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February 1996

EPA Superfund Record of Decision:

Denzer and Schafer X-Ray Co, Berkeley Township, Ocean County, NJ 9/29/1995

SEP 28 1995

Record of Decision
Denzer & Schafer X-Ray Company Site

Kathleen C. Callahan, Director
Emergency and Remedial Response Division

Jeanne M. Fox
Regional Administrator

Attached for your approval is the Record of Decision (ROD) for the Denzer & Schafer Superfund site, The site is located in Berkeley Township, Ocean County, New Jersey.

The Denzer & Schafer X-Ray Company is engaged in the reclamation of silver from microfilm and x-rays. Past activities at the facility have included the reclamation of silver by chemical stripping and incineration of spent film. In 1974, the company switched from incineration to a caustic soda and salt silver reclamation process. Between 1974 and 1981, the facility disposed of its stripping solution by discharging it to the plant's subsurface sanitary septic system. The septic system has subsequently been abandoned and filled with sand. Currently, the process wastewater is stored in above-ground tanks prior to disposal off site.

The New Jersey Department of Environmental Protection (NJDEP) conducted a remedial investigation at the site from 1986 to 1991, and supplementary ground water investigations from 1992 to 1995. The results of the latter investigations indicated that site-related ground water contamination, which was found during the earlier investigative effort, no longer poses a threat to public health under current or likely future land use scenarios. Therefore, no further action is required pursuant to CERCLA. However, since low levels of ground water contamination continue to exist in the immediate vicinity of the site, a monitoring program of ground and surface waters will be implemented.

The Proposed Plan for the site was released on June 30, 1995 and a public meeting held in Berkeley Township on July 20. The public comment period continued through August 7, 1995. The community supported the proposed no action with monitoring remedy.

The ROD has been reviewed by NJDEP and the appropriate program offices in Region II, and their comments have been incorporated into the attached document.

SYMBOL --->	NJSB-1	NJP	ORC	ERRD	ERRD	OEP	DRA	RA
SURNAME -->	BONSELLINO	FRISCO	KARLEN	PAVLOU	CALLAHAN	RANDOL	MUSZYNSKI	FOX
DATE ----->		9/26	9/25/95		9/25	9/25/95		9/25/95

If you have any questions concerning this ROD, I will be happy to discuss it at your convenience.

Attachment

DECLARATION STATEMENT

RECORD OF DECISION

Denzer & Schafer X-Ray Company

Site Name and Location

Denzer & Schafer X-Ray Company
Berkeley Township, Ocean County, New Jersey

Statement of Basis and Purpose

This decision document presents the selected remedial action for the Denzer & Schafer X-Ray Company site. The remedial action was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based the administrative record for the site.

The New Jersey Department of Environmental Protection concurs with the selected remedy.

Description of the Selected Remedy

The selected remedy for the Denzer & Schafer X-Ray Company site is to take no action with monitoring of ground and surface waters.

The New Jersey Department of Environmental Protection conducted a remedial investigation at the site from 1986 to 1991, and supplementary ground water investigations from 1992 to 1995. The results of the latter investigations indicated that site-related ground water contamination, which was detected during the earlier investigative effort, no longer poses a threat to public health under current or likely future land use scenarios. Therefore, no further action is required pursuant to CERCLA.

However, since ground water contamination continues to exist in the immediate vicinity of the site, albeit at relatively low levels, a monitoring program of ground and surface waters will be implemented. In addition, the underground storage tank and stripped film debris at the site will be addressed by the State of New Jersey under its enforcement authorities.

Declaration of Statutory Determinations

In accordance with the requirements of CERCLA and the NCP, I have determined that no remedial action is necessary to protect human health and the environment at the Denzer & Schafer X-Ray Company site. However, a program to monitor ground and surface waters in the vicinity of the site will be implemented under the No Action with Monitoring Alternative.

Because this remedy will result in low levels of hazardous substances remaining on the site above health-based levels, a review will be conducted within five years to ensure that the no action with monitoring remedy continues to provide adequate protection of human health and the environment.

The Environmental Protection Agency has determined that its response at the Denzer & Schafer site is complete. Therefore, the site now qualifies for inclusion on the Construction Completion List.

Jeanne M. Fox
Regional Administrator

9/25/95
Date

DECISION SUMMARY

DENZER AND SCHAFER X-RAY COMPANY SITE

BERKELEY TOWNSHIP, OCEAN COUNTY, NEW JERSEY

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION II

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DECISION SUMMARY FOR THE RECORD OF DECISION

DENZER AND SCHAFER X-RAY COMPANY

SITE NAME, LOCATION AND DESCRIPTION

The Denzer & Schafer X-Ray Company is located on Block 858, Lot 46A on the north side of Hickory Lane approximately 4,700 feet west of Route 9 in the Bayville area of Berkeley Township. (See the Site Location Map - Figure 1). The size of the property is approximately 10 acres. Barnegat Bay is approximately two miles to the east of the site and Toms River is two miles to the north.

The site is situated between two drainage systems. Potter Creek, which flows east to the Barnegat Bay, is approximately 2,000 feet to the south. Wetlands associated with the headwaters of Mill Creek are 2,000 feet to the west and north. Mill Creek is a northeast flowing tributary of Toms River.

An unpaved access road runs across the north end of the Denzer & Schafer property roughly parallel to Hickory Lane. Single family residential neighborhoods are located to the north, northeast and east of the site. Six commercial buildings and one residence are located to the west along Hickory Lane. Approximately 2,000 feet to the west are the Central Railroad of New Jersey tracks. A quarry and the Berkeley Township sewage treatment plant are immediately west of the tracks. A new residential development is proposed to the south across Hickory Lane (see Figure 1).

The Denzer & Schafer facility is located on a local topographic high about 50 feet above mean sea level (MSL). The immediate surrounding area is gently sloping, undeveloped and covered with pine trees. The wetlands associated with Potter and Mill Creeks are at an elevation of 30 feet above MSL.

The site lies within the Atlantic Coastal Plain Physiographic Province. The coastal plain is a wedge shaped series of unconsolidated sediments composed of clay, silt, sand and gravel of Tertiary and Cretaceous Age. The surficial soil is classified as the Downer Loamy Sand. Typically, the soil is well drained, grayish brown, loamy sand.

SITE HISTORY AND ENFORCEMENT ACTIONS

The Denzer & Schafer X-Ray Company is engaged in the reclamation of silver from microfilm and x-rays. Past activities at the facility have included the reclamation of silver by chemical stripping or incineration of spent film. The Denzer & Schafer X-Ray Company is not regulated under the Resource Conservation and Recovery Act (RCRA). In 1974, the company switched from incineration to a caustic soda and salt silver reclamation

process. Between 1974 and 1981, the facility disposed of its stripping solution by discharging it to the plant's subsurface sanitary septic system.

Additionally, shredded and stripped film generated during the same time period (1974 to 1981) was stock piled in an area just north of the process building (See Figure 2). The stock pile of film waste was subsequently transferred to an off-site landfill. However, for the past four years, the stripped film waste has again been stored around the site in cardboard containers.

The old sanitary septic system which received the process wastewater has since been abandoned and filled with sand. Until 1990, process wastewater was transferred to an on-site process wastewater storage tank for periodic off-site disposal. Currently, the process wastewater is stored in above-ground tanks prior to disposal off site. Two septic systems currently serve the site. Both reportedly are used for the disposal of sanitary waste only.

In addition to the silver recovery business, Microindustries, Inc., a microfilming service company, is located at the site. Microindustries, Inc. has been in operation since about 1970 and has operated exclusively as a microfilming service company. Microfilm processing waste, such as photographic developers and fixers, are generated as part of the company's operations. These wastes were discharged to the plant's sanitary septic system prior to 1981. From 1981 to 1990, the microfilming process waste, reportedly about 25 gallons every six weeks, was transferred to the same on-site process wastewater storage tank used for storing the silver recovery process waste.

Two Administrative Orders (one in January 1977 and the other in May 1981) were issued to the Denzer & Schafer X-Ray Company by the New Jersey Department of Environmental Protection (DEP). The DEP required Denzer & Schafer to immediately cease the discharge of wastewaters to its septic system, to submit a proposal to DEP for permanent treatment and off-site disposal of its wastewater, and to install a ground water monitoring system. In late 1981, as a result of these requirements, Mr. John Schafer, the owner of the facility, funded a ground water study which included the installation of nine shallow monitoring wells and two deep wells. One additional shallow well and three piezometers were installed in mid-1984. Periodic sampling of these wells since August 1981 and analyses of soil samples collected at the site indicate that waste from past operations has contaminated ground water at the site (See Figure 3).

The site was proposed for inclusion on the Environmental Protection Agency's (EPA's) National Priorities List (NPL) of Superfund sites on December 30, 1982, and subsequently added to the NPL on September 8, 1983.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

At the onset of the Remedial Investigation in 1987, the DEP established records repositories at the Berkeley Township Municipal Building and the Berkeley Township Library. All major site-related documents were sent to these locations. A central location for a comprehensive collection of all records relating to this site is the DEP main office in Trenton.

Since 1987, the DEP has held two public meetings in Berkeley Township regarding the Denzer and Schafer X-Ray Company site. The first meeting was held on February 26, 1987 to announce initiation of the Remedial Investigation. The second public meeting was held on July 20, 1995 to summarize the findings of the Remedial Investigation and Supplementary Ground Water Investigation and discuss the Proposed Plan. DEP held a public comment period on the Proposed Plan from June 30, 1995 to August 7, 1995. A summary of the questions and comments received at the public meeting and during the comment period and DEP's responses are included in the Responsiveness Summary section of this document.

SCOPE AND ROLE OF ACTION

This ROD presents the selected remedial action for the Denzer and Schafer X-Ray Company site, chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The selection of the remedy described in this ROD is based upon documentation comprising the administrative record.

SITE CHARACTERISTICS

A Remedial Investigation and Feasibility Study was undertaken by DEP under a cooperative agreement with EPA in 1986. A two-phased Remedial Investigation conducted by SMC Environmental Services Group was completed in April 1991. DEP conducted additional ground water sampling from 1992 to 1995.

The RI was designed to characterize the physical conditions of the area, delineate the nature and extent of contamination, identify contaminant migration pathways, and characterize any potential environmental impacts and human health risk resulting from site contamination.

The scope of the RI included the collection and analysis of soil, ground water and air samples, an aquifer testing program which

included a pump test and borehole Gamma Ray logging, a surface Electromagnetic Conductivity survey, tank testing, test pit excavation and sampling, and process wastewater sampling (See Figure 3).

The Quaternary Age Cape May Formation directly underlies the site and is 20 to 30 feet thick. It consists primarily of medium to coarse sand interbedded with fine gravel and silt. Beneath the Cape May is the Tertiary age Cohansey Formation. It consists of medium to coarse sand interbedded with silt, gravel and clay. The clay is usually not continuous and does not act as an aquitard. The Cohansey Formation is up to 250 feet thick in the Berkeley Township area. It acts as the major source of potable well water. The two formations are hydraulically connected and act as a single, unconfined, extremely porous aquifer. The depth to the ground water table ranges from eleven to twenty-three feet below the surface.

The Denzer & Schafer facility is in a recharge zone. There is a ground water high under the site. The water table slopes away from the process building resulting in a radial pattern of ground water flow in the shallow aquifer, which mimics the local topography. Ground water flow in the deeper aquifer is to the northeast. A downward vertical gradient exists between the two aquifers, consistent with a recharge zone. Average ground water flow velocity is about 185 feet per year.

The ground water investigation was conducted in a phased approach. The earliest round of ground water sampling (1987) showed levels of volatile organics exceeding primary Federal and State Drinking Water Maximum Contaminant Levels (MCLs). While elevated levels of several semi-volatile organics were also found, no MCLs were exceeded. However, several heavy metals were found at levels exceeding MCLs.

A second ground water sampling round, which included newly installed monitoring wells, was conducted in 1989. The volatile and semi-volatile results were, in general, similar to data collected in 1987. While more compounds were detected in the 1989 samples, the levels of some contaminants, particularly toluene and benzoic acid, were significantly reduced. Several metals continued to be elevated. While no single well-defined ground water plume was identified, a number of wells contained contaminants which were identified in Denzer & Schafer process wastewater samples. Table 1 presents the range of concentrations for the significant contaminants found in the ground water during the RI.

Subsequent to issuance of the RI report, the DEP along with EPA decided that additional off-site wells and ground water sampling were needed to determine whether any potential threat existed to off-site potable well users. This additional work was carried

out from 1992 to 1995 and is detailed in a Supplemental Remedial Investigation Report. The results of these studies are briefly summarized below.

