

FIVE-YEAR REVIEW REPORT

EWAN PROPERTY SUPERFUND SITE

**331 Tuckerton Road
Shamong Township, New Jersey 08088**

August 2009

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 2
Emergency and Remedial Response Division
290 Broadway
New York, NY 10007-1866**

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name (<i>from WasteLAN</i>): Ewan Property		
EPA ID (<i>from WasteLAN</i>): NJD980761365/ NJD0200791		
Region: 2	State: NJ	City/County: Town of Shamong, Burlington County
SITE STATUS		
NPL status: <input checked="" type="checkbox"/> Final <input type="checkbox"/> Deleted <input type="checkbox"/> Other (specify)		
Remediation status (choose all that apply): <input type="checkbox"/> Under Construction <input checked="" type="checkbox"/> Constructed <input checked="" type="checkbox"/> Operating		
Multiple OUs?* <input checked="" type="checkbox"/> YES <input type="checkbox"/>	Construction completion date: 9/24/1999	
Are portions of this site in use or suitable for reuse? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A		
REVIEW STATUS		
Lead agency: <input checked="" type="checkbox"/> EPA <input type="checkbox"/> State <input type="checkbox"/> Tribe <input type="checkbox"/> Other Federal Agency		
Author name: Stephen Cipot		
Author title: Remedial Project Manager	Author affiliation: EPA	
Review period:** 9/2004 to 7/2009		
Date(s) of site inspection: April 22, 2009		
Type of review: <input type="checkbox"/> Post-SARA <input type="checkbox"/> Pre-SARA <input type="checkbox"/> NPL-Removal only <input type="checkbox"/> Non-NPL Remedial Action Site <input type="checkbox"/> NPL State/Tribe-lead <input checked="" type="checkbox"/> Policy <input type="checkbox"/> Regional Discretion		
Review number: <input type="checkbox"/> 1 (first) <input checked="" type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify)		
Triggering action: <input type="checkbox"/> Actual RA Onsite Construction at OU #1 <input type="checkbox"/> Actual RA Start at OU# 1 <input type="checkbox"/> Construction Completion <input checked="" type="checkbox"/> Previous Five-Year Review Report <input type="checkbox"/> Other (specify)		
Triggering action date (<i>from WasteLAN</i>): 9/27/2004		
Does the report include recommendation(s) and follow-up action(s)? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no Is the remedy protective of the environment? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no		

[OU refers to operable unit.]

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1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA), Region 2 has conducted a five-year review of the remedies implemented at the Ewan Property Superfund Site, in accordance with the comprehensive Five-Year Review Guidance OSWER Directive 9355.7-03B-P (June 2001). The purpose of a five-year review is to assure that implemented remedies protect public health and the environment, and that they function as intended by the decision documents. This five-year review is being conducted as a matter of policy because the remedial actions, upon completion, will not leave hazardous substances, pollutants, or contaminants at the Site above levels that allow for unlimited use and unrestricted exposure, but require more than five years to complete. The trigger of this policy five-year review is the signature date of the previous five-year review. This document will become part of the Site file and made available to the public in the repository.

The Ewan Property Superfund Site has been addressed in two remedial phases. Operable Unit 1 (OU1) addressed buried drums, disposal trenches, and heavily contaminated soils. The OU1 Record of Decision (ROD) was issued September 29, 1988. The Operable Unit 2 (OU2) remedy addressed the remaining moderately and residually contaminated soils and contaminated groundwater. The OU2 ROD was issued on September 29, 1989. EPA issued an Explanation of Significant Differences (ESD) on July 13, 1994, which modified the OU2 soils remedy by including the OU1 and OU2 soils remedies in the OU1 remedial action.

Since 1997, the remedial action has been in the Long-Term Operation and Maintenance phase (O&M).

2.0 SITE CHRONOLOGY

Table 1 - Chronology of Events

Event	Date
Independent waste haulers deposited drums of semi-volatile and volatile chemicals on property owned by Herbert Ewan.	1974-75
EPA added Ewan Site to the National Priorities List (Superfund)	1984
Remedial Investigation completed by EPA.	1988
EPA issued an OU1 ROD for the Site soils and buried drums	Sept. 1988
EPA issued an OU2 ROD for the Site soil and groundwater	Sept. 1989
EPA issued Unilateral Administrative Order for design, construction and cleanup of OU1.	Sept. 1989
EPA issued an ESD for the Site which modified the OU2 soils remedy by including the OU1 and OU2 soils remedies in the OU1 remedial action, so that only a single excavation of contaminated soil was needed at the Site.	July 1994

The OU1 remedial action was implemented and completed.	1995-96
EPA issued Unilateral Administrative Order for design, construction and cleanup of OU2.	May 1995
The OU2 design was completed for the on-Site groundwater pump, treatment, and recharge system.	1997
Construction was completed for the on-Site groundwater pump, treatment and recharge system. The Site entered the Operation and Maintenance phase.	Sept. 1999
Under EPA oversight, the PRPs completed a short-term technical evaluation of the remedy and implemented the results to optimize the remedial treatment system.	2000-2002
Under EPA oversight, the Potentially Responsible Parties (PRPs) conducted a pilot-scale study of several technologies to address residually contaminated soil hotspot areas in the saturated zone.	2003-2004
Under EPA oversight, the PRPs conducted an investigation in the area of Intermediate Cohansey (IC) Aquifer IC-7, and excavated the Top of Cohansey (TC) TC-30 hotspot.	2004
First Five-Year Review	Sept. 2004
The supplemental Dual Phase Extraction (DPE) system was initiated in full-scale operation.	Nov 2004
Wetland Creation Area Monitoring Program 2004 Annual Report	April 2005
Under EPA oversight, the PRPs conducted the focused subsurface soil/groundwater seasonally saturated zone sampling.	June 2005
Self Monitoring Report/New Jersey Discharge Elimination Survey (NJPDES) Discharge Monitoring Report and 2.5-Year Groundwater Quality Monitoring Report	July 2005
Focused Subsurface Soil/Groundwater Seasonally Saturated Zone Sampling Report	Sept. 2005
The groundwater recovery and treatment system was shut down and the DPE system was operated as the sole remedy.	June 2006
Off-Site Well Sampling Report	Nov. 2006
Comprehensive Evaluation conducted of Dual Phase Extraction as the Sole Remedy	March 2007
Classification Exception Area (CEA) Biennial Certification Monitoring Report issued.	Jan. 2008
Self-Monitoring Report/NJPDES Discharge Monitoring Report and 2.5-Year Groundwater Quality Monitoring Report issued.	March 2008

3.0 BACKGROUND

3.1 Location

The Ewan Property Superfund Site is located in Shamong Township, Burlington County, New Jersey, off of Tuckerton Road, near the intersection of Route 206 (see attached Figure, Site Location Map). The Site is shown on the Shamong Township tax map as Block 23, lots 31.01 and 32.02. The Site's latitude is 39° 48' 07" N and longitude is 74° 43' 17" W. The entire Ewan parcel totals 43 acres; the disposal-site area known as Site A is roughly 4 acres, with a total of nine acres fenced. The property is currently under the private ownership of Ms. Verna Dale Donnelly (formerly Vera Dale Ewan) of Willingboro, NJ. This Site falls within the Central Pine Barrens Preservation Area of the New Jersey Pinelands, and is viewed as an ecologically sensitive area. EPA selected cleanup standards appropriate for this Pinelands Site.

3.2 Geology

The Ewan Property Site is in the Atlantic Coastal Plain physiographic province. The overall topography of the Site is relatively flat, and it is about 80 feet above mean sea level. The Site is underlain by unconsolidated deposits of clay, silt, sand and gravel which are Quaternary, Tertiary and Cretaceous in age. The bedrock is of early Paleozoic or Pre-Cambrian age, and found at a depth of approximately 2,100 feet below the surface.

The Cohansey Sand immediately underlies the Site and is composed of unconsolidated sands, silts and fine gravel; it averages 85 feet in thickness. A discontinuous clay layer partially separates the Cohansey Sand from the underlying Kirkwood Aquifer, but the two aquifers are considered to be hydraulically linked at the Site. The deeper Kirkwood Aquifer is estimated to be at a depth of approximately 85 feet.

