL FOR COMPREHENSIVE SAMPLING ROUNDS ONLY
W	MONITORING WELL FOR WATER LEVEL MEASUREMENT ONLY

LEGEND:

◇	LOCATIONS INCLUDED IN LONG-TERM VOC CONCENTRATION TREND EVALUATION
⊕	SHALLOW OVERBURDEN MONITORING WELL
●	NTCRA 1 EXTRACTION WELL
▣	PIEZOMETER
▲	STREAM/RIVER GAUGE POINT

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SRSNE SUPERFUND SITE
SOUTHINGTON, CONNECTICUT
MONITORED NATURAL ATTENUATION REPORT

GROUNDWATER MONITORING LOCATIONS SHALLOW OVERBURDEN

ARCADIS Design & Consultancy for natural and built assets

FIGURE
2

CITY: MANCHESTER, CT DIV/GROUP: ENV DB: B.SMALL PM: J. HOLDEN TM/TR: R. STEVENSON
G:\ENVCAD\Manchester\ACT\B0054634\0001\02200\2016 MNA\54634C02.DWG LAYOUT: 2 SAVED: 10/26/2015 3:14 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 9/14/2016 4:18 PM BY: SMALL, BRIAN
XREFS: IMAGES: PROJECTNAME: ----
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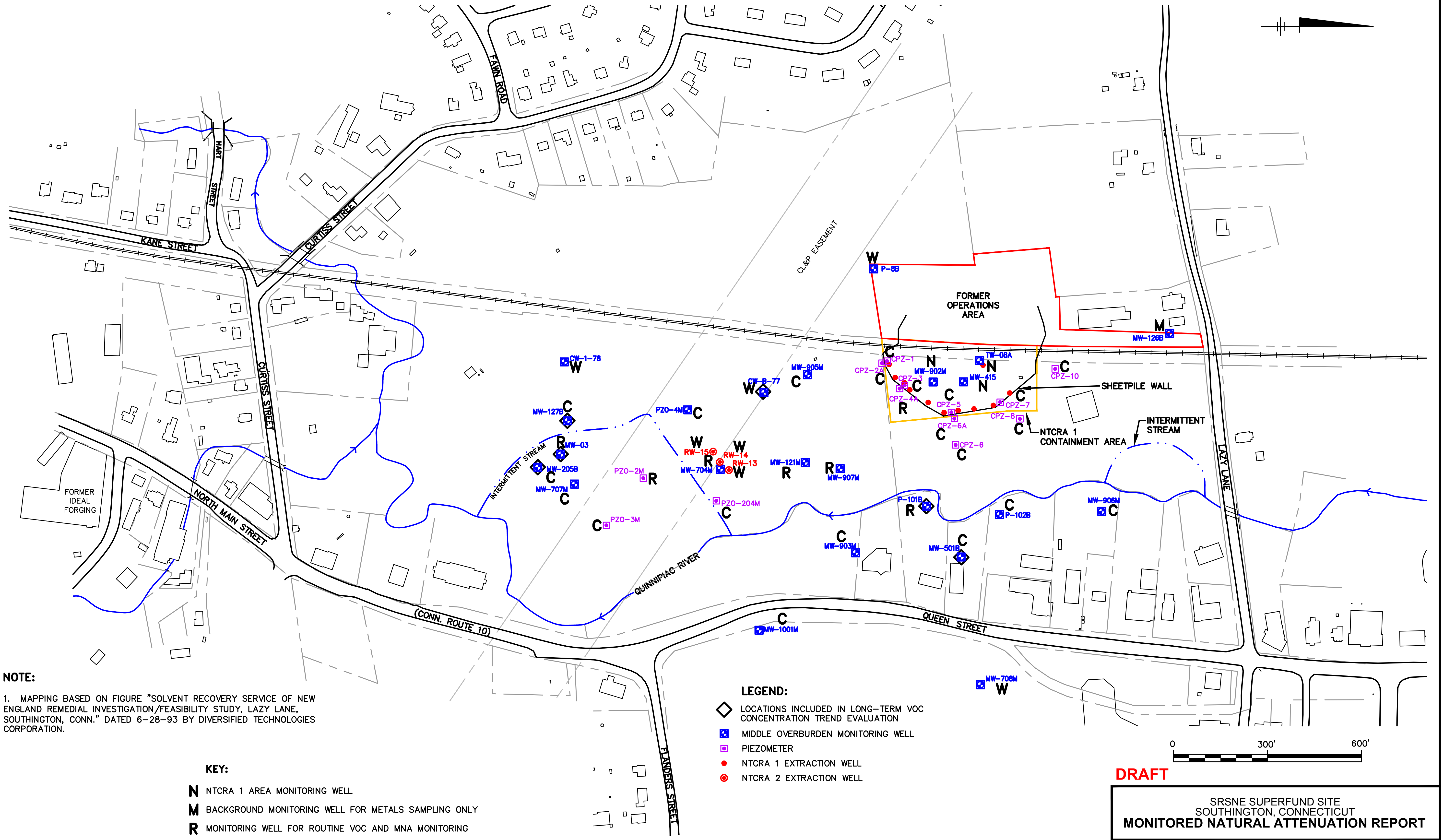

NOTE:

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

KEY:

N	NTCRA 1 AREA MONITORING WELL
M	BACKGROUND MONITORING WELL FOR METALS SAMPLING ONLY
R	MONITORING WELL FOR ROUTINE VOC AND MNA MONITORING
C	MONITORING WELL FOR COMPREHENSIVE SAMPLING ROUNDS ONLY
W	MONITORING WELL FOR WATER LEVEL MEASUREMENT ONLY

LEGEND:

◇	LOCATIONS INCLUDED IN LONG-TERM VOC CONCENTRATION TREND EVALUATION
▣	MIDDLE OVERBURDEN MONITORING WELL
▣	PIEZOMETER
●	NTCRA 1 EXTRACTION WELL
◉	NTCRA 2 EXTRACTION WELL

DRAFT

SRSNE SUPERFUND SITE
SOUTHINGTON, CONNECTICUT
MONITORED NATURAL ATTENUATION REPORT

GROUNDWATER MONITORING LOCATIONS MIDDLE OVERBURDEN

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FIGURE
3

CITY: MANCHESTER, CT DIV/GROUP: ENV DB: B.SMALL PM: J. HOLDEN TM/TR: R. STEVENSON
G:\ENVCAD\Manchester\ACT\B0054634\0001\02200\2016 MNA\54634C03.DWG LAYOUT: 3 SAVED: 10/26/2015 3:14 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 9/14/2016 4:18 PM BY: SMALL, BRIAN
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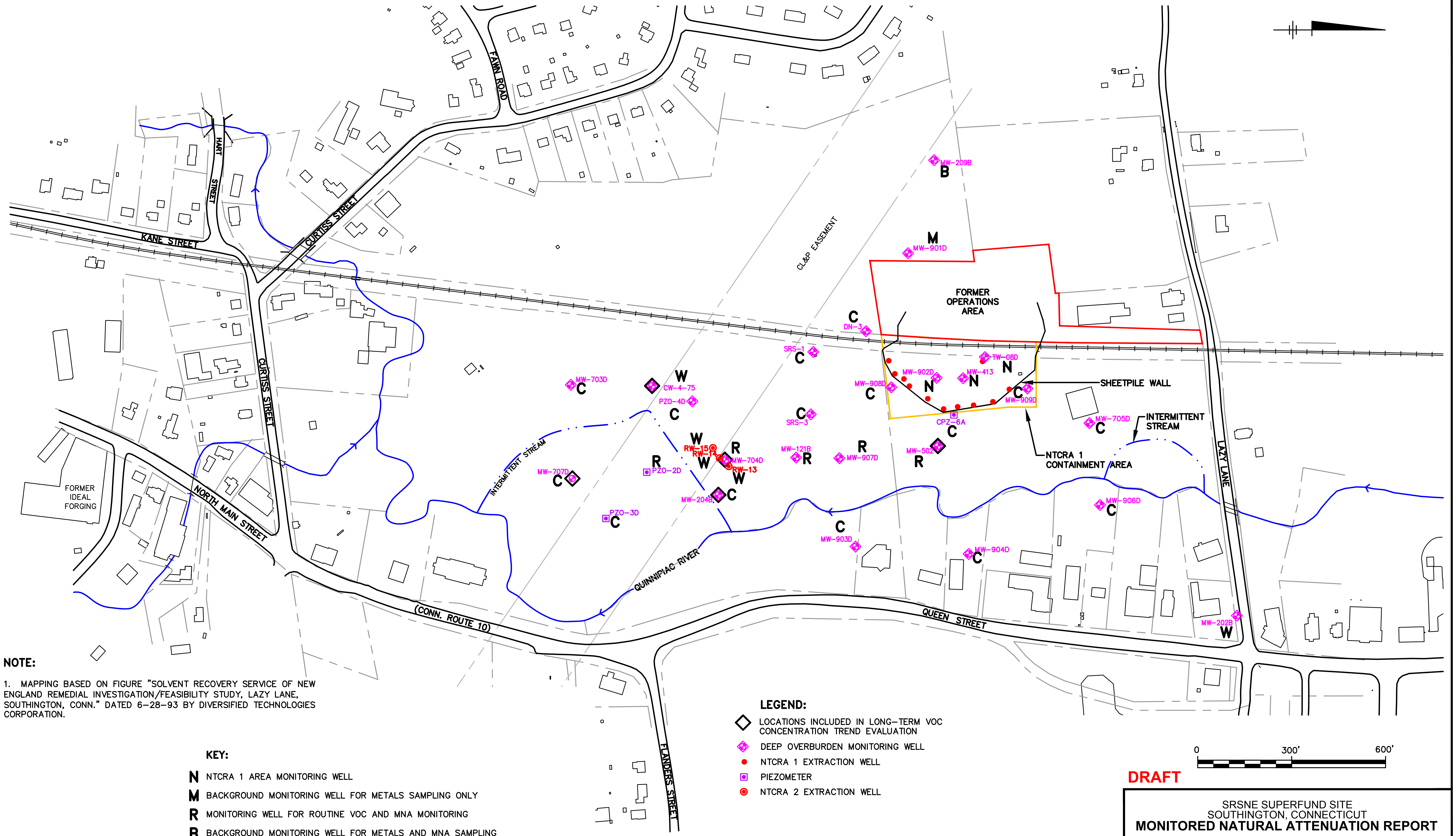


NOTE:

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

KEY:

N NTCRA 1 AREA MONITORING WELL
M BACKGROUND MONITORING WELL FOR METALS SAMPLING ONLY
R MONITORING WELL FOR ROUTINE VOC AND MNA MONITORING
B BACKGROUND MONITORING WELL FOR METALS AND MNA SAMPLING
C MONITORING WELL FOR COMPREHENSIVE SAMPLING ROUNDS ONLY
W MONITORING WELL FOR WATER LEVEL MEASUREMENT ONLY

LEGEND:

◇ LOCATIONS INCLUDED IN LONG-TERM VOC CONCENTRATION TREND EVALUATION
◈ DEEP OVERBURDEN MONITORING WELL
● NTCRA 1 EXTRACTION WELL
▣ PIEZOMETER
◉ NTCRA 2 EXTRACTION WELL

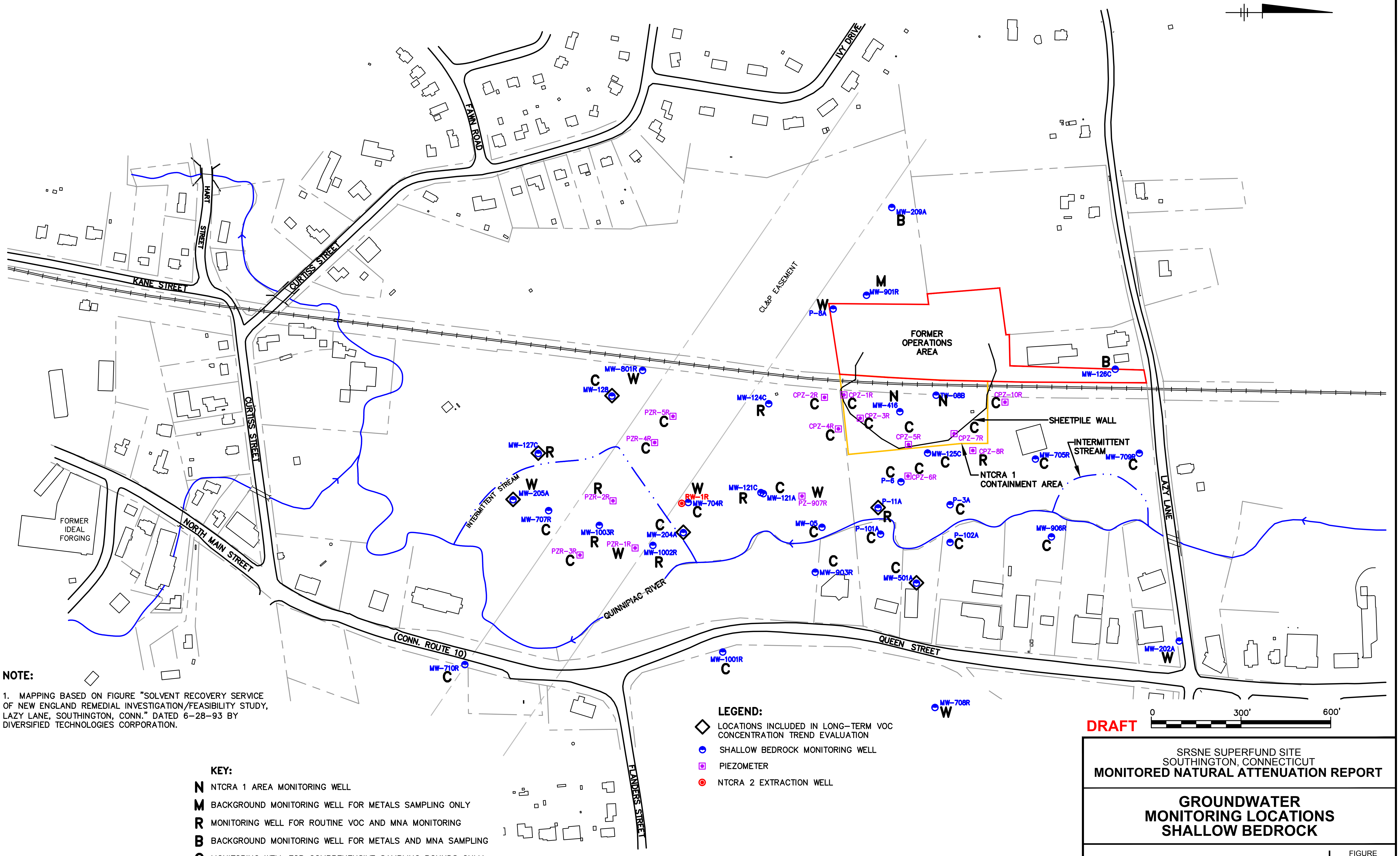
DRAFT

SRSNE SUPERFUND SITE
SOUTHINGTON, CONNECTICUT
MONITORED NATURAL ATTENUATION REPORT

GROUNDWATER MONITORING LOCATIONS DEEP OVERBURDEN

ARCADIS Design & Consultancy for natural and built assets

FIGURE
4



NOTE:

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

LEGEND:

◇ LOCATIONS INCLUDED IN LONG-TERM VOC CONCENTRATION TREND EVALUATION

● SHALLOW BEDROCK MONITORING WELL

▣ PIEZOMETER

◉ NTCRA 2 EXTRACTION WELL

KEY:

N NTCRA 1 AREA MONITORING WELL

M BACKGROUND MONITORING WELL FOR METALS SAMPLING ONLY

R MONITORING WELL FOR ROUTINE VOC AND MNA MONITORING

B BACKGROUND MONITORING WELL FOR METALS AND MNA SAMPLING

C MONITORING WELL FOR COMPREHENSIVE SAMPLING ROUNDS ONLY

W MONITORING WELL FOR WATER LEVEL MEASUREMENT ONLY

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SOUTHINGTON, CONNECTICUT
MONITORED NATURAL ATTENUATION REPORT

GROUNDWATER MONITORING LOCATIONS SHALLOW BEDROCK

ARCADIS Design & Consultancy for natural and built assets

FIGURE
5

CITY: MANCHESTER, CT DIV/GROUP: ENV DB: B.SMALL PM: J. HOLDEN TM/TR: R. STEVENSON
G:\ENVCAD\Manchester\ACT\B0054634\0001\02200\2016 MNA\54634C05.DWG LAYOUT: 5 SAVED: 10/26/2015 3:13 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 9/14/2016 4:18 PM BY: SMALL, BRIAN
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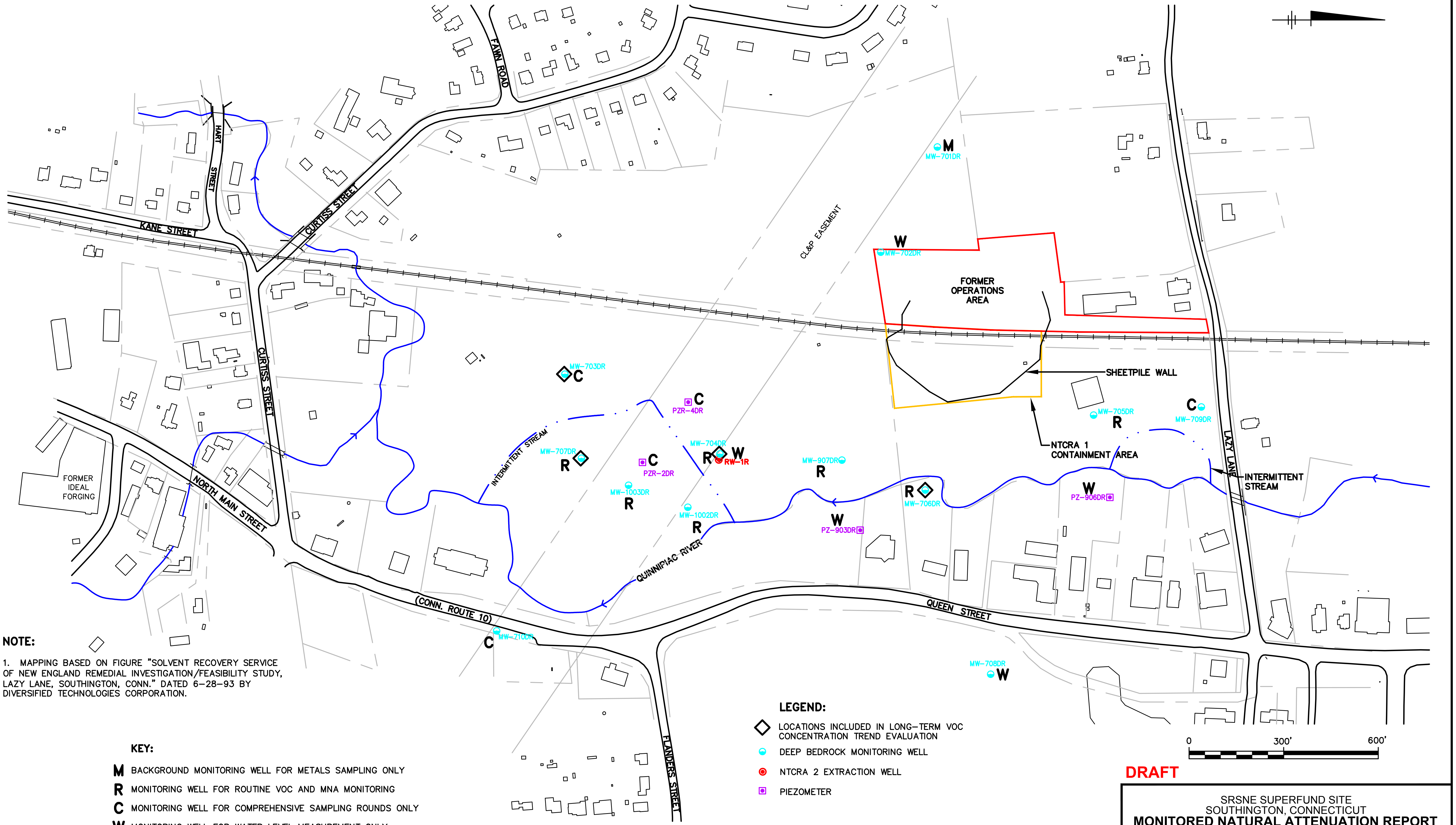

NOTE:

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

KEY:

M BACKGROUND MONITORING WELL FOR METALS SAMPLING ONLY

R MONITORING WELL FOR ROUTINE VOC AND MNA MONITORING

C MONITORING WELL FOR COMPREHENSIVE SAMPLING ROUNDS ONLY

W MONITORING WELL FOR WATER LEVEL MEASUREMENT ONLY

LEGEND:

◇ LOCATIONS INCLUDED IN LONG-TERM VOC CONCENTRATION TREND EVALUATION

◒ DEEP BEDROCK MONITORING WELL

◉ NTCRA 2 EXTRACTION WELL

▣ PIEZOMETER

DRAFT

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SOUTHINGTON, CONNECTICUT
MONITORED NATURAL ATTENUATION REPORT

GROUNDWATER MONITORING LOCATIONS DEEP BEDROCK

ARCADIS Design & Consultancy for natural and built assets

FIGURE
6

CITY: MANCHESTER, CT DIV/GROUP: ENV DB: B.SMALL PM: J. HOLDEN TM/TR: R. STEVENSON
G:\ENVCAD\Manchester\ACT\B0054634\0001\02200\2016 MNA\54634C06.DWG LAYOUT: 6 SAVED: 10/26/2015 3:13 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 9/14/2016 4:18 PM BY: SMALL, BRIAN
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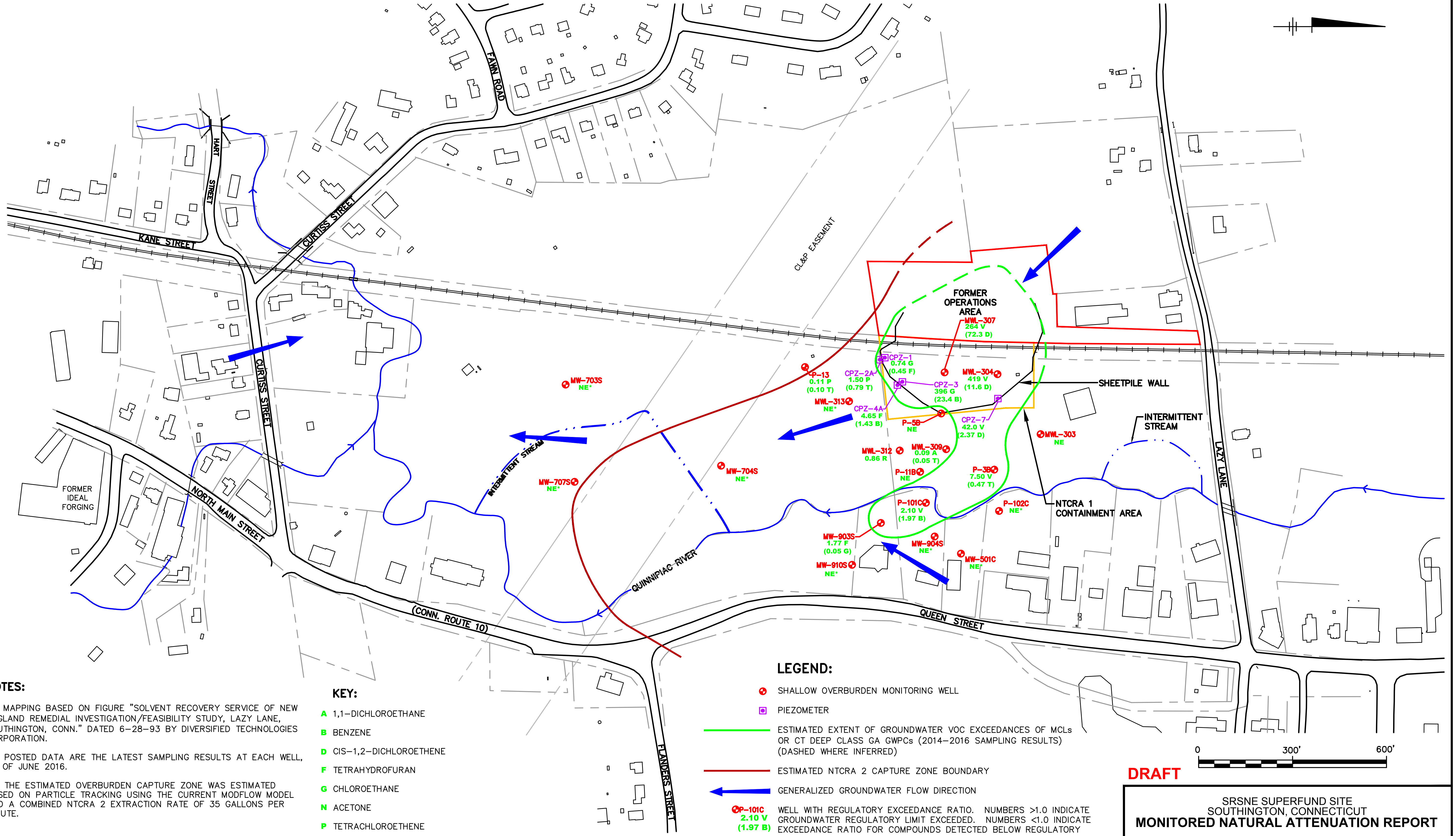

NOTES:

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

2. POSTED DATA ARE THE LATEST SAMPLING RESULTS AT EACH WELL, AS OF JUNE 2016.

3. THE ESTIMATED OVERBURDEN CAPTURE ZONE WAS ESTIMATED BASED ON PARTICLE TRACKING USING THE CURRENT MODFLOW MODEL AND A COMBINED NTCRA 2 EXTRACTION RATE OF 35 GALLONS PER MINUTE.

KEY:

A	1,1-DICHLOROETHANE
B	BENZENE
D	CIS-1,2-DICHLOROETHENE
F	TETRAHYDROFURAN
G	CHLOROETHANE
N	ACETONE
P	TETRACHLOROETHENE
R	TRANS-1,3-DICHLOROPROPENE
T	TRICHLOROETHENE
V	VINYL CHLORIDE
NE	EXCEEDANCE RATIO LESS THAN 0.10

LEGEND:

⊕	SHALLOW OVERBURDEN MONITORING WELL
⊡	PIEZOMETER
🟩	ESTIMATED EXTENT OF GROUNDWATER VOC EXCEEDANCES OF MCLs OR CT DEEP CLASS GA GWPCs (2014-2016 SAMPLING RESULTS) (DASHED WHERE INFERRED)
🟥	ESTIMATED NTCRA 2 CAPTURE ZONE BOUNDARY
←	GENERALIZED GROUNDWATER FLOW DIRECTION
⊕P-101C 2.10 V (1.97 B)	WELL WITH REGULATORY EXCEEDANCE RATIO. NUMBERS >1.0 INDICATE GROUNDWATER REGULATORY LIMIT EXCEEDED. NUMBERS <1.0 INDICATE EXCEEDANCE RATIO FOR COMPOUNDS DETECTED BELOW REGULATORY LIMIT. FIRST NUMBER INDICATES MAXIMUM MULTIPLE OF A DETECTED VOC OVER REGULATORY LIMIT (e.g., 130 INDICATES 130 x LIMIT). LETTER INDICATES COMPOUND WITH INDICATED EXCEEDANCE RATIO (e.g., P = TETRACHLOROETHENE). NUMBERS IN PARENTHESES INDICATE OTHER EXCEEDANCE RATIOS FOR SELECT COMPOUNDS AND WELLS. COMPOUNDS DETECTED IN BLANK(S) ARE NOT INCLUDED IN THIS EVALUATION.
*	NO DETECTIONS ABOVE INTERIM CLEANUP LEVELS (ICLs) AT THIS LOCATION.

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SRSNE SUPERFUND SITE
SOUTHINGTON, CONNECTICUT
MONITORED NATURAL ATTENUATION REPORT

VOC EXCEEDANCE PLUME
SHALLOW OVERBURDEN

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FIGURE
7

CITY: MANCHESTER, CT DIV/GROUP: ENV DB: B.SMALL PM: J. HOLDEN TM/TR: R. STEVENSON
G:\ENVCAD\Manchester\ACT\B0054634\0001\02200\2016 MNA\54634C07.DWG LAYOUT: 7 SAVED: 9/26/2016 10:42 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 9/26/2016 10:43 AM BY: SMALL, BRIAN
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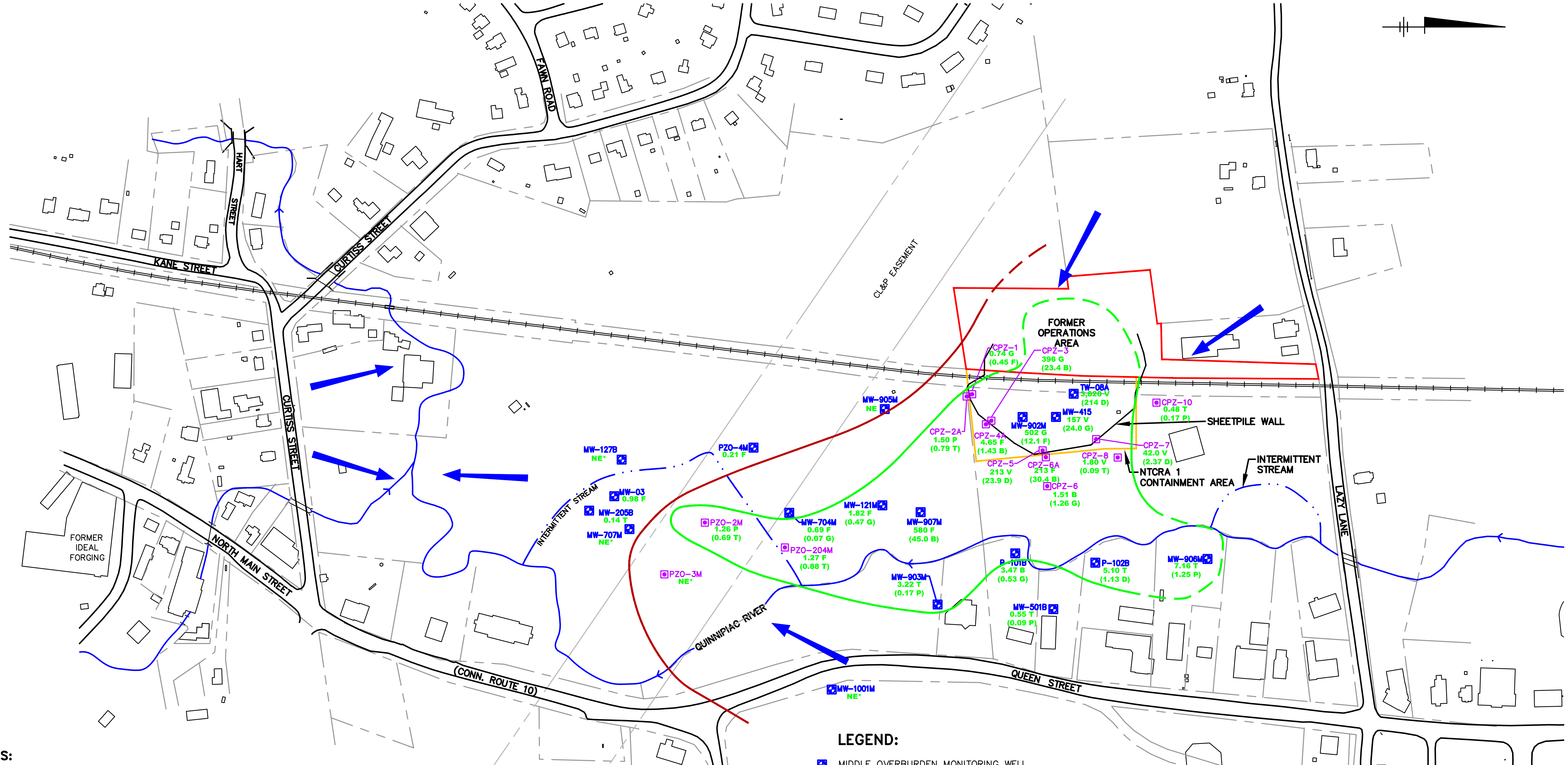

NOTES:

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

2. POSTED DATA ARE THE LATEST SAMPLING RESULTS AT EACH WELL, AS OF JUNE 2016.

3. THE ESTIMATED OVERBURDEN CAPTURE ZONE WAS ESTIMATED BASED ON PARTICLE TRACKING USING THE CURRENT MODFLOW MODEL AND A COMBINED NTCRA 2 EXTRACTION RATE OF 35 GALLONS PER MINUTE.

KEY:

B	BENZENE
D	CIS-1,2-DICHLOROETHENE
F	TETRAHYDROFURAN
G	CHLOROETHANE
P	TETRACHLOROETHENE
T	TRICHLOROETHENE
V	VINYL CHLORIDE
NE	EXCEEDANCE RATIO LESS THAN 0.10

LEGEND:

▣	MIDDLE OVERBURDEN MONITORING WELL
▣	PIEZOMETER
—	ESTIMATED EXTENT OF GROUNDWATER VOC EXCEEDANCES OF MCLs OR CT DEEP CLASS GA GWPCs (2014–2016 SAMPLING RESULTS) (DASHED WHERE INFERRED)
—	ESTIMATED NTCRA 2 CAPTURE ZONE BOUNDARY
←	GENERALIZED GROUNDWATER FLOW DIRECTION
MW-903M 3.22 T (0.17 P)	WELL WITH REGULATORY EXCEEDANCE RATIO. NUMBERS >1.0 INDICATE GROUNDWATER REGULATORY LIMIT EXCEEDED. NUMBERS <1.0 INDICATE EXCEEDANCE RATIO FOR COMPOUNDS DETECTED BELOW REGULATORY LIMIT. FIRST NUMBER INDICATES MAXIMUM MULTIPLE OF A DETECTED VOC OVER REGULATORY LIMIT (e.g., 130 INDICATES 130 x LIMIT). LETTER INDICATES COMPOUND WITH INDICATED EXCEEDANCE RATIO (e.g., P = TETRACHLOROETHENE). NUMBERS IN PARENTHESES INDICATE OTHER EXCEEDANCE RATIOS FOR SELECT COMPOUNDS AND WELLS. COMPOUNDS DETECTED IN BLANK(S) ARE NOT INCLUDED IN THIS EVALUATION.
*	NO DETECTIONS ABOVE INTERIM CLEANUP LEVELS (ICLs) AT THIS LOCATION.

SRSNE SUPERFUND SITE
SOUTHINGTON, CONNECTICUT
MONITORED NATURAL ATTENUATION REPORT

VOC EXCEEDANCE PLUME
MIDDLE OVERBURDEN

ARCADIS Design & Consultancy for natural and built assets

FIGURE
8

CITY: MANCHESTER, CT DIV/GROUP: ENV DB: B.SMALL PM: J. HOLDEN TM/TR: R. STEVENSON
G:\ENVCAD\Manchester\ACT\B0054634\0001\02200\2016 MNA\54634C08.DWG LAYOUT: 8 SAVED: 9/23/2016 3:18 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 9/26/2016 10:43 AM BY: SMALL, BRIAN
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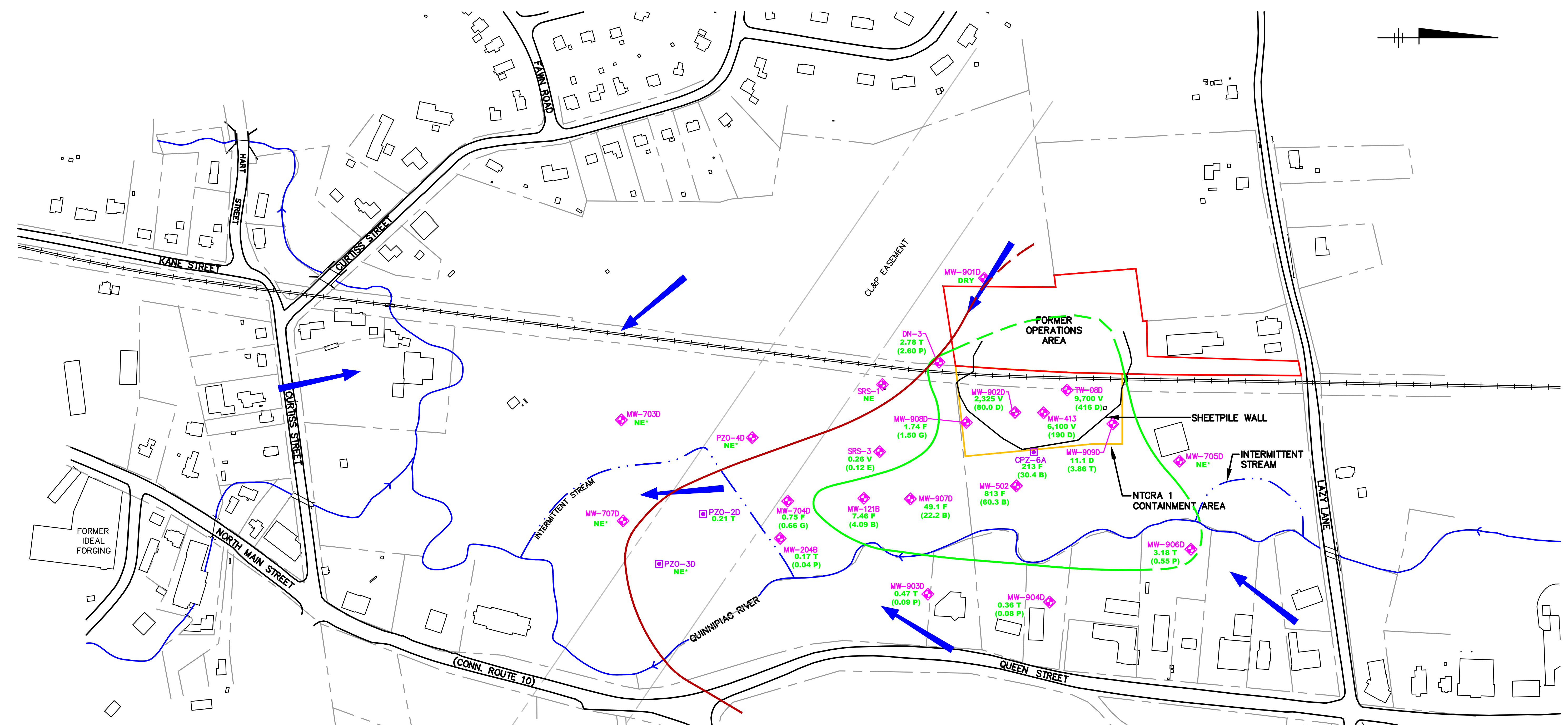

NOTES:

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

2. POSTED DATA ARE THE LATEST SAMPLING RESULTS AT EACH WELL, AS OF JUNE 2016.

3. THE ESTIMATED OVERBURDEN CAPTURE ZONE WAS ESTIMATED BASED ON PARTICLE TRACKING USING THE CURRENT MODFLOW MODEL AND A COMBINED NTCRA 2 EXTRACTION RATE OF 35 GALLONS PER MINUTE.

KEY:

B	BENZENE
D	CIS-1,2-DICHLOROETHENE
E	1,1-DICHLOROETHANE
F	TETRAHYDROFURAN
P	TETRACHLOROETHENE
T	TRICHLOROETHENE
V	VINYL CHLORIDE
NE	EXCEEDANCE RATIO LESS THAN 0.10

LEGEND:

◈	DEEP OVERBURDEN MONITORING WELL
▣	PIEZOMETER
🟩	ESTIMATED EXTENT OF GROUNDWATER VOC EXCEEDANCES OF MCLs OR CT DEEP CLASS GA GWPCs (2014–2016 SAMPLING RESULTS) (DASHED WHERE INFERRED)
🟥	ESTIMATED NTCRA 2 CAPTURE ZONE BOUNDARY
←	GENERALIZED GROUNDWATER FLOW DIRECTION
MW-502 ◈ 813 F (60.3 B)	WELL WITH REGULATORY EXCEEDANCE RATIO. NUMBERS >1.0 INDICATE GROUNDWATER REGULATORY LIMIT EXCEEDED. NUMBERS <1.0 INDICATE EXCEEDANCE RATIO FOR COMPOUNDS DETECTED BELOW REGULATORY LIMIT. FIRST NUMBER INDICATES MAXIMUM MULTIPLE OF A DETECTED VOC OVER REGULATORY LIMIT (e.g., 130 INDICATES 130 x LIMIT). LETTER INDICATES COMPOUND WITH INDICATED EXCEEDANCE RATIO (e.g., P = TETRACHLOROETHENE). NUMBERS IN PARENTHESES INDICATE OTHER EXCEEDANCE RATIOS FOR SELECT COMPOUNDS AND WELLS. COMPOUNDS DETECTED IN BLANK(S) ARE NOT INCLUDED IN THIS EVALUATION.
*	NO DETECTIONS ABOVE INTERIM CLEANUP LEVELS (ICLs) AT THIS LOCATION.

