

Site Review and Update

WOODLAND ROUTE 532 DUMP

WOODLAND TOWNSHIP, BURLINGTON COUNTY, NEW JERSEY

CERCLIS NO. NJD980505887

AND

WOODLAND ROUTE 72 DUMP

WOODLAND TOWNSHIP, BURLINGTON COUNTY, NEW JERSEY

CERCLIS NO. NJD980505879

AUGUST 23, 1995

**U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia**

Site Review and Update: A Note of Explanation

The purpose of the Site Review and Update is to discuss the current status of a hazardous waste site and to identify future ATSDR activities planned for the site. The SRU is generally reserved to update activities for those sites for which public health assessments have been previously prepared (it is not intended to be an addendum to a public health assessment). The SRU, in conjunction with the ATSDR Site Ranking Scheme, will be used to determine relative priorities for future ATSDR public health actions.

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Prepared by:

New Jersey Department of Health
Environmental Health Service
Under Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

SITE BACKGROUND AND HISTORY

The Woodland Route 532 and 72 sites are located in Woodland Township, Burlington County, New Jersey (Figure 1). The Route 532 site is approximately 1 1/8 miles west of the junction of Route 532 west and Route 72. The Route 72 site is approximately 1 1/3 miles east of this junction. Both sites are situated in the Pinelands Preservation Area District. Commercial cranberry bogs are located 1/2 mile northwest of the Route 72 site, and 1 mile west-southwest of the Route 532 site. The sites are approximately 3 miles apart.

The Route 532 site is approximately 20 acres in size and is located on tax block 4210, lot 1. The site is at the end of an unpaved access road approximately 1/8 mile south of Route 532. Goodwater Run, an intermittent stream, and Bayley Road border the site to the east. An unpaved forest fire control road runs along the southern edge of the site.

The Route 72 site is approximately 12 acres in size and is located on tax block 5501, lot 15 and tax block 6301, lot 1. The site is 1/4 mile south of Route 72 along Crawley Road. Pope Branch, an intermittent stream, is located approximately 500 feet to the north and 1,000 feet west of the site.

The major industries in the Pinelands are cranberry and blueberry cultivation. Because the area is in the Pinelands Preservation Area District, future development is limited in the area around the sites.

Both the sites overlie the Cohansey and Kirkwood Aquifers. Of the two formations, the high-yielding Cohansey Aquifer is the major source of potable water for the area and was impacted by the past disposal practices associated with the sites. In addition, the Woodland Township sites are located in a regional recharge area for these aquifers. The Cohansey Aquifer also provides the base flow of many regional surface water bodies (e.g., streams, bogs). Groundwater is used for agricultural, domestic, and industrial purposes.

The population of Woodland Township, based upon 1980 census data, is approximately 2,500 people. The New Lisbon State School, 5 2/5 miles northwest of the Route 532 site, accounts for roughly 1200 of this total. The remaining population is centered around the villages of Chatsworth and Dukes Bridge, which are 2 miles west of, and 3 1/10 miles south of Route 532 and 72 sites respectively. One private residence is located between the two sites. Groundwater is used for agricultural, domestic, and industrial purposes. It provides domestic supplies within a 3-mile radius of the site to 220 private wells in Chatsworth and Dukes Bridge, as well as a few isolated residences. There is no evidence of private potable well contamination associated with either site.

The sites were operated jointly for the purpose of waste disposal between the early 1950's and 1962. The type and quantity of waste disposed at these sites is unknown. Waste materials brought to the sites were either buried, dumped, or burned. Currently, both of these sites are inactive.

The New Jersey Department of Environmental Protection (NJDEP) was advised of environmental problems at both the sites (Route 532 and 72) by the Burlington County Health Department in April 1979. The NJDEP subsequently conveyed the information to the U.S. Environmental Protection Agency (USEPA).

In september 1983, both the sites were proposed for inclusion on the National Priorities List (NPL) of Superfund sites. Both the sites were added to the NPL in September 1984. Due to the similarities of the two sites (i.e., waste disposal practices, location and physical/chemical characteristics), enforcement efforts for both the sites have been combined.

The NJDEP issued a directive on March 4, 1985 to companies identified as potential responsible parties (PRPs) to arrange for the investigation and remediation of both the sites. Access to both the sites remained uncontrolled from 1962 until 1986, when a chain-link fence was installed at Route 532 and 72 sites.

