SUPERFUND SITE PRELIMINARY CLOSE OUT REPORT

Linemaster Switch Superfund Site
Woodstock, Connecticut

March 2005

DOCUMENT INDEX

SECTION

I. INTRODUCTION

This Preliminary Close-Out Report documents that EPA has completed construction activities at the Linemaster Switch Superfund Site in accordance with OSWER Directive 9320.2-09A-P, January 2000. EPA conducted a final inspection on October 5, 2004 and has determined that the remedy is constructed in accordance with the remedial design and remedial action (RD/RA) plans and specifications. No further construction is anticipated.

II. SUMMARY OF SITE CONDITIONS

A. Site Location and history:

The Linemaster Switch Superfund Site (the Site) is located on Plaine Hill Road in the town of Woodstock, Connecticut. Comprising 90 acres, it is bounded on the north and east by Route 169, on the west by Plaine Hill Road, and on the south by Route 171.

Linemaster Switch is an active manufacturing facility. The Site includes woodlands, grass meadows, wetland areas, and several ponds and streams. The manufacturing facility is situated on a hill, with topography dropping off in all directions. Surface water streams in the vicinity of the Site generally flow east or northeasterly into Roseland Lake, located about 0.75 miles east of the Site, which then drains south into the Little River. Most of the properties surrounding the Site are residential. Drinking water for the Linemaster facility and surrounding properties is provided by individual overburden and bedrock groundwater wells. Semi-annual residential well monitoring indicates that there continue to be no adverse impacts from the Site to residential consumption of groundwater. The primary direction of groundwater flow is to the east-northeast, following the natural hydraulic gradient two major fracture traces identified at the Site. A map of the Site is depicted in Figure 1-1.

B. Waste Characterization

As part of Linemaster's manufacturing operations, paint thinner, trichloroethylene (TCE), and other volatile organic compounds (VOCs) were used for spray painting and vapor degreasing operations. Approximately 20 to 200 gallons per year of TCE and other chemicals were discharged into an on-Site drywell located in front of the east side of Linemaster's manufacturing building. The exact amount of TCE and other chemicals discharged to the drywell is unknown, but the discharge reportedly occurred from 1969 through 1979.

In July 1980, the Connecticut Department of Environmental Protection (CTDEP) conducted a Site inspection of the facility pursuant to the Resource Conservation and

Recovery Act (RCRA) and, in July 1984, it conducted a Preliminary Assessment pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

As a result of the 1980 and 1984 CTDEP investigations, EPA conducted Site inspections at Linemaster in December 1985 and February 1986. During these inspections, EPA sampled the on-Site production well and the back-up production well, in addition to off-Site water supply wells. Results of sampling and analysis indicated the presence of VOCs in the production well, the back-up production well, and several off-Site wells. VOCs, primarily TCE, were identified at concentrations exceeding state and federal drinking water standards. TCE was identified on-Site at concentrations as high as 3,900 micrograms per liter (ug/l). TCE was detected in three off-Site water supply wells at 5,000 ug/l, 11ug/l, and 2.4 ug/l.

On April 8, 1986, CTDEP issued an Abatement Order to Linemaster to investigate the extent of Site contamination, and to take the actions necessary to minimize or eliminate any contamination. A Superfund Removal Action took place in mid-1986 to provide bottled water to affected users. In February 1987, in response to State demands, Linemaster began designing an interim removal treatment system (IRTS) to address groundwater contamination. This system would treat contaminated groundwater to drinking water standards using an air stripper and activated carbon.

On February 19, 1990, EPA added the Linemaster Switch Site to the National Priorities List (NPL). The Remedial Investigation/ Feasibility Study (RI/FS) for the Site was completed in 1993. The RI/FS concluded that the disposal of TCE and other hazardous substances into the drywell had contaminated soil and on-Site groundwater to levels that were above state and federal standards (see Table 1). Moreover, so long as soil in the vicinity of the drywell continued to act as a source of groundwater contamination, EPA concluded that VOC concentrations in groundwater posed an unacceptable risk to human health and the environment given the present and potential future use of the groundwater as a drinking water supply.