Monitoring wells with ten-foot screens were installed in three zones of the Cohansey Sand, based on the extent of contamination in the aquifer, and in the Kirkwood Aquifer. Wells in the Top of the Cohansey (TC) are screened between 15 to 22 feet deep. Wells in the Intermediate Cohansey (IC) are screened between 44 to 56 feet. Wells in the Bottom of the Cohansey (BC) are screened between 72 to 87 feet. Ten-foot screen zones for the three Kirkwood wells are set between 92 to 124 feet.

3.3 Land Use

Between 1974 and 1976, a portion of the Ewan property was used as an unregulated industrial waste disposal-site. Currently, this area of the Ewan property is fenced and remediation of the groundwater and soils is occurring. Much of the remaining property lies as undeveloped forest and wetlands within the Pinelands Preservation Area. In the roughly one mile area that surrounds the Site, land use includes agriculture, wetland, residential, recreational ballfields, and forest. Within the past five years, the area has

become increasingly residential. The closest residential property is 2,000 feet to the east of the Site, with the nearest downgradient potable water supply well located roughly three quarters of a mile south of the Site, at a recreational ballfield. This water is being sampled as part of the overall groundwater sampling programs and Site contaminants have not been identified.

3.4 Natural Resources

Locally, there are a few resources that have been or could be affected by prior activities on the Site. The Site borders the Pinelands Agricultural and is within the Pinelands Preservation Area, located within the Central Pine Barrens Area of the New Jersey Pinelands. This area is viewed as ecologically sensitive and development is guided by the Pinelands Comprehensive Management Plan administered by the New Jersey Pinelands Commission in cooperation with units of local, state and federal governments. The Cohansey and Kirkwood Aquifers are the primary supplies for potable drinking water to local residents. An unnamed tributary to Springer's Brook is located adjacent to the northern and western boundaries of the property. Historically, bog iron is found locally, however, there are no records of previous mining operations on-Site.

3.5 History of Contamination

Disposal activities at the Site were reported to have taken place between 1974 and 1976. The Ewan Site, as defined in the RI, received industrial waste from a number of companies, in the form of bulk liquids and drums.

The area covered by the property includes a total of 43 acres. The 1988 Remedial Investigation found that a 9-acre area identified as Area A was used for disposal of bulk liquids, drums, fiberglass, resin and resin hardner. Most liquid wastes were reportedly deposited within drums of varying integrity. Disposal trenches were excavated to roughly 10 feet below the surface; it appeared as though one trench per truckload was dug. A total of 35 separate trenches have been identified. Once the drums and bulk liquids were emptied into or unloaded into a trench, the trench was backfilled and re-contoured.

3.6 Discovery and Results

In September 1982, a call from a concerned citizen prompted an investigation by local officials and the New Jersey Department of Environmental Protection (NJDEP). During the initial groundwater sampling event, contamination was discovered on-Site. In addition to the groundwater contamination of the Cohansey aquifer, residual product was evident in the soils of the unsaturated zone, as light non-aqueous phase liquid (LNAPL).

3.7 Initial Response and Action

A Preliminary Site Assessment was conducted in 1984. This investigation was conducted in two phases. The first phase included the installation of five monitoring wells, collection of groundwater and surface water samples and completion of a preliminary geophysical magnetometer survey to identify electromagnetic conductivity anomalies. The second phase of this investigation included the collection of potable well water and surface water samples. The nearest potable wells are located approximately 3/4 mile from the Site, and had not been impacted by Site contamination based on ongoing sampling.

In addition, a security fence was installed by the Potentially Responsible Parties (PRPs) in 1988. This fence remains at the Site and is inspected and maintained regularly.

3.8 Basis for Taking Action

A remedial investigation and feasibility study (RI/FS) was conducted in 1986 and completed in 1988. The significant findings of the remedial investigation included:

- Approximately 4,500 cubic yards of source material was buried on-Site, including between 5,000-8,000 drums and heavily contaminated materials, in 35 trenches. The disposal area encompassed approximately 200,000 square feet. An additional 29,500 cubic yards of contaminated soil was estimated to be in close proximity to the source material, later revised to 22,000 cubic yards which would require treatment during implementation of the OU2 remedy;
- Soil and groundwater samples indicated that the source materials contained chlorinated organic compounds, aromatic hydrocarbons and metals. Contaminants include: 1,2-dichloroethane; tetrachloroethene; 1,1,1-trichloroethane; methylene chloride; trichloroethene; carbon tetrachloride; 1,1-dichloroethane; chloroform; benzene; ethylbenzene; naphthalene; xylenes; toluene; lead; barium; copper; and chromium;
- A groundwater contaminant plume which contained high levels of volatile organic compounds (VOCs), was estimated to be 500 feet long, 600 feet wide and 30 feet deep.

Public health risks posed by Site contaminants prior to remediation at the Site included the potential for direct contact with contaminated wastes and soils, as well as the potential for ingestion of contaminated groundwater underlying the Site.

4.0 **REMEDIAL ACTION**

4.1 Remedy Selection and Remedial Goals

Based upon the RI/FS findings, EPA chose to address Site remediation in two operable units, referred to as OU1 and OU2. EPA issued the RODs for OU1 and OU2, in 1988 and 1989, respectively.

On September 29, 1988, EPA issued the ROD for OU1. Components of the OU1 remedy are summarized as follows:

- The excavation and off-site incineration of buried drums;
- The excavation and off-site disposal or incineration of heavily contaminated soils (OU1 soils);
- Monitoring of the air and groundwater during remedial activities; and
- Backfilling of trenches.

On September 29, 1989, EPA issued the OU2 ROD. The components of the OU2 remedy are summarized as follows:

- Excavation and treatment, via solvent extraction and soil washing, of residually contaminated OU2 soils, followed by placement of the treated soils back onto the site;
- Collection and treatment of the contaminated groundwater, and on-Site reinjection of the treated effluent;
- Recontouring and restoration of the disposal areas;
- Construction of an on-site wetlands area; and
- Environmental monitoring to ensure effectiveness of the remedy.

On July 13, 1994, EPA issued an Explanation of Significant Differences (ESD) which explained a change in remedial strategy from the OU1 and OU2 RODs with respect to soils. EPA determined that it was more practicable and cost-effective to handle all the contaminated soils in the same action. EPA modified both remedies by calling for the excavation of all contaminated soils during OU1, and thus only a single excavation of contaminated soil would be needed at the Site. Any residually contaminated soils would be flushed during OU2.

The objective for the soils remedy is to control source materials and prevent contamination of the underlying aquifer. The overall objective for groundwater was to provide protection to drinking water supplies, as well as preserve and restore Site groundwater in the most heavily protected portion of the Central Pine Barrens Region of New Jersey.

The PRPs for the Site have been implementing the remedies under three Unilateral Administrative Orders issued by EPA, as follows:

UAO Index No. II-CERCLA-90114 issued to Chrysler on September 26, 1989, directing it to perform the OU1 remedy.

UAO Index No. II-CERCLA-90114 (note the same index no.) issued to 18 additional respondents on June 11, 1990, directing them to cooperate and participate with Chrysler in implementing the OU1 remedy.

UAO Index No. II-CERCLA-95-0107 issued to 18 respondents (including Chrysler) on May 19, 1995, directing the PRPs to perform the OU2 remedy.

4.2 Achievement of Remedial Goals

The 1989 ROD for OU2 presented a list of groundwater parameters and final remedial goals that were to be achieved when the groundwater remedy was complete. The final remedial goals are Federal Maximum Contaminant Levels (MCLs), as well as the New Jersey Class 1-PL standards designated by NJAC 7:9-C1.5. The final Remedial Design (RD) Report presented additional remedial objectives which were developed for contaminants not identified in the OU2 ROD, but subsequently detected in Site groundwater, as well as updated NJAC 7:9-C1.5 standards. For inorganic compounds, the RD Report established site-specific background levels which were developed from upgradient well data, consistent with NJAC 7:9-C.1.5.

In 1999, a Classification Exemption Area (CEA) was established. To assess compliance, monitoring well data are compared with the final remedial goals.

