Second Five-Year Review Report

for

North Penn Area 1
Superfund Site

Souderton
Montgomery County, PA

September 2008

Prepared By:
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Approved By:

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Date:

9/16/08

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List of Acronyms

1,1-DCA	1,1-dichloroethane
1,1-DCE	1,1-dichloroethene
1,2-DCE	cis- and trans-1,2-dichloroethene
1,1,1-TCA	1,1,1-trichloroethane
ARARs	Applicable or Relevant and Appropriate Requirements
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Contaminant of Concern
COE	U.S. Army Corps of Engineers
EPA	Environmental Protection Agency
ESD	Explanation of Significant Differences
GKM	Granite Knitting Mill
GPRA	Government Performance and Results Act
IAG	Interagency Agreement
MCL	Maximum Contaminant Level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
NPWA	North Penn Water Authority
O&M	Operations and Maintenance
OU	Operable Unit
ppb	Parts Per Billion
PADEP	Pennsylvania Department of Environmental Protection
PCE	Perchloroethene/Tetrachloroethene
PCOR	Preliminary Close Out Report
POTW	Publicly Owned Treatment Works
PRP	Potentially Responsible Party
RA	Remedial Action
RAO	Remedial Action Objective
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
SDWA	Safe Drinking Water Act
TCE	Trichloroethene
VOC	Volatile Organic Compound

Executive Summary

The North Penn 1 Site is located in the Borough of Souderton in Montgomery County, Pennsylvania. As a result of the contamination identified, the Site was placed on the NPL on March 31, 1989. EPA issued a Record of Decision (ROD) for the Site on September 30, 1994. The contaminants of concern are VOCs, primarily perchloroethene (PCE) and trichloroethene (TCE). The remedy selected included soil excavation with off-site disposal and a groundwater extraction system with discharge to a Publicly Owned Treatment Works (POTW).

The ROD divided the remedial work into two separate remedial actions. The first operable unit (OU) was the source control operable unit (OU1). The selected remedy for OU1 included the excavation of contaminated soils at each of three properties (Gentle Cleaners, Parkside Apartments, and Granite Knitting Mill (GKM)) with off-site disposal. The second OU was for groundwater contamination (OU2). The selected interim remedy for OU2 consisted of pumping the upper interval of the GKM well and the entire NPWA S9 well.

On October 29, 1997, EPA issued an Explanation of Significant Differences (ESD) for the Site. The purpose of this ESD was to document the determination that no soil would be removed from the Parkside Apartments since PCE levels were below the remediation goal established in the ROD. This ESD also documented EPA's decision not to pump well S9 because of the low concentrations of PCE detected in the well during the Remedial Investigation/Feasibility Study (RI/FS) and Remedial Design (RD) studies in addition to a change in the clean up goal for the aquifer from background to the Maximum Contaminant Level (MCL). A second ESD for the September 30, 1994 ROD was issued on September 24, 1998 to document EPA's decision that the interim extraction system selected for OU2 should be sufficient to serve as the final remedy for the contaminated groundwater.

As part of the Remedial Action (RA), a total of 482 tons of contaminated soil were excavated from the entire backyard at the Gentle Cleaners property and in four (4) different areas at the GKM property. The groundwater extraction system was installed at the GKM well and consisted of an extraction pump and conveyance piping, with direct discharge to the sanitary sewer.

In February 2005, the groundwater extraction system associated with the GKM well was shut down. Concentrations of PCE within this well were below the cleanup standard, but one of the monitoring wells, S1, located approximately 200 feet southwest and downgradient of the GKM well, showed elevated levels of PCE which reached concentrations as high as 8,300 ppb. EPA's contractor is currently tasked to install a pump, electric, and a pipeline to the sanitary sewer so that by early fall a groundwater pump and treat system will begin operating at well S1.

The remedy at OU1, the source control operable unit, is protective of human health and the environment. The contaminated soil identified during the remedial investigation was removed to the cleanup levels established in the ROD and any potential exposure risk to this soil has been eliminated. Furthermore, this source of contamination migrating to the groundwater was removed.

While the remedy at OU2, groundwater contamination, is expected to achieve protectiveness in the long-term, there are several issues that need to be resolved. The groundwater extraction system associated with the GKM well was shut down in February 2005 since concentrations of PCE within this well were below the cleanup standard. However, monitoring well S1, located 200 feet southwest and downgradient of the GKM well, showed elevated levels of PCE, which reached concentrations as high as 8,300 ppb. The persistent, high concentrations of PCE in monitoring well S1 should be further evaluated with respect to identifying any remaining source in the soils or shallow bedrock. More frequent sampling of the S1 monitoring well should occur. Optimization of the current groundwater extraction system is currently underway and will include bringing well S1 on-line as the extraction well. Additionally, the remedy for the Site should be modified to require institutional controls.

A protectiveness determination for this Site is being deferred at this time. A determination regarding the short-term protectiveness of the remedy is being deferred until additional information regarding 1,4-dioxane is collected, and the vapor intrusion pathway is evaluated. Due to the high concentrations of shallow groundwater contamination in monitoring well S1, a protectiveness determination of the groundwater cannot be made at this time until further information is obtained. The time required to perform additional investigations and gather information regarding the long-term pumping effects of well S1 will be approximately 18 months. After EPA and Pennsylvania Department of Environmental Protection (PADEP) have a chance to evaluate that information, EPA will make a protectiveness determination regarding the Site.

GPRA Measure Review:

As part of this Five Year Review, the Government Performance and Results Act (GPRA) Measures have also been reviewed. The GPRA Measures and their status are provided as follows:

Environmental Indicators

Human Health: The current Environmental Indicator is Human Exposure Under Control (HEUC). However, following this Five Year Review, the Environmental Indicator will be updated to Insufficient Data to Determine Human Exposure Control Status (HEID).

