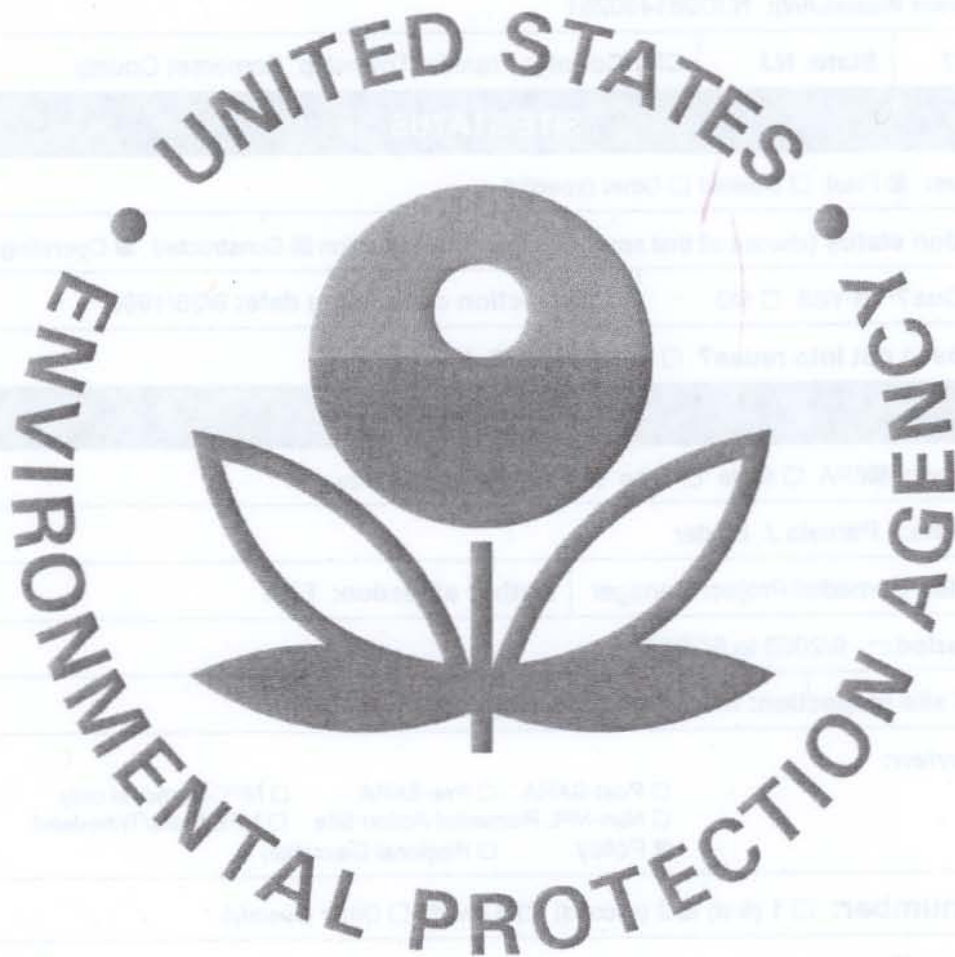


**SECOND FIVE-YEAR REVIEW REPORT  
HIGGINS FARM SUPERFUND SITE  
FRANKLIN TOWNSHIP, SOMERSET COUNTY, NEW JERSEY**



**Prepared by:  
U.S. Environmental Protection Agency  
Region II  
New York, New York**

**September 2008**

## Five-Year Review Summary Form

### SITE IDENTIFICATION

Site name (from WasteLAN): Higgins Farm

EPA ID (from WasteLAN): NJD981490261

Region: 2

State: NJ

City/County: Franklin Township, Somerset County

### SITE STATUS

NPL status:  Final  Deleted  Other (specify)

Remediation status (choose all that apply):  Under Construction  Constructed  Operating

Multiple Ous?  YES  NO

Construction completion date: 9/28/1998

Has site been put into reuse?  YES  NO  N/A

### REVIEW STATUS

Lead agency:  EPA  State  Tribe  Other Federal Agency

Author name: Pamela J. Baxter

Author title: Remedial Project Manager

Author affiliation: EPA

Review period:\*\* 9/2003 to 6/2008

Date(s) of site inspection: N.A. Daily operating facility

Type of review:

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

Review number:  1 (first)  2 (second)  3 (third)  Other (specify)

Triggering action:

- Actual RA Onsite Construction at OU #1  Actual RA Start at OU# 1  
 Construction Completion  Previous Five-Year Review Report  
 Other (specify)

Triggering action date (from WasteLAN): 9/29/2003

\* ["OU" refers to operable unit.]

\*\* [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

## Five-Year Review Summary Form (continued)

### *Issues, Recommendations, and Follow-Up Actions*

The selected remedy has been fully implemented. It includes ongoing operation, maintenance and monitoring activities. As anticipated by the decision documents, these activities are subject to routine modification and adjustment. NCH has made some modifications since taking over operations and it is anticipated that additional modifications and adjustments are appropriate. EPA is reviewing the draft Off-Site Investigation Report and anticipates some adjustments resulting from this report. This review identified two issues which could affect future protectiveness: 1) the boundaries of the plume need to be verified and 2) off-property groundwater concentrations exceed soil vapor screening values. Table 3, includes recommendations and follow-up actions to address these issues.

### *Protectiveness Statement*

The OU-1 remedy (public water supply extension) protects human health and the environment by controlling exposure pathways that could result in unacceptable risks. The OU-2 remedy protects human health and the environment in the short-term; however, in order for it to be protective in the long-term the issues raised in Table 3 need to be resolved. Since OU-2 is protective in the short-term, the Site is considered protective in the short-term.

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## Executive Summary

A five-year review for the Higgins Farm Superfund Site (Site), located in Franklin Township, Somerset County New Jersey has been completed. Two Record of Decisions (RODs) have been signed by EPA for the Site. The first ROD was signed on September 24, 1990 which selected an interim remedy to connect the potentially affected residents to an existing potable water supply to prevent ingestion of contaminated groundwater. A second ROD was signed on September 30, 1992 which selected a long-term solution, construction of an on-site treatment plant to treat contaminated groundwater, implementation of a sampling program, limited investigations to confirm sources of contamination were identified, and removal and proper disposal of contaminated material generated during Site related activities. Construction completion of the Site was on September 28, 1998. Based upon a review of the ROD, the Preliminary Close Out Report, the first five-year review and a number of reports prepared by a contractor and inspections of the Site, it has been concluded that the remedy is continuing to function as intended and is currently protective of human health and the environment. In order for it to be protective in the long-term, this report found that two issues need to be addressed.

## **I. Introduction**

This second five-year review for the Higgins Farm Superfund Site (Site), located in Franklin Township, Somerset County, New Jersey, was conducted by the U.S. Environmental Protection Agency (EPA) Region 2, in accordance with the Comprehensive Five-Year Review Guidance, OSWER Directive 9355.7-03B-P (June 2001). The purpose of five-year reviews 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 Site was addressed in two remedial phases. The first phase provided an alternate water supply for nearby residents. The second phase is the remediation of contaminated groundwater.

A policy review is triggered by the construction completion. Construction completion of this Site was documented in a Preliminary Close Out Report which was signed by EPA on September 28, 1998. While the Site remedies are intended to restore the Site to unlimited use without restriction, it will take more than five years to accomplish this level of clean up.

## **II. Site Chronology**

See Table 1 for the Site chronology.

## **III. Background**

### **Physical Characteristics**

The Higgins Farm Site is located in a rural residential area on County Route 518 in Franklin Township, Somerset County, New Jersey. The Site, which is approximately 75 acres in size, is currently owned by Mrs. Lisbeth Higgins and is operated as a cattle farm. The Site is primarily pasture land and is relatively flat and poorly drained. There are two residences on the farm, and other residences bordering the Site to the northeast and northwest. Trap Rock Industries Kingston Quarry borders the Site to the South.

The geology in the area surrounding the Higgins Farm Superfund Site is known as the Newark Basin and consists of primarily Triassic sedimentary and Jurassic igneous rocks. The rocks that formed within the Newark Basin are called the Newark Supergroup, and consist of sandstone, mudstone, siltstone, and shale

sedimentary rocks, which are interbedded with basalt flows and diabase intrusions. At the Site, a diabase intrusion predominates the bedrock. Open joints were frequently observed in the top 20 feet of bedrock, but decreased in frequency with depth. The structural geology indicates that steeply dipping faults occur under the Site.

Overlying the bedrock is a continuous layer of a fine-grained Saprolite-weathered diabase, and on top of this, sediment from the Raritan Formation which comprises the unconsolidated overburden. These sediments vary from 3 to 16 feet thick and are thickest in the Northern part of the Site.