0 300' 600'

DRAFT

SRSNE SUPERFUND SITE
SOUTHINGTON, CONNECTICUT
MONITORED NATURAL ATTENUATION REPORT

VOC EXCEEDANCE PLUME
DEEP OVERBURDEN

ARCADIS Design & Consultancy for natural and built assets

FIGURE
9

CITY: MANCHESTER, CT DIV/GROUP: ENV DB: B.SMALL PM: J. HOLDEN TM/TR: R. STEVENSON
G:\ENVCAD\Manchester\ACT\B0054634\0001\02200\2016 MNA\54634C09.DWG LAYOUT: 9 SAVED: 9/26/2016 10:43 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 9/26/2016 10:43 AM BY: SMALL, BRIAN
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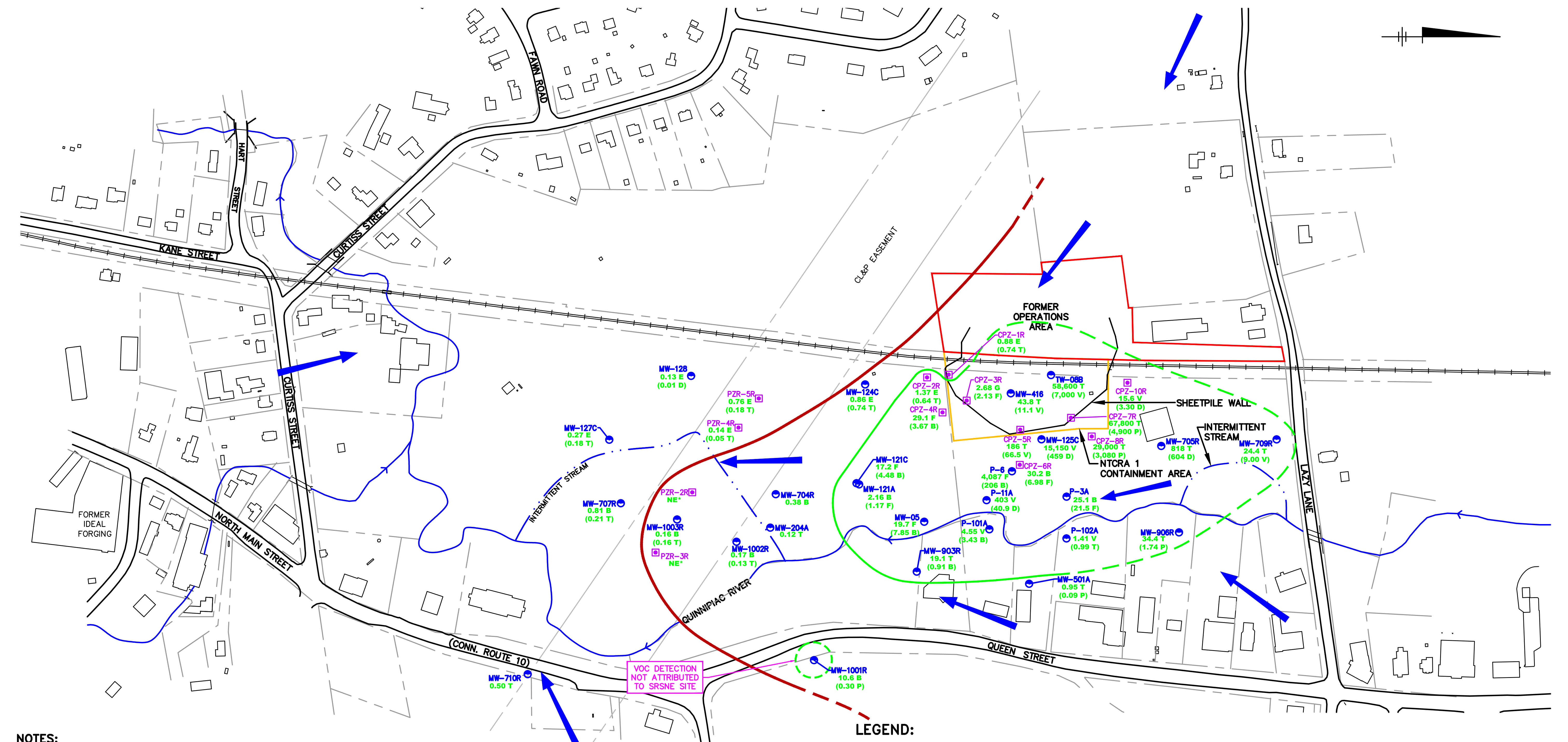

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G:\ENVCAD\Manchester\ACT\B0054634\0001\00220\2016 MNA\54634C10.DWG LAYOUT: 10 SAVED: 9/15/2016 9:56 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 9/15/2016 9:56 AM BY: SMALL, BRIAN
XREFS: 54634X01 54634X00 IMAGES: PROJECTNAME: ----

NOTES:

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

2. POSTED DATA ARE THE LATEST SAMPLING RESULTS AT EACH WELL, AS OF JUNE 2016.

3. THE ESTIMATED BEDROCK CAPTURE ZONE WAS ESTIMATED BASED ON PARTICLE TRACKING USING THE CURRENT MODFLOW MODEL AND A COMBINED NTCRA 2 EXTRACTION RATE OF 35 GALLONS PER MINUTE.

KEY:

B	BENZENE
D	CIS-1,2-DICHLOROETHENE
E	1,1-DICHLOROETHENE
F	TETRAHYDROFURAN
G	CHLOROETHANE
P	TETRACHLOROETHENE
T	TRICHLOROETHENE
V	VINYL CHLORIDE
NE	EXCEEDANCE RATIO LESS THAN 0.10

LEGEND:

◓	SHALLOW BEDROCK MONITORING WELL
▣	PIEZOMETER
🟩	ESTIMATED EXTENT OF GROUNDWATER VOC EXCEEDANCES OF MCLs OR CT DEEP CLASS GA GWPCs (2014–2016 SAMPLING RESULTS) (DASHED WHERE INFERRED)
🟥	ESTIMATED NTCRA 2 CAPTURE ZONE BOUNDARY
←	GENERALIZED GROUNDWATER FLOW DIRECTION
◓P-11A 403 V (40.9 D)	WELL WITH REGULATORY EXCEEDANCE RATIO. NUMBERS >1.0 INDICATE GROUNDWATER REGULATORY LIMIT EXCEEDED. NUMBERS <1.0 INDICATE EXCEEDANCE RATIO FOR COMPOUNDS DETECTED BELOW REGULATORY LIMIT. FIRST NUMBER INDICATES MAXIMUM MULTIPLE OF A DETECTED VOC OVER REGULATORY LIMIT (e.g., 130 INDICATES 130 x LIMIT). LETTER INDICATES COMPOUND WITH INDICATED EXCEEDANCE RATIO (e.g., P = TETRACHLOROETHENE). NUMBERS IN PARENTHESES INDICATE OTHER EXCEEDANCE RATIOS FOR SELECT COMPOUNDS AND WELLS. COMPOUNDS DETECTED IN BLANK(S) ARE NOT INCLUDED IN THIS EVALUATION.
*	NO DETECTIONS ABOVE INTERIM CLEANUP LEVELS (ICLs) AT THIS LOCATION.

DRAFT

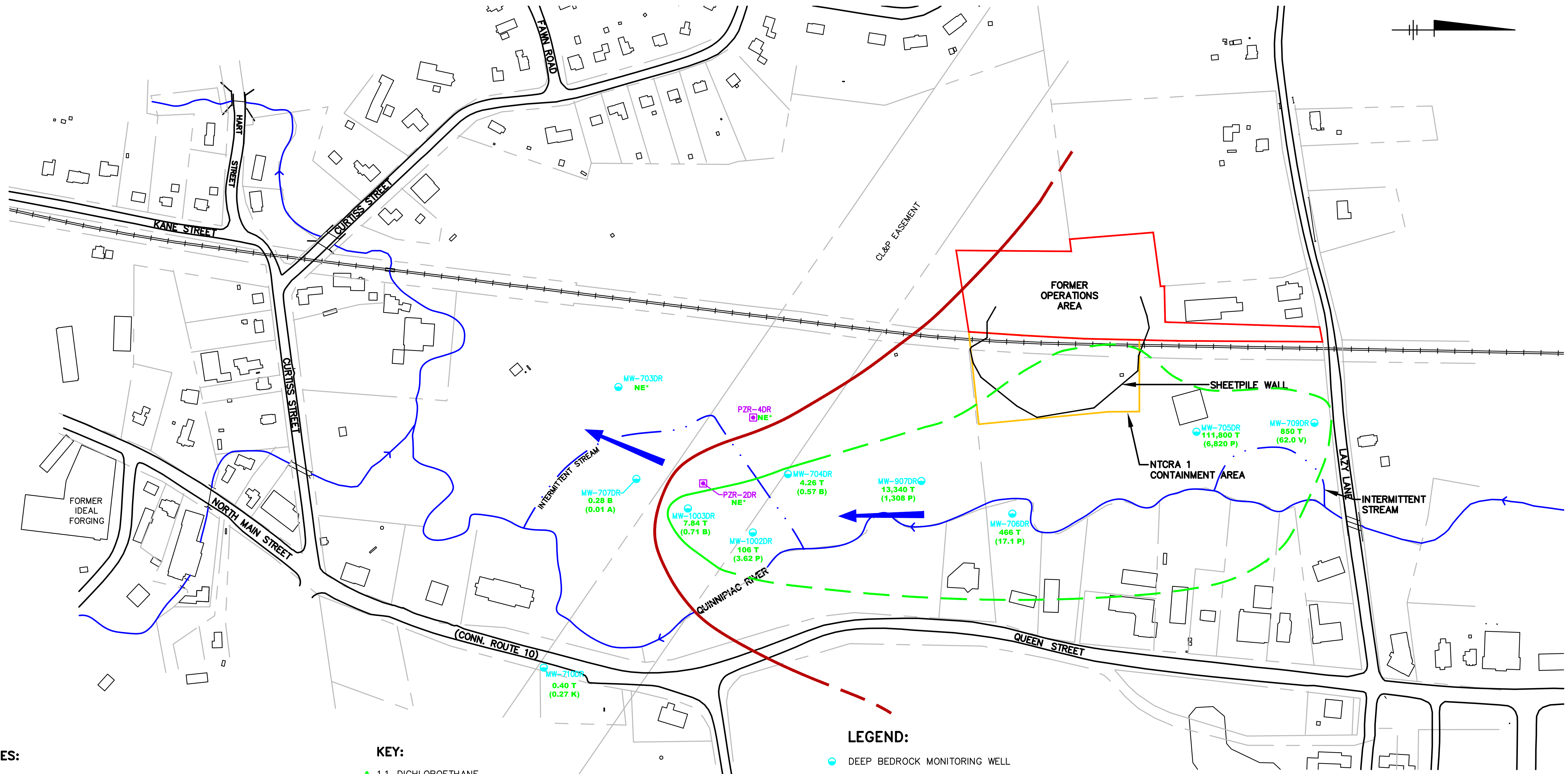
0 300' 600'

SRSNE SUPERFUND SITE
SOUTHINGTON, CONNECTICUT
MONITORED NATURAL ATTENUATION REPORT

VOC EXCEEDANCE PLUME
SHALLOW BEDROCK

ARCADIS Design & Consultancy for natural and built assets

FIGURE
10



NOTES:

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

2. POSTED DATA ARE THE LATEST SAMPLING RESULTS AT EACH WELL, AS OF JUNE 2016.

3. THE ESTIMATED BEDROCK CAPTURE ZONE WAS ESTIMATED BASED ON PARTICLE TRACKING USING THE CURRENT MODFLOW MODEL AND A COMBINED NTCRA 2 EXTRACTION RATE OF 35 GALLONS PER MINUTE.

KEY:

A	1,1–DICHLOROETHANE
B	BENZENE
G	CHLOROETHANE
K	1,2–DICHLOROETHANE
P	TETRACHLOROETHENE
T	TRICHLOROETHENE
V	VINYL CHLORIDE
NE	EXCEEDANCE RATIO LESS THAN 0.10

LEGEND:

◒	DEEP BEDROCK MONITORING WELL
▣	PIEZOMETER
🟩	ESTIMATED EXTENT OF GROUNDWATER VOC EXCEEDANCES OF MCLs OR CT DEEP CLASS GA GWPCs (2014–2016 SAMPLING RESULTS) (DASHED WHERE INFERRED)
🟥	ESTIMATED NTCRA 2 CAPTURE ZONE BOUNDARY
←	GENERALIZED GROUNDWATER FLOW DIRECTION
MW–907DR◒ 13,340 T (1,308 P)	WELL WITH REGULATORY EXCEEDANCE RATIO. NUMBERS >1.0 INDICATE GROUNDWATER REGULATORY LIMIT EXCEEDED. NUMBERS <1.0 INDICATE EXCEEDANCE RATIO FOR COMPOUNDS DETECTED BELOW REGULATORY LIMIT. FIRST NUMBER INDICATES MAXIMUM MULTIPLE OF A DETECTED VOC OVER REGULATORY LIMIT (e.g., 130 INDICATES 130 x LIMIT). LETTER INDICATES COMPOUND WITH INDICATED EXCEEDANCE RATIO (e.g., P = TETRACHLOROETHENE). NUMBERS IN PARENTHESES INDICATE OTHER EXCEEDANCE RATIOS FOR SELECT COMPOUNDS AND WELLS. COMPOUNDS DETECTED IN BLANK(S) ARE NOT INCLUDED IN THIS EVALUATION.
*	NO DETECTIONS ABOVE INTERIM CLEANUP LEVELS (ICLs) AT THIS LOCATION.

0 300' 600'

DRAFT

SRSNE SUPERFUND SITE
SOUTHINGTON, CONNECTICUT
MONITORED NATURAL ATTENUATION REPORT

VOC EXCEEDANCE PLUME
DEEP BEDROCK

ARCADIS Design & Consultancy for natural and built assets

FIGURE
11

CITY: MANCHESTER, CT DIV/GROUP: ENV DB: B.SMALL PM: J.HOLDEN TM/TR: R. STEVENSON
G:\ENVCAD\Manchester\ACT\B0054634\0001\02200\2016 MNA\54634C11.DWG LAYOUT: 11 SAVED: 9/15/2016 9:58 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 9/15/2016 9:58 AM BY: SMALL, BRIAN
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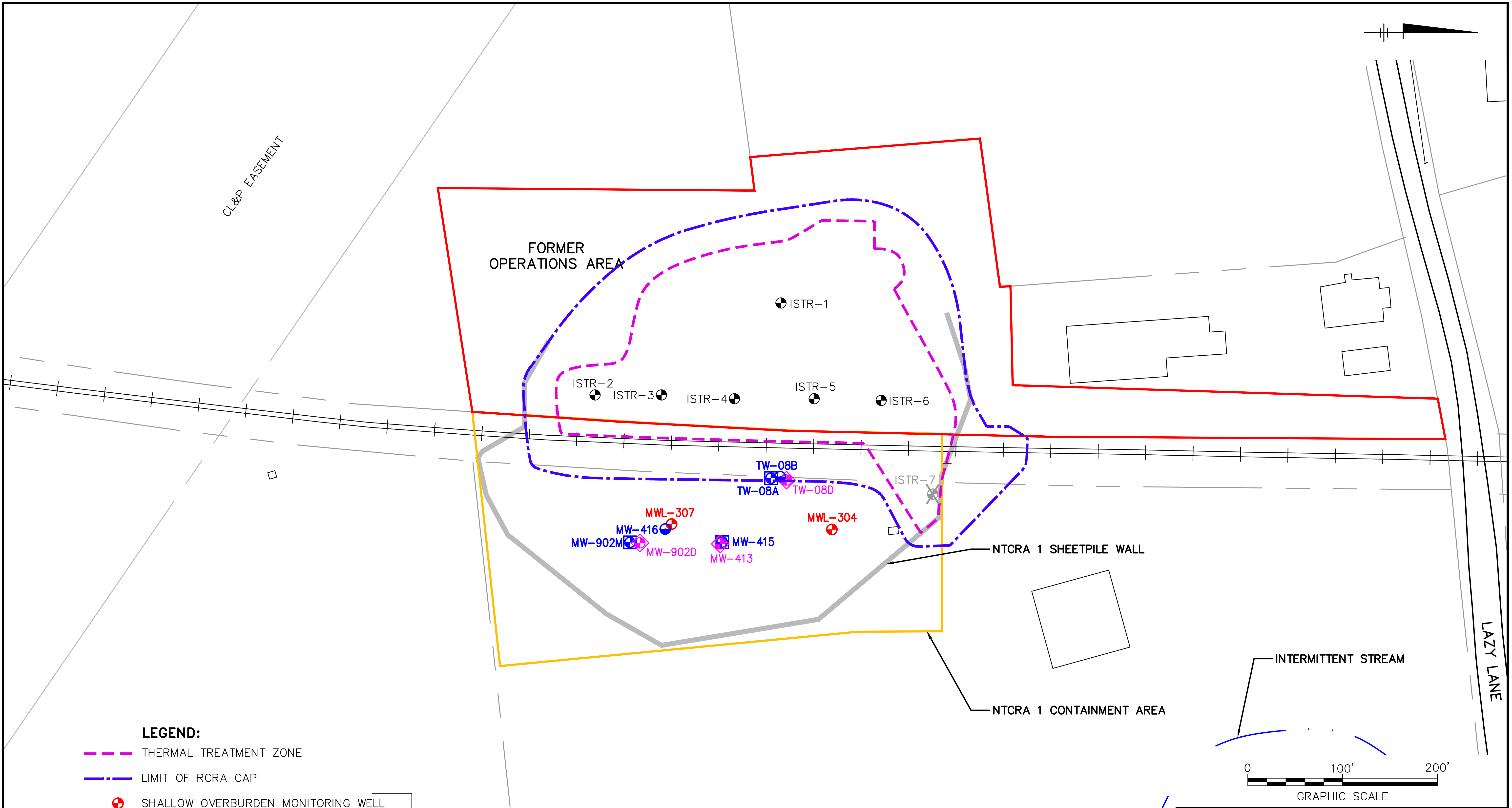

LEGEND:

▬ ▬	THERMAL TREATMENT ZONE
▬ · ▬	LIMIT OF RCRA CAP
⊕	SHALLOW OVERBURDEN MONITORING WELL
⊞	MIDDLE OVERBURDEN MONITORING WELL
◈	DEEP OVERBURDEN MONITORING WELL
◒	SHALLOW BEDROCK MONITORING WELL
◒	DEEP BEDROCK MONITORING WELL
⊕	ISTR WELLS
⊗	DESTROYED ISTR WELL

"N" WELLS SHOWN ON THIS FIGURE

NOTE:

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

SRSNE SUPERFUND SITE
SOUTHINGTON, CONNECTICUT
MONITORED NATURAL ATTENUATION REPORT

THERMAL TREATMENT AREA MONITORING WELLS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
12

CITY: MANCHESTER, CT DIV/GROUP: ENV DB: B.SMALL PM: J. HOLDEN TM/TR: R. STEVENSON
G:\ENVCAD\Manchester\ACT\B0054634\0001\02200\2016 MNA\54634C12.DWG LAYOUT: 12 SAVED: 10/4/2016 12:41 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 10/5/2016 8:47 AM BY: SMALL, BRIAN
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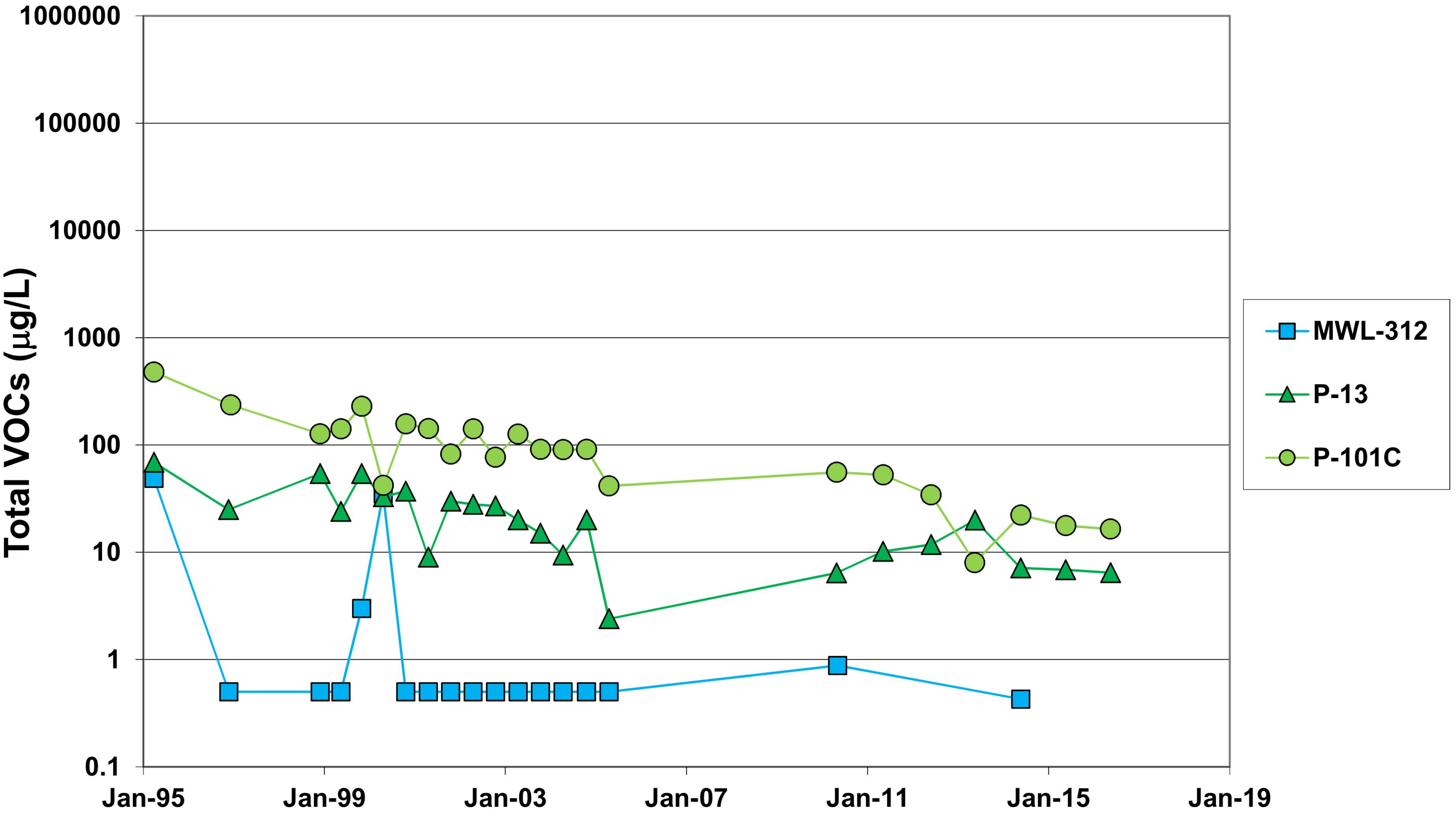


SRSNE SUPERFUND SITE
SOUTHINGTON, CONNECTICUT

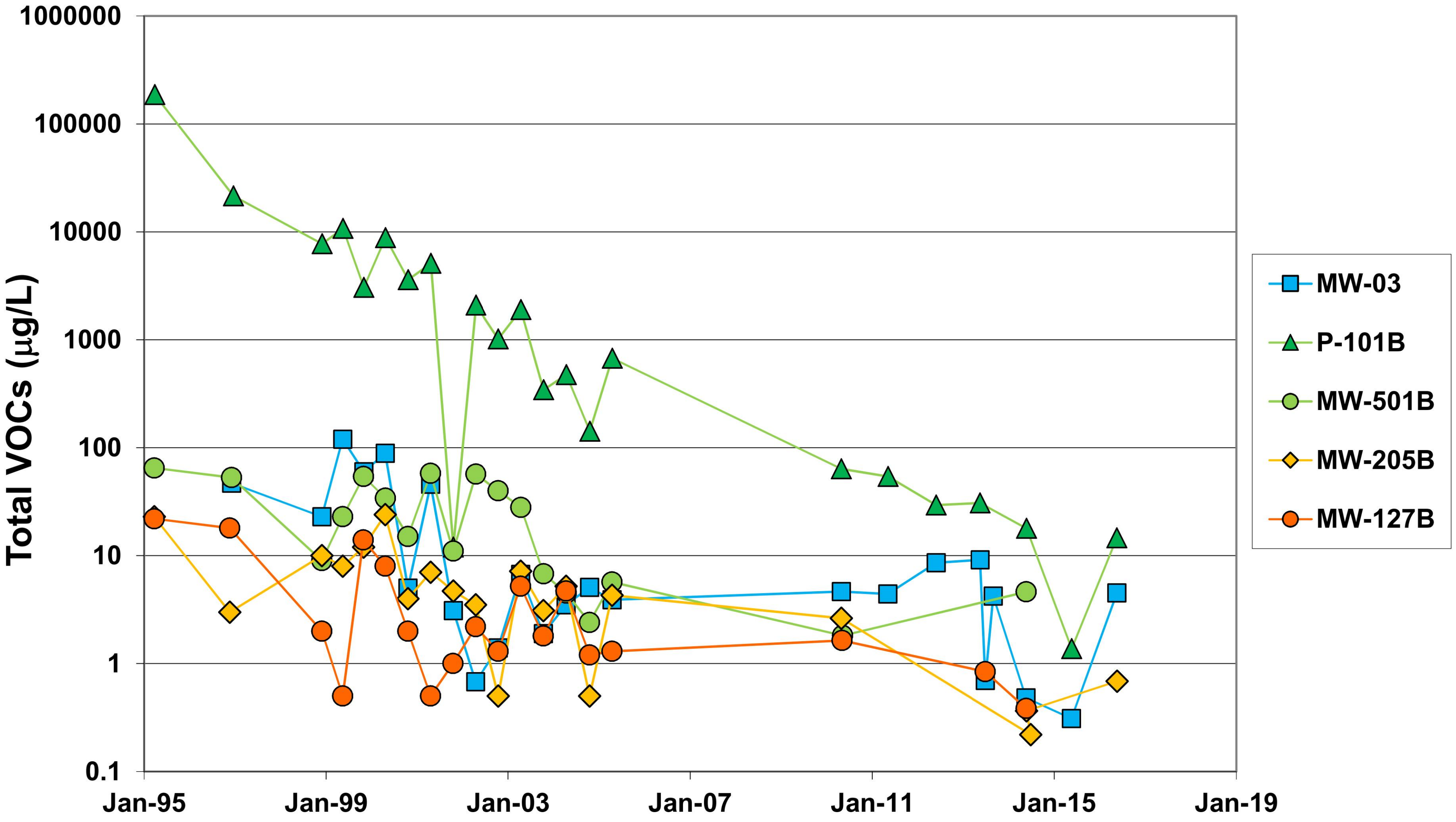
MONITORED NATURAL ATTENUATION REPORT

GROUNDWATER TOTAL VOC CONCENTRATIONS WITH TIME SHALLOW OVERBURDEN

ARCADIS Design & Consultancy for natural and built assets

FIGURE

13

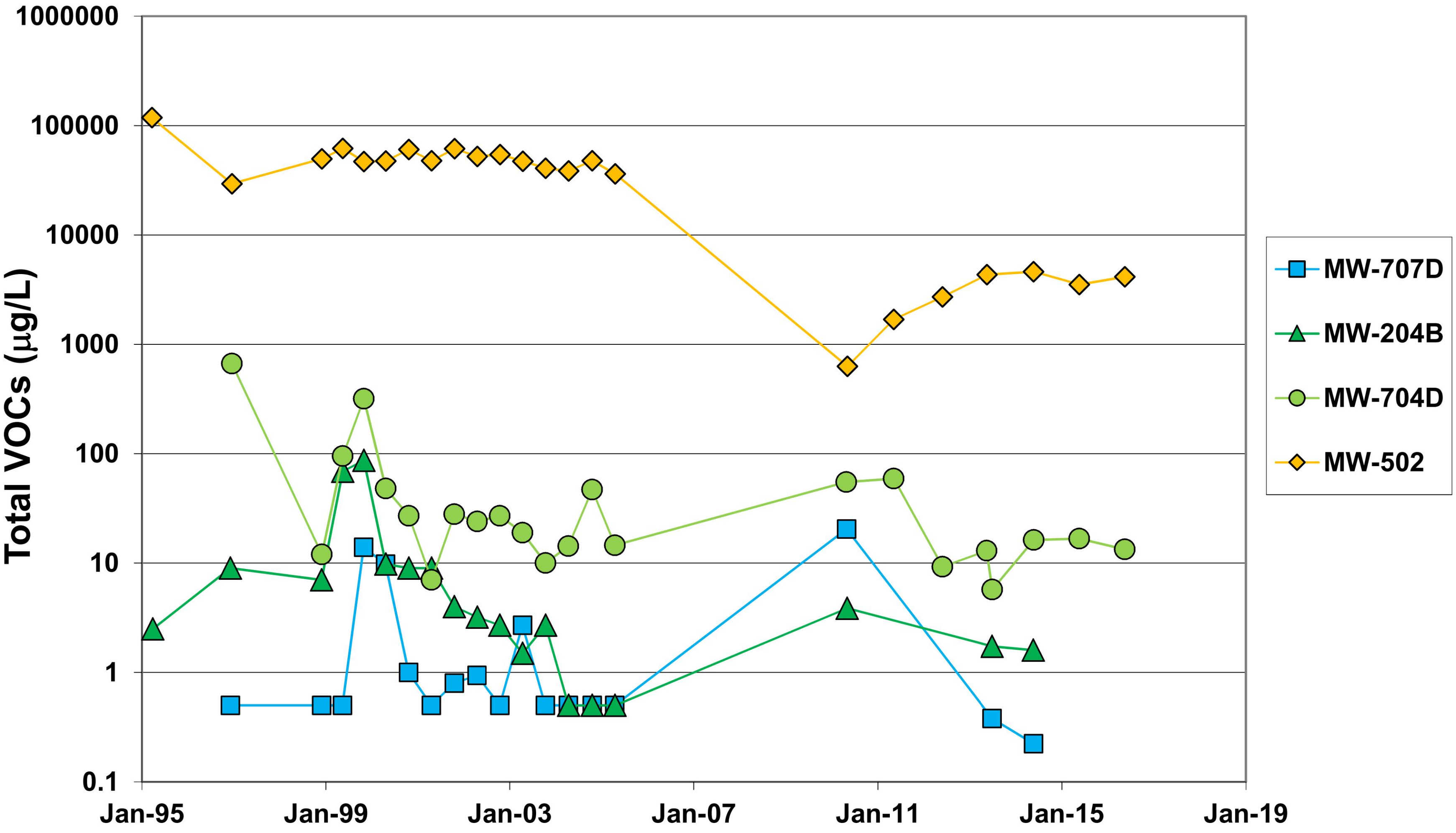


SRSNE SUPERFUND SITE
SOUTHINGTON, CONNECTICUT
MONITORED NATURAL ATTENUATION REPORT

GROUNDWATER TOTAL VOC CONCENTRATIONS WITH TIME MIDDLE OVERBURDEN

ARCADIS Design & Consultancy for natural and built assets

FIGURE
14

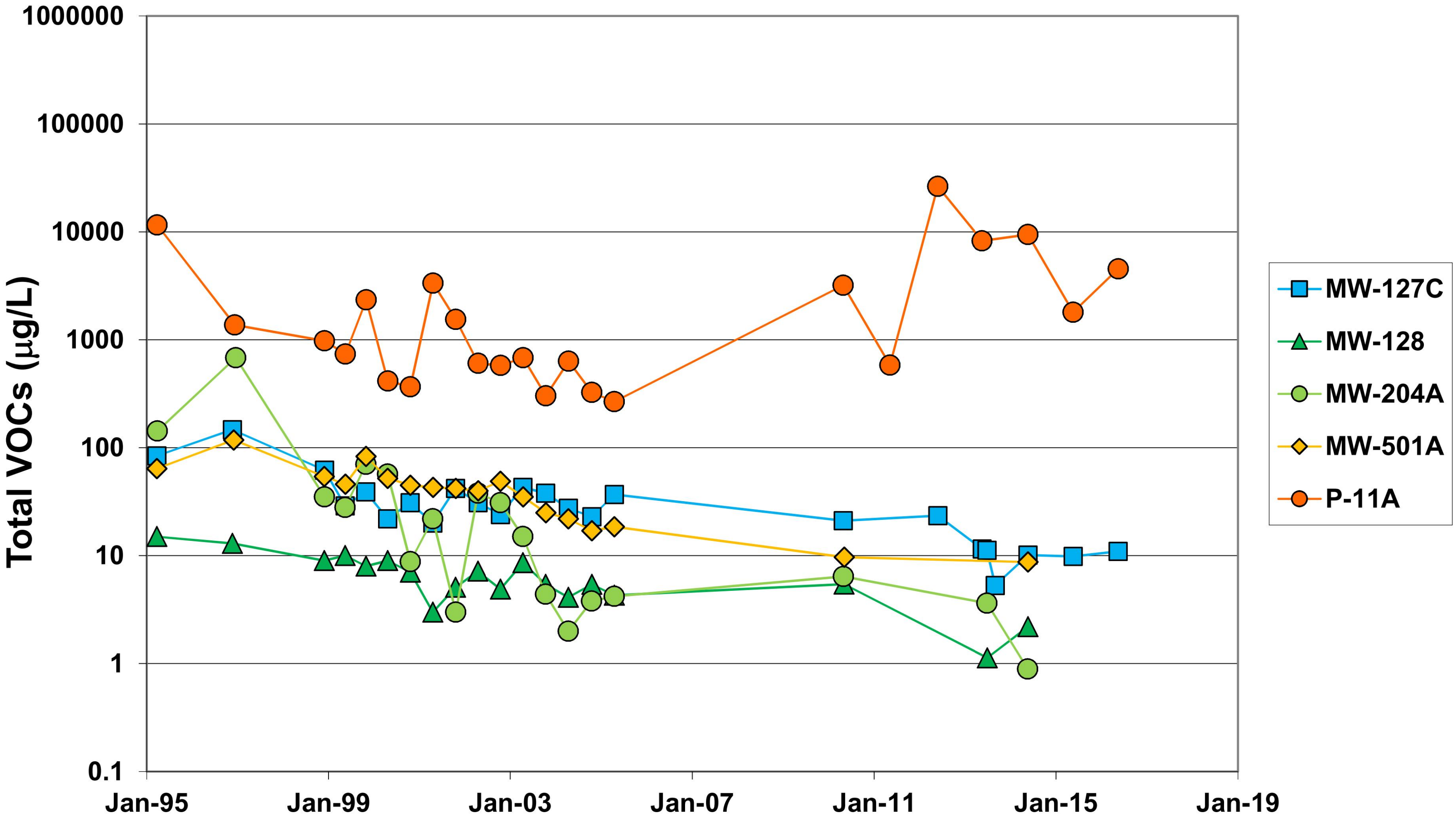


SRSNE SUPERFUND SITE
SOUTHINGTON, CONNECTICUT
MONITORED NATURAL ATTENUATION REPORT

GROUNDWATER TOTAL VOC CONCENTRATIONS WITH TIME DEEP OVERBURDEN

ARCADIS Design & Consultancy for natural and built assets

FIGURE
15



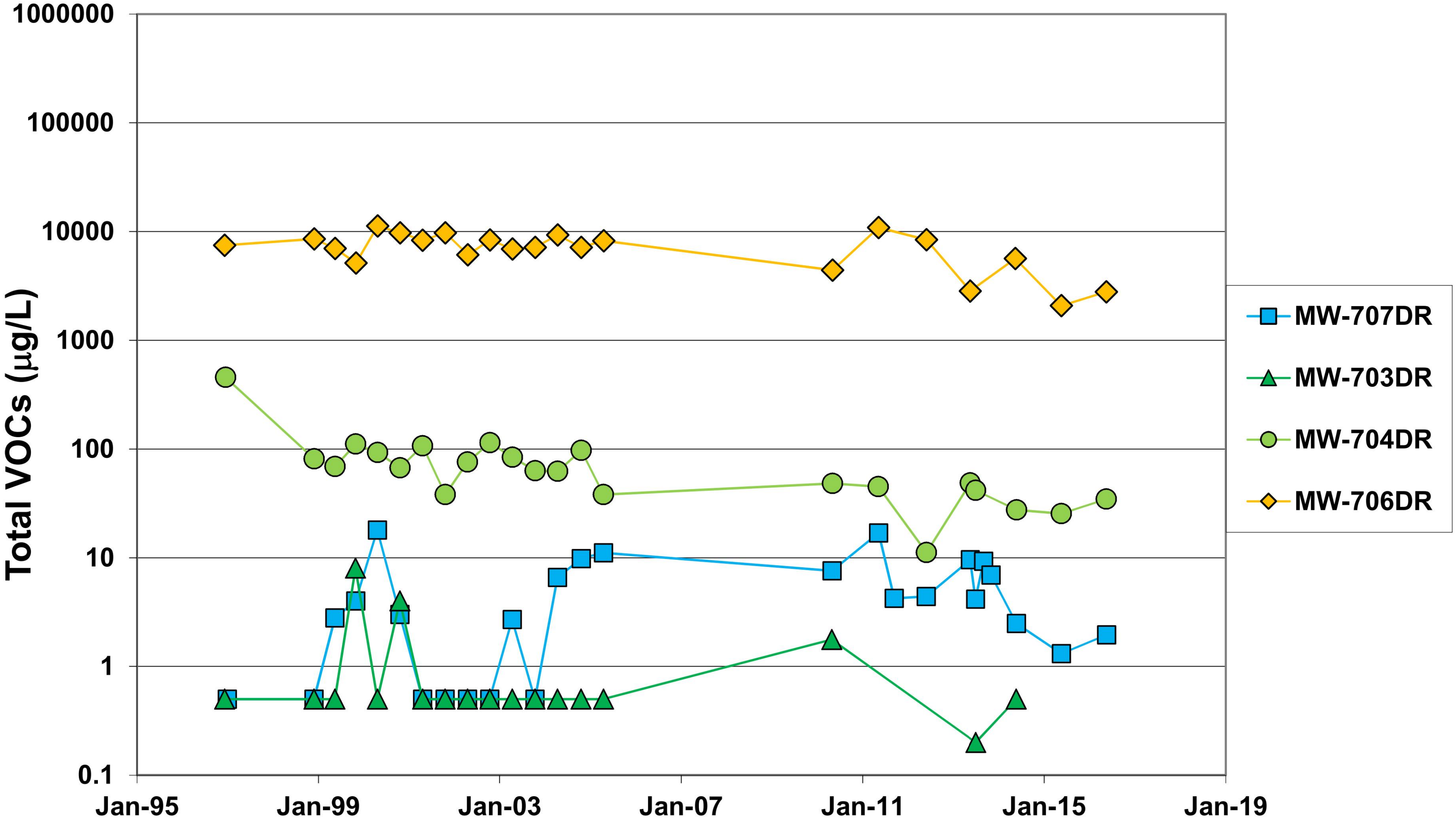
SRSNE SUPERFUND SITE
SOUTHINGTON, CONNECTICUT

MONITORED NATURAL ATTENUATION REPORT

GROUNDWATER TOTAL VOC CONCENTRATIONS WITH TIME SHALLOW BEDROCK

ARCADIS Design & Consultancy for natural and built assets

FIGURE
16



SRSNE SUPERFUND SITE
SOUTHINGTON, CONNECTICUT

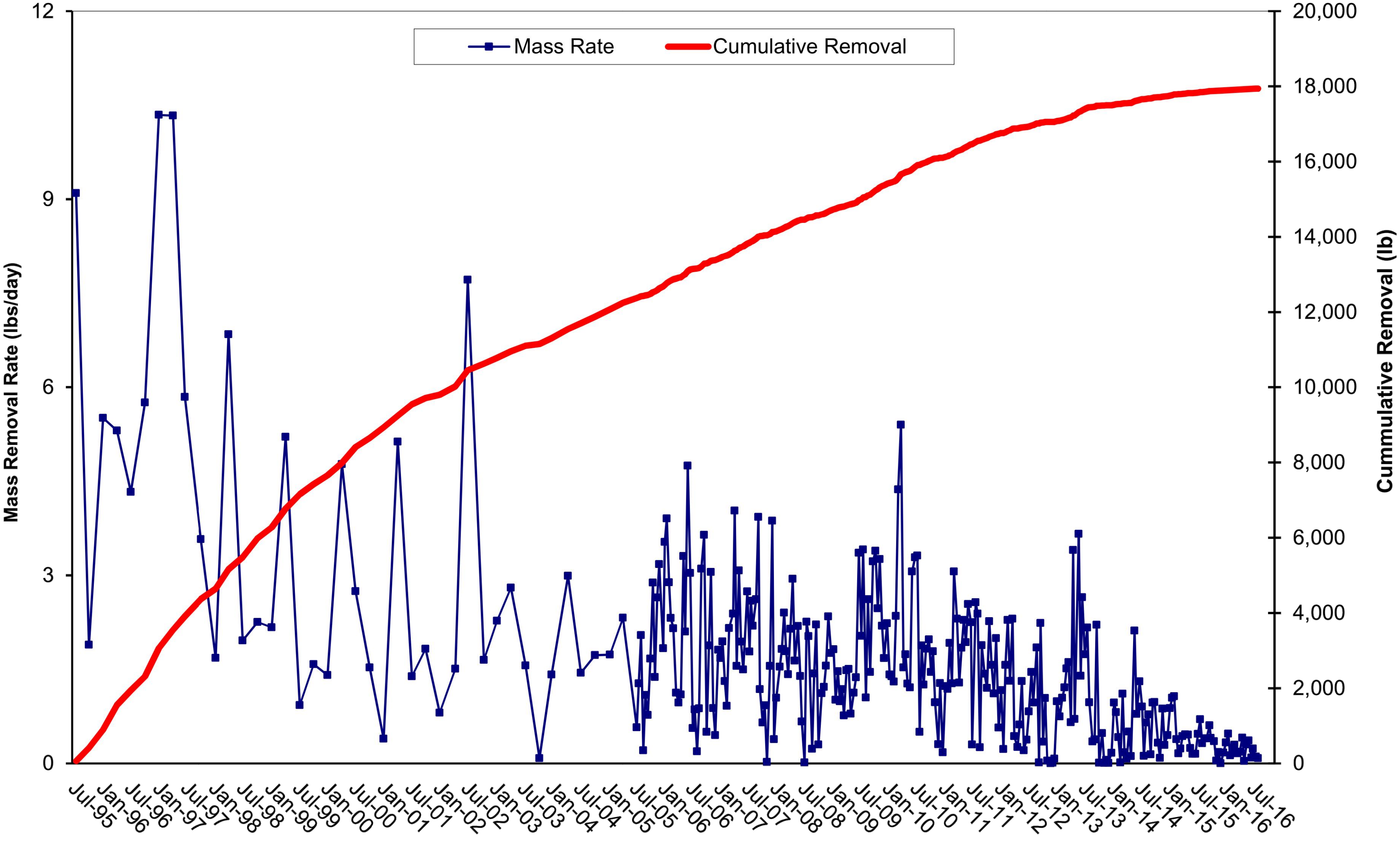
MONITORED NATURAL ATTENUATION REPORT

GROUNDWATER TOTAL VOC CONCENTRATIONS WITH TIME DEEP BEDROCK

ARCADIS Design & Consultancy for natural and built assets

FIGURE

17



SRSNE SUPERFUND SITE
SOUTHINGTON, CONNECTICUT

MONITORED NATURAL ATTENUATION REPORT

TOTAL MASS OF VOCs REMOVED BY NTCRA 1 AND NTCRA 2 GROUNDWATER EXTRACTION WELLS

ARCADIS Design & Consultancy for natural and built assets

FIGURE

18

APPENDIX A

Field Sampling Forms

March 2016 Post-Thermal Treatment Event

ARCADIS

Attachment A
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: TW-08D
Well Type: [✓ ● Monitoring] ● Other:
Well Finish: [✓ ● Stick Up] ● Flush Mount
Measuring Pt: [✓ ● Top of Casing] ● Other (specify):
Total Depth As Constructed (ftbgs): **Screened Interval (ftbgs):** 17.0 – 22.0
Well Casing: Diameter: 2" Material: Steel
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 3/10/2016 Time: 09:21
Weather Conditions: 60 Partly Sunny
Depth to groundwater at time of deployment: 3.80
Total well depth at time of deployment: 26.18
Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.75
Deployment Method/Position of Weight:

ppm: 101 ppm

● Bottom Anchor: Weight attached to bottom of HydraSleeve™. Weight rests on well bottom.
[✓ ● Top-Down]: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 19.2

Retrieval

Date and Time of Retrieval: Date: 3/11/2016 Time: 11:00
Total # of days deployed: 1
Weather Conditions: 58° Cloudy
Depth to groundwater at time of retrieval: 3.99
Total well depth at time of retrieval: 26.18
Downhole Field Parameters Upon Retrieval: Turb: 63.15
Temp: 22.6 (°C) **ORP:** 40.2 (mV) **Water quality meter:** YSI Professional Plus
pH: 7.45 **DO:** 0.62 (mg/L) **Serial #:** 10E100237

Notes/Observations:
Outer: 22"
steel: 19.5"

Field Sampling Technician: Name(s) and Company

Name	Company
Mike Redman/Matt Kassane	Arcadis
Ryan Malone	O&M

ARCADIS

Attachment A
HydraSleeve™ Field Form

Site: SRSNE

Location: Southington, CT

Well ID: TW-88B

Well Type: [✓ ● Monitoring] ● Other:

Well Finish: [✓ ● Stick Up] ● Flush Mount

Measuring Pt: [✓ ● Top of Casing] ● Other (specify):

Total Depth As Constructed (ftbgs): **Screened Interval (ftbgs):** 21.5 - 31.5

Well Casing: Diameter: 2" Material: Steel

Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 3/10/2016 Time:

Weather Conditions:

Depth to groundwater at time of deployment:

Total well depth at time of deployment:

Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.75

Deployment Method/Position of Weight:

● Bottom Anchor: Weight attached to bottom of HydraSleeve™. Weight rests on well bottom.

● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.

● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

PID - 68.4 ppm

Deployment Depth (Top of HydraSleeve™) (ftbgs):

Retrieval

Sample(s) W:45

Date and Time of Retrieval: Date: 3/11/2016 Time:

Total # of days deployed: +1 day

Weather Conditions: 58° Cloudy

Depth to groundwater at time of retrieval:

Total well depth at time of retrieval:

Downhole Field Parameters Upon Retrieval:

Temp:______ **(°C)** **ORP:**______ **(mV)** **Water quality meter:** YSI Professional Plus

pH:______ **DO:**______ **(mg/L)** **Serial #:** 10E 100237

Notes/Observations:

Outer: 28"
Steel: 25.5"

Could not deploy HS or DTW meter, due to damaged riser

Field Sampling Technician: Name(s) and Company

Name: Mike Feldman / Matt Kissane / Ryan Miler

Company: Arcadis O&M

MONITORING WELL FIELD DATA SHEET - Low-Flow Sampling

Project Name: SRSNE	Monitoring Well I.D.	Sample Identification
Project Location: Southington CT	TW-08R	TW-08B-03112016
Project Number:		

Well Measurement Data

Date: 3/11/16 Time: 09:45 Sampler(s): RM, MR, MK Weather: 55 Partly Cloudy

	Depth (ft.)	+ Corr. Factor (ft.)	= True DTW (ft.)
Depth to LNAPL		+	=
Depth to Water	4.46	+	=
Depth to DNAPL		+	=
Depth to Bottom	27.70	+	=

Measuring Device: [✓ Interface Probe] / Tape / Sinco / Other

Measuring Point: TPS / PVC / Other STEEL

LNAPL Thickness: N/A DNAPL Thickness: N/A

Comments:

Well Condition Inspection

General Condition: Good / Fair / Needs Repair

Outside

Steel Casing: [✓ OK] / [✓ Bent] / Damaged / None

Well Cap: [✓ Good] / Broken / Rusted / None

Well I.D.: [✓ Visible] / Illegible / None

Cement Collar: [✓ OK] / Cracked / Heaved / None

Lock: [✓ Good] / Broken / Rusted / None

Comments:

Inside

PVC Casing: [✓ OK] / Damaged / None STEEL

Is PVC Plumb? [✓ Yes] / No

H2O between PVC and Steel? [✓ No] / Yes

Evidence of: [✓ None] / Spiders / Rodents / Bees, Wasps

Ponding Around Well? No / [✓ Yes]

Area Around Well Flagged? [✓ Yes] / No

Purging & Stabilization

Pump Intake Depth (feet):

Sampler(s):

DTW Prior To Purge (ft.):

DTW After Sampling (ft.):

Purging/Sampling Device: Grundfos / Peristaltic / Bladder / Other

Date Sampled:

Time	Water Level (ft)	Pump Dial (Hz)	Pump Rate (mL/min)	Purge Volume (Liters)	Temp. (°C)	SC (uS/cm)	pH (SU)	ORP (mv)	DO (mg/L)	Turb. (NTU)
	max. 0.3' drawdown				3%	3%	0.1 SU	10mV	10%	10% (if >1)
09:45	4.90		100		20.8	819	7.78	43.6	1.30	41.98
09:50	5.30		↓		20.1	744	7.24	23.6	0.56	55.88
09:55	5.28				19.1	743	7.05	41.0	0.42	40.40
10:00	5.22				18.5	742	6.91	14.4	0.27	52.67
10:05	5.24				19.1	736	6.88	9.3	0.23	60.28
10:10	5.15				19.7	741	6.87	-0.4	0.21	69.30
10:15	5.19				20.4	739	6.82	-11.0	0.16	68.36
10:20	5.21				20.3	741	6.84	-12.0	0.15	61.85
10:25	5.23				20.5	738	6.85	-12.6	0.15	58.32
10:30	5.23				20.1	739	6.84	-12.2	0.13	55.42
10:35	5.25				20.8	739	6.83	-12.2	0.13	52.31
10:40	5.25				20.6	738	6.82	-11.4	0.12	49.88

Sampled @ 10:45

Sample Data

Field Decontamination: None / Submersible Pump / Pump Tubing / Other

Appearance: Color: [✓ Clear] / Grey / Orange / Yellow / Brown / Black / Other

Odor: None / (Describe) Unure

Turbidity: [✓ Clear] / Silty (slightly / very) / Sandy (slightly / very) / Other

Sheen: None / (light / heavy) / (hydrocarbon / organic)

Comments: MS/MSD Dup done one this well

OVM Readings On Well: PID # 68.4 ppm

Container	Number	Pres.	Analysis	Total
VOAs	3	HCl	VOCs 8260	12
VOA	2	Trisodium Phosphate	Dissolved Gas	8
Poly 250mL	1	none	SO4, Cl, NO3, NO2	4
VOA	3	H2SO4	TOC	12
Poly-125mL	1	HNO3	Total Fe Mn	4
Poly-125mL	✓	none	Alk-T-2320	4
Poly	1	HNO3	Dissolved Fe MN (SF)	4
Amber	2	none	4 2-1,4 Dioxane-SIM	8

DUP, MS/MSD performed on this well

ARCADIS

Attachment A
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: TW-08A
Well Type: [✓ Monitoring] ● Other:
Well Finish: [✓ Stick Up] ● Flush Mount
Measuring Pt: [✓ Top of Casing] ● Other (specify):
Total Depth As Constructed (ftbgs): 14.0
Screened Interval (ftbgs): 4.0 - 14.0
Well Casing: Diameter: 2"
Material: Steel
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 3/10/2016 Time: 09:43
Weather Conditions: 60 Partly Sunny
Depth to groundwater at time of deployment: 4.41
Total well depth at time of deployment: 14.40
Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.75
Deployment Method/Position of Weight:

PID: 15.1 ppm

● Bottom Anchor: Weight attached to bottom of HydraSleeve™. Weight rests on well bottom.
[✓ Top-Down]: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 9.4

Retrieval

Date and Time of Retrieval: Date: 3/11/2016 Time: 10:15
Total # of days deployed: 1 day
Weather Conditions: 57° Cloudy
Depth to groundwater at time of retrieval: 4.88
Total well depth at time of retrieval: 14.40
Downhole Field Parameters Upon Retrieval: Turb: 187.5
Temp: 17.9 (°C)
ORP: 31.7 (mV)
Water quality meter: YSI Pro Plus
pH: 6.43
DO: 2.25 (mg/L)
Serial #: 10E100237

Notes/Observations:

Outer Casing: 27
Steel: 24"

Field Sampling Technician: Name(s) and Company

Name: Mike Redman / Matt Kusen
Company: Arcadis

Name: Ryan Malone
Company: O&M

ARCADIS

Attachment A
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: MW-413

Well Type: [✓ ● Monitoring] ● Other:
Well Finish: [✓ ● Stick Up] ● Flush Mount
Measuring Pt: [✓ ● Top of Casing] ● Other (specify):
Total Depth As Constructed (ftbgs): 19.8 **Screened Interval (ftbgs):** 14.8 - 19.8
Well Casing: Diameter: 2" Material:
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 3/10/2016 Time: 9:58
Weather Conditions: 60 Partly Sunny
Depth to groundwater at time of deployment: 3.58
Total well depth at time of deployment: 22.41
Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.75
Deployment Method/Position of Weight:

- ● Bottom Anchor: Weight attached to bottom of HydraSleeve™. Weight rests on well bottom.
- ● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
- ● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

PID: 0.0 ppm

Deployment Depth (Top of HydraSleeve™) (ftbgs): 16.8

Retrieval

Date and Time of Retrieval: Date: 3/11/2016 Time: 11:50
Total # of days deployed: 1 day
Weather Conditions: 57° Cloudy
Depth to groundwater at time of retrieval: 3.71
Total well depth at time of retrieval: 22.41
Downhole Field Parameters Upon Retrieval:
Turb: 36.40
Temp: 14.2 **(°C)** **ORP:** 47.4 **(mV)** **Water quality meter:** YSI Professional Plus
pH: 6.81 **DO:** 8.66 **(mg/L)** **Serial #:** 10E100 237

Notes/Observations:
Outer Casing: 27"
PVC: 25"

Field Sampling Technician: Name(s) and Company

Name	Company
Mike Redman / Matt Kissane	Arcadis
Ryan Malone	O&M

ARCADIS

Attachment A
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: MW-415

Well Type: [✓ Monitoring] • Other:
Well Finish: [✓ Stick Up] • Flush Mount
Measuring Pt: [✓ Top of Casing] • Other (specify):
Total Depth As Constructed (ftbgs): 11.8 **Screened Interval (ftbgs):** 6.8 – 11.8"
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 3/10/2016 Time: 10:12
Weather Conditions: 60 Partly Sunny
Depth to groundwater at time of deployment: 3.75
Total well depth at time of deployment: 14.10
Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.75
Deployment Method/Position of Weight:
- • Bottom Anchor: Weight attached to bottom of HydraSleeve™. Weight rests on well bottom.
- [✓ Top-Down]: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
- • Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

PID: 0.0 ppm

Deployment Depth (Top of HydraSleeve™) (ftbgs): 8.8

Retrieval

Date and Time of Retrieval: Date: 3/11/2016 Time: 12:10
Total # of days deployed: 1 day
Weather Conditions: 58° Cloudy
Depth to groundwater at time of retrieval: 2.92
Total well depth at time of retrieval: 14.10
Downhole Field Parameters Upon Retrieval: Turb: 21.50
Temp: 16 (°C) **ORP:** 66.2 (mV) **Water quality meter:** YSI Professional Plus
pH: 6.65 **DO:** 1.11 (mg/L) **Serial #:** 10E100237

Notes/Observations:
Outer Casing: 30"
PVC: ≈ 28"

Field Sampling Technician: Name(s) and Company

Name	Company
Mike Redman Matt Kissane	Arcadis
Ryan Malone	O&M

ARCADIS

Attachment A
HydraSleeve™ Field Form

Site: SRSNE

Location: Southington, CT

Well ID: MW-902D

Well Type: [✓ ● Monitoring] ● Other:

Well Finish: [✓ ● Stick Up] ● Flush Mount

Measuring Pt: [✓ ● Top of Casing] ● Other (specify):

Total Depth As Constructed (ftbgs): 240 **Screened Interval (ftbgs):** 19.0 - 24.0

Well Casing: Diameter: 2" Material: Steel

Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 3/10/2016 Time: 11:00

Weather Conditions: 60 Partly Sunny

Depth to groundwater at time of deployment: 7.56

Total well depth at time of deployment: 21.40

Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.75"

Deployment Method/Position of Weight:

PID = 10.6

● Bottom Anchor: Weight attached to bottom of HydraSleeve™. Weight rests on well bottom.

[✓ ● Top-Down]: Weight attached to bottom of HydraSleeve™. Weight suspended in well.

● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 21

Retrieval

Date and Time of Retrieval: Date: 3/11/2016 Time: 13:45

Total # of days deployed: 1 day

Weather Conditions: 60 Sunny

Depth to groundwater at time of retrieval: 8.21

Total well depth at time of retrieval: 21.40

Downhole Field Parameters Upon Retrieval:

Temp: 11.1 **(°C)** **ORP:** 30.9 **(mV)** Turb: 15.53 **Water quality meter:** YSI Professional Plus

pH: 6.90 **DO:** 1.40 **(mg/L)** **Serial #:** 10E100237

Notes/Observations:

Outer Casing: 29"
PVC: 26.5

Field Sampling Technician: Name(s) and Company

Name	Company
Mike Redman / Matt Kissam	Arcadis
Ryan Malone	O&M

ARCADIS

Attachment A
HydraSleeve™ Field Form

Site: SRSNE

Location: Southington, CT

Well ID: MW-902M

Well Type: [✓ ● Monitoring] ● Other:

Well Finish: [✓ ● Stick Up] ● Flush Mount

Measuring Pt: [✓ ● Top of Casing] ● Other (specify):

Total Depth As Constructed (ftbgs): 17.5 **Screened Interval (ftbgs):** 17.5 - 17.5

Well Casing: Diameter: 2" Material: Steel

Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 3/10/2016 Time: 11:11

Weather Conditions: 60 Partly Sunny

Depth to groundwater at time of deployment: 7.03

Total well depth at time of deployment: 26.22

Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.75

Deployment Method/Position of Weight:

PID: 0.3

● Bottom Anchor: Weight attached to bottom of HydraSleeve™. Weight rests on well bottom.

[✓ ● Top-Down:] Weight attached to bottom of HydraSleeve™. Weight suspended in well.

● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 15

Retrieval

Date and Time of Retrieval: Date: 3/11/2016 Time: 14:00

Total # of days deployed: +1 day

Weather Conditions: 59° Cloudy

Depth to groundwater at time of retrieval: 7.48

Total well depth at time of retrieval: 26.22

Downhole Field Parameters Upon Retrieval:

Turb: 14.58

Temp: 10.5 **(°C)** **ORP:** -81.8 **(mV)** **Water quality meter:** YSI Professional Plus

pH: 6.91 **DO:** 1.81 **(mg/L)** **Serial #:** 10E100237

Notes/Observations:

Out Casing: 32"

Steel: 29"

Field Sampling Technician: Name(s) and Company

Name Company

Mike Pedman / Matt Kissane Arcadis

~~[illegible]~~ Ryan Malone O&M

ARCADIS

Attachment A
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: MWL-304
Well Type: [✓ Monitoring] ● Other:
Well Finish: [✓ Stick Up] ● Flush Mount
Measuring Pt: [✓ Top of Casing] ● Other (specify):
Total Depth As Constructed (ftbgs): 11.0 **Screened Interval (ftbgs):** 1.0-11.0
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 3/10/2016 Time: 09:11
Weather Conditions: 60 Partly Sunny
Depth to groundwater at time of deployment: 5.97
Total well depth at time of deployment: 16.15
Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.75
Deployment Method/Position of Weight:

PID: 0.0

● Bottom Anchor: Weight attached to bottom of HydraSleeve™. Weight rests on well bottom.
[✓ ● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.]
● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 8.3

Retrieval

Date and Time of Retrieval: Date: 3/11/2016 Time: 12:20
Total # of days deployed: 1
Weather Conditions: 57° Cloudy
Depth to groundwater at time of retrieval: 6.14
Total well depth at time of retrieval: 16.15
Downhole Field Parameters Upon Retrieval:
Temp: 13.2 (°C) **ORP:** 22.2 (mV) Turb: 49.01 **Water quality meter:** YSI Professional Plus
pH: 7.46 **DO:** 3.56 (mg/L) **Serial #:** 10B100237

Notes/Observations:

Outer Casing: 44"
PVC: 41" set @ 8.3 ftbgs due due to low water table

Field Sampling Technician: Name(s) and Company

Name	Company
Mike Redman / Matt Kissane	Arcadis
Ryan Malone	O&M

ARCADIS

Attachment A
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: MWL-307
Well Type: [✓ Monitoring] ● Other:
Well Finish: [✓ Stick Up] ● Flush Mount
Measuring Pt: [✓ Top of Casing] ● Other (specify):
Total Depth As Constructed (ftbgs): 11.00 **Screened Interval (ftbgs):** 1.0 - 11.0
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 3/10/2011 Time: 11:38
Weather Conditions: 65 Partly Sunny
Depth to groundwater at time of deployment: 2.31
Total well depth at time of deployment: 12.87
Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.75
Deployment Method/Position of Weight:
- ● Bottom Anchor: Weight attached to bottom of HydraSleeve™. Weight rests on well bottom.
- [✓ Top-Down]: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
- ● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

PID: 0.0 ppm

Deployment Depth (Top of HydraSleeve™) (ftbgs): 8.0

Retrieval

Date and Time of Retrieval: Date: 3/11/2011 Time: 14:15
Total # of days deployed: 1 day
Weather Conditions: 57° Cloudy
Depth to groundwater at time of retrieval: 2.60
Total well depth at time of retrieval: 12.87
Downhole Field Parameters Upon Retrieval: TURB: 9.15
Temp: 10.8 (°C) **ORP:** 89.0 (mV) **Water quality meter:** YSI Professional Plus
pH: 6.75 **DO:** 2.60 (mg/L) **Serial #:** 10C100237

Notes/Observations:
outer casing: 27".
PVC: 18"

Field Sampling Technician: Name(s) and Company

Name	Company
Mike Redman / Matt Kissane	Arcadis
Ryan Malone	O&M

ARCADIS

Attachment A
HydraSleeve™ Field Form

Site: SRSNE

Location: Southington, CT

Well ID: MW-416

Well Type: [✓ Monitoring]   ● Other:

Well Finish: [✓ Stick Up]   ● Flush Mount

Measuring Pt: [✓ Top of Casing]   ● Other (specify):

Total Depth As Constructed (ftbgs): 49.4   **Screened Interval (ftbgs):** 29.4 - 49.4

Well Casing: Diameter: 2"   Material: PVC

Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 3/10/2016   Time: 11:17

Weather Conditions: 65 Partly Sunny

Depth to groundwater at time of deployment: 7.50

Total well depth at time of deployment: 49.11

Dimensions of HydraSleeve™: Length (in.) 36   Diameter (in.) 1.75

Deployment Method/Position of Weight:

PID: 0.0

● Bottom Anchor: Weight attached to bottom of HydraSleeve™. Weight rests on well bottom.

[✓ Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.]

● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well..

Deployment Depth (Top of HydraSleeve™) (ftbgs): 39.4

Retrieval

Date and Time of Retrieval: Date: 3/11/2016   Time: 14:30

Total # of days deployed: +1 day

Weather Conditions: 59° Cloudy

Depth to groundwater at time of retrieval: 8.84

Total well depth at time of retrieval: 49.11

Downhole Field Parameters Upon Retrieval:

Temp: 15.0 (°C)   **ORP:** 60.2 (mV)   Turb: 12.98   **Water quality meter:** YSI Professional Plus

pH: 8.46   **DO:** 3.05 (mg/L)   **Serial #:** 10E100237

Notes/Observations:

Outer Casing: 31

PVC: 29.5

Field Sampling Technician: Name(s) and Company

Name	Company
Mike Redmond/ Matt Kissane	Arcadis
Ryan Malloy	O+M

June 2016 Annual Event

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Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: MW-707M

Well Type: ● [✓ Monitoring] ● Other:
Well Finish: ● [✓ Stick Up] ● Flush Mount
Measuring Pt: ● [✓ Top of Casing] ● Other (specify):
Total Depth As Constructed (ftbgs): 68.0 **Screened Interval (ftbgs):** 58.0-68.0'
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/2/16 Time: 1330
Weather Conditions: Sunny ~80°
Depth to groundwater at time of deployment: 8.95
Total well depth at time of deployment: 69.92
Dimensions of HydraSleeve™: Length (in.) 36" Diameter (in.) 1.8"
Deployment Method/Position of Weight:
● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.
PID (ppm): 0.0
Deployment Depth (Top of HydraSleeve™) (ftbgs): 63.0'

Retrieval

Date and Time of Retrieval: Date: 6/6/16 Time: 11:00
Total # of days deployed: 4 days
Weather Conditions: 75°
Depth to groundwater at time of retrieval: ~~4.63~~ 5.75
Total well depth at time of retrieval: 69.91
Downhole Field Parameters Upon Retrieval:
Temp: 15.06 (°C) **ORP:** 173.2 (mV) **Water quality meter:** YSI 556 MPS
pH: 7.54 **DO:** 9.87 (mg/L) **Serial #:** 14100061

Notes/Observations:
Turbidity - 17.52 NTU
* Full Recovery Cond 414 uS/cm

Field Sampling Technician: Name(s) and Company

Name	Company
Mike Redman	Arcadis
Chris Glidden	Arcadis

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Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: MW-707[illegible]

Well Type: [✓ Monitoring] ● Other:
Well Finish: [✓ Stick Up] ● Flush Mount
Measuring Pt: [✓ Top of Casing] ● Other (specify):
Total Depth As Constructed (ftbgs): 30.0' **Screened Interval** (ftbgs): 20.0-30.0'
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/2/16 Time: 1325
Weather Conditions: Sunny ~80°
Depth to groundwater at time of deployment: 8.97'
Total well depth at time of deployment: 32.10'
Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.8
Deployment Method/Position of Weight:
PID (ppm): 0.0
● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.
Deployment Depth (Top of HydraSleeve™) (ftbgs): 25.0'

Retrieval

Date and Time of Retrieval: Date: 6/6/16 Time: ~~10:30~~ 10:35
Total # of days deployed: 4 days
Weather Conditions: 76°
Depth to groundwater at time of retrieval: 8.81
Total well depth at time of retrieval: 32.68
Downhole Field Parameters Upon Retrieval:
Temp: 15.11 (°C) **ORP:** 159.4 (mV) **Water quality meter:** YSI 556 mps
pH: 7.00 **DO:** 9.86 (mg/L) **Serial #:** 14F100061

Notes/Observations:

Turbidity - 28.02 NTU * Full recovery
~~[illegible]~~ DUP-06062016-1 286 µS/cm

Field Sampling Technician: Name(s) and Company

Name	Company
Mike Redman	Arcadis
Chris [illegible]	Arcadis

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Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: ~~[illegible]~~ MW-707R

Well Type: ● [✓ Monitoring] ● Other:
Well Finish: ● [✓ Stick Up] ● Flush Mount
Measuring Pt: ● [✓ Top of Casing] ● Other (specify):
Total Depth As Constructed (ftbgs): 125.0' **Screened Interval (ftbgs):** 115.0-125.0'
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/2/16 Time: 1315
Weather Conditions: Sunny & 80°
Depth to groundwater at time of deployment: 9.97'
Total well depth at time of deployment: 126.35'
Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.8
Deployment Method/Position of Weight:
PID (ppm): 0.0

● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 120.0'

Retrieval

Date and Time of Retrieval: Date: 6/6/16 Time: 10:20
Total # of days deployed: 4 days
Weather Conditions: 75°
Depth to groundwater at time of retrieval: 9.85
Total well depth at time of retrieval: 126.34
Downhole Field Parameters Upon Retrieval:
Temp: 18.08 (°C) **ORP:** 143.2 (mV) **Water quality meter:** YSI 556 MPS
pH: 6.07 **DO:** 3.61 (mg/L) **Serial #:** 14F100061

Notes/Observations:

*Turbidity 34.29 NTU *Full Recovery
*MS/MSD Cond 763 uS/cm

Field Sampling Technician: Name(s) and Company

Name	Company
Mike Redman	Arcadis
~~Mike~~ Chris Glidden	Arcadis

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Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE

Location: Southington, CT

Well ID: MW-1003R

Well Type: [✓ Monitoring] ● Other:

Well Finish: [✓ Stick Up] ● Flush Mount

Measuring Pt: [✓ Top of Casing] ● Other (specify):

Total Depth As Constructed (ftbgs): 118.0' **Screened Interval (ftbgs):** 103.0'-118.0'

Well Casing: Diameter: 2" Material: PVC

Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/2/16 Time: 1340

Weather Conditions: Sunny ~80°

Depth to groundwater at time of deployment: 9.70'

Total well depth at time of deployment: 121.35'

Dimensions of HydraSleeve™: Length (in.) 36" Diameter (in.) 1.8"

Deployment Method/Position of Weight:

PID (ppm): 0.0

● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.

● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 110.5'

Retrieval

Date and Time of Retrieval: Date: 6/6/16 Time: 11:40

Total # of days deployed: 4 days

Weather Conditions: 76°F

Depth to groundwater at time of retrieval: 9.20

Total well depth at time of retrieval: 121.35

Downhole Field Parameters Upon Retrieval:

Temp: ~~22~~ 24.05 (°C) **ORP:** 76.6 (mV) **Water quality meter:** YSI 556 mps

pH: 9.22 **DO:** 1.53 (mg/L) **Serial #:** 14000161

Notes/Observations:

*PID- upon retrieval ~~[illegible]~~ -0.0 *Turb 25.7 NTU

*Full retrieval *Conduct 2043

Field Sampling Technician: Name(s) and Component

Name	Company
Mike [illegible]	Arcadis
[illegible]	Arcadis

ARCADIS

Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: MW-1003DR
Well Type: [✓ ● Monitoring] ● Other:
Well Finish: [✓ ● Stick Up] ● Flush Mount
Measuring Pt: [✓ ● Top of Casing] ● Other (specify):
Total Depth As Constructed (ftbgs): 192.0' **Screened Interval (ftbgs):** 177.0 - 192.0'
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/2/16 Time: 1345
Weather Conditions: Sunny 80°
Depth to groundwater at time of deployment: 14.26'
Total well depth at time of deployment: 196.27'
Dimensions of HydraSleeve™: Length (in.) 36" Diameter (in.) 1.8"
Deployment Method/Position of Weight:
PID (ppm): 0.0 [illegible]
[illegible]
● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.
Deployment Depth (Top of HydraSleeve™) (ftbgs): 184.5'

Retrieval

Date and Time of Retrieval: Date: 6/6/2016 Time: 1200
Total # of days deployed: 4days
Weather Conditions: 76°F
Depth to groundwater at time of retrieval: 14.36
Total well depth at time of retrieval: 196.27
Downhole Field Parameters Upon Retrieval:
Temp: 20.22 **(°C)** **ORP:** 64.4 **(mV)** **Water quality meter:** YSI 556 MPS
pH: 12.03 **DO:** 1.28 **(mg/L)** **Serial #:** 14000161

Notes/Observations:

*(PID)-upon retrieval – 0.0
*Full ~~[illegible]~~ retrieval

Cond: 3353
Turbidity 58.29

Field Sampling Technician: Name(s) and Company

Name	Company
Mike Redman	Arcadis
Chris Glidden	Arcadis

ARCADIS

Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE

Location: Southington, CT

Well ID: P20-2M

Well Type: [✓ Monitoring] ● Other:

Well Finish: [✓ Stick Up] ● Flush Mount

Measuring Pt: [✓ Top of Casing] ● Other (specify):

Total Depth As Constructed (ftbgs): 56.0′ **Screened Interval (ftbgs):** 46.0-56.0′

Well Casing: Diameter: 2″ Material: PVC

Well Screen: Diameter: 2″

Deployment

Date and Time of Deployment: Date: 6/2/16 Time: 1415

Weather Conditions: Sunny ~80°

Depth to groundwater at time of deployment: 8.55′

Total well depth at time of deployment: 58.34′

Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.8

Deployment Method/Position of Weight:

PID (ppm): 0.0

● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.

● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 51.0′

Retrieval

Date and Time of Retrieval: Date: 6/6/2016 Time: 1450)

Total # of days deployed: 4 days

Weather Conditions: 83°F

Depth to groundwater at time of retrieval: 8.44

Total well depth at time of retrieval:

Downhole Field Parameters Upon Retrieval:

Temp: 18.71 (°C) **ORP:** 107.1 (mV) **Water quality meter:** YSI 556 MPS

pH: 9.31 **DO:** 2.35 (mg/L) **Serial #:** 14000161

Notes/Observations:

*full retrieval *Conductivity - 318

*PID upon retrieval 0.0ppm Turbidity 21.07

Field Sampling Technician: Name(s) and Company

Name	Company
Mike Redmar	Arcadis
Chris G[illegible]	Arcadis

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Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: MW-1002DR

Well Type: ● [✓ Monitoring] ● Other:
Well Finish: ● [✓ Stick Up] ● Flush Mount
Measuring Pt: ● [✓ Top of Casing] ● Other (specify):

Total Depth As Constructed (ftbgs): 192.0' **Screened Interval (ftbgs):** 177.0-192.0'
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/2/16 Time: 1405
Weather Conditions: Sunny ~80°
Depth to groundwater at time of deployment: 59.86'
Total well depth at time of deployment: 189.98'
Dimensions of HydraSleeve™: Length (in.) 30 Diameter (in.) 1.8
Deployment Method/Position of Weight:

PID (ppm): 0.0

● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.

● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 184.5'

Retrieval

Date and Time of Retrieval: Date: 6/6/2016 Time: 13:55
Total # of days deployed: 4 days
Weather Conditions: 78°
Depth to groundwater at time of retrieval: ~~59.98~~ 59.58
Total well depth at time of retrieval: 189.98
Downhole Field Parameters Upon Retrieval:
Temp: 17.54 **(°C)** **ORP:** 133.6 **(mV)** **Water quality meter:** YSI 556 MPS
pH: 10.94 **DO:** 3.45 **(mg/L)** **Serial #:** 14000161

Notes/Observations:

Pid upon retrieval – 0.0 ppm
* Full recovery

Cond: 2259
Turb: 36.61

Field Sampling Technician: Name(s) and Company

Name	Company
Mike Redman	Arcadis
Chris Glidden	Arcadis

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Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: MW-1009R
Well Type: ● [✓ Monitoring] ● Other:
Well Finish: ● [✓ Stick Up] ● Flush Mount
Measuring Pt: ● [✓ Top of Casing] ● Other (specify):
Total Depth As Constructed (ftbgs): 120.0' **Screened Interval (ftbgs):** 105.0-120.0'
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/2/16 Time: 1355
Weather Conditions: Sunny ~80°
Depth to groundwater at time of deployment: 5.55'
Total well depth at time of deployment: 122.31'
Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.8
Deployment Method/Position of Weight:
PID (ppm): 0.0

● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.

● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 112.5'

Retrieval

Date and Time of Retrieval: Date: 6/6/2016 Time: 13:25
Total # of days deployed: 4 day
Weather Conditions: 79° F
Depth to groundwater at time of retrieval: 5.42
Total well depth at time of retrieval: 122.29
Downhole Field Parameters Upon Retrieval:
Temp: 20.31 **(°C)** **ORP:** 32.7 **(mV)** **Water quality meter:** YSI 556 MPS
pH: 9.63 **DO:** 2.24 **(mg/L)** **Serial #:** 14000161

Notes/Observations:

* Pid upon retrieval - 0.0ppm
*Cond 3780 * Turbidity - 28.16 NTU

Field Sampling Technician: Name(s) and Company

Name	Company
Mike Redman	Arcadis
Chris Glidden	Arcadis

ARCADIS

Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: CPZ-6
Well Type: [✓ Monitoring] ● Other:
Well Finish: [✓ Stick Up] ● Flush Mount
Measuring Pt: [✓ Top of Casing] ● Other (specify):
Total Depth As Constructed (ftbgs): 25.2' **Screened Interval (ftbgs):** 10.2-25.2'
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/2/16 Time 0912
Weather Conditions: Sunny ~70°
Depth to groundwater at time of deployment: 5.47'
Total well depth at time of deployment: 24.41'
Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.8
Deployment Method/Position of Weight:

PID (ppm): 0.0

● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.

● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 17.7'

Retrieval

Date and Time of Retrieval: Date: 6/6/16 Time: 1320
Total # of days deployed: 4
Weather Conditions: Sunny ~80°F
Depth to groundwater at time of retrieval: 5.48
Total well depth at time of retrieval: 24.41
Downhole Field Parameters Upon Retrieval:
Temp: 19.45 (°C) **ORP:** -25.8 (mV) **Water quality meter:** YSI556
pH: 7.25 **DO:** 2.22 (mg/L) **Serial #:** 14L100845

Notes/Observations:

Turb: 7.618
Cond: 691 uS/cm

Field Sampling Technician: Name(s) and Company

Name Company

ARCADIS

Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE

Location: Southington, CT

Well ID: MW-704B

Well Type: ● [✓ Monitoring] ● Other:

Well Finish: ● Stick Up ● [✓ Flush Mount]

Measuring Pt: ● [✓ Top of Casing] ● Other (specify):

Total Depth As Constructed (ftbgs): 63.0' **Screened Interval** (ftbgs): 530-63.0'

Well Casing: Diameter: 2" Material: PVC

Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/2/10 Time: 1130

Weather Conditions: Sunny ~75°

Depth to groundwater at time of deployment: 5.98'

Total well depth at time of deployment: 61.00'

Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.8

Deployment Method/Position of Weight:

PID (ppm): 0.0

● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.

● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 58.0'

Retrieval

Date and Time of Retrieval: Date: 6/6/10 Time: 1300

Total # of days deployed: 4

Weather Conditions: Sunny ~80°

Depth to groundwater at time of retrieval: 5.90'

Total well depth at time of retrieval: 61.00'

Downhole Field Parameters Upon Retrieval:

Temp: 17.10 (°C) **ORP:** -29.0 (mV) **Water quality meter:** YSI556

pH: 7.32 **DO:** .79 (mg/L) **Serial #:** 14L100815

Notes/Observations:

Turb: 58.2

Cond: 198 µs/cm

Field Sampling Technician: Name(s) and Company

Name: DB/MK

Company: Arcadis

ARCADIS

Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: MW-704DR
Well Type: [✓ Monitoring] ● Other:
Well Finish: [✓ Stick Up] ● Flush Mount
Measuring Pt: [✓ Top of Casing] ● Other (specify):
Total Depth As Constructed (ftbgs): 132.0' **Screened Interval (ftbgs):** 102.0-132.0'
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/2/16 Time: 1110
Weather Conditions: Sunny ~75°
Depth to groundwater at time of deployment: 69.41'
Total well depth at time of deployment: 135.0'
Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.8
Deployment Method/Position of Weight:
● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.
PID (ppm): 0.0
Deployment Depth (Top of HydraSleeve™) (ftbgs): 117.0'

Retrieval

Date and Time of Retrieval: Date: 6/6/16 Time: ~~[illegible]~~ 1330
Total # of days deployed: 4
Weather Conditions: Sunny ~80°
Depth to groundwater at time of retrieval: 69.56'
Total well depth at time of retrieval: 135.0'
Downhole Field Parameters Upon Retrieval:
Temp: 24.06 (°C) **ORP:** 84.9 (mV) **Water quality meter:** YSI 556
pH: 7.02 **DO:** 2.83 (mg/L) **Serial #:** 14L100845

Notes/Observations:
Turb: 69.82
Cond: 1249 us/cm

Field Sampling Technician: Name(s) and Company

Name	Company
DB, MK	Arcadis

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Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: MW-503

Well Type: [✓ Monitoring] ● Other:
Well Finish: [✓ Stick Up] ● Flush Mount
Measuring Pt: [✓ Top of Casing] ● Other (specify):
Total Depth As Constructed (ftbgs): 35.0' **Screened Interval (ftbgs):** 15.0-25.0'
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/2/16 Time: 1000
Weather Conditions: Sunny ~70°
Depth to groundwater at time of deployment: 8.11'
Total well depth at time of deployment: 36.15'
Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.8
Deployment Method/Position of Weight:
PID (ppm): 0.0

● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.

● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 20.0'

Retrieval

Date and Time of Retrieval: Date: 6/6/16 Time: 1135
Total # of days deployed: 4
Weather Conditions: Sunny ~70°
Depth to groundwater at time of retrieval: 8.09'
Total well depth at time of retrieval: 30.15'
Downhole Field Parameters Upon Retrieval:
Temp: 16.06 (°C) **ORP:** -48.7 (mV) **Water quality meter:** YSI556
pH: 6.73 **DO:** 1.12 (mg/L) **Serial #:** 14L100845

Notes/Observations:

Turb: 214.7 NTU
Cond: 910 us/cm

Field Sampling Technician: Name(s) and Company

Name Company

ARCADIS

Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: MW-908D

Well Type: [✓ Monitoring] ● Other:
Well Finish: [✓ Stick Up] ● Flush Mount
Measuring Pt: [✓ Top of Casing] ● Other (specify): ?
Total Depth As Constructed (ftbgs): 29.9' **Screened Interval (ftbgs):** 24.9-29.9'
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment:	Date: 6/2/10 Time: 1035
Weather Conditions:	Sunny ~70°
Depth to groundwater at time of deployment:	10.41'
Total well depth at time of deployment:	32.78'
Dimensions of HydraSleeve™: Length (in.)	36 Diameter (in.) 1.8
Deployment Method/Position of Weight:	
PID (ppm): 0.0	● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well. ● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.
Deployment Depth (Top of HydraSleeve™) (ftbgs):	27.4'

Retrieval

Date and Time of Retrieval:	Date: 6/6/10 Time: 1120
Total # of days deployed: 4	
Weather Conditions: Partly Cloudy ~70°	
Depth to groundwater at time of retrieval:	10.50
Total well depth at time of retrieval:	32.78'
Downhole Field Parameters Upon Retrieval:	

Temp: 18.31 (°C) **ORP:** -63.1 (mV) **Water quality meter:** YSI 556
pH: 7.18 **DO:** 1.85 (mg/L) **Serial #:** 4L100845

Notes/Observations:

Turb: 98.2
Cond: 1150 uS/cm

Field Sampling Technician: Name(s) and Company

Name	Company
MK+DB	Arcadis

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Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: CPZ-4A

Well Type: [✓ Monitoring] ● Other: ____
Well Finish: [✓ Stick Up] ● Flush Mount
Measuring Pt: [✓ Top of Casing] ● Other (specify): ____
Total Depth As Constructed (ftbgs): 23.3' **Screened Interval (ftbgs):** 8.3-23.3'
Well Casing: Diameter: 2" Material: pvC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/2/16 Time: 1020
Weather Conditions: Sunny ~70°
Depth to groundwater at time of deployment: 10.27'
Total well depth at time of deployment: 27.8'
Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.8
Deployment Method/Position of Weight:

PID (ppm): 0.3 [illegible]

● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 15.8'

Retrieval

Date and Time of Retrieval: Date: 6/6/16 Time: 1030
Total # of days deployed: 4
Weather Conditions: PartlyCloudy ~70°
Depth to groundwater at time of retrieval: 10.24
Total well depth at time of retrieval: 27.8'
Downhole Field Parameters Upon Retrieval:
Temp: 21.33 (°C) **ORP:** 44 (mV) **Water quality meter:** YSI556
pH: 6.23 **DO:** 1.38 (mg/L) **Serial #:** 14L100845

Notes/Observations:

Turb: 172.1
Cond. 785us/cm

Field Sampling Technician: Name(s) and Company

Name	Company
MK+DB	Arcadis

ARCADIS

Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: MW-907BR
Well Type: [✓ ● Monitoring] ● Other:
Well Finish: [✓ ● Stick-Up] ● Flush Mount
Measuring Pt: [✓ ● Top of Casing] ● Other (specify):
Total Depth As Constructed (ftbgs): 174' **Screened Interval (ftbgs):** 159-174'
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment:	Date: 6/2/16	Time: 1145	
Weather Conditions:	Sunny ~75°		
Depth to groundwater at time of deployment:	0.0		
Total well depth at time of deployment:	172.96'		
Dimensions of HydraSleeve™: Length (in.)	36	Diameter (in.)	1.8
Deployment Method/Position of Weight:			
PID (ppm): 0.0	● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well. ● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.		
Deployment Depth (Top of HydraSleeve™) (ftbgs):	166.5'		

Retrieval

Date and Time of Retrieval:	Date: 6/6/16	Time: 1540	
Total # of days deployed:	4		
Weather Conditions:	Sunny ~80°		
Depth to groundwater at time of retrieval:	0.0		
Total well depth at time of retrieval:	172.96		
Downhole Field Parameters Upon Retrieval:			
Temp: 19.17 (°C)	**ORP:** -27.9 (mV)	**Water quality meter:** YSI556	
pH: 8.16	**DO:** 1.19 (mg/L)	**Serial #:** 14L100845	

Notes/Observations:

Turb: 35.15
Cond: 2139µS/cm

Field Sampling Technician: Name(s) and Company

Name	Company
DB+MK	Arcadis

ARCADIS

Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: MW-907M
Well Type: ● [✓ Monitoring] ● Other:
Well Finish: ● [✓ Stick Up] ● Flush Mount
Measuring Pt: ● [✓ Top of Casing] ● Other (specify):
Total Depth As Constructed (ftbgs): 38.1 Screened Interval (ftbgs): 28.1-38.1'
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/2/16 Time: 1205
Weather Conditions: Sunny ~75°
Depth to groundwater at time of deployment: 8.00'
Total well depth at time of deployment: 40.55'
Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.8
Deployment Method/Position of Weight:

PID (ppm): 0.0

● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.

● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 33.1'

Retrieval

Date and Time of Retrieval: Date: 6/6/16 Time: 1505
Total # of days deployed: 4
Weather Conditions: Sunny ~80°
Depth to groundwater at time of retrieval:
Total well depth at time of retrieval: 38.1'
Downhole Field Parameters Upon Retrieval:
Temp: 17.47 (°C) ORP: -46.7 (mV) Water quality meter: YSI 556
pH: 6.93 DO: 1.04 (mg/L) Serial #: 14L100815

Notes/Observations:

Turb: 12.3
Cond: 913 µs/cm

Field Sampling Technician: Name(s) and Company

Name	Company
DB+MK	Arcadis

ARCADIS

Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: P-10K
Well Type: [✓ Monitoring] ● Other:
Well Finish: [✓ Stick Up] ● Flush Mount
Measuring Pt: [✓ Top of Casing] ● Other (specify):
Total Depth As Constructed (ftbgs): 13.0 Screened Interval (ftbgs): 3.0-13.0'
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/2/16 Time: 1600
Weather Conditions: Sunny ~80°
Depth to groundwater at time of deployment: 4.10'
Total well depth at time of deployment: 15.20'
Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.8
Deployment Method/Position of Weight:
PID (ppm): 0.0
● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.
Deployment Depth (Top of HydraSleeve™) (ftbgs): 9.5'

Retrieval

Date and Time of Retrieval: Date: 6/6/2016 Time: 17:45
Total # of days deployed: 4 days
Weather Conditions: 82°F
Depth to groundwater at time of retrieval: 3.67
Total well depth at time of retrieval: 15.25
Downhole Field Parameters Upon Retrieval:
Temp: 20.59 (°C) ORP: -92.6 (mV) Water quality meter: YSI 556 MPS
pH: 7.67 DO: 1.17 (mg/L) Serial #: 1410061

Notes/Observations:

* full Retrieval Cond - 284
* Pid @ time retrieval 0.0 turb - 13.28

Field Sampling Technician: Name(s) and Company

Name	Company
Mike Redman	Arcadis
Chris Glidden	Arcadis

1' 1.63= 6.16 liter

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) SRSNE

Well Number MW-127C Date 6/6/16

Field Personnel RM DB

Sampling Organization O&M, Inc.

