United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R02-91/144
June 1991

EPA

Superfund Record of Decision:

Mattiace Petrochemicals, NY

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. EPA/ROD/R02-91/144	2.	3. Recipient's Accession No.

4. Title and Subtitle
SUPERFUND RECORD OF DECISION
Mattiace Petrochemicals, NY
Second Remedial Action - Final

5. Report Date 06/27/91

6.

7. Author(s)

8. Performing Organization Rept. No.

9. Performing Orgainization Name and Address

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C)
(G)

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

16. Abstract (Limit: 200 words)

The 2-acre Mattiace Petrochemicals site is an inactive liquid storage and redistribution facility in Glen Cove, Nassau County, New York. Surrounding land use is primarily industrial. Glen Cove Creek, a potential wetland area, is located south of the site. The site overlies a system of three unconsolidated sedimentary aquifers, of which the surficial Upper Glacial Aquifer has been affected by onsite contamination. From the mid-1960s to 1986, organic solvents were stored, blended, and repackaged onsite. Onsite features involved with the operation included a metal Quonset hut, a concrete fire shed, a leaching pond, a partially covered concrete loading dock, and 32 underground and 24 above-ground storage tanks. Drums were reconditioned onsite, and the resulting water/solvent mixtures were discharged to above-ground tanks or to an onsite leaching pond. A solvent water separator was used to collect overflow from the above-ground tanks for discharge to the leaching pond. There is evidence, however, that overflow from these tanks may have been discharged directly into the soil. In 1988, EPA characterized and disposed of 100,000 gallons of hazardous liquids offsite from approximately 24 above- and 32 underground storage tanks. In 1989, a second EPA investigation identified approximately 25 buried drums

(See Attached Page)

17. Document Analysis a. Descriptors
Record of Decision - Mattiace Petrochemicals, NY
Second Remedial Action - Final
Contaminated Media: soil, debris, gw
Key Contaminants: VOCs (PCE, TCE, toluene, xylenes), other organics (PAHs, pesticides, phenols), metals (arsenic, chromium, lead)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 102
	20. Security Class (This Page) None	22. Price

Abstract (Continued)

and numerous other containers that were leaking contaminated material into the surrounding soil and ground water. A 1990 Record of Decision (ROD) provided for removal of onsite buried drums containing sludge, as well as the associated highly contaminated soil as Operable Unit 2 (OU2). In 1989, EPA characterized onsite contamination, and discovered a layer of "free product" floating on top of contaminated ground water and contaminated sediment in Glen Cove Creek. This ROD addresses remediation of onsite source materials, as well as management of migration of contaminated shallow ground water. The primary contaminants of concern affecting the soil, debris, and ground water are VOCs including PCE, TCE, toluene, and xylenes; other organics including PAHs, pesticides, and phenols; and metals including arsenic, chromium, and lead.

The selected remedial action for this site includes excavating and treating offsite 208 cubic yards of pesticide-contaminated "hot spot" soil, possibly by incineration, followed by offsite disposal of residuals; backfilling excavated areas with clean soil; treating 17,141 cubic yards of contaminated soil using in-situ vacuum extraction, followed by activated carbon to control off-gases, as needed; decontaminating and demolishing the Quonset hut, 24 above-ground tanks, 32 underground tanks, and 1,360 cubic yards of concrete and asphalt, followed by offsite disposal; removing 15,000 gallons of "free product" using ground water extraction wells and a skimmer pump, followed by offsite treatment and disposal; pumping and treatment of ground water using precipitation and clarification as pretreatment to remove metals, and air stripping to remove organics, and reinjecting the treated water onsite; treating air effluent from the air stripper using thermal treatment; treating water effluent from the air stripper using carbon adsorption, and regenerating spent carbon offsite; performing treatability studies; conducting a soil gas survey to monitor off-gas migration; and monitoring ground water, Glen Cove Creek sediment, and surface water. The estimated present worth cost for this remedial action is $15,930,592, which includes an annual O&M cost of $692,997 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Soil cleanup goals are based on achieving an excess lifetime cancer risk of 10^{-6}. Chemical-specific goals for soil include PCE 0.6 mg/kg, TCE 0.07 mg/kg, and xylenes 259 mg/kg. Ground water cleanup levels are the more stringent of Federal MCLs or State standards, and include PCE 5 ug/l (State), TCE 5 ug/l (MCL), and xylenes 5 ug/l (State).

ROD FACT SHEET

SITE

Name:	Mattiace Petrochemical Co., Inc.
Location/State:	Glen Cove, Nassau County, N.Y.
EPA Region:	II
HRS Score (date):	30.63-31.94
NPL Rank (date):	Group 14 (proposed June, 1988)

ROD

Date Signed: June 27, 1991

Selected Remedy- * In Situ Vacuum Extraction of Volatile Organic Contaminants from Soil in General Site Area
* Excavation of Pesticide "Hot Spots" with Off-site Treatment and Disposal
* Demolition, Removal, and Landfill Disposal of Site Structures, Above- and Belowground Storage Tanks, and Concrete and Asphalt Debris
* Groundwater Extraction and Treatment via Air Stripping and Carbon Adsorption, Followed by Reinjection
* Monitoring of Groundwater in the Area of the Site, as well as Surface Water and Sediments in Glen Cove Creek.

Capital Cost:	$6,544,487
O and M:	$692,997
Present Worth:	$15,930,592

LEAD-Remedial, EPA

Primary contact:	Edward G. Als- (212) 264-0522
Secondary Contact:	Douglas Garbarini- (212) 264-0109

WASTE

Type and media: Soil-*VOCs- Tetrachloroethylene, trichloroethylene, xylenes
*Semi-VOCs- alpha chlordane.
*Inorganics- N/A
Groundwater--*VOCs-tetrachloroethylene, trichloroethylene, chloroform, ethylbenzene, xylenes, methylene chloride, isophorone, and 1,2-dichlorobenzene.
"Floating Product"-toluene, xylenes, trichloroethylene, tetrachloroethylene

Origin: On-site waste disposal, spillage from hazardous materials handling

DECLARATION FOR THE RECORD OF DECISION

MATTIACE PETROCHEMICAL CO., INC.

SITE NAME AND LOCATION

Mattiace Petrochemical Co., Inc.
Glen Cove, Nassau County, New York

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Mattiace Petrochemical Co., Inc. site ("the Site"), developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. §9601 et seq., and, to the extent applicable, the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300. This decision is based on the administrative record for this site. The attached index (**Appendix 5**) identifies the items that comprise the administrative record.

The State of New York concurs on the selected remedy.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this Record of Decision, may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE REMEDY

This ROD contains the remedy selected for the releases or threats of releases documented by the Mattiace first operable unit investigation. The major components of the selected remedy include:

* In Situ Vacuum Extraction of Volatile Organic Contaminants from Soil in General Site Area

* Excavation of Pesticide "Hot Spots" with Off-site Treatment and Disposal

* Demolition, Removal, and Landfill Disposal of Site Structures, Above- and Belowground Storage Tanks, and Concrete and Asphalt Debris

* Groundwater Extraction and Treatment via Air Stripping and Carbon Adsorption, Followed by Reinjection

* Monitoring of Groundwater in the Area of the Site, as well as Surface Water and Sediments in Glen Cove Creek.

The Mattiace second operable unit remedial action, which was the subject of a September 27, 1990 ROD, is presently underway at the Site and should be completed shortly. The second operable unit ROD called for the excavation and offsite disposal of buried drums and containers that were found on the Mattiace property during the second operable unit investigation.

DECLARATION

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

Since this remedy will result in hazardous substances remaining for an indefinite time at the Site above health-based levels, a review will be conducted no later than five years after commencement of the remedial action to ensure that this remedy continues to provide adequate protection of human health and the environment.

Constantine Sidamon-Eristoff
Regional Administrator

Date 6/27/91

Decision Summary

MATTIACE PETROCHEMICAL CO., INC.

GLEN COVE, NEW YORK

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION II

NEW YORK

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SITE NAME, LOCATION, AND DESCRIPTION

The Mattiace Petrochemical Co., Inc. Site ("the Site"), which includes the 1.9 acre property owned by Mattiace Petrochemical Co. Inc., is located on Garvey's Point Road in Glen Cove on Long Island, New York (**FIGURE 1**). LIMCO Manufacturing Corporation, a precision sheet metal manufacturer, is located along the eastern and southern border of the Mattiace property. Property formerly owned by Edmos, a knitting, dying, and finishing textile fabric manufacturer, borders the Mattiace property to the west. This property is presently owned by 20 Garvey's Point Road Corporation and is occupied by Medallion Oil Co. and various other tenants. Undeveloped property owned by the Glen Cove Development Corporation is located to the north of the Mattiace property. A residential area is located just north of this undeveloped area, within one hundred yards of the Mattiace property. The study area also contains the Garvey's Point Preserve, the Glen Cove marina, residential areas, and other industrial facilities in addition to those mentioned above.

The Mattiace facility is located approximately 500 feet directly north of Glen Cove Creek. The Creek empties into Hempstead Harbor approximately 1500 feet west of the Mattiace facility. The facility, which is no longer active, is a fenced enclave containing 32 underground and 24 aboveground chemical storage tanks of various capacities. Most of the underground tanks are connected with an underground manhole piping system which collected chemical overflows from the storage tanks as well as stormwater. This collection system leads to a solvent/ stormwater separator in the southeast part of the property where any solvents were allowed to separate from water. Although the separator made it possible to skim the solvents for proper disposal and pump the remaining water to on-site leaching pools, there were likely occasions when the entire contents of the solvent/stormwater separator were pumped directly out to the driveway at the southwest corner of the Site.

The property also includes the following: a metal Quonset building, in which drum cleaning and reconditioning was performed; a wetwell outside the Quonset building into which the process liquids from drum reconditioning were discharged; a concrete fire shed; and a concrete loading dock partially covered by a slanted metal roof. The south end of the property was a truck parking area when the facility was operational. See **FIGURE 2** for a detailed diagram of the facility layout.

The regional geology in the Mattiace study area is generally comprised of 3 unconsolidated sediments, namely, the Raritan Formation, the Magothy Formation, and the Upper Glacial Formation. The Site is underlain by the Upper Glacial and Magothy Formations, under which lays the Raritan Clay, which is a minimum of 50 feet thick at the Site and of very uniform composition locally.

Groundwater is a source of drinking water for an estimated 44,000 people in the area, although there is presently no indication that any water supplies are contaminated or in danger of contamination as a result of conditions at the Site. This is because groundwater contamination from the Site moves generally southwest toward Glen Cove Creek and Hempstead Harbor, with no intervening public water supply wells. The groundwater contamination is also restricted to the Upper Glacial deposits above the Raritan Clay, which suggests that contaminated groundwater will ultimately discharge to surface water, i.e. the Harbor or the Creek, and not travel beneath the Harbor or the Creek.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

The Mattiace Petrochemical Company began operating in the mid-1960's, receiving chemicals by tank truck, blending and redistributing them to its customers. The primary operations were the storing, blending, and repackaging of organic solvents. These solvents were stored in aboveground and belowground tanks, and they were blended and repackaged in 55 gallon drums under a covered section of the concrete loading dock located in the northeast corner of the property. The 55 gallon drums were stacked and temporarily stored on the loading dock prior to shipment to various buyers.

The metal Quonset hut located in the western portion of the property was used by the M and M drum cleaning operation to clean, pressure test, and repaint drums. The M and M operation and the Mattiace operation were both owned by Mattiace Industries. The resulting aqueous/solvent mixture was collected in a wetwell in the southeast external corner of the Quonset hut. The liquids in this wetwell were periodically discharged to one of the adjacent aboveground tanks or into a leaching pool on the property.

An underground tank farm used for the storage of organic solvents is located in the northeast corner of the property. Thirty two underground and twenty four aboveground storage tanks exist mainly in the northeastern section of the Mattiace property. The underground tanks are interconnected by a spill prevention system. Excess material from overfilled tanks drain through a series of four concrete manholes and discharge into the solvent/stormwater separator which is located in the southeast corner of the property. This spill prevention system also acts as a stormwater collection system. Stormwater from the lower portion of the separator was intended to be drained by gravity and then pumped into the northwest leach pools. However, the liquids which collected in the separator and ponded in the southeast corner of the property were sometimes pumped through a hose down the Mattiace driveway while the facility was operational.

In 1986, the Mattiace Petrochemical Company filed for bankruptcy as a result of legal problems resulting from its non-compliance with various environmental regulations. At the request of the State of New York, the Bankruptcy Court removed the protection of assets normally extended to a reorganizing company in 1987 in order to ensure that the Company ceased operations. Meanwhile, in August 1986, a Grand Jury handed up a 21 count charge against the Company and three of its officers. In May 1988, a jury returned felony charges against the Company and its president.

On July 8, 1988, EPA notified William, Otto, and Louis Mattiace of their status as potentially responsible parties at the Mattiace Site, as well as provided them the opportunity to remediate the Site through an EPA Consent Order. No offer was received by EPA in response to this notification. In August, 1988, a Federal lien was placed on the Mattiace property by EPA.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

A Community Relations Plan was developed for the Site by EPA which designated the Glen Cove Public Library as the public information repository. All public information concerning the Site, including the Site Administrative Record file, is presently located at this repository.

The Proposed Plan for remediation at the Site which resulted from the remedial investigation and feasibility study (RI/FS) was mailed on May 14, 1991 to the Glen Cove Public Library (as the Site's public information repository) and to the individuals or entities on the mailing list for the Site, which included State and local officials and other interested parties. General notice of the availability of the Proposed Plan was placed in Long Island Newsday on May 17, 1991 and the Glen Cove Pilot Record on May 23, 1991 (**FIGURES 3 and 4**). An EPA press release was also issued on May 17, 1991. A public meeting was held on May 30, 1991, to solicit public comment on the RI/FS and Proposed Plan. The duration of the public comment period was 30 days and ended on June 14, 1991.

All comments received by EPA during the public comment period are responded to in detail in the Responsiveness Summary which is attached as **APPENDIX 4**.

SCOPE AND ROLE OF OPERABLE UNIT

This response action complements two earlier response actions at the Site. EPA initiated a removal action at the Site in February, 1988, which included waste characterization and off-site disposal of approximately 100,000 gallons of hazardous substances from aboveground and belowground tanks. The removal action was completed in June, 1988.

Subsequently, EPA commenced a comprehensive RI at the Site in October, 1989. The RI included the following: a geophysical survey; a soil gas survey (**FIGURE 5**); installation and sampling of 11 groundwater monitoring wells and two piezometers (**FIGURE 6**, which also shows 4 wells installed as part of the preliminary investigation conducted by Woodward Clyde); drilling and sampling of 22 soil and 3 hand augur borings (**FIGURE 7**); and sampling of Glen Cove Creek water and sediments (**FIGURE 8**).

The geophysical survey was performed to assess, among other things, the possibility that hazardous substances were disposed of through burial on-site. The survey indicated that several areas at the Site should be further investigated because of the possibility of buried drums of hazardous substances. Therefore, EPA initiated the second operable unit focused feasibility study (FFS) in December, 1989 to further define the findings of the geophysical investigation. With the creation of the second operable unit at the Site, all other elements of the Site investigation were designated as first operable unit activities.

The second operable unit investigation's objectives consisted of the identification of any buried drums which contained hazardous substances, as well as the identification of significantly contaminated soils. The investigation concentrated on three areas at the Site which were suspected of being used for drummed hazardous waste disposal. EPA found an estimated 25-50 drums buried in the area designated source area 1, which is located along the western perimeter of the Site. No drums were found in any of the other suspected source areas. An FFS report was then issued which became the basis for the EPA's September 27, 1990 Record of Decision (ROD) for remediation of source area 1 (**FIGURE 9**). Remedial action implementing the remedy selected in that ROD is presently underway and should be completed shortly.

The overall goal of the first operable unit investigation, which is the investigation upon which this ROD is based, is to reduce the concentrations of all Site contaminants to levels which are protective of human health and the environment.

EPA believes that the selected remedy will achieve this goal by meeting the following remedial action objectives:

1) reduce to acceptable levels the on-site potential health effects associated with contaminated soils and residual leakage from underground tanks;

2) minimize the off-site migration of contaminated groundwater and surface runoff to potential environmental receptors; and,

3) restore the groundwater currently being degraded as a result of the Site to its most beneficial use.

SUMMARY OF SITE CHARACTERISTICS

The soil contamination at the Site is extensive across the entire facility area, with "hot spots" of contamination occurring in several locations on the Site (one of these "hot spots", the buried drum area along the western boundary of the Site, is presently being remediated pursuant to the second operable unit ROD). These locations are generally associated with seven groups of underground storage tanks on the Site, as well as three other locations corresponding to soil boring numbers 5, 9, and 11, which are all contaminated primarily with pesticides. Some of the more frequently occurring contaminants of concern in the soil (with maximum concentrations in parentheses) were: tetrachloroethylene (410 milligrams/killigram, or mg/kg), trichloroethylene (37 mg/kg), xylenes (2,600 mg/kg), and 1,4-alpha chlordane (9 mg/kg) (**TABLE 1**).

The RI also determined the existence of severe groundwater contamination in the Upper Glacial aquifer beneath the Site. Additional data gathered from previous investigations in the Garvey's Point area and reviewed by EPA indicate pervasive groundwater contamination in the area, most likely as a result of its commercial/industrial nature. The groundwater contamination attributable to the Site is particularly severe, and includes a localized layer of "floating product" at the top of the water table directly under the Site. This "floating product" consists of approximately 15,000 gallons of a mixture of organic chemicals, including total xylenes (6% by weight), trichloroethylene (12%), tetrachloroethylene (10%), and toluene (12%). Excluding the "floating product", analysis of groundwater during the RI indicates the following concentrations of some contaminants of concern: tetrachloroethylene (100 milligrams/liter, or mg/l), trichloroethylene (230 mg/l), chloroform (81 mg/l), ethylbenzene (370 mg/l), xylenes (422 mg/l), methylene chloride (750 mg/l), isophorone (57 mg/l), and 1,2-dichlorobenzene (5.3 mg/l) (**TABLE 2**). These concentrations are several orders of magnitude above Federal and state drinking water standards. The movement of groundwater in the Upper Glacial aquifer in the vicinity of the Site is slow and generally in a southwest direction toward Glen Cove Creek. On the basis of the RI, as well as other information sources considered during the investigation, EPA believes that none of the area's potable water supply wells are in locations that would cause them to be presently affected or threatened by the groundwater contamination from the Site.

Moreover, it is likely that contaminated groundwater, as well as surface water runoff from the Site, is responsible for a portion of the contamination that EPA detected in Glen Cove Creek's sediments. It is very difficult to delineate and quantify the constituents which could be directly related to the Site given the documented releases of organic chemicals from other

facilities in the area, many of which are the same as those substances released from the Mattiace facility. EPA's sampling of the Creek's sediments indicated elevated concentrations of organic contamination, particularly semi-volatile compounds such as bis (2-ethylhexyl)phthalate (21 mg/kg), fluoranthrene (7 mg/kg), and pyrene (6 mg/kg) (**FIGURE 10**). Some inorganics, such as aluminum and iron, were also found in high concentrations. The semi-volatile compounds detected in the Creek sediments were also found on the Site during the RI but in relatively low concentrations and minor frequency of occurrence. Therefore, it is possible that the Site is a source of these compounds in the Creek sediments, but the amount of contribution is similarly difficult to quantify.

SUMMARY OF SITE RISKS

A baseline risk assessment was developed as part of the remedial investigation for the Site. The risk assessment evaluates the potential impacts on human health and the environment if the contamination at the Site is not remediated. This information is used by EPA to make a determination as to whether remediation of the Site is required.

EPA evaluated nearby residents and others who might spend extended periods of time on or around the Site under a current land use scenario. EPA also used a scenario based on future residential land use at the Site in order to assess the maximum plausible risk that the Site could pose. Under both scenarios, several exposure pathways (direct contact, inhalation and ingestion) were evaluated for surface and subsurface soils and air, while exposure to groundwater (ingestion, contact, and inhalation) was evaluated only for the future use scenario. Exposure assumptions were made that would include current nearby residents/workers and future on-site residents, including children, as the receptors (or potential receptors). 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.

For known or suspected carcinogens, acceptable exposure levels are generally concentration levels that theoretically represent an excess upper bound lifetime cancer risk to an individual of between $1x10^{-4}$ (or one incident of Site-related cancer among an exposed population of 10,000 people) to $1x10^{-6}$ (or one incident of Site-related cancer among an exposed population of 1,000,000 people). EPA derives this risk by using existing information on the relationship between dose of carcinogen and carcinogenic response. The 10^{-6} risk level is used as the point of departure for determining remediation goals for alternatives when

regulatory standards or requirements are not available or are not sufficiently protective.

For systemic toxicants, acceptable exposure levels generally represent concentration levels to which the human population, including sensitive subgroups, may be exposed without adverse effect.

Selection of Contaminants of Concern

Contaminants which have inherent toxic/carcinogenic effects that are likely to pose the greatest concern with respect to the protection of public health and the environment, and that were detected at the Site in significant concentrations and/or frequencies of occurrence were selected as contaminants of concern. The contaminants of concern at the Mattiace Site are presented in **TABLE 3.**

Exposure Assessment

An exposure pathway is the course a contaminant takes from the source to the exposed receptor. Exposure pathways in general must consist of the following four elements:

1. a source and mechanism of constituent release;
2. a retention or transport medium;
3. a point of potential human contact with the medium; and
4. an exposure route at the contact point.

In this assessment, both current and potential future exposure pathways are considered. Current activity patterns at the Site are examined to identify current exposure potential to residents and workers near the Site as it presently exists. In developing future exposure pathways, it is assumed that no further remedial actions will be undertaken. It is further assumed that a residential development may be constructed on the Mattiace property, and that exposure to contaminants in soils may occur during and after the construction.

To quantitatively assess the potential risks to human health associated with the exposure scenarios considered in this assessment, estimates of chronic daily intakes (CDIs) are developed. CDIs are expressed as the amount of a substance taken into the body per unit body weight per unit time, or mg/kg/day. A CDI is averaged over a lifetime for carcinogens and over the exposure period for noncarcinogens. An average case and a reasonable maximum case are considered. The average case is based on average (but conservative) conditions of exposure and the average exposure point concentrations. The reasonable maximum case is based on upper-bound conditions of exposure and the reasonable maximum exposure point concentration, and as such represents the extreme upper limit of potential exposure.

Toxicity Assessment

Cancer potency factors (CPFs) have been developed by EPA's Carcinogenic Assessment Group for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. CPFs, 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 provide an upper bound estimate of the excess lifetime cancer risk associated with exposure at that intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the CPF. Use of this approach makes the underestimation of the actual cancer risk highly unlikely. CPFs are derived from the results of human epidemiological studies or chronic animal bioassays to which animal-to-human extrapolation and uncertainty factors have been applied.

Noncarcinogenic risks were assessed using a hazard index (HI) computed from expected daily intake levels (subchronic and chronic) and reference doses, or RfDs (representing acceptable intakes). Potential concern for noncarcinogenic effects of a single contaminant in a single medium is expressed as the hazard quotient (HQ). This is the ratio of the estimated intake (derived from the contaminant concentration in a given medium) to the contaminant's RfD. By adding the HQs for all contaminants within a medium or across all media to which a given population may reasonably be exposed, the HI can be generated. The HI is useful as a reference point for gauging the potential effects of environmental exposures to complex mixtures. In general, HIs which are less than one are not likely to be associated with any health risk, and are therefore less likely to be of concern than HIs greater than one.

For a listing of the indices of toxicity, i.e. RfDs, CPFs (or slope factors), please see **TABLE 4.**

In accordance with EPA's guidelines for evaluating the potential toxicity of complex mixtures, it was assumed that the toxic effects of the Site-related chemicals would be additive. Thus, lifetime excess cancer risk and the CDI:RfD ratios were summed to indicate the potential risks associated with mixtures of potential carcinogens and noncarcinogens, respectively.

Under current EPA guidelines, the likelihood of carcinogenic and noncarcinogenic effects as a result of exposure to Site chemicals are considered separately.

Risk Characterization

The risk characterization quantifies present and/or potential future threats to human health that result from exposure to the contaminants of concern. EPA calculated significant carcinogenic

risks associated with prolonged exposure to contaminated soils on the Mattiace property. Reasonable maximum exposure risks for adults were on the order of $3x10^{-3}$ for inhalation, and $2x10^{-3}$ for dermal absorption, with even greater risks posed for sensitive populations, such as children. Inhalation risks were chiefly as a result of airborne volatile organic compounds, particularly trichloroethylene. The dermal absorption risk was chiefly as a result of semi-volatile pesticides in the soils. Adult non-carcinogenic risks from these types of exposures were also significant, with hazard indices ranging from 6.3 for inhalation (mainly from a variety of airborne volatile organic compounds) to 23 for dermal absorption (mainly from alpha chlordane, a pesticide).

EPA also calculated the risk to public health associated with exposure to contaminated groundwater, even though no exposures are presently occurring, as part of the future residential use scenario. EPA calculated an adult carcinogenic risk from the exposure to groundwater directly beneath the Site of $8x10^{-1}$ for groundwater ingestion (chiefly from a variety of volatile organic compounds), and $3x10^{-2}$ for dermal absorption (chiefly from the volatile organic compounds carbon tetrachloride and vinyl chloride). Adult non-carcinogenic effects were also significant, with hazard indices ranging from 4,730 for groundwater ingestion (chiefly from carbon tetrachloride) to 195 for dermal absorption (chiefly from carbon tetrachloride). For a complete listing of the health effects criteria and the calculated adult risks for various chemicals and exposure pathways, see **TABLE 4.**

Moreover, contaminated groundwater, as well as surface water runoff from the Site, is likely responsible for a portion of the contamination that EPA found in Glen Cove Creek's sediments. Since most of the contaminants found in high concentrations exhibit low water solubility and a high affinity for adsorption to sediments, it would be expected that they would tend to remain in the sediments with little dissolution in the overlying water column. Therefore, any release of these contaminants from the sediment to the water column should be insignificant relative to the amount of tidal "flushing" of Creek water that takes place. EPA considered human exposure to these sediments an unlikely possibility (in particular chronic long-term exposure), because of the present use and physical nature of the Creek, i.e., boat traffic, bulkheaded (no exposed sediments), etc. Therefore, only the risk associated with exposure to Creek water was evaluated. This assessment indicates that no unacceptable risks to public health are posed by the low contaminant concentrations found in the Creek water.

