Five-Year Review Report
American Thermostat Superfund Site
Town of Catskill
Greene County, New York

Prepared by:

United States Environmental Protection Agency
Region 2
New York, New York

September 2003

Five-Year Review Summary Form

SITE IDENTIFICATION

Site Name *(from WasteLAN)*: American Thermostat

EPA ID *(from WasteLAN)*: NYD001233634

Region: 2	**State:** NY	**City/County:** Town of Catskill/Greene

SITE STATUS

NPL Status: **O** Final **G** Deleted **G** Other (specify) _____

Remediation Status (choose all that apply): **G** Under Construction **O** Operating **G** Complete

Multiple OUs? **O** YES **G** NO	**Construction completion date:** 9/25/1998

Are portions of the site in use or suitable for reuse? **O** YES **G** NO **G** N/A (site involves groundwater plume and not real property)

REVIEW STATUS

Lead agency: **O** EPA **G** State **G** Tribe **G** Other Federal Agency _____

Author name: Christos Tsiamis

Author title: Remedial Project Manager	**Author affiliation:** EPA

Review period:** 9/25/1998 to 9/25/2003

Date(s) of site inspection:

Type of review:

G Post-SARA **G** Pre-SARA **G** NPL-Removal only
G Non-NPL Remedial Action Site **G** NPL State/Tribe-lead
G Regional Discretion **O** Policy **G** Statutory

Review number: **O** 1 (first) **G** 2 (second) **G** 3 (third) **G** Other (specify) _____

Triggering action:

G Actual RA Onsite Construction at OU #____ **G** Actual RA Start at OU#____
O Construction Completion **G** Previous Five-Year Review Report
G Other (specify) _____

Triggering action date *(from WasteLAN)*: 9/25/1998

Due date *(five years after triggering action date)*: 9/25/2003

Does the report include recommendation(s) and follow-up action(s)? **G** yes **O** no
Is human exposure under control? **O** yes **G** no
Is contaminated groundwater under control? **O** yes **G** no **G** not yet determined

Is the remedy protective of the environment? **O** yes **G** no **G** not yet determined
Acres in use or available for use: **restricted:** 2 **unrestricted:** 6

I. Introduction

This five-year review was conducted in accordance with the Comprehensive Five-Year Review Guidance, OSWER Directive 9355.7-03B-P (June 2001). The purpose of a five-year review is to assure that implemented remedies protect public health and the environment and that they function as intended by the decision documents. This report will become part of the site file.

This is the first five-year review for the American Thermostat site. Upon completion of the remedial action, contaminant levels will be reduced to levels that permit unlimited use and unrestricted exposure. Since the remedial action requires more than five years to complete, this five-year review is being conducted as a matter of Environmental Protection Agency (EPA) policy.

II. Site Chronology

Table 1 (attached) summarizes the site-related events from discovery to construction completion.

III. Background

Physical Characteristics

The site is located in a rural residential area in the Town of Catskill, Greene County, New York, approximately 30 miles southwest of Albany and five miles west of the Village of Catskill. The approximately eight-acre site is bordered by Routes 23B and Route 23 on the north and south, respectively, by a residential property on the west, and by New York State-owned property on the east. The site contains the former American Thermostat building and the water treatment plant constructed for the implementation of the groundwater remedy.

The topography within the vicinity of the site may be characterized as gently rolling foothills of the Catskill Mountains which are deeply incised by stream channels. The site is located on a slight ridge overlooking Catskill Creek Valley. Immediately west of the facility is a small valley which includes Tributary B, a tributary of Catskill Creek. East of the facility is Tributary A, which also flows into Catskill Creek, located approximately a quarter mile to the east of the site.

Site Geology/Hydrogeology

Regionally, the bedrock within Greene County consists of interbedded shales and sandstones of Devonian age, known as the Catskill Formation. The Catskill Formation is made up of four distinct bedrock groups. From oldest to youngest, these groups are Hamilton, Geneses, Sonya, and West Falls. The site lies within

the Hamilton Group. In the vicinity of the site, the bedrock is at an average depth of 28-30 feet below the ground surface. The unconsolidated soils overlying the bedrock are primarily glacially-derived soils and sediments.