Groundwater flow occurs in two separate hydrologic units beneath the Site: the overburden unit and the bedrock aquifer. Groundwater flow in the overburden unit occurs under unconfined conditions within the unconsolidated sediments overlying the bedrock aquifer.

Groundwater in the overburden discharges to streams, recharges the bedrock, or flows down the slope of the bedrock and discharges into seeps, streams, and wetlands. Groundwater flow in the bedrock occurs through secondary features such as fractures, joints, and cavities. The bedrock groundwater flow direction is very complex due to the infrequent fracturing. The shallow and deep aquifer potentiometric surfaces generally follow the topography of the Site under non-pumping conditions. Groundwater flow across the Site generally originates in a radial fashion from the area of highest topographic elevation in the north central part of the Site.

#### Land and Resource Use

Franklin Township is located within the Middlesex-Somerset-Hunterdon, New Jersey, Metropolitan Statistical Area. The area within a 1-mile radius of Higgins Farm is located in census tract 534, which covers a large portion of Franklin Township. According to the 2000 census tract, the population is 15,460 people. The land use at the Site and in the vicinity of the Site is residential, agricultural and commercial. The Higgins Farm Site continues to be used in farming by the Higgins family except for portions of the property currently used in the remediation of groundwater.

Access to the groundwater remediation system at the Site is limited by fences. The remediation system includes groundwater



extraction wells, underground conveyance piping to a treat plant building, tanks, and groundwater extraction wells. In addition, an access road and groundwater monitoring wells are present on Site.

#### History of Contamination

Mr. Clifford Higgins, Sr., operated a disposal business on Laurel Avenue approximately 1 mile from the Site beginning in the latter 1950s. Mr. Higgins continued to own and operate the business until approximately 1985. According to local residents, Higgins Farm may have been used for disposal of wastes from this business. Aerial photographs covering the period of time from 1940 to 1983 show disturbed areas in the area of the NJDEP fenced area, east of the excavation pit area, and in the former drum area. During the 1960s, municipal sludge and penicillin wastes were also used as fertilizers on the farm.

#### Initial Response

In December 1985, the Franklin Township Health Department found that elevated levels of chlorobenzene existed in a residential well located on Route 518, adjacent to the Site. The New Jersey Department of Environmental Protection (NJDEP) investigated and discovered a drum burial dump at the Site approximately forty yards from the contaminated well.

During the spring and summer of 1986, NJDEP sampled residential wells and soils on and in the vicinity of the Site. Analysis of the soil samples indicated the presence of volatile organic compounds (VOCs), pesticides, metals, and dioxins. Analysis of samples taken from ten nearby residential wells revealed that the wells were contaminated with VOCs. As a result, in November 1986, NJDEP established a "well impact area" near the Higgins Farm Site, which provides notice of installation of new wells within a one-mile radius of the Site. Thirty-one residences were included within the well impact area at Higgins Farm. EPA responded to the presence of contamination in drinking water wells neighboring the Site by providing bottled water to the potentially impacted residents. Carbon filters were installed in the residences in the spring of 1989.

#### Basis For Taking Action

EPA began a Remedial Investigation (RI) in late summer 1989. The purpose of the RI was to identify the nature and extent of

contaminant source areas; to define contamination of groundwater, soil, surface water and sediment; characterize Site hydrogeology; and to determine the risk to human health and the environment posed by the Site. Contaminants found in soil and groundwater included volatile organic contaminants, base/neutral compounds, metals, pesticides, and dioxins.

#### IV. REMEDIAL ACTIONS

##### Remedy Selection

On September 24, 1990, EPA issued the first ROD which selected an interim remedy to connect the potentially affected residential properties to an existing potable water supply to prevent ingestion of contaminated groundwater.

A second ROD was signed by EPA on September 30, 1992 which selected the long-term solution for the Higgins Farm Site. Specifically, the ROD outlined the following activities:

- Construction of an on-site treatment plant to treat the contaminated groundwater;
- Discharge of the treated groundwater to an on-site surface water body;
- Implementation of a sampling program involving monitoring wells and downgradient residential wells to evaluate off-site migration and the effectiveness of the groundwater extraction system;
- Limited investigations to confirm that all sources of contamination were identified; and
- Removal and proper disposal of contaminated materials which were generated during previous Site stabilization and remedial investigation activities that were presently stored on the Site.

The remedial action objectives were established to capture and treat the contaminated groundwater in an attempt to restore the aquifer to federal and state drinking water standards, to control or limit the future off-site migration of the contaminated groundwater, and to minimize the potential for direct exposure of the populace.

## Remedy Implementation

The interim remedy included the design and construction of a potable water supply line extension system and connection to an existing potable water supply system; continued operation and maintenance (O&M) of the existing carbon filter units until the potable water supply line was in place; environmental sampling of appropriate residential wells; and removal of carbon filter units and private well connections after the potable water supply line was installed. In August 1992, EPA's removal program completed the excavation of 94 drums and contaminated soils which were discovered during test pit excavation activities in the NJDEP fenced area. Other removal actions included the construction of a metal barn to house contaminated soil from the excavation pit area, drainage and backfilling of the excavation pit, and treatment and storage of the pumped liquids from the excavation pit. All known drums, hazardous waste and contaminated soils were removed from the Site and disposed of at an EPA-approved disposal facility. Post excavation sampling was conducted to ensure that all contamination was removed, and the area has been backfilled with clean material. More information for these removal actions is contained in the On Scene Coordinator's Closeout Reports.

The cancer and non-carcinogenic risks associated with the ingestion and dermal contact with contaminants in soils and sediments are below or within EPA's acceptable risk range. Hence, soils left on the Site do not pose a human health and/or environmental threat. However, groundwater associated with the Site does pose human health risks and must be treated.

Twenty-six residences were connected to the water main, which distributes potable water from South Brunswick's water supply system. Installation of the water line and the residential hook-ups was completed on May 11, 1993. Currently, NCH is checking and sampling some of the inactive private residential wells.

After clearing and grubbing activities for the construction of the groundwater treatment system had been completed, additional buried containers and drums were discovered at the Site and were removed by EPA in 1996.

The groundwater remedy consisted of installing 12 piezometers, 20 recovery wells, and associated piping, electrical and instrumental components. A groundwater treatment system was

constructed. A 100-foot by 120-foot prefabricated metal building was supplied and erected. The following is a list of tanks and equipment fabricated for the groundwater treatment system: 90-foot lightning stack, large fiberglass equalization tank, carbon steel tanks, air stripping system, clarifier, filter press, pump skids, pressure filter system, and ion exchange systems. The effluent is discharged to a pond that eventually flows into Carters Brook.

An off-site investigation was conducted to determine if the Site contaminants are migrating off-site. This information is documented in the Draft Off-Site Investigation Report, August 2008. Also, quarterly groundwater sampling events are conducted. The results of the latest data collected are present in the appendix section of this report.

EPA filed a complaint in federal district court against potentially responsible parties (PRPs), Mrs. Lisbeth Higgins, the FMC Corporation and the NCH Corporations in 1998, seeking reimbursement of response costs incurred in connection with the release or threatened release of hazardous substances at the Site. Consent decrees with the parties, valued at approximately \$31 million in work and reimbursement of response costs, were entered in October 2006 and August 2007. Also, as part of her settlement, Mrs. Higgins agreed to preserve her property as farmland.

#### Chronology of Groundwater Sampling Events

Fifteen conventional groundwater monitoring wells have been installed at the Site as part of the Site's groundwater monitoring program. Seven of the conventional monitoring wells were installed in the unconsolidated sediments overlying the bedrock aquifer, and are referred to as overburden wells. The remaining eight conventional monitoring wells were installed in the bedrock aquifer, which are known as bedrock wells.

Sampling events have been conducted at the Site since 1990. Three rounds of groundwater samples were collected from monitoring wells between 1990 and 1998. Mostly, semi-annual groundwater sampling has been conducted on the Site since April 2000. From April 2000 through March 2007, the analyte list included volatile organic compounds (VOCs), Target Analyte List (TAL) metals and a suite of natural attenuation parameters. In September 2007, TAL metals and natural attenuation parameters were deleted from the groundwater monitoring program, since past

sampling results indicated only non-detect concentrations. As a result, beginning with the third quarter of 2007, the groundwater monitoring program for the Site consists of groundwater elevation measurements and sampling for VOCs.

During the second quarter of 2008, groundwater monitoring and sampling activities were conducted between March 31 and April 9, 2008. All monitoring and sampling activities were conducted in accordance with the protocol set forth in the EPA approved Site-specific Quality Assurance Plan, Field Sampling Plan, the Groundwater Investigation Plan, and the revised monitoring plan approved in September 2007. In 2008, a change was made to use passive diffusion bag samplers for sampling the conventional monitoring wells at the Site.

