Department of Environmental Conservation

Town of New Windsor Landfill

New Windsor, New York

Site number 336019

New York State
RECORD OF DECISION

October, 1991

Funded under Title 3 of the 1986
Environmental Quality Bond Act

Prepared by the Division of Hazardous Waste Remediation

New York State Department of Environmental Conservation
MARIO M. CUOMO, *Governor* THOMAS C. JORLING, *Commissioner*

DECLARATION
RECORD OF DECISION

SITE NAME AND LOCATION

Town of New Windsor Landfill
Town of New Windsor
Orange County, New York
Site Code: 336019
Funding Source: 1986 Environmental Quality Bond Act

STATEMENT OF PURPOSE

This document describes the Record of Decision for the Town of New Windsor Landfill and identifies the New York State Department of Environmental Conservation's (NYSDEC) selected remedy, developed in accordance with the New York State Environmental Conservation Law (ECL), and consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 USC Section 9601, et., seq., as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). Exhibit A identifies the documents that comprise the Administrative Record for the site and includes the final Remedial Investigation and Feasibility Study (RI/FS) report dated June 1991, prepared by EA Engineers of Newburgh, N.Y. The documents in the Administrative Record are the basis for the Record of Decision.

This document provides some background information on the New Windsor Landfill (NWLF), briefly describes the alternatives which were considered to remediate the site and presents the Department's Record of Decision. For a detailed description and evaluation of the alternatives considered, the RI/FS report mentioned above should be consulted.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action described in this Proposed Remedial Action Plan (PRAP), present a current or potential threat to public health, welfare, and the environment.

RECORD OF DECISION

TOWN OF NEW WINDSOR LANDFILL

ORANGE COUNTY, NEW YORK

ID NUMBER 336019

PREPARED BY

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF HAZARDOUS WASTE REMEDIATION

OCTOBER 1991

FUNDED UNDER TITLE 3 OF THE

1986 ENVIRONMENTAL QUALITY BOND ACT

STATEMENT OF BASIS

This decision is based upon the administrative record for the NWLF site. A copy of the record is available for public review and/or copying at the following locations:

New York State Department of Environmental Conservation
Division of Hazardous Waste Remediation: Anthony R. Sheeran
50 Wolf Road, Albany, New York 12233-7010
Hours: 8:30 AM - 4:45 PM Monday - Friday 518-457-1641

New York State Department of Environmental Conservation
Region 3 Office: Ram Pergadia 914-255-5453
21 South Putt Corners Road
New Paltz, New York 12561
Hours. 8:30 AM - 4:30 PM Monday - Friday

New Windsor Town Hall
Town Clerk's Office 914-565-8800
555 Union Avenue
New Windsor, New York 12553
Hours: 9:00 AM - 4:00 PM Monday - Friday

Newburgh Free Library
124 Grand Avenue
Newburgh, New York 12550

The following documents are the primary components of the administrative record:

A. "Final Remedial Investigation and Feasibility Study: Town of New Windsor Landfill," prepared by EA Engineering, P.C.; June 1991.

B. "Draft Remedial Investigation Report: Town of New Windsor Landfill," prepared by EA Engineering, P.C.; August 1990.

C. "Town of New Windsor Landfill Investigation," prepared by the Town of New Windsor, June 1988.

D. "Town of New Windsor Landfill Phase II Investigation," prepared for New York State Department of Conservation by Wehran Engineering, P.C.; June 1985

E. "Town of New Windsor Landfill Phase I Investigation," prepared for New York State Department of Conservation by Ecological Analysts, Inc.; June 1983

DESCRIPTION OF PROPOSED REMEDY

The major elements of the selected remedial program can be summarized as follows:

- o The excavation of refuse materials from the encroachment areas located northwest (1.2 acres), south (0.1 acre), and west (0.2 acres) of the site. These materials will be consolidated within the main landfill area and the area reclaimed.

- o The excavation of contaminated sediments from the leachate collection area, excavated waste areas, and the first pond on the unnamed tributary north of the main fill. These sediments will be consolidated within the main fill area and the area reclaimed.

- o Construction of an engineered multimedia capping system to encompass the main fill area (including relocated wastes) and the fill area which has encroached onto the western property. This cap system will include passive vent systems for landfill gas emissions.

- o Construction of a surface water diversion system along the southern and western boundaries of the site. This system will collect clean, precipitation induced runoff and bypass it around the fill for discharge to the creek north of the site. The need for a supplemental groundwater interceptor/diversion system will be evaluated in the actual design stage. If shown necessary, a groundwater interceptor will be included in this alternative.

- o Design and construction of a leachate water collection system . This system will enclose the northern end of the site and extend partially around the eastern and western borders. Conceptually the system will collect and convey leachate to an onsite pretreatment plant (if required) and pumping station for discharge to the Town of New Windsor sanitary sewer system. The leachate will be treated onsite to comply with existing pretreatment requirements of the New Windsor Sewage Treatment Plant if shown necessary during design activities.

- o Environmental monitoring to determine the effectiveness of the remedial program. Groundwater, surface waters, leachate and vent gases will all be subjected to a periodic monitoring program designed to detect any changes in the effectiveness of the remedial program.

DECLARATION

The selected remedy is designed to be protective of human health and the environment, is designed to comply with applicable State environmental quality standards, and is cost effective. This remedy results in hazardous waste materials remaining present under the engineered capping system and as such will require periodic evaluations of the post-closure monitoring program to determine the effectiveness of the selected remedy. The site was operated as a municipal landfill prior to promulgation of rules and regulations concerning the disposal of hazardous material and as such has been shown to contain materials typical of that time frame. The presence of these materials in the landfill will require the imposition of deed restrictions which limit the future uses of the site to specific non-intrusive activities, and restricts the utilization of groundwaters beneath the site in accordance with the operational and maintenance programs to be developed during the Remedial Design.

3/7/1991
Date

Edward O. Sullivan
Deputy Commissioner
Office of Environmental Remediation

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RECORD OF DECISION
TOWN OF NEW WINDSOR LANDFILL SITE
SITE #336019

I. SITE LOCATION AND DESCRIPTION

The former Town of New Windsor landfill site is located in the Town of New Windsor on Square Hill Road, Orange County, New York. The site is located adjacent to the southbound lanes of the New York State Thruway and the Stewart Air National Guard Base portion of Stewart Airport. The immediate area of the site is characterized as a low-lying hardwood wetland area with undeveloped parcels located to the north, south and west. The site and the surrounding area are zoned for planned industrial development and this zoning is not contiguous with any strictly residential zoned areas. Figure 1 shows the location of the site with respect to the local area.

The disposal area is approximately 11 acres in size and is located on three separate parcels. The Town parcel contains approximately 7.6 acres of waste fill materials, while the remaining 3.4 acres of waste fill materials are located on the adjacent parcels to the west and northwest. The nearest residence is located approximately 800 ft., southwest of the site along Silver Stream Road. The area surrounding the site is serviced by public water; however, several residences were determined to utilize private wells for water supplies.

II. SITE HISTORY

The NWLF operated from 1962 through 1976 and received both municipal and industrial wastes during that timeframe. Available existing information indicates that the site received paint sludges from Lightron of Cornwall Corporation, and numerous drums and/or barrels from Newburgh Barrel and Drum Company. The exact contents of these drums were not recorded by the site operators at the time of disposal. Subsequent information has been developed that indicates that some of these barrels may have contained waste adhesives and solvents from Tuck Tape Inc. Other industrial users of the site were American Felt and Filter Co., Frye Manufacturing Co., McBeth Kollmorgan, GAF/Floor Tile Co., and National Gypsum Co.

The first report concerning the possible problems presented by the site began with a standard USEPA form prepared in August 1980 which identified the site as a "Potential Hazardous Waste Site". Subsequently, the USEPA contracted with Fred C. Hart Associates to perform a hazardous waste site investigation. This resulted in the April 1981 document entitled "Hazardous Waste Site Investigation of the Town of New Windsor Landfill." This document reports the suspected presence of up to 3,000 drums of paint

sludge from Lightron of Cornwall and up to 6,000 gallons of adhesive wastewater disposed of by Tuck Tape (transported by Newburgh Drum and Barrel Co.). This report concluded that the USEPA should not follow-up with any other actions at this time since the site may fall under NYS jurisdiction.

In 1983, the New York State Department of Environmental Conservation (NYSDEC) contracted with Ecological Analysts, Inc., to prepare a Phase I: Preliminary Investigation of the landfill. This investigation centered around a review of all existing data sources to determine the potential threat to human health and the environment from the site. The draft report also contained preliminary USEPA Hazard Ranking System (HRS) forms. The forms indicated that the site could present a significant threat. This type of investigation did not involve any actual environmental sampling.

The USEPA contracted with NUS Corporation in 1984 to conduct an evaluation of the water quality from the Newburgh City water supply. The City utilizes Lake Washington as a source for drinking water and this lake shares a watershed with the NWLF and the Stewart Annex landfill. NUS took environmental samples from soil, sediments and surface waters near the landfills and from private wells and the City distribution system. The resulting report (dated October 15, 1984) concluded that the City's water supply was free of hazardous substance contamination and that the same was true for private supply wells in the vicinity of the two landfills. The report also concluded that the stream which received direct drainage from the landfills did contain contaminants and should be prevented from entering Lake Washington.

NYSDEC decided that the site should be the subject of Phase II Engineering Investigation and contracted with Wehran Engineering, P.C., to perform the necessary work. The work included test pits within the landfill, the installation of the first groundwater monitoring wells onsite, and environmental sampling. In June of 1985, Wehran submitted their report which concluded that the site was a threat due to the results of environmental samples obtained. The shallow groundwater was found to be impacted by inorganic chemicals and the soils within the landfill contained many chemicals which could present problems if they migrated from the site.

Acting on the basis of the above information, NYSDEC reclassified the landfill on its Registry of Inactive Hazardous Waste Sites as a Class 2 site in 1986. The Town of New Windsor became eligible for 75% funding for the remediation of inactive hazardous waste sites with the passage of the 1986 Environmental Quality Bond Act. Negotiations began in early 1988 for an Order on Consent with NYSDEC which would govern the Town's actions towards remediation of the site. The subsequent Order was executed on the eighth of February 1989.

III. CURRENT SITE STATUS

A. Summary of Field Investigations:

The following paragraphs summarize the components and conclusions of the current field investigations performed at the site. This investigation was conducted in accordance with plans formally approved by NYSDEC in January 1990 and encompassed two separate phases of work conducted in the spring and fall of 1990. For more detailed information regarding the individual investigations or for additional regional information, refer to the appropriate report(s) listed in the Administrative Record (Exhibit 1).

B. Summary of Site Conditions:

For ease of reference, the following information summarizes the main characteristics of the Town of New Windsor Landfill site (all values are approximate):

Landfill Area to Remediate:	11.0 acres
Landfill Area of Encroachment:	3.4 acres
Contaminated Media:	surface waters leachate sediments landfilled wastes

Regionally, groundwater in the unconsolidated aquifer (shallowest and therefore threatened/contaminated by the site) flows to the south-southeast towards Lake Washington. However, the local flow pattern is such that the gradients turn to the north in the immediate vicinity of the site due to the presence of the Thruway roadbed and the low-lying wetlands. The bedrock aquifer has a predominant south-southeast flow direction and does not exhibit the same change in direction as seen with the unconsolidated aquifer.