In 1992, the DEP installed off-site monitoring wells at nine locations (See Figure 4). These wells and all of the previously installed wells were sampled for volatile and semi-volatile organics and metals. The significant results of this sampling event are summarized in Table 2. Both the number and concentrations of all of the volatile and semi-volatile contaminants, which were detected during the original investigation, were significantly reduced. With respect to organic contaminants, no MCLs were exceeded in any of the wells. Chloroform levels in several wells did, however, slightly exceed the New Jersey Ground Water Quality Standards. Metal levels, particularly chromium and lead, exceeded MCLs even at the most downgradient locations. Based on this data, it was concluded that the organic contamination related to the Denzer & Schafer site, has degraded and/or dissipated to levels which no longer pose a significant threat.

The DEP conducted a series of focused investigations in late 1994 and early 1995. The investigations were designed to evaluate the effect of different sampling techniques on metal contaminant levels in the shallow aquifer. It was suspected that the high levels of chromium and lead in the ground water might be due to the high pump rate, unfiltered sampling collection procedures used in the 1988 through 1993 sampling events. At high flow rates, the unfiltered sampling technique mobilizes small, naturally occurring particles which contain these metals. A low-flow micropurge sampling method was utilized during these most recent investigations. This low-flow method, when performed properly, is believed to more accurately reflect ground water use patterns and produce analytical results which are more representative of mobile species in ground water under natural gradients.

All wells which had previously shown metal concentrations exceeding MCLs were then resampled using the new method. The resultant data is summarized in Table 3. The data showed that MCLs for all metals with the exception of lead were not exceeded in any monitoring well. The drinking water level for lead was slightly elevated in three monitoring wells, two of which were located in the former leach field of the Denzer & Schafer facility. The data further indicated that the lead present in these wells is not very mobile and, consequently, does not appear to pose a threat to downgradient ground water users.

Air samples collected during both phases of the RI showed levels of contamination similar to normal background levels.

Surface water samples were collected from the standing water pool

west of the Denzer & Schafer facility. The samples were generally free of priority pollutant compounds. However, coliform bacteria, evidence of a sanitary wastewater discharge, were present in the surface water downgradient from the sanitary wastewater system.

Surface soil samples were collected from the area where film waste was stock piled. The resultant analytical data indicate that the contaminant levels do not exceed levels of concern.

Subsurface soil samples were collected from the area of the old septic tanks. There were three six foot high concrete tanks buried two to three feet below the surface. No volatiles, base neutral/acid extractables (BNAs) or pesticides were found above levels that might indicate a health risk. A number of metals were detected in the four samples; however, the concentrations were below levels of concern.

Subsurface soil samples were also collected from two test pits within a magnetic anomaly northeast of the process building. No volatiles, BNAs or pesticides were found at levels that might indicate a human health risk. Silver was detected in the samples, but again below levels of concern.

Thirty-nine subsurface soil samples were collected from borings during the installation of the monitoring wells. Based on the resultant analytical data, to a depth of about twenty feet below the ground surface, samples do not show contamination above levels of concern.

SUMMARY OF SITE RISKS

As part of the RI, an evaluation was conducted to estimate the potential human health problems that could result if the ground water contamination was not addressed.

Ecological risks were not characterized because the contamination found is associated with ground water and no ecological exposure pathway exists.

Human Health Risk Assessment

The RI and supplemental investigations concluded that lead in the ground water is the only contaminant that exceeds Federal and State Drinking Water Standards. Currently, there is not a verified toxicity factor for lead that can be used in normal risk assessment methodologies to determine the health risks associated with this contaminant. However, EPA has developed the IEUBK Model as a useful tool to aid in making more informed decisions about the concentrations of lead in the environment that might be expected to impact human health.

The IEUBK Model was designed to model exposure from lead in the environment to predict blood levels in children. Incorporating site-specific soil and ground water data into the model predicted that 100 percent of the population would be below the threshold of 10 micrograms per deciliter (ug/dl) for children exposed to lead off site. For children exposed to lead on site, 99.99 percent of the population would be below the threshold of 10 ug/dl. These results indicate that for both future residential land use on and off site, the levels are consistent with Superfund's lead directive that employs a level of protectiveness which results in 95% of the population distribution falling below 10 ug/dl.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA requires that each selected site remedy be protective of human health and the environment, be cost effective, comply with other statutory laws, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. In addition, the statute includes a preference for the use of treatment as a principal element for the reduction of toxicity, mobility, or volume of the hazardous substances.

For the Denzer & Schafer site, the remediation goals were to prevent any human exposure to contaminated ground water. Toward this end, a Remedial Investigation and Feasibility Study (RI/FS) was prepared which evaluated five ground water remedial alternatives. It should be noted that the RI/FS was initiated based on the earlier sampling data indicating that site contamination represented a significant and unacceptable risk. The more recent data, including that resulting from the low-flow sampling method previously discussed, suggest the site does not pose such an unacceptable risk. Under these circumstances, preparation of an FS would not have been necessary. The remedial alternatives described below are those evaluated in the RI/FS and are provided for information purposes. An addendum to the RI/FS reflecting the more recent sampling data and current site conditions was prepared and included as part of the administrative record for the site.

Alternative GW-1: No Action with Ground Water Monitoring (Natural Attenuation)

No action would be taken at the Denzer & Schafer X-Ray Company site under this alternative to remove, remediate, or contain contaminated ground water. A ground water monitoring program would be implemented to assess contaminant migration and the effects of natural processes such as degradation, attenuation and dilution of the concentrations of the ground water contaminants over time.

Alternative GW-2: Connection to Public Water Supply

This alternative would include the connection of 129 residential and commercial potable wells that could theoretically be impacted by site contaminants to the Berkeley Water Company and the Berkeley Township Municipal Utility Authority public water supply systems. All private wells would be sealed and abandoned.

Alternative GW-3: Point of Entry Treatment

Under this alternative, Point-Of-Entry-Treatment (POET) household water treatment units for removal of volatile organic compounds and metals from drinking water would be installed at each of the potentially affected potable wells in the vicinity of the site. A POET device reduces the levels of contaminants in drinking water before it is distributed throughout the building or residence.

Alternative GW-4: Ground Water Extraction, Off-Site Treatment at Publicly Owned Treatment Works (POTW)

This alternative involves the recovery of contaminated ground water underlying the Denzer & Schafer site utilizing a series of collection wells. The extracted ground water would be pumped to the Ocean County Utilities Authority (OCUA) wastewater treatment plant for treatment and disposal.

Alternative GW-5: Ground Water Extraction/On-Site Treatment and Reinjection

This alternative also involves the recovery of contaminated ground water underlying the site. A series of collection wells would be installed to extract the contaminated ground water. In contrast to the previous alternative, the extracted ground water would be treated in a wastewater facility to be constructed on the site. The treated water would be reinjected.

SELECTED REMEDY

Section 121 (d), Degree of Cleanup (1), of CERCLA and SARA, states "Remedial actions selected under this section or otherwise required or agreed to by the President under this Act shall attain a degree of cleanup of hazardous substances, pollutants, and contaminants released into the environment and of control of further release at a minimum which assures protection of human health and the environment. Such remedial actions shall be relevant and appropriate under the circumstances presented by the release or threatened release of such substance, pollutant or contaminant".

As previously discussed, field investigations of the Denzer &

Schafer site indicate that the site no longer poses a significant risk to human health or the environment. The organic contaminants, found in the ground water some time ago, have degraded and/or dissipated to acceptable levels. Similarly, the most recent sampling of ground water, utilizing a low-flow collection method believed to more accurately represent ground water conditions, did not reveal unacceptable levels of inorganic/metals contamination. As a result, the risk posed by the site is negligible. Any residual ground water contamination (involving lead) appears limited to a small area of the site. In view of the above, DEP and EPA have determined that no action is required for the Denzer & Schafer X-Ray Company site.

However, since the aquifer still exhibits low levels of contamination at the site itself, EPA and DEP believe that a monitoring program is warranted to ensure that the current situation does not change. Based on the most current RI data, low-level ground water contamination exists in a relatively confined area near the former waste disposal field. DEP and EPA will develop a monitoring program which will include monitoring of ground and surface waters and sediment, including the intermittent pond directly east of the Denzer & Schafer X-Ray Company building, Potter Creek to the south and Mill Creek to the north. DEP will also establish a Classification Exception Area based on the ground water monitoring to ensure that new wells will not be installed in the area without appropriate precautions.

The proposed decision is based on the following facts:

- the remedial investigation and subsequent investigations indicate that the high concentrations of organic contaminants found in the ground water have degraded and/or dissipated to acceptable levels, and inorganic contaminants previously found in the underlying aquifer were not truly indicative of the actual conditions in the ground water, but were caused by the method of sampling;

- the only ground water contamination currently found above MCLs exists in a relatively confined area near the former waste disposal field;

- the Risk Assessment showed that the chemicals of concern present at the Denzer & Schafer site do not pose a significant health threat; and

- the previous source of contamination (the process wastewater in the septic tank) no longer exists.

However, since the facility is still active, there is a potential for future contamination to the environment from future uncontrolled releases. There are some existing conditions on the

site that are likely to cause future releases if not corrected. These conditions include a release from the existing uncontained storage of processed film at the site and future unauthorized use of the existing underground storage tank. While these conditions cannot be addressed under CERCLA, they will be addressed by DEP utilizing authorities it possesses under New Jersey's environmental laws.

Explanation of Significant Changes

The Proposed Plan for the Denzer & Schafer X-Ray Company site was released to the public on June 29, 1995. This plan identifies the preferred alternative, Alternative GW-1, No Action with Monitoring. The No Action alternative includes a recommendation to conduct a five year review and an ecological assessment at the time of the first review. The review will be conducted within five years after commencement of the monitoring program to ensure that the no action with monitoring remedy continues to provide adequate protection of human health and the environment.

EPA and DEP reviewed all written and verbal comments submitted during the public comment period. Upon review of these comments, EPA found no cause to modify the remedy as outlined in the Proposed Plan.

Table 1 - Summary of Significant Ground Water Results from the Remedial Investigation Report - 1987 and 1989 Sampling Rounds

	Concentration Range	Federal/State Drinking Water Std.
Organics	(ppb)	(ppb)
Chloroform	ND - 34	100*
1,1,1 Trichloroethane	ND - 42	29
Trichloroethene	ND - 32	1
Benzene	ND - 54	1
Toluene	ND - 1600	1000
1,2 Dichloroethane	ND - 8	2
1,2 Dichoropropane	ND - 8	5
Phenol	ND - 250	NA
2-Methylphenol	ND - 42	NA
4-Methylphenol	ND - 210	NA
Benzoic acid	ND - 13000	NA
Inorganics		
Chromium	ND - 397	100
Lead	ND - 127	15
Arsenic	ND - 51	50
Mercury	ND - 5	2
Silver	ND - 102	NA

NA - There is no primary State or Federal Drinking Water Standard for this compound/element

* - Chloroform is part of the trihalomethane class of compounds. The Standard for the total concentration of trihalomethanes is 100 ppb

ppb - parts per billion

Table 2 - Summary of Significant Ground Water Results from the 1992 Sampling Round

	Concentration Range	Federal/State Drinking Water Std.
Organics	(ppb)	(ppb)
Chloroform	ND - 37	100*
1,1,1 Trichloroethane	ND	29
Trichloroethene	ND	1
Benzene	ND	1
Toluene	ND - 100	1000
1,2 Dichloroethane	ND	2
1,2 Dichoropropane	ND	5
Phenol	ND - 35	NA
2-Methylphenol	ND - 42	NA
4-Methylphenol	ND - 16	NA
Benzoic acid	ND - 66	NA
Inorganics		
Chromium	ND - 522	100
Lead	ND - 237	15
Arsenic	ND - 40	50
Mercury	ND - 3	2
Silver	ND - 197	NA
Antimony	ND - 39	6
Nickel	ND - 147	100
Cadmium	ND - 9	5
Thallium	ND - 2	2

NA - There is no Primary State or Federal Drinking Water Standard for this compound/element

* - Chloroform is part of the trihalomethane class of compounds. The Standard for the total concentration of trihalomethanes is 100 ppb

ppb - parts per billion

Table 3 - Summary of Significant Ground Water Results from the 1994/1995 Sampling Rounds

	Concentration Range	Federal/State Drinking Water Std.
Inorganics	(ppb)	(ppb)
Chromium	ND - 81	100
Lead	ND - 48	15
Mercury	ND - .4	2
Antimony	ND	6
Nickel	ND - 34	100
Cadmium	ND - 2	5
Thallium	ND	2

ppb - parts per billion

Figure 1
Site Location Map
Denzer and Schafer X-Ray Company Superfund Site
Berkeley Township
Ocean County

