SUPERFUND PROPOSED PLAN

Mattiace Petrochemical Co., Inc.

Glen Cove, N.Y.

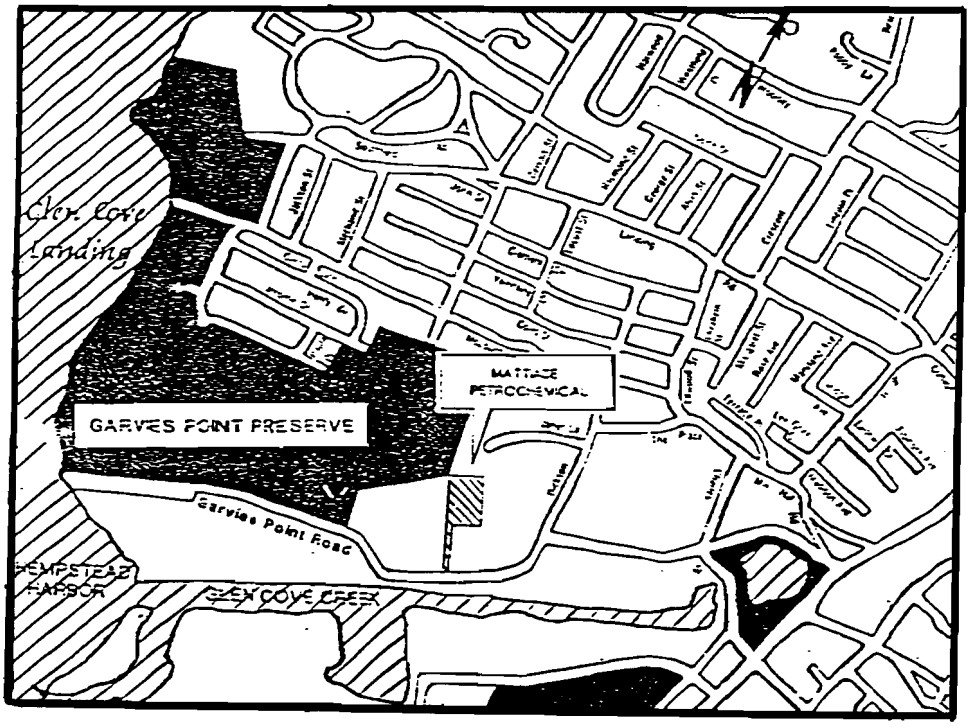
EPA
Region 2

MAY 1991

PROPOSED PLAN
MATTIACE PETROCHEMICAL CO., INC. SUPERFUND SITE
GLEN COVE, N.Y.

ANNOUNCEMENT OF PROPOSED PLAN

This Proposed Plan describes the remedial alternatives considered for the Mattiace Petrochemical Co. Inc. Superfund Site (the "Site") located in the City of Glen Cove, Nassau County, New York, and identifies the preferred remedial alternative with the rationale for this preference. The Proposed Plan was developed by the U.S. Environmental Protection Agency ("EPA") with support from the New York State Department of Environmental Conservation ("NYSDEC"). EPA is issuing the Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended ("CERCLA") and Section 300.430(f) of the National Contingency Plan ("NCP"). The alternatives summarized here are described in the remedial investigation and feasibility study ("RI/FS") report for the Site, which should be consulted for a more detailed description of all the alternatives.



SITE MAP

This Proposed Plan is being provided as a supplement to the RI/FS report to inform the public of EPA's and NYSDEC's preferred remedy and to solicit public comments pertaining to all the remedial alternatives evaluated, as well as the preferred alternative.

Changes to the preferred remedy or a change from the preferred remedy to another remedy may be made if public comments or additional data indicates that such a change will result in a more appropriate solution. The final decision regarding the selected remedy will be made after EPA has taken into consideration all comments from the public. Public comment is being solicited on all the alternatives considered in the detailed analysis phase of the RI/FS because EPA and NYSDEC may select a remedy other than the preferred remedy.

COMMUNITY ROLE IN SELECTION PROCESS

EPA relies on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, the RI/FS report has been made available to the public for a 30-day public comment period which concludes on June 14, 1991.

