EPA/ROD/R02-92/182
1992

EPA Superfund
Record of Decision:

BIOCLINICAL LABORATORIES, INC.
EPA ID: NYD980768683
OU 01
BOHEMIA, NY
09/30/1992

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

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.

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 theselected 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.

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

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SECTION

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 dry-wells, 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 well-field) 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 1,1dichloroethane 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, wellpoint 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 concentrationsexceeding 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 groundwater 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 onsite 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; and 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-amillion 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-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] tobe allowable.

For the current-use scenario, the most significant risk level identified for Site workers was 2.9 x 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 x 10[-4] for adults and 9.70 x 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 x 10[-6] for ingestion of upgradient groundwater (see Table 19). The highest carcinogenic risk level of 2.43 x 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 x 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 fiveyear 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

APPENDIX II

TABLES

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

<Footnotes>

(-) - 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).

</footnotes>

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]	(2.80)[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]	(0.220[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	5.8[J]	4.2[J]	5.6[J]	8.8[J]
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	0.21[J]	(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	12.1[J]	12.9[J]	11.3[J]	11.4[J]
Zinc	17.6	16.7[J]	21.4	77.5

<Footnotes>

J = Estimated value

U = Non-detects, detection limit is reported in parentheses

()UJ = Not detected, detection limit is estimated

R = Unusable
</footnotes>

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 fit)	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	1.5[J]
Barium	13.3	14.6	12.2
Beryllium	(0.22)[U]	(0.20)[U]	(0.21)[U]
Cadmium	1.9[J]	(0.61)[UJ]	0.86[J]
Calcium	2100	4400	5340
Chromium	610	16.9	226
Cobalt	1.7	2.0	1.7
Copper	19.7[J]	14.2[J]	14.9[J]
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	28.9[J]	26.6[J]	24.8[J]
Zinc	52.9	29.5	44.3

<Footnotes>
J = Estimated value

U = Non-detects, detection limit is reported in parentheses

()UJ = Not detected, detection limit is estimated

R = Unusable
</footnotes>

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

(HITS)	LOCATION	FREQUENCY OF DETECTION	RANGE OF DETECTED VALUES
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-SB09	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

<Footnotes>
(-) - Not Detected

(*) - Refers to soil borings from which samples were taken at the top (4.5-11 feet) and bottom (40.48 feet).
</footnotes>

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
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

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

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	2470133000
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
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	223044100
Vanadium	LW02,LW03	2/9	19.8-139
Zinc	LW01,LW02,LW03, LW05,LW06,LW07, LW08	7/7	114-5290

<Footnote>
* Note that detected values are measured in a liquid matrix.
</footnote>

STATE OF MAINE

Department of Environmental Protection

MAIN OFFICE: RAY BUILDING, HOSPITAL STREET, AUGUSTA
MAIL ADDRESS: State House Station 17, Augusta, 04333

207-289-7688

JOHN R. McKERMAN, JR.
GOVERNOR

DEAN C. MARRIOTT
COMMISSIONER

June 4, 1992

Thomas A. Dames
Captain, CEC, U.S. Navy
Commanding Officer
Department of the Navy, Northern Division
Naval Facilities Engineering Command
Building 77-L
Philadelphia Naval Shipyard
Philadelphia, PA 19112-5094

RE: Naval Air Station Brunswick Superfund Site, Brunswick, Maine

Dear Captain Dames:

The Maine Department of Environmental Protection (MEDEP) has reviewed the June 1992 Draft Record of Decision (ROD) regarding Sites 1 & 3 for the Naval Air Station Brunswick Superfund Site located in Brunswick, Maine.

Based on that draft the MEDEP concurs with the selected remedial action. This action consists of a multi-component approach for the containment of waste and remediation of groundwater as outlined in the following:

I. Slurry Wall

A. The soil/bentonite slurry wall will be placed around the landfill.
B. The wall will be keyed into natural clay formations.
C. Due to interference from the weapons compound, the wall will not be continuous around the landfill site.

II. Cap

A. A low-permeability cap will be constructed over the landfill area.
B. The cap will extend over the slurry wall.
C. The cap will not extend into the Weapons Compound Area.
D. Future closure of the Weapons Compound will result in a reevaluation of the cap construction.