Groundwater is found between 5 to 8 feet below the ground surface in the overburden, and in the bedrock fracture zones.

Land and Resource Use

The area surrounding the site is characterized as rural-residential. The American Thermostat Corporation was the only manufacturing facility in the area, which is a popular tourist and residential area. There are a few full-time residences, vacation homes, and several small businesses in the vicinity of the site. Approximately 5,000 people live within a 3-mile radius of the site in low-density residential areas. Until a waterline was installed to protect the public from exposure to the contaminated groundwater, all homes within ½ mile of the site used private wells. At present, all residences and businesses within the immediate vicinity of the site receive water from the municipal supply of the Village of Catskill.

Catskill Creek is classified as a trout stream and has considerable recreational value to local and visiting fishermen. The Creek is also an auxilary water supply for the Village of Catskill.

History of Contamination

From 1954 to 1985, the American Thermostat Corporation built thermostats for small appliances at the site. In 1981, NYSDEC discovered that American Thermostat employees were improperly disposing of chemicals at the site—workers had been pouring waste organic solvents down drains attached to an abandoned septic system for a number of years and they had been dumping solvents and sludges onto the parking lot. State health personnel tested wells in the vicinity of the site and found them to be contaminated with tetrachloroethylene (PCE) and trichlorethylene (TCE).

Initial Response

In February 1983, New York State entered into an interim consent order with American Thermostat Corporation and Amro Realty Corporation (the property owner) in which the companies agreed to clean up the site and its surroundings; install, monitor, and maintain carbon filter systems for five affected wells; supply bottled water for consumption by the affected residents; and monitor two groups of bordering private wells to determine whether any contamination had spread beyond the original affected area. However, when the company went out of business in May 1985, it stopped providing bottled water and abandoned the maintenance of carbon filtration systems at the affected homes. The State requested that EPA take over the maintenance of the water treatment systems, sample other private wells near the site, and provide bottled water and carbon filtration systems where necessary. In addition to undertaking the work requested by the State, EPA also installed three air stripping systems at the site. A system of seven

extraction and reinjection wells and a soil vacuum extraction system were installed at the site in 1989 for the purpose of accelerating the treatment of the groundwater.

Basis for Taking Action

The site is being addressed as two operable units. The first operable unit provided a clean water supply to residents near the site. The second operable unit covers source control and the cleanup of the contaminated groundwater.

Following the listing of the site on the National Priorities List in June 1986, EPA undertook a focused feasibility study (FFS) to evaluate alternative water supplies for the affected and potentially affected residences at the site.

In January 1988, EPA initiated a source control remedial investigation/feasibility study (RI/FS) to determine the nature and extent of contamination emanating from the site and to evaluate remedial alternatives. The RI concluded that the groundwater in the site vicinity was contaminated with volatile organic compounds (VOCs), primarily PCE and TCE. An estimated 26,000 square feet of soil at the site were also found to be contaminated with TCE and PCE down to a maximum depth of approximately 30 feet. Contamination was also detected in portions of the building located on-site.

IV. Remedial Actions

Remedy Selection

Based upon the results of the above-noted FFS, in January 1988, EPA signed a Record of Decision (ROD), calling for the extension of the existing Village of Catskill water district pipeline to the affected and potentially affected areas as an interim remedy.

On June 29, 1990, a ROD to control the source of the contamination was signed, selecting low temperature thermal desorption (LTTD) to treat the contaminated soil and extraction, air stripping, carbon adsorption, and reinjection for treating the contaminated groundwater. The ROD also called for the decontamination of the building by vacuuming, dusting, and wiping of approximately 67,000 square feet of the building floor, off-site disposal/treatment of the collected hazardous dust, removal and off-site disposal/treatment of 18 hazardous waste liquid drums stored in the building, and removal and off-site disposal/treatment of sludge from four drainage pits inside the building.