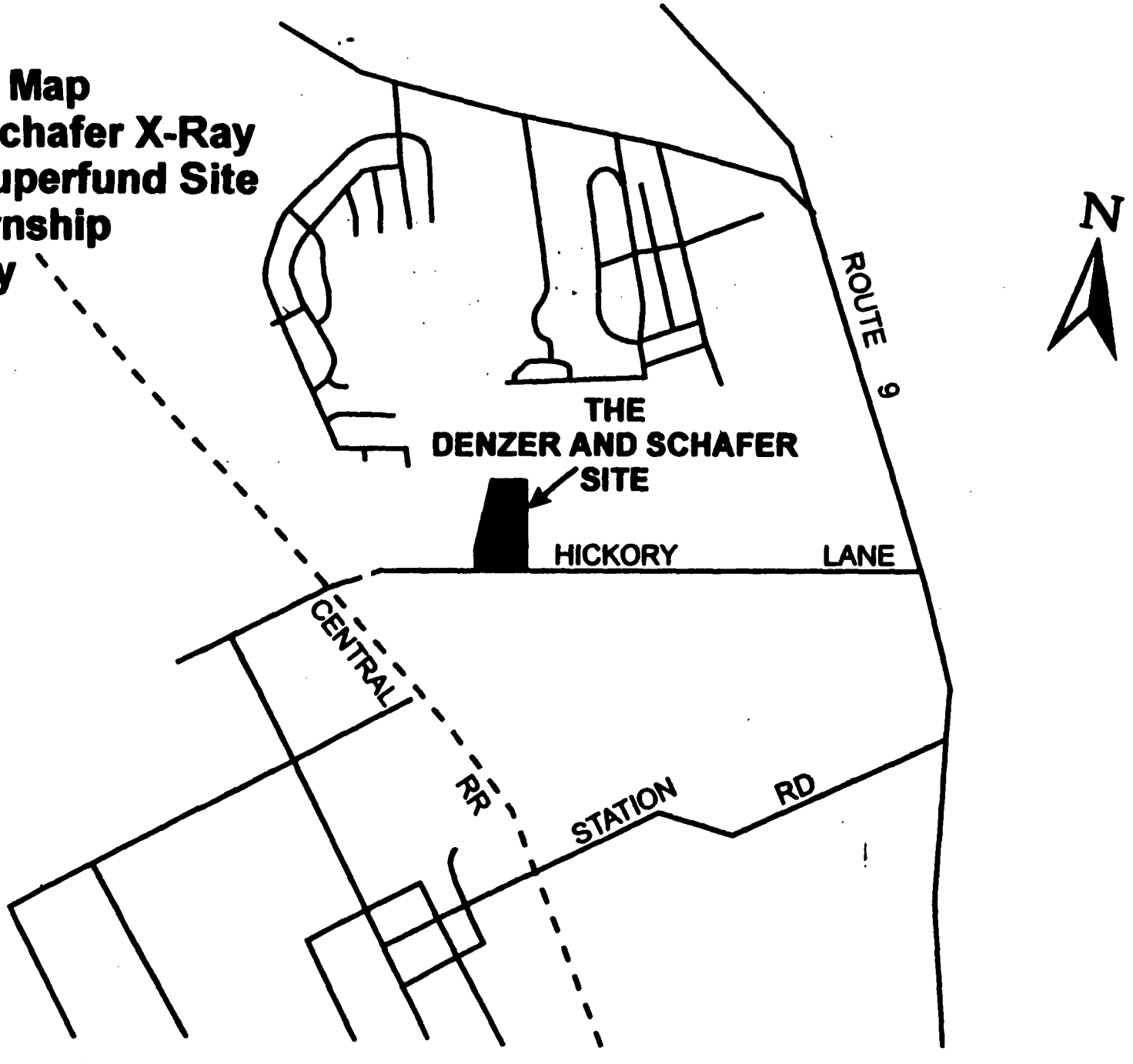


Figure 2
Denzer & Schafer
X-Ray Co.
Superfund Site

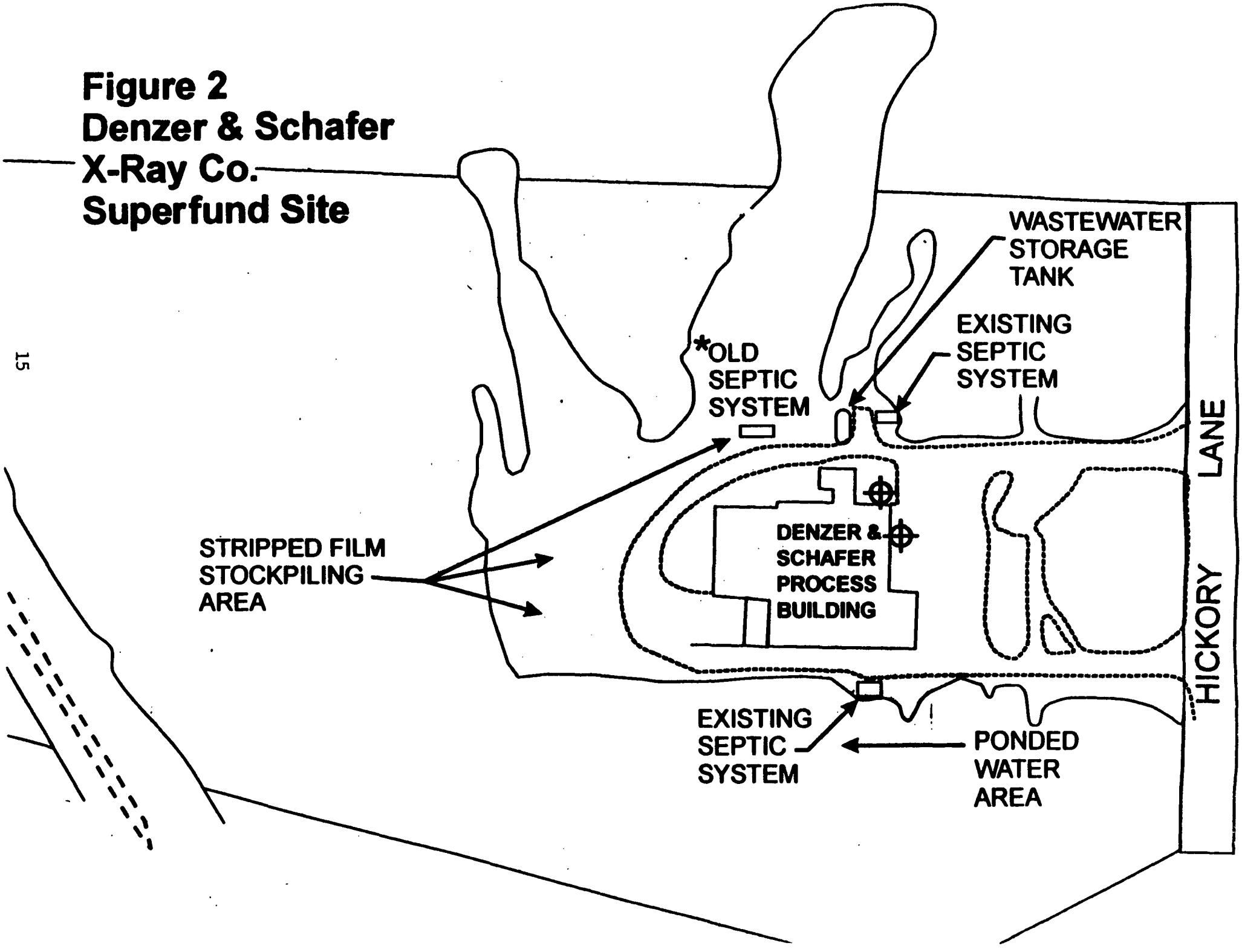
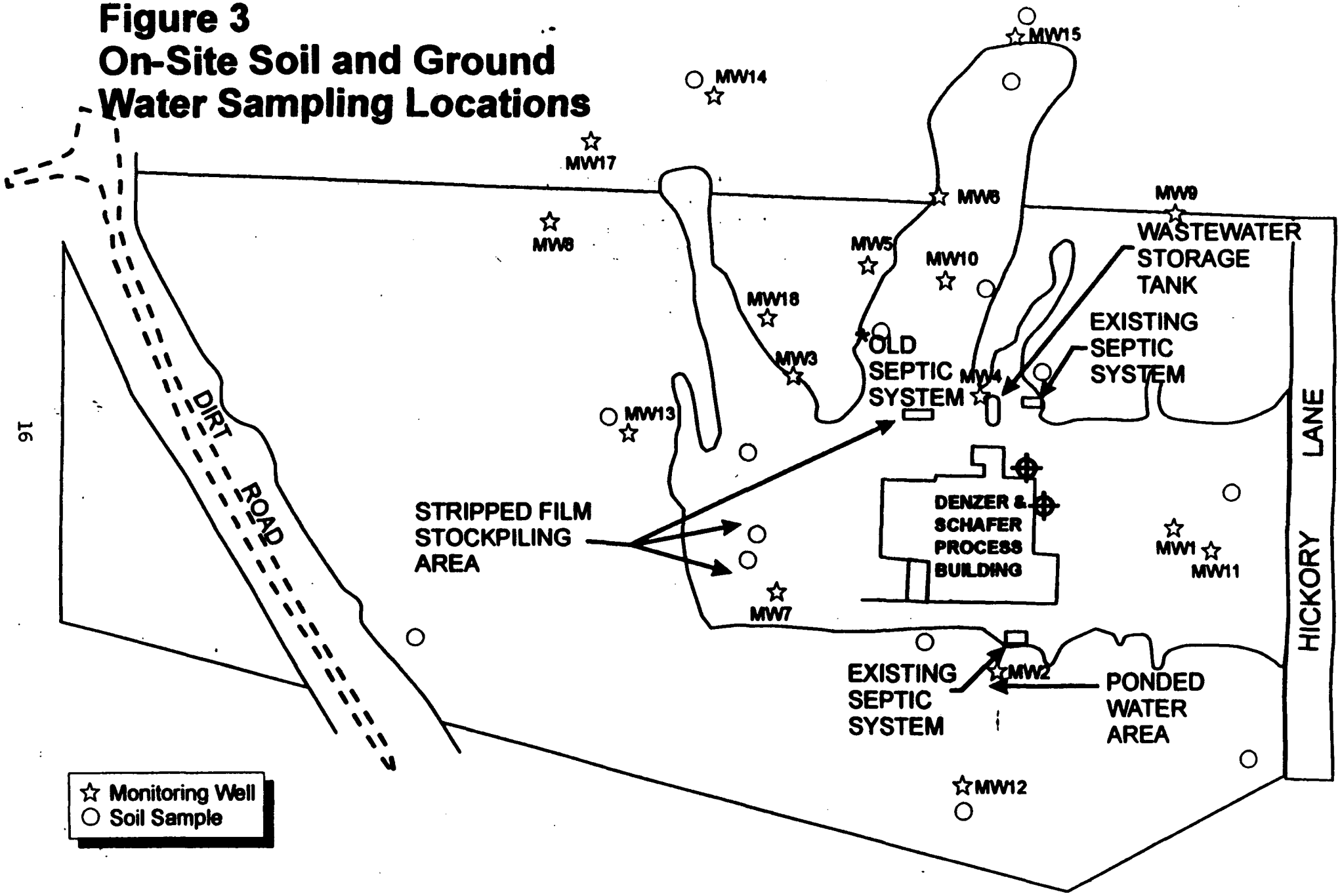