Copies of the RI/FS report, Proposed Plan and supporting documentation are available at the following locations:

Glen Cove Public Library
Glen Cove Road
Glen Cove, New York 11542

EPA Document Control Center
26 Federal Plaza, Room 2930
New York, New York 10278
Tel. (212) 264-8770
Hours: Mon-Fri., 9:00 a.m. to 4:00 p.m.

Pursuant to Section 117(a) of CERCLA, a public meeting will be held at the Glen Cove City Hall located on Bridge Street in Glen Cove, New York on Thursday, May 30, 1991 at 7:30 p.m., to allow EPA to present the conclusions of the RI/FS, to further elaborate on the preferred remedy, and to receive public comments.
Written and oral comments will be documented in the Responsiveness Summary section of the Record of Decision ("ROD"), the document which formalizes the selection of the remedy.

All written comments should be addressed to:
Edward G. Als
Remedial Project Manager
U.S. Environmental Protection Agency
26 Federal Plaza, Room 29-100
New York, New York 10278

SITE BACKGROUND

The Mattiace Petrochemical Co., Inc. Site is located on Garvey's Point Road in Glen Cove on Long Island, New York. The Garvey's Point area, although heavily industrialized along Glen Cove Creek, also contains the Garvey's Point Preserve, the Glen Cove marina, and residential areas. Local geology includes a shallow band of the Upper Glacial aquifer resting atop a thick, continuous clay layer, which is underlain by deep water bearing deposits (Lloyd Sands).

Several of the commercial/industrial properties in the Garvey's Point area are presently being investigated or are potential candidates for investigation under state and federal hazardous waste laws.

The Mattiace facility is 1.9 acres in size and 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 naturally separated 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 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 would be 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.

Mattiace Petrochemical Company began operating in the mid-1960's, receiving chemicals by tank truck, blending and redistributing them to its customers. Operations ceased in September 1987. A preliminary assessment indicated that various organic chemicals, including toluene, 1,1,1-trichloroethane, ethylbenzene, and xylene are present in high concentrations in the soil and groundwater at the site. Groundwater is a source of drinking water for an estimated 44,000 people in the area, although none of these water supplies are threatened or contaminated as a result of the Mattiace site.

In 1986, Mattiace 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 Mattiace 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. In August, 1988, a lien was placed on the Mattiace property by EPA. To date, only one potentially responsible party, Mattiace Petrochemical Co., Inc. has been identified.

EPA initiated a removal action at the Site in February, 1988, which included waste characterization and off-site treatment and disposal of approximately 100,000 gallons of hazardous materials from above and below ground tanks. This removal action was completed in June, 1988.

EPA commenced a **1st operable unit** RI at the Site in October, 1989. The RI included a geophysical survey (the results of which prompted EPA to conduct a separate focused investigation, designated the **2nd operable unit** investigation), a soil gas survey; installation and sampling of 11 groundwater monitoring wells (plus two piezometers); drilling and sampling of 21 soil borings; and sampling of Glen Cove Creek water, sediments, and other groundwater monitoring wells previously installed in the area.

The **2nd operable unit** focused investigation, performed in 1990, concentrated on three areas at the Mattiace site suspected to have been used for drummed hazardous waste disposal. The focused investigation uncovered 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. A focused feasibility study (FFS) was then performed and became the basis for the EPA's September 27, 1990 ROD for remediation of source area 1. Remedial action implementing the remedy selected in that ROD is presently underway.

SCOPE AND ROLE OF OPERABLE UNIT

The scope and role of this operable unit is the <u>comprehensive</u> investigation and remediation, if necessary, of the release of contamination into the environment from the Mattiace facility. The scope and role of the **1st operable unit** contrasts with the earlier **2nd operable unit**, whose scope was limited to the search for and subsequent remediation of buried drums on the property. The overall goal of the **1st operable unit** is to reduce the concentrations of all Site contaminants to levels which are protective of human health and the environment.

EPA believes that the preferred remedy will achieve this goal by

meeting the following remedial action objectives:

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

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

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

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.