During remedial action construction activities, six West Bay multi port sampling wells were installed at the Site. In March 2008, two Waterloo multi port sampling wells were installed at the Site. Water level measurements were obtained from the Waterloo wells by collecting hydrostatic pressure readings from the transducers by using the GeoKon Model GK-404 vibrating wire readout. The latest sampling results are reported in the Groundwater Monitoring Report-Second Quarter 2008 dated August 5, 2008.

The treatment system's influent and effluent water were collected on May 9, 2008, and were analyzed for compliance in accordance to the Discharge Monitoring Report. The results of the sampling event were reported to be below permit discharge equivalent limits.

#### System Operations/Operations and Maintenance

NCH Corporation took over operations and maintenance activities on September 9, 2006. NCH has optimized the treatment system, as recommended in the Remediation System Evaluation (RSE) Report, dated May 2004, in an effort to operate the system more efficiently, reduce operating costs, and improve technical operation. The RSE report concluded that the groundwater extraction system is generally operating in a way that achieves containment of the contaminant plume, although additional monitoring wells are recommended to verify plume capture. The groundwater extraction system has reduced the groundwater contaminant concentrations over the period of operation. Several wells have concentrations at or below cleanup levels and the RSE team recommended that they be turned off.

An update of all existing work plans is currently being conducted by NCH. Revisions to existing work plans are expected to be completed within the next few months. The modified Water Allocation Permit Equivalency was sent from the NJDEP on Oct 31, 2007. This Equivalency became effective on November 1, 2007. Upon receiving the approved Water Allocation Permit Equivalency, from NJDEP, the pumps in wells number 8, 10A, 11 and 16 have been upgraded to 10 gallons per minute (gpm) from 5 gallons gpm.

The total amount of water discharged for the second quarter period was recorded as 851,260 gallons at approximately (19.1 gpm). This total was taken from the plant mechanical effluent flow meter. As of August 2008, approximately 92,670,000 gallons of water was treated at the plant. At the end of the latest report period, August 31, 2008, 15 recovery wells were on-line and pumping between 4 and 10 gpm. Based on sampling data which indicated attainment of groundwater cleanup levels, well numbers 1, 3a and 5 were shut off on February 11, 2005 and well numbers 2 and 13 on July 13, 2005. Radio transceivers installed in February 2004 are functioning as desired. Permission was received from NJDEP to increase the pumping rate to 10 gpm in extraction wells 8, 10A, 11 and 16. The 10 gpm pumps were installed in November 2007 and are functioning as desired.

EPA has an interagency agreement with the U.S. Army Corps of Engineers (USACE) to conduct field oversight activities. The funds, which were negotiated during cost recovery negotiations with the PRPs, are used from a special account established for EPA's future cost.

#### V. Progress Since Last Review

The first five-year review of the Site was conducted in 2003 and it concluded that the remedy implemented from the September 1992 ROD, was fully protective of human health and the environment. Among other activities conducted during the first five-year review, an optimization study was conducted. At that time, the draft RSE report had recommendations to make the plant more efficient to operate. According to the recommendations made in the Final RSE report dated May 2004, on July 16, 2007, NCH streamlined the existing pump and treat system in order to allow the plant to operate more efficiently.

The plant was streamlined since the contaminant concentration levels have decreased and some concentration levels are below MCLs. The following plant changes were made: the reaction,

flocculation, and clarifier were taken off line in July 2007. The Granular Activated Carbon filters were brought on line in July 2007. Both Weak Acid Ion Exchange units were taken out of service in July 2007. The Regeneration water pumps became the Carbon Filter Backwash pumps. The Chelating Ion Exchange units have been taken off line since April 10, 2000. The air strippers were taken out of service in July 2007. All chemical feed systems were taken out of service in July 2007 with the exception of the Final pH control which was terminated in August 2007.

Sludge is pressed at the site since there are some solids, mainly iron, that are in the influent. The sludge is shipped to Republic Environmental in Hatfield PA as RCRA non-hazardous. Emptying and cleaning of all unused process tanks were completed in March 2008. The removal of all unneeded chemicals and cleaning of the tanks and associated piping was completed in December 2007. Computer logic software upgrades were installed in the plant in July 2008. Preventive maintenance is being performed as required and scheduled maintenance is being performed in a timely matter.

Site safety checks and safety meetings are conducted daily. No safety issues were noted. The safety shower and eyewash located outside with the chemical storage tanks were removed from service in December 2007, since Site related chemicals are no longer needed to operate the plant.

## **VI. FIVE-YEAR REVIEW PROCESS**

### **Administrative Components**

The five-year review team consisted of Ms. Pamela J. Baxter, Remedial Project Manager; Mr. Robert Alvey, Hydrogeologist; Mr. Charles Nace, Risk Assessor; and Mr. Thomas Roche, USACE (Long Term Remediation Activities-Oversight).

### **Community Involvement**

EPA's Community Involvement Coordinator for the Higgins Farm Superfund Site is Ms. Natalie Loney. An announcement was published in the Home News and Tribune, the area newspaper, on September 12, 2008, notifying the community of the five-year review process. The notice indicated that upon completion of the five-year review, the document would be available to the public at the Franklin Township Public Library located at 485

Demott Lane, Somerset, New Jersey. In addition, the notice included the RPM's name, address and telephone number for questions related to the five-year review process of the Higgins Farm Superfund Site in general.

#### Document Review

The documents, data, and information which were reviewed in completing this second five-year review are summarized in Table 2 (attached).

#### Data Review

The original construction of the groundwater extraction system consisted of 20 recovery wells with contingency plans for additional wells if deemed necessary. Plant operations began in May 1998. The goal of the groundwater portion of the selected remedy is to limit off-site migration and restore the groundwater quality to drinking water standards. The monitoring program stipulated in the ROD is intended to evaluate potential off-site contaminant migration as well as the effectiveness of the groundwater extraction system. This activity is documented in a draft Off-Site Investigation Report dated August 5, 2008, prepared by NCH. A preliminary review of this report indicates the presence of low levels volatile organic compounds located immediately downgradient of the Site, which warrant further evaluation.

Well data are presented in the appendix section of this document. There are two sections, metals detected in groundwater above New Jersey Groundwater Quality Standards for 2007 and Volatile Organic Compounds Above New Jersey Groundwater Quality Standards for 2007 and 2008. The wells data indicate that there are some exceedances in some of the wells. For example, regarding volatile organic contaminants there are exceedances of trichloroethene, tetrachloroethene, trichloroethane, dichloroethane, benzene, vinyl chloride, and tetrachloroethane in various wells. Also, there are metals exceedance such as aluminum, beryllium, chromium, and arsenic. There are high exceedances of iron and manganese, which are naturally occurring in that area.

#### Site Inspection

There is one plant operator on Site full time and USACE is on-site on a part-time basis. The implementation of the results of



the Optimization Study has led to a semi-automatic treatment system. EPA is on Site on a regular basis to attend monthly progress meetings and to occasionally observe and inspect Site activities. Therefore, no specific Site inspection was conducted for this five-year review. The Site is secured by fencing and all visitors are required to sign in.

#### Interviews/Meetings

Monthly meetings are held between the NCH's Project Coordinator, de Maximus, USACE, NJDEP, and EPA. Also, there is regular contact, via phone calls, emails and additional meetings between de Maximus, USACE, and EPA. No specific interviews were conducted.

### **VII. Technical Assessment**

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

Yes, the remedy is functioning as intended by the decision documents. The groundwater quality has not met the cleanup goals, but the concentrations have decreased over time. A Remedial System Evaluation was performed at this Site, and based on the recommendations of the RSE, the groundwater treatment system has been modified to enhance both the efficiency and economics of treatment. Pumping operations at some of the recovery wells also documented sufficient declines in contamination levels to warrant suspension of pumping at those locations. The recovery well network is planned to be optimized in 2008. (See appendix for well data)

Currently, there are no completed pathways for exposure to the contaminated groundwater for human health or ecological receptors; therefore, the remedy is currently protective of human health and the environment. The groundwater has not met the cleanup goals, although the concentrations have decreased over time.

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

*Human Health* - The exposure assumptions and toxicity data that were used in the human health risk assessment were valid at the time that the risk assessment was conducted. Given that the

contaminated groundwater is not currently being utilized as a potable water source, there are currently no complete pathways for human exposure, thus the current remedy is protective of human health. The cleanup levels for the groundwater have been identified as the federal and state drinking water standard maximum contaminant levels for groundwater qualities, whichever is lower. These standards are still valid, although they have not been attained at this time. The remedial action objectives presented in the RODs are still valid.