Figure 3
On-Site Soil and Ground Water Sampling Locations



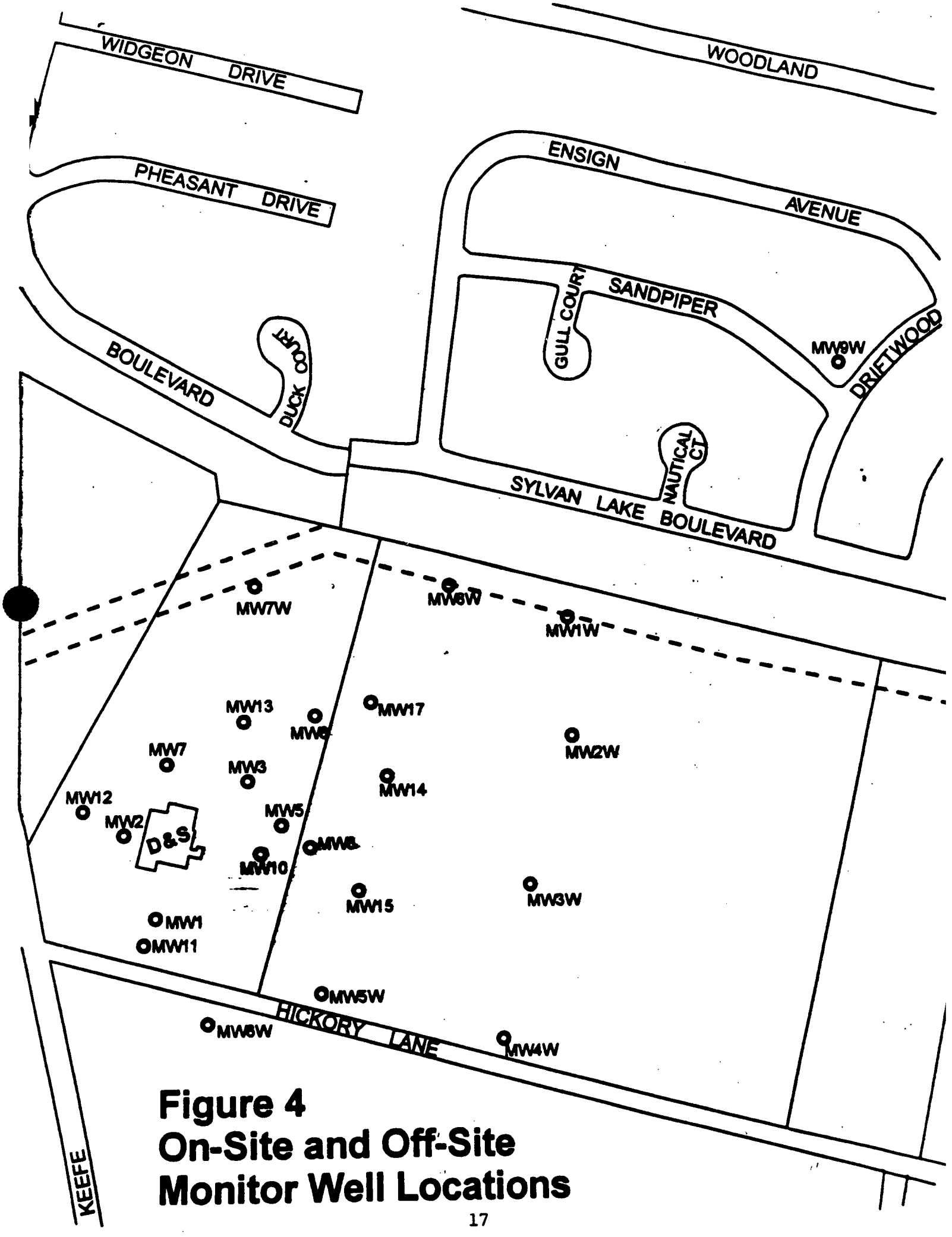


Figure 4
On-Site and Off-Site Monitor Well Locations

RESPONSIVENESS SUMMARY

DENZER AND SCHAFER X-RAY COMPANY SUPERFUND

A. OVERVIEW

This is a summary of the public's questions and comments regarding the Proposed Plan to address ground water at the Denzer and Schafer X-Ray Company Superfund site and the New Jersey Department of Environmental Protection's (DEP's) responses to those comments.

The public comment period extended from June 30, 1995 through August 7, 1995 and provided interested parties the opportunity to comment on the Proposed Plan, the Remedial Investigation (RI) reports, and other documentation related to the Denzer and Schafer X-Ray Company Superfund site. On July 20, 1995 at 7:00 p.m., the DEP held a public meeting at the Berkeley Township Police Headquarters Courtroom on Pinewald-Keswick Road to discuss the reports and the preferred remedy.

In the Proposed Plan, the DEP recommended no further action to address the residual lead contamination in the septic leach field at the Denzer and Schafer X-Ray Company facility. In addition, the Proposed Plan recommended monitoring of ground water, surface water and sediments, and establishing a Classification Exception Area at the site to monitor the ground water criteria exceedances and to ensure that new drinking water wells will not be installed without proper precautions.

B. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

The Denzer and Schafer X-Ray Company Superfund site is an operating facility located on Hickory Lane in Berkeley Township, Ocean County. The facility reclaims silver from x-ray negatives. Between 1974 and 1981, Denzer and Schafer discharged process waste solution into the facility's subsurface sanitary septic system. In addition to the Denzer and Schafer facility, Microindustries Inc., a microfilming service company, is located at the site. Microindustries Inc. also discharged microfilm processing waste into the facility's septic system prior to 1981.

In 1981, the DEP ordered the Denzer and Schafer X-Ray Company to cease the discharge of process wastewaters to the septic system. The DEP also required the company to install ground water monitoring wells to determine whether ground water quality at the site had become degraded due to the past discharges. Between 1981 and 1985, the owner of the facility installed ten shallow and three deep ground water monitoring wells at the site. Sampling of the wells and analysis of soil samples indicated that past operations had contaminated the ground water at the site

with organic compounds and metals. In 1985, the site was placed on the federal National Priorities List (NPL). In 1987, the DEP initiated a Remedial Investigation and Feasibility Study (RI/FS) to assess the extent of the contamination at the site and evaluate remedial alternatives. The RI/FS was followed by a Supplementary Ground Water Investigation in 1992 to determine whether the ground water contamination presented a risk to residential wells in the vicinity of the site. The Supplementary Ground Water Investigation was completed in 1995.

Community interest in this site has historically been low. The DEP held two public meetings in Berkeley Township during the Remedial Investigation phase. The first meeting was held on February 26, 1987 to announce initiation of the Remedial Investigation. The second public meeting was held on July 20, 1995 to summarize the findings of the Remedial Investigation and Supplementary Ground Water Investigation. Attendance at the first meeting was fairly high, with over 100 members of the public present; however, fewer than 10 citizens attended the second meeting.

Over the years, the DEP has received inquiries about this site from the developer of the Sonata Bay residential community which closely borders the site to the north, as well as from people interested in purchasing properties in the area.

C. SUMMARY OF COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND DEP RESPONSES

Questions and comments raised during the July 20, 1995 public meeting to discuss the findings of the Remedial Investigation and Feasibility Study and Proposed Plan, and received during the comment period which ran from June 30, 1995 to August 7, 1995 are summarized below.

Questions and Comments

1. In 1988, contamination was discovered at the Butler Boulevard area which is only down the street from where the Denzer and Schafer site is located. Is there any reason why Denzer and Schafer doesn't have to clean the area and others do?

No cleanup is required at the Denzer and Schafer site because there is no significant contamination left to be removed. Initially, it was determined that a discharge of a high pH saline wastewater with low levels of contaminants into the facility's septic system had resulted in ground water contamination. The discharge was stopped, and the contaminants have dissipated to levels that are not of concern due to natural attenuation and/or biodegradation.

2. Is it possible that the ground water contamination at the

Butler Boulevard site is related to the Denzer and Schafer site?

The Butler Boulevard site, which is located about a mile southeast of the Denzer and Schafer site, is under investigation by the DEP's Bureau of Site Assessment to address benzene contamination in the ground water. There does not appear to be any connection between the Denzer and Schafer site and the Butler Boulevard site. Further, the sampling of ground water monitoring wells has indicated that contamination at the Denzer and Schafer site has not migrated off-site.

3. What was buried at the Denzer and Schafer site that has been removed?

The septic tank which received the wastewater has been removed and the septic field was filled with sand and abandoned.

4. About two-tenths of a mile northeast of the Denzer and Schafer site, across Route 9, there are 16 contaminated potable wells. Due to the contamination, several of these residences were connected to the Berkeley Water Company water supply in the early 1990s. Is it possible that this problem is related to the Denzer and Schafer site?

The 16 contaminated potable wells are not believed to be related to the Denzer and Schafer site. Sampling of the outer ring of ground water monitoring wells which were installed around the Denzer and Schafer site as part of the supplementary ground water investigation have not shown any contamination. The contamination at the Denzer and Schafer site would have been detected in the outer ring of wells before it reached the wells in question. In addition, the anomalous levels of sodium and elevated pH that characterize the wastewater discharge at the site have not been detected in off-site monitoring wells or potable wells, indicating that the affect of the site discharge has not reached that far northeast. (Please note that the two-tenths mile distance in the question is incorrect. Route 9 is almost one mile northeast from the Denzer and Schafer property boundary).

5. (Follow up to Question 4 above) Is it possible that one or more of the ground water monitoring wells that make up the outer ring of monitoring wells may have been installed through a clay lens, thereby allowing a plume of contamination to pass by the wells undetected?

The borings for the outer wells were gamma logged prior to well installation. As such, the wells were screened in the more permeable zones where the contamination would more likely migrate. In addition, because the wells in the outer ring are of multiple depths, it is unlikely that a plume of contamination could have bypassed the outer ring of wells without being

detected.

6. Will the monitoring wells at the site continued to be monitored?

The DEP will continue to monitor the area that comprises the Classification Exception Area for as long as the lead remains at elevated levels, or until it is determined that the lead levels fall below the drinking water standards. Monitoring wells other than those in the Classification Exception Area may be sampled also, and based on the results of that sampling it will be determined whether to continue to sample them or not.

7. Are the monitoring wells kept locked?

Yes.

8. Are the monitoring wells of different depths?

Yes. The wells range up to 90 feet in depth. Wells in the area of the site were frequently installed in clusters of two or three wells, with each screened at a different depth.

9. What is the name of the aquifer that was contaminated?

The name of the aquifer is the Cohansey.

10. Was anything done to actually purge the contaminants from the ground water?

No actions were taken by the DEP to purge the contaminants from the ground water. The contamination dissipated due to natural attenuation and/or natural biodegradation. However, there was a pump test done at the site to determine the aquifer characteristics wherein ground water was pumped at approximately 80 gallons per minute for about two days. The water collected during the pump test was sent to the local publicly-owned sewage treatment plant.

11. How many homes have wells in the immediate area?

There are 129 homes with wells within a one-mile radius of the site according to a survey that was conducted in 1992.

12. Was a health survey done of the families that live in residences with private wells, and that may have been drinking contaminated ground water perhaps even before the site was placed on the Superfund List?

The Agency for Toxic Substances and Disease Registry (ATSDR) reviews every Superfund site to determine whether a health study is necessary. A health study has not been done, but the New

Jersey Department of Health and ATSDR are considering follow up activities for those residents that may have been exposed to past contamination from this site or any other source in the area.

13. Who will pay for the testing of the ground water monitoring wells?

The state government will assume the full cost of the of the ground water monitoring.

14. Will DEP continue to oversee the operations at Denzer and Schafer until the company is no longer in business?

The activities related to the discharge of any hazardous substances at the Denzer and Schafer site would be monitored by DEP as long as such monitoring is warranted.

15. The chairperson of the Berkeley Township Environmental Commission expressed concern that at least one person had recently decided against purchasing property at the Sonata Bay development due to the neighboring Denzer and Schafer Superfund site.

DEP has sent letters to the Sonata Bay management company stating that the Denzer and Schafer Superfund site does not pose a threat to the residents of Sonata Bay because the residences are connected to the public water supply.

16. What is the rank or number of this site on the Superfund list?

The site is not designated a number on the NPL. Both DEP and the Environmental Protection Agency (EPA) no longer rank the sites on the Superfund list according to severity.

17. Is there any way of removing the lead that is in the water table so that it doesn't contaminate the deeper aquifers? As long as there is lead contamination in the ground water in an area where there are private wells, and the potential exists for impacts to Potter's Creek and Mill Creek, it will continue to be a concern.

The amount of lead in the ground water is so small that it would not be cost-effective to remove it. In addition, it is unlikely that the lead in the ground water will travel very far. A more likely scenario is that the lead will slowly spread outward and the concentrations will decrease due to dilution.

The DEP will establish a Classification Exception Area in the area where the lead in the ground water exceeds drinking water standards. This will ensure that new wells are not installed in the area without proper precautions. In addition, the DEP will

also develop a ground water monitoring program to make certain that in the future the lead contamination does not present a threat to private wells in the area.

18. The mayor and the chairperson of the Berkeley Township Environmental Commission requested that future ground water sampling results be provided to the township.

DEP will provide future ground water sampling results to the Berkeley Township Office of Emergency Management, the Environmental Commission and the Ocean County Health Department.

19. The DEP is incorrect in its statement that the ground water at the site flows to the northeast. A half-mile east of the Denzer and Schafer site is a creek that flows across Hickory Lane southeast to Potter's Creek. The Sonata Bay development outfall line for the retention basin also comes across Hickory Lane and goes to Potter's Creek. All the surface water flows southeast to Potter's Creek, not in a northeasterly direction.

Surface water and ground water can flow in different directions. In this case, the surface water and ground water are all flowing in the same general direction. The surface water is flowing southeast and the ground water is flowing northeast, both are generally heading east, towards the ocean. Ground water level measurements, conductivity data, and the presence of certain organic contaminants all indicate that the principal ground water flow direction at the facility is to the northeast.

20. A resident of Hickory Lane with a private well expressed concern that during the entire time that the Remedial Investigation was taking place, he was not notified of the existence of the site and the potential for contamination of his well. He stated that his well was never sampled by DEP.

To determine the potential for contamination of private wells due to this site, DEP sampled the private wells closest to the site on three separate occasions. In 1987, sixteen wells were sampled, four of which were located on Hickory Lane. In 1990, ten wells were sampled, two of which were located on Hickory Lane. Lastly, in 1994, nine wells were sampled, five of which were located on Hickory Lane. When sampling of those wells showed that they were not being affected by the site, the DEP determined there was no reason to continue sampling wells at residences further from the site. This would include those wells located on the eastern end of Hickory Lane.

21. (Follow up to Question 20) The resident stated that since ground water can behave unpredictably, DEP should have sampled all homes with private wells on Hickory Lane regardless of the results from sampling the private wells closest to the site.