Identify MP PVC T

Depth to ____ / ____ of screen

(below MP) top bottom

Pump Intake at (ft. below MP) 95

Purging Device; (pump type) Bladder

Total Volume Purged ____

PID: ____

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
0	3.65		150	.75	815.90	314	7.54	123.4	6.53	29.82	Clear
5	3.83			1.50	12.65	315	7.42	149.1	8.41	89.20	
10	4.01			2.25	12.47	315	7.52	145.3	4.50	77.48	
15	4.10			3.00	12.86	318	7.60	143.5	4.42	87.35	Cloudy
20	4.18			3.75	12.95	320	7.62	143.8	4.25	102.6	
25	4.22			4.50	13.65	316	7.63	145.2	4.29	84.60	
30	4.22			5.25	12.63	315	7.60	145.8	4.17	111.1	
35	4.24			6.00	12.58	315	7.61	130.0	4.82	180.0	
40	4.24			6.75	14.38	332	7.63	99.8	8.49	123.4	
45	4.24			7.50	14.76	334	7.64	97.1	9.67	187.2	
50	4.24			8.25	14.64	333	7.60	93.5	10.71	199.8	
55	4.24			9.00	14.26	331	7.53	91.8	11.65	214.7	
60				9.75	13.85	327	7.55	91.9	11.71	210.0	
65											
70											
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water: 3.65

Depth to Bottom: 102.28

Comments:

Sample @ 14:50

Head space on 1 dissolved gas

MW-124C-06162016

10' screen 1.63 G = 6.16 liters

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) SRSNE
Well Number MW-124C Date 6/6/16
Field Personnel RM, DB
Sampling Organization O+M
Identify MP PVCT

Depth to (below MP) 35.9 / 45.9 of screen
top bottom
Pump Intake at (ft. below MP) 40
Purging Device; (pump type) Bladder
Total Volume Purged
PID:

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
0	7.52		~~200~~ 150	1.0	14.80	401	4.90	148	15.0	17.36	Clear
5	8.30			1.75	11.76	345	6.02	150.2	11.82	19.68	
10	8.48			2.5	11.69	346	6.36	180.2	10.31	8.93	
15	8.73			3.25	12.38	349	6.47	187.0	9.73	6.43	
20	9.03			4.00	13.11	359	6.68	184.6	9.08	6.25	
25	9.28			4.75	13.20	361	6.84	190.9	9.21	5.34	
30	9.36			5.50	13.13	360	6.88	198.9	9.01	5.22	
35	9.48			6.25	12.98	358	6.89	207.5	8.79	5.01	
40											
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water: 7.52
Depth to Bottom:

Comments:

Sample @ 11:30

1.63 gallons
6.16 liters

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) SRSNE
Well Number MW-704 M Date 6/7/16
Field Personnel RM
Sampling Organization O+M
Identify MP PVC Top

Depth to ______ / ______ of screen
(below MP) top bottom
Pump Intake at (ft. below MP) ≅ 42
Purging Device; (pump type) Bladder
Total Volume Purged ______

PID: ______

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
0	8.04	11/4	180	0.900	15.59	260	7.39	12.6	4.09	10.63	Clear
5	8.08	↓	↓	1.8	13.38	256	7.46	-75.0	0.41	1.38	
10	8.10			2.7	13.04	254	7.47	-86.4	0.25	2.17	
15	8.10			3.6	12.50	250	7.48	-92.3	0.20	0.00	
20	8.10			4.5	12.79	252	7.46	-97.0	0.16	0.40	
25	8.10			5.4	12.89	253	7.46	-99.2	0.14	0.56	
30											
35											
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water: 8.04
Depth to Bottom: 47.95

Comments:
Sample @ 09:30

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) SRSNE
Well Number P-12 Date 6/7/16
Field Personnel MK + DB
Sampling Organization
Identify MP TOC

Depth to (below MP) 9 top / 12 bottom of screen
Pump Intake at (ft. below MP) ~ 12
Purging Device; (pump type) Bladder
Total Volume Purged 11.5

PID: 0.0

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
1455	7.58	–	100	.5	16.53	422	4.96	229.9	1.67	808.2	
1500	7.92	–	100	1	17.11	424	4.99	238.7	1.31	563.4	
1505	8.11	–	100	1.5	18.94	428	5.00	272.8	1.06	421.7	
1525	8.41	–	100	3.5	18.04	413	5.64	220.1	2.14	389.6	
1530	8.43	–	100	4	17.67	410	5.63	212.8	2.22	371.2	
1535	8.45	–	100	4.5	17.51	408	5.62	211.3	2.26	368.7	
1540	8.46	–	100	5	17.46	405	5.61	210.1	2.30	361.5	
1545	8.46	–	100	5.5	17.49	402	5.62	207.1	2.31	32[illegible]	
1550	8.47	–	100	6	17.39	402	5.63	206.8	2.31	298.7	
1555	8.47	–	100	6.5	17.38	400	[illegible]	204.6	2.32	246.4	
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water: 7.20
Depth to Bottom: 16.58

Comments:

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WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) SRSNE
Well Number P-12 Date 6/7/16
Field Personnel MK + DB
Sampling Organization Arcadis
Identify MP TOC

Depth to ________/________ of screen
(below MP) top bottom
Pump Intake at (ft. below MP) ________
Purging Device; (pump type) Bladder
Total Volume Purged 11.5

PID: 0.0

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
1600	8.48	-	100	7	17.00	397	5.67	198.7	2.32	210.1	
1605	8.48	-	100	7.5	17.01	396	5.68	194.6	2.31	208.7	
1610	8.49	-	100	8	16.71	396	5.68	189.8	2.32	199.2	
1615	8.49	-	100	8.5	16.72	397	5.68	189.7	2.30	180.7	
1620	8.50	-	100	9	16.74	397	5.68	189.5	2.28	167.6	
1625	8.50	-	100	9.5	16.69	396	5.67	189.2	2.26	152.3	
1630	8.50	-	100	10	16.68	397	5.67	189.3	2.27	132.1	
1635	8.50	-	100	10.5	16.59	396	5.71	189.1	2.25	118.7	
1640	8.51	-	100	11	16.58	396	5.71	188.8	2.25	110.4	
1645	8.51	-	100	11.5	16.59	395	5.72	189.2	2.24	108.3	
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water: 7.20
Depth to Bottom: 16.58

Comments:
Sample @ 1650

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WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) SIRSNE

Well Number MWL-304 Date 6-7-16

Field Personnel DB/MIC

Sampling Organization Arcadis

Identify MP TOC

Depth to 2 / 11 of screen
(below MP) top bottom

Pump Intake at (ft. below MP) ~9.0

Purging Device; (pump type) Bladder

Total Volume Purged 7.75

PID: 0.0

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
0835	6.01		150	1.00	15.81	325	7.03	78.0	7.49	118.8	
0840	6.52			1.75	15.76	321	7.03	74.6	7.10	145.1	
0845	6.80			2.50	16.15	298	7.00	81.2	7.11	148.7	
0850	7.02			3.25	17.01	280	7.02	85.6	7.23	179.4	
0855	7.36			4.00	17.64	259	7.00	91.1	7.26	121.4	
0900	7.61			4.75	17.77	277	7.01	96.3	7.18	120.7	
0905	7.89			5.50	17.92	279	7.07	99.5	7.15	32.1	
0910	8.12			6.25	18.17	281	7.01	98.2	6.71	10.9	
0915	8.34			7.00	18.58	281	7.06	97.1	6.57	10.1	
0920	8.52			7.75	18.67	282	7.01	97.0	6.59	9.4	
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water: 5.19

Depth to Bottom: 13.18

Comments:

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) SIRSWE
Well Number MW-126B Date 6-7-16
Field Personnel DB+MLC
Sampling Organization Arcadis
Identify MP

Depth to 5 / 12.5 of screen
(below MP) top bottom
Pump Intake at (ft. below MP) ~9.0
Purging Device; (pump type) Bladder
Total Volume Purged 9.0
PID: 0.0

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
1300	3.24		200	1.0	552	22.88	6.38	97.4	5.78	29.93	
5	3.26			2.0	547	15.31	6.39	111.1	2.51	27.14	
10	3.27			3.0	535	15.30	6.37	112.4	2.02	23.68	
15	3.28			4.0	539	15.31	6.36	112.0	1.57	15.39	
20	3.29			5.0	544	15.28	6.34	113.7	1.48	7.62	
25	3.30			6.0	539	15.31	6.35	115.0	1.46	4.91	
30	3.31			7.0	529	14.46	6.36	115.0	1.47	3.11	
35	3.32			8.0	527	14.39	6.36	114.9	1.45	4.77	
40	3.32			9.0	526	14.37	6.36	114.7	1.46	4.16	
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water: 3.16
Depth to Bottom: 12.47

Comments: Sample @ 1345

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) SRSNE
Well Number P-13 Date 6-7-16
Field Personnel DB/MLC
Sampling Organization Arcadis
Identify MP TOC

Depth to 4 / 14.9 of screen
(below MP) top bottom
Pump Intake at (ft. below MP) ~12.5'
Purging Device; (pump type) Bladder
Total Volume Purged 6.75 liter

PID: 0.0

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
1030	10.41		150	.75	15.47	285	7.84	53.2	1.21	94.17	
1035	10.49		↓	1.5	15.14	285	7.79	49.8	1.14	42.1	
1040	11.11			2.25	14.64	285	7.75	49.6	1.01	30.7	
1100	11.20			3.75	15.07	↓	7.73	48.2	0.92	15.6	
1105	11.28			4.50	15.06		7.72	48.3	0.89	8.7	
1110	11.37			5.25	15.11		7.71	48.2	0.86	4.1	
1115	11.41			6.00	15.10		7.71	48.2	0.85	3.6	
1120	11.42			6.75	15.11		7.71	48.8	.85	3.5	
1125	11.42			7.50	15.10		7.71	49.1	.85	3.2	
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water: 10.66
Depth to Bottom: 17.20

Comments:

ARCADIS

Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE

Location: Southington CT

Well ID: P101A

Well Type: [✓ Monitoring] • Other:

Well Finish: [✓ Stick Up] • Flush Mount

Measuring Pt: [✓ Top of Casing] • Other (specify):

Total Depth As Constructed (ftbgs): 96.0' **Screened Interval (ftbgs):** 66.0-96.0'

Well Casing: Diameter: 2" Material: PVC

Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/12/16 Time: 1545

Weather Conditions: Sunny ~80°

Depth to groundwater at time of deployment: 3.08'

Total well depth at time of deployment: 97.75'

Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.8

Deployment Method/Position of Weight:

PID (ppm): 0.0

• Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.

• Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs):

Retrieval

Date and Time of Retrieval: Date: 6/16/2016 Time: 17:55

Total # of days deployed: 4 days

Weather Conditions: 82°F

Depth to groundwater at time of retrieval: 2.98

Total well depth at time of retrieval: 97.75

Downhole Field Parameters Upon Retrieval:

Temp: 23.07 **(°C)** **ORP:** -8.5 **(mV)** **Water quality meter:** YSI 556 MPS

pH: 7.43 **DO:** 2.53 **(mg/L)** **Serial #:** 14F100661

Notes/Observations:

* Full Retrieval
* PID @ time of retrieval - 0.0 ppm

Cond - 543
Turb - 51.21

Field Sampling Technician: Name(s) and Company

Name	Company
Mike Redman	Arcadis
Chris Glidden	Arcadis

ARCADIS

Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: MW-907D

Well Type: [✓ Monitoring] • Other:
Well Finish: [✓ Stick Up] • Flush Mount
Measuring Pt: [✓ Top of Casing] • Other (specify):
Total Depth As Constructed (ftbgs): 50.0' **Screened Interval (ftbgs):** 40.0-50.0'
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/2/16 Time: 1155
Weather Conditions: Sunny ~ 75°
Depth to groundwater at time of deployment: 8.52'
Total well depth at time of deployment: 52.6'
Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.8
Deployment Method/Position of Weight:

PID (ppm): 0.0

• Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.

• Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 45.0'

Retrieval

Date and Time of Retrieval: Date: 6/6/16 Time: 1605
Total # of days deployed: 4
Weather Conditions: Sunny ~ 80°
Depth to groundwater at time of retrieval: 8.54'
Total well depth at time of retrieval: 52.6
Downhole Field Parameters Upon Retrieval:
Temp: 13.85 **(°C)** **ORP:** -74.5 **(mV)** **Water quality meter:** YSI 556
pH: 7.20 **DO:** 0.76 **(mg/L)** **Serial #:** 14L100815

Notes/Observations:

Turb: 4.58
Cond: 593 µS/cm

Field Sampling Technician: Name(s) and Company

Name	Company
DB + MK	Arcadis

ARCADIS

Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: P-6
Well Type: ● [✓ Monitoring] ● Other:
Well Finish: ● [✓ Stick Up] ● Flush Mount
Measuring Pt: ● [✓ Top of Casing] ● Other (specify):
Total Depth As Constructed (ftbgs): 57.5 **Screened Interval (ftbgs):** 47.5-57.5'
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/2/16 Time: 0928
Weather Conditions: Sunny ~70°
Depth to groundwater at time of deployment: 6.28'
Total well depth at time of deployment: 59.21'
Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.8
Deployment Method/Position of Weight:
PID (ppm): 0.0
● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.
Deployment Depth (Top of HydraSleeve™) (ftbgs): 52.5

Retrieval

Date and Time of Retrieval: Date: 6/7/16 Time: 1040
Total # of days deployed: 5 days
Weather Conditions: 79° Sunny
Depth to groundwater at time of retrieval: 6.11
Total well depth at time of retrieval: 59.21
Downhole Field Parameters Upon Retrieval:
Temp: 14.39 **(°C)** **ORP:** -104.9 **(mV)** **Water quality meter:** YSI 556 MPS
pH: 6.72 **DO:** 1.43 **(mg/L)** **Serial #:** 14FRW059

Notes/Observations:

*Full recovery
A PID @ retrieval - 0.0 ppm
Turb - 26.93
Conductivity: 1220 us/cm

Field Sampling Technician: Name(s) and Company

Name	Company
Mike Redman	Arcadis
Chris Glidden	Arcadis

ARCADIS

Appendix B-2
HydraSleeve™ Field Form

*CPZ-6
*MW-908D
P-101A
*P-6
*PZO-204M

Dont do

Site: SRSNE
Location: Southington, CT
Well ID: PZO-204M
Well Type: [✓ Monitoring] • Other:
Well Finish: [✓ Stick Up] • Flush Mount
Measuring Pt: [✓ Top of Casing] • Other (specify):
Total Depth As Constructed (ftbgs): 55.7 **Screened Interval (ftbgs):** 45.7-55.7'
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/2/16 Time: 1100
Weather Conditions: Sunny ~75°
Depth to groundwater at time of deployment: 5.21'
Total well depth at time of deployment: 56.88'
Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.8
Deployment Method/Position of Weight:
PID (ppm): 0.0
• Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
• Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.
Deployment Depth (Top of HydraSleeve™) (ftbgs): 50.7

Retrieval

Date and Time of Retrieval: Date: 6/7/16 Time: 11:55
Total # of days deployed: 5 days
Weather Conditions: 82°F Sunny
Depth to groundwater at time of retrieval: 5.09
Total well depth at time of retrieval: 56.88
Downhole Field Parameters Upon Retrieval:
Temp: 20.00 **(°C)** **ORP:** -90.9 **(mV)** **Water quality meter:** YSI556
pH: 7.40 **DO:** 1.15 **(mg/L)** **Serial #:** 14L100845

Notes/Observations:

*Full retrieval
*Pid @ time of retrieval 0.0ppm
turb - 23.44
Spec conduct 548 uS/cm

Field Sampling Technician: Name(s) and Company

Name	Company
Mike Redman	Arcadis
Chris Glidden	Arcadis

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Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: MW-121C

Well Type: [✓ Monitoring] Other:
Well Finish: [✓ Stick Up] Flush Mount
Measuring Pt: [✓ Top of Casing] Other (specify):
Total Depth As Constructed (ftbgs): 68.7 **Screened Interval (ftbgs):** 58.7 - 68.7
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/2/16 Time: 13:50
Weather Conditions: 75 Sunny
Depth to groundwater at time of deployment: 6.81
Total well depth at time of deployment: 70.29
Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.8
Deployment Method/Position of Weight:

PID (ppm): 0.0

[✓ Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.]

Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 63.7

Retrieval

Date and Time of Retrieval: Date: 6/7/16 Time: 8:50
Total # of days deployed: 5 day
Weather Conditions: 72° Sunny
Depth to groundwater at time of retrieval: 6.80
Total well depth at time of retrieval: 70.29
Downhole Field Parameters Upon Retrieval:
Temp: 18.58 **(°C)** **ORP:** -22.5 **(mV)** **Water quality meter:** 556 MPS #14H100059
pH: 6.58 **DO:** 2.57 **(mg/L)** **Serial #:** 145100059

Notes/Observations:

*Full recovery
*PID @ retrival - 0.00
Conductivity - 574
Turb - 8.88

Field Sampling Technician: Name(s) and Company

Name	Company
Mike Redman	Arcadis
Chris Gilder	Arcadis

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Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: MW-121 B

Well Type: [✓ ● Monitoring] ● Other:
Well Finish: [✓ ● Stick Up] ● Flush Mount
Measuring Pt: [✓ ● Top of Casing] ● Other (specify):
Total Depth As Constructed (ftbgs): 52.0 **Screened Interval (ftbgs):** 42.0-52.0
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/2/16 Time: 14:10
Weather Conditions: 75 Sunny
Depth to groundwater at time of deployment: 6.88
Total well depth at time of deployment: 53.90
Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.8
Deployment Method/Position of Weight:

PID (ppm): 0.0

[✓ ● Top-Down]: Weight attached to bottom of HydraSleeve™. Weight suspended in well.

● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 47.0

Retrieval

Date and Time of Retrieval: Date: 6/7/2016 Time: 8:35
Total # of days deployed: 5days
Weather Conditions: 72° Sunny
Depth to groundwater at time of retrieval: 6.84
Total well depth at time of retrieval: 53.90
Downhole Field Parameters Upon Retrieval:
Temp: 17.49 **(°C)** **ORP:** -21.1 **(mV)** **Water quality meter:** 556 MPS
pH: 6.66 **DO:** 47.5 **(mg/L)** **Serial #:** 14F100059

Notes/Observations:

* Full Retrieval
* PID @ retrevial - 0.0ppm
Conductivity - 659
Turb - 13.95NTU

Field Sampling Technician: Name(s) and Company

Name	Company
Mike Reelmen	Arcadis
Chris Glidden	Arcadis

ARCADIS

Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: MW - 121M

Well Type: [✓ ● Monitoring] ● Other:
Well Finish: [✓ ● Stick Up] ● Flush Mount
Measuring Pt: [✓ ● Top of Casing] ● Other (specify):
Total Depth As Constructed (ftbgs): 31 **Screened Interval (ftbgs):** 21 - 31
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/2/16 Time: 13:15
Weather Conditions: 75 sunny
Depth to groundwater at time of deployment: 7.25
Total well depth at time of deployment: 33.25
Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.8
Deployment Method/Position of Weight:

PID (ppm): 0.0

[✓ ● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.]

● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 26

Retrieval

Date and Time of Retrieval: Date: 6/7/16 Time: 9:25
Total # of days deployed: 5 days
Weather Conditions: Sunny 72°
Depth to groundwater at time of retrieval: 7.26
Total well depth at time of retrieval: 33.24
Downhole Field Parameters Upon Retrieval:
Temp: 20.16 **(°C)** **ORP:** -83.4 **(mV)** **Water quality meter:** YSI 556 MPS
pH: 7.28 **DO:** 2.26 **(mg/L)** **Serial #:** 14F100059

Notes/Observations:

* Full Recovery
* PID retrival - 0.0 ppm
Conductivity - 259
Turb - 18.22 NTU

Field Sampling Technician: Name(s) and Company

Name	Company
Mike Redman	Arcadis
Chris Gladden	Arcadis

ARCADIS

Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: P-11A

Well Type: [✓ Monitoring] • Other:
Well Finish: [✓ Stick Up] • Flush Mount
Measuring Pt: [✓ Top of Casing] • Other (specify):
Total Depth As Constructed (ftbgs): 68.0' **Screened Interval (ftbgs):** 58.0-68.0'
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/2/16 Time: 0940
Weather Conditions: Sunny ~70°
Depth to groundwater at time of deployment: 6.34'
Total well depth at time of deployment: 65.70'
Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.8
Deployment Method/Position of Weight:
PID (ppm): 0.0

- Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
- Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 63.0

Retrieval

Date and Time of Retrieval: Date: 6/7/16 Time: 10:25
Total # of days deployed: 5 day
Weather Conditions: 79° Sunny
Depth to groundwater at time of retrieval: 6.34
Total well depth at time of retrieval: 65.69
Downhole Field Parameters Upon Retrieval:
Temp: 18.01 **(°C)** **ORP:** -97.1 **(mV)** **Water quality meter:** 556 MPS
pH: 7.01 **DO:** 2.17 **(mg/L)** **Serial #:** 14B100059

Notes/Observations:

* Full recovery
* PID @ retrival - 0.0ppm

Turb - 3.51 NTU
Conductivity - 665 us/cm

Field Sampling Technician: Name(s) and Company

Name	Company
Chris Glidden	Arcadis
Mike Redman	Arcadis

ARCADIS

Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: PZR-5R

Well Type: • [✓ Monitoring] • Other:
Well Finish: • [✓ Stick Up] • Flush Mount
Measuring Pt: • [✓ Top of Casing] • Other (specify):
Total Depth As Constructed (ftbgs): 73.0' **Screened Interval (ftbgs):** 53.0-73.0'
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/2/16 Time: 14:20
Weather Conditions: Sunny ~80°
Depth to groundwater at time of deployment: 6.75'
Total well depth at time of deployment: 75.56'
Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.8
Deployment Method/Position of Weight:
PID (ppm): 0.0
• Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
• Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.
Deployment Depth (Top of HydraSleeve™) (ftbgs): 63.0

Retrieval

Date and Time of Retrieval: Date: 6/6/2016 Time: 15:40
Total # of days deployed: 4 day
Weather Conditions: 83°F
Depth to groundwater at time of retrieval: 6.63
Total well depth at time of retrieval: ~~75.56~~ 75.56
Downhole Field Parameters Upon Retrieval:
Temp: 17.81 (°C) **ORP:** 187.2 (mV) **Water quality meter:** YSI 556 MPS
pH: 8.16 **DO:** 4.11 (mg/L) **Serial #:** 14F100061

Notes/Observations:
Pid Retrieval - 0.0 * full retrieval
Spec Cond 1860 us/cm Turbidity - 12.89

Field Sampling Technician: Name(s) and Company

Name	Company
Chris Glidden	Arcadis
Mike Redman	Arcadis

ARCADIS

Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE

Location: Southington, CT

Well ID: DN-3

Well Type: ● [✓ Monitoring] ● Other:

Well Finish: ● [✓ Stick Up] ● Flush Mount

Measuring Pt: ● [✓ Top of Casing] ● Other (specify):

Total Depth As Constructed (ftbgs): 21.8 **Screened Interval (ftbgs):** 8.8 - 21.8

Well Casing: Diameter: 2" Material: PVC

Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/1/16 Time: 15:25

Weather Conditions: 75 Sunny

Depth to groundwater at time of deployment: 8.15

Total well depth at time of deployment: 23.51

Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.8

Deployment Method/Position of Weight:

PID (ppm): 0.0

● [✓ Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.]

● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs):

Retrieval

Date and Time of Retrieval: Date: 6/7/2016 Time: 14:36

Total # of days deployed: 5 days

Weather Conditions: 84°F Sunny

Depth to groundwater at time of retrieval: 8.39

Total well depth at time of retrieval: 23.51

Downhole Field Parameters Upon Retrieval:

Temp: 18.59 **(°C)** **ORP:** -10.9 **(mV)** **Water quality meter:** YSI 556

pH: 6.84 **DO:** 3.82 **(mg/L)** **Serial #:** 14F100059

Notes/Observations:

*Full retrieval *turb 13.36 NTU

*Pid @ recovery -0.0 ppm *Spec Cond 319 us/cm

Field Sampling Technician: Name(s) and Company

Name	Company
Mike Redmen	Arcadis
Chris Glidden	Arcadis

ARCADIS

Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: CPZ-8R

Well Type: • [✓ Monitoring] • Other:
Well Finish: • [✓ Stick Up] • Flush Mount
Measuring Pt: • [✓ Top of Casing] • Other (specify):
Total Depth As Constructed (ftbgs): **Screened Interval (ftbgs):**
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/2/16 Time: 855
Weather Conditions: Sunny ~70°
Depth to groundwater at time of deployment: 7.87'
Total well depth at time of deployment: [illegible]' 62.76'
Dimensions of HydraSleeve™: Length (in.) 36" Diameter (in.) 1.8"
Deployment Method/Position of Weight:
PID (ppm): 5.0
• Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
• Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.
Deployment Depth (Top of HydraSleeve™) (ftbgs):

Retrieval

Date and Time of Retrieval: Date: 6/7/2016 Time: 14:55
Total # of days deployed: 5 days
Weather Conditions: 84°F
Depth to groundwater at time of retrieval: 7.63
Total well depth at time of retrieval: 62.76'
Downhole Field Parameters Upon Retrieval:
Temp: 17.72 **(°C)** **ORP:** -139.0 **(mV)** **Water quality meter:** YSI 556
pH: 7.02 **DO:** 1.32 **(mg/L)** **Serial #:** ~~15~~ 14F100459

Notes/Observations:
* full recovery * turb 61.07 NTU
* Pid @ recovery - 4.63 ppm * Spec Cond 682 us/cm

Field Sampling Technician: Name(s) and Company

Name	Company
Mike Redman	Arcadis
Chris Glidden	Arcadis

* Signs of visable sheen

ARCADIS

Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE
Location: ~~MW-706DR~~ Southington, CT
Well ID: MW-706DR
Well Type: [✓ Monitoring] • Other: ____
Well Finish: [✓ Stick Up] • Flush Mount
Measuring Pt: [✓ Top of Casing] • Other (specify): ____
Total Depth As Constructed (ftbgs): ____ **Screened Interval (ftbgs):** 125.5 - 126.5
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/6/2016 Time: ~~8~~ 17:25
Weather Conditions: 82°F
Depth to groundwater at time of deployment: 2.47
Total well depth at time of deployment: 178.42
Dimensions of HydraSleeve™: Length (in.) 36" Diameter (in.) 1.8"
Deployment Method/Position of Weight:
PID (ppm): 0.0
[✓ Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.]
• Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.
Deployment Depth (Top of HydraSleeve™) (ftbgs): ____

Retrieval

Date and Time of Retrieval: Date: 6/7/16 Time: ~~[illegible]:35~~ (17:35)
Total # of days deployed: ~~[illegible]~~ 1 day
Weather Conditions: 82° Cloudy
Depth to groundwater at time of retrieval: 2.58
Total well depth at time of retrieval: 128.41
Downhole Field Parameters Upon Retrieval:
Temp: 21.09 **(°C)** **ORP:** 115.8 **(mV)** **Water quality meter:** YSI556
pH: 8.05 **DO:** 4.86 **(mg/L)** **Serial #:** 14F100059

Notes/Observations:
*full recovery turb - 13.90
*Pid@ retrieval -0.0ppm spec Cond - 286 us/cm

Field Sampling Technician: Name(s) and Company

Name	Company
Chris Glidden	Arcadis
Mike Redman	Arcadis

ARCADIS

Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: MW-705 DR
Well Type: [✓ Monitoring] ● Other:
Well Finish: [✓ Stick Up] ● Flush Mount
Measuring Pt: [✓ Top of Casing] ● Other (specify):
Total Depth As Constructed (ftbgs): 100.0 **Screened Interval (ftbgs):** 90.0 - 100.0
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/2/16 Time: 14:30
Weather Conditions: 75 Sunny
Depth to groundwater at time of deployment: 5.20
Total well depth at time of deployment: 104.5
Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.8
Deployment Method/Position of Weight:
PID (ppm): 3.91

[✓ Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.]

● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs):

Retrieval

Date and Time of Retrieval: Date: 6/7/2016 Time: 15:25
Total # of days deployed: 5days
Weather Conditions: 84°F Sunny
Depth to groundwater at time of retrieval: 4.91
Total well depth at time of retrieval: 104.47
Downhole Field Parameters Upon Retrieval:
Temp: 25.59 **(°C)** **ORP:** -65.4 **(mV)** **Water quality meter:** YSI556
pH: 9.43 **DO:** 1.14 **(mg/L)** **Serial #:** 14F100059

Notes/Observations:
*Full recovery *Turb - 20.62 NTU
PID @ recovery 3.91ppm Spec Cond. 703 us/cm

Field Sampling Technician: Name(s) and Company

Name	Company
Mike Ledman	Arcadis
Chris Glidden	Arcadis

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) SRSWG

Well Number P20-2D Date 6/8/2016

Field Personnel Chris Glidden / Mike Redman

Sampling Organization Arcadis

Identify MP TOC

Depth to 75 / 85 of screen
(below MP) top bottom

Pump Intake at (ft. below MP) 80

Purging Device; (pump type) Bladder

Total Volume Purged

PID: 0.0

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
13:40	7.06	100	100	.5L	11.68	223	7.94	8.9	11.09	5.21	Start purge
13:50	7.07	100	100	1.0L	11.68	222	7.95	12.6	10.89	5.05	
14:00	7.08	100	100	1.5L	11.69	218	7.96	17.7	10.67	5.01	
14:05	7.09	100	100	2.0L	11.72	217	7.97	20.3	10.49	4.95	
14:10	7.10	100	100	2.5L	11.74	217	7.98	24.5	10.34	4.91	
14:15	7.11	100	100	3.0L	11.76	215	7.99	29.2	10.20	4.79	
14:20	7.11	100	100	3.5	11.79	214	7.99	28.1	10.05	4.76	
14:25	7.12	100	100	4L	11.78	213	8.00	33.8	9.87	4.75	
14:30											Sample·
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water: 7.05

Depth to Bottom: 85.41

Comments:

* MS/MSD + Dup-06082016-1

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) SRSNE
Well Number P-101B Date
Field Personnel Mike Redman / Chris Glidden
Sampling Organization Arcadis
Identify MP TOC

Depth to (below MP) 34 top / 44 bottom of screen
Pump Intake at (ft. below MP) 39
Purging Device; (pump type) Bladder Pump
Total Volume Purged 11L
PID: 0.0

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turbidity NTU	Comments
9:00	3.20'		100								Start purge
10:05	3.21'		100	6.5 Liters purged prior to starting readings							
10:10	3.21'		100		12.74	385	6.39	-52.6	18.41	25.54	
10:15	3.21'		100		12.90	385	6.63	-77.5	14.25	17.43	
10:20	3.21'		100		13.11	389	6.77	-86.8	10.14	14.13	
10:25	3.21'		100		13.13	387	6.79	[illegible]	8.43	11.33	
10:30	3.21'		100		13.24	387	6.82	-93.1	7.94	8.32	
10:35	3.21'		100		13.35	388	6.86	-99.5	7.44	8.56	
10:40	3.21'		100		13.52	390	6.95	-106.1	7.98	8.73	
10:45	3.21		100	11L	13.41	392	6.99	-100.2	8.32	8.70	
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water: 3.20
Depth to Bottom: 43.71

Comments:
Sample @ 10:50

DTW - 3.20'

1/2

m

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) SRSNE
Well Number MW-901R Date 6/8/16
Field Personnel RM
Sampling Organization O&M, Inc.
Identify MP PVC Top

Depth to 25 / 40 of screen
(below MP) top bottom
Pump Intake at (ft. below MP) 30
Purging Device; (pump type) Bladder
Total Volume Purged 19.25

PID:

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1] CPM	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
0	20.28	11/4	250	1.25 ~~.25~~	13.56	200	6.88	199.1	11.30	115.6	Start Purge 14:50
5	20.08	↓	↓	2.50	11.88	349	6.76	206.7	7.05	185.5	
10	20.28			3.75	10.65	322	6.71	210.2	6.73	192.3	
15	20.28			5.0	10.43	316	6.69	215.8	6.49	138.6	
20	20.28			6.25	10.57	318	6.69	219.8	6.41	103.4	
25	20.28			7.50	10.48	307	6.64	217.7	6.08	150.3	
30	20.28			8.75	10.48	284	6.52	205.0	5.96	136.5	
35	20.28			10.00	10.48	282	6.51	205.8	5.99	103.8	Achieved min purge requirement
40	20.28			11.25	10.63	289	6.52	208.6	6.08	164.0	
45	20.28	↓	↓	12.50	10.56	275	6.48	211.9	6.00	118.2	
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water: 20.28
Depth to Bottom: 42.35

Comments:

Screen = 15
x .163
2.45 gals / 9.24 L

MW-901R ①

2/2

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name)

Well Number MW-901R Date 6/8/16

Field Personnel

Sampling Organization

Identify MP

Depth to ______ / ______ of screen
(below MP) top bottom

Pump Intake at (ft. below MP)

Purging Device; (pump type)

Total Volume Purged

PID:

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1] CPM	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
50	20.28	11/4	250	13.75	10.58	271	6.45	213.7	6.02	109	
55	20.28	↓	↓	15.0	10.50	265	6.43	219.1	6.04	87.9	
60	20.28	↓	↓	16.25	10.49	264	6.43	223.0	6.02	65.75	
65	20.28	↓	↓	18.00	10.54	266	6.43	225.0	6.03	69.76	
70	20.28	↓	↓	19.25	10.54	264	6.43	226.7	6.01	61.36	Sample @ 16:00
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water:

Depth to Bottom:

Comments:

MW-901R ②

1/2

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) SRSNE
Well Number MW-209A Date 6/8/16
Field Personnel RM
Sampling Organization O+M, Inc
Identify MP PVC Top

Depth to (below MP) 18 top / 28 bottom of screen
Pump Intake at (ft. below MP) 30
Purging Device; (pump type) Bladder
Total Volume Purged 15.75 L

PID:

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1] CPM	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
0	21.89	11/4	~~250~~ 225	~~225~~ 1.125	13.25	342	5.75	319.7	9.35	19.33	Start purge 11:20
5	21.89	↓	↓	2.25	12.09	315	6.01	324.1	7.40	18.78	
10	21.89	↓	↓	3.375	10.97	303	6.07	312.4	7.19	28.01	
15	21.89	↓	↓	4.5	10.95	301	6.13	296.7	7.14	36.48	
20	21.89	↓	↓	5.625	10.96	302	6.14	291.1	7.11	30.92	
25	21.89	↓	↓	6.75	10.81	304	6.18	284.0	7.05	30.11	
30	21.89	↓	↓	7.875	10.62	289	6.28	175.6	7.20	5.09	
35	21.89	↓	↓	9.0	10.59	288	6.27	190.3	7.19	2.27	
40	21.89	↓	↓	10.125	10.52	290	6.28	200.2	7.16	0.60	
45	21.89	↓	↓	11.25	10.51	290	6.29	206.1	7.12	0.52	
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water: 21.89
Depth to Bottom: 40.04

Comments:

Screen = 20 ft
× .163
3.26 gals / 12.34 liters

MW-209A-①

2/2

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name)__________

Well Number MW-209A Date 6/8/16

Field Personnel__________

Sampling Organization__________

Identify MP__________

Depth to _____/_____ of screen (below MP) top bottom

Pump Intake at (ft. below MP)__________

Purging Device; (pump type)__________

Total Volume Purged__________

PID: __________

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1] CPM	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
50	21.89	11/4	225	12.375	10.52	293	6.32	212.1	7.08	0.26	Clear | Achieved min purge requirement
55	21.89			13.5	10.49	294	6.34	214.8	7.05	0.31	
60	21.89			14.625	10.45	295	6.35	218.9	7.02	0.01	
65	21.89			15.75	10.46	296	6.37	222.3	7.06	0.09	Sample @ 13:50
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water: __________

Depth to Bottom: __________

Comments:

MW-209A ②

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) SRSNE
Well Number MW-701DR Date 6/8/16
Field Personnel RM
Sampling Organization O&M, Inc.
Identify MP PVC TOP

Depth to (below MP) top / bottom of screen 14.5' screen
Pump Intake at (ft. below MP) ≈100
Purging Device; (pump type) Bladder
Total Volume Purged 11.25 L
PID:

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1] CPM	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
0	17.68	11/4	150	.75	12.48	298	4.18	250.5	9.54	30.08	Start Purge @ 9:05
5	17.88	↓	↓	1.50	11.86	293	5.56	154.5	5.63	41.76	Clear
10	18.01			2.25	12.35	309	6.08	144.5	6.02	43.80	
15	18.19			3.00	12.27	308	6.23	152.5	5.89	44.08	
20	18.27			3.75	12.14	313	6.38	160.2	5.80	21.86	
25	18.35			4.50	11.96	309	6.46	172.0	5.78	16.64	
30	18.40			5.25	11.95	305	6.51	187.3	5.74	6.47	
35	18.42			6.00	11.94	304	6.54	191.0	5.73	8.03	
40	18.44			6.75	11.77	304	6.57	194.7	5.73	4.48	
45	18.46			7.50	11.90	306	6.60	194.1	5.68	2.75	
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water: 17.68

Depth to Bottom: 105.65

Comments:

Screen : 14.5
× .163
2.36 gallons / 8.93 liters

MW-701 DR ①

212

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name)__________
Well Number MW-701 DR Date 6/8/16
Field Personnel__________
Sampling Organization__________
Identify MP__________

Depth to ______/______ of screen
(below MP) top bottom
Pump Intake at (ft. below MP)______
Purging Device; (pump type)______
Total Volume Purged ______
PID: ______

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1] CPM	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
50	18.47	11/4	150	8.25	11.90	307	6.65	193.7	5.63	2.55	Clear
55	18.47	↓	↓	9.00	11.84	308	6.67	193.8	5.61	2.48	minimum purge volume met
60	18.47	↓	↓	9.75	11.82	309	6.70	194.3	5.57	0.96	
65	18.47	↓	↓	10.50	12.01	311	6.71	194.4	5.61	0.99	
70	18.47	↓	↓	11.25	11.82	310	6.72	194.6	5.59	0.91	Sample @ 10:20
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water: ______

Depth to Bottom: ______

Comments:

MW-701 DR ②

ARCADIS

Attachment A
HydraSleeve™ Field Form

Site: SRSNE

Location: Southington, CT

Well ID: CPZ-1[illegible]

Well Type: [✓ ● Monitoring] ● Other:

Well Finish: [✓ ● Stick Up] ● Flush Mount

Measuring Pt: [✓ ● Top of Casing] 25.2 ● Other (specify):

Total Depth As Constructed (ftbgs): [illegible] **Screened Interval (ftbgs):** [illegible] 20.2'-25.2'

Well Casing: Diameter: 2" Material: PVC

Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/7/2016 Time: 13:27

Weather Conditions: 83°F Sunny

Depth to groundwater at time of deployment: [illegible] 5.18

Total well depth at time of deployment: 25.12'

Dimensions of HydraSleeve™: Length (in.) 36" Diameter (in.) 1.8"

Deployment Method/Position of Weight:

● Bottom Anchor: Weight attached to bottom of HydraSleeve™. Weight rests on well bottom.

● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.

● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 17.7'

Retrieval

Date and Time of Retrieval: Date: 6-9-16 Time: 1417

Total # of days deployed: [illegible] ~2 Days

Weather Conditions: 80° Sunny

Depth to groundwater at time of retrieval: 5.45

Total well depth at time of retrieval: 25.12

Downhole Field Parameters Upon Retrieval:

Temp: 13.64 **(°C)** **ORP:** 40.0 **(mV)** **Water quality meter:** YSI 556 MPS

pH: 7.12 **DO:** 12.31 **(mg/L)** **Serial #:** 14F10061

Notes/Observations: SC: 798 uS/cm Turb: 46.5 NTU PID: 0.0 ppm

Field Sampling Technician: Name(s) and Company

Name	Company
DB - Arcadis	
RM - O&M	

ARCADIS

Attachment A
HydraSleeve™ Field Form

Site: SRSNE

Location: Southington, CT

Well ID: MW-908D

Well Type: [✓ ● Monitoring] ● Other:

Well Finish: [✓ ● Stick Up] ● Flush Mount

Measuring Pt: [✓ ● Top of Casing] ● Other (specify):

Total Depth As Constructed (ftbgs): **Screened Interval (ftbgs):** 24.90 - 29.90

Well Casing: Diameter: 2" Material:

Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/7/16 Time: 13:45

Weather Conditions: 84°F

Depth to groundwater at time of deployment: 10.41

Total well depth at time of deployment: 29.87

Dimensions of HydraSleeve™: Length (in.) 36" Diameter (in.) 1.8

Deployment Method/Position of Weight:

- ● Bottom Anchor: Weight attached to bottom of HydraSleeve™. Weight rests on well bottom.
- ● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
- ● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 27.40

Retrieval

Date and Time of Retrieval: Date: 6/9/16 Time: 1510

Total # of days deployed: ~2 Days

Weather Conditions: Sunny + 80°F

Depth to groundwater at time of retrieval: 10.58

Total well depth at time of retrieval: 29.86

Downhole Field Parameters Upon Retrieval:

Temp: 13.77 **(°C)** **ORP:** -87.6 **(mV)** **Water quality meter:** YSI 556 MPS

pH: 7.30 **DO:** 5.10 **(mg/L)** **Serial #:** 14F 1006/

Notes/Observations:

Cond: 494 uS/cm PID - 0.00 ppm

Turb: 19.77 NTU

Field Sampling Technician: Name(s) and Company

Name	Company
Dan Brodsky	Arcadis
Ryan Malone	O&M

ARCADIS

Attachment A
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: P-6

Well Type: [✓ ● Monitoring] ● Other:
Well Finish: [✓ ● Stick Up] ● Flush Mount
Measuring Pt: [✓ ● Top of Casing] ● Other (specify):
Total Depth As Constructed (ftbgs): 57.5 **Screened Interval (ftbgs):** 47.5-57.5
Well Casing: Diameter: 2" Material:
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/7/16 Time: 13:15
Weather Conditions: 82°F Sunny
Depth to groundwater at time of deployment: 6.11
Total well depth at time of deployment: 59.21'
Dimensions of HydraSleeve™: Length (in.) 36" Diameter (in.) 1.8"
Deployment Method/Position of Weight:
- ● Bottom Anchor: Weight attached to bottom of HydraSleeve™. Weight rests on well bottom.
- ● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
- ● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 52.5'

Retrieval

Date and Time of Retrieval: Date: 6-9-16 Time: 1440
Total # of days deployed: ~2 Days
Weather Conditions: Sunny ± 80°F
Depth to groundwater at time of retrieval: 6.35
Total well depth at time of retrieval: 59.21
Downhole Field Parameters Upon Retrieval:
Temp: 12.95 **(°C)** **ORP:** -52.6 **(mV)** **Water quality meter:** YSI 556 MPS
pH: 6.84 **DO:** 10.06 **(mg/L)** **Serial #:** 14F100061

Notes/Observations: SC: 1447 uS/cm Turb: 33.16 NTU PID: 0.0

Field Sampling Technician: Name(s) and Company
Name Company

1/2

2.75 gallons
= 10.4 liters

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) SRSWE / continued on 6/9
Well Number MW-03 Date 6-6-16
Field Personnel RM
Sampling Organization O&M
Identify MP PVC Top

Depth to ______ / ______ of screen
(below MP) top bottom
Pump Intake at (ft. below MP) ≈68
Purging Device; (pump type) Bladder
Total Volume Purged ______

PID: ______

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
0	7.43		100	.5	21.36	330	7.52	-157.6	10.57	26.80	Clear
5	7.43			1.0	17.70	305	7.13	-162.1	2.18	5.96	
10	7.43			1.5	16.56	302	7.35	-161.1	1.86	5.64	
15	7.43			2.0	16.87	304	7.45	-162.8	1.58	5.40	
20	7.46			2.5	16.85	307	7.60	-163.2	1.54	5.46	
25	7.46			3.0	16.74	309	7.61	-129.7	2.38	5.51	
30	7.46			3.5	16.40	313	7.67	-99.4	3.26	3.55	
35	7.46			4.0	16.52	315	7.70	-81.6	4.84	3.27	
40	7.46			4.5	16.40	318	7.71	-62.5	5.71	2.38	
45	7.46			5.0	16.96	320	7.75	-53.3	9.77	2.21	
50	7.46			5.5	17.20	322	7.74	-46.3	9.15	2.23	
55	7.46			6.0	17.29	323	7.75	-43.1	9.19	2.94	
60	7.46		✓	6.5	17.28	323	7.76	-39.2	9.16	2.76	
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water: 7.43
Depth to Bottom: 82.5

Comments:
Sample @ 17:15

2/2

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) SRSNE
Well Number MW-03 Date
Field Personnel Mike Redmen
Sampling Organization Arcadis
Identify MP Top of PVC

Depth to 52.5 / 82.5 of screen
(below MP) top bottom
Pump Intake at (ft. below MP) 66.5
Purging Device; (pump type) Bladder
Total Volume Purged

PID: 0.0

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
14:20	7.59	11/4	50	6.5							Start Purge
15:20	7.41	11/4	50	9.5	14.24	203	5.12	-19.2	9.27	17.51	
15:25	7.43	11/4	50	9.75	19.19	220	5.09	-24.8	8.89	17.09	
15:30	7.49	11/4	50	10.00	14.17	231	5.09	-29.2	9.15	16.59	
15:35											Sample
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water: 7.71
Depth to Bottom:

Comments:

1/2

4.89 gallons
18.48 liters

30' screen

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) SRSNE
Well Number MW-707DR Date 6/7/16, continued on 6/9
Field Personnel RM
Sampling Organization O+M
Identify MP PVC Top

Depth to ______ / ______ of screen
(below MP) top bottom
Pump Intake at (ft. below MP) 170
Purging Device; (pump type) Bladder
Total Volume Purged ______

PID: ______

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
0	10.89	11/4	100	.5	20.85	362	7.52	-51.8	10.78	14.24	Clear
5	10.93			1.0	14.20	524	7.09	-136.7	2.26	11.33	
10	11.00			1.5	13.50	717	7.39	-134.0	1.52	9.43	
15	11.09			2.0	13.04	799	7.54	-106.6	0.78	6.81	
20	11.19			2.5	12.98	801	7.55	-101.0	0.72	6.22	
25	11.36			3.0	12.89	808	7.56	-96.0	0.67	5.67	
30	11.38			3.5	13.12	856	7.59	-90.7	0.53	9.24	
35	11.55			4.0	13.67	884	7.61	-88.9	0.51	8.36	
40	11.69			4.5	13.33	898	7.63	-87.5	0.51	8.44	
45	11.81			5.0	13.54	909	7.64	-86.6	0.48	6.78	
50	12.01			5.5	13.75	916	7.64	-86.3	0.47	7.07	
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water: 10.89
Depth to Bottom: ~~1972~~ 195.03

Comments:
Sample @ 11:15

2/2

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) SRSNE
Well Number MW-707DR Date 6/9/2016
Field Personnel Mike Redman
Sampling Organization Arcadis
Identify MP ~~TOC~~ TOP of PVC

Depth to 162 / 192 of screen
(below MP) top bottom
Pump Intake at (ft. below MP) 177
Purging Device; (pump type) Bladder
Total Volume Purged 15.0L

PID: 0.0

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turbidity NTU	Comments
11:26	11.08	10/5	100	5.5 L							start purge
12:40	12.82	10/5	100	13.5L	15.05	1403	7.38	-91.7	5.79	145.7	
12:45	12.95	10/5	100	14.0L	15.16	1404	7.41	-96.4	5.59	139.5	
12:50	13.08	10/5	100	14.5L	15.32	1407	7.43	-98.9	5.43	132.7	
12:55				15.0							Sample
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water: 11.08
Depth to Bottom: 195.02

Comments:

1/2

3.26 gallons
12.33 Liters

20' screen

CP2-SR

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) SRSNE
Well Number R2R-2R Date 6/7/16 / continued on 6/9/16
Field Personnel RM
Sampling Organization O+M
Identify MP PVC TOP

Depth to ____/____ of screen
(below MP) top bottom
Pump Intake at (ft. below MP) 130
Purging Device; (pump type) Bladder
Total Volume Purged ____

PID: ____

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1] CPM	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
0	9.3	11/4	150	.750	15.08	257	7.75	55.1	5.38	11.25	Clear
5	7.21			1.50	16.72	251	7.66	42.2	2.89	6.69	
10	7.80			2.25	20.34	267	7.66	37.1	2.62	6.32	
15	8.21			3.00	13.99	228	7.67	22.4	2.13	5.30	
20	8.42			3.75	13.77	228	7.55	11.0	1.85	6.61	
25	8.56			4.50	14.01	228	7.61	5.9	1.81	9.54	
30	8.67			5.25	13.70	226	7.63	2.6	1.76	8.82	
35	8.88			6.00	13.82	228	7.69	0.3	1.72	7.72	
40	8.96			6.75	13.65	227	7.68	-10.3	1.59	7.05	
45				7.50	13.54	225	7.69	-10.7	1.54	8.56	
50											
55											
Stabilization Criteria			6.750	6.750	3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water: 9.3
Depth to Bottom: 139.78

Comments:

212

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) SRSNE
Well Number PZR-2R Date 6/9/2016
Field Personnel MR - Mike Redman
Sampling Organization Arcadis
Identify MP Top of PVC

Depth to 120' / 140' of screen
(below MP) top bottom
Pump Intake at (ft. below MP) 130'
Purging Device; (pump type) Bladder
Total Volume Purged

PID: 0.0

Clock Time 24 HR	Water Depth below MP ft	Pump Dial¹	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.² µS/cm	pH	ORP³ mv	DO mg/L	Turb-idity NTU	Comments
9:00	9.36	4/11	150ml	6.750							Start purge
9:40	9.67	4/11	150ml/m	12.750	13.53	371	5.85	09.5	4.31	15.71	
9:45	9.81	4/11	150ml/m	13.500	14.15	345	5.87	07.7	5.19	14.61	
9:50	9.95	4/11	150ml/m	14.250	13.93	314	6.01	-06.8	4.45	5.85	
9:55	10.40	4/11	150ml/m	15.00	13.74	288	6.09	-08.7	4.05	6.15	
10:00	10.83	4/11	150ml/m	15.750	13.54	279	6.15	02.1	3.94	6.39	
10.05				16.250							Sample @ 10:05
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water: 9.36'
Depth to Bottom: 139.77

Comments:

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) SRSNE
Well Number MW-126C Date 6/9/16
Field Personnel RM
Sampling Organization O+M Inc.
Identify MP PVC Top

Depth to ______ / ______ of screen
(below MP) top bottom
Pump Intake at (ft. below MP) 29
Purging Device; (pump type) Bladder
Total Volume Purged ______

PID: ______

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1] CPM	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
0	2-75	11/4	150	.75	13.29	643	5.26	250.4	11.64	15.01	Purge @ 8:50
5	2.75	↓	↓	1-50	14.37	588	6.11	180.2	5.62	14.52	Clear
10	2-76			2-25	13.34	564	6.20	187.2	5.86	16.03	
15	2.76			3.00	13.60	566	6.24	190.0	5.76	14.07	
20	2.76			3.75	13.70	566	6.27	193.7	5.73	13.41	
25	2.76			4-50	13.70	563	6.30	195.8	5.75	13.48	
30	2-76			5.25	13.59	555	6.32	198.9	5.76	13.02	
35	2-76			6.00	13.81	553	6.35	200.8	5.75	9.39	
40	2-76			6-75	13.54	548	6.37	202.1	5.83	9.20	Met min. Purge Requirement
45	2-76			7-5	13.59	545	6.39	203.7	5-75	4.85	
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water: 2.75

Depth to Bottom: 33.6

Comments:

Screen: 10 ft
× .163
1.63 gals / 6.17L

MW-126C ①

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name)
Well Number MW-126C Date 6/9/16
Field Personnel
Sampling Organization
Identify MP

Depth to ______ / ______ of screen
(below MP) top bottom
Pump Intake at (ft. below MP)
Purging Device; (pump type)
Total Volume Purged

PID:

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1] CPM	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
55	2.76	11/4	150	8.25	13.38	541	6.40	203.9	5.83	3.75	
60	2.76	11/4	150	9.00	13.46	541	6.41	204.0	5.77	3.68	Sample @ 09:45
											Perform MS/MSD + DUP-06092016-1
											on
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water:
Depth to Bottom:

Comments:

MW-126C ②

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) SRSNG
Well Number MW-209B Date 6/8/16
Field Personnel RM
Sampling Organization O+M, Inc.
Identify MP PVC Top

Depth to ________ / ________ of screen
(below MP) top bottom
Pump Intake at (ft. below MP) ________
Purging Device; (pump type) Bailer
Total Volume Purged 0.2 Gals / 0.75 L

PID: ________

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
14:30	15.90			0.75							Bail 1 well volume - 6/8/16
	15.98										Sample ① - 6/9/16
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water: 15.9

Depth to Bottom: 17.12

Comments:

Resample for Diss. Metals

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) SRSNE
Well Number MW-209A Date 6/9/16
Field Personnel RM
Sampling Organization O+M, Inc.
Identify MP PVC Top

Depth to ______ / ______ of screen
(below MP) top bottom
Pump Intake at (ft. below MP) 30
Purging Device; (pump type) Bladder
Total Volume Purged 3.0 Liters

PID: ______

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1] CPM	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
0	21.89	11/4	150	.75	12.20	326	6.46	141.4	8.07	6.52	Start purge @ 11:15
5	21.89	↓	↓	1.50	11.25	318	6.46	161.6	7.24	9.32	
10	21.89			2.25	11.08	318	6.48	187.2	7.17	12.70	
15	21.89			3.00	11.18	322	6.51	175.9	7.08	12.87	Sample @ 11:30
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water: 21.89

Depth to Bottom: ______

Comments:

ARCADIS

Attachment A
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington, CT
Well ID: P-101A

Well Type: [✓ Monitoring] ● Other:
Well Finish: [✓ Stick Up] ● Flush Mount
Measuring Pt: [✓ Top of Casing] ● Other (specify):
Total Depth As Constructed (ftbgs): **Screened Interval (ftbgs):** 66.00 – 9600
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/7/15 Time: 14:13
Weather Conditions: 84°F - Sunny
Depth to groundwater at time of deployment: 3.04
Total well depth at time of deployment: 95.87
Dimensions of HydraSleeve™: Length (in.) 36" Diameter (in.) 1.8"
Deployment Method/Position of Weight:
[✓ Bottom Anchor]: Weight attached to bottom of HydraSleeve™. Weight rests on well bottom.
● Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.
Deployment Depth (Top of HydraSleeve™) (ftbgs): 81

Retrieval

Date and Time of Retrieval: Date: 6/10/16 Time: 11:35
Total # of days deployed: 3
Weather Conditions: 65 Sunny.
Depth to groundwater at time of retrieval: 3.21
Total well depth at time of retrieval: 95.87
Downhole Field Parameters Upon Retrieval:
Temp: 13.85 (°C) **ORP:** -106.9 (mV) **Water quality meter:** YSI 556 MPS
pH: 7.24 **DO:** 1.61 (mg/L) **Serial #:** 14L100845

Notes/Observations:
SC: 392 PID: 0.0
Turb: 19.02 Full Recovery: Yes

Field Sampling Technician: Name(s) and Company

Name	Company
Mike Reidman	Arcadis
Ryan Malone	O&M

ARCADIS

Appendix B-2
HydraSleeve™ Field Form

Site: 3BSNE

Location: Southington, CT

Well ID: MW-121C

Well Type: ● [✓ Monitoring] ● Other:

Well Finish: ● [✓ Stick Up] ● Flush Mount

Measuring Pt: ● [✓ Top of Casing] ● Other (specify):

Total Depth As Constructed (ftbgs): 68.7 **Screened Interval (ftbgs):** 58.7 - 68.7

Well Casing: **Diameter:** 2" **Material:** PVC

Well Screen: **Diameter:** 2"

Deployment

Date and Time of Deployment: **Date:** 6-8-16 **Time:** 1516

Weather Conditions: P. Cloudy 65°F

Depth to groundwater at time of deployment: 6.89

Total well depth at time of deployment: 70.20

Dimensions of HydraSleeve™: Length (in.) 36" Diameter (in.) 1.8

Deployment Method/Position of Weight:

PID (ppm): 0.0 [illegible]

● [✓ Top-Down]: Weight attached to bottom of HydraSleeve™. Weight suspended in well.

● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 63.7

Retrieval

Date and Time of Retrieval: **Date:** 6-9-16 **Time:** 10:40

Total # of days deployed: 2

Weather Conditions: 60 Sunny

Depth to groundwater at time of retrieval: 6.97

Total well depth at time of retrieval: 70.20

Downhole Field Parameters Upon Retrieval:

Temp: 11.57 **(°C)** **ORP:** -68.1 **(mV)** **Water quality meter:** YSI MPS 556

pH: 7.28 **DO:** 8.04 **(mg/L)** **Serial #:** 14L100845

Notes/Observations:

Full Recovery: Yes Turbidity: 32.05

PID: 0.0 Conductivity: 420

Field Sampling Technician: Name(s) and Company

Name	Company
Dave Birdsong	Arcadis
Mike Rodahan	Arcadis
Ryan Malone	ODM

ARCADIS

Appendix B-2
HydraSleeve™ Field Form

Site: SRSNE

Location: Southington, CT

Well ID: MW-205B

Well Type: ● Monitoring ● Other:

Well Finish: ● Stick Up ● Flush Mount

Measuring Pt: [✓ ● Top of Casing] ● Other (specify):

Total Depth As Constructed (ftbgs): 49.0 **Screened Interval (ftbgs):** 39.0-49.0

Well Casing: Diameter: 2" Material: PVC

Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6-8-16 Time: 1517

Weather Conditions: P. Cloudy 65°F

Depth to groundwater at time of deployment: 5.80

Total well depth at time of deployment: 48.37

Dimensions of HydraSleeve™: Length (in.) 36 Diameter (in.) 1.8

Deployment Method/Position of Weight:

PID (ppm): 0.0

[✓ ● Top-Down]: Weight attached to bottom of HydraSleeve™. Weight suspended in well.

● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 44.0

Retrieval

Date and Time of Retrieval: Date: 6/10/16 Time: 08:45

Total # of days deployed: 2

Weather Conditions: 55 Sunny

Depth to groundwater at time of retrieval: 5.93

Total well depth at time of retrieval: 48.37

Downhole Field Parameters Upon Retrieval:

Temp: 10.75 (°C) **ORP:** -47.8 (mV) **Water quality meter:** YSI 556 MPS

pH: 6.94 **DO:** 8.19 (mg/L) **Serial #:** 14L100845

Notes/Observations:

- Full Recovery: Yes Turbidity: 4.18
- PID - 0.0ppm Conductivity: 316

Field Sampling Technician: Name(s) and Company

Name	Company
Dave Birdsey	Arcadis
Mike Rodarch	Arcadis
Ryan Malone	O&M

ARCADIS

Appendix B-2
HydraSleeve™ Field Form

Site: SIRSNE

Location: Southington Ct

Well ID: CP2-6A

Well Type: ● Monitoring ● Other:

Well Finish: [✓ ● Stick Up] ● Flush Mount

Measuring Pt: ● Top of Casing ● Other (specify):

Total Depth As Constructed (ftbgs): 24.1 **Screened Interval (ftbgs):** 9.1 - 24.1

Well Casing: Diameter: 2" Material: PVC

Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6-8-16 Time: 1456

Weather Conditions: P. cloudy ± 65°F

Depth to groundwater at time of deployment: 8.92

Total well depth at time of deployment: 27.07

Dimensions of HydraSleeve™: Length (in.) 36" Diameter (in.) 1.8

Deployment Method/Position of Weight:

PID (ppm): 0.0

[✓ ●] Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.

● Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 16.6'

Retrieval

Date and Time of Retrieval: Date: 6/10/16 Time: 08:15

Total # of days deployed: 2

Weather Conditions: 55 Sunny

Depth to groundwater at time of retrieval: 9.14'

Total well depth at time of retrieval: 27.07

Downhole Field Parameters Upon Retrieval:

Temp: 11.91 (°C) **ORP:** 28.5 (mV) **Water quality meter:** YSI 556 MPS

pH: 5.46 **DO:** 1.50 (mg/L) **Serial #:** 14L100845

Notes/Observations:

Full Recovery: Yes
PID @ Retrieval: 0.0 ppm

Turbidity: 5.18
Sp. conductivity: 834

Field Sampling Technician: Name(s) and Company

Name	Company
Dave Bardsley	Arcadis
Mike Redman	Arcadis
Ryan Malon	O+M

ARCADIS

Attachment A
HydraSleeve™ Field Form

Site: SRSNE
Location: Southington
Well ID: ~~P22-204M~~ P20-204M

Well Type: [✓ Monitoring] • Other:
Well Finish: [✓ Stick Up] • Flush Mount
Measuring Pt: [✓ Top of Casing] • Other (specify):
Total Depth As Constructed (ftbgs): 55.7 **Screened Interval (ftbgs):** 45.7 - 55.7
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 6/7/2016 Time: 13:02
Weather Conditions: 83° Sunny
Depth to groundwater at time of deployment: 5.15"
Total well depth at time of deployment: 56.88
Dimensions of HydraSleeve™: Length (in.) 36" Diameter (in.) 1.8"
Deployment Method/Position of Weight:
- Bottom Anchor: Weight attached to bottom of HydraSleeve™. Weight rests on well bottom.
- [✓ Top-Down:] Weight attached to bottom of HydraSleeve™. Weight suspended in well.
- Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ftbgs): 50.7

Retrieval

Date and Time of Retrieval: Date: 6/10/16 Time: 09:45
Total # of days deployed: 3
Weather Conditions: 60 Sunny
Depth to groundwater at time of retrieval: 5.81
Total well depth at time of retrieval: 56.88
Downhole Field Parameters Upon Retrieval:
Temp: 16.79 (°C) **ORP:** -84.0 (mV) **Water quality meter:** YSI 556 MPS
pH: 6.89 **DO:** 2.63 (mg/L) **Serial #:** 14L100845

Notes/Observations:
Full Recovery: Yes SC: 454
PID: 0.0 ppm Turb: 21.32

Field Sampling Technician: Name(s) and Company

Name		Company
Mike	Redman	Arcadis
Ryan	Malone	ODM

July 2016 Post-Thermal Treatment Event

-eve™ Field Form

ARCADIS Design & Consultancy for natural and built assets

Site: SRSNE

Location: Southington

Well ID: MW-416

Well Type: ☑ Monitoring ☐ Other:

Well Finish: ☑ Stick Up ☐ Flush Mount

Measuring Pt: ☑ Top of Casing ☐ Other (specify):

Total Depth As Constructed (ft bgs): 49.4

Screened Interval (ft bgs): 29.4-49.4

Well Casing: Diameter: 2"

Well Screen: Diameter: 2" Material: PVC

Deployment

Date and Time of Deployment: Date: 7-18-16 Time: 0830

Weather Conditions: 85° Sunny

Depth to groundwater at time of deployment: 11.66

Total well depth at time of deployment: 50.02

Dimensions of HydraSleeve™: Length (in.) 38" Diameter (in.) 1.75

Deployment Method/Position of Weight:

☐ Bottom Anchor: Weight attached to bottom of HydraSleeve™. Weight rests on well bottom.

☐ Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.

☐ Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ft bgs): 39.4

Retrieval

Date and Time of Retrieval: Date: 7-19-16 Time: 0850

Total # of days deployed: 1 Day

Weather Conditions: Sunny 80°F

Retrieval Method: ☑ Continuous Pull (preferred) ☐ Short Strokes

Depth to groundwater at time of retrieval (measured before retrieval): 11.64

Total well depth at time of retrieval (measured after retrieval): 50.02

Downhole Field Parameters Upon Retrieval:

Temp: 22.97 (°C)

pH: 7.50

Specific Conductivity: 401 (uS/cm)

ORP: 121.4 (mV)

DO: 8.39 (mg/L)

Water quality meter: YSI Pro Plus

Serial #: 15D101641

Turbidity of Groundwater Sample (dispensed from HydraSleeve™):

Turbidity: 39.41 (NTU)

Turbidity meter: micro plus **Serial #:** 201403718

Notes/Observations:

Notes: 0.0

250 ml TOC
extra TOC
extra VOL

Field Sampling Technician: Name(s) and Company

Name	Company
DB + MK	Arcadis
RM	[illegible]

HydraSleeve™ Field Form

ARCADIS Design & Consultancy for natural and built assets

Site: SRSNE
Location: Southington, CT
Well ID: MW2-304
Well Type: ☑ Monitoring ☐ Other:
Well Finish: ☑ Stick Up ☐ Flush Mount
Measuring Pt: ☑ Top of Casing ☐ Other (specify):
Total Depth As Constructed (ft bgs): 11.0 **Screened Interval (ft bgs):** 1-11'
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 7-18-16 Time: 0905
Weather Conditions: 85° Sunny
Depth to groundwater at time of deployment: 10.7'
Total well depth at time of deployment: 16.22
Dimensions of HydraSleeve™: Length (in.) 38 Diameter (in.) 1.75
Deployment Method/Position of Weight:
☐ Bottom Anchor: Weight attached to bottom of HydraSleeve™. Weight rests on well bottom.
☐ Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
☐ Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.
Deployment Depth (Top of HydraSleeve™) (ft bgs): ~10.1

Retrieval

Date and Time of Retrieval: Date: 7-19-16 Time: 0515
Total # of days deployed: 1 Day
Weather Conditions: 85° Sunny
Retrieval Method: ☐ Continuous Pull (preferred) ☐ Short Strokes
Depth to groundwater at time of retrieval (measured before retrieval):
Total well depth at time of retrieval (measured after retrieval): 16.22
Downhole Field Parameters Upon Retrieval:
Temp: 24.97 (°C) **ORP:** 63.8 (mV) **Water quality meter:** YSI Pro Plus
pH: 5.95 **DO:** 7.07 (mg/L) **Serial #:** 15D101641
Specific Conductivity: 3101 (uS/cm)
Turbidity of Groundwater Sample (dispensed from HydraSleeve™):
Turbidity: 22.97 (NTU) **Turbidity meter:** micro Plus **Serial #:** 201403716

Notes/Observations:

Deployed at 13.5 Ft from PVC - no water / No extra volume

PID: 0.0

Field Sampling Technician: Name(s) and Company

Name	Company
PB/MK	Arcadis
RM	City

HydraSleeve™ Field Form

ARCADIS Design & Consultancy for natural and built assets

Site: Southington
Location: SRSNE
Well ID: TW-08D

Well Type: ☑ Monitoring ☐ Other:
Well Finish: ☑ Stick Up ☐ Flush Mount
Measuring Pt: ☑ Top of Casing ☐ Other (specify):
Total Depth As Constructed (ft bgs): 31.5 **Screened Interval (ft bgs):** 21.5 - 31.5
Well Casing: Diameter: 2" Material: steel
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 7-18-16 Time: 0920
Weather Conditions: 80° Sunny
Depth to groundwater at time of deployment: 8.62
Total well depth at time of deployment: 26.18
Dimensions of HydraSleeve™: Length (in.) 38 Diameter (in.) 1.75
Deployment Method/Position of Weight:

☐ Bottom Anchor: Weight attached to bottom of HydraSleeve™. Weight rests on well bottom.

☐ Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.

☐ Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ft bgs): 26.5

Retrieval

Date and Time of Retrieval: Date: 7-19-16 Time: 0945
Total # of days deployed: 1 Day
Weather Conditions: Sunny 80° F
Retrieval Method: ☐ Continuous Pull (preferred) ☐ Short Strokes
Depth to groundwater at time of retrieval (measured before retrieval): 8.66
Total well depth at time of retrieval (measured after retrieval): 26.18
Downhole Field Parameters Upon Retrieval:
Temp: 30.68 **(°C)** **ORP:** 158.6 **(mV)** **Water quality meter:** YSI Pro Plus
pH: 5.91 **DO:** 1.72 **(mg/L)** **Serial #:** 15D101641
Specific Conductivity: 576 **(uS/cm)**
Turbidity of Groundwater Sample (dispensed from HydraSleeve™):
Turbidity: 42.77 **(NTU)** **Turbidity meter:** Micro PW **Serial #:** 201403318

Notes/Observations:

PID: 5.6 10

Field Sampling Technician: Name(s) and Company

Name	Company
DB/MK	Arcadis
RM	OEM

HydraSleeve™ Field Form

ARCADIS Design & Consultancy for natural and built assets

Site: SRSNE
Location: Southington
Well ID: TW-08R

Well Type: ☒Monitoring ☐Other:
Well Finish: ☒Stick Up ☐Flush Mount
Measuring Pt: ☒Top of Casing ☐Other (specify):
Total Depth As Constructed (ft bgs): 14.0 **Screened Interval (ft bgs):** 4.0-14
Well Casing: Diameter: 2" Material: Steel
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 7-18-16 Time: 0945
Weather Conditions: 80°F
Depth to groundwater at time of deployment: 9.18
Total well depth at time of deployment: 14.44
Dimensions of HydraSleeve™: Length (in.) 38. Diameter (in.) 1.75
Deployment Method/Position of Weight:
☐Bottom Anchor: Weight attached to bottom of HydraSleeve™. Weight rests on well bottom.
☐Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
☐Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.
Deployment Depth (Top of HydraSleeve™) (ft bgs): ~10.1

Retrieval

Date and Time of Retrieval: Date: 7-19-16 Time: 1015
Total # of days deployed: 1 Day
Weather Conditions: Sunny 80°F
Retrieval Method: ☐ Continuous Pull (preferred) ☐ Short Strokes
Depth to groundwater at time of retrieval (measured before retrieval): 9.19
Total well depth at time of retrieval (measured after retrieval): 14.45
Downhole Field Parameters Upon Retrieval:
Temp: 31.17 **(°C)** **ORP:** 44.3 **(mV)** **Water quality meter:** YSI Pro Plus
pH: 5.85 **DO:** 3.51 **(mg/L)** **Serial #:** 15D101641
Specific Conductivity: 1643 **(uS/cm)**
Turbidity of Groundwater Sample (dispensed from HydraSleeve™):
Turbidity: 12.82 **(NTU)** **Turbidity meter:** Micro TPW **Serial #:** 201403318

Notes/Observations:

PID: 0.0
Deployed at 12.18 from steel due to lack of GW
(2) 800 ml TOC
extra VOA
extra TOC

Field Sampling Technician: Name(s) and Company

Name	Company
DB+MK	Arcadis
AM	O B[illegible]

HydraSleeve™ Field Form

ARCADIS Design & Consultancy for natural and built assets

Site: SRSWE
Location: Southington CT
Well ID: MW-41S

Well Type: ☑ Monitoring ☐ Other:
Well Finish: ☑ Stick Up ☐ Flush Mount
Measuring Pt: ☑ Top of Casing ☐ Other (specify):

Total Depth As Constructed (ft bgs): 19.8 **Screened Interval (ft bgs):** 14.8-19.8
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 7-18-16 Time: 1665
Weather Conditions: 80° Sunny
Depth to groundwater at time of deployment: / 8.10
Total well depth at time of deployment: 22.42
Dimensions of HydraSleeve™: Length (in.) 38 Diameter (in.) 1.75
Deployment Method/Position of Weight:

☐ Bottom Anchor: Weight attached to bottom of HydraSleeve™. Weight rests on well bottom.
☐ Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
☐ Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.

Deployment Depth (Top of HydraSleeve™) (ft bgs): 17.3

Retrieval

Date and Time of Retrieval: Date: 7-19-16 Time: 1045
Total # of days deployed: 1 Day
Weather Conditions: 80° Sunny
Retrieval Method: ☑ Continuous Pull (preferred) ☐ Short Strokes
Depth to groundwater at time of retrieval (measured before retrieval): 8.19
Total well depth at time of retrieval (measured after retrieval): 22.41
Downhole Field Parameters Upon Retrieval:
Temp: 24.08 **(°C)** **ORP:** 13.9 **(mV)** **Water quality meter:** YSI Pro Plus
pH: 6.03 **DO:** 3.38 **(mg/L)** **Serial #:** 15D101641
Specific Conductivity: 1476 **(uS/cm)**
Turbidity of Groundwater Sample (dispensed from HydraSleeve™):
Turbidity: 19.85 **(NTU)** **Turbidity meter:** Micro TPw **Serial #:** 201403718

Notes/Observations:

Notes: 0.0

(250) ml TOC
extra VOA
extra TOC

Field Sampling Technician: Name(s) and Company

Name Company
DBlmik Arcadis
RM Olin

HydraSleeve™ Field Form

ARCADIS | Design & Consultancy for natural and built assets

Site: SRSNE
Location: Southington, CT
Well ID: MW-415

Well Type: ☑Monitoring ☐Other:
Well Finish: ☑Stick Up ☐Flush Mount
Measuring Pt: ☑Top of Casing ☐Other (specify):
Total Depth As Constructed (ft bgs): 11.8 **Screened Interval (ft bgs):** 6.8-11.8
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 7-18-16 Time: 1025
Weather Conditions: Sunny 80°F
Depth to groundwater at time of deployment: 9.32
Total well depth at time of deployment: 14.15
Dimensions of HydraSleeve™: Length (in.) 38 Diameter (in.) 1.75
Deployment Method/Position of Weight:
☐Bottom Anchor: Weight attached to bottom of HydraSleeve™. Weight rests on well bottom.
☐Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
☐Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.
Deployment Depth (Top of HydraSleeve™) (ft bgs): 8.8

Retrieval

Date and Time of Retrieval: Date: 7-19-16 Time: 1115
Total # of days deployed: 24 hour
Weather Conditions: Sunny 80°F
Retrieval Method: ☑ Continuous Pull (preferred) ☐ Short Strokes
Depth to groundwater at time of retrieval (measured before retrieval): 9.38
Total well depth at time of retrieval (measured after retrieval): 14.15
Downhole Field Parameters Upon Retrieval:
Temp: 25.67 **(°C)** **ORP:** 141.6 **(mV)** **Water quality meter:** YSI ProPlus
pH: 6.67 **DO:** 3.26 **(mg/L)** **Serial #:** 15D101641
Specific Conductivity: 1249 **(uS/cm)**
Turbidity of Groundwater Sample (dispensed from HydraSleeve™):
Turbidity: 18.32 **(NTU)** **Turbidity meter:** micro Plus **Serial #:** 201403718

Notes/Observations:

notes: 0.0

extra VOA
extra TOC
not enough for Alk.

Field Sampling Technician: Name(s) and Company

Name	Company
DB mK	Arcadis
RM	ORM

HydraSleeve™ Field Form

ARCADIS Design & Consultancy for natural and built assets

Site: SRSNE
Location: Southington
Well ID: MW-902M

Well Type: ☑ Monitoring ☐ Other:
Well Finish: ☑ Stick Up ☐ Flush Mount
Measuring Pt: ☑ Top of Casing ☐ Other (specify):
Total Depth As Constructed (ft bgs): 17.5 **Screened Interval (ft bgs):** 12.5 - 17.5
Well Casing: Diameter: 2" Material: Steel
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 7-18-16 Time: 1640
Weather Conditions: Sunny ± 80°F
Depth to groundwater at time of deployment: 11.36
Total well depth at time of deployment: 26.28
Dimensions of HydraSleeve™: Length (in.) 38 Diameter (in.) 1.75
Deployment Method/Position of Weight:
☐ Bottom Anchor: Weight attached to bottom of HydraSleeve™. Weight rests on well bottom.
☐ Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
☐ Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.
Deployment Depth (Top of HydraSleeve™) (ft bgs): 15'

Retrieval

Date and Time of Retrieval: Date: 7-19-16 Time: 1145
Total # of days deployed: 1 Day
Weather Conditions: Sunny 80°F
Retrieval Method: ☑ Continuous Pull (preferred) ☐ Short Strokes
Depth to groundwater at time of retrieval (measured before retrieval): 11.43
Total well depth at time of retrieval (measured after retrieval): 26.28
Downhole Field Parameters Upon Retrieval:
Temp: 19.85 **(°C)** **ORP:** 28.1 **(mV)** **Water quality meter:** YSI Pro Plus
pH: 6.56 **DO:** 4.17 **(mg/L)** **Serial #:** 15P101641
Specific Conductivity: 820 **(uS/cm)**
Turbidity of Groundwater Sample (dispensed from HydraSleeve™):
Turbidity: 22.97 **(NTU)** **Turbidity meter:** MicroPlus **Serial #:** 201103718

Notes/Observations:

NOTES: [illegible]

250 ml Alkalinity
extra VOA
extra TOC

Field Sampling Technician: Name(s) and Company

Name Company
DB + MR Arcadis
RM BBM

HydraSleeve™ Field Form

ARCADIS Design & Consultancy for natural and built assets

Site: S2SWE
Location: Southington
Well ID: MW-902D

Well Type: ☑ Monitoring ☐ Other:
Well Finish: ☑ Stick Up ☐ Flush Mount
Measuring Pt: ☑ Top of Casing ☐ Other (specify):
Total Depth As Constructed (ft bgs): 24.0 **Screened Interval (ft bgs):** 19.0-24.0
Well Casing: Diameter: 2" Material: steel
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 7-18-16 Time: 1130
Weather Conditions: 85° sunny
Depth to groundwater at time of deployment: 11.6
Total well depth at time of deployment: 21.42
Dimensions of HydraSleeve™: Length (in.) 38 Diameter (in.) 1.75
Deployment Method/Position of Weight:
☐ Bottom Anchor: Weight attached to bottom of HydraSleeve™. Weight rests on well bottom.
☐ Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
☐ Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.
Deployment Depth (Top of HydraSleeve™) (ft bgs): ~20'

Retrieval

Date and Time of Retrieval: Date: 7-19-16 Time: 1245
Total # of days deployed: 1 Day
Weather Conditions: 80° Sunny
Retrieval Method: ☑ Continuous Pull (preferred) ☐ Short Strokes
Depth to groundwater at time of retrieval (measured before retrieval): 11.63
Total well depth at time of retrieval (measured after retrieval): 21.43
Downhole Field Parameters Upon Retrieval:
Temp: 19.68 **(°C)** **ORP:** 78.2 **(mV)** **Water quality meter:** YSI Pro Plus
pH: 6.14 **DO:** 6.05 **(mg/L)** **Serial #:** 15D101641
Specific Conductivity: 2156 **(uS/cm)**
Turbidity of Groundwater Sample (dispensed from HydraSleeve™):
Turbidity: 9.95 **(NTU)** **Turbidity meter:** microPlus **Serial #:** 201403718

Notes/Observations:

outer casing: 29"
PVC: 26.5"
PID: 2.5
250 ml alkalinity
extra VOA vial
extra TOC

Field Sampling Technician: Name(s) and Company

Name	Company
DBAMK -	Arcadis
RM -	OTM

HydraSleeve™ Field Form

ARCADIS Design & Consultancy for natural and built assets

Site: SRSNE
Location: Southington
Well ID: MW6-307

Well Type: ☑ Monitoring ☐ Other:
Well Finish: ☑ Stick Up ☐ Flush Mount
Measuring Pt: ☑ Top of Casing ☐ Other (specify):
Total Depth As Constructed (ft bgs): 11.0 **Screened Interval (ft bgs):** 1.0-11.0
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 7-18-16 Time: 1300
Weather Conditions: Sunny ± 80°F
Depth to groundwater at time of deployment: 6.90
Total well depth at time of deployment: 12.97
Dimensions of HydraSleeve™: Length (in.) 38 Diameter (in.) 1.75
Deployment Method/Position of Weight:
☐ Bottom Anchor: Weight attached to bottom of HydraSleeve™. Weight rests on well bottom.
☐ Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
☐ Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.
Deployment Depth (Top of HydraSleeve™) (ft bgs): 7.8

Retrieval

Date and Time of Retrieval: Date: 7-19-16 Time: 1330
Total # of days deployed: Est 1 Day
Weather Conditions: Sunny 80°F
Retrieval Method: ☑ Continuous Pull (preferred) ☐ Short Strokes
Depth to groundwater at time of retrieval (measured before retrieval): 6.91
Total well depth at time of retrieval (measured after retrieval): 12.98
Downhole Field Parameters Upon Retrieval:
Temp: 23.40 (°C) **ORP:** 103.7 (mV) **Water quality meter:** YSI Pro Plus
pH: 6.54 **DO:** 3.49 (mg/L) **Serial #:** 15D101644
Specific Conductivity: 1967 (uS/cm)
Turbidity of Groundwater Sample (dispensed from HydraSleeve™):
Turbidity: 22.76 (NTU) **Turbidity meter:** micro plus **Serial #:** 201403718

Notes/Observations:

outer casing: ~~[illegible]~~
PVC:18"

(2) 60 ml TOC
extra vial VOA
extra vial TOC

Field Sampling Technician: Name(s) and Company

Name Company
DB + MK Arcadis
RM OBM

HydraSleeve™ Field Form

ARCADIS Design & Consultancy for natural and built assets

Site: SRSNE
Location: Southington CT
Well ID: DN-3

13' Screen

Well Type: ☑ Monitoring ☐ Other:
Well Finish: ☑ Stick Up ☐ Flush Mount
Measuring Pt: ☑ Top of Casing ☐ Other (specify):
Total Depth As Constructed (ft bgs): **Screened Interval (ft bgs):** ~~18-21.8~~ 8.8-21.8
Well Casing: Diameter: 2" Material: PVC
Well Screen: Diameter: 2"

Deployment

Date and Time of Deployment: Date: 7-18-16 Time: 1410
Weather Conditions: Sunny ≥ 90°F
Depth to groundwater at time of deployment: 11.35
Total well depth at time of deployment: 23.64
Dimensions of HydraSleeve™: Length (in.) 38 Diameter (in.) 1.75
Deployment Method/Position of Weight:
☐ Bottom Anchor: Weight attached to bottom of HydraSleeve™. Weight rests on well bottom.
☐ Top-Down: Weight attached to bottom of HydraSleeve™. Weight suspended in well.
☐ Top-Down: Weight attached to top of HydraSleeve™. Weight suspended in well.
Deployment Depth (Top of HydraSleeve™) (ft bgs): 15.3 ~~16.8~~

Retrieval

Date and Time of Retrieval: Date: 7-19-16 Time: 1600
Total # of days deployed: 1 Day
Weather Conditions: Sunny 80°F
Retrieval Method: ☑ Continuous Pull (preferred) ☐ Short Strokes
Depth to groundwater at time of retrieval (measured before retrieval): 11.40
Total well depth at time of retrieval (measured after retrieval): 23.64
Downhole Field Parameters Upon Retrieval:
Temp: 15.76 **(°C)** **ORP:** 129.9 **(mV)** **Water quality meter:** YSI Pro Plus
pH: 7.75 **DO:** 6.71 **(mg/L)** **Serial #:** 815D10164
Specific Conductivity: 250 **(uS/cm)**
Turbidity of Groundwater Sample (dispensed from HydraSleeve™):
Turbidity: 9.46 **(NTU)** **Turbidity meter:** MicroPlus **Serial #:** 20140371S

Notes/Observations:
3 VOAs

Field Sampling Technician: Name(s) and Company

Name Company
DB+WK Arcadis

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) SRSNE
Well Number TW-08B Date 7-20-16
Field Personnel DB/MK
Sampling Organization Arcadis
Identify MP

Depth to 21.5 / 31.5 of screen
(below MP) top bottom
Pump Intake at (ft. below MP) ~26.5
Purging Device; (pump type) peri
Total Volume Purged 13.75L

PID: 0.0

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
0925	9.20		250	1.25	29.20	1040	6.08	52.2	5.04	2.02	MS/MSD Collected
0930	9.22		250	2.5	29.27	1033	6.26	34.7	3.45	1.54	DUP Collected
0935	9.25		250	3.75	29.20	1033	6.35	23.7	3.19	0.27	
0940	9.28		250	5	28.27	1020	6.46	16.9	3.04	0.18	Dup-07202016-#1
0955	9.31		250	8.75	29.49	1036	6.54	-6.5	2.20	0.01	
1000	9.33		250	10	29.86	1045	6.55	-9.5	2.14	0.02	
1005	9.35		250	11.25	30.29	1053	6.56	-13.7	1.92	0.01	
1010	9.37		250	12.5	30.22	1018	6.55	-15.3	1.90	0.03	
1015	9.38		250	13.75	30.26	1050	6.59	-14.9	1.89	0.01	
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

Initial Depth to Water: 9.18
Depth to Bottom: 27.96

Comments:

APPENDIX B

Equipment Calibration Logs

March 2016 Post-Thermal Treatment Event

ARCADIS
Infrastructure, environment, facilities

YSI & Turbidity Meter Calibration Log

DATE: 3/10/2016

INSTRUMENT IDENTIFICATION

Brand: YSI	Model: Professional Plus	Serial Number: 12E100372
Brand: Micro Pw	Model: 2000	Serial Number: 201110078

CALIBRATION RECORD

Morning Calibration		Afternoon Check		Evening Check	
Standard	Calibration Successful	Standard	Reading	Standard	Reading
pH (S.I. units)					
4.00	4.17	4.00		4.00	4.16
7.00	7.05	7.00		7.00	7.06
10.00	10.21	10.00		10.00	10.10
Turbidity (NTUs)					
0	0.0	0		0	0.6
10	10.0	10		10	10.6
100					
Conductivity (µmhos/cm)					
~~1.413~~ 1000 µS/cm	1193	1.413		1000 µS/cm ~~1.413~~	1197
Dissolved Oxygen (mg/L) Barametric Pressure _____ in.H_2O*25.4=_____mmHg		Not Applicable		Not Applicable	
REDOX (mV) (Zobel Solution)	200 (198.7)	Chart [1]		Chart [1] 200	198.1
Temperature (°C)	~~198.7~~ 16.6°C				16.8

[1] The REDOX of the Zobel solution is temperature dependent, a chart is provided with the meter to check the reading for the appropriate temperature. REDOX must be calibrated by the manufacturer.

ARCADIS
Infrastructure, environment, facilities

YSI & Turbidity Meter Calibration Log

DATE: 3/11/2016

INSTRUMENT IDENTIFICATION

Brand: YSI	Model: Professional Plus	Serial Number: 10E100237
Brand: Turbidity Meter	Model: MicroTPW 2000	Serial Number: 201110078

CALIBRATION RECORD

Morning Calibration		Afternoon Check		Evening Check	
Standard	Calibration Successful	Standard	Reading	Standard	Reading
pH (S.I. units)					
4.00	4.30	4.00		4.00	4.27
7.00	7.01	7.00		7.00	7.00
10.00	10.06	10.00		10.00	10.04
Turbidity (NTUs)					
0.2	0.2	0		0	0.2
10	10	10		10	10
1000	1000				1000
Conductivity (µmhos/cm)					
~~1.413~~ 1000	993	1.413		1.413	985
Dissolved Oxygen (mg/L)		Not Applicable		Not Applicable	
Barametric Pressure					
in.H_2O*25.4=	mmHg				
REDOX (mV)		Chart [1]		Chart [1]	
(Zobel Solution) (200 mV)	199.6			200	200.2
Temperature (ºC)	15.0				17.6

[1] The REDOX of the Zobel solution is temperature dependent, a chart is provided with the meter to check the reading for the appropriate temperature. REDOX must be calibrated by the manufacturer.