Two scenarios were developed based on current (industrial) and possible future (residential) land use at the Site. Under both scenarios, several pathways (direct contact, inhalation and ingestion) were evaluated for exposure to surface and subsurface soils, air, and groundwater used for drinking and domestic purposes. The populations evaluated included nearby residents and future on-site residents, including children. 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.

The baseline risk assessment includes an evaluation for both carcinogenicity and non-carcinogenicity. EPA considers carcinogenic risk in the range of 10^{-4} to 10^{-6} to be acceptable. This risk range can be interpreted to mean that an individual may have a one in ten thousand to a one in a million increased chance of developing cancer as a result of site-related exposure to a carcinogen over a 70-year lifetime under the specific exposure conditions at the Site. The non-carcinogenic effects associated with different pathways is represented by a hazard index ("HI"). An HI value greater than 1 is considered to pose a significant non-carcinogenic effect.

The results of the RI conducted for this Site indicate that both the soil at the Mattiace facility and the groundwater in the immediate vicinity of the Site are heavily contaminated with a variety of organic chemicals, of which many are hazardous to human health. The risks posed by these chemicals to public health are mainly associated with inhalation of organic vapors and contaminated particulates (dust); dermal absorption of contaminants

from soils; and ingestion and dermal absorption of contaminants from groundwater, particularly under future land use scenarios.

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" i.e., the buried drum area along the western boundary of the Site, is presently being remediated pursuant to the 2nd operable unit Record of Decision). These locations are generally associated with seven groups of underground storage tanks on the site, as well as 3 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 mg/kg), trichloroethylene (37 mg/kg), xylenes (2,600 mg/kg), and 1,4-alpha chlordane (9 mg/kg). EPA calculated significant carcinogenic risks associated with exposure to contaminated soils. Reasonable maximum exposure risks 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; while 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) and 23 for dermal absorption (mainly from alpha chlordane, a pesticide).

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 Mattiace 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 indicated the following concentrations of some contaminants of concern: tetrachloroethylene (100 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). 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 used 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. Nevertheless, particularly in the absence of institutional controls regulating groundwater usage in the Garvey's Point area, EPA believes that the risk to public health associated with exposure to contaminated groundwater, even if no exposures are presently occurring, should be calculated. 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).

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. It is very difficult to delineate and quantify the constituents which could be directly related to the Mattiace Site, given the documented releases of organic chemicals, many of which are the same as those released from the Mattiace facility, from other facilities in the area. 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). Some inorganics, such as aluminum and iron, were also found in high concentrations. The semi-volatile compounds 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 difficult to quantify.

Further, since these compounds exhibit low water solubility and a high affinity for adsorption to sediments, it would be expected that the semi-volatiles found in the sediments would tend to remain there with little dissolution in the overlying water column. Therefore, any release of these contaminants from the sediment to the water column should be very slow 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), due to the present use and physical nature of the Creek, i.e., boat traffic, bulkheaded (no exposed sediments), etc. Therefore, only the risks associated with exposure to Creek water was evaluated. This assessment indicated no unacceptable risks to public health were posed by the low contaminant concentrations found in the 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 effect is difficult to quantify and would depend, among other things, on the duration of exposure and on the particular species exposed.

In summary, actual or threatened releases of hazardous substances from this Site, if not addressed by the preferred 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, and ingestion or dermal absorption of contaminated groundwater.

SUMMARY OF REMEDIAL 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 and 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 ("SC") and 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 alternatives 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: 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 soil 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 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.

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 system, and applying a vacuum to the system 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 are achieved.

The excavation of soils for off-site treatment and disposal would include excavation of all soil "hot spots", or concentrated areas of soil contamination that pose significantly greater risk than does the surrounding soil at the Site. The offsite 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 treatment would be similarly disposed of or recycled offsite. 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 Mattiace 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, and 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.

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 and sent off-site while the remaining soils would be treated on-site 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.

The excavation of soils for off-site treatment and disposal would only include excavation of pesticide "hot spots", or areas of soil contaminated with pesticides that pose greater risk than does the general Site soil. 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 Mattiace site to approximately 10^{-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.