The DEP must make responsible use of the financial resources provided for investigation of this and other sites. This would preclude sampling wells that, based on its best scientific judgement, were not in danger of being contaminated due to the site. Sampling of private wells close to the site did not reveal contamination due to the site. Sampling of ground water monitoring wells around the site also show no contamination. This evidence indicates that additional sampling of private wells beyond that which was originally conducted was not warranted.

22. (Follow up to Question 21) At which homes were private wells sampled as part of the Denzer and Schafer Superfund site Remedial Investigation?

The DEP does not release the names and addresses of residents whose wells were sampled for reasons of privacy. A total of 35 homes were sampled, 11 of which were on Hickory Lane.

23. (Follow up to Question 22) What procedure did DEP use when the private residential wells were sampled? Were samples collected from the outside tap? Were the owners of the homes informed that their wells were sampled?

Sampling of the private residential wells was arranged ahead of time through letters and phone calls. Samples were collected from the outside tap when the homeowner was not available to allow the sample to be collected from the inside tap. Before the samples were collected, the water was allowed to run for a period of time to ensure that a sample was representative of the ground water. The sampling results were provided to the residents and the local health official in the form of letters.

24. The owner of Denzer and Schafer X-Ray Company, Mr. John Schafer, stated that the facility never discharged lead into the ground water at the site. He stated that lead was not compatible with x-ray film, and therefore, the lead contamination could not have resulted from the operations at the site. He added that lead is known to be a contaminant in the ground water in many other places in New Jersey, and it cannot be assumed that the contamination is due to actions of the Denzer and Schafer X-Ray Company.

The DEP has not determined the source of the lead in the ground water in this case. Although lead is an element present in soil which may leach into ground water in some situations, it is not known whether the lead found in the ground water underlying the Denzer & Schafer site represents a naturally occurring condition or is the result of site-related contamination. Despite Mr. Schafer's statement, the highest levels of ground water contamination in the area were found beneath the site. In either event, DEP believes it is appropriate to establish a Classification Exception Area and implement a ground water

monitoring program.

25. Mr. Schafer stated that the Denzer and Schafer X-Ray Company was given permission by the state to use the caustic solution which was discharged into the septic system and that all actions taken by the facility up until the time that the contamination was discovered were legitimate. He also noted that he worked with the DEP to develop an alternative to open burning of the x-ray films when open burning was made illegal.

The DEP is including Mr. Schafer's assertions as part of this record. The Superfund program can address various types of contamination problems that pose a threat to public health or the environment. The activities leading to these problems can include those of a legitimate nature that may have been authorized at the time as well as illegal activities. In either event, the parties responsible for the contamination are liable for cleanup costs under the Superfund legislation.

26. (Follow up to Question 25) If DEP acknowledges that the lead contamination may not be a result of operations at the Denzer and Schafer site, will it be taking actions to determine from where the contamination originated?

The DEP may take actions to determine the exact cause of the lead contamination if, as a result of the ground water monitoring, levels are found to increase, which would suggest the existence of an ongoing source. If the lead levels dissipate, as they are expected to, it would indicate that there is no longer an ongoing source of lead contamination.

27. Are the residents on Hickory Lane eligible for Superfund money to connect to the public water supply?

The residents are not eligible for Superfund money to connect to the public water supply since there has been no demonstrated threat to their wells.

28. (Follow up to Question 27) If later there is determined to be a risk to those private wells, will Superfund money be made available to connect residences on Hickory Lane to the public water supply?

When the DEP connects residences to the public water supply, it is usually an initial reaction to a potential threat to private wells, or it is a case where it is less expensive to connect the residence to a waterline than to monitor a contaminant plume. Neither of the above is the case at the Denzer and Schafer site. The most recent data indicates that the wells on Hickory Lane are not at risk from contamination at the Denzer and Schafer site. If DEP finds that wells are threatened, it will consider action at that time.

29. How long will the ground water contamination at the site continue to be monitored?

Ground water at the site will be monitored during the five year period following the ROD. At the end of the first five year period, the DEP will determine whether additional monitoring is required.

30. Will DEP and EPA now be taking steps to remove the Denzer and Schafer site from the NPL? Given the standard for inclusion of a site on the NPL, it would seem clear that the Denzer and Schafer site clearly no longer merits such classification.

Once the Record of Decision is signed, the DEP will recommend that the Environmental Protection Agency delete the site from the NPL. Deletion of the site is a formal rule making process which can take several months.

Superfund Proposed Plan

Denzer and Schafer X-Ray Company

Berkeley Township, Ocean County June 1995

PURPOSE OF THE PROPOSED PLAN

This Proposed Plan identifies the preferred remedy for the Denzer & Schafer X-Ray Company site in Ocean County, New Jersey, and describes the rationale for this preference. The Proposed Plan was developed by the New Jersey Department of Environmental Protection (DEP), as lead agency, with support from the U.S. Environmental Protection Agency (EPA). DEP is issuing the Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, and Section 300.430(f) of the National Contingency Plan (NCP).

This Proposed Plan is being provided as a supplement to the Remedial Investigation (RI) and Feasibility Study (FS) reports and Baseline Risk Assessment to inform the public of DEP's and EPA's preferred remedy and to solicit public comments on this preference.

The remedy described in this Proposed Plan is the preferred remedy for the site. Changes to the preferred remedy or a change from the preferred remedy to another remedy may be made, if public comments or additional data indicate that such a change will result in a more appropriate remedial action. The final decision regarding the selected remedy will be made after DEP and EPA have taken into consideration all public comments. We are soliciting public comment on the RI/FS because DEP and EPA may select a remedy other than the preferred remedy.

COMMUNITY ROLE IN THE SELECTION PROCESS

DEP and EPA rely on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, the RI/FS report, Proposed Plan and supporting documentation have been made available to the public for a public comment period which begins on June 30, 1995 and concludes on August 7, 1995.

A public meeting will be held during the public comment period at the Berkeley Township Police Headquarters Courtroom on Thursday, July 20, 1995 at 7:00 pm to present the conclusions of the RI/FS, to elaborate further on the reasons for recommending the preferred alternative, and to receive public comments.

Comments received at the public meeting and written comments received during the public comment period will be documented in a Responsiveness Summary section of a Record of Decision (ROD), the document which formalizes the selection of the remedy. All written comments should be addressed to :

Donald Kakas, Chief
Bureau of Community Relations
Site Remediation Program
NJDEP
401 East State Street - CN 413
Trenton, NJ 08625-0413
(609) 984-3081

Dates To Remember

June 30, 1995 through August 7, 1995
Public Comment Period

Thursday, July 20, 1995 at 7:00 p.m.
Public Meeting at the Berkeley Township
Police Headquarters Courtroom
Pinewald-Keswick Road
Bayville, NJ

New Jersey Department of Environmental Protection
Site Remediation Program
(609) 984-3081 • Bureau of Community Relations

Printed on recycled paper

Copies of the RI and FS reports, Proposed Plan, and supporting documentation are available at the following locations:

New Jersey Department of Environmental Protection
401 East State Street
CN 413
Trenton, NJ 08625-0413
Phone: (609) 984-3081

Berkeley Township Library
42 Station Road
Bayville, NJ 08721
Phone: (908) 269-2144

Berkeley Township Municipal Building
P.O. Box B
Pinewald-Keswick Road
Bayville, NJ 08721
Phone: (908) 244-7400

SITE BACKGROUND

The Denzer & Schafer X-Ray Company is located on Block 858, Lot 46A, on the north side of Hickory Lane approximately 4,700 feet west of Route 9 in the Bayville area of Berkeley Township. The size of the property is approximately 10 acres. Barnegat Bay is approximately two miles to the east of the site and Toms River is two miles to the north.

The site is situated between two drainage systems. Potter Creek, which flows east to the Barnegat Bay, is approximately 2,000 feet to the south. Wetlands associated with the headwaters of Mill Creek are 2,000 feet to the west and north. Mill Creek is a northeast flowing tributary of Toms River.

An unpaved access road runs across the north end of the Denzer & Schafer property roughly parallel to Hickory Lane. Single family residential neighborhoods are located to the north, northeast and east of the site. Six commercial buildings and one residence are located to the west along Hickory Lane. Approximately 2,000 feet to the west are the Central Railroad of New Jersey tracks. A quarry and the Berkeley Township sewage treatment plant are immediately west of the tracks. A new residential development is proposed to the south across Hickory Lane (see Figure 1).

The Denzer & Schafer facility is located on a local topographic high about 50 feet above mean sea level (MSL). The immediate surrounding area is gently sloping, undeveloped and covered with pine trees. The wetlands associated with Potter and Mill Creeks are at an elevation of 30 feet above MSL.

The site lies within the Atlantic Coastal Plain Physiographic Province. The coastal plain is a wedge shaped series of unconsolidated sediments composed of clay, silt, sand and gravel of Tertiary and Cretaceous Age. The surficial soil is classified as the Downer Loamy Sand. Typically, the soil is well drained, grayish brown, loamy sand.

SITE HISTORY AND ENFORCEMENT ACTIONS

The Denzer & Schafer X-Ray Company is engaged in the reclamation of silver from microfilm and x-rays. Past activities at the facility have included the reclamation of silver by chemical stripping or incineration of spent film. The Denzer & Schafer X-Ray Company is not regulated under the Resource Conservation and Recovery Act (RCRA). In 1974, the company switched from incineration to a caustic soda and salt silver reclamation process. Between 1974 and 1981, the facility disposed of its stripping solution by discharging it to the plant's subsurface sanitary septic system.

Additionally, shredded and stripped film generated during the same time period (1974 to 1981) was stock piled in an area just north of the process building (see Figure 2). The stock pile of film waste was subsequently transferred to an off-site landfill. For lack of a disposal or recycling facility the stripped film had again been stored around the site from 1989 to 1994. Since then, the stripped film is again being transferred to an off-site facility.

The old sanitary septic system which received the process wastewater has since been abandoned and filled with sand. Until 1990, process wastewater was transferred to an on-site process wastewater storage tank for periodic off-site disposal. Currently, the process wastewater is stored in above-ground tanks prior to disposal off site. Two septic systems currently serve the site. Both reportedly are used for the disposal of sanitary waste only.

In addition to the silver recovery business, Microindustries, Inc., a microfilming service company, is located at the site. Microindustries, Inc. has been in operation since about 1970 and has operated exclusively as a microfilming service company. Microfilm processing waste, such as photographic developers and fixers, are generated as part of the company's operations. These wastes were discharged to the plant's sanitary septic system prior to 1981. From 1981 to 1990, the microfilming process waste, reportedly about 25 gallons every six weeks, was transferred to the same on-site process wastewater storage tank used for storing the silver recovery process waste.

Two Administrative Orders (one in January 1977 and the other in May 1981) were issued to the Denzer & Schafer X-Ray Company by DEP. The latter required Denzer & Schafer to immediately cease the discharge of wastewaters to its septic system, to submit a proposal to DEP for permanent treatment and off-site disposal of its wastewater, and to install a ground water monitoring system. In late 1981, as a result of these requirements, Mr. John Schafer, the owner of the facility, funded a ground water study which included the installation of nine shallow monitoring wells and two deep wells. One additional shallow well and three piezometers were installed in mid-1984. Periodic sampling of these wells since August 1981 indicate that waste from past operations has contaminated ground water at the site.

The site was proposed for inclusion on the EPA Superfund National Priorities List (NPL) on December 30, 1982, and subsequently was added to the NPL on September 8, 1983.

REMEDIAL INVESTIGATION SUMMARY

A Remedial Investigation and Feasibility Study was undertaken by DEP under a cooperative agreement with EPA in 1986. A two-phased Remedial Investigation conducted by SMC Environmental Services Group was completed in April 1991. DEP conducted additional ground water sampling from 1992 through 1995.

The RI was designed to characterize the physical conditions of the area, delineate the nature and extent of contamination, identify contaminant migration pathways, and characterize any potential environmental impacts resulting from site contamination.

The scope of the RI included the collection and analysis of soil, ground water and air samples, an aquifer testing program which included a pump test and borehole Gamma Ray logging, a surface Electromagnetic Conductivity survey, tank testing, test pit excavation and sampling, and process wastewater sampling.

Physical Conditions

The Quaternary Age Cape May Formation directly underlies the site and is 20 to 30 feet thick. It consists primarily of medium to coarse sand interbedded with fine gravel and silt. Beneath the Cape May is the Tertiary age Cohansey Formation. It consists of medium to coarse sand interbedded with silt, gravel and clay. The clay is usually not continuous and does not act as an aquitard. The Cohansey Formation is up to 250 feet thick in the Berkeley Township area. It acts as the major source of potable well water. The two formations are hydraulically connected and act as a single, unconfined, extremely porous aquifer. The depth to the ground water table ranges from eleven to twenty-three feet below the surface.