June 2016 Annual Event

ARCADIS
Infrastructure, environment, facilities

YSI & Turbidity Meter Calibration Log

DATE: 6/6/16

INSTRUMENT IDENTIFICATION

Brand: YSI 650 MDS	Model: 556 MPS	Serial Number: 14L100845
Brand: Micro TPW	Model: 20140315/20000	Serial Number: 20140315

CALIBRATION RECORD

Morning Calibration		Afternoon Check		Evening Check	
Standard	Calibration Successful	Standard	Reading	Standard	Reading
pH (S.I. units)					
4.00	4.11 → 4.00	4.00		4.00	4.12
7.00	6.90 → 7.00	7.00		7.00	7.19
10.00	10.08 → 10.02	10.00		10.00	10.08
Turbidity (NTUs)					
0.02	→ 0.02	0		0.02	0.13
10	→ 10	10		10	10.56
1000	→ 1000			1000	982.5
Conductivity (µmhos/cm)					
1000	1002 → 1000	10		1000	1048
Dissolved Oxygen (mg/L) 750.3 mm Hg Zero DO Solution	101.1 → 98.7	Not Applicable		Not Applicable	
REDOX (mV)		Chart [1]		Chart [1]	
(Zobel Solution)	235.0				237.1
(Light's Solution)	489.2				491.5
Temperature (C)	21.71				22.35

---

[1] The REDOX of the Zobel solution is temperature dependent, a chart is provided with the meter to check the reading for the appropriate temperature. REDOX must be calibrated by the manufacturer.

ARCADIS
Infrastructure, environment, facilities

YSI & Turbidity Meter Calibration Log

DATE: 6/6/16

INSTRUMENT IDENTIFICATION

Brand: YSI	Model: 556 MPS	Serial Number: 14F100059
Brand:	Model: Micro TPI	Serial Number: 201404348

CALIBRATION RECORD

Morning Calibration		Afternoon Check		Evening Check	
Standard	Calibration Successful	Standard	Reading	Standard	Reading
pH (S.I. units)					
4.00 391 →		4.00		4.00	4.00
7.00 6.90 →		7.00		7.00	7.00
10.00 10.07 →		10.00		10.00	10.02
Turbidity (NTUs)					
~~0~~ .02	.02	0		0.02	.02
~~1~~ 10	10	10		10	10
~~10~~ 1000	1000			1000	1000
Conductivity (µmhos/cm)					
1000 915 →		10		1000	1001
Dissolved Oxygen (~~mg/L~~ %)					
749.1 Zero DO Solution 106.4 →	98.7	**Not Applicable**		**Not Applicable**	
REDOX (mV)		Chart ¹		Chart ¹	
(Zobel Solution)	222.1 → 239.0				200
(Light's Solution)	472.5				497.5
Temperature (C)	19.11				24.71

---

¹ The REDOX of the Zobel solution is temperature dependent, a chart is provided with the meter to check the reading for the appropriate temperature. REDOX must be calibrated by the manufacturer.

ARCADIS
Infrastructure, environment, facilities

YSI & Turbidity Meter Calibration Log

DATE: 6/6/2016

INSTRUMENT IDENTIFICATION

Brand: YSI	Model: 556 MPS	Serial Number: 14F00061
Brand: MicroTW	Model: 2000	Serial Number: 201503444

CALIBRATION RECORD

Morning Calibration		~~Afternoon~~ Check Evening		Evening Check	
Standard	Calibration Successful	Standard	Reading	Standard	Reading
pH (S.I. units)					
4.00 4.04 /	4.00	4.00	4.00	4.00	4.
7.00 6.90 /	7.00	7.00	7.01	7.00	
10.00 10.14	10.02	10.00	10.02	10.00	
Turbidity (NTUs)					
0.02	0.02	0.02	0.02	0	
10	10.0	10	10.0	10	
1000	1000	1000	1000		
Conductivity (~~µmhos/cm~~) µS/cm					
10/1000 989/	1000	10	1001	10	
Dissolved Oxygen (mg/L) Bar. Press 74.8 Zero DO Solution	[illegible] 98.8 / 98.5	Not Applicable		Not Applicable	
REDOX (mV)		Chart [1]		Chart [1]	
(Zobel Solution)	148.5 / 200		200		
(Light's Solution)	498.3		496.7		
Temperature (C)	21.76		22.77		

---

[1] The REDOX of the Zobel solution is temperature dependent, a chart is provided with the meter to check the reading for the appropriate temperature. REDOX must be calibrated by the manufacturer.

ARCADIS
Infrastructure, environment, facilities

YSI & Turbidity Meter Calibration Log

DATE: 6/7/2016

INSTRUMENT IDENTIFICATION

Brand: YSI	**Model:** 556 MPS	**Serial Number:** 14F100059
Brand: MicroPW	**Model:** MicroTPJ	**Serial Number:** 20140434 8

CALIBRATION RECORD

Morning Calibration		**Afternoon Check**		**Evening Check**	
Standard	Calibration Successful	Standard	Reading	Standard	Reading
pH (S.I. units)					
4.00	4.01 / 400	4.00		4.00	4.09
7.00	6.98/ 7.00	7.00		7.00	7.08
10.00	10.05/ 10.00	10.00		10.00	10.06
Turbidity (NTUs)					
0.02	0.02	0		0	0.0
10	10.0	10		10	11.35
1000	1000				
Conductivity ~~(µmhos/cm)~~ µS/cm					
1000	991/ 1000	10		10	999
Dissolved Oxygen (mg/L) 746.0	~~[illegible]~~				
Zero DO Solution	~~746.0~~ 98.3	Not Applicable		Not Applicable	
REDOX (mV)		Chart [1]		Chart [1]	
(Zobel Solution)	246.9/ 200.0				201.1
(Light's Solution)	482.3				485.6
Temperature (C)	17.83				19.21

---

[1] The REDOX of the Zobel solution is temperature dependent, a chart is provided with the meter to check the reading for the appropriate temperature. REDOX must be calibrated by the manufacturer.

ARCADIS
Infrastructure, environment, facilities

YSI & Turbidity Meter Calibration Log

DATE: 6/7/16

INSTRUMENT IDENTIFICATION

Brand: YSI 650 MDS	Model: 556 MPS	Serial Number: 14L100845
Brand: MicroTPW	Model: 20000	Serial Number: 201403315

CALIBRATION RECORD

Morning Calibration		Afternoon Check		Evening Check	
Standard	Calibration Successful	Standard	Reading	Standard	Reading
pH (S.I. units)					
4.00 4.15 →	3.99	4.00		4.00	4.11
7.00 7.14 →	7.00	7.00		7.00	6.99
10.00 10.09 →	9.98	10.00		10.00	9.99
Turbidity (NTUs)					
0.02 →	0.02	0	[illegible]	0	0.17
10 →	10.0	10		10	8.53
1000 →	1000				
Conductivity (µmhos/cm)					
1000, 1046 →	1000	10		10	
Dissolved Oxygen (mg/L) P= 745.9 mm Hg					
Zero DO Solution	98.2	Not Applicable		Not Applicable	
REDOX (mV)		Chart [1]		Chart [1]	
(Zobel Solution)					
(Light's Solution)	484.5				183.5
Temperature (C)	17.96				27.76

---

[1] The REDOX of the Zobel solution is temperature dependent, a chart is provided with the meter to check the reading for the appropriate temperature. REDOX must be calibrated by the manufacturer.

ARCADIS
Infrastructure, environment, facilities

YSI & Turbidity Meter Calibration Log

DATE: 6/7/2016

INSTRUMENT IDENTIFICATION

Brand: YSI	**Model:** 556 MPS	**Serial Number:** 14F00061
Brand: microPW	**Model:** 2000	**Serial Number:** 20150344

CALIBRATION RECORD

Morning Calibration		**Afternoon Check**		**Evening Check**	
Standard	Calibration Successful	Standard	Reading	Standard	Reading
pH (S.I. units)					
4.00	4.00/ 4.00	4.00		4.00	4.21
7.00	7.01/ 7.00	7.00		7.00	7.36
10.00	10.0/ 10.0	10.00		10.00	10.15
Turbidity (NTUs)					
0,02	0.02	0		0.02	3.89
10	10	10		10	16.17
1000	1000			1000	996.9
Conductivity (~~µmhos/cm~~) µS/cm					
1000	1000/ 1000	10		10	1000
Dissolved Oxygen (mg/L) 747.1		Not Applicable		Not Applicable	
Zero DO Solution	747.1 98.1				
REDOX (mV)		Chart [1]		Chart [1]	
(Zobel Solution)	241.3/ 200				207
(Light's Solution)	481.9				483.6
Temperature (C)	17.74				19.02

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[1] The REDOX of the Zobel solution is temperature dependent, a chart is provided with the meter to check the reading for the appropriate temperature. REDOX must be calibrated by the manufacturer.

ARCADIS
Infrastructure, environment, facilities

YSI & Turbidity Meter Calibration Log

DATE: 6/8/16

INSTRUMENT IDENTIFICATION

Brand:	Model:	Serial Number:
Brand: MicroTPW	Model: 20000	Serial Number: 20140434 8

CALIBRATION RECORD

Morning Calibration		Afternoon Check		Evening Check	
Standard	Calibration Successful	Standard	Reading	Standard	Reading
pH (S.I. units)					
4.00	4.08/4.01	4.00		4.00	3.89
7.00	6.93/7.00	7.00		7.00	7.02
10.00	10.03/10.00	10.00		10.00	10.01
Turbidity (NTUs)					
0.02	0.02	0		0	0.08
10	10	10		10	9.95
1000	1000			1000	1008
Conductivity (µmhos/cm)					
10	850 / 1000	10		10	973
Dissolved Oxygen (mg/L)		Not Applicable		Not Applicable	
Zero DO Solution	746.6 9.23/9.40				
REDOX (mV)		Chart [1]		Chart [1]	
(Zobel Solution)	201.6/200.00				197.06
(Light's Solution)	444.5				434.5
Temperature (C)	17.25				19.51

[1] The REDOX of the Zobel solution is temperature dependent, a chart is provided with the meter to check the reading for the appropriate temperature. REDOX must be calibrated by the manufacturer.

ARCADIS
Infrastructure, environment, facilities

YSI & Turbidity Meter Calibration Log

DATE: 6/8/16

INSTRUMENT IDENTIFICATION

Brand: YSI	Model: 556	Serial Number: 14F100054
Brand: MicroTW	Model: 20000	Serial Number: 201403315

CALIBRATION RECORD

Morning Calibration		Afternoon Check		Evening Check	
Standard	Calibration Successful	Standard	Reading	Standard	Reading
pH (S.I. units)					
4.00	3.94 → 4.00	4.00		4.00	4.03
7.00	7.11 → 7.07	7.00		7.00	7.02
10.00	10.22 → 10.00	10.00		10.00	9.94
Turbidity (NTUs)					
0.02	0.02	0		0.02	0.00
10	10	10		10	11.17
1000	1000			1000	1037
Conductivity (~~µmhos/cm~~) uS/cm					
1000	929 → 1000	10		1000	1070
Dissolved Oxygen (mg/L) 116.9 746.4 mm Hg		Not Applicable		Not Applicable	
Zero DO Solution	98.2				
REDOX (mV)		Chart [1]		Chart [1]	
(Zobel Solution)	201.3 → 200.0				199.0
(Light's Solution)	482.1				481.9
Temperature (C)	17.67				19.06

---

[1] The REDOX of the Zobel solution is temperature dependent, a chart is provided with the meter to check the reading for the appropriate temperature. REDOX must be calibrated by the manufacturer.

ARCADIS
Infrastructure, environment, facilities

YSI & Turbidity Meter Calibration Log

DATE: 6/8/16

INSTRUMENT IDENTIFICATION

Brand: YSI	Model: 556	Serial Number: 14L00845
Brand: Mircro Prod	Model: 20000	Serial Number: 201503444

CALIBRATION RECORD

Morning Calibration		Afternoon Check		Evening Check	
Standard	Calibration Successful	Standard	Reading	Standard	Reading
pH (S.I. units)					
4.00	4.00/ 4.00	4.00		4.00	4.10
7.00	6.99/ 7.00	7.00		7.00	6.96
10.00	10.18 / 10.03	10.00		10.00	10.04
Turbidity (NTUs)					
0.02	0.02	0		0.02	1.21
10	10	10		10	9.12
1000	1000			1000	883.7
Conductivity (µmhos/cm)					
10	904/1000	10		10	999
Dissolved Oxygen (mg/L)					
Zero DO Solution	749.7 9.43/9.54	Not Applicable		Not Applicable	
REDOX (mV)	201.9/200	Chart [1]		Chart [1]	202
(Zobel Solution)	~~17.15~~				
(Light's Solution)	445.9				446.1
Temperature (C)	17.15				17.60

---

[1] The REDOX of the Zobel solution is temperature dependent, a chart is provided with the meter to check the reading for the appropriate temperature. REDOX must be calibrated by the manufacturer.

ARCADIS
Infrastructure, environment, facilities

YSI & Turbidity Meter Calibration Log

DATE: 6/9/16

INSTRUMENT IDENTIFICATION

Brand: YSI	Model: 556	Serial Number: 14F100061
Brand: Micr PW	Model: 20000	Serial Number: 201404348

CALIBRATION RECORD

Morning Calibration		Afternoon Check		Evening Check	
Standard	Calibration Successful	Standard	Reading	Standard	Reading
pH (S.I. units)					
4.00	3.92/4.00	4.00		4.00	4.07
7.00	7.09/7.00	7.00		7.00	6.99
10.00	9.89/9.89	10.00		10.00	10.02
Turbidity (NTUs)					
0.02	0.02	0		0.03	4.77
10.	10.0	10		10	10.29
1000	1000			1000	937.2
Conductivity (~~µmhos/cm~~) uS/cm					
1000	943/1000	10		1000	1118
Dissolved Oxygen (mg/L) 750.8		Not Applicable		Not Applicable	
Zero DO Solution	9.61				
REDOX (mV)		Chart ¹		Chart ¹	
(Zobel Solution)	205.6/200.0				189.4
(Light's Solution)	418.2				
Temperature (C)	14.32				18.6C

---

[1] The REDOX of the Zobel solution is temperature dependent, a chart is provided with the meter to check the reading for the appropriate temperature. REDOX must be calibrated by the manufacturer.

ARCADIS
Infrastructure, environment, facilities

YSI & Turbidity Meter Calibration Log

DATE: 6/9/2016

INSTRUMENT IDENTIFICATION

Brand: YSI	Model: 556	Serial Number: 14L100845
Brand: Micro Pro	Model: 2000e	Serial Number: 201503444

CALIBRATION RECORD

Morning Calibration		Afternoon Check		Evening Check	
Standard	Calibration Successful	Standard	Reading	Standard	Reading
pH (S.I. units)					
4.00	4.00/4.00	4.00		4.00	4.06
7.00	6.96/7.00	7.00		7.00	6.97
10.00	10.07/10.01	10.00		10.00	10.07
Turbidity (NTUs)					
0.02	0.02	0		0.0	0.0
10	10.0	10		10	5.73
1000	1000			1000	690.
Conductivity (~~µmhos~~/cm) uS/cm					
~~10~~ 1000	938/1000	10		1000	1050
Dissolved Oxygen (mg/L)					
751.7 Zero DO Solution	11.70	Not Applicable		Not Applicable	
REDOX (mV)		Chart [1]		Chart [1]	
(Zobel Solution)	203.3/200				190.9
(Light's Solution)	418.7				336.8
Temperature (C)	18.25				18.54

---

[1] The REDOX of the Zobel solution is temperature dependent, a chart is provided with the meter to check the reading for the appropriate temperature. REDOX must be calibrated by the manufacturer.

ARCADIS
Infrastructure, environment, facilities

YSI & Turbidity Meter Calibration Log

DATE: 6/9/2016

INSTRUMENT IDENTIFICATION

Brand: YSI	Model: 556 MPS	Serial Number: 14F100059
Brand: Micro Pro	Model: 20000	Serial Number: 20403315

CALIBRATION RECORD

Morning Calibration		Afternoon Check		Evening Check	
Standard	Calibration Successful	Standard	Reading	Standard	Reading
pH (S.I. units)					
4.00	4.06/ 4.00	4.00		4.00	4.32
7.00	6.89 / 7.00	7.00		7.00	6.79
10.00	10.22 / 10.03	10.00		10.00	10.03
Turbidity (NTUs)					
0.02	0.02	0		0.03	0.0
10	10	10		10	~~10.11~~ 6.42
1000	1000			1000	1011
Conductivity (µmhos/cm)					
1000	904 / 1000	10		10	989
Dissolved Oxygen (mg/L)					
750.5 Zero DO Solution	8.53	Not Applicable		Not Applicable	
REDOX (mV)		Chart [1]		Chart [1]	
(Zobel Solution)	263.9/200.0				203.3
(Light's Solution)	417.3				419.5
Temperature (C)	14.25				19.28

[1] The REDOX of the Zobel solution is temperature dependent, a chart is provided with the meter to check the reading for the appropriate temperature. REDOX must be calibrated by the manufacturer.

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Infrastructure, environment, facilities

YSI & Turbidity Meter Calibration Log

DATE: 6/10/2016

INSTRUMENT IDENTIFICATION

Brand:	YSI	**Model:**	556	**Serial Number:**	14L100845
Brand:	Micro PW	**Model:**	2000	**Serial Number:**	201503444

CALIBRATION RECORD

Morning Calibration		**Afternoon Check**		**Evening Check**	
Standard	Calibration Successful	Standard	Reading	Standard	Reading
pH (S.I. units)					
4.00	4.06/4.00	4.00		4.00	4.09
7.00	6.97/7.00	7.00		7.00	6. 7.03
10.00	10.07/10.01	10.00		10.00	10.25
Turbidity (NTUs)					
0.02	0.62	0		0.02	0.95
10	10	10		10	13.2
1000	1000			1000	993
Conductivity (µmhos/cm) uS/cm					
1000	1050/1000	10		1000	969
Dissolved Oxygen (mg/L)					
756.9 Zero DO Solution	106.2	**Not Applicable**		**Not Applicable**	
REDOX (mV)		Chart [1]		Chart [1]	
(Zobel Solution)	190.9/200				201.5
(Light's Solution)	336.8				339.9
Temperature (C)	18.54				19.26

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[1] The REDOX of the Zobel solution is temperature dependent, a chart is provided with the meter to check the reading for the appropriate temperature. REDOX must be calibrated by the manufacturer.

July 2016 Post-Thermal Treatment Event

ARCADIS
Infrastructure, environment, facilities

YSI & Turbidity Meter Calibration Log

DATE: 7-18-16

INSTRUMENT IDENTIFICATION

Brand: YSI	Model: 556	Serial Number: 15D101641
Brand: MicroPV	Model: 2000	Serial Number: COM0374

CALIBRATION RECORD

Morning Calibration		Afternoon Check		Evening Check	
Standard	Calibration Successful	Standard	Reading	Standard	Reading
pH (S.I. units)					
4.00	4.05	4.00		4.00	4.07
7.00	7.17	7.00		7.00	6.99
10.00	10.10	10.00		10.00	10.02
Turbidity (NTUs)					
0.02	0.02	0		0	1.62
10	10	10		10	10.74
1000	1000				945.3
Conductivity (µmhos/cm)					
1000	909/1000	10		10	1118
Dissolved Oxygen (mg/L) 7508		Not Applicable		Not Applicable	
Zero DO Solution	9.96				
REDOX (mV)		Chart[1]		Chart[1]	
(Zobel Solution)	205.6/200				189.4
(Light's Solution)	449.3				450
Temperature (C)	23.21				21.68

---

[1] The REDOX of the Zobel solution is temperature dependent, a chart is provided with the meter to check the reading for the appropriate temperature. REDOX must be calibrated by the manufacturer.

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Infrastructure, environment, facilities

YSI & Turbidity Meter Calibration Log

DATE: 7-19-16

INSTRUMENT IDENTIFICATION

Brand: YSI	Model: 556	Serial Number: 15 D101641
Brand: MicroPW	Model: 2000	Serial Number: 201103718

CALIBRATION RECORD

Morning Calibration		Afternoon Check		Evening Check	
Standard	Calibration Successful	Standard	Reading	Standard	Reading
pH (S.I. units)					
4.00	3.77	4.00		4.00	4.02
7.00	7.07	7.00		7.00	7.05
10.00	10.08	10.00		10.00	10.02
Turbidity (NTUs)					
0.02	0.02	0		0	.02
10	10	10		10	10.13
1000	1000				952.3
Conductivity (µmhos/cm)					
1000	1082/1000	10		10	1113
Dissolved Oxygen (mg/L)					
7508 Zero DO Solution	7.78	Not Applicable		Not Applicable	
REDOX (mV)		Chart [1]		Chart [1]	
(Zobel Solution)	233.3/200				179.2
(Light's Solution)	465.1				478.2
Temperature (C)	25.22				25.24

---

[1] The REDOX of the Zobel solution is temperature dependent, a chart is provided with the meter to check the reading for the appropriate temperature. REDOX must be calibrated by the manufacturer.

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YSI & Turbidity Meter Calibration Log

DATE: 7/20/16

INSTRUMENT IDENTIFICATION

Brand: YSI	Model: 556	Serial Number: 15D101641
Brand: MicroTPW	Model: 20200	Serial Number: 201404 03318

CALIBRATION RECORD

Morning Calibration		Afternoon Check		Evening Check	
Standard	Calibration Successful	Standard	Reading	Standard	Reading
pH (S.I. units)					
4.00	3.97	4.00		4.00	4.08
7.00	7.03	7.00		7.00	7.11
10.00	10.07	10.00		10.00	9.98
Turbidity (NTUs)					
0.02	0.02	0		0.02	1.24
10	10	10		10	12.18
1000	1000			1000	997.4
Conductivity (µmhos/cm)					
1000	936/1000	10		1000	991
Dissolved Oxygen (mg/L)					
Zero DO Solution	98%	Not Applicable		Not Applicable	
REDOX (mV)		Chart ¹		Chart ¹	
(Zobel Solution)	240.1/200				202.1
(Light's Solution)	482.1				480.7
Temperature (C)	21.50				22.41

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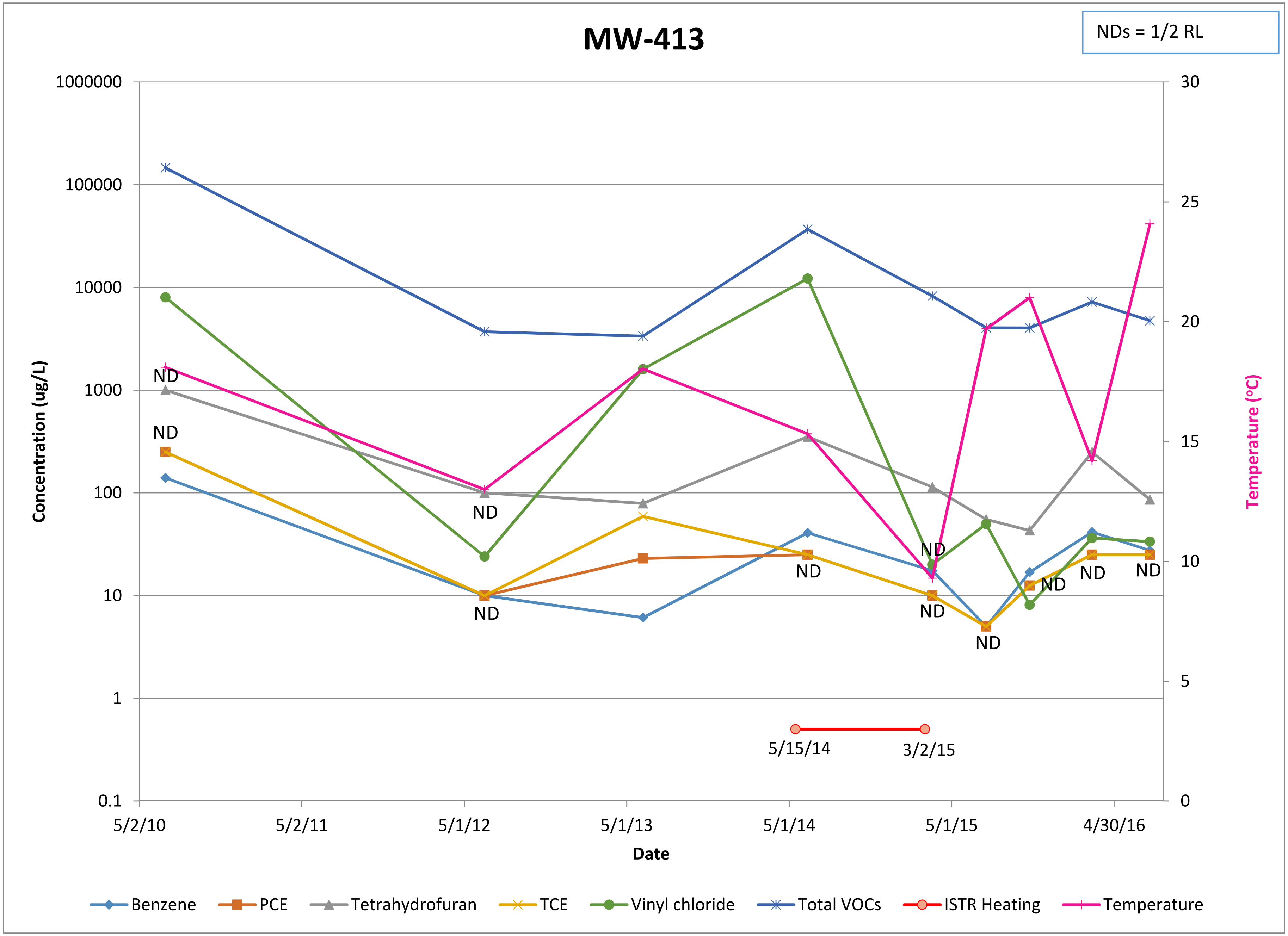
[1] The REDOX of the Zobel solution is temperature dependent, a chart is provided with the meter to check the reading for the appropriate temperature. REDOX must be calibrated by the manufacturer.

APPENDIX C

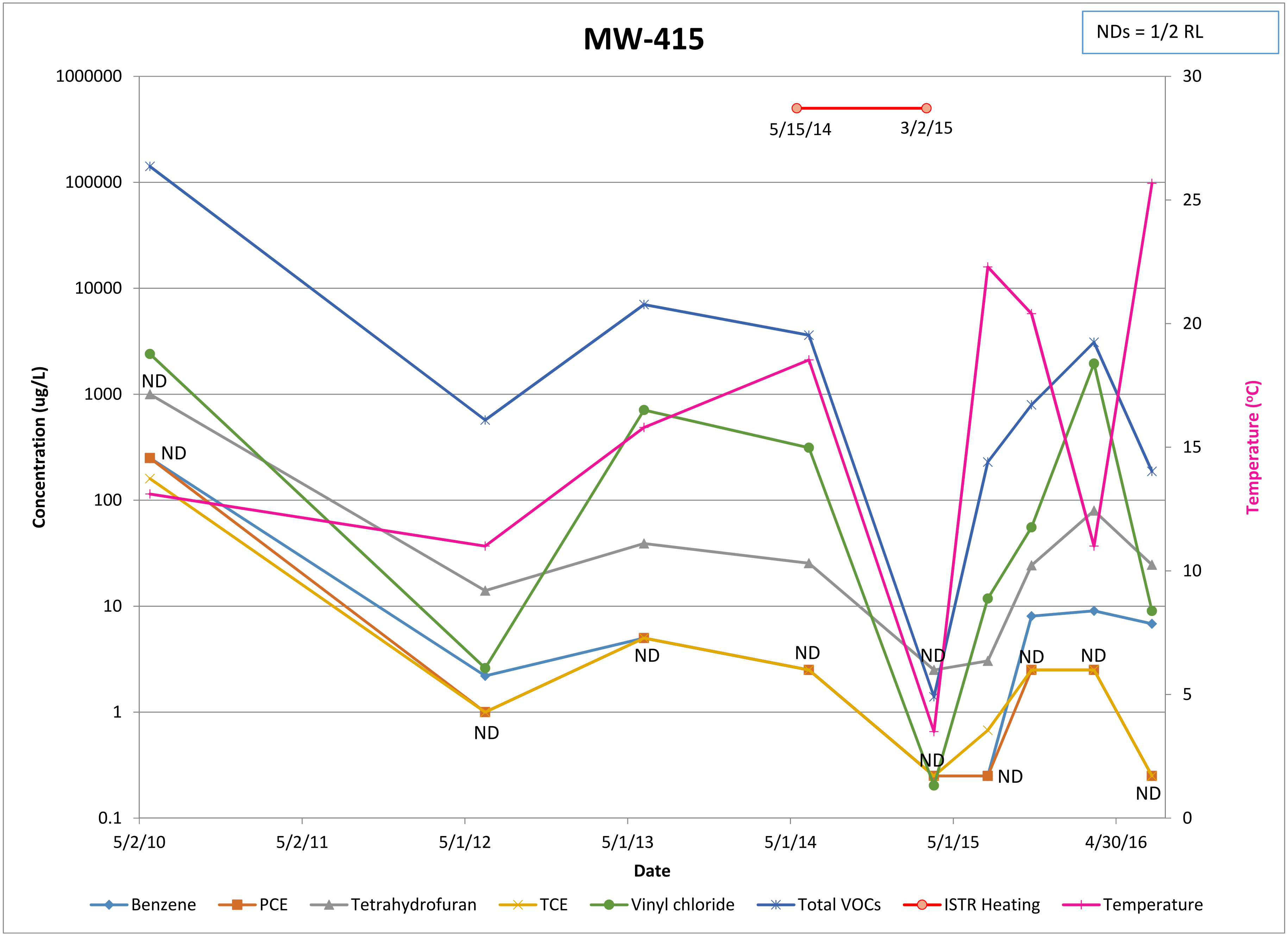
Post-Thermal Treatment Trend Graphs

Groundwater Sampling Summary - Post-Thermal Treatment Sampling (N Wells)

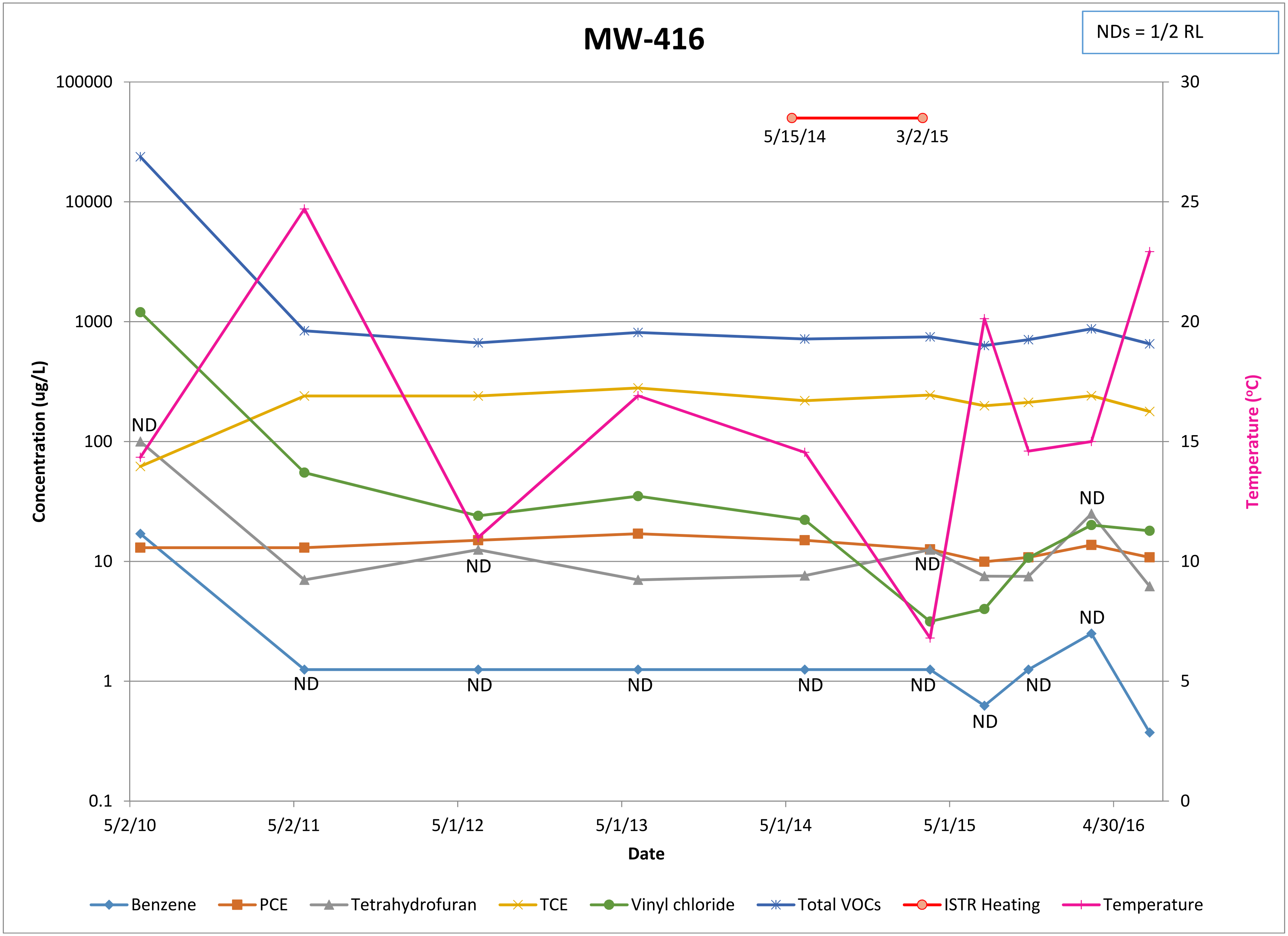
SRSNE Superfund Site
Southington, Connecticut



Groundwater Sampling Summary - Post-Thermal Treatment Sampling (N Wells)
SRSNE Superfund Site
Southington, Connecticut



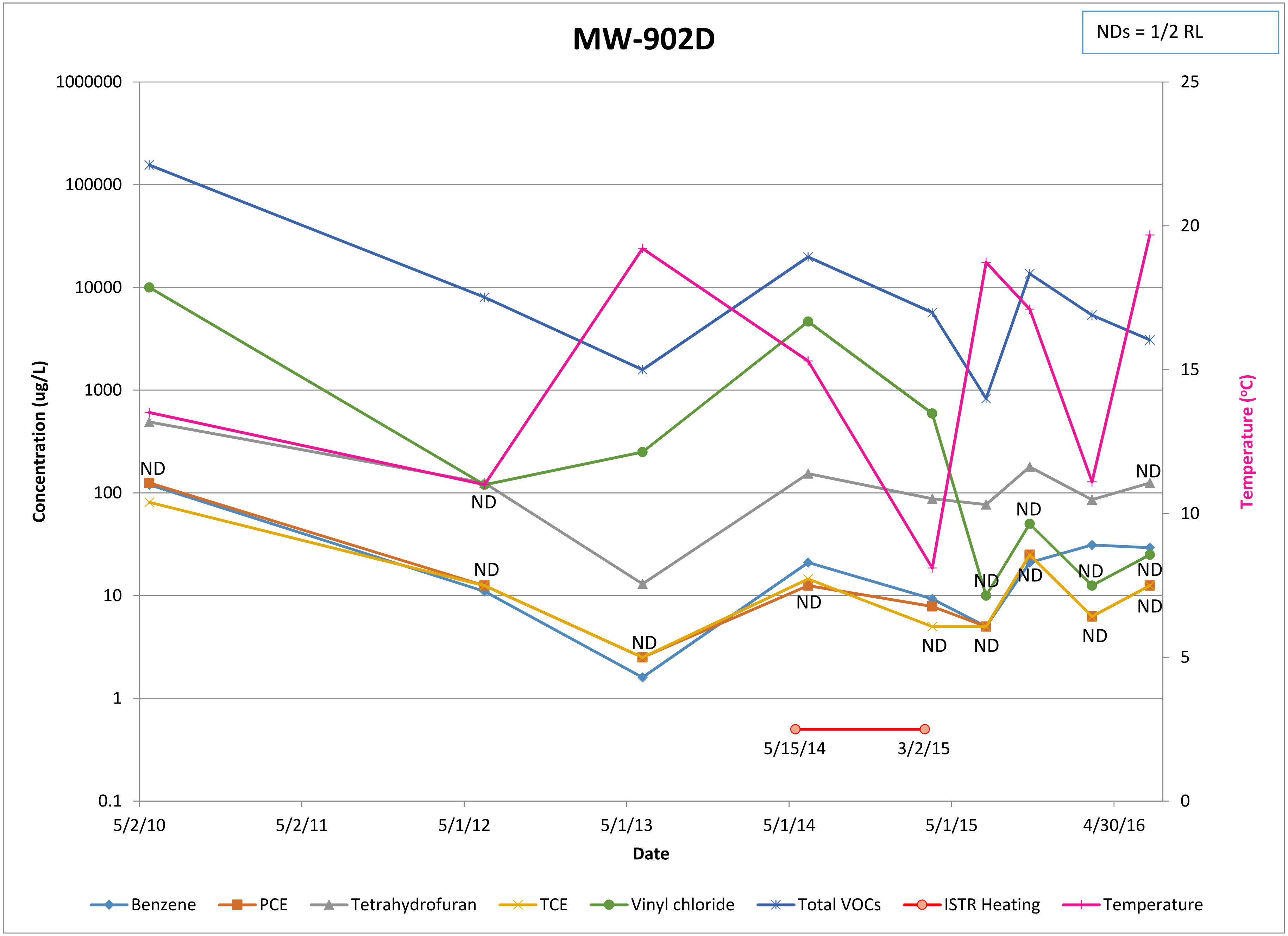
Groundwater Sampling Summary - Post-Thermal Treatment Sampling (N Wells)
SRSNE Superfund Site
Southington, Connecticut



Groundwater Sampling Summary - Post-Thermal Treatment Sampling (N Wells)

SRSNE Superfund Site

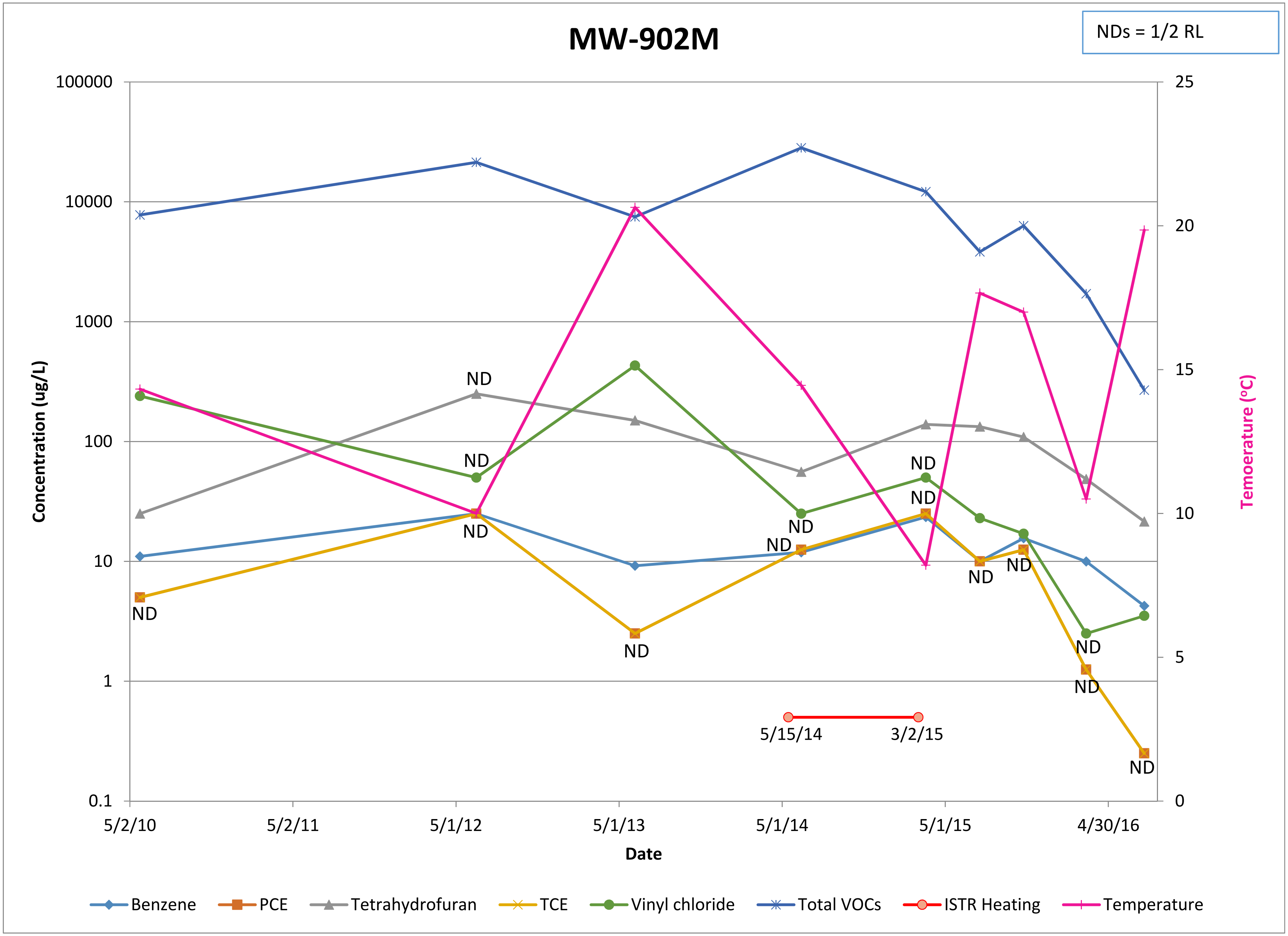
Southington, Connecticut



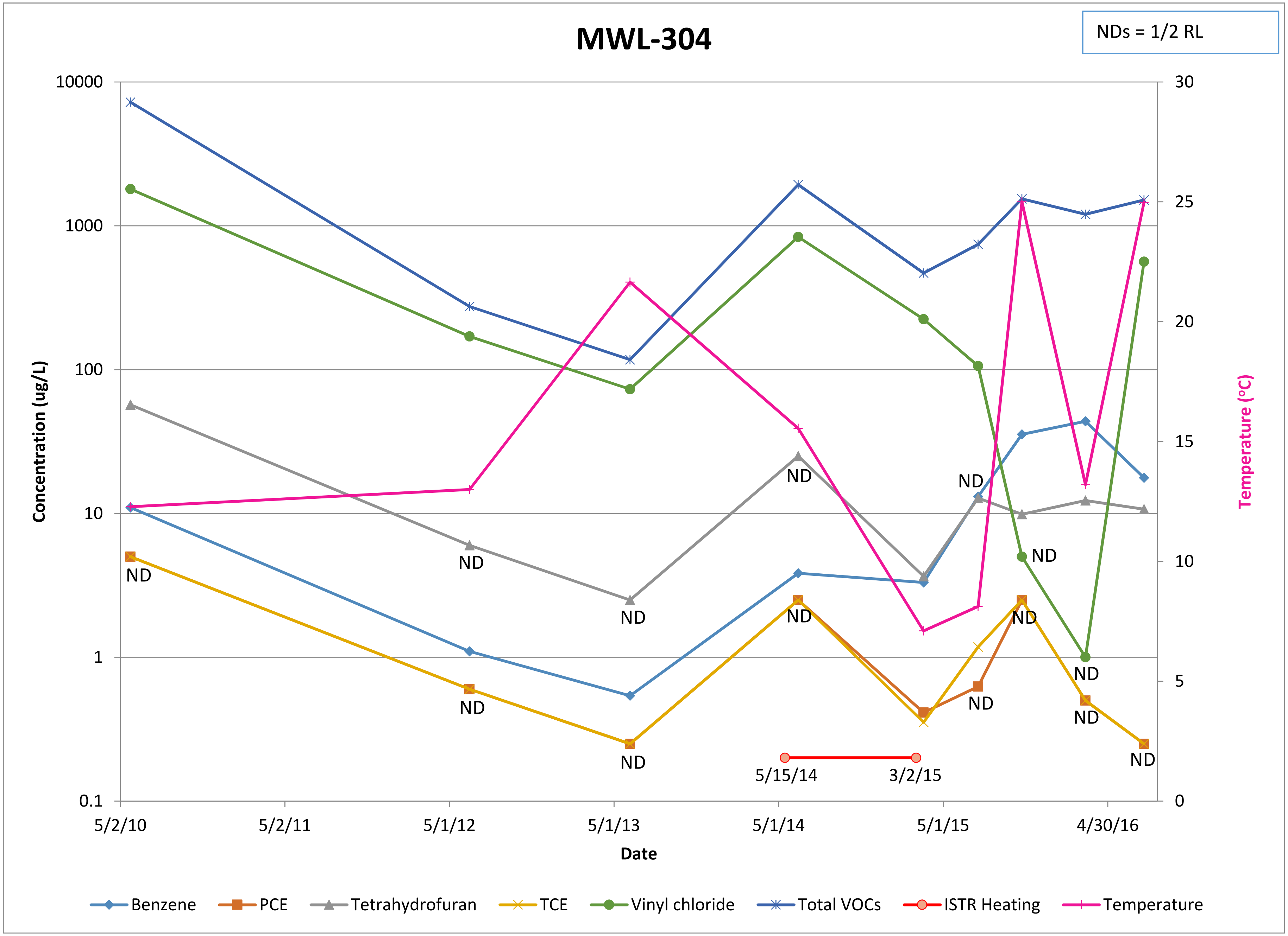
Groundwater Sampling Summary - Post-Thermal Treatment Sampling (N Wells)

