Department of Environmental Conservation

Division of Hazardous Waste Remediation

Record of Decision

Grumman Aerospace, Bethpage Facility
Operable Unit 1
Inactive Hazardous Waste Site
Site Number 130003A

March 1995

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* MICHAEL D. ZAGATA, *Commissioner*

RECORD OF DECISION

GRUMMAN AEROSPACE - BETHPAGE FACILITY
OPERABLE UNIT 1
NASSAU COUNTY, NEW YORK

SITE NUMBER 130003A

PREPARED BY:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS WASTE REMEDIATION

MARCH 1995

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Grumman Aerospace - Bethpage Facility
Town of Oyster Bay
Nassau County, New York
Site Code: 130003A
Funding Source: Grumman Corporation, Northrop-Grumman Corporation

STATEMENT OF BASIS AND PURPOSE

The selected remedial action for Operable Unit 1 at the Grumman Aerospace - Bethpage Facility is presented in this decision document. The selection was made in accordance with the New York State Environmental Conservation Law (ECL), and is consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). The factual and legal bases for selecting the remedy for this site are summarized in this document.

A list of the documents that comprise the Administrative Record for this site is presented as Exhibit A. The documents in the Administrative Record were used to provide the bases for this Record of Decision.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action described in this Record of Decision (ROD), present a current or potential threat to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The remedy selected for the on-site soils is no further action beyond the two interim remedial measures (IRMs) which are being conducted at the site.

1. A soil vapor extraction remedy commenced on December 6, 1994. This system has been designed to remove chlorinated organic compounds (primarily trichloroethene) from unsaturated soils in an area adjacent to Plant 2.

2. A further investigation is being conducted at Plant 15 where it appears that a perchloroethene spill occurred. If it is confirmed that this area is a source area, the soil vapor extraction system at Plant 2 will be moved to Plant 15 at the conclusion of the Plant 2 IRM.

DECLARATION

The selected remedy is protective of human health and the environment, is in compliance with State and federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent possible, and is cost effective. This remedy is considered to be a permanent remedy. The preference for remedies which result in the reduction in the toxicity, mobility, or volume of the waste is satisfied to the maximum extent possible.

3/29/95
Date

Michael J. O'Toole, Jr., Director
Division of Hazardous Waste Remediation

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RECORD OF DECISION
GRUMMAN AEROSPACE - BETHPAGE FACILITY
NASSAU COUNTY, NEW YORK
SITE NUMBER: 130003A

SECTION 1: SITE LOCATION AND DESCRIPTION

The Grumman site is approximately 500 acres in size and is located in a mixed industrial/commercial/residential area in east central Nassau County (see Figure 1). The Bethpage High School is located opposite the northeast corner of the site. The site is bounded by Stewart Avenue to the north, Central Avenue and Harrison Avenue to the south, NY Route 107 to the southwest, South Oyster Bay Road to the west, and the Naval Weapons Industrial Reserve Plant (Site Number 130003B) to the east. The RUCO Polymer federal Superfund site (NY Number 130004) is located immediately to the west of the site (see Figure 2).

SECTION 2: SITE HISTORY

2.1: Operational History

The Grumman Aerospace Corporation was established in the early 1930s at the present site in Bethpage. The Naval Weapons Industrial Reserve Plant - Bethpage (NWIRP) was established in 1933. Several naval aircraft were developed and manufactured at the site since the 1930s. Other activities at the site included the manufacturing of naval amphibious craft and the manufacturing of various satellites, etc. for the National Aeronautics and Space Administration (NASA).

2.2: Waste Handling, Treatment and Disposal Practices

From 1943-1949, Grumman disposed of their chromic acid wastes directly on the ground or in open seepage basins. In 1949, a chromic acid treatment system was put on-line at Plant 2.

Since the early 1950s, some of the wastes generated by Grumman have been taken to the NWIRP property for treatment or storage before being taken off site by private haulers. These wastes are primarily chlorine-substituted hydrocarbons.

There are several locations on the Grumman site where wastes are/were stored, treated, or disposed of. These areas are listed on Tables 1-3 (see also Figure 2). These areas were targeted for investigation during the Remedial Investigation /Feasibility Study (RI/FS). The reader should also review Figures 2-3 and 4-15 of the Remedial Investigation Report for the exact locations of these storage, treatment, or disposal areas and the sampling locations used to determine if these areas are source areas.

In addition to the chromic acid treatment system located at Plant 2, systems for treating phenols, oils, and other organic chemicals, and for recovering silver also exist at Plant 2.

2.3: Remedial History

The following is a chronology of the remedial history at the site:

1948-1949

December 1947
Grumman was notified that Well #3 of the Central Park Water District (predecessor of the present day Bethpage Water District) contained 1.4 parts per million (ppm) of hexavalent chromium.