4.3 Remedy Implementation

Operable Unit One

On August 16, 1994, OU1 remedial construction commenced. Trench excavation activities were completed on July 14, 1995. Off-site disposal of drums and associated soils was completed by September 1995. An estimated 3,820 drums and 14,000 cubic yards of contaminated soil were excavated to a depth of approximately 10 feet for off-site disposal from 35 disposal trenches in the seasonally unsaturated zone. During excavation, many of the drums were found to be damaged or disintegrated. Trench excavations were backfilled with a combination of soil from an off-site borrow pit (used below the seasonally saturated zone) and Site soil of acceptable quality generated during excavation. At the conclusion of OU1 remedial construction, confirmatory side wall samples were collected within the excavation trenches to assure that the soil remedial objectives had been attained. An earthen berm was constructed around the perimeter of the excavation area to prevent stormwater run-on and run-off.

The OU1 remedial action was completed in 1995. The Ewan PRP Trust submitted to EPA a Notice of Completion and a report entitled *Final Report for Remedial Construction, Operable Unit One, Ewan Property Site, Shamong Township, New Jersey*, on October 3, 1995. EPA approved the Report in correspondence dated January 2, 1996.

As part of the OU1 Remedial Design activities, wetlands delineation was conducted at the Site. Wetlands were identified on and surrounding the Ewan Site. Concurrent with the OU1 Remedial Construction activities, wetlands mitigation was conducted to create and restore three acres of wetlands that were impacted by the remedial action and the construction of the Site access the road. The created and restored wetlands were developed in conjunction with the NJDEP and the Pinelands Commission, to be consistent in vegetative characteristics with local wetlands. The wetland-monitoring program was conducted to verify the overall health and condition of the on-Site wetlands, and to ensure that the wetlands that had been created as part of the mitigation activities remain viable and healthy. During the wetlands monitoring program, an invasive tree known as the Russian Olive Tree was identified to be pervasive throughout the wetlands creation area. In 2005, a corrective action plan was effectively implemented to address the invasive Russian Olive Tree.

Operable Unit Two

As described in the OU2 ROD and ESD, extraction, treatment and on-Site re-infiltration of treated groundwater was chosen as the remedial action for both contaminated groundwater and lesser contaminated soils. Treated effluent would be re-infiltrated into the underlying aquifer within the plume boundaries until the groundwater remedial objectives have been met. Residual contaminated soils would be remediated via flushing. After remediation is complete, the disposal areas would be restored and recontoured.

The Ewan PRPs initiated design of the groundwater cleanup remedy in August of 1995, immediately following their removal of buried drums and associated soils. The design was completed in late 1998, followed by the construction of the extraction, treatment and re-infiltration system in February 1999. The remedial system was designed to handle a flow of more than 200,000 gallons per day. A total of six re-infiltration basins were constructed, covering approximately 200,000 square feet. Beginning in March 1999, the entire system underwent an extensive six-month period of rigorous tests. First, clean water was run through the treatment system and re-infiltration basins, followed by progressively contaminated water until it was demonstrated that the system was consistently able to meet discharge criteria. In September 1999, the remedial system entered the long-term operation and maintenance phase.

The groundwater extraction, treatment and re-infiltration system was designed to achieve the following objectives:

- a) establish hydraulic control of the contaminant plume via a closed loop system;
- b) aquifer restoration to meet maximum contaminant levels (MCLs), as well as the New Jersey Class 1-PL standards, by the extraction of aqueous-phase contaminants for ex-situ treatment; and
- c) re-infiltration of the treated effluent within the plume boundaries.

Saturated zone flow modeling was conducted that utilized data on aquifer hydraulic characteristics generated during the OU1 and OU2 Remedial Design Investigations. Based on the model solution, an extraction system was chosen that consisted of seven extraction wells and a total extraction rate of 200 gallons per minute (gpm).

The major components of the treatment process originally included the following:

- Groundwater pumping and conveyance system;
- Equalization tank;
- Metals precipitation;
- Flocculation and settling;
- Continuous backwash filtration;
- Neutralization;
- Air stripping towers (decommissioned April 2002);
- Off-gas treatment (HCL scrubber decommissioned January 2002);
- Catalytic oxidizer(decommissioned January 2002);
- Liquid-phase carbon adsorption system;
- Treated water storage;
- Chemical feed systems;
- Residuals handling;
- Control building;
- Infiltration system; and
- In-situ bio-remediation system (decommissioned 2000).

The full-scale treatment system was designed based on groundwater sampling results and anticipated maximum influent conditions, system flow rate and discharge requirements. The treatment process was designed to remove volatile organics, semi-volatile organics, metals and conventional parameters (e.g., suspended solids, turbidity, Biological Oxygen Demand (BOD), etc.). The system includes sufficient flexibility to operate over a variety of conditions, allowing the operation to be optimized following start-up on an as-needed basis. As the influent conditions have changed over time, the flexible design has allowed various components and operation of the system to be discontinued or modified since 1999. The full-scale treatment system operated from 1999 until 2006, when the hot spot treatment dual phase extraction (DPE) pilot test began. The DPE system continues to operate. Because of significantly lower flow rates generated by DPE, presently the extracted water undergoes batch treatment in the full-scale treatment plant, twice a week, followed by recharge of the effluent through the existing reinfiltration network. The full-scale extraction and treatment system can be restarted with 24 hours notice. Throughout the implementation of the OU2 groundwater remedy, the remedy has operated as designed, and consistently meets the performance goals for the treated effluent.

The re-infiltration basin area is approximately 200,000 square feet as defined by an existing berm. Re-infiltration occurs through a series of six infiltration basins that were designed to augment vertical infiltration through shallow soils containing clays and silts.

An extensive sampling network and monitoring program has been established which includes over 70 groundwater monitoring points, both wells and piezometers, that are sampled and monitored regularly according to the Site groundwater sampling program.

The estimated PRP Site Costs for OU1, and the annual OU2 Site Costs are listed in Table 2.

4.4 System Operations and Maintenance /Long Term Operation and Maintenance

The long-term operation and maintenance (O&M) for the extraction, treatment and recharge system began on September 24, 1999. The O&M phase was originally estimated to run for a period of approximately 10 years. It was estimated that the cleanup goals would be met within that time frame. During O&M, EPA has commissioned the United States Army Corps of Engineers (USACE) to take split samples for EPA laboratory analysis and to provide oversight and technical evaluation of the remedy. The split sampling events were occurring on a bimonthly basis, and in the last year, because of decreasing concentration trends, now occur three times per year (April, August, and December). Split sampling occurs at the influent (SP-2A or 2B) and the effluent (SP-11) sampling points.

As part of the adjustments made in order to optimize and improve performance of O&M, a number of system modifications have been implemented. Several system components were decommissioned because declining levels of influent contamination no longer warranted their use, including the following:

- a) In-situ bio-remediation was terminated in early 2000;
- b) The catalytic oxidizer and hydrochloric acid scrubber were taken off-line in January 2002; and,
- c) The two air stripping towers were taken off-line in April 2002.

Originally the re-infiltration system was designed to also function as an oxygen and nutrient delivery system as a polishing step for acetone, other ketones and biological oxygen demand, and to enhance biodegradation of residual soils contaminants in the re-infiltration area. However, subsequent to system start-up, acetone, ketones and biological oxygen demand were found to have been removed during treatment, and the addition of nutrients had the detrimental effect of allowing iron-precipitating bacteria to flourish. This caused iron fouling in system components. Based on this finding, the in-situ bio-remediation step was discontinued within the first year of operation.

In April 2002, the two air strippers were also bypassed because influent contaminant loading had decreased significantly. The operation of the air strippers was unnecessary and costly.

In addition to the above, changes to the remedial system included the following:

- a) An aggressive maintenance program was implemented to periodically clean fouling of extraction wells, conveyance lines, and other system components;
- b) Plant operations computer and software were upgraded several times;
- c) Extraction well flows were adjusted to optimally extract contaminants from the groundwater plume;
- d) Flows to several infiltration basins were modified to maximize recovery of residual contamination, and to limit the spread of contamination vertically and/or horizontally;
- e) Supplemental in-situ pilot studies were conducted to evaluate the effectiveness of prospective technologies to enhance the recovery of residual soil contaminants within identified soil hotspots;
- f) In 2003, an investigation was conducted to determine the nature and extent of a small amount of low level contamination that had intermittently been detected at monitoring well IC-7;
- g) In June 2004, soils excavation was conducted in the vicinity of monitoring well TC-30, which removed approximately 1,100 cubic yards of contaminated soils from a hot spot that had been identified as part of the IC-7 investigation (as discussed below); and
- h) The groundwater and extraction system was taken off-line on June 20, 2006, to implement the pilot test of a continuous operation DPE system in the areas identified as hot spots around monitoring wells TC-32 and TC-33. In addition, an expanded groundwater monitoring program was implemented to confirm the effectiveness of the DPE pilot test system.