Groundwater Migration: Groundwater Migration Insufficient Data (GMID)

Sitewide Ready for Anticipated Use (RAU): The Site is not Site-Wide Ready for Anticipated Use (SWRAU) but is expected to achieve SWRAU on June 30, 2010.

Five-Year Review Summary Form

SITE IDENTIFICATION

Site name: North Penn Area 1

EPA ID: PAD002342475

Region: 3	**State:** PA	**City/County:** Borough of Souderton, Montgomery

SITE STATUS

NPL status: ✓ Final ☐ Deleted ☐ Other (specify)_____

Remediation Status (choose all that apply): ☐ Under Construction ✓ Operating ☐ Complete

Multiple OUs?* ✓ YES ☐ NO	**Construction completion date:** September 24, 1998

Has site been put into reuse? ☐ YES ☐ NO ✓ NA

REVIEW STATUS

Lead agency: ✓ EPA ☐ State ☐ Tribe ☐ Other Federal Agency _____

Author name: Stacie L. Peterson

Author title: Remedial Project Manager	**Author Affiliation:** U.S. EPA - Region 3

Review period: June 2008 - September 2008

Date(s) of site inspection: June 17, 2008

Type of review: ✓ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only ☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead ☐ 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# _____

☐ Construction Completion ✓ Previous Five-Year Review Report

☐ Other (specify)

Triggering action date: September 26, 2003

Due date (five years after triggering action date): September 26, 2008

* "OU" refers to operable unit.

Five-Year Review Summary Form, cont'd.

Issues:

The following issues were identified in the Five-Year Review:

- One of the monitoring wells, S1, has shown significant and persistent concentrations of tetrachloroethene (PCE).
- Vapor intrusion has been identified as a potential new migration pathway for volatile contaminants.
- EPA has recently become aware that many VOC sites also contain 1,4-dioxane, a solvent stabilizer which has not been sampled for at this Site.
- The remedy has no established institutional controls.

Recommendations and Follow-up Actions:

- The recommendations and follow-up actions for the high concentrations of PCE in the monitoring well focus on extraction of the contaminated groundwater within the well, further investigations to identify the source and extent of the contamination, and more frequent sampling of the S1 monitoring well.
- The potential for vapor intrusion to the residences located in close proximity to the groundwater contamination should be evaluated.
- 1,4-dioxane should be added to the list of analytes included in the groundwater monitoring program.
- Modify the remedy to address institutional controls.

Statement of Protectiveness:

The remedy at OU1, the source control operable unit, is protective of human health and the environment. The contaminated soil identified during the remedial investigation was removed to the cleanup levels established in the ROD and any potential exposure risk to this soil has been eliminated. Furthermore, this source of contamination migrating to the groundwater was removed.

While the remedy at OU2, groundwater contamination, is expected to achieve protectiveness in the long-term, there are several issues that need to be resolved. The groundwater extraction system associated with the GKM well was shut down in February 2005 since concentrations of PCE within this well were below the cleanup standard.

However, monitoring well S1, located 200 feet southwest and downgradient of the GKM well, showed elevated levels of PCE, which reached concentrations as high as 8,300 ppb. The persistent, high concentrations of PCE in monitoring well S1 should be further evaluated with respect to identifying any remaining source in the soils or shallow bedrock. More frequent sampling of the S1 monitoring well should occur. Optimization of the current groundwater extraction system is currently underway and will include bringing well S1 on-line as the extraction well. Additionally, the remedy for the Site should be modified to require institutional controls.

A protectiveness determination for this Site is being deferred at this time. A determination regarding the short-term protectiveness of the remedy is being deferred until additional information regarding 1,4-dioxane is collected, and the vapor intrusion pathway is evaluated. Due to the high concentrations of shallow groundwater contamination in monitoring well S1, a protectiveness determination of the groundwater cannot be made at this time until further information is obtained. The time required to perform additional investigations and gather information regarding the long-term pumping effects of well S1 will be approximately 18 months. After EPA and Pennsylvania Department of Environmental Protection (PADEP) have a chance to evaluate that information, EPA will make a protectiveness determination regarding the Site.

U.S. Environmental Protection Agency Region III
Five-Year Review Report
North Penn Area 1
Superfund Site
Borough of Souderton,
Montgomery County, Pennsylvania

I. Introduction

The purpose of the Five-Year Review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports. In addition, five-year review reports identify issues, if any, found during the review and will identify recommendations to address them. This Five-Year Review report for the North Penn Area 1 Superfund Site will become a part of the site file and the Administrative Record.

The Environmental Protection Agency (EPA) is preparing this Five-Year Review report pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) § 121 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA §121 states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgement of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

The Agency interpreted this requirement further in the NCP; 40 C.F.R. § 300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

US EPA, Region 3 has conducted the Five-Year Review of the remedial action implemented at the North Penn Area 1 Superfund Site ("North Penn 1 Site" or "Site") in the Borough of Souderton, Montgomery County, Pennsylvania. This review was conducted for the entire site by

the Remedial Project Manager (RPM) from June 2008 through September 2008. This report documents the results of the Five-Year Review.

This is the second policy Five-Year Review for the North Penn Area 1 Site. The triggering action for this review is the signature date of the first Five-Year Review signed on September 26, 2003.

II. Site Chronology

Table 1 lists the chronology of events at the North Penn Area 1 Site.