C. Record of Decision

The selected remedy for the Site was contained in the 1993 ROD and included both source control and management of migration (or groundwater control) components, including:

- In-situ vacuum extraction of contaminated soil to remove volatile organic compounds (VOCs);
- Extraction of contaminated groundwater from the overburden and bedrock using extraction wells;

- Treatment of contaminated groundwater using air stripping with carbon emission controls;
- Environmental monitoring of soil, groundwater, surface water, and private residential wells;
- Institutional controls in the form of deed restrictions to prohibit the use of the groundwater until the cleanup levels are met; and
- Five-year Reviews

The 1993 ROD specified that all contaminated soils above cleanup goals would be treated by in-situ vapor extraction. Once in-situ vapor extraction commenced, it was estimated that a period of approximately ten years of continuous operation of the system would be required for the soil to be remediated to the cleanup levels specified in the ROD. Thereafter, it was estimated that an additional 35 years would be required to restore the groundwater to beneficial reuse.

Subsequent to the issuance of the 1993 ROD, Linemaster performed a Dual Vapor Extraction (DVE) Pilot Test in December 1994 to gather data that would be used to design the DVE system. A DVE system consists of extracting soil vapors through a series of extraction wells in conjunction with a dewatering system. The vapors were extracted by a high vacuum blower, which transfered the contaminated vapors through carbon filters in order to remove the VOCs from the vapors prior to discharge to the atmosphere. The dewatering system improved the effectiveness of vapor extraction by removing groundwater from the soil targeted for vapor extraction. Contaminated water from the dewatering system was treated to drinking water standards at the IRTS.

Based on the results of the DVE pilot test, Linemaster concluded that there was insufficient data on soil characteristics to develop a Conceptual Remedial Design, and that enhancements to the natural characteristics of overburden would be required to achieve adequate air and groundwater flow for the performance of the DVE system. To address these two issues, Linemaster performed a second pilot test in November 1995 to delineate the extent of soil contamination to be addressed by DVE, and to evaluate whether or not the permeability of the overburden could be enhanced through hydraulic fracturing. Based on the results of this test, EPA concluded that hydraulic fracturing would enhance the permeability of the overburden and therefore, design of the DVE system could proceed. However, in recognition that the extremely low permeability of the overburden may limit the ability of this system to meet the cleanup levels specified in the ROD, EPA divided the design of the DVE into two phases (i.e., Phase 1A and 1B), with the implementation of the second phase being delayed until EPA, CTDEP, and

Linemaster had the opportunity to evaluate the performance of the DVE system on soil located within the vicinity of the former drywell.

During the Fall of 1996, Linemaster installed a series of hydro-fractured wells in the former drywell area. After testing of the wells was completed, the wells were connected to the IRTS, and dewatering of the Phase 1A area began in April 1998. In December 1998, construction of the DVE system within the Phase 1A area was completed and the system became operational.

EPA, CTDEP, and Linemaster had monitored the performance of the DVE system during its period of operation from December 1998 through 2004. In February 2001, Linemaster, in consultation with EPA and CTDEP, developed and implemented a DVE Optimization Plan because monitoring of the DVE system had shown that the hydro-fractured wells had only dewatered approximately 60% of the Phase 1A area, and the VOC removal rates of the vapor extraction component of the DVE system were steadily declining. The optimization plan included, among other things, testing of the dewatering wells, increasing the subsurface vacuum, and redevelopment of the fractured wells. These tasks were intended to improve both dewatering and VOC removal rates within soil. However, it was determined in November 2003 that none of the tasks performed as part of the optimization plan significantly improved the performance of the DVE system. EPA concluded that the low permeability soil was preventing further dewatering and VOC removal within the Phase 1A area. Consequently, EPA determined that the vapor extraction component of the DVE system was no longer significantly contributing to the remediation of the Site and that further remediation via vapor extraction should not be pursued. This determination resulted in EPA agreeing to a moratorium on the vapor extraction component of the DVE system in November 2003. The purpose of the moratorium was to allow EPA the opportunity to perform a formal review and evaluation of the DVE and IRTS systems to determine if the cleanup objectives presented in the 1993 ROD are still achievable. EPA has completed its evaluation and determined that the remedy selected in the 1993 ROD should be modified.

