PB93-963807
EPA/ROD/R02-92/182
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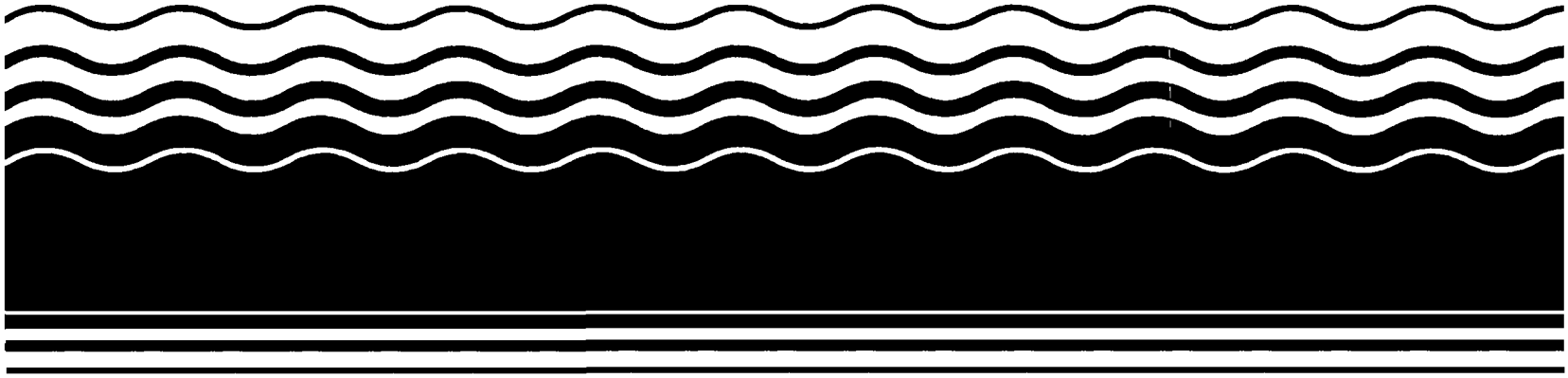
United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA

Superfund Record of Decision:

Bioclinical Laboratories, NY



NOTICE

The appendices listed in the index that are not found in this document have been removed at the request of the issuing agency. They contain material which supplement, but adds no further applicable information to the content of the document. All supplemental material is, however, contained in the administrative record for this site.

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. EPA/ROD/R02-92/182	2.	3. Recipient's Accession No.

4. Title and Subtitle	5. Report Date
SUPERFUND RECORD OF DECISION Bioclinical Laboratories, NY First Remedial Action - Final	09/30/92 6.
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12. Sponsoring Organization Name and Address U.S. Environmental Protection Agency 401 M Street, S.W. Washington, D.C. 20460	13. Type of Report & Period Covered 800/000 14.

15. Supplementary Notes

PB93-963807

16. Abstract (Limit: 200 words)

The 2.6-acre Bioclinical Laboratories (BCL) site is located in Bohemia, Suffolk County, New York. BCL occupied 1 unit in a 10-unit building, leased by various tenants. Land use in the area is mixed commercial, industrial, and residential. The nearest residential development is found approximately 1,000 feet from the site, and most residents are connected to the public water supply system. The two aquifers underlying the site, the Upper Glacial and the Magothy, represent the main source of potable water for the area. From 1972 to 1984, BCL used the site to formulate and repackage industrial chemicals for wholesale distribution to manufacturers. During this process, indoor sinks that were used for washing chemical mixing vessels drained to the east sanitary sewer system. In 1981, a fire partially destroyed BCL's chemical inventory and resulted in surface water runoff of hazardous waste. The county ordered BCL to clean out the sanitary system and submit a plan for installing a ground water monitoring system; however, no wells were ever installed. In 1984, the business was sold and moved to another location; in 1990, it ceased operation entirely. An additional source of contamination has been partially attributed to another tenant at the site, the Panatone

(See Attached Page)

17. Document Analysis a. Descriptors

Record of Decision - Bioclinical Laboratories, NY
First Remedial Action - Final
Contaminated Media: None
Key Contaminants: None

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 54
	20. Security Class (This Page) None	22. Price

EPA/ROD/R02-92/182
Bioclinical Laboratories, NY
First Remedial Action - Final

Abstract (Continued)

Finishing Corporation. Their metal finishing operations were connected to the west sanitary sewer system. Numerous sanitary code violations by Panatone led to a limited ground water investigation by the county in 1981 that revealed 1,1,1-TCA and 1,1-DCA at concentrations above state drinking water standards. In addition to the west sanitary sewer system, Panatone utilized a leaching pool on the north side of the building to dispose of effluent. In 1985, this leaching pool was pumped out, cleaned, and removed from service. Sampling performed by the county in 1991 revealed no contamination in the east sewer system and minor contamination in the west sewer system. In 1992, the property owner and current tenants cleaned out the contamination in the west sewer system and were ordered to halt future potentially hazardous discharges. This ROD will determine the nature and extent of contamination to ensure protection of human health and the environment and is the only OU planned for the site. As a result of previous clean-up activities, risk assessment results indicate that contaminant levels do not exceed risk-based standards; therefore, there are no contaminants of concern affecting the site.

The selected remedial action for this site is no further action. The risk assessment results indicate that the levels of contamination present in the soil, air, sediment, and ground water present risks which fall within or below EPA's allowable risk range. There are no costs associated with the no action remedy.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

ROD FACT SHEET

SITE

Site name:	Bioclinical Laboratories, Inc.
Site location:	Town of Islip, Suffolk County, New York
HRS score:	36.64

ROD

Date signed:	Sept. 30, 1992
Selected remedy:	No Further Action
Capital cost:	N/A
O & M cost:	N/A
Present-worth cost:	N/A

LEAD

Fund:	Environmental Protection Agency
Primary contact:	Damian Duda (212-264-9589)
Secondary contact:	Doug Garbarini (212-264-0109)
Main PRP:	Carpentier Construction

WASTE

Waste types:	Volatile and semi-volatile organics (trichloroethene, 1,1,1-trichloroethane, trichlorofluoromethane, bis(2-ethylhexyl) phthalate, etc.)
	Inorganics (arsenic, chromium, lead, etc.)
Waste quantity:	Unknown
Contaminated media:	Soils, sediments, groundwater

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Bioclinical Laboratories
Hamlet of Bohemia, Town of Islip, Suffolk County, New York

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Bioclinical Laboratories site (Site), which was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. §§ 9601-9675, and the National Contingency Plan (NCP). This decision document explains the factual and legal basis for selecting the remedy for this Site. The information supporting this remedial action decision is contained in the administrative record for this Site. The administrative record index is attached (Appendix III).

The New York State Department of Environmental Conservation concurs with the selected remedy, as per the attached letter (Appendix IV).

DESCRIPTION OF THE SELECTED REMEDY - NO FURTHER ACTION

The United States Environmental Protection Agency (EPA) in consultation with the State of New York has determined that the Site does not pose a significant threat to human health or the environment and, therefore, remediation is not appropriate. This determination is based on previous cleanup activities conducted at the Site and the remedial investigation activities conducted by EPA from 1989 through March 1992. Thus, "No Further Action" is the selected remedy for the Site.

DECLARATION

In accordance with the requirements of CERCLA, as amended, and the NCP, it has been determined that no further remedial action is necessary to protect human health and the environment at the Site. Previous cleanup activities conducted in response to Suffolk County Department of Health Services' enforcement actions have remediated the significant contamination present at the Site. Since this remedy will not result in hazardous substances remaining on-site above health-based levels, the five-year review will not apply to this action.

Since EPA has determined that no further remedial action is necessary at the Site, the Site now qualifies for inclusion in the "Sites Awaiting Deletion" subcategory of the Construction Completion category of the National Priorities List.

Constantine Sidamon-Eristoff
Regional Administrator

Date 9/30/92

RECORD OF DECISION
DECISION SUMMARY

Bioclinical Laboratories
Hamlet of Bohemia
Town of Islip
Suffolk County, New York

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

TABLE OF CONTENTS

SITE NAME, LOCATION AND DESCRIPTION

The Bioclinical Laboratories (BCL) site (Site) is located at 1585 Smithtown Avenue in the Hamlet of Bohemia in Suffolk County, New York, approximately 0.5 mile south of Long Island's MacArthur Airport (see Figure 1). BCL previously occupied Unit I of a 10-unit building, which is situated on 2.6 acres; each unit of the building is occupied by various tenants. The remainder of the Site is covered mostly by pavement (see Figure 2). The one-story building has approximately 39,000 square feet of floor space and is situated on a 2.6-acre paved lot. The building is serviced by two distinct on-site sanitary systems, each consisting of a septic tank, distribution pool, and related storm drain drywells, located south of the building on the east and west sides. BCL was connected to the east system. The storm drains at the Site collect runoff from the asphalt areas and recharge it directly into the aquifer.

The land in the vicinity of the Site is zoned for industrial and commercial development, with many small industries located in the area. The nearest residential development is approximately 1,000 feet to the south of the Site, just beyond a 3-acre lot of deciduous forest.

There is no designated New York State significant habitat, agricultural land, historic or landmark site directly or potentially affected by the Site. There are no endangered species or critical habitats within close proximity of the Site.

At the Site, the aquifers of concern include the Upper Glacial (300 feet thick) and the underlying Magothy (900 feet thick) (see Figure 3). The aquifers are Class IIA aquifers and represent the sole source of potable water for the area. The Site is underlain by a thick relatively homogeneous deposit of fine to coarse grain sand. Here the Magothy aquifer overlies the Raritan Clay Member of the Raritan formation and is overlain by the Gardiner Clay which acts as a confining layer. Both local and regional groundwater flow within the Site vicinity are in a south-southwesterly direction (see Figure 4). The velocity of the horizontal groundwater flow in the Upper Glacial Aquifer is estimated to be 1.85 feet/day and that of the Magothy Aquifer is estimated to be 0.5 feet/day. Groundwater level measurements indicate that groundwater generally occurs 30 to 40 feet below grade.

As of 1986, the Suffolk County Department of Health Services (SCDHS) had identified 14 municipal wells (Locust Avenue wellfield) within a 3-mile radius of the Site, serving an estimated population of 5,549 persons. Subsequently, with the expansion of public water supply to the immediate vicinity of the Site, many users of private wells were disconnected from private wells and reconnected to the public water supply system available in the area.

There are no surface water courses in proximity to the Site. The closest water body is the Connetquot River, which is approximately 2.2 miles to the southwest; the Site is not within the watershed of the river.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

BCL was founded in 1972 to formulate and repackage industrial chemicals for wholesale distribution to manufacturers. During this processing, containers contaminated with various inorganic chemicals were washed both indoors and outdoors for reuse. Indoor sinks were used for washing chemical mixing vessels; these sinks drained to the east sanitary system. Drums were routinely rinsed above storm drains at the front and rear of the building.

In July 1981, a fire partially destroyed BCL's chemical inventory. This resulted in surface runoff of hazardous waste and air emissions. In September 1981, SCDHS issued a Decision and Order to BCL to clean out the sanitary system and submit a plan for the installation of a groundwater monitoring system. In November 1981, the sanitary system was cleaned out and a plan for groundwater investigation was submitted. SCDHS deemed the plan inadequate, and no wells were installed by BCL. BCL was sold in 1984 and moved operations to another location. As of April 1990, the subject business had ceased operations.

Another source of organic and inorganic contamination at the Site has been partially attributed to activities by another tenant, Panatone Finishing Corporation (Panatone). Panatone, a company involved in the preparation and application of finished metal products, leased Unit D of the building. Panatone was connected to the west sanitary system of the building. Numerous violations of the Suffolk County Sanitary Code were issued by the SCDHS to Panatone for discharging hazardous substances to the environment. In September 1981, SCDHS issued a Consent Order to Panatone to cease discharges of hazardous materials to surface soils and the sanitary system, to clean up contaminated soils and to apply for pertinent discharge permits. In October 1981, Panatone complied with the provisions of the order. Subsequently, a limited groundwater investigation was conducted as a result of enforcement actions related to the violations. This investigation detected 1,1,1-trichloroethane and 1,1-dichloroethane above New York State Department of Health (NYSDOH) drinking water standards. In addition to the west sanitary system, Panatone utilized a leaching pool (unrelated to the sanitary system) for the disposal of effluent on the north side of the building. In October 1985, this leaching pool was pumped out, cleaned, and removed from service by the owner of the property. Panatone is no longer in operation.

During 1983 and 1984, the U.S. Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (NYSDEC) conducted a preliminary assessment of the Site. As a result, the Site was proposed to the National Priorities List (NPL) in June 1986; final NPL listing occurred in March 1989.

In 1986, EPA initiated a potentially responsible party (PRP) search to identify PRPs other than the Site owner. On January 4, 1989, pursuant to Section 107(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. § 9607(a), EPA issued notice letters to Carpentier Construction Corp., the operator of the Site, and Mrs. Sidney Fox of BCL.

In 1988, as a result of the incomplete groundwater assessment performed by Panatone and the final NPL listing, EPA, under CERCLA authority, issued a work assignment to its contractor Ebasco Services, Inc. to perform the remedial investigation and feasibility study (RI/FS) for the Site.

During the summer of 1991, EPA and SCDHS officials met to discuss the contamination found in the on-site sanitary systems and the potential for ongoing discharges of contaminants to those sanitary systems.

Subsequently, in September 1991, SCDHS sampled the east and west sanitary systems and related storm drains and determined that the east system (BCL) was clean, while the west system had evidence of minor contamination. In May 1992, pursuant to a December 1991 SCDHS directive, the owner of the building, in conjunction with the current tenant, cleaned out the contamination in the west system; the property owner, in conjunction with the current tenant, was also directed to halt future potentially hazardous discharges.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The RI report and the Proposed Plan for the Site were released to the public for comment on July 29, 1992. These documents, as well as other site-related documents, have been 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 Connetquot Public Library in Bohemia and the Sachem Public Library in Holbrook. A press release announcing the availability of these documents was issued on July 30, 1992. The public comment period ended on August 28, 1992. The public notice for the Site was published in Newsday on Monday, August 3, 1992 and in Suffolk Life on Wednesday, August 5, 1992.

On August 11, 1992, EPA conducted a public meeting at the Greenbelt Recreation Center in Holtsville, Suffolk County, New York to inform local officials and interested citizens about the Superfund process, discuss the RI findings, present the Proposed Plan, and respond to questions from area residents and other attendees.

EPA did not receive any comments on the RI or Proposed Plan during the public meeting. Responses to written comments on the RI and the proposed remedy received during the public comment period are included in the Responsiveness Summary (see Appendix V).

SCOPE AND ROLE OF OPERABLE UNIT

This is the first and only operable unit planned for the Site. The primary objective of this operable unit is to determine the nature and extent of contamination at the Site and to identify measures, as appropriate, to ensure protection of human health and the environment.

The specific objectives of the RI and the risk assessment for the Site are as follows:

- to identify all potential source areas of contamination;

- to characterize the nature and extent of possible contamination in environmental media on-site;

- to determine the hydrogeologic characteristics of the Site by assessing potential current and/or future impacts on downgradient receptors; and,

- to assess the current and future potential risks to public health and the environment caused by site contamination in the absence of remedial action.

SITE CHARACTERISTICS

Previous site investigations, conducted by SCDHS from 1977 to the mid-1980s, showed that there had been 1) unregulated discharges to the on-site sanitary systems and to an on-site leaching pit and 2) unacceptable raw material (chemicals) and waste handling practices which resulted in frequent spills to the surface soils.