Table 1. Chronology of Site Events

Event	Date
North Penn Water Authority (NPWA) discovers tetrachloroethene (PCE) contamination in well S9; sampling is initiated	1979
Site discovery report completed	July 1986
Site proposed to National Priorities List (NPL)	January 22, 1987
Final NPL listing	March 31, 1989
Remedial Investigation (RI) report completed	March 1993
Feasibility Study (FS) report completed	June 1994
Record Of Decision (ROD) selecting remedy is signed	September 30, 1994
Remedial Design (RD) approved by EPA	September 12, 1996
EPA issued Explanation of Significant Differences (ESD #1) for not pumping well S9 and not removing soil at the Parkside Apartments property	October 29, 1997
Start of Construction for Soil Removal & Groundwater Treatment	June 8, 1998
Construction for Operable Unit (OU) #1 (OU1) (soil removal)	June - July 1998
Construction for OU #2 (OU2) (groundwater treatment)	June - July 1998
Remedial action completion report issued for OU1 and OU2	August 1998

Event	Date
EPA issued second ESD (ESD #2) establishing the interim Remedial Action (RA) for OU2 as the final remedy for the site	September 24, 1998
Preliminary Close Out Report (PCOR) signed	September 24, 1998
First Five-Year Review Completed	September 26, 2003

III. Background

Physical Characteristics

The North Penn 1 Site is located in the Borough of Souderton in Montgomery County, Pennsylvania. The Site is located south of the intersection of Main Street and Green Street. It encompasses the area surrounding the following three properties: Gentle Cleaners, Granite Knitting Mills, and Parkside Apartments.

Land and Resource Use

The Site is an area that contains a mixture of commercial and residential properties. An estimated 75,000 people obtain drinking water from public and private wells within 3 miles of the site. All residences within the immediate area use public drinking water supplies. Due to the topography and bedrock conditions, the groundwater flow in the immediate area follows the slope of the land surface (to the southwest). Figure 1 is a site map of the area.

History of Contamination

The North Penn 1 Site is one of 12 sites identified in the North Penn area on the basis of contamination of groundwater by volatile organic compounds (VOCs) in production wells. The contamination at this Site was first noted in 1979 in the North Penn Water Authority (NPWA) well S9. The well was immediately taken out of service because of high tetrachloroethene (PCE) concentrations found in the groundwater. Sampling was conducted at several wells in the area to determine the concentrations of contamination in the groundwater. The following contaminants were identified:

- 1,1,1-trichloroethane (1,1,1-TCA)
- 1,1-dichloroethane (1,1-DCA)
- 1,1-dichloroethene (1,1-DCE)
- cis- and trans-1,2-dichloroethene (1,2-DCE)
- trichloroethene (TCE)
- tetrachloroethene (PCE)

These contaminants were found in several wells at concentrations of up to 250 parts per billion (ppb).

As a result of the contamination identified, the Site was proposed for the National Priorities List (NPL) in January 22, 1987 and was placed on the NPL in March 31, 1989.

EPA identified five facilities in the area that may have contributed to the ground water contamination. As part of the Remedial Investigation/Feasibility Study (RI/FS), no significant contamination was found at two of the facilities. The remaining three facilities found to have soil and groundwater contamination were Gentle Cleaners, Granite Knitting Mills (GKM), and Parkside Apartments.

Gentle Cleaners, a dry cleaning business, began operating before 1953 and used PCE. It was documented that a 75 gallon spill of PCE occurred in the early 1970s at Gentle Cleaners. Discharge of PCE to a sink that drained into the same area of the spill may have contributed to soil contamination. Granite Knitting Mills operated a dry cleaning machine using PCE from 1967 to 1979. Property owners reported discharges from the facility into the alley that runs along the southeast side of the building. These discharges were described as solvents and dyes. The Parkside Apartments once included a dry cleaning business.

Initial Response Activities

After discussions with the five facilities that may have contributed to the groundwater contamination, the owners or operators of the properties indicated that they were not willing and/or able to perform or finance activities at the Site to prevent a release or threatened release of hazardous substances, pollutants, or contaminants. Therefore, in 1991, EPA initiated the RI/FS activities with funds from the Hazardous Substance Superfund, as authorized by Section 104 of CERCLA, 42 U.S.C. S 7604.

Basis for Taking Action

During the RI/FS, EPA sampled the groundwater and soil. Sampling and analysis of soil and groundwater detected VOCs, primarily PCE and TCE. A summary description of the soil and groundwater results are described below.

Soil

At all three facilities, Gentle Cleaners, GKM, and Parkside Apartments, the contamination found was primarily PCE. At Gentle Cleaners, the highest concentrations of PCE were detected in samples from the 6- to 10-foot interval in the backyard of the facility. The highest concentration at the facility was found to be 300,000 ppb. At the GKM facility, the highest concentration of PCE was from the 6- to 8-foot level and was found to be 6,900 ppb. At the Parkside Apartments, the highest concentration of PCE, located next to the building, was found to be 120 ppb.

Groundwater

VOCs, particularly PCE and TCE, were detected in the groundwater at the Site. The highest concentrations of contamination occurred in the wells at the center of the Site, including, but not limited to, the GKM well and NPWA well S9. PCE was detected at or above the Maximum Contaminant Level (MCL) of 5 ppb only in well S9.

Based on the RI/FS, EPA determined that actual or threatened releases of hazardous substances from the Site, if not addressed by implementing a cleanup action, may present an imminent and substantial endangerment to public health, welfare, or the environment.

IV. Remedial Actions

Remedy Selection

After reviewing the result of the RI/FS, EPA issued a Record of Decision (ROD) for the Site on September 30, 1994. The contaminants of concern are VOCs, primarily PCE and TCE. The remedy selected included soil excavation and groundwater pump and treat.