Since the Creek is contiguous with Hempstead Harbor, and ultimately with Long Island Sound, the contamination from the Site has the potential to affect any of the species of flora and fauna that use or inhabit these environs, although the degree of

the effects is difficult to quantify and would depend, among other things, on the duration of exposure and on the particular species exposed.

More specific information concerning public health risks is contained in the volume entitled Remedial Investigation Report-Mattiace Petrochemical Site (Chapter 6-Human Health Risk Assessment) located at the Glen Cove Public Library.

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. In the case of soils, the conservative models used assume that the contaminant is present at the maximum detected concentration throughout the volume of soils being examined. Environmental chemistry analysis error can stem from several sources, including the errors inherent in the analytical methods, chain of custody problems, and characteristics of the matrix being sampled. Environmental parameter measurements primarily contribute to uncertainty because little verified information is available.

In the Site risk assessment there are uncertainties regarding the estimates of how often, if at all, an individual would come in contact with the chemicals of concern and the period of time over which such exposure would occur. In particular, this applies to the future residential exposures. There is also significant uncertainty in the models used to estimate exposure point concentrations.

Toxicological data error (potentially occurring in extrapolating both from animals to humans and from high to low doses) is also a large source of potential error in this risk assessment. There is also a great deal of uncertainty in assessing the toxicity of a mixture of chemicals. In this assessment, the effects of exposure to each of the contaminants present in the environmental media have initially been considered separately. The separate evaluation and subsequent summation of contaminant-specific risk may not account for potential synergistic or antagonistic

interactions of chemical mixtures.

In summary, actual or threatened releases of hazardous substances from this Site, if not addressed by the selected remedy or one of the other active measures considered, may present a current or potential threat to public health and the environment through, at a minimum, any of the following exposure pathways: inhalation of particulates and/or vapors from contaminated soils, dermal absorption of contaminated soils, under both the current land use and a future residential land use scenario, and ingestion, inhalation or dermal absorption of contaminated groundwater under a future residential land use scenario.

The FS, in which remedial alternatives are developed, screened, and then carefully evaluated in detail, forms the basis for the selected remedy.

DESCRIPTION OF ALTERNATIVES

CERCLA requires that each selected Site remedy be protective of human health and the environment, be cost effective, comply with other statutory laws, and utilize permanent solutions, alternative technologies, and resource recovery alternatives to the maximum extent practicable. In addition, the statute includes a preference for the use of treatment as a principal element for the reduction of toxicity, mobility, or volume of the hazardous substances.

The remedial alternatives considered in the FS are organized according to the media which they address: soil contamination ("**SC**") and management of migration of groundwater ("**MOM**"). These alternatives were screened based on implementability, effectiveness, and cost. The screening resulted in remedial alternatives upon which a detailed analysis was performed. A "no action" alternative was also evaluated in the FS, as required by regulation, to provide an appropriate alternative in the event that no contravention of standards nor significant health or environmental risks were identified as a result of the Site contamination.

The alternatives presented below are those which were evaluated in detail following the preliminary screening of alternatives. These alternatives have retained their pre-screening alphanumerical designations in order to correspond with the descriptions of the alternatives which are contained in the FS report. The present worth costs are estimates which take into account both the capital cost and the operation and maintenance (O and M) costs for up to 30 years. "Time to implement" is defined as the period of time needed for the alternative to be started (e.g., amount of time needed for design and construction of a treatment facility). The remedial alternatives considered for addressing the soil contamination at the site are as follows:

SOILS

SC-1: No Action

SC-3: **a.** In Situ Vacuum Extraction of General Site Area/ Excavation of All "Hot Spots" with Off-Site Treatment and Disposal

b. In Situ Vacuum Extraction of General Site Area and Non-Pesticide "Hot Spots"/Excavation of Pesticide "Hot Spots" with Off-Site Treatment and Disposal

c. In Situ Vacuum Extraction of General Site Area and Non-Pesticide "Hot Spots"

SC-5: On-site Low Temperature Thermal Treatment of General Site Area and All "Hot Spots"

SC-1: No Action

Capital Cost: $71,876
Annual Operation and Maintenance (O&M) Cost: $11,305
Present Worth Cost: $245,656
Time To Implement: 2 months

The Superfund program requires that the no action alternative be considered as a baseline for comparison with other alternatives. Under this alternative, the contaminated soil would be left in place without treatment. Also, installation of additional security measures, such as repairs and modifications as necessary to the existing fencing and the use of electronic devices to detect trespassing (with subsequent notification of local authorities) would be performed as needed. No action would also include a public education program in order to increase public awareness of Site conditions and hazards. Since this alternative would involve no contaminant removal, CERCLA requires that the Site be reviewed every five years. If justified by the review, remedial actions may be implemented in the future to remove or treat the wastes.

SC-3: **a.** In Situ Vacuum Extraction of General Site Area/ Excavation of All "Hot Spots" with Off-Site Treatment and Disposal

Capital Cost: $17,896,733
Annual O&M Cost: $73,699
Present Worth Cost: $18,097,415
Time To Implement: 36 months

This alternative involves in situ treatment of 11,950 cubic yards (cy) of contaminated soil by means of vacuum extraction, and excavation of 6,956 cy of soil (which includes excavation soil expansion factor). For costing purposes, off-site treatment was assumed to be incineration, although other more innovative technology may eventually be selected on the basis of cost and treatment equivalence.

In situ extraction, or removal of organic contaminants from the soil without major soil disturbance, is accomplished by installing soil vapor extraction wells at strategic points, manifolding the wells, and applying a vacuum in order to draw contaminated soil gases out of the ground and into a treatment system. The treatment system is comprised of a vapor/liquid separator. It was assumed that an activated carbon canister would be utilized for off-gas emission, although equivalent technologies could be utilized. Spent activated carbon would be regenerated for re-use at an off-site location. The in situ vacuum extraction system would be operated until soil cleanup levels corresponding to EPA's target risk level of $1x10^{-6}$ are achieved.

The soil cleanup levels of selected indicator chemicals which have been determined by EPA to correspond to a $1x10^{-6}$ risk level are given below:

CHEMICAL	CLEANUP LEVEL (mg/kg)
Volatile Organics	
Tetrachloroethylene	0.6
Trichloroethylene	0.07
4-Methyl-2-Pentanone	52.1
Xylene	259
Pesticides	
Aldrin	0.04
Alpha Chlordane	0.5
Heptachlor Epoxide	0.07

The excavation of soils for off-site treatment and disposal would include excavation of all soil "hot spots", or areas of soil contamination that is more highly concentrated than the surrounding soil contamination at the Site. The off-site transportation, treatment, and disposal would conform to applicable/appropriate requirements of the Resource Conservation and Recovery Act ("RCRA"), including land disposal requirements ("LDR"), as well as the requirements of State hazardous waste laws and regulations. Any hazardous residuals resulting from on-site vacuum extraction treatment would be similarly disposed of or recycled off-site. Clean fill would be used to backfill

excavated areas. EPA believes that this alternative would be effective in achieving reduction of human carcinogenic risk posed by contaminated soils at the Site to approximately $1x10^{-6}$.

This alternative would also include the decontamination (as necessary), demolition, removal, and landfill disposal of the Quonset hut, 24 aboveground storage tanks, 32 underground storage tanks, and 1,360 cy of concrete and asphalt. Treatability studies would also have to be performed to determine design parameters and the need for treatment of off-gases for the vacuum extraction system.

SC-3: b. In Situ Vacuum Extraction of General Site Area and Non-Pesticide "Hot Spots"/ Excavation of Pesticide "Hot Spots" with Off-Site Treatment and Disposal

Capital Cost: $3,227,566
Annual O&M Cost: $100,138
Present Worth Cost: $3,500,242
Time to Implement: 36 months

This alternative is the same as Alternative **SC-3a**, with the exception that only the pesticide "hot spots" would be excavated for off-site treatment and disposal, while the remaining soils would be treated on-site to meet the cleanup levels specified in Alternative **SC-3a** using in situ vacuum extraction technology.

Specifically, this alternative would involve in situ treatment of 17,141 cy of contaminated soil by means of vacuum extraction, and excavation of 208 cy of soil (which includes excavation soil expansion factor) contaminated primarily with pesticides for off-site treatment and disposal, in accordance with applicable/ appropriate requirements of RCRA, as well as the requirements of State hazardous waste laws and regulations. For costing purposes, off-site treatment was assumed to be incineration, although other more innovative technology may eventually be selected on the basis of cost and treatment equivalence.

The excavation of soils for off-site treatment and disposal would only include excavation of the pesticide "hot spots". Clean fill would be used to backfill excavated areas. EPA believes that this alternative would be effective in achieving reduction of human carcinogenic risk posed by contaminated soils at the Site to approximately $1x10^{-6}$.

This alternative would also include the decontamination (as necessary), demolition, removal, and landfill disposal of the Quonset hut, 24 aboveground storage tanks, 32 underground storage tanks, and 1,360 cy of concrete and asphalt. Treatability studies would also have to be performed to determine design parameters and the need for treatment of off-gases for the vacuum extraction system.

SC-3: c. In Situ Vacuum Extraction of General Site Area and Non-Pesticide "Hot Spots"

Capital Cost: $2,731,392
Annual O&M Cost: $100,138
Present Worth Cost: $3,004,068
Time To Implement: 36 months

This alternative is the same as alternative **SC-3b**, with the exception that the pesticide "hot spots" would not be excavated for off-site treatment and disposal. Specifically, this alternative involves in situ vacuum extraction of the entire contaminated soil volume of 17,301 cy to the soil cleanup levels specified in Alternative **SC-3a** for volatile organics. However, cleanup levels for pesticides would not be attainable in the pesticide "hot spots", since the three pesticides of concern at the Site are not significantly affected by vacuum extraction technology.

EPA believes that this alternative would be effective in achieving reduction of human carcinogenic risk posed by contaminated soils at the Site to approximately $1x10^{-4}$. This increase in potential human health risk is caused by leaving the 3 localized pesticide "hot spots" on-site (totalling 160 cy compacted volume).

This alternative would also include the decontamination (as necessary), demolition, removal, and landfill disposal of the Quonset hut, 24 aboveground storage tanks, 32 underground storage tanks, and 1,360 cy of concrete and asphalt. Treatability studies would also have to be performed to determine design parameters and the need for treatment of off-gases for the vacuum extraction system.

SC-5: On-site Low Temperature Thermal Treatment of General Site Area and All "Hot Spots"

Capital Cost: $8,378,012
Annual O&M Cost: $1,089,526
Present Worth Cost: $11,344,791
Time To Implement: 33 months

In this alternative, approximately 22,490 cy (which includes excavation soil expansion factor) of contaminated soils would be excavated and then fed into a low-temperature thermal processor located on-site. The processor would operate at a temperature of approximately 400° F, which is sufficient to vaporize the organic compounds, including the pesticides, present in the soils. After treatment, the soil would be tested to assure it meets both RCRA and the soil cleanup levels specified in Alternative **SC-3a** prior to being used as backfill. Treatment of off-gases from this

alternative, through the use of carbon or an equivalent technology, has been assumed necessary to comply with the Clean Air Act and applicable/appropriate State stack emission regulations. This assumption would be confirmed during design testing.

EPA believes that this alternative would be effective in achieving reduction of human carcinogenic risk posed by contaminated soils at the Site to approximately $1x10^{-6}$.

This alternative would also include the decontamination (as necessary), demolition, removal, and landfill disposal of the Quonset hut, 24 aboveground storage tanks, 32 underground storage tanks, and 1,360 cy of concrete and asphalt. Treatability studies would also have to be performed to determine design parameters and the need for treatment of off-gases for the vacuum extraction system.

GROUNDWATER

MOM-1: No Action

MOM-3: Groundwater Extraction/ Air Stripping/ Thermal Treatment of Air Effluent/ Carbon Adsorption of Water Effluent/ Reinjection of Treated Effluent

MOM-6: Groundwater Extraction/ UV-Peroxide Oxidation/ Reinjection of Treated Effluent

MOM-1: No Action

Capital Cost: 0
Annual O&M Cost: $114,131
Present Worth Cost: $1,754,422
Time To Implement: Immediate

The no action alternative for groundwater would involve semi-annual monitoring of groundwater monitoring wells associated with the Site, in order to assess future movement of the groundwater plume of contamination. Annual monitoring of Glen Cove Creek's water and sediments would also be included as part of the monitoring plan.

MOM-3: Groundwater Extraction/ Air Stripping/ Thermal Treatment of Air Effluent/ Carbon Adsorption of Water Effluent/ Reinjection of Treated Effluent

Capital Cost: $3,316,921
O&M Cost: $592,859
Present Worth Cost: $12,430,350

Time To Implement: 22 months

In this alternative, extraction and injection wells would be installed into the contaminated groundwater plume. For costing purposes, EPA estimated that 8 extraction wells would be required in order to capture and remove the plume of contaminated groundwater. First, the "floating product" beneath the Site would be removed through the extraction wells with a skimmer pump, with subsequent off-site treatment and disposal in accordance with the appropriate requirements of RCRA. Next, the contaminated groundwater would be pumped, pretreated through precipitation and clarification to remove iron and manganese (these metals would interfere with subsequent treatment) and treated via air stripping to remove volatile organics. The air effluent would then be thermally treated to meet the applicable/appropriate requirements of the Clean Air Act and State laws and regulations. The water effluent from the air stripper would be carbon-treated in order to reduce the level of any remaining organic contaminants to meet applicable/ appropriate requirements of the Safe Drinking Water Act and State laws and regulations prior to reinjection into the ground through groundwater reinjection wells. For costing purposes, EPA estimated that four reinjection wells would be necessary. Actual locations of extraction and reinjection wells would be determined from additional groundwater monitoring during the design phase of the project. Spent activated carbon would be regenerated at an off-site location for reuse. Any hazardous residuals resulting from on-site treatment would be disposed of off-site in accordance with the applicable/appropriate requirements of RCRA and State hazardous waste laws and regulations.

An example of some of the applicable or appropriate and relevant requirements for groundwater remediation at this Site are:

CHEMICAL	REQUIREMENT	REFERENCE
Tetrachloroethylene	5 ug/l	Part 5-NY Sanitary Code
Trichloroethylene	5 ug/l	40 CFR Parts 141 & 142
Ethylbenzene	5 ug/l	Part 5-NY Sanitary Code
Total xylenes	5 ug/l	Part 5-NY Sanitary Code
Methylene Chloride	5 ug/l	Part 5-NY Sanitary Code
o-Dichlorobenzene	5 ug/l	Part 5-NY Sanitary Code

This alternative would involve semi-annual monitoring of groundwater monitoring wells associated with the Site in order to assess future movement of the groundwater plume of contamination. Annual monitoring of Glen Cove Creek's water and sediments would also be included as part of the monitoring plan. In addition, EPA would conduct 5 year reviews of the Site as CERCLA requires in order to ensure that the human health and the environment were adequately protected.

MOM-6: Groundwater Extraction/ UV-Peroxide Oxidation/ Reinjection of Treated Effluent

Capital Cost: $5,663,820
O&M Cost: $1,597,227
Present Worth Cost: $30,216,393
Time To Implement: 21 months

This alternative is the same as **MOM-3**, except in the method of contaminated groundwater treatment. Under **MOM-6**, an ultraviolet radiation/oxidation system would be utilized to treat organic contaminants from the extracted groundwater to acceptable levels. Off-gas and water effluents from this treatment process would be further "polished" in an ozone reduction unit (air) and in a carbon unit (water). The carbon unit would reduce the level of any remaining organic contaminants to meet applicable/ appropriate requirements of the Safe Drinking Water Act and State laws and regulations, prior to reinjection into the ground through groundwater reinjection wells.

This alternative would also involve semi-annual monitoring of groundwater monitoring wells associated with the Site, in order to assess future movement of the groundwater plume of contamination. Annual monitoring of Glen Cove Creek's water and sediments would also be included as part of the monitoring plan. In addition, EPA would conduct 5 year reviews of the Site as CERCLA requires in order to ensure that public health and the environment were adequately protected.

SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

The selected remedy for the first operable unit at the Site is a combination of **SC-3b** (In Situ Vacuum Extraction of General Site Area and Non-Pesticide "Hot Spots"/ Excavation of Pesticide "Hot Spots" with Off-Site Treatment and Disposal) and **MOM-3** (Groundwater Extraction/ Air Stripping/ Carbon Adsorption of Water Effluent/ Thermal Treatment of Air Effluent/ Reinjection of Treated Effluent). Based on current information, this combination of alternatives offers the best balance among the nine evaluation criteria that EPA uses as a means of evaluating remedial actions.

This section provides a glossary of the nine criteria and an analysis, with respect to these criteria, of the remedial alternatives which were evaluated for the Site.

Glossary of Evaluation Criteria

o Overall protection of human health and the environment addresses whether a remedy provides adequate protection and describes how risks are eliminated, reduced, or controlled through treatment, engineering controls, or institutional

controls.

o Compliance with ARARs addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements (ARARs) and/or provide grounds for invoking a waiver of ARARs.

o Short-term effectiveness addresses the period of time needed to achieve protection against any adverse impacts on human health and the environment that a Site may pose during the construction and implementation period of an alternative.

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

o Reduction of toxicity, mobility, or volume refers to the anticipated performance of the treatment technologies with respect to these parameters.

o Implementability involves the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the chosen solution.

o Cost involves both capital and O and M costs. Cost comparisons are made on the basis of present worth values, which have both capital and O and M costs factored in.

o State acceptance indicates whether the State concurs with, opposes, or has no comment on the preferred alternative.

o Community acceptance indicates whether the community concurs with, opposes, or has no comment on the preferred alternative.

Analysis

Analysis of Soil Alternatives

o Overall Protection of Human Health and the Environment

Alternative SC-1 (No Action) would only offer minimal protection of human health through reduction of the present direct contact threat by further limiting Site access. The related benefits are minimal since the Site already has an effective level of restricted access. Relative to the environment, this alternative would not provide any increased protection to flora and fauna over the present baseline condition. Given the present risk levels at the Site and the level of risk reduction and environmental benefit expected from the implementation of each

alternative, EPA considers all of the alternatives for source control, except for the no action alternative, to be sufficiently protective of human health and the environment. The no action alternative is therefore unacceptable, and is eliminated from further analysis. Each of the alternatives (except no action) utilizes treatment to eliminate the principal threat posed by the Site soils. **SC-3a** and **b**, and **SC-5** would provide the highest degree of protectiveness, while **SC-3c** would provide less, but adequate protection of human health and the environment.

o Compliance with ARARs

The technologies proposed for use in Alternatives **SC-3a, b,** and **c,** as well as **SC-5** would be designed and implemented to meet all ARARs. Federal and state regulations dealing with the handling and transportation of hazardous wastes to an off-site treatment facility would be followed. Alternatives **SC-3a** and **b** would require consideration of LDRs since each would require off-site treatment of soils. The responsibility for meeting applicable LDRs would rest with the off-site treatment and disposal facility. Alternative **SC-3c** would not require consideration of LDRs since no excavation and placement of hazardous substances would occur during implementation. Alternative **SC-5** is expected to meet applicable LDRs. Likewise, Alternative **SC-5** is expected to meet appropriate closure requirements by achieving "hybrid" clean closure, which is a combination of closure considerations and requirements taken from both the RCRA and CERCLA programs. Hybrid clean closure is achieved when the treated matrix (soil, in this case) to be land disposed will not pose a direct contact threat, nor will groundwater be adversely affected by leachate from the treated matrix.

o Short-term Effectiveness

Alternatives **SC-3a, b,** and **c** would all require approximately 3 years to design and construct, while **SC-5** would take between two and three years to design and construct. Once constructed, Alternatives **SC-3a** and **b** would reduce risks associated with contaminated soil most rapidly since they involve limited excavation and offsite disposal of the high risk areas of contamination. Once constructed, **SC-3a** would take approximately 2.5 years to effectively reduce the levels of soil contaminants to the target levels (related excavation under **SC-3a** would be accomplished relatively quickly and, in any event, well before the in situ treatment is completed). The **SC-3b, SC-3c** and **SC-5** alternatives would require a slightly longer time, approximately 3 years, to complete treatment after being constructed. Treatment-related impacts would likely be the greatest for Alternative **SC-5** since it requires the largest amount of contaminated soil excavation and because it involves on-site thermal treatment of all contaminated soils prior to replacement on-site. Treatment-related impacts for the **SC-3** alternatives

involving in situ vapor extraction would be minimal. Short-term impacts for excavation under **SC-3a** and **b** would be a concern mainly for Site workers, but such concerns should be minimized through development and adherence to appropriate health and safety protocols.

o Long-term Effectiveness and Permanence

All of the soil alternatives involve treatment technologies that have been utilized previously at other Superfund sites, i.e., in situ vacuum extraction, low temperature thermal treatment, and excavation with off-site treatment and disposal. Based on the demonstrated effectiveness of these technologies at other sites, all of the **SC-3** alternatives, as well as the **SC-5** alternative, should result in permanent risk reduction so that risks associated with remediated soils are within EPA's acceptable risk range. The **SC-3** alternatives will accomplish this primarily through in situ vacuum extraction, with additional reductions of risk under **SC-3a** and **b** through the excavation of soil "hot spots". **SC-3c** would only achieve risk reduction to $1x10^{-4}$, which is the level of risk presently associated with the pesticide "hot spots" (not readily treatable via vacuum extraction).

o Reduction of Toxicity, Mobility, or Volume

All of the treatment alternatives under consideration would reduce the volume and concentrations of soil contaminants to health-based residual levels. This in turn would eliminate the non-carcinogenic toxicity of Site contaminants while reducing carcinogenic risk factors to within the EPA-acceptable risk range. The mobility of residual Site contaminants would be unaffected, as none of the alternatives under consideration rely on containment technology.

o Implementability

EPA believes that all of the soil alternatives presently under consideration are implementable in terms of the materials and services that would be needed, as well as from the standpoint of administrative requirements or restrictions that presently exist. Alternatives **SC-3a, b,** and **c** would require the performance of treatability studies for the in situ vacuum extraction technology in order to determine essential design parameters.

o Cost

The relative present worth costs of the soil remediation alternatives are given below:

Alternative	Capital Cost	O&M Cost	Present Worth Cost
SC-3a	**$17,896,733**	**$73,699**	**$18,097,415**

SC-3b	**$3,227,566**	**$100,138**	**$3,500,242**
SC-3c	**$2,731,392**	**$100,138**	**$3,004,068**
SC-5	**$8,378,012**	**$1,089,526**	**$11,344,791**

As can be seen from the table, Alternative **SC-3a** is significantly more expensive than the other source remediation alternatives, while Alternative **SC-3c** is the least expensive alternative in terms of present worth costs.

o State Acceptance

The State of New York has reviewed and concurs with the selected remedy (see State letter of concurrence- **APPENDIX 3**).

o Community Acceptance

EPA concludes that the selected remedy has the support of the affected community based on the comments received during the public comment period, including those comments received during the public meeting held on May 30, 1991.

Analysis of Water Alternatives

o Overall Protection of Human Health and the Environment

Alternative **MOM-1**, or no action (monitoring only), provides no increase in protection for either public health or the environment. Given the high degree of future risk posed by ingestion of and dermal contact with contaminated groundwater, together with the uncertainty of the legislative feasibility and long-term effectiveness of institutional controls (local or state restrictions on access to groundwater in the area of contamination), EPA believes that the no action alternative cannot assure long-term protection of public health. Selection of the no action alternative would also have no effect on mitigating presently unquantified impacts occurring in the waters of Glen Cove Creek and Hempstead Harbor, and to a lesser extent, Long Island Sound, as a result of the groundwater contamination from the Site. The no action alternative is therefore unacceptable, and it has been eliminated from further analysis. Alternatives **MOM-3** and **MOM-6** both involve extraction and treatment of the groundwater plume. The alternatives vary in the types of treatment employed after extraction; however, the treatments employed under each alternative would result in air/water effluents that meet applicable discharge or emission standards. Further, both of these alternatives would be similarly effective in protecting human health and the environment by preventing off-site migration of contaminated groundwater as well as by reducing future risks posed by ingestion of and dermal contact with groundwater contamination emanating from the Site.

o Compliance with ARARs

Alternatives **MOM-3** and **MOM-6** should both eventually meet potable water ARARs (primarily 10 NYCRR Part 5 regulations) as a result of the accelerated pumping and treatment activity common to these alternatives, as well as the cleanup of contaminated soils which have directly contributed to the groundwater contamination. However, groundwater contamination may be especially persistent in the immediate vicinity of the contaminants' source, where concentrations are very high. Also, the ability to meet potable water ARARs within the Site's plume, or area of attainment, may also be hindered by the phenomenon of low concentration adsorption, which occurs during extended pumping of contaminated groundwater. This phenomenon has been experienced during other Superfund groundwater pump-and-treat remedial actions, as well as documented empirically in bench and pilot scale studies. In addition, it is important to note that the actual attainment of groundwater ARARs may be further restricted because of the existence of other areas of groundwater contamination in Garvey's Point which may eventually comingle with the Mattiace plume. Therefore, the certainty of achieving cleanup goals at all points throughout the plume may only be known after implementation and operation of the pumping and treatment activity for a period of time sufficient to ascertain cleanup effectiveness.

o Short-term Effectiveness

Both the **MOM-3** and the **MOM-6** groundwater alternatives would take approximately 2 years to design and construct. In the short-term, removal of the "floating product" layer, as well as the significant removal of contamination from groundwater expected initially upon implementation of either of the **MOM** alternatives should result in a dramatic improvement in groundwater quality over its currently degraded state.

Short-term impacts associated with construction and operation of the various groundwater treatment alternatives should be minor and easily minimized through appropriate health and safety protocols during construction, as well as diligent operation and maintenance practices once either of the **MOM-3** or the **MOM-6** alternatives is operational.

o Long-term Effectiveness and Permanence

Both the **MOM-3** and the **MOM-6** groundwater alternatives would involve treatment technologies, i.e. groundwater and free product pumpage, air stripping, carbon adsorption, thermal treatment, uv/peroxide oxidation, etc. that have been utilized previously at other Superfund sites. Based on the demonstrated effectiveness of these technologies at other sites, these alternatives should result in permanent, long-term effectiveness after the target reductions of groundwater contamination have been reached.