The previous five-year review (2003) indicated that the vapor intrusion pathway should be evaluated following the USEPA guidance document "Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils". The first step in this guidance document asks if volatile organic compounds are present in the groundwater at elevated concentrations. The answer to this question is yes, which leads to step two in the guidance document. Step two asks if there are currently (or potentially) inhabited buildings within 100 feet of the groundwater plume. The answer to this question is no, with the exception of the treatment facility located on the Site. Since there are no inhabitable buildings located within 100 feet of the groundwater plume, the vapor intrusion pathway can be considered to be incomplete at this time.

*Ecological* - The contaminated groundwater at the Site is not discharging to the local wetlands or surface water, therefore, there is no exposure to ecological receptors. Additionally, the wetlands located above the plume have been monitored to ensure that the extraction wells are not impacting the water levels in the wetlands. Based on the information provided during the Site visit, there does not appear to be any impacts to the wetlands from the extraction wells. The remedy being implemented is currently protective of the environment and ecological receptors.

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

No other information has come to light that could call into question the protectiveness of the remedy.

#### VIII. Recommendations and Follow-Up Actions

The selected remedy has been fully implemented. It includes ongoing operation, maintenance and monitoring activities. As

anticipated by the decision documents, these activities are subject to routine modification and adjustment. NCH has made some modifications since taking over operations and it is anticipated that additional modifications and adjustments are appropriate. EPA is reviewing the draft Off-Site Investigation Report and anticipates some adjustments resulting from this report. This review identified two issues which could affect future protectiveness: 1) the boundaries of the plume need to be verified and 2) off-property groundwater concentrations exceed soil vapor screening values. Table 3, includes recommendations and follow-up actions to address these issues.

**IX. Protectiveness Statement**

The OU-1 remedy (public water supply extension) protects human health and the environment by controlling exposure pathways that could result in unacceptable risks. The OU-2 remedy protects human health and the environment in the short-term; however, in order for it to be protective in the long-term the issues raised in Table 3 need to be resolved. Since OU-2 is protective in the short-term, the Site is considered protective in the short-term.

**X. Next Five-Year Review**

EPA will conduct another Five-Year review by September 2013.

Approved:



9/30/08

George Pavlou, Acting Director  
Emergency and Remedial Response Division

Date

Table 1 - Site Chronology

Event	Date(s)
NJDEP investigated drum activities at the Site.	January 2, 1986
NJDEP requested EPA to assume lead role in mitigating the Site.	March 1987
Higgins Farm is placed on the National Priorities List.	March 1989
EPA notified six Potentially Responsible Parties (PRPs) of potential liability and offered them the opportunity to conduct or finance the RI and FS.	March 1989
EPA offered the PRPs' the opportunity to install a potable water line along Route 518 to service impacted or potentially impacted residents.	October 17, 1989
The PRPs were informed that EPA had not received an acceptable offer to install the public water line.	February 1990
EPA released a Focused Feasibility Study report and Proposed Plan for alternate potable water supply line.	June 1990
EPA issued interim ROD for waterline.	September 24, 1990
Installation of potable waterline was completed by EPA.	December 21, 1992
EPA issued a second ROD for groundwater extraction and treatment system.	September 30, 1992
All potentially impacted residents were connected to the waterline.	May 11, 1993
EPA completed Design Basis Report.	December 1993
EPA signed Interagency Agreement with USACE to procure and manage a remedial design contractor.	March 17, 1995
Remedial Action contract awarded to Dow Environmental Inc.	August 31, 1995
USACE issued Notice to Proceed to Remedial Action contractor.	September 15, 1995
30-day Startup period commenced.	December 1, 1997

Event	Date (s)
Issuance of Certification of Compliance of Remedial Action activities.	May 13, 1998
Construction Completion of Site Activities	September 28, 1998
The commencement of the first of 10 years of the Long-Term Response Action under EPA.	November 1999
First Five-Year Review completed.	September 29, 2003
Remediation System Evaluation Final Report prepared by USACE-Hazardous, Toxic and Radioactive Waste Center of Expertise.	May 2004
FMC and NCH Corporations' consent decrees were lodged into U.S. District Court, for the District of New Jersey.	August 10, 2006
NCH took over long term remediation activities.	September 9, 2006
FMC and NCH consent decree was entered into Court.	October 26, 2006
NCH paid EPA \$1,000,000 for past response costs.	November 20, 2006
FMC paid EPA \$15,607,836.14 for response costs.	November 21, 2006
NCH streamlined the pump and treat system.	July 16, 2007
Mrs. Higgins' (owner of the Site) consent decree was entered into court.	August 20, 2007
Mrs. Higgins paid EPA \$1,300,000 for response costs.	September 17, 2007
A Franklin Township meeting was held to preserve the Higgins Site as farmland.	November 15, 2007
Second Five-Year Review completed.	September, 2008

**Table 2 - Documents, Data, and Information Reviewed in  
Completing the Five-Year Review**

Draft Off-Site Investigation Report, August 5, 2008

Groundwater Monitoring Report Second Quarter 2008

Monthly Progress Reports

Record of Decision, EPA, September 1990

Record of Decision, EPA, September 30, 1992

Remediation System Evaluation Report, May 2004

**Table 3 - Recommendations and Follow-Up Actions**

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
The boundaries of the plume need to be verified	EPA is reviewing the draft Off-Site Investigation Report.	EPA	EPA	12/08	N	N
The boundaries of the plume need to be verified	Further monitoring, including possible additional monitoring and extraction wells, may be needed to verify and control the boundaries of the plume.	NCH	EPA	12/10	N	Y
Off-property groundwater concentrations exceed soil vapor screening levels	If off-site development in the path of the plume were to occur, the vapor intrusion pathway should be evaluated.	NCH	EPA	To be determined	N	Y

Appendix

Wells Data



**Metals Detected in Groundwater Above New Jersey Groundwater Quality Standards Year 2007  
Higgins Farm Superfund Site Somerset County, New Jersey**

Well Number	Sample Date	Sample Depth (ft)	Aluminum (ug/L)	Arsenic (ug/L)	Beryllium (ug/L)	Cadmium (ug/L)	Chromium (ug/L)	Iron (ug/L)	Lead (ug/L)	Manganese (ug/L)	Nickel (ug/L)	Silver (ug/L)	Zinc (ug/L)
<b>New Jersey Groundwater Quality Standard (µg/L)</b>			200	3	1	4	70	300	5	50	100	40	2000
<b>Overburden Monitoring Well</b>													
MW-01S	03/06/06	11	344	<8	<1	<1	5	527	<3	216	7	<5	<1.3
MW-01S	03/05/07	11	174 B	<4.5	0.19 B	<0.5	7.2 B	143 B	<2.2	318	4.3 B	<1.2	<1.3
MW-02S	03/06/06	12.5	3800	<8	<1	<1	26	8330	<3	288	24	<5	24
MW-02S	03/07/07	12.5	4100	<4.5	<1	<0.5	3.2	4850	<2.2	160	9.1	<1.2	<1.3
MW-05S	03/10/06	8	102	<8	<1	<1	<5	337	<3	7	<5	<5	<1.3
MW-05S	03/02/07	8	<77.4	<4.5	<1	<0.5	<2.8	<39.7	<2.2	5	<3.9	<1.2	62
MW-06S	03/08/06	13.5	1070	<8	<1	<1	65	1570	<3	115	17	<5	<1.3
MW-06S	09/21/06	13.5	NR	<3	<0.3	<0.4	NR	NR	<2	NR	NR		<1.3
MW-06S	03/07/07	13.5	29600	8.8	2	<0.5	1060	51800	20.4	1480	113	<1.2	<1.3
MW-08S	03/07/06	6.5	3980	<8	<1	<1	11	5960	<3	61	11	<5	<1.3
MW-08S	03/06/07	6.5	102 B	<4.5	<1	<0.5	4 B	1300	<2.2	156	<3.9	<1.2	<1.6 B (U)
MW-09S	03/09/06	11	60	<8	<1	<1	<5	124	<3	<5	<5	<5	<1.3 (R)
MW-09S	03/05/07	11	<77.4	<4.5	<1	<0.5	5.1 B	198	<2.2	5.2 B	<3.9	<1.2	<4
MW-10S	03/07/06	7.5	601	<8	<1	<1	<5	2070	<3	19	<5	<5	<1.3
MW-10S	09/21/06	7.5	NR	<3	<0.3	<0.4	NR	NR	<2	NR	NR		<1.3
MW-10S	03/07/07	7.5	<77.4	<4.5	<1	<0.5	<2.8	157	<2.2	17	<3.9	<1.2	<1.3
<b>Bedrock Aquifer Monitoring Wells</b>													
MW-01D	03/06/06	100	27	<8	<1	<1	<5	1690	11	28	<5	<5	18
MW-01D	03/05/07	100	<77.4	<4.5	<1	<0.5	<2.8	4870	<2.2	79.7	<3.9	<1.2	<1.3
MW-02D	03/06/06	100	<25	<8	<1	<1	<5	11800	<3	492	<5	<5	147
MW-02D	03/07/07	100	8390	<4.5	0.37 B	<0.5	9.4 B	158000	22.2	715	23.5 B	<1.2	25
MW-03D	03/07/06	100	25	<8	<1	<1	<5	946	<3	192	<5	<5	18
MW-03D	03/06/07	100	<77.4	<4.5	<1	<0.5	<2.8	11500	<2.2	339	<3.9	<1.2	NR
MW-04D	03/08/06	100	40	<8	<1	<1	<5	350	<3	129	<5	<5	<1.3
MW-04D	03/06/07	100	<77.4	<4.5	<1	<0.5	<2.8	694	<2.2	150	<3.9	<1.2	<1.3