The Denzer & Schafer facility is in a recharge zone. There is a ground water high under the site. The water table slopes away from the process building resulting in a radial pattern of ground water flow in the shallow aquifer, which mimics the local topography. Ground water flow in the deeper aquifer is to the northeast. A downward vertical gradient exists between the two aquifers, consistent with a recharge zone. Average ground water flow velocity is about 185 feet per year.

Ground Water

The ground water investigation was conducted in a phased approach. The earliest round of ground water sampling (1987) showed levels of volatile organics exceeding primary Federal and State Drinking Water Maximum Contaminant Levels (MCLs). Elevated levels of several semi-volatile organics were also found, however, no MCLs were exceeded. In addition, several heavy metals were found at levels exceeding MCLs.

A second ground water sampling effort, which included newly installed monitoring wells, was conducted in 1989. The volatile and semi-volatile results, in general, were similar to data collected in 1987. More compounds, however, were detected in the 1989 samples, but the levels of some contaminants,

particularly toluene and benzoic acid, were significantly reduced. Levels of several metals continued to be elevated. While no single well-defined ground water plume was identified, a number of wells contained contaminants which were also found in Denzer & Schafer process wastewater samples. Table 1 presents the range of concentrations for the significant contaminants found in the ground water during the RI.

Subsequent to issuance of the RI report, the DEP along with EPA decided that additional off-site wells and ground water sampling were needed to determine if there was any potential threat to off-site potable well users. This additional work was carried out from 1992 through 1995 and is detailed in a Supplemental Remedial Investigation Report. The results of these studies are briefly summarized below.

In 1992, the DEP installed off-site monitoring wells at nine locations. These wells and all of the previously installed wells were sampled for volatile and semi-volatile organics and metals. The significant results of this sampling event are summarized in Table 2. Both the number and concentrations of all of the volatile and semi-volatile contaminants, which were detected during the original investigation, were significantly reduced. With respect to organic contaminants, no MCLs were exceeded in any of the wells. Chloroform levels in several wells did, however, slightly exceed the New Jersey Ground Water Quality Standards. Metal levels, particularly chromium and lead, exceeded MCLs even at the most downgradient locations. Based on this data, it was concluded that the organic contamination related to the Denzer & Schafer site has degraded and/or dissipated to levels which no longer pose a significant threat.

The DEP conducted a series of focused investigations in late 1994 and early 1995. The investigations were designed to evaluate the effect of different sampling techniques on metal contaminant levels in the shallow aquifer. It was suspected that the high levels of chromium and lead in the ground water might be due to the high pump rate, unfiltered sampling collection procedures used in the 1987 through 1993 sampling events. At high flow rates, the unfiltered sampling technique mobilizes small, naturally occurring particles which contain these metals. Ordinarily, these particles are not mobilized by residential drinking water well pumps. A low-flow micropurge sampling method was utilized during these most recent investigations. This low-flow method is believed to more accurately reflect ground water use patterns and produce analytical results which are more representative of actual ground water conditions.

All wells which had previously shown metal concentrations exceeding MCLs were resampled using the new method. The resultant data is summarized in Table 3. The data showed that MCLs for all metals with the exception of lead were not exceeded in any monitoring well. The MCL for lead was slightly elevated in three monitoring wells, two of which were located in the former leach field of the Denzer & Schafer facility. The data further indicated that the lead present in these wells is not very mobile and, consequently, does not appear to pose a threat to downgradient ground water users.

Air

Air samples collected during both phases of the RI showed levels of contamination similar to normal background levels.

Surface Water

Surface water samples were collected from the standing water pool west of the Denzer & Schafer facility. The samples were generally free of priority pollutant compounds. However, coliform bacteria, evidence of a sanitary wastewater discharge, were present in the surface water downgradient from the sanitary wastewater system.

Surface Soils

Surface soil samples were collected from the area where film waste was stock piled. The resultant analytical data indicate that the contaminant levels do not exceed levels of concern.

Subsurface Soils

Subsurface soil samples were collected from the area of the old septic tanks. There were three six-foot high concrete tanks buried two to three feet below the surface. No volatiles, base neutral/acid extractables (BNAs) or pesticides were found above levels that might indicate a health risk. A number of metals were detected in the four samples; however, the concentrations were below levels of concern.

Subsurface soil samples were also collected from two test pits within a magnetic anomaly northeast of the process building. No volatiles, BNAs or pesticides were found at levels that might indicate a human

health risk. Metals were detected in the samples, but again below levels of concern.

Thirty-nine subsurface soil samples were collected from borings during the installation of the monitoring wells. Based on the resultant analytical data, the subsurface soils, to a depth of about twenty feet below ground level, do not indicate a human health risk.

SUMMARY OF SITE RISKS

As part of the RI, an evaluation was conducted to estimate the potential human health problems that could result if the ground water contamination was not addressed.

Ecological risks were not characterized because the significant risk is associated with contaminated ground water and no exposure pathway exists.

Human Health Risk Assessment

The RI and supplemental investigations concluded that lead in the ground water is the only contaminant which exceeds Federal and State Drinking Water Standards. Currently, there is not a verified toxicity factor for lead that can be used in normal risk assessment methodologies to determine the health risks associated with this contaminant. However, EPA has developed the IEUBK Model as a useful tool to aid in making more informed decisions about the concentrations of lead in the environment that might be expected to impact human health.

The IEUBK Model was designed to model exposure from lead in the environment to predict blood levels in children. Incorporating site-specific soil and ground water data into the model predicted that 99.75 percent of the population would be below the threshold of 10 ug/dl for children exposed to lead off site. For children exposed to lead on site, 93.16 percent of the population would be below the threshold of 10 ug/dl. These results indicate that future residential use of off-site land would not pose an unacceptable risk. The off-site lead levels are consistent with the Reasonable Maximum Exposure concept used in Superfund, i.e., protecting the 95th-99th percentile. However, for future residential on-site exposure, the level of protection is slightly below the Reasonable Maximum Exposure.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA requires that each selected site remedy be protective of human health and the environment, be cost effective, comply with other statutory laws, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. In addition, the statute includes a preference for the use of treatment as a principal element for the reduction of toxicity, mobility, or volume of the hazardous substances.

For the Denzer & Schafer site, the remediation goals were to prevent any human exposure to contaminated ground water. Toward this end, a Feasibility Study was prepared which evaluated five ground water remedial alternatives. It should be noted that the FS was initiated based on the earlier sampling data indicating that site contamination represented a significant and unacceptable risk. The more recent data, including that resulting from the low-flow sampling method previously discussed, suggest the site does not pose such an unacceptable risk. Under these circumstances, preparation of an FS would not have been necessary. The remedial alternatives described below are those evaluated in the FS and are provided for information purposes. An addendum to the RI reflecting the more recent sampling data and current site conditions was prepared and is included as part of the administrative record for the site.

Alternative GW-1: No Action with Ground Water Monitoring (Natural Attenuation)

No action would be taken at the Denzer & Schafer X-Ray Company site under this alternative to remove, remediate or contain contaminated ground water. A ground water monitoring program would be implemented to assess contaminant migration and the effects of natural processes such as degradation, attenuation and dilution of the concentrations of the ground water contaminants over time.

Alternative GW-2: Connection to Public Water Supply

This alternative would include the connection of 129 residential and commercial potable wells that could theoretically be impacted by site contaminants to the Berkeley Water Company and Berkeley Township Municipal Utility Authority public water supply systems. All private wells would be sealed and abandoned.

Alternative GW-3: Point of Entry Treatment

Under this alternative, Point-Of-Entry-Treatment (POET) household water treatment units for removal of volatile organic compounds and metals from drinking water would be installed at each of the potentially affected potable wells in the vicinity of the site. A POET device reduces the levels of contaminants in drinking water before it is distributed throughout the building or residence.

Alternative GW-4: Ground Water Extraction, Off-Site Treatment at Publicly Owned Treatment Works

This alternative involves the recovery of contaminated ground water underlying the Denzer & Schafer site utilizing a series of collection wells. The extracted ground water would be pumped to the Ocean County Utilities Authority wastewater treatment plant for treatment and disposal.

Alternative GW-5: Ground Water Extraction/On-Site Treatment and Reinjection

This alternative also involves the recovery of contaminated ground water underlying the site. A series of collection wells would be installed to extract the contaminated ground water. In contrast to the previous alternative, the extracted ground water would be treated in a wastewater treatment facility to be constructed on the site. The treated water would be reinjected.

DISCUSSION OF THE NO ACTION REMEDY

Section 121(d), Degree of Cleanup (1), under CERCLA and SARA, states "Remedial actions selected under this section or otherwise required or agreed to by the President under this Act shall attain a degree of cleanup of hazardous substances, pollutants, and contaminants released into the environment and of control of further release at a minimum which assures protection of human health and the environment. Such remedial actions shall be relevant and appropriate under the circumstances presented by the release or threatened release of such substance, pollutant or contaminant".

As previously discussed, field investigations of the Denzer & Schafer site indicate that the site no longer poses a significant risk to human health or the environment. The organic contaminants, found in the ground water some time ago, have degraded and/or dissipated to acceptable levels. Similarly, the most recent sampling of ground water, utilizing a low-flow collection method believed to more accurately represent ground water conditions, did not reveal unacceptable levels of inorganic/metals contamination. As a result, the risk posed by this site is negligible. Any residual ground water contamination (involving lead) appears limited to a small area of the site. In view of the above, DEP and EPA have determined that no action is required for the Denzer & Schafer X-Ray Company site.

However, since the aquifer still exhibits low levels of contamination at the site itself, EPA and DEP believe that a monitoring program is warranted to ensure that the current situation does not change. Based on the most current RI data, low-level ground water contamination exists in a relatively confined area near the former waste disposal field. DEP and EPA will develop a monitoring program for the ground water. Baseline sampling of surface water and sediment in Potter Creek, Mill Creek and the intermittent pond east of the Denzer and Schafer site will also be conducted. DEP will establish a Classification Exception Area (CEA) based on the ground water monitoring to ensure that new wells will not be installed without appropriate precautions.

The proposed decision is based on the following facts:

- the remedial investigation and subsequent investigations indicate that the high concentrations of organic contaminants found in the ground water have degraded and/or dissipated to acceptable levels, and inorganic contaminants previously found in the underlying aquifer were not truly indicative of the actual concentrations in the ground water, but were caused by the method of sampling;

- the only ground water contamination currently found above MCLs exists in a relatively confined area near the former waste disposal field;

- the Risk Assessment showed that the chemicals of concern present at the Denzer & Schafer site do not pose a significant health threat; and

- the previous source of contamination (the process wastewater in the septic tank) no longer exists.

However, since the facility is still active, there is a potential for future contamination to the environment from future uncontrolled releases. There are some existing conditions on the site that are likely to cause future releases if not corrected. These conditions include potential releases from uncontained storage of processed film at the site and the existing underground storage tank. Use of the underground storage tank has been discontinued, and in order to prevent future unauthorized use the DEP has referred this matter to its Bureau of Underground Storage Tanks (BUST).

Table 1 - Summary of Significant Ground Water Results from the Remedial Investigation Report - 1987 and 1989 Sampling Rounds

	Concentration Range	Federal/State Drinking Water Std.
Organics	(ppb)	(ppb)
Chloroform	ND - 34	100*
1,1,1 Trichloroethane	ND - 42	29
Trichloroethene	ND - 32	1
Benzene	ND - 54	1
Toluene	ND - 1600	1000
1,2 Dichloroethane	ND - 8	2
1,2 Dichoropropane	ND - 8	5
Phenol	ND - 250	NA
2-Methylphenol	ND - 42	NA
4-Methylphenol	ND - 210	NA
Benzoic acid	ND - 13000	NA
Inorganics		
Chromium	ND - 397	100
Lead	ND - 127	15
Arsenic	ND - 51	50
Mercury	ND - 5	2
Silver	ND - 102	NA

NA - There is no primary State or Federal Drinking Water Standard for this compound/element

* - Chloroform is part of the trihalomethane class of compounds. The Standard for the total concentration of trihalomethanes is 100 ppb

ppb - parts per billion

Table 2 - Summary of Significant Ground Water Results from the 1992 Sampling Round

	Concentration Range	Federal/State Drinking Water Std.
Organics	(ppb)	(ppb)
Chloroform	ND - 37	100*
1,1,1 Trichloroethane	ND	29
Trichloroethene	ND	1
Benzene	ND	1
Toluene	ND - 100	1000
1,2 Dichloroethane	ND	2
1,2 Dichoropropane	ND	5
Phenol	ND - 35	NA
2-Methylphenol	ND - 42	NA
4-Methylphenol	ND - 16	NA
Benzoic acid	ND - 66	NA
Inorganics		
Chromium	ND - 522	100
Lead	ND - 237	15
Arsenic	ND - 40	50
Mercury	ND - 3	2
Silver	ND - 197	NA
Antimony	ND - 39	6
Nickel	ND - 147	100
Cadmium	ND - 9	5
Thallium	ND - 2	2

NA - There is no Primary State or Federal Drinking Water Standard for this compound/element