Preliminary groundwater modelling indicates that the time needed to restore the groundwater degraded as a result of the Site to its previous most beneficial use, i.e. a potential potable water source, is approximately 30 years. However, this estimate should be qualified by the discussion under Compliance with ARARs above. Since both the **MOM-3** and the **MOM-6** alternatives rely on an optimized extraction and discharge scenario, this estimate is the same for both alternatives.

o Reduction of Toxicity, Mobility, or Volume

Both the **MOM-3** and the **MOM-6** groundwater alternatives would significantly reduce the volume and concentrations of contaminants in the groundwater plume. In addition, mobility of the groundwater plume would be drastically reduced and perhaps eliminated. Therefore, both of the groundwater treatment alternatives would eliminate the future risks associated with non-carcinogenic toxicity of Site contaminants while reducing the carcinogenic risk to acceptable levels through the attainment of ARARs. Low concentration soil/contaminant binding may occur during extended pumping of groundwater such that groundwater ARARS are difficult or impossible to achieve at the point of compliance. However, these ARARs correspond to a very low risk level; therefore, if such a failure to obtain these requirements through groundwater treatment were to occur, it is nevertheless likely that either alternative would result in the reduction of the future risk associated with ingestion and dermal contact to within EPA's acceptable risk range.

o Implementability

EPA believes that both of the groundwater alternatives presently under consideration are implementable in terms of the materials and services that would be needed, as well as from the standpoint of administrative requirements or restrictions that presently exist.

o Cost

The relative costs of the groundwater remediation alternatives are given below:

Alternative	Capital Cost	O&M Cost	Present Worth Cost
MOM-3	**$3,316,921**	**$592,859**	**$12,430,350**
MOM-6	**$5,663,820**	**$1,597,227**	**$30,216,393**

As can be seen from the table, Alternative **MOM-3** has a significantly lower present worth cost than Alternative **MOM-6**.

o State Acceptance

The State of New York has reviewed and concurs with the selected remedy (see State letter of concurrence- **APPENDIX 3**).

o Community Acceptance

EPA concludes that the selected remedy has the support of the affected community based on the comments received during the public comment period, including those comments received during the public meeting held on May 30, 1991.

SELECTED REMEDY

General

The selected remedy for the Site is a combination of **SC-3b** (In Situ Vacuum Extraction of General Site Area Soils and Non-Pesticide "Hot Spots"/ Excavation of Pesticide "Hot Spots" with Off-Site Treatment and Disposal) and **MOM-3** (Groundwater Extraction/ Air Stripping/ Carbon Adsorption of Water Effluent/ Thermal Treatment of Air Effluent/ Reinjection of Treated Groundwater).

Any hazardous non-regenerative residuals resulting from on-site treatment will be disposed off-site in accordance with the applicable/appropriate requirements of RCRA and State hazardous waste laws and regulations.

The estimated cost for the selected remedy is:

Capital Cost: $6,544,487
Present Worth Cost: $15,930,592

A detailed description of costs associated with the selected remedy is presented in **TABLE 5**.

Soil Remedy

The soil remediation aspect of the selected remedy will involve in situ treatment of approximately 17,140 cy of contaminated soil (including non-pesticide "hot spots") by means of vacuum extraction, and excavation of approximately 208 cy of soil (which includes excavation soil expansion factor) contaminated primarily with pesticides for off-site treatment and disposal, in accordance with applicable/appropriate requirements of RCRA and State hazardous waste laws and regulations. For costing purposes, off-site treatment was assumed to be incineration, although other more innovative technology may be eventually selected on the basis of cost and treatment equivalence.

The in situ vacuum extraction system will be operated until soil cleanup levels corresponding to EPA's target risk level of $1x10^{-6}$ are achieved. The soil cleanup levels of selected indicator

chemicals determined by EPA to correspond to a $1x10^{-6}$ risk level are given below:

CHEMICAL	CLEANUP LEVEL (mg/kg)
Volatile Organics	
Tetrachloroethylene	0.6
Trichloroethylene	0.07
4-Methyl-2-Pentanone	52.1
Xylene	259

In addition, the excavation of the pesticide "hot spots" will be intended to reduce residual pesticide contamination to the following cleanup levels which correspond to a $1x10^{-6}$ risk level:

CHEMICAL	CLEANUP LEVEL (mg/kg)
Pesticides	
Aldrin	0.04
Alpha Chlordane	0.5
Heptachlor Epoxide	0.07

In situ vacuum extraction of contaminated soils will involve the removal of organic contaminants from the soil without major soil disturbance, and is accomplished by installing soil vapor extraction wells at strategic points, manifolding the wells, and applying a vacuum in order to draw contaminated soil gases out of the ground and into a treatment system. For costing purposes, EPA has estimated that 12 such wells will be needed; however, the actual number and sizing of the wells will be determined during the design phase of this project. The treatment system for extracted soil gases is comprised of a vapor/liquid separator and an activated carbon canister for off-gas emission control, although equivalent technologies could be utilized. The details of the extracted soil gas treatment system will also be finalized during design. In addition, treatability studies will also be performed to determine design parameters for the vacuum extraction system (**FIGURE 11**).

EPA may also include the use of the vacuum/treatment technology on VOC-contaminated stockpiles of soil from the general Site area (not the Area 1 drum burial area, which will be excavated for off-site treatment and disposal in accordance with the second operable unit ROD). These stockpiles will be a result of EPA's regrading the western part of the Site in order to increase the stability of a retaining wall, which is scheduled to occur during the second operable unit remedial action.

The excavation of soils for off-site treatment and disposal will

involve excavation of pesticide-contaminated "hot spots". Approximately 208 cy of soils are expected to be removed from the three areas that are contaminated with pesticides.

Clean fill will be used to backfill excavated areas. Contaminated surface runoff associated with remedial activity at the Site, particularly excavation of the pesticide-contaminated areas, will be controlled through the use of covers, berms, etc.

The selected remedy will also include the decontamination (as necessary), demolition, removal, and landfill disposal of the Quonset hut, 24 aboveground storage tanks, 32 underground storage tanks, including the solvent/stormwater separator in the southeast part of the property, and 1,360 cy of concrete and asphalt. Clean fill will be used to backfill excavated tank areas.

Groundwater Remedy

The contaminated groundwater aspect of the selected remedy will include extraction and injection wells installed into the contaminated groundwater plume. For costing purposes, EPA estimates that 8 extraction wells will be required in order to capture and remove the plume of contaminated groundwater. First, approximately 15,000 gallons of "floating product" beneath the Site will be removed through the extraction wells with a skimmer pump, with subsequent transportation of the extracted product off-site for treatment and disposal. Next, approximately 20,000 gallons per day of the contaminated groundwater plume will be pumped out of the ground and into an equalization tank, pretreated via precipitation and clarification to remove iron and manganese (these metals would interfere with subsequent treatment), and then treated on-site by means of air stripping technology to remove volatile organics. The air effluent from the air stripper will then be thermally treated prior to discharge in order to meet the applicable/appropriate requirements of the Clean Air Act and State laws and regulations. The water effluent from the air stripper will be carbon-treated in order to reduce any remaining organic contaminants to levels below applicable/appropriate requirements of the Safe Drinking Water Act (maximum contaminant levels, or MCLs) and State laws and regulations (10 NYCRR Part 5).

An example of some of the ARARs for groundwater remediation at this Site are:

CHEMICAL	REQUIREMENT	REFERENCE
Tetrachloroethylene	5 ug/l	10 NYCRR Part 5
Trichloroethylene	5 ug/l	40 CFR Parts 141 & 142
Ethylbenzene	5 ug/l	10 NYCRR Part 5
Total xylenes	5 ug/l	10 NYCRR Part 5

Methylene Chloride	5 ug/l	10 NYCRR Part 5
o-Dichlorobenzene	5 ug/l	10 NYCRR Part 5

Spent activated carbon will be transported off-site and regenerated for reuse. The treated water effluent will then be reinjected into the ground through groundwater reinjection wells (For costing purposes, EPA estimates 4 reinjection wells). Reinjection will take place hydraulically upgradient of the extraction zone in order to accelerate the rate of groundwater treatment. Actual spatial and depth locations of extraction and reinjection wells will be determined from additional groundwater monitoring to be conducted during the design phase of the project (**FIGURE 12**). During the design phase, EPA will also consider and attempt to mitigate the possible impact that localized pumping and reinjection may have on the wetland vegetation along the Creek and in Garvey's Point Preserve, although the likelihood of such impact is considered remote at the present time.

The goal of the groundwater portion of the selected remedy is to restore groundwater under the Site to its most beneficial use, which is as a potential supply of potable water. Based on information obtained during the RI and on a careful analysis of remedial alternatives, EPA believes that the selected remedy will achieve this goal. It may become apparent, during implementation or operation of the groundwater extraction system, that contaminant levels have ceased to decline and are remaining constant at levels higher than the remediation goal over some portion of the contaminated plume. In such a case, the system performance standards and/or the remedy may be reevaluated.

The selected remedy will include groundwater extraction for an estimated period of 30 years, during which the system's performance will be carefully monitored on a regular basis and adjusted as warranted by the performance data collected during operation. Modifications may include any or all of the following:

- Discontinuing pumping at individual wells where cleanup goals have been attained

- Alternating pumping at wells to eliminate stagnation

- Pulse pumping to allow aquifer equilibration and to allow adsorbed contaminants to partition into groundwater

- Installing additional extraction wells to facilitate or accelerate cleanup of the contaminant plume

TABLE 6 provides a summary of the remediation goals for both soil and groundwater at the Site.

Monitoring Program

The selected remedy includes both a short-term monitoring program, which is intended to assist in designing the selected remedy through acquisition of additional remedy-specific information, and a long-term monitoring program for evaluation of the cleanup. Ancillary programs for monitoring worker safety during remedy design and construction are standard in the Superfund program and do not require further elaboration.

The short-term monitoring program will include the following elements:

- groundwater monitoring to further define localized hydrologic gradients, as well as the extent of the Site groundwater plume. This information will assist in the design of the groundwater extraction and reinjection system and will likely necessitate the construction of several new monitoring wells at strategic locations previously identified during the RI.

- radiological monitoring during any excavation activities at the Site (as a precautionary measure due to the history of limited landfilling of radiological materials in the nearby Garvey's Point landfill).

- treatability studies for the in situ vacuum extraction system, which will likely involve pilot scale testing and monitoring to ascertain design parameters that are associated with the soils on-site.

- soil gas survey of the perimeter of the Mattiace property and beyond, as necessary, to determine whether appreciable amounts of contaminated soil gas are migrating off-site in the vadose zone.

- additional sampling of soil and sediment along the surface runoff pathway from the Mattiace property to Glen Cove Creek, including the sediments, if any, in the storm sewer which discharges to the Creek.

The selected remedy also includes the following long-term monitoring provisions:

- a soil sampling program utilizing soil borings as needed to ascertain the progress of the in situ vacuum extraction soil cleanup. Soil samples will be analyzed for, at a minimum, those organic compounds for which action levels have been specified as part of the selected remedy. This program will be more fully developed during the construction of the in situ vacuum extraction system.

- a semi-annual groundwater monitoring program to ascertain the progress of the pumping and treatment of groundwater.

Groundwater samples will be analyzed for, at a minimum, the contaminants of concern identified in the risk assessment contained in the risk assessment for the Site. This program will be more fully developed during the construction of the groundwater pumping and treatment system.

- an annual sampling program of Glen Cove Creek sediment and water column to determine any increase or decrease in the levels of contaminants in both media. Samples will be taken in the three locations that were sampled during the first operable unit RI, and samples will be analyzed for, at a minimum, the contaminants of concern identified in the risk assessment for the Site.

As required by CERCLA, EPA will also conduct five year reviews of the Site in order to ensure that public health and the environment are adequately protected.

During the performance of long-term monitoring, EPA may determine that a remedial action objective has been met. At that point, EPA may terminate any monitoring programs associated with that objective. For the long-term groundwater monitoring program, however, EPA will continue to monitor on a semi-annual basis for at least one year after cleanup levels are achieved and groundwater extraction/treatment has ceased in order to ensure that cleanup levels are maintained. Upon meeting all remedial objectives, or determining that the Site has been sufficiently purged of contaminants so that public health is no longer threatened by exposure to the Site, EPA will initiate proceedings to delete the Site from the National Priorities List.

STATUTORY DETERMINATIONS

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

Protection of Human Health and the Environment

The selected remedy will result in the reduction of soil

contaminants at the Site to health-based cleanup levels through the use of in situ vacuum extraction and the excavation and removal of three pesticide "hot spots" not amenable to the vacuum extraction technology. The selected remedy will also provide for the cleanup of contaminated groundwater beneath the Site (including removal of the concentrated "floating product" layer) to existing ARARs, which are intended to protect human health by assuring the quality of potable water supplies. Although the groundwater contaminated at this Site is not presently used for potable water by the community, its most beneficial use according to a classification made by the State of New York is as potable water. Therefore, EPA believes that the groundwater remedy selected should address the aquifer's potential use as potable water. In addition, all existing above- and belowground storage tanks will be decontaminated and removed off-site, thereby eliminating any threats posed by residual contamination still residing in the tanks. Although some risks may be posed to Site workers during excavation and hazardous waste/residuals handling, these risks can be easily mitigated through implementation of appropriate health and safety precautions.

Compliance With Applicable or Appropriate and Relevant Standards

The selected remedy for source control (**SC-3b**: In Situ Vacuum Extraction of General Site Area and Non-pesticide "Hot Spots"/ Excavation of Pesticide "Hot Spots" with Off-site Treatment and Disposal) is expected to comply with all ARARs. Any off-site facility used for treatment and disposal will be fully RCRA-permitted and will be in compliance with the terms of the permit. Any contaminated soil, debris, or sediments from the Site will be treated using specific technologies or specific treatment levels, as appropriate, to comply with LDRs. Any residuals from the treatment processes that are non-regenerative will be treated and disposed of in compliance with LDRs.

The selected groundwater remedy **MOM-3** (Groundwater Extraction/ Air Stripping/ Carbon Adsorption of Water Effluent/ Thermal Treatment of Air Effluent/ Reinjection of Treated Groundwater) is expected to comply with the associated ARARs over time. It may become apparent, during implementation or operation of the groundwater extraction system, that contaminant levels have ceased to decline and are remaining constant at levels higher than ARARs over some portion of the contaminated plume. In such a case, the system performance standards and/or the remedy may be reevaluated.

At its completion, EPA intends that the selected remedy will comply with, at a minimum, the following ARARs:

Action-specific ARARs:

- RCRA 40 CFR Part 262 - Standards Applicable to Generators

of Hazardous Waste

- RCRA 40 CFR Part 263 - Standards Applicable to Transporters of Hazardous Waste

- RCRA 40 CFR Part 264 - Subpart F Applicable to Groundwater Monitoring at Hazardous Waste Facilities
- Subpart J Applicable to Treatment Systems at Hazardous Waste Facilities

- RCRA 40 CFR Part 268 - Land Disposal Restrictions on Regulated Hazardous Waste

- 6 NYCRR Part 372 - Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities

- 6 NYCRR Subpart 373-2 - Final State Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

- 6 NYCRR Parts 200, 201, 212, and 231 - New York State regulations for air emissions

Chemical-specific ARARs:

- 6 NYCRR 703 and 10 NYCRR Part 5 - New York State groundwater quality standards and drinking water standards

- 40 CFR Parts 141 and 142 - Federal Drinking Water Standards

Location-specific ARARs:

- U.S. Coastal Zone Management Act

- National Historic Preservation Act

Cost Effectiveness

The selected remedy provides overall effectiveness proportional to its cost. The total capital and present worth costs for the selected remedy are estimated to be $6,544,487 and $15,930,592, respectively. The selected soil alternative, **SC-3b**, is the second least expensive treatment alternative. **SC-3c** is slightly less costly to implement; however, the corresponding reduction in protection of public health does not, in EPA's view, warrant its selection.

The selected groundwater alternative, **MOM-3**, is the least expensive treatment alternative.

Utilization of Permanent Solutions and Alternative Treatment Technologies (or Resource Recovery Technologies) to the Maximum Extent Practicable and Preference for Treatment as a Principal Element

The removal and subsequent permanent treatment of soil and groundwater contaminants through the technologies of the selected remedy satisfies the statutory preference of CERCLA for utilizing permanent solutions and alternative treatment technologies to the maximum extent practicable. The selected remedy will also permanently and significantly reduce the toxicity, mobility, and volume of hazardous substances in both the soil and groundwater at the Site, thereby eliminating all the principal threats of contamination at the Site.

DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for the Site was released to the public in May 1991. The Proposed Plan identified a combination of **SC-3b** and **MOM-3** as the preferred alternative to remediate the source of contamination. EPA reviewed all comments submitted during the public comment period. Upon review of these comments, it was determined that no significant changes to the selected remedy, as it was originally identified in the Proposed Plan, were necessary.

APPENDIX 1

MATTIACE PETROCHEMICAL SITE
SUMMARY OF CHEMICAL COMPOUNDS DETECTED
SOIL SAMPLES VOLATILE ANALYSES ALL DEPTHS

Compound	No. of Samples	Occur	Un-Detect	Est	Reject	Freq. Detect	Minimum Detected Concentration (ug/kg)	Sample Location (depth ft)	Maximum Detected Sample Concentration (ug/kg)	Sample Location (depth ft)
Chloroethane	92	3	82	1	7	0.03	3	SB15 (10-12)	96	SB15 (10-12)
*Methylene Chloride	92	9	83	2	0	0.10	220	SB11 (18-20)	35,000	SB03 (18-20)
Acetone	92	34	58	23	0	0.37	0	SB03 (4-6)	150,000	SB06 (4-6)
1,1-Dichloroethene	92	2	90	1	0	0.02	4	SB15 (14-16)	39	SB15 (10-12)
1,1-Dichloroethane	92	11	81	7	0	0.12	2	MW3D (4-6)	3,700	SB11 (0-2)
Trans-1,2-dichloroethene	92	34	58	17	0	0.37	2	SB16 (10-12)	120,000	SB11 (0-2)
Chloroform	92	6	86	1	0	0.07	13	MB01 (0-2)	2,500	SB11 (0-2)
*1,2-Dichloroethane	92	9	83	5	0	0.10	2	MW3D (4-6)	4,200	SB03 (18-20)
2-Butanone	92	46	21	38	25	0.50	8	SB15 (4-6)	110,000	SB19 (0-2)
1,1,1-Trichloroethane	92	32	60	30	0	0.35	2	MW3D (4-6)	120,000	SB11 (0-2)
*Carbon Tetrachloride	92	1	82	0	9	0.01	3,800	MW3D (18-20)	3,800	MW3D (18-20)
Vinyl Acetate	92	5	87	5	0	0.05	590	SB17 (20-21)	1,200	SB19 (10-12)
*Trichloroethene	92	44	48	7	0	0.48	1	MB03-0001 (0-.5)	370,000	SB19 (0-2)
Benzene	92	3	86	1	0	0.03	26	SB11 (4-6)	1,300	SB11 (0-2)
4-Methyl-2-pentanone	92	43	49	34	0	0.47	3	SB16 (0-2)	210,000	SB07 (4-6)
2-Hexanone	92	6	86	6	0	0.07	160	SB14 (18-20)	100,000	SB09 (4-6)
*Tetrachloroethene	92	51	41	26	0	0.55	1	SB20 (4-6)	410,000	SB04 (18-20)
1,1,2,2-Tetrachloroethane	92	3	89	2	0	0.03	3	MW3D (4-6)	6,300	MW3D (10-12)
Toluene	92	74	18	22	0	0.81	1	SB15 (4-6)	1,100,000	SB04 (18-20)
Ethylbenzene	92	50	42	9	0	0.54	1	SB17 (0-2)	460,000	SB01 (0-2)
Styrene	92	1	91	0	0	0.01	1,000	SB06 (0-2)	1,000	SB06 (0-2)
*Total Xylenes	92	60	32	19	0	0.65	4	SB09 (0-2)	2,600,000	SB01 (0-2)

Note:

* indicates contaminant of concern

TABLE 1

MATTIACE PETROCHEMICAL SITE
SUMMARY OF CHEMICAL COMPOUNDS DETECTED
SOIL SAMPLES INORGANIC ANALYSES (ALL DEPTHS)

Compound	No. of Samples	Occur	Un-Detect	Est	Reject	Freq. Detect	Minimum Detected Concentration (mg/kg)	Sample Location (depth ft)	Maximum Detected Sample Concentration (mg/kg)	Sample Location (depth ft)
Silver	92	3	89	3	0	0.03	0.86	SB11 (0-2)	1.4	SB12 (0-2)
Aluminum	92	91	1	0	0	0.99	694	SB17 (10-12)	289,000	SB13 (4-6)
Arsenic	92	79	13	10	0	0.86	0.27	SB19 (4-6)	15.6	SB11 (0-2)
Barium	92	73	0	20	19	0.79	4.4	SB17 (10-12)	271	SB01 (20-22)
Beryllium	92	56	36	0	0	0.61	0.19	SB01 (4-6)	1.8	SB01 (20-22)
Calcium	92	92	0	43	0	1.00	48.3	SB13 (10-12)	78,900	SB10 (0-2)
Cadmium	92	8	84	1	0	0.09	0.65	SB17 (10-12)	16	SB12 (0-2)
Cyanide	92	3	89	0	0	0.03	1.1	SB05 (0-2)	2.3	SB01 (4-6)
Cobalt	92	85	7	7	0	0.92	1.1	SB06 (24-26)	47	SB03 (18-20)
Chromium	92	85	0	41	7	0.92	3.3	SB13 (22-24)	101	SB06 (10-12)
Copper	92	61	1	10	30	0.66	2.8	SB05 (4-6)	73.6	SB19 (0-2)
Iron	92	92	0	0	0	1.00	1,380.0	SB13 (22-24)	46,008.8	SB01 (20-22)
Mercury	92	5	87	0	0	0.05	0.15	SB11 (4-6)	2.9	SB12 (0-2)
Potassium	92	92	0	7	0	1.00	5.2	SB14 (0-2)	9,240	SB01 (20-22)
Magnesium	92	92	0	20	0	1.00	68.8	SB03 (10-12)	41,900	SB10 (0-2)
Manganese	92	75	0	17	17	0.82	0.45	SB28 (10-12)	889	SB11 (4-6)
Sodium	92	55	37	9	0	0.60	21.9	SB13 (22-24)	663	MW3D (18-20)
Nickel	92	89	3	5	0	0.97	1.2	SB13 (22-24)	43.6	SB06 (10-12)
Lead	92	68	0	37	24	0.74	1.0	SB20 (4-6)	204	SB09 (4-6)
Antimony	92	10	78	9	4	0.02	3.0	SB06 (24-26)	22.1	SB10 (0-2)
Selenium	92	1	76	0	15	0.01	0.48	MW3D (4-6)	0.48	MW3D (4-6)
Thallium	92	2	71	0	19	0.02	0.23	SB12 (4-6)	0.27	SB12 (0-2)
Vanadium	92	92	8	21	0	1.00	3.5	SB13 (22-24)	114	SB03 (18-20)
Zinc	92	70	2	67	20	0.76	2.2	SB13 (22-24)	224	SB03 (18-20)

Note:

* indicates contaminant of concern

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MATTIACE PETROCHEMICAL SITE
SUMMARY OF CHEMICAL COMPOUNDS DETECTED
SOIL SAMPLES PESTICIDE/PCB ANALYSIS (ALL DEPTHS)

Compound	No. of Samples	Occur	Un-Detect	Est	Reject	Freq. Detect	Minimum Detected Concentration (ug/kg)	Sample Location (depth ft)	Maximum Detected Sample Concentration (ug/kg)	Sample Location (depth ft)
Alpha-BHC	91	3	88	3	0	0.03	10	SB12 (22-24)	49	SB10 (0-2)
Delta-BHC	91	6	85	6	0	0.07	21	SB10 (10-12)	160	SB08 (4-6)
Gamma-BHC	91	2	89	2	0	0.82	120	SB19 (0-2)	150	SB05 (0-2)
Heptachlor	91	5	86	5	0	0.05	2.3	SB10 (14-16)	180	SB09 (0-2)
*Aldrin	91	6	85	5	0	0.07	3.2	SB08 (10-12)	260	HB03 (0-2)
*Heptachlor Epoxide	91	12	78	12	1	0.13	2.4	SB07 (0-2)	930	SB09 (0-2)
4-4-DDE	91	6	85	6	0	0.07	1.7	HB01 (0-2)	12	HB01 (0-2)
4-4-DDD	91	4	87	4	0	0.04	2.4	HB01 (0-2)	100	SB08 (4-6)
Endosulfan Sulfate	91	2	89	2	0	0.02	120	SB20 (24-25)	720	SB03 (0-2)
4-4-DDT	91	17	74	17	0	0.19	1.1	SB08 (0-2)	140	HB03 (0-2)
Endrin Ketone	91	1	90	1	0	0.01	85	SB04 (0-2)	85	SB04 (0-2)
*Alpha Chlordane	91	10	81	10	0	0.11	2.5	SB07 (0-2)	9,100	SB11 (0-2)
Gamma Chlordane	91	7	84	7	0	0.07	4.3	SB07 (0-2)	31	SB20 (24-28)
Aroclor 1248	91	1	77	1	13	0.01	450	SB05 (4-6)	460	SB05 (4-6)
Aroclor 1254	91	1	90	1	0	0.01	180	SB01 (10-12)	180	SB01 (10-12)
Aroclor 1260	91	4	87	4	0	0.04	150	MW3D (4-6)	780	SB12 (4-6)
Endosulfan II	91	1	90	1	0	0.01	15	SB12 (22-24)	15	SB12 (22-24)

Note:

* indicates contaminant of concern

CONTINUED

MATTIACE PETROCHEMICAL SITE
SUMMARY OF CHEMICAL COMPOUNDS DETECTED
SOIL SAMPLES EXTRACTABLE ANALYSES (ALL DEPTHS)