4.5 Recent Investigations

Hydraulic Control

Based on low-level groundwater detections in three general areas outside the re-infiltration basins, identified as IC-2 (including IC-10 and IC-11), IC-7 (including IC-13, IC-14), and the BC-17 area wells, EPA believed that not all of the plume had been completely contained, and that the re-infiltration of treated groundwater over residually contaminated soils areas, might be contributing to a minor outward spread of low-level contamination in these areas. Because groundwater recharge was superimposed over extraction, the hydraulics of the remedy are complicated, and there was a concern as to whether the remedy exhibited sufficient hydraulic control. Based on monitoring wells that were screened across the shallow and intermediate zones, for the most part, water levels indicated that contamination was contained within the capture zones of the seven extraction system wells; however, water level data is not always a clear indication of control. To give a more clear indication of control, new monitoring wells were installed as needed to fill data gaps in coverage. Based on sampling of all monitoring wells, hydraulic control appears to be maintained throughout the extraction/recharge area, and the contaminant plume continues to shrink.

Detections in IC-2 area

Between 2000 and 2003, detections in monitoring well IC-2 went from non-detect (ND) to a concentration of 370 parts per billion (ppb) of total volatiles on June 19, 2003. The December 2003 sampling round showed 0.13 ppb concentration of total volatiles. Based on results, new monitoring wells were installed downgradient of IC-2, at IC-13 and IC-14. In February 2004, IC-13 and IC-14 were sampled and bis(2-ethylhexyl)phthalate and naphthalene were detected at levels slightly above the remedial goals. The area is believed to be within extraction well EW-7's zone of capture, and the extraction flow of EW-7 had been increased until June 2006, to maximum levels, to address this concern. Well EW-7 has since been shut off as of June 20, 2006, to implement the DPE pilot test program, and the area continues to be closely monitored.

Detections in IC-7 area

In addition to the IC-2 detections described above, there have been intermittent exceedances of the remedial goals in well IC-7 involving tetrachloroethene (PCE), trichloroethene (TCE), and 2-methylnaphthalene, which when resampled were not duplicated. As a result, in accordance with approved work plans, the IC-7 area became the subject of a separate supplemental investigation called *IC-7 Corrective Action Plan Supplemental Investigation*. This investigation was conducted in the summer of 2002. This investigation demonstrated that detected concentrations in IC-7 were not associated with the performance of the groundwater recovery and re-infiltration system. Instead, the source was identified as TC-30 soils within the re-infiltration basins. IC-7 is directly downgradient or in the groundwater flow path of TC-30. A corrective action was performed by increasing extraction flows from extraction wells EW-1 and EW-6, and the removal of source soils in the vicinity of TC-30. In early 2004, approximately 1,000 cubic yards of source soil were removed from the TC-30 area, and several new monitoring wells were installed, including two new downgradient monitoring wells IC-8 and IC-9. Low levels of volatile organic compounds and 2-methylnaphthalene are intermittently detected in new downgradient wells IC-8 and IC-9, but had decreased below the compliance criteria as of September 2008. Groundwater monitoring to date has confirmed no elevated levels of contaminants have been detected in IC-7 since June 2002. In addition, in order to monitor whether low-level contamination has travelled downgradient of the IC-7 area, EPA required the installation of two new downgradient wells. The new wells were installed in April 2009, and will be included in the on-going sampling program.

Detections in BC-17 area

Sporadic exceedances of total xylenes concentrations have also been detected in well BC-17. In June 2005 and September 2006, the total xylenes concentrations slightly exceeded the remedial goal in well BC-17; however, during subsequent sampling events, the xylene concentrations were below the compliance criteria. Similarly, from March 2008 through December 2008, total xylenes were detected above the compliance criteria; however, in March 2009 the total xylenes concentrations were found to be below the compliance criteria. The total xylenes concentrations detected in well BC-17 are sporadic and consistent with findings in the IC-7 area. The area will continue to be sampled.

Residuals Soils

In June 2005, a sampling program was undertaken to characterize conditions in the seasonally-saturated zone beneath the former drum disposal area. A total of 44 soil samples were collected from within the reinfiltration basins. At each of 22 locations sampled, one sample was collected from the soil/water interface, and one from the saturated zone within each boring. This program confirmed the effectiveness of contaminant removal in the former TC-30 source area. It also confirmed that no significant concentrations of VOCs or semi-volatile organic compounds (SVOCs) remain in unsaturated soils, and that VOCs and SVOCs in saturated soils were limited in scope and meet risk-based criteria. The program also confirmed that the current groundwater monitoring program adequately characterizes groundwater conditions in the former drum disposal area.

The 2005 seasonally saturated sampling program identified two additional areas where residual groundwater contamination was above remedial goals. These two areas are in the immediate vicinity of wells TC-32 and TC-33, and are currently being addressed through supplemental actions. The Ewan PRP Trust conducted a DPE pilot study over an extended period during 2003 and 2004. The study combined the recovery of contaminants in both soil vapor and the aqueous phases. The results of the study revealed that DPE could more efficiently address areas of residual contamination in a shorter amount of time than the current groundwater remediation system.

4.6 DPE Pilot System Operation and Performance

As a result of the on-going monitoring programs and investigations, as described above, two residual hot spot soils areas were identified, known as the TC-32 and TC-33 areas. These two areas are currently being addressed through supplemental actions. During 2003 and 2004, the Ewan PRP Trust conducted a DPE pilot study. The study involved piloting the recovery of contaminants in both soil vapor and the aqueous phases from these two areas. The results of the pilot study revealed that the DPE technology can more efficiently address residual contaminant areas in a shorter amount of time than the current full-scale groundwater remediation system. In mid 2004, the PRPs submitted a proposal to use the DPE technology on an extended basis. EPA approved the proposal to extend the period of operation of the DPE program.

In addition, in 2004, the PRPs developed a soils sampling program designed to identify if any other remaining soil hot spots remain within the recharge basin area, and to help determine the overall effectiveness of the soil flushing part of the original remedy to reduce soil contamination throughout the former disposal area.

Based on the data obtained from the Site sampling programs, it was determined that the groundwater extraction and reinfiltration system was no longer efficiently recovering meaningful quantities of VOCs and SVOCs, per volume of water being extracted, and that the DPE system was more effectively addressing the limited soils areas of

contaminants that remain. The full-scale groundwater extraction system was taken off-line on June 20, 2006 with continued full-time operation of the DPE system in the TC-32 and TC-33 areas. An expanded groundwater monitoring program was also implemented to confirm the effectiveness of the DPE system.

During the initial six-month DPE evaluation period, decreasing trends were evident in most monitoring wells across the site. Furthermore, significant decreases in concentrations of constituents of concern were evident with the lowest concentrations detected in the majority of the monitoring wells at the end of the six-month testing period in December 2006. Since operating the DPE system on its own, monthly groundwater sampling has revealed no concentrations of VOCs or SVOCs exceeding remedial objectives with the exception of occasional unconfirmed low-level detections in the historic IC-7 and IC-9, and BC-17 areas, outside the former disposal area (i.e. Reinfiltration Basin area). The expanded groundwater monitoring program, as well as routine groundwater monitoring conducted between June 2006 through December 2008, confirm that the DPE system is effectively and efficiently recovering residual concentrations in shallow groundwater within the two soils hot spot areas.

In October 2008, the PRP Group initiated a groundwater sampling program downgradient of wells IC-7 and IC-9, to identify the appropriate locations to install two additional downgradient CEA Compliance wells. These two new monitoring wells were installed in April 2009 and will be incorporated into the on-going groundwater monitoring program.

In December 2008, groundwater sampling indicated that all wells outside of the area of groundwater contamination were below the remedial objectives. Only one well, TC-32, within the former disposal area, had VOC concentrations consistently slightly exceeding the remedial objectives. SVOCs were not detected above the remedial objectives in any monitoring well sampled. All other monitoring wells in the former disposal areas have concentrations below remedial objectives. Based upon recent groundwater monitoring results from March 2009, it is anticipated that concentrations will continue to decrease over time.

