

**RCRA Corrective Action**  
**Environmental Indicator (EI) RCRIS code (CA750)**  
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**Migration of Contaminated Groundwater Under Control**

Interim Final 2/5/99

**Facility Name:** Wyeth Pharmaceuticals, Inc. a.k.a. Lederle Labs, Wyeth-Ayerst  
**Facility Address:** 401 North Middletown Road, Pearl River, New York 10965  
**Facility EPA ID#:** NYD054065909

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

X  If yes - check here and continue with #2 below.

If no - re-evaluate existing data, or

If data are not available skip to #6 and enter "IN" (more information needed) status code.

**BACKGROUND**

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI's developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated groundwater and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

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Site Description

The Wyeth pharmaceutical plant is located on a 580-acre site in Pearl River. The site was first used as a dairy farm prior to being purchased by Lederle in 1907, with the subsequent erection of a plant for the manufacture of serums and other pharmaceutical antitoxins. The site straddles the border between the towns of Clarkstown and Orangetown in Rockland County, New York. The facility is located approximately 1.5 miles north of the New Jersey state border and is 20 miles northwest of New York City. The facility is situated to the west of Route 304 and approximately 5 miles east of the Garden State Parkway extension into New York State. It is bounded by Middletown Road on the East, Crooked Hill Road to the south, and forested and residential areas to the west and north. The landfill area is in the western portion of the facility adjacent to Muddy Creek, a stream which runs through the site. Figure 1 shows the facility and its surroundings.

Over the past 96 years many more buildings and process facilities were constructed on this site to support the production of more pharmaceutical products and to conduct medical and pharmaceutical research. American Cyanamid Company purchased this facility in 1930. Wyeth-Ayerst purchased it in 1995. Hazardous wastes are generated at the facility including: laboratory chemicals, spent mixed solvents, alcohol liquors, aqueous mercury wastes and scintillation vials. The facility has a New York State Department of Environmental Conservation (NYSDEC) Part 373 RCRA Permit which addresses the operation and maintenance of its hazardous waste storage areas and site wide RCRA corrective action.

**Potential Threats and Contaminants:**  
**Contaminants.**

A total of 29 solid waste management units (SWMUs) were identified at this facility with potential releases of hazardous constituents. RCRA investigations detected no releases at 22 of the SWMUs, but did detect releases to the environment in the vicinity of seven (7) units. Two (2) of the three closed landfills released volatile organic constituents (VOCs) to the surrounding groundwater. Also contributing to the VOC groundwater contamination were solvent releases from the closed Solvent Burning Pit SWMU. Spills at the abandoned Spent Combined Acid Filtrate (SCAF) tank area, SWMU, contaminated surrounding soils and structures with methyl isobutyl ketone (MIBK). The underground sewer system, SWMU, conveying industrial wastewater containing highly diluted VOCs leaked these constituents to the subsurface, but at insignificant concentrations. Very low concentrations of polycyclic aromatic hydrocarbons (PAHs), also known as semi-volatile organic constituents (SVOCs), were found in the deep soil during the excavation of sewer pipe (SWMU) at the Building 137 demolition site. There the probable source was tar materials used to coat the foundation and roof of that building. A seventh SWMU was identified as a mercury spill area.

**Potential Threats From Contaminated Groundwater.**

At this facility, contaminated groundwater would pose a threat if ingested; however there are no known public or private drinking water supply wells impacted by this groundwater. All adjacent housing is on municipal water supply. The State considers all its groundwater to be a potential source of potable water and should be remediated to its Groundwater Quality Protection Standards.

Trespassers are kept off site by a combination of fencing and security and they would not be expected to come in contact with contaminated groundwater if they should gain access to the site. Workers sampling and managing contaminated groundwater corrective measures will do so following an appropriate health and safety plan.

**Cleanup Approach and Progress:**

Numerous activities have taken place at the facility over time including closure of all but one landfill, excavation of materials from the burn pit area and maintenance and removal of sections of the sewers. Additional groundwater investigation was implemented in 1999 that included the installation and monitoring of new down-gradient overburden wells along the centerline of the plume. MW-99A was installed at the edge of the property and MW-99B was installed where the highest concentrations were detected during the initial screening for well locations down-gradient from SWMU 64. During the RFI bedrock groundwater quality was assessed by monitoring two deep wells, including the production well located up-gradient from operating Landfill 3A. Trichloroethene was detected at 11.0 ug/l in well 66B. Chlorinated ethenes also have been detected in regional water supply wells located up-gradient and distant from the facility.