The ROD specified that approximately 7,000 cubic yards (CY) of soil above the water table exceeding 1.0 milligram per kilogram (mg/kg) for PCE and 0.4 mg/kg for TCE[1] were to be excavated and thermally

[1] Based on a risk assessment performed as part of the source control RI/FS, it was determined that soils containing less than 1.0 mg/kg of PCE and less than 0.4 mg/kg of TCE would present excess

treated by LTTD. Sampling conducted during the RD, however, revealed additional contamination both in the shallow soil (above the water table) and in the deep soil (from the water table down to bedrock). Since the source material would contribute to the existing groundwater contamination problem via leaching and direct contact (for soil below the water table), EPA concluded that remediating the additional shallow soil and the soil below the water table would be beneficial to the long-term groundwater cleanup. Based on the RD findings, it was concluded that approximately 13,000 CY of soil would need to be remediated as part of the source control remedy. These findings were documented in a July 1997 Explanation of Significant Differences (ESD).

Remedy Implementation

Alternate Water Supply

Although an alternate water supply remedy was selected in 1988, the design of the alternate water supply was not initiated by EPA's contractor, TAMS Consultants (TAMS), until July 1990. The delay in the initiation of the RD was due to lengthy negotiations between EPA, NYSDEC, the New York State Department of Health, and the Town and the Village of Catskill aimed at resolving several complex issues regarding the new water supply system and the development of a new water district.

The plans and specifications related to the construction of the alternate water supply were completed in September 1991. TAMS awarded a remedial action (RA) contract to F.C. Compagni Construction Company, Inc. to implement the remedy in October 1991. The construction of the alternate water supply, which included the installation of approximately 3.5 miles of pipeline and connections to 52 residences, started in May 1992 and was completed in November 1992. The Village of Catskill assumed responsibility for maintaining the alternate water supply system in accordance with an October 1991 memorandum of understanding between EPA and the Village of Catskill.

Building Decontamination

The building decontamination RD was initiated by TAMS in October 1990; the plans and specifications were completed in September 1991. TAMS awarded a contract to All-State Powervac, Inc. to implement the remedy in July 1992. The cleanup activities at the building were initiated on September 14, 1992 and were completed on September 29, 1992.

Soil Remediation

The soil excavation and treatment RD was initiated by TAMS in October 1990; the plans and specifications related to the soil treatment were completed in September 1992. Following the RD completion, Foster Wheeler Environmental Corporation became EPA's contractor for the soil RA. In April 1993, Foster Wheeler Environmental Corporation awarded an RA contract to Williams Environmental Services, Inc. (Williams) to implement the soil remedy. Williams initiated the soil remediation in September 1993 and had

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carcinogenic risks of no more than $1x10^{-6}$, falling within EPA's target risk range of 10^{-4} to10^{-6}.

completed the treatment of 12,670 CY of contaminated soil by May 1995. Prior to Williams' mobilization to the site, EPA conducted preconstruction deep soil sampling to define the outer limits of the contamination. Based on these results and on the findings of post-excavation wall and floor sampling performed by Williams during the execution of the soil remedy, EPA defined several areas for additional excavation and treatment both on the site and on the adjacent private property and estimated the total potential additional volume of contaminated soil to be 30,000 CY.

In the interest of assessing possible cost and schedule benefits, attempts were made to simply extend William's scope of work. However, based on independent cost estimates by Foster Wheeler Environmental Corporation and EPA and on initial soil remedy bidding information, Williams' proposal was deemed to be unacceptable. As a result, a new procurement process was initiated. Foster Wheeler Environmental Corporation awarded an RA contract for the excavation and thermal treatment of the additional soil to O'Brien & Gere Technical Services, Inc. in October 1995. O'Brien & Gere Technical Services, Inc. initiated construction of the final phase of the soil remedy in December 1995 and completed all thermal treatment and backfill work by December 1996. The quantity of soil treated during this phase of the soil remedy was 25,644 CY. The total amount of contaminated source material remediated was 38,314 CY.