Compound	No. of Samples	Occur	Un-Detect	Est	Reject	Freq. Detect	Minimum Detected Concentration (ug/kg)	Sample Location (depth ft)	Maximum Detected Sample Concentration (ug/kg)	Sample Location (depth ft)
Phenol	92	5	84	3	3	0.05	130	MW3D (4-6)	2,700	SB14 (0-2)
1,4-Dichlorobenzene	92	3	88	3	1	0.03	2,700	SB11 (0-2)	12,000	SB05 (0-2)
Benzyl Alcohol	92	2	89	2	1	0.02	7	SB14 (10-12)	15	SB18 (0-2)
1,2-Dichlorobenzene	92	16	75	12	1	0.17	70	SB05 (10-12)	750,000	SB05 (0-2)
2-methylphenol	92	1	88	1	3	0.01	30	SB09 (10-12)	30	SB09 (10-12)
4-methylphenol	92	2	87	2	3	0.02	370	SB14 (0-2)	2,000	SB08 (4-6)
Isophorone	92	19	72	12	1	0.21	54	SB18 (4-6)	67,000	SB01 (4-6)
Benzoic Acid	92	4	85	4	3	0.04	460	SB13 (10-12)	5,500	SB14 (0-2)
2,2,4-Trichlorobenzene	92	2	89	2	1	0.02	850	SB11 (18-200	950	SB11 (0-2)
Naphthalene	92	49	42	43	1	0.53	29	MW3D (4-6)	34,000	SB11 (18-20)
Diethylphthalate	92	7	84	7	1	0.08	40	SB13 (0-2)	4,800	SB12 (0-2)
Fluorene	92	6	85	6	1	0.07	43	SB11 (10-12)	1,600	SB11 (18-20)
N-nitrosodiphenylamine	92	1	90	1	1	0.01	3,000	SB11 (18-20)	3,000	SB11 (18-20)
??malnithrene	92	5	86	5	1	0.05	49	SB09 (10-12)	2,800	SB11 (0-2)
Di-n-butylphthalate	92	51	41	32	0	0.55	36	SB19 (24-26)	2,400,000	SB05 (0-2)
Fluoranthrene	92	5	86	5	1	0.05	66	HB01 (0-2)	550	SB11 (0-2)
Pyrene	92	5	86	4	1	0.05	83	HB01 (0-2)	830	SB11 (0-2)
Butyl benzyl phthalate	92	5	86	4	1	0.05	170	SB11 (10-12)	11,000	SB08 (4-6)
Benzo[a]anthracene	92	3	88	2	1	0.03	44	SB09 (10-12)	580	HB02 (0-2)
bis[2-ethylhexyl]phthalate	92	64	28	44	0	0.70	0	SB04 (4-6)	1,700,000	SB09 (0-2)
2-methylnaphthalene	91	23	67	19	1	0.25	49	SB13 (0-2)	19,000	SB11 (0-2)
Acenaphthylene	91	1	89	1	1	0.01	130	HB02 (0-2)	130	HB02 (0-2)
Chrysene	91	3	87	2	1	0.03	46	SB09 (10-12)	410	SB02 (0-2)
Di-n-octyl phthalate	91	10	80	4	1	0.11	36	MW3D (4-6)	36,000	SB11 (0-2)
Benzo[b]fluoranthene	91	1	87	1	1	0.01	45	HB01 (0-2)	45	HB01 (0-2)
Benzo[k]fluoranthene	91	3	87	2	1	0.03	37	HB01 (0-2)	640	HB02 (0-2)
Benzo[a]pyrene	91	1	89	8	1	0.01	450	HB02 (0-2)	450	HB02 (0-2)
Indeno[1,2,3-CD]pyrene	91	2	88	1	1	0.02	450	HB02 (0-2)	4,400	SB11 (4-6)
Dibenz[a,b]anthracene	91	1	89	1	1	0.01	4,500	SB11 (4-6)	4,500	SB11 (4-6)
Benzo[g,h,i]perylene	91	1	89	1	1	0.01	5,400	SB11 (4-6)	5,400	SB11 (4-6)

Note:
* - indicates contaminant of concern

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MATTIACE PETROCHEMICAL SITE
SUMMARY OF CHEMICAL COMPOUNDS DETECTED
GROUNDWATER SAMPLES NORTH OF GROUNDWATER DIVIDE
VOLATILE ANALYSES

TABLE 2

Compound	No. of Samples	Occur	Un-Detect	Est	Reject	Freq. Detect	Minimum Detected Concentration (ug/L)	Sample Location	Maximum Detected Sample Concentration (ug/L)	Sample Location
*Vinyl Chloride	11	2	9	1	0	0.18	73	MW5S	370	MW5D
Chloroethane	11	1	10	1	0	0.09	21	MW5S	21	MW5S
*Methylene Chloride	11	5	6	4	0	0.45	25,000	MW3D	750,000	MW6S
1,1-Dichloroethene	11	6	5	3	0	0.55	38	MW8S	3,800	MW3D
1,1-Dichloroethane	11	8	3	5	0	0.73	2	MW7S	7,600	MW3 (dup)
Trans-1,2-dichloroethene	11	1	10	1	0	0.09	30	MW8D (dup)	30	MW8D (dup)
*Chloroform	11	8	3	4	0	0.73	27	MW8S	81,000	MW6S
*1,2-Dichloroethane	11	4	7	3	0	0.36	620	MW8D (dup)	11,000	MW5D
1,1,1-Trichloroethane	11	9	2	7	0	0.82	15	MW7S	91,000	MW6S
*2-Butanone	11	2	5	2	4	0.18	57,000	MW5D	120,000	MW5S
*Carbon Tetrachloride	11	3	8	2	0	0.27	310	MW5D	87,000	MW3 (dup)
*Trichloroethene	11	9	2	8	0	0.82	140	MW7S	230,000	MW6S
Benzene	11	6	5	5	0	0.55	320	MW3D	7,000	MW5D
4-methyl-2-pentanone	11	3	8	3	0	0.27	21,000	MW6S	47,000	MW3 (dup)
2-Hexanone	11	3	0	3	8	0.27	190	MW8D	2,300	MW5D
*Tetrachloroethene	11	8	3	5	0	0.73	57	MW7S	100,000	MW6S
Toluene	11	3	8	3	0	0.27	63,000	MW5S	130,000	MW5D
Chlorobenzene	11	2	9	2	0	0.18	7	MW5S	8	MW5D
*Ethylbenzene	11	8	3	6	0	0.73	32	MW7S	370,000	MW3 (dup)
Dichlorofidluoromethane	11	2	9	2	0	0.18	86,000	MW10	620,000	MW7D
1,1,1,2-Tetrachloroethane	11	1	10	1	0	0.09	87	MW5S	87	MW5S
*M & P Xylenes	11	8	3	7	0	0.73	110	MW7S	422,000	MW3 (dup)
o-Xylene	11	5	6	4	0	0.45	36	MW7S	9,400	MW3 (dup)
Isopropylbenzene	11	5	6	4	0	0.45	2	MW7S	100	MW5D (dup)
n-Propylbenzene	11	3	8	2	0	0.27	70	MW5D	92	MW5D
2-Chlorotoluene	11	5	6	4	0	0.45	2	MW7S	1,000	MW8D (dup)
4-Chlorotoluene	11	1	10	1	0	0.09	150	MW8D (dup)	150	MW8D (dup)
1,3,5-Trimethylbenzene	11	6	5	5	0	0.55	13	MW7S	430	MW8D (dup)
1,2,4-Trimethylbenzene	11	6	5	4	0	0.55	880	MW5D	32,000	MW6S
p-Isopropytoluene	11	3	8	2	0	0.27	2	MW7S	860	MW8D (dup)
N-butylbenzene	11	1	10	1	0	0.09	2	MW7S	2	MW7S
cis-1,2-Dichloroethene	11	8	3	6	0	0.73	920	MW8S	190,000	MW3 (dup)
1,3-Dichlorobenzene	11	1	10	1	0	0.09	56	MW5S	56	MW5S
1,4-Dichlorobenzene	11	4	7	4	0	0.36	41	MW8D	200	MW5S
1,2-Dichlorobenzene	11	4	7	3	0	0.36	440	MW8D (dup)	2,600	MW3 (dup)
1,2,4-Trichlorobenzene	11	1	10	1	0	0.09	5	MW5S	5	MW5S
Naphthalene	11	5	6	3	0	0.45	6	MW7S	6,900	MW3 (dup)

Note:

MATTIACE PETROCHEMICAL SITE
SUMMARY OF CHEMICAL COMPOUNDS DETECTED
GROUNDWATER SAMPLES EXTRACTABLES NORTH OF GROUNDWATER DIVIDE

Compound	No. of Samples	Occur	Un-Detect	Est	Reject	Freq. Detect	Minimum Detected Concentration (ug/L)	Sample Location	Maximum Detected Sample Concentration (ug/L)	Sample Location
Phenol	10	7	3	3	0	0.70	100	MW8D	18,000	MW5D
1,3-Dichlorobenzene	10	1	9	1	0	0.10	41	MW3D	41	MW3D
1,5-Dichlorobenzene	10	2	8	1	0	0.20	50	MW8D	190	MW3D
Benzyl alcohol	10	2	8	1	0	0.20	880	MW8D	1,500	MW5D
*1,2-Dichlorobenzene.	10	8	2	2	0	0.80	210	MW8S	5,300	MW8D (dup)
2-Methylphenol	10	5	5	3	0	0.50	100	MW8D	2,100	MW8D (dup)
4-Methylphenol	10	5	5	1	0	0.50	140	MW8D	3,700	MW8D (dup)
*Isophorone	10	9	1	0	0	0.90	1,500	MW3D	57,000	MW6S
Benzoic Acid	10	6	4	6	0	0.60	380	MW3D	16,000	MW5D
*Naphthalene	10	7	3	0	0	0.70	380	MW8D	4,800	MW7S
*Di-n-Butylphthalate	10	7	3	3	0	0.70	58	MW8D	6,900	MW6S
*Bis(2-ethylhexyl)phthalate	10	6	4	1	0	0.60	24	MW7D	27,000	MW7S

Note:

* - indicates contaminant of concern

CONTINUED

MATTIACE PETROCHEMICAL SITE
SUMMARY OF CHEMICAL COMPOUNDS DETECTED
GROUNDWATER SAMPLES NORTH OF GROUNDWATER DIVIDE
INORGANICS

Compound	No. of Samples	Occur	Un-Detect	Est	Reject	Freq. Detect	Minimum Detected Concentration (ug/L)	Sample Location	Maximum Detected Sample Concentration (ug/L)	Sample Location
Silver	10	1	9	0	0	0.10	98.1	MW3D	98.1	MW3D
Aluminum	10	10	0	0	0	1.00	449	MW3D	221,000	MW5S
Arsenic	10	7	3	7	0	0.70	3.7	MW1D	11.9	MW5D
Barium	10	10	0	0	0	1.00	31.4	MW7D	1,320	MW5S
*Beryllium	10	5	5	0	0	0.50	1.3	MW6S	12.9	MW5S
Calcium	10	10	0	0	0	1.00	9,670	MW7D	200,000	MW6S
Cadmium	10	2	8	1	0	0.20	5.3	MW6S	104	MW1D
Cyanide	10	6	4	0	0	0.60	11.4	MW8D	69	MW5D
Cobalt	10	10	0	0	0	1.00	46.7	MW1D	1,120	MW6S
Chromium	10	10	0	9	0	1.00	21.1	MW6S	562	MW5S
Copper	10	10	0	0	0	1.00	10.9	MW3D	259	MW5S
Iron	10	10	0	5	0	1.00	983	MW5D	253,000	MW5S
Mercury	10	4	6	0	0	0.40	0.21	MW6S	1.8	MW1D
Potassium	10	10	0	0	0	1.00	2,230	MW5D	19,400	MW7S
Magnesium	10	10	0	4	0	1.00	2,650	MW7D	44,300	MW1D
*Manganese	10	10	0	0	0	1.00	285	MW7D	64,200	MW5S
Sodium	10	10	0	0	0	1.00	8,970	MW7D	627,000	MW5D
Nickel	10	10	0	0	0	1.00	46.7	MW8S	402	MW5S
Lead	10	10	0	0	0	1.00	5.3	MW5D	111	MW5S
Vanadium	10	8	2	5	0	0.80	21.3	MW5D	394	MW5S
Zinc	10	8	0	7	2	0.80	53.5	MW7D	517	MW5S

Note:

* indicates contaminant of concern

CONTINUED

MATTIACE PETROCHEMICAL SITE
SUMMARY OF CHEMICAL COMPOUNDS DETECTED
GROUNDWATER SAMPLES NORTH OF GROUNDWATER DIVIDE
PESTICIDE/PCB

Compound	No. of Samples	Occur	Un-Detect	Est	Reject	Freq. Detect	Minimum Detected Concentration (ug/L)	Sample Location	Maximum Detected Sample Concentration (ug/L)	Sample Location
*Aldrin	12	3	6	2	1	0.25	0.73	MW5D	7.2	MW6S
Alpha-BHC	12	2	8	0	0	0.17	1.1	MW7S	1.8	MW6S
*Alpha-Chlordane	12	1	9	0	0	0.08	31	MW6S	31	MW6S
Beta-BHC	12	4	5	2	1	0.33	8.2	MW3D	7	MW6S
4-4-DDE	12	1	9	0	0	0.08	2.1	MW6S	2.1	MW6S
Delta-BHC	12	4	6	2	0	0.33	0.95	MW7S	2.3	MW6S
Heptachlor Epoxide	12	1	9	1	0	0.08	2.8	MW7S	2.8	MW7S
GAMMA-BHC	12	2	8	2	0	0.17	2.5	MW10	63	MW7S
*Heptachlor	12	4	6	3	0	0.33	0.7	MW5S	5.6	MW7S

Note:

* indicates contaminant of concern

CONTINUED

MATTIACE PETROCHEMICAL SITE
SUMMARY OF CHEMICAL COMPOUNDS DETECTED
GROUNDWATER SAMPLES SOUTH OF GROUNDWATER DIVIDE
VOLATILE ANALYSES

Compound	No. of Samples	Occur	Un-Detect	Est	Reject	Freq. Detect	Minimum Detected Concentration (ug/L)	Sample Location	Maximum Detected Sample Concentration (ug/L)	Sample Location
*Vinyl Chloride	5	4	1	2	0	0.80	2	MW1S	2,600	MW07
Chloroethane	5	3	2	2	0	0.60	5	MW1S	6,400	MW09
Methylene Chloride	5	1	4	1	0	0.20	390	MW09	390	MW09
1,1-Dichloroethene	5	4	1	3	0	0.80	2	MW4S	170	MW07
1,1-Dichloroethane	5	3	2	0	0	0.60	3	MW2S	25	MW1S
Trans-1,2-dichloroethene	5	3	2	3	0	0.60	0.7	MW4S	36	MW09
1,2-Dichloroethane	5	3	2	2	0	0.60	5	MW4S	210	MW09
*1,1,1-Trichloroethane	5	4	1	3	0	0.80	2	MW1S	3,400	MW07
*2-Butanone	5	2	0	2	3	0.40	3,200	MW09	6,200	MW07
Trichloroethene	5	5	0	2	0	1.00	4	MW2S	45	MW1S
Benzene	5	4	1	4	0	0.80	0.3	MW1S	260	MW09
Tetrachloroethene	5	5	0	2	0	1.00	2	MW2S	32	MW1S
Toluene	5	1	4	1	0	0.20	42,000	MW09	42,000	MW09
Chlorobenzene	5	2	3	1	0	0.40	0.5	MW1S	9	MW2S
Ethylbenzene	5	3	2	2	0	0.60	2	MW2S	2,200	MW09
M & P Xylenes	5	3	2	2	0	0.60	6	MW2S	1,100	MW07
o-Xylene	5	3	2	2	0	0.60	2	MW2S	2,400	MW09
Isopropylbenzene	5	3	2	2	0	0.60	3	MW2S	69	MW09
n-Propylbenzene	5	2	3	2	0	0.40	42	MW07	60	MW09
2-Chlorotoluene	5	3	2	3	0	0.60	0.6	MW2S	60	MW09
4-Chlorotoluene	5	1	4	1	0	0.20	140	MW09	140	MW09
1,3,5-Trimethylbenzene	5	2	3	2	0	0.40	0.6	MW2S	160	MW09
1,2,4-Trimethylbenzene	5	3	2	2	0	0.60	15	MW2S	160	MW09
Sec-Butylbenzene	5	1	4	1	0	0.20	0.9	MW2S	0.9	MW2S
p-Isopropytoluene	5	2	3	2	0	0.40	5	MW07	14	MW09
*cis-1,2-dichloroethene	5	4	1	3	0	0.80	35	MW1S	16,000	MW07
1,4-Dichlorobenzene	5	1	4	0	0	0.20	1.3	MW2S	1.3	MW2S
1,2-Dichlorobenzene	5	2	3	1	0	0.40	0.4	MW1S	8	MW2S
Naphthalene	5	4	1	4	0	0.80	0.1	MW1S	290	MW09

Note:
* indicates contaminant of concern

CONTINUED

MATTIACE PETROCHEMICAL SITE
SUMMARY OF CHEMICAL COMPOUNDS DETECTED
GROUNDWATER SAMPLES SOUTH OF GROUNDWATER DIVIDE
EXTRACTABLE ANALYSES

Compound	No. of Samples	Occur	Un-Detect	Est	Reject	Freq. Detect	Minimum Detected Concentration (ug/L)	Sample Location	Maximum Detected Sample Concentration (ug/L)	Sample Location
Phenol	5	2	2	0	1	0.40	39	MW07	240	MW09
1,2-Dichlorobenzene	5	2	3	2	0	0.40	5	MW07	62	MW1S
2-Methylphenol	5	2	2	0	1	0.40	73	MW07	180	MW09
4-Methylphenol	5	2	2	0	1	0.40	290	MW07	1,200	MW09
2,4-Dimethylphenol	5	2	2	2	1	0.40	7	MW07	95	MW09
Benzoic Acid	5	2	2	2	1	0.40	220	MW07	870	MW09
*Naphthalene	5	4	1	1	0	0.80	50	MW07	170	MW09
Di-n-Butylphthalate	5	2	3	0	0	0.40	12	MW4S	360	MW1S
*Bis(2-ethylhexyl)phthalate	5	2	3	0	0	0.40	100	MW4S	1,200	MW1S

Note:

* - indicates contaminant of concern

CONTINUED

MATTIACE PETROCHEMICAL SITE
SUMMARY OF CHEMICAL COMPOUNDS DETECTED
GROUNDWATER SAMPLES SOUTH OF GROUNDWATER DIVIDE
INORGANIC ANALYSES

Compound	No. of Samples	Occur	Un-Detect	Est	Reject	Freq. Detect	Minimum Detected Concentration (ug/L)	Sample Location	Maximum Detected Sample Concentration (ug/L)	Sample Location
Silver	5	2	3	0	0	0.40	17.3	MW07	18.4	MW1S
Aluminum	5	5	0	0	0	1.00	643	MW07	17,600	MW2S
Arsenic	5	5	0	5	0	1.00	4.2	MW1S	10.3	MW09
Barium	5	5	0	0	0	1.00	73	MW07	368	MW2S
Beryllium	5	2	3	0	0	0.40	1.2	MW1S	1.2	MW2S
Calcium	5	5	0	0	0	1.00	49,100	MW1S	154,000	MW09
Cadmium	5	1	4	0	0	0.20	21.9	MW09	21.9	MW09
Cyanide	5	1	4	0	0	0.20	10.4	MW09	10.4	MW09
Cobalt	5	4	1	3	0	0.80	7.3	MW4S	95.1	MW09
Chromium	5	4	1	0	0	0.80	27.2	MW09	335	MW1S
Copper	5	5	0	5	0	1.00	41.2	MW4S	76.5	MW09
Iron	5	5	0	0	0	1.00	33,500	MW4S	145,000	MW09
Potassium	5	5	0	0	0	1.00	2,740	MW4S	9,160	MW09
Magnesium	5	5	0	0	0	1.00	12,700	MW2S	51,400	MW09
*Manganese	5	5	0	0	0	1.00	1,830	MW1S	12,200	MW2S
Sodium	5	5	0	0	0	1.00	13,100	MW4S	138,000	MW1S
Nickel	5	5	0	0	0	1.00	8.6	MW07	117	MW2S
Lead	5	5	0	0	0	1.00	7.1	MW07	19.9	MW1S
Vanadium	5	4	1	2	0	0.80	5.5	MW07	50.7	MW1S
Zinc	5	2	0	2	3	0.40	136	MW2S	157	MW1S

Note:

* - indicates contaminant of concern

LHS72-T4b/3

CONTINUED

MATTIACE PETROCHEMICAL SITE
SUMMARY OF CHEMICAL COMPOUNDS DETECTED
GROUNDWATER SAMPLES SOUTH OF GROUNDWATER DIVIDE
PESTICIDE/PCB ANALYSES

Compound	No. of Samples	Occur	Un-Detect	Est	Reject	Freq. Detect	Minimum Detected Concentration (ug/L)	Sample Location	Maximum Detected Sample Concentration (ug/L)	Sample Location
Beta-BHC	5	1	4	1	0	0.20	0.87	MW1S	0.87	MW1S
4-4-DDT	5	1	4	1	0	0.20	4.6	MW07	4.6	MW07

Note:

* indicates contaminant of concern

CONTINUED

TABLE 3

MATTIACE PETROCHEMICAL SITE

SELECTED CONSTITUENTS OF CONCERN

METALS	VOLATILES	SEMI-VOLATILES
IN AIR		
Antimony	1,1,1-Trichloroethane	1,2-Dichlorobenzene
Arsenic	1,2-Dichloroethene	1,4-Dichlorobenzene
Barium	1,2-Dichloroethane	2-Methylnaphthalene
Beryllium	2-Butanone	Aldrin
Cadmium	4-Methyl-2-pentanone	Alpha chlordane
Chromium	Acetone	Heptachlor epoxide
Lead	Carbon tetrachloride	Naphthalene
Manganese	Ethylbenzene	
	Methylene chloride	
	Tetrachloroethene	
	Toluene	
	Trichloroethene	
	Xylenes	
IN SURFACE WATER		
Manganese	Bromodichloromethane	None
Thallium	t-1,2-Dichloroethene	
	Tetrachloroethene	
IN SOIL		
Antimony	1,1,1-Trichloroethane	1,2-Dichlorobenzene
Arsenic	2-Butanone	1,4-Dichlorobenzene
Barium	t-1,2-Dichloroethene	2-Methylnaphthalene
Beryllium	Chloroform	Aldrin
Cadmium	Ethylbenzene	Alpha chlordane
Chromium	Tetrachloroethene	Heptachlor epoxide
Lead	Toluene	Naphthalene
Manganese	Trichloroethene	
	Xylenes	

CONTINUED

MATTIACE PETROCHEMICAL SITE

SELECTED CONSTITUENTS OF CONCERN IN GROUNDWATER -- NORTH OF GW DIVIDE

Arsenic
Barium
Beryllium
Cadmium
Chromium
Manganese

1,2-Dichloroethane
2-Butanone
Carbon tetrachloride
Chloroform
Ethylbenzene
Methylene chloride
Tetrachloroethene
Trichloroethene
Vinyl chloride
m&p-Xylenes

1,2-Dichlorobenzene
Aldrin
Alpha chlordane
Bis(2-ethylhexyl)phthalate
Di-n-butylphthalate
Heptachlor
Isophorone
Naphthalene
Phenol

IN GROUNDWATER -- SOUTH OF THE GW DIVIDE

Arsenic
Barium
Chromium
Manganese

1,1,1-Trichloroethane
1,1-Dichloroethene
c-1,2-Dichloroethene
2-Butanone
Ethylbenzene
Methylene chloride
Naphthalene
Vinyl chloride
m&p-Xylenes
o-Xylenes

1,2-Dichlorobenzene
2,4-Dimethylphenol
4-Methylphenol
Bis(2-ethylhexyl)phthalate
Di-n-butylphthalate
Naphthalene

TABLE 4

MATTIACE PETROCHEMICAL SITE

CARCINOGENIC RISK ESTIMATES
ADULTS

Selected Constituent of Concern	CDI (mg/kg/day)	Adj. for Absorption	Inhalation SF (mg/kg/day)-1	Tumor Site	Weight of Evidence	Constituent Specific Risk
Exposure Pathway: Inhalation of airborne constituents						
Metals						
Arsenic	4.03E-08	No	5.00E+01	respiratory tract	A	2.01E-06
Beryllium	3.73E-09	No	8.40E+00	lung	B2	3.13E-08
Cadmium	8.26E-09	No	6.10E+00	respiratory tract	B1	5.04E-08
Chromium (VI)	4.16E-08 **	No	4.10E+01	lung	A	1.71E-06
Semi-Volatiles						
1,4-Dichlorobenzene	1.22E-07	No	ND	NA	B2	NA
Aldrin	2.63E-09	No	1.70E+01	liver	B2	4.47E-08
Alpha Chlordane	2.52E-08	No	1.30E+00	liver	B2	3.28E-08
Heptachlor epoxide	9.43E-09	No	9.10E+00	liver	B2	8.58E-08
Volatiles						
1,2-Dichloroethane	1.67E-03	No	9.10E-02	circulatory system	B2	1.52E-04
Carbon tetrachloride	1.59E-03	No	1.30E-01	liver	B2	2.07E-04
Methylene chloride	3.39E-02	No	1.40E-02	lung, liver	B2	4.75E-04
Tetrachloroethene	6.32E-02	No	3.30E-03	leukemia, liver	B2	2.09E-04
Trichloroethene	1.23E-01	No	1.70E-02	lung	B2	2.09E-03
				Total Pathway Risk:		3.14E-03
Exposure Pathway: Inhalation of volatile constituents during showering						
1,2-Dichloroethane	1.46E-04	No	9.10E-02	circulatory system	B2	1.33E-05
Carbon tetrachloride	1.39E-04	No	1.30E-01	liver	B2	1.81E-05
Methylene chloride	2.96E-03	No	1.40E-02	lung, liver	B2	4.14E-05
Tetrachloroethene	5.52E-03	No	3.30E-03	leukemia, liver	B2	1.82E-05
Trichloroethene	1.07E-02	No	1.70E-02	lung	B2	1.82E-04
				Total Pathway Risk:		2.73E-04