To address the contamination, three remedial action objectives (RAOs) were established for the Site, as described in the ROD.

- Remove the potential exposure risk from the contaminated soil;
- Eliminate the source of contamination migrating to groundwater;
- Prevent the spread of contaminated groundwater.

The ROD divided the remedial work into two separate remedial actions. The first operable unit (OU) was the source control operable unit (OU1). The ROD selected a final remedial action for OU1, which addresses the soil contamination that is contributing to groundwater contamination. The second OU is for groundwater contamination (OU2). The groundwater remedy selected in the ROD was an interim action, and EPA later selected it as the final groundwater remedy.

The selected remedy for OU1 included the excavation of contaminated soils at each of the three properties (Gentle Cleaners, GKM, and Parkside Apartments) with off-site disposal. Soils were to be excavated until the PCE levels reached those identified in Table 2.

Table 2. Soil Remediation Goals for the North Penn 1 Site

Property	PCE Soil Remediation Goal
Gentle Cleaners	270 ppb
Granite Knitting Mills	260 ppb
Parkside Apartments	820 ppb

The interim remedy for OU2 consisted of pumping two wells: (1) the upper interval of the GKM well (the top 30 to 40 feet); and (2) the entire NPWA S9 well, which was approximately 270 feet deep. The extracted water from these wells would be combined prior to treatment. An option considered in the ROD for treatment was the direct discharge of the extracted water to a Publicly Owned Treatment Works (POTW).

Remedy Implementation

On February 2, 1995, EPA entered into an interagency agreement (IAG) with the U.S. Army Corps of Engineers (USACE) to conduct the Remedial Design (RD) for the Site. EPA approved the design on September 12, 1996. As part of the RD, soil sampling was conducted at the three properties of concern to determine the volume of soil that would need to be removed. Levels of contamination in soils at the Parkside Apartments property were below the remediation goals established in the ROD. Therefore, excavation of soils was not required at this property, only at the GKM and the Gentle Cleaners properties. Also, as part of the RD activities, three new wells were installed (S1, S2, and D3). These new wells, in addition to well S9, were sampled at that time. Since sampling results in all wells revealed low concentrations of contamination, EPA determined that extracted water would be discharged to the sanitary sewer to be treated at the POTW.

On October 29, 1997, EPA issued an Explanation of Significant Differences (ESD). The purpose of this ESD was to document the determination that no soil would be removed from the Parkside Apartments since PCE levels were below the remediation goal established in the ROD. This ESD also documented EPA's decision not to pump well S9 because of the low concentrations of PCE detected in the well during the RI/FS and RD studies in addition to a change in the cleanup goal for the aquifer from background to MCL. At the time the ROD was prepared, the Commonwealth of Pennsylvania's remediation standards required that groundwater be cleaned to background levels, i.e. those levels of each contaminant that would be found in the area in the absence of a source of contamination (0 for PCE). Subsequent to the issuance of the ROD, the Commonwealth of Pennsylvania signed into law the Land Recycling and Remediation Standards Act (ACT II of 1995). The Pennsylvania Department of Environmental Protection identified Act 2 as an applicable or relevant and appropriate requirement (ARAR). EPA determined that Act II does not, under the circumstances at the Site, impose any requirements

that are more stringent than the federal standards. Based on this change in Pennsylvania's remediation standards, EPA determined that Maximum Contaminant Levels (MCLs) would be used as the cleanup goals for the Site instead of background levels. The MCLs are the maximum permissible concentrations of a chemical in drinking water as established in the Safe Drinking Water Act (SDWA). Therefore, EPA determined that pumping of well S9 was not necessary since the concentrations of PCE contamination did not exceed the MCL.

On March 26, 1998, EPA entered into an IAG with the USACE to conduct the remedial action at the Site. USACE hired Roy F. Weston Inc. (WESTON) to conduct the construction activities. On June 8, 1998, WESTON mobilized to the site. A total of 482 tons of contaminated soil were excavated from the entire backyard at the Gentle Cleaners property and in four (4) different areas at the GKM property. The groundwater extraction system was installed at the GKM well, consisting of an extraction pump and conveyance piping, with direct discharge to the sanitary sewer for treatment at the sewage treatment plant. In addition, samples were collected from the three existing monitoring wells (S1, S2, and D3) and well S9. Construction activities were completed on July 13, 1998.

A second ESD (for the September 30, 1994 ROD) was issued on September 24, 1998 to document EPA's decision that the interim extraction system selected for OU2 should be sufficient to serve as the final remedy for the contaminated groundwater. Therefore, the interim action conducted during construction activities was determined to be the final remedial action for OU2.

The Site achieved construction completion status when the Preliminary Close Out Report (PCOR) was issued by EPA on September 24, 1998.

System Operation/Operation and Maintenance

A system of monitoring wells was installed to monitor the cleanup progress of the contaminated groundwater (D3, S1, S2, and S9). On October 30, 2002, a new monitoring well, S3, was drilled. It was used as a replacement to monitoring well S9 because the North Penn Water Authority shut down the S9 well. The monitoring program required quarterly sampling for the first two years and semi-annual sampling thereafter until contaminants of concern reached their MCL. Currently, monitoring wells D3, S1, S2, and S3 are sampled twice per year.

In February 2005, the groundwater remediation system associated with the GKM well was shut down. Concentrations of PCE within this well were below the cleanup standard, but one of the monitoring wells, S1, located approximately 200 feet southwest and downgradient of the GKM well, showed elevated levels of PCE which reached concentrations as high as 8,300 ppb. The groundwater from the GKM well is no longer being extracted and sent to the POTW for treatment.