Groundwater Remediation

The groundwater remediation RD was initiated by TAMS in October 1990; the plans and specifications related to the groundwater extraction and treatment were completed in September 1993. Initiation of the groundwater RA, though, had to be postponed until all soil RA activities at the site were completed. Following the RD completion, Foster Wheeler Environmental Corporation became EPA's contractor for the groundwater RA. In March 1997, Foster Wheeler Environmental Corporation awarded an RA contract to Fluor Daniel GTI, Inc. to implement the groundwater remedy. The construction of the groundwater remedy began in June 1997 and was completed in July 1998.

System Operations/Operation and Maintenance

Since August 1998, the groundwater treatment plant has operated at a pumping rate of approximately 70 gallons per minute. The system has consistently met groundwater cleanup action levels and groundwater reinjection requirements. The treatment plant staffing includes an operator and a staff engineer. The operator is present at the site on a daily basis for eight hours, attending to equipment repairs and maintenance at the plant and at the well vaults, and performing the scheduled sampling of the wells. The plant engineer does not routinely visit the site, but performs occasional site inspections and prepares project reports (monthly). The wells (extraction and monitoring) are sampled according to the schedule contained in the operation and maintenance (O&M) manual, as revised during subsequent optimizations of the system.

Routine maintenance of the system includes repairs of well pumps and process equipment at the treatment plant, backwashing of the multimedia filters and of the liquid carbon adsorption filter, pumping standing

water from the well vaults, and replenishing treatment chemicals.

The annual O&M costs are approximately $765,000; these costs are broken down in Table 2 (attached).

V. Five-Year Review Process

Administrative Components

The five-year review team consisted of Christos Tsiamis (remedial project manager [RPM]), Edward Modica (hydrogeologist), and Charles Nace and Julie McPherson (risk assessors).

Community Involvement

The EPA Community Involvement Coordinator for the American Thermostat site, James Haklar, published a notice in the *Hudson Valley Newspapers/Daily Mail,* a local newspaper, on August 13, 2003, notifying the community of the initiation of the five-year review process. The notice indicated that EPA would be conducting a five-year review of the remedy for the site to ensure that the implemented remedy remains protective of public health and the environment and is functioning as designed. It was also indicated that once the five-year review is completed, the results will be made available in the local site repository. In addition, the notice included the RPM's address and telephone number for questions related to the five-year review process or the American Thermostat site. A similar notice will be sent when the review is completed.

Document Review

The documents, data, and information which were reviewed in completing the five-year review are summarized in Table 3 (attached).

Data Review

A review of monitoring well data collected during the review period (see Tables 4-6) shows a decreasing trend in VOC contamination.

Site Inspection

On September 22, 2003, a 5-year review-related site inspection was conducted by Christos Tsiamis, the RPM, Julie McPherson (Risk Assessor), Joe Yavonditte (NYSDEC), and Richard Feeney (Tetra Tech FW).

Interviews

No interviews were conducted for this review.

VI. Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

Alternate Water Supply

The 1988 ROD called for the extension of the existing Village of Catskill water district pipeline to the affected and potentially affected areas. The construction of the alternate water supply connected 52 affected and potentially affected residences to the Village of Catskill's water supply. The Village of Catskill is presently maintaining the alternate water supply system. The alternate water supply is functioning as intended by the 1988 ROD.

Source Control

The 1990 ROD, as modified by the 1997 ESD, called for the cleanup of the contaminated soil at the site in order to eliminate the threat to human health from possible ingestion or dermal contact with the soil. Also, the treatment of the soil to remove the mobile VOCs would result in the elimination of a long-term source of contamination of the groundwater.

The analytical results from post-excavation soil samples collected from the excavation limits indicated that the residual levels of PCE and TCE were well below the 1.0 mg/kg and 0.4 mg/kg target levels, respectively. Therefore, the remediation of the source of contamination has reduced contamination of site soils in the unsaturated zone to acceptable health-based levels.