CONTINUED

MATTIACE PETROCHEMICAL SITE

CARCINOGENIC RISK ESTIMATES
ADULTS

Selected Constituent of Concern	CDI (mg/kg/day)	Adj. for Absorption	Tumor Site	Oral SF (mg/kg/day)-1	Weight of Evidence	Constituent Specific Risk
Exposure Pathway: Ingestion of constituents in soil						
Metals						
Arsenic	2.23E-05	No	skin	ND	A	NA
Beryllium	2.00E-06	No	total	4.30E+00	B2	8.60E-06
Cadmium	2.29E-05	No	NA	ND	B1	NA
Chromium (VI)	8.80E-06 **	No	NA	ND	A	NA
Semi-Volatiles						
1,4-Dichlorobenzene	1.71E-05	No	liver	2.40E-02	B2	4.10E-07
Aldrin	3.71E-07	No	liver	1.70E+01	B2	6.31E-06
Alpha chlordane	1.30E-05	No	liver	1.30E+00	B2	1.69E-05
Heptachlor epoxide	1.33E-06	No	liver	9.10E+00	B2	1.21E-05
Volatiles						
Chloroform	3.57E-06	No	kidney	6.10E-03	B2	2.18E-08
Tetrachloroethene	2.43E-04	No	liver	5.10E-02	B2	1.24E-05
Trichloroethene	5.29E-04	No	liver	1.10E-02	B2	5.82E-06
				Total pathway risk:		6.26E-05
Volatiles						
Bromodichloromethane	3.56E-08	No	liver	1.30E-01	B2	4.63E-09
Tetrachloroethene	1.78E-07	No	liver	5.10E-02	B2	9.08E-09
				Total pathway risk:		1.37E-08
Exposure Pathway: Ingestion of constituents in groundwater south of the GW divide						
Metals						
Arsenic	2.94E-04	No	skin	NA	A	NA
Chromium (VI)	1.20E-03 **	No	NA	NA	A	NA
Semi-Volatiles						
Bis(2-ethylhexyl)phthalate	3.43E-02	No	liver	1.40E-02	B2	4.80E-04
Volatiles						
Vinyl chloride	7.43E-02	No	lung	2.30E-00	A	1.71E-01
				Total carcinogen risk:		1.71E-01

MATTIACE PETROCHEMICAL SITE

CARCINOGENIC RISK ESTIMATES
ADULTS

Selected Constituent of Concern	CDI (mg/kg/day)	Adj. for Absorption	Tumor Site	Oral SF (mg/kg/day)-1	Weight of Evidence	Constituent Specific Risk
Exposure Pathway: Ingestion of constituents in groundwater north of the GW divide						
Metals						
Arsenic	3.40E-04	No	skin	ND	A	ND
Beryllium	3.69E-04	No	total	4.30E+00	B2	1.59E-03
Cadmium	2.97E-03	No	NA	ND	B1	ND
Chromium (VI)	2.01E-03 **	No	NA	ND	A	ND
Semi-Volatiles						
Aldrin	2.06E-04	No	liver	1.70E+01	B2	3.50E-03
Alpha chlordane	8.86E-04	No	liver	1.30E+00	B2	1.15E-03
Bis(2-ethylhexyl)phthalate	7.71E-01	No	liver	1.40E-02	B2	1.08E-02
Heptachlor	1.60E-04	No	liver	4.50E+00	B2	7.20E-04
Volatiles						
1,2-Dichloroethane	3.14E-01	No	circulatory system	9.10E-02	B2	2.86E-02
Carbon tetrachloride	2.49E+00	No	liver	1.30E-01	B2	3.24E-01
Chloroform	2.31E+00	No	kidney	6.10E-03	B2	1.41E-02
Methylene chloride	2.14E+01	No	liver	7.50E-03	B2	1.60E-01
Tetrachloroethene	2.86E+00	No	liver	5.10E-02	B2	1.46E-01
Trichloroethene	6.57E+00	No	liver	1.10E-02	B2	7.23E-02
Vinyl chloride	1.06E-02	No	liver	2.30E+00	A	2.44E-02
				Total pathway risk:		7.86E-01
Exposure Pathway: Dermal absorption of constituents in soil						
Metals						
Arsenic	8.94E-06	Yes	skin	ND	A	NA
Beryllium	8.02E-07	Yes	total	4.30E+00	B2	3.45E-04
Cadmium	9.17E-06	Yes	NA	ND	B1	NA
Chromium (VI)	3.53E-06	Yes	NA	ND	A	NA
Semi-Volatiles						
1,4-Dichlorobenzene	6.88E-05	Yes	liver	2.40E-02	B2	1.65E-05
Aldrin	1.49E-06	Yes	liver	1.70E+01	B2	2.53E-04
Alpha chlordane	5.21E-05	Yes	liver	1.30E+00	B2	6.77E-04
Heptachlor epoxide	5.33E-06	Yes	liver	9.10E+00	B2	4.85E-04
Volatiles						
Chloroform	1.43E-05	Yes	kidney	6.10E-03	B2	8.72E-07
Tetrachloroethene	9.74E-04	Yes	liver	5.10E-02	B2	4.97E-04
Trichloroethene	2.12E-03	No	liver	1.10E-02	B2	2.33E-05
				Total pathway risk:		2.30E-03
Exposure Pathway: Dermal absorption of constituents in surface water during recreational activities						
Volatiles						
Bromodichloromethane	1.16E-08	Yes	liver	1.30E-01	B2	1.51E-08
Tetrachloroethene	5.80E-08	Yes	liver	5.10E-02	B2	2.96E-08
				Total pathway risk:		4.47E-08

MATTIACE PETROCHEMICAL SITE

CARCINOGENIC RISK ESTIMATES
ADULTS

Selected Constituent of Concern	CDI (mg/kg/day)	Adj. for Absorption	Tumor Site	Oral SF (mg/kg/day)-1	Weight of Evidence	Constituent Specific Risk
Exposure Pathway: Dermal absorption of constituents in groundwater south of the GW divide						
Metals						
Arsenic	1.19E-06	Yes	skin	NA	A	NA
Chromium (VI)	4.86E-06 **	Yes	NA	NA	A	NA
Semi-Volatiles						
Bis(2-ethylhexyl)phthalate	1.39E-04	Yes	liver	1.40E-02	B2	1.95E-05
Volatiles						
Vinyl chloride	3.02E-04	Yes	lung	2.30E+00	A	6.95E-03
				Total pathway risk:		6.97E-03
Exposure Pathway: Dermal absorption of constituents in groundwater north of the GW divide						
Metals						
Arsenic	1.38E-06	Yes	skin	ND	A	NA
Beryllium	1.50E-06	Yes	total	4.30E+00	B2	6.45E-04
Cadmium	1.21E-05	Yes	NA	ND	B1	NA
Chromium (VI)	8.15E-06 **	Yes	NA	ND	A	NA
Semi-Volatiles						
Aldrin	8.35E-07	Yes	liver	1.70E+01	B2	1.42E-04
Alpha Chlordane	3.60E-06	Yes	liver	1.30E+00	B2	4.68E-05
Bis(2-ethylhexyl)phthalate	3.13E-03	Yes	liver	1.40E-02	B2	4.38E-04
Heptachlor	6.50E-07	Yes	liver	4.50E+00	B2	2.92E-05
Volatiles						
1,2-Dichloroethane	1.28E-03	Yes	circulatory system	9.10E-02	B2	1.16E-03
Carbon tetrachloride	1.01E-02	Yes	liver	1.30E-01	B2	1.31E-02
Chloroform	9.40E-03	Yes	kidney	6.10E-03	B2	5.73E-04
Methylene chloride	8.70E-02	Yes	liver	7.50E-03	B2	6.52E-03
Tetrachloroethene	1.16E-02	Yes	liver	5.10E-02	B2	5.92E-03
Trichloroethene	2.67E-02	No	liver	1.10E-02	B2	2.94E-04
Vinyl chloride	4.29E-05	Yes	liver	2.30E+00	A	9.87E-04
				Total pathway risk:		2.92E-02
Nearby Residential Population in Area - Total Carcinogenic Risk						2.92E-02

CDI = Chronic Daily Intake

SF = Slope Factor

***: CDI represents 7 to 1 partitioning of Total chromium into Trivalent and Hexavalent forms.*

CONTINUED

MATTIACE PETROCHEMICAL SITE

HAZARD INDEX ESTIMATES
ADULTS

Selected Constituent of Concern	CDI (mg/kg/day)	Adj. for Absorption	Effects of Concern	Inhalation RfD (mg/kg/day)	Hazard Quotient
Exposure Pathway: Inhalation of airborne constituents					
Metals					
Antimony	4.20E-08	No	NA	ND	NA
Barium	5.73E-07	No	fetotoxicity	1.00E-04	5.73E-03
Lead	1.47E-06	No	CNS effects	4.30E-04	3.42E-03
Manganese	2.82E-06	No	CNS effects	3.00E-04	9.40E-03
Semi-Volatiles					
1,2-Dichlorobenzene	4.01E-06	No	decr. body weight	4.00E-02	1.00E-04
2-Methylnaphthalene	1.93E-07	No	NA	ND	ND
Aldrin	2.63E-09	No	NA	ND	ND
Alpha chlordane	2.52E-08	No	NA	ND	ND
Naphthalene	2.84E-07	No	NA	ND	ND
Volatiles					
1,1,1-Trichloroethane	5.22E-02	No	hepatoxicity	3.00E-01	1.74E-01
1,2-Dichloroethene	4.28E-02	No	NA	ND	ND
2-Butanone	4.31E-02	No	CNS effects	9.00E-02	4.76E-01
4-Methyl-2-pentanone	2.42E-02	No	CNS effects	2.00E-02	2.15E+00
Acetone	1.91E-03	No	NA	ND	ND
Carbon tetrachloride	1.59E-03	No	NA	ND	ND
Ethylbenzene	5.11E-02	No	NA	ND	ND
Methylene chloride	3.39E-02	No	NA	8.57E-01	3.96E-02
Tetrachloroethene	6.32E-02	No	NA	ND	NA
Toluene	2.39E-01	No	CNS effects	5.71E-01	4.19E-01
Xylenes	2.58E-01	No	CNS effects	8.57E-02	3.01E+00
			Pathway Hazard Index:		6.29E+00
Exposure Pathway: Inhalation of volatile constituents during showering					
1,1,1-Trichloroethane	1.07E-02	No	hepatoxicity	3.00E-01	3.57E-02
t-1,2-Dichloroethene	3.74E-03	No	NA	ND	NA
2-Butanone (MEK)	3.76E-03	No	CNS effects	9.00E-02	4.18E-02
4-Methyl-2-pentanone	2.11E-03	No	CNS effects	2.00E-02	1.05E-01
Acetone	1.72E-04	No	NA	ND	NA
Carbon tetrachloride	1.39E-04	No	NA	ND	NA
Ethylbenzene	4.46E-03	No	NA	ND	NA
Tetrachloroethene	5.52E-03	No	NA	ND	NA
Toluene	4.56E-03	No	CNS effects	5.71E-01	7.99E-03
Xylenes	2.25E-02	No	CNS effects	8.57E-02	2.63E-01
			Pathway Hazard Index:		4.53E-01

CONTINUED

MATTIACE PETROCHEMICAL SITE

HAZARD INDEX ESTIMATES

ADULTS

Selected Constituent of Concern	Adult CDI *(mg/kg/day)*	Adj. for Absorption	Effects of Concern	Oral RfD *(mg/kg/day)*	Hazard Quotient
Exposure Pathway: Ingestion of constituents in soil					
Metals					
Antimony	3.16E-05	No	reduced lifespan	4.00E-04	7.90E-02
Barium	2.60E-04	No	increased blood pressure	5.00E-02	5.20E-03
Lead	2.43E-04	No	CNS effects	1.40E-03	1.74E-01
Manganese	8.67E-04	No	CNS effects	2.00E-01	4.34E-03
Semi-Volatiles					
1,2-Dichlorobenzene	1.07E-03	No	liver effects	9.00E-02	1.19E-02
2-Methylnaphthalene	2.71E-05	No	ocular lesions	4.00E-03	6.78E-03
Aldrin	3.71E-07	No	liver lesions	3.00E-05	1.24E-02
Alpha chlordane	1.30E-05	No	liver necrosis	6.00E-05	2.17E-01
Naphthalene	4.00E-05	No	ocular lesions	4.00E-03	1.00E-02
Volatiles					
1,1,1-Trichloroethane	1.71E-04	No	hepatotoxicity	9.00E-02	1.90E-03
2-Butanone	1.57E-04	No	fetotoxicity	5.00E-02	3.14E-03
Ethylbenzene	6.57E-04	No	hepatotoxicity	1.00E-01	6.57E-03
Tetrachloroethene	2.43E-04	No	hepatotoxicity	1.00E-02	2.43E-02
t-1,2-Dichloroethene	1.71E-04	No	hematotoxicity	2.00E-02	8.55E-03
Toluene	1.30E-03	No	CNS effects	3.00E-01	4.33E-03
Xylenes	3.71E-03	No	mortality	2.00E+00	1.86E-03
			Pathway Hazard Index:		5.70E-01
Exposure Pathway: Ingestion of constituents in groundwater south of the GW divide					
Metals					
Barium	1.05E-02	No	increased blood pressure	5.00E-02	2.10E-01
Manganese	3.49E-01	No	CNS effects	2.00E-01	1.74E+00
Semi-Volatiles					
1,2-Dichlorobenzene	1.77E-03	No	liver effects	9.00E-02	1.97E-02
4-Methylphenol	3.43E-02	No	reduced fetal weight	6.00E-01	5.72E-02
Bis(2-ethylhexyl)phthalate	3.43E-02	No	increased liver weight	2.00E-02	1.71E+00
Naphthalene	4.86E-03	No	ocular lesions	4.00E-03	1.21E+00
Di-n-butylphthalate	1.03E-02	No	mortality	1.00E-01	1.03E-01
2,4-Dimethylphenol	2.71E-03	No	neurological & hematological changes	2.00E-02	1.36E-01
Volatiles					
1,1,1-Trichloroethane	9.71E-02	No	hepatotoxicity	9.00E-02	1.08E+00
1,1-Dichloroethene	4.86E-03	No	liver lesions	9.00E-03	5.40E-01
2-Butanone	1.77E-01	No	fetotoxicity	5.00E-02	3.54E+00
Methylene chloride	1.11E-02	No	liver toxicity	6.00E-02	1.85E-01
Ethylbenzene	6.29E-02	No	hepatotoxicity	1.00E+01	6.29E-01
m&p Xylenes	3.14E-02	No	mortality	2.00E+00	1.57E-02
o Xylenes	6.86E-02	No	mortality	2.00E+00	3.43E-02
cis-1,2-Dichloroethene	4.57E-01	No	hematotoxicity	1.00E-02	4.57E+01
			Pathway Hazard Index:		5.69E+01

CONTINUED

MATTIACE PETROCHEMICAL SITE

HAZARD INDEX ESTIMATES

ADULTS

Selected Constituent of Concern	CDI (mg/kg/day)	Adj. for Absorption	Effects of Concern	Oral RfD (mg/kg/day)	Hazard Quotient
Exposure Pathway: Ingestion of constituents in groundwater north of the GW divide					
Metals					
Barium	3.78E-02	No	increased blood pressure	5.00E-02	7.56E-01
Manganese	1.83E+00	No	CNS effects	2.00E-01	9.15E+00
Semi-Volatiles					
1,2-Dichlorobenzene	1.51E-01	No	liver effects	9.00E-02	1.68E+00
Aldrin	2.06E-04	No	hepatotoxicity	3.00E-05	6.87E+00
Alpha chlordane	8.86E-04	No	hepatotoxicity	6.00E-05	1.48E+01
Bis(2-ethylhexyl)phthalate	7.71E-01	No	increased liver weight	2.00E-02	3.85E+01
Di-n-butylphthalate	1.97E-01	No	mortality	1.00E-01	1.97E+00
Isophorone	1.63E+00	No	kidney lesions	2.00E-01	8.15E+00
Naphthalene	1.37E-01	No	ocular lesions	4.00E-03	3.43E+01
Phenol	5.14E-01	No	reduced fetal weight	6.00E-01	8.57E-01
Volatiles					
2-Butanone	3.43E+00	No	fetotoxicity	5.00E-02	6.86E+01
Carbon tetrachloride	2.49E+00	No	liver lesions	7.00E-04	3.56E-03
Chloroform	2.31E+00	No	liver lesions	1.00E-02	2.31E+02
Ethylbenzene	1.06E+01	No	hepatotoxicity	1.00E-01	1.06E+02
Methylene chloride	2.14E+01	No	hepatotoxicity	6.00E-02	3.57E+02
Tetrachloroethene	2.86E+00	No	hepatotoxicity	1.00E-02	2.86E+02
m&p Xylenes	1.21E+01	No	mortality	2.00E+00	6.05E+00
				Pathway Hazard Index:	4.73E+03
Exposure Pathway: Dermal absorption of constituents in soil					
Metals					
Antimony	1.27E-05	Yes	reduced lifespan	4.00E-04	3.17E+00
Barium	1.04E-04	Yes	increased blood pressure	5.00E-02	2.08E-01
Lead	9.74E-05	Yes	CNS effects	1.40E-03	6.96E+00
Manganese	3.47E-04	Yes	CNS effects	2.00E-01	1.73E-01
Semi-Volatiles					
1,2-Dichlorobenzene	4.30E-03	Yes	liver effects	9.00E-02	4.78E-01
2-Methylnaphthalene	1.09E-04	Yes	ocular lesions	4.00E-03	2.73E-01
Aldrin	1.49E-06	Yes	liver lesions	3.00E-05	4.97E-01
Alpha chlordane	5.21E-05	Yes	liver necrosis	6.00E-05	8.68E+00
Naphthalene	1.60E-04	Yes	ocular lesions	4.00E-03	4.00E-01
Volatiles					
1,1,1-Trichloroethane	6.88E-04	Yes	hepatotoxicity	9.00E-02	7.64E-02
2-Butanone	6.30E-04	Yes	fetotoxicity	5.00E-02	1.26E-01
Ethylbenzene	2.64E-03	Yes	hepatotoxicity	1.00E-01	2.64E-01
t-1,2-Dichloroethene	6.88E-04	Yes	hematotoxicity	2.00E-02	3.44E-01
Tetrachloroethene	9.74E-04	Yes	hepatotoxicity	1.00E-02	9.74E-01
Toluene	5.21E-03	Yes	CNS effects	3.00E-01	1.74E-01
Xylenes	1.49E-02	Yes	mortality	2.00E+00	7.45E-02
				Pathway Hazard Index:	2.29E-01

CONTINUED

MATTIACE PETROCHEMICAL SITE

HAZARD INDEX ESTIMATES

ADULTS

Selected Constituent of Concern	Adult CDI *(mg/kg/day)*	Adj. for Absorption	Effects of Concern	Oral RfD *(mg/kg/day)*	Hazard Quotient
Exposure Pathway: Dermal absorption of constituents in surface water during swimming					
Metals					
Manganese	1.28E-06	Yes	CNS effects	2.00E-01	6.40E-04
Thallium	1.33E-07	Yes	increased SGOT	7.00E-05	1.90E-01
Volatile					
t-1,2-Dichloroethene	2.32E-08	Yes	hematotoxicity	2.00E-02	1.16E-05
Bromodichloromethane	1.16E-08	Yes	nephrotoxicity	2.00E-02	5.80E-06
Tetrachloroethene	5.80E-08	Yes	hepatotoxicity	1.00E-02	5.80E-05
				Pathway Hazard Index:	1.91E-01
Exposure Pathway: Dermal absorption of constituents in groundwater south of the GW divide					
Metals					
Barium	4.27E-05	Yes	increased blood pressure	5.00E-02	8.54E-02
Manganese	1.42E-03	Yes	CNS effects	2.00E-01	7.10E-01
Semi-Volatiles					
1,2-Dichlorobenzene	7.19E-06	Yes	liver effects	9.00E-02	7.99E-04
4-Methylphenol	1.39E-04	Yes	reduced fetal weight	6.00E-01	2.32E-03
Bis(2-ethylhexyl)phthalate	1.39E-04	Yes	increased liver weight	2.00E-02	6.95E-02
Di-n-butylphthalate	4.18E-05	Yes	mortality	1.00E-01	4.18E-03
Naphthalene	1.97E-05	Yes	ocular lesions	4.00E-03	4.93E-02
2,4-Dimethylphenol	1.10E-05	Yes	neurological & hematological changes	2.00E-02	5.50E-03
Volatiles					
1,1,1-Trichloroethane	3.94E-04	Yes	hepatotoxicity	9.00E-02	4.38E-02
1,1-Dichloroethene	1.97E-05	Yes	liver lesions	9.00E-03	2.19E-02
2-Butanone	7.19E-04	Yes	fetotoxicity	5.00E-02	1.44E-01
Methylene chloride	4.52E-05	Yes	liver toxicity	6.00E-02	7.53E-03
Ethylbenzene	2.55E-04	Yes	hepatotoxicity	1.00E-01	2.55E-02
m&p Xylenes	1.28E-04	Yes	mortality	2.00E+00	6.40E-04
o Xylenes	2.78E-04	Yes	mortality	2.00E+00	1.39E-03
cis-1,2-Dichloroethene	1.86E-03	Yes	hematotoxicity	1.00E-02	1.86E+00
				Pathway Hazard Index:	3.03E+00

CONTINUED

MATTIACE PETROCHEMICAL SITE

HAZARD INDEX ESTIMATES

ADULTS

Selected Constituent of Concern	Adult CDI *(mg/kg/day)*	Adj. for Absorption	Effects Of Concern	Oral RfD *(mg/kg/day)*	Hazard Quotient
Exposure Pathway: Dermal absorption of constituents in groundwater north of the GW divide					
Metals					
Barium	1.53E-04	Yes	increased blood pressure	5.00E-02	3.06E-01
Manganese	7.45E-03	Yes	CNS effects	2.00E-01	3.72E+00
Semi-Volatiles					
1,2-Dichlorobenzene	6.15E-04	Yes	liver effects	9.00E-02	6.83E-02
Aldrin	8.35E-07	Yes	hepatotoxicity	3.00E-05	2.78E-01
Alpha chlordane	3.60E-06	Yes	hepatotoxicity	6.00E-05	6.00E-01
Bis(2-ethylhexyl)phthalate	3.13E-03	Yes	increased liver weight	2.00E-02	1.56E+00
Di-n-butylphthalate	8.00E-04	Yes	mortality	1.00E-01	8.00E-02
Isophorone	6.61E-03	Yes	kidney lesions	2.00E-01	3.30E-01
Naphthalene	5.57E-04	Yes	ocular lesions	4.00E-03	1.39E+00
Phenol	2.09E-03	Yes	reduced fetal weight	6.00E-01	3.48E-02
Volatiles					
2-Butanone	1.39E-02	Yes	fetotoxicity	5.00E-02	2.78E+00
Carbon tetrachloride	1.01E-02	Yes	liver lesions	7.00E-04	1.44E+02
Chloroform	9.40E-03	Yes	liver lesions	1.00E-02	9.40E+00
Ethylbenzene	4.29E-02	Yes	hepatotoxicity	1.00E-01	4.29E-01
Methylene chloride	8.70E-02	Yes	hepatotoxicity	6.00E-02	1.45E+01
Tetrachloroethene	1.16E-02	Yes	hepatotoxicity	1.00E-02	1.16E+01
m&p Xylenes	4.90E-02	Yes	mortality	2.00E+00	2.45E-01
				Pathway Hazard Index:	1.95E+02
Nearby Residential Population in Area - Total Chronic Hazard Index					1.95E+02

CDI = Chronic Daily Intake
RfD = Chronic Reference Dose

TABLE 5

SUMMARY OF COST ESTIMATE
ALTERNATIVE SC-3B

Element/Item		Total Cost	Description
I.	GENERAL	$32,856	Treatability study, trailers, storage, paving
II.	EXTRACTION WELL CONSTRUCTION	$31,850	10 8" wells (15 ft deep)
III.	VACUUM EXTRACTION SYSTEM	$53,288	Instrumentation/ electric, piping, blower
IV.	OFF-SITE DISPOSAL	$402,645	208 cy of expanded pesticide soil
V.	BACKFILL	$4,054	
VI.	CARBON ADSORPTION	$1,220,000	
VII.	STRUCTURE REMOVAL	$108,000	Demolition/ removal of Quonset hut, 1360 cy of concrete and asphalt
VIII.	STORAGE TANK REMOVAL	$505,000	Demolition/ removal of 24 aboveground, 32 belowground tanks
TOTAL CONSTRUCTION COST		**$3,227,566**	
I.	POWER	$2,000	
II.	CARBON ADSORPTION	$23,820	
III.	MISC/ CONTINGENCY	$74,318	
TOTAL ANNUAL O&M COST		**$100,138**	
TOTAL PRESENT WORTH		**$3,500,242**	

CONTINUED

SUMMARY OF COST ESTIMATE
ALTERNATIVE MOM-3

I.	GROUNDWATER EXTRACTION/INJECTION SYSTEM	$212,960	12 wells, 6 inch SS casing, submersible pumps, well development etc.
II.	PRECIPITATION/ CLARIFICATION SYSTEM	$79,000	Package plant
III.	FLOATING PRODUCT REMOVAL	$120,120	Pump, tank, transport and disposal
IV.	AIR STRIPPER	$29,500	Tower, assoc. hardware
V.	CARBON ADSORPTION (LIQUID)	$39,000	
VI.	THERMAL TREATMENT	$1,761,750	Vertide unit w. scrubber, quench system, instruments and controls.
VII.	MISC.	$127,000	Modelling, pump test, survey etc.
TOTAL CONSTRUCTION COST		**$3,316,921**	
I.	POWER	$328,033	
II.	CARBON ADSORPTION	$11,000	
III.	MISC/ CONTINGENCY	$253,826	
TOTAL ANNUAL O&M COST		**$592,859**	
TOTAL PRESENT WORTH		**$12,430,350**	