V. Progress Since Last Five-Year Review

Since the date of the last review, sampling of the monitoring wells has continued semiannually.

In February 2005, the groundwater extraction system associated with the GKM well was shut down. From December 2002 - December 2004, concentrations of PCE within the GKM well were below the cleanup standard. However, since 1998, monitoring well S1, which is located near the GKM well, has continued to show elevated concentrations of PCE, as compared to the concentrations detected during the RD sampling. The last Five-Year Review recommended conducting an investigation to determine the source of contamination detected in well S1. In May 2006, a seven-day pump test was conducted in well S1. Several samples were collected throughout the pump test at S1 for analysis of PCE. The results of the analysis showed persistent high concentrations of PCE contamination at well S1, which further supported the decision to utilize the S1 extraction well to remediate the groundwater in lieu of the GKM well. Furthermore, the sustained elevated concentrations of PCE throughout the test was suggestive of a potential source remaining either in soils or in the shallow bedrock, which may require additional investigations at or near well S1 to identify the source of the high concentrations of the groundwater contamination at this well. In June 2008, soil boring sampling with a geoprobe was performed for vapor screening near the S1 monitoring well. This sampling indicated total VOCs in the soil of up to 4 ppm (4,000 ppb). Consequently, EPA's contractor is currently tasked to install a pump, electric, and a pipeline to the sanitary sewer so that by early fall a groundwater pump and treat system will begin operating at well S1.

VI. Five-Year Review Process

Administrative Components

The following personnel were involved in the Five-Year Review: Stacie Peterson, the EPA Remedial Project Manager (RPM), Maria de los A. Garcia, the previous RPM for the Site, David Polish, the EPA Community Involvement Coordinator, Thomas Cinti, EPA Regional Counsel, EPA's technical team of Patricia Flores, Bernice Pasquini, and Linda Watson, and Tim Sheehan and Megan Harkins from PADEP.

Community Involvement

A notice appeared in the Reporter newspaper on August 8, 2008 indicating that EPA was conducting a Five-Year Review for the Site. Another notice will be sent to the same newspaper to announce that the Five-Year Review report for the North Penn 1 site has been completed. Information on the results of the review and the report availability will be part of the announcement.

Interviews

In the summer of 2008, EPA conducted a joint Site visit with PADEP to discuss Site activities and the upcoming Five-Year Review. EPA also informed Souderton Borough Manager, Mr. Michael Coll, of the Five-Year Review on June 20, 2008 to find out if he or any members of the community had any concerns about the Site. On July 30, 2008, EPA informed the GKM building owner, Mr. Kerry Gingrich, of the Five-Year Review. Concerns focused on the redevelopment or sale of the GKM property, which appear to be limited by the fact that the property is part of a Superfund site.

Site Inspection

Site inspections were conducted on June 17, 2008 and August 12, 2008 by Stacie Peterson, EPA RPM and Maria de los A. Garcia, previous EPA RPM. At the time of the June 17, 2008 inspection, a geoprobe study near well S1 was being conducted by the EPA contractor. Mr. Tim Sheehan and Ms. Megan Harkins, from PADEP, accompanied Ms. Peterson and Ms. Garcia during the August 12, 2008 inspection. The GKM building was in operation, while the Gentle Cleaners building appeared shut down. All monitoring wells and the extraction well were securely locked.

Document Review

The Five-Year Review consisted of a review of relevant documents including the RI/FS reports, ROD, ESDs, Preliminary Closeout Report (PCOR), groundwater sampling data, and the previous Five-Year Review report.

Data Review

From June 2002 to December 2004, the GKM extraction well was monitored for VOCs. During this time, the PCE results ranged from 2 to 3.1 ppb, which is below the 5 ppb MCL for PCE. TCE concentrations, which ranged from nondetect to 0.38 ppb, were below the TCE MCL of 5 ppb. After the remediation system was shutdown in February 2005, monitoring of the well ceased, with the last round of sampling being from December 2004. PCE and TCE sampling results from June 2002 to December 2004 for the GKM extraction well are shown in Table 3.

Table 3. PCE and TCE Sampling Data for Extraction Well GKM

Date	TCE Concentration (ppb)	PCE Concentration (ppb)
June 2002	0.35	3.1
December 2002	0.26	2
June 2003	0.38	2.9
December 2003	ND	3
June 2004	0.22	2.2
December 2004	0.29	2.8

ND - Not detected above detection limits.
Maximum Contaminant Level (MCL) for PCE = 5 ppb
Maximum Contaminant Level (MCL) for TCE = 5 ppb

For the past five years, semiannual groundwater monitoring data has been collected from four monitoring wells (D3, S1, S2, and S3). High concentrations of PCE continue to be present for well S1, as shown in Table 4. The highest concentration of 8,300 ppb was found in December 2003. The lowest concentration of 110 ppb was found in July 2007. Although the TCE data did fluctuate for well S1 at times, as shown in Table 4, the TCE concentrations have remained below the MCL of 5 ppb since May 2006.