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 offsite treatment and disposal. Specifically, this alternative involves in situ vacuum extraction of the entire contaminated soil volume of 17,301 cy, although the pesticide "hot spots" would not be significantly affected.

EPA believes that this alternative would be effective in achieving reduction of public health risk posed by contaminated soils at the Mattiace site to approximately $1x10^{-4}$ (carcinogenic risk). This increase in potential human health risk is caused by leaving the 3 localized pesticide "hot spots" on-site (totalling 160 cy compacted volume). In-situ vacuum extraction will not effectively remove pesticides from site soils.

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: 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 operates 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 cleanup criteria corresponding to the EPA target risk level 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 Mattiace 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 Mattiace 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 in order to ensure that the human health and the environment were adequately protected.

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, it was assumed 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 offsite treatment and disposal in accordance with the appropriate requirements of RCRA. Next, the contaminated groundwater plume would be pumped out of the ground, 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 of State laws and regulations. The water effluent would also be carbon-treated in order to meet applicable/appropriate requirements of the Safe Drinking Water Act and of State laws and regulations, prior to reinjection into the ground through groundwater reinjection wells (assume 4 reinjection wells for costing purposes). 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 for re-use at an off-site location. Any hazardous residuals resulting from on site treatment would be disposed of offsite in accordance with the applicable/appropriate requirements

of RCRA and of State hazardous waste laws and regulations.

This alternative would also involve semi-annual monitoring of groundwater monitoring wells associated with the Mattiace 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 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) prior to discharge.

This alternative would also involve semi-annual monitoring of groundwater monitoring wells associated with the Mattiace 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 in order to ensure that public health and the environment were adequately protected.

EVALUATION OF ALTERNATIVES

The preferred alternative for the Mattiace Petrochemical Co. Inc. site 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 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 alternatives under consideration for remediation of the Site.

Glossary of Evaluation Criteria

o Overall Protection of Human Health and the Environment addresses whether or not 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 or not 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 involves the period of time needed to achieve protection against any adverse impacts on human health and the environment that may be posed during the construction and implementation period of the 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 risk 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, based on its review of the RI/FS and Proposed Plan, the State concurs with, opposes, or has no comment on the preferred alternative.

o Community Acceptance will be assessed in the Record of Decision (ROD) following a review of the public comments received on the RI/FS report and on the Proposed Plan.

Analysis of Soil Alternatives

o Overall Protection of Human Health and the Environment

Alternative **SC-1** (No Action) would only slightly increase 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 onsite and offsite 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 to be sufficiently protective of human health and the environment, except for no action. No action 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 offsite treatment of soils. The responsibility for meeting applicable LDRs would rest with the offsite 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 Superfund programs. Hybrid clean closure is achieved when the treated matrix (soil, in this case) to be placed 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-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 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 i.e., in situ vacuum extraction, low temperature thermal treatment, and excavation with offsite treatment and disposal, that have been utilized previously at other Superfund sites. 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 10^{-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	Present Worth Cost
SC-3a	$18,097,415
SC-3b	$3,500,242
SC-3c	$3,004,068
SC-5	$11,344,791

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

o State and Community Acceptance

The NYSDEC has reviewed and agrees with the concept of the Proposed Plan. Community acceptance will be ascertained after the completion of the public comment period, which was initiated with the distribution of this Proposed Plan.

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 Mattiace site. No action is therefore unacceptable, and is eliminated from further analysis. Alternatives **MOM-3** and **MOM-6**, all 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, all of these alternatives would be similarly effective in protecting human health and the environment by preventing offsite migration of contaminated groundwater as well as by reducing future risks posed by ingestion of and dermal contact with groundwater contaminated as a result of the Mattiace operation.