Since start-up in March 1999, the OU2 groundwater treatment methods, comprising both the full-scale pump and treatment and the DPE systems have operated effectively. They have significantly contained the plume, as well as significantly reduced levels of groundwater contamination in most areas. Through December 31, 2008, approximately 304 pounds of contaminants have been recovered through treatment of the groundwater via the full-scale treatment system, and an additional 188 pounds have been subsequently removed through the DPE system for a total of 492 pounds. This is approximately 104 pounds more than had been reported for the first five-year review, conducted in September 2004, when approximately 388 total pounds were reported to have been removed through treatment. In addition, approximately 467,050,000 gallons of contaminated groundwater have been extracted and treated.

The PRP Group has recently recommended termination the DPE remedial system with implementation of a monitored natural attenuation program (MNA), with continued groundwater monitoring. The EPA has reviewed the proposal and has requested additional information to assist with its review. The EPA and NJDEP will revisit the PRPs' proposal after the requested information has been received and evaluated.

4.7 Off-Site Well Sampling

As part of the remedial action, an off-site residential well sampling program is conducted at eight downgradient residential wells, to ensure that no Site-related contamination is impacting local potable wells. The nearest downgradient wells are located approximately $\frac{3}{4}$ miles, southwest of the Site. Off-site wells are sampled on a five-year basis. During the previous five-year review Site inspection tour, township officials alerted EPA that a new seasonal-use public ball field irrigation/potable water supply well would be installed approximately $\frac{3}{4}$ mile downgradient of the Site. During the tour, EPA agreed to add this new well to the off-site residential well sampling program. This well has since been installed. The off-site well sampling conducted in 2006 confirmed that there were no impacts to off-site wells, including the new supply well. The off-site wells are next scheduled to be sampled in June 2011.

In June 2008, a number of off-site private residential wells were sampled by individual property owners as a result of an initial residential well sampling conducted pursuant to the New Jersey Private Well Testing Act. Subsequent sampling of additional nearby homes conducted by the Burlington County Health Department revealed mercury concentrations detected above the MCLs. These potable wells are located in the vicinity of the Ewan Site, but hydraulically upgradient and side gradient. Review of Site-related data indicates that mercury is not a Site contaminant, and it has never been detected in the wells immediately downgradient of the Site. The occurrences of mercury in the local potable wells, as well as occasional low-level detections in scattered on-Site wells are attributed to regional mercury groundwater contamination that had been identified by the NJDEP site case manager. The NJDEP provided a regional study map, Unexplained Mercury Groundwater Concentrations in Southern New Jersey, dated April 2004. The NJDEP and the local health department are following up on the matter. For further information and questions regarding this matter, the NJDEP contact, James DeNoble, can be reached at 609-777-4101. The Shamong Township Administrator can be reached at 609-268-2377.

5.0 FIVE-YEAR REVIEW PROCESS

5.1 Administrative Components

The five-year review team consists of Stephen Cipot, EPA (Remedial Project Manager); Michael Van Itallie, (EPA Attorney); Michael Scorca, EPA (Hydrogeologist); Marian Olsen, EPA (Risk Assessor); Michael Clementson, EPA (Ecological Risk Assessor);

Natalie Loney, EPA (Community Involvement Coordinator); James DeNoble, NJDEP (Case Manager); and Fernando Angelelli, Engineer with the USACE. The USACE has been contracted by EPA to oversee O&M activities.

5.2 Community Involvement

EPA's Community Involvement Coordinator for this Site is Ms. Natalie Loney. EPA notified the community that it had initiated the five-year review process by publishing a notice in the Burlington County Times Newspaper on April 14, 2009 (copy attached). The notice indicated that EPA would be conducting a five-year review of the remedy at the Ewan Property Site to ensure the remedy remains protective of human health and the environment and is functioning as designed, and that once the five-year review is completed, the results will be made available in the local Site repositories. The notice included the RPM's business address and telephone number for questions related to the five-year review process for the Site. EPA also sent an email to the Shamong Township Administrator/Clerk, who had expressed an interest in the Site, advising of the Five-Year Review process, which announced an invitation to participate in the Site inspection. The Shamong Township Administrator attended the five-year review site visit held on April 22, 2009, with one other township official in attendance.

5.3 Document Review

The documents, data, and information which were reviewed in completing the five-year review are found in the attached Bibliography.

5.4 Data Review

The data reviewed included the historical data from the Site file for OU1 and OU2, the administrative record, as well as subsequent extensive groundwater monitoring data from the operation and maintenance phase of the groundwater extraction, treatment, recharge remedy (OU2), and DPE system from 2004 through 2009. Please see section 4.5 for a detailed discussion of recently collected data as part of on-going O&M activities.

5.5 Summary of Activities Since the Last Five-Year Review

The last five-year review was issued by EPA on September 30, 2004. That review did not list any specific recommendations, noting that numerous routine O&M activities were ongoing. Further, the last five-year review concluded that the remedies implemented at this Site were protective of human health and the environment.

Since the last five-year review, the full-scale groundwater extraction, treatment, and reinfiltration system, was placed on stand-by mode based upon system operation, and soil, and groundwater monitoring data. In November 2004, a DPE system was piloted to determine its effectiveness in achieving remedial goals in a more efficient manner than the full-scale remedial system, by focusing on specific identified remaining soils hot-spot

areas. Following a six-month period of extensive groundwater monitoring, in June 2006, DPE treatment continued in two limited hot-spot soils areas. The full-scale treatment system operation ceased, while maintaining the ability to become fully operational with 24 hours notice. The DPE recovery wells and effluent conveyance lines are directed to the treatment system building, and the treated effluent is discharged to the existing reinfiltration basins.

In 2004, the PRPs conducted an investigation in the area of IC-7, and excavated the TC-30 hotspot within the reinfiltration basin area, and seven new monitoring wells were installed (IC-8, IC-9, IC-10, IC-11, and IC-12, IC-13, IC-14).

In June 2005, a focused subsurface soil/groundwater seasonally saturated zone sampling program was conducted to help identify any remaining soils hot spot areas, to improve the efficiency of the DPE remediation, and the overall effectiveness of OU2 remediation. The results of this sampling program confirmed that remedial actions are addressing the majority of residual saturated zone soil and groundwater contamination within the reinfiltration basins.

In July 2005, the comprehensive 2.5-year sampling event was conducted that provided a comprehensive sampling of groundwater from the majority of on-site wells.

In June 2006, based upon the results of the focused subsurface/groundwater seasonally saturated zone sampling program and groundwater quality monitoring, an evaluation of the overall effectiveness of OU2 remediation was conducted. Based upon this evaluation, full-time operation of the groundwater recovery system was terminated and the system was placed on standby mode, while the DPE system was operated to treat the 2 Site hot-spot areas. Following a six-month period of extensive groundwater monitoring, a comprehensive evaluation of site conditions with only the DPE system operating was conducted. The results of this evaluation indicated that the DPE system was effectively addressing the limited residual groundwater contamination, and the DPE system continues to operate.

In July 2006, the five year off-site well sampling program was conducted. The results of the off-site well sampling program confirmed no impacts to any off-site wells, all results were below the remediation standards.

In March 2008, a comprehensive 2.5-year groundwater quality monitoring event was again conducted. The results of the groundwater quality monitoring programs continue to confirm that groundwater quality continues to improve.

In October 2008, the PRPs initiated a groundwater sampling program downgradient of wells IC-7, IC-8 and IC-9 to identify locations for additional sentinel wells in this area of the Site where fluctuating low concentrations of constituents of concern have been detected. Based upon the results of the groundwater sampling program, two additional

sentinel wells were installed in April 2009, and the Site CEA will be revised to reflect current Site groundwater conditions.

5.6 Site Inspection

A Site inspection for this five-year review was conducted April 22, 2009, by the members of the five-year review team, including representatives from the NJDEP, EPA, USACE, the PRPs, and local government representatives.

The team inspected the Site for general conditions, drainage, debris and access controls. The Site was found to be in good condition. The fence surrounding the Site remains intact; there are no visible signs of trespassing onto the Site, and both the treatment plant building and the Site in general are free of debris. The Site drainage gradient allows for maximum rainfall runoff from its surface to off-site areas, including adjacent wetlands; it continues to function as designed. The re-infiltration basins are in good working order. The vegetation found at the Site is a combination of uplands forest and primarily wetlands vegetation, both of which appeared to be healthy. The restored wetlands continue to support healthy vegetation. This vegetation does not suggest that environmental conditions are being degraded as a result of proximity to the Site.