* - Chloroform is part of the trihalomethane class of compounds. The Standard for the total concentration of trihalomethanes is 100 ppb

ppb - parts per billion

Table 3 - Summary of Significant Ground Water Results from the 1994/1995 Sampling Rounds

	Concentration Range	Federal/State Drinking Water Std.
Inorganics	(ppb)	(ppb)
Chromium	ND - 81	100
Lead	ND - 48	15
Mercury	ND - .4	2
Antimony	ND	6
Nickel	ND - 34	100
Cadmium	ND - 2	5
Thallium	ND	2

ppb - parts per billion

Figure 1
Site Location Map
Denzer and Schafer X-Ray Company Superfund Site
Berkeley Township
Ocean County

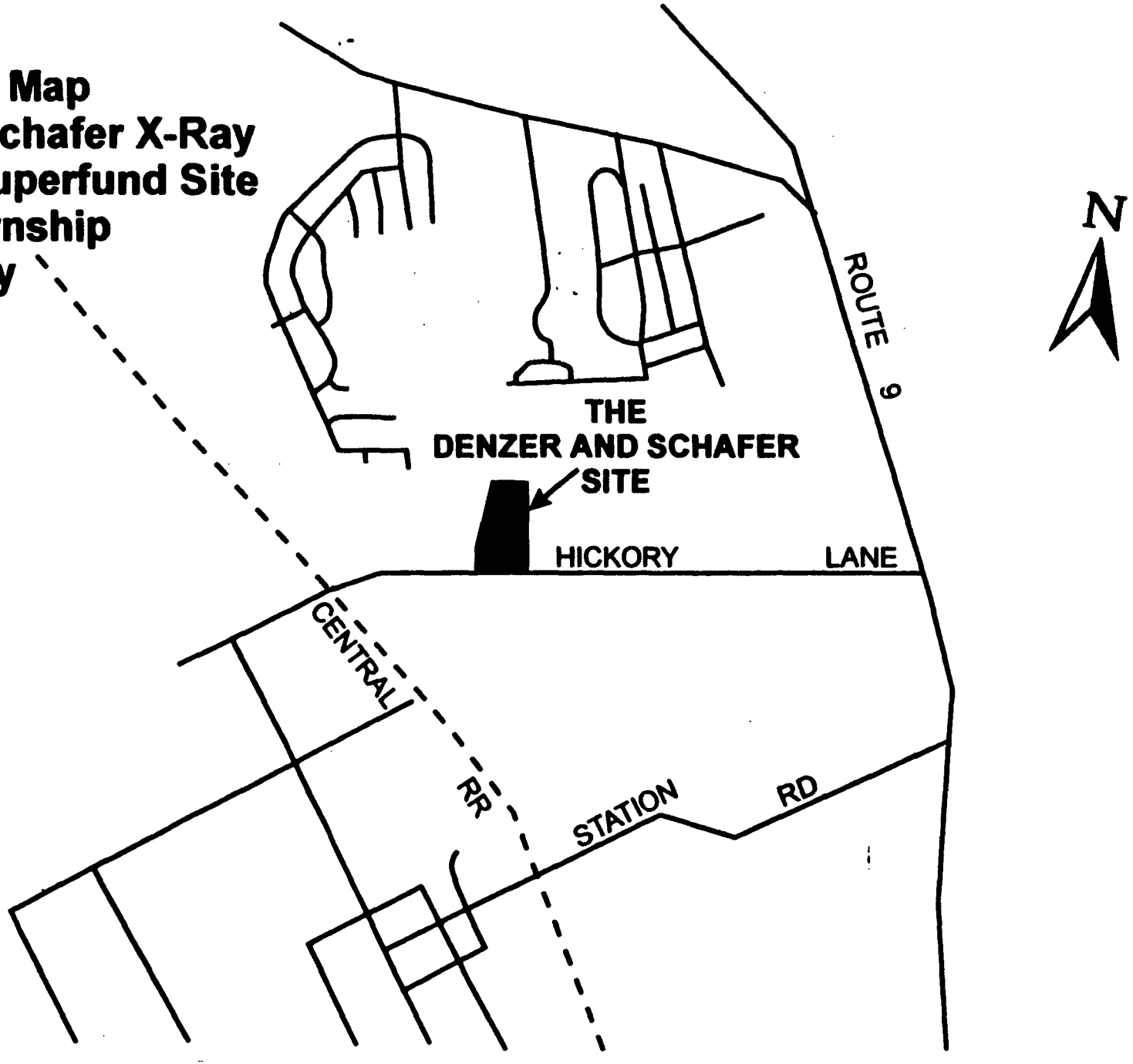


Figure 2
Denzer & Schafer
X-Ray Co.
Superfund Site

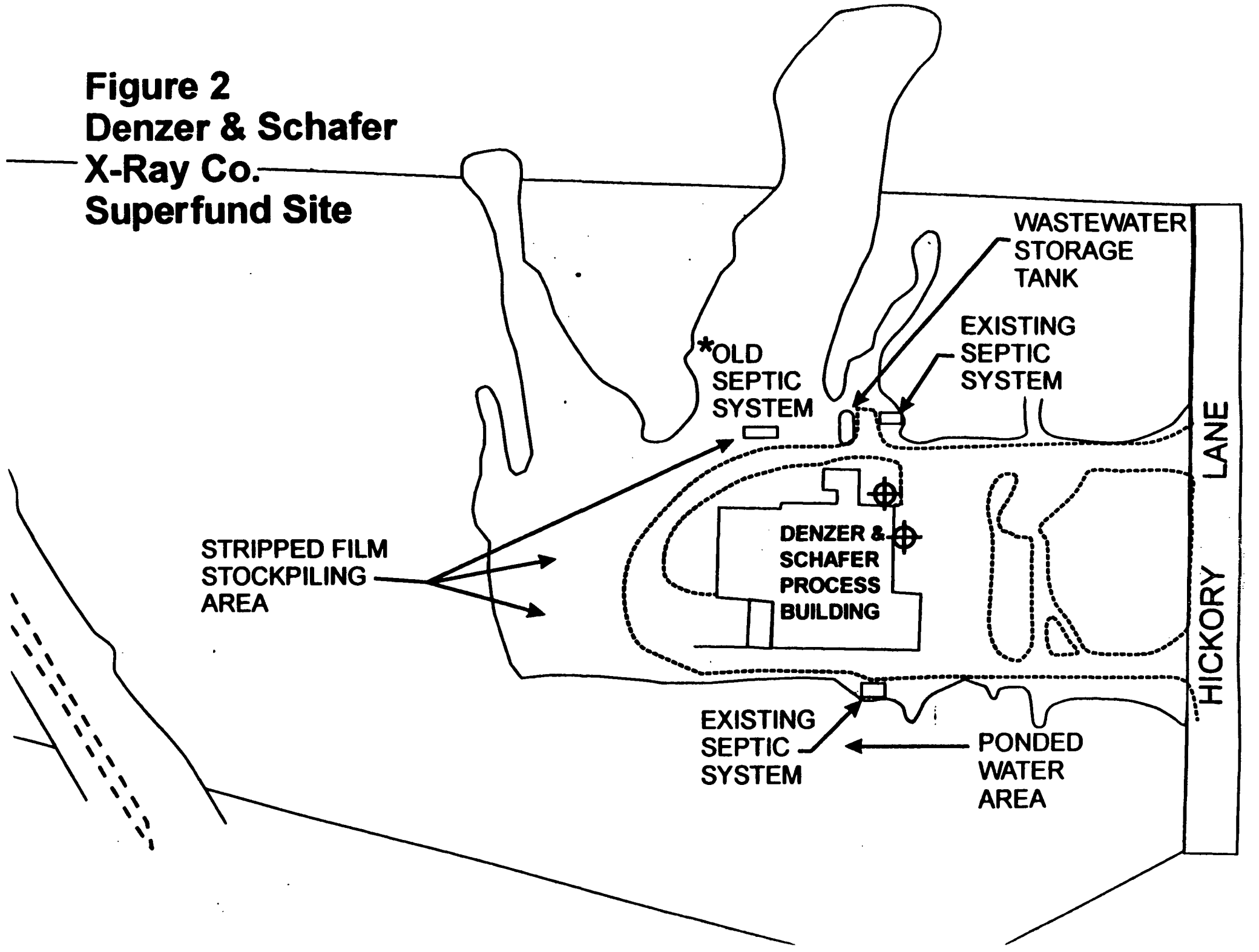
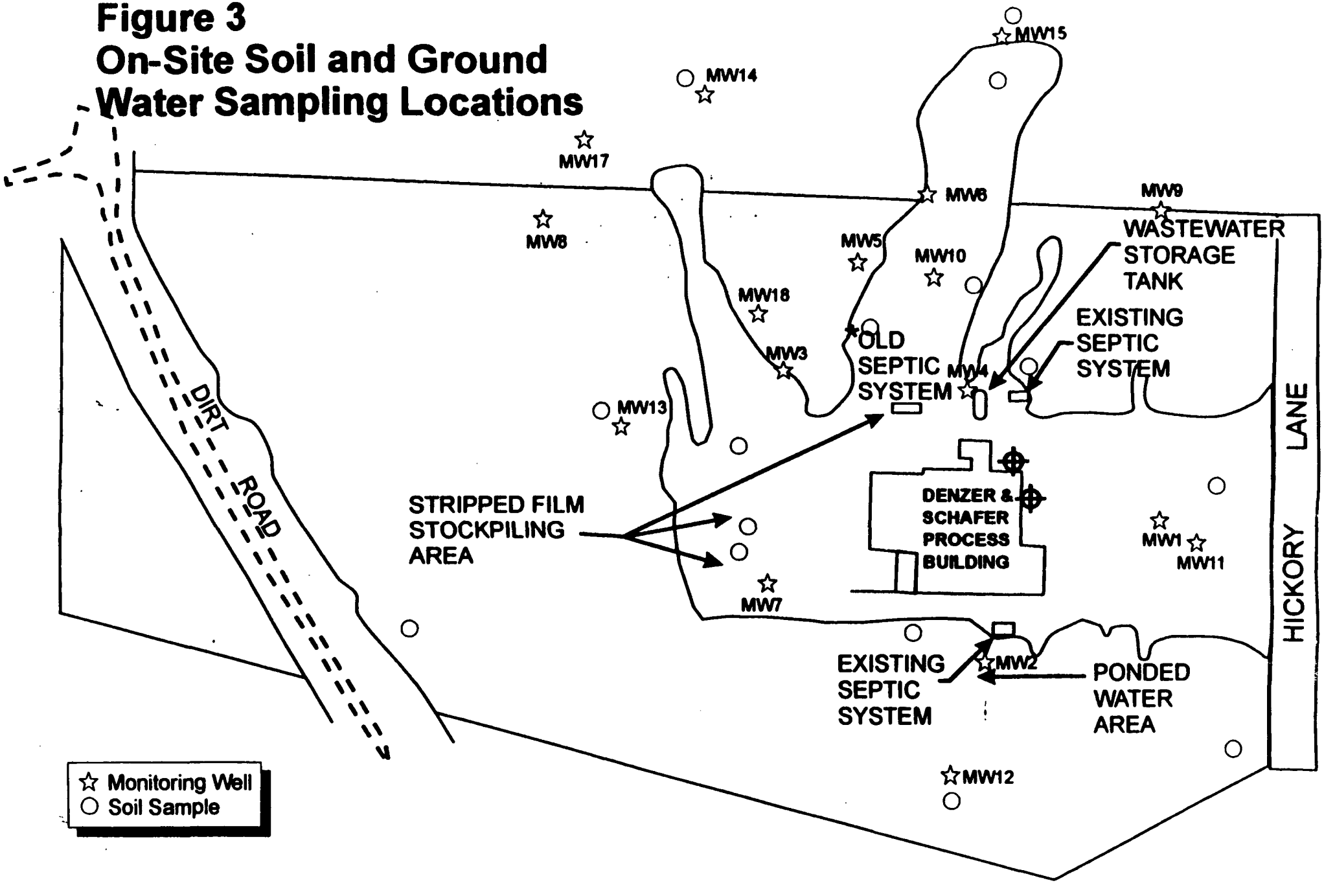