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2. Is **groundwater** known or reasonably suspected to be “contaminated”<sup>1</sup> above appropriately protective “levels” (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

  X   If yes - continue after identifying key contaminants, citing appropriate “levels,” and referencing supporting documentation.

       If no - skip to #8 and enter “YE” status code, after citing appropriate “levels,” and referencing supporting documentation to demonstrate that groundwater is not “contaminated.”

       If unknown - skip to #8 and enter “IN” status code.

RATIONALE:

Groundwater monitoring data collected under the site’s Part 373 Permit indicate exceedences of New York State Groundwater Quality Standards (Part 703).

KEY CONTAMINANTS: Benzene; Chloroform; 1,1-Dichloroethane; 1,2-Dichloroethane; cis-1,2-Dichloroethene; 1,1,1-Trichloroethane; Trichloroethene; Vinyl Chloride; Chloride

| <i>Ranges in Concentration in Groundwater (ug/l)</i> |                                  |                     |                              |
|--|----------------------------------|---------------------|------------------------------|
| <i>Parameter</i>                                     | <i>Groundwater Standard ug/l</i> | <i>2003 (March)</i> | <i>2002 (highest levels)</i> |
| Benzene  | 1.0                              | ND                  | ND- 4.4                      |
| Chloroform   | 7.0                              | ND - 9.9            | ND - 18                      |
| 1,1-Dichloroethane                                   | 5.0                              | ND - 16             | ND - 28                      |
| 1,2-Dichloroethane                                   | 0.6                              | ND - 0.65           | ND - 1.2                     |
| cis-1,2-Dichloroethene                               | 5.0                              | ND - 5.4            | ND - 7.4                     |
| 1,1,1-Trichloroethane                                | 5.0                              | ND - 11             | ND - 22                      |
| Trichloroethene                                      | 5.0                              | ND - 41             | ND - 64                      |
| Vinyl Chloride                                       | 2.0                              | ND - 2.5            | ND - 3.5                     |
| Chloride   | 250 mg/l                         | 3.2 - 869           | 3.1 - 546                    |

The sample locations and individual well results are represented on Figure 2.

The contaminated groundwater in the overburden is not used at the site. This contaminant plume which flows to the south is attenuating naturally and migration beyond the facility property is not expected to occur. Therefore, no human exposure route exists for the contaminated overburden groundwater. Bedrock groundwater does contain elevated levels of chlorinated ethenes,

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<sup>1</sup> “Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate “levels” (appropriate for the protection of the groundwater resource and its beneficial uses).

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but it is not used as a source of drinking water on-site. Its primary use is for non-contact cooling water. The NYS Department of Health identified five wells downgradient of the site but the uses of these wells is unknown.

REFERENCES:

Three-Year CMS Groundwater Sampling Report - June 2003  
NYSDEC Technical and Operational Guidance Series No. 1.1.1 - April 2000  
RCRA Facilities Assessment/Investigation Report - April 1997

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within “existing area of contaminated groundwater”<sup>2</sup> as defined by the monitoring locations designated at the time of this determination)?

  X   If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the “existing area of groundwater contamination”<sup>2</sup>)

       If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the “existing area of groundwater contamination”<sup>2</sup>) - skip to #8 and enter “NO” status code, after providing an explanation.

       If unknown - skip to #8 and enter “IN” status code.

RATIONALE:

It is expected that natural attenuation of the contaminants will prevent the contaminant plume from migrating off-site to any possible downgradient users. The probable impacts of volatile organic compounds downgradient of the southern property boundary and SWMU 62 were evaluated using the USEPA BIOSCREEN Model. Using worst case conservative assumptions the model indicated that only vinyl chloride would have any potential to reach the site boundary. Monitoring has shown the vinyl chloride values to be non-detect at the southern boundary.

REFERENCES:

Three-Year CMS Groundwater Sampling Report - June 2003  
Natural Attenuation Evaluation SWMU-62 - November 2000

4. Does “contaminated” groundwater **discharge** into **surface water** bodies?

  X   If yes - continue after identifying potentially affected surface water bodies.