The Site RPM has not been notified of any additional concerns with the remedy that were not already under consideration in this review.

5.7 Interviews/Meetings

During the Site inspection, the five-year review team discussed Site status with the PRPs, State program representatives, local government representatives and the local press. In addition, there have been on-site meetings with concerned parties and with local government officials and community representatives over the course of the remedial action. EPA regularly communicates with the PRPs, the plant operator, the state Case Manager, the Pinelands Commission, USACE, Borough representatives, and interested residents.

6.0 TECHNICAL ASSESSMENT

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

Yes, the remedies are functioning as intended in the original RODs and ESD. As described in Section 4.0, the goals of the OU2 ROD were to address impacts to soil and groundwater through the extraction, treatment and re-infiltration of treated groundwater. Based upon extensive data collected and evaluated, the remedy is functioning as intended, groundwater contamination is being controlled, the performance goals for the treated effluent have been consistently maintained, and there are substantial overall decreasing trends in concentrations of Site contaminants in Site groundwater.

The basis for this conclusion lies in the following:

- Successful operation of the full-scale groundwater extraction, treatment and re-infiltration system, from 1999 to mid-2006;
- The subsequent and successful implementation of DPE to recover residual contamination in the vicinity of wells TC-32 and TC-33 from 2006 to the present;
- The excavation and soil removal at TC-30;
- Extensive groundwater monitoring from 1999 to 2009, and sampling results from the new IC-8, IC-9, IC-10, IC-11, IC-12, IC-13, IC-14 wells installed at the Site;
- Within the former disposal and infiltration basins area, a round of soils sampling conducted in 2005 indicates that no significant concentrations of VOCs or SVOCs remain in unsaturated soils, and that VOCs and SVOCs in saturated soils are limited in scope at low levels; and
- The off-site well sampling program continues to demonstrate the absence of any Site-related impact on potable downgradient wells, including two wells located at the Town's ball fields, immediately downgradient of the Site.

As described in Section 4.4, the O&M activities were projected to run for a period of approximately 10 years. Although the remedy has operated for 10 years and the OU2 ROD groundwater remedial goals have not yet been completely achieved throughout the Site, significant progress has been made toward achieving them in most areas. Low residual levels of contamination remain localized in very isolated spots, and the further limited recovery of contaminants through the on-going DPE operation indicate the remedy is functioning as intended by the decision documents.

The actions under OU1 that were performed to address the source material and heavily and moderately contaminated soils also remain protective.

These actions interrupt the direct exposure pathways of direct contact with the contaminated groundwater and soils. The remedies are functioning as intended to interrupt direct exposure to the contaminated soils and groundwater.

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

- a. Soil. Soil use at the Site is not expected to change during the next five years.

The exposure analysis used in the 1988 risk assessment followed guidance available at that time. During the implementation of the OUI remedy in 1995, drums and soils were excavated and removed from Area A and the excavation extended to the sidewalls. Clean soil was used to backfill the excavated area. Post-excavation samples were collected from the sidewalls of the excavated areas from September 1994 to July 1995. Comparison of the sidewall sample data to current residential risk based screening levels for potential cancer and non-cancer health effects assuming exposures of adults and children for 350 days/year for a period of 24 years and 6 years, respectively were conducted. This comparison of sidewall data compared to residential risk-based concentrations (RBCs) that meet EPA's goals of protection (i.e., cancer risk of one in a million and non-cancer Hazard Index (HI) of 1), indicates that the risks did not exceed EPA's goal of protection for any contaminant with only one exception i.e., one sidewall sample arsenic concentration slightly exceeded the non-cancer HI of 1, but it was noted that this is not a chemical of concern at the Site.

In addition, given that heavily and moderately contaminated soils were excavated and backfilled with clean soil in 1995 (e.g. OUI), the human exposure pathways have been interrupted. Based on current studies, there appears to be no significant concentrations of contaminants in either saturated or unsaturated soils. Additional analysis may be necessary at a later time, which may include the collection of additional soils samples.

The soil remedy remains protective.

b. Groundwater. A Classification Exception Area (CEA) is in place to prevent wells from being drilled within the area of groundwater contamination. December 2006 sampling of VOCs and SVOCs found that the detected concentrations in all CEA Compliance Wells were below the remedial objectives.

The evaluation of the direct contact pathways showed that all nearby residents are consuming private well water and the groundwater remedies, coupled with the contaminant reductions already achieved, prevents off-site migration. The ROD identifies MCLs well as New Jersey Class 1-PL standards designated by NJAC 7:9-C-1.5, for groundwater as Applicable Relevant and Appropriate Requirements (ARARs), and these standards remain protective of the groundwater, and, therefore, the remedy is protective for this exposure pathway.

As discussed in Section 4.3, EPA is aware of a new seasonal-use public ball field irrigation/potable water supply well that was installed approximately ¾ mile downgradient of the Site. EPA has conducted sampling of this well and at eight additional residential wells and found that there were no impacts in the off-site wells from the site. The off-site wells will be resampled in June 2011.

The groundwater remedy remains protective.

c. Vapor Intrusion. Currently, the groundwater treatment plant is the only

building located on the Site. Evaluation of the groundwater concentrations for trichloroethylene at the site indicated a limited number of samples above the groundwater screening criteria for Vapor Intrusion of 5.3 micrograms per liter (ug/l) associated with a cancer risk of 1×10^{-4} (U.S. EPA 2002 OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance, available at:

epa.gov/osw/hazard/correctiveaction/eis/vapor/complete.pdf). This pertains to TCE identified at location TC-32, at 23 ug/l and 24 ug/l, found on 3/22/2007 and 6/19/2007, respectively, and 7.3 ug/l TCE found at location TC-35 in September 2007). Although not expected, if this land were to be developed for residential or industrial purposes in the future, further evaluation of this pathway should be conducted. This evaluation should include site-specific considerations such as the type of building, the location of the building in relation to the maximum detected concentration in groundwater, and the subsurface characteristics at the Site.

d. Are the Cleanup Values Selected in the ROD Still Valid?

The purpose of OU1 selected remedy for the soils was to remove grossly contaminated soils and hazardous waste and therefore, prevent the migration of hazardous substances, pollutants and contamination from these the source areas to Site groundwater. As such specific ARARs were not established for the soils at the Site. However, extensive soil excavations were performed and the excavations were backfilled with clean soil in 1995; therefore, the human exposure pathways have been interrupted. Based on current data, there are no significantly elevated concentrations of contaminants in either saturated or unsaturated soils.

Federal Maximum Contaminant Levels, state MCLs, and standards established in NJAC 7:9-C-1.5 were identified as ARARs in the Record of Decision for remediation of the on-site groundwater. These remain valid and are protective.

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

Based on the evaluation of the potential human exposures at the Site, there is no new information that has been developed that could call into question the protectiveness of this remedy.

6.4 Technical Assessment Summary

- Site contaminants are hydraulically contained in the groundwater phase, and in residually contaminated soils within the Site recharge basins which receive treated effluent as part of a soils flushing action.
- The DPE system to recover residual contamination in the vicinity of wells TC-32 and TC-33 has continued to operate as designed, from 2006 to present.
- While the full-scale groundwater extraction, treatment and recharge system is no longer operating on a continual basis, it remains fully intact, well maintained, in good working condition (including the batch treatment for DPE operation, and re-infiltration of treated groundwater), and can be turned on with 24 hours notice.
- The security fence around the Site is in good repair and is maintained and inspected on a on-going basis and the CEA is in place to prevent the use of the water as a potable water source as an institutional control for the groundwater.
- While occasional trespassing has occurred, there is presently no evidence of trespassing, or damage to the Site remedy or to the monitoring wells.
- There have not been drinking water wells or withdrawals of water for drinking purposes within the plume area. The closest downgradient withdrawal of water for potable purposes is in a well located approximately 3/4 mile away. This well has not been impacted by the Site contamination.

7.0 **ISSUES**

There are no major issues that affect the protectiveness of the remedies at this Site.

8.0 **RECOMMENDATIONS AND FOLLOW-UP ACTIONS**

There are no specific recommendations as a result of this five-year review. The Site has on-going active routine operation and maintenance activities, remedial activities, including an operating dual-phase extraction, re-infiltration and treatment system, and long term maintenance and monitoring activities. As expected by EPA, these activities are subject to routine modifications and adjustments. Previous sections of this report include a description of on-going modifications which are now occurring or will occur in the near future.