The New Jersey Department of Environmental Protection (NJDEP) concluded a study of soil and groundwater contamination at the Route 72 site in 1989. Groundwater was found to be contaminated with volatile organic compounds (VOCs), semi-volatiles, heavy metals, and pesticides. Surface and subsurface soils were contaminated with VOCs, semi-volatiles, polychlorinated biphenyls (PCBs), and the pesticides.

The New Jersey Department of Environmental Protection (NJDEP) concluded a study of soil and groundwater contamination at the Route 532 site in 1989. Groundwater and soil were contaminated with volatile organic compounds (VOCs), semi-volatiles, heavy metals, and pesticides.

Radionuclide contamination was also detected in small isolated locations at both sites. The surface soils at both the sites had elevated levels of gamma radioactivity from thorium-232, radium-226, and uranium-238.

On January 2, 1990, the NJDEP entered into a second Administrative Consent Order (ACO II) with PRPs to remove surface liquids and sludges from isolated locations at both sites. A Record of Decision (ROD) was signed on May 16, 1990 for both the sites. The ROD estimated there was a total of 54,000 cubic yards of contaminated surface materials and sediments (soils, sludges, debris, etc.) and 19 cubic yards of radiologically contaminated surface materials at the two sites.

A third order, ACO III, was signed with PRPs on June 15, 1990 to excavate for off-site disposal all visibly contaminated surface soils from both the sites as specified in the ROD. EPA selected the cleanup remedy, which involves excavating all contaminated surface materials and disposing them at an approved off-site facility and installing a groundwater treatment system consisting of air stripping and re-injection of the treated water back into the aquifer.

By January 1991, waste materials were removed from both the sites and disposed of by the potentially responsible parties at an EPA-approved facility. Design of the groundwater cleanup is scheduled to be completed in 1995.

On August 15, 1991, the fourth ACO (ACO IV) was signed with PRPs to arrange for the extraction and treatment of contaminated groundwater as specified in the ROD and to perform a remedial investigation and feasibility study (RI/FS), and remedial action, if necessary, for the subsurface soils for both the sites.

The remedial action described in the May 1990 ROD was the first of two planned operable units for both the sites. The first operable unit action was to address the remediation of contaminated surface materials, sediments and ground water at the sites. The design of the groundwater remedy is currently underway.

After the ROD was signed, a study was conducted to more fully characterize the presence and extent of contamination in the subsurface soils at both the sites (the second operable unit).

Groundwater sampling was performed as part of the RI/FS. Analysis of the samples identified the presence of organic, inorganic, and radioactive contaminants in the groundwater at both sites. In addition, groundwater monitoring indicated that the contaminant plume extended downgradient (southwest) of both the sites (Figure 2).

The plumes at both the sites consist primarily of VOCs, PAHs, and aromatic solvents. The most mobile of these compounds 1,2-dichloroethane, bis(2-chloroethyl)ether, and several methylphenols were detected at the leading edge of the plumes originating from both sites. Concentrations of total organics of 10,000 ug/L and 1,500 ug/L were identified half mile downgradient of Route 72 site and Route 532 site respectively. This contamination has the potential of threatening a nearby marsh and cranberry bog.

Off-site sampling of both surface water and sediment found contamination in the marsh, reservoirs, and cranberry bogs which was attributable to the Route 532 site. The principal contaminants were 1,2-dichloroethane and bis(2-chloroethyl)ether. On-site surface water sampling was not performed at these sites as there are no surface water bodies on site. The NJDEP Bureau of Environmental Evaluation and Risk Assessment collected cranberry samples before and during the harvest. These samples were analyzed for priority pollutant volatile and semi-volatile organic compounds in accordance with methods developed by the NJDEP Bureau of Organic Analytical Services. Cranberry sampling results indicate that the fruit has not been affected by contaminated surface water and contaminated sediment.

In 1993, a subsurface soils study was completed for both the sites, which indicated that levels of contamination in subsurface soils poses no risk to human health and the environment. In September 1993, a second ROD was signed for both the sites. NJDEP documented in the ROD that no further action was necessary regarding the subsurface soils.

