Final Engineering Report

Rotron-Woodstock Site
Town of Woodstock, Ulster County, New York State

March 2011

THE Chazen COMPANIES

Prepared for:

PerkinElmer, Inc
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Rotron-Woodstock Site
Town of Woodstock, Ulster County, New York State

Site Number 3-56-009

March 2011

Prepared by:
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CERTIFICATIONS

I, Daniel W. Stone, P.E. am currently a registered professional engineer licensed by the State of New York, I had primary direct responsibility for implementation of the remedial program activities, and I certify that the Remedial Designs memorialized in the OU-1 and OU-2 Records of Decision were implemented and that all construction activities were completed in substantial conformance with the Department-approved Remedial Designs.

I certify that the data submitted to the Department with this Final Engineering Report demonstrates that the remediation requirements set forth in the Remedial Action Work Plans and Records of Decision and in all applicable statutes and regulations have been or will be achieved in accordance with the time frames, if any, established in for the remedy.

I certify that all use restrictions, Institutional Controls, Engineering Controls, and/or any operation and maintenance requirements applicable to the Site are contained in a declaration of covenants and restrictions created and filed with the clerk of the County in which the site is located. .

I certify that the Site Management Plan referenced above has been submitted for the continual and proper operation, maintenance, and monitoring of all Engineering Controls employed at the Site, including the proper maintenance of all remaining monitoring wells, and that such plan has been approved by Department.

I certify that any financial assurance mechanisms required by the Department pursuant to Environmental Conservation Law have been executed. I certify that all information and statements in this certification form are true.

I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, Daniel W. Stone, of Chazen Engineering, Land Surveying & Landscape Architecture Co., P.C. am certifying as Owner's Designated Site Representative and I have been authorized and designated by all site owners to sign this certification for the site.

3/29/11

NYS Professional Engineer # Date Signature

LIST OF ACRONYMS

Acronym	Definition
COC	Compounds of Concern
DER-10	Division of Environmental Remediation, technical guidance document 10
FER	Final Engineering Report
IRM	Interim Remedial Measure
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OU-1/OU-2	Operational Unit 1/Operational Unit 2
RAR	Remedial Action Report

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FINAL ENGINEERING REPORT

1.0 BACKGROUND AND SITE DESCRIPTION

Rotron Inc. entered into an Order on Consent with the NYSDEC in 1995 to remediate contaminants found on the 98 acre property located in Town of Woodstock, Ulster County, New York (Figure 1). The Order on Consent required Rotron Inc, to investigate and remediate contaminated soils and groundwater at the site. The site's Compounds of Concern (COCs) subject to this remedial commitment are Trichloroethene (TCE), 1,1,1-Trichloroethane (TCA), Freon 113, 1,2-Dichlorethene (1,2-DCE) and 1,1-Dichloroethane (1,1-DCA).

The site consists of seven parcels identified as tax parcels Section 027.018 Block 5 Lots 1, 2, 3, 4, 5 6 and 7.1. The boundaries of specific parcels near the center of the Rotron site with remaining contaminated soils are identified on a site survey provided within Appendix A. All parcels affected by remedial activities are bound by deed restrictions referencing a Site Management Plan as a governing document for required ongoing environmental management obligations. The Site Management Plan, which includes "as built" drawings certified by a NYS Professional Engineer, of engineered structures, is provided in Appendix A.

Remedial work at this site was separated into two Operable Units (OU-1 and OU-2) OU-1 addressed human health exposure in off-site locations and OU-2 addressed contaminants on the site. After completion of the remedial work described by the separate Records of Decision for OU-1 and OU-2, some contamination was left in the subsurface at the Site. A Site Management Plan has been prepared and approved for use to manage this remaining contamination at the Site in perpetuity or until cancellation of the SMP and/or extinguishment of the deed restriction with NYSDEC approval.

Remedial action work on the site began in 1995, and was completed in 2004 with the exception of Soil Vapor Intrusion investigations conducted in 2006.

This Final Engineering Report (FER) has been prepared by The Chazen Companies, on behalf of Rotron Inc. and its successional Responsible Party, PerkinElmer, Inc., in accordance with the requirements in NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation and other guidelines provided by NYSDEC.