Grumman designed and installed a chromic acid

treatment system at Plant 2.

1973
An odor and taste problem was discovered in water pumped from some of Grumman's on site production wells. The Nassau County Health Department (NCHD) was notified of this on or about December 12, 1973.

August 1975
After several rounds of sampling and laboratory analyses by various regulatory agencies, the State Health Department determined that chlorinated hydrocarbons were the cause of the odor and taste problems. The compounds that were isolated included vinyl chloride and perchloroethylene (PCE).

August 1975 - early 1980's
Sampling of wells on Grumman property and at public supply wells was conducted on numerous occasions. Sampling of wastewaters, primarily at RUCO Polymer, was also conducted during this time.

1983
The Grumman site was added to the NYSDEC's Registry of Inactive Hazardous Waste Sites in New York State as a Class 2a site. This classification was assigned to this site because there was insufficient information to assign it a classification set forth in the Environmental Conservation Law (ECL). At the time, the NWIRP-Bethpage site was incorporated into the boundaries of the Grumman site.

1986 - 1989
The United States Geologic Survey (USGS) and the NCHD conducted a regional groundwater study in the Bethpage/Hicksville/Levittown area.

December 1987
The Grumman site was reclassified to Class 2. A Class 2 site is a site which poses a significant threat to human health and/or the environment, and for which action is required.

October 1990
Grumman and the NYSDEC entered into an Order on Consent in which Grumman agreed to conduct an RI/FS at their Bethpage site.

December 1990
A public meeting was held at the Bethpage High School to present the RI/FS Work Plan to the public.

February 1991
The Phase I RI field work commenced.

January 1992
A report entitled: Data Report - Phase I Remedial Investigation, Grumman Aerospace Corporation, Bethpage New York was issued by Geraghty & Miller, Inc. (consultants to Grumman).

May 1992
A fact sheet and Notice of a Public meeting was issued on June 6, 1992 by the NYSDEC.

June 1992
A public meeting was held at the Bethpage Public Library to update the public on the progress of the RI.

August 1992
The Phase II RI field work commenced.

March 1993
Grumman and the NWIRP sites were listed separately in the NYSDEC's Registry of Inactive Hazardous Waste Sites in New York State as Class 2 sites.

March 1994
The design of the soil vapor extraction system for Plant 2 was approved by the NYSDEC. Construction activities were commenced.

September 1994
A report entitled: Remedial Investigation Report, Grumman Aerospace Corporation, Bethpage, New York, September 1994 was issued by Geraghty & Miller, Inc.

October 1994
The Proposed Remedial Action Plan was issued by the NYSDEC.

A public meeting was held on October 26, 1994 during which the NYSDEC and the New York State Department of Health (NYSDOH) presented the proposed remedy to the public and answered questions posed by the public.

December 1994
The final construction activities were completed and operation of the soil vapor extraction treatment system at Plant 2 commenced.

[Note: Several parcels have been delisted from the Grumman site since 1991. Copies of the delisting petitions are on file at the document repositories. A list of these petitions is presented in Exhibit A.]

SECTION 3: ENFORCEMENT STATUS

The NYSDEC and Grumman Aerospace Corporation entered into an Order on Consent on October 25, 1990. By signing this Order, the Grumman Corporation agreed to conduct a Remedial Investigation/Feasibility Study at the site. The goal of the Remedial Investigation was to determine the nature and extent (both on site and off site) of contamination attributable to the site.

SECTION 4: HIGHLIGHTS OF COMMUNITY PARTICIPATION

In order to inform the local community and to provide a mechanism for citizens to make the NYSDEC aware of their concerns, a citizen participation program has been implemented by the NYSDEC. In accordance with the 1988 New York State Citizen Participation Plan, the following goals have been accomplished:

1 - Information repositories have been established at the Bethpage Public Library and the NYSDEC Region 1 Office in Stony Brook.

2 - Documents and reports pertaining to this site have been placed into the aforementioned repositories.

3 - A "contact list" of interested parties (e.g. - local citizens, media, public interest groups, and elected government officials) has been developed.

4 - A public meeting was held in December 1990 during which the work plan for the RI/FS was presented to the public.

5 - A public meeting was held in June 1992 to provide an update on the progress of the RI/FSs being conducted at both the Grumman and NWIRP-Bethpage sites.

6 - A public notice on the completion of the Remedial Investigation and the development of the Proposed Remedial Action Plan for remediating the contaminated on-site soils was distributed to the contact list on October 11, 1994. A public comment period extended from October 11, 1994 - December 9, 1994 during which time the public was invited to submit written questions or comments on the proposed remedy to the NYSDEC.

7 - A public meeting was held on October 26, 1994 during which the NYSDEC and NYSDOH presented the proposed remedy to the public.