Under the direction of EPA, Ebasco Services Inc. conducted an RI from May 1989 to March 1992 to characterize the geology, groundwater hydrology and chemical quality of the soils and groundwater at the Site. Typical background concentrations for metals in

soils are presented in Table 1. The investigation consisted of sampling of suspected source areas, subsurface soil sampling, surface soil sampling, sampling of the sediments and liquids in the two sanitary systems, a soil-gas survey, monitoring well installation, well-point sampling, groundwater sampling and geotechnical testing. The results of the RI are summarized below. All sampling results were compared with New York State and Federal applicable or relevant and appropriate requirements (ARARs) (see Table 2).

Groundwater

Twenty-three monitoring wells (shallow, intermediate and deep) were installed on-site and off-site to monitor both upgradient and downgradient conditions at the Site (Figure 4). On several occasions from 1990-1992, the wells were sampled for a broad spectrum of contaminants, including volatile organics (VOCs), semi-VOCs, pesticides, polychlorinated biphenyls (PCBs), and inorganics. Validated data were generated for both on-site wells (four rounds for organics and inorganics) and off-site wells (two rounds for organics and inorganics).

Tables 3 and 4 list the inorganic and organic contaminants detected in the groundwater at the Site, as well as the frequency and range of detection. Sampling data for organic contaminants indicated isolated instances where State or Federal maximum contaminants levels (MCLs) were exceeded. Aside from the organic contaminant trichloroflouromethane (TCFM) which is discussed below, no organic contaminant exceeded its respective MCL in more than one sampling round. During the Short Round sampling, toluene was detected above its MCL (5 ug/l) in one well at a maximum concentration of 13.3 ug/l. In Round I sampling, bis(2-ethylhexyl) phthalate (BEHP) was detected at concentrations exceeding its MCL (5 ug/l) in seven upgradient and downgradient wells at a maximum concentration of 72 ug/l. In Round III sampling, trichloroethene was detected above its MCL (5 ug/l) in two wells, at a maximum concentration of 9.8 ug/l. Two organic contaminants were detected above MCLs in Round IV: 1,1,1-trichloroethane in 4 wells, with a maximum concentration of 12 ug/l (MCL= 5 ug/l); and 1,1-dichloroethane in two wells with a maximum concentration of 21 ug/l (MCL = 5 ug/l).

As noted above, TCFM was the only organic contaminant to exceed MCLs in more than one sampling round. The highest TCFM concentration of 170 ug/l was found in monitoring well MW-06 in the initial round (the January/February 1990 Short Round) of sampling. TCFM was detected above its MCL in three other wells during the Short Round. It was also detected above its MCL in two wells during Rounds III (19.7 and 26.7 ug/l) and IV (19.0 and 34.5 ug/l). The concentration of this compound decreased significantly in the monitoring wells over the four rounds of ground-

water sampling, especially in MW-06. In Rounds III (February 1991) and IV (March 1991), the concentration of TCFM in MW-06 dropped to a nondetectable level and 4 ug/l, respectively. This contaminant was not detected above MCLs in any of the off-site wells. The presence of TCFM, a compound which does not persist in the environment due to its high volatility, in the on-site wells is believed to have resulted from ongoing discharges to the on-site sanitary systems.

The unfiltered inorganic sampling results showed instances of chromium, lead and silver concentrations above ARARs. Silver (MCL = 50 ug/l) was detected in one well at concentrations of 76.5 ug/l during the Short Round and 112 ug/l at a different well during Round I. Lead was detected above the Federal Action level of 15 ug/l in some upgradient and downgradient wells; an upgradient sample had the highest concentration of 162 ug/l. These unfiltered samples correlate, in part, to elevated total suspended solids in the samples. Historically, lead was not related to Site discharges. Surface and subsurface soil sampling did not reveal elevated lead concentrations. The higher lead data results could represent a background or upgradient condition.

The chromium (MCL = 50 ug/l) concentrations are shown in Table 5. The unfiltered samples collected during the Short Round and Rounds I and II indicated some elevated levels of chromium, which might have been an artifact of previous Site usage. In order to clarify the highly variable nature of the results, four supplemental rounds of samples were collected from the wells of concern, and analyses were performed on both filtered and unfiltered samples. Concentrations of chromium in the filtered groundwater samples did not exceed New York State or Federal MCLs. The additional results indicated that the elevated chromium concentrations in unfiltered samples correlated directly to elevated total suspended solids in the samples and were not representative of the quality of the groundwater.

Surface/Subsurface Soils

Six surface soil samples were taken on the north side of the building to investigate the "hot spots" north of the building, related to known or suspected discharges documented by the SCDHS (see Figure 5). One-time detections of semi-VOCs, including phenol and butyl-benzyl-phthalate, were found at relatively high concentrations, 470 ug/kg and 800 ug/kg, respectively. No VOCs were detected. Inorganic contaminants, including arsenic, chromium, and selenium, had concentrations similar to background concentrations (see Table 6).

Supplementary soil samples (see Figure 6) taken at various depths at the former leaching pool location behind the building showed a somewhat elevated concentration of chromium above background at

610 mg/kg (4 feet) (see Table 7). Samples collected at two (2) feet above and below this sample indicated lower concentrations of chromium. Typical U.S. sandy soils show levels up to 200 mg/kg of chromium. Remaining soil samples exhibited concentrations similar to typical background levels.

Eighteen subsurface soil samples (soil borings) were taken at locations both north and south of the building and around the leaching pits of the east and west sanitary systems (see Figure 5). These samples were taken to provide further information on Site geology and to determine the extent of horizontal and vertical contamination. A summary of the subsurface sampling is shown in Table 8. A one-time detection of the semi-VOC diethyl phthalate was found (170 ug/kg). Of the inorganic contaminants, cobalt, copper and manganese were detected above Long Island subsurface soil background levels but below U.S. soil background levels.

Sediments/Aqueous Samples

Seven sediment samples were taken from the on-site sanitary systems and storm drains on the south side of the building (see Figure 5). The results of the sediment sampling are shown in Table 9. Organic results showed elevated levels of VOCs, including toluene (640 mg/kg) and ethylbenzene (19 mg/kg), and semi-VOCs, including BEHP (87 mg/kg), 1,4-dichlorobenzene (31 mg/kg), 4-methylphenol (1100 mg/kg), and benzo(a)anthracene (890 ug/kg). Numerous inorganic contaminants were detected, including arsenic (4.1 mg/kg), chromium (346 mg/kg), cobalt (134 mg/kg), lead (1460 mg/kg), and silver (130 mg/kg).

Nine samples (see Table 10) were taken from the liquids present in the septic tanks and related storm drains on the south side of the building complex. Elevated levels of semi-VOCs were detected, including BEHP (22 ug/l), benzoic acid (880 ug/l) and 4-methylphenol (410 ug/l). Elevated levels of some inorganics were detected, including cadmium (38.8 ug/l), chromium (3350 ug/l), lead (624.5 ug/l), and silver (858 ug/l).

SUMMARY OF SITE RISKS

Based on the results of the RI, a baseline risk assessment (RA) was conducted to estimate the risks associated with current and future Site conditions, including land use. The baseline RA evaluates the potential impacts on human health and the environment at a site which could result from site contamination if no remedial action were taken. This information is used to make a determination as to whether remediation of a site may be required.

As part of the baseline RA, the following four-step process is utilized for assessing site-related human health risks for a reasonable maximum exposure scenario: Hazard Identification--identifies the contaminants of concern at the site based on several factors such as toxicity, frequency of occurrence, and concentration; Exposure Assessment--estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathway (e.g, ingesting contaminated well-water) by which humans are potentially exposed; Toxicity Assessment--determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response); and, Risk Characterization--summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative (e.g., one-in-a-million excess cancer risk) assessment of site-related risks.

Under current EPA guidelines, the likelihood of carcinogenic (cancer-causing) and noncarcinogenic effects due to exposure to site chemicals are considered separately. An assumption is made that the noncarcinogenic toxic effects of the site-related chemicals would be additive. The same assumption is made for the carcinogens found at a site.

The baseline RA began with selecting contaminants of concern which are representative of Site conditions. Chemicals of concern were identified for Site surface soils, subsurface soils, and groundwater underlying the Site (see Tables 11-13).

Two scenarios were developed based on current (commercial/industrial) and future (residential or commercial/industrial) land uses at the Site. Several pathways (direct contact, inhalation, and ingestion) were evaluated for exposure to groundwater, subsurface and surface soils (see Table 14). The only population evaluated under current-use conditions was the site worker population. The future populations evaluated included on-site residents (adults and children), on-site workers and construction workers. An exposure assessment was conducted to estimate the magnitude, frequency, and duration of actual and/or potential exposures to the chemicals of potential concern via all pathways by which humans are potentially exposed. Reasonable maximum exposure is defined as the highest exposure that is reasonably expected to occur at the Site for individual and combined pathways.

Potential carcinogenic risks were evaluated using the cancer slope factors (CSFs) developed by EPA for the inorganic (see Table 15) and organic (see Table 16) contaminants of concern. CSFs have been developed by EPA's Carcinogenic Risk Assessment Verification Endeavor for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals.

CSFs, which are expressed in units of $(mg/kg\text{-}day)^{-1}$, are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to generate the upper bound estimate of the excess lifetime cancer risk associated with exposure to the compound intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the CSF. Use of this approach makes the underestimation of the risk highly unlikely. EPA considers excess upper bound individual lifetime cancer risk in the range of 10^{-4} to 10^{-6} to be allowable.

For the current-use scenario, the most significant risk level identified for Site workers was 2.9×10^{-6} for inhalation of soil (see Table 17). For the future-use scenario/reasonable maximum exposure case, the most significant carcinogenic risks [2.43×10^{-4} for adults and 9.70×10^{-5} for children] were from the ingestion of upgradient groundwater (see Table 18). For the future-use construction worker scenario, the carcinogenic risk level was 6.5×10^{-6} for ingestion of upgradient groundwater (see Table 19). The highest carcinogenic risk level of 2.43×10^{-4} indicates that there are two chances in 10,000 of getting cancer over a 70-year lifetime. This excess cancer risk, however, is within EPA's allowable excess cancer risk range (10^{-4} to 10^{-6}). The majority of the carcinogenic risk from the ingestion of upgradient groundwater is attributable to the presence of arsenic and beryllium; neither of which are related to on-site discharges. The arsenic and beryllium concentrations found were well below their respective MCLs of 50 ug/l and 4 ug/l, respectively.

To assess the overall noncarcinogenic effects posed by more than one contaminant, EPA has developed the Hazard Quotient (HQ) and Hazard Index (HI). The HQ is the ratio of the chronic daily intake for a contaminant to the reference dose for that chemical; the reference dose being a measure of the chemical's "threshold" for adverse effects with many built-in safety factors. The HQs are summed for all contaminants within an exposure pathway (e.g., groundwater ingestion) to give the HI. When the HI exceeds one, there may be concern for potential noncarcinogenic health effects, if the contaminants in question are believed to cause a similar toxic effect.

The HI values for the current-use and future-use scenario for site workers, and the future-use scenarios for adults, children, construction workers are shown in Tables 17-19. As a result of the presence of manganese in the upgradient groundwater, the HI value for the future-use upgradient groundwater ingestion pathway for children exceeds one at HI = 3.76. As a result of the presence of both managanese and thallium in the downgradient groundwater, the HI value for the future-use downgradient groundwater ingestion pathway for children also exceeds one at HI = 1.76. Thallium was the major contributor to the HI of 1.76; however, thallium was only detected during one round of sampling at 3 ug/l

in one well out of twenty-three sampled and is not a contaminant of concern at the Site. Manganese is an essential dietary nutrient and is present in levels that are typical of the average daily dietary intake. The manganese contamination is not related to the Site. HI values did not exceed one for the other pathways evaluated.

The carcinogenic and noncarcinogenic risks associated with exposures to individual compounds of concern across the pathways evaluated (excluding future upgradient groundwater) were summed to indicate the potential risks associated with mixtures of potential carcinogens and noncarcinogens, respectively (see Table 20). The exposed population which is subject to most significant carcinogenic risk (7.8×10^{-5}) is the adult resident population under the future-use scenario; the pathway contributing most significantly to this risk is the ingestion of groundwater. The exposed population which is subject to the most significant noncarcinogenic risk (HI = 1.88) is the child resident population under the future-use scenario; the majority of this risk is also posed by the ingestion of groundwater. As explained above, even though thallium was the major contributor to the increased HI value for the child resident future-use scenario, it is not a contaminant of concern. Thus, the baseline RA showed that the carcinogenic risks at the Site are within EPA's allowable risk range and the noncarcinogenic risk are also acceptable, even though there are instances where some organic and inorganic contaminants exceed ARARs; these excursions were not considered to be significant for reasons discussed above under the Site Characteristics Section.

Since some low levels of VOCs were found in some monitoring wells, the owners of existing downgradient private wells will be notified by either NYSDOH or SCDHS that they can request that the Suffolk County Water Authority sample their wells to ensure that their water supply continues to be of acceptable quality.

An ecological risk assessment considers potential exposure routes of contamination to terrestrial wildlife. Since the majority of the Site is paved or covered with structures, there is little, if any, potential for wildlife to be exposed to contaminated surface soils on-site. The only potential route of exposure to wildlife in the Site vicinity would be if contaminants were transported via groundwater and discharged into surface waters some distance from the Site. Off-site monitoring wells, however, did not indicate the presence of contaminants at significant levels. Therefore, no significant effect would be found on aquatic organisms in the area's surface water from groundwater discharge off-site.

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.

DESCRIPTION OF THE "NO FURTHER ACTION" REMEDY

The risk assessment indicates that the levels of contaminants present in the soil, air, sediments and groundwater at the Site present risks which fall within or below EPA's allowable risk range. In addition, sampling results indicate that, with the exception of a few minor excursions in the groundwater above MCLs, the majority of contaminants do not exceed MCLs in the groundwater or background levels in the soils and air. Enforcement actions taken by the SCDHS have resulted in the clean-out of the west sanitary systems and a former leaching pit in the rear of the building.

There remains some question about whether the east sanitary system has been adequately cleaned out. Therefore, since both sanitary systems are currently operational and subject to the

Suffolk County Sanitary Code, the SCDHS will attempt to secure the clean out of the east system by the owner of the property.

EPA and NYSDOH recommend to SCDHS that it consider performing inspections to monitor the discharges into the two systems in order to ensure the protection of the groundwater in the area.

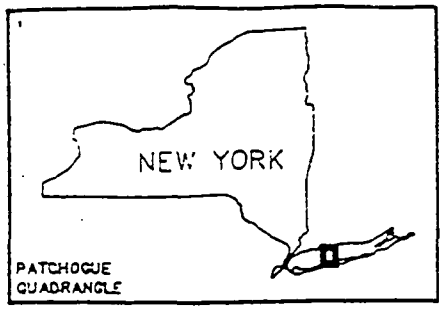
Based upon the findings of the RI performed at the Site, EPA, in consultation with NYSDEC, has determined that the Site does not pose a significant threat to human health or the environment. EPA, therefore, has selected a "No Further Action" remedy for the Site. Since this remedy will not result in hazardous substances remaining on-site above health-based levels, the five-year review will not apply to this action.

DOCUMENTATION OF SIGNIFICANT CHANGES

There are no significant changes from the preferred alternative, as presented in the Proposed Plan.

