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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION II

JACOB K. JAVITS FEDERAL BUILDING

NEW YORK, NEW YORK 10278-0012

APR 19 1993

Mr. Edward R. Belmore, P.E.
Director
Bureau of Western Remedial Action
Division of Hazardous Waste Remediation
New York State Department of Environmental
Conservation (NYSDEC)
50 Wolf Road
Albany, NY 12233

819001

Re: Final Record of Decision (ROD), Batavia Landfill Site

Dear Mr. Belmore:

Attached please find a final signed copy of the Record of Decision.for the Batavia Landfill Site located in Genesee County, New York. As noted in previous correspondence, the cleanup of the site has been separated into two operable units. This ROD is one of two operable units and it addresses the provisions for extending the municipal waterline to areal residents whose potable water supply is currently threatened by the Batavia Landfill. The second operable unit will focus on the pursuit of a permanent site-remedy for the Batavia Landfill.

Please contact me if you have any questions, or have your staff contact Michael Walters at (212) 264-6312.

Sincerely yours,

Carole Petersen, Chief
New York/Caribbean Superfund Branch II

Attachment

cc: R. Schick, NYSDEC (w/ attachment)
Steve Scharf, NYSDEC/(w/ attachment)
M. Mintzer, 20RC (w/ attachment)

APR 21 1993

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RECORD OF DECISION

BATAVIA LANDFILL SITE

TOWN OF BATAVIA, GENESEE COUNTY, NEW YORK

United States Environmental Protection Agency
Region II
New York, New York
March 1993

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Batavia Landfill Site
Town of Batavia
Genesee County, New York

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected interim remedial action for the Batavia Landfill Site (the "Site"), which was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision document explains the factual and legal basis for selecting the remedy for this Site.

The New York State Department of Environmental Conservation concurs with the selected interim remedy.

The information supporting this remedial action decision is contained in the Administrative Record for this Site, the index for which is attached as Appendix III.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the Site to the local potable water supply, present an imminent and substantial endangerment to public health, welfare, or the environment. The interim remedial action selected in this Record of Decision ("ROD") will abate the threat that the Site poses for the nearby residents who rely solely on the local groundwater for potable water needs.

DESCRIPTION OF THE SELECTED REMEDY

The ROD is for the first operable unit for the Site. The major components of the selected interim remedy include the following:

- Providing a public water supply to residents in the northwest portion of the Town of Batavia along Kelsey and Pratt Roads, north and south of the NYS Thruway, along Kelsey Road to the Galloway Road/Kelsey Road intersection.

- The interim remedy also provides for the replacement or retrofitting of the residential ground water well piping systems with new piping and appurtenances needed for accessing each home to the waterline.

This is a significant change from the interim remedy proposed in the Proposed Plan (Alternative 2A) presented to the public on August 28, 1992 (see 'Documentation of Significant Changes" on page 20 of the ROD).

DECLARATION OF STATUTORY DETERMINATIONS

This interim action is protective of human health and the environment, complies with (or waives) Federal and State applicable or relevant and appropriate requirements for this limited-scope action, and is cost effective. This action is interim and not intended to utilize permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable for this interim action. Because this action does not constitute the final remedy for the Site, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element will be addressed by the final response action. Subsequent actions are planned to address fully the threats posed by the conditions at this Site. Because this remedy will result in hazardous substances remaining on Site above health-based levels, a review will be conducted within five years after commencement of the remedial action as EPA continues to develop final remedial alternatives for the Site. The review will be conducted to ensure that the remedy continues to provide adequate protection of human health and the environment. Because this is an interim action ROD, a review of this Site and this remedy will be continuing as part of the development of the final remedy for the Site.

William J. Muszynski
Acting Regional Administrator

3/31/93
Date

ROD FACT SHEET

SITE

Site name: Batavia Landfill

Site location: Town of Batavia, Genesee County, New York

HRS score: 44.16

ROD

Selected remedy: Kelsey/Pratt Roads and Galloway/Kelsey Roads Waterline Extension north and south of the New York State Thruway.

Capital cost: $1,018,415

O & M cost: $55,760/yr

Present Worth cost: $1,928,843

LEAD

United States EPA

Primary Contact: Michael Waiters (FTS) 264-6312

Secondary Contact: Kevin Lynch (FTS) 264-6194

PRPs include: NL Industries, Unisys Corporation, Town of Batavia, City of Batavia, GTE Products Corporation, Eaton Corporation, and R.E. Chapin Manufacturing Works, Inc.

WASTE

Waste type: Chromium Hydroxide sludge, magnesium sludges, inks, spent solvents and oils, and sweepings containing barium.

Waste origin: Industrial waste.

Contaminated medium: Soil, sediment, groundwater, surface water.

RECORD OF DECISION
DECISION SUMMARY

Batavia Landfill Site

Town of Batavia, Genesee County, New York

United States Environmental Protection Agency
Region II
New York, New York

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ATTACHMENTS

SITE NAME, LOCATION AND DESCRIPTION

The Batavia Landfill Site (Figure 1) (the "Site") is located about 3 miles west-northwest of the City of Batavia, Genesee County, New York. The Site is 35 acres in size and is bounded to the north and portions of the east by the Galloway Swamp; to the east by the Town of Batavia's Sanitary Landfill (now closed) (the "Sanitary Landfill"); to the south by Harloff Road; and to the west by vacant propetty. The New York State Thruway (Interstate Route 90) is about 200 feet to the south. It should be noted that the boundary between the Site and the Sanitary Landfill directly to the east is not well defined. In fact, portions of the two landfills may overlap. The Town of Batavia owns both the Site property and the adjoining Sanitary Landfill to the east. The Site also includes the areal extent of contamination emanating from the Site.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

The Site property was owned by private citizens from 1828 to 1967. The land was used primarily for agricultural purposes until about 1960. During the 1950s, portions of the land were mined to provide construction materials for the New York State Thruway. The Site accepted industrial wastes for on-site disposal from 1968 until 1980, the year NYSDEC declared the Site an open dump based on noncompliance with the surface water criteria (40 CFR Part 257). Poor housekeeping practices and the disposal of industrial and hazardous wastes resulted in the closure of the Site. Industrial wastes known to have been disposed of at the Site include but are not limited to: chromium hydroxide sludge, magnesium sludges, inks, spent solvents, oils and sweepings containing barium.

On December 20, 1982, the Site was proposed for inclusion on the National Priorities List (NPL) and the Site was added to the NPL by publication in the Federal Register (FR) on September 8, 1983 (48 FR 40658).

The following persons are considered the potentially responsible parties (PRPs) for the Site:

a. Town of Batavia
b. City of Batavia
c. Eaton Corporation
d. GTE Products Corporation (successor to GTE-Sylvania)
e. NL Industries, Inc. (because of activities of its former Doehler-Jarvis division)
f. R.E. Chapin Manufacturing Works, Inc.
g. Unisys Corporation (successor to Burroughs Corp.)

EPA first sent notice of potential responsibility in 1982 to the PRPs listed above or to a predecessor or affiliate of such person. Subsequent notices of potential responsibility for the Site were sent in 1984 in connection with planned RI/FS activities and in 1988 in connection with the planned removal action.

It is anticipated that EPA will send additional notice to these PRPs in connection with the interim remedial action selected in this ROD to determine whether these PRPs will agree to perform the selected remedy.

On August 9, 1984, EPA and NL Industries (one of the PRPs) entered into an Administrative Order on Consent for the performance of a Remedial Investigation ("RI") and Feasibility Study ("FS") at the Site.

On July 31, 1990 EPA and the following PRPs entered into an Administrative Order on Consent for the removal of drums and visibly contaminated soils from the Site: Unisys Corporation, GTE-Sylvania, Eaton Corporation, R. E. Chapin Manufacturing Works, Inc., the Town of Batavia and the City of Batavia. The surface drum removal operation was completed on October 14, 1991, by the six aforementioned PRPs.

RI studies performed by the NYSDEC in the early 1980s, studies conducted by NUS Corporation and in December 1982, by. Fred C. Hart Associates and later studies by NL Industries (one of the PRPs), dating from 1985 to 1992, revealed releases of hazardous substances to the soil, sediment and groundwater at the Site, attributable to the past hazardous waste disposal activities at the Site between 1968 and 1980.

Sampling and chemical analyses results show the releases of total chromium (181 parts per billion ("ppb"), arsenic (251 ppb), lead (433 ppb), 1,1,1,-trichloroethane ("TCA") (110 ppb), toluene (1,900 ppb), and methylene chloride (181 ppb) to the local groundwater, the primary source of drinking water for the residents in the nearby vicinity, particularly to the south and east of the Site. (See Table D "Summary of Statistical Distributions of Contaminants in Ground Water" in Appendix II.) This table shows the levels of contaminants in the southern portion of the Site which studies indicate are migrating toward to the potable water source further south to the Trailer Parks homes and Pratt Road residences (see Figure 1)).

The contamination to the soil and sediment is present but very irregular. This is primarily as a result of the haphazard nature of past disposal of waste and waste-filled drums at the 35-acre Site. In the Summer of 1991, Blasland & Bouck Engineers, P.C., under contract from six PRPs (not including NL Industries) removed 632 drums from the Site's surface (some were filled with hazardous wastes) which amounted to 35.3 tons of contaminated solids, 1,700 gallons of decontamination water, 27.1 tons of crushed drums and 55 gallons of cyanide-bearing oils.

Sampling and chemical analyses results have shown, among other things, the presence of total chromium (320,000 ppb), arsenic (58,800 ppb), lead (359,000 ppb), TCA (380 ppb), methylene chloride (1,100 ppb) and toluene (2,000 ppb) in the Site's soil and sediment. The surface waters at the Site also exhibited persistent levels of heavy metal and volatile organic contamination.

In August 1985, NL Industries contracted with ERCO to conduct the RI/FS. ERCO, in turn, contracted with GZA GeoEnvironmental of New York (formerly GZA Associates, Inc.,) to aid in the study.

GZA, working as a subconsultant to ERCO, completed a preliminary study entitled "Remedial Investigation Report for Batavia Town Landfill, Batavia, New York' dated Dec'ember 1985. The work done to complete this report included assembly and review of available data pertaining to waste types and quantities suspected to have been disposed of at the Site, and a review of regional geologic and hydrogeologic information, prior reports, etc. The results of the RI confirmed that groundwater contamination was present at the Site. Based on the available data base, EPA deemed that additional work was required to better characterize the chemical and hydrogeologic conditions at the Site prior to initiating the FS. NL Industries thus contracted with GZA to complete an RI/FS. ERCO was also retained by NL Industries to perform selected sampling and perform the chemical testing.

In April 1989, NL Industries submitted a report entitled 'Batavia Landfill Site Draft Remedial Investigation Report", prepared by GZA, which EPA determined to be insufficient for providing an adequate data base upon which to develop an FS for an overall Site remedy. In April 1991, NL Industries conducted a limited re-sampling of selected project groundwater monitoring wells for total (unfiltered) metals and hexavalent chromium and then resubmitted the report now entitled "Batavia Landfill Site Remedial Investigation Report Final Draft" dated May 1992. NL Industries and EPA disagreed on the interpretation of the RI data. EPA then contracted with Alliance Technologies, Inc ("Alliance" now called TRC Environmental Corporation), an EPA Technical Enforcement Support (TES) contractor, to develop a Conceptual Hydrogeologic Model for the Site based upon EPA's interpretation of the RI data (the "EPA Groundwater Model"). The EPA Groundwater Model was incorporated into the final RI Report for the Site in an EPA Preface in place of the groundwater model developed by GZA for NL Industries.

A residential well sampling/analyses survey conducted by the New York State Department of Health (NYSDOH) on homes along Pratt Road, within close proximity to the Site, have shown the presence of TCA (6 ppb) and chloroform (2 ppb) in the potable water supply. This is below the federal Maximum Contaminant Level (MCL) for potable water of 200 ppb for TCA and the proposed MCL of 100 ppb for chloroform. The New York State MCL for a principal organic contaminant (TCA) is 5 ppb and 100 ppb for chloroform. The EPA Groundwater Model, developed from accumulated RI data, predicts that the levels of contaminants from the Site will continue to increase in the residential wells to the south of the Site should the source (the Site) be left unremediated.

As a result of the NYSDOH residential well sampling in 1991, which revealed the presence of contaminants in the potable water supply south of the Site, EPA prepared an interim baseline risk assessment to estimate the risks associated with Site conditions to persons living near the Site who relied upon local groundwater for their potable water supply.

Following completion of the RI, including the baseline risk assessment, EPA requested, in a letter dated April 20, 1992 that NL Industries perform a Focused Feasibility Study (FFS) to identify and study potential alternative solutions for providing the citizens with a safe water supply. On May 11, 1992, NL Industries declined to perform the FFS, so the study was contracted by EPA to Alliance. The FFS was completed on August 28, 1992 and released to the public with the RI Report and the Proposed Plan.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The RI report, the FFS report and the Proposed Plan for the Site were released to the public for comment on August 28, 1992. These documents were made available to the public in the administrative record file at the EPA Docket Room in Region II, New York and the information repositories at The Richmond Library and the Batavia Town Hall, both located in the Town of Batavia. The notice of availability for the above-referenced documents was published in the Batavia Daily News on August 29, 1992. The public comment period on these documents was held from August 29,1992 to October 28,1992.

On September 10, 1992, EPA and the NYSDEC conducted a public meeting at John Kennedy Junior High School, located at 166 Vine Street, Batavia, New York, to inform local officials and interested citizens about the Superfund process, to review planned remedial activities at the Site, and to respond to any questions from area residents and other attendees.

Responses to the comments received since the commencement of the public comment period on August 29, 1992, including comments received at the public meeting on September 10, 1992 are included in the Responsiveness Summary together with EPA's responses to the comments. (see Appendices V and VI).

SCOPE AND ROLE OF OPERABLE UNIT

EPA is selecting an interim action to ensure a safe water supply to residents affected or potentially affected by the hazardous substances released from the Site to the potable water supply. Provision of an alternate water supply is considered an interim solution for ground water contamination, since it does not address the problems of restoring groundwater to its beneficial uses. This is one of two operable units planned for the Site.

EPA is further investigating the Site through a Site-wide RI/FS in order to develop an overall remedy for the Site. During an RI, EPA collects data to characterize site conditions; determine the nature of the contamination, and assess risk to human health and the environment. The goal of the FS is to develop a wide range of remedial action alternatives that ensure the protection of human health and the environment. The final remedy for this Site will be proposed at the conclusion of the RI/FS.

EPA's decision to address the ground water contamination problem as an interim remedial action will serve to eliminate the possibility of human exposure to contaminated ground water emanating from the Site. This remedy does not constitute a final action for the ground water. To the extent possible, this interim remedial action will be consistent with any planned future actions.

Remedial action objectives are specific goals to protect human health and the environment. These objectives are based on available information and standards such as applicable or relevant and appropriate requirements (ARARs) and risk-based levels established in the risk assessment.

The single remedial action objective of the interim remedy is to prevent human exposure (through ingestion) to contaminants in ground water at levels in excess of risk-based and ARARs based levels. The remedial action should protect the residential population that now draws from wells located immediately south of the Site and in the nearby vicinity.

SITE CHARACTERISTICS

A. Hydrogeology

The upper 10 feet of bedrock is highly fractured and hydraulic conductivity in bedrock ranged from 1 to 70 feet/day. In the northern part of the Site's bedrock strata, the Onondaga limestone is overlain by a thick glaciolacustrine sequence of silt and clay, but this sequence is not continuous across the Site. In other portions of the Site, the bedrock is overlain by the water bearing lower soil unit characterized by fine sands, silts and gravels. The bedrock is likely to be highly permeable and is hydraulically connected to the unconsolidated overburden. The hydraulic connection between bedrock and overburden is evidenced by the discontinuity of the low permeability lenses and the fact that Site related contaminants have been detected in all hydrogeologic units on Site.

The silt and clay layer, present in the northern and southern portions of the Site, is discontinuous and varies in thickness between 1 and 30 feet. Because of the discontinuity of the low permeability lenses, the upper soil zones, the low permeability lenses and the lower soils should be considered as one heterogeneous aquifer. The interconnectedness of the aquifer is demonstrated by the detection of Site contaminants in samples from wells screened at all depths.