**Metals Detected in Groundwater Above New Jersey Groundwater Quality Standards Year 2007**  
**Higgins Farm Superfund Site Somerset County, New Jersey**

Well Number	Sample Date	Sample Depth (ft)	Aluminum (ug/L)	Arsenic (ug/L)	Beryllium (ug/L)	Cadmium (ug/L)	Chromium (ug/L)	Iron (ug/L)	Lead (ug/L)	Manganese (ug/L)	Nickel (ug/L)	Silver (ug/L)	Zinc (ug/L)
<b>New Jersey Groundwater Quality Standard (µg/L)</b>			<b>200</b>	<b>3</b>	<b>1</b>	<b>4</b>	<b>70</b>	<b>300</b>	<b>5</b>	<b>50</b>	<b>100</b>	<b>40</b>	<b>2000</b>
MW-05D	03/10/06	100	126	<8	<1	<1	<5	31400	<3	333	<5	<5	<1.3
MW-05D	03/02/07	100	<77.4	<4.5	<1	<0.5	<2.8	26800	3	497	<3.9	<1.2	<1.3
MW-06D	03/09/06	100	<25	<8	<1	<1	<5	42000	<3	1240	<5	<5	<1.3
MW-06D	03/07/07	100	<77.4	<4.5	<1	<0.5	<2.8	52100	7.7	1160	8.1 B	<1.2	<1.3
MW-07D	03/09/06	100	26	<8	<1	<1	<5	18600	<3	532	<5	<5	<1.3 (R)
MW-07D	03/06/07	100	<77.4	<4.5	0.15 B	<0.5	<2.8	22800	2.3 B	489	<3.9	<1.2	<4
MW-08D	03/07/06	100	26	<8	<1	<1	<5	1010	<3	189	<5	<5	<1.3
MW-08D	03/06/07	100	<77.4	4.7	<1	<0.5	<2.8	33000	4.8	259	<3.9	<1.2	<1.3
<b>Westbay Wells</b>													
WB-11	03/15/06	42	<25	<8	<1	<1	<5	441	<3	165	<5	<5	<1.3
WB-11	03/16/06	179	<25	<8	<1	<1	7	<830	<3	<5	5	<5	15
WB-11	03/16/06	89	<25	<8	<1	<1	<5	441	<3	165	<5	<5	22
WB-11	03/02/07	179	<77.4	<4.5	<1	<0.5	9.8	71.8	<2.2	3.7	<3.9	<1.2	<1.3
WB-11	03/02/07	89	<77.4	<4.5	<1	<0.5	3.3	133	<2.2	70.8	<3.9	<1.2	<1.3
WB-11	03/02/07	42	<77.4	<4.5	<1	<0.5	<2.8	2130	<2.2	448	<3.9	<1.2	<1.3
WB-12	03/15/06	45	161	<8	<1	<1	<5	145	<3	<5	<5	<5	17.1
WB-12	03/15/06	140	<25	<8	<1	<1	12	6930	<3	431	9	<5	<1.3
WB-12	09/20/06	140	NR	<3	<0.3	<0.4	<0.1 (U)	NR	<2	NR	NR		35
WB-12	09/20/06	45	NR	<3	<0.3	<0.4	<0.1	NR	<2	NR	NR		39
WB-12	03/02/07	45	<77.4	<4.5	<1	<0.5	7.4	4460	<2.2	383	5	<1.2	<25 (U)
WB-12	03/05/07	140	260	<4.5	<1	<0.5	4.3 B	134 B	<2.2	<2.9	<3.9	<1.2	<3.4 (U)
WB-13	03/17/06	190	383	<8	<1	<1	<5	478	<3	8	<5	<5 (R)	2650
WB-13	03/17/06	140	32	<8	<1	<1	<5	<830	<3	<5	<5	<5 (R)	<1.4 (U)
WB-13	03/17/06	51	<25	<8	<1	<1	<5	141	<3	72	<5	<5 (R)	<22 (U)
WB-13	03/05/07	51	<77.4	<4.5	<1	<0.5	6.9 B	259	<2.2	83.9	6.4 B	<1.2	2860
WB-13	03/05/07	140	<77.4	<4.5	<1	<0.5	<2.8	84.3 B	<2.2	3.1 B	<3.9	<1.2	<5.4 (U)
WB-13	03/08/07	190	478	5.9	<1	<0.5	15.8	656	<2.2	11 B	12.5 B	<1.2	20

**Metals Detected in Groundwater Above New Jersey Groundwater Quality Standards Year 2007  
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Well Number	Sample Date	Sample Depth (ft)	Aluminum (ug/L)	Arsenic (ug/L)	Beryllium (ug/L)	Cadmium (ug/L)	Chromium (ug/L)	Iron (ug/L)	Lead (ug/L)	Manganese (ug/L)	Nickel (ug/L)	Silver (ug/L)	Zinc (ug/L)
<b>New Jersey Groundwater Quality Standard (µg/L)</b>			<b>200</b>	<b>3</b>	<b>1</b>	<b>4</b>	<b>70</b>	<b>300</b>	<b>5</b>	<b>50</b>	<b>100</b>	<b>40</b>	<b>2000</b>
WB-14	02/28/07	107.5	<77.4	<4.5	<1	<0.5	4.3	184	<2.2	<2.9	<3.9	<1.2	15.5
WB-14	02/28/07	42.5	<77.4	<4.5	<1	<0.5	5.1	7680	2.2	449	<3.9	<1.2	17.3
WB-14	03/01/07	194.5	96.3	<4.5	<1	<0.5	4	71.8	<2.2	<2.9	<3.9	<1.2	17.1
WB-14	03/01/07	149.5	723	<4.5	<1	<0.5	13.4	1870	<2.2	14.8	10.9	<1.2	27.2
WB-15	03/23/06	110	123	<8	<1	<1	<5	123	<3	<5	<5	<5 (R)	86
WB-15	03/23/06	75	35	<8	<1	<1	<5	<830	<3	<5	<5	<5 (R)	<1.3
WB-15	03/23/06	150	94	<8	<1	<1	<5	<830	<3	<5	<5	<5 (R)	<1.3
WB-15	03/01/07	75	<77.4	<4.5	<1	<0.5	<2.8	403	<2.2	140	<3.9	<1.2	11.8
WB-15	03/01/07	150	201	<4.5	<1	<0.5	12.6	146	<2.2	6.1	4.4	<1.2	20.8
WB-15	03/01/07	110	112	<4.5	<1	<0.5	12	187	<2.2	3.7	4.8	<1.2	62.4
WB-16	02/26/07	152	8.1 B	<3.2	<0.3	<0.4	13.6	112 B	<2.7	8.9 B	9.4 B	<1.4	165
WB-16	02/28/07	110	95.5 B	<3.2	<0.3	<0.4	12.7	141 B	<2.7	20.8	8.4 B	<1.4	39.2
WB-16	02/28/07	28	71.1 B	<3.2	<0.3	<0.4	16.2	116 B	<2.7	85.4	10.6 B	<1.4	108
<b>Extraction Wells</b>													
RW-01	03/01/06	NA	<500	<3	<1	<2	<2	564 (J)	<3	53	<19	<3	<1.3
RW-01	02/28/07	NA	<62.6	<3.2	<0.3	<0.4	<1.6	507	<2.7	56.8	<2.4	<1.4	<1.3
RW-02	03/01/06	NA	26	<1	<1	<2	<5	3280 (J)	<3	404	<5	<8	20
RW-02	03/08/07	NA	<77.4	<4.5	<1	<0.5	<2.8	1790	<2.2	307	<3.9	<1.2	<1.3
RW-03	03/08/06	NA	<25	<8	<1	<1	<5	2810	<3	430	<5	<5	<1.3
RW-03	02/28/07	NA	496	5.6	0.69	<0.5	17.2	197000	26.7	835	9.9	<1.2	<1.3
RW-03A	03/01/06	NA	58	<1	<2	<2	7	574 (J)	<3	19	5	<8	<1.3
RW-03A	02/28/07	NA	<77.4	<4.5	<1	<0.5	3.8	91.6	<2.2	7.9	<3.9	<1.2	<1.3
RW-04	03/01/06	NA	<800	<1	<2	<2	<5	222 (J)	<3	23	<5	<8	<1.3
RW-04	02/28/07	NA	<62.6	<3.2	<3	<0.4	<1.6	2010	<2.7	53.7	<2.4	<1.4	<1.3
RW-05	03/01/06	NA	35	<1	<2	<2	<5	358 (J)	<3	57	<5	<8	<1.3
RW-05	02/28/07	NA	73.3 B	<3.2	<3	<0.4	3.3 B	449	<2.7	79	<2.4	<1.4	<1.3
RW-06	03/01/06	NA	<800	<1	<2	<2	<5	<830 (J)	<3	<10	<5	<4	<1.3
RW-06	03/08/07	NA	<77.4	<4.5	<1	<0.5	<2.8	734	<2.2	14 B	<3.9	<1.2	<1.3