2.0 REMEDIAL OBJECTIVES

As enumerated in the OU-2 Record of Decision, the Remediation Goals for the site selected for the site consist of:

- Eliminate, to the extent practicable, ingestion and direct contact with groundwater affected by the site that does not attain NYSDOH Drinking Water Standards;
- Eliminate, to the extent practicable, off-site migration of groundwater that does not attain NYSDEC Class GA Ambient Water Quality Criteria;
- Eliminate, to the extent practicable, migration of contaminated shallow groundwater in the Plant 4 area to the on-site receiving stream and to the underlying bedrock aquifer such that there are no exceedences of applicable environmental standards;
- Eliminate, to the extent practicable, exceedences of applicable environmental quality standards related to releases of contaminants from on-site soils to the groundwater and/or surface water of the State of New York; and
- Eliminate, to the extent practicable, ingestion, direct contact, or inhalation of the relevant COCs in on-site soils. As indicated, site the COCs consist Trichloroethene (TCE), 1,1,1-Trichloroethane (TCA), Freon 113, 1,2-Dichlorethene (1,2-DCE) and 1,1-Dichloroethane (1,1-DCA).

3.0 DESCRIPTION OF SELECTED REMEDY

As enumerated in the OU-1 Record of Decision, remedy components selected for the site included:

- Continued operation of bedrock groundwater recovery well RW-8 and wells at the Fernwood Garden Apartments for plume control and groundwater remediation purposes until such a time that Rotron-related dissolved VOC concentrations in the bedrock groundwater have reached Class GA groundwater standards, to the extent feasible.
- Extension of a public water system to residents whose wells were either impacted or threatened by the bedrock aquifer contaminated groundwater. Rotron Inc. and the Town of Woodstock reached agreement whereby Rotron Inc. funded the extension of the public water supply to properties identified in the OU-1 Record of Decision. Rotron Inc. also undertook enhanced residential sampling on private properties abutting the proposed water district expansion area to determine if additional parcels required public water. This monitoring program was continued until NYSDEC and NYSDOH authorized its termination due to consistent absence of VOC detections.

As enumerated in the OU-2 Record of Decision, remedy components selected for the site included:

- Construction of shallow groundwater intercept trenches in the Plant 4 area to contain existing shallow plumes to the northwest and east of Plant 4. Shallow groundwater was to be treated with either an ex-situ air stripper system or in-situ sparge beds;
- Installation of three new bedrock groundwater monitoring wells near the Plant 4 area;
- A contingency for the installation of bedrock recovery wells near Plant 4 should Compounds of Concern break through to the bedrock aquifer in the Plant 4 area. Production well PW-3 may be used for this purpose or other wells. Extracted groundwater will be treated prior to discharge and aquifer testing will be required to evaluate on-site and off-site hydrogeologic impacts;
- Construction of two shallow groundwater intercept trenches in the vicinity of the C-1 Building, Quonset Huts and the Swale area, one along the former drywell discharge line and the other parallel to the swale, to capture and treat contaminated overburden groundwater which might otherwise move downward and laterally into the bedrock aquifer;
- Installation of additional bedrock recovery wells RW-9 and RW-10 near RW-8 to supplement RW-8 in controlling the existing bedrock groundwater plume in this area, and installation of additional bedrock recovery well RW-11 nearer to Rotron's production well PW-2;
- Excavation of up to 500 cubic yards of impacted soil from around the former drywell location below the C-1 building, exclusive of and in addition to any soils excavated during installation of the shallow groundwater intercept trenches;

- Implementation of institutional controls in the form of a deed restriction, requiring prior approval from the NYSDEC and NYSDOH before excavation in the contaminated soils remaining on the Rotron property; and
- Preparation of a long-term monitoring program, anticipated to be conducted for a period of up to 30 years or until such time that the NYSDEC determines that sampling is no longer required.

4.0 INTERIM REMEDIAL MEASURES AND OPERABLE UNITS

The installation of remedial well RW-8, extension of the public water system to adjacent properties, and enhanced sampling of off-site property wells beyond the public water system expansion boundaries were all completed as Interim Remedial Measures during the OU-1 work period.

Operable Unit No. 1 (OU-1) was designated to address the bedrock groundwater to the west, south, southeast and to the north of the Rotron Inc. property. Bedrock groundwater to the east and to the northeast of the Plant 4 building on the Rotron facility, surface water, and all remaining source areas on the Rotron facility were addressed in Operable Unit No. 2 (OU-2). The two operable units were developed to facilitate prioritized mitigation of OU-1 area.