Figure 3
On-Site Soil and Ground Water Sampling Locations



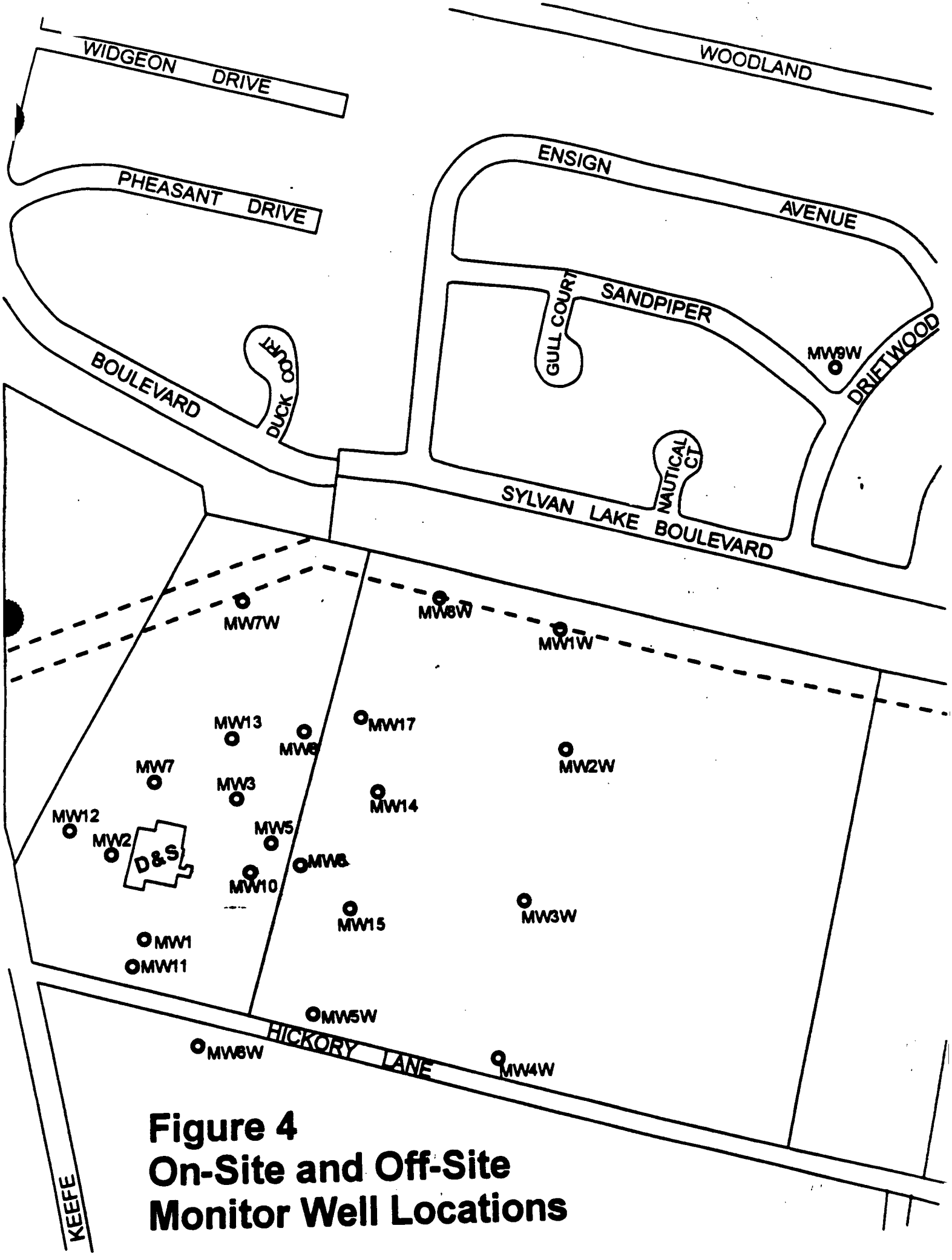


Figure 4
On-Site and Off-Site Monitor Well Locations

Public Meeting *Agenda*

Public Meeting
to Discuss the Proposed Plan for the
Denzer and Schafer X-Ray Company Superfund Site
July 20, 1995
7:00 p.m.
Berkeley Township Police Headquarters Courtroom
Pinewald-Keswick Road
Bayville, New Jersey

1. Opening Remarks and Introduction	Edward Putnam, Assistant Director Remedial Planning and Design Element Division of Publicly Funded Site Remediation New Jersey Department of Environmental Protection (DPFSR, NJDEP)
2. Site History	Anil Singh, Site Manager Bureau of Site Management DPFSR, NJDEP
3. Project Overview and Proposed Plan	Steve MacGregor, Technical Coordinator Bureau of Environmental Evaluation and Risk Assessment DPFSR, NJDEP
4. Comments/Questions	The floor will be open for comments and questions at this time.
5. Closing Remarks	Edward Putnam

Public Meeting Notice

For the Proposed Plan for Remediation of the

Denzer and Schafer X-Ray Company Superfund Site

Berkeley Township, Ocean County

Public Meeting: **Thurs., July 20, 1995, 7:00 pm**
Berkeley Twp Police Headquarters
Courtroom
Pinewald-Keswick Road
Bayville, NJ Ocean County

Comment Period: **June 30, 1995**
August 7, 1995

Site Background

The Denzer and Schafer X-Ray Company Superfund site is an operating facility located on Hickory Lane in Berkeley Township, Ocean County. The facility reclaims silver from x-ray negatives. Between 1974 and 1981 Denzer and Schafer discharged process waste solution into the plant's subsurface sanitary septic system. In addition to the Denzer and Schafer facility, Microindustries, Inc., a microfilming service company, is located at the site. Microindustries, Inc. also discharged microfilm processing waste into the plant's septic system prior to 1981.

In 1981 the New Jersey Department of Environmental Protection (DEP) ordered the Denzer and Schafer X-Ray Company to cease the discharge of process waste waters to the septic system. The DEP also required the company to install ground water monitoring wells to determine whether ground water quality at the site had become degraded due to the past discharges. Between 1981 and 1985, the owner of the facility installed ten shallow and three deep ground water monitoring wells at the site. Sampling of the wells and analysis of soil samples indicated that past operations had contaminated the ground water at the site with organic compounds and metals. In 1985 the site was placed on the federal National Priorities List (Superfund), and in 1987 the DEP initiated a Remedial Investigation/Feasibility Study (RI/FS) to assess the extent of the contamination at the site and evaluate remedial alternatives. The RI/FS was followed by a Supplementary Ground Water Investigation to determine whether ground water contamination presented a risk to residential wells in the vicinity of the site.

Current Status

The RI/FS and Supplementary Ground Water Investigation concluded that, with the exception of lead, contamination that was detected in the ground water early in the investigation had largely dissipated, due to natural biodegradation and attenuation. It was also determined that lead contamination in the ground water did not pose a risk to private wells in the vicinity of the site.

Based on the information concluded from the RI/FS and the Supplementary Ground Water Investigation, the DEP and the United States Environmental Protection Agency recommend the following for the Denzer and Schafer X-Ray Company Superfund site:

No Action with Monitoring

Under the No Action remedy, there would be no action to remediate residual contamination that remains in the ground water at the site. Ground water, surface water and sediment sampling would be conducted to monitor the contamination. The DEP will establish a Classification Exception Area (CEA) based on the ground water monitoring to ensure that new wells are not installed without appropriate precautions.

New Jersey Department of Environmental Protection
Site Remediation Program
(609) 984-3081 • Bureau of Community Relations

Documents Available for Review in Repositories

The Remedial Investigation Report, Feasibility Study, Supplementary Ground Water Investigation, Proposed Plan and other documents related to this site are available for review at the following locations:

Berkeley Township Library
42 Station Road
Bayville, NJ 08721
(908) 269-2144

Berkeley Township Municipal Building
Pinewald-Keswick Road
Bayville, NJ 08721
(908) 244-7400

NJ Department of Environmental Protection
401 East State Street, CN 413
Trenton, NJ 08625
(609) 984-3081

Community Role in the Remediation Process

The DEP solicits public comments on the Proposed Plan for the Denzer and Schafer X-Ray Company site during the public comment period which runs from June 30, 1995 through August 7, 1995. No decision on the remedial action will be made until all public comments are evaluated. The final decision document, the Record of Decision, will include summaries of both oral and written comments and the DEP responses to these comments. Written comments before and after the meeting should be directed to:

Donald F. Kalas, Acting Chief
Bureau of Community Relations
New Jersey Department of Environmental Protection
CN 413
Trenton, NJ 08625-0413

If you have any question, please contact Heather Swartz, Community Relations Coordinator for this site, at (609) 984-3081 or 1-(800)-253-5647.

Community Relations Program

Superfund Site Activities

As part of the state/federal cleanup program at Superfund contaminated sites, a Community Relations Program is conducted to advise local residents and officials about planned actions at major stages of a cleanup project and to receive comments from them. Local briefings and/or public meetings, conducted with elected officials and residents, generally occur at the following times:

1) The start of a Remedial Investigation/Feasibility Study (RI/FS) to address concerns of local residents and officials early in the process.

2) The completion of a Proposed Plan which describes the results of an RI/FS and a preferred alternative for remediation. This meeting takes place within a 30-day comment period on the Proposed Plan during which the RI/FS and related documents are availabl for review in local repositories, usually a public library and/or a municipal building.

3) Prior to the start of cleanup actions (physical treatment/stabilization/removal) to inform local residents and officials of expected activities.

In addition to the activities outlined above, there is ongoing communication with local officials and residents as needed. Depending on whether the New Jersey Department of Environmental Protection (DEP) or the United States Environmental Protection Agency (EPA) is the lead agency in conducting remedial actions at a site, the Community Relations Program is conducted by DEP or EPA. Comments from the public are welcome throughout the Superfund process.

In New Jersey, DEP's Bureau of Community Relations (BCR) is headed by Donald Kakas, Acting Chief, BCR, (609) 984-3081. At EPA, Region II, the Chief of the Community Relations Branch is Lillian Johnson, (212) 264-2515.

New Jersey Department of Environmental Protection
Site Remediation Program
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9/94

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Major Stages in a Superfund Site Cleanup

1.) Site Identified, Assessed and Prioritized

↓

2.) Determination of Lead Agency (State:NJDEP or Federal:USEPA)

↓

3.) Community Relations Plan Activated

↓

4.) Remedial Investigation (Public Meeting Held)

↓

5.) Feasibility Study

↓

6.) Proposed Plan for Remedial Action (Public Meeting Held)

↓

7.) Selection of Remedial Action Alternative (Formal Record of Decision)

↓

8.) Engineering Design

↓

9.) Cleanup Action (Public Meeting/Briefing Held)

↓

10.) Cleanup Evaluation

↓

11.) Operation and Maintenance

↓

12.) Site Deleted from Superfund National Priorities List

Public Meeting *Evaluation*

Please Print

Date:_____ **Meeting Topic (Site):** _____
(Optional) Name/Affiliation:_____

The New Jersey Department of Environmental Protection is very interested in what you thought of this meeting so that we can continue to improve future meetings. Please complete this survey before leaving to help us in this effort.

1. How did you hear of this meeting?

____Newspaper ____Television ____Posted Notice ____Other_____
____Radio ____Mailed Notice ____Word of Mouth

2. Please respond to the following statements using a scale from 1-5, where:

1 = agree strongly **2 = agree moderately** **3 = neither agree nor disagree**
4 = disagree moderately **5 = disagree strongly**

a. Agency representatives spoke clearly and were easily heard. ____
b. Technical aspects were presented in a way I could understand. ____
c. Graphics used were visually clear and understandable. ____
d. Agency representatives clearly explained their actions and plans. ____
e. I had adequate opportunity to talk with agency representatives either during the meeting or privately before or after the meeting. ____
f. My concerns were expressed to Agency representatives either by me or others during this meeting. ____
g. I felt "understood" by agency representatives. ____
h. Agency representatives seemed interested in the opinions and questions of those outside of the agency. ____
i. Agency representatives responded adequately to the questions. ____
j. I understand the issues covered in this meeting. ____
k. I gained better appreciation of the dilemmas to be confronted. ____
l. I feel a need for more meetings. ____

(over)

New Jersey Department of Environmental Protection
Site Remediation Program
(609) 984-3081 • Bureau of Community Relations

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3. **The thing I liked most about this meeting was:**

4. **The thing I liked least about this meeting was:**

5. **Can you suggest ways this meeting could have been improved?**

6. **Other comments, questions and concerns(if you have questions and want a response, please leave your name and phone number here):**

Please leave this form, filled out at the public meeting reception table or mail to:

Bureau of Community Relations
New Jersey Department of Environmental Protection
CN 413
Trenton, NJ 08625-0413

Thanks to Rutgers University Environmental Communication Research Program (copyright 1988)

ROD FACT SHEET

SITE

Name :	Denzer & Schafer X-Ray Company
Location/State :	Berkeley Township, Ocean County, New Jersey
EPA Region :	II
HRS Score(date):	40.36 (12/82)
Site ID # :	NJD046644407

ROD

Date Signed:	September 29, 1995
Remedy :	No Action
Operating Unit Number:	OU-1
Capital cost:	$0
Construction Completion:	n.a.
O & M:	$0
Present worth:	$0

LEAD

Remdial/Enforcement:	Remedial
EPA/State/PRP	State of NJ Lead
Primary contact (phone):	Anil Singh, NJDEP, 609/984-0980
Secondary contact(phone)	Matthew Westgate, U.S. EPA, 212/637-4422
Main PRP(s)	John Schafer
PRP Contact (phone)	

WASTE

Type:	metals, organics
Medium:	ground water
Origin:	silver reclaiming from film
Est. quantity:	mostly dissipated