Data on vertical gradients are limited because relatively few well clusters have wells with screens in the shallow, intermediate and deep portions of the aquifer. Review of available water level elevation data indicates that in the western portion of the Site, vertical gradients are predominantly downward. In the eastern portion of the Site, they vary and may be downward to horizontal to slightly upward. Precipitation, surface topography and bedrock fractures are all variables that can influence groundwater movement in surface water bodies (swamps, wetlands, ponds etc.,) to recharge (upward gradient) or discharge (downward gradient) groundwater.

Based on the data provided for wells screened at or very near the water table, shallow ground water flow appears to be to the south in the southern portion of the Site, to the east-northeast in the southern central region, and toward the east-southeast in the northern-central portion of the Site. EPA has determined that flow is to the north in the northern part of the Site.

It is highly probable that the residential, agricultural, and municipal wells in the nearby area of the Site significantly influence ground water flow patterns within the Site also, and that these patterns would vary at least seasonally. For example, ground water flow patterns may be more influenced by these wells during the summer months when ground water usage is highest for agricultural wells, and the amount of rainfall is typically lower. This influence may actually result in reversal of hydraulic gradients, acceleration or retardation of contaminant migration or vertical distribution of contaminants.

Limestone bedrock may often develop extensive fractures which serve as preferential flow channels for ground water. Fractures that are present, therefore, may have a significant influence on rates and patterns of ground water flow in the bedrock aquifer. Based on information presented in the RI Report (GZA, 1992), ground water movement in the Onondaga formation is through a fracture network consisting of vertical and horizontal discontinuities. The vertical fractures identified typically occur at strike orientations of N75°E and N40°W, with a secondary set at N5°E. Information contained in the RI Report indicates that these fractures serve as conduits to collect, transmit and recharge water from overlying soil deposits to water-bearing zones within the rock, and also to larger horizontal fractures which are the primary water-bearing zones. The ground water flow rates and directions in the bedrock can vary greatly over the Site based upon the distribution of this fracture network and locations of existing extraction and/or recharge systems. In particular, there is a high potential for preferential migration of contaminants.

B. Chemical Characteristics

Due to the nature of the interim remedy presented in this document, which is to selectively address the potential impacts of contaminated ground water on the residential community located immediately south and in the vicinity of the Site, the following paragraphs describe the nature and extent of ground water contamination based on existing ground water sampling data and 'the hydrogeologic conditions at the Site.

Ground water sampling of the upper soil/fill, lower soil and bedrock zones in the immediate vicinity of the Site was conducted in March 1988 and April 1991. Data obtained from these sampling events indicate that 18 volatile organic compounds (VOCs), 12 semi-VOCs, and 20 metals are present in the upper soil/fill zone with a similar group of chemicals being found in the lower soil zone and bedrock. In general, the types and concentrations of contaminants detected were similar in both sampling rounds. A description of contamination detected throughout each zone appears below.

Upper Soil/Fill Zone

VOCs detected in the upper soil/fill zone of the Site include benzene, chlorobenzene, chloroethane, 1,1-dichloroethane (1,1-DCA), ethyl benzene, toluene, 1,1,1-trichloroethane (1,1,1-TCA), and xylene at concentrations ranging from below detection limit (BDL) to 300 ppb. Semi-VOCs include a number of poly-aromatic hydrocarbons (PAHs), including bis(2-ethylhexyl)phthalate and N-nitrosodiphenylamine at concentrations ranging from BDL to 310 ppb. Metals detected in this zone include barium, chromium, lead, magnesium, manganese and zinc; the highest level(s) being reported for magnesium (394,000 ppb) and manganese (220 ppb). The distribution of many of the contaminants throughout the upper soil/fill zone appears to vary significantly depending upon geology, stratigraphy or fill and proximity to the waste deposits identified at the Site.

Lower Soil Zone

During the April 1991 sampling and analysis event, 20 VOCs, 16 semi-VOCs, and 20 metals were detected in the lower soil zone. The most prevalent VOCs were acetone, benzene, chloroethane, dichloroethane, methylene chloride and toluene, with concentrations ranging from BDL to 2,300 ppb. For semi-VOCs, the most prevalent contaminants were bis(2-ethylhexyl)phthalate, N-nitrosodiphenylamine, 4-methyl-phenol, and phenols at concentrations ranging from BDL to 4,700 ppb. It is noted that the concentrations of organics in the lower zone were consistently lower than those reported in the upper soil/fill zone.

Metals detected in the lower soil zone include barium, chromium, lead, magnesium, manganese and zinc. In general, the concentrations of metals reported in the lower soil zone were somewhat lower than the levels reported in the upper fill zone. For example, barium in the upper soil/fill zone ranged from 4,800 to 11,000 ppb as compared to a range of BDL to 240 ppb in the lower zone.

Bedrock Zone

A review of the RI data indicates that the only metal detected in bedrock wells above natural background levels for the area was magnesium. The concentration of magnesium exceeded background concentrations in each well except two [BL-16R and MW-10] with the highest concentration reported in monitoring well BL-15R (93,800 ppb).

SUMMARY OF SITE RISKS

Based upon the results of the RI, specifically the ground water data, a baseline interim risk assessment was conducted by EPA to estimate the risks associated with current and future Site conditions. The baseline risk assessment estimates the human health risk which could result from the contamination at the Site if no remedial action were taken.

Human Health Risk Assessment

EPA conducted a baseline ground water interim risk assessment to evaluate the potential risks to human health associated with the Site in its current state. The Risk Assessment focused on contaminants in the ground water which are likely to pose significant risks to

human health and the environment. The summary of the contaminants of concern (COC) in sampled groundwater and the concentrations used in the risk assessment are listed in Table A for human health receptors only.

EPA's baseline risk assessment addressed the potential risks to human health by identifying the ingestion exposure pathway by which the public may be exposed to contaminant releases at the Site under current and future land-use conditions. The potential risk associated with ingestion of ground water were assessed for both present and future land use scenarios. The exposure assumptions used in the risk calculations are presented in Tables B and C of Appendix II. The risk assessment utilized information from the general RI database generated during the 1985-1991 timeframe.

Under current EPA guidelines, the likelihood of carcinogenic (cancer-causing) and noncarcinogenic effects due to exposure to Site chemicals are considered separately. It was assumed that the toxic effects of the Site-related chemicals would be additive. Thus, carcinogenic and noncarcinogenic risks associated with exposures to individual compounds of concern were assumed to indicate the potential risks associated with mixtures of potential carcinogens and noncarcinogens, respectively.

Noncarcinogenic risks were assessed using a hazard index (HI) approach, based on a comparison of expected contaminant intakes and safe levels of intake (Reference Doses). Reference doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects. RfDs, which are expressed in units of mg/kg-day, are estimates of daily exposure levels for humans which are thought to be safe over a lifetime (including sensitive individuals). Estimated intakes of chemicals from environmental media (e.g., the amount of a chemical ingested from contaminated drinking water) are compared to the RfD to derive the hazard quotient for the contaminant in the particular medium. The HI is obtained by adding the hazard quotients for all compounds across all media that impact a particular receptor population.

An HI greater than 1.0 indicates that the potential exists for noncarcinogenic health effects to occur as a result of Site-related exposures. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media. The reference doses for the compounds of concern at the Site are presented in Table A. A summary of the noncarcinogenic risks associated with these chemicals for ingestion scenarios is found in Table B.

It can be seen from Table B that the acute HI for noncarcinogenic effects for adult residents from ingestion was 5.37 and the chronic HI was 26.8, therefore, noncarcinogenic effects may occur from the exposure routes evaluated in the interim Risk Assessment. The noncarcinogenic risk was attributable to several compounds or metals including arsenic, zinc and antimony.

Potential carcinogenic risks were evaluated using the cancer slope factors developed by EPA for the contaminants of concern. Cancer slope factors (SFs) have been developed by EPA's Carcinogenic Risk Assessment Verification Endeavor for estimating excess

lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. SFs, which are expressed in units of $(mg/kg\text{-}day)^{-1}$, are mukiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to generate an upper-bound estimate of the excess lifetime cancer risk associated with exposure to the compound at that intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the SF. Use of this approach makes the underestimation of the risk highly unlikely. The SF for the compounds of concern are presented in **Table A.**

For known or suspected carcinogens, EPA considers excess upper-bound individual lifetime cancer risks of between approximately 10^{-4} to 10^{-6} to be acceptable. This level indicates that an individual has not greater than a one in ten thousand to one in a million chance of developing cancer as a resuk of Site-related exposure to a carcinogen over a 70-year period under specific exposure conditions at the Site. The potential excess lifetime cancer risk for adult residents using the highest levels of contaminants detected in the contaminated residential wells is 1.24×10^{-3}, which means that approximately one person in a thousand could potentially develop cancer over a 70-year exposure period. This exceeds EPA's target risk range of 10^{-4} to 10^{-6}. Under current conditions the ground water from the Site is unlikely to impact the residential areas to the north and east. However, the possibility exists that conditions may change due to factors including local well pumping and construction activities in the area or as otherwise discussed above under 'Site Characteristics - Hydrogeology". The potential risk characterization shows that cancer risks (ingestion only) associated with the groundwater pathways south of the Site exceeded EPA's target risk range. The potential cancer risks calculated for the Site are presented in **Table C.** The two chemicals that mostly accounted for the carcinogenic risk are:

1. vinyl chloride (maximum concentration = 7.2 ppb)
2. arsenic (maximum concentration = 167 ppb)

Uncertainties

The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include:

- environmental chemistry sampling and analysis
- environmental parameter measurement
- fate and transport modeling
- exposure parameter estimation
- toxicological data

Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is significant uncertainty as to the actual levels present. Environmental chemistry-analysis error can stem from several sources including the errors inherent in the analytical methods and characteristics of the matrix being sampled.

Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the chemicals of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the chemicals of concern at the point of exposure.

Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the Risk Assessment provides upper-bound estimates of the risks to populations near the Site, and is highly unlikely to underestimate actual risks related to the Site.

More specific information concerning public health risks, including a quantitative evaluation of the degree of risk associated with various exposure pathways, is presented in the Risk Assessment Report.

In general, the ingestion risks presented herein are likely to be conservative estimates of true risks. The ground water scenario conservatively assumes that contaminants detected in monitoring wells will reach residences without attenuation. In addition, the exposure parameters used in the ground water assessment to characterize the reasonable maximum exposure (RME) are health protective values.

Actual or threatened releases of hazardous substances from the Site, if not addressed by the preferred alternative or one of the other active measures considered, may present a threat to public health, welfare or environment.

Ecological Risk Assessment

Several water bodies, located on or adjacent to the site, receive drainage from the Site. The site is bordered on the north and east by Galloway Swamp, and the central portion of the Site was swamp prior to use as a landfill. Additional studies will be undertaken to complete an ecological assessment under the general Site-wide remedial investigation.

DESCRIPTION OF REMEDIAL ALTERNATIVES

EPA is presenting an interim action to ensure a safe water supply to residents affected or potentially affected by the Site. Installation of an alternate water supply is considered an interim solution for ground water contamination, since it does not address the problem of restoring ground water to its beneficial uses.

This Record of Decision evaluates in detail five (5) remedial alternatives for addressing the potential threat the contamination, associated with the Site, poses to the nearby residents who rely solely on the local potable water supply. The time to implement reflects only the time required to construct or implement the remedy and does not include the time required

to design the remedy, negotiate with the responsible parties, or procure contracts for design and construction.

Because all alternatives will result in contaminants remaining on-site above health based levels, CERCLA requires that the Site be reviewed every five years. However, when the full Site-wide RI/FS is completed in the near future, a permanent Site remedy will be implemented, if warranted, to remove, treat or dispose of the wastes.

These alternatives are:

Alternative 1: No Action

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison of other alternatives. The no-action alternative provides a basis for comparing the potential impacts to human health and the environment, should the Site be left unremediated, with those conditions resulting from other action alternatives. No clean-up or mitigation measures would be used to remediate contaminated ground water or control potential migration under this alternative. A ground water monitoring program, utilizing existing wells at the Site, would be implemented to monitor the potential migration of ground water. Ground water samples would be collected for 30 years, or until it is decided otherwise during the 5-year review process. Under the no-action alternative, the potential for off-Site migration of contaminated ground water would continue.

Capital Cost: No capital costs were calculated
O & M Cost: $19,200/yr (30 yrs)
Present Worth Cost: $376,300
Construction Time: 6 months

Alternative Number 2: Alternate Water Supply

The alternate water supply alternative provides increased protection to human health by providing municipal water to consumers by a public waterline extension, thereby eliminating the need for using existing residential wells. Extension of a waterline to two possible areas was considered. Each home along the routes specified under Alternatives 2A and 2B would be connected to the extended waterline.

Alternative 2A: Kelsey/Pratt Roads Waterline Extension

This alternative would require extending boundaries of the existing Consolidated Water District to include the area in the northwest portion of the Town along Kelsey and Pratt Roads, south of the NYS Thruway. The existing Consolidated Water District includes properties to the west of Kelsey Road, north of Route 5 and south of the NYS Thruway, and several properties located both north and south of Pratt Road. The water district extension would enable the Town to supply potable water to properties in two additional areas (on either side of the existing Consolidated Water District) including those properties

located both north and south of Pratt Road (see Figure 2). The waterline extension to the residences south of the Site would include the provision of accessories, appurtenances and the additional home piping necessary for accessing the waterline for domestic consumption. This alternative would also require the installation of monitoring wells to the east of the Site to detect any migration of contaminants toward the residential wells on Kelsey Road. The monitoring system would consist of a series of nine (9) wells (in three clusters) approximately 750 feet west of Kelsey Road, with each cluster having one well screened in the upper soil and intermediate zones, and at the bedrock. The wells would be sampled four (4) times a year (to account for seasonal variations, rather than two times per year as stated in the Proposed Plan) for the next five (5) years or until a final Site remedy for the Site is in place. At that time, the final Site remedy and groundwater monitoring plan for the Site would be in place.

Capital Costs: $633,547
O & M Costs: $52,972/yr
(30 yrs - water supply)
Ground water monitoring: $78,000/yr
(5 yrs - groundwater monitoring)
Present Worth: $1,838,443*
Construction Time: 6 months

Alternative 28: Kelsey/Pratt Roads and Galloway/Kelsey Roads Waterline Extension

Alternative 28 would include all the aspects of Alternative 2A, except the detection monitoring system would not be employed. In addition, Alternative 2B would require expanding the area encompassed by the existing Consolidated Water District, by extending the waterline (specified in Alternative 2A) under the NYS Thruway, to residences on Kelsey Road (north of the NYS Thruway) including residences six hundred feet to the west of the Galloway/Kelsey Road intersections on Galloway Road (see Figure 3).

Capital Costs: $1,018,415
O & M : $55,760/yr (30 yrs)
Present Worth: $1,928,843*
Construction Time: 9 Months

* (These cost figures are different than those presented in the Proposed Plan. See 'Documentation of Significant Changes' on Page 20)

Alternative Number 3: Ground Water Extraction/Treatment System

This alternative includes the application of an interceptor/groundwater extraction system designed to contain and prevent contaminated ground water plumes, emanating from the Site, from reaching the local potable water supply along Pratt and Kelsey Roads.

Approximately 10 pump/treat wells along the southern perimeter of the Site, each operating at 50 gallons per minute, would treat 500 gallons of ground water per minute. Filtration

and chemical treatment would be employed to remove suspended solids (i.e., metals and suspended solids) from the groundwater water which would then flow into an air stripper for treatment to remove volatile organic compounds. Effluent from the air stripper is expected to have less than 1 ppb volatile organic compound concentration for each of the contaminants of concern present in the ground water. The presence of vinyl chloride in the ground water also necessitates the use of thermal combustion of the effluent air.

Treated water would be discharged to the Galloway Swamp.