APPENDIX I

FIGURES



SCALE

N

1 0.5 0 1 MILE

1 0.5 0 1 KILOMETER

LONG ISLAND MAC ARTHUR AIRPORT

VETERAN'S MEMORIAL HIGHWAY

RECHARGE BASINS

BIOCLINICAL LABORATORIES

RECHARGE BASINS

COMMERCIAL

WOODED AREA

COMMERCIAL AND LIGHT INDUSTRIAL ZONES

RESIDENTIAL AREAS

LOCUST AVENUE WELLFIELD

SMITHTOWN

CHURCH STREET WELLFIELD

BOHEMIA

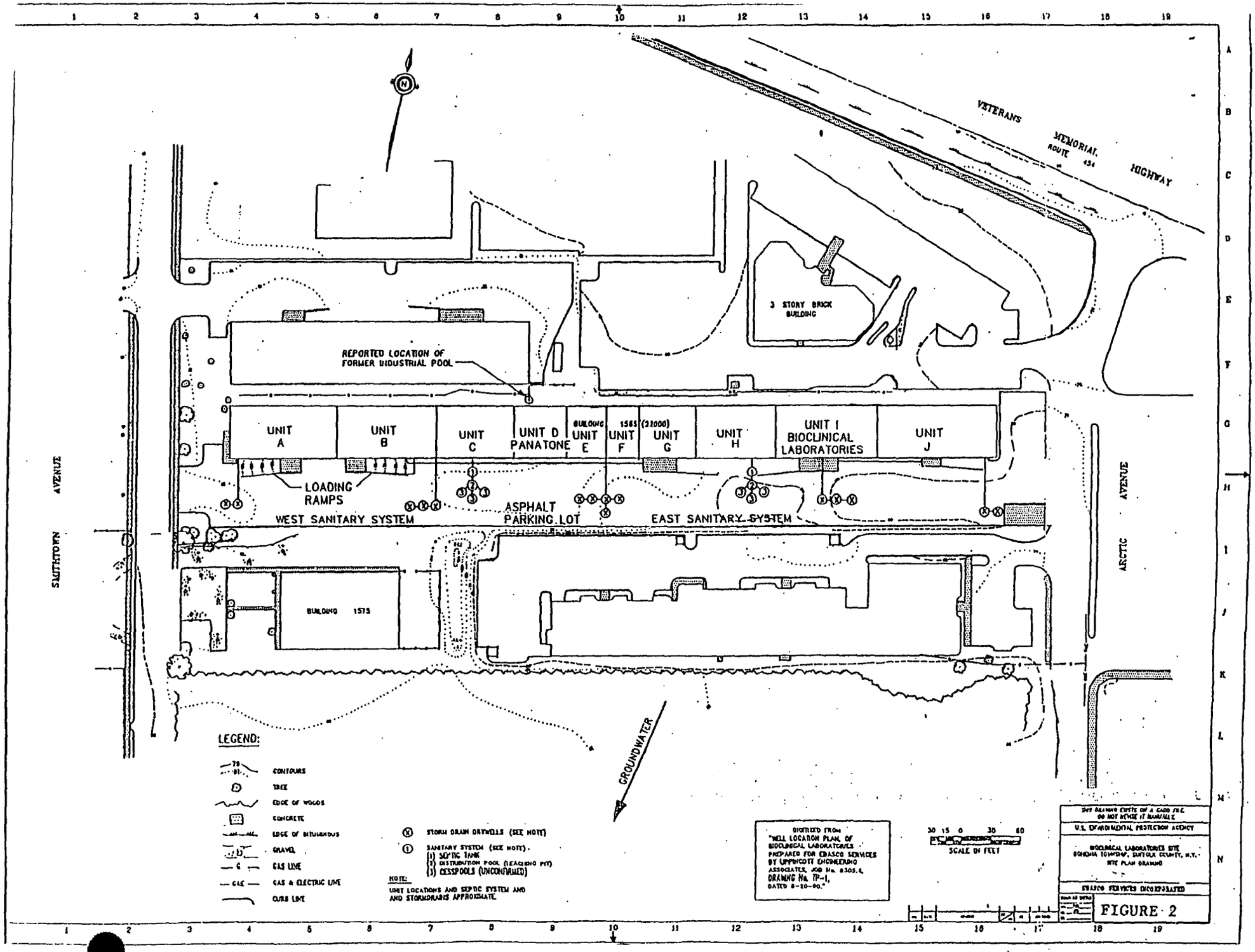
AVENUE

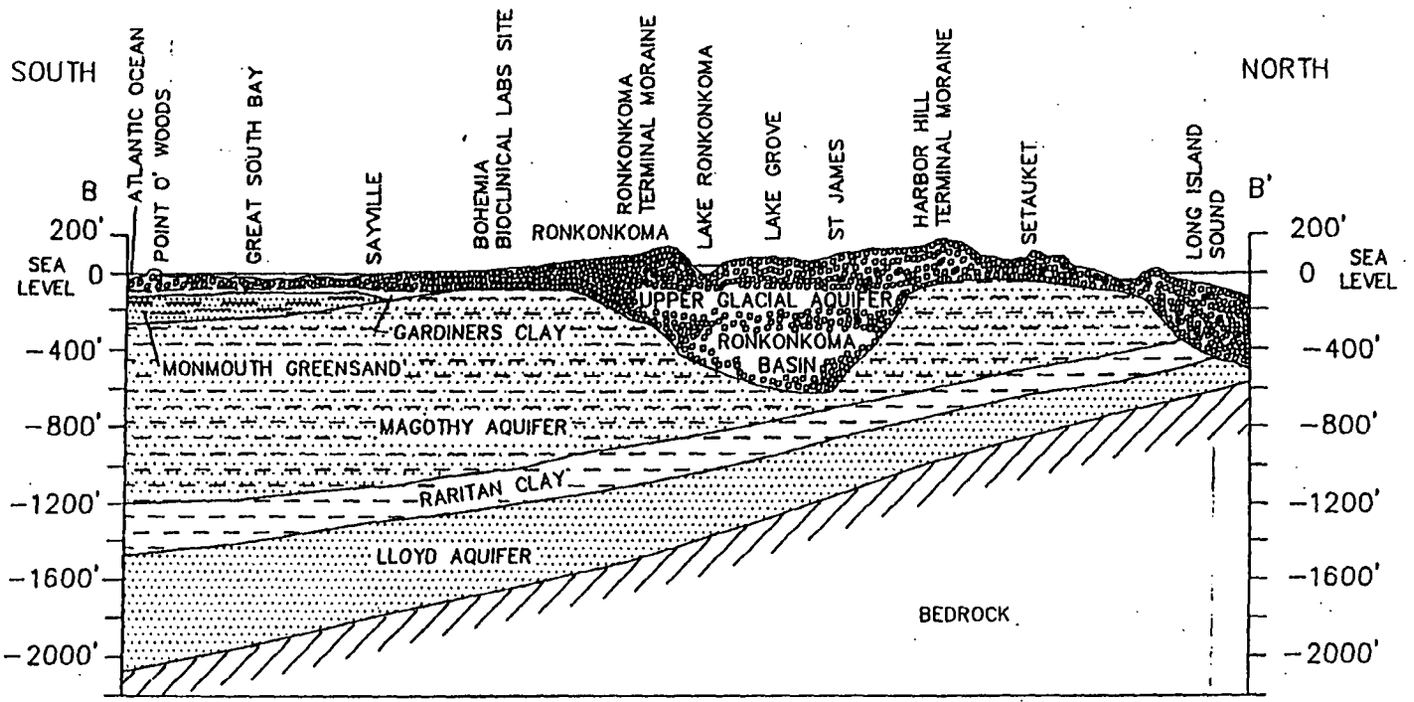
KEY

- BIOCLINICAL LABORATORIES
- RESIDENTAL AREAS
- RECHARGE BASIN
- LOCUST AVE. WELLFIELD AND CHURCH STREET WELLFIELD
- WOODED AREA

SOURCE: USGS, 1979.

EBASCO SERVICES INCORPORATED		U.S. ENVIRONMENTAL PROTECTION AGENCY	
DEPT 940 DR J.R.	APPROVED	BIOCLINICAL LABORATORIES SITE	FIGURE 1
DATE ____ CH ____		SITE LOCATION MAP CENTRAL ISLIP, NEW YORK	
SCALE AS NOTED			00


VETERANS MEMORIAL HIGHWAY
ROUTE 454
3 STORY BRICK BUILDING
REPORTED LOCATION OF FORMER INDUSTRIAL POOL
UNIT A
UNIT B
UNIT C
UNIT D PANATONE
BUILDING UNIT E
1585 (21000) UNIT F
UNIT G
UNIT H
UNIT I BIOCLINICAL LABORATORIES
UNIT J
LOADING RAMPS
WEST SANITARY SYSTEM
ASPHALT PARKING LOT
EAST SANITARY SYSTEM
SMITHTOWN AVENUE
ARCTIC AVENUE
BUILDING 1575
GROUNDWATER
LEGEND:
CONTOURS
TREE
EDGE OF WOODS
CONCRETE
EDGE OF BITUMINOUS
GRAVEL
G GAS LINE
G&E GAS & ELECTRIC LINE
CURB LINE
STORM DRAIN DRYWELLS (SEE NOTE)
SANITARY SYSTEM (SEE NOTE).
1) SEPTIC TANK
2) DISTRIBUTION POOL (LEACHING PIT)
3) CESSPOOLS (UNCONFIRMED)
NOTE:
UNIT LOCATIONS AND SEPTIC SYSTEM AND AND STORMDRAINS APPROXIMATE.
DIGITIZED FROM "WELL LOCATION PLAN OF BIOCLINICAL LABORATORIES PREPARED FOR ERASCO SERVICES BY UPPINCOTT ENGINEERING ASSOCIATES, JOB No. 8305.4, DRAWING No. TP-1, DATED 8-20-90."
30 15 0 30 60
SCALE IN FEET
U.S. ENVIRONMENTAL PROTECTION AGENCY
BIOCLINICAL LABORATORIES SITE
BOHEMIA TOWNSHIP, SUFFOLK COUNTY, N.Y.
SITE PLAN DRAWING
ERASCO SERVICES INCORPORATED
FIGURE 2



EXPLANATION

- CLAY
- GRAVEL
- SAND
- BEDROCK
- SANDY CLAY, CLAYEY SAND, AND SILT

SOURCE: JENSEN AND SOREN, 1974.

0 1 MILE
APPROXIMATE SCALE

THIS DRAWING EXISTS ON A CADD FILE. DO NOT REVISE IT MANUALLY.

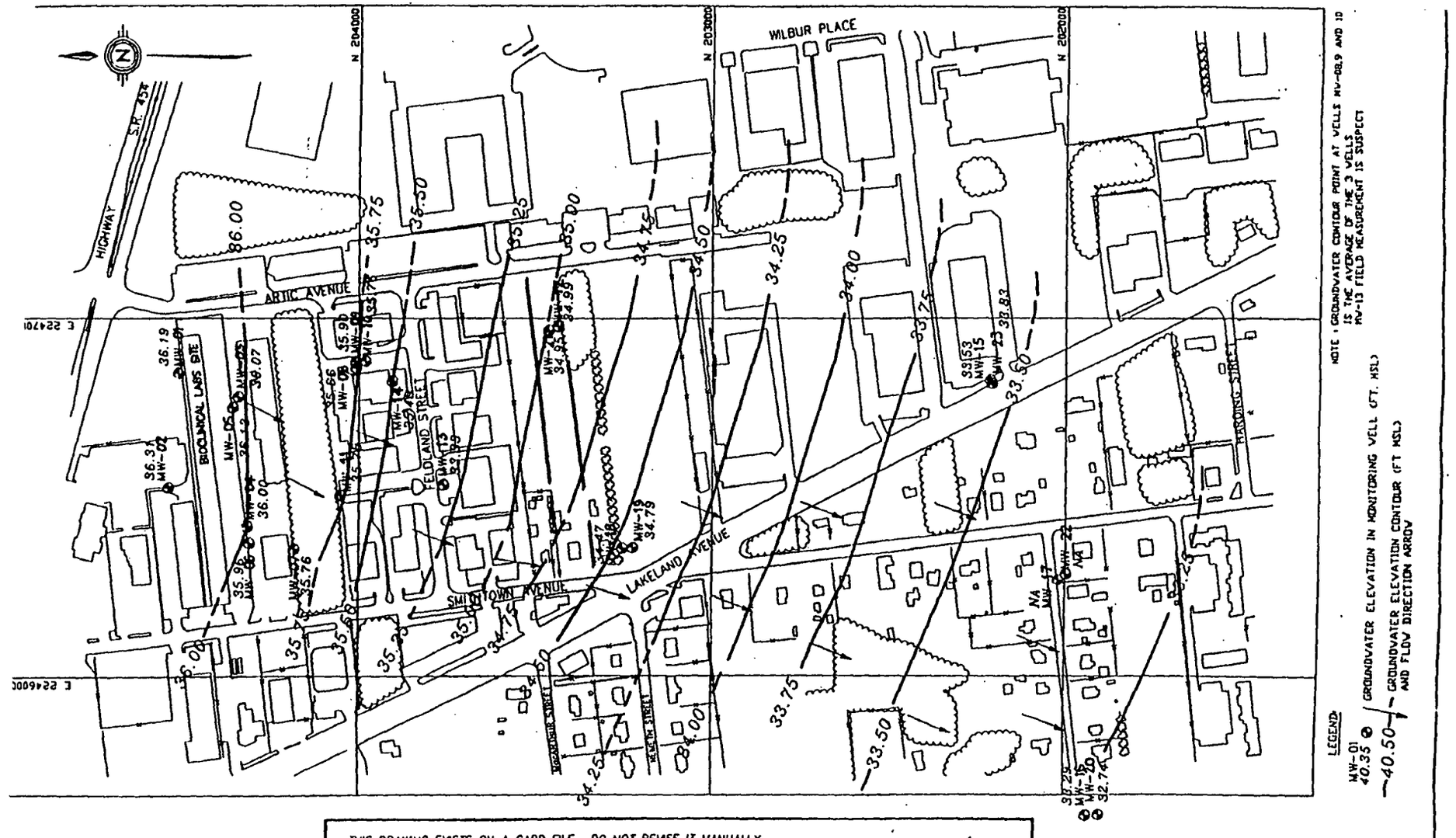
REV	DATE	BY	CH	APPROVED	REV	DATE	BY	CH	APPROVED

EBASCO SERVICES INCORPORATED

DEPT. 940 DR. J.R. APPROVED
DATE. CH.
SCALE AS NOTED

U.S ENVIRONMENTAL PROTECTION AGENCY
BIOCLINICAL LABORATORIES SITE
GEOLOGIC CROSS SECTION OF LONG ISLAND AT BOHEMIA, NEW YORK

FIGURE 3



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REV	DATE	BY	CH	APPROVED	REV	DATE	BY	CH	APPROVED

EBASCO SERVICES INCORPORATED

DEPT. 940 DR. J.R. APPROVED

DATE. CH.