The geology and hydrogeology of the site are complex. The bulk of the contamination at the site appears to be contained within the actual waste mass and the sediments present along the toe of slope to the north in the area known as the leachate accumulation area. The landfill is underlain by layers of ablation till and lodgement till over bedrock in the southern portion of the site. These formations are responsible for the localized change in direction of flow to the north. The central and northern portions of the site are underlain by marsh deposits and lacustrine deposits over bedrock. This results in a preferential flow direction away from the lodgement tills and towards the more conductive deposits to the north. The organic peats present in this area have acted to retard the migration of contaminants from the landfill.

A magnetometer and soil gas survey were used to identify any significant locations within the fill mass which may have indicated a distinct drum disposal area. Based on the results of these two field tasks, a total of 14 test trenches were then performed. Samples were taken of the soils present and of the fluids at the groundwater waste mass interface. The result of these efforts indicated that a viable drum removal action does not exist at the site. As would be expected at all similar aged landfills, the samples did show that the waste mass itself has a wide variety of organic and inorganic compounds present. Tables 1 and 2 present the results of the test trench sediment samples from the RI (inorganic and organics, respectively).

A total of 8 partially full and badly deteriorated and/or crushed drums were recovered from the central/western portion of the site. These drums were tested and the contents were found to be a characteristic hazardous waste due to ignitability (3) and trichloroethene level (1). These drums are currently secured in salvage drums and will be removed from the site in accordance with NYSDEC requirements during remediation. The potential to conduct a full scale removal operation was evaluated but not selected due to the lack of intact and recoverable drums, the baseline health risk assessment, and the lack of migration shown in perimeter samples.

The stability of the concentrations of the contaminants in the disposal area and the extremely steep concentration gradient outside of the disposal area indicate that vertical and horizontal migration of contaminants has not taken place to a large extent. No pesticides, PCBs, or semi-volatile compounds were detected in the groundwater monitoring wells along the site perimeter. Theses groundwater samples also showed no volatile organic compounds were consistently detected at levels above the contract laboratory protocol detection limits. Only estimated detections were found in groundwater samples (and were not present in a consistent pattern). The NYS Department of Health conducted a private well sampling program in the vicinity of the site and determined that the site was not impacting these groundwater resources. Table 3 summarizes the groundwater analytical data for the 4/90 and 10/90 sampling events. Table 4 summarizes the concentration ranges along with federal and State water quality criteria and guidance values for groundwater and surface water.

The impact of the site is, therefore, primarily restricted to the sediments immediately adjacent to the waste mass in the area where leachates accumulate and the surface waters of the creek which receives periodic leachate releases. The results of the Phase I sediment samples from the leachate accumulation area showed the presence of semi-volatile compounds at relatively high levels which yielded unacceptable risks. The Phase II Program was designed to establish the boundaries of this problem. A grid of sediment sample locations was established and the results showed that only the area immediately adjacent to the waste mass (less than 25 feet out) and in the first pond have contaminant levels which are of concern and will be consolidated within the main fill area prior to capping. The depth of contamination was found to be less than two feet.

The two rounds of surface water samples indicate that the site is releasing contaminants directly to the creek north of the site. Table 5 presents the results of the RI samples from the stream system. The hydraulic profile of this area indicates an upward gradient from the bedrock and that shallow groundwater is recharging the creek. The creek flow consists almost entirely of waters which originate from leachate releases or from upwelling groundwater that has passed through the waste mass. The relatively high organic carbon content of the peat soils in this area appear to be effectively retarding contaminant migration beyond the initial 25 feet from the edge of fill. Although Class C water quality standards are being exceeded, it is believed that once the site is isolated to stop the periodic leachate releases and upgradient clean waters are routed around the landfill that the water quality will again be within standards. The post-closure monitoring program will verify the future quality of the surface waters.

A health risk assessment was accomplished on the present-use exposure conditions and on future-use exposure conditions. The details of this task can be found in Chapter 6 of the RI report and are briefly summarized here. The site presents an unacceptable health risk for dermal contact with the sediments in the leachate accumulation area and in the first pond of the creek immediately adjacent to the fill mass. An unacceptable risk was also present for future use of the leachate as a drinking water source and when used for showering. Dermal contact with and ingestion of test pit soils resulted in unacceptable risks.

IV. ENFORCEMENT STATUS

Orders on Consent

Date	Index No.	Subject of Order
8 February 1989	W3-0079-8704	Implementation of a Remedial Program

The Town of New Windsor has initiated actions aimed at exploring the possibility of achieving cost sharing and/or cost recovery agreements with potentially responsible parties which utilized the landfill to dispose of industrial or commercial waste streams. The results of these actions will be utilized to offset the cost of the remedial program to both the Town of New Windsor and the State of New York. The 1986 Environmental Quality Bond Act is being used to reimburse the Town for up to 75 percent (75%) of the costs for the remedial program. Currently there have been no agreements reached.

V. GOALS FOR THE REMEDIAL ACTIONS

The remedial alternative selected for the site by the Department was developed in accordance with the New York State Environmental Conservation Law (ECL) and is consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 USC Section 9601, et., seq., as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). The criteria used in evaluating the potential remedial alternatives can be summarized as follows:

1. Compliance with Applicable or Relevant and Appropriate New York State Standards, Criteria and Guidelines (SCGs)--SCGs are divided into the categories of chemical-specific (e.g., groundwater standards), action-specific (e.g., design of a landfill), and location-specific (e.g., protection of wetlands).

2. Protection of Human Health and the Environment--This criterion is an overall and final evaluation of the health and environmental impacts to assess whether each alternative is protective. This is based upon a composite of factors assessed under other criteria, especially short/long-term effectiveness and compliance with SCGs.

3. Short-term Impacts and Effectiveness--The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment is evaluated. The length of time needed to achieve the remedial objectives is estimated and compared with other alternatives.

4. Long-term Effectiveness and Permanence--If wastes or residuals will remain at the site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude and nature of the risk presented by the remaining wastes; 2) the adequacy of the controls intended to limit the risk to protective levels; and 3) the reliability of these controls.

5. Reduction of Toxicity, Mobility, and Volume--Department policy is to give preference to alternatives that permanently and significantly reduce the toxicity, mobility, and volume of the wastes at the site. This includes assessing the fate of the residues generated from treating the wastes at the site.

6. Implementablity--The technical and administrative feasibility of implementing the alternative is evaluated. Technically, this includes the difficulties associated with the construction and operation of the alternative, the reliability of the technology, and the ability to effectively monitor the effectiveness of the remedy. Administratively, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining special permits, rights-of-way for construction, etc.

7. Cost--Capital and operation and maintenance costs are estimated for the alternatives and compared on a present worth basis. Although cost is the last criterion evaluated, where two or more alternatives have met the requirements of the remaining criteria, lower cost can be used as the basis for final selection.

The overall objective of the remediation is to reduce the concentrations of contaminants and the routes of exposure to levels which are protective of human health and the environment. The site-specific goals for remediating the site can be summarized in general as follows:

- o Reduce, control, or eliminate the contamination present in the shallow saturated zone (leachate water) within the fill mass.
- o Reduce or eliminate the mobility of the organic contamination in the fill area and in the leachate collection area north of the fill mass.
- o Reduce or eliminate the threat to surface waters and the associated wetlands by containing any future leaching from the fill mass.
- o Eliminate the potential for direct human or animal contact with the waste mass, leachate seeps, and stream sediments in the first pond area.

The following section addresses the alternatives that have been evaluated to achieve these goals.

VI. SUMMARY OF THE EVALUATION OF THE REMEDIAL ALTERNATIVES

A. Initial Screening of the Alternatives:

The NWLF has been evaluated as a single "operable unit." That is, the site consists essentially of a single contaminated area and the evaluations would not benefit from dividing the site into separate pieces.

The FS initially screened 18 different technologies either individually or in combination with other technologies for technical implementablity in achieving the remedial goals. The following items describe the technologies and summarizes the basis for passing or excluding a technology from the detailed analysis. More complete descriptions of the technologies can be found in the RI/FS report.

Technologies/Processes that Passed Screening

Source Area Containment Actions

1. Capping

Capping would consist of the construction of an engineered multi-media cap designed to minimize contact with wastes and the infiltration of rainwater into the fill area. This technology includes passive gas control systems.

2. Grading and Revegetation

This technology would be used in conjunction with capping and involves reshaping the surface of the landfill and the surrounding area such that rain induced surface water flows are controlled from a hydraulic standpoint and prevented from creating leachate and erosional problems.

3. Diversion of Offsite Surface Waters

This technology involves the design of an engineered system of drainage structures and culverts which will eliminate the current situation where clean waters from the surrounding area collect in the low-lying area surrounding the landfill. This ponding creates a hydraulic force which drives these fluids through the wastes and results in leachate releases.

Source Area Treatment Actions:

4. Soil Washing

This technology involves the removal of contaminants from excavated soils through mixing with various solvents, surfactants, and/or chelating agents. This technology is most effective on homogeneous soils with less than 35% fines. Heterogeneous materials such as those present at a municipal landfill will reduce the efficiency of soil washing due to large variability of particle sizes and the presence of non-soil debris. This technology was considered at the NWLF only in conjunction with select areas of homogenous wastes.

5. Incineration

Onsite and offsite thermal incineration technologies have the potential to reduce the volume of organic waste material present at the NWLF. Treatability/Pilot burns would be necessary to select the most appropriate treatment process. These technologies would effectively destroy the source area contaminants that are present. On-site incineration, mobile incineration and offsite incineration are retained as potential remedial technologies to remediate the site only when used in conjunction with excavation to address site problems.

6. Groundwater/Leachate Collection Actions:

Collection actions will extract contaminated leachate waters from the shallow aquifer within the fill and collect offsite clean groundwater with subsequent diversion around the site. Extracted leachates would be subjected to a treatment technology (biological, chemical and/or physical) prior to any effluent discharges. Effluent discharge options were retained through the initial screening process and included a permitted discharge to the creek and a discharge to the Town of New Windsor Sewage Treatment Plant. Current Town pretreatment standards require that the leachate be subjected to some form of treatment prior to discharge to the sanitary sewer system.

8. Monitoring

Common to all of the remedial alternatives, including the no action alternative, a environmental monitoring program will be implemented to evaluate the progress of the remedial alternative selected. This will consist of periodic sampling and analyzing groundwater from the network of monitoring wells, surface water from the creek and vent gases from the cap on a regular basis.

Technologies Excluded from Further Analysis

1. In-situ Chemical Treatment--Utilization of a soil flushing agent to remove contaminants from the buried wastes without any excavations was screened and rejected. The heterogeneous nature of the wastes at the NWLF combined with the presence of high percentages of construction debris greatly reduce the efficiency of this process.