Capital Costs: $5,229,804
O & M : $305,614/yr (30 yrs)
Present Worth: $9,927,858
Construction Time : 1 year

Alternative Number 4: Ground Water Treatment at Each Contaminated Residential Well

Alternative 4 would involve the treatment of extracted ground water at each of the respective residences in the affected area as the primary response action. This alternative would provide direct treatment of ground water extracted from residential wells prior to use and/or consumption by residents. It would involve the installation of a point-of-entry water treatment system at each of the water supply wells for the mobile home parks. Treatment processes to be utilized in each point-of-entry treatment system include filtration, ultraviolet (UV) radiation, and granular activated carbon. Equipment and support services associated with the treatment systems and required maintenance of each system is readily available. Implementation of Alternative 4 would require coordination among the appropriate federal, state, and local agencies. This alternative also would require a pilot study, at one or more of the residential wells, to measure, evaluate, and maximally develop the effectiveness of this treatment strategy.

Capital Cost: $276,875
O & M: $237,040/yr (30 yrs)
Present Worth: $4,923,000
Construction Time: 6 months

SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

The comparative analysis furnishes the basis for determining which alternative provides the "best balance" of tradeoffs with respect to the nine evaluation criteria set forth in the NCP and OSWER Directive 9355.3-01. To achieve this objective, this section evaluates the relative performance of the alternatives with respect to the nine criteria, so that the advantages and disadvantages associated with each alternative are clearly understood.

During the detailed evaluation of remedial alternatives, each alternative was assessed utilizing the nine evaluation criteria. These criteria were developed to address the requirements of Section 121 of CERCLA to ensure all important considerations are factored into remedy selection decisions.

The following "threshold" criteria are the most important, and must be satisfied by any alternative in order to be eligible for selection:

1. Overall protection of human health and the *environment* addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. Compliance with *ARARs* addresses whether or not a remedy would meet all of the applicable, or relevant and appropriate requirements of federal and state environmental statutes and requirements or provide grounds for invoking a waiver.

The following "primary balancing" criteria are used to make comparisons and to identify the major trade-offs between alternatives:

3. Long-term effectiveness and permanence refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

4. Reduction of toxicity, mobility, or volume through *treatment* is the anticipated performance of a remedial technology, with respect to these parameters, that a remedy may employ.

5. Short-term *effectiveness* addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation periods until cleanup goals are achieved.

6. Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed.

7. Cost includes estimated capital and operation and maintenance costs, and the present-worth costs.

The following "modifying" criteria are considered fully after the formal public comment period on the Proposed Plan is complete:

8. State acceptance indicates whether, based on its review of the RI/FS and the Proposed Plan, the State supports, opposes, and/or has identified any reservations with the preferred alternative.

9. Community acceptance refers to the public's general response to the alternatives described in the Proposed Plan and the RI/FS reports. Factors of community acceptance to be discussed include support, reservation, and opposition by the community.

A comparative analysis of the remedial alternatives based upon the evaluation criteria noted above follows.

1. Overall Protection of Human Health and the Environment

Alternative 1 provides no reliable protection to human health, particularly for the nearby residents who currently rely on the local potable water supply. They will continue to be threatened by contaminant plumes migrating from the Site. This alternative, therefore, ranked lowest.

Alternatives 2A and 2B provide a high degree of protection to human health through the extension of the Batavia municipal water supply system to area residents potentially at risk from the continued consumption of the local potable water. The extension of the public water supply system to area residents will provide a higher quality of drinking water than that which could be drawn from the residential wells located immediately south and in the vicinity of the Site. The potential threat to drinking water posed by the Site to local residents would essentially be removed under Alternative 2A or 2B.

Alternative 3 could provide an effective barrier to reduce further migration of contaminated ground water to residential water supply wells south of the Site. This alternative would be highly protective of human health providing that the zone of contamination does not extend outside the vertical and horizontal recovery-capture zone. Due to the complexity of the hydrogeology at the Site, it is possible that contaminants could still reach residential wells if Alternative 3 were selected.

Alternative 4 would be highly effective to protect human health by eliminating the risk posed by the consumption of contaminated ground water extracted from residential wells immediately south of the Site.

2. Compliance with ARARs

There are several types of ARARs: action-specific, chemical-specific, and location-specific. Action-specific ARARs are technology or activity-based requirements or limitations related to various activities. Chemical-specific ARARs are usually numerical values which establish the amount or concentrations of a chemical that may be found in, or discharged to, the ambient environment. Location-specific ARARs are restrictions placed on the concentra-

tions of hazardous substances or on the conduct of activities solely because they occur in a special location.

The principal ARARs for this interim remedy are the Federal and State Maximum Contaminant Levels (MCLs) for drinking water supplies.

Alternative 1, No Action, would not comply with ARARs. The residential wells could still be exposed to fugitive contaminant plumes downstream from the Site ground water monitoring well system but currently upstream from the residential wells. This is the critical weakness associated with this Alternative. Therefore, it ranks lowest in comparison to other Alternatives.

Alternatives 2A and 2B both comply with ARARs, for this limited scope of action, which will be attained by providing the residents with an alternate clean municipal water supply.

Alternative 3, Ground Water Intercept/Treatment System, should achieve compliance with ARARs. The ground water contaminant plumes emanating from the Site towards the residential wells would be controlled by a pump/treat system and the effluent would meet or exceed MCLs.

Alternative 4, Ground Water Treatment at Each Contaminated Residential Well, would achieve compliance with ARARs.

3. Long-Term Effectiveness and Permanence

Under the No Action Alternative, the potential for off-Site migration of contaminated ground water would continue. Therefore, long term effectiveness would be very poor. The risk to potential receptors would continue and would be expected to increase.

Alternatives 2A and 2B would provide a clean and dependable source of drinking water to residents potentially affected by contaminant plumes migrating from the Site to the local potable water supply. Long-term effectiveness of either of these interim remedies is excellent.

Properly maintained, the extraction/treatment alternative (Alternative 3) should provide viable and effective treatment of ground water along the southern boundary of the Site for many years. However, the possibility exists that, due to the complexity of the hydrogeology, contaminants outside the range of the pump/treat system may continue to migrate towards the residential well water supply. As such, this Alternative does not eliminate the potential for exposure.

Alternative 4 reduces the risk through exposure and is reliable. it is deemed to have good long term effectiveness provided that the units are properly maintained.

4. Reduction in Toxicity, Mobility, or Volume

Under the No Action Alternative, reduction in toxicity, mobility, or volume (TMV) of contaminated material present in ground water would be limited to natural attenuation mechanisms, which would occur over a long period of time. Therefore, this alternative is ranked lowest in this regards.

Alternatives 2A and 2B do not result in a reduction of the TMV of contaminants in ground water. However, the toxicity of the ground water that would be ingested by local residents would be essentially eliminated.

Alternative 3 will reduce off-Site migration and levels of contaminants in ground water flowing towards the residential supply wells located immediately south of the Site. This alternative is most effective when compared to other Alternatives in reducing TMV.

Use of point-of-entry treatment systems in Alternative 4 would not contribute to any reduction in mobility or volume of the contaminated ground water. These systems would reduce toxicity and therefore health risks posed to residents using water from wells in which contaminants have been detected.

5. Short-Term Effectiveness

Alternative 1 would not create adverse impacts to human health or the environment during implementation. However, it may take decades for natural attenuation processes to restore ground water quality. Reduction of risks to potential receptors would not occur.

Alternatives 2A and 2B could pose minimal potential risk resulting from direct contact and/or inhalation of fugitive dust and volatile emissions from soils underlying the water table during excavation activities associated with the installation of the waterline extension (i.e., trenching). These effects can be controlled through the use of dust suppressing techniques. Alternatives 2A and 2B would take 6 months and 9 months, respectively, to implement.

Atternative 3 could have similar short-term effects which may occur due to construction of the extraction wells, piping and treatment system. In addition to erosion and construction hazards noted for Alternatives 2A and 2B, Alternative 3 would include significant additional vehicular traffic during system construction and these activities may create some potential fugitive dust. Alternative 3 would take 1 year to implement.

Alternative 4 could have minimal short-term effects. Little potential risk would be associated with the installation of the point-of-entry treatment systems which should take 6 months to implement.

6. Implementability

The No Action Alternative would not present implementation difficulties. It is highly implementable.

Alternatives 2A and 2B would use readily available technologies. They have a high level of implementability since the technologies are straight forward and significant planning has already occurred in this regard. However, Alternative 2B involves extending the waterline under the NYS Thruway and there are a few difficulties associated with this procedure. Alternatives 2A and 2B will both require authorization of the Genesee County and New York State Highway Department for construction activities conducted within roadways and the NYS State Thruway right-of-way, respectively. The disposal of debris generated under these alternatives would require meeting the requirements of federal and state permits.

The proposed extraction/treatment system in Atternative 3 could be implemented using proven and conventional technologies.

Alternative 4 could be readily and easily implemented. The equipment is readily available 'off the shelf' and therefore, is highly implementable. However, monitoring and maintenance schedules for the treatment systems appropriate for the ground water quality present in the area of the residential wells would be needed.

7. Cost

In terms of comparing present worth costs, No Action has the lowest estimated cost; $295,152. Alternatives 2A and 2B are in the mid-range with estimated present worth costs of $1,838,443 and $1,928,843 respectively. The present worth cost of Alternative 4 is $3,920,772. Alternative 3, ground water extraction/treatment, resulted in the highest present worth cost of $9,927,858.

8. State Acceptance

NYSDEC concurs with the interim remedy in this ROD.

9. Communitv Acceptance

At the public Meeting held on September 10, 1992 and during the public comment period, the community strongly supported Alternative 2B as their choice of an interim remedial action for the Site. All comments that were received from the public are addressed in the attached Responsiveness Summary.

SELECTED REMEDY

Based upon consideration of the requirements of CERCLA, the detailed analysis of the alternatives, and public comments, both NYSDEC and EPA have determined that Alternative 2B is the appropriate interim remedy for the Site.

The major components of the selected remedy are as follows:

- Providing a public water supply to residents in the northwest portion of the Town of Batavia along Kelsey and Pratt Roads, north and south of the NYS Thruway, along Kelsey Road to the Galloway Road/Kelsey Road intersection.

- The interim remedy also provides for the replacement or retrofitting of the residential ground water well piping systems with new piping and appurtenances needed for accessing each home to the waterline.

The selected alternative achieves ARARs more quickly, or as quickly, and at a moderate cost when compared to the other options. Therefore, the selected alternative will provide the best balance of trade-offs among alternatives with respect to the evaluating criteria. EPA and the NYSDEC believe that the selected alternative will be protective of human health, comply with ARARs, be cost-effective, and utilize permanent solutions.

STATUTORY DETERMINATIONS

Under its legal authorities, EPA's primary responsibility at Superfund sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences. These specify that when complete, the selected remedial action for this Site must comply with applicable or relevant and appropriate environmental standards established under federal and state environmental laws unless a statutory waiver is justified. The selected remedy also must be cost-effective and utilize permanent solutions and alternative treatment technologies or resource-recovery technologies to the maximum extent practicable. Finally, the statute includes a preference for remedies that employ treatment that permanently and significantly reduce the volume, toxicity, or mobility of hazardous wastes, as available.

Based upon an evaluation of the various alternatives, EPA and the NYSDEC concur in the selection of Alternative 2B as the selected interim remedy. This interim remedy will involve providing a public water supply to residents in the northwest portion of the Town of Batavia along Kelsey and Pratt Roads, north and south of the NYS Thruway, including residents along Kelsey Road up to the Galloway Road/Kelsey Road intersection, by extending the water mains of the existing Consolidated Water District of the Town of Batavia. This interim action is protective of human health and the environment, complies with Federal and State applicable or relevant and appropriate requirements for this limited-scope action, and is cost effective. This action is interim and not intended to utilize permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable for this interim action. Because this action does not constitute the final remedy for the Site, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element will be addressed by the final response action. Subsequent actions are planned to address fully the threats posed by the conditions at this Site. This interim remedy will got conflict with any future Site-wide remedy.

The following sections discuss how the selected remedy meets these statutory requirements.

Protection of Human Health and the Environment

The selected interim remedy will ensure that the residents have a safe drinking water supply system. The selected interim remedy, one of two operable unit remedies, is not protective of the environment. A Site-wide FS will be done in the future to develop a permanent remedy for the Site.

Compliance with ARARs

The selected remedy will meet ARARs (i.e., federal and state MCLs for drinking water standards), does not interfere with, preclude, or delay the final remedy, and is consistent with EPA's priorities for taking further action.

Cost-Effectiveness

In terms of comparing present worth costs, the "No Action" alternative, which does nothing to abate the potential threat, has the lowest estimated cost; $295,152. Alternative 2A and 2B are in the mid-range with estimated present worth costs of $1,838,443 and $1,928,843 respectively. Alternatives 2A and 2B both can effectively eliminate the potential threat the Site poses to the residential water supply. The present worth cost of Alternative 4 is $3,920,772. Alternative 3, ground water extraction/treatment, resulted in the highest present worth cost of $9,927,857.

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

The utilization of permanent solutions to address the coritamination at, or emanating from, the Site will be addressed under a second operable unit remedy in the near future.

Preference for Treatment as a Principal Element

Use of treatment technologies are not required for this interim remedy. The development of treatment technologies will be addressed under the second operable unit site remedy in the near future.

DOCUMENTATION OF SIGNIFICANT CHANGES

EPA has selected Alternative 2B as the interim remedy for the Site instead of Alternative 2A which was the remedy preferred in the Proposed Plan.

Cost figures for Alternative 2B were recalculated to reflect the cost of installing the alternate water supply system north of the NYS Thruway to Galloway Road based upon Western

New York area contract bid prices over the last three (3) years, as submitted to EPA during the public comment period. Local cost figures were used to calculate Alternative 2B because they were considered more accurate to this remedy selection than national averages (used in the Proposed Plan) and because the cost comparisons were important to the selection of this remedy. Cost figures for installation of the alternate water supply system south of the NYS Thruway would also be different based upon the new cost assessment, but no changes were made to reflect such new costs because those changes would be the same in Alternatives 2A and 2B and would not affect cost comparisons between the two Alternatives, and are within EPA's tolerated accuracy ranges of plus fifty percent (50%) to minus thirty percent (30%).

Comments received during the public comment period also caused EPA to conclude that Alternative 2A would, if selected, require testing of the monitoring wells on a quarterly basis rather than on a semi-annual basis (to reflect seasonal variations in the water levels in the aquifer), thus increasing the projected present value cost of Alternative 2A.

The result was that Alternative 2B was determined to have a present value cost of approximately $90,000 more than the present value cost of Alternative 2A. At the time that the Proposed Plan was released to the public, it was assumed that Alternative 2B would have a present value cost of more than $500,000 greater than Alternative 2A.

By selecting Alternative 2B, an alternate water supply will be provided at this time to persons living east of the Site. Implementation of Alternative 2B will avoid the cost of installing additional monitoring wells and performing five years of monitoring as provided by Alternative 2A.

During the public comment period, the local community expressed a strong preference for Alternative 2B over Alternative 2A.

EPA has determined that Alternative 2A and 2B equally satisfy seven of the nine criteria by which the remedy is assessed (See "Summary of Comparative Analysis of Alternatives") but Alternative 2B is more cost effective and has greater community acceptance.