SRSNE Superfund Site

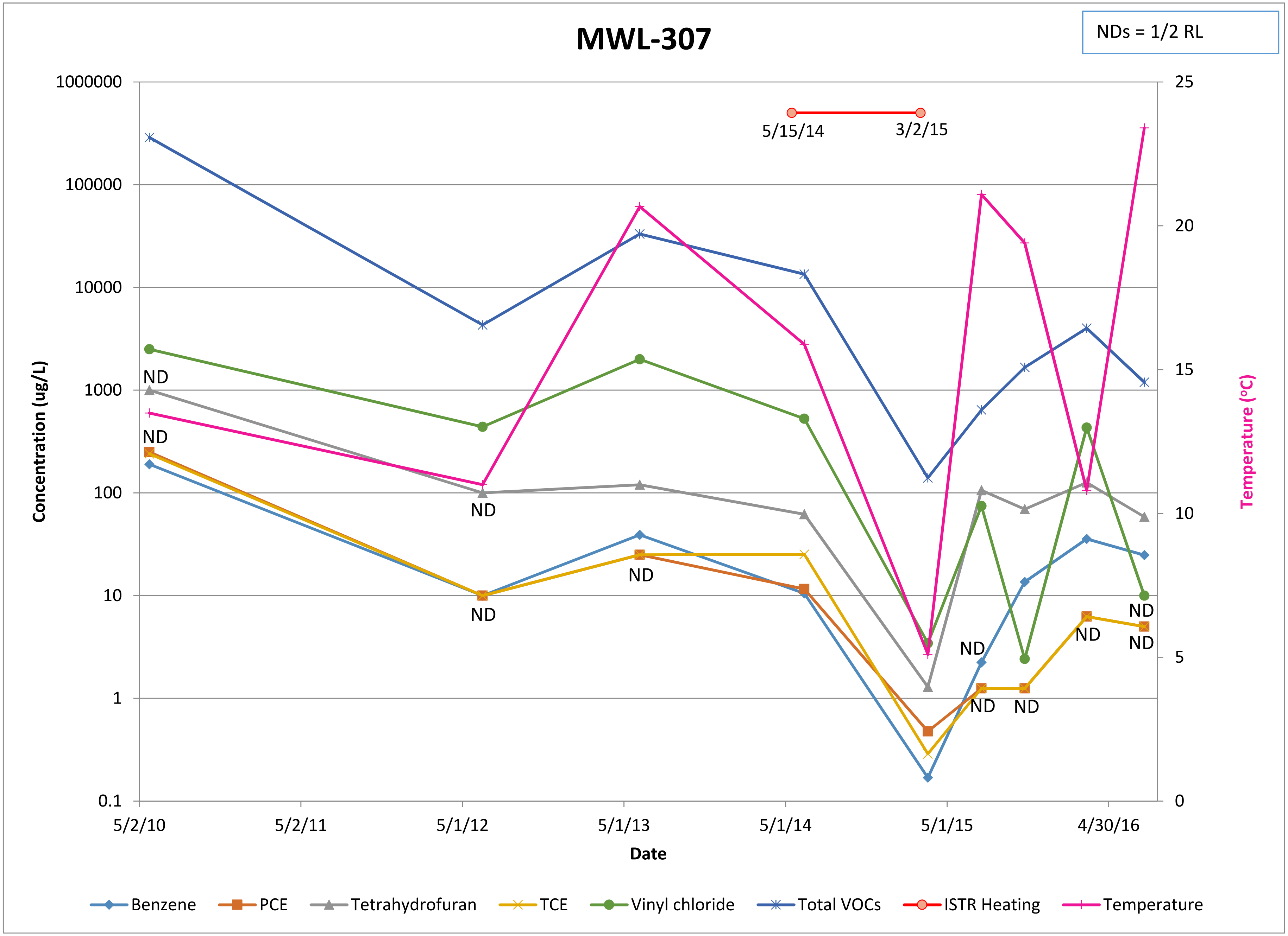
Southington, Connecticut



Groundwater Sampling Summary - Post-Thermal Treatment Sampling (N Wells)
SRSNE Superfund Site
Southington, Connecticut

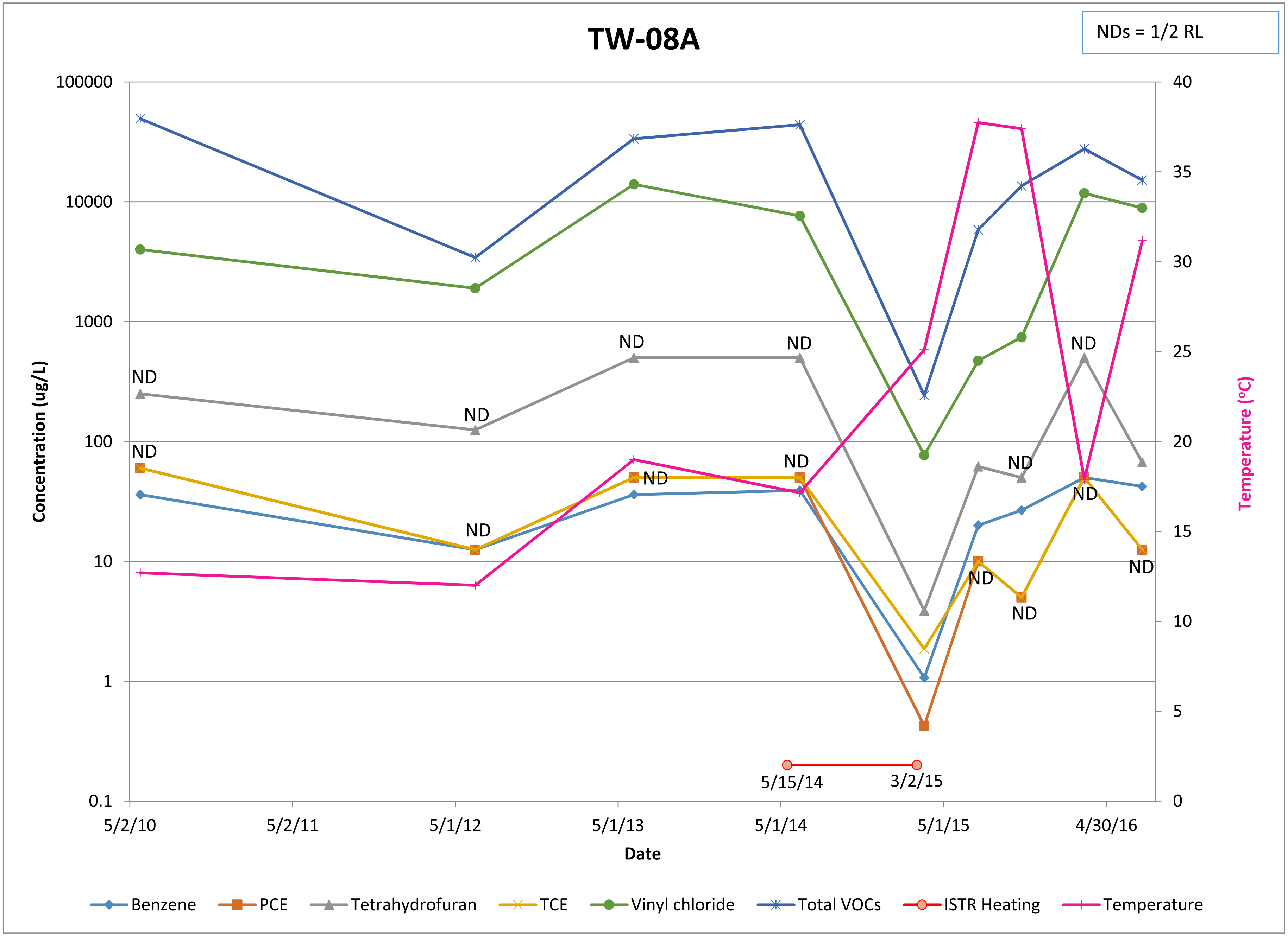


Groundwater Sampling Summary - Post-Thermal Treatment Sampling (N Wells)
SRSNE Superfund Site
Southington, Connecticut

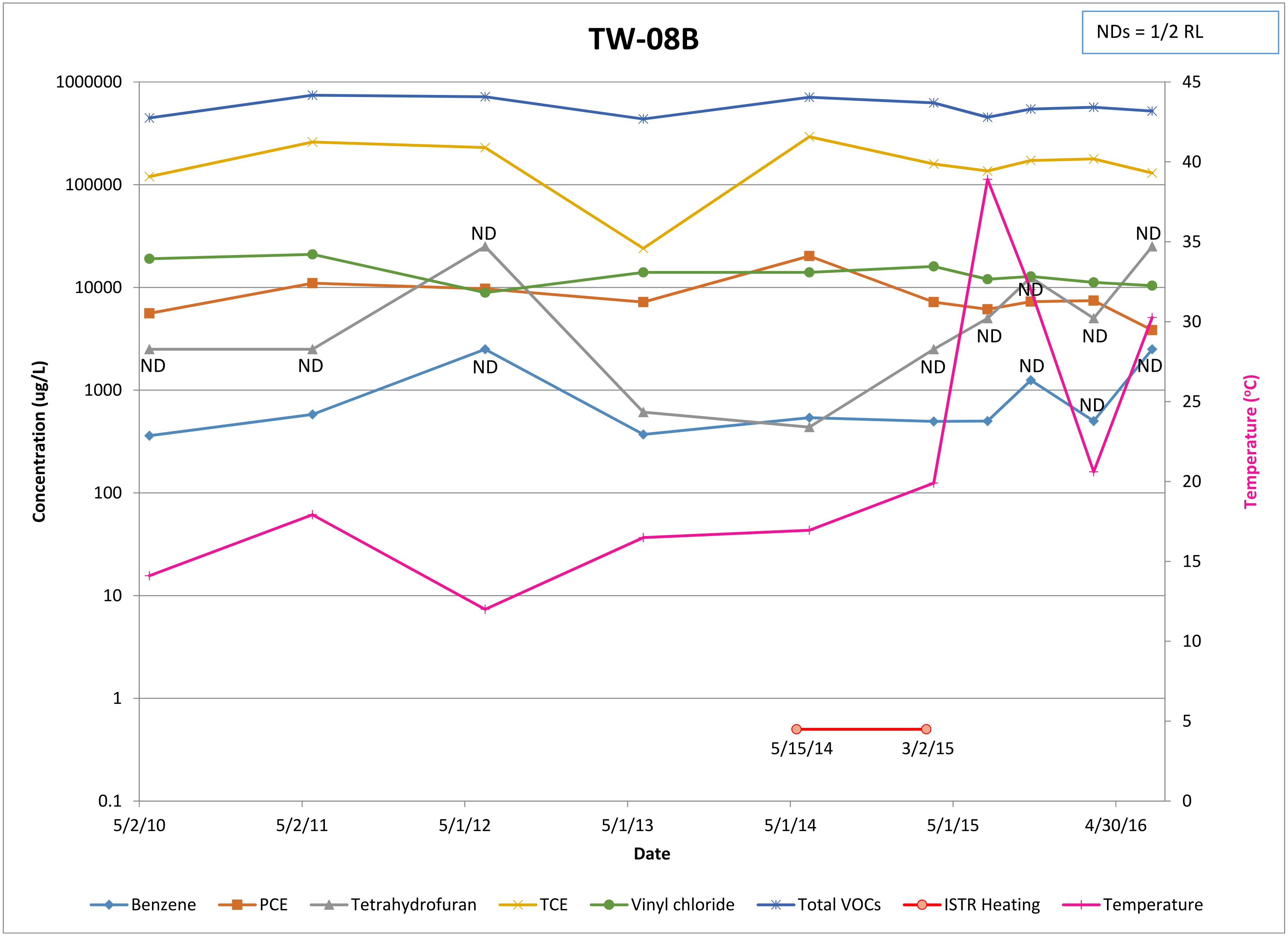


Groundwater Sampling Summary - Post-Thermal Treatment Sampling (N Wells)

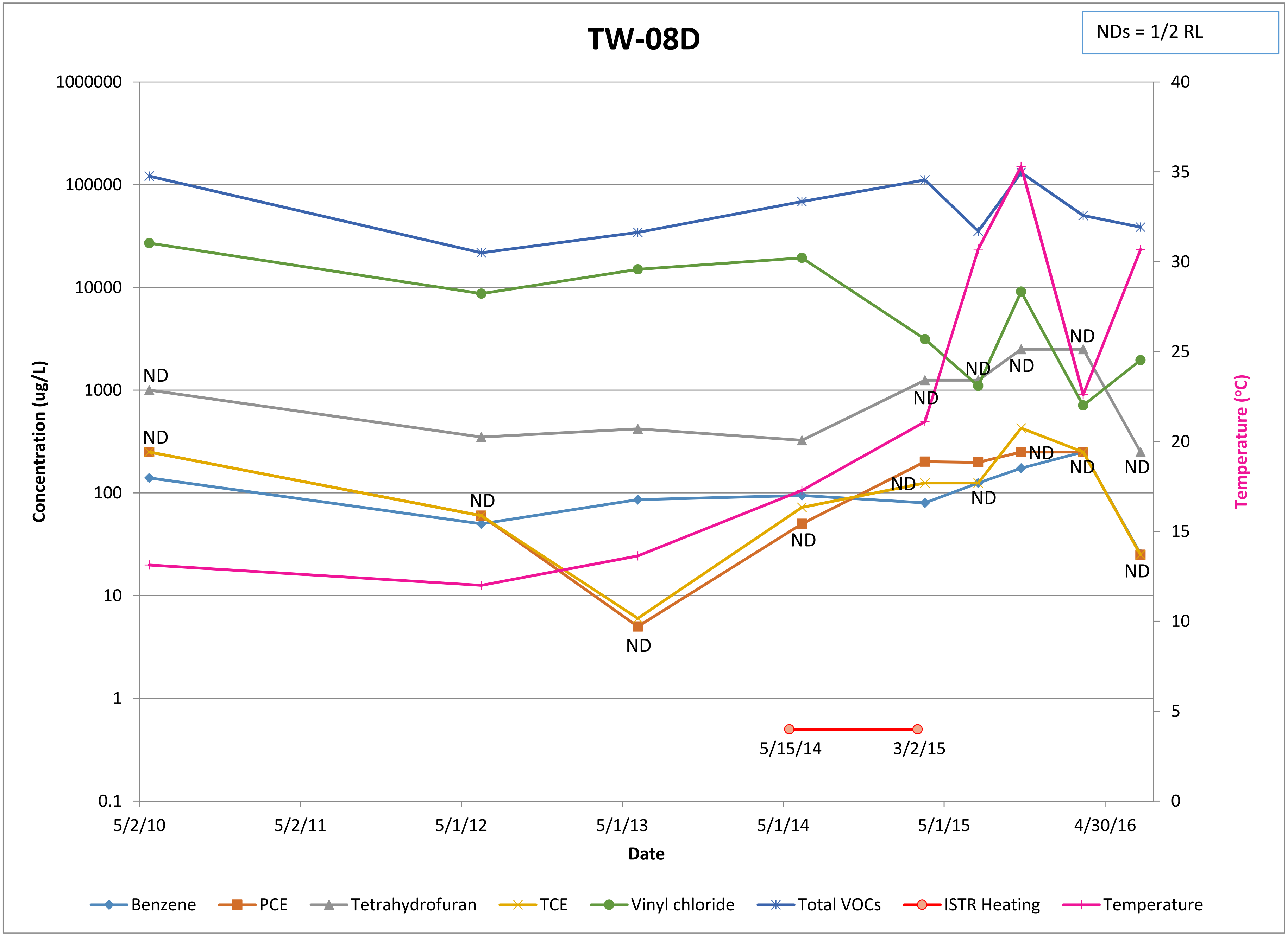
SRSNE Superfund Site
Southington, Connecticut



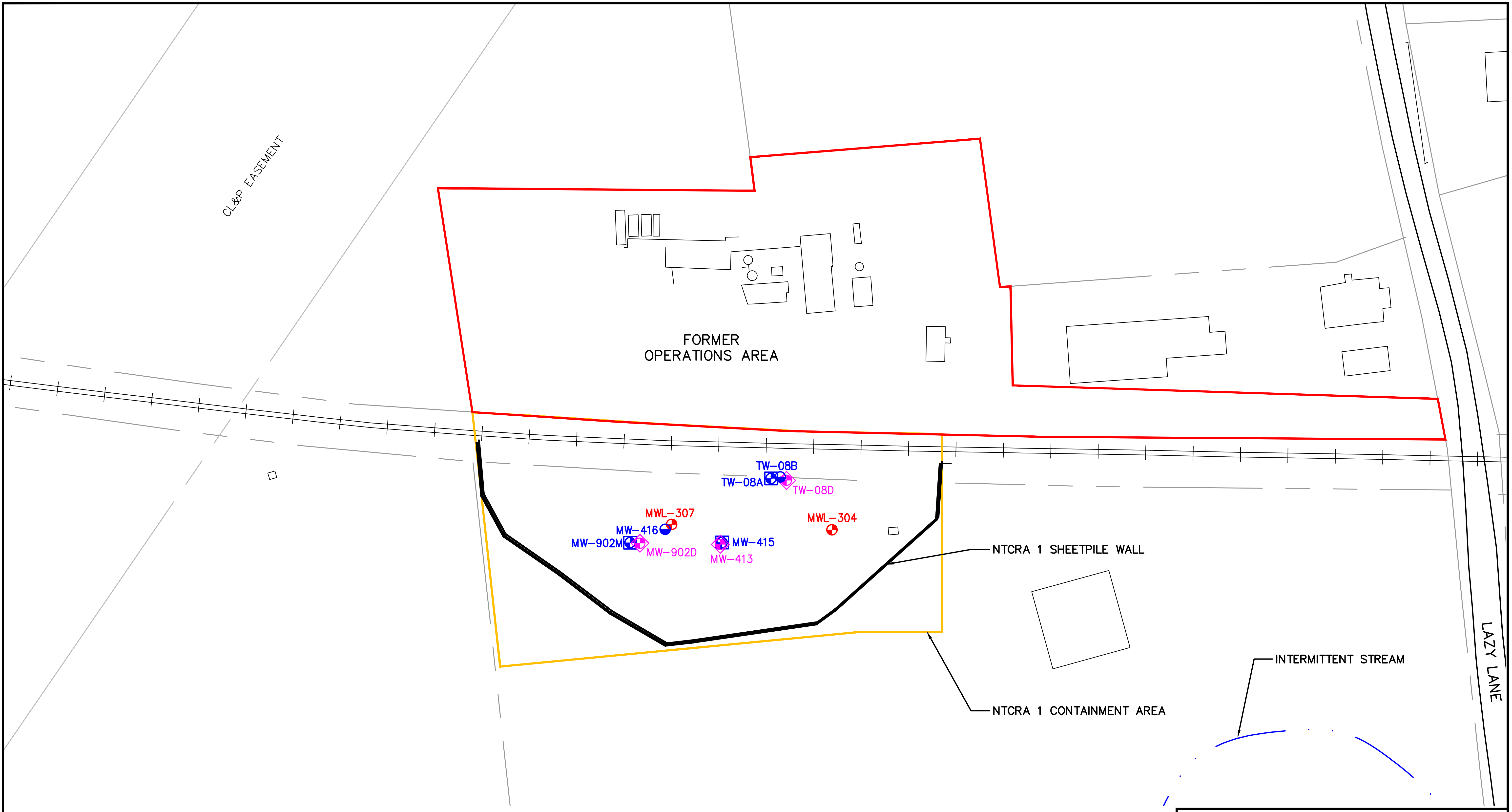
Groundwater Sampling Summary - Post-Thermal Treatment Sampling (N Wells)
SRSNE Superfund Site
Southington, Connecticut



Groundwater Sampling Summary - Post-Thermal Treatment Sampling (N Wells)
SRSNE Superfund Site
Southington, Connecticut



CITY: SYRACUSE, NY GROUP: ENVCAD DB: P. LISTER PM: M. GEFELL TM: M. GEFELL TR: R. STEVENSON LYR: ON=*;OFF=REF, (FRZ)
G:\ENVCAD\Manchester\ACT\B0054634\0001\01900\54634B02.DWG LAYOUT: 2 SAVED: 4/1/2015 5:12 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 4/1/2015 5:12 PM BY: SMALL, BRIAN



NOTE:

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

LEGEND:

●	SHALLOW OVERBURDEN MONITORING WELL
▣	MIDDLE OVERBURDEN MONITORING WELL
◈	DEEP OVERBURDEN MONITORING WELL
◒	SHALLOW BEDROCK MONITORING WELL

0 100' 200'
GRAPHIC SCALE

DRAFT

SRSNE SUPERFUND SITE
SOUTHINGTON, CONNECTICUT

GROUNDWATER MONITORING LOCATIONS N WELLS

ARCADIS

FIGURE
2

APPENDIX D

2016 Microbiological Survey Technical Memorandum

DRAFT

MEMO

Arcadis U.S., Inc.
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Manchester
Connecticut 06042-1625
Tel 860 645 1084
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To:

Bruce Thompson (de maximis)

Copies:

Jessie McCusker (de maximis)
Jeff Holden (Arcadis)
Mike Gefell (Anchor QEA)
Ray Stevenson (Arcadis)

From:

Julie Sueker
Monica Heintz

Date:

November 16, 2016

Arcadis Project No.:

B0054634.0001.02200

Subject:

2016 Microbiological Survey Technical Memorandum
Solvents Recovery Service of New England, Inc.
(SRSNE) Superfund Site
Southington, Connecticut

Arcadis U.S. Inc. (Arcadis) has prepared this *2016 Microbiological Survey Technical Memorandum* (memo) on behalf of the Solvents Recovery Service of New England, Inc. (SRSNE) Site Group. This memo summarizes the scope, results, and data evaluation associated with the use of Bio-Trap® samplers and DNA-based analyses to assess groundwater microbiological characteristics at 16 groundwater monitoring wells in the affected groundwater zone downgradient from the former SRSNE Operations Area (Figures 1 through 4). This includes 14 wells where quantitative polymerase chain reaction (qPCR) was performed on individual gene targets, and two wells where qPCR was performed using the QuantArray-Chlor and QuantArray-Petro gene suites. The objectives of this survey were two-fold:

1. To conduct a preliminary evaluation of the potential for biodegradation of 1,4-dioxane, and
2. To compare pre- and post-thermal treatment microbial communities at select wells.

BACKGROUND

Bio-Trap® samplers are a passive sampling tool used to survey subsurface microbial communities. These samplers consist of a plastic housing filled with Bio-Sep® beads. These beads are approximately 2 to 4 millimeters in diameter, and are a composite of an inert structural material (Nomex®) covered with powdered activated carbon. Together, these form a suitable surface for colonization by microbes. Bio-Trap® samplers are typically deployed for approximately 30 days.

Following retrieval, the Bio-Trap® samplers are submitted to Microbial Insights of Knoxville, Tennessee. Deoxyribonucleic acid (DNA) is extracted from the Bio-Sep® beads, and qPCR analysis is applied to enumerate copy numbers of phylogenetic and functional genes of interest. Phylogenetic genes are genes that identify specific species of interest, while functional genes code for enzymes used in particular metabolic pathways. Phylogenetic genes are used to enumerate specific microorganisms that are known to mediate specific degradation reactions, while functional genes provide confirmation that the microbial community has the capacity to produce the enzymes necessary to complete specific reactions in known degradation pathways (Interstate Technology & Regulatory Council [ITRC] 2011).

CENSUS analysis is a method by which qPCR is used to enumerate gene targets selected for a specific project application. This method was used for the analysis of 1,4-dioxane and tetrahydrofuran (THF) biodegradation potential, and functional gene targets were selected that encode for enzymes that mediate metabolic and cometabolic 1,4-dioxane and THF biodegradation. When a substrate is degraded metabolically, it is used for cell maintenance and growth. Microorganisms able to metabolically oxidize 1,4-dioxane, using a combination of dioxane monooxygenase (DXMO) and aldehyde dehydrogenase (ALDH) enzymes, have been discovered (Gedalanga et al. 2014; Li et al. 2014). DXMO mediates the first step in biodegradation of 1,4-dioxane and THF. When enzymes produced for the purpose of catalyzing metabolic degradation have relaxed substrate specificity, as many monooxygenase enzymes do, they may cometabolize compounds that the microorganisms who produced the enzyme are not capable of deriving energy or the building blocks of biomass from (Hazen 2010). There is evidence that the following groups of microorganisms have the capacity to mediate 1,4-dioxane cometabolism (Mahendra and Alvarez-Cohen 2006):

- Propane oxidizing bacteria (propanotrophs) producing propane monooxygenase (PPO)
- Methane oxidizing bacteria (methanotrophs) producing soluble methane monooxygenase (SMMO)
- Phenol degrading bacteria producing phenol hydroxylase (phenol 2-monooxygenase, PHE)
- Toluene oxidizing bacteria producing toluene monooxygenases (RMO and RDEG)

There is also evidence that some of these groups, including propanotrophs and potentially toluene oxidizing bacteria, have the capability to cometabolize THF. Notably, the enzymes that have been linked to 1,4-dioxane and THF metabolism and cometabolism are monooxygenase enzymes. These enzymes require oxygen as a substrate, and therefore their activity is likely limited under the reducing to strongly reducing conditions present at the Site. However, even small amounts of dissolved oxygen may stimulate activity and result in 1,4-dioxane biodegradation.

QuantArray analysis is a method by which qPCR is used to simultaneously enumerate gene copy numbers for a range of phylogenetic and functional gene targets that have been identified as characteristic of specific degradation processes. The QuantArray-Chlor analysis provides a tool for assessing the potential for anaerobic reductive dechlorination of CVOCs as well as aerobic cometabolism of CVOCs. Many of the enzymes that mediate cometabolism of 1,4-dioxane also mediate cometabolism of chlorinated compounds. The QuantArray-Petro analysis provides a tool for assessing the potential for aerobic and anaerobic degradation of benzene, toluene, ethylbenzene, xylenes (BTEX), methyl *tert*-butyl ether (MTBE), polycyclic aromatic hydrocarbons (PAHs), and alkanes. In addition to providing enumeration of gene copy numbers for microorganisms and enzymes relevant to the degradation of CVOCs and petroleum hydrocarbons, QuantArray analyses enumerate methanogenic organisms, sulfate-reducing bacteria, and total bacteria to provide additional context for results.

For some gene targets in the QuantArray, Microbial Insights presents a qualitative ranking of the abundance, from low to high, and a quantitative percentile relative to numbers observed across a wide range of samples analyzed from different sites. For some CENSUS gene targets Microbial Insights also provides percentile rankings for the abundance detected relative to other samples analyzed.

CENSUS survey results for 1,4-dioxane biodegradation potential are presented on Figures 1 through 4. These results, along with percentile rankings for gene abundance, are also presented in Table 1. QuantArray survey results, including qualitative and quantitative rankings, are presented in Tables 2 and 3 and Figures 5 through 7.

1,4-DIOXANE BIODEGRADATION POTENTIAL

Between April 22 and 25, 2016, Bio-Trap® samplers were deployed at 14 monitoring wells, with a duplicate Bio-Trap® sampler deployed at one well (MW-704DR, Table 1). Bio-Trap® samplers were retrieved on June 2, 2016, and shipped overnight to Microbial Insights. Microbial Insights extracted DNA from the samplers and used qPCR analyses to quantify selected CENSUS gene targets (Table 1).

Figures 1 through 4 present gene target counts (in terms of cells per bead) for wells screened in the middle overburden, deep overburden, shallow bedrock, and deep bedrock intervals, respectively. Data are presented for the seven enzymes indicated above that are capable of metabolizing or cometabolizing 1,4-dioxane and/or THF. In addition to gene quantification results, these figures present concentrations of 1,4-dioxane, THF, toluene, and methane from the most recent sampling event (June 2016) at each of the 14 wells. Both gene presence and substrate presence are relevant for an assessment of biodegradation potential. For 1,4-dioxane metabolism, the relevant substrates are 1,4-dioxane, and oxygen. For 1,4-dioxane cometabolism, the relevant substrates are THF, propane, methane, phenol, toluene, and oxygen. For THF metabolism and cometabolism, 1,4-dioxane is a relevant substrate. Dissolved oxygen concentrations in site groundwater are typically low; however, where the other required substrates are present, even a relatively small amount of oxygen may stimulate biodegradation.

Five wells were tested in the middle overburden interval. The genes that encode enzymes that mediate 1,4-dioxane and THF metabolism (DXMO and ALDH) were detected in two of the five wells (CPZ-6A and MW-907M), and genes that encode enzymes that mediate 1,4-dioxane cometabolism were detected in each of the five monitoring wells. Four wells were tested in the deep overburden interval. The genes that encode DXMO and ALDH were detected in one of those wells (MW-502), and the genes that encode enzymes that mediate 1,4-dioxane cometabolism were detected in each of the four wells. In the shallow bedrock and deep bedrock intervals, DXMO and ALDH were not detected in any of the five wells tested, but genes encoding the enzymes that mediate 1,4-dioxane cometabolism were detected in the three shallow bedrock and two deep bedrock monitoring wells included in the evaluation. Results from the duplicate Bio-Trap® sampler deployed at monitoring well MW-704DR are comparable to the primary sample at this location.

These results indicate that the subsurface microbial community at the Site has the capability to biodegrade 1,4-dioxane and THF via multiple pathways. To evaluate the extent to which biodegradation is occurring, additional lines of evidence will be necessary, including an evaluation of the expression of the gene targets discussed here. An evaluation of gene expression can be completed with a messenger ribonucleic acid (mRNA) survey of the same genetic targets. Demonstrated expression of the relevant gene targets with an mRNA survey provides a strong line of evidence that not only are the necessary organisms present, but that they are also active. This line of evidence is especially important in environments where some necessary substrates may be present only at low-levels (e.g., oxygen, propane, phenol). Another valuable line of evidence for the efficacy of 1,4-dioxane and THF biodegradation is the demonstration of decreasing concentrations over time.

PRE- AND POST-THERMAL TREATMENT COMPARISON

In June and July 2014, a microbiological survey was conducted to characterize the subsurface microbial community prior to initiation of thermal remediation (Arcadis 2014). This survey served to enumerate populations of select microorganisms, and related functional genes, capable of degrading chlorinated volatile organic compounds (CVOCs) and petroleum hydrocarbons, as a basis for comparison following thermal remediation. Thermal remediation was performed between May 2014 and March 2015.

Between April 22 and 25, 2016, Bio-Trap® samplers were deployed at two wells previously analyzed using QuantArray (ISTR-1 and ISTR-5), and incubated in situ until June 2, 2016. Bio-Trap® samplers were shipped overnight to Microbial Insights, where DNA was extracted and QuantArray qPCR analyses were used to enumerate a variety of microorganisms capable of biodegradation of chlorinated compounds (ISTR-1 and ISTR-5, Table 2) and petroleum hydrocarbons (ISTR-5, Table 3).

QuantArray-Chlor results from well ISTR-1 are presented in Figure 5. Interpretations between the 2014 baseline microbiological survey and the 2016 microbiological survey are somewhat confounded because of the difference in incubation periods. In 2014, the Bio-Trap® sampler deployed at ISTR-1 was removed after an approximately one-week incubation because this well was within the active thermal treatment zone, and the Bio-Trap® needed to be removed before elevated groundwater temperatures affected the results. In 2016, the Bio-Trap® sampler at this well incubated for approximately one-month. This difference in incubation period may explain the greater abundance and diversity of microorganisms measured in the 2016 sample. ISTR-1 results from the 2016 survey indicate a diversity of microorganisms capable of reductive dechlorination of chlorinated ethenes, ethanes, and benzenes, and indicate that the community has the capability to mediate aerobic cometabolic biodegradation.

QuantArray-Chlor results from well ISTR-5 are presented in Figure 6. Because Bio-Trap® samplers deployed at ISTR-5 during the 2014 and 2016 microbial surveys incubated for a comparable period (approximately one-month), the results from these samplers provide a direct comparison of pre- and post-thermal treatment conditions. Relative to the baseline period, a greater diversity of organisms capable of reductive dechlorination were detected in 2016. However, while vinyl chloride reductase genes (BVC and VCR) were detected at medium-high to high levels in 2014, they were not detected in 2016. The diversity of organisms with the capability to mediate aerobic cometabolism also increased between 2014 and 2016. However, the combination of increased populations of sulfate reducers and methanogens and the increased diversity of organisms capable of reductive dechlorination suggest that strongly reducing conditions persist, and that limited availability of dissolved oxygen may preclude substantial aerobic biodegradation in this area of the Site.

QuantArray-Petro results from well ISTR-5 are presented in Figure 7. A comparison of results between 2014 and 2016 suggests a shift in the anaerobic microbial community from those capable of degradation of benzene, toluene, ethylbenzene, and xylenes to those capable of degradation of alkanes. Results also indicate increases in the diversity and abundance of organisms capable of aerobic biodegradation of petroleum hydrocarbons.

Because site groundwater conditions are moderately reducing to strongly reducing, it is likely that anaerobic biodegradation mechanisms dominate over aerobic biodegradation mechanisms for chlorinated compounds and petroleum hydrocarbons. However, even small amounts of dissolved oxygen may result in aerobic biodegradation, and the presence of the microorganisms that mediate aerobic biodegradation suggest that these processes may be active in areas that are relatively more oxidizing now or may become more oxidizing in the future.

SUMMARY AND CONCLUSIONS

Between April and June 2016, Bio-Trap® samplers were deployed at 16 monitoring wells. DNA was extracted from each and qPCR analyses for genes of interest were conducted. At 14 monitoring locations, the potential for 1,4-dioxane biodegradation was assessed. At two locations QuantaArray-Petro and/or QuantArray-Chlor analyses were applied to compare microbial communities capable of biodegradation of petroleum hydrocarbons and chlorinated compounds with those identified prior to thermal treatment (during the 2014 baseline assessment). Results indicate a broad range of capabilities within the site microbial community, with organisms capable of aerobic and anaerobic degradation present. Because groundwater conditions are generally reducing to strongly reducing, it is likely that aerobic biodegradation is limited. However, it is possible that even small amounts of dissolved oxygen stimulate processes that may include the metabolism and/or cometabolism of 1,4-dioxane. To evaluate if organisms capable of 1,4-dioxane biodegradation are active, an mRNA genetic survey of the same gene targets assessed here is required.

ATTACHMENTS

Table 1 – 1,4-Dioxane Biodegradation Potential – June 2016

Table 2 – QuantArray-Chlor Summary Table – June 2016

Table 3 – QuantArray-Petro Summary Table – June 2016

Figure 1 – 1,4-Dioxane and Tetrahydrofuran Biodegradation Potential – Middle Overburden

Figure 2 – 1,4-Dioxane and Tetrahydrofuran Biodegradation Potential – Deep Overburden

Figure 3 – 1,4-Dioxane and Tetrahydrofuran Biodegradation Potential – Shallow Bedrock

Figure 4 – 1,4-Dioxane and Tetrahydrofuran Biodegradation Potential – Deep Bedrock

Figure 5 – Comparison of Pre- and Post-Thermal QuantArray-Chlor Results – ISTR-1

Figure 6 – Comparison of Pre- and Post-Thermal QuantArray-Chlor Results – ISTR-5

Figure 7 – Comparison of Pre- and Post-Thermal QuantArray-Petro Results – ISTR-5

REFERENCES

Arcadis. 2014. 2014 Baseline Microbiological Survey Technical Memorandum. September 15, 2014.

Gedalanga, P.B., Pornwongthong, P., Mora, R., Chiang, S.D., Baldwin, B., Ogles, D., Mahendra, S. 2014. Identification of Biomarker Genes to predict Biodegradation of 1,4-Dioxane. Applied and Environmental Microbiology. 80(10):3209-3218.

Hazen, T.C. 2010. Cometabolic Bioremediation. Handbook of Hydrocarbon and Lipid Microbiology. 2505-2514.

Interstate Technology & Regulatory Council. 2011. Technology Overview Environmental Molecular Diagnostics Fact Sheets. November

Li, M., Mathieu, J., Liu, Y., Van Orden, E.T., Yang, Y., Fiorenza, S., Alvarez, P.J.J. 2014. The Abundance of Tetrahydrofuran/Dioxane monooxygenase Genes 9thmA/sxmA) and 1,4-Dioxane Degradation Activity Are Significantly Correlated at Various Impacted Aquifers. Environmental Science and Technology. 1:122-127.

Mahendra, S. and Alvarez-Cohen, L. 2006. Kinetics of 1,4-Dioxane Biodegradation by Monooxygenase-Expressing Bacteria. Environmental Science and Technology. 40:5435.

TABLES

Table 1 - 1,4-Dioxane Biodegradation Potential - June 2016
Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site
Southington, Connecticut

	Sample Location		CPZ-6			CPZ-6A			P-6		
	Sample Date		6/2/2016			6/2/2016			6/2/2016		
		Well Group	B			C			C		
		Layer	MOB			MOB,DOB			SBR		
Gene Target		**Gene Type**	**Cells per Bead**	**Laboratory Flag**	**Percentile Ranking**	**Cells per Bead**	**Laboratory Flag**	**Percentile Ranking**	**Cells per Bead**	**Laboratory Flag**	**Percentile Ranking**
Dioxane Monooxygenase	DXMO	F	2.50E+02	U	--	**2.18E+02**	J	--	2.50E+02	U	--
Aldehyde Dehydrogenase	ALDH	F	2.50E+02	U	--	**9.54E+01**	J	--	2.50E+02	U	--
Propane Monooxygenase	PPO	F	**3.55E+02**		--	**6.11E+02**		--	**8.14E+01**	J	--
Soluble Methane Monooxygenase	SMMO	F	**4.93E+03**		15	**3.55E+03**		13	**2.81E+03**		11
Phenol Hydroxylase	PHE	F	**2.27E+04**		50	**3.93E+04**		61	**4.47E+04**		63
Toluene Monooxygenase 2	RDEG	F	**1.16E+04**		45	**2.53E+04**		60	**1.12E+04**		45
Toluene Monooxygenase	RMO	F	**6.85E+02**		12	**1.52E+04**		56	**1.77E+03**		20

	Sample Location		MW-502			MW-908D			PZO-204M		
	Sample Date		6/2/2016			6/2/2016			6/2/2016		
		Well Group	R			C			C		
		Layer	DOB			DOB			MOB		
Gene Target		**Gene Type**	**Cells per Bead**	**Laboratory Flag**	**Percentile Ranking**	**Cells per Bead**	**Laboratory Flag**	**Percentile Ranking**	**Cells per Bead**	**Laboratory Flag**	**Percentile Ranking**
Dioxane Monooxygenase	DXMO	F	**1.12E+01**	J	--	2.50E+02	U	--	2.50E+02	U	--
Aldehyde Dehydrogenase	ALDH	F	**5.20E+00**	J	--	2.50E+02	U	--	2.50E+02	U	--
Propane Monooxygenase	PPO	F	**1.61E+02**	J	--	**6.90E+00**	J	--	**1.38E+02**	J	--
Soluble Methane Monooxygenase	SMMO	F	**3.19E+03**		12	**2.63E+03**		10	**2.12E+03**		8
Phenol Hydroxylase	PHE	F	**1.36E+05**		81	**1.22E+04**		39	**7.79E+03**		31
Toluene Monooxygenase 2	RDEG	F	**5.11E+04**		71	2.50E+02	U	NA	**4.56E+03**		28
Toluene Monooxygenase	RMO	F	**1.09E+05**		87	**6.06E+04**		80	**6.13E+01**	J	<9

	Sample Location		MW-704DR			MW-704DR (DUP)			MW-704D		
	Sample Date		6/2/2016			6/2/2016			6/2/2016		
		Well Group	R			R			R		
		Layer	DBR			DBR			DOB		
Gene Target		**Gene Type**	**Cells per Bead**	**Laboratory Flag**	**Percentile Ranking**	**Cells per Bead**	**Laboratory Flag**	**Percentile Ranking**	**Cells per Bead**	**Laboratory Flag**	**Percentile Ranking**
Dioxane Monooxygenase	DXMO	F	2.50E+02	U	--	2.50E+02	U	--	2.50E+02	U	--
Aldehyde Dehydrogenase	ALDH	F	2.50E+02	U	--	2.50E+02	U	--	2.50E+02	U	--
Propane Monooxygenase	PPO	F	**2.57E+01**	J	--	**5.03E+01**	J	--	**3.09E+01**	J	--
Soluble Methane Monooxygenase	SMMO	F	**8.23E+03**		20	**1.02E+04**		21	**2.19E+03**		9
Phenol Hydroxylase	PHE	F	**1.04E+04**		36	**1.11E+04**		37	**8.39E+04**		74
Toluene Monooxygenase 2	RDEG	F	**1.05E+03**		<6	**8.21E+02**		<6	**1.31E+04**		48
Toluene Monooxygenase	RMO	F	**2.41E+03**		24	**2.74E+03**		26	**5.03E+04**		77

	Sample Location		MW-907M			MW-907DR			MW-03		
	Sample Date		6/2/2016			6/2/2016			6/2/2016		
		Well Group	R			R			R		
		Layer	MOB			DBR			MOB		
Gene Target		**Gene Type**	**Cells per Bead**	**Laboratory Flag**	**Percentile Ranking**	**Cells per Bead**	**Laboratory Flag**	**Percentile Ranking**	**Cells per Bead**	**Laboratory Flag**	**Percentile Ranking**
Dioxane Monooxygenase	DXMO	F	**1.41E+01**	J	--	2.50E+02	U	--	2.50E+02	U	--
Aldehyde Dehydrogenase	ALDH	F	**1.55E+01**	J	--	2.50E+02	U	--	2.50E+02	U	--
Propane Monooxygenase	PPO	F	**1.51E+01**	J	--	2.50E+02	U	--	**5.42E+01**	J	--
Soluble Methane Monooxygenase	SMMO	F	**8.72E+03**		20	**1.19E+03**		3	**8.62E+02**		<2
Phenol Hydroxylase	PHE	F	**7.19E+03**		30	**2.47E+03**		15	**2.26E+04**		50
Toluene Monooxygenase 2	RDEG	F	**2.56E+03**		18	**8.15E+02**		<6	2.50E+02	U	NA
Toluene Monooxygenase	RMO	F	**1.70E+04**		58	2.50E+02	U	NA	**4.04E+03**		32

	Sample Location		MW-707R			PZO-2D			P-101A		
	Sample Date		6/2/2016			6/2/2016			6/2/2016		
		Well Group	C			R			C		
		Layer	SBR			DOB			SBR		
Gene Target		**Gene Type**	**Cells per Bead**	**Laboratory Flag**	**Percentile Ranking**	**Cells per Bead**	**Laboratory Flag**	**Percentile Ranking**	**Cells per Bead**	**Laboratory Flag**	**Percentile Ranking**
Dioxane Monooxygenase	DXMO	F	2.50E+02	U	--	2.50E+02	U	--	2.50E+02	U	--
Aldehyde Dehydrogenase	ALDH	F	2.50E+02	U	--	2.50E+02	U	--	2.50E+02	U	--
Propane Monooxygenase	PPO	F	**2.59E+02**		--	**4.09E+01**	J	--	**7.56E+01**	J	--
Soluble Methane Monooxygenase	SMMO	F	**2.90E+03**		11	**9.42E+02**		<2	**8.70E+03**		20
Phenol Hydroxylase	PHE	F	**1.35E+05**		81	**2.21E+05**		87	**1.52E+03**		11
Toluene Monooxygenase 2	RDEG	F	**1.79E+05**		88	**8.49E+04**		79	**1.72E+02**	J	<6
Toluene Monooxygenase	RMO	F	**1.69E+03**		19	**4.97E+03**		35	**3.54E+02**		11

Notes:

U = Gene not detected at a copy number above the value indicated

J = Estimated gene copy number below practical quantitation limit, but above lower quantitation limit.