ATSDR Activity

The Agency for Toxic Substances and Disease Registry (ATSDR) completed preliminary health assessments for the Route 532 and Route 72 sites in November 1988, and January 1989 respectively.

The preliminary health assessments noted that contaminated groundwater, surface water, and on-site soils were the identifiable potential human exposure pathways associated with the site. In addition, inhalation of volatile organic compounds in air was cited as another potential source of human exposure. Contaminants of concern based on the on-site sampling indicated the presence of various volatile organic compounds, polychlorinated biphenyls, pesticides and inorganic compounds including lead, chromium, and mercury in soil. In addition, there were two areas identified at the Route 72 site which had levels of surface gamma radioactivity (thorium-232: 4500 +/- 400 pci/gm, radium-226: 180 +/- 20 pci/gm, and uranium-238: 260 +/- 100 pci/gm greater than background.

The preliminary health assessments did not identify community health concerns.

The preliminary health assessments identified the following public health concerns:

- 1) Inhalation of site related contaminants (VOCs) in air after volatilization is a potential exposure pathway. This pathway is not substantiated in the light of current site data and information as contaminated surface materials and sediments (soils, sludges, debris, etc.) at the two sites has been excavated and removed from both the sites.
- 2) Direct contact and incidental ingestion of contaminated soil and surface water in the bogs by area residents is the most likely route of exposure. This pathway is not substantiated in the light of current site data and information as removal of on-site contaminated materials have eliminated the source of groundwater contamination. Low concentrations of 1,2-dichloroethane (1,2 -DCA) and bis(2-chloroethyl)ether (BCEE) which may be related to the Route 532 site have been detected in Goodwater Run Bog, a body of surface water used for commercial cranberry harvesting located less than one mile southwest and downgradient to Route 532 site. However, based upon these concentrations inhalation of volatilized chemicals from surface water is possible but insignificant exposure pathway.

In summary, the ATSDR categorized both the sites as a potential public health concern because of the risk to human health resulting from possible exposure to hazardous substances at concentrations that may result in adverse health effects.

Recommendations were made to conduct the following activities:

- 1) Obtain additional information on contaminants to further characterize the site and characterization of the hydrogeology of the area.
- 2) Obtain additional information on potential environmental pathways through which the contaminants can reach the residents living near the site.
- 3) Any private wells and public water supplies in a location that could be impacted by the groundwater contaminant plumes should be identified and sampled on a periodic basis.

CURRENT SITE CONDITIONS

On November 22, 1994 N.P. Singh, and Jim Pasquale of the NJDOH conducted site visits of the Route 532 and Route 72 sites accompanied by the Regional Representative of ATSDR, Steve Jones and remedial project director of de maximis, Inc. The site visit included a formal presentation by the remedial project director. Conditions at both the sites, since the preliminary health assessment have changed.

The following observations were made and information obtained during the site visit:

- Both the sites are virtually devoid of vegetation and are characterized by loose sandy soils.
- An active remediation operation was on going at both the sites, as specified in the ROD for Operable Unit 1.
- Both the sites are fenced, have an entrance gate and are posted with no trespassing and hazard signs. There was no evidence of any trespassing on the site. Conditions at the site have changed physically since the 1988 and 1989 preliminary health assessment of Route 532 and Route 72 sites. That is, the remedial activities had not been initiated at the time of the 1989 preliminary health assessment.
- On-site groundwater monitoring wells were observed.

CURRENT ISSUES

Based on the current site conditions, site-related contamination is present in groundwater and groundwater remains as the primary media of concern. The primary public health issue

associated with the Route 532 and Route 72 sites pertains to the potential impact of the groundwater plume on cranberry bogs.

Groundwater that is used in the area primarily comes from the Kirkwood and Cohansey Aquifers. The Woodland Township sites are in a direct recharge area for the Cohansey Aquifer. Off-site geophysical survey results suggest that a plume of contaminated groundwater might be migrating in a southwesterly direction from the Route 532 site somewhere between the surface and 50 feet below ground level. The plume appears to be approximately 400 feet wide just south of the site, and approximately 900 feet wide 1/4 mile southwest of the site, and is currently limited to the wetlands.

Geophysical investigation at the Route 72 site determined that the contaminant plume is traveling in a deeper flow system, extending 1 1/4 miles downgradient of the site and is not discharging to the wetlands. If the plume goes unchecked the likely discharge point is the Wading River located 5 3/10 miles downgradient of the site.