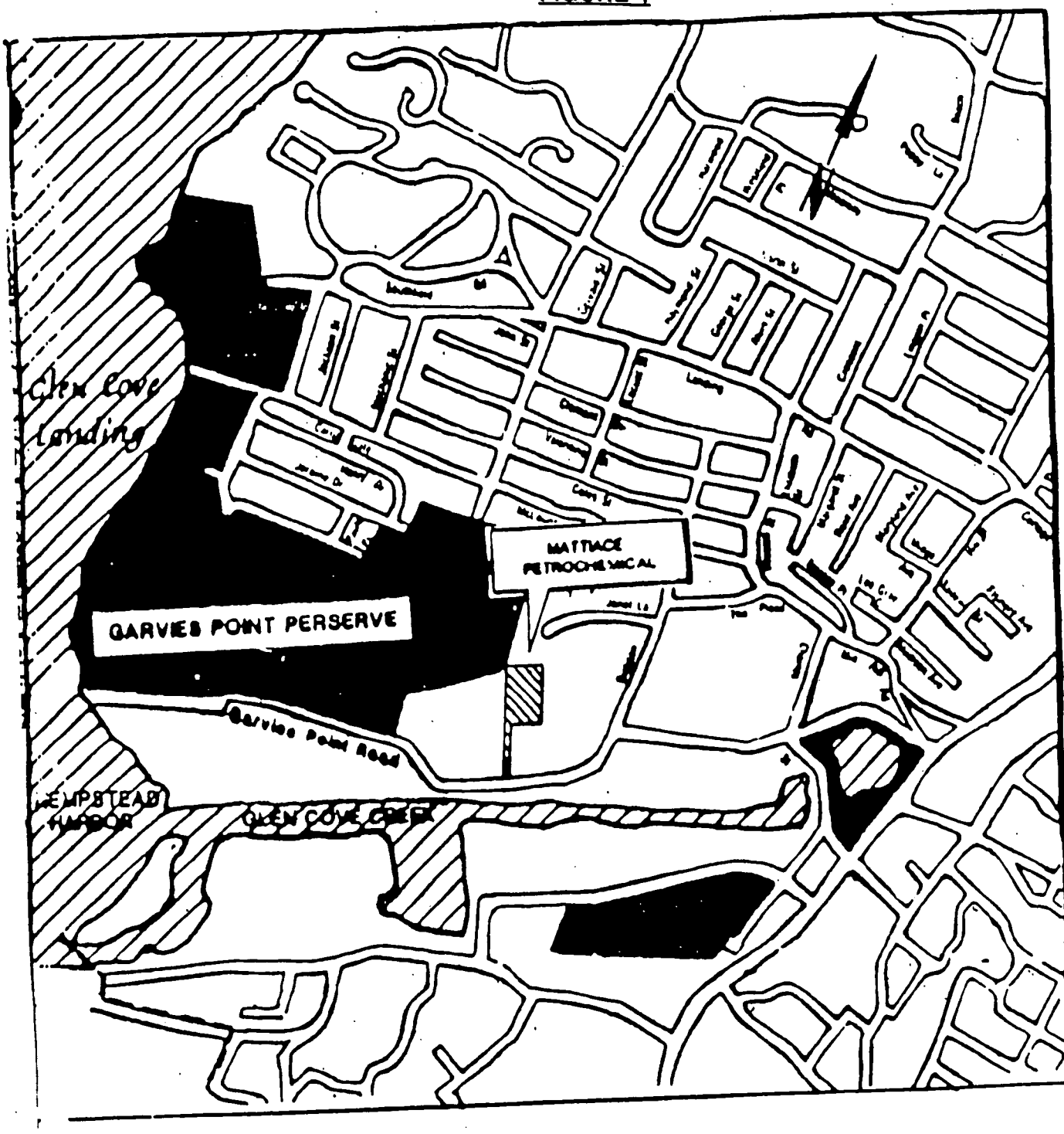
TABLE 6

REMEDIATION GOALS SUMMARY TABLE

Medium	Chemical	Remediation Level	Point of Compliance	Basis of Goal	Cancer Risk Level
Soil	Tetrachloroethylene	0.6 ug/kg	All facility grounds	Risk Assessment	1.0×10^{-6}
	Trichloroethylene	0.07 ug/kg			"
	4-Methyl-2-Pentanone	52.1 ug/kg			"
	Xylene	259 ug/kg			"
	Aldrin	0.04 ug/kg			"
	Alpha Chlordane	0.5 ug/kg			"
	Heptachlor Epoxide	0.07 ug/kg			"
Ground-water	Tetrachloroethylene	5 ug/l	Upper Glacial Aquifer	NY Sanitary Code	N/A
	Trichloroethylene	5 ug/l		40 CFR Parts 141/42	N/A
	Ethylbenzene	5 ug/l		NY Sanitary Code	N/A
	Total xylenes	5 ug/l		NY Sanitary Code	N/A
	Methylene Chloride	5 ug/l		NY Sanitary Code	N/A
	o-Dichlorobenzene	5 ug/l		NY Sanitary Code	N/A

APPENDIX 2

FIGURE 1



LEGEND:

- PARK PRESERVE
- SURFACE WATER
- MATTIACE SITE

"NOT TO SCALE"

SOURCE: GLEN COVE CHAMBER OF COMMERCE

U.S. ENVIRONMENTAL PROTECTION AGENCY

MATTIACE SITE

SITE LOCATION MAP

IT INTERNATIONAL TECHNOLOGY CORP

FIGURE 2

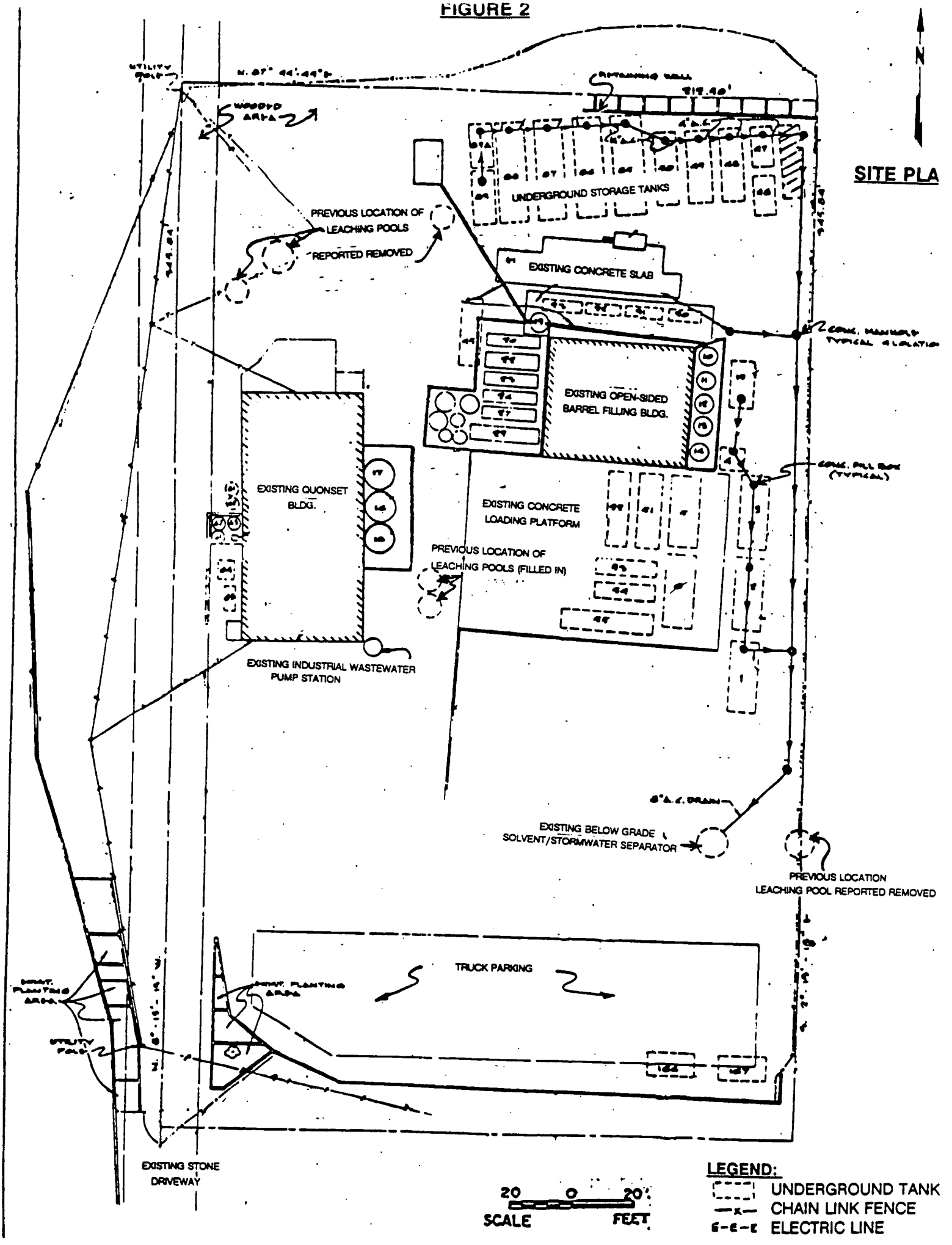

N
SITE PLA
UNDERGROUND STORAGE TANKS
PREVIOUS LOCATION OF LEACHING POOLS
REPORTED REMOVED
EXISTING CONCRETE SLAB
EXISTING OPEN-SIDED BARREL FILLING BLDG.
EXISTING QUONSET BLDG.
EXISTING CONCRETE LOADING PLATFORM
PREVIOUS LOCATION OF LEACHING POOLS (FILLED IN)
EXISTING INDUSTRIAL WASTEWATER PUMP STATION
EXISTING BELOW GRADE SOLVENT/STORMWATER SEPARATOR
PREVIOUS LOCATION LEACHING POOL REPORTED REMOVED
TRUCK PARKING
EXISTING STONE DRIVEWAY
20 0 20'
SCALE FEET
LEGEND:
UNDERGROUND TANK
CHAIN LINK FENCE
ELECTRIC LINE

FIGURE 3

AFFIDAVIT OF PUBLICATION

EBASCO ENVIRONMENTAL
RECEIVED
MAY 21 1991
DEV R. SACHDEV

STATE OF NEW YORK)
:SS.:
COUNTY OF SUFFOLK)

Pamela Acerra of Newsday, Inc., Suffolk County, N.Y., being duly sworn, says that such person is, and at the time of publication of the annexed Notice was the Principal Clerk (hereinafter the "Clerk") of the Publisher of NEWSDAY, a newspaper published in the Town of Huntington, County of Suffolk, County of Nassau, New York City, and elsewhere in the State of New York and other places, and that the Notice of which the annexed is a true copy, was published in the following editions/counties of said newspaper, in which the initialed signature of the Clerk appears in the box;

New York City	
Nassau	PA
Suffolk	

once in each week for ______ consecutive weeks, to wit: (dates of publication).

May 17,1991

Pamela Acerra

Sworn to before me this 17th day of May,1991

ELAINE CASTELLANO
Notary Public, State of New York
No 4693301
... 91

Elaine Castellano

Notary Public
Suffolk County, N.Y.

0300-0017

AD: 5FY60800
16-MAY-91 04:33:14

Legal Notice

L-8444
THE UNITED STATES
ENVIRONMENTAL
PROTECTION AGENCY
invites
PUBLIC COMMENT ON THE
PROPOSED REMEDIATION OF
THE MATTIACE
PETROCHEMICAL CO., INC.
(1ST OPERABLE UNIT-
COMPREHENSIVE SITE
REMEDIATION)
Located at
GARVEY'S POINT ROAD,
GLEN COVE, N.Y.

The U.S. Environmental Protectic
Agency (EPA) as lead agency fo
the Mattiace Petrochemical Supe
fund site will hold a Public Meetir
to discuss the Feasibility Study R
port (FS) and the proposed Plan fo
the site. The N.Y.S. Department
Environmental Conservation (NY
DEC) as support agency will also b
in attendance. The meeting will b
held on May 30, 1991 at 7:30 p.m.
the City Council Chambers of Ci
Hall, Glen Cove Road, Glen Cov
N.Y.

EPA evaluated the following rem
dial options for the Mattiace Petr
chemical site:

For Soil Contamination:

-SC-3: a. In Situ Vacuum Extrc
tion of General Site Area/E
cavation of All "Hot Spots
with Off-Site Treatment or
Disposal

b. In Situ Vacuum Extraction
General Site Area and Non-Pes
cide "Hot Spots"/Excavation
Pesticide "Hot Spots" with O
Site Treatment and Disposal

c. In Situ Vacuum Extraction
General Site Area and Non-Pes
cide "Hot Spots"

-SC-5: Low Temperature Therm
Treatment of General Site Area a
All "Hot Spots"

For Groundwater Contaminations:

-MOM-3: Groundwater Extractic
Air Stripping/Thermal Treatment
Air Effluent/Carbon Adsorption
Water Effluent/Reinjection of Trec
[illegible]

-MOM-[illegible]: Groundwater [illegible]
[illegible]

The no action alternative was u
evaluated as required by the Natic
al Oil and Hazardous Substanc
Pollution Contingency Plan.

Based on available information, t
proposed option at this time is
combination of SC-3b (In Situ Vac
um Extraction of General Si
Area/Excavation of Pesticide "H
Spots" with Off-Site Treatment o
Disposal) and MOM-3 (Groundw
ter Extraction/Air Stripping/Carb
Adsorption of Water Effluent/The
mal Treatment of Air Effluent/Re
jection of Treated Effluent).

EPA and NYSDEC welcome t
public's comments on the altern
tive identified above. EPA w
choose the final remedy after t
public comment period ends a
consultation with NYSDEC is cc
cluded. EPA may select an opti
other than the proposed alternati
after consideration of all commer
is completed.

Complete documentation of the pr
ect findings is presented in the
and FS Reports, and in the Propos
Plan. These documents are avc
able at the Glen Cove Pub
Library.

The public may comment in pers
at the public meeting and/or m
submit written comments throu
June 14, 1991 to:

Edward G. Als
Remedial Project Manager
Emergency and Remedial
Response Division
U.S. Environmental
Protection Agency
Room 2930, 26 Federal Plaza
New York, New York 10278
(212) 264-0522

FIGURE 4

Affidavit of Publication

THE UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
Invites
PUBLIC COMMENT ON THE
PROPOSED REMEDIATION OF THE
MATTIACE PETROCHEMICAL CO., INC.
(1st OPERABLE UNIT -
COMPREHENSIVE SITE REMEDIATION)
Located at
GARVEY'S POINT ROAD, GLEN COVE, N.Y.

The U.S. Environmental Protection Agency (EPA) as lead agency for the Mattiace Petrochemical Superfund site will hold a Public Meeting to discuss the Feasibility Study Report (FS) and the Proposed Plan for the site. The N.Y.S. Department of Environmental Conservation (NYSDEC) as support agency will also be in attendance. The meeting will be held on May 30, 1991 at 7:30 p.m. in the City Council Chambers of City Hall, Glen Cove Road, Glen Cove, N.Y.

EPA evaluated the following remedial options for the Mattiace Petrochemical site:

For Soil Contamination:

- SC-3: a. In Situ Vacuum Extraction of General Site Area/Excavation of All "Hot Spots" with off-site Treatment and Disposal.
  b. In Situ Vacuum Extraction of General Site Area and Non-Pesticide "Hot Spots"/Excavation of Pesticide "Hot Spots" with Off-Site Treatment and Disposal
  c. In Situ Vacuum Extraction of General Site Area and Non-Pesticide "Hot Spots"
- SC-5: Low Temperature Thermal Treatment of General Site Area and All "Hot Spots".

For Groundwater Contamination:

- MOM-3: Groundwater Extraction/Air Stripping/Thermal Treatment of Air Effluent/Carbon Absorption of Water Effluent/Reinjection of Treated Effluent
- MOM-6: Groundwater Extraction/UV-Peroxide Oxidation/Reinjection of Treated Effluent

The no action alternative was also evaluated as required by the National Oil and Hazardous Substances Pollution Contingency Plan.

Based on available information, the proposed option at this time is a combination of SC-3b (In Situ Vacuum Extraction of General Site Area/Excavation of Pesticide "Hot Spots" with off-site Treatment and Disposal) and MOM-3 (Groundwater Extraction/Air Stripping/Carbon Absorption of Water Effluent/Thermal Treatment of Air Effluent/Reinjection of Treated Effluent).

EPA and NYSDEC welcome the public's comments on the alternative identified above. EPA will choose the final remedy after the public comment period ends and consultation with NYSDEC is concluded. EPA may select an option other than the proposed alternative after consideration of all comments is completed.

Complete documentation of the project findings is presented in the RI and FS Reports, and in the Proposed Plan. These documents are available at the Glen Cove Public Library.

The public may comment in person at the public meeting and/or may submit written comments through June 14, 1991 to:

Edward G. Als
Remedial Project Manager
Emergency and Remedial Response Division
U.S. Environmental Protection Agency
Room 2930
26 Federal Plaza
New York, New York 10278
(212) 264-0522

05-22-91-1T-#2795-RP

County of Nassau
State of New York, SS

Valerie de Roche', being duly sworn, deposes and says that she is the principal Clerk of the Publisher of

The Glen Cove Record Pilot

a weekly newspaper published at Mineola in the county of Nassau, in the State of New York, and that a notice, a printed copy of which is hereunto annexed, has been published in said newspapers once in each week for

One weeks, viz:

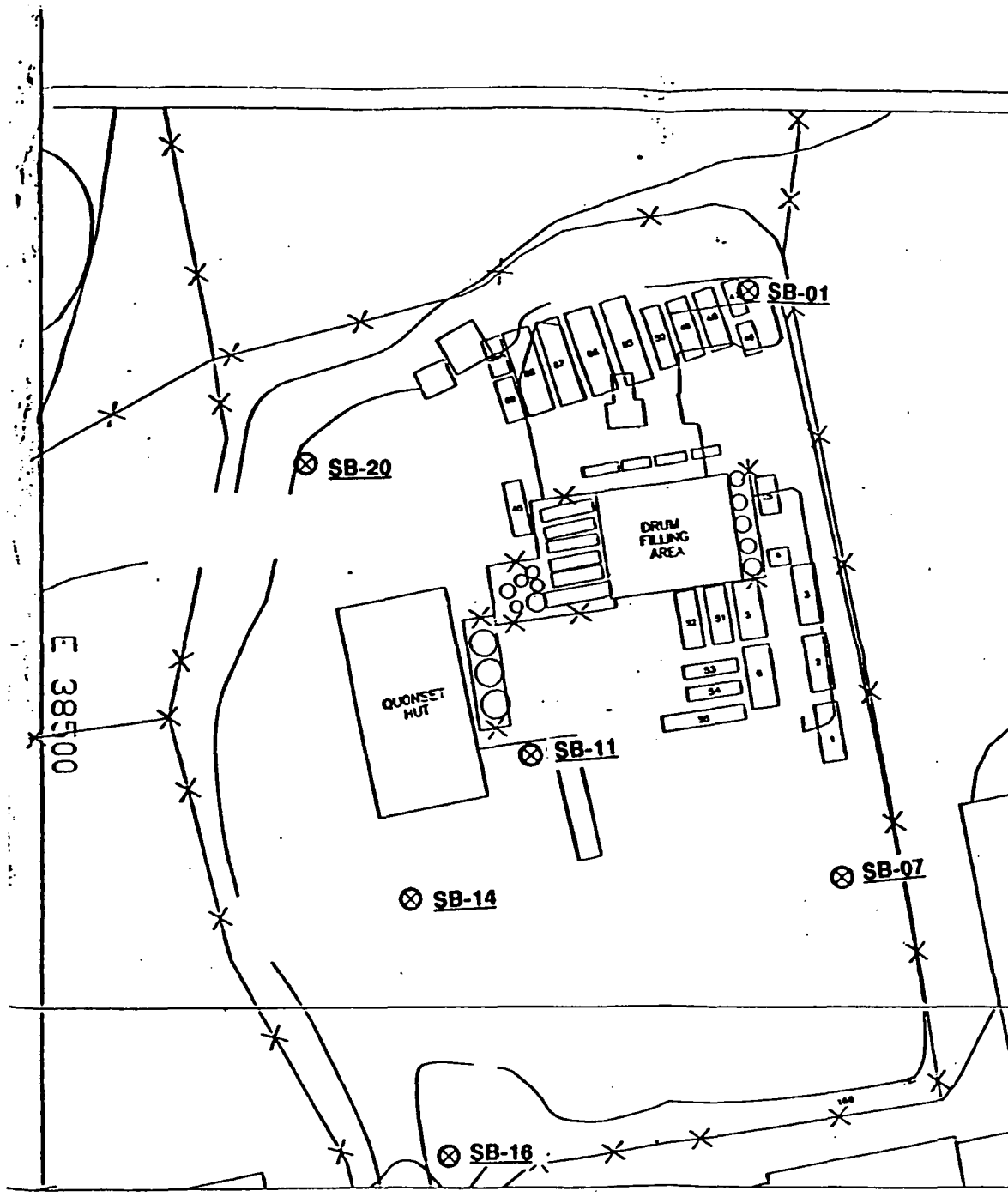
May 23, 1991

Valerie de Roché

Sworn to me this 23rd day of May 19 91

Elizabeth L. Boecke

ELIZABETH L. BOECKE
Notary Public, State of New York
No. 30-4505506
Qualified in Nassau County
Commission Expires Jan. 31, 1992



LEGEND

⊗ SOIL GAS SAMPLE LOCATION

0 22.5 45 67.5

SCALE OF FEET

NO.	DATE	DESCRIPTION OF REVISION	REV. BY	DWG	ECHO BY	APPVD BY
0	12/3/90	DEVELOPED DRAWING	M.S.M.	QAD	DG	CAD

PROJECT MANAGER: M. HARTMAN | DRAWN BY: VIVEK NANG

INTERNATIONAL TECHNOLOGY CORPORATION

SOIL GAS SURVEY MONITORING LOCATIONS

Prepared For:
U.S. ENVIRONMENTAL PROTECTION AGENCY
PROJECT No. 529065
OCTOBER 1990

LEVEL(S)	DATE INITIATED	DRAWING NUMBER
0	11/01/90	529065.22

FIGURE 6

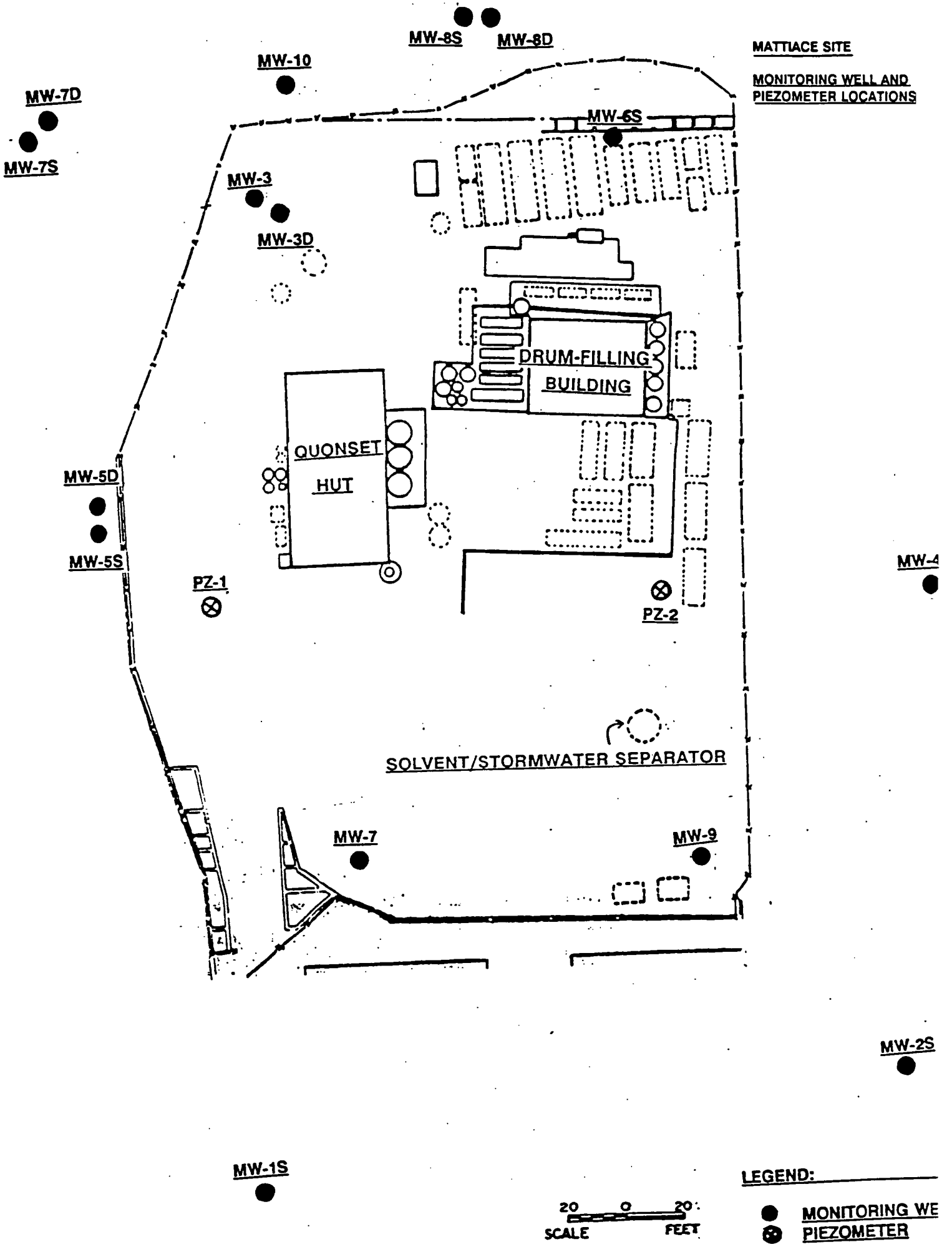
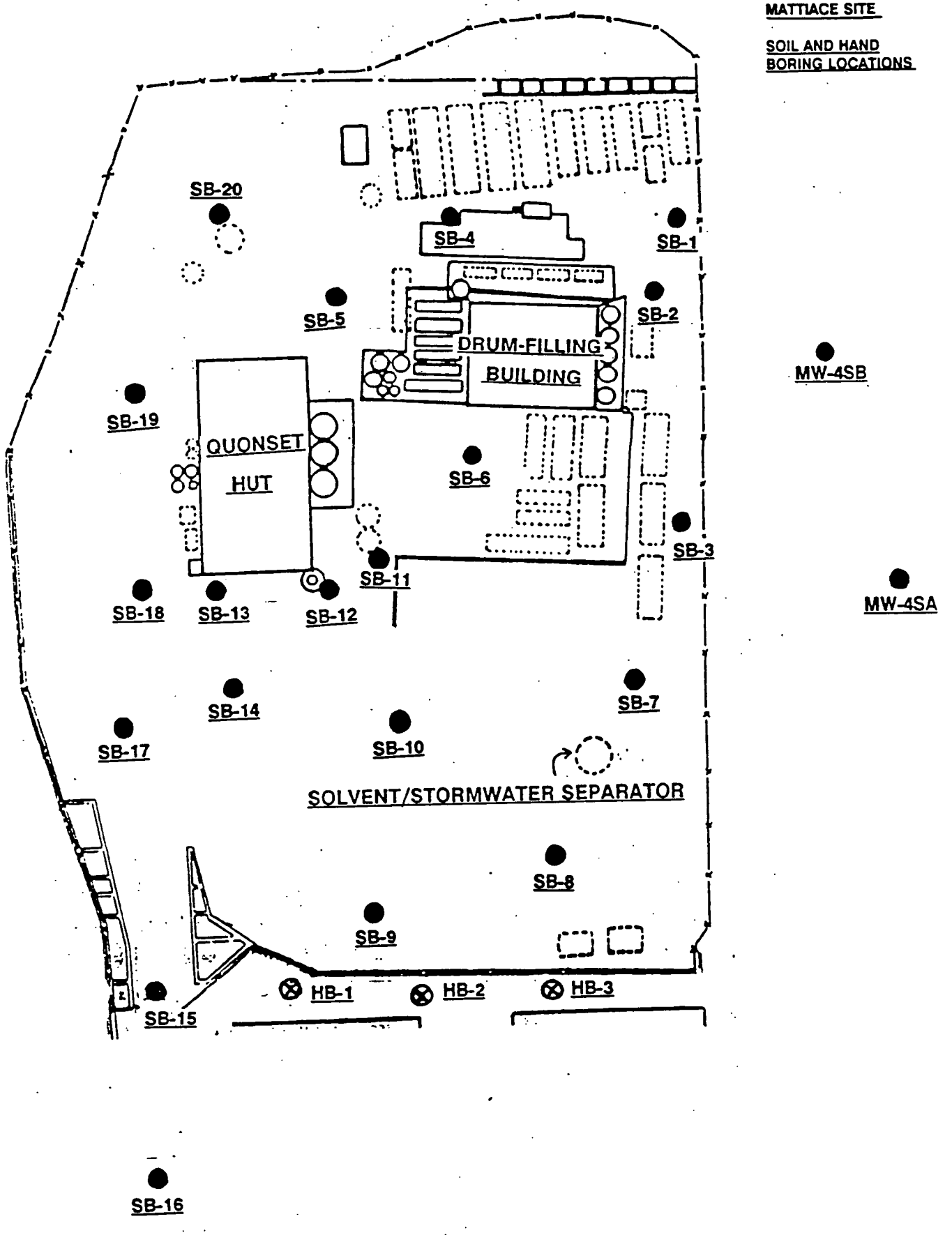