2. In-situ Biological Treatment--Injection of bacteria into the waste mass to reduce the concentrations of contaminants was evaluated and rejected. The technology was rejected due to the heterogeneous nature of the waste present and concern about the possible effects of the by-products of biodegradation.

3. In-situ Thermal Vitrification--This technology consists of the application of thermal processes to volatilize or destroy organic solvent contaminates from the source area. Radio frequency heating and in-situ heating are two proven technologies. The relatively high groundwater table at the NWLF will result in excessive power requirements to heat the wastes. These technologies do not work with wastes which contain large buried objects characteristic of a landfill. These technologies will not be retained for the remediation of the NWLF.

4. Solidification/Stabilization--Solidification is a process by which wastes are mixed with solidifying agents which result in a conversion to an inert solid matrix which resists any leaching of contaminants. These processes work on wastes which are mostly homogeneous in nature and which do not contain high percentages of bulky wastes. The heterogeneous nature of the NWLF would not result in efficient application of these types of technologies and they are rejected.

5. Active Gas Extraction--This process is commonly applied to sites which contain widespread elevated volatile organic contaminates. Given the age of the landfill material at the NWLF and the lack of widespread volatile contamination this technology was rejected.

B. Evaluation of the Alternatives:

Remediation of the NWLF entails addressing contaminated leachates and sediments/soils present adjacent to the landfill. The FS evaluated all screened technologies such that the selected remedial alternative would include a source area alternative and a groundwater/leachate alternative in combination with a post closure monitoring program. The specific details of the evaluation of assembled technologies is presented in Section 6 of the FS.

For all inactive hazardous waste sites, the evaluation of the No-Action alternative is carried through to the end of the analysis for comparison purposes. At this site, the No-Action alternative is not acceptable since leachates would continue to contaminate the surrounding environment at levels that present a significant threat. Additionally the No-Action alternative is inappropriate for a landfill which has not achieved the current closure requirements presented in 6 NYCRR Part 360: Solid Waste Management Facilities.

C. Selection of the Remedy:

Comparing the various remedial alternatives shows that they can be grouped into two general categories; Source Control Alternatives and Leachate Alternatives. A total of seven source area alternatives and four leachate water alternatives were subjected to a detailed screening process. The specifics of each alternative evaluated can be found in Chapters 3 and 4 of the FS report. The selected alternative results in a remedial program which is both protective of human health and the environment and which recognizes the unique problems presented with a landfill site which has been inactive for 16 years and contains such a heterogeneous waste mass. The preferred alternative also allows the Town of Windsor to utilize the parcel upon completion as the future site of the Town Highway Department facilities, thereby enhancing the prospects for continued compliance. Table 6 presents the feasible alternatives developed for remediation of the NWLF site.

VII. CITIZEN PARTICIPATION

To inform the local community and to provide a mechanism for citizens to make the Department aware of their concerns, a citizen participation program has been implemented. In accordance with a citizen participation (CP) program developed for the project, the following goals have been accomplished :

- Information repositories have been established;
- Documents and reports associated with the project have been placed into the repositories;
- A "contact list" of interested parties (e.g., local citizens, media, public interest groups, government agencies, economic agencies, etc) has been created;
- Periodic fact sheets and notices of upcoming meetings have been distributed to the contact list on a regular basis;
- A public informational meeting was held prior to the official start of the field investigations at the landfill;
- A public informational meeting was held in September of 1990 to present the results of the Phase I investigation and to discuss additional field work being planned;
- A public notice of the completion of the RI/FS and of the availability of the proposed remedial action plan was issued in the Newburgh Leader Harold and the New Windsor Sentinel;
- A public comment period was established and a public meeting was held on September 11, 1991 in New Windsor to describe the proposed remedial remedy. The transcript for the project is part of the Administrative Record for the project and is in the document repositories;

A summary of the comments received during the public meeting and the public comment period are included in Exhibit D along with the Department's responses to those comments. No written comments were received concerning the PRAP. A public notice of the selected remedy will be issued along with a brief summary of the remedial program.

VIII. SUMMARY OF THE GOVERNMENT'S DECISION

The selected remedial program represents the best technical and cost-effective approach from among the assembled alternatives. It recognizes the reality of the fact that this site was primarily a municipal landfill and has been inactive for 16 years without any significant remediation. It can be implemented in a short timeframe and results in achievement of the remedial goals. The selected remedial program consists of Source Alternative 2A and Leachate Water Alternative W1. The combination of these two alternatives includes the following elements:

- o Excavation of approximately 1.5 acres of waste fill currently encroaching on the NYSDOT Stewart property from the northwestern corner and on the properties south and east of the site. These materials would be redeposited within the Town landfill area. The excavated area will be returned to its natural state to the extent possible through regrading with topsoil and vegetative plantings.

- o Excavation and redeposition of sediments and soils from the leachate accumulation areas, the excavated zones, and the first pond on the creek to levels such that carcinogenic-Polycyclic Aromatic Hydrocarbons (c-PAHs) are less than 250 parts per billion.

- o Design and construction of a multi-layered capping system in accordance with NYSDEC regulations to encompass the western encroachment and the main fill area (total of approximately 9.75 acres). The cap system will include a landfill gas venting system, a low permeability membrane liner, protective barrier soils and a topsoil layer to support vegetative plantings. The design will also incorporate the long-term use of the property as the site of the future Town Highway Department facilities.

- o Design and construction of an engineered system of surface water diversion structures along the southern and western perimeter. The clean waters will be conveyed past the waste mass and discharged to the creek system in an unaltered state. The need for a supplemental groundwater interceptor/diversion system will be evaluated in the actual design stage. If shown necessary, a groundwater interceptor will be included in this alternative.

- o Design and construction of a leachate water collection system. This system will enclose the northern end of the site and extend partially around the eastern and western borders. Conceptually the system will consist of a gravity flow trench of varying depth connected to a collection tank and pump station. The collected fluids would be

treated on-site to comply with the pretreatment requirements of the Town of New Windsor Sewage Treatment Plant and discharge to the nearest sewer interceptor located at the base of Square Hill Road. The need for and specific method of pretreatment will be determined during the design stage based upon treatability and pilot test results.

o Environmental monitoring in accordance with DEC regulations to determine the effectiveness of the remedial program. Groundwater, surface waters, leachate and vent gases will all be subjected to a periodic monitoring program designed to detect any changes in the effectiveness of the remedial program.

o Imposition of deed restrictions which limit the future uses of the site to specific non-intrusive activities and restricts the utilization of groundwaters beneath the site in accordance with the operational and maintenance programs to be developed during the Remedial Design.

The Town of New Windsor has estimated the cost of the preferred alternative described above to be $6,950,000. This estimate includes $3,490,000 in capital costs and $3,460,000 in present worth of recurring operational and maintenance costs for the 30 year post closure monitoring period. These estimates are subject to change based upon the results of the actual design task and any available bid information.

Protection of Human Health and the Environment

The selected remedy is protective of human health and the environment in that it will effectively eliminate the current routes of exposure to chemicals present in the waste mass and will remove wastes which have migrated beyond the current toe of slope along the northern border of the site. This isolation of wastes will be combined with a leachate removal and treatment system that will eliminate future releases to the environment.

Groundwaters whose quality has been impacted as a result of the landfilling operations at the site is not currently infringing on any private well supplies. As noted in the administrative record, public water supplies are available in the area of concern. The post closure monitoring program will include specific elements designed to ensure that the community is not exposed to drinking waters that are contravened by this site.

Compliance with State Standards, Criteria, and Guidance

The selected remedy will comply with all applicable New York State Standards, Criteria, and Guidance (SCGs). Contaminated sediments will be removed from those areas where they approach the SCGs and redeposited within the landfill proper prior to the installation of the engineered cap. Contaminated waters (leachates) which have come in contact with the waste mass will be collected and treated such that SCGs are met. The specific method of achieving the SCGs will be determined during the design stage of the project. The post closure monitoring program will ensure that the selected remedy continues to achieve the SCGs as time goes on.

Cost-Effectiveness

Analyses in the RI/FS reports demonstrates that the selected remedy provides overall effectiveness proportional to its cost. Although other alternatives (e.g., off-site secure disposal and incineration) could provide a higher degree of certainty in achieving the remedial goals, the selected remedy presents an acceptable level of confidence at a significantly lower cost. This determination also takes into account the fact that the site is a municipal landfill which has been inactive for over fifteen years, the nature of the danger to human health and the environment presented by the landfill, and the extent to which other alternative remedies would impose additional risks to the community and the environment during implementation.

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

The selected remedy does not include alternative treatment technologies nor does it provide a permanent or irreversible remedy. Due to the extremely heterogenous nature (both physically and chemically) and large volume of the landfilled wastes, the implementation of a permanent or alternative technology is impracticable. The selected remedy will result in the removal and isolation under the cap system of off-site materials which presented an unacceptable risk in the RI/FS.

Preference for Treatment as a Principal Element

The selected remedy includes treatment as a principal element for the landfill leachates. The primary component of the remedy for the source is a engineered isolation system which will eliminate the unacceptable risks determined in the RI/FS. As discussed in the above paragraph, treatment of the landfilled materials has been deemed impracticable at this site.

EXHIBIT A: ADMINISTRATIVE RECORD

TOWN OF NEW WINDSOR LANDFILL

ORANGE COUNTY, N.Y. ID NUMBER 336019

A. "Final Remedial Investigation and Feasibility Study: Town of New Windsor Landfill," with appendices, prepared by EA Engineering, P.C.; June 1991.

B. "Draft Remedial Investigation Report: Town of New Windsor Landfill," with appendices, prepared by EA Engineering, P.C.; August 1990.

C. "1986 EQBA Title 3 State Assistance Contract #C300069" executed in February 1990 between the State of New York and The Town of New Windsor.

D. "Final Work Plans for the RI/FS at The Town of New Windsor Landfill" with supporting documents, prepared by E & A Engineering, P.C., for the Town of New Windsor, January 1990.

E. "Town of New Windsor Application for Title 3 Assistance" prepared by McGoey,Hauser and Edsall,P.C., for the Town of New Windsor, January 1990.

F. "Stewart Commercial Center Environmental Assessment" prepared by Tectonic Engineering Consultant P.C. for Kent Management, October 1989.

G. Order on Consent between NYSDEC and the Town of New Windsor, executed on 8 February 1989, index# W3-0079-8704:Implementation of a Remedial Program at the Town of New Windsor Landfill.

H. "Town of New Windsor Landfill Investigation," prepared by the Town of New Windsor, June 1988.

I. "Town of New Windsor Landfill Phase II Investigation," prepared for New York State Department of Conservation by Wehran Engineering, P.C.; June 1985

J. "Evaluation Of Data From City of Newburgh Water Supply, USMA Newburgh Landfill and New Windsor Landfill" prepared for USEPA by NUS Corporation, October 1984.

K. "Town of New Windsor Landfill Phase I Investigation," prepared for New York State Department of Conservation by Ecological Analysts, Inc.; June 1983

L. "Hazardous Waste Site Investigation of the Town of New Windsor Landfill", prepared by Fred C. Hart Associates,Inc. for the USEPA, April 1981.