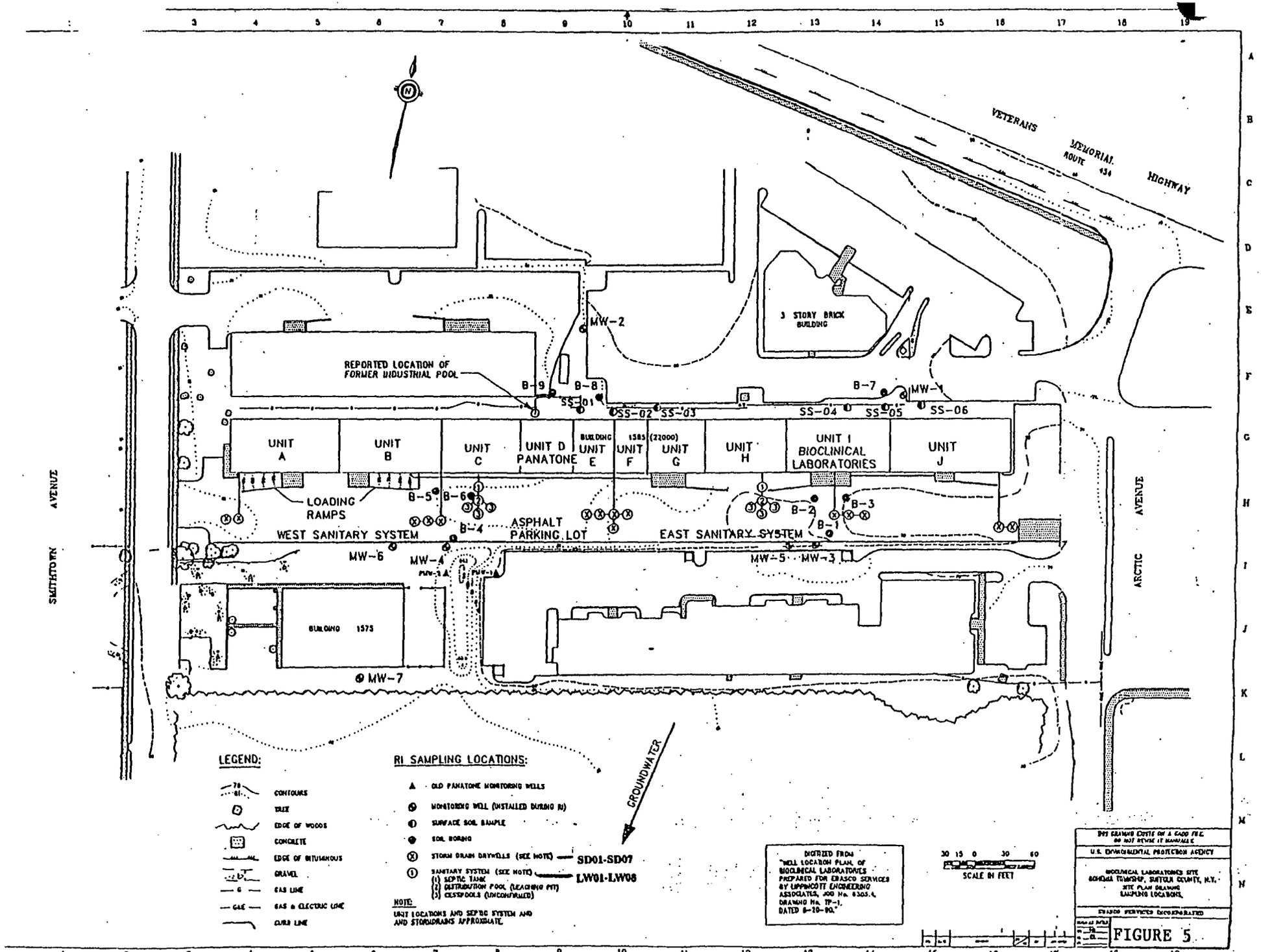
SCALE AS SHOWN

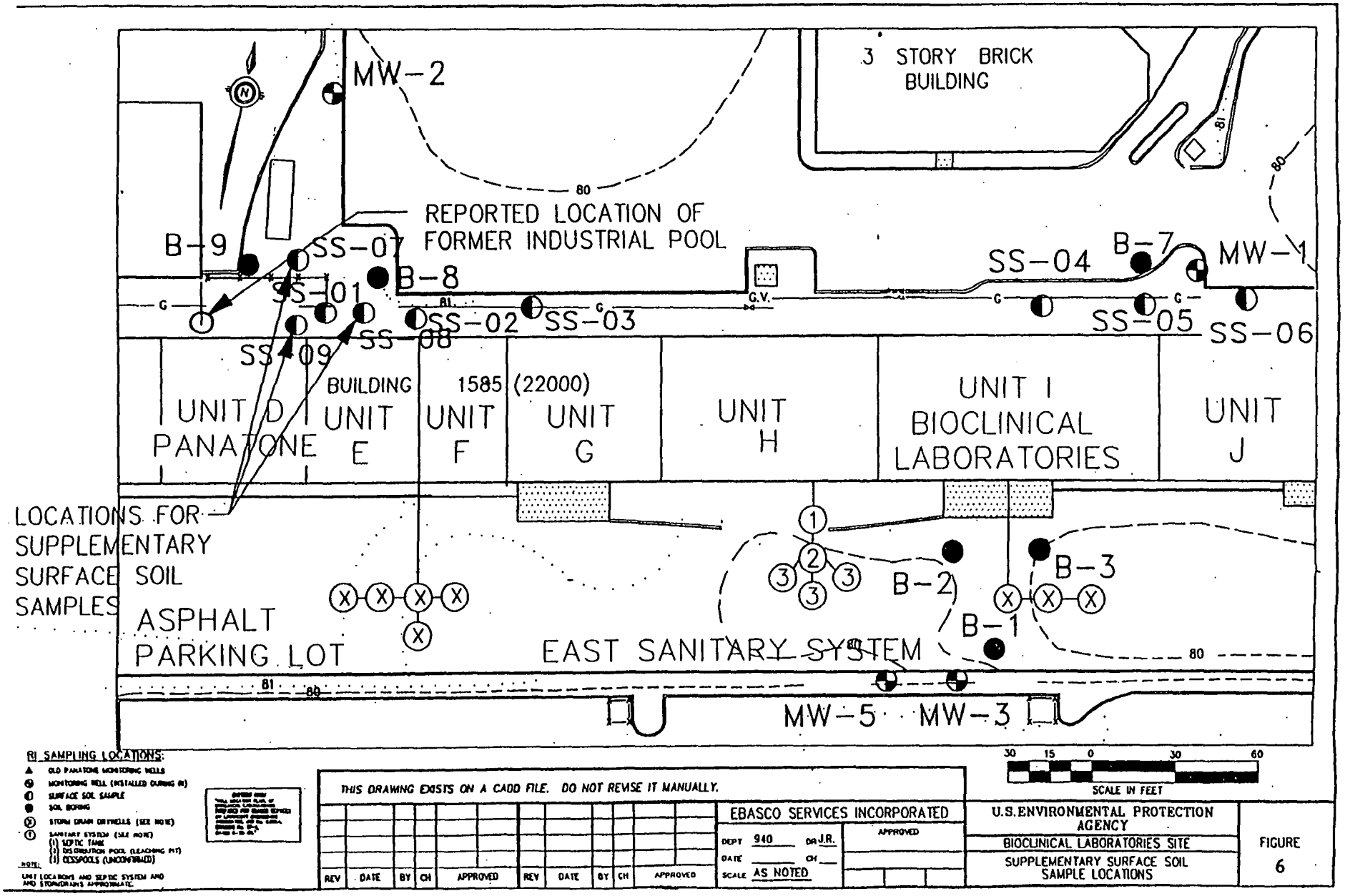
U.S ENVIRONMENTAL PROTECTION AGENCY

BIOCLINICAL LABORATORIES SITE

MONITORING WELL LOCATIONS GROUNDWATER ELEVATIONS (3/92)

FIGURE 4


VETERANS MEMORIAL HIGHWAY
ROUTE 454
3 STORY BRICK BUILDING
MW-2
REPORTED LOCATION OF FORMER INDUSTRIAL POOL
B-9
B-8
B-7
MW-1
SS-01
SS-02
SS-03
SS-04
SS-05
SS-06
UNIT A
UNIT B
UNIT C
UNIT D PANATONE
BUILDING 1585 (22000)
UNIT E
UNIT F
UNIT G
UNIT H
UNIT I BIOCLINICAL LABORATORIES
UNIT J
LOADING RAMPS
B-5
B-6
B-4
B-2
B-3
B-1
ASPHALT PARKING LOT
WEST SANITARY SYSTEM
EAST SANITARY SYSTEM
MW-6
MW-4
MW-5
MW-3
SMITHTOWN AVENUE
ARCTIC AVENUE
BUILDING 1575
MW-7
GROUNDWATER
LEGEND:
CONTOURS
TREE
EDGE OF WOODS
CONCRETE
EDGE OF BITUMINOUS
GRAVEL
GAS LINE
GAS & ELECTRIC LINE
CURB LINE
RI SAMPLING LOCATIONS:
OLD PANATONE MONITORING WELLS
MONITORING WELL (INSTALLED DURING RI)
SURFACE SOIL SAMPLE
SOIL BORING
STORM DRAIN DRYWELLS (SEE NOTE) SD01-SD07
SANITARY SYSTEM (SEE NOTE) LW01-LW08
(1) SEPTIC TANK
(2) DISTRIBUTION POOL (LEACHING PIT)
(3) CESSPOOLS (UNCONFIRMED)
NOTE:
UNIT LOCATIONS AND SEPTIC SYSTEM AND STORMDRAINS APPROXIMATE.
DIGITIZED FROM "WELL LOCATION PLAN OF BIOCLINICAL LABORATORIES PREPARED FOR ERASCO SERVICES BY LIPPINCOTT ENGINEERING ASSOCIATES, JOB No. 8305.4, DRAWING No. IP-1, DATED 8-10-90."
30 15 0 30 60
SCALE IN FEET
U.S. ENVIRONMENTAL PROTECTION AGENCY
BIOCLINICAL LABORATORIES SITE
SCHOOL TOWNSHIP, SUFFOLK COUNTY, N.Y.
SITE PLAN DRAWING
SAMPLING LOCATIONS
ERASCO SERVICES INCORPORATED
FIGURE 5



RI SAMPLING LOCATIONS:

- OLD PANATONE MONITORING WELLS
- MONITORING WELL (INSTALLED DURING RI)
- SURFACE SOIL SAMPLE
- SOIL BORING
- STORM DRAIN DRYWELLS (SEE NOTE)
- SANITARY SYSTEM (SEE NOTE)
  (1) SEPTIC TANK
  (2) DISTRIBUTION POOL (LEACHING PIT)
  (3) CESSPOOLS (UNCONFIRMED)

NOTE:
UNIT LOCATIONS AND SEPTIC SYSTEM AND STORMDRAINS APPROXIMATE

THIS DRAWING EXISTS ON A CADD FILE. DO NOT REVISE IT MANUALLY.

REV	DATE	BY	CH	APPROVED	REV	DATE	BY	CH	APPROVED

SCALE IN FEET: 30 15 0 30 60

EBASCO SERVICES INCORPORATED

DEPT 940 DR J.R.
DATE ____ CH ____
SCALE AS NOTED
APPROVED

U.S. ENVIRONMENTAL PROTECTION AGENCY
BIOCLINICAL LABORATORIES SITE
SUPPLEMENTARY SURFACE SOIL SAMPLE LOCATIONS

FIGURE 6

APPENDIX II

TABLES

TABLE 1
BIOCLINICAL LABS SITE
TYPICAL METAL BACKGROUND SOIL LEVELS (mg/kg)

ELEMENT	CONCENTRATION RANGE IN TYPICAL EASTERN U.S. BACKGROUND SOIL *	CONCENTRATION FOR TYPICAL U.S. SANDY SOIL (3)	CONCENTRATION IN SOME LONG ISLAND SOIL (4)	CONCENTRATION RANGE IN SITE SURFACE SOIL	CONCENTRATION IN SOME LONG ISLAND SUBSURFACE SOILS (4)	CONCENTRATION RANGE IN SITE SUBSURFACE SOIL
Al	10000-300000	—	1490-4150	6560-9040**	380-2750	219-1360
Sb	<1-500(1)	—	ND	ND	ND-4.3	ND
As	5-15(1)	0.1-30	1.2-3.4	3.2-4.9**	ND-3.0	0.48-1.8
Ba	100-3500	20-1500	28	9.9-33.8**	0.48-14.2	1.2-5.4
Be	<1-7(1)	1-3	ND-0.4	ND	ND-0.78	ND
Cd	0.01-7	—	ND-50	ND-1.3	ND-2.0	ND
Ca	100-400000	—	975-24500	556-1220	ND-1830	28.2-84
Cr	10-80(1)	3-200	3.3-323	7.9-197**	1.3-94.1	1.8-6.5
Co	<3-70(1)	0.4-20	ND-1.2	ND-2.8**	ND-2.2	ND-3.0**
Cu	2-100	1-70	5.9-87	4.3-20.5	ND-7.2	1.7-8.8**
Fe	7000-550000	—	5650-8920	5300-9950**	870-5840	662-3275
Pb	3-30(1)	<10-70	34-83	9.3-23.8	0.45-4.6	0.57-1.9
Mg	600-6000	—	616-13800	567-1200	88-877	39.4-715
Mn	100-4000	7-2000	86.9-123	31.2-58.1	6.7-103	3.8-104**
Hg	0.2-0.6(1)	0.01-0.54	ND-0.6	ND-4.0**	ND	ND
Ni	4-30(1)	5-70	1.8-16	ND-6.2	ND-4.1	ND-3.7
K	400-30000	—	121-600	339-927**	32.7-340	ND
Se	0.1-2.0	0.005-35	ND-0.66	0.25-2.7**	ND-0.66	ND-0.59
Ag	0.1-5.0	—	ND-2.7	R	ND	ND
Na	750-7500	—	ND-1100	273	ND-70	ND-64.1
Tl	1-2(2)	—	ND-1.2	ND-0.37	ND-0.38	ND
V	20-500	7-150	3.5-13	12.8-21.4**	1.1-5.8	ND-3.6
Zn	10-300	<15-164	11.4-153	11.0-207**	ND-11.4	ND-3.3

(*) - Dragun, 1988
(**) - Maximum detected concentration exceeds one or more background concentrations.
(-) - Not Available
(ND) - Not Detected
(R) - Rejected
(1) - Conner, J.J. and H.T. Shacklette, 1975
(2) - USEPA, 1982.
(3) - Kabata-Pendias et al., 1984
(4) - Data obtained from unsaturated soil samples taken from the surface to the water table from off-site locations as part of the Preferred Plating Corporation Site Remedial Investigation (Ebasco, 1989) and Circuitron Corporation Site Remedial Investigation (Ebasco, 1990).