MW-8S
MW-8D
MW-10
MW-7D
MW-7S
MW-6S
MW-3
MW-3D
DRUM-FILLING
BUILDING
QUONSET
HUT
MW-5D
MW-5S
PZ-1
PZ-2
SOLVENT/STORMWATER SEPARATOR
MW-7
MW-9
MW-2S
MW-1S
MATTIACE SITE
MONITORING WELL AND
PIEZOMETER LOCATIONS
LEGEND:
MONITORING WE
PIEZOMETER
20 0 20
SCALE
FEET

FIGURE 7


MATTIACE SITE
SOIL AND HAND BORING LOCATIONS
SB-20
SB-4
SB-1
SB-5
SB-2
DRUM-FILLING BUILDING
MW-4SB
SB-19
QUONSET HUT
SB-6
SB-3
SB-11
MW-4SA
SB-18
SB-13
SB-12
SB-14
SB-7
SB-17
SB-10
SOLVENT/STORMWATER SEPARATOR
SB-8
SB-9
HB-1
HB-2
HB-3
SB-15
SB-16
LEGEND:
SOIL BORING
HAND BORING
20 0 20
SCALE
FEET

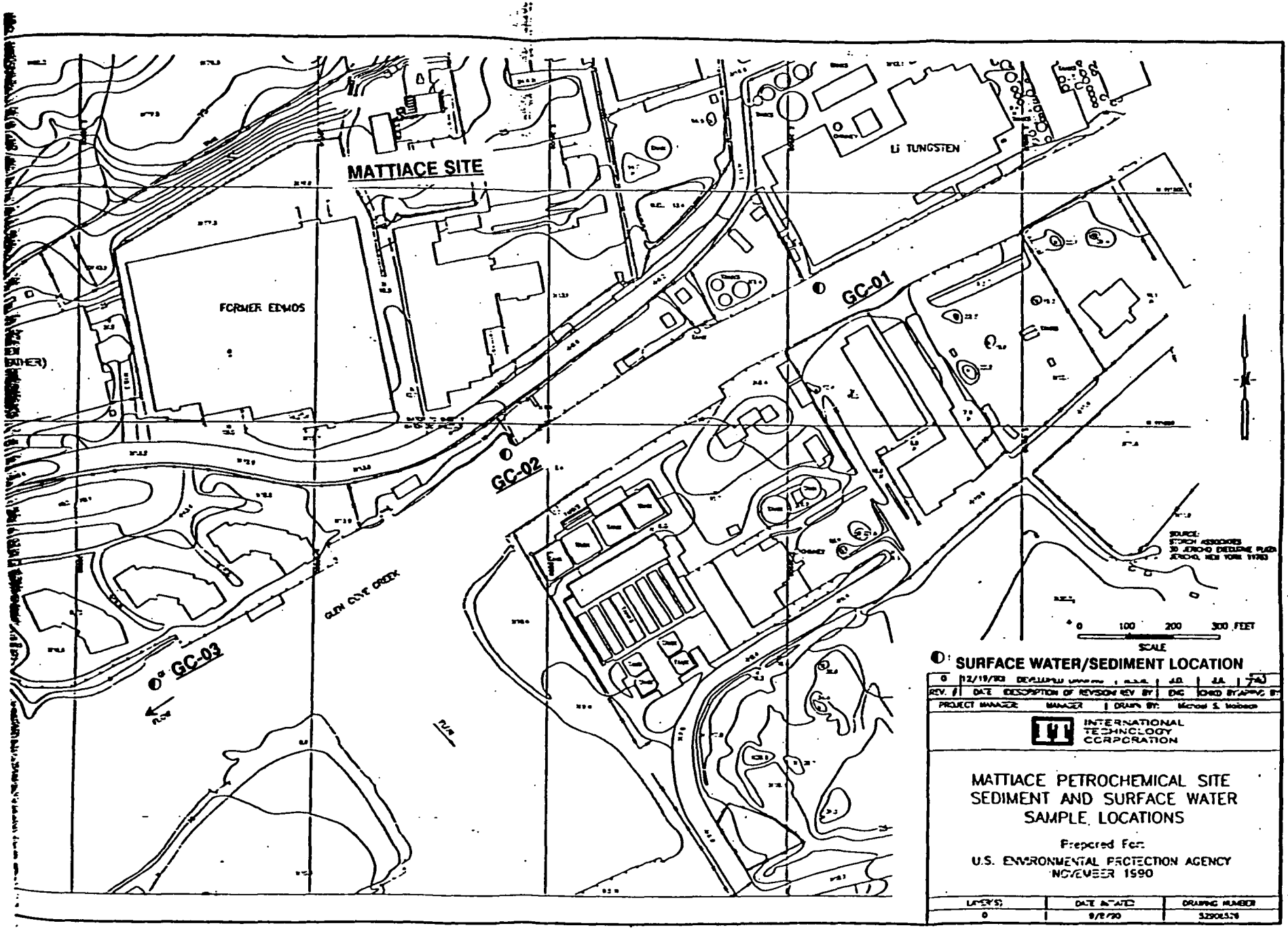

MATTIACE SITE
FORMER EDMOS
LI TUNGSTEN
GC-01
GC-02
GC-03
GLEN COVE CREEK
0 100 200 300 FEET
SCALE
SURFACE WATER/SEDIMENT LOCATION
INTERNATIONAL TECHNOLOGY CORPORATION
MATTIACE PETROCHEMICAL SITE
SEDIMENT AND SURFACE WATER
SAMPLE LOCATIONS
Prepared For:
U.S. ENVIRONMENTAL PROTECTION AGENCY
NOVEMBER 1990

FIGURE 8

FIGURE 9

DECLARATION FOR THE RECORD OF DECISION

MATTIACE PETROCHEMICAL CO., INC.

SITE NAME AND LOCATION

Mattiace Petrochemical Co., Inc.
Glen Cove, Nassau County, New York

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Mattiace Petrochemical Co., Inc. site, developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act and, to the extent applicable, the National Contingency Plan. This decision is based on the administrative record for this site. The attached index identifies the items that comprise the administrative record.

The State of New York concurs on the selected remedy.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE REMEDY

This ROD contains the remedy selected for the releases or threats of release documented by the Mattiace second operable unit investigation. The major components of the selected remedy include:

* Excavation of drums, containers, and contaminated soils from area 1 (western boundary of Mattiace property).

* Containerization of hazardous materials.

* Transportation offsite to a permitted hazardous waste treatment facility for treatment and disposal.

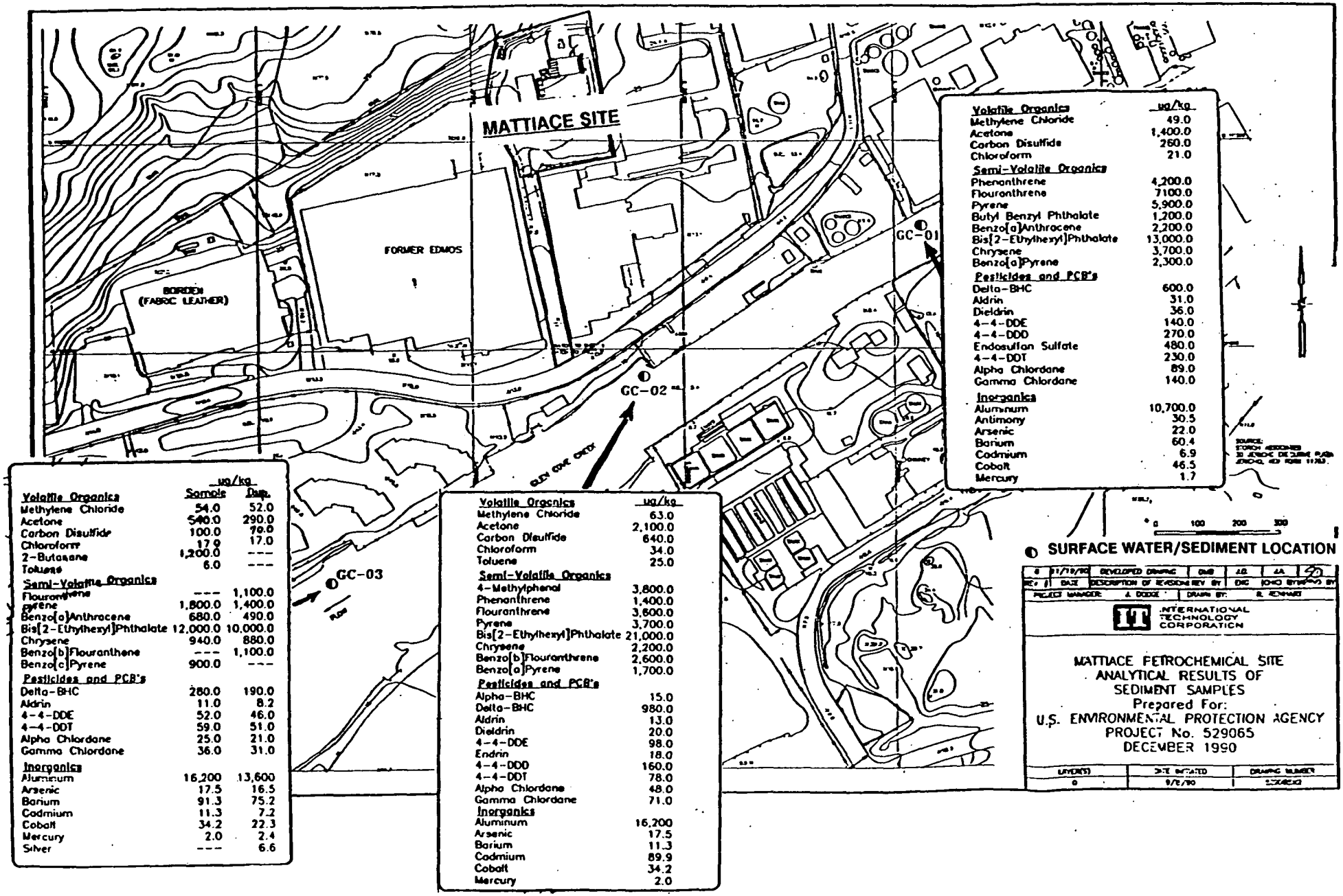
The results of the Mattiace first operable unit investigation, which is presently underway and involves a comprehensive evaluation of all site contamination, will be available early next year. These results will include a proposed remedy to address any contamination which has been found to threaten public health or the environment.

DECLARATION

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

Constantine Sidamon-Eristoff
Regional Administrator

Date 9/27/90



	ug/kg	
Volatile Organics	Sample	Dup.
Methylene Chloride	54.0	52.0
Acetone	540.0	290.0
Carbon Disulfide	100.0	79.0
Chloroform	17.0	17.0
2-Butanone	1,200.0	---
Toluene	6.0	---
Semi-Volatile Organics		
Flouranthene	---	1,100.0
pyrene	1,800.0	1,400.0
Benzo[a]Anthracene	680.0	490.0
Bis[2-Ethylhexyl]Phthalate	12,000.0	10,000.0
Chrysene	940.0	880.0
Benzo[b]Flouranthene	---	1,100.0
Benzo[a]Pyrene	900.0	---
Pesticides and PCB's		
Delta-BHC	280.0	190.0
Aldrin	11.0	8.2
4-4-DDE	52.0	46.0
4-4-DDT	59.0	51.0
Alpha Chlordane	25.0	21.0
Gamma Chlordane	36.0	31.0
Inorganics		
Aluminum	16,200	13,600
Arsenic	17.5	16.5
Barium	91.3	75.2
Cadmium	11.3	7.2
Cobalt	34.2	22.3
Mercury	2.0	2.4
Silver	---	6.6

Volatile Organics	ug/kg
Methylene Chloride	63.0
Acetone	2,100.0
Carbon Disulfide	640.0
Chloroform	34.0
Toluene	25.0
Semi-Volatile Organics	
4-Methylphenol	3,800.0
Phenanthrene	1,400.0
Flouranthrene	3,600.0
Pyrene	3,700.0
Bis[2-Ethylhexyl]Phthalate	21,000.0
Chrysene	2,200.0
Benzo[b]Flouranthrene	2,600.0
Benzo[a]Pyrene	1,700.0
Pesticides and PCB's	
Alpha-BHC	15.0
Delta-BHC	980.0
Aldrin	13.0
Dieldrin	20.0
4-4-DDE	98.0
Endrin	18.0
4-4-DDD	160.0
4-4-DDT	78.0
Alpha Chlordane	48.0
Gamma Chlordane	71.0
Inorganics	
Aluminum	16,200
Arsenic	17.5
Barium	11.3
Cadmium	89.9
Cobalt	34.2
Mercury	2.0

Volatile Organics	ug/kg
Methylene Chloride	49.0
Acetone	1,400.0
Carbon Disulfide	260.0
Chloroform	21.0
Semi-Volatile Organics	
Phenanthrene	4,200.0
Flouranthrene	7100.0
Pyrene	5,900.0
Butyl Benzyl Phthalate	1,200.0
Benzo[a]Anthracene	2,200.0
Bis[2-Ethylhexyl]Phthalate	13,000.0
Chrysene	3,700.0
Benzo[a]Pyrene	2,300.0
Pesticides and PCB's	
Delta-BHC	600.0
Aldrin	31.0
Dieldrin	36.0
4-4-DDE	140.0
4-4-DDD	270.0
Endosulfan Sulfate	480.0
4-4-DDT	230.0
Alpha Chlordane	89.0
Gamma Chlordane	140.0
Inorganics	
Aluminum	10,700.0
Antimony	30.5
Arsenic	22.0
Barium	60.4
Cadmium	6.9
Cobalt	46.5
Mercury	1.7

FIGURE 10

FIGURE 11

MATTIACE SITE

PROPOSED VACUU
EXTRACTION WE

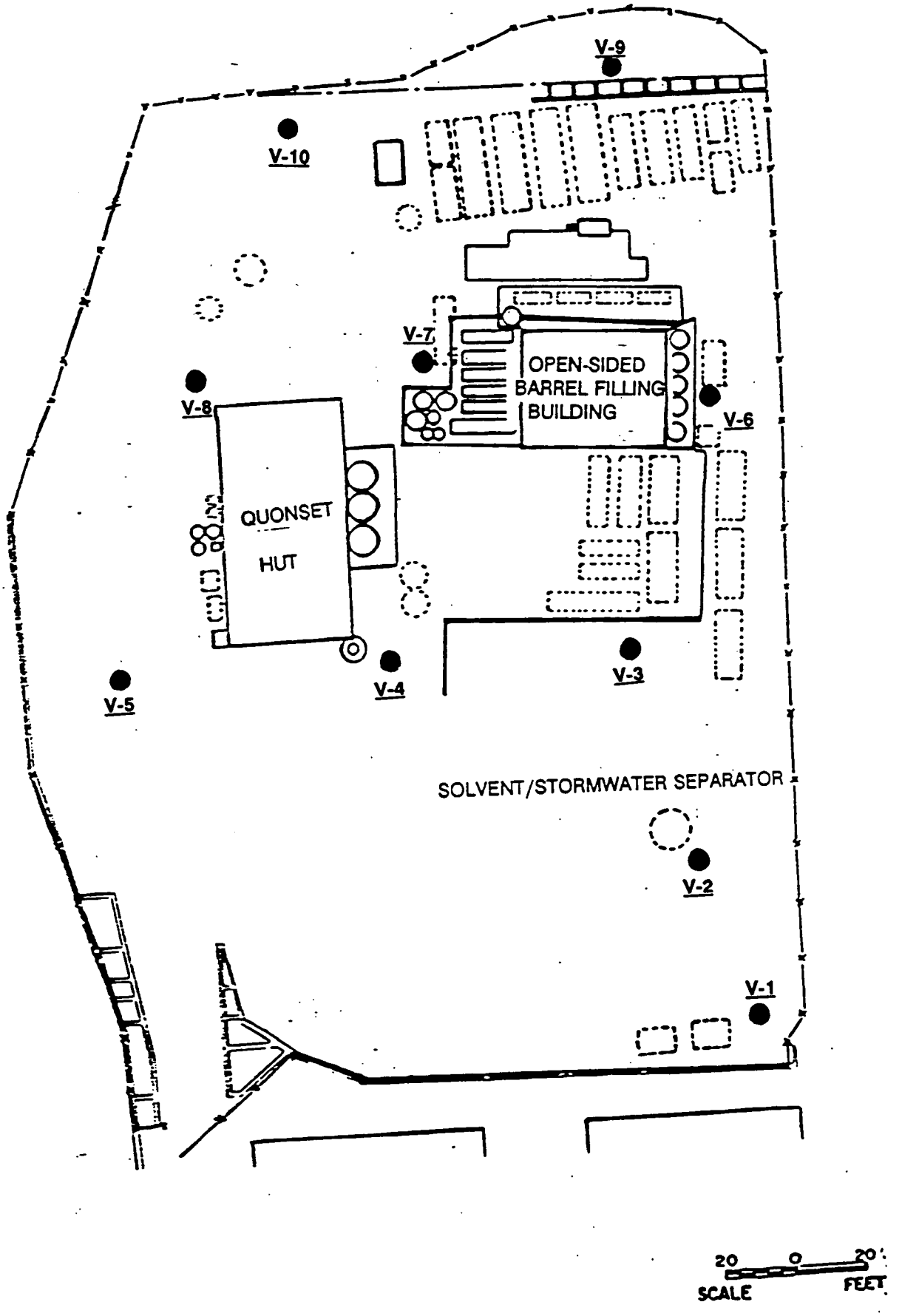
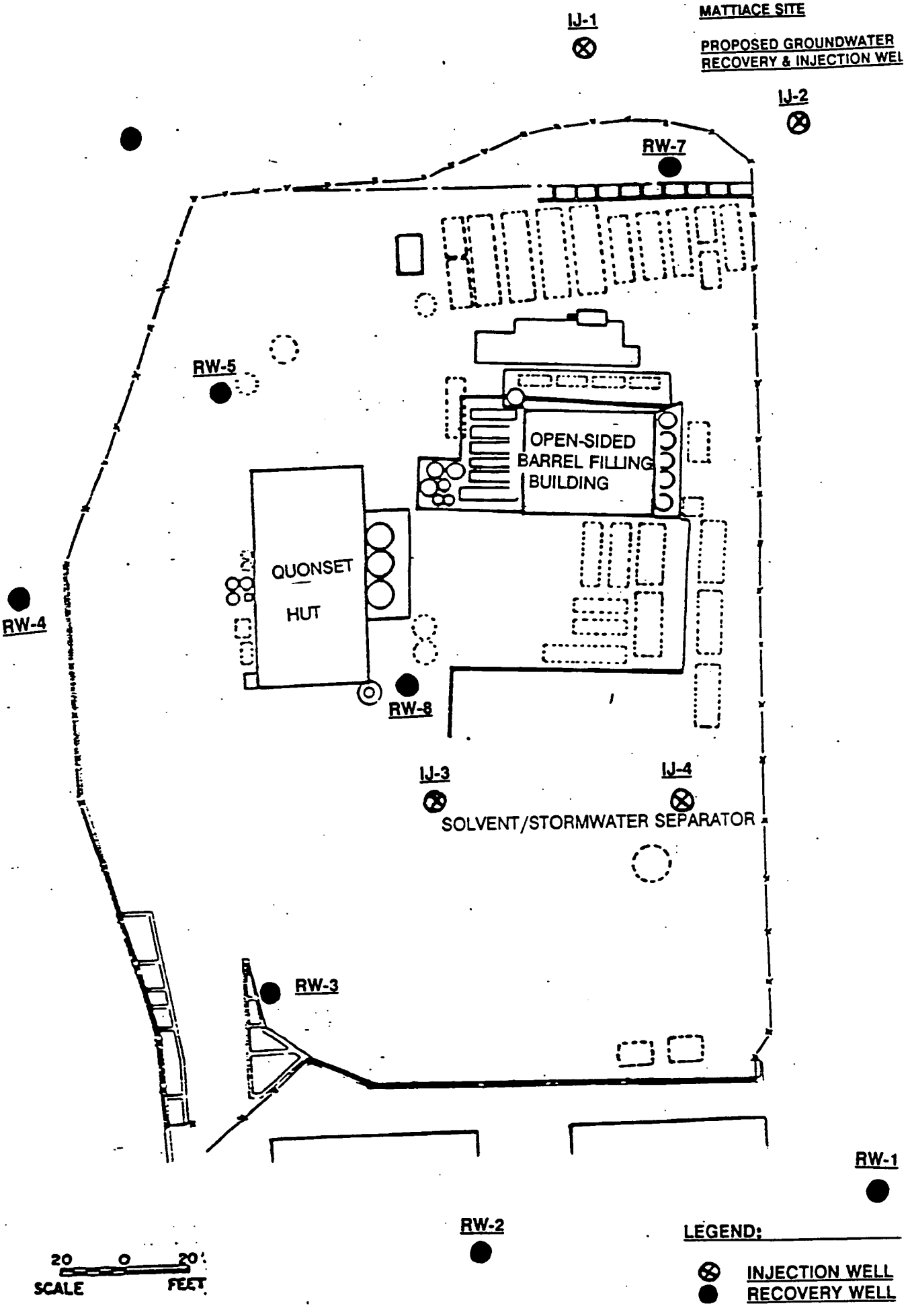


FIGURE 12


MATTIACE SITE
PROPOSED GROUNDWATER RECOVERY & INJECTION WEL
IJ-1
IJ-2
RW-7
RW-5
OPEN-SIDED BARREL FILLING BUILDING
QUONSET HUT
RW-4
RW-8
IJ-3
IJ-4
SOLVENT/STORMWATER SEPARATOR
RW-3
RW-1
RW-2
LEGEND:
INJECTION WELL
RECOVERY WELL
20 0 20'
SCALE FEET

APPENDIX 3

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233 -7010

Thomas C. Jorling
Commissioner

Ms. Kathleen C. Callahan
Director
Emergency & Remedial Response Division
U.S. Environmental Protection Agency
Region II
26 Federal Plaza
New York, NY 10278

JUN 2 6 1991

Dear Ms. Callahan:

Re: Mattiace Petrochemical Co., Inc. ID No. 130017
Glen Cove, Nassau County, New York

The New York State Department of Environmental Conservation (NYSDEC) has reviewed the draft operable unit one Declaration for the Record of Decision (ROD) for the above-referenced site. The NYSDEC concurs with the selected remedy which includes in-situ vacuum extraction/excavation of contaminated soils and extraction and treatment of contaminated groundwater.

If you have any questions, please contact Mr. James Bologna, of my staff, at (518) 457-3976.