M. "Transcript from the Proposed Remedial Action Plan Public Meeting" Prepared by Roberta O'Rourke, for the NYSDEC, September 11, 1991.

EXHIBIT B: PROJECT CHRONOLOGY

TOWN OF NEW WINDSOR LANDFILL

ORANGE COUNTY, NEW YORK

ID NUMBER 336019

1962 - 1976	Town of New Windsor operates a municipal disposal site at the property owned by the Town of New Windsor on Square Hill Road.
1976	The Town ceases to operate the site as a landfill and continues to utilize the area as a stock pile area for the Town Highway Department.
12/1980	The USEPA conducts a "Sampling inspection of the New Windsor landfill and the surrounding area". The letter report detailing this inspection concludes that "the landfill does not appear to have any major impact on the City of Newburgh water supply" and that "this site should be closely monitored to detect contamination".
4/1981	USEPA contractor (F.C.Hart,Inc.) prepares a report entitled "Hazardous Waste Site Investigation" concerning the Town of New Windsor Landfill. This report concludes that "since the site may fall under NYS jurisdiction, that sampling should not be conducted at this time"
6/1983	NYSDEC contractor Ecological Analysts, Inc. prepares a NYSDEC "Phase I:Preliminary Assessment of the Town of New Windsor Landfill" This report contains the first Hazard Ranking Scores (HRS) and indicates the site has the potential to be a significant threat to public health and the environment.
10/1984	USEPA Contractor NUS Corp. conducts a sampling program to determine the impact of area landfills on the City of Newburgh water supply system and concludes in their report "Evaluation of Data from the City of Newburgh Water Supply, Stewart Annex Landfill and New Windsor Landfill" that both the supply system and private wells are free of hazardous substance contamination and that the unnamed creek north of the two landfills should be prevented from entering Lake Washington due to "volatile organics and pesticides".
6/1985	NYSDEC contractor Wehran Engineering. P.C. prepares a NYSDEC Phase II: Engineering Investigation at the New Windsor Landfill.. This work resulting in the first groundwater monitoring wells at the site. NYSDEC concludes that sufficient information is available to classify the landfill as a Class 2:inactive Hazardous Waste Site and nominates the landfill for inclusion on the USEPA National Priorities List (NPL).

EXHIBIT B: PROJECT CHRONOLOGY
continued

1986	USEPA rejects the nomination of the Town of New Windsor Landfill for the NPL due to a revision in the NYSDEC calculated HRS.
3/1988	The Town of New Windsor Police Department conducts an investigation into the industrial users of the landfill and submits a report to the DEC during discussions for a Order on Consent to conduct a remedial program at the site.
2/1989	The Town and DEC sign the Order on Consent.
5/1989	The Town of New Windsor procures E & A Engineering, P. C. to conduct a RI/FS at the landfill.
12/1989	A public information session is held to present the plans for the RI/FS to the public and receive input.
1/1990	The DEC approves the work plans for the RI/FS.
2/1990	The Town and State sign a State Assistance Contract to reimburse the Town for up to 75% of eligible costs from the 1986 EQBA.
8/1990	E & A submits a report with appendices detailing the results of the Phase I:RI. NYS reviews and comments to the Town on necessary Phase II work.
9/1990	A public information session is held to seek input on the investigative results to the public and to brief them on the Phase II work plans.
4/1991	The Town submits a draft RI/FS with appendices to NYS detailing both phases of the current work project.
5/1991	NYS transmits comments and concerns to the Town on the draft reports.
6/1991	The Town submits a revised "Final RI/FS Report" with appendices.
7/1991	The Town meets with potentially responsible industrial parties to begin discussion on cost sharing.
8/1991	The State prepares and publishes a proposed remedial action plan based upon the E & A RI/FS reports.
9/1991	The State holds an open public meeting to discuss the results of the RI/FS and to present the PRAP to the public.

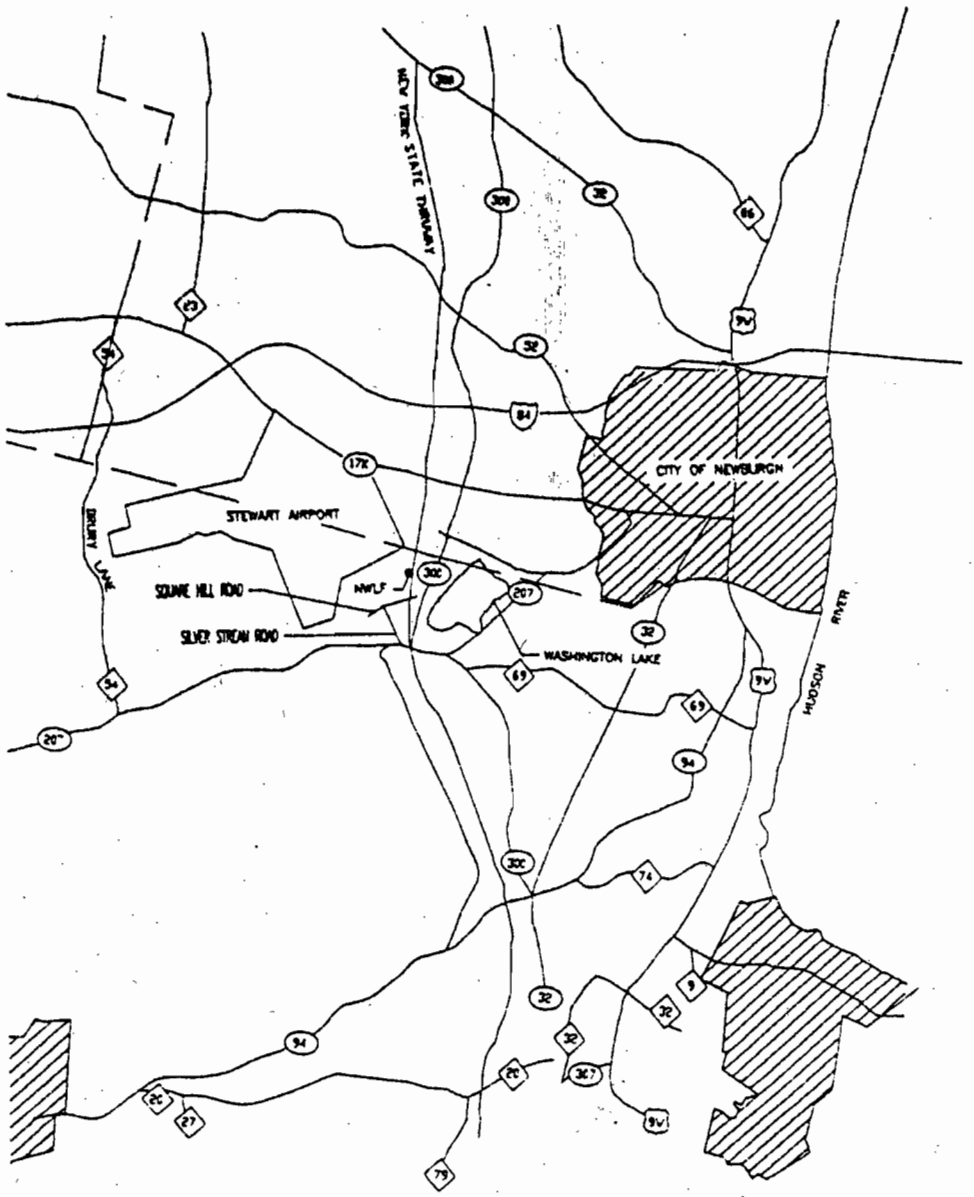

Figure 1 Site location map for the Town of New Windsor Landfill.

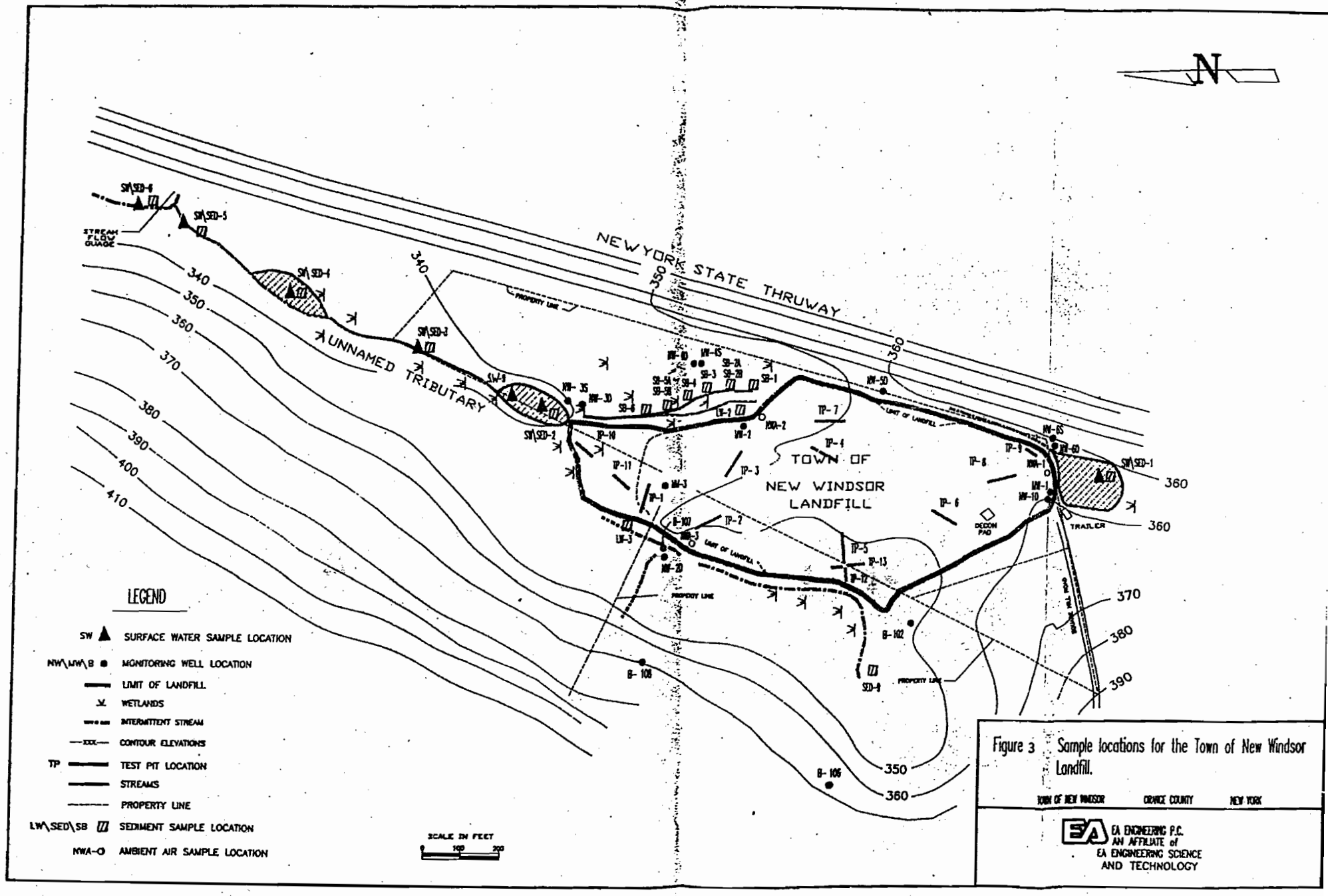

Figure 3 Sample locations for the Town of New Windsor Landfill.