In December 2004 EPA signed an Explanation of Significant Differences. The remedy was revised for this site to discontinue operation of the vapor extraction component of the DVE system while maintaining continued operation of the groundwater extraction and treatment component of the system. EPA did not change the cleanup objectives for the site, or any of the cleanup levels provided in the 1993 ROD. This modified remedy will not rely on vapor extraction for further remediation of soil. Rather, the soil cleanup levels presented in the ROD will be achieved through the flushing of contaminants via the continued operation of the groundwater extraction component of the DVE system. The vapor extraction component of the DVE system was permanently decommissioned in 2004.

D. Enforcement History

On April 8, 1986, CTDEP issued an Abatement Order to Linemaster to investigate the extent of Site contamination, and to take the actions necessary to minimize or eliminate any contamination. A Superfund Removal Action took place in mid-1986 to provide bottled water to affected users. In September 1987, an Administrative Order by Consent (AOC) was signed between EPA and Linemaster requiring Linemaster to perform a Site investigation and well monitoring, in addition to providing alternate drinking water supplies, as needed. In June 1989, Linemaster removed the drywell. After the Site was added to the National Priorities List (NPL) in February 1990, EPA and Linemaster entered into a second AOC in September 1991 under which Linemaster agreed to perform a Remedial Investigation/ Feasibility Study (RI/FS) at the Site.

E. Redevelopment Potential

Prior to 1952, the Site property was used for residential purposes and small-scale farming. Starting in 1952, Linemaster began manufacturing foot-operated switches at the Site. Currently, Linemaster manufactures electrical power switches, air valves, electrical cord sets, and metal name plates at the Site. Linemaster's manufacturing building is located near the center of the Site, and on its topographic high point. There are also two residential homes, and three smaller cottages on the property which are used occasionally for recreational purposes. No further redevelopment potential is expected at the Site.

III. DEMONSTRATION OF QUALITY ASSURANCE AND QUALITY CONTROL

All work performed at the Site was consistent with the ROD and the final design and RA Work Plan. The RA Work Plan Report, including a Quality Assurance Project Plan (QAPP), incorporated all EPA quality assurance and quality control (QA/QC) procedures and protocol. EPA analytical methods were used for all validation and monitoring samples during RA activities. All procedures and protocol followed for soil and discharge water have been documented in semi-annual monitoring reports during the RA. EPA has found the construction quality assurance and performance data to be acceptable. Performance data was regularly reviewed during the construction program to confirm that the materials installed met the requirements of the plans and specifications.

All construction quality assurance material was provided to EPA and is located in the EPA Region I Records Center in Boston, MA. The QA/QC program utilized throughout the RA was sufficiently rigorous and was adequately complied with to enable EPA and the State to determine that the results reported are accurate to the degree needed to assure satisfactory execution of the RA, consistent with the ROD and accepted remedial design.

IV. ACTIVITIES AND SCHEDULE FOR SITE COMPLETION

All preliminary completion requirements for the Site have been met as specified in OSWER Directive 9320.2-09A-P (January 2000). Specifically, all construction activities that constitute substantial completion identified in the ROD, as modified by the ESD, have been successfully implemented and a final inspection by EPA and the CTDEP was conducted on October 5, 2004. Institutional controls to prevent the use of contaminated groundwater have been implemented at the site. Operation and Maintenance activities will continue to be conducted by Linemaster and overseen by EPA until cleanup goals are expected to be met, in approximately thirty years.