APPENDIX I

FIGURES

Figures

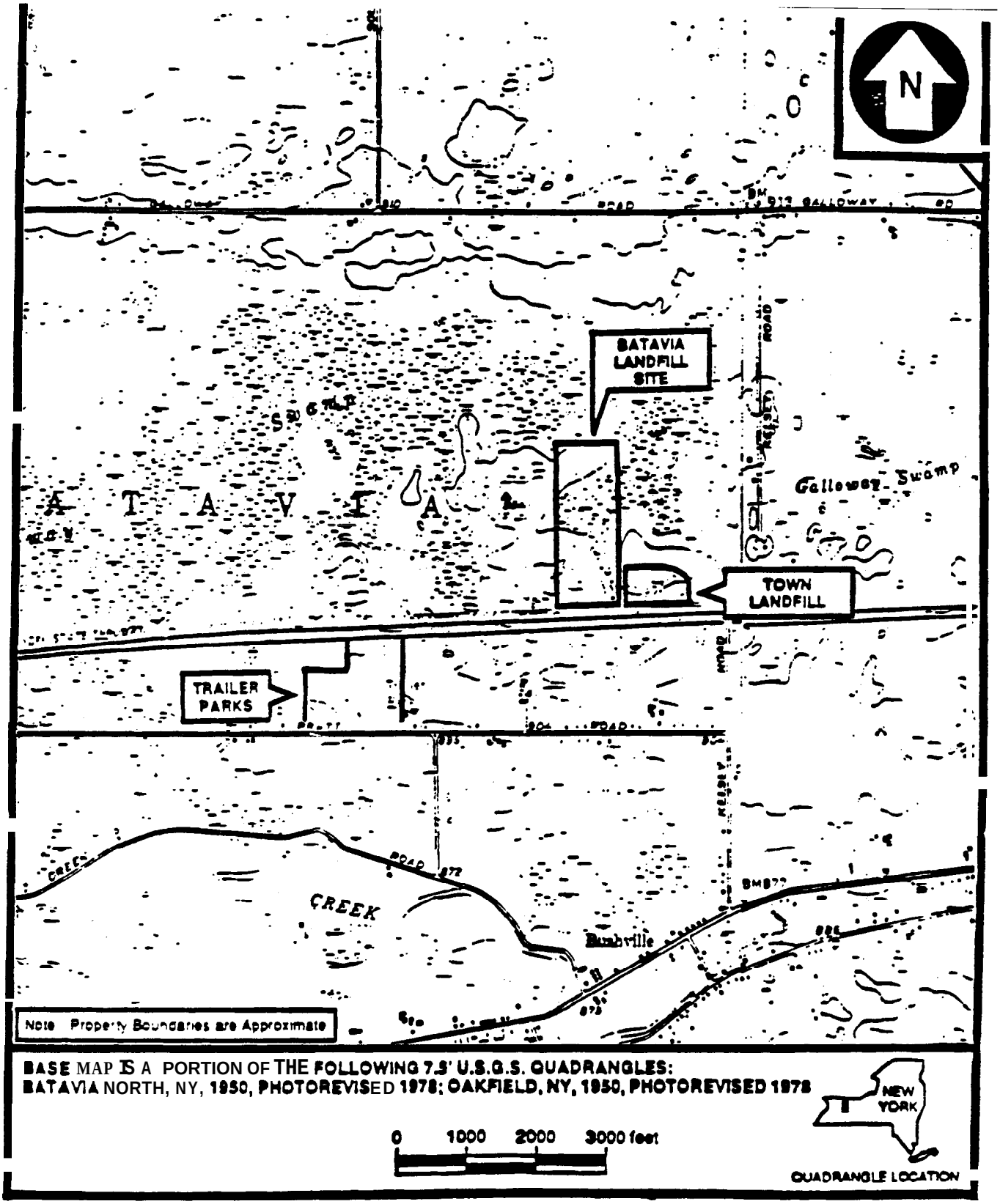

Figure 1

SITE LOCATION

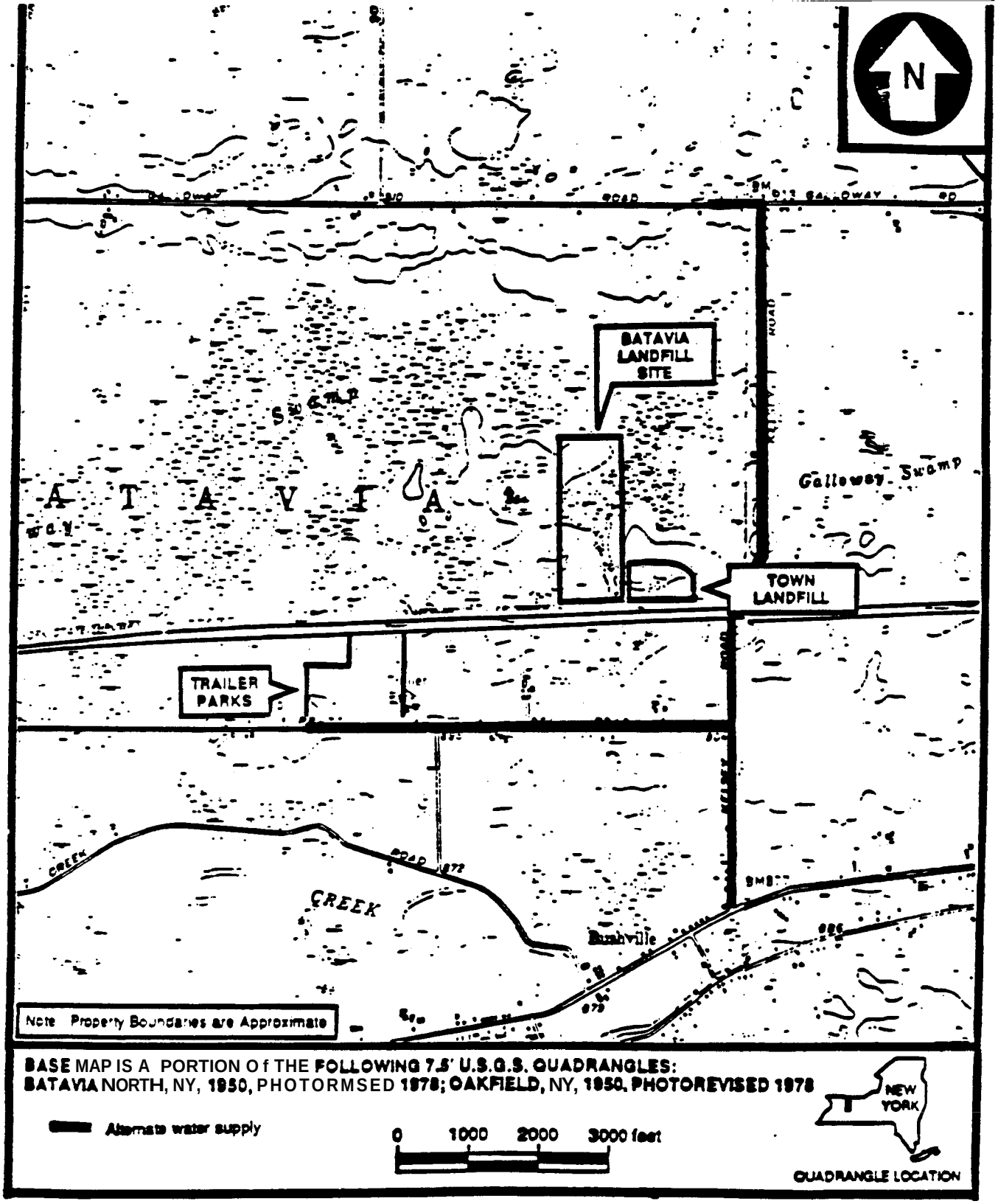

Figure 3

ALTERNATIVE 2B

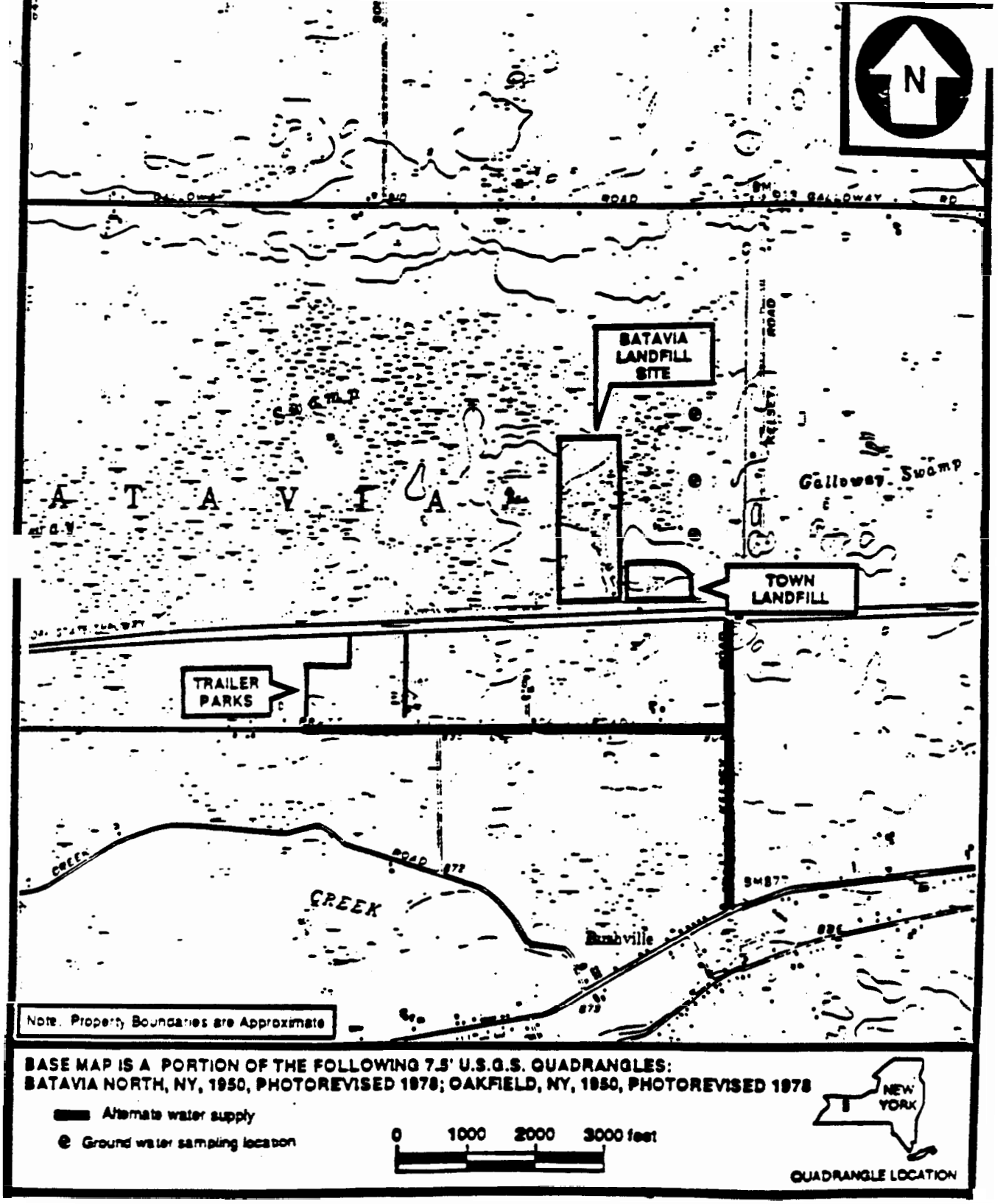

Figure 2

ALTERNATIVE 2A

TABLE A

TOXICITY VALUES FOR
THE BATAVIA LANDFILL SITE
GROUND WATER CONTAMINANTS OF CONCERN (COCs)

APPENDIX II

TABLES

TABLE A TOXICITY VALUES FOR BATAVIA LANDFILL SITE GROUND WATER COCs.

Chemical	Carcinogenic Weight of Evidence Classification	Oral Slope Factor (mg/kg/day)-1	Chronic Oral RfD (mg/kg/day)	Acute Oral "RfD" [1-Dy HA/10] (mg/kg/day)
VOCs				
Acetone	D		1.00E-01 a	
Benzene	A	2.90E-02 a		2.00E-02 c
Bromodichloromethane	B2	1.30E-01 a	2.00E-02 a	7.00E-01 c
2-Butanone (MEK)	D		5.00E-02 b	8.00E+00 c
Chlorobenzene	D		2.00E-02 a	2.00E-01 c
Chloroethane (ethyl chloride)	B2	2.90E-03 d	4.00E-01 d	
Chloroform	B2	6.10E-03 a	1.00E-02 a	4.00E-01 c
Chloromethane (methyl chlor.)	C	1.30E-02 b		9.00E-01 c
1,4 Dichlorobenzene (para)	C	2.40E-02 b	1.00E-01 d	1.00E+00 c
1,1-Dichloroethane	C		1.00E-01 b	
1,2-Dichloroethane	B2	9.10E-02 a		7.40E-02 a
1,1-Dichloroethylene	C	6.00E-01 a	9.00E-03 a	2.00E-01 c
trans-1.2-Dichloroethylene	--		2.00E-02 a	2.00E+00 c
1,2-Dichloropropane	B2	6.80E-02 b		
Ethylbenzene	D		1.00E-01 a	3.20E+00 a
2-Hexanone (MBK)	--		4.00E-02 d	
Methylene chloride	B2	7.50E-03 a	6.00E-02 a	1.33E+00 a
4-Methyl-2-pentanone	--		5.00E-02 b	
Toluene	D		2.00E-01 b	2.00E+00 c
1,1,1-Trichloroethane	D		9.00E-02 b	1.00E+01 a
Trichloroethylene	B2	1.10E-02 b	6.00E-03 d	
Vinyl chloride (chloroethylene)	A	1.90E+00 b		3.00E-01 c
Xylenes	D		2.00E+00 a	4.00E+00 c
BNAs				
Benzoic acid	D		4.00E+00 a	
Bis(2-ethylhexyl)phthalate	B2	1.40E-02 a	2.00E-02 a	
Diethylphthalate	D		8.00E-01 a	
Di-n-butyl phthalate	D		1.00E-01 a	
Dimethylphthalate	D		1.00E+00 b	
2-Methylnaphthalene	--			
4-Methylphenol (p-cresol)	C		5.00E-02 b	
Naphthalene	D		4.00E-03 b	5.00E-02 c
N-Nitrosodiphenylamine	B2	4.90E-03 a		
phenol	D		6.00E-01 a	6.00E-01 c

TABLE A TOXICITY VALUES FOR BATAVIA LANDFILL SITE GROUND WATER COCs. (CONTINUED)

Chemical	Carcinogenic Weight of Evidence Classification	Oral Slope Factor (mg/kg/day)-1	Chronic Oral RfD (mg/kg/day)	Acute Oral "RfD" [1-Dy HA/10] (mg/kg/day)
INORGANICS				
Aluminum	--			
Antimony	--		4.00E-04 a	1.50E-03 c
Arsenic	A	1.75E+00 e	3.00E-04 a	
Barium	--		5.00E-02 b	
Beryllium	B2	4.30E+00 a	5.00E-03 a	3.00E+00 c
Calcium	--			
Chromium, total	--		8.76E-01 g	1.40E-01 a
Cobalt	--			
Copper	D		4.00E-02 d	
Iron	D		5.00E-01 d	
Lead	B2			
Magnesium	--			
Manganese	D		1.00E-01 a	
Mercury	D		3.00E-04 b	
Nickel	A		2.00E-02 a,f	1.00E-01 c
Potassium	--			
Vanadium	D		7.00E-03 b	8.00E-03 c
Zinc	D		2.00E-01 b	4.00E-01 c

LEGEND

a From IRIS 2/1/92.
b. From HEAST FY 1991.
c. From MCL/HA listing, Office of Drinking Water, November 1991.
d. Interim value from ECAO (see text for complete reference).
e. Arsenic oral slope factor derived from unit risk in IRIS.
f. Value is for nickel, soluble salts.
g. Value is weighted-average value of the Hex and Tri RfDs assuming 7 parts Tri to 1 part Hex.