The high yielding surficial Cohansey aquifer is the major source of potable water for the area. No public water supply system exists in neighboring Woodland Township. Residents each have private domestic water supply wells. The depth of most wells have been determined to be 4 to 200 feet (the Cohansey aquifer is approximately 200 feet deep).

Groundwater is the main transport media for site related contaminants. In the past, residents of Chatsworth and Dukesbridge located 3 miles downgradient of the sites wanted to know if the contaminant plume could spread to their private wells and if drinking contaminated groundwater would affect their health. Removal of on-site sludges and drums have eliminated the source of contamination. Sampling of the only potable well located within a one mile radius between the Route 72 and Route 532 sites did not reveal any organic contamination. It appears that contaminated groundwater is not impacting the private wells. Design of the groundwater treatment system consisting of an air stripping, metals removal, biological treatment, and advanced oxidation or carbon adsorption, with reinjection of the treated water back into aquifer is underway and to be completed by fall of 1995.

Groundwater is used to flood the cranberry bogs for the cultivation of cranberries. The utilization of contaminated groundwater appears to be the most likely future potential human exposure pathway. The cranberry harvesters are the most likely population to be exposed to contaminants present in ground water under current usage. The local populations potentially exposed to chemicals from surface water in the cranberry bog is confined to workers who harvest the cranberries. Concerns were voiced that contaminated groundwater discharging into the cranberry bogs and bog reservoir would affect the commercial cranberry farming operations. Cranberry samples before and during the harvest were collected and analyzed for priority pollutant volatile and semi-volatile organic compounds. Cranberry sampling results indicate that the fruit has not been affected by contaminated surface water and contaminated sediment.

Data from off-site monitoring wells located half a mile downgradient of the 532 site indicated that the contaminant plume had reached the groundwater table. Low concentrations of 1,2-dichloroethane (1,2 -DCA) and bis(2-chloroethyl)ether (BCEE) which may be related to the Route 532 site have been detected in Goodwater Run Bog, a body of surface water used for commercial cranberry harvesting located less than one mile southwest and downgradient to Route 532 site.

Site related contamination is also present in the wetland downgradient from the Route 72 site. 1,2-dichloroethane (range of 7 ppb to 45 ppb) and bis (2-chloroethyl) ether (BCEE) was detected in only one stream water sample at a concentration of 12 ppb.

Discharge of groundwater contaminants to the nearby marsh and a reservoir for cranberry bogs constitutes a potential exposure pathway to chemicals present in surface water and sediments. However, the detected levels of 1,2-dichloroethane (1,2- DCA), and bis (2-chloroethyl) ether (BCEE) were well below the ATSDR drinking water comparison values for these contaminants. At such concentrations, it is unlikely that non-carcinogenic adverse health effects would occur due to any incidental ingestion of these chemicals during the harvesting of cranberries.

Exposures can also occur through the inhalation and dermal route. Volatilization from surface water is a potential release mechanism for some compounds at the site and air is an appropriate transport medium. At such concentrations, it is unlikely that non-carcinogenic adverse health effects would occur. Hence inhalation of volatilized chemical from surface water is another possible but insignificant exposure pathway.

The community has not expressed a perception of increased incidence of adverse health outcomes. As the facilities are inactive and all wastes have been excavated and removed from the site, the current risk of exposure to on-site contaminants is believed to be minimal.

CONCLUSIONS

1. Based on the Remedial Investigation, site-related contamination is present in groundwater. After a review of the most recent documents and the current site conditions for the both the sites, the ATSDR and the NJDOH have determined that, no current human exposures are occurring at the present time. The vertical and horizontal extent of the off site groundwater contaminant plumes have been completely characterized and monitoring wells located along the periphery are adequate to detect all off-property migration of contaminants.
2. The ATSDR/NJDOH has determined that the former conclusions that the site being of potential public health concern is no longer valid in light of current site data and information. The ATSDR and the NJDOH currently consider the sites to pose no apparent public health hazard.