5.0 DESCRIPTION OF REMEDIAL ACTIONS PERFORMED

The site was remediated in accordance with remedial commitments recorded in the OU-1 and OU-2 Records of Decision, dated March 1997 and March 2001, and consistent with the following Interim Remedial Measure and Remedial Action Work Plans:

Draft Feasibility Study for Extending the Woodstock Water District to the NYS Route 375/Birch Lane/Delisio Lane Area, Town of Woodstock, Ulster County, New York – February 1996 (Revised March 19, 2996) prepared by Brinnier & Larios, P.C.

Operable Unit #1 Groundwater Interim Remedial Measures Work Plan, EG&G Rotron Woodstock Facility, Woodstock, New York – July 1996 prepared by The Chazen Companies.

Groundwater Treatment Facility, Rotron Inc. Woodstock Facility, Woodstock, New York – December 1996, prepared by The Chazen Companies.

Operable Unit #2 Phase I Remedy Implementation Work Plan, Rotron Inc. Woodstock Facility Woodstock NY, September 2001, prepared by The Chazen Companies.

Operable Unit #2 Phase II Remedy Implementation Work Plan, Rotron Inc. Woodstock Facility Woodstock NY, March 5, 2003, prepared by The Chazen Companies.

The following OU-1 and OU-2 Remedial Actions have been completed on and near the Site.

- Provision of a water district expansion (Appendix F) for nearby private properties from the nearby Woodstock water district to provide an alternate source of potable water to parcels west of the site where point-of-entry-treatment (POET) systems had previously been in use and where site contaminants had been detected in private wells.

- Offsite disposal of approximately 500 cubic yards of soils excavated from around a former drywell location near the swale.

- Installation of two shallow groundwater intercept trenches to manage shallow plumes migrating eastward and westward away from the Plant 4 area.

- Installation of two segments of a shallow groundwater intercept trench to manage shallow COC plumes flowing to the swale area. One segment lies along the trace of a former perforated wastewater discharge line extending from behind the C-1 building toward the swale. The second line extends across the hillside below the sand filter system to intercept all shallow groundwater flowing downhill from the Casting and Quonset hut areas.

- Installation of three bedrock wells (RW-8, RW-9 and RW-10) along the west site perimeter to provide hydraulic control to groundwater in this area impacted by COCs which could otherwise migrate westward off the site.

- Installation of one bedrock well (RW-11) near monitoring well MW-9 to provide hydraulic control in an area where site contaminants might migrate either eastward toward Rotron's potable well PW-2 or southward toward Hasbrouck Lane.

- Continued pumping of former water supply wells at the off-site Fernwood Apartments to provide hydraulic control on a residual contaminant plume in the off-site neighborhood area.

- Installation of a sub slab depressurization system under the Maintenance Garage.

- Execution and recording of deed restrictions referencing the Site Management Plan for parcels where contaminant residues residue remains in soil or groundwater.

- Development and implementation of a Site Management Plan.

Most remedial activities were completed at the site in 2004 with the exception of Soil Vapor Intrusion investigations which were initiated in 2006. Most of these remedial investments are described in fuller detail in the OU-2 Remedial Action Report (Appendix B). Design drawings and Completion Certifications for the public water system expansion west of the Site, and private well sampling conducted to confirm groundwater quality stability in parcels abutting the water district boundaries are found in Appendices F and G, respectively.

6.0 GOVERNING DOCUMENTS

Governing documents are found in the Site Management Plan, bound in Appendix A. Monthly project reports were provided to NYSDEC throughout the OU-1 and OU-2 work periods.

7.0 REMEDIAL PERFORMANCE/DOCUMENTATION SAMPLING

A copy of the 2010 Annual Status and Monitoring Report is included in Appendix C, describing the most recently-completed year of remedial performance/documentation sampling data. Data trends described in this report describe generally stable or declining VOC concentrations across the site.

8.0 CONTAMINATION REMAINING AT THE SITE

Dissolved-phase contaminant residual remains in soils in two broad areas shown on the site survey (found within Appendix A). Site soils consist of glacial till, transitioning from less dense ablation till to extremely dense lodgment till. Under most site buildings and adjacent areas the transition boundary lies between 15 and 20 feet below grade. Along the west site boundary, where a swale lies near the Rotron Road entry area, lodgment till is absent. Total organic carbon (TOC) values in the ablation till formation ranged from over 10,000 milligrams per kilogram (mg/kg) down to 374 mg/kg. The accepted average TOC value for soils near the dense till boundary where a majority of COCs persist on the site is 621 mg/kg or 0.062%.