TABLE B

GROUND WATER INGESTION/FUTURE RESIDENTIAL SCENARIOS FOR NONCARCINONGENIC RISKS

TABLE : B
STIE : IATAVLA
ENV. MEDIUM : GKWND WATER
EXPOSURE TYPE : INGESTION/FUTURE RESIDENTIAL SCENARIOS
RISK TYPE : NONCARCINOGENIC

Contaminant of Concern	Conc. (mg/L)	Ingestion Rate (L/day)	Exposure Frequency (days/yr)	Exposure Duration (years)	Body Weight (kg)	Averaging Time (days)	Acute Body Dose (mg/kg/day)	Chronic Body Dose (mg/kg/day)	Acute Protective Body Dose (mg/kg/day)	Chronic Protective Body Dose (mg/kg/day)	Acute Hazard Quotient	Chronic Hazard Quotient
Acetone	8.37E-01	2	350	30	70	10950	2.39E-02	2.29E-02		1.00E-01		2.29E-01
Benzene	7.04E-03	2	350	30	70	10950	2.01E-04	1.93E-04	2.00E-02		1.01E-02	
Bromodichloromethane	1.20E-03	2	350	30	70	10950	3.43E-05	3.29E-05	7.00E-01	2.00E-02	4.90E-05	1.64E-03
2-Butanone (MEK)	4.32E-02	2	350	30	70	10950	1.23E-03	1.18E-03	8.00E+00	5.00E-02	1.54E-04	2.37E-02
Chlorobenzene	5.98E-03	2	350	30	70	10950	1.71E-04	1.64E-04	2.00E-01	2.00E-02	8.55E-04	8.20E-03
Chloroethane (ethyl chloride)	5.94E-02	2	350	30	70	10950	1.70E-03	1.63E-03		4.00E-01		4.07E-03
Chloroform	5.07E-03	2	350	30	70	10950	1.45E-04	1.39E-04	4.00E-01	1.00E-02	3.62E-04	1.39E-02
Chloromethane (methyl chloride)	7.50E-03	2	350	30	70	10950	2.14E-04	2.05E-04	9.00E-01		2.38E-04	
1,4 Dichlorobenzene (para)	9.80E-03	2	350	30	70	10950	2.80E-04	2.68E-04	1.00E+00	1.00E-01	2.80E-04	2.68E-03
1,1-Dichloroethane	8.33E-02	2	350	30	70	10950	2.38E-03	2.28E-03		1.00E-01		2.28E-02
1,2-Dichloroethane	1.50E-03	2	350	30	70	10950	4.29E-05	4.11E-05	7.40E-02		5.79E-04	
1,1-Dichloroethylene	3.05E-03	2	350	30	70	10950	8.71E-05	8.36E-05	2.00E-01	9.00E-03	4.36E-04	9.28E-03
trans-1,2-Dichloroethylene	5.50E-03	2	350	30	70	10950	1.57E-04	1.51E-04	2.00E+00	2.00E-02	7.86E-05	7.54E-03
1,2-Dichloropropane	3.50E-03	2	350	30	70	10950	1.00E-04	9.59E-05				
Ethylbenzene	1.89E-02	2	350	30	70	10950	5.40E-04	5.17E-04	3.20E+00	1.00E-01	1.69E-04	5.17E-03
2-Hexanone (MBK)	1.20E-02	2	350	30	70	10950	3.44E-04	3.29E-04		4.00E-02		8.24E-03
Methylene chloride	2.07E-02	2	350	30	70	10950	5.91E-04	5.67E-04	1.33E+00	6.00E-02	4.44E-04	9.45E-03
4-Methyl-2-pentanone	2.01E-02	2	350	30	70	10950	5.75E-04	5.52E-04		5.00E-02		1.10E-02
Toluene	1.23E-01	2	350	30	70	10950	3.51E-03	3.37E-03	2.00E+00	2.00E-01	1.76E-03	1.68E-02
1,1,1-Trichloroethane	1.49E-02	2	350	30	70	10950	4.26E-04	4.09E-04	1.00E+01	9.00E-02	4.26E-05	4.54E-03
Trichloroethylene	1.18E-02	2	350	30	70	10950	3.37E-04	3.23E-04		6.00E-03		5.38E-02
Vinyl chloride (chloroethylene)	7.20E-03	2	350	30	70	10950	2.06E-04	1.97E-04	3.00E-01		6.86E-04	
Xylenes	2.49E-02	2	350	30	70	10950	7.12E-04	6.82E-04	4.00E+00	2.00E+00	1.78E-04	3.41E-04
Benzoic acid	3.30E-02	2	350	30	70	10950	9.43E-04	9.04E-04		4.00E+00		2.26E-04
Bis(2-ethylhexyl)phthalate	1.19E-01	2	350	30	70	10950	3.40E-03	3.26E-03		2.00E-02		1.63E-01
Diethylphthalate	1.43E-02	2	350	30	70	10950	4.10E-04	3.93E-04		8.00E-01		4.91E-04
Di-n-butyl phthalate	2.50E-03	2	350	30	70	10950	7.14E-05	6.85E-05		1.00E-01		6.85E-04
Dimethylphthalate	2.04E-02	2	350	30	70	10950	5.83E-04	5.59E-04		1.00E+00		5.59E-04
2-Methylnaphthalene	1.50E-03	2	350	30	70	10950	4.29E-05	4.11E-05				
4-Methylphenol (p-cresol)	1.43E+00	2	350	30	70	10950	4.10E-02	3.93E-02		5.00E-02		7.86E-01
Naphthalene	1.62E-02	2	350	30	70	10950	4.62E-04	4.43E-04	5.00E-02	4.00E-03	9.23E-03	1.11E-01
N-Nitrosodiphenylamine	4.25E-02	2	350	30	70	10950	1.21E-03	1.16E-03				
Phenol	2.37E-02	2	350	30	70	10950	6.77E-04	6.49E-04	6.00E-01	6.00E-01	1.13E-03	1.08E-03
Aluminum	5.57E+01	2	350	30	70	10950	1.59E+00	1.53E+00				
Antimony	7.88E-02	2	350	30	70	10950	2.25E-03	2.16E-03	1.50E-03	4.00E-04	1.50E+00	5.40E+00

TABLE : B
SITE : BATAVIA
ENV. MEDIUM : GROUND WATER
EXPOSURE TYPE : INGESTION/FUTURE RESIDENTIAL SCENARIOS
RISK TYPE : NONCARCINOGENIC

Contaminant of Concern	Conc. (mg/L)	Ingestion Rate (L/day)	Exposure Frequency (days/yr)	Exposure Duration (years)	Body Weight (kg)	Averaging Time (days)	Acute Body Dose (mg/kg/day)	Chronic Body Dose (mg/kg/day)	Acute Protective Body Dose (mg/kg/day)	Chronic Protective Body Dose (mg/kg/day)	Acute Hazard Quotient	Chronic Hazard Quotient
Arsenic	4.60E-02	2	350	30	70	10950	1.31E-03	1.26E-03		3.00E-04		4.20E+00
Barium	7.67E-01	2	350	30	70	10950	2.19E-02	2.10E-02		5.00E-02		4.20E-01
Beryllium	1.38E-03	2	350	30	70	10950	3.94E-05	3.78E-05	3.00E+00	5.00E-03	1.31E-05	7.56E-03
Calcium	6.69E+02	2	350	30	70	10950	1.91E+01	1.83E+01				
Chromium, total	1.18E-01	2	350	30	70	10950	3.36E-03	3.23E-03	1.40E-01	8.76E-01	2.40E-02	3.68E-03
Cobalt	65 1E-02	2	350	30	70	10950	1.86E-03	1.78E-03				
Copper	3.89E-01	2	350	30	70	10950	1.11E-02	1.07E-02		4.00E-02		2.66E-01
Iron	1.31E+02	2	350	30	70	10950	3.74E+00	3.59E+00		5.00E-01		7.18E+00
Lead	1.96E-01	2	350	30	70	10950	5.59E-03	5.36E-03				
Magnesium	2.27E+02	2	350	30	70	10950	6.48E+00	6.21E+00				
Manganese	2.09E+00	2	350	30	70	10950	5.97E-02	5.73E-02		1.00E-01		5.73E-01
Mercury	3.30E-04	2	350	30	70	10950	9.43E-06	9.04E-06		3.00E-04		3.01E-02
Nickel	1.55E-01	2	350	30	70	10950	4.43E-03	4.25E-03	1.00E-01	2.00E-02	4.43E-02	2.12E-01
Potassium	6.49E+01	2	350	30	70	10950	1.85E+00	1.78E+00				
Vanadium	8.35E-02	2	350	30	70	10950	2.39E-03	2.29E-03	8.00E-03	7.00E-03	2.98E-01	3.27E-01
Zinc	4.87E+01	2	350	30	70	10950	1.39E+00	1.33E+00	4.00E-01	2.00E-01	3.48E+00	6.67E+00
										HAZARD INDEX:	5.37E+00	2.68E+01

TABLE C

GROUND WATER INGESTION/FUTURE RESIDENTIAL SCENARIOS FOR CARCINONGENIC RISKS

TABLE . C
SITE : BATAVIA
ENV. MEDIUM : GROUND WATER
EXPOSURE TYPE : INGESTION/FUTURE RESIDENTIAL SCENARIOS
RISK TYPE : CARCINOGENIC

Contaminant of Concern	Concentration (mg/L)	Ingestion Rate (L/day)	Exposure Frequency (days/year)	Exposure Duration (years)	Body Weight (kg)	Averaging Time (days)	Intake (mg/kg/day)	Oral Slope Factor -1 (mg/kg/day)	Increased CA Risk
Acetone	8.37E-01	2	350	30	70	25550	9.82E-03		
Benzene	7.04E-03	2	350	30	70	25550	8.27E-05	2.90E-02	2.40E-06
Bromodichloromethane	1.20E-03	2	350	30	70	25550	1.41E-05	1.30E-01	1.83E-06
2-Butanone (MEK)	4.32E-02	2	350	30	70	25550	5.07E-04		
Chlorobenzene	5.98E-03	2	350	30	70	25550	7.03E-05		
Chloroethane (ethyl chloride)	5.94E-02	2	350	30	70	25550	6.98E-04	2.90E-03	2.02E-06
Chloroform	5.07E-03	2	350	30	70	25550	5.95E-05	6.10E-03	3.63E-07
Chloromethane (methyl chloride)	7.50E-03	2	350	30	70	25550	8.81E-05	1.30E-02	1.14E-06
1,4 Dichlorobenzene (para)	9.80E-03	2	350	30	70	25550	1.15E-04	2.40E-02	2.76E-06
1,1-Dichloroethane	8.33E-02	2	350	30	70	25550	9.79E-04		
1,2-Dichloroethane	1.50E-03	2	350	30	70	25550	1.76E-05	9.10E-02	1.60E-06
1,1-Dichloroethylene	3.05E-03	2	350	30	70	25550	3.58E-05	6.00E-01	2.15E-05
trans-1,2-Dichloroethylene	5.50E-03	2	350	30	70	25550	6.46E-05		
1,2-Dichloropropane	3.50E-03	2	350	30	70	25550	4.11E-05	6.80E-02	2.79E-06
Ethylbenzene	1.89E-02	2	350	30	70	25550	2.22E-04		
2-Hexanone (MBK)	1.20E-02	2	350	30	70	25550	1.41E-04		
Methylene chloride	2.07E-02	2	350	30	70	25550	2.43E-04	7.50E-03	1.82E-06
4-Methyl-2-pentanone	2.01E-02	2	350	30	70	25550	2.36E-04		
Toluene	1.23E-01	2	350	30	70	25550	1.44E-03		
1,1,1-Trichloroethane	1.49E-02	2	350	30	70	25550	1.75E-04		
Trichloroethylene	1.18E-02	2	350	30	70	25550	1.38E-04	1.10E-02	1.52E-06
Vinyl chloride (chloroethylene)	7.20E-03	2	350	30	70	25550	8.45E-05	1.90E+00	1.61E-04
Xylenes	2.49E-02	2	350	30	70	25550	2.92E-04		
Benzoic acid	3.30E-02	2	350	30	70	25550	3.87E-04		
Bis(2-ethylhexyl)phthalate	1.19E-01	2	350	30	70	25550	1.40E-03	1.40E-02	1.95E-05
Diethylphthalate	1.43E-02	2	350	30	70	25550	1.68E-04		
Di-n-butyl phthalate	2.50E-03	2	350	30	70	25550	2.94E-05		
Dimethylphthalate	2.04E-02	2	350	30	70	25550	2.40E-04		
2-Methylnaphthalene	1.50E-03	2	350	30	70	25550	1.76E-05		
4-Methylphenol (p-cresol)	1.43E+00	2	350	30	70	25550	1.68E-02		
Naphthalene	1.62E-02	2	350	30	70	25550	1.90E-04		
N-Nitrosodiphenylamine	4.25E-02		350	30	70	25550	4.99E-04	4.90E-03	2.44E-06
	2.37E-02		350	30	70	25550	2.78E-04		
Aluminum	5.57E+01		350	30	70	25550	6.54E-01		
	7.88E-02		350	30		25550	9.25E-04		
Arsenic	4.60E-02		350	30				1.75E+00	9.44E-04

TABLE . C
SITE : BATAVIA
ENV. MEDIUM : GROUND WATER
EXPOSURE TYPE : INGESTION/FUTURE RESIDENTIAL SCENARIOS
RISK TYPE : CARCINOGENIC

Contaminant of Concern	Concentration (mg/L)	Ingestion Rate (L/day)	Exposure Frequency (days/year)	Exposure Duration (years)	Body Weight (kg)	Averaging Time (days)	Intake (mg/kg/day)	Oral Slope Factor -1 (mg/kg/day)	Increased CA Risk
Barium	7.67E-01	2	350	30	70	25550	9.W-03		
Beryllium	1.38E-03	2	350	30	70	25550	1.62E-05	4.30E+00	6.97E-05
Calcium	6.69E+02	2	350	30	70	25550	7.85E+00		
Chromium, total	1.18E-01	2	350	30	70	25550	1.38E-03		
Cobalt	6.5IE-02	2	350	30	70	25550	7.64E-04		
Copper	3.89E-01	2	350	30	70	25550	4.57E-03		
Iron	1.3IE+02	2	350	70	70	25550	1.54E+00		
Lead	1.96E-01	2	350	30	70	25550	2.30E-03		
Magnesium	2.27E+02	2	350	30	70	25550	2.66E+00		
Manganese	2.09E+00	2	350	30	70	25550	2.45E-02		
Mercury	3.30E-04	2	350	30	70	25550	3.87E-06		
Nickel	1.55E-01	2	350	30	70	25550	1.82E-03		
Potassium	6.49E+01	2	350	30	70	25550	7.62E-01		
Vanadium	8.3SE-02	2	350	30	70	25550	9.80E-04		
Zinc	4.87E+01	2	350	30	70	25550	5.72E-01		
							TOTAL RISK:		1.24E-03

TABLE D

SUMMARY OF STATISTICAL DISTRIBUTION OF CONTAMINANTS IN GROUND WATER

TABLE D SUMMARY STATISTICS FOR BATAVLA LANDFILL SITE INTERIM RISK ASSESSMENT (ug/l).

TYPE=Ground Water - Southern Site Area

Class	Analyce	Num. Times Detected	Num. Samples Analyzed	Lowest Detected Conc.	Highest Dececced Conc.	Highest Conc. Locat.	Geom. Mean Conc.	95 Pct. Upp. Conf. Limit	Min. Detect. Limit	Max. Detect. Limit
VOCs	Chloromethane	1	21	7.50	7.50	MW 04	5.94	8.29	10.0	50.0
	Vinyl Chloride	3	21	3.10	7.20	MW 01	6.15	9.82	10.0	50.0
	Chloroethane	12	21	2.30	120.00	BL 19 SS	12.05	59.42	10.0	50.0
	Methylene Chloride	18	23	1.80	86.00	BL 09	6.30	20.69	5.0	5.0
	Acetone	6	23	240.00	1700.00	MW 01	17.33	836,63	10.0	50.0
	1.1-Dichloroethene	1	21	3.05	3.05	BL 20	3.18	4.88	5.0	25.0
	1.1-Dichloroethane	12	23	2.00	200.00	MW 04	9.33	83.34	5.0	25.0
	Chloroform	3	21	1.50	5.30	BL 18 R	3.14	5.07	5.0	25.0
	1.2-Dichloroethane	1	21	1.50	1.50	BL 21	3.07	4.85	5.0	25.0
	1.4-Dichlorobenzene	2	12	3.70	9.80	BL 18 SS	6.72	13.10	10.0	60.0
	2-Butanone	1	22	1500.00	1500.00	BL 09	8.07	43.22	10.0	50.0
	1,1,1-Trichloroethane	5	21	1.20	110.00	MW 04	3.97	14.92	5.0	25.0
	Bromodichloromethane	1	21	1.20	1.20	BL 18 R	3.04	4.89	5.0	25.0
	1.2-Dichloropropane	1	21	3.50	3.50	BL 21	3.20	4.92	5.0	25.0
	Trichloroethene	2	21	26.00	74.50	BL 20	4.13	11.79	5.0	25.0
	Benzene	6	21	1.10	19.00	BL 18 SS	3.52	7.04	5.0	25.0
	4-Methyl-2-Pentanone	2	21	52.00	170.00	BL 09	7.21	20.14	5.0	50.0
	2-Hexanone	5	21	3.40	37.00	MW 01	6.76	12.03	10.0	50.0
	Toluene	5	22	4.40	1900.00	MW 01	5.71	122.96	5.0	25.0
	Chlorobenzene	3	21	1.30	25.00	BL 18 SS	3.28	5.98	5.0	25.0
	Ethylbenzene	3	21	32.00	140.00	BL 18 SS	4.53	18.88	5.0	25.0
	trans-1,2-Dichloroethene	6	21	3.00	7.25	BL 20	3.63	5.50	5.0	25.0
	Total Xylenes	5	21	5.70	160.00	BL 18 SS	4.86	24.91	5.0	25.0
BNAs	Phenol	3	13	6.10	51.00	BL 09	8.42	23.68	10.0	40.0
	4-Methylphenol	4	14	11.00	2900.00	MW 01	15.74	1434.38	10.0	40.0
	Benzoic Acid	1	12	33.00	33.00	HI. 18 SS	35.33	66.00	50.0	300.0
	Naphthalene	2	12	12.00	40.00	BL 09	7.61	16.16	10.0	40.0
	2-Methylnaphthalene	1	12	1.50	1.50	BL 18 SS	6.24	15.00	10.0	60.0
	Dimethylphthalate	1	13	50.00	50.00	MW 01	8.04	20.41	10.0	60.0
	Diethylphthalate	4	12	3.10	28.00	BL 18 SS	6.38	14.34	10.0	60.0
	N-Nitrosodiphenylamine	4	13	1.05	50.00	MW 01	4.75	42.47	1.0	60.0
	Di-n-butylphthalate	1	12	2.50	2.50	BL 18 SS	6.52	13.64	10.0	60.0
	bis(2-Ethylhexyl)phthalate	7	13	1.50	310.00	MW 04	6.95	118.87	10.0	60.0
	Total Phenols	4	13	20.00	600.00	MW 01	11.49	207.91	10.0	10.0

TABLE D SUMMARY STATISTICS FOR BATAVIA LANDFILL SITE INTERIM RISK ASSESSMENT (ug/l) (CONTINUED).