3. The ATSDR/NJDOH have not identified any additional community health concerns associated with sites related contaminants.
4. Ground water contamination in the nearby marsh and a reservoir for cranberry bogs constitutes a potential exposure pathway to chemicals present in surface water. Of the several contaminants identified of particular concern are 1,2-dichloroethane (1,2-DCA), and bis (2-chloroethyl) ether (BCEE) as they have been found in low concentrations in the surface water in the cranberry bog. However, the detected levels of 1,2-dichloroethane (1,2- DCA), and bis (2-chloroethyl) ether (BCEE) were well below the ATSDR drinking water comparison values for these contaminants. At such concentrations, it is unlikely that non-carcinogenic adverse health effects would occur due to any incidental ingestion of these chemicals during the harvesting of cranberries.
5. The recommendation from the 1989 ATSDR Preliminary Health Assessment for comprehensive investigation to characterize the sites has been satisfied.
6. The recommendations from the 1989 Preliminary Health Assessment that the residential well survey should be conducted are not valid under current site conditions and in light of current information. Current data indicate that none of the potable wells in the sites study area are contaminated.
7. Recommendations in the preliminary health assessment to remove the contaminated soils on-site have been satisfied.

RECOMMENDATIONS

1. There are no outstanding recommendations from the preliminary health assessment which remain valid and unsatisfied.
2. Based upon current site data and information no further health assessment evaluation or follow-up health activities are recommended for both the sites. The ATSDR and the NJDOH have determined that no current human exposures are occurring at the present time.
3. Future environmental, toxicological, health outcome data or changes in the conditions as a result of implementing the proposed plan, may determine the need for additional actions at this site.
4. Remedial activities specified in the ROD, when implemented, are sufficient to address remaining concerns of the ATSDR, the NJDOH, and the community regarding the site and are consistent with protection of the public health.

5. The data and information developed in this Site Review and Update have been evaluated to determine whether Health Activities Recommendation Panel (HARP) follow-up actions may be indicated. No HARP evaluation is indicated at this time.

DOCUMENTS REVIEWED

1. Geo Trans Inc. - Status Report on Groundwater Modeling for the Woodland Township Route 532 Site, Burlington County, New Jersey. January 1994.
2. Environ Corporation - Assessment of Occupational Health Risk at Cranberry Bogs associated with Woodland Township Route 532 and Route 72 Sites, Burlington County, New Jersey. November, 1993.
3. Harding Lawson Associates - Final Draft Environmental Constraints Analysis, Route 532 Site, Woodland Township Burlington County, New Jersey. October 1993.
4. Record of Decision, Woodland Township Route 532 and Route 72 Sites. September 28, 1993.
5. EEC - Subsurface Soil Contaminant Characterization of the Route 532 and Route 72 Sites, Woodland Township Burlington County, New Jersey. April 1993.
6. EEC - Final Draft Results of Sampling (Fall 1992), Cranberry Bog and Wetlands, Route 72 Site, Woodland Township, Burlington County, New Jersey. January 1993.
7. Record of Decision, Woodland Township Route 532 and Route 72 Sites, Woodland Township, Burlington County, New Jersey. USEPA. May 16, 1990.
8. Camp Dresser & McKee Inc.- Final Draft Remedial Investigation Report for the Woodland Township Route 532 and Route 72 Hazardous Waste Sites, Burlington County, New Jersey. Vol I., Vol II, July 1989.
9. Camp Dresser & McKee Inc. - Final Draft Addendum to the Remedial Investigation Report for the Woodland Township Route 532 and Route 72 Hazardous Waste Sites, Burlington County, New Jersey. Vol I., July 1989.
10. Camp Dresser & McKee Inc. - Final Draft Remedial Investigation Report for the Woodland Township Route 532 and Route 72 Sites, Burlington County, New Jersey. Appendices Vol I., Vol II, July 1989.
11. Preliminary Health Assessment for the Woodlands Route 72 Dump, Woodland Township, Burlington County, New Jersey. ATSDR. January 19, 1989.
12. Preliminary Health Assessment for the Woodlands Route 532 Dump, Woodland Township, Burlington County, New Jersey. ATSDR. November 15, 1988.

13. EPA Hazard Ranking System Document: Route 532 and Route 72 site, Woodland Township, Burlington County, NJ. 1983
14. Toxicological Profile for Lead. U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, Atlanta, Georgia. ATSDR 1993.
15. Toxicological Profile for Chromium. U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, Atlanta, Georgia. ATSDR 1993
16. Toxicological Profile for 1,2-dichloroethane. U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, Atlanta, Georgia. ATSDR 1993.
17. Public Health Assessment Guidance Manual. U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, Atlanta, Georgia. ATSDR 1992.