**Metals Detected in Groundwater Above New Jersey Groundwater Quality Standards Year 2007**  
**Higgins Farm Superfund Site Somerset County, New Jersey**

Well Number	Sample Date	Sample Depth (ft)	Aluminum (ug/L)	Arsenic (ug/L)	Beryllium (ug/L)	Cadmium (ug/L)	Chromium (ug/L)	Iron (ug/L)	Lead (ug/L)	Manganese (ug/L)	Nickel (ug/L)	Silver (ug/L)	Zinc (ug/L)
<b>New Jersey Groundwater Quality Standard (µg/L)</b>			<b>200</b>	<b>3</b>	<b>1</b>	<b>4</b>	<b>70</b>	<b>300</b>	<b>5</b>	<b>50</b>	<b>100</b>	<b>40</b>	<b>2000</b>
RW-07	03/02/06	NA	<800	<1	<2	<2	<9	1290 (J)	<3	170	<5	<4	<1.3
RW-07	03/08/07	NA	408	<3.2	<3	<0.4	<1.6	1790	<2.7	116	<2.4	<1.4	<1.3
RW-08	03/02/06	NA	<800	<1	<2	<2	<23	2860 (J)	<3	747	11	<4	<1.3
RW-08	03/01/07	NA	<77.4	<4.5	<1	<0.5	<2.8	2760	<2.2	734	8.2	<1.2	16
RW-08A	03/02/06	NA	<800	<1	<2	<2	<9	5610 (J)	<3	339	<5	<4	<1.3
RW-08A	03/08/07	NA	70.4 B	<3.2	<3	<0.4	2.5 B	4230	<2.7	59.3	<2.4	<1.4	<1.3
RW-09	03/02/06	NA	<800	<1	<2	<2	<5	1860 (J)	<3	166	<5	<4	16
RW-09	09/20/06	NA	NR	<3	<3	<0.4	NR	NR	<2	NR	NR		15
RW-09	03/08/07	NA	226	<3.2	<3	<0.4	<1.6	2580	<2.7	634	9.9 B	<1.4	15
RW-09A	03/02/06	NA	25	<1	<2	<2	<5	231 (J)	<3	21	<5	<4	<1.3 (R)
RW-09A	03/08/07	NA	433	<3.2	<3	<0.4	<1.6	83.2 B	<2.7	10.7 B	<2.4	<1.4	<1.3
RW-10	03/03/06	NA	679	<1	<2	<2	7	12300 (J)	<3	355	<5	<4	<1.3 (R)
RW-10	03/01/07	NA	<77.4	<4.5	<1	<0.5	7.7	946	<2.2	79.1	<3.9	<1.2	<5.8
RW-10A	03/03/06	NA	40	<1	<1	<1	<5	9830 (J)	<3	696	5	<5	<1.3
RW-10A	02/27/07	NA	<62.6	<3.2	<3	<0.4	<1.6	748	<2.7	54	4.4 B	<1.4	<1.3
RW-11	03/03/06	NA	28	<8	<1	<1	<5	1310 (J)	<3	526	<5	<5	26
RW-11	02/27/07	NA	72.6 B	<3.2	<3	<0.4	3.4 B	125	<2.7	335	<2.4	<1.4	26
RW-12	03/03/06	NA	26	<8	<1	<1	<5	159 (J)	<3	63	<5	<5	72
RW-12	02/27/07	NA	11 B	<3.2	<3	<0.4	<1.6	347	<2.7	96.8	<2.4	<1.4	41
RW-13	03/03/06	NA	30	<8	<1	<1	<5	<830 (J)	<3	33	<5	<5	<1.3
RW-13	03/02/07	NA	<77.4	<4.5	<1	<0.5	<2.8	143	<2.2	33.6	<3.9	<1.2	<1.3
RW-14	03/15/06	NA	<25	<8	<1	<1	<5	7420	<3	627	7	<5	<8.2 (U)
RW-14	03/01/07	NA	<77.4	<4.5	0.11	<0.5	<2.8	17300	<2.2	652	7.3	<1.2	<1.24 (U)
RW-15	03/23/06	NA	29	<8	<1	<1	<5	<830	<3	6	<5	<5 (R)	<1.3
RW-15	03/01/07	NA	<77.4	<4.5	<1	<0.5	<2.8	<39.7	<2.2	3.4	<3.9	<1.2	243
RW-16	03/16/06	NA	<25	<8	<1	<1	<5	16100	<3	524	<5	<5	26
RW-16	03/01/07	NA	<77.4	<4.5	<1	<0.5	<2.8	3670	<2.2	458	<3.9	<1.2	46

**Metals Detected in Groundwater Above New Jersey Groundwater Quality Standards Year 2007  
Higgins Farm Superfund Site Somerset County, New Jersey**

Well Number	Sample Date	Sample Depth (ft)	Aluminum (ug/L)	Arsenic (ug/L)	Beryllium (ug/L)	Cadmium (ug/L)	Chromium (ug/L)	Iron (ug/L)	Lead (ug/L)	Manganese (ug/L)	Nickel (ug/L)	Silver (ug/L)	Zinc (ug/L)
<b>New Jersey Groundwater Quality Standard (ug/L)</b>													
			200	3	1	4	70	300	5	50	100	40	2000

Notes:

- Detections greater than the analytical reporting limit are shown in **bold italic** font.
- Detections greater than the NJDEP Ground Water Quality Standards are shown in **shaded cells**
- < = analyte not detected at the indicated reporting limit
- NA = Not applicable
- NR = No sample was collected or sample was not analyzed for specific analyte.
- Data qualifiers assigned by the laboratory are shown in regular typeface.
- Data qualifiers assigned by the contractor during data validation are shown in parenthesis.
- B = The analyte was detected in an associated method blank.
- (R) = The sample result was rejected due to deficiencies in the ability to analyze the sample and meet QC criteria. Assigned as a result of data validation.
- (U) = The concentration of the analyte was less than 5-times the concentration measured in associated blanks. Assigned as a result of data validation.

**Volatile Organic Compounds Detected in Groundwater Above New Jersey Groundwater Quality Standards Years 2007 and 2008  
Higgins Farm Superfund Site Somerset County, New Jersey**

Well Number	Sample Date	Sample Depth (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	1,1-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	1,1,2,2-Tetrachloroethane (µg/L)	1,1,2-Trichloroethane (µg/L)	1,2-Dichloroethane (µg/L)	Benzene (µg/L)	Chlorobenzene (µg/L)
<b>New Jersey Groundwater Quality Standard (µg/L)</b>											
			1	1	1	1	1	3	1	1	50
<b>Overburden Monitoring Well</b>											
MW-01S	03/05/07	11	<1	<1	<2	<5	<1	<3	<2	<1	<5
MW-01S	04/07/08	11	<1	<1	<2	<5	<1	<3	<2	<1	<5
MW-02S	03/07/07	12.5	<1	<1	<2	<5	<1	<3	<2	<1	<5
MW-02S	04/07/08	12.5	<1	<1	<2	<5	<1	<3	<2	<1	<5
MW-05S	03/02/07	8	<1	<1	NR	<5	<1	<3	<2	<1	<5
MW-05S	04/07/08	8	<1	<1	<2	<5	<1	<3	<2	<1	<5
MW-06S	03/07/07	13.5	320	3.2 J	<10	<25	<5	<15	<10	<5	<25
MW-06S	09/26/07	13.5	980	15	<20	<50	<10	<30	<20	<10	<50
MW-06S	04/07/08	13.5	6.3	<1	<2	<5	<1	<3	<2	<1	<5
MW-08S	03/06/07	6.5	<1	<1	<2	<5	<1	<3	<2	<1	<5
MW-08S	04/07/08	6.5	<1	<1	<2	<5	<1	<3	<2	<1	<5
MW-09S	03/05/07	11	2.7	2.3	<2	<5	<1	<3	<2	<1	<5
MW-09S	04/07/08	11	2	1.5	<2	<5	<1	<3	<2	<1	<5
MW-10S	09/28/07	7.5	<1	<1	<2	<5	<1	2.3	<2	<1	<5
MW-10S	04/07/08	7.5	<1	<1	<2	<5	<1	2.3	<2	<1	<5
<b>Bedrock Aquifer Monitoring Wells</b>											
MW-01D	03/05/07	100	<1	<1	<2	<5	<1	<3	<2	<1	<5
MW-01D	04/07/08	50	<1	<1	<2	<5	<1	<3	<2	<1	<5
MW-01D	04/07/08	75	<1	<1	<2	<5	<1	<3	<2	<1	<5
MW-01D	04/07/08	100	<1	<1	<2	<5	<1	<3	<2	<1	<5
MW-01D	04/07/08	125	<1	<1	<2	<5	<1	<3	<2	<1	<5
MW-01D	04/07/08	150	<1	<1	<2	<5	<1	<3	<2	<1	<5