o Compliance with ARARs

Alternatives **MOM-3 and MOM-6** should both eventually meet potable

water ARARs (NYSDOH Part 5 regulations) as a result of the accelerated pumping and treatment activity common to these alternatives, and as a result of 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 Mattiace plume of contamination may also be restricted due to the existence of other areas of groundwater contamination in the Garvey's Point area. In addition, it is important to note that the actual attainment of groundwater ARARs at the point of compliance 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. Therefore, the certainty of achieving cleanup goals at all points throughout the area of attainment, or 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 of the MOM alternatives would take approximately 2 years to design and construct. In the short-term, removal of the floating product layer, as well as the large removals of contamination from groundwater expected initially upon implementation of either of the MOM alternatives, should result in a large 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 protocol during construction, as well as diligent operation and maintenance practices once any of the alternatives are operational.

o Long-term Effectiveness and Permanence

Both of the 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, both of the alternatives should result in permanent, long-term effectiveness after having achieved the target reductions of soil contamination. Preliminary groundwater modelling indicates that the time needed to restore the groundwater degraded as a result of this Site to its previous most beneficial use i.e., as 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 of the

MOM alternatives rely on an optimized extraction and discharge scenario, this estimate is the same for all alternatives.

o Reduction of Toxicity, Mobility, or Volume

All of the alternatives for groundwater remediation 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, all 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, so that failure to obtain these requirements through groundwater treatment would still likely result in reduction of the future risk associated with ingestion and dermal contact to within EPA's acceptable risk range.

o Implementability

EPA believes that all 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	Present Worth Cost
MOM-3	**$12,430,350**
MOM-6	**$30,216,393**

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

o State and Community Acceptance

The NYSDEC has reviewed and agrees with the concept of the Proposed Plan. Community acceptance will be ascertained after the completion of the public comment period, which was initiated with the distribution of this Proposed Plan.

PROPOSED REMEDY

The preferred alternative for the Mattiace Petrochemical Co., Inc. Site 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 (Ground-water Extraction/ Air Stripping/ Carbon Adsorption of Water Effluent/ Thermal Treatment of Air Effluent/ Reinjection of Treated Groundwater)**

The estimated cost for the preferred alternative is:

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

The soil remediation aspect of the preferred alternative would involve in situ treatment of 17,140 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 and State hazardous waste laws and regulations. For costing purposes, off-site treatment was assumed to be incineration.

In situ vacuum extraction of contaminated soils would involve the removal of organic contaminants from the soil without major soil disturbance, and is accomplished by installing approximately 12 soil vapor extraction wells at strategic points, manifolding the system, and applying a vacuum to the system 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 and an activated carbon canister would be utilized for off-gas emission control, although equivalent technologies could be utilized.

The excavation of soils for off-site treatment and disposal would include excavation of pesticide "hot spots", or areas of soil contaminated with pesticides that pose greater risk than does the surrounding soil at the Site. Clean fill would be used to backfill excavated areas. EPA believes that this alternative would be effective in achieving reduction of potential carcinogenic risk posed by contaminated soils at the Site to approximately 10^{-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 for the vacuum extraction system.

The contaminated groundwater aspect of the preferred alternative would include extraction and injection wells installed into the contaminated groundwater plume. For costing purposes, it was

assumed 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. Next, the contaminated groundwater plume would be pumped out of the ground into an equalization tank, pretreated by means of precipitation and clarification to remove iron and manganese (these metals would interfere with subsequent treatment), and treated by means of air stripping to remove volatile organics. The air effluent from the air stripper would then be thermally treated prior to discharge in order to meet the applicable/appropriate requirements of the Clean Air Act and of State laws and regulations. The water effluent from the stripper would then be treated with carbon prior to discharge. Spent activated carbon would be regenerated for re-use at an off-site location. Treated water effluent will then be reinjected into the ground through groundwater reinjection wells (assume 4 reinjection wells for costing purposes). Reinjection would take place hydraulically upgradient in order to accelerate the rate of groundwater treatment. Actual locations of extraction and reinjection wells would be determined from additional groundwater monitoring during the design phase of the project.

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

The preferred alternative also includes long-term monitoring on a semi-annual basis of groundwater wells in the vicinity of the Site, as well as annual monitoring of the water and sediments of Glen Cove Creek. In addition, EPA would conduct 5-year reviews of the Site in order to ensure that public health and the environment were adequately protected.