TOWN OF NEW WINDSOR ORANGE COUNTY NEW YORK

EA ENGINEERING P.C.
AN AFFILIATE of
EA ENGINEERING SCIENCE
AND TECHNOLOGY

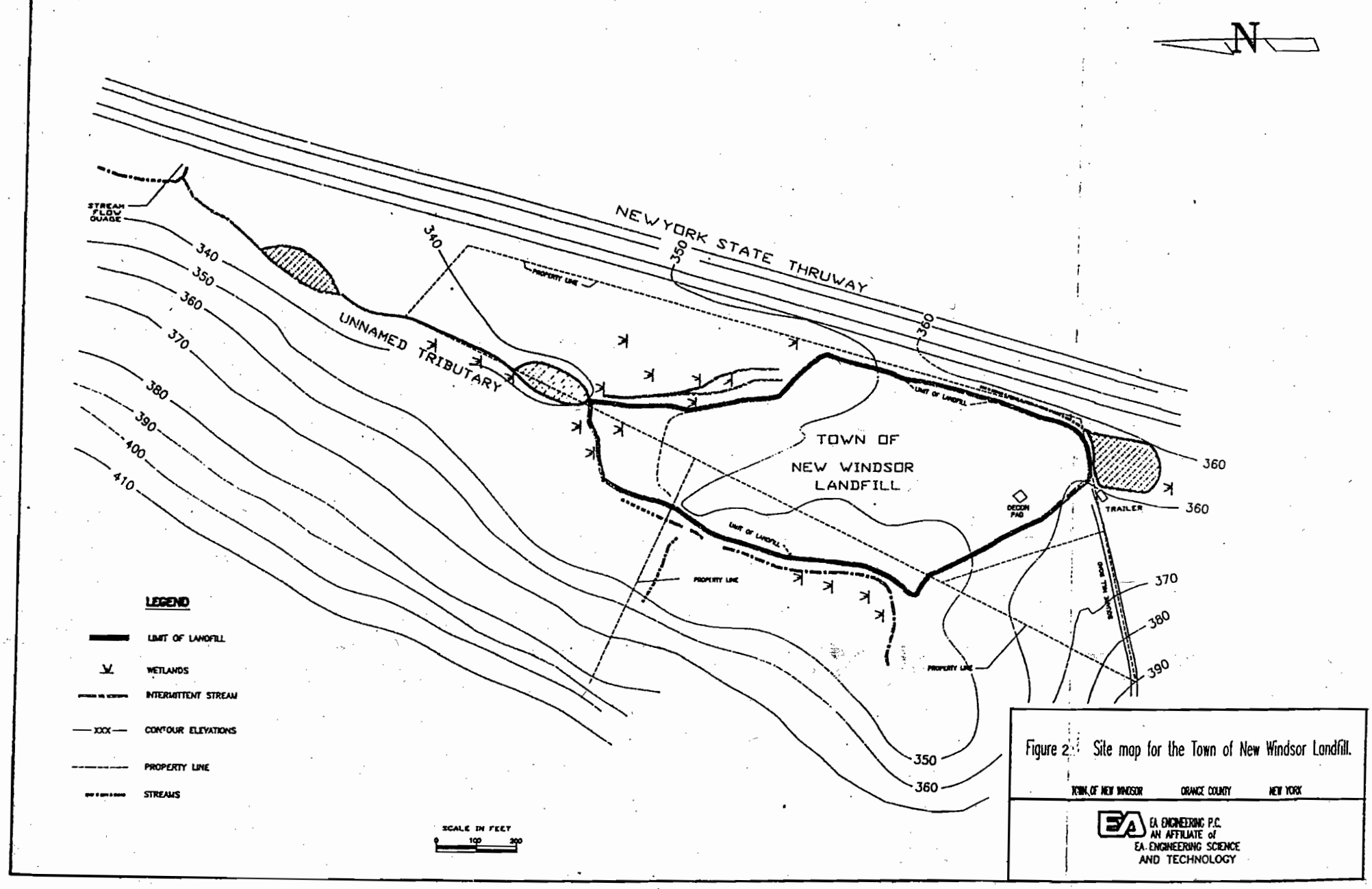

Figure 2: Site map for the Town of New Windsor Landfill.

TOWN OF NEW WINDSOR ORANGE COUNTY NEW YORK

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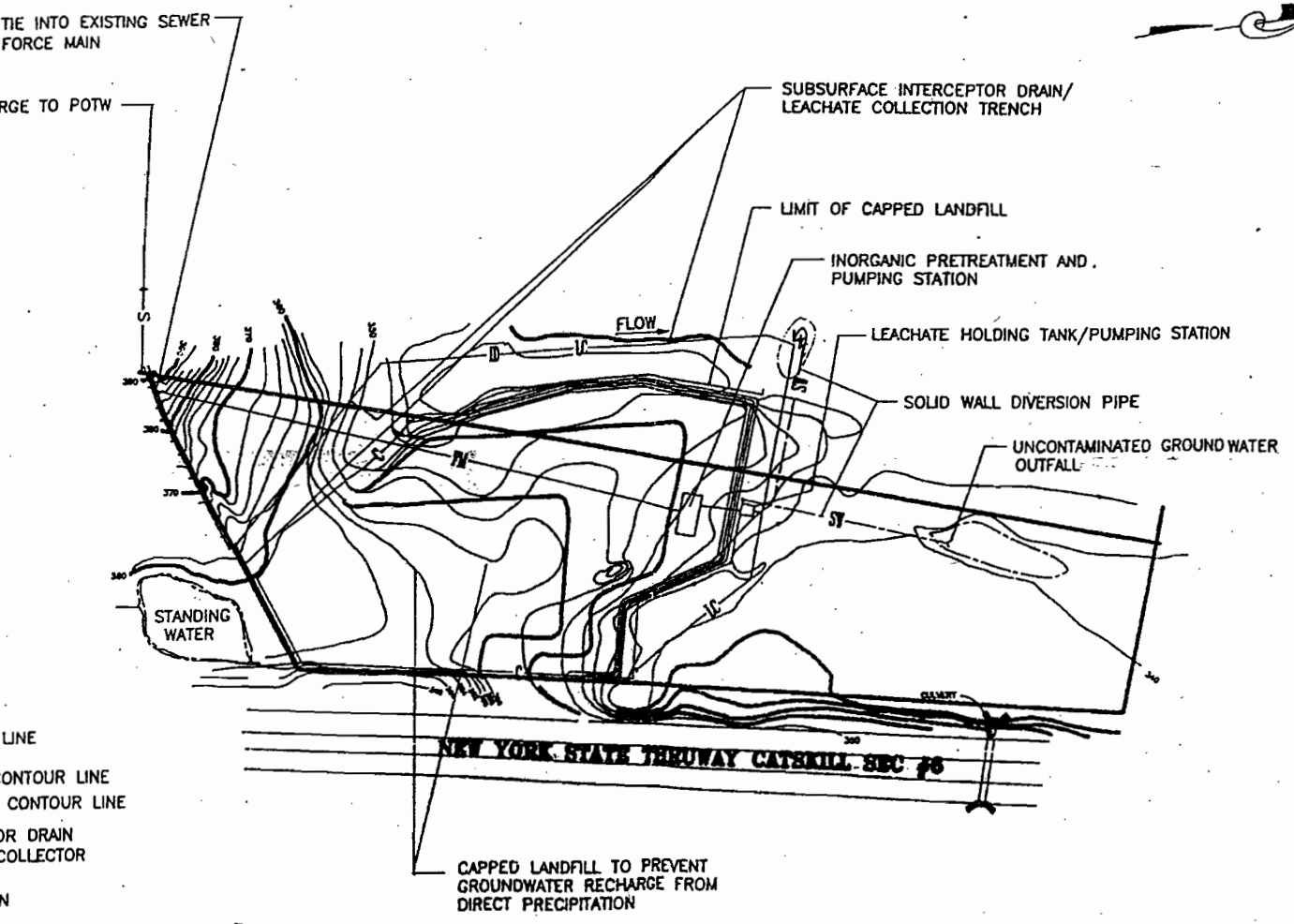
AND TECHNOLOGY



LEGEND:

- PROPERTY LINE
- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE
- D — LC — INTERCEPTOR DRAIN LEACHATE COLLECTOR
- FM — FORCE MAIN
- ST — SOLID WALL DIVISION PIPE
- C — LIMIT OF CAP
- S — SEWER LINE
- OUTFALL LOCATION

0 100
SCALE IN (ft.)

FIGURE 4
CONCEPTUAL PLAN FOR LEACHATE ALTERNATIVE W1 COLLECTION, TREATMENT AND DISCHARGE TO POTW FOR SOURCE AREA ALTERNATIVE #2
TOWN OF NEW WINDSOR ORANGE COUNTY NEW YORK

DESIGN	DATE
DRAWN BY	SCALE
CHECKED BY	PROJECT NO.
PROJECT ENG.	SHT. No.

LA ENGINEERING P.C.

TABLE 1: TOWN OF NEW WINDSOR LANDFILL
TEST PIT SAMPLES INORGANICS SUMMARY TABLE
Phases I & II

Parameter:	fequency of Detection	Mean	Range (MG/KG)
Aluminum	13/13	8676.9	6,240 - 16,200
Arsenic	13/13	5.7	2.9 - 10.4
Barium	13/13	151.2	34B - 1,030R
Beryllium	12/13	0.4	(<0.35U) - 0.54B
Cadmium	10/13	1.2	(<0.83U) - 3.6J
Calcium	12/13	19630.8	797B - 106,000
Chormium	13/13	18.7	14.5 - 32.1
Cobalt	12/13	7.	(<2.6U) - 11B
Copper	13/13	97.6	10.4 - 581J
Iron	13/13	23730.8	14,900 - 32,000
Lead	13/13	385.3	49J - 4,140J
Magnesium	13/13	6124.6	3,800 - 8050
Manganese	13/13	585.4	374 - 797
Mercury	9/13	0.5	(<0.1U) - 1.5
Nickel	13/13	20.5	12.6B - 28.2
Potassium	13/13	2202.3	725B - 12,500
Selenium	1/13	0.1	(<0.24U) - 0.47JB
Sodium	13/13	126.1	43.9 - 285B
Vanadium	13/13	20.3	16.8 - 23.5
Zinc	13/13	187.5	53.8 - 831J

Notes: 1. All concentration units are milligrams per Kilogram (PPM) dry weight unless otherwise noted.
2. Mean calculated setting non-detects at 0.5 SQL.
3. B = Value less than CRQL, J = Value is an estimate following QA/QC review of the data, U = Not detected, sample quantitation limita are shown as (< ___U)
4. Samples acquired April 1990 and October 1990