       If no - skip to #7 (and enter a “YE” status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater “contamination” does not enter

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<sup>2</sup> “existing area of contaminated groundwater” is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination and is defined by designated (monitoring) locations proximate to the outer perimeter of “contamination” that can and will be sampled/tested in the future to physically verify that all “contaminated” groundwater remains within this area, and that the further migration of “contaminated” groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

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surface water bodies.

\_\_\_\_\_ If unknown - skip to #8 and enter "IN" status code.

RATIONALE:

Pearl Brook also known as Muddy Brook at the center of the valley can be a gaining stream in the spring and a losing stream in the winter and summer. Based upon estimated groundwater discharge measurements and groundwater flows to and from Muddy Brook, on average Muddy Brook is a gaining stream with approximately 50% of groundwater discharging to the Brook. Other surface water bodies at the facility include Reed and Finlay Ponds. Both Ponds collect surface water from the site, and non-contact cooling water from the facility is discharged to Reed Pond. The two ponds eventually discharge to Muddy Creek with Reed Pond being the main source of water to the Creek.

REFERENCES:

RCRA Facilities Assessment/Investigation Report - April 1997  
Three-Year CMS Groundwater Sampling Report - June 2003

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be "**insignificant**" (i.e., the maximum concentration<sup>3</sup> of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

X If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration<sup>3</sup> of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

\_\_\_\_\_ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration<sup>3</sup> of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations<sup>3</sup> greater than 100 times their appropriate groundwater "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

\_\_\_\_\_ If unknown - enter "IN" status code in #8.

RATIONALE:

The groundwater that discharges to Muddy Brook represents approximately 1% of the brook's flow. Based upon the hydraulic gradients, approximately 0.9% of the flow in the Creek is gained from groundwater east of the Creek and approximately 0.1% of the flow in the Creek is gained from groundwater west of the Creek. Based upon the concentrations

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<sup>3</sup> As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

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of contaminants in the groundwater and the significant dilution factors upon mixing with the stream flow, impacts would be insignificant to the stream quality. Although a large percentage of the contaminated overburden groundwater can enter Muddy Creek during periods of high rainfall and snow melt the very low contaminant concentrations in the groundwater are assimilated by the larger volume of Creek water resulting in very low contaminant levels and no violation of the Creek's water quality standards.

REFERENCES:

RCRA Facilities Assessment/Investigation Report - April 1997

6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be "**currently acceptable**" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented<sup>4</sup>)?

  X If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR  
2) providing or referencing an interim-assessment<sup>5</sup>, appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

\_\_\_\_\_ If no - (the discharge of "contaminated" groundwater can not be shown to be "currently acceptable") - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

\_\_\_\_\_ If unknown - skip to #8 and enter "IN" status code.

The impacts should be acceptable as discussed in #5 above.

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as

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<sup>4</sup> Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

<sup>5</sup> The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

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necessary) dimensions of the "existing area of contaminated groundwater?"

If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

If no - enter "NO" status code in #8.

If unknown - enter "IN" status code in #8.

RATIONALE:

The site's NYSDEC Part 373 permit and Groundwater Monitoring Plan require additional monitoring at this site at appropriate locations to continue to monitor groundwater plumes. As part of the Corrective Measures Study the facility is performing quarterly monitoring for a period of three years to further evaluate the effectiveness of the natural attenuation at the site. Following the conclusion of this study, future monitoring activities will be evaluated.

REFERENCES:

NYSDEC Part 373 Permit  
Draft Three Year CMS Groundwater Sampling Workplan - April 2001

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

**YE - Yes.** "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the Lederle Labs (Wyeth-Ayerst) facility, EPA ID # NYD 054065909 located at 401 North Middletown Road, Pearl River, Rockland County, New York 10965. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater". This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

NO - Unacceptable migration of contaminated groundwater is observed or expected.

IN - More information is needed to make a determination.