Building Decontamination

The 1990 ROD specified that, in order for the building to be utilized in the future, hazardous dust would have to be removed from contaminated surfaces, and all hazardous materials in drums and drainage pits in the building would be removed and disposed.

An inspection on September 29, 1992 verified that the building had been cleared of all debris, visible dust had been vacuumed from the floors, and the drainage pits had been power washed.

Presently, the building is available for reuse.

Plume containment

The 1990 ROD called for the extraction and treatment of the contaminated groundwater so as to contain

the migration of the contaminant plume and, in time, to achieve federal and state groundwater standards.

The groundwater management system includes extraction, injection, and monitoring wells installed in the overburden and bedrock aquifers, as well as residential monitoring wells. Initially, the groundwater management system consisted of 16 overburden extraction wells, 14 extraction bedrock wells, 14 injection wells, and 10 monitoring wells. In early 1999, after VOC contamination was detected in three residential wells along Scotch Rock Road and in two wells at the Country Estates residential development, which were located beyond the previous limits of the contaminated groundwater plume, seven existing residential wells were included in the groundwater monitoring[2]. By 2000, a total of nine residential wells were monitored.

From 1998 to 2001, groundwater monitoring was conducted on a monthly basis in all wells. However, in an effort to optimize the groundwater management system, several measures were implemented over the years. Specifically, in September 2000, an injection well was converted into extraction well (EW-15) and extraction well (EW-12) was deepened to access a zone of higher aquifer contamination. Starting in mid-2001, all of the overburden extraction wells, six monitoring wells, and eight bedrock extraction wells were being monitored semiannually, while the remaining bedrock extraction and monitoring wells and all nine residential wells continued to be sampled monthly. In October 2001, an injection well in the vicinity of the site, where high PCE concentration was detected, was converted into an extraction well (EW-16). Also, in 2001, pumping was discontinued for one overburden and two bedrock extraction wells that had reached the groundwater standards. As a result of additional optimization measures, the pumping at 5 bedrock extraction wells with very low contaminant concentrations will be discontinued in Fall 2003. At that time, the groundwater system will extract water from nine bedrock and 13 overburden wells[3]. Also, the

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[2] In November 1998, the New York State Department of Health (NYSDOH) reported to EPA the detection of VOC contamination in two wells servicing the Country Estates residential development, located in the western boundary of the Town of Catskill. During sampling conducted by EPA and NYSDOH in December 1998 and January 1999, VOC contamination was detected in three additional residential wells along Scotch Rock Road which, like the Country Estates wells, were located outside the previous limits of the contaminated groundwater plume. EPA undertook emergency actions to provide temporary sources of clean drinking water to the affected residents, while continuing to monitor the contamination in the affected wells. The results of this monitoring indicate that for nearly two years, the water in the three residential wells has met drinking water standards. Similarly, the water in both Country Estates wells has met drinking water standards since January 2003. EPA expects this trend to continue as a result of its ongoing extraction and treatment of contaminated groundwater in the area. EPA also believes that certain recent improvements to the groundwater extraction system described below have resulted in containing the spread of the groundwater contamination in the area.

[3] The overburden wells have been installed on the plant grounds to capture contaminated water at the source and to prevent it from moving into the bedrock aquifer, which is the source of potable water

sampling of eight monitoring wells that no longer yield useful information point will be discontinued. In addition, the monitoring of the bedrock extraction wells and the residential monitoring wells will be taking place on a quarterly basis, with the exception of two wells that service the Country Estates development; these two wells are still being monitored on a monthly basis.

EPA is also continuing to see decreases in the levels of contamination in the groundwater in the vicinity of the site as a direct result of the groundwater extraction and treatment system. For the past several years, groundwater sampling results have shown that contamination has not migrated beyond the residential wells along Scotch Rock Road, which constitutes the known limit of the contaminated groundwater plume.

To date, over 160 million gallons of contaminated groundwater have been treated and approximately 1.2 tons of VOCs have been removed from the groundwater. TCE and PCE concentrations in the majority of the monitoring and extraction wells have been reduced by well over 90% (see Tables 4-6). In addition, the average concentration of the PCE, the main contaminant, in the incoming water at the treatment system has been reduced by approximately 60% (see Table 7).