Table 4. PCE and TCE Sampling Data for Well S1

Date	PCE Concentration (ppb)	TCE Concentration (ppb)
June 2002	**650**	**5**
December 2002	**2200**	**32**
June 2003	**6500**	**63**
December 2003	**8300**	**36**
June 2004	**2700**	**31**
December 2004	**5800+**	**35**

June 2005	**150+**	3.6
December 2005	**1100+**	**5.5**
May 2006	**250+**	**4.9**
December 2006	**180+**	3.5
July 2007	**110+**	3.4
June 2008	**520+**	3.6

Bold type - Exceedence of MCL
Maximum Contaminant Level (MCL) for PCE = 5 ppb
Maximum Contaminant Level (MCL) for TCE = 5 ppb
+ Concentration determined by sample dilution

For the past five years, PCE results from well S3 have consistently remained below the MCL, ranging from nondetect to 1.8 ppb. Within the last five years, well D3, which ranged in concentration from nondetect to 2.1 ppb, had no exceedences of the PCE MCL of 5 ppb. Well S2 had four exceedences of the PCE MCL within the last five years, with the most recent exceedence of 9.9 ppb being from June 2008. TCE results from wells D3, S2, and S3 have consistently remained below the MCL for TCE, ranging from nondetect to 3.4 ppb.

As a part of this Five-Year Review, a review of the local regulations was performed to determine if institutional controls (legal restrictions) are in place to protect the remedy and prevent human exposure. In order to prevent exposure to the groundwater contamination, Montgomery County's permitting process requires that all newly constructed drinking water wells be tested for certain parameters, including VOCs. If the tested parameters exceed the County's drinking water standards, an approval to operate will not be granted and consumption of the groundwater is not permitted. In addition, Souderton Borough has a local ordinance that requires all new construction built within 175 feet of a public water line to connect to the water line. Because of the current configuration of the Borough, all new construction would be within the requirement to connect to public water. Furthermore, no residences in the area of the North Penn Area 1 Site are on private water wells. To protect the remedy, all groundwater monitoring wells are secured.

VII. Technical Assessment

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

Contaminated Soil

Yes. The RAOs of the ROD included the removal of the potential exposure risk from the contaminated soil and the elimination of the source of contamination (i.e., soil) migrating to the groundwater. To meet these objectives, a total of 482 tons of contaminated soil were excavated from the entire backyard at the Gentle Cleaners property and in four (4) different areas at the

GKM property. All post-excavation sample analytical results indicated all contaminated soil above the cleanup level was removed. All soil was transported to the Clean Earth facility in New Castle, Delaware where it was thermally treated and then ultimately disposed at the Salem County Municipal Landfill in New Jersey.

Groundwater

No. The RAOs in the ROD for groundwater included preventing the spread of contaminated groundwater. While the contaminated soil was excavated and removed and confirmation sampling showed soil cleanup standards were reached, results from the S1 monitoring well, which is located approximately 200 feet southwest and downgradient of the GKM well, have continued to show very high levels (with concentrations as high as 8,300 ppb) above the 5 ppb PCE clean-up standard. However, low concentrations of VOCs in the monitoring wells near the Parkside Apartments (S3 and D3) indicate that contamination has not spread onto the Parkside Apartment property. Further investigations to identify the source of contamination of monitoring well S1 must be completed before long-term groundwater remedial activities continue. Investigation activities include, but are not limited to, pumping well S1 and more frequent monitoring of well S1 to evaluate groundwater trends.

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

Changes in Standards and To Be Considereds (TBCs)

Have standards identified in the ROD been revised, and does this call into question the protectiveness of the remedy? Do newly promulgated standards call into question the protectiveness of the remedy? Have TBCs used in selecting cleanup levels at the site changed, and could this affect the protectiveness fo the remedy?

The ROD established cleanup goals for the soil and groundwater at the Site in order to achieve the RAOs. The results of the post-excavation confirmatory soil sampling after the hot spot removal confirmed that the performance standards in the ROD have been achieved for the soil-to-groundwater pathway. Based on the high concentrations of PCE at monitoring well S1 and because the vapor intrusion pathway, which is described below, has yet to be assessed, additional evaluation of the soil may be necessary as a source to vapor intrusion and/or the groundwater.

The groundwater cleanup standards currently in effect were established in the 1997 ESD. These standards are at current MCLs. Since MCLs have not changed, the groundwater cleanup standards in the ROD remain protective. The groundwater remedy will continue until MCLs are achieved. A risk assessment of the residual contaminant concentrations in groundwater should be performed once the cleanup goals are met to ascertain that the acceptable risk range has been achieved.

Changes in Exposure Pathways

Has land use or expected land use on or near the site changed?

No.

Have human health or ecological routes of exposure or receptors been newly identified or changed in a way that could affect the protectiveness of the remedy?

Since the last Five-Year Review, vapor intrusion has become a new pathway that is being evaluated for sites that have VOC contamination in the soil or groundwater. Vapor intrusion is the movement of VOCs from contaminated groundwater or soil into existing buildings or the potential migration of the VOCs into future buildings near contaminated groundwater or soil. Since persistent and significant concentrations of PCE continue to exceed the MCL standards at monitoring well S1, vapors from the contaminant could potentially result in intrusion issues for residential and/or commercial structures located near this area. Since an initial evaluation of the site data indicates that vapor intrusion may be a concern, a risk investigation of this pathway should be performed.

Are there newly identified contaminants or contaminant sources?

EPA has recently become aware that sites with VOCs may also be contaminated with the solvent stabilizer 1,4-dioxane. The VOC most commonly associated with 1,4-dioxane is 1,1,1-TCA, which has historically been detected at the North Penn 1 Site. Therefore, sampling of 1,4-dioxane is highly recommended to confirm that this chemical is not of concern at the Site.

Are there unanticipated toxic byproducts of the remedy not previously addressed by the decision documents?

No.

Have physical site conditions or the understanding of these conditions changed in a way that could affect the protectiveness fo the remedy?

See the discussion regarding vapor intrusion, above.