INTERVIEWS/PERSONAL COMMUNICATIONS:

1. Emergency & Remedial Response Division/USEPA:
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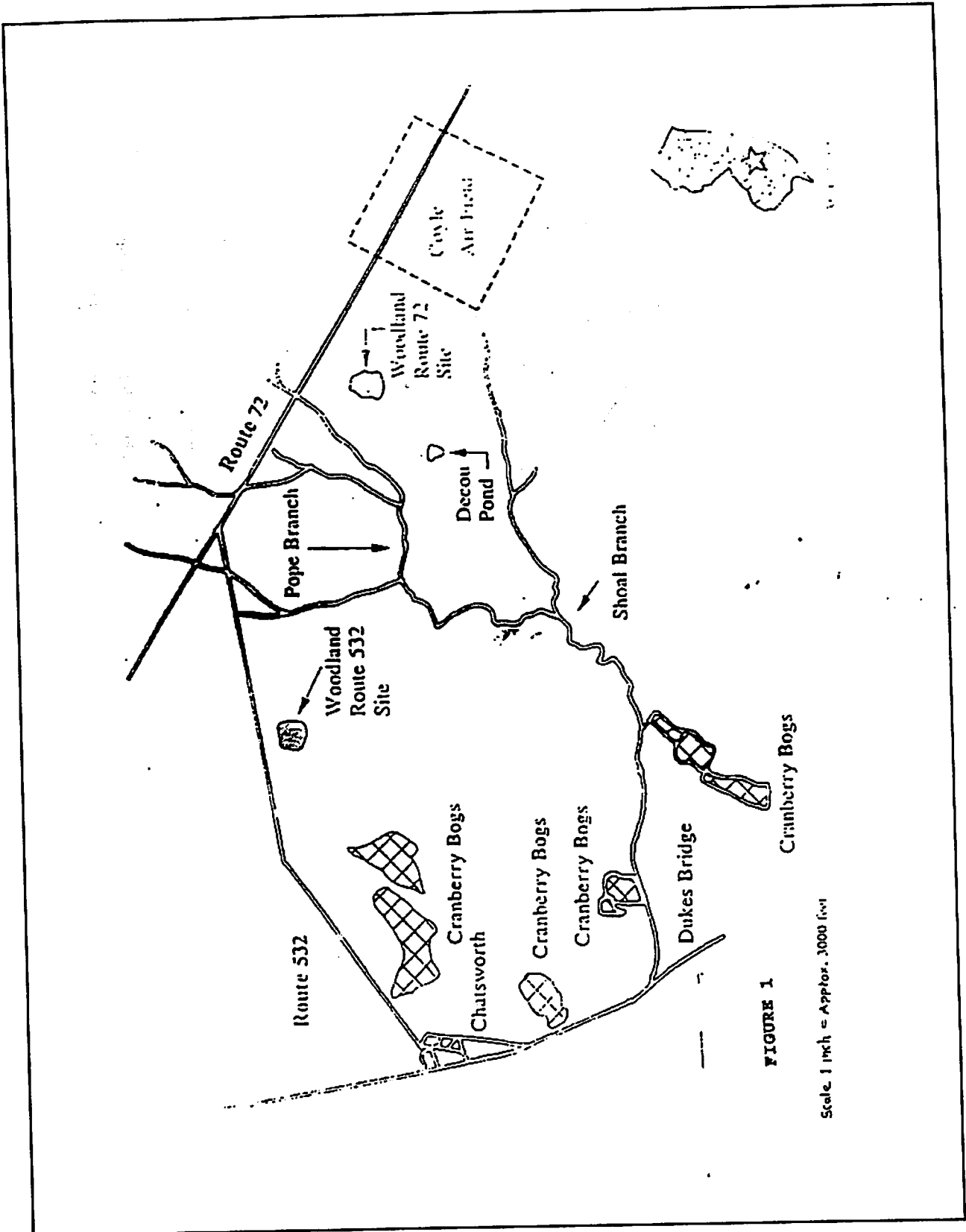