TABLE 2

BIOCLINICAL LABORATORIES SITE
FEDERAL AND NEW YORK STATE HEALH-BASED ARARS
COMPARED TO GROUNDWATER CONTAMINATION (UG/L)

COMPOUND	SDWA[1] MCLs	SDWA MCLGs	NYS[2] MCLs	NYSAWQC[3] CLASS GA WATER	UPGRADIENT RANGE OF GROUNDWATER CONTAMINATION
INORGANICS:					
Arsenic	-	Zero	50	25	2.1-4.4
Barium	5000	5000	1000	1000	29.9-232
Beryllium	4	Zero	-	-	1.0-3.1
Cadmium	5	5	10	10	4.2
Chromium (Total)	100	100	50	50 (VI)	37.9-1310
Cobalt	-	-	-	-	10.1-21.8
Copper	1300	1300	-	1000	45.6-141
Iron	-	-	-	300	5830-69700
Lead	15*	Zero	50	25	9.3-162
Manganese	-	-	-	300	113-2190
Nickel	100	100	-	-	24.5-118
Silver	-	-	50	50	4.3-7.6
Vanadium	-	-	-	-	9.0-87.5
Zinc	-	-	-	5000	40.6-146

COMPOUND	SDWA[1] MCLs	SDWA MCLGs	NYS[2] MCLs	NYSAWQC[3] CLASS GA WATER	DOWNGRADIENT RANGE OF GROUNDWATER CONTAMINATION
INORGANICS:					
Arsenic	-	Zero	50	25	2.0-3.7
Barium	5000	5000	1000	1000	8.6-118
Beryllium	4	Zero	-	-	1.1-1.7
Cadmium	5	5	10	10	3.3-10.5
Chromium (Total)	100	100	50	50 (VI)	6.8-75.8
Cobalt	-	-	-	-	3.6-10.0
Copper	1300	1300	-	1000	7.2-240
Iron	-	-	-	300	55.8-12000
Lead	15*	Zero	50	25	4.6-74.5
Manganese	-	-	-	300	11.6-1090
Mercury	2	2	2	2	0.42
Nickel	100	100	-	-	6.8-40.8
Selenium	50	50	10	20	2.0-44.6
Silver	-	-	50	50	3.3-112
Thallium	2	0.5	-	-	3.0
Vanadium	-	-	-	-	4.3-19.6
Zinc	-	-	-	5000	6.0-589

TABLE 2 (Continued)

BIOCLINICAL LABORATORIES SITE
FEDERAL AND NEW YORK STATE HEALH-BASED ARARS
COMPARED TO GROUNDWATER CONTAMINATION (UG/L)

COMPOUND	SDWA(1) MCLs	SDWA MCLGs	NYS(2) MCLs	NYSAWQC(3) CLASS GA WATER	DOWNGRADIENT RANGE OF GROUNDWATER CONTAMINATION
ORGANICS:					
Bis(2-ethylhexyl) phthalate	4	Zero	50	4200	2.0-72.0
2,4-Dimethylphenol	-	-	50	1 (Total)	5.0
1,2,4-Trichlorobenzene	9	9	5	-	0.5
cis-1,2-Dichloroethene	70	70	5	-	0.10
Trichloroethene	5	Zero	5	10	0.6-17.6
4-Methyl-2-pentanone	-	-	50	-	4.0
Methylene Chloride	5	Zero	5	-	120
1,2-Dichloroethane	5	Zero	5	-	2.0
Benzene	5	Zero	5		0.37-1.0
Tetrachloroethene	5	Zero	5	-	0.70-2.0
Chloromethane	-	-	5	-	1.0-3.0
1,1,1-Trichloroethane	200	200	5	-	0.70-12.0
Carbon Disulfide	-	-	50	-	0.20-0.64
1,1-Dichloroethane	-	-	5	-	0.50-21.0
Chloroform	-	-	50	100	0.14-2.0
Trichlorofluoromelane	-	-	5	-	0.37-170
Total Xylenes	10000	10000	15***	-	0.60-0.80
1,3,5-Trimethylbenzene	-	-	5	-	0.10-0.60
Naphthalene	-	-	50	-	0.29-0.42

COMPOUND	SDWA(1) MCLs	SDWA MCLGs	NYS(2) MCLs	NYSAWQC(3) CLASS GA WATER	UPGRADIENT RANGE OF GROUNDWATER CONTAMINATION
ORGANICS:					
2-Butanone	-	-	10	-	8.0
cis-1,2-Dichloroethene	70	70	5	-	0.5-2.0
Trichloroethene	5	Zero	5	10	1.0-2.0
4-Methyl-2-pentanone	-	-	50	-	5.0-28
Chloroform	-	-	50	100	0.1-0.26
Trichlorofluoromethane	-	-	5	-	0.13
Total Xylenes	10000	10000	15***	-	0.6-1.0
Naphthalene	-	-	50	-	1.0
Endosulfan Sulfate	-	-	-	-	0.27

- Not Available
ND Non-detect
* Federal Action Level
** Each xylene (m-,o-,p-) has a 5 ug/l requirement.
(1) Drinking Water Regulations and Health Advisories (USEPA-2/92).
(2) NYS Sanitary Code: Ch.1, Part 5 (Drinking Water Supplies)/Public Health Law 225, Subpart 5-1 (Public Water Supplies) (NYS-1/90).
(3) NYS Water Quality Regulations: Surface Water and Groundwater Classifications and Standards (Title 6, Ch.10, Parts 700-705).

TABLE 3

BIOCLINICAL LABS SITE
INORGANIC DATA SUMMARY TABLE
GROUNDWATER SAMPLES - ALL ROUNDS

Parameter	Short Round MW-01 thru MW-07 Jan-Feb 1990		Round 1 MW-01 thru MW-23 Sept 1990		Round 2 MW-01 thru MW-23 Oct 1990		Round 3 Feb 1991	Round 4 Mar 1991	Suppl. Round 1 [Note 3] Jan 1992		Suppl. Round 2 [Note 3] Mar 1992		Suppl. Round 3 [Note 4] Apr 1992		Suppl. Round 4 [Note 5] June 1992	
	Freq	Range	Freq	Range	Freq	Range			Freq	Range	Freq	Range	Freq	Range	Freq	Range
Aluminum	7/7	3200-46800	25/25	45.2-22800	23/23	59.1-16,000	NOT	NOT	5/5	1500-54,300						
Arsenic	7/7	2.0-2.9	1/17	3.2	8/23	2.1-4.2			0/5	---						
Barium	7/7	33.1-232	24/25	9.1-118	23/23	8.6-109			5/5	20.6-173						
Beryllium	4/7	1.3-3.1	1/2	1.0	1/2	1.0	SAMPLED	SAMPLED	1/5	2.2						
Calcium	7/7	44380-35900	24/25	3820-23300	23/23	2360-23,800			5/5	5820-15,300						
Cadmium	0/7	---	2/23	5.5-10.5	8/22	2.9-5.8			0/5	---						
Chromium	7/7		21/25	5.9-1310	21/23	9.1-251			5/5	11.1-1030	0/5	---	0/5	---	5/10	18-28
Cobalt	4/7	26.5-190	3/25	4.6-12.4	2/23	4.2-7.7			5/5	2.1-37.8						
Copper	7/7	4.4-21.8	19/25	7.9-240	23/23	7.2-74.6			5/5	8.1-119						
Iron	7/7	21.2-141	25/25	55.8-37900	23/23	190-26,550			5/5	1270-81,500						
Lead	7/7	5820-69700	21/21	4.6-162	21/21	5.0-42.8			5/5	3.4-95						
Magnes.	7/7	9.3-46.0	24/25	1530-10800	23/23	1310-9360			5/5	1550-7030						
Manganese	7/7	1940-6250	20/20	15.5-1090	23/23	11.6-980			5/5	85.2-3000						
Nickel	7/7	145-2190	18/25	10.5-118	14/23	6.8-28.2			4/5	7.0-168						
Potassium	7/7	7.3-58.9	25/25	238-10600	22/22	920-7740			5/5	1470-4180						
Silver	7/7	1140-9790	2/25	4.3-112	1/21	24.2			0/5	---						
Sodium	7/7	3.3-76.5	24/25	3040-44900	23/23	3060-36,100			5/5	10400-27300						
Vanadium	7/7	3020-27900	6/25	9.7-42.5	10/23	4.3-30.0			4/5	2.0-100						
Zinc	7/7	9.0-87.5	19/21	20.1-589	17/17	6.0-305			5/5	19.1-171						
Mercury	1/5	46.9-146	---	---	---	---			0/5	---						
Selenium	2/5	0.42	2/23	7.0-16.5	5/20	2.0-14.2			3/5	1.5-2.7						
Thallium	0/7	14.6-44.6	0/23	---	1/23	3.0			0/5	---						

Notes:
1. All concentration ranges are in µg/l.
2. Freq. represents frequency of detection.
3. Wells sampled during this round were MW-01, MW-02, MW-05, and UG-1 (new upgradient well).
4. Wells sampled during this round were MW-01, MW-02, MW-04, MW-5 and UG-1. Filtered results shown.
5. Wells sampled during this round were MW-01 thru MW-07 and UG-1. Filtered results shown.

TABLE 4

BIOCLINICAL LABS SITE
VOLATILE, SEMI-VOLATILE, PESTICIDE & PCB DATA SUMMARY TABLE
GROUNDWATER SAMPLES - ALL ROUNDS

Parameter	Short Round MW-01 thru MW-07 Jan-Feb 1990		Round 1 MW-01 thru MW-23 Sept 1990	Round 2 MW-01 thru MW-23 Oct 1990	Round 3 MW-01 thru MW-23 Feb 1991		Round 4 MW-01 thru MW-23 Mar 1991		Supp. Round 1 Note 3 Jan 1992		Supp. Rounds 2, 3, 4 Note 4 Mar 1992 - June 1992
	Freq.	Range			Freq.	Range	Freq.	Range	Freq.	Range	
Volatile											
Cis 1,2-Dichloroethene	3/7	0.5-3.3			0/23	-	0/23	-	0/5	-	
2-Butanone	1/7	8.0			0/23	-	0/23	-	0/5	-	
Trichloroethene	5/7	1.0-5.8			4/23	0.89-17.6	4/23	0.6-2.0	0/5	-	
4-Methyl-2 Pentanone	3/7	2.3-28			0/23	-	0/23	-	0/5	-	
Toluene	3/7	2.0-13.3			0/23	-	0/23	-	0/5	-	
M&P Xylenes	4/7	0.55-1.0	ALL	ALL	0/23	-	1/23	0.8	0/5	-	NO
Chloromethane	1/7	0.75			0/23	-	3/23	2.0-3.0	1/5	3.0	
Methylene Chloride	1/7	60.3	VOC	VOC	0/23	-	0/23	-	2/5	0.6-0.7	VOLATILE/SEMI-
1,1-Dichloroethane	2/7	0.5-0.55			1/23	8.93	4/23	0.85-21	0/5	-	
1,2-Dichloroethane	1/7	1.3	DATA	DATA	0/23	-	0/23	-	3/5	4.0-6.0	VOLATILE
Benzene	1/7	0.75			2/23	0.15-0.37	0/23	-	0/5	-	
Tetrachloroethene	3/7	1.0-2.0	REJECTED	REJECTED	0/23	-	1/23	0.85	2/5	0.3-0.3	PESTICIDE/PCB
Trichlorofluoromethane	4/7	11.0-170			7/23	0.17-26.7	8/23	0.5-34.5	0/5	-	
Styrene	1/7	0.6	BY	BY	0/23	-	0/23	-	0/5	-	ANALYSIS
4-Chlorotoluene	1/7	0.4			0/23	-	0/23	-	0/5	-	
Dichlorodifluoromethane	1/7	1.0	DATA	DATA	0/23	-	0/23	-	0/5	-	FOR
Hexachlorobutadiene	1/7	0.6			0/23	-	0/23	-	0/5	-	
1,2,3-Trichlorobenzene	1/7	0.5	VALIDATION	VALIDATION	0/23	-	0/23	-	0/5	-	THESE
1,2,4-Trichlorobenzene	1/7	0.5			0/23	-	0/23	-	0/5	-	
0-Xylene	1/7	0.7			1/23	0.44	0/23	-	0/5	-	ROUNDS
Chloroform	0/7	-			12/2	0.10-1.8	7/23	0.1-2.0	3/5	0.2-0.7	
Carbon Disulfide	0/7	-			3	0.64	2/23	0.5-0.6	0/5	-	
1,1,1-Trichloroethane	0/7	-			1/23	4.3-6.2	7/23	0.8-12	3/5	0.5-2.0	
Ethylbenzene	0/7	-			2/23	0.23	0/23	-	0/5	-	
Butylbenzene	0/7	-			1/23	0.33	0/23	-	0/5	-	
Napthalene	0/7	-			1/23	0.29-0.42	0/23	-	0/5	-	
1,2,4 Trimethylbenzene	0/7	-			2/23	0.78	0/23	-	0/5	-	
1,3,5 Trimethylbenzene	0/7	-			1/23	0.17	0/23	-	0/5	-	
1,1 Dichloroethene	0/7	-			1/23	-	1/23	0.2	0/5	-	
1,2 Dichloroethene	0/7	-			0/23	0.6-2.3	5/23	0.1-0.8	0/5	-	
1,2 Dichloropropanone	0/7	-			2/23	-	1/23	0.5	0/5	-	
1,4 Dichlorobenzene	0/7	-			0/23	-	1/23	0.9	0/5	-	
1,3,5 Trichloromethylbenzene	0/7	-			0/23	-	9/23	0.1-0.6	0/5	-	
					0/23						

TABLE 4 (CONTINUED)

BIOCLINICAL LABS SITE
VOLATILE, SEMI-VOLATILE, PESTICIDE & PCB DATA SUMMARY TABLE
GROUNDWATER SAMPLES - ALL ROUNDS

Parameter	Short Round MW-01 thru MW-07 Jan-Feb 1990		Round 1 MW-01 thru MW-23 Sept 1990		Round 2 MW-01 thru MW-23 Oct 1990		Round 3 MW-01 thru MW-23 Feb 1991	Round 4 MW-01 thru MW-23 Mar 1991	Supp. Round 1 [Note 3] Jan 1992	Supp. Rounds 2, 3, 4 [Note 4] Mar 1992 - June 1992
	Freq.	Range	Freq.	Range	Freq.	Range				
Semi-Volatile										
Napthalene	1/7	1.0	0/23	-	0/23	-	NOT	NOT	NOT	
D-N-Butyl Phthalate	1/7	7.5	0/23	-	0/23	-				
Bis(2-Ethylhexyl)Phthalate	0/7	-	16/23	2.0-72	0/23	-	SAMPLED	SAMPLED	SAMPLED	
Pyrene	0/7	-	1/23	3.0	0/23	-				
Fluoranthene	0/7	-	2/23	2.0	0/23	-				
2,4-Dimethylphenol	0/7	-	1/23	5.0	0/23	-				
Pesticides/PCBs										
Endosulfan Sulfate	0/7	-	0/23	-	1/23	0.16	NOT SAMPLED	NOT SAMPLED	NOT SAMPLED	

Notes:
1. All concentration ranges are in µg/l.
2. Freq. represents frequency of detection.
3. Wells sampled during this round were MW-01; MW-02, MW-05, MW-05D, and UG-1.
4. No volatile, semi-volatile, pesticide or PCB analyses were performed during these 3 rounds of supplemental sampling.

TABLE 5

BIOCLINICAL LABS SITE
CHROMIUM ANALYSIS RESULTS

Sampling Event / Well #	January/February 1990 Short Round (µg/l)	September 1990 Round # 1 (µg/l)	October 1990 Round # 2 (µg/l)	January 1992 Supplemental Round (µg/l)	March 1992 Ebasco Sampling (µg/l)		April 1992 E&D Sampling (µg/l)			June 1992 ERT Sampling (µg/l)		
					Unfiltered	Filtered	Unfiltered	Filtered	TSS	Unfiltered	Filtered	TSS
MW-01	37.9	1310 (J)	251	432	21.5 (J)	6.5U	214	10U	81.6	159	10U	43.5
MW-01 DUP (MW-111)										161	71*	30.6
MW-02	190 (J)	160 (J)	156 (J)	1030	39.9 (J)	6.5U	143	10U	440	58	18	162
MW-03	28.15 (J)	11.1	10.9							33	10U	2.6
MW-04	35.10 (J)	5.9	9.6				10	10U	20	10U	10U	6.0
MW-05	26.5 (J)	33.3	31.4	127	299 (J)	6.5U	33	10U	44.4	10U	10U	17.8
MW-05 DUP				183						29	24	53.8
MW-06	57.30 (J)	54.9	58.0							31	28	35.2
MW-07	49.90 (J)	75.8 (J)	53.6							29	24	53.8
UG-01				11.1	6.5 U	6.5U	10U	10U	19.2	19	10U	15.8
UG-01 DUP (VG-01)				11.1	6.5 U	6.5U (J)						

Note:
* - Data deemed invalid due to problem in field filtration.
U - Non-detect, detection limit is listed
(J) - Estimated

TABLE 6
BIOCLINICAL LABS SITE
REMEDIAL INVESTIGATION REPORT
SUMMARY OF SURFACE SOIL CHEMICAL CONSTITUENTS (UG/KG)

	LOCATION	FREQUENCY OF DETECTION	RANGE OF DETECTED VALUES (HITS)
Volatile Compounds			
No Compounds Detected	SS01-SS06	0/6	-
Semivolatile Compounds			
Butyl benzyl phthalate	SS01	1/6	470
Phenol	SS06	1/6	800
Pesticides/PCBs			
No Compounds Detected	SS01-SS06	0/6	-
Inorganic Compounds (mg/kg)*			
Aluminum	SS01-SS06	6/6	6560-9040
Arsenic	SS01-SS06	6/6	3.2-4.9
Barium	SS01-SS06	6/6	9.9-33.8
Cadmium	SS01	1/6	1.3
Calcium	SS01-SS06	6/6	556-1220
Chromium	SS01-SS06	6/6	7.9-197
Cobalt	SS01,SS03,SS05, SS06	4/6	2.1-2.8
Copper	SS01-SS06	6/6	4.3-20.5
Iron	SS01-SS06	6/6	5300-9950
Lead	SS01-SS06	6/6	9.3-23.8
Magnesium	SS01-SS06	6/6	567-1200
Manganese	SS01-SS06	6/6	31.2-58.1
Mercury	SS04,SS05	2/6	3.8-4.0
Nickel	SS01,SS05	2/6	5.2-6.2
Potassium	SS01-SS06	6/6	339-927
Selenium	SS01-SS06	6/6	0.25-2.7
Sodium	SS02	1/1	273
Thallium	SS01,SS02,SS04, SS05	4/6	0.24-0.37
Vanadium	SS01-SS06	6/6	12.8-21.4
Zinc	SS01-SS06	6/6	11-207

(-) - Not Available
(*) - Numerous detected values (hits) exceed Typical Eastern U.S. Background Soil Concentrations (Dragun, 1988 and Conner and Shacklette, 1975), Typical U.S. Sandy Soil Concentrations (Kabata-Pendias, 1984) or data obtained from unsaturated soil samples taken from the surface to the water table from off-site locations as part of the Preferred Plating Corporation Site Remedial Investigation (Ebasco, 1989) and Circuitron Corporation Site Remedial Investigation (Ebasco, 1990).