Changes in Risk Assessment Methods

The original risk assessment was performed approximately 15 years ago, and risk assessment methodology and toxicity factors have changed since then. There have been significant changes in EPA's risk assessment guidance since the ROD, including changes in dermal guidance, inhalation methodologies, and exposure factors. At the time of the ROD, the cleanup levels for the soil were based on protection of groundwater to background levels (using minimum

detection levels), which was later revised to MCLs. Since groundwater concentrations still exceed performance standards for PCE, a final determination as to whether the performance standards are protective is premature. Current risk assessment guidance may change again in the coming years, and protectiveness is best assessed at the time when it is believed that groundwater cleanup has been achieved. Therefore, it is recommended that the groundwater risks be evaluated at the end of the remedy, to ensure protectiveness at that time. In the interim, no residences in the area of the North Penn Area 1 Site are on private water wells and locally implemented institutional controls are in place.

Expected Progress Toward Meeting RAOs

Is the remedy progressing as expected?

Contaminated Soil

Yes. The soil contamination remedy required that contaminated soil be excavated and removed to soil cleanup standards. Based on the cleanup standards, the Gentle Cleaners and GKM properties needed to have soil excavated and removed. A total of 482 tons of contaminated soil were excavated from the entire backyard at the Gentle Cleaners property and in four (4) different areas at the GKM property. All post-excavation sample analytical results indicated all contaminated soil above the cleanup level was removed. All soil was transported to the Clean Earth facility in New Castle, Delaware where it was thermally treated and then ultimately disposed at the Salem County Municipal Landfill in New Jersey.

Groundwater

Uncertain. The groundwater contamination remedy required pumping the upper interval of the GKM well (the top 30 to 40 feet). The GKM well was pumped from approximately 1998 - 2005. In February 2005, the groundwater remediation system associated with well GKM was shut down. Concentrations of PCE within the well were below the cleanup standard, but one of the monitoring wells, S1, located approximately 200 feet southwest and downgradient of the GKM well, showed elevated levels of PCE which reached concentrations as high as 8,300 ppb. The groundwater from the GKM well is no longer being extracted and sent to the POTW. The extraction system is in the process of being optimized where monitoring well S1 is being converted to an extraction well to cleanup the groundwater contamination.

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

Since the last Five-Year Review, institutional controls (legal restrictions that protect a remedy and prevent human exposure) is an issue that is evaluated at Superfund sites. In 1994 when the ROD for North Penn Area 1 was issued, institutional controls were not considered as components of remedies. As a result, the remedy described in the ROD did not include institutional controls. In order to address this issue, institutional controls will need to be evaluated, and the remedy modified to include the need for institutional controls.

Technical Assessment Summary

The review of Site-related documents, risk assumptions, and the results of the Site inspection indicate the remedy for the soil (OU1) is functioning as intended. The contaminated soil was excavated until the PCE levels reached the clean up goals established in the ROD. As for the remedy for the groundwater contamination (OU2), the remedy may not be functioning as intended. In February 2005, the groundwater remediation system associated with well GKM was shut down. Although concentrations of PCE within this well were low, one of the monitoring wells, S1, located approximately 200 feet southwest and downgradient of the GKM well, showed elevated concentrations of PCE (as high as 8,300 ppb). The PCE concentrations within the monitoring well S1 have been significant and persistent. The persistent, high concentrations of PCE in monitoring well S1 should be further evaluated with respect to identifying any remaining source in the soils or shallow bedrock. More frequent sampling of the S1 monitoring well should occur. Optimization of the current groundwater extraction system is currently underway and will include bringing well S1 on-line as the extraction well. In summary, there is still additional investigatory and possible remedial work that needs to be performed in order to meet the RAOs established in the ROD.

Also, since the last Five-Year Review, vapor intrusion has been identified as a potential new migration pathway for VOC contaminants. An initial evaluation of the site data indicates that vapor intrusion may be a potential pathway at the Site, therefore, an evaluation of this pathway should be performed. Institutional controls or legal restrictions have also been newly identified as necessary actions to protect a remedy and prevent exposure to contamination. In order to address this issue, institutional controls will need to be evaluated, and the remedy modified to include the need for institutional controls. EPA has recently become aware that sites with VOCs may also be contaminated with the solvent stabilizer 1,4-dioxane. It is recommended that 1,4-dioxane be added to the list of analytes included in the groundwater sampling program.

VIII. Issues

Table 5. Issues

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
	Current	Future
High concentrations of PCE in monitoring well S1	N	Y
Vapor Intrusion	Y	Y
1,4-dioxane is not sampled for at the Site	N	Y
No established institutional controls	N	Y

IX. Recommendations and Follow-Up Actions

Table 6. Recommendation and Follow-Up Actions

Issue	Recommendations/ Follow-up Actions	Party Responsible	Milestone Date	Affects Protectiveness? (Y/N)	
				Current	Future
High concentrations of PCE in well S1	♦ Extraction of the groundwater associated with well S1	EPA	12/08	N	Y
	♦ Increase sampling frequency for well S1	EPA	12/08		
	♦ Begin additional investigations to determine the source and extent of contamination associated with well S1	EPA	12/09		
Vapor Intrusion	♦ Perform vapor intrusion evaluation	EPA	12/09	Y	Y
1,4-dioxane not sampled	♦ Add 1,4-dioxane to the list of analytes included in the groundwater sampling program	EPA	12/08	N	Y
Institutional Controls	♦ Modify remedy to address institutional controls	EPA	3/10	N	Y