F= Functional gene

NA = percentile not applicable due to result below reporting limit

-- = percentile not calculated due to insufficient data in Microbial Insights Database

Bold = Analyte detected above the laboratory reporting limit

MOB = Middle Overburden

DOB = Deep Overburden

SBR = Shallow Bedrock

DBR = Deep Bedrock

Table 2 - QuantArray-Chlor Summary Table - June 2016
Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site
Southington, Connecticut

		Sample Location	ISTR-5			ISTR-1		
		Sample Date	6/2/2016			6/2/2016		
		Layer	MOB/DOB			MOB/DOB		
Gene Target		**Gene Type**	**Cells per Bead**	**Laboratory Flag**	**Percentile Ranking**	**Cells per Bead**	**Laboratory Flag**	**Percentile Ranking**
Reductive Dechlorination								
Dehalococcoides spp.	DHC	P	**1.22E+05**		78	**5.24E+04**		73
Dehalobacter spp.	DHBt	P	**1.47E+04**		54	**1.65E+04**		56
Desulfitobacterium spp.	DSB	P	**9.26E+03**			**5.17E+03**		--
Desulfuromonas spp.	DSM	P	2.50E+02	U	NA	2.50E+02	U	NA
BAV1 Vinyl Chloride Reductase	BVC	F	2.50E+01	U	NA	2.50E+01	U	NA
Vinyl Chloride Reductase	VCR	F	2.50E+01	U	NA	2.50E+01	U	NA
tce Reductase	TCE	F	**5.43E+03**		54	**2.48E+03**		48
Dehalogenimonas spp.	DHG	P	**5.72E+04**		67	**9.32E+04**		73
1,1-Dichloroethane Reductase	DCA	F	2.50E+02	U		2.50E+02	U	--
1,2-Dichloroethane Reductase	DCAR	F	2.50E+02	U		2.50E+02	U	--
Dehalobacter DCM	DCM	P	**6.12E+02**			2.50E+02	U	--
Chloroform reductase	CFR	F	2.50E+02	U		2.50E+02	U	--
Dehalobium chlorocoercia	DECO	P	**9.44E+02**			**4.86E+03**		--
Aerobic Cometabolism								
Soluble Methane Monooxygenase	SMMO	F	**3.75E+03**		13	**3.53E+03**		13
Particulate Methane Monooxygenase	PMMO	F	**9.76E+03**			**6.49E+03**		--
Toluene Dioxygenase	TOD	F	**5.92E+01**	J	<3	**9.76E+01**	J	<3
Phenol Hydroxylase	PHE	F	**1.70E+03**		12	**1.17E+05**		79
Toluene Monooxygenase 2	RDEG	F	**6.08E+03**		33	**3.18E+04**		64
Toluene Monooxygenase	RMO	F	2.50E+02	U	NA	**1.58E+02**	J	<9
Epoxyalkane Transferase	EtnE	F	2.50E+02	U		2.50E+02	U	--
Ethene Monooxygenase	EtnC	F	2.50E+02	U		2.50E+02	U	--
Trichlorobenzene Dioxygenase	TCBO	F	2.50E+02	U		2.50E+02	U	--
Dichloromethane Dehalogenase	DCMA		2.50E+02	U		2.50E+02	U	--
Other								
Methanogens	MGN	F	**1.70E+03**			**5.73E+04**		--
Sulfate Reducing Bacteria	APS	F	**3.32E+04**		46	**4.71E+06**		83
Total Eubacteria	EBAC	P	**9.37E+06**		44	**2.22E+07**		69

Notes:
U = Gene not detected at a copy number above the value indicated
J = Estimated gene copy number below practical quantitation limit, but above lower quantitation limit.
F= Functional gene
P = Phylogenetic gene
ug/L = micrograms per liter
mg/L = milligrams per liter
NA = percentile not applicable due to result below reporting limit
-- = percentile not calculated due to insufficient data in Microbial Insights Database
Bold = Analyte detected above the laboratory reporting limit
MOB = Middle Overburden
DOB = Deep Overburden
SBR = Shallow Bedrock
DBR = Deep Bedrock

Relative abundance indicated by microbial insights in comparison with other sites

🟥	Low
🟧	Medium-Low
🟨	Medium
🟩	Medium-High
🟩	High

Table 3 - QuantArray-Petro Summary Table - June 2016
Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site
Southington, Connecticut

	Sample Location		ISTR-5		
	Sample Date		6/2/2016		
		Layer	MOB/DOB		
Gene Target		**Gene Type**	**Cells per Bead**	**Laboratory Flag**	**Percentile Ranking**
Anaerobic BTEX					
Benzoyl Coenzyme A Reductase	BCR	F	2.50E+02	U	--
Benzylsuccinate synthase	bssA	F	2.50E+02	U	NA
Benzene Carboxylase	abcA	F	2.50E+02	U	--
Anaerobic PAHs and Alkanes					
Naphthalene Carboxylase	ANC	F	2.50E+02	U	--
Naphthylmethylsuccinate Synthase	mnssA	F	2.50E+02	U	--
Alklysuccinate Synthase	assA	F	**8.67E+04**		53
Aerobic BTEX and MTBE					
Toluene/Benzene Dioxygenase	TOD	F	**5.92E+01**	J	<3
Phenol Hydroxylase	PHE	F	**1.70E+03**		12
Toluene 2 Monooxygenase/Phenol Hydroxylase	RDEG	F	**6.08E+03**		33
Toluene Ring Hydroxylating Monooxygenases	RMO	F	2.50E+02	U	NA
Xylene/Toluene Monooxygenase	TOL	F	2.50E+02	U	--
Ethylbenzene/Isopropylbenzene Dioxygenase	EDO	F	2.50E+02	U	--
Biphenyl/Isopropylbenzene Dioxygenase	BPH4	F	2.50E+02	U	--
Methylibium petroliphilum	PM1	P	**1.99E+03**		<6
TBA Monooxygenase	TBA	F	2.50E+02	U	--
Aerobic PAHs and Alkanes					
Naphthalene Dioxygenase	NAH	F	**4.80E+03**		43
Napthalene-inducible Dioxygenase	NidA	F	2.50E+02	U	--
Phenanthrene Dioxygenase	PHNA	F	2.50E+02	U	--
Alkane Monooxygenase	ALKB	F	2.50E+02	U	--
Alkane Monooxygenase	ALMA	F	2.50E+02	U	--
Other					
Sulfate Reducing Bacteria	APS	F	**3.32E+04**		46
Total Eubacteria	EBAC	P	**9.37E+06**		44

Notes:

U = Gene not detected at a copy number above the value indicated

J = Estimated gene copy number below practical quantitation limit, but above lower quantitation limit.

F= Functional gene

P = Phylogenetic gene

ug/L = micrograms per liter

mg/L = milligrams per liter

NA = percentile not applicable due to result below reporting limit

-- = percentile not calculated due to insufficient data in Microbial Insights Database

Bold = Analyte detected above the laboratory reporting limit

MOB = Middle Overburden

DOB = Deep Overburden

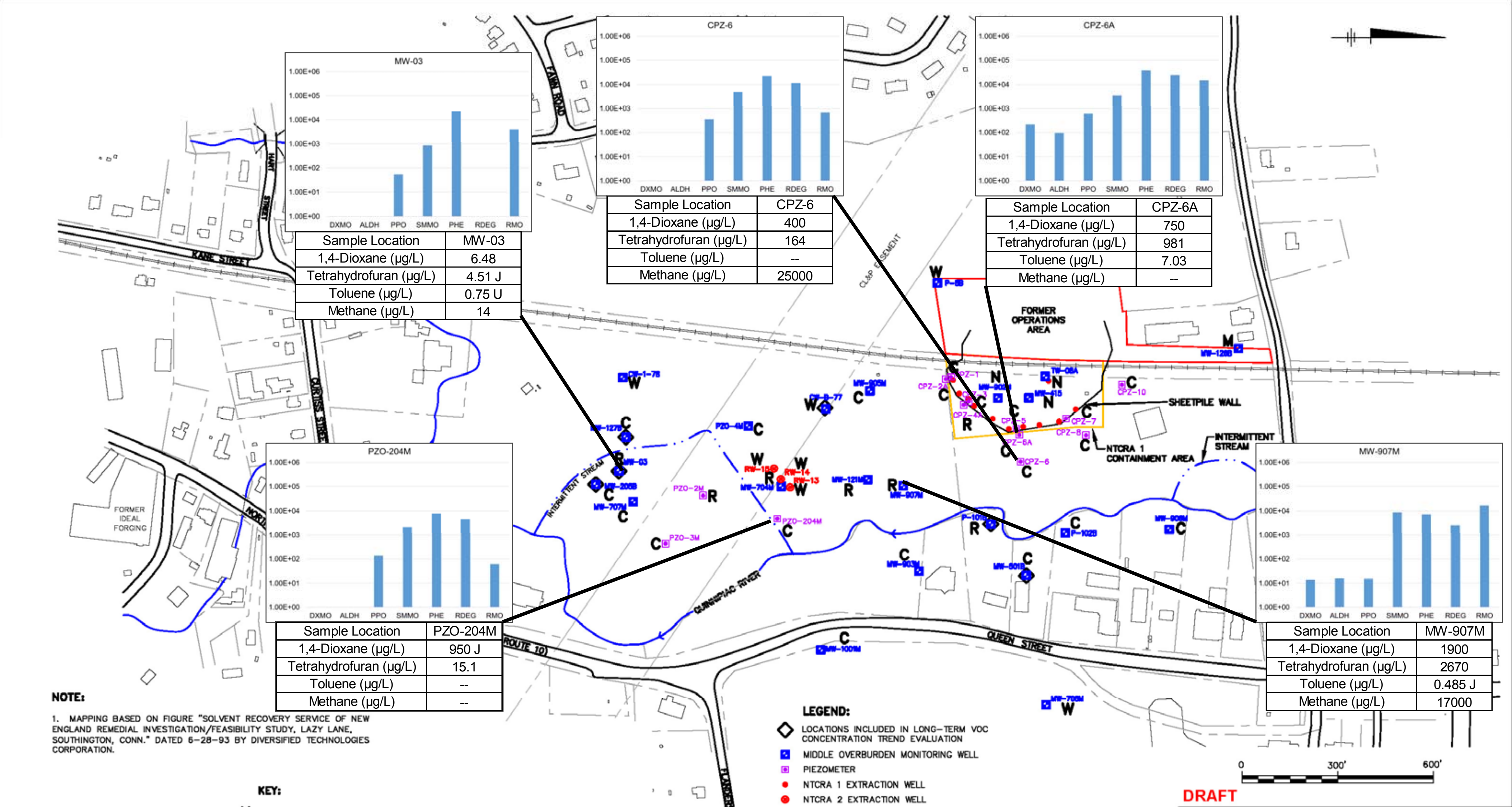
SBR = Shallow Bedrock

DBR = Deep Bedrock

Relative abundance indicated by microbial insights in comparison with other sites

🟥	Low
🟧	Medium-Low
🟨	Medium
🟩	Medium-High
🟩	High

FIGURES



Sample Location	MW-03
1,4-Dioxane (µg/L)	6.48
Tetrahydrofuran (µg/L)	4.51 J
Toluene (µg/L)	0.75 U
Methane (µg/L)	14

Sample Location	CPZ-6
1,4-Dioxane (µg/L)	400
Tetrahydrofuran (µg/L)	164
Toluene (µg/L)	--
Methane (µg/L)	25000

Sample Location	CPZ-6A
1,4-Dioxane (µg/L)	750
Tetrahydrofuran (µg/L)	981
Toluene (µg/L)	7.03
Methane (µg/L)	--

Sample Location	PZO-204M
1,4-Dioxane (µg/L)	950 J
Tetrahydrofuran (µg/L)	15.1
Toluene (µg/L)	--
Methane (µg/L)	--

Sample Location	MW-907M
1,4-Dioxane (µg/L)	1900
Tetrahydrofuran (µg/L)	2670
Toluene (µg/L)	0.485 J
Methane (µg/L)	17000

NOTE:

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

LEGEND:

◇ LOCATIONS INCLUDED IN LONG-TERM VOC CONCENTRATION TREND EVALUATION
▣ MIDDLE OVERBURDEN MONITORING WELL
▣ PIEZOMETER
● NTCRA 1 EXTRACTION WELL
● NTCRA 2 EXTRACTION WELL

KEY:

N NTCRA 1 AREA MONITORING WELL
M BACKGROUND MONITORING WELL FOR METALS SAMPLING ONLY
R MONITORING WELL FOR ROUTINE VOC AND MNA MONITORING
C MONITORING WELL FOR COMPREHENSIVE SAMPLING ROUNDS ONLY
W MONITORING WELL FOR WATER LEVEL MEASUREMENT ONLY

-- : constituent concentration not measured
J: laboratory estimated concentration
U: non-detect at reporting limit posted
µg/L: micrograms per liter
Constituent concentrations measured June 2016

Gene Name Abbreviations
DXMO: dioxane monooxygenase
ALDH: aldehyde dehydrogenase
PPO: propane monooxygenase
SMMO: soluble methane monooxygenase
PHE: phenol hydroxylase
RDEG and RMO: toluene monooxygenases

DRAFT

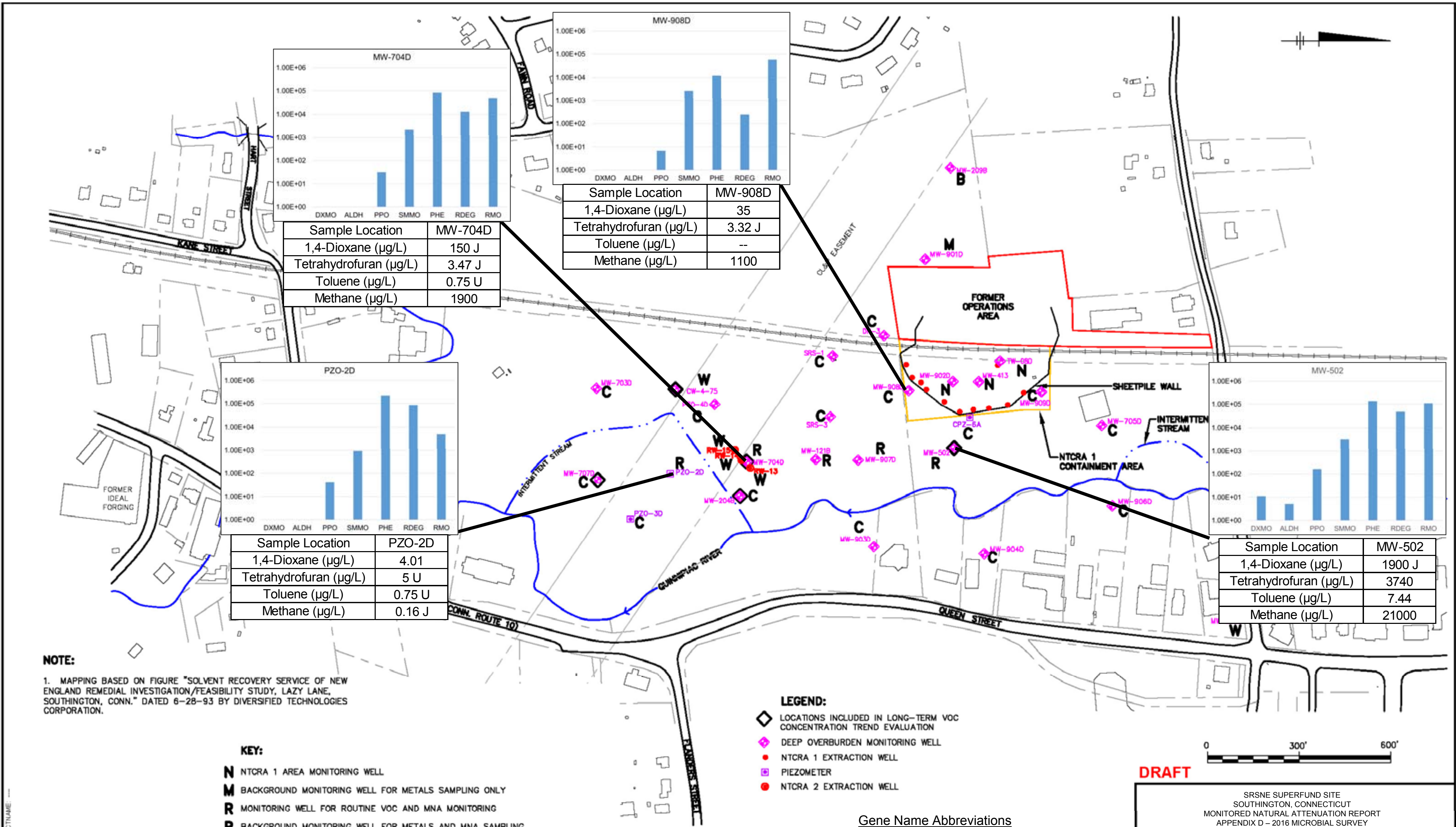
SRSNE SUPERFUND SITE
SOUTHINGTON, CONNECTICUT
MONITORED NATURAL ATTENUATION REPORT
APPENDIX D – 2016 MICROBIAL SURVEY

1,4-DIOXANE AND TETRAHYDROFURAN
BIODEGRADATION POTENTIAL
MIDDLE OVERBURDEN

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

XREFS: 54634X01 54634X00 IMAGES: PROJECTNAME: ----



Sample Location	MW-704D
1,4-Dioxane (µg/L)	150 J
Tetrahydrofuran (µg/L)	3.47 J
Toluene (µg/L)	0.75 U
Methane (µg/L)	1900

Sample Location	MW-908D
1,4-Dioxane (µg/L)	35
Tetrahydrofuran (µg/L)	3.32 J
Toluene (µg/L)	--
Methane (µg/L)	1100

Sample Location	PZO-2D
1,4-Dioxane (µg/L)	4.01
Tetrahydrofuran (µg/L)	5 U
Toluene (µg/L)	0.75 U
Methane (µg/L)	0.16 J

Sample Location	MW-502
1,4-Dioxane (µg/L)	1900 J
Tetrahydrofuran (µg/L)	3740
Toluene (µg/L)	7.44
Methane (µg/L)	21000

NOTE:

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

LEGEND:

◇	LOCATIONS INCLUDED IN LONG-TERM VOC CONCENTRATION TREND EVALUATION
◈	DEEP OVERBURDEN MONITORING WELL
●	NTCRA 1 EXTRACTION WELL
▣	PIEZOMETER
●	NTCRA 2 EXTRACTION WELL

KEY:

N	NTCRA 1 AREA MONITORING WELL
M	BACKGROUND MONITORING WELL FOR METALS SAMPLING ONLY
R	MONITORING WELL FOR ROUTINE VOC AND MNA MONITORING
B	BACKGROUND MONITORING WELL FOR METALS AND MNA SAMPLING
C	MONITORING WELL FOR COMPREHENSIVE SAMPLING ROUNDS ONLY
W	MONITORING WELL FOR WATER LEVEL MEASUREMENT ONLY

-- : constituent concentration not measured
J: laboratory estimated concentration
U: non-detect at reporting limit posted
µg/L: micrograms per liter
Constituent concentrations measured June 2016

Gene Name Abbreviations
DXMO: dioxane monooxygenase
ALDH: aldehyde dehydrogenase
PPO: propane monooxygenase
SMMO: soluble methane monooxygenase
PHE: phenol hydroxylase
RDEG and RMO: toluene monooxygenases

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DEEP OVERBURDEN

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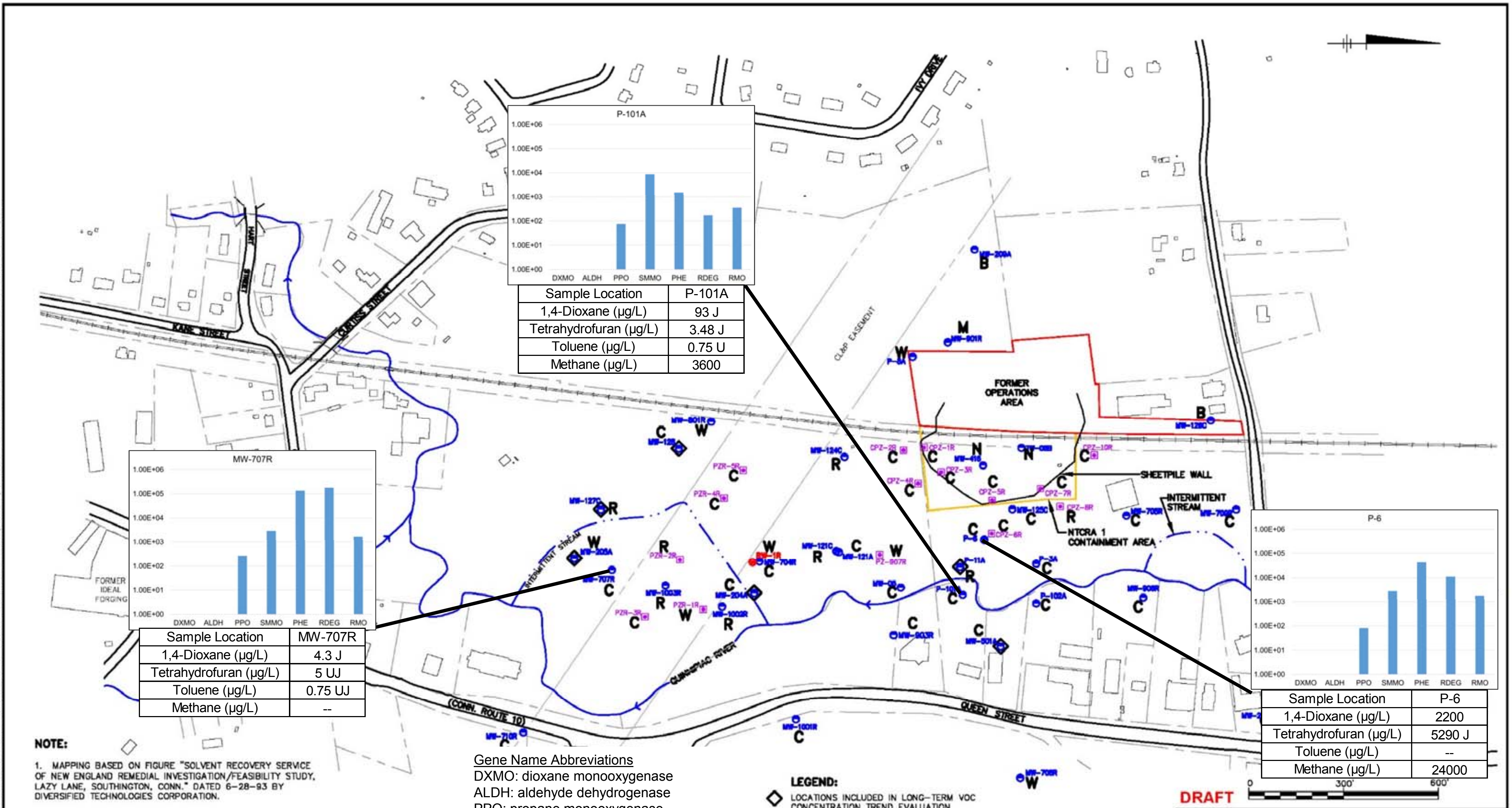
FIGURE
2

XREFS: 54634X01 54634X00 IMAGES: PROJECTNAME: ---



Sample Location	P-101A
1,4-Dioxane (µg/L)	93 J
Tetrahydrofuran (µg/L)	3.48 J
Toluene (µg/L)	0.75 U
Methane (µg/L)	3600

Sample Location	MW-707R
1,4-Dioxane (µg/L)	4.3 J
Tetrahydrofuran (µg/L)	5 UJ
Toluene (µg/L)	0.75 UJ
Methane (µg/L)	--

Sample Location	P-6
1,4-Dioxane (µg/L)	2200
Tetrahydrofuran (µg/L)	5290 J
Toluene (µg/L)	--
Methane (µg/L)	24000

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PHE: phenol hydroxylase
RDEG and RMO: toluene monooxygenases

LEGEND:

◇ LOCATIONS INCLUDED IN LONG-TERM VOC CONCENTRATION TREND EVALUATION
● SHALLOW BEDROCK MONITORING WELL
▣ PIEZOMETER
● NTCRA 2 EXTRACTION WELL

KEY:

N NTCRA 1 AREA MONITORING WELL
M BACKGROUND MONITORING WELL FOR METALS SAMPLING ONLY
R MONITORING WELL FOR ROUTINE VOC AND MNA MONITORING
B BACKGROUND MONITORING WELL FOR METALS AND MNA SAMPLING
C MONITORING WELL FOR COMPREHENSIVE SAMPLING ROUNDS ONLY
W MONITORING WELL FOR WATER LEVEL MEASUREMENT ONLY

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BIODEGRADATION POTENTIAL
SHALLOW BEDROCK

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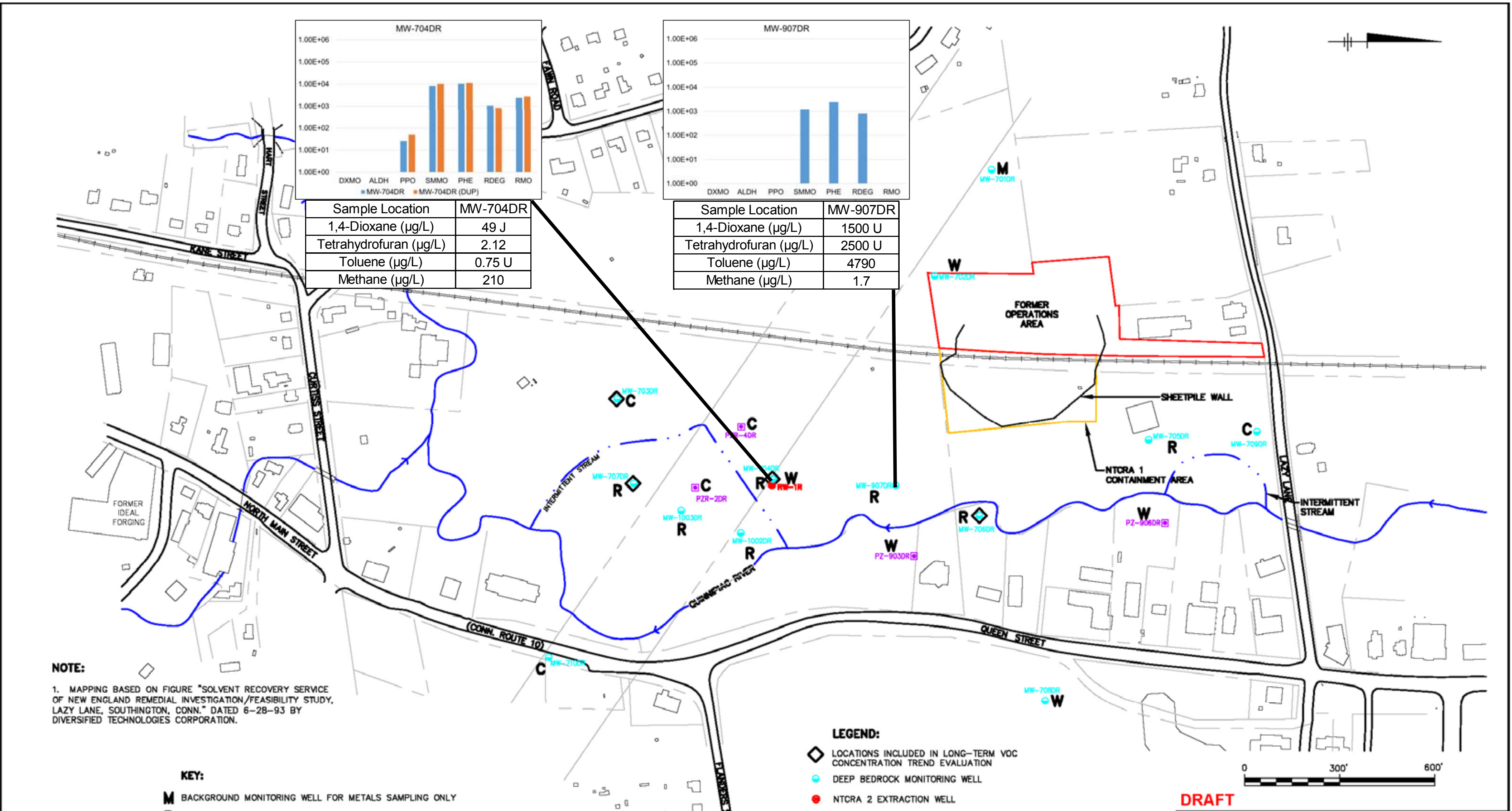
FIGURE
3



Sample Location	MW-704DR
1,4-Dioxane (µg/L)	49 J
Tetrahydrofuran (µg/L)	2.12
Toluene (µg/L)	0.75 U
Methane (µg/L)	210

Sample Location	MW-907DR
1,4-Dioxane (µg/L)	1500 U
Tetrahydrofuran (µg/L)	2500 U
Toluene (µg/L)	4790
Methane (µg/L)	1.7

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KEY:

M BACKGROUND MONITORING WELL FOR METALS SAMPLING ONLY
R MONITORING WELL FOR ROUTINE VOC AND MNA MONITORING
C MONITORING WELL FOR COMPREHENSIVE SAMPLING ROUNDS ONLY
W MONITORING WELL FOR WATER LEVEL MEASUREMENT ONLY

LEGEND:

◇ LOCATIONS INCLUDED IN LONG-TERM VOC CONCENTRATION TREND EVALUATION
◒ DEEP BEDROCK MONITORING WELL
● NTCRA 2 EXTRACTION WELL
▣ PIEZOMETER

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FIGURE
4

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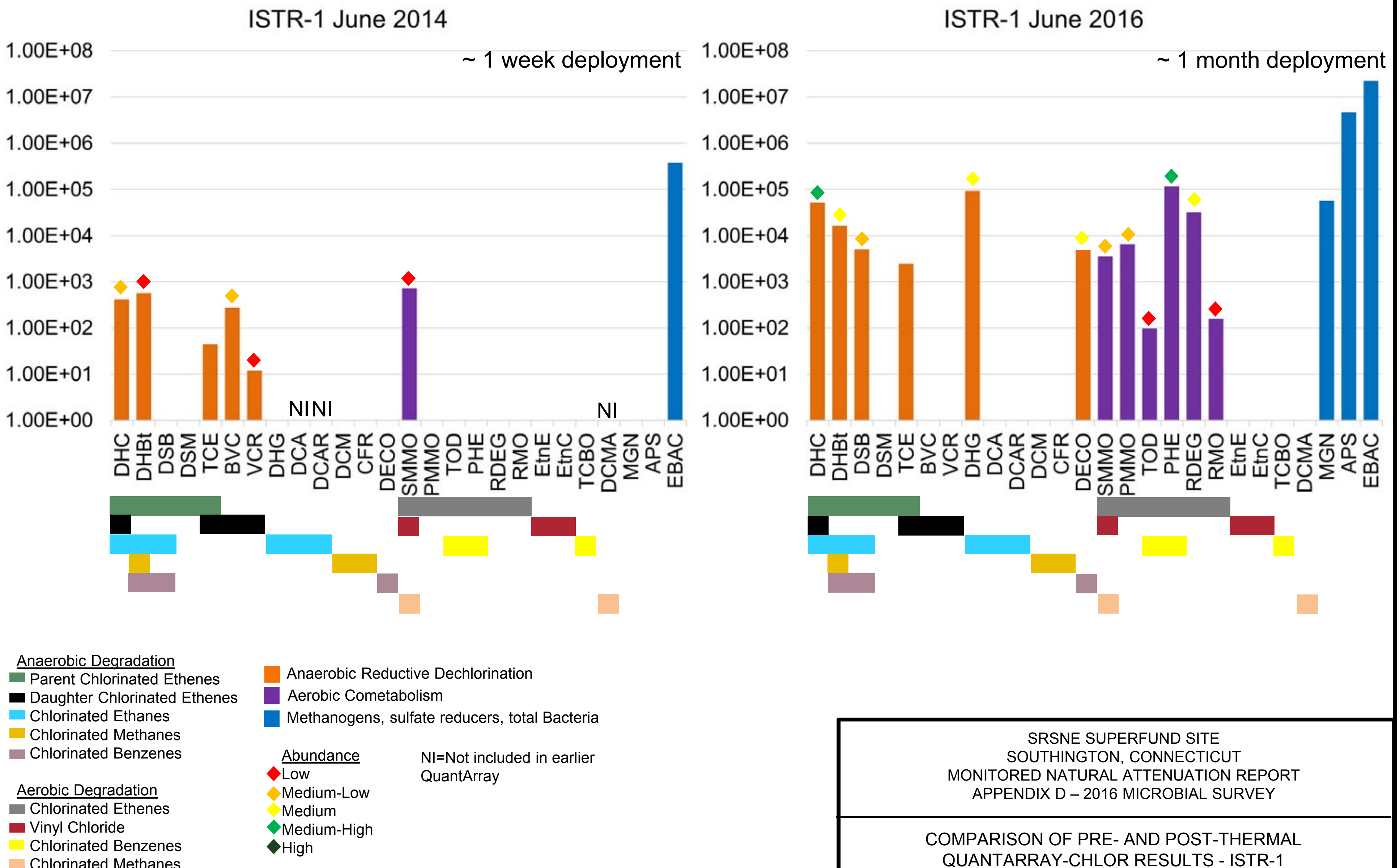

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COMPARISON OF PRE- AND POST-THERMAL
QUANTARRAY-CHLOR RESULTS - ISTR-1

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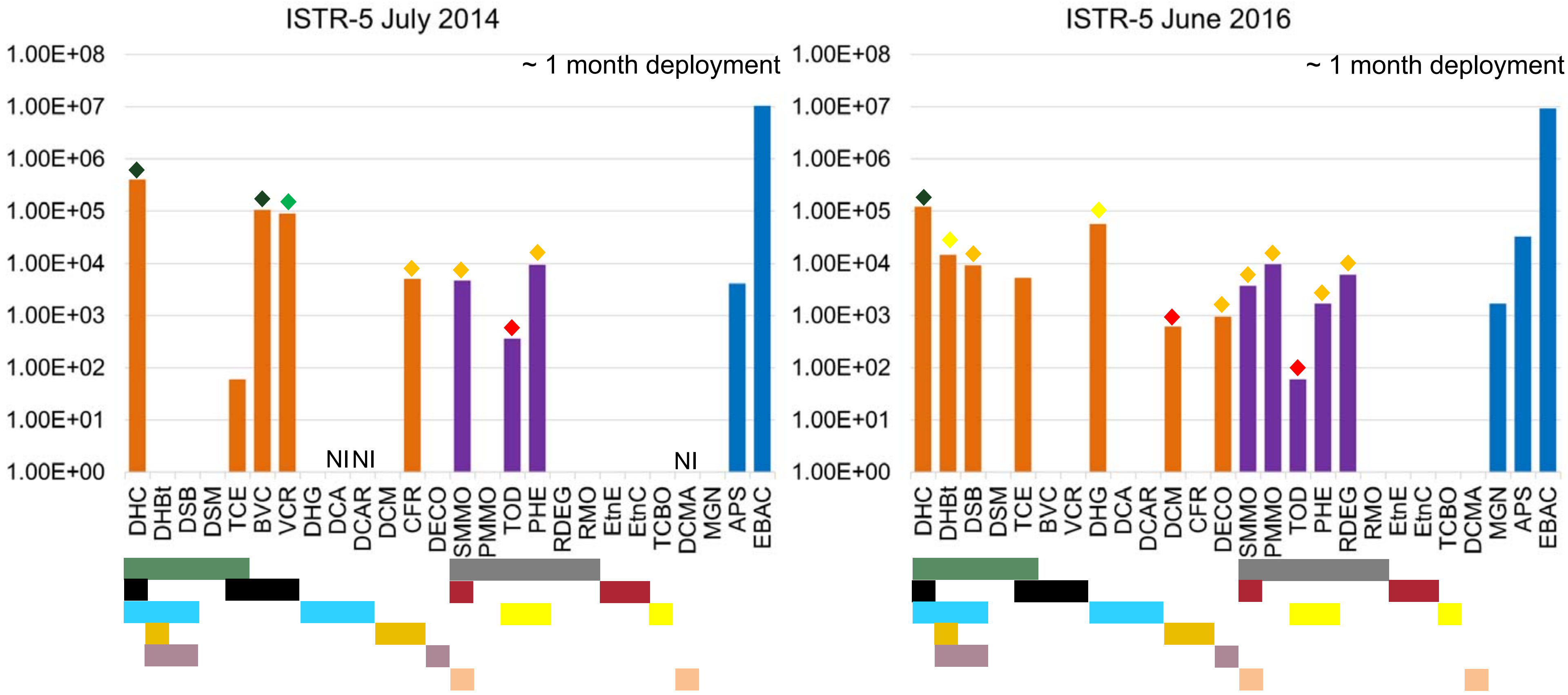
FIGURE
5



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COMPARISON OF PRE- AND POST-THERMAL
QUANTARRAY-CHLOR RESULTS - ISTR-5

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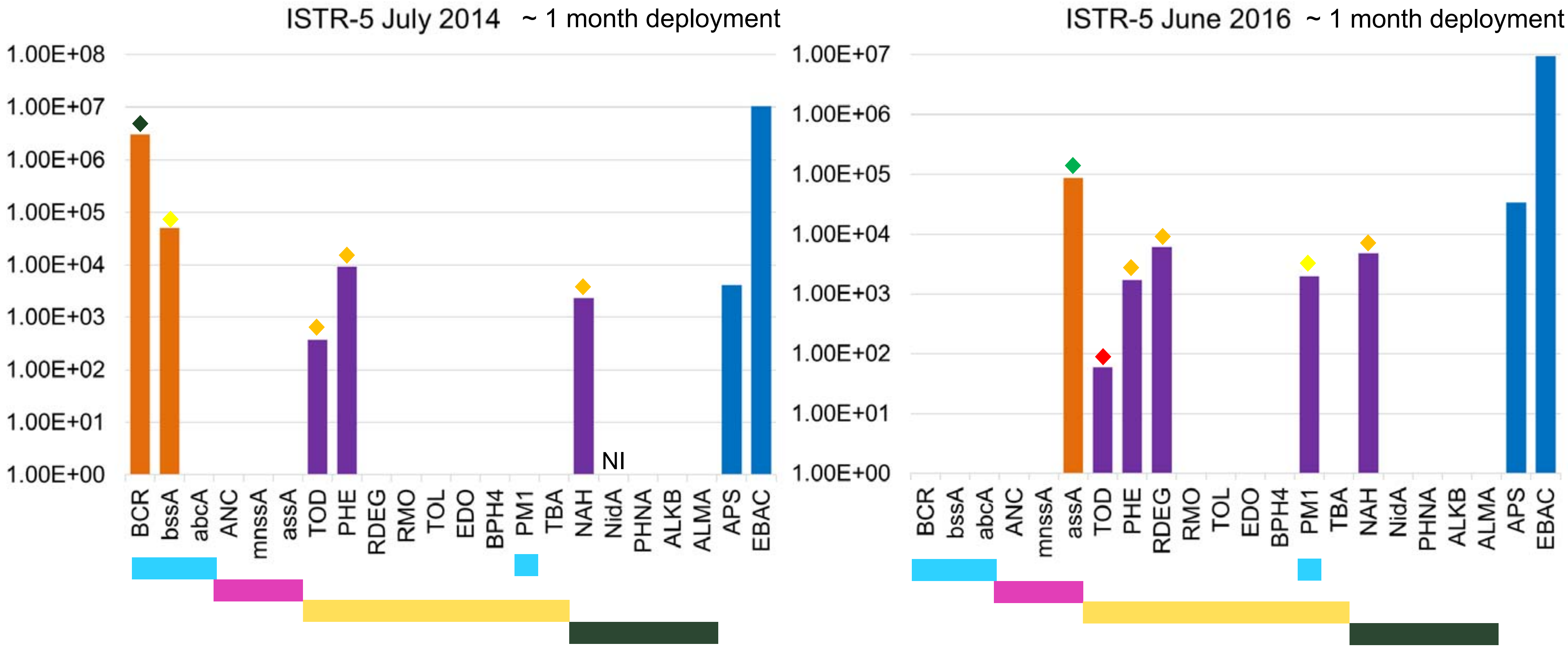
FIGURE
6



Anaerobic Degradation
🟦 BTEX and MTBE
🟪 PAH and Alkanes

Aerobic Degradation
🟨 BTEX
🟩 PAH and Alkanes

🟧 Anaerobic Reductive Dechlorination
🟪 Aerobic Cometabolism
🟦 Methanogens, sulfate reducers, total Bacteria

Abundance
◆Low
◆Medium-Low
◆Medium
◆Medium-High
◆High

NI=Not included in earlier QuantArray

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COMPARISON OF PRE- AND POST-THERMAL
QUANTARRAY-PETRO RESULTS - ISTR-5

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FIGURE
7