Table 6 (continued)

Bioclinical Labortory Site
January 1992 Surface Soil Samples (in mg/kg)
Summary for Detected Concentrations of Inorganic Compounds

Inorganic Compound	SS07	SS07Dup	SS08	SS09
Aluminum	6310	6370	7690	6090
Antimony	(2.8)UJ	(2.8)UJ	(2.9)UJ	(2.8)UJ
Arsenic	1.7	1.5	1.6	1.3
Barium	10.9	12.9	11.7	19.8
Beryllium	(0.22)U	(0.21)U	(0.22)U	(0.22)U
Cadmium	(0.66)UJ	(0.64)UJ	(0.66)UJ	(0.65)UJ
Calcium	18000	51200	2290	1230
Chromium	40.8	45.6	57.0	86.3
Cobalt	2.1	1.7	2.1	2.0
Copper	5.8J	4.2J	5.6J	8.8J
Iron	6610	5370	6510	5420
Lead	5.6	3.9	15.5	52.7
Magnesium	2700	3800	750	511
Manganese	40.5	38.9	42.3	50.3
Mercury	(0.10)U	(0.10)U	(0.10)U	(0.10)U
Nickel	6.3	3.0	3.3	4.9
Potassium	234	319	216	203
Selenium	0.24	0.21J	(0.22)U	(0.22)U
Silver	(0.66)U	(0.64)U	(0.66)U	(0.65)U
Sodium	36.4	47.3	83.1	57.4
Thallium	(0.22)U	(0.21)U	(0.22)U	(0.22)U
Vanadium	12.1J	12.9J	11.3J	11.4J
Zinc	17.6	16.7J	21.4	77.5

J = Estimated value
U = Non-detects, detection limit is reported in parentheses
()UJ = Not detected, detection limit is estimated
R = Unusable

Table 7

Bioclinical Labortory Site
January 1992 Leaching Pit Soil Samples (in mg/kg)
Summary for Detected Concentrations of Inorganic Compounds

Inorganic Compound	LP-02 (Leaching Pit-4 ft)	LP-03 (Leaching Pit-5 ft)	LP-04 (Leaching Pit-6 ft)
Aluminum	12600	4610	7820
Antimony	(2.8)UJ	(2.7)UJ	(2.8)UJ
Arsenic	1.2	1.2	1.5J
Barium	13.3	14.6	12.2
Beryllium	(0.22)U	(0.20)U	(0.21)U
Cadmium	1.9J	(0.61)UJ	0.86J
Calcium	2100	4400	5340
Chromium	610	16.9	226
Cobalt	1.7	2.0	1.7
Copper	19.7J	14.2J	14.9J
Iron	6880	5550	5520
Lead	47.4	22.6	32.8
Magnesium	1320	2380	2570
Manganese	73.3	70.5	68.1
Mercury	(0.10)U	(0.11)U	(0.10)U
Nickel	10.3	11.2	8.8
Potassium	126	190	174
Selenium	(0.22)U	(0.21)U	(0.21)U
Silver	(0.65)U	(0.61)U	(0.64)U
Sodium	86.1	299	177
Thallium	(0.22)U	(0.21)U	(0.21)U
Vanadium	28.9J	26.6J	24.8J
Zinc	52.9	29.5	44.3

J = Estimated value
U = Non-detects, detection limit is reported in parentheses
()UJ = Not detected, detection limit is estimated
R = Unusable

TABLE 8
BIOCLINICAL LABS SITE
REMEDIAL INVESTIGATION REPORT
SUMMARY OF SUBSURFACE SOIL CHEMICAL CONSTITUENTS (UG/KG)*

	LOCATION	FREQUENCY OF DETECTION	RANGE OF DETECTED VALUES (HITS)
Volatile Compounds			
Acetone	SB01	1/18	40
Semivolatile Compounds			
Diethyl phthalate	SB06	1/18	170
Pesticides/PCBs			
No Compounds Detected	SB01-SB09	0/18	-
Inorganic Compounds (mg/kg)			
Aluminum	SB01-SB09	18/18	219-1360
Arsenic	SB01-SB09	18/18	0.48-1.8
Barium	SB01-SB09	18/18	1.2-5.4
Calcium	SB07-SB09	6/6	28.2-84.0
Chromium	SB01-SB09	18/18	1.8-6.5
Cobalt	SB01-SB05,SB07, SB09	7/18	0.84-3.0
Copper	SB01-SB09	18/18	1.7-8.8
Iron	SB01-SB09	18/18	662-3275
Lead	SB01-SB09	18/18	0.57-1.9
Magnesium	SB01-SB09	18/18	39.4-458
Manganese	SB01-SB09	18/18	3.8-104
Nickel	SB01-SB05	5/18	2.7-3.7
Potassium	-	0/18	-
Selenium	SB07	2/16	0.59
Sodium	SB01-SB06, SB08	14/18	18.9-64.1
Vanadium	SB01-SB09	18/18	1.3-3.6
Zinc	SB06-SB09	7/8	2.1-3.3

(-) - Not Detected
(*) - Refers to soil borings from which samples were taken at the top (4.5-11 feet) and bottom (40-48 feet).

TABLE 9
BIOCLINICAL LABS SITE
REMEDIAL INVESTIGATION REPORT
SUMMARY OF SEDIMENT CHEMICAL CONSTITUENTS IN THE SANITARY SYSTEMS (UG/KG)

	LOCATION	FREQUENCY OF DETECTION	RANGE OF DETECTED VALUES (HITS)
Volatile Compounds			
2-Butanone	SD01,SD02,SD03, SD05,SD06,SD07	6/7	3-12000
Carbon Disulfide	SD03,SD05,SD06 SD07	4/7	2-3
Ethylbenzene	SD01,SD02,SD03, SD04,SD05,SD06	6/7	1-19000
Methylene Chloride	SD04	1/7	2500
Styrene	SD01	1/7	18000
Toluene	SD01,SD04,SD05, SD06	4/7	60-640000
Total Xylenes	SD02,SD03,SD04 SD05,SD06	5/7	6-18000
Semivolatile Compounds(1)			
Naphthalene	SD02,SD03,SD05, SD06	4/6	25-53
Acenaphthene	SD02,SD03,SD05, SD06	4/6	47-140
Dibenzofuran	SD02,SD03,SD05, SD06	4/6	38-110
Fluorene	SD02,SD03,SD05, SD06	4/6	72-230
Phenanthrene	SD02,SD03,SD05, SD06	4/6	625-1400
Anthracene	SD02,SD03,SD05 SD06	4/6	104-300
Di-n-butyl phthalate	SD02,SD03,SD05	3/6	85-450
Fluoranthene	SD02,SD03,SD05, SD06	4/6	1050-1900
Pyrene	SD02,SD03,SD05 SD06	4/6	1300-3200
Butyl benzyl phthalate	SD02,SD03,SD05 SD06	4/6	535-3500
Benzo(a)anthracene	SD02,SD03,SD05, SD06	4/6	410-890
Chrysene	SD02,SD03,SD05 SD06	4/6	550-1100
Bis(2-ethylhexyl) phthalate	SD01-SD06	6/6	1650-87000
Di-n-octyl phthalate	SD02,SD05,SD06	3/6	183-1300
Benzo(b+k) fluoranthene	SD02,SD05,SD06	3/6	780-2000

TABLE 9 (Cont'd)
BIOCLINICAL LABS SITE
REMEDIAL INVESTIGATION REPORT
SUMMARY OF SEDIMENT CHEMICAL CONSTITUENTS IN THE SANITARY SYSTEMS (UG/KG)

	LOCATION	FREQUENCY OF DETECTION	RANGE OF DETECTED VALUES (HITS)
Benzo(a)pyrene	SD02, SD03, SD05 SD06	4/6	268-690
Indeno (1,2,3-cd) pyrene	SD02,SD03,SD05, SD06	4/6	120-270
Benzo(g,h,i)perylene	SD02,SD03,SD05 SD06	4/6	160-280
1,4-Dichlorobenzene	SD01	1/6	31000
4-Methylphenol	SD01	1/6	1100000
Dimethylphthalate	SD03,SD05,SD06	3/6	29-180
2-Methylnaphthalene	SD04,SD05,SD06	3/6	24-4300
Pesticides/PCBs(1)			
4,4'-DDT	SD01,SD06	2/6	26-310
Inorganic Compounds (mg/kg)			
Aluminum	SD01-SD07	7/7	2400-8395
Antimony	SD01,SD03,SD04	3/7	4.3-9.0
Arsenic	SD02,SD03,SD04, SD05,SD06,SD07	6/7	1.8-4.3
Barium	SD01,SD02,SD03 SD05,SD06,SD07	6/6	31.1-81.4
Cadmium	SD01,SD02,SD03 SD04	4/4	0.31-21.5
Calcium	SD01-SD07	7/7	1920-16400
Chromium	SD01-SD07	7/7	18.9-346
Cobalt	SD01-SD07	7/7	3.3-134
Copper	SD04	1/1	5110
Iron	SD01-SD07	7/7	4170-50700
Lead	SD01-SD07	7/7	70-1460
Magnesium	SD01-SD07	7/7	1230-12500
Manganese	SD01-SD07	7/7	48.9-99
Mercury	SD01,SD03,SD04, SD06,SD07	5/7	0.15-1.6
Nickel	SD01-SD07	7/7	15.7-539
Potassium	SD01-SD07	7/7	105-788
Silver	SD01,SD02,SD03, SD04,SD06	5/5	1.0-130
Sodium	SD01-SD07	7/7	359-590
Vanadium	SD01-SD07	7/7	3.7-36.5
Zinc	SD01,SD02,SD03 SD04	4/4	124-9310

(1) Only six analyses were performed as one sample was received by the laboratory in a cracked jar.

TABLE 10
BIOCLINICAL LABS SITE
REMEDIAL INVESTIGATION REPORT
SUMMARY OF SEPTIC TANKS AND STORM DRAINAGE DRYWELL CHEMICAL CONSTITUENTS (UG/L)*

	LOCATION	FREQUENCY OF DETECTION	RANGE OF DETECTED VALUES (HITS)
Volatile Compounds			
Acetone	LW07	1/9	280
Toluene	LW05, LW06	2/9	340-360
2-Butanone	LW01, LW02, LW05, LW06	4/9	2.0-35
Ethylbenzene	LW01, LW02, LW05, LW06	4/9	11-13
Total Xylenes	LW01, LW02, LW05, LW06	4/9	55-69
Carbon Disulfide	LW02, LW05, LW06, LW07	4/9	1.0-8.0
Semivolatile Compounds			
Pyrene	LW03	1/9	3.5
Bis(2-ethylhexyl) phthalate	LW01, LW02 LW03, LW05, LW07	5/9	3.0-22
Phenol	LW01, LW02, LW05, LW06	4/9	20-65
4-Methylphenol	LW01, LW02, LW05	3/9	100-410
2,4-Dimethylphenol	LW01, LW02	2/9	2.0-5.0
Benzoic Acid	LW01, LW02 LW05	3/9	180-880
Benzyl Alcohol	LW05	1/9	23
Naphthalene	LW05, LW06	2/9	1.0-2.0
2-Methylnaphthalene	LW06	1/9	2.0
Pesticides/PCBs			
4,4'-DDD	LW02, LW06	2/9	0.10-0.17
Beta-BHC	LW05, LW06	2/9	0.14-0.78
Delta-BHC	LW05, LW06	2/9	0.30-0.44
Heptachlor	LW05, LW06	2/9	0.13-0.14
Inorganic Compounds			
Aluminum	LW01-LW09	9/9	223-49900
Antimony	LW02	1/9	31.2
Barium	LW01-LW09	9/9	82.6-781
Cadmium	LW01, LW02, LW03, LW05, LW06	5/8	2.2-38.8
Calcium	LW01-LW09	9/9	2470-133000
Chromium	LW01, LW02, LW03	3/3	133-3350
Cobalt	LW01, LW02, LW03	3/9	9.7-36
Copper	LW01, LW02, LW05, LW06, LW07	5/5	22.4-8190
Iron	LW01-LW09	9/9	373-66950
Lead	LW01-LW09	9/9	9.8-625

*Note that detected values are measured in a liquid matrix.

TABLE 10 (Cont'd)
BIOCLINICAL LABS SITE
REMEDIAL INVESTIGATION REPORT
SUMMARY OF SEPTIC TANKS AND STORM DRAINAGE DRYWELL CHEMICAL CONSTITUENTS (UG/L)*

	LOCATION	FREQUENCY OF DETECTION	RANGE OF DETECTED VALUES (HITS)
Magnesium	LW01-LW06,LW09	7/9	633-21550
Manganese	LW01-LW09	9/9	9.9-749
Mercury	LW01,LW02,LW03, LW04,LW06	5/5	0.2-1.0
Nickel	LW01,LW02,LW03, LW06	4/9	20.1-123
Potassium	LW01-LW03,LW05, LW06,LW08,LW09	7/9	530-17800
Silver	LW01,LW02,LW03, LW05,LW06,LW08	6/8	6.0-858
Sodium	LW01-LW09	9/9	2230-44100
Vanadium	LW02,LW03	2/9	19.8-139
Zinc	LW01,LW02,LW03, LW05,LW06,LW07, LW08	7/7	114-5290

*Note that detected values are measured in a liquid matrix.