X. Statement of Protectiveness

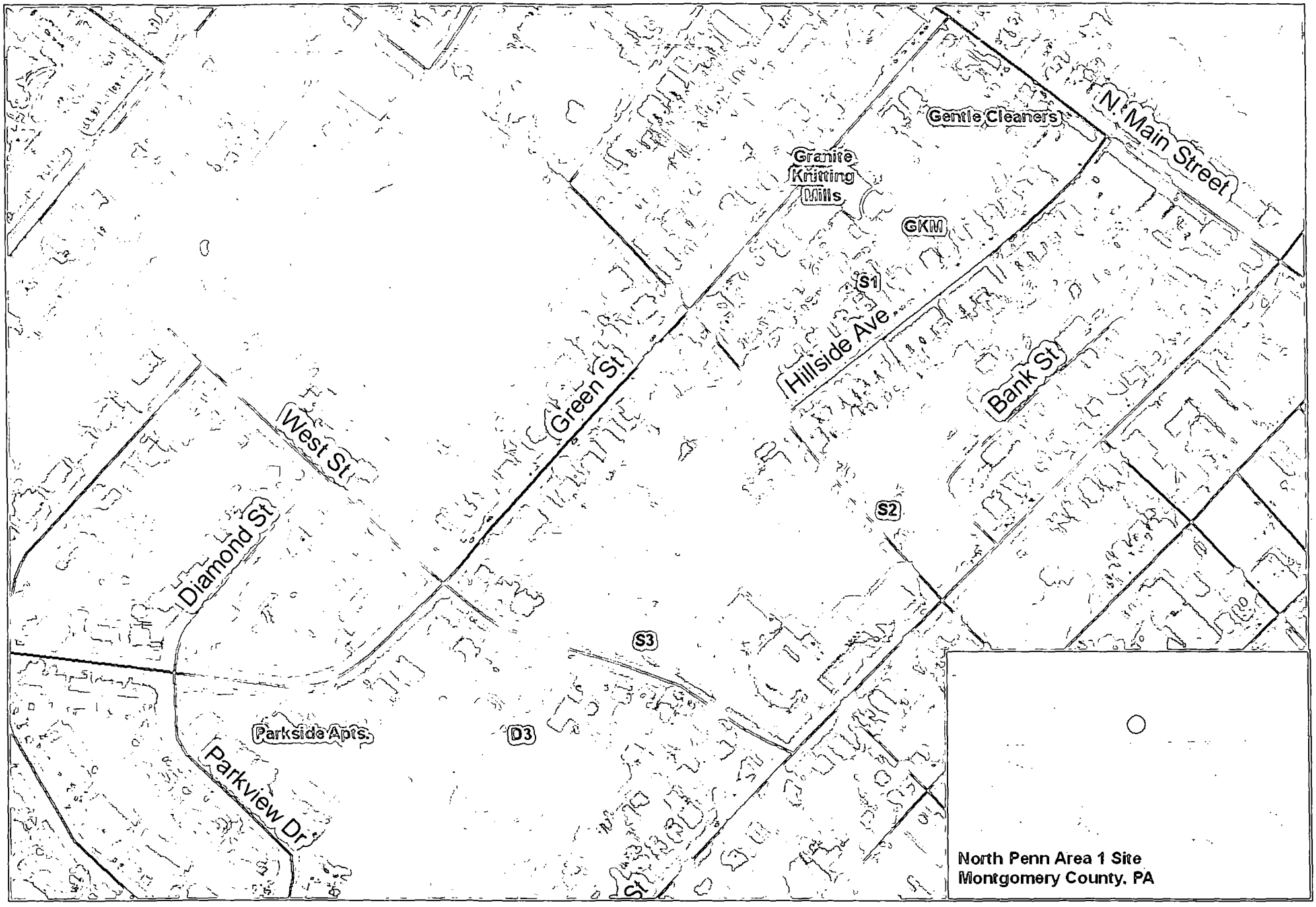
The remedy at OU1, the source control operable unit, is protective of human health and the environment. The contaminated soil identified during the remedial investigation was removed to the cleanup levels established in the ROD and any potential exposure risk to this soil has been eliminated. Furthermore, this source of contamination migrating to the groundwater was removed.

While the remedy at OU2, groundwater contamination, is expected to achieve protectiveness in the long-term, there are several issues that need to be resolved. The groundwater extraction system associated with the GKM well was shut down in February 2005 since concentrations of PCE within this well were below the cleanup standard. However, monitoring well S1, located 200 feet southwest and downgradient of the GKM well, showed elevated levels of PCE, which reached concentrations as high as 8,300 ppb. The persistent, high concentrations of PCE in monitoring well S1 should be further evaluated with respect to identifying any remaining source in the soils or shallow bedrock. More frequent sampling of the S1 monitoring well should occur. Optimization of the current groundwater extraction system is currently underway and will include bringing well S1 on-line as the extraction well. Additionally, the remedy for the Site should be modified to require institutional controls.

A protectiveness determination for this Site is being deferred at this time. A determination regarding the short-term protectiveness of the remedy is being deferred until additional information regarding 1,4-dioxane is collected, and the vapor intrusion pathway is evaluated. Due to the high concentrations of shallow groundwater contamination in monitoring well S1, a protectiveness determination of the groundwater cannot be made at this time until further information is obtained. The time required to perform additional investigations and gather information regarding the long-term pumping effects of well S1 will be approximately 18 months. After EPA and PADEP have a chance to evaluate that information, EPA will make a protectiveness determination regarding the Site.

XI. Next Review

The next Five-Year Review for the North Penn Area 1 Superfund Site is required by September 2013, five years from the completion date of this review.



N

LEGEND

Monitoring Well

Extraction Well

Figure 1: North Penn Area 1 Site Location Map

0 125 250 500 750 1,000 Feet

Note: S-9 was shutdown in October 2002 and was replaced with S-3

AR301581

Map Creation Date: 08/11/2008