TABLE 2: TOWN OF NEW WINDSOR LANDFILL
TEST PIT SAMPLES ORGANICS SUMMARY TABLE
Phases I & II

Parameter:		fequency of Detection	Mean	Range (PPB)
Trichlorethene		2/13	11.5	(<6U) - 69
Toluene		4/13	84692	(<6U) - 880,000
Ethylbenzene	Note:5	2/13	2276	(<6U) - 450J
Xylene		2/13	3349	(<6U) - 12000
Acetone	Note:5	3/13	4988	(<20U) - 200J
Napthalene		5/13	1976	(<380U) - 6400
Acenaphthylene	Note:5	6/13	2039	(<380U) - 870J
Acenaphthene		6/13	1338	(<380U) - 2300
Dibenzofuran	Note:5	6/13	1584	(<380U) - 1400
Fluorene		7/13	1812	(<380U) - 2500
Phenanthrene		11/13	7415	(<400U) - 21000
Anthracene		8/13	2206	(<380U) - 4600
Di-n-butylphthalate		5/13	3177	(<400U) - 17000
Fluoranthene		12/13	10092	65J - 25000
Pyrene		11/13	8792	(<400U) - 21000
Benzo(a)anthracene		10/13	4965	(<380U) - 13000
Benzo(b)anthracene		9/13	4746	(<380U) - 13000
Benzo(k)anthracene		9/13	3869	(<380U) - 9300
Chrysene		10/13	4677	(<380U) - 12000
Benzo(a)pyrene		10/13	4418	(<380U) - 11000
Indeno(1,2,3-cd)pyrene		8/13	2615	(<380U) - 5800J
Benzo(g,h,i)perylene		6/13	2215	(<380U) - 4600J
2-methylphenol		2/13	1706	(<400U) - 400J
Endosufan I		1/13	5.5	(<9.2U) - 11J
Dieldrin		4/13	156.6	(<18U) - 1200J
4,4'-DDD	Note:5	2/13	118.6	(<18U) - 51
4,4'-DDT		2/13	120.1	(<19U) - 1400J
Endrin Ketone		2/13	163.8	(<18U) - 1900
Alpha Chlordane		2/13	67.5	(<92U) - 170J
Gamma Chlordane		2/13	78	(<92U) - 320J
Alpha-BHC	Note:5	1/13	28.5	(<9.6U) - 9.2

Notes: 1. All concentration units are micrograms per kilogram (ppb) dry weight unless otherwise noted.
2. Mean calculated setting non-detects at 0.5 SQL.
3. B = Value less than CRQL, J = Value is an estimate following QA/QC review of the data, U = Not detected, sample quantitation limita are shown as (< ___U)
4. Samples acquired April 1990 and October 1990
5. Mean exceeded maximum value due to elevated detection limits in certain samples.

TABLE 3: TOWN OF NEW WINDSOR LANDFILL
GROUNDWATER SAMPLES SUMMARY TABLE
Phases I & II

Parameter:	fequency of Detection	Mean [1]	Range (PPB)
Arsenic	16/27	6.1	(<2.2) - 27.0
Barium	27/27	103.2	13 - 236
Cadmium	3/27	2.6	(<5.0) - 7.1J
Lead	25/27	9.9	(<1.1) - 44.2
Copper	26/27	30.0	(<3.0) - 150
Chormium	18/27	16.0	(,6.0) - 65.6
Manganese	27/27	813.4	5.3 - 1510
Mercury	11/27	0.2	(<0.2) - 0.68
Potassium PPM	27/27	3.6	0.48 - 13.3
Aluminum PPM	22/27	7.4	(<0.1) - 45.2
Iron PPM	26/27	15.3	(<0.1) - 99.7
Magnesium PPM	27/27	16.1	0.49 - 50.2
Calcium PPM	27/27	117.3	7.04 - 363
Sodium PPM	27/27	94.0	4.7 - 765
Chlorides PPM	13/13	233.3	5.3 - 1,852
Ammonia PPM	13/13	0.7	0.08 - 5.85
Benzene	2/27	1.4	(<0.5) - 2J
Chlorobenzene	1/27	1.4	(<0.5) - 0.2J
Toluene	1/27	1.4	(<0.5) - 0.4J
Chlorform	2/27	1.4	(<0.5) - 0.2J
Methylene Chloride	1/27	2.5	(<5.0) - 3J

Notes: 1. All concentration units are micrograms per liter (ppb) unless otherwise noted.
2. Mean calculated setting non-detects at 0.5 SQL.
3. B = Value less than CRQL, J = Value is an estimate following QA/QC review of the data, U = Not detected, sample quantitation limita are shown as (< ___U)
4. Samples acquired April 1990 and October 1990

TABLE 4-4 COMPARISON OF OBSERVED GROUND-WATER CONCENTRATIONS[1] TO STATE AND FEDERAL ARARs FOR THE TOWN OF NEW WINDSOR LANDFILL

Analyte	Phase I Samples			Phase II Samples			SDWA MCLs	NYSDOH MCLs[2]	NYSDEC MCLs[2]	NYSDEC Class GA Groundwater
	Overburden	Bedrock	Leachate Well	Overburden	Bedrock	Leachate Well				
Chloroethane	—	—	(<10U)-12	—	—	(<2.5U)-15		5		
Methylene chloride	—	(<5U)-3	—	—	—	—		50	5	5
Benzene	—	(<5U)-2	(<5U)-1	—	—	0.4 - 0.8	5	0.7	0.7	ND
1,1,2,2-tetrachloroethane	—	—	(<5U)-2	—	—	—		5	0.2	5
Chlorobenzene	—	—	(<5U)-13	(<0.5U)-0.2	—	1.3 - 5.6		5	20	5
Acetone	—	—	(<5U)-13	(<0.5U)-0.2	—	—		50		
Bromoform	—	—	—	—	—	—		50	50	50
Chloroform	—	(<2.2U)-27	—	—	(<0.5U)-0.3	—		7	0.2	100
Toluene	—	—	—	(<0.5U)-0.3	—	(<0.5U)-0.8		5	5	5
M/P-xylene	—	—	—	—	—	0.4-1.3		5	5	5
O-xylene	—	—	—	—	—	0.3-0.6		5	5	5
Isopropylbenzene	[3]	[3]	[3]	[3]	[3]	0.5-1.1		50		
N-propylbenzene	[3]	[3]	[3]	[3]	[3]	0.6-1.4		5		
1,2,4-trimethylbenzene	[3]	[3]	[3]	[3]	[3]	3.1-3.4		5		
Sec-butylbenzene	[3]	[3]	[3]	[3]	[3]	(<2.5U)-0.3		5		
1,3-dichlorobenzene	—	—	—	—	—	(<2.5U) 0.2		5	50	5
1,4-dichlorobenzene	—	—	—	—	—	(<2.5U)-1		5	20	5
N-butylbenzene	—	—	—	—	—	(<2.5U)-0.4		5		
1,2-dichlorobenzene	—	—	—	—	—	(<2.5U)-0.5		5	50	4.7
Naphthalene	—	—	—	—	—	(<2.5U)-1.8		50	10	10
1,1-dichloroethene	—	—	—	—	—	(<2.5U)-0.2		5	0.07	5
Cis-1,2-dichloroethene	—	—	—	—	—	(<2.5U)-0.2		5		
Arsenic	(<2.2U)-18.2	(<2.2U)-27	(<2.2U)-3.8	(<2.2U)-6	(<2.2U)-16.5	(<2.2U)-4.7			50	50
Barium	42-236	13-37	71-238	88-214	18-85	249-295	1,000		1,000	1,000
Cadmium	(<4U)-5.1	—	(<4U)-9.4	(<5U)-7.1	—	7.5-9.7	10		10	10
Chromium	(<6U)-65.6	(<6U)-9.4	(<6U)-6.2	(<6U)-37.6	(<6U)-25.2	(<6U)-6.3		50	50	
Iron	1,890-99,700	(<100U)-1,600	6,990-83,500	353-33,100	118-1,080	30,100-85,800			300	300
Lead	2.6-42.2	1.5-4.1	6.4-19.9	(<1.1U)-23.8	(<1.1U)-2.6	12.8-38.1	50		50	25
Manganese	290-5,500	17.9-130	329-2,390	419-1,210	5.3-52.8	1,590-4,140			300	300
Mercury	—	—	(<0.2U)-0.25	(<0.2U)-0.68	0.22-0.48	<0.2U)-0.29			2	2
Nickel	(<14U)-165	—	—	(<17U)-171	—	—				
Vanadium	(<15U)-62	—	—	(<14U)-24.8	—	—				
Zinc	12.3-28.5	3.9-19.3	26.6-135	5.6-86.4	(<44)-82.3	30.6-226			300	300

1. All concentration units are in µg/l.
2. Total volatiles not to exceed 100 µg/l
3. Not a targeted analyte.

NOTE: Dashes (—) indicate analyte not detected in samples.

TABLE 4 COMPARISON OF OBSERVED SURFACE WATER CONCENTRATIONS[1] TO STATE AND FEDERAL ARARs FOR THE TOWN OF NEW WINDSOR LANDFILL

Analyte	Round 1 Sample	Round 2 Sample	SDWA MCLs	NYS MCLs[2]	NYS Class A Surface Water
Chloroethane	(<10U)-44	(<10U)-32		5	
Chlorobenzene	(<5U)-2	(<5U)-1.2		5	
Acetone	(<10U)-44	---		5	
Bromoform	(<5U)-4	---		5	
Benzene	---	(<2.5U)-1	5	5	
Barium	33-191	15-291		1,000	1,000
Chromium	(<6U)-6.4	---			50
Iron	(<1,000)-21,900	67-49,100		300	300
Lead	(<1.1U)-4.3	3.1-21.6		50	50
Manganese	13.7-1,530	2.3.6-2,080		300	300
Mercury	(<0.2U)-1.1	(>0.2U)-0.5		2	2
Selenium	(>2.2U)-3.6	---			10
Zinc	(<2U)-27.6	4.7-34.9			300
Chloride[3]	121-250	102-177			250
Amonia[3]	(<0.1U)-11.1	0.13-12.4			2
TKN[3]	[4]	0.24-12.5			
Nitrate[3]	[4]	0.046-0.625			10
Nitrate[3]	---	0.003-0.043			
Sulfide[3]	[4]	2-5			
Phosphorus (total)[3]	[4]	0.07-0.24			
Hardness[3]	131-293	52.8-343			
TOC[3]	[4]	9.37-15.9			
TDS[3]	[4]	21.5-990			
TSS[3]	[4]	(<10U)-80			

1. All concentration units are in $\mu g/\ell$, except as noted.
2. Total volatiles not to exceed 100 $\mu g/\ell$.
3. Concentration units are in mg/ℓ.
4. Not a targeted analyte.

NOTE: Dashes (---) indicate analyte not detected in samples.