V. SUMMARY OF REMEDIATION COSTS

The ROD estimated the remedial action would be a total net present value of $7,708,000. The capital costs were estimated at $1,402,900, the Operation and Maintenance costs were estimated at $6,305,500.

VI. FIVE YEAR REVIEW

Hazardous substances will remain at the Site above levels that allow for unlimited use and unrestricted exposure after the completion of remedial action. Pursuant to CERCLA section 121(c) and as provided in OSWER Directive 9355.7-03B-P, "Structure and Components for Five-Year Reviews," dated June 2001, EPA must conduct statutory five-year reviews. The first five year review was completed in May 2004. The second five year review is scheduled for May of 2009 to ensure the remedy remains protective of public health and the environment. Finally, EPA will determine and document site completion in accordance with OSWER Directive 9320.2-3A/3B "Procedures for Completion and Deletion of National Priorities List Sites" and OSWER Directive 9320.2-09 (August 1995).

Approved by:

Susan Studlien 3/29/05

Susan Studlien, Director
Office of Site Remediation and Restoration

Date

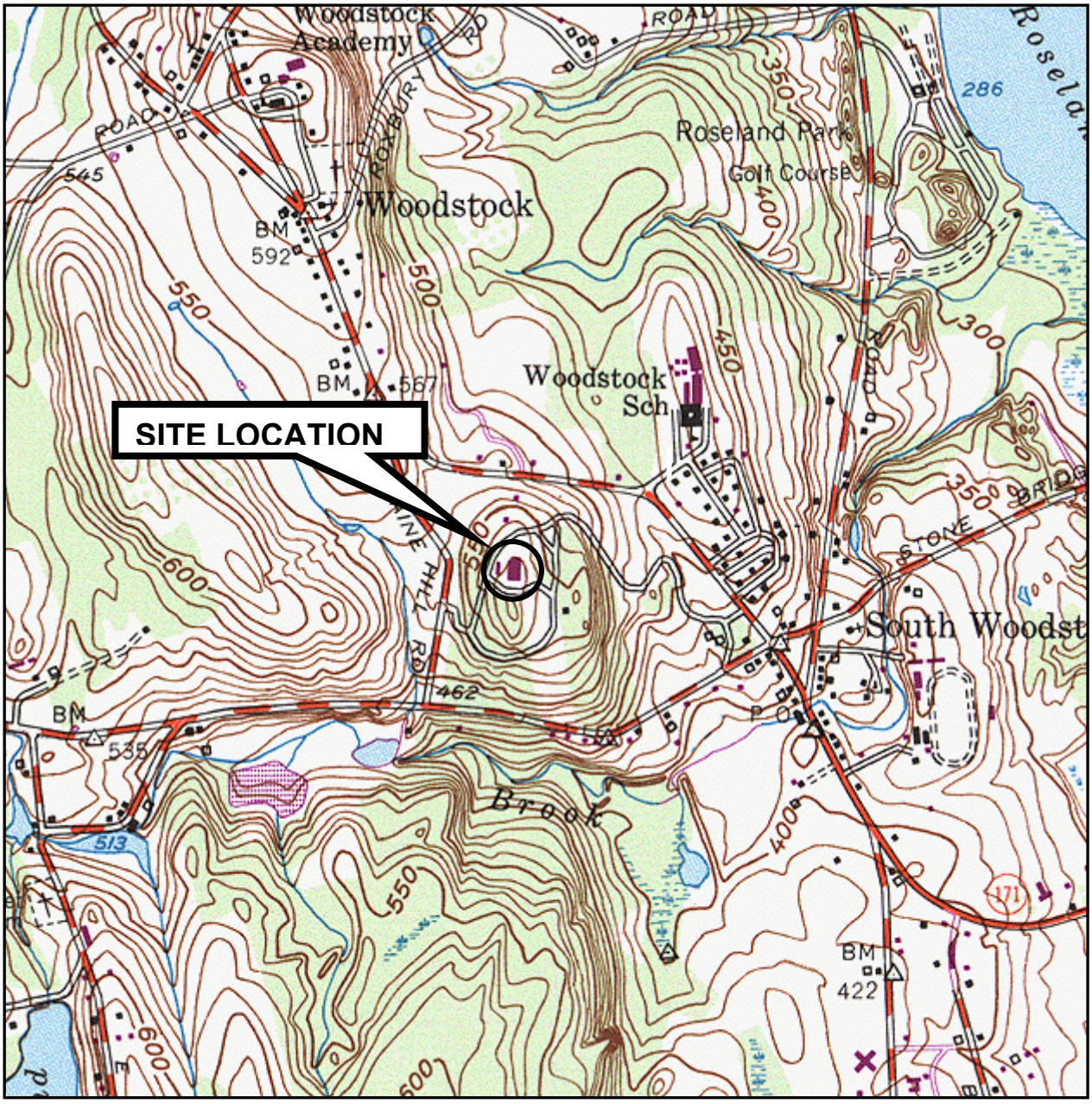
Table 1

List of Site Contaminants

	Contaminant	Clean-Up Level (ppb)	Pre-ROD Concentrations (ppb)	
Media				
Soil			**average**	**maximum**