Soil cleanup objectives for the site were adjusted to reflect these till-boundary TOC values. Soil management areas with identified COC residual exceeding the site-specific cleanup objectives on the site are shown on the site survey within Appendix A. No free-phase COCs were found in soils anywhere on the site during site Remedial Investigations.

COC residuals were identified in subsurface soils near and under Plant 4 as well as in the broad zone extending from the C-1 building to the swale. A total of up to 150,000 cubic yards of soil appeared likely to exceed soil cleanup objectives for the site.

In the Plant 4 area, test pit and soil boring sampling identified TCE, cis-1,2-DCE, 1,1,1-TCA, 1,1-DCA and Freon 113 in subsurface soils above cleanup values. The total volume of COC-

impacted soil above cleanup objectives in the Plant 4 area was estimated be 13,000 cubic yards. Up to 60 percent of these soils lay either under Plant 4, within 5 feet of Plant 4 foundations, or deeper than 9 feet below grade.

In the C-1 Building area extending down to the swale, the total volume of COC-impacted soils above cleanup objectives identified by test pitting and borings was estimated to be 32,000 cubic yards. Up to 30 percent of these soils lay either under existing buildings, building footings, or under the sanitary sand filter system and approximately 80 percent of the soils lay deeper than 9 feet below grade.

In the vicinity of the Quonset Huts, extending from Plant 1 to below the Maintenance Garage, limited sampling and soil gas samples identified 1,1,1-TCA and 1,1-DCA were present although firm volumes were not established due to underground utilities which prevented invasive subsurface remedial investigations.

Test pitting in an old scrap dump area to the left of Rotron Road, when entering the site and beginning to ascend the hill, identified no soils with COCs exceeding soil cleanup objectives.

Some of this impacted soil was removed during installation of the shallow groundwater intercept trenches. In all other locations these contaminated soils remain on the site, subject to long-term monitoring and hydraulic control measures engineered to limit off-site migration of dissolved phase and all site management obligations detailed in the Site Management Plan referenced by Deed Restrictions.

9.0 SOIL COVER [OR CAP] SYSTEM

A soil cap system is not part of the approved remedy for this site.

10.0 OTHER ENGINEERING CONTROLS

Engineering Controls have been described above, consisting of shallow groundwater intercept trenches, bedrock groundwater extraction wells and a subslab depressurization system. Final design drawings and details are provided in the Site Management Plan and the OU-2 Remedial Action Report found in Appendices A and B. Final design drawings and details for the groundwater treatment facilities on the site and at the Fernwood Garden Apartments are found in Appendices D and E, respectively.

11.0 INSTITUTIONAL CONTROLS

Deed Restrictions have been implemented for each of the site parcels with remaining contaminants and/or remedial features. Copies of the deed restrictions are found in the Site Management Plan (Appendix A). Copies of County filing documentation for the deed restrictions are provided in Appendix H.