TABLE 11

BIOCLINICAL LABS SITE
REMEDIAL INVESTIGATION REPORT
CONTAMINANTS OF CONCERN CONCENTRATIONS (UG/KG)
LOCATION, FREQUENCY OF DETECTION, RANGE AND MEAN VALUES
SURFACE SOILS

	LOCATION	FREQUENCY OF DETECTION	RANGE OF DETECTED VALUES (HITS)	ARITHMETIC MEAN	GEOMETRIC MEAN	95%(1) UCL
Volatile Compounds						
No Compounds	-	0/7	-	-	-	-
Semivolatile Compounds						
Phenol	SS06	1/7	800	433	414	557
Butyl Benzyl Phthalate	SS01	1/7	470	386	385	416
Pesticides/PCBs						
No Compounds	-	0/7	-	-	-	-
Inorganic Compounds (mg/kg)*						
Arsenic	SS01-SS06	7/7	3.2-4.9	4.2	4.1	4.7
Barium	SS01-SS06	7/7	9.9-33.8	14.6	13.3	22.3
Cadmium	SS01	1/7	1.3	0.59	0.54	0.85
Chromium	SS01-SS06	7/7	7.9-197	55.1	32.5	197 X
Cobalt	SS01,SS03,SS05, SS06	4/7	2.1-3.1	2.1	1.9	3.1 X
Copper	SS01-SS06	7/7	4.3-20.5	8.9	7.8	15.6
Iron	SS01-SS06	7/7	5300-9950	8070	7936	9677
Lead	SS01-SS06	7/7	9.3-23.8	17.0	16.2	23.7
Manganese	SS01-SS06	7/7	31.2-62.3	46.2	45.2	56.8
Mercury	SS04,SS05	2/7	3.8-4.0	1.2	0.18	4.0 X
Nickel	SS01,SS05	2/7	5.2-6.2	3.4	3.2	5.2
Selenium	SS01-SS06	7/7	0.25-2.7	0.79	0.55	2.5
Thallium	SS01,SS02,SS04, SS05	4/7	0.24-0.37	0.22	0.20	0.37 X
Vanadium	SS01-SS06	7/7	12.8-21.4	16.4	16.1	19.6
Zinc	SS01-SS06	7/7	11-207	43.2	22.7	165

(1) - 95% Upper Confidence Limit
(X) - Indicates that the 95% UCL is greater than the maximum detection. In this case, the maximum detection for the contaminant is used to calculate risk.
(-) - Not available
(*) - Numerous detected values (hits) exceed Typical Eastern U.S. Background Soil Concentrations (Dragun, 1988 and Conner and Shacklette, 1975), Typical U.S. Sandy Soil Concentrations (Kabata-Pendias, 1984) or data obtained from unsaturated soil samples taken from the surface to the water table from off-site locations as part of the Preferred Plating Corporation Site Remedial Investigation (Ebasco, 1989) and Circuitron Corporation Site Remedial Investigation (Ebasco, 1990).

TABLE 12

BIOCLINICAL LABS SITE
REMEDIAL INVESTIGATION REPORT
CONTAMINANTS OF CONCERN CONCENTRATIONS (UG/KG)
LOCATION, FREQUENCY OF DETECTION, RANGE AND MEAN VALUES
SUBSURFACE SOILS (TOP AND BOTTOM ANALYSES)

	LOCATION	FREQUENCY OF DETECTION	RANGE OF DETECTED VALUES (HITS)	ARITHMETIC MEAN	GEOMETRIC MEAN	95%(1) UCL
Volatile Compounds						
No Compounds	-	0/19	-	-	-	-
Semivolatile Compounds						
No Compounds	-	0/19	-	-	-	-
Pesticides/PCBs						
No Compounds	-	0/19	-	-	-	-
Inorganic Compounds (mg/kg)*						
Arsenic	SB01-SB09	19/19	0.48-1.8	0.79	0.75	1.2
Barium	SB01-SB09	19/19	1.2-6.8	2.5	2.2	4.4
Chromium	SB01-SB09	19/19	1.8-6.7	3.5	3.2	6.7 X
Cobalt	SB01-SB05(U), SB07(U), SB09(U)	8/19	0.84-3.0	1.0	0.79	3.0 X
Copper	SB01-SB09	19/19	1.7-8.8	3.9	3.4	5.7
Iron	SB01-SB09	19/19	662-3580	1844	1644	3037
Lead	SB01-SB09	19/19	0.57-1.9	1.0	0.99	1.3
Manganese	SB01-SB09	19/19	3.8-104	36.1	22.9	94.4
Nickel	SB01-SB05(U)	6/19	2.7-3.9	1.7	1.3	3.9 X
Selenium	SB07-(U,L)	2/17	0.59	0.26	0.24	0.30
Vanadium	SB01-SB06(U,L), SB07-SB09(U), SB08(L)	17/19	1.3-4.5	2.2	1.9	3.4
Zinc	SB06-SB08 (U,L) SB09 (U)	7/8	2.1-3.3	2.4	2.2	3.3

(1) - 95% Upper Confidence Limit. The values used are for the top samples only (4.5-11 feet) as receptors are not believed to come in contact with subsurface soil deeper than 11 feet.
(-) - Not available
(*) - Numerous detected values (hits) exceed Typical Eastern U.S. Background Soil Concentrations (Dragun, 1988 and Conner and Shacklette, 1975), Typical U.S. Sandy Soil Concentrations (Kabata-Pendias, 1984) or data obtained from unsaturated soil samples taken from the surface to the water table from off-site locations as part of the Preferred Plating Corporation Site Remedial Investigation (Ebasco, 1989) and Circuitron Corporation Site Remedial Investigation (Ebasco, 1990).
(U) - Upper boring
(L) - Lower boring
(X) - Indicates that the 95% UCL is greater than the maximum detection. In this case, the maximum detection for the contaminant is used to calculate risk.

TABLE 13
BIOCLINICAL LABS SITE
CONTAMINANTS OF CONCERN CONCENTRATIONS (UG/L)
LOCATION, FREQUENCY OF DETECTION, RANGE AND MEAN VALUES
GROUNDWATER (ALL ROUNDS)*

	LOCATION	FREQUENCY[2] OF DETECTION	RANGE OF DETECTED VALUES (HITS)	ARITHMETIC MEAN	GEOMETRIC MEAN	95%[3] UCL
UPGRADIENT MONITORING WELLS:						
Volatile Compounds[1] (Low Detection Limit)						
cis 1,2-Dichloroethene	MW01, MW02	2/7	0.5-2.0	0.53	0.28	2.0 X
Trichloroethene	MW01, MW02	2/7	1.0-2.0	0.60	0.29	2.0 X
4-Methyl-2-pentanone	MW01, MW02	2/7	5.0-28.0	4.9	0.68	28 X
Naphthalene**	MW01	1/7	1.0	0.39	0.23	1.0 X
Chloroform	MW01	2/7	0.10-0.26	0.28	0.19	0.26 X
2-Butanone	MW01	1/1	8.0	8.0	8.0	8.0 X
Trichlorofluoromethane	MW01	1/7	0.13	0.37	0.32	0.13 X
Total Xylenes	MW01, MW02	2/7	0.60-1.0	0.43	0.32	1.0 X
Semivolatile Compounds						
No Compounds	-	0/7	-	-	-	-
Pesticides/PCBs						
Endosulfan Sulfate	MW02	1/7	0.27	0.08	0.06	0.17
Inorganic Compounds						
Arsenic	MW01, MW02	5/5	2.1-4.4	3.5	3.4	4.4 X
Barium	MW01, MW02	7/7	29.9-232	86.3	69.2	200
Beryllium	MW01, MW02	5/7	1.0-3.1	1.3	1.1	2.81
Cadmium	MW02	1/7	4.2	2.2	2.0	3.28
Chromium	MW01, MW02	5/7	37.9-1310	323	187	1310 X
Cobalt	MW01, MW02	7/7	7.3-21.8	9.0	6.5	21.8 X
Copper	MW01, MW02	5/7	45.6-141	78.7	72.1	124
Iron	MW01, MW02	7/7	5830-69700	29061	22631	69700 X
Lead	MW01, MW02	7/7	9.3-162	48.2	34.0	162 X
Manganese	MW01, MW02	7/7	113-2190	753	477.	2190 X
Nickel	MW01, MW02	7/7	24.5-118	45.6	38.4	85.7
Silver	MW01, MW02	3/7	4.3-7.6	3.7	3.3	6.0
Vanadium	MW01, MW02	7/7	9.0-87.5	34.4	27.1	87.5
Zinc	MW01, MW02	7/7	40.6-146	78.5	70.3	131

(-) Not available.
* All rounds refer to the combination of the short round, Round I, Round II, Round III and Round IV sample data.
** *Naphthalene* is considered a volatile organic contaminant only when analyzed using the low detection limit method.
(1) Volatile organic contaminant results for Round I and II sampling events were determined by USEPA to be unusable in this report. Therefore, sample results from Round III and IV sampling events were used.
(2) The number of valid analyses includes duplicates as individual samples.
(3) Indicates that the 95% UCL is greater than the maximum detection. In this case, the maximum detection for the contaminant is used to calculate risk.

TABLE 13 (Cont'd)
BIOCLINICAL LABS SITE
CONTAMINANTS OF CONCERN CONCENTRATIONS (UG/L)
LOCATION, FREQUENCY OF DETECTION, RANGE AND MEAN VALUES
GROUNDWATER (ALL ROUNDS)*

	LOCATION	FREQUENCY[2] OF DETECTION	RANGE OF DETECTED VALUES (HITS)	ARITHMETIC MEAN	GEOMETRIC MEAN	95%[3] UCL	
DOWNGRADIENT MONITORING WELLS:							
Volatile Compounds[1] (Low Detection Limit)							
cis 1,2-Dichloroethene	MW03, MW06, MW07, MW09, MW12, MW16	8/53	0.10-6.0	0.48	0.26	0.65	
Trichloroethene	MW03, MW04, MW06 MW07, MW09, MW12 MW13, MW14, MW16	11/53	0.60-17.6	1.3	0.39	2.1	
4-Methyl-2-pentanone	MW03	1/53	4.0	0.44	0.32	0.54	
Methylene chloride	MW03	1/53	120	3.3	0.83	1.8	
1,2-Dichloroethane	MW03	1/53	2.0	0.96	0.60	1.3	
Benzene	MW03, MW23	2/53	0.37-1.0	0.34	0.24	0.50	
Tetrachloroethene	MW03, MW05, MW06	4/53	0.70-2.0	0.40	0.27	0.56	
1,2,4-Trichlorobenzene	MW04	1/53	0.50	0.32	0.21	0.50	X
Chloromethane	MW03, MW07, MW13	4/53	1.0-3.0	0.57	0.46	0.62	
Carbon Disulfide	MW12, MW19	3/53	0.20-0.64	0.33	0.23	0.50	
Chloroform	MW03, MW05, MW08, MW11, MW13, MW18, MW20	16/53	0.14-2.0	0.49	0.31	0.82	
1,1-Dichloroethane	MW03, MW04, MW06, MW07, MW08	8/53	0.50-21.0	1.1	0.26	1.3	
1,3,5-Trimethylbenzene	MW09, MW12, MW16, MW19-23	11/53	0.10-0.60	0.28	0.20	0.38	
1,1,1-Trichlorethane	MW03, MW04, MW06, MW07, MW13, MW15, MW18	10/53	0.70-12.0	1.0	0.34	1.9	
Trichlorofluoromethane	MW03-7, MW11, MW13, MW14	21/53	0.37-170	14.1	1.1	25.8	
Total Xylenes	MW03, MW04, MW23	5/53	1.0-1.5	0.37	0.31	.50	
Naphthalene**	MW20, MW23	2/53	0.29-0.42	0.33	0.23	0.42	

(-) Not available.
* All rounds refer to the contamination of the short round, Round I, Round II, Round III and Round IV sample data
** Naphthalene is considred a volatile organic contaminated only when analyzed using the low detection unit method
(1) Volatile organic contaminant results for Round I and Round II sampling events were determined by USEPA to be unusable in this report. Therefore, sample results from Round III and IV sampling events were used.
(2) The number of valid analyses includes duplicates as individual samples.
(3) Indicates that the 95% UCL is greater than the maximum detection. In this case, the maximum detection for the contaminant is used to calculate risk.

TABLE 13 (Cont'd)
BIOCLINICAL LABS SITE
CONTAMINANTS OF CONCERN CONCENTRATIONS (UG/L)
LOCATION, FREQUENCY OF DETECTION, RANGE AND MEAN VALUES
GROUNDWATER (ALL ROUNDS)*

	LOCATION	FREQUENCY(2) OF DETECTION	RANGE OF DETECTED VALUES (HITS)	ARITHMETIC MEAN	GEOMETRIC MEAN	95%(3) UCL
DOWNGRADIENT MONITORING WELLS (Cont'd)						
Semivolatile Compounds						
Bis(2-ethylhexyl)phthalate	MW04, MW05, MW07-10 MW12-20, MW23	17/50	2.0-72.0	8.3	5.9	9.0
2,4-Dimethylphenol	MW19	1/46	5.0	5.3	5.2	5.0
Pesticides/PCBs						
No Compounds	-	0.52	-	-	-	-
Inorganic Compounds						
Arsenic	MW03-08, MW12-14	13/45	2.0-3.7	1.4	1.2	1.6
Barium	MW03-MW23	51/52	8.6-118	32.0	26.0	41.4
Beryllium	MW03, MW04	4/52	1.1-1.7	0.57	0.54	0.60
Cadmium	MW04, MW06, MW09-11 MW17, MW19	9/51	3.3-10.5	2.6	2.3	2.9
Chromium	MW03-16, MW18-23	45/52	6.8-75.8	21.4	15.2	75.8 X
Cobalt	MW03-MW05	6/52	3.6-10.0	3.6	3.3	4.1
Copper	MW03-MW23	46/52	7.2-240	33.6	21.4	52.5
Iron	MW03-MW23	52/52	55.8-12000	3173	1514	6259
Lead	MW03-MW23	45/45	4.6-74.5	22.1	17.8	27.3
Manganese	MW03-MW23	47/47	11.6-1090	167	83.6	297
Mercury	MW07	1/52	0.42	0.11	0.10	0.11
Nickel	MW03-11, MW14-16, MW18-23	35/52	6.8-40.8	11.4	8.6	14.6
Selenium	MW03-06, MW09, MW12, MW16	11/51	20-44.6	3.3	1.6	3.2
Silver	MW03-MW07	7/52	3.3-112	6.4	2.9	5.2
Thallium	MW21	1/52	3.0	1.08	0.93	1.2
Vanadium	MW03-08, MW11-14	18/52	4.3-19.6	5.0	3.2	6.4
Zinc	MW03-MW23	38/40	6.0-589	80.5	43.5	145

(-) Not available.
* All rounds refer to the contamination of the short round, Round I, Round II, Round III and Round IV sample data
** Naphthalene is considered a volatile organic contaminant only when analyzed using the individual unit mehtod.
(1) Volatile organic contaminated results for Round I and II sampling events were determined by USEPA to be unusable in this report. Therfore, sample results from Round III and IV were used.
(2) The number of valid analyses includes duplicates as individual sampling.
(3) Indicates that the 95% UCL is greater than the maximum detection. In this case, the maximum detection for the contaminant is used to calculate risk.