FIGURE 1

Scale: 1 inch = Approx. 3000 feet

Figure 1 - Sites Location Map

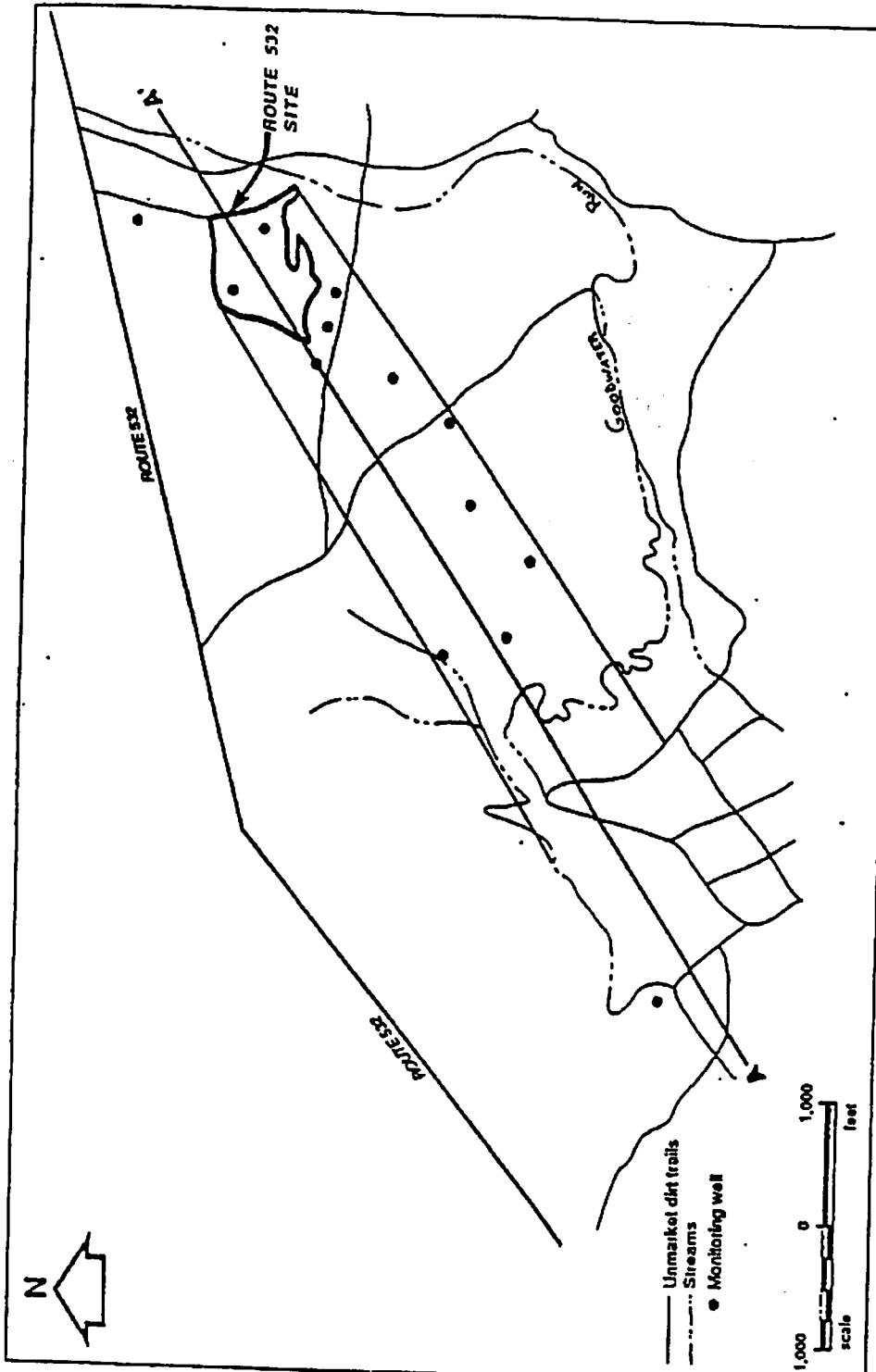


FIGURE 2
Route 532 Site
Area of Contaminant Plume and Location of Cross-Section
 Feasibility Study for Woodland Township Route 532 and 72 Sts

CDM
 environmental engineers, scientists,
 planners & management consultants

Figure 2 - Contaminant Plume