The Applicable or Relevant and Appropriate Requirements for groundwater cleanup include EPA's Maximum Contaminant Levels (MCLs) and New York State's groundwater quality standards. The action levels established for PCE and TCE are 5 µg/l (proposed MCL and New York State's groundwater quality standard at the time of ROD issuance). Based on the analytical results associated with the groundwater management system influent and effluent VOC sampling and monitoring, it has been concluded that the groundwater management system is effectively treating the VOC-contaminated water to concentrations meeting the action levels.

The groundwater treatment system's effluent also meets all reinjection requirements.

Based upon the results of the five-year review, is has been concluded that the alternate water supply is functioning as intended by the 1988 ROD and that the groundwater extraction and treatment system is functioning as intended by the 1990 ROD.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy still valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. Contaminated soil was treated to reduce the risk to receptors who may become exposed to contaminated soil and to remove a continuing source of contamination to the groundwater. The criteria for the cleanup were 1.0 mg/kg for PCE and 0.4 mg/kg for TCE. PCE. Post-excavation confirmational samples indicated that this was achieved. While PCE and TCE toxicity values have changed since the

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in the area. The bedrock wells are located on and off the plant grounds.

ROD, the new risk-based concentrations (calculated to protect long-term exposure) indicate that the residual levels of PCE and TCE in the site soil do not pose an unacceptable risk.

There have been no changes in the Applicable or Relevant and Appropriate Requirements and no new standards affecting the protectiveness of the groundwater remedy.

The residential properties located within the affected and potential downgradient plume area were connected to the Village of Catskill's public water supply. Approximately 40 residences are being served by the alternate water supply.

In 1998, VOC contamination was detected in two wells servicing the Country Estates residential development and three residential wells along Scotch Rock Road. All of these wells are located outside the previous limits of the contaminated groundwater plume. EPA undertook emergency actions to provide temporary sources of clean drinking water to the affected residents, while continuing to monitor the contamination in the affected wells. The results of this monitoring indicate that for nearly two years, the water in the three residential wells has met drinking water standards. Similarly, the water in both Country Estates wells has met drinking water standards since January 2003.

The concentrations of contaminants of concern in the groundwater at the site remain above the MCLs.

Certain exposure assumptions (*e.g.*, inhalation rates, soil ingestion rate) have changed since the baseline risk assessment was conducted in 1989; however these changes do not affect the remedy since residents are not utilizing the groundwater for potable purposes.

The groundwater use is not expected to change during the next five years, the period of time considered in this review. Therefore, the groundwater remedy is protective, since routes of exposure have been interrupted.

Soil vapor intrusion was also evaluated as a potential exposure pathway based on the conservative (health protective) assumption that residences are located above the maximum detected concentrations and utilized the health-based screening criteria provided in *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Pathway from Groundwater and Soils* (EPA, November 2002). This guidance provides calculations of concentrations in groundwater associated with indoor air concentrations at acceptable levels of cancer risk and noncancer hazard. This review compared the maximum detected concentrations of the chemicals of potential concern with the vapor intrusion screening criteria. The maximum concentrations detected in on-site wells exceeded the screening criteria for TCE, PCE, and vinyl chloride at the most protective screening level (10^{-6}) and the upperbound of the acceptable risk (10^{-4}). Cis-1,2-dichloroethene and 1,2-dichloroethene (total) maximum concentrations detected on the plant property exceeded the screening criteria at the most protective screening level, but did not exceed the upperbound risk level (10^{-4}). The results of this screening do not mean that there is an unacceptable risk associated with vapor intrusion in the existing building or in any buildings construction on the plant property in the future. Rather, this

merely indicates that the vapor intrusion pathway should be evaluated should the existing building be occupied or should there be new construction on the property. In the instance of new construction, site-specific considerations, such as the type of building, the location of the building to the maximum detected concentration, and the subsurface characteristics of the site, would have to be evaluated.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

There is no information that calls into question the protectiveness of the remedy.