	1,2- dichloroethane	4	N/A	N/A
	dichloromethane	3	N/A	N/A
	tetrachloroethene (PCE)	10	80.1	2,800
	trichloroethane (TCE)	5	122.6	4,022
	cis- 1,2-dichloroethene	50	47.2	938
	toluene	1,000	274.5	7,577
	1,1,1-trichloroethane	300	9.1	11
	xylenes	100	264.4	8,300
Groundwater				
	acetone	3,700	2,129	50,000
	arsenic	50	41.2	513
	benzene	5	44.7	54
	beryllium	4	9.7	87
	cadmium	5	63.3	757
	carbon tetrachloride	5	14	47.5
	chloroform	100	17	58.7
	chloromethane	6.5	11.8	120
	1,2- dichloroethane	5	7.8	70.9
	1,1-dichloroethene	7	109.5	813
	cis- 1,2-dichloroethene	70	803.5	26,000
	dichloromethane	5	236.6	1810
	1,2-dichloropropane	5	169.9	420
	2-hexanone	1,500	766.3	2,100
	methlyethylketone	1,800	1,366.5	38,000
	tetrachloroethene (PCE)	5	132.1	1,800
	1,1,1-trichloroethane	200	103.1	1,700
	1,1,2-trichloroethane	5	23	71.9
	trichloroethene (TCE)	5	42,931.9	800,000
	toluene	1,000	2529.6	64,000
	vinyl chloride	2	10	20.3

Table 2: Schedule for Site Completion

TASK	SCHEDULE	RESPONSIBLE ORGANIZATION
Long-Term Monitoring	December 31, 2032	PRPs
Final Site Inspection	December 31, 2032	EPA, CTDEP, PRPs
Remedial Action Report	March 31, 2033	PRPs
FCOR	June 30, 2033	EPA
NPL Deletion	June 30, 2034	EPA



QUADRANGLE LOCATION

Source: TOPO! Interactive Maps on CD, U.S.G.S.
7.5 Minute Series Topographic Quadrangle Map
Putnam, Conn. 1955, Photorevised 1970