TYPE=Ground Water - Southern Site Area

Class	Analyte	Num. Times Detected	Num. Samples Analyzed	Lowest Detected Conc.	Highest Detected Conc.	Highest Conc. Locat.		Geom. Mean Conc.	95 Pct. Upp. Conf. Limit	Min. Detect. Limit	Max. Detect. Limit
Inorg.	Aluminum	14	15	2480.00	55700.00	MW 04		9476.55	1059997.59	30.0	30.0
	Antimony	11	15	20.90	120.00	MW 01		30.43	78.79	14.0	28.0
	Arsenic	11	15	3.60	167.00	MW 04		8.27	45.95	3.0	8.0
	Barium	23	23	84.00	2220.00	MW 04		390.25	766.74		
	Beryllium	3	15	1.60	2.70	BL 20		0.87	1.38	1.0	2.0
	Calcium	15	15	33200.00	792000.00	BL 19	SD	269316.20	668926.03		
	Chromium,Total	20	23	5.20	181.00	BL 01		24.39	117.77	3.0	10.0
	Cobalt	13	15	3.85	65.10	MW 04		11.74	80.47	2.0	2.0
	Copper	15	15	3.30	389.00	MW 04		63.64	428.12		
	Iron	15	15	219.00	131000.00	MW 04		29017.43	601223.34		
	Lead	21	23	7.00	433.00	MW 05		22.60	195.55	2.0	2.0
	Magnesium	23	23	22800.00	330000.00	MW 04		113988.91	226806.92		
	Manganese	15	15	35.50	2090.00	BL 19	SD	715.11	3311.12		
	Mercury	6	15	0.30	0.50	MW 05		0.17	0.33	0.2	0.2
	Nickel	14	15	10.40	155.00	MW 04		50.82	217.83	5.0	5.0
	Potassium	15	15	2660.00	123000.00	BL 18	SS	11257.03	64902.69		
	Vanadium	11	15	10.40	83.50	BL 19	SD	16.39	142.89	5.0	5.0
	Zinc	23	23	36.60	76800.00	MW 04		393.18	48674.30		

TABLE E

MCLs FOR BATAVIA LANDFILL SITE GROUND WATER COCs

TABLE E MCLS FOR BATAVIA LANDFILL SITE GROUND WATER COCS.

Chemical	MCL (ug/l)	MCLG (ug/l)	Reg. Status'	Secondary MCL (ug/l)
VOCs				
Acetone				
Benzene	5.0	zero	F	
Bromodichloromethane	100.0	-	L	
2-Butanone (MEK)	-	-	L	
Chlorobenzene	100.0	100.0	F	
Chloroethane (ethyl chloride)	-	-	L	
Chloroform	100.0	-	L	
Chloromethane (methyl chloride)	-	-	L	
1,4 Dichlorobenzene (para)	75.0	75.0	F	5.0
1,1-Dichloroethane	-	-	L	
1,2-Dichloroethane	5.0	zero	F	
1,1-Dichloroethylene	7.0	7.0	F	
trans-1,2-Dichloroethylene	100.0	100.0	F	
1,2-Dichloropropane	5.0	zero	F	
Ethylbenzene	700.0	700.0	F	30.0
2-Hexanone (MBK)				
Methylene chloride	5.0	zero	P	
4-Methyl-2-pentanone				
Toluene	1000.0	1000.0	F	40.0
I,1,1-Trichloroethane	200.0	200.0	F	
Trichloroethylene	5.0	zero	F	
Vinyl chloride (chloroethylene)	2.0	zero	F	
Xylenes	10000.0	10000.0	F	20.0
BNAs				
Benzoic acid				
Bis(2-ethylhexyl)phthalate				
Diethylphthalate	-	-	-	
Di-n-butyl phthalate	-	-	-	
Dimethylphthalate	-	-	-	
Methylnaphthalene, 2-				
4-Methylphenol (p-cresol)				
Naphthalene	-	-	-	
N-Nitrosodiphenylarnine				
Phenol	-	-	-	

TABLE E MCLS FOR BATAVIA LANDFILL SITE GROUND WATER COCS.
(CONTINUED)

Chemical	MCL (ug/l)	MCLG (ug/l)	Reg. Status[1]	Secondary MCL (ug/l)
INORGANICS				
Aluminum		-	L	50 to 200
Antimon	10.0/5.0	3.0	P	
Arsenic	[illegible]	-	*	
Barium	2000.0	2000.0	F	
Beryllium	1.0	zero	P	
Calcium				
Chromium, total	100.0	100.0	F	
Cobalt				
Copper	1300.0**	1300.0	P	1000.0
Iron				300.0
Lead	15.0**	zero	F	
Magnesium				
Manganese	-	-	-	50.0
Mercury	2.0	2.0	F	
Nickel	100.0	100.0	P	
Potassium				
Vanadium	-	-	L	
Zinc	-	-	L	5000.0

[1] Regulatory Status as follows:
F: Final
P: Proposed
L: Listed for regulation

* Arsenic under review
**Treatment Technique Action Level

TABLE F

TABLE F **SUMMARY** OF GROUND WATER CONTAMINANTS WITH CARCINOGENIC AND NONCARCINOGENIC RISKS EXCEEDING EPA'S ACCEPTABLE LIMITS

Contaminant of Concern	Incremental Carcinogenic Risk*	Noncarcinogenic Risk*	
		Acute Hazard Index	Chronic Hazard Index
Benzene	2.40E−06		
Bromodichloromethane	1.83E−06		
Chloroethane	2.02E−06		
Chloromethane	1.14E−06		
1,4−Dichlorobenzene	2.76E−06		
1,2−Dichloroethane	1.60E−06		
1,1−Dichloroethylene	2.15E−05		
1,2−Dichloropropane	2.79E−06		
Methylene Chloride	1.82E−06		
Trichloroethylene	1.52E−06		
Vinyl Chloride	1.61E−04		
Bis(2−ethylhexyl)phthalate	1.95E−05		
N−Nitrosodiphenylamine	2.44E−06		
Antimony		1.50E+00	5.40E+00
Arsenic	9.44E−04		4.20E+00
Beryllium	6.97E−05		
Iron			7.18E+00
Zinc		3.48E+00	6.67E+00
Total Site Risk**	1.24E−03	5.37E+00	2.68E+01

* Blank cells indicate that risk is below EPA's acceptable limits (1.0E−04 to 1.0E−06 for carcinogens or 1.0 for noncarcinogens) or risk was not quantified due to inadequate toxicity data.

** Total includes fraction of risk contributed by other contaminants having risk below EPA's acceptable limits.

APPENDIX III

ADMINISTRATIVE RECORD INDEX

APPENDIX IV

STATE LETTER OF CONCURRENCE

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

MAR 2 3 1993

Thomas C. Jorling
Commissioner

Mr. George Pavlou, P.E.
Acting Division Director
Emergency & Remedial Response Division
U.S. Environmental Protection Agency
Region II
26 Federal Plaza
New York, New York **10278**

Dear Mr. Pavlou:

Re: Batavia Landfill Site, Batavia (T), Genesee County, New York, Site No. 8-19-001

The Record of Decision (ROD) for the Batavia Landfill site Interim Remedial Measure (IRM) has been reviewed by the New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH). This ROD identifies the interim remedy to address private wells contaminated by the Batavia **Landfill** site.

The selected **IRM** is **Alternative 2B.** This alternative will extend the public water supply line west on Pratt **Road** to the trailer park located south of the NYS Thruway and from NYS Route 5 north under the **NYS** Thruway **terminating** at the intersection of Kelsey and **Galloway** Road. The NYSDEC and the NYSDOH concur with the remedy selected by the ROD as it provides for the protection of human health by the extension of municipal water to residents whose private wells are either contaminated or have the potential to be contaminated by the Batavia Landfill site.

If you have any questions, you may **contact** Mr. Robert W. Schick, P.E., of my staff, at **518/457-4343.**

Sincerely,

Ann Hill DeBarbieri

Ann Hill **DeBarbieri**
Deputy **Commissioner**
Office of Environmental Remediation

cc: **C.** Petersen, **USEPA**
K. Lynch, **USEPA**
M. Walters, **USEPA**
A. **Carlson,** NYSDOH

APPENDIX V

RESPONSIVENESS SUMMARY
BATAVIA LANDFILL SITE

The U.S. Environmental Protection Agency (EPA) held a public comment period from August 29, 1992 to October 28, 1992 for interested citizens

RESPONSIVENESS SUMMARY
FOR THE INTERIM REMEDIAL ACTION
FOR THE FIRST OPERABLE UNIT
AT THE
BATAVIA LANDFILL SUPERFUND SITE
CITY OF BATAVIA, TOWN OF BATAVIA, GENESEE COUNTY, NEW YORK

RESPONSIVENESS SUMMARY
FOR THE INTERIM REMEDIAL ACTION
FOR THE FIRST OPERABLE UNIT
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BATAVIA LANDFILL SUPERFUND SITE
CITY OF BATAVIA, TOWN OF BATAVIA, GENESEE COUNTY, NEW YORK

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RESPONSIVENESS SUMMARY
BATAVIA LANDFILL SUPERFUND BITE

This Responsiveness Summary contains a written summary of public comments and concerns about the Remedial Investigation and Focused Feasibility Study Reports and the Proposed Plan for an interim remedial action for the first operable unit for the Batavia Landfill Superfund site (the "Site") together with the response by the United States Environmental Protection Agency (EPA) to those comments and concerns. EPA, in consultation with the New York State Department of Environmental Conservation (NYSDEC), selects the interim remedy for the first operable unit only after reviewing and considering all public comments received since the commencement of the public comment period. The public comment period was held from August 29, 1992 to October 28, 1992

This Responsiveness Summary is organized into the following sections:

I. Responsiveness Summary Overview

This section provides a brief outline of the interim remedial measure selected in the Record of Decision to abate the groundwater contaminant threat to the drinking water supply of local residents.

II. Backaround on Community Involvement and Concerns

This section provides a brief history of community concerns and interests regarding the Site.

III. Summary of Questions and Comments Received During the Public Comment Period and EPA Responses

This section summarizes both oral and written comments submitted to EPA at the public meeting and since the beginning of the public comment period, and provides EPA's responses to these comments. Written comments received since the commencement of the public comment period are included in the Administrative Record.

I. RESPONSIVENESS SUMMARY OVERVIEW

On August 28, 1992, the United States Environmental Protection Agency ("EPA") released to the public the Remedial Investigation Report, Focused Feasibility Study and Proposed Plan for the first operable unit at the Site. The Proposed Plan described the remedial alternatives considered by EPA as an interim remedy for the Site and identified the preferred remedial alternative with the rationale for the preference.

In accordance with Section 300.430(f)(3)(i) of the National Oil and Hazardous Substance Pollution Contingency Plan, 40 CFR 300.430(f)(3) ("NCP"), a notice of availability and brief analysis of the Proposed Plan was published in a major local newspaper; a public meeting was held on September 10, 1992 at the John Kennedy Elementary School, 166 Vine Street, Batavia, New York regarding the Proposed Plan and the supporting analysis and information; and an opportunity was afforded from August 29, 1992 to October 28, 1992 for public comment thereon.

A transcript of the public meeting held on September 10, 1992 is attached as Appendix VI to the Record of Decision (ROD).

EPA screened possible alternatives, giving consideration to nine key criteria described at Section 300.430(f) of the NCP, 40 CFR § 300.430(f):

Threshold criteria, including:

- Overall protection of human health and the environment; and
- Compliance with requirements or standards under applicable or relevant and appropriate Federal and State environmental laws, and local environmental and health laws.

Primary balancing criteria, including:

- Long-term effectiveness;
- Short-term effectiveness;
- Reduction of mobility, toxicity, or volume;
- Ability to implement;
- Cost; and

Modifying criteria, including:

- State acceptance; and
- Local acceptance.

EPA weiahed State and local acceptance of the alternative interim remedies prior to reaching the final decision regarding the interim remedy for the first operable unit for this Site.

The major components of the selected interim remedy include the following:

- Providing a public water supply to residents in the north-west portion of the Town of Batavia along Kelsey and Pratt Roads by extension of the water mains of the existing Consolidated Water district of the Town of Batavia.

- Replacing or retrofitting the residential ground water well piping systems with new piping and appurtenances needed for accessing each home to the waterline.

II. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

There has been continued community interest and concern about the Site for more than ten years. EPA established a file of relevant information relating to the Site, including local community relations documents, at information repositories located at the Batavia Town Hall and at the Batavia Library, located near the Site. Public meetings were held from time to time and fact sheets prepared by EPA were made available. There has been extensive local press coverage of activities at the Site including press reports of concerns about drinking water.

Community interest has been heightened since an August 1991 residential sampling program by the New York State Department of Health (NYSDOH) revealed trace amounts of hazardous substances in residential wells south of the Site, which substances were believed to be attributable to the Site. Subsequent sampling and chemical analyses of the residential well ground water on Pratt and Kelsey Roads, in October 1991 and January 1992, have not indicated any abatement in the levels of contamination in the potable ground water supply south of the landfill. The chemical data results for the residential wells sampled by the NYSDOH was made available to each homeowner or resident whose wells were sampled and results are also included in the Administrative Record for the Site.

EPA and NYSDEC rely on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, the RI (including the Interim Ground Water Risk Assessment Report) and FFS reports, the Proposed Plan, and supporting documentation were made available to the public during a public comment period which began on August 29, 1992 and concluded on October 28, 1992. A notice of availability and brief analysis of the Proposed Plan was published in a major local newspaper.

The public meeting for the Site began at 7:00 P.M. on September 10, 1992 with presentations by EPA followed by a question and answer session. Approximately seventy persons including local residents and local public officials attended the meeting. Kevin Lynch, Chief, Western New York Superfund Compliance Section II; Michael Walters, EPA Remedial Project Manager; and Michael

Basile, Region II Community Relations Coordinator, represented EPA. Responses to oral comments made at the public meeting are summarized in this Responsiveness Summary. A transcript of the public meeting is attached to the ROD as Appendix VI.

The alternative identified in the ROD and in the Proposed Plan as Alternative 2B was selected by EPA as the interim remedy for the first operable unit at the Site. The remedy identified as Alternative 2A was the remedy identified as the preferred alternative in the Proposed Plan. For a discussion of the reason for such change, see "Documentation of Significant Changesn at page 20 of the ROD.