12.0 DEVIATIONS FROM THE REMEDIAL ACTION WORK PLAN

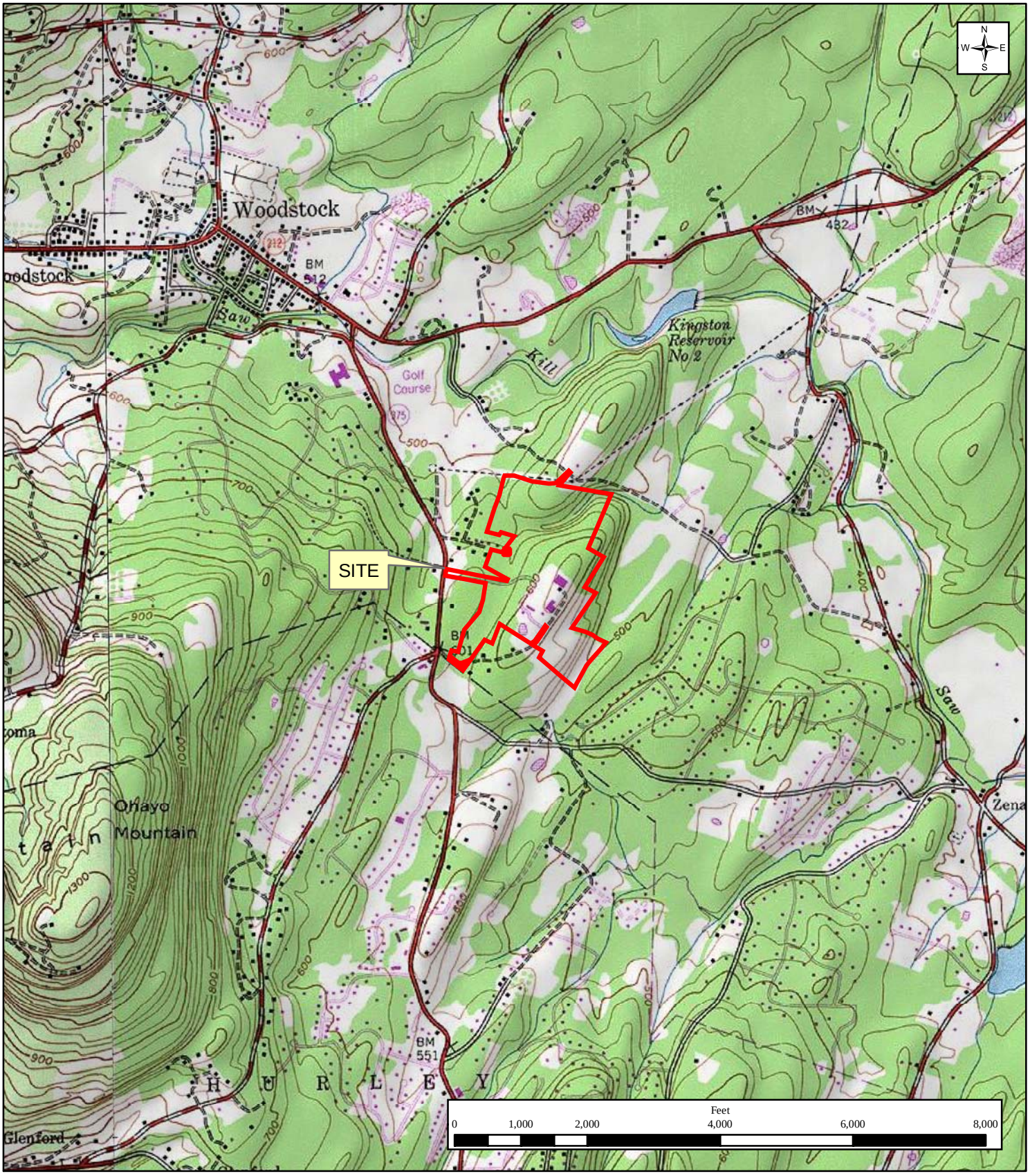
The only deviations to Remedial Work Plans occurred because preferred locations for remedial wells could not be used because no waterbearing fractures were encountered during well installations. An initially proposed well RW-9 location at the end of Deliseo Lane was relocated to its present location along Rotron Road, and the initially proposed well RW-11 location near the sand filter system was moved to its current location. In both instances, the intent of remedial action commitments was met albeit from modified groundwater withdrawal locations.

13.0 DATA TABLES

Appendix B provides a copy of the 2010 Annual Report for the site, which includes trend plots and tables describing historic and current site data.

FIGURES

Figure 1: Site Location Map
Figure 2: Site Layout Map



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Rotron Woodstock Site

Figure 1 - Site Location Map

55 Hasbrouck Lane
Town of Woodstock, Ulster County, New York

Source: U.S.G.S. Topographic Map of the Woodstock, New York Quadrangle, Dated 1945 (Photorevised 1980), 7.5-Minute Series