WOODARD & CURRAN
Engineering • Science • Operations

DATE: Nov 2004
DWN: L. Warner
APP: J. Markey
REV.: 0

FIGURE 1-1
LINEMASTER SWITCH CORPORATION
PLAINE HILL ROAD
WOODSTOCK, CONNECTICUT
SITE LOCATION MAP

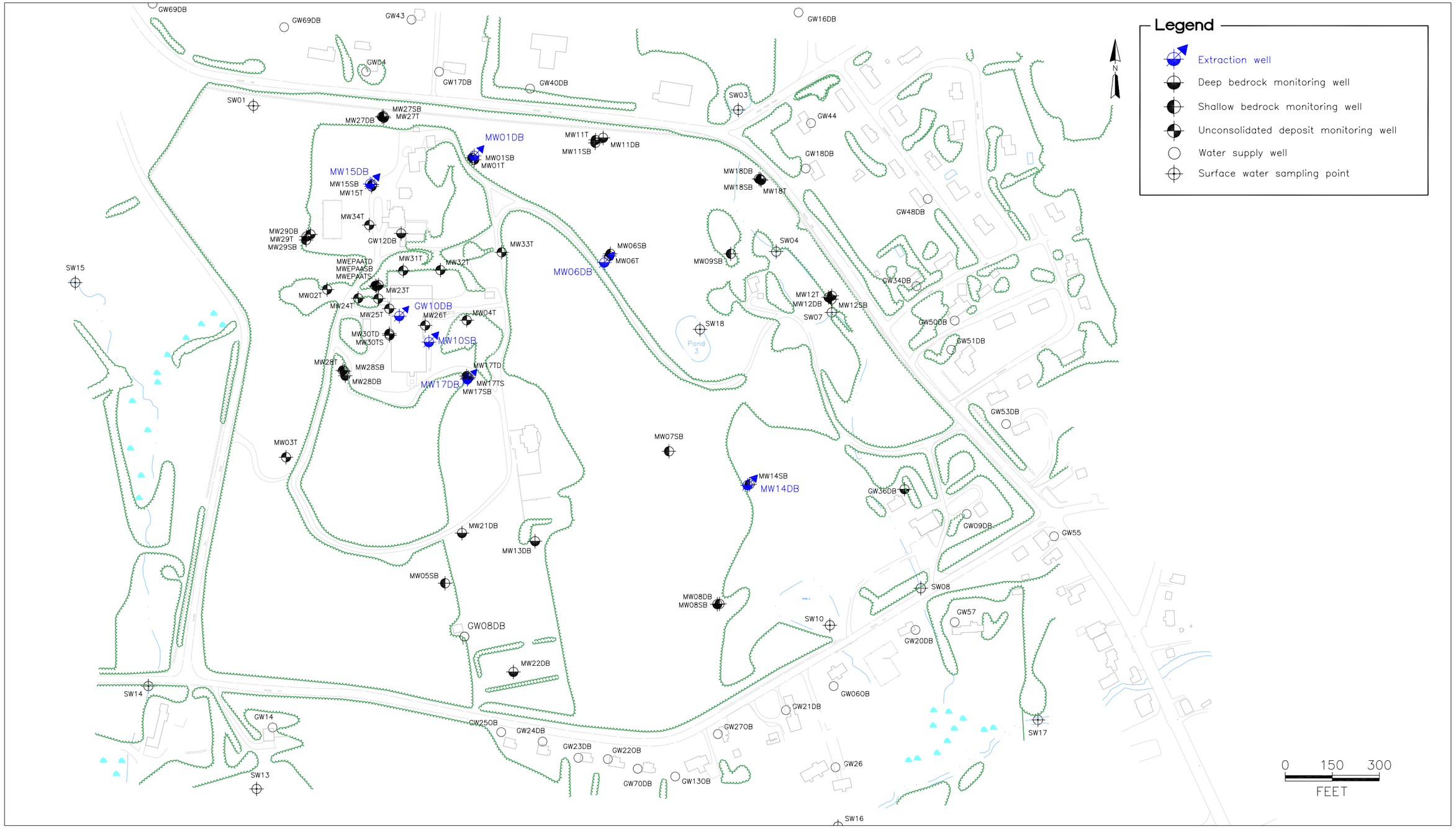


Figure 2–1
Site Plan
LineMaster Switch Corporation
Woodstock, Connecticut

WOODARD & CURRAN
Engineering · Science · Operations

Fig2–1 – siteplan.dwg