TABLE 5: TOWN OF NEW WINDSOR LANDFILL
SURFACE WATER SAMPLES SUMMARY TABLE
Phases I & II

Parameter:		fequency of Detection	Mean	Range (PPB)
Aluminum		3/15	120.7	(<100) - 536
Arsenic		1/15	2.2	(<2.2) - 2.7
Barium		15/15	134.3	15 - 309
Cadmium		3/15	3.8	(<5.0) - 10.2J
Lead		13/15	5.4	(<1.1) - 21.6
Copper		7/15	3.3	(<3.0) - 7.5
Zinc		14/15	15.7	(<1) - 34.9
Manganese		15/15	965.4	13.7 - 2,080
Mercury		10/15	0.3	(<0.2) - 1.1J
Potassium	PPM	15/15	3.2	1.19 - 5.15
Iron	PPM	14/15	12.2	(<0.10) - 49.1
Calcium	PPM	15/15	81.0	17.3 - 115
Magnesium	PPM	15/15	10.4	4.69 - 13.8
Sodium	PPM	15/15	82.1	45.2 - 127
Chlorides	PPM	15/15	145.7	102 - 250
Ammonia	PPM	13/15	5.5	(<0.1) - 12.4
TDS	PPM	14/14	320.1	215 - 990
Chloroethane		8/15	15.7	(<10) - 53
Benzene		1/15	2.3	(<2.5) - 1J
Chlorobenzene		2/15	2.4	(<5) - 2J
Acetone		1/15	7.6	(<10) - 44J
Bromoform		1/15	2.6	(<5) - 4J

Notes: 1. All concentration units are micrograms per liter (ppb) unless otherwise noted.
2. Mean calculated setting non-detects at 0.5 SQL.
3. B = Value less than CRQL, J = Value is an estimate following QA/QC review of the data, U = Not detected, sample quantitation limits are shown as (< ___U)
4. Samples acquired April 1990 and October 1990 .

TABLE 6 COMPARISON OF FEASIBLE REMEDIAL ALTERNATIVES REVISED 7/30/91 p 1 of 4

Alt No.		Type of Action	Performance Period	Innovative Technology	Subject to LDRs	Requires Offsite Transport/ Disposal	Capital Cost ($ x 1E6)	Present Worth O&M Cost ($ x 1E6)	Total Cost ($ x 1E6)
Source Area									
1	No action with site control	None	N/A	No	No	No	0.305	1.295	1.600
2A	Cap with surface water and gas vent controls (Partial Consolidation)	Containment/ Diversion	6 months	No	No	No	3.052	1.295	4.347
2B	Cap with surface water and gas vent controls (Complete Consolidation)	Containment/ Diversion	6 months	No	No	Yes	5.150	1.295	6.445
3A	Total excavation with Offsite landfilling	Removal	18 months	No	Yes	Yes	52.895	1.214	54.109
3B	Total excavation with Offsite landfilling and Treatment	Removal/Offsite Treatment	18 months	No	Yes	Yes	59.220	1.214	60.434

Note: "Performance Period" is the period over which the remedial action will take place

TABLE 6 (cont)

Alt No		Type of Action	Performance Period	Innovative Technology	Subject to LDRs	Requires Offsite Transport/ Disposal	Capital Cost ($ x 1E6)	Present Worth O&M Cost ($ x 1E6)	Total Cost ($ x 1E6)
Source Area (cont)									
4A	Selective excavation with Onsite treatment by soil washing	Removal/Onsite Treatment	18 months	Yes	Yes	No			
	- Partial Consolidation						3.65	1.29	4.94
	- Complete Consolidation						3.52	1.29	4.81
4B	Selective excavation with Onsite treatment by soil incineration	Removal/Onsite Treatment	18 months	No	Yes	No			
	- Partial Consolidation						5.12	1.29	6.41
	- Complete Consolidation						5	1.29	6.29

TABLE 6 (cont)

Alt No.		Type of Action	Performance Period	Innovative Technology	Air Discharge	SPDES Discharge	Capital Cost ($ x 1E6)	Present Worth O&M Cost ($ x 1E6)	Total Cost ($ x 1E6)
Leachate Water									
W1	Collection, treatment and discharge of leachate to POTW	Offsite treatment	2 years	No	Yes	No			
	- Partial Consolidation						0.44	2.17	2.61
	- Full Consolidation						0.42	2.17	2.59
W2A	Collection, treatment by Carbon adsorption and discharge of leachate to stream	Onsite Treatment	2 years	No	Yes	Yes			
	- Partial Consolidation						0.67	11.02	11.69
	- Full Consolidation						0.64	11.02	11.66

Table 6 (Cont)

Alt No.		Type of Action	Performance Period	Innovative Technology	Air Discharge	SPDES Discharge	Capital Cost ($ x 1E6)	Present Worth O&M Cost ($ x 1E6)	Total Cost ($ x 1E6)
W2B	Collection, treatment by Air stripping and discharge of leachate to stream	Onsite Treatment	2 years	No	Yes	Yes			
	- Partial Consolidation						0.7	3.04	3.74
	- Full Consolidation						0.68	3.04	3.72
W2C	Collection, treatment by UV Oxidation and discharge of leachate to stream	Onsite Treatment	2 years	Yes	Yes	Yes			
	- Partial Consolidation						0.87	2.4	3.27
	- Full Consolidation						0.86	2.4	3.26

Note: O&M Costs based upon 10 gpm treatment units. 50 gpm units would have higher costs

Capital costs based upon pretreatment by suspended solids (Option A).

TABLE 7: COST ESTIMATES FOR THE SELECTED REMEDIAL PROGRAM
Town of New Windsor Landfill, Site #336019

OPERABLE UNIT:	SELECTED ALTERNATIVE:	TOTAL ESTIMATED COST (PW)	ESTIMATED CAPITAL COSTS	ESTIMATED O/M COSTS (PW 30 yrs)	ESTIMATED AVERAGE ANNUAL O/M COSTS
1	Consolidation of landfill from 11.2 to 9.5 acres. Capping landfill iaw 360 reqr. Surface water diversion system. Excavation of PAH contaminated sediments from site perimeter areas.	$4,347,000 note 1	$3,052,000 note 1	$1,295,000 notes 2 & 3	$43,167 notes 2 & 3
2	Installation of a leachate collection system, with all treatment systems necessary to meet pretreatment standards for discharge to the Town treatment plant note 4	$2,680,000 note 1	$521,000 note 1	$2,159,000 notes 2 & 3	$71,967 notes 2 & 3
1991 Dollars		$7,027,000	$3,573,000	$3,454,000	$115,133

NOTES:
1 These figures include the following costs: contingencies (25%) permits/implmentation (10%) and mobilization (10%) in the column listing capital costs.
2 The present worth column does not include any adjustment factor for a anticpated inflation rate for the 30 year timeframe quoted.
3 The present worth column does include an adjustment factor for the time value of money. The factor used was 8 percent annually for 29 periods.
4 These costs assume treatment onsite for metals and TSS removal prior to discharge to sanitary lines, and also assume a flow rate of 50gpm.
5 For a complete description of the selected remedy please see the actual ROD and the RI/FS report.

Prepared by NYSDEC, Oct 1991

EXHIBIT A: ADMINISTRATIVE RECORD

TOWN OF NEW WINDSOR LANDFILL

ORANGE COUNTY, N.Y. ID NUMBER 336019

A. "Final Remedial Investigation and Feasibility Study: Town of New Windsor Landfill," with appendices, prepared by EA Engineering, P.C.; June 1991.

B. "Draft Remedial Investigation Report: Town of New Windsor Landfill," with appendices, prepared by EA Engineering, P.C.; August 1990.

C. "1986 EQBA Title 3 State Assistance Contract #C300069" executed in February 1990 between the State of New York and The Town of New Windsor.

D. "Final Work Plans for the RI/FS at The Town of New Windsor Landfill" with supporting documents, prepared by E & A Engineering, P.C., for the Town of New Windsor, January 1990.

E. "Town of New Windsor Application for Title 3 Assistance" prepared by McGoey,Hauser and Edsall,P.C.. for the Town of New Windsor, January 1990.

F. "Stewart Commercial Center Environmental Assessment" prepared by Tectonic Engineering Consultant P.C. for Kent Management, October 1989.

G. Order on Consent between NYSDEC and the Town of New Windsor, executed on 8 February 1989, index# W3-0079-8704:Implementation of a Remedial Program at the Town of New Windsor Landfill.

H. "Town of New Windsor Landfill Investigation," prepared by the Town of New Windsor, June 1988.

I. "Town of New Windsor Landfill Phase II Investigation," prepared for New York State Department of Conservation by Wehran Engineering, P.C.; June 1985

J. "Evaluation Of Data From City of Newburgh Water Supply, USMA Newburgh Landfill and New Windsor Landfill" prepared for USEPA by NUS Corporation, October 1984.

K. "Town of New Windsor Landfill Phase I Investigation," prepared for New York State Department of Conservation by Ecological Analysts, Inc.; June 1983

L. "Hazardous Waste Site Investigation of the Town of New Windsor Landfill", prepared by Fred C. Hart Associates,Inc. for the USEPA, April 1981.

M. "Transcript from the Proposed Remedial Action Plan Public Meeting" Prepared by Roberta O'Rourke, for the NYSDEC, September 11, 1991.

EXHIBIT B: PROJECT CHRONOLOGY

TOWN OF NEW WINDSOR LANDFILL

ORANGE COUNTY, NEW YORK

ID NUMBER 336019

1962 - 1976	Town of New Windsor operates a municipal disposal site at the property owned by the Town of New Windsor on Square Hill Road.
1976	The Town ceases to operate the site as a landfill and continues to utilize the area as a stock pile area for the Town Highway Department.
12/1980	The USEPA conducts a "Sampling inspection of the New Windsor landfill and the surrounding area". The letter report detailing this inspection concludes that "the landfill does not appear to have any major impact on the City of Newburgh water supply" and that "this site should be closely monitored to detect contamination".
4/1981	USEPA contractor (F.C.Hart,Inc.) prepares a report entitled "Hazardous Waste Site Investigation" concerning the Town of New Windsor Landfill. This report concludes that "since the site may fall under NYS jurisdiction, that sampling should not be conducted at this time"
6/1983	NYSDEC contractor Ecological Analysts, Inc. prepares a NYSDEC "Phase I:Preliminary Assessment of the Town of New Windsor Landfill" This report contains the first Hazard Ranking Scores (HRS) and indicates the site has the potential to be a significant threat to public health and the environment.
10/1984	USEPA Contractor NUS Corp. conducts a sampling program to determine the impact of area landfills on the City of Newburgh water supply system and concludes in their report "Evaluation of Data from the City of Newburgh Water Supply, Stewart Annex Landfill and New Windsor Landfill" that both the supply system and private wells are free of hazardous substance contamination and that the unnamed creek north of the two landfills should be prevented from entering Lake Washington due to "volatile organics and pesticides".
6/1985	NYSDEC contractor Wehran Engineering. P.C. prepares a NYSDEC Phase II: Engineering Investigation at the New Windsor Landfill. This work resulting in the first groundwater monitoring wells at the site. NYSDEC concludes that sufficient information is available to classify the landfill as a Class 2:inactive Hazardous Waste Site and nominates the landfill for inclusion on the USEPA National Priorities List (NPL).