**Volatile Organic Compounds Detected in Groundwater Above New Jersey Groundwater Quality Standards Years 2007 and 2008  
Higgins Farm Superfund Site Somerset County, New Jersey**

Well Number	Sample Date	Sample Depth (feet)	Tetrachloro-ethene (µg/L)	Trichloro-ethene (µg/L)	1,1-Dichloro-ethene (µg/L)	Vinyl chloride (µg/L)	1,1,2,2-Tetrachloro-ethane (µg/L)	1,1,2-Trichloro-ethane (µg/L)	1,2-Dichloro-ethane (µg/L)	Benzene (µg/L)	Chloro-benzene (µg/L)
<b>New Jersey Groundwater Quality Standard (µg/L)</b>			<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>50</b>
MW-02D	03/07/07	100	<1	<1	<2	<5	<1	<3	<b>0.9 J</b>	<1	<5
MW-02D	04/07/08	50	<1	<1	<2	<5	<1	<3	<b>0.7</b>	<1	<5
MW-02D	04/07/08	75	<1	<1	<2	<5	<1	<3	<b>0.7</b>	<1	<5
MW-02D	04/07/08	100	<1	<1	<2	<5	<1	<3	<b>1</b>	<1	<5
MW-02D	04/07/08	125	<1	<1	<2	<5	<1	<3	<b>0.9</b>	<1	<5
MW-02D	04/07/08	150	<1	<1	<2	<5	<1	<3	<b>1</b>	<1	<5
MW-03D	03/06/07	100	<1	<1	<2	<5	<1	<b>1</b>	<2	<1	<5
MW-03D	04/07/08	50	<1	<1	<2	<5	<1	<3	<2	<1	<5
MW-03D	04/07/08	75	<1	<1	<2	<5	<1	<3	<2	<1	<5
MW-03D	04/07/08	100	<1	<1	<2	<5	<1	<b>0.6</b>	<b>3.4</b>	<1	<5
MW-03D	04/07/08	125	<1	<1	<2	<5	<1	<b>0.9</b>	<b>4.6</b>	<1	<5
MW-03D	04/07/08	150	<1	<1	<2	<5	<1	<b>0.8</b>	<b>4.8</b>	<1	<5
MW-04D	03/06/07	100	<1	<b>3.6</b>	<2	<5	<1	<3	<2	<1	<5
MW-04D	04/07/08	50	<1	<b>4</b>	<2	<5	<1	<3	<2	<1	<5
MW-04D	04/07/08	75	<1	<b>3.9</b>	<2	<5	<1	<3	<2	<1	<b>0.3</b>
MW-04D	04/07/08	100	<b>1.8</b>	<b>2</b>	<2	<5	<1	<3	<2	<1	<5
MW-04D	04/07/08	125	<b>4.9</b>	<b>3.6</b>	<2	<5	<1	<3	<b>0.4</b>	<1	<b>0.3</b>
MW-04D	04/07/08	150	<b>6.6</b>	<b>3.8</b>	<2	<5	<1	<3	<2	<1	<5
MW-05D	03/02/07	100	<1	<1	NR	<5	<1	<3	<2	<1	<5
MW-05D	04/07/08	50	<1	<1	<2	<5	<1	<3	<2	<1	<5
MW-05D	04/07/08	75	<1	<1	<2	<5	<1	<3	<2	<1	<5
MW-05D	04/07/08	100	<1	<1	<2	<5	<1	<3	<2	<1	<5
MW-05D	04/07/08	125	<1	<1	<2	<5	<1	<3	<2	<1	<5
MW-05D	04/07/08	150	<1	<1	<2	<5	<1	<3	<2	<1	<5

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<b>New Jersey Groundwater Quality Standard (µg/L)</b>											
			1	1	1	1	1	3	1	1	50
MW-06D	03/07/07	100	<1	2.4	<2	<5	<1	<3	<2	0.6 J	<5
MW-06D	04/07/08	50	<1	1.8	<2	<5	<1	<3	<2	0.5	<5
MW-06D	04/07/08	75	<1	1.6	<2	<5	<1	<3	<2	0.4	<5
MW-06D	04/07/08	100	<1	1.6	<2	<5	<1	<3	<2	0.3	<5
MW-06D	04/07/08	125	<1	1.5	<2	<5	<1	<3	<2	0.4	<5
MW-06D	04/07/08	150	<1	1.7	<2	<5	<1	<3	<2	0.3	<5
MW-07D	03/06/07	100	<1	1.6	<2	<5	<1	<3	<2	<1	1.5 J
MW-07D	04/07/08	50	<1	0.8	<2	<5	<1	<3	<2	<1	0.7
MW-07D	04/07/08	75	<1	0.8	<2	<5	<1	<3	<2	<1	0.7
MW-07D	04/07/08	100	<1	0.8	<2	<5	<1	<3	<2	<1	0.8
MW-07D	04/07/08	110	<1	0.9	<2	<5	<1	<3	<2	<1	0.9
MW-08D	03/06/07	100	<1	<1	<2	<5	<1	<3	<2	<1	<5
MW-08D	04/07/08	50	<1	<1	<2	<5	<1	<3	<2	<1	<5
MW-08D	04/07/08	75	<1	<1	<2	<5	<1	<3	<2	<1	<5
MW-08D	04/07/08	100	<1	<1	<2	<5	<1	<3	<2	<1	<5
MW-08D	04/07/08	125	<1	<1	<2	<5	<1	<3	<2	<1	<5
MW-08D	04/07/08	150	<1	<1	<2	<5	<1	<3	<2	<1	<5
<b>Westbay Wells</b>											
WB-11	03/02/07	42	12	5.7	NR	<5	<1	<3	<2	<1	<5
WB-11	03/02/07	89	26	7.2	NR	<5	<1	<3	<2	8.4	7.5
WB-11	03/02/07	179	53	7.4	NR	0.3	<1	<3	1.3	37	17
WB-11	04/08/08	42	13	4.7	<2	<5	<1	<3	<2	<1	<5
WB-11	04/08/08	89	17	3.5	<2	<5	<1	<3	<2	4.7	4.8 J
WB-11	04/08/08	179	68	8.5	<2	<5	<1	<3	1.1 J	34	16