Table 14

BIOCLINICAL LABS SITE
POTENTIAL EXPOSURE PATHWAYS

	Population	Matrix	Route of Exposure
CURRENT AND FUTURE USE			
Commercial/Industrial	Site Workers	Surface Soil	Ingestion Dermal Contact Inhalation
FUTURE USE			
Commercial/Industrial	Site Workers	Groundwater	Ingestion Dermal Contact Inhalation (Shower Model)
	Const. Workers	Surface Soil	Ingestion Dermal Contact Inhalation
		Subsurface Soil	Ingestion Dermal Contact Inhalation
		Groundwater	Ingestion Dermal Contact Inhalation (Shower Model)
Residential	Residents	Surface Soil	Ingestion Dermal Contact Inhalation
		Subsurface Soil	Ingestion Dermal Contact Inhalation
		Groundwater	Ingestion Dermal Contact Inhalation (Shower Model)

TABLE 15

BIOCLINICAL LABS SITE
CHRONIC TOXICITY DATA FOR NONCARCINOGENIC
AND POTENTIALLY CARCINOGENIC EFFECTS
DOSE RESPONSE EVALUATION (a)

	NONCARCINOGENS : Reference Doses		CARCINOGENS : Slope Factors				
Chemical Name	Oral RfD (mg/kg-day)	Inhalation RfD (mg/kg-day)	Oral SF (mg/kg-day)^-1	Weight of Evidence	Inhalation SF (mg/kg-day)^-1	Weight of Evidence	Compounds w/o Criteria
Inorganics:							
Arsenic	1.00E-03*	-	1.75E+00	A	1.50E+01	A	Cobalt
Barium	7.00E-02	1.00E-04*	-	-	-	-	Copper
Beryllium	5.00E-03	-	4.30E+00	B2	8.40E+00*	B2	Iron
Cadmium	5.00E-04 (H2O)	-	-	-	6.30E+00*	B1	Lead
	1.00E-03 (Food)	-	-	-	-	-	Selenium
Chromium (III)	1.00E+00	5.71E-07*	-	-	-	-	
Chromium (VI)	5.00E-03	5.71E-07*	-	-	4.20E+01*	A	
Manganese	1.00E-01	1.14E-04	-	D	-	D	
Mercury	3.00E-04*	8.57E-05*	-	D	-	D	
Nickel (b)	2.00E-02	-	-	-	1.70E+00	A	
Silver	3.00E-03	-	-	D	-	D	
Thallium (c)	7.00E-05*	-	-	D	-	-	
Vanadium	7.00E-03*	-	-	-	-	-	
Zinc	2.00E-01*	-	-	D	-	D	

EPA Weight of Evidence Classifications are as follows:
Group A - Human Carcinogen. Sufficient evidence from epidemiologic studies to support a causal association between exposure and cancer.
Group B1 - Probable Human Carcinogen. Limited evidence of carcinogenicity in humans from epidemiological studies.
Group B2 - Probable Human Carcinogen. Sufficient evidence of carcinogenicity in animals. Inadequate evidence of carcinogenicity in humans.
Group C - Possible Human Carcinogen. Limited evidence of carcinogenicity in animals.
Group D - Not Classified. Inadequate evidence of carcinogenicity in animals.
(a) Integrated Risk Information System (IRIS) May, 1991.
(b) An oral RfD exists for the soluble salt form only. The SF represents the nickel subsulfide form of the chemical for conservatism.
(c) The oral RfD represents the soluble salt form of the chemical.
*: Health Effects Assessment Summary Tables - Fourth Quarter. USEPA, 1990.
-: Not Available

TABLE 16

BIOCLINICAL LABS SITE
CHRONIC TOXICITY DATA FOR NONCARCINOGENIC
AND POTENTIALLY CARCINOGENIC EFFECTS
DOSE RESPONSE EVALUATION (a)

	NONCARCINOGENS : Reference Doses		CARCINOGENS : Slope Factors				
Chemical Name	Oral RfD (mg/kg-day)	Inhalation RfD (mg/kg-day)	Oral SF (mg/kg-day)`-1	Weight of Evidence	Inhalation SF (mg/kg-day)`-1	Weight of Evidence	Compounds w/o Criteria
Volatiles:							
Acetone	1.00E-01*	-	-	-	-	-	Butyl benzene
Benzene	-	-	2.90E-02	A	2.90E-02	A	4-Chlorotoluene
2-Butanone	5.00E-02	9.00E-02*	-	D	-	D	1,2,3-
Carbon Disulfide	1.00E-01	2.86E-03*	-	-	-	-	Trichlorobenzene
Chloroform	1.00E-02	-	6.10E-03	B2	8.10E-02	B2	1,2,4-
Chloromethane	-	-	1.30E-02*	C	6.30E-03*	C	Trimethylbenzene
1,4-Dichlorobenzene	-	2.00E-01*	2.40E-02*	C	-	C	1,3,5-
Dichlorodifluoromethane	2.00E-01	5.00E-02*	-	-	-	-	Trimethylbenzene
1,1-Dichloroethane	1.00E-01*	1.00E-01*	-	C	-	C	
1,2-Dichloroethane	-	-	9.10E-02	B2	9.10E-02*	B2	
1,1-Dichloroethene	9.00E-03	-	6.00E-01	C	1.75E-01	C	
cis 1,2-Dichloroethene	1.00E-02*	-	-	D	-	D	
1,2-Dichloropropane	-	-	6.80E-02*	B2	-	B2	
Ethylbenzene	1.00E-01	2.90E-01	-	D	-	D	
Hexachlorobutadiene	2.00E-03	-	7.80E-02*	C	7.80E-02*	C	
4-Methyl-2-Pentanone	5.00E-02	2.00E-02*	-	-	-	-	
Methylene Chloride	6.00E-02	8.57E-01*	7.50E-03	B2	1.40E-02*	B2	
Styrene	2.00E-01	-	3.00E-02*	B2	2.00E-03*	B2	
Tetrachloroethene	1.00E-02	-	5.10E-02*	B2/C	1.82E-03*	B2/C	
Toluene	2.00E-01	5.71E-01*	-	-	-	-	
1,2,4-Trichlorobenzene	1.31E-03*	3.00E-03*	-	-	-	-	
1,1,1-Trichloroethene	9.00E-02	3.00E-01*	-	D	-	D	
Trichloroethene	-	-	1.10E-02*	B2	1.70E-02*	B2	
Trichlorofluoromethane	3.00E-01	2.00E-01*	-	-	-	-	
Total Xylenes	2.00E+00	8.57E-02*	-	D	-	D	

EPA Weight of Evidence Classifications are as follows:
Group A - Human Carcinogen. Sufficient evidence from epidemiologic studies to support a causal association between exposure and cancer.
Group B1 - Probable Human Carcinogen. Limited evidence of carcinogenicity in humans from epidemiological studies.
Group B2 - Probable Human Carcinogen. Sufficient evidence of carcinogenicity in animals. Inadequate evidence of carcinogenicity in humans.
Group C - Possible Human Carcinogen. Limited evidence of carcinogenicity in animals. Inadequate or lack of human data.
Group D - Not Classified. Inadequate evidence of carcinogenicity in animals.
(a) Integrated Risk Information System (IRIS) May, 1991.
*: Health Effects Assessment Summary Tables - Fourth Quarter. USEPA, 1990.
-: Not Available

TABLE 16 (continued)

BIOCLINICAL LABS SITE
CHRONIC TOXICITY DATA FOR NONCARCINOGENIC
AND POTENTIALLY CARCINOGENIC EFFECTS
DOSE RESPONSE EVALUATION (a)

	NONCARCINOGENS : Reference Doses		CARCINOGENS : Slope Factors				
Chemical Name	Oral RfD (mg/kg-day)	Inhalation RfD (mg/kg-day)	Oral SF (mg/kg-day)^-1	Weight of Evidence	Inhalation SF (mg/kg-day)^-1	Weight of Evidence	Compounds w/o Criteria
Semivolatiles:							
Bis(2-ethylhexyl) phthalate	2.00E-02	-	1.40E-02	B2	-	B2	
Butyl Benzyl Phthalate	2.00E-01	-	-	C	-	C	
Di-n-Butyl Phthalate	1.00E-01	-	-	D	-	D	
Diethylphthalate	8.00E-01*	-	-	-	-	-	
2,4-Dimethylphenol	2.00E-02	-	-	-	-	-	
Fluoranthene	4.00E-02	-	-	D	-	D	
Naphthalene	4.00E-03*	-	-	D	-	D	
Phenol	6.00E-01	-	-	D	-	D	
Pyrene	3.00E-02	-	-	D	-	D	
Pesticides:							
None Detected	-	-	-	-	-	-	Endosulfan Sulfate

EPA Weight of Evidence Classifications are as follows:
Group A - Human Carcinogen. Sufficient evidence from epidemiologic studies to support a causal association between exposure and cancer.
Group B1 - Probable Human Carcinogen. Limited evidence of carcinogenicity in humans from epidemiological studies.
Group B2 - Probable Human Carcinogen. Sufficient evidence of carcinogenicity in animals. Inadequate evidence of carcinogenicity in humans.
Group C - Possible Human Carcinogen. Limited evidence of carcinogenicity in animals.
Group D - Not Classified. Inadequate evidence of carcinogenicity in animals.
(a) Integrated Risk Information System (IRIS) May, 1991.
*: Health Effects Assessment Summary Tables - Fourth Quarter. USEPA, 1990.
-: Not Available

TABLE 17

BIOCLINICAL LABS SITE
RISK LEVELS AND HAZARD INDEX VALUES
SUMMARY ACROSS EXPOSURE PATHWAYS
PRESENT AND FUTURE-USE SCENARIOS - SITE WORKERS

PRESENT AND FUTURE-USE SCENARIO	CARCINOGENIC RISK LEVELS Reasonable Maximum Case	NONCARCINOGENIC HAZARD INDEX LEVELS Reasonable Maximum Case
Present and Future-Use Scenario		
1) Use of Surface Soils		
Soil Ingestion	8.04E-07	8.48E-03
Soil Dermal Contact	1.04E-06	1.45E-02
Soil Inhalation	2.90E-06	4.66E-03
Future-Use Scenario		
1) Use of Groundwater (Downgradient)		
Groundwater Ingestion	2.43E-05	3.02E-01
Groundwater Dermal Contact	2.93E-08	1.77E-03
2) Use of Groundwater (Upgradient)		
Groundwater Ingestion	8.31E-05	8.86E-01
Groundwater Dermal Contact	5.26E-09	1.77E-02

TABLE 18

BIOCLINICAL LABS SITE
RISK LEVELS AND HAZARD INDEX VALUES
SUMMARY ACROSS EXPOSURE PATHWAYS
FUTURE-USE SCENARIOS - RESIDENTS (CHILDREN & ADULTS)

FUTURE-USE SCENARIOS	CHILDREN		ADULTS	
	CARCINOGENIC RISK LEVELS Reasonable Maximum Case	NONCARCINOGENIC HAZARD INDEX LEVELS Reasonable Maximum Case	CARCINOGENIC RISK LEVELS Reasonable Maximum Case	NONCARCINOGENIC HAZARD INDEX VALUES Reasonable Maximum Case
1) Use of Surface Soils				
Soil Ingestion	8.57E-07	4.63E-02	8.04E-07	8.69E-03
Soil Dermal Contact	2.57E-07	1.83E-02	1.04E-06	1.48E-02
Soil Inhalation	4.99E-07	3.77E-03	1.87E-06	2.78E-03
2) Use of Subsurface Soils				
Soil Ingestion	8.11E-08	1.41E-03	6.70E-08	2.32E-04
Soil Dermal Contact	2.43E-08	4.22E-04	8.64E-08	3.00E-04
Soil Inhalation	4.25E-09	1.70E-03	2.81E-09	1.12E-03
3) Use of Groundwater (Downgradient)				
Groundwater Ingestion	2.84E-05	1.76E+00	7.11E-05	8.82E-01
Groundwater Dermal Contact	1.07E-07	2.80E-02	4.58E-07	2.39E-02
Groundwater Volatile Inhalation	1.07E-06	4.55E-02	2.50E-06	2.12E-02
4) Use of Groundwater (Upgradient)				
Groundwater Ingestion	9.70E-05	3.76E+00	2.43E-04	1.88E+00
Groundwater Dermal Contact	1.93E-08	3.25E-01	8.22E-08	2.77E-01
Groundwater Volatile Inhalation	1.88E-07	2.22E-02	4.38E-07	1.04E-02

TABLE 19

BIOCLINICAL LABS SITE
RISK LEVELS AND HAZARD INDEX VALUES
SUMMARY ACROSS EXPOSURE PATHWAYS
FUTURE-USE SCENARIOS - CONSTRUCTION WORKERS

FUTURE-USE SCENARIO	CARCINOGENIC RISK LEVELS Reasonable Maximum Case	NONCARCINOGENIC HAZARD INDEX LEVELS Reasonable Maximum Case
1) Use of Surface Soils		
Soil Ingestion	1.34E-07	9.85E-03
Soil Dermal Contact	1.73E-07	1.49E-02
Soil Inhalation	6.11E-07	7.27E-03
2) Use of Subsurface Soils		
Soil Ingestion	3.35E-08	1.12E-03
Soil Dermal Contact	4.32E-08	1.45E-03
Soil Inhalation	2.81E-08	1.07E-02
3) Use of Groundwater (Downgradient)		
Groundwater Ingestion	1.90E-06	1.01E-01
Groundwater Dermal Contact	2.93E-09	7.52E-04
4) Use of Groundwater (Upgradient)		
Groundwater Ingestion	6.48E-06	4.98E-01
Groundwater Dermal Contact	5.26E-10	1.95E-03

TABLE 20

BIOCLINICAL LABS SITE
CARCINOGENIC AND NONCARCINOGENIC RISKS
SUMMATIONS ACROSS EXPOSURE PATHWAYS

CHILDREN

Soil Ingestion (Surface) + Soil Dermal Contact (Surface) + Soil Inhalation (Surface) + Groundwater Ingestion (Downgradient) + Groundwater Dermal Contact (Downgradient) + Groundwater Volatile Inhalation (Downgradient)

Carcinogens

Reasonable Maximum Case = 8.57 E-07 + 2.57 E-07 + 4.99 E-07 + 2.04 E-05 + 1.07 E-07 + 1.07 E-06 = 3.12 E-05

Noncarcinogens

Reasonable Maximum Case = 4.63 E-02 + 1.83 E-02 + **3.7 E-03** + 1.76 E+00 + 2.80 E-03 + 4.55 E-02 = **1.88**

ADULTS

Soil Ingestion (Surface) + Soil Dermal Contact (Surface) + Soil Inhalation (Surface) + Groundwater Ingestion (Downgradient) + Groundwater Dermal Contact (Downgradient) + Groundwater Volatile Inhalation (Downgradient)

Carcinogens

Reasonable Maximum Case = 8.04 E-07 + 1.04 E-06 + 1.07 E-06 + 7.11 E-05 + 4.58 E-07 + 2.50 E-06 = 7.78 E-05

Noncarcinogens

Reasonable Maximum Case = 8.69 E-03 + 1.48 E-02 + **2.78 E-03** + 8.02 E-01 + 2.39 E-02 + 2.12 E-02 = **9.5 E-01**

SITE WORKERS

Soil Ingestion (Surface) + Soil Dermal Contact (Surface) + Soil Inhalation (Surface) + Groundwater Ingestion (Downgradient) + Groundwater Dermal Contact (Downgradient)

Carcinogens

Reasonable Maximum Case = 8.04 E-07 + 1.04 E-06 + 2.90 E-06 + 2.43 E-05 + 2.93 E-08 = 2.91 E-05

Noncarcinogens

Reasonable Maximum Case = 8.48 E-03 + 1.45 E-02 + **4.66 E-03** + 3.02 E-01 + 1.77 E-03 = **3.3 E-01**

CONSTRUCTION WORKERS

Soil Ingestion (Surface) + Soil Dermal Contact (Surface) + Soil Inhalation (Surface) + Groundwater Ingestion (Downgradient) + Groundwater Dermal Contact (Downgradient)

Carcinogens

Reasonable Maximum Case = 1.34 E-07 + 1.73 E-07 + 6.11 E-07 + 1.90 E-06 + 2.93 E-09 = 2.82 E-06

Noncarcinogens

Reasonable Maximum Case = 9.85 E-03 + 1.49 E-02 + **7.27 E-03** + 1.01 E-01 + 7.52 E-04 = **1.34 E-01**