The selected interim remedial alternative will consist of providing an alternate supply of clean, dependable drinking water to residents on Pratt Road and Kelsey Road by extending the water lines of the Consolidated Water District of the Town of Batavia to service such residences and by replacing or retrofitting of the residential ground water well piping systems with new piping and appurtenances needed for accessing the residences to the waterline.

III. SUMMARY OF MAJOR QUESTIONS AND CONCERNS RECEIVED SINCE THE COMMENCEMENT OF THE PUBLIC COMMENT PERIOD AND EPA RESPONSES

Public comments were expressed at the public meeting on September 10, 1992, and in written comments sent to EPA during the public comment period. These concerns are summarized below and are organized into the following categories:

A. COMMENTS FROM THE GENERAL PUBLIC

B. COMMENTS FROM LOCAL GOVERNMENTS

1. COMMENTS FROM THE BOARD OF TRUSTEES, VILLAGE OF OAKFIELD

2. COMMENTS FROM THE TOWN BOARD, TOWN OF BATAVIA

C. COMMENTS FROM POTENTIALLY RESPONSIBLE PARTIES

1. COMMENTS FROM NL INDUSTRIES, INC.

2. COMMENTS FROM EATON CORPORATION, GTE PRODUCTS CORP., UNISYS, INC., R.E. CHAPIN MANUFACTURING WORKS, INC., CITY OF EATAVIA, TOWN OF EATAVIA (the "PRP GROUP").

A. COMMENTS FROM THE GENERAL PUBLIC

1. Preference for Proposed Plan Alternative 2B:

At the public meeting and in subsequent written comments local residents asserted:

- that persons living on Kelsey Road north of the NYS Thruway were actually closer to the Site than persons living south of the Thruway;
- that some of those residents had been told by County authorities not to drink their well water;
- that many of them have not used their water for drinking purposes for many years;
- that their wells had not been tested since 1988 and that because contamination in the aquifers can change over time EPA should not make its decision based upon an assumption that there was no contamination in their wells; and
- that the old tests may not be reliable in any event since they were not performed at various seasons to account for seasonal fluctuations in the water supply due to local irrigation use and other factors.

The public also expressed the concern that the cost of providing water to the residents on the northern portion of Kelsey Road would increase in the future so that it would be more economical to provide mains now rather than in the future.

EPA Response: EPA has, in a Record of Decision ("ROD"), selected the remedy identified therein and in the Proposed Plan as Alternative 2B as the interim remedy for the Site. The remedy identified as Alternative 2A was the remedy identified as the preferred alternative in the Proposed Plan. For a discussion of the reason for such change, see "Documentation of Significant Changes" at page 20 of the ROD. Selection of Alternative 2B addresses the identified concerns.

Due to the gradient between the Site and the wells on northern Kelsey Road the hazardous substances would likely be intercepted by Galloway Swamp before reaching drinking water wells. Selected residential wells on northern Kelsey Road have been sampled by the NYSDOH on three separate occasions recently (August 1991, October 1991 and January 1992). All such sampling events failed to detect the presence of contamination, thus supporting EPA's belief that the wells on northern Kelsey Road are unlikely receptors for Site contaminants. However, in stating its preference for Alternative 2A in the Proposed Plan, because future contamination from the Site, can not be ruled out with absolute certainty (whether caused by changed circumstances or by presently unperceived fact), EPA planned to monitor conditions east of the Site by means of a series of nine monitoring wells to ascertain that hazardous substances were

not migrating to the homes that were not to have received public water. However after consideration of public comments the EPA has decided to implement Alternative 2B, extending the waterline on northern Kelsey Road thus negating the need for the planned monitoring.

2. Public concern about costs of implementing the preferred remedy and the alternate remedies:

A local resident asked if the connection from the water mains to the house will be part of the remedy and thus paid for by someone other than the residents. Secondly, he inquired as to who will assume the maintenance costs for the new water supply, from the Consolidated Water District, once it becomes operational. Thirdly, he wanted to know why the EPA's capital cost estimate in a draft of the focused feasibility study was higher than the Town of Batavia's estimate for similar work.

EPA Response: The cost of installing the mains and connecting up each home on Pratt and Kelsey Roads (including one installation at each Trailer Park) to the waterline will be provided for by the interim remedy, thus it will be paid for by the EPA or the PRPs.

EPA's responsibility for the alternate water supply ends upon completion of construction, when responsibility for operation and maintenance is transferred to the Consolidated Water District. Therefafter, each resident would pay for use of the water system in accordance with the requirements of the water district.

The EPA cost figure cited by the local resident was from a "draft" work-in-process document and did not reflect EPA's final calculations. In response to public comments, EPA did revise its cost estimates based upon local cost figures submitted to it during the public comment period.

3. Concern About Sampling Result Showing High TCA Contamination:

A local resident inquired about a May 1986 sampling of a private well at 8084 Kelsey Road which exhibited abnormally high amounts of 1,1,1-trichloroethane (240 parts per billion), and stated his belief that it must be from the Site.

EPA Response: Other homes sampled at that time on Kelsey Road indicated no contamination. New York State Department of Health's (NYSDOH's) August and October 1991 and January

1992 testing of a well installed in that location in 1986 to replace the contaminated well has since consistently failed to show contamination. All of the information gathered under the remedial investigation suggests that the 1986 presence of TCA in the residential well at 8084 Kelsey was from a source other than the site. If the TCA disclosed in the 1986 sample were from the Site, then it would have been likely that other wells on Kelsey Road sampled in 1986 would also have shown TCA contamination in 1986.

4. The owner of a local trailer park wanted to know if the connections to the public water supply would be made to the individual trailers or to the system presently in place for the trailer park.

EPA Response: The connection would be from the water main to the trailer park's system, and not to the individual trailers.

B. COMMENTS FROM LOCAL GOVERNMENTS

1. COMMENTS FROM THE BOARD OF TRUSTEES, VILLAGE OF OAKFIELD

Following the public meeting, the Village of Oakfield sent to EPA a copy of a resolution adopted by its Board of Trustees on September 14, 1992, urging EPA to

- select alternative 2B as the interim remedy;
- connect the alternate water system to the Village of Oakfield water supply; and
- continue seasonal monitoring of groundwater heading in the direction of the Village of Oakfield Municipal water source.

EPA Response:

EPA has selected Alternative 2B as the interim remedy for the Site.

Based on data from the RI there is no risk to the Oakfield wells attributable to the Site. Therefore, the remedy does not include connection to the Oakfield supply wells. The northernmost monitoring wells between the Site and the Village of Oakfield have been resampled and results did not detect contamination. A monitoring program for the Site will be addressed in the Site-wide remedy upon conclusion of the site-wide RI/FS.

2. COMMENTS FROM THE TOWN BOARD, TOWN OF BATAVIA

The Town of Batavia Town Board passed a Resolution (No. 111) on September 16, 1991, declaring the preferred interim remedy, Alternative 2A, unacceptable. The Board voiced collective approval for Alternative 2B with the addition of a connection to an existing water main on Route 63 (the "loop").

The Batavia Town Board, at the public meeting and in written comments from their consultant Nussbaum & Clarke disagreed with EPA's projected costs for installing the waterline, which they felt was too high an estimate. They also questioned the ability of the waterline extensions in Alternative 2B (without the "loop") to sustain adequate system water pressure, especially for firefighting purposes, because of the "dead end" piping, and that this may possibly increase operation and maintenance costs (i.e., flushing and chlorination requirements).

EPA Response:

EPA has selected Alternative 2B as the interim remedy for the Site.

EPA has performed calculations to evaluate the adequacy of the pressure in the water line extension proposed as Alternative 2B. Based on this analysis, EPA has determined that there exists adequate pressure in the water line extension proposed in Alternative 2B to support residential water users along Galloway Road, in addition to meeting fire fighting capability, under peak demand situations. The result of EPA's system pressure analysis for Alternative 2B is summarized as follows: The standard minimum pressure required to provide the residential and fire fighting service is 20 pounds per square inch (20 psi). EPA calculations show that a residual water pressure of 43.4 psi (pounds per square inch) will exist in the proposed waterline extension under Alternative 2B (without the "loop" to Route 63).

EPA's analysis showed that Alternative 2B is cost effective.

C. COMMENTS FROM POTENTIALLY RESPONSIBLE PARTIES

1. COMMENTS FROM NL INDUSTRIES, INC.
(Incorporating comments prepared by GZA GeoEnvironmental, Inc. (GZA) for NL Industries, Inc. (dated October 28, 1992) on the Draft Final Focused Feasibility Study (FFS))

2. COMMENTS FROM EATON CORPORATION, GTE PRODUCTS CORP., UNISYS, INC., R.E. CHAPIN MANUFACTURING WORKS, INC., CITY OF EATAVIA, TOWN OF EATAVIA (the "PRP GROUP").
(Incorporating i.) comments prepared by Environ Corporation

for the PRP Group (dated October 1992) on the Draft Interim Ground Water Risk Assessment; and ii.) comment's prepared by Legette, Brashears & Graham, Inc. (LBG), for the PRP Group (dated October 1992), on the Remedial Investigation (RI) Report prepared by GZA GeoEnvironmental, Inc. (GZA)).

1. RESPONSE TO COMMENTS FROM NL INDUSTRIES

Response to Comments prepared GZA GeoEnvironmental, Inc. (GZA) for NL Industries, Inc. (dated October 28, 1992) on the Draft Final Focused Feasibility Study (FFS))

I. General Comments

Issue 1 **The comment disagrees with EPA's hydrogeologic model for the Site by questioning EPA's conclusion that ground water in the south of the Site flows southward to the residential areas.**

Response As stated in the Preface to the RI Report, EPA believes that EPA's Conceptual Groundwater Model best represents hydrogeologic conditions at the Site.

Issue 2 **The comment also disagrees with the assumption in the Interim Ground Water Risk Assessment of flow of contaminants with no attenuation, degradation or dispersion.**

Response This approach is common practice in risk assessment. It is considered especially relevant given the contaminants of concern and the fact that current or potential future receptors are located in relatively close proximity to the contaminant source. For example, vinyl chloride, a conservative contaminant which is not expected to further degrade, is not expected to be significantly affected by attenuation given the relatively short distance and high mobility of this compound. Also, the dispersion coefficient for contaminant plumes in ground water is relatively small and would not be expected to have a significant effect on diluting the contaminant plume. The Interim Ground Water Risk Assessment was prepared in accordance with EPA Guidance based upon EPA's understanding of Site hydrogeology.

II. Page-Specific Comments

§ 1.1, ¶ 1 **The comment states that the FFS considers remediation of areas east, northeast and south of the site, and therefore is inconsistent with EPA's**

Interim around Water Risk Assessment which does not consider potential affects to residences east and northeast of the site.

Although the Interim Ground Water Risk Assessment disclosed the need for remedial action at the Site based upon hazardous substances that had been released or threatened to be released to the south, the FFS is required to develop and evaluate remedial alternatives such that relevant information concerning remedial action alternatives can be presented to a decision maker and the appropriate remedy selected. Consideration should not be limited to addressing areas south of the Site.

§ 1.21 ¶ 4 The comment states that fill is not present over the entire southern portion of the site.

Based on visual observations made during EPA/TRC's on-site reconnaissance conducted on June 5, 1992 at the Site, the entire southern portion of the Site appeared to be recently vegetated or filled.

§ 1.3.2, ¶ 2 The comment does not agree with the EPA's assessment that the ground water levels are affected by off-site withdrawals.

GZA's continuous ground water level measurements were performed for a period of only 11 days (maximum measurement interval) during late December 1987 and early January 1988, and thus would not reflect seasonal withdrawals from nearby wells supporting agricultural uses. Effects of these wells would only be observed during the spring and summer months. In addition, the data collected by GZA and presented in the RI Report are of insufficient duration to document long term trends in aquifer water levels. Lastly, a plot of a portion of the data from well BL-5R shows a cyclic oscillation of 0.6 feet maximum. These data indicate that the bedrock water levels are subject to some off-site influence, possibly from water production wells including, but not limited to, the agricultural production well located 0.6 miles southeast of the Site.

§ 1.3.2, ¶ 4. The comment concludes that the Clarendon-Lindon Fault, located approximately five miles east of

the site, is not a probable pathway for flow at the Site.

Section 1.3.2 of the FFS is not implying that this fault is a ground water pathway for flow at the Site. The FFS merely points out that the highly fractured zones in the limestone bedrock formation and the impacts of newly constructed wells may create a complex hydrogeologic regime. Therefore, the possibility exists that production wells located in the vicinity of the fault could affect ground water flow along the fault thereby exerting an influence on contaminant pathways.

I 1.3.4, ¶ 2 The comment states that RI elevation data would indicate that ground water flows north from the pond (which is south of the Site and south of I-90) to the Site and contradicts EPA's conclusions that i.) the pond is a discharge point for ground water from the Site and ii.) that groundwater flows north to south.

The pond referred to is part of a localized condition and does not negate the general north to south flow determined in EPA's Conceptual Groundwater Model. Since it is not known whether the pond water and ground water are hydraulically connected, no conclusion should be drawn from a comparison of the data which were presented.

I 1.4, ¶ 1 The comment states that EPA should address data gaps prior to implementing the remedy.

Alternatives developed in the FFS consist of conceptual designs. Depending on the remedy selected, more data may have been needed to do a detailed design. For example, if Alternative 3 had been selected, data would have been needed to properly design the extraction system. Sufficient data exists to characterize the potential risks due to ground water contamination at the Site and such risks were evaluated in the Interim Ground Water Risk Assessment.

§ 1.4, ¶ 8 The comment suggests that only data from the southern portion of the Site is relevant to the FFS.

This section of the FFS characterizes the nature

and extent of ground water contamination at the Site and is appropriate. The FFS is primarily concerned with providing immediate protection of human health and the environment. As such, it is warranted that contaminants observed at locations other than in the vicinity of the southern portion of the site be considered.

§ 2.1, ¶ 1 **The comment notes that referenae to "...universal Federal" is unclear.**

This was a typographical error. The reference should have been to "the universe of Federal and State requirements . . ." rather than "the universal Federal and State requirements . . ."

§ 2.2, ¶ 4 **The comment states that the FFS erroneously states that a "similar suite of chemicals was found in the lower soil zone and bedrock." The comment notes that this statement is inconsistent with the RI data which indicates that several organics were detected in the lower soil sone and not in bedrock.**

The FFS uses the term "similar", not "identical". The chemicals found in both the soil and the bedrock, and the fact of the groundwater flow direction, indicate that there are not two distinct aquifers but rather one heterogenous aquifer.

§ 2.2, ¶ 6 **The comment states that the FFS implies that contaminants from the Site have the potential to impact all residences in the vicinity of the site. The comment further states that since EPA has only assessed impacts on homes south of the site in the Interim Ground Water Risk Assessment, this statement should be deleted.**

EPA has quantified the risk to the residents to the south of the Site. However, there does exist the potential impact to other residents due to factors such as a change in hydrogeologic conditions due to factors including local well pumping and/or construction activities in the area.

§ 3.1, ¶ 2 **The comment states that chloroethane, 1,1-**

dichloroethane, xylenes, barium, magnesium and manganese (compounds which would be **expected** in contamination from the Bite) are more mobile than **1,1,1-TCA** in ground water. **Since** these compounds were either not detected or not tested at the residential wells along Pratt Road, **EPA's suggestion** that **1,1,1-TCA** detected at the residences **is** attributable to the Bite **is** unfounded.

RI data, including **EPA's** Conceptual Groundwater Model, demonstrates that groundwater from the Site is migrating towards the wells. EPA believes that the contaminants detected at the Site do not exist as a well mixed, homogenous plume. Therefore, it cannot be assumed that given the initial concentrations of contaminants at the Site, their varying densities, the location of receptor well intakes, and other hydrogeologic parameters **(e.g.,** cation exchange capacities) that these compounds would necessarily be detected with 1,1,1-TCA at residential wells.

§ 3.1, ¶ 8 **The comment states that EPA does not know which way the groundwater flows in the bedrock at the Bite.**

RI data, including **EPA's** Conceptual Groundwater Model, demonstrates that groundwater from the Site is migrating towards the wells. The paragraph questioned in the comment discusses the possibility of seasonal variations of flow but does not contradict the conclusions of **EPA's** Conceptual Groundwater Model.