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Well Number	Sample Date	Sample Depth (feet)	Tetrachloro-ethene (µg/L)	Trichloro-ethene (µg/L)	1,1-Dichloro-ethene (µg/L)	Vinyl chloride (µg/L)	1,1,2,2-Tetrachloro-ethane (µg/L)	1,1,2-Trichloro-ethane (µg/L)	1,2-Dichloro-ethane (µg/L)	Benzene (µg/L)	Chloro-benzene (µg/L)
<b>New Jersey Groundwater Quality Standard (µg/L)</b>											
			1	1	1	1	1	3	1	1	50
WB-12	03/02/07	45	<1	1.2	NR	<5	<1	<3	<2	0.7	1.7
WB-12	03/05/07	140	34	14	2.3	<5	<1	<3	<2	0.8 J	<5
WB-12	09/21/07	45	<1	1.9	<2	<5	<1	<3	0.3 J	1.2	1.7 J
WB-12	09/21/07	140	66	26	3.9	0.6 J	<1	<3	1 J	2.5	0.7 J
WB-12	04/08/08	45	<1	1.1	<2	<5	<1	<3	<2	0.9 J	1.4 J
WB-12	04/08/08	140	46	19	3.4	0.5 J	<1	<3	1 J	2	0.8 J
WB-13	03/05/07	51	2.8	11	<2	<5	<1	0.4 J	0.3 J	0.7 J	0.8 J
WB-13	03/05/07	140	7.1	14	<2	<5	<1	0.4 J	0.3 J	0.8 J	1 J
WB-13	03/08/07	190	2.9	1.5	<2	<5	<1	<3	<2	<1	<5
WB-13	04/08/08	51	3.8	13	<2	<5	<1	<3	<2	0.6 J	1 J
WB-13	04/08/08	140	7.2	14	<2	<5	<1	<3	<2	0.8 J	1.4 J
WB-13	04/08/08	190	2.3	1.4	<2	<5	<1	<3	<2	<1	<5
WB-14	02/28/07	42.5	<1	0.3	<2	<5	<1	<3	<2	<1	<5
WB-14	02/28/07	107.5	<1	0.3	<2	0.8	<1	<3	<2	<1	<5
WB-14	03/01/07	149.5	<1	<1	<2	0.5	<1	<3	<2	<1	<5
WB-14	03/01/07	194.5	<1	<1	<2	0.5	<1	<3	<2	<1	<5
WB-15	03/01/07	75	<1	<1	NR	<5	<1	<3	<2	<1	<5
WB-15	03/01/07	110	<1	0.4	NR	1.8	<1	<3	<2	<1	<5
WB-15	03/01/07	150	<1	<1	NR	1.1	<1	<3	<2	<1	<5
WB-16	02/28/07	28	<1	<1	<2	<5	<1	<3	<2	<1	<5
WB-16	02/28/07	110	<1	<1	<2	0.7 J	<1	<3	<2	<1	<5
WB-16	02/26/07	152	<1	<1	<2	<5	<1	<3	<2	<1	<5

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Well Number	Sample Date	Sample Depth (feet)	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	1,1-Dichloroethene (µg/L)	Vinyl chloride (µg/L)	1,1,2,2-Tetrachloroethane (µg/L)	1,1,2-Trichloroethane (µg/L)	1,2-Dichloroethane (µg/L)	Benzene (µg/L)	Chlorobenzene (µg/L)
<b>New Jersey Groundwater Quality Standard (µg/L)</b>											
			1	1	1	1	1	3	1	1	50
<b>Waterloo Wells</b>											
WS-17	12/04/07	60.5	1.4	2.2	1.2 J	0.3 J	<1	1.7 J	0.7 J	1.6	0.9 J
WS-17	12/04/07	109	1	2.1	1.1 J	0.4 J	<1	1.5 J	0.6 J	1.4	0.7 J
WS-17	04/08/08	60.5	<1	0.4 J	<2	<5	<1	0.5 J	0.5 J	1	0.9 J
WS-17	04/08/08	109	1	1.5	<2	<5	<1	0.7 J	0.5 J	1.4	1.2 J
WS-18	12/04/07	59.5	2.1	2.3	<2	<5	<1	0.5 J	0.4 J	1.8	1.5 J
WS-18	12/04/07	107	<1	0.5 J	<2	<5	<1	<3	0.4 J	1.4	1.1 J
WS-18	04/08/08	59.5	<1	<1	<2	<5	<1	0.7 J	0.4 J	1.7	1.7 J
WS-18	04/08/08	107	<1	<1	<2	<5	<1	<3	<2	0.9 J	1 J
<b>Extraction Wells</b>											
RW-01	02/28/07	NA	<1	<1	<2	<5	<1	<3	<2	<1	<5
RW-01	04/09/08	NA	<1	<1	<2	<5	<1	<3	<2	<1	<5
RW-02	03/08/07	NA	<1	1.4	<2	12	<1	27	67	<1	0.6 J
RW-02	04/09/08	NA	<1	<1	<2	2.3 J	<1	3.9	24	<1	<5
RW-03	02/28/07	NA	0.8	5.8	0.8	7	0.8	180	41	<1	<5
RW-03	04/09/08	NA	<1	1.5	<2	5.2	<1	37	82	<1	<5
RW-03A	02/28/07	NA	<1	<1	<2	<5	<1	14	<2	<1	<5
RW-03A	04/09/08	NA	<1	<1	<2	<5	<1	27	<2	<1	<5
RW-04	02/28/07	NA	<1	0.3 J	0.5 J	<5	<1	0.5 J	0.6 J	<1	<5
RW-04	04/09/08	NA	<1	<1	<2	<5	<1	0.6 J	<2	<1	<5
RW-05	02/28/07	NA	<1	<1	<2	<5	<1	<3	<2	<1	<5
RW-05	04/09/08	NA	<1	<1	<2	<5	<1	<3	<2	<1	<5

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<b>New Jersey Groundwater Quality Standard (µg/L)</b>											
			1	1	1	1	1	3	1	1	50
RW-06	03/08/07	NA	0.6 J	<1	<2	<5	<1	<3	<2	<1	<5
RW-06	04/09/08	NA	2.3	0.7 J	<2	<5	<1	<3	<2	<1	<5
RW-07	03/08/07	NA	89	8.2	<2	<5	<1	<3	<2	<1	<5
RW-07	04/09/08	NA	97	13	<2	<5	<1	<3	<2	<1	<5
RW-08	03/01/07	NA	11	5.6	NR	<5	<1	<3	<2	<1	<5
RW-08	04/07/08	NA	12	5.5	<2	<5	<1	<3	<2	<1	<5
RW-08A	03/08/07	NA	0.6 J	0.9 J	<2	<5	<1	<3	<2	<1	<5
RW-08A	04/09/08	NA	<1	0.9 J	<2	<5	<1	<3	<2	<1	<5
RW-09	03/08/07	NA	1.3	2.1	<2	<5	<1	<3	<2	<1	<5
RW-09	09/26/07	NA	1.1	1.8	<2	<5	<1	<3	<2	<1	<5
RW-09	04/07/08	NA	1.2	1	<2	<5	<1	<3	<2	<1	<5
RW-09A	03/08/07	NA	2.5	1.2	<2	<5	<1	<3	<2	<1	<5
RW-09A	04/09/08	NA	1.3	0.6 J	<2	<5	<1	<3	<2	<1	<5
RW-10	03/01/07	NA	0.7	4.7	NR	<5	<1	<3	<2	<1	<5
RW-10	04/07/08	NA	<1	0.7 J	<2	<5	<1	<3	<2	<1	<5
RW-10A	02/27/07	NA	11	9.5	<2	<5	1.1	0.9 J	<2	<1	<5
RW-10A	04/07/08	NA	8.1	6.4	<2	<5	0.8 J	0.5 J	<2	<1	0.7 J
RW-11	02/27/07	NA	92	82	1.7 J	<5	22	15	1.5 J	<1	<5
RW-11	04/07/08	NA	85	63	<2	<5	19	10	<2	<1	<5
RW-12	02/27/07	NA	0.8 J	0.8 J	<2	<5	<1	<3	<2	<1	<5
RW-12	04/07/08	NA	<1	0.6 J	<2	<5	<1	<3	<2	<1	<5

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<b>New Jersey Groundwater Quality Standard (µg/L)</b>											
			<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>50</b>
RW-13	03/02/07	NA	<1	<1	NR	<5	<1	<3	<2	<1	<5
RW-13	04/09/08	NA	<1	<1	<2	<5	<1	<3	<2	<1	<5
RW-14	03/01/07	NA	<b>2.9</b>	<b>3.4</b>	<2	<b>1.1</b>	<1	<b>0.4</b>	<b>12</b>	<b>0.4</b>	<b>25</b>
RW-14	04/09/08	NA	<b>1 J</b>	<1	<2	<5	<1	<3	<2	<1	<5
RW-15	03/01/07	NA	<b>0.6</b>	<b>0.3</b>	<2	<5	<1	<3	<2	<1	<5
RW-15	04/09/08	NA	<b>2.2</b>	<b>3.1</b>	<2	<b>2.5 J</b>	<1	<b>36</b>	<b>14</b>	<1	<b>5</b>
RW-16	03/01/07	NA	<b>170</b>	<b>17</b>	<2	<5	<1	<3	<b>0.6</b>	<b>1.2</b>	<b>3.6</b>
RW-16	04/07/08	NA	<b>120</b>	<b>12</b>	<2	<5	<1	<3	<2	<b>0.9 J</b>	<b>2.3 J</b>

**Notes:**

Detections greater than the analytical reporting limit are shown in **bold italic** font.

Detections greater than the NJDEP Ground Water Quality Standards are shown in **shaded cells**

< = analyte not detected at the indicated reporting limit

NA = Not applicable

NR = No sample was collected or sample was not analyzed for specific analyte.

Data qualifiers assigned by the laboratory are shown in regular typeface.

J = The associated numerical value is the approximate concentration of the analyte in the sample.