Technical Assessment Summary

Based upon the results of the five-year review, it has been concluded that:

- the Village-supplied drinking water meets water quality standards;
- site soils have been cleaned to protective levels;
- the building has been decontaminated;
- the groundwater extraction and treatment system is operating properly;
- the treated groundwater meets reinjection criteria;
- the fence around the site is intact and in good repair;
- the groundwater monitoring wells are functional;
- there is no evidence of trespassing, vandalism or damage (to the extraction wells, monitoring wells, or fence); and
- there are no drinking water wells within the plume of contamination and none are expected to be drilled because of existing local and state requirements.

VII. Recommendations and Follow-Up Actions

There are no recommendations or follow-up actions associated with this review.

VIII. Protectiveness Statement

The groundwater contamination at the American Thermostat site is under control and there is no exposure to human receptors from site-related contaminants. The site is protective and expected to remain so, at least until the next five-year review. The remedy is protective of the environment.

IX. Next Review

The next five-year review for the American Thermostat site should be completed before September 2008.

Approved:

George Pavlou, Director
Emergency and Remedial Response Division

9/25/03
Date

Table 1: Chronology of Site Events	
Event	**Date(s)**
NYSDEC discovers improper disposal of chemicals at the site	1981
NYSDOH detects PCE and TCE contamination in wells in the vicinity of the site	1981
New York State enters into interim consent order with American Thermostat Corporation	1983
American Thermostat Corporation goes out of business	1985
Site is placed on National Priorities List	1986
Focused Feasibility Study for alternate water supply	1987
Record of Decision for alternate water supply	1988
Source control and groundwater Remedial Investigation/Feasibility Study initiation	1988
Record of Decision for source control	1990
Remedial design for alternate water supply	1991
Remedial design for building decontamination	1991
Completion of alternate water supply	1992
Completion of building decontamination	1992
Remedial design for soil remediation	1992
Remedial design for groundwater remedy	1993
Initiation of soil remediation	1993
Completion of Phase I of soil remediation	1995
Completion of Phase II of soil remediation	1996
Explanation of Significant Differences for soil remediation	1997
Initiation of construction for groundwater remedy	1997
Completion of construction for groundwater remedy, initiation of remedy	1998
Preliminary Site Close-Out Report	1998

Table 2: Annual Costs	
Estimated Costs for Contract Performance	**Cost per Year**
Annual O&M costs (lump sum subcontract)	$485,000
Supervising contractor oversight costs	$280,000
Total estimated cost	$765,000

Table 3: Documents, Data, and Information Reviewed in Completing the Five-Year Review
• Record of Decision (alternate water supply), EPA, January 1988
• Record of Decision (source control), EPA, June 1990
• LTEVF Operations Reports, prepared by O'Brien & Gere, Inc. for Foster Wheeler Environmental Corporation, 1996
• Remedial Action Report (source control), Foster Wheeler Environmental, July 1997
• Explanation of Significant Differences, EPA, July 1997
• Remedial Action Report (groundwater remedy), Foster Wheeler Environmental, September 1998
• Well Informational Manual, Foster Wheeler Environmental, August 1998
• Preliminary Site Close-Out Report, EPA, September 1998
• Extraction, Monitoring, and Residential Well Sampling Data, 1998 - 2003
• Operations, Maintenance, and System Effectiveness Reports, prepared by IT Corporation
• Groundwater Remediation Monthly Progress Reports (September 1998-March 2003), prepared by Foster Wheeler Environmental, Inc. for EPA
• Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils, EPA, November 2002
• EPA guidance for conducting five-year reviews and other guidance and regulations to determine if any new applicable or relevant and appropriate requirements relating to the protectiveness of the remedy have been developed since EPA issued the ROD

Table 4: Trichloroethylene and Tetrachloroethylene Concentrations in Bedrock Extraction Wells at the American Thermostat Superfund Site, Greene County, New York