§ 3.1, ¶ 9 **The comment cites measured rainfalls over the past three years and average precipitation for inclusion in the BBB to support its contention that there has not been a three year drought.**

For purposes of this study, drought conditions are not defined only by average or total annual precipitation values. Such values can be misleading. If precipitation events during a given time interval do not exceed evaporation and transpiration, no aquifer recharge occurs. Any analysis of aquifer recharge and assessment of whether a drought is occurring, must also take into account additional variables in the water balance including runoff, evaporation and

transpiration. GZA's comments do not address these issues. Further the absence or existence of a drought would not have an effect upon the decision.

§ 4.1.2, ¶ 2 **The comment states that the residences along Pratt Road are not "directly" south of the Site since they are approximately one-half mile away.**

The FFS does not describe the homes as "directly" south. However, this is a semantic difference with no effect. Based upon the RI including EPA's Conceptual Groundwater Model, EPA has determined that the Site presents an imminent and substantial endangerment to the residents.

§ 4.1.2, ¶ 2 **The oomment states that ground water monitoring is a remedial alternative that will prevent undetected movement of compounds from the Site toward Pratt Road and should be considered in the FFS.**

Ground water monitoring is considered in the evaluation of "Alternative 1: No Action" to monitor the migration of contaminants, in ground water from the Site.

§ 4.1.4.3, ¶ 3 **The comment asks what additional sampling is planned.**

Additional sampling is not planned in connection with the interim remedial action to which this Responsiveness Summary relates.

5 5.2.1.2, ¶ 1 **The comment requests that EPA provide oalculations supporting its statement that natural attenuation mechanisms would require several decades to reduce contaminant concentrations to acceptable levels.**

Attenuation at this location is not attributable to mathematical manipulation because the landfill is expected to be a continuing source for the foreseeable future. As such, attenuation of the source through leaching of contaminants will likely not occur until a source control remedy is implemented. In fact, it is possible that contaminant concentrations may increase. Although the sentence concerning natural attenuation over decades was incorrect, the error has no effect on

the conclusions of the FFS.

§ 5.2.2, ¶ 2 **The comment asks whether consideration was given to the town paying for portions of the remedial alternative that are of benefit to them but not necessary for remediation.**

EPA has determined that all parts of the selected interim remedy are necessary to address the identified risks.

§ 5.2.2, ¶ 2 **The comment states that the objective of the FFB is to provide proteation of potential reaeptors where contaminants have been detected, and that the FFB is inconsistent with other sections of the FFS and the RA.**

This comment has been addressed in the above responses for comments on **§ 1.4 ¶ 8** and **§** 2.2 **¶** 6.

§ 5.2.3, ¶ 2 **The comment states that the BFB, RA, etc. should not be based on assumed groundwater flow directions, rather UBEPA should evaluate the actual flow direction south of the site.**

Using the data from the RI Report the EPA has determined the actual flow direction and found it to be south in the southern part of the Site. The groundwater elevations in monitoring wells MW-1, BL-1, BL-9 and BL-20 when plotted graphically do indicate a definite southern groundwater movement from the Site towards Pratt Road.

§ 5.2.3, ¶ 3 **The comment states that the seepage velocity value included in GZA's 1991 draft version of the RI report should not be used for hypothetical flow to the south.**

Seepage velocity values from the RI were used to estimate hydraulic conductivity based upon gradients and estimates of porosity. Estimating hydraulic conductivity in this manner is sound hydrologic practice, at this level of study. The RI did not present any information that would support the contention, in the comment on this paragraph, that overburden hydraulic conductivity is directionally dependent. Change in flow direction or gradient will not change the hydraulic conductivity of the aquifer. Therefore,

the determination of hydraulic conductivity by the methods used in the FFS is appropriate.

§ 5.2.3, ¶ 3 **The comment states that the EPA incorrectly calculated hydraulic conductivity values and that EPA should have used the values contained in the RI Report.**

GZA's 1991 draft version of the RI report did not present any calculations for hydraulic conductivity. Therefore, EPA calculated the values based on the data in the draft RI Report. The hydraulic conductivity values used in the FFS are within the same order of magnitude as the values of the GZA 1992 final RI Report. Therefore, the conclusions of the FFS would not be impacted.

2. RESPONSE TO COMMENTS FROM EATON CORPORATION, GTE PRODUCTS CORP., UNISYS, INC., R.E. CHAPIN MANUFACTURING WORKS, INC., CITY OF BATAVIA, TOWN OF BATAVIA (the "PRP GROUP").

i. Response to Comments prepared by Environ Corporation for the PRP Group

A. Executive Summary

Issue 1 **The comment asserts that i.) there is no showing that contamination in the off-site wells is Bite related nor ii.) is there a showing that significant site-related contamination will occur in the subject wella.**

Response EPA has concluded that the data contained in the RI studies, as noted in the Preface to the RI Report and in the Interim Ground Water Risk Assessment, support the conclusion that Site related hazardous substances will migrate to the subject off-site drinking water wells and that, due to such migration, there is an imminent and substantial endangerment to persons who rely upon those wells for their drinking water.

B. Scope of the Interim Ground Water Risk Assessment

Issue 1 **The comment questions whether the document constitutes a baseline risk assessment because only one medium and pathway of exposure was evaluated.**

Response As stated in the document, the Interim Ground Water Risk Assessment was intended to only focus on ground

water. Pursuant to the NCP, EPA may address a site by separating it into manageable units (denominated as operable units) to address geographical portions of a site, specific site problems, or initial phases of an action so as to efficiently address the site.

Issue 2 The comment states that time of contaminant travel was not included in the Interim Ground Water Risk Assessment, precluding determination of when contamination will reach off-site wells.

Response Time of travel calculations are typically made during the RI and are not considered part of the risk assessment. The risk assessment must evaluate whether drinking water exposures could potentially occur in the future. Conservatively, the Interim Ground Water Risk Assessment assumed that contaminants would reach nearby receptors without attenuation, an approach often adopted by EPA.

C. rim Ground Water Risk Assessment

Issue 1 The comment states that the interpretation of site hydrogeology influences the risk assessment and states a preference for the hydrogeologio model prepared by GZA for NL Industries.

Response As stated in the Preface to the RI Report, EPA believes that EPA's Conceptual Groundwater Model best represents hydrogeologic conditions at the Site. The Interim Ground Water Risk Assessment was prepared in accordance with EPA Guidance based upon EPA's understanding of Site hydrogeology.

D. Selection of Data

Issue 1 The comment suggests that 1991 data should have been included in the quantitative risk assessment.

Response The 1991 data available for wells evaluated in the Interim Ground Water Risk Assessment (southern part of the site) were limited. Only 4 samples were available for the wells included in the Interim Ground Water Risk Assessment data base and, if included in the calculations, would not substantially affect the Interim Ground Water Risk Assessment.

Issue 2 The comment is critical of using unfiltered ground water results in the Interim Ground Water Risk Assessment.

Response EPA calls for evaluating risk associated with unfiltered ground water sampling results. Note that EPA Guidance (RAGS, page 6-27) says that "data from unfiltered samples should be used to estimate exposure concentrations." RAGS states that data from filtered samples "may underestimate chemical concentrations in water from an unfiltered tap."

E. Use of Monitoring Well Data to Estimate Domestic Ground Water Concentrations

Issue 1 The comment notes that monitoring well results were used to estimate domestic ground water concentrations. No contaminant attenuation was assumed.

Response This approach is common practice in risk assessment. It is considered especially relevant given the contaminants of concern and the fact that current or potential future receptors are located in relatively close proximity to the contaminant source. For example, vinyl chloride, a conservative contaminant which is not expected to further degrade, is not expected to be significantly affected by attenuation given the relatively short distance and high mobility of this compound. Also, the dispersion coefficient for contaminant plumes in ground water is relatively small and would not be expected to have a significant effect on diluting the contaminant plume. The use of numerical models to evaluate contaminant transport in ground water may be the source of great uncertainty. In this case, inputs to the model (e.g., degradation, retardation) would provide a source of great uncertainty.

F. Use of Detectio.. [illegible]

Issue 1 The comment questions the treatment of non-detect results in determining risk assessment exposure point concentrations.

Response The treatment of non-detects in the Interim Ground Water Risk Assessment (i.e., using one-half the detection limits for non-detects) is in keeping with the most recent risk assessment Guidance available for the Superfund program (i.e., RAGS). The fact that the contaminant is present in other samples in the medium (ground water) suggests that it may be present in the

"non-detect" samples at levels below the quantitation limit. Using one-half the quantitation limit is a common approach.

Issue 2 The comment indicates that certain chemicals could have been eliminated from the Interim Ground Water risk assessment due to infrequent detection.

Response Frequency of detection is an optional criterion that may be used to eliminate contaminants from the risk assessment (RAGS, page 5-20). The EPA RAGS document recommends including all chemicals in the risk assessment, regardless of frequency of detection, if it is not unwieldy to do so. This is the approach that was used in this risk assessment. Note also that a chemical's toxicity should be considered (in addition to frequency of detection) in selecting contaminants for the risk assessment. Vinyl chloride, the contaminant cited by the comment, has a relatively high carcinogenic potency such that it may pose risk at very low concentrations.

Issue 3 The comment questions i.) the method used to calculate the upper confidence limit (UCL) concentration which is used in risk equations; and ii.) the fact that several of the calculated UCLs exceed the maximum detected concentration.

Response The upper confidence limit is calculated by first transforming each data point with the natural logarithm function. The subsequent equation used to calculate the UCL is provided by Gilbert (1987) and is cited by both EPA's RAGS document and recent Supplemental Guidance to RAGS: Calculatina the Concentration Term (1992) as one of the favored methods.

The calculated UCLs are estimates of the true mean. The estimate relies on several statistical parameters, including the number of samples and the standard deviation of the data distribution. In most cases, a smaller number of samples will result in higher UCLs. This is evident when evaluating summary statistics based on a total of 12 samples analyzed. In addition, detection limits that are higher than detected results may also result in higher UCLs. One way of alleviating the effect of elevated detection limits is to resample using analytical techniques to lower the detection limit, especially for chemicals that are quite toxic and may show risk at levels below typical detection limits (e.g., vinyl chloride). In light of uncertainty

regarding the true levels of certain contaminants due to elevated detection limits, it is appropriate to use the maximum detected concentration if the UCL is even higher.

G. Exposure Assumptions

Issue 1 **The comment suggests that other exposure pathways associated with ground water may pose significant risk.**

Response The ingestion pathway, evaluated in the Interim Ground Water Risk Assessment, is the most significant pathway. The risk determined by this analysis lies outside of the tolerated risk range. Evaluation of additional **exposure** pathways for ground water would only serve to increase risk.

Issue 2 **The comment discusses recent EPA policy approaches to further characterize risk by evaluating a range of exposure assumptions. The brevity of the uncertainty analysis is also cited.**

Response Recent EPA Guidance recommends calculating estimates of exposure using a central tendency as well as a reasonable maximum exposure (RME) in an attempt to quantify the uncertainty associated with the risk assessment. The implementation of the use of central tendency is currently under development by the Agency. However, it is current EPA policy to make all risk management decisions based on risk assessments performed using reasonable maximum exposures, the method used to perform this Interim Ground Water Risk Assessment.

H. Toxicoloaical Evaluation

Isaue 1 **The comment cites uncertainties and varying levels of confidence in the chemical-specifia toxicity values used in the Interim Ground later Risk Assessment for arsenic.**

Response The arsenic slope factor value used in the Interim Ground Water Risk Assessment reflects **EPA's** current approach for evaluating arsenic at Superfund sites.

I. Risk Characterization and **Proposed** Remediation

Issue 1 **The comment expresses a preference for certain**

assumptions in a risk assessment prepared for the Site by GZA.

Response EPA policy requires that EPA perform the RI risk assessment. The Interim Ground Water Risk Assessment was prepared in accordance with EPA protocols for performance of a risk assessment.

Issue 2 The comment states that i.) EPA assumed no attenuation of chemicals; and ii.) EPA aoncluded that TCA concentration currently found in residential wells pose an insignificant risk to receptors.

Response With respect to the first part of this comment, EPA correctly **assumed** no attenuation in the Interim Ground Water Risk Assessment (see EPA response to Item **E,** issue **1,** above).

With respect to the second part of this comment, the remediation decisions in the Record of Decision are driven by the Interim Ground Water Risk Assessment which is based on the migration of hazardous substances from the Site and not on analysis of residential wells.

ii.) Response to comments prepared by Legette, Brashears & Graham, Inc. (LBG), for the PRP Group (dated October 1992), on the Remedial Investigation (RI) Report prepared by GZA GeoEnvironmental, Inc. (GZA)).

Issue 1 The comment indicates that both water-level data and contaminant concentrations demonstrate ground water flow is to the northeast. The comment also questions the Bite as the source for 1,1,1-TCA observed in residential wella along Pratt Road.

Response EPA does not dispute that there is a strong component of ground water flow toward the east and northeast. However in the southern portion of the Site there is a southern component of flow in both the overburden and bedrock. EPA believes that the data indicate that the Site is the source of the TCA observed in the residential wells. However, the decision was not based upon a finding of TCA actually in the residential wells but rather upon the risk from the migration of hazardous substances from the Site.

Issue 2 The comment indicates that ground water flow in the southern portion of the site has not been well

understood; previous interpretations which indicate a southerly ground water flow in this area are not supported by available RI data.

Response The RI report illustrates that ground water elevation data demonstrate a southerly component of flow in both the overburden and bedrock in the southern portion of the landfill. According to GZA's RI report, water level measurements collected from overburden monitoring wells (located counterclockwise [CCW] from north to, southwest) MW-1 (893.2' above mean sea level [msl]), MW-5 (892.9 ' above msl), BL-1 (891.6' above msl) and bedrock monitoring wells (also located CCW from north to southwest) BL-4R (888.7 ' above msl), BL-3R (888. '5 above msl), and MW-10 (888.0' above msl) demonstrate that there is ground water flow beyond the southern site boundary.

APPENDIX VI

TRANSCRIPT OF PUBUC MEETING
SEPTEMBER 10, 1092

APPENDIX VII

MODIFIED COST ESTIMATE FOR ALTERNATIVE 2B BASED UPON LOCAL CONSTRUCTION CONTRACT BID AVERAGES

Atternatlve 2B - Kelsey Road North of the Thruway

Earth Work	2,000 cu. yd.	$5.0/cu. yd.	$ 10,000
10" Waterline	6,400 LF	$ 32/LF	$204,800
20" Casing Thruway	280 LF	$200/LF	$ 56,000
Valves	6 ea.	$1,350/ea.	$ 8,100
Tee	1 ea.	520/ea.	$ 520
Fire Hydrant	11 ea.	$1,000/ea.	$ 11,000
Service Connection	8 ea.	$1,900/ea.	$ 15,200
			$305,620 Direct Capital Cost
		Contingency 10%	$ 30,562
			$336,182
		Eng. Supervision Administrative 25%	$ 84,046
			$420,228 Total Capital Cost
O&M = $2,788/yr. - Present Worth (30 year)			$ 42,859

Alternative 2B

Capital Cost:	$ 598,187	2A (Pipe)
	$ 420.228	2B (North)
	$1,018,415	2B Total Capital Cost

O & M

$ 52,972	2A (Pipe)
$ 2,788	2B (North)
$ 55,760	2B Total O & M 1 yr.

Total Present Worth (30 years)

$1,465,343	2A (Pipe)
$ 463,087	2B (North)
$1,928,843	2B Total Present Worth (@ 5 % annual interest))

References:

1. The Final Focused Feasibility Study Report for the Batavia Landfill, dated August 28, 1992, prepared by TRC Environmental Corporation under contract to the U.S. EPA. (Contract No.: 68-W9-0003 (TES 6)).

2. Town of Batavia Proposed Consolidated Water District Extension, dated April 1992, prepared by Nussbaumer & Clarke, Inc.

3. Letter, dated September 15, 1992, from Dean T. Perry, P.E., of Nussbaumer & Clarke; Inc., to Mr. Frank Repicci, Manager, Town of Batavia.