III. Groundwater Extraction Wells

A. Groundwater extraction wells will be installed which will remove contaminated groundwater beneath the cap and within the slurry wall.
B. The number and placement of extraction wells will be determined during the design phase. C. Pump tests will be conducted to determine pumping rates.

IV. Groundwater Treatment

A. Extracted groundwater will be pumped to a central treatment plant.
B. Groundwater will be pretreated to remove inorganic compounds.
C. Groundwater will be treated to reduce or eliminate volatile organic compounds through the use of UV/oxidation technology.
D. Treatment levels will be based on the Public Operated Treatment Work's (POTW) National Pollution Discharge Elimination System permit and/or MCLs.
E. Treatability studies will be conducted prior to full-scale design.

V. Discharge of Treated Water

A. Discharge of treated water will be to the base sanitary sewer system which connects to the Brunswick Sewer District, Public Operated Treatment Works (POTW). POTW approval will be required.
B. Flow from the NABS treatment facility will not cause the POTW to exceed its capacity.

VI. Clean-up levels

A. Groundwater clean-up levels for contaminants have been set at the MCL.
B. No soil clean-up levels were established.
C. Ecological target clean-up levels for leachate seeps and surface water have been set at the Ambient Water Quality Criteria or risk based levels.

VII. Institutional controls

A. Land use restrictions will be placed on future use of the landfill and groundwater affected by the landfill. These restrictions will prohibit disturbance of landfilled materials and extraction of groundwater for any use besides remediation.
B. Warning signs will be placed in appropriate locations.

VIII. Environmental monitoring

A. Groundwater flow and quality will be monitored.
B. Surface water, sediments, and leachate seeps will be monitored.
C. Dispersion and degradation of contamination already emanated from the landfill will be monitored.
D. At a minimum, environmental monitoring will continue for 30 years.
E. Five year reviews will be conducted.
F. A risk assessment will be part of the 5 year review.
G. The need for future remedial action will be assessed.

This concurrence is based upon the State's understanding that:

A. The MEDEP will continue to participate in the Federal Facilities Agreement dated October 19, 1990 and in the review and approval of operational designs and monitoring plans.

B. Groundwater extraction wells established within the slurry wall enclosure will be maintained. Groundwater elevation levels will be monitored within the landfill to determine the effectiveness of the slurry wall/cap. If groundwater levels rise, resulting in contact between contained waste and the groundwater, the extraction wells will be reactivated to maintain appropriate groundwater levels. Discharge water from any future pumping, beyond that anticipated in this ROD, will require treatment.

C. At the completion of the remedy, any residual risk at the site will fall within the risk range specified under the Federal National Contingency Plan (NCP). The MEDEP remains concerned that the groundwater clean-up standard for vinyl chloride is not consistent with the risk range specified in the NCP. In particular, if vinyl chloride is reduced no lower than 2.0 ppb groundwater clean-up level specified in this ROD, the residual risk from this compound alone will exceed the worst case 10-4 cut off specified in the NCP. The MEDEP finds the specified groundwater clean-up goal for vinyl chloride, may not provide sufficient protection

of public health. The State, however, anticipates that in reducing most compounds at the Site to their respective groundwater clean-up goals, vinyl chloride will be reduced to protective levels well below the clean-up goals stated in the ROD. Therefore our concurrence is based upon the understanding that the decision as to completion of the remedy for groundwater will be based on the total residual groundwater risk from the Site and that further remedial action will be required if the total site risk exceeds the 10[-4] cutoff specified in the NCP.

D. Institutional controls must remain in place as part of the remedial alternative, if the calculated total excess cancer risk for the site exceeds 10[-5]

E. The site conditions shall be reviewed within five(5) years from the conclusion of the remedial action to ensure that public health and the environment are not significantly impacted by the remedial contaminants. Of particular concern to the MEDEP is the potential for increased concentrations of vinyl chloride due to anaerobic degradation of residual chlorinated compounds in groundwater.

The MEDEP looks forward to working with the Department of the Navy and the USEPA to resolve the environmental problems posed by this site. If you need additional information, do not hesitate to contact myself or members of my staff.

Sincerely,

Dean C. Marriott
Commissioner

cc: Alan Prysunka, Director, BHMSWC
Michael Barden, Director, DSIR
Mark Hyland, Director, FFU