Approved by (signature)  Date September 26, 2003  
(print) Keith H. Gronwald  
(title) Engineering Geologist 2

Supervisor (signature)  Date 9/28/03  
(print) Edwin Dassatti  
(title) Director, Bureau of Solid Waste and Corrective Action  
(EPA Region or State) NYSDEC

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Locations where References may be found:

NYSDEC, 625 Broadway, Albany, NY 12233-7252

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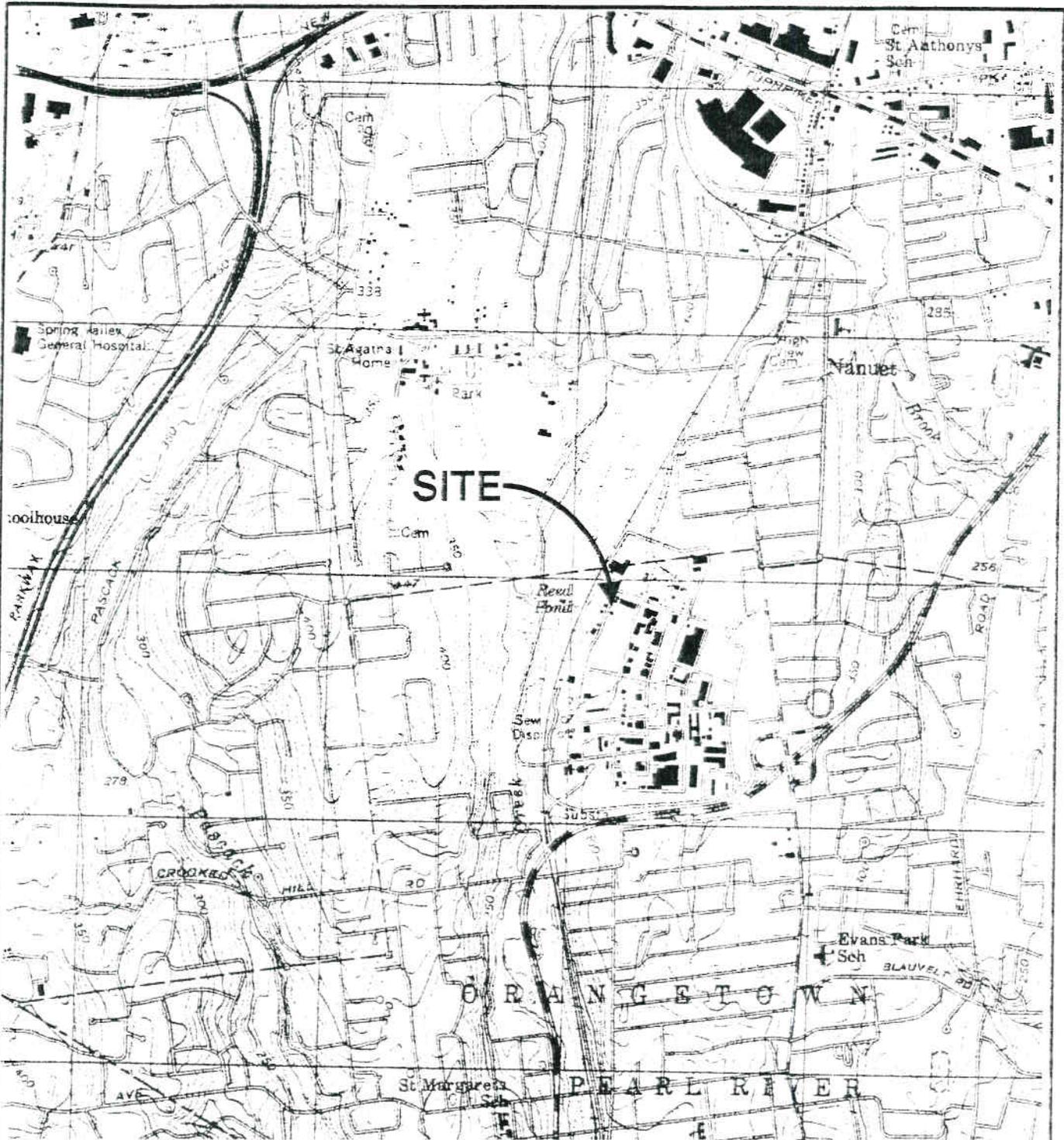
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New York  
Quadrangle

LATITUDE: N41° 04' 34.5"  
LONGITUDE: W74° 01' 07"



SOURCE: USGS 7.5 MINUTE  
TOTOQUAD, PARK RIDGE, NJ-  
NY QUADRANGLE, 1995.

Scale: 1:24000

FIGURE 1

Wyeth

401 NORTH MIDDLETOWN ROAD  
PEARL RIVER, NEW YORK

SITE LOCATION MAP

**PARSONS**

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