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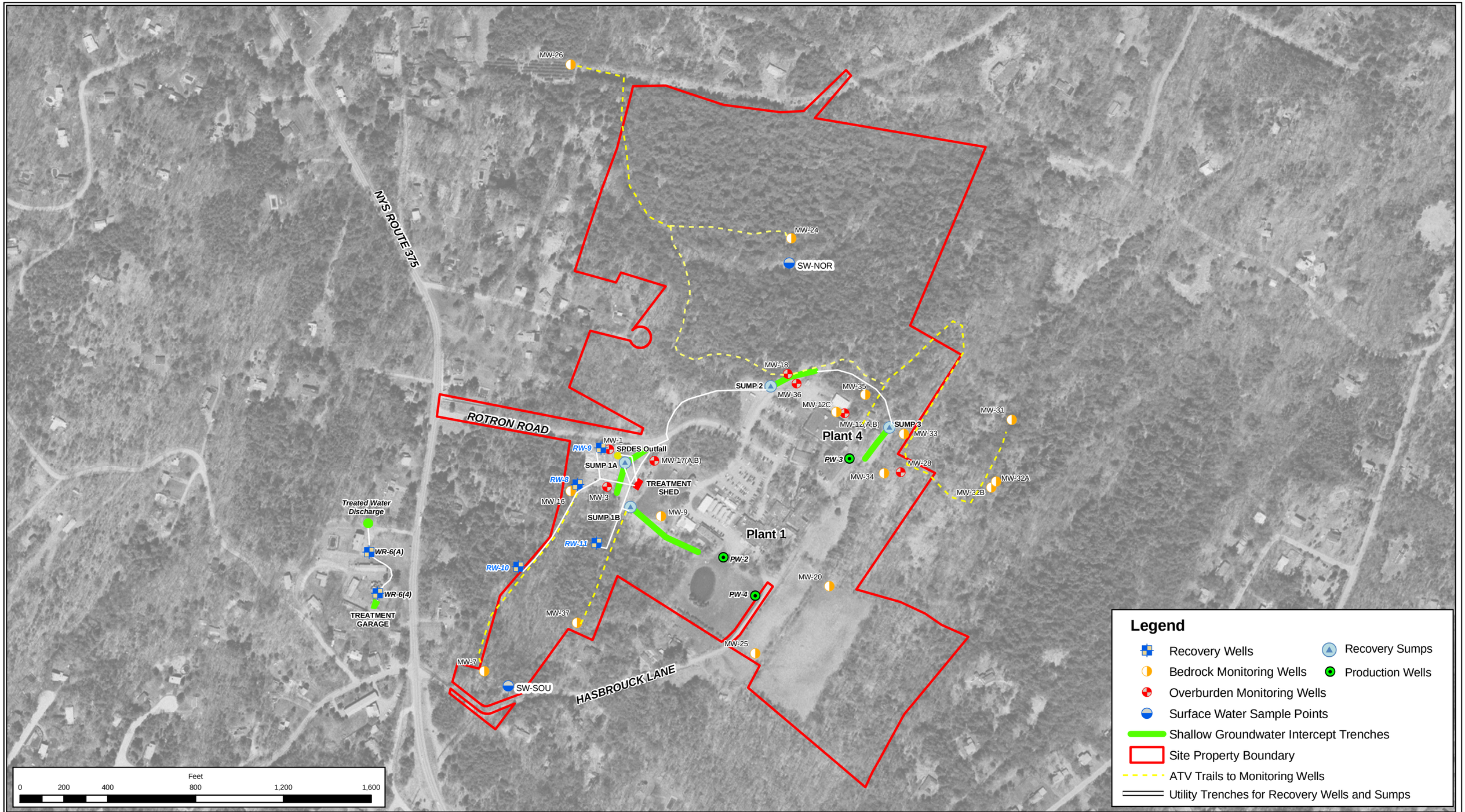
Project:	49801.00
Figure:	1



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W E
S

Rotron Woodstock Site

Figure 2 - Site Layout Map

55 Hasbrouck Lane
Town of Woodstock, Ulster County, New York

Source: NYS Office of Cyber Security and Critical Infrastructure Coordination 2004 Orthoimagery; Wells and Remedial System Features plotted by Chazen, 2003-2010.

Drawn:	EJO
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Figure:	2

APPENDICES

Appendix A: 2010 Site Management Plan, including Deed Restrictions & Site Survey
Appendix B: 2004 OU-2 Remedial Action Report
Appendix C: 2010 Annual Status and Monitoring Report
Appendix D: Amended Groundwater Treatment Facility, September 1997
Appendix E: Groundwater Treatment Facility, Fernwood Garden Apartments, December 1998
Appendix F: OU-1 Woodstock Water District Expansion Construction Drawings and Certifications of Completion.
Appendix G: Private Well Sampling Documentation
Appendix H: County Filing Documentation for Deed Restrictions

Contained on Compact Disk