Sincerely,

Edward O. Sullivan
Deputy Commissioner

cc: D. Garbarini, USEPA-Region II
E. Als, USEPA-Region II

FAX MEMO
PAGES 1 DATE 6/27 FAX
TO Doug Garbarini
FROM J. Bologna
CO.
PH # 518-457-3976 FAX #

TOTAL P.01

APPENDIX 4

RESPONSIVENESS SUMMARY

MATTIACE PETROCHEMICAL CO., INC.
GLEN COVE, NASSAU COUNTY, N.Y.

The U.S. Environmental Protection Agency (EPA) scheduled a public comment period from May 15, 1991 through June 14, 1991 for interested parties to comment on EPA's final Feasibility Study (FS) and Proposed Plan for the first operable unit at the Mattiace Petrochemical Co., Inc. Site. EPA held a public meeting on May 30, 1991 at the Glen Cove City Hall, located on Bridge Street, Glen Cove, N.Y. to describe the remedial alternatives and present EPA's Proposed Plan for addressing the first operable unit objectives at the Site.

A transcript of the meeting is included in the Administrative Record file for the Site and documents those questions addressed and EPA's responses at the public meeting. Other comments received during the comment period, as well as those comments made during the public meeting, are summarized and responded to in this responsiveness summary. All comments were considered prior to the selection of the remedy for the Mattiace Petrochemical Co., Inc. Site.

* * * * *

The following are further responses to comments expressed at the May 30, 1991 public meeting:

Comment: Is the Site made up of fill, and if so, what is its source?

Response: The Site appears to conform to the surrounding topography in the area, and therefore the existing Site grade does not appear to be the result of extensive filling. EPA is not presently aware of any locations on the Site that have been filled with material that originated offsite.

Comment: What other constituents comprised the "floating product" in the groundwater? The reported levels in the RI only account for a small amount of the total mass of floating product.

Response: The concentrations of organic chemicals that were analyzed for in the "floating product" samples taken by EPA were reported in Appendix A-5 of the Remedial Investigation Report. The TCL volatile organic parameters were erroneously reported in the units "ug/kg" instead of the correct "mg/kg" units. The corrected pages of Appendix A-5 are attached to this Responsiveness Summary as **ATTACHMENT 1.** Based on the reported (corrected) concentrations of TCL volatile constituents, these constituents comprise between approx. 38-58% of the "floating product" mass. The remaining mass, which was not analytically identified, may be emulsified groundwater.

Comment: Clarify the State's jurisdiction in regard to potable

water permitting.

Response: The State of New York presently does not regulate groundwater withdrawals rated at less than 40 gallons per minute. However, the New York State Department of Health does require registration (without further regulation) of all groundwater withdrawals regardless of withdrawal rate.

Comment: Did you investigate the existence of private wells in the area?

Response: EPA did a survey of all residential and industrial wells within a one-half mile radius of the Site. A total of 20 wells were located based on the records of NYSDEC and NYSDOH, and the results are reported in the April, 1989 workplan for the Site (page 3-18). Based on the survey, there are only three wells that could conceivably be affected by the groundwater contamination from the Site because of their proximity to and direction from the Site. However, the three wells, Well # 4440 (LIMCO Corp.), and Wells 8690 and 8709D (Fabric Leather Corp.), are all screened in the Lloyd Aquifer, which is not hydraulically connected to the contaminated aquifer under investigation.

Comment: Some of the New York State drinking water standards contained in the FS report are not correct.

Response: The standards specified in Table 2-1 of the FS were reviewed and commented on by the New York State Departments of Environmental Conservation and Health. At the present time, EPA considers the respective State Agency's approval regarding the standards as properly reflective of all applicable State regulations.

Comment: Could the removal of the "floating product" layer be performed earlier than what was presented during the public meeting?

Response: EPA presently estimates that the removal of "floating product" will begin in mid-1993 and take approximately one year to complete. This estimate assumes that certain administrative steps involving program enforcement occur and are followed by a design for the groundwater remedy to be completed by mid-1993. At the present time, EPA has already examined in a preliminary fashion the possibility of rapidly commencing "floating product" removal after consideration of certain enforcement alternatives. Because of several technical problems associated with this approach, EPA believes that the completion of the groundwater design phase will be necessary prior to implementing the "floating product" removal. However, at the commencement of the groundwater design phase, EPA will further examine possible ways of initiating the "floating product" removal prior to completion of design.

Comment: What's the status of the drum removal (OU 2)?

Response: The drum removal, which was the selected remedy contained in the 2nd operable unit Record of Decision for this Site, is presently underway. LILCO provided power line rerouting services the week of June 17th, which was necessary prior to commencement of actual drum excavation and removal. EPA estimates that 4 months will be required (commencing with the LILCO activity) before all the excavated materials are removed from the Site. However, actual excavation and staging of hazardous materials should take only 2-4 weeks.

Comment: Are the Sea Cliff Well and the Glen Cove Wells which were mentioned in the public meeting presentation being affected?

Response: As indicated during the presentation, based on the RI, neither well(field) has the potential to be affected by the Mattiace groundwater plume because of their locations relative to the plume. The Glen Cove Wells are located approximately two miles upgradient of the Site, while the Sea Cliff Well, while closer, is away from the projected path of the plume. The Sea Cliff Well is also screened in the Lloyd Aquifer, which is not connected hydraulically with the Upper Glacial Aquifer in that area.

* * * * * *

The following are responses to comments submitted by ERM-Northeast, on behalf of 20 Garvey's Point Road Corporation, transmitted on June 14, 1991.

Comment: Selection of New York State Sanitary Code standards as ARARs may adversely impact the ability of the selected remedy to achieve its goal because of the extremely high concentrations of organics in groundwater, as well as the presence of a separate (lighter) phase of organic contamination, which will continue to contaminate the groundwater below it.

Response: EPA recognizes that the ARARs for this Site will be difficult to attain in all areas of groundwater contamination (see ROD discussion, page 22), because of the high concentrations of groundwater contaminants. However, as part of the selected remedy, EPA will effectively remove all hazardous substances at the Site which might act as sources of continuing groundwater contamination. The selected remedy will include removal of the "floating product" layer, as well as all underground tanks and containment vessels, e.g. the solvent/stormwater separator. It will also include soil remediation, so that all sources of groundwater contamination will be addressed. Therefore, any difficulty which may be encountered in reaching selected ARARs for this Site will be as a result of the factors cited in the ROD discussion, and not as a result of leaching of contaminant sources into the groundwater.

Comment: Why isn't groundwater cleanup of inorganic constituents

to ARARs being pursued?

Response: The maximum groundwater concentrations of inorganic constituents of concern i.e., manganese and beryllium, found at the Mattiace Site are given in Table 2-1 of the FS Report. The maximum detected concentration of beryllium is within both the ARAR and risk assessment action levels. On the other hand, the maximum detected concentration of manganese exceeds the applicable New York State ARAR. This ARAR is a secondary (aesthetic) drinking water standard related to taste, rather than a primary health-related standard. Both manganese and iron will be removed from groundwater during the pretreatment process which is part of the groundwater selected remedy. Further, the risk assessment indicates that the present maximum concentrations of manganese do not pose an unacceptable risk to public health or the environment.

Comment: The proposed groundwater remedy of extraction and reinjection may move high concentrations of contaminants into areas not presently affected by these chemicals or levels.

Response: The recovery and reinjection system which will be designed as part of the selected remedy will strive to be a "closed" system, i.e. groundwater contaminants will be effectively contained from further migration. The long-term monitoring program contained in the ROD will assist in determining whether the remedy is successful in this regard. Future modifications to the constructed remedy, e.g. additional recovery or reinjection wells, could be effected at a later date if indicated by the monitoring.

Comment: The proposed groundwater remedy will probably not be successful since the RI did not adequately define certain essential hydrological and contaminant parameters. Therefore, a supplemental RI should be undertaken to develop required information prior to selection of a groundwater remedy.

Response: EPA does not believe that a second operable unit for groundwater is the proper response to the information needs identified in the remedial investigation. EPA believes sufficient information is available to select this remedy. Pre-design studies will be undertaken to further develop the data base required to implement the selected groundwater remedy, including calculating the proper numbers and placements of groundwater recovery and reinjection wells. Since community relations is an integral part of all phases of a Superfund project, the results of the pre-design studies will be made available to the public after completion.

Comment: Additional surface soil sampling should be performed on the former Edmos property to assess the possible impact of contaminated stormwater runoff on that property.

Response: In the selected remedy, EPA has included additional sampling of soil and sediment along the documented surface/

stormwater sewer runoff pathway from the Mattiace property to Glen Cove Creek, including the sediments, if any, in the storm sewer which discharges to the Creek. This pathway may technically include parts of the former Edmos property, such as the unpaved "common driveway" area between the Mattiace gate and Garvey's Point Road.

[N.B.: At the public meeting (and recorded in the public meeting transcript), the Remedial Project Manager was quoted as saying that the present worth cost estimate for the proposed remedy is $11.2 million. The quoted present worth estimate was in error. The correct present worth cost estimate is $15.9 million, as was indicated in the Proposed Plan.]

ATTACHMENT 1

MATTIACE PETROCHEMICAL SITE
FLOATING PRODUCT
TCL VOLATILES

DATE:12/27/[illegible]
TIME:13:5[illegible]
PAGE: 1
Report format

SAMPLE ID	MP-MW6S-FLPD	MP-MW6S-FLRP
UNITS	MG/KG	MG/KG
	---	---
TCL VOLATILE PARAMETERS:		
CHLOROMETHANE	---	---
BROMOMETHANE	---	---
VINYL CHLORIDE	---	---
CHLOROETHANE	---	---
METHYLENE CHLORIDE	---	---
ACETONE	---	---
CARBON DISULFIDE	---	---
1,1-DICHLOROETHENE	---	---
1,1-DICHLOROETHANE	---	---
TRANS-1,2-DICHLOROETHENE	---	---
CHLOROFORM	---	---
1,2-DICHLOROETHANE	---	---
2-BUTANONE	---	---
1,1,1-TRICHLOROETHANE	20,000.000	37,000.000
CARBON TETRACHLORIDE	---	---
VINYL ACETATE	---	---
BROMODICHLOROMETHANE	---	---
1,2-DICHLOROPROPANE	---	---
TRANS-1,3-DICHLOROPROPENE	---	---
TRICHLOROETHENE	67,000.000	120,000.000
DIBROMOCHLOROMETHANE	---	---
1,1,2-TRICHLOROETHANE	---	---
BENZENE	---	---
CIS-1,3-DICHLOROPROPENE	---	---
2-CHLOROETHYLVINYLETHER	---	---
BROMOFORM	---	---
4-METHYL-2-PENTANONE	---	---
2-HEXANONE	---	---
TETRACHLOROETHENE	52,000.000	98,000.000
1,1,2,2-TETRACHLOROETHANE	---	---
TOLUENE	64,000.000	120,000.000
CHLOROBENZENE	---	---
ETHYLBENZENE	6,800.000	13,000.000
STYRENE	---	---

EXPLANATION OF CODES :

(no codes)	DETECTED AT CONCENTRATION INDICATED
J	ESTIMATED VALUE
B	COMPOUND FOUND IN BLANK
U or ---	UNDETECTED
NA	NOT ANALYZED FOR
X,R	REJECTED VALUE
NR	VALIDATED RESULTS NOT RECEIVED OR RESULT NOT REPORTED
JN	PRESUMPTIVE EVIDENCE FOR THE PRESENCE OF THE MATERIAL AT AN ESTIMATED VALUE

CONTINUED

MATTIACE PETROCHEMICAL SITE
FLOATING PRODUCT
TCL VOLATILES

SAMPLE ID	MP-MW6S-FLP0	MP-MW6S-FLRP
UNITS	MG/KG	MG/KG
	---	---
TOTAL XYLENES	32,000.000	61,000.000
ACRYLONITRILE	---	---
1,1,1,2-TETRACHLOROETHANE	---	---
ISOBUTANOL	---	---
TOTAL TICS	10	10
TIC CONCENTRATION	75,900.000JN	129,100.000

EXPLANATION OF CODES :

(no codes)	DETECTED AT CONCENTRATION INDICATED
J	ESTIMATED VALUE
B	COMPOUND FOUND IN BLANK
U or ---	UNDETECTED
NA	NOT ANALYZED FOR
X,R	REJECTED VALUE
NR	VALIDATED RESULTS NOT RECEIVED OR RESULT NOT REPORTED
JN	PRESUMPTIVE EVIDENCE FOR THE PRESENCE OF THE MATERIAL AT AN ESTIMATED VALUE

APPENDIX 5

MATTIACE PETROCHEMICAL COMPANY SITE
OPERABLE UNIT ONE
ADMINISTRATIVE RECORD
INDEX OF DOCUMENTS

SITE IDENTIFICATION

Correspondence

REMOVAL RESPONSE

Correspondence

REMEDIAL INVESTIGATION

Sampling & Analysis Plans

Work Plans

Remedial Investigation Reports

P. 40 - 578 Report: Final Remedial Investigation Report Mattiace Petrochemical Site. Operable Unit One, Glen Cove, New York. Volume I of II. Prepared by EBASCO Services Inc. April 1991

P. 579 - 1233 Report: Final Remedial Investigation Report Mattiace Petrochemical Site. Operable Unit One, Glen Cove, New York. Volume II of II. Prepared by EBASCO Services Inc. April 1991

Correspondence

P. 1234 - 1237 Letter to Mr. Edward Als, US EPA from Mr. James J. Bologna, Bureau of Eastern Remedial Action, NY State Department Environmental Conservation, Re: Comments on Draft Remedial Investigation Report Mattiace Petrochemical Site ID No.130017. February 1, 1991

P. 1238 - 1239 Letter to Ms. Jill Hacker, Project Officer, US EPA and Mr. Edward Als, US EPA, from Mr. Mario Verdibello, PE. Re: Arcs II Program - EPA Contract No.68-W8-0110. Work Assignment No.--6-2L2B. Mattiace Petrochemical Data Evaluation. October 25, 1990

P. 1240 - 1243 Memorandum to file Re: Mattiace Petrochemical Co., Inc. Retaining Wall Collapse. October 25, 1990

P. 1244 - 1256 Memorandum to Directors of Waste Management Div., Directors of Emergency & Remedial Response Div., Directors of Hazardous Waste Management Division, and Regional Counselors from Mr. Henry L. Longest II, Director Office of Emergency and Remedial Response, US EPA and Mr. Bruce M. Diamond, Director, Office of Waste Programs Enforcement, US EPA. Re: Suggested ROD language for various Ground Water remediation options. October 10, 1990

P. 1257 - 1258 Letter to Honorable Donald P. De Riggi, Mayor of Glen Cove, New York from Mr. Edward Als, US EPA. Re: Status of work being performed by EPA at the Mattiace Superfund site on Garvey's Point Road. July 27, 1990

P. 1259 - 1260 Letter to Honorable Donald P. De Riggi, Mayor of Glen Cove, New York from Ms. Constantine Sideamon-Eristoff, Regional Administrator, US EPA. Re: Sites (Li Tungsten, Mattiace, Garvies Pt.) along Glen Cove Creek which contain hazardous materials. July 25, 1990

P. 1261 Letter to Mr. Edward Als, RPM, US EPA from Honorable Donald P. De Riggi, Mayor of Glen Cove, New York, Re: Mattiace-Edmos status update. July 23, 1990

P. 1262 Letter to Ms. Lillian Johnson, Chief, Superfund Community Relations, US EPA from Mr. Sydne B. Marshall, Ph.D, Ebasco Environmental. Re: Mattiace Petrochemical Site, Glen Cove, New York. Additions to the Mailing List. July 5, 1990

P. 1263 - 1264 Letter to Mr. Dana Boyadjian, Project Manager, IT Corporation from Mr. Edward G. Als, US EPA, Re: Mattiace Petrochemical Superfund Site-Offsite Groundwater characterization. June 29, 1990

P. 1265 - 1266 Letter to Mr. Dana Boyadjian, Project Manager, IT Corporation from Mr. Edward G. Als, US EPA, Re: Revision of subtask 3I(Section 3.3.8) of workplan for Mattiace Petrochemical Superfund site (OU2) entitled Groundwater Monitoring. May 25, 1990

P. 1267 Letter to Mr. Mario Verdibello, Supervising Engineer, Ebasco Services Inc., from Mr. Edward G. Als, US EPA, Re: Recent field change request no.15 at the Mattiace Petrochemical Superfund site in Glen Cove, New York. February 15, 1990

P. 1268 - 1270 Letter to Mr. Charles W. Bowman, Land Use Company from Mr. Robert N. Thurber, Sr. Environmental Analyst, NYSDEC. Re: Dredging of Bona Fide Industries Site. December 8, 1989

P. 1271 - 1272 Letter to Mr. Edward Als, US EPA from Mr. Dana M. Boyadjian, Project Engineer, IT Corporation and Mr. Robert C. Landle, CPG, IT Corporation. Re: Mattiace Petrochemical Site relocation of two monitor wells. December 4, 1989

P. 1273 - 1274 Letter to Mr. Edward Als, US EPA from Ms. Debra L. Rothberg of Jones, Day, Reavis, & Pogue. Re: Permission for access: Li Tungsten Property July 21, 1989

. 1275 - 1279 Memorandum to Regional Waste Management Division Directors, Regional Superfund Branch Chiefs, Regional Air Division Directors, Regional Air Branch Chiefs, OERR Division Directors, OAQPS Division Directors from Henry L. Longest II, Director Office of Emergency & Remedial Response, US EPA and Mr. Gerald Emison, Director Office of Air Quality Planning & Standards. Re: Control of Air Emissions from Superfund Air Strippers and Superfund Groundwater Sites. June 15, 1989

P. 1280 US EPA permission form for access to properties concerning the Mattiace Petrochemical Superfund Site RI/FS Investigations, Glen Cove, New York. June 9, 1989

P. 1281 US EPA permission form for access to properties concerning the Mattiace Petrochemical Superfund Site RI/FS Investigations, Glen Cove, New York. May 23, 1989

P. 1282 US EPA permission form for access to properties concerning the Mattiace Petrochemical Superfund Site RI/FS Investigations, Glen Cove, New York. May 22, 1989

P. 1283 - 1284 Letter to Mr. Jan Burman, c/o Ms. Debra L. Rothberg, Beveridge and Diamond, PA, from Mr. Edward Als, US EPA. Re: US EPA conducting Remedial Investigation/Feasibility Study (RI/FS) Activities at the Mattiace Petrochemical Superfund Site in Glen Cove, New York. May 17, 1989

P. 1285 Letter to Honorable Alfonse M. D'Amato, US Senator, from Mr. William J. Muszynski, P.E., Acting Regional Administrator US EPA. Re: Response to letter written on behalf of the Mayor of City of Glen Cove, Honorable Donald DeRiggi. March 3, 1989

P. 1286 - 1287 Letter to Honorable Donald P. De Riggi, Mayor & Supervisor, Glen Cove, New York from Mr. William J. Muszynski, Acting Regional Administrator US EPA. Re: Response letter concerning Glen Cove Creek. February 21, 1989

P. 1288 - 1290 Letter to Honorable Alfonse M. D'Amato, US Senator, from Honorable Donald P. De Riggi, Mayor, Glen Cove, New York. Re: Six sites containing various degrees of soil contamination at Glen Cove Creek. January 31, 1989

P. 1291 - 1293 Letter to Honorable Alfonse M. D'Amato, US Senator, from Mr. William J. Muszynski, P.E., Acting Regional Administrator US EPA. Re: Properties owned by Old Bank of Maryland which exhibit various degrees of soil contamination. January 26, 1989

P. 1294 Letter to Mr. Edward Als, US EPA from Honorable Donald P. De Riggi, Mayor, Glen Cove, New York. Re: Inspection of Glen Cove Creek. January 26, 1989

P. 1295 - 1296 Letter to Mr. William J. Muszynski, Acting Regional Administrator, EPA from Honorable Donald P. De Riggi, Mayor & Supervisor, Glen Cove, New York. Re: EPA to do work at Mattiace with an examination of the entire creek area be examined for remedial work. January 20, 1989

P. 1297 Letter to Mr. William Muszynski, Acting Regional Administrator, EPA from Honorable Donald P. De Riggi, Mayor & Supervisor, Glen Cove, New York. Re: Discovery of arsenic plume at the easterly end of Glen Cove Creek in the Charles Street vicinity. January 20, 1989

P. 1298 Letter to Mr. Edward G. Als, US EPA, from Mr. Robert Wither, Project Engineer, Bureau of Eastern Remedial Action, NY State Department of Environmental Conservation. Re: Mattiace Petrochemical Site work plan. January 6, 1989

P. 1299 Letter to Mr. Robert Poltin, Chief, Eastern Remedial Hazardous Waste Section, NY State Department of Environmental Conservation, from Mr. Edward G. Als, US EPA. Re: Draft workplan for the Mattiace Petrochemical Co. Superfund site in Glen Cove, New York. January 3, 1989

FEASIBILITY STUDY

Correspondence

P. 1300 - 1302 Letter to Mr. Edward G. Als, US EPA, from Mr. James J. Bologna, Bureau of Eastern Remedial Action, NY State Department of Environmental Conservation. Re: Draft Feasibility Study Report Mattiace Petrochemical Site-EPA ID#130017. March 13, 1991

STATE COORDINATION

Correspondence

P. 1303 Letter to Mr. Stephen D. Luftig, US EPA-Region II from Mr. James P. Cowan, State Clearing Hours, NY State Division of the Budget. Re: Federal Funding Application - Mattiace Petrochemical, Inc., Nassau Co. September 22, 1988

P. 1304 Project Notification & Review System. Applicant: US EPA Project Title: Mattiace Petrochemical Company Inc. Superfund (RI/FS) Site. Signed by Susan D. Windesheim, Clearinghouse Administrator, Long Island Regional Planning Board. September 1, 1988

P. 1305 Project Notification & Review System. Applicant: US EPA Project Title: Mattiace Petrochemical Company Inc. Superfund (RI/FS) Site. September 1, 1988

P. 1306 Project Notification & Review System. Applicant: US EPA Project Title: Mattiace Petrochemical Company Inc. Superfund (RI/FS) Site. September 1, 1988

P. 1307 - 1309 Letter to Mr. James Cowan, NY State Clearinghouse from Mr. Stephen D. Luftig, Director Emergency & Remedial Response Division, US EPA. Re: Mattiace Petrochemical Company, Inc. Superfund Site Notification of proposed Superfund project to be funded by EPA. August 18, 1988

P. 1310 - 1312 Letter to Department of State, Uniform Commercial Code Division from Mr. James F. Doyle, Assistant Regional Counsel, US EPA. Re: Notice of "Federal Lien" on property belonging to Mattiace Industries, Inc. August 17, 1988

P. 1313 - 1314 Letter to Mr. Stephen Luftig, Director Emergency & Remedial Response Division, US EPA from Mr. Michael J. O'Toole, Jr. P.E., Acting Director, NY State Department Environmental Conservation. Re: Request for US EPA SARA Removal Action. Mattiace Petrochemicals Site #1-30-017. February 4, 1988

ENFORCEMENT

Correspondence

P. 1315 - 1317 Letter to Mr. William J. Mattiace, Mr. Otto P. Mattiace, and Mr. Louis J. Mattiace from Mr. Stephen D. Luftig, Director Emergency & Remedial Response Division, US EPA. Re: Notice letter pursuant to Section 107(a) and Section 104(b), of CERCLA, Mattiace Petrochemical Co., Inc. Site, Glen Cove, Nassau County, New York. July 8, 1988

P. 1318 - 1319 Letter to Mr. Louis J. Mattiace, Mattiace Petrochemical Company from Mr. Stephen D. Luftig, Director Emergency & Remedial Response Division, US EPA. Re: Mattiace Petrochemical Company, Removal Action Pursuant to CERCLA 42 U.S.C. March 30, 1988

P. 1320 - 1321 Letter to Mattiace Petrochemical Company, c/o Philip Tomich, Burruano & Tomich from Mr. Stephen D. Luftig, Director Emergency & Remedial Response Division. Re: Mattiace Petrochemical Company, Glen Cove, New York, Removal Action Pursuant to CERCLA 42 U.S.C. March 30, 1988

P. 1322 - 1324 Letter to Mr. William J. Mattiace, Mr. Otto P. Mattiace and Mr. Louis J. Mattiace from Mr. Richard L. Caspe, Project Engineer, Director Emergency & Remedial Response Division, US EPA. Re: Mattiace Petrochemical Company, Inc. Site, Glen Cove, New York. November 16, 1990

HEALTH ASSESSMENTS

Correspondence

P. 1325 Memorandum to Mr. Dwayne Harrington, NYCRAB, from Mr. Arthur Block, ATSDR Regional Representative, Dept. of Health and Human Services. Re: New York State Dept. of Health Review: Ref: Mattiace Petrochemical Record of Decision. October 3, 1990

P. 1326 - 1327 Letter to Honorable Donald P. DeRiggi, Mayor, Glen Cove, New York from Mr. Edward G. Als, US EPA. Re: Security at Mattiace Superfund site on Garvey's Point Road. August 30, 1990

NATURAL RESOURCE TRUSTEES

Findings of Fact

P. 1328 - 1338 Letter to Mr. Vincent Pitruzzello, US EPA-Region II, from Mr. Robert Pavia, Ph.D, US Department of Commerce. Re: NOAA's Preliminary Natural Resource Survey(PNRS) for the Mattiace Petrochemical Company, Inc. site (Site ID 2B) in Glen Cove, New York. August 29, 1990. Includes Findings of Fact, August 28, 1990.

Correspondence

P. 1339 - 1342 Letter to Mr. Vincent Pitruzello, Chief Program Support Branch, Emergency & Remedial Response Division US EPA from Mr. Jonathan P. Deason, Director Office of Environmental Affairs, US Department of the Interior, Office of Secretary. Re: IAG No.DW14933450-01-1, Preliminary natural resources survey of the Mattiace Petrochemical Site, Glen Cove, Nassau County, New York. October 3, 1990

P. 1343 - 1349 Letter to Mr. Robert W. Hargrove, Chief Environmental Impacts Branch, US EPA from Mr. Clifford G. Day, Supervisor, US Department of the Interior, Fish & Wildlife Service. Re: Listing of endangered & threatened species in the vicinity of the Mattiace Petrochemical National Priorities List Site in Glen Cove, Nassau County, New York. June 21, 1989

Correspondence