EPA will continue with the various on-site and off-site monitoring programs, to assess the progress of the selected remedies.

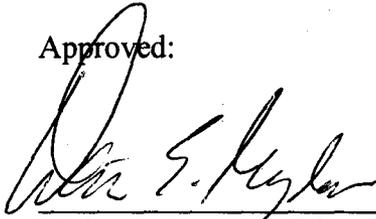
9.0 PROTECTIVENESS STATEMENT

Currently, there is no exposure to human or environmental receptors from Site contaminants. The remedies implemented at this Site currently protect human health and the environment.

10.0 NEXT FIVE-YEAR REVIEW

EPA will conduct another Five-Year Review by August 2014, unless groundwater cleanup objectives are achieved earlier then and a Final Close-Out Report or deletion of the Site occurs.

Approved:



Walter E. Mugdan, Director
Emergency and Remedial Response Division

8/26/2008
Date

Table 2 Approximate PRP Site Costs for OU1 and OU2

Year	Activity	Approximate Cost
1995	OU1 Design and Construction	\$15,100,000
1996 - 1999	OU2 Design and Construction	\$7,400,000
1999	OU2 O&M	\$750,000
2000	OU2 O&M	\$750,000
2001	OU2 O&M	\$750,000
2002	OU2 O&M	\$750,000
2003	OU2 O&M	\$750,000
2004	OU2 O&M	\$750,000
2005	OU2 O&M	\$750,000
2006	OU2 O&M	\$750,000
2007	OU2 O&M	\$700,000
2008	OU2 O&M	\$650,000
2009	OU2 O&M	\$550,000

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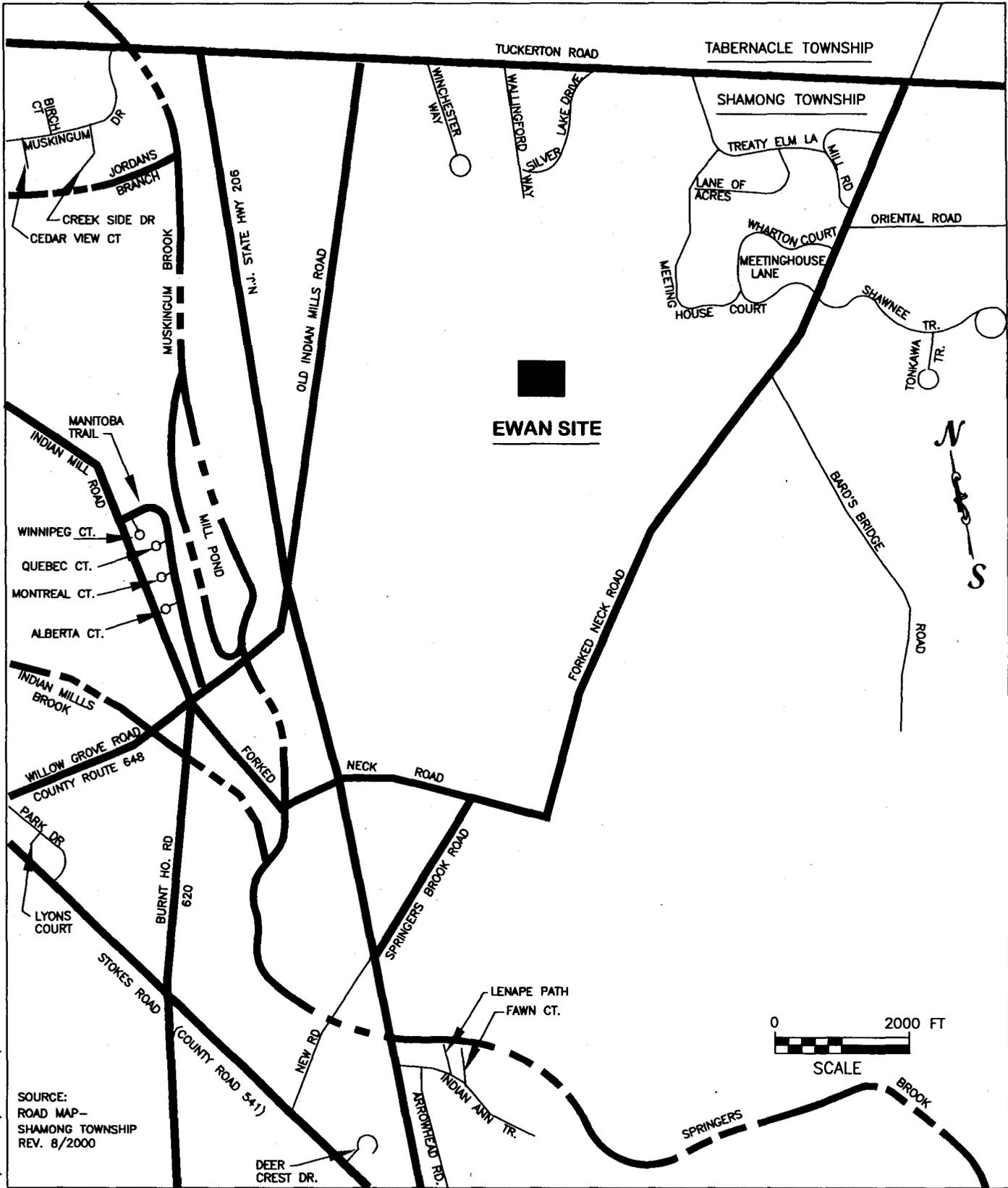
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LIST OF ACRONYMS APPEARING IN THIS REPORT

ARAR	Applicable Relevant and Appropriate Requirements
BC	Bottom of Cohansey Aquifer
BOD	Biological Oxygen Demand
BRL	Below Remedial Level
CEA	Classification Exception Area
DGW	Discharge to Groundwater
DPE	Dual-Phase Extraction
EPA	U.S. Environmental Protection Agency
ESD	Explanation of Significant Differences
IC	Intermediate Cohansey Aquifer
IGWSCC	Impact to Groundwater Soil Cleanup Criteria
LNAPL	Light Non-Aqueous Phase Liquid
LTRA	Long Term Response Action
MCL	Maximum Contaminant Level
mg/kg	Milligrams per kilogram
NA	Not Applicable
NJDEP	New Jersey Department of Environmental Protection
NJPDES	New Jersey Pollutant Discharge Elimination System
O&M	Operations and Maintenance
OU1	Operable Unit 1
OU2	Operable Unit 2
PCB	Polychlorinated Biphenyl
PCE	Tetrachloroethene
PQL	Practical Quantitation Limit
PRP	Potentially Responsible Party
RBC	Risk Based Concentrations
RI/FS	Remedial Investigation and Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
SVOCs	Semi-Volatile Organic Compounds
TC	Top of Cohansey Aquifer
TCE	Trichloroethene
USACE	United States Army Corps of Engineers
UTL	Upper Tolerance Limit
VOCs	Volatile Organic Compounds