Well Number	Highest Detected TCE Concentration (µg/l)[a]	April 2003 TCE Concentration (µg/l)	Highest Detected PCE Concentration (µg/l)[a]	April 2003 PCE Concentration (µg/l)
EW-1	120	ND	490	ND
EW-2	3200	42	19,000	320
EW-3	400	NS	100	NS
EW-4	1300	2.8	5,800	2.1
EW-5	2600	14	2,300	60
EW-6	3400	120	15,000	610
EW-7	4200	3000	32,000	4700
EW-8	1200	1.1	200	0.89
EW-9	1900	220	18,000	1200
EW-10	76	38	850	680
EW-11	180	8.9	1,300	3400
EW-12	470[b]	110	5,000[b]	1300
EW-13	82	0.43[c]	10	0.89[c]
EW-14	380	76	3800	63
EW-15	17[d]	ND	310[d]	2.3
EW-16	5500	1600	12000	2000

Notes:

a= highest detected concentration during first two years of operation

b= highest detected concentration since deepening of well on 9/00

c= (4/01) discontinued pumping and sampling

d= highest detected concentration since converted into extraction well on 9/00

e= highest detected concentration since converted into extraction well on 11/01

ND=not detected

Table 5: Trichloroethylene and Tetrachloroethylene Concentrations in Overburden Extraction Wells at the American Thermostat Superfund Site, Greene County, New York

Well Number	Highest Detected TCE Concentration (µg/l)	April 2003 TCE Concentration (µg/l)	Highest Detected PCE Concentration (µg/l)	Apri 2003 PCE Concentration (µg/l)
OW-1	1100	120	19,000	780
OW-2	640	59	5,100	1700
OW-3	850	530	22,000	16000
OW-4	200	87[f]	9,300	2000[f]
OW-5	5.5	ND	7,800	4600
OW-6	19	8.1	270	120
OW-7	240	180	14,000	1800
OW-8	1.2	0.53[c]	8.9	4.2[c]
OW-9	6.9	ND	1,200	280
OW-10	9.4	ND	1,400	470
OW-11	7500	80	34,000	410
OW-12	1300	22	1,600	140
OW-13	31	50	3800	2500
OW-14	2100	590	79000	35000
OW-15[d]	470	94	7800	1600
OW-16	770	7.8	5600	200

Notes:

c= (4/01) discontinued pumping and sampling
f= (10/01) no longer being sampled
ND=not detected

Table 6: Trichloroethylene and Tetrachloroethylene Concentrations in Monitoring Wells at the American Thermostat Superfund Site, Greene County, New York

Well Number	Highest Detected TCE Concentration (µg/l)	April 2003 TCE Concentration (µg/l)	Highest Detected PCE Concentration (µg/l)	April 2003 PCE Concentration (µg/l)
MW-1	5.5	1.6	52	ND
MW-2	190	ND	8	ND
MW-4	20	ND	660	ND
MW-5	120	1	660	1.3
MW-6	3.2	ND	97	ND
MW-8	38	ND	1,000	ND
MW-9	2.7	ND	55	ND
MW-10	2.1	ND	52	1.6
MW-11	4.2	ND	53	0.45
MW-12	6.3	ND	180	1

Notes:

ND=not detected

Table 7: Reduction of PCE Concentration in Influent Tank at the American Thermostat Site Water Treatment Plant[g]	
Sample Date	PCE Concentration in Influent Tank (µg/l)
October 1998	2,600
October 2001	1,200
October 2002	1,100

Notes:

g: Presently, the influent tank combines water from 9 bedrock and 13 overburden extraction wells.

Table 8: Acronyms Used in this Document	
ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EPA	United States Environmental Protection Agency
CIC	Community Involvement Coordinator
ESD	Explanation of Significant Differences
FFS	Focused Feasibility Study
MCL	Maximum Contaminant Level
NPL	National Priorities List
NYSDEC	New York State Department of Environmental Protection
NYSDOH	New York State Department of Health
PCE	Tetrachloroethylene
RA	Remedial Action
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
TCE	Trichloroethylene