EXHIBIT B: PROJECT CHRONOLOGY
continued

1986	USEPA rejects the nomination of the Town of New Windsor Landfill for the NPL due to a revision in the NYSDEC calculated HRS.
3/1988	The Town of New Windsor Police Department conducts an investigation into the industrial users of the landfill and submits a report to the DEC during discussions for a Order on Consent to conduct a remedial program at the site.
2/1989	The Town and DEC sign the Order on Consent.
5/1989	The Town of New Windsor procures E & A Engineering, P. C. to conduct a RI/FS at the landfill.
12/1989	A public information session is held to present the plans for the RI/FS to the public and receive input.
1/1990	The DEC approves the work plans for the RI/FS.
2/1990	The Town and State sign a State Assistance Contract to reimburse the Town for up to 75% of eligible costs from the 1986 EQBA.
8/1990	E & A submits a report with appendices detailing the results of the Phase I:RI. NYS reviews and comments to the Town on necessary Phase II work.
9/1990	A public information session is held to seek input on the investigative results to the public and to brief them on the Phase II work plans.
4/1991	The Town submits a draft RI/FS with appendices to NYS detailing both phases of the current work project.
5/1991	NYS transmits comments and concerns to the Town on the draft reports.
6/1991	The Town submits a revised "Final RI/FS Report" with appendices.
7/1991	The Town meets with potentially responsible industrial parties to begin discussion on cost sharing.
8/1991	The State prepares and publishes a proposed remedial action plan based upon the E & A RI/FS reports.

EXHIBIT C

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS WASTE REMEDIATION
INACTIVE HAZARDOUS WASTE DISPOSAL REPORT

4/91 VERSION

CLASSIFICATION CODE: 2 REGION: 3 SITE CODE: 336019
EPA ID: NYD980531495

NAME OF SITE : New Windsor Town Landfill
STREET ADDRESS: Silver Stream Rd.
TOWN/CITY: COUNTY: ZIP:
New Windsor Orange 12550

SITE TYPE: Open Dump- Structure- Lagoon- Landfill-X Treatment Pond-
ESTIMATED SIZE: 14 Acres

SITE OWNER/OPERATOR INFORMATION:
CURRENT OWNER NAME....: Town of New Windsor
CURRENT OWNER ADDRESS.: 555 Union Avenue, New Windsor, NY
OWNER(S) DURING USE...: Town of New Windsor
OPERATOR DURING USE...: Town of New Windsor
OPERATOR ADDRESS.....: 555 Union Avenue, New Windsor, NY
PERIOD ASSOCIATED WITH HAZARDOUS WASTE: From June 62 To April 76

SITE DESCRIPTION:
This site is an inactive municipal landfill which received industrial wastes from Tuck Industries and Newburgh Barrel and Drum Co. Hazardous waste deposition on site consisted of drums of paint sludge (containing corrosive caustic soda) and adhesive waste water. A field investigation revealed the presence of leachate seeps and approximately 5-10 drums exposed above the surface. Initial sampling results indicated that groundwater was impacted by inorganics. Soil samples from the test pit investigation revealed base neutral extractable organics. These compounds have the potential to be discharged into the surrounding groundwater and surface water. Site drainage flows into a stream that bypasses Lake Washington, which is utilized for municipal water supply. A DEE consent order has been signed for a remedial program. The RI/FS is in progress with EQBA funding. During the RI, no intact drums were found and it was shown that no viable removal actions are available. The draft RI/FS report has been submitted and is under review. This site was rejected for inclusion on the National Priorities List (NPL).

HAZARDOUS WASTE DISPOSED: TYPE	Confirmed-X	Suspected- QUANTITY (units)
Paint sludges (containing corrosive caustic soda) (D002)		2500-3000 55-gal. drums
Adhesive waste water		5000-6000 gallons

EXHIBIT C

SITE CODE: 336019

ANALYTICAL DATA AVAILABLE:
Air- Surface Water-X Groundwater-X Soil-X Sediment-X

CONTRAVENTION OF STANDARDS:
Groundwater-X Drinking Water-X Surface Water-X Air-

LEGAL ACTION:

TYPE...: Consent Order-DEE State- X Federal-
STATUS: Negotiation in Progress- Order Signed- X

REMEDIAL ACTION:

Proposed- Under design- In Progress- Completed-
NATURE OF ACTION:

GEOTECHNICAL INFORMATION:
SOIL TYPE: Organic soils underlain by glacial tills and clays
GROUNDWATER DEPTH: 0-5'

ASSESSMENT OF ENVIRONMENTAL PROBLEMS:

Leachate seeps show presence of organic and heavy metal consitituents. Surface water also shows some impact.

ASSESSMENT OF HEALTH PROBLEMS:

EXHIBIT D

RESPONSIVENESS SUMMARY

For Comments Received at the September 11, 1991 Public Meeting

New Windsor Town Landfill Inactive Hazardous Waste Disposal Site

INTRODUCTION:

The public meeting for the New Windsor Town Landfill Inactive Hazardous Waste Site (#336019) began at 7:30 pm on September 11, 1991 at the Town Of New Windsor Town Hall. Town Supervisor George Green opened the meeting and introduced Anthony Sheeran, of the Division of Hazardous Waste Remediation for New York State Department of Environmental Conservation (DEC). Mr. Sheeran introduced himself, as the project engineer for DEC working on site, and the following attendees:

Kim Mann - New York State Department of Health

John Samuelian - EA Engineering, consultant for the Town of New Windsor

James Farr - McGoey, Edsall and Hauser

Mr. Sheeran briefly explained the history of the site and the major milestones that were reached throughout the investigation. Mr. Sheeran also outlined the funding mechanism for the remediation of the landfill: under provision of the 1986 Environmental Quality Bond Act, the State is committed to reimburse the Town of New Windsor for up to 75% of the eligible costs incurred during the remedial program. Mr. Mann also provided a brief explanation of the role of NYSDOH in the inactive hazardous waste remediation program in general and the New Winsdor site in particular.

QUESTIONS AND RESPONSES:

The following pages provide a summary of the responses to questions asked by the public during the meeting. Please note that there were no written comments received during the public comment period.

Q - **What was the expected hazard from following the "no-action" option for remediation?**

R - The hazard posed by the site, as presented in the risk assessment portion of the RI, is the expected risk from the site without proper remediation. The highest risk associated with the site's present conditions is the potential for skin contact due to the presence of

polyaromatic hydrocarbons (PAHs) in the leachate collection area and the test pits. In addition to the health risks noted in the risk assessment, there were risks associated with the compounds that exceeded New York State's criteria for groundwater and surface water protection. The site has uncontrolled leachate release that must be properly addressed.

Q - **What fraction of the PAHs at the site are expected to be coming from the run-off from the NYS Thruway and 300?**

R - NYSDEC did not assess or characterize where the PAHs were emanating from or what percentage came from a particular source. Instead, NYSDEC noted their presence at the landfill and determined the proper means of handling the risk posed by these compounds. The PAHs will be moved back and isolated from exposure.

Q - **What type of risk assessment did you use, the linear non-threshold model?**

R - Yes, that is the one preferred by the US Environmental Protection Agency (USEPA). The exposure parameters for the site were determined by examining several factors, including exposure factor for an individual over their lifetime and residential time, length of time in the presence of the landfill, and a factor for how much of the contaminants will be absorbed into the skin. The residential factor estimates the average and maximum time an individual will live in the residential community (estimated nine year average, 30 year maximum).

Q - **Have you measured the leachate being collected to determine whether the concentrations of contaminates exceed the levels that are acceptable to our sewer system? How close are they to the Town's standards?**

R - There is no collection taking place at the present time. A leachate collection system is part of the proposed plan and has not been put into place. Samples of the leachate were taken during the field investigations. Some of the samples had concentrations of metals that exceeded New Windor's standards for discharging into the Town's sewer system. From these samples, NYSDEC has determined that there is a potential for pre-treating the leachate prior to discharge to the wastewater treatment facility.

Although samples of the leachate have been collected from the landfill, these samples will not be used to determine whether the leachate meets the standards set by New Windsor. The leachate that will be collected when the engineered

piping system is in place will have different concentrations and constituents from the samples taken during the field investigation. Samples were collected from select areas with the worst conditions on the landfill while the collection system will carry leachate from the entire nine acre landfill. For this reason, NYSDEC will evaluate the leachate, for discharge to the Town sewer system with possible pretreatment, after the collection system has been designed and tested.

Q - You are planning on putting asphalt on the landfill to accommodate a Town Garage. Have you examined the cost difference between putting on a multi-layer cap or just placing asphalt over the entire area?

R - An asphalt cap is not acceptable as a single matrix cap. This type of cap was not evaluated; cost estimates were not conducted.

Q - If the area of the test pits and PAH contamination was fenced off to stop skin contact, would the leachate become the biggest problem?

R - At this time, there is uncontrolled leachate release which must be addressed. However, it is also necessary to address the risk associated with skin contact with the test pit area. NYSDEC determined that excavating the areas of PAH contamination and placing the excavated material under the cap on the landfill proper would address the risks of these areas.

Q. - Have you considered the impacts on the landfill and its hazardous wastes from the road being placed on the upper slope between Stewart Airport and the landfill? What are the effects of water run-off?

R. - It is unclear how this road affects the landfill. It is assumed that the placement of the road will follow proper planning, including provisions for roadway drainage.

Q. - Were any exposure pathways determined for plant and animal life?

R. - NYSDOH does not evaluate wildlife exposures. However, NYSDEC does evaluate potential risks to wildlife and plants. On this site, it was determined that water quality standards for aquatic life were contravened. The site exceeded acceptable limits for aquatic life for inorganics. Based on visual inspections and environmental data for the site, whole body and tissue analyses for wildlife were considered

unnecessary. Wildlife and vegetation at the site appear to be doing well. However, during the 30 year monitoring program we may want to further evaluate the wildlife.

Q. - Is there a schedule for monitoring?

R. - The schedule is not set at this time. The schedule will be developed during the design stage prior to construction of the cap and leachate collection and surface water diversion systems. Until the designs are final, we can not determine how many sampling points are necessary. NYSDEC typically uses the requirements outlined in the NYS Solid Waste Regulations as baseline requirements for monitoring frequency and analytes.

Q. - How did you determine cost of monitoring without knowing schedule?

R. - By using the Solid Waste Regulations as a baseline, we received cost estimates from laboratories. The baseline estimates included quarterly sampling for gas and surface water, quarterly groundwater sampling for limited analyses and yearly groundwater sampling for full analysis and monthly (or more) sampling for leachate discharge depending on Town requirements.

Q. - What type and how much of gas are you venting?

R. - Methane is the principal component of the vented gas. NYSDEC uses models to estimate generation rates of landfill gas. The model is based on factors such as landfill size, age, and moisture content. A number has not been determined for this site, but given the fact that landfill operations ceased over 15 years ago, it is safe to assume that methane production has peaked and is now on the downward curve. Also, the wet conditions here accelerate the rate at which bacteria will produce methane gas.