SOURCE:
ROAD MAP—
SHAMONG TOWNSHIP
REV. 8/2000

FOUR NESHAMINY INTERPLEX, SUITE 300
TREVOSE, PENNSYLVANIA 19053

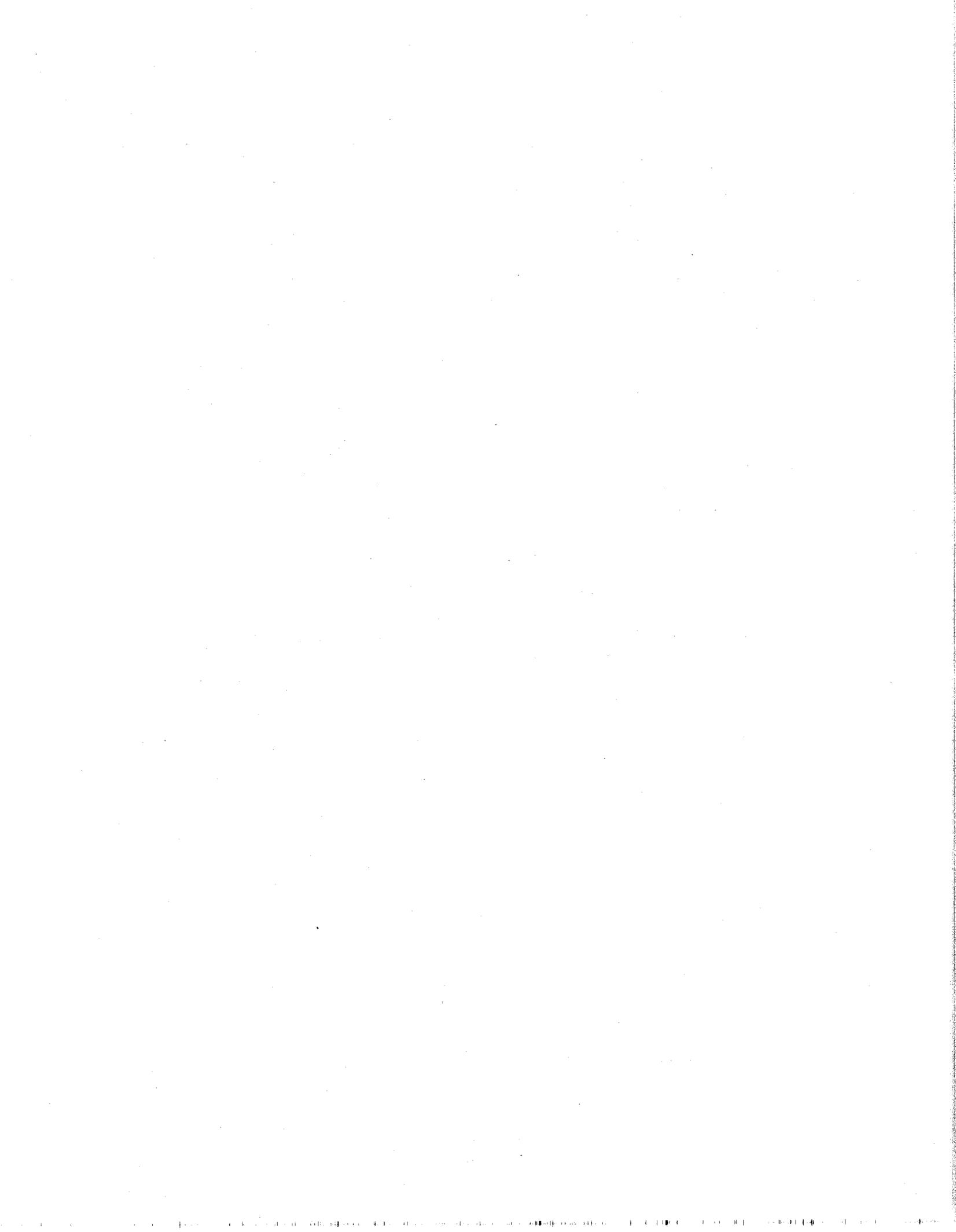
ENVIRONMENTAL / CONSULTING ENGINEERS

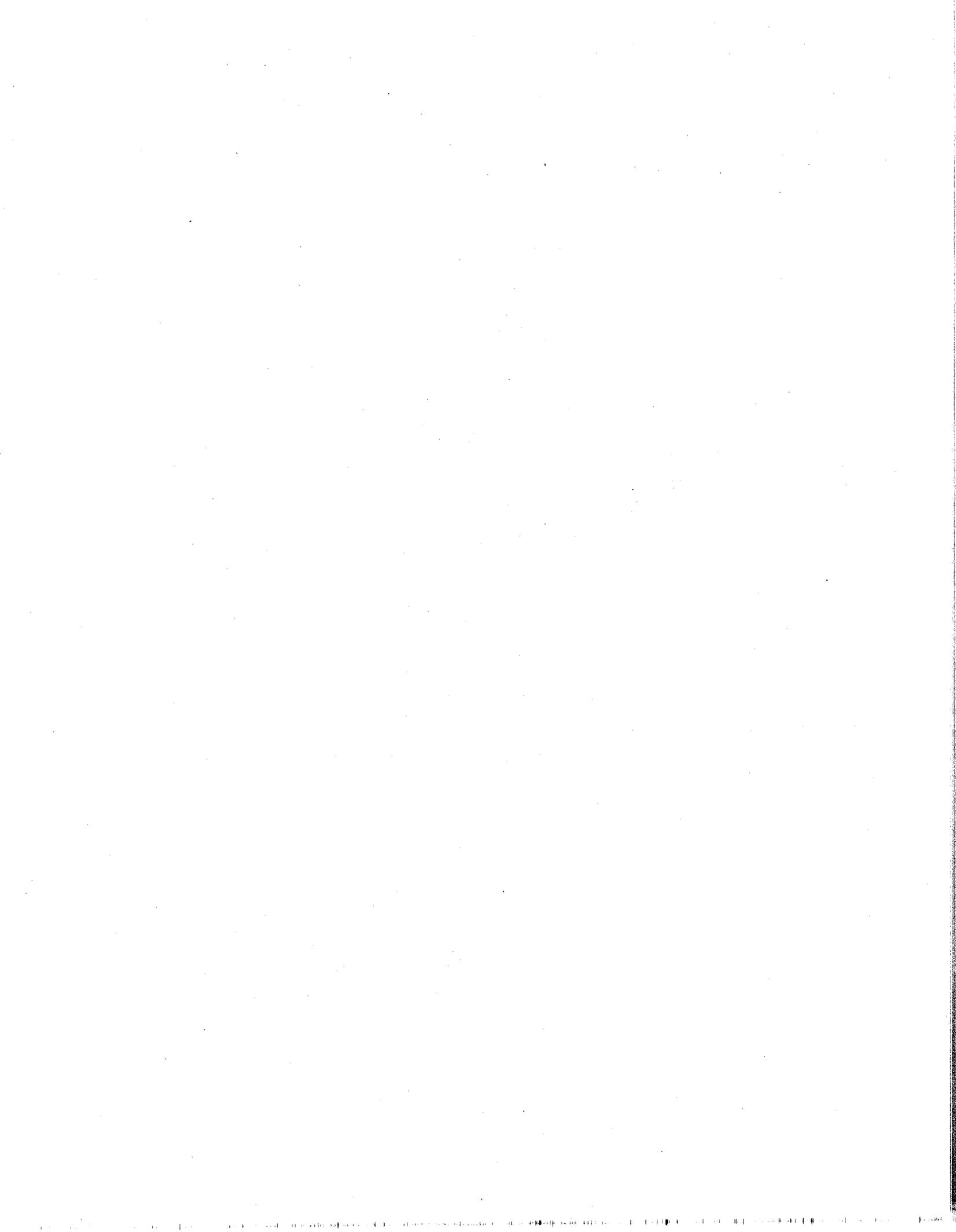
L:\WORK\ENV\project\73535\task 7\CADFILE\SITE LOCATION MAP



PROJECT:
EWAN PROPERTY SUPERFUND SITE
ENGINEERING SERVICES AND
OPERATIONS AND MANAGEMENT
SHAMONG TOWNSHIP, BURLINGTON CO. NJ

TITLE: SITE LOCATION MAP	
SCALE: 1"=2000'	DATE: 12/03
PROJECT NO. 73535	FIGURE NO. 1







EPA is conducting a five year review of the Ewan Property Superfund site!

The United States Environmental Protection Agency is conducting the second five-year review of the remedies addressing the clean-up at the **Ewan Property Superfund Site** in **Shamong Township, New Jersey**.

The purpose of the five-year review is to ensure that the remedies implemented for the site continue to be protective of public health and the environment and are functioning as designed. The remedies for the Ewan Property Superfund Site consist of the following:

- 1) excavation, off-site treatment and disposal of drums and contaminated soils;
- 2) extraction and treatment of contaminated groundwater;
- 3) treatment of residually contaminated soils via flushing with treated groundwater.

All drums and associated soils were excavated and disposed off-site by 1995. The groundwater remedy at the site, which has been in operation since late 1999, has been progressively capturing, treating, and reducing the groundwater contamination and the residual soil contamination beneath the site. The potentially responsible parties' contractor is providing monthly monitoring and reporting to the EPA and New Jersey Department of Environmental Protection.

EPA estimates that the five-year review will be completed by June 2009. Once the five-year review is completed, the results will be made available at EPA's NYC office, and at the site repository, located at:

Municipal Clerks Office
Shamong Township Municipal Building
105 Willow Grove Road
Shamong, NJ 08088
609-268-2377

If you have any questions about the Ewan Property Superfund Site or the five year review process please contact:

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