A summary of the comments/questions offered during the October 26, 1994 public meeting and written comments received during the public comment period, as well as the State's responses to these comments/questions is presented in Exhibit B of this document.

SECTION 5: CURRENT STATUS

Pursuant to the aforementioned order, Grumman conducted a Remedial Investigation (RI) at the site with oversight provided by the NYSDEC. The RI was conducted in two phases. The first phase of the RI was conducted between February 1991 and January 1992. The second phase of the RI was conducted between August 1992 and June 1994. The RI work is described in the following reports:

- Data Report - Phase I Remedial Investigation, Grumman Aerospace Corporation, Bethpage, New York, January 1992, prepared by Geraghty & Miller, Inc.

- Remedial Investigation Report, Grumman Aerospace Corporation, Bethpage, New York, September 1994, prepared by Geraghty & Miller, Inc.

The RI activities consisted of the following tasks:

- A total of 87 soil gas samples were collected at eleven areas on the site. These samples underwent analyses for volatile organic compounds (VOCs). This was a tool for identifying source areas.

- More than 40 soil samples were collected and analyzed for the target compound list of analytes to further identify source areas.

- A total of 41 groundwater monitoring wells were installed on and off-site at depths ranging from 55 to 550 feet deep. Groundwater samples were collected from a network of 75 wells (34 pre-existing wells were included in this network) and analyzed for VOCs and, in most cases, metals. The primary purpose of this task was to determine the quality of the groundwater below and downgradient of the site. The second purpose of this task was to use the data generated from the water table wells to locate potential source areas.

The analytical data generated during the RI were compared to the applicable Standards, Criteria, and Guidance values (SCGs) in determining the need for remedial action(s). Soil SCGs identified for this site were based on NYSDEC clean-up guidelines developed to protect groundwater resources. **[NOTE: As this ROD is written to present the selected remedy for addressing on-site source areas, there are only limited discussions in this ROD regarding the groundwater quality data generated during the RI. These data, along with the preferred remedy for addressing groundwater remediation at the Grumman, Navy, and RUCO Polymer sites, will be presented in a Proposed Remedial Action Plan (PRAP) tentatively scheduled to be issued in the Winter of 1995.]**

Brief summaries of the results of the soil gas surveys and of the analytical results of the soil sampling tasks are presented in the following sub-sections.

5.1: Results of the Soil Gas Surveys

Soil gas surveys were conducted at 11 locations on the site. Based on these results, two areas (an above ground trichloroethylene (TCE) tank adjacent to Plant 2 and an area at Plant 15) were identified as potential sources (see Table 4).

5.2: Soils Data

Four soil borings were drilled near the aforementioned aboveground TCE tank in order to confirm that a spill occurred in this area (see Figures 2 and 3). Trichloroethylene was detected in subsurface soil samples collected from these borings at concentrations ranging from 0.044 to 130 parts per million (ppm). In addition, a monitoring well screened across the water table was installed in this area.

Trichloroethylene was detected in groundwater at this location at a concentration of 160 parts per billion (ppb) which is significantly higher than the groundwater standard of 5 ppb. Based upon this data and the soil gas data, it was determined that a spill occurred around the TCE tank and this source area was targeted for remediation (see Section 7 of this ROD).

One soil boring was drilled in the potential source area identified at Plant 15 (see Figures 2 and 5) during the soil gas survey. A sample collected from this boring contained no VOCs above the detection limit of the analysis. As in the case at Plant 2, a water table well was installed and sampled at this location. No site-related contaminants were detected in this well. However, due to the high concentrations of VOCs (PCE) detected during the soil gas survey, this area is still considered to be a potential source, and additional investigation, and possibly remediation activities, will be conducted at this location.

The clean-up goals for these contaminants in soils are: 0.7 ppm (in soil) for TCE and 1.4 ppm (in soil) for PCE.

Soil samples were collected in recharge basins and during the monitoring well installation process. No additional source areas were identified based upon a review of the analytical data.

[NOTE: Based on a review of the groundwater analytical data, no additional potential source areas were identified on the Grumman site.]

5.3: Summary of Potential Exposure Pathways

Based upon a review of the data generated during the RI, two potential human exposure pathways were analyzed. The first pathway is direct contact with contaminated soils. The contamination at Plant 2 and (possibly) Plant 15 is present in subsurface soils which, for the most part, are covered with asphalt. The potential for exposures via this pathway would exist if the IRM activities were not undertaken. However, exposures via this pathway do not exist because the contamination is being removed from the soil.

The second potential pathway analyzed is the ingestion of contaminated groundwater. At Plant 2, TCE is migrating down through the unsaturated zone into the Upper Glacial Aquifer (approximately 50 feet below grade). Once in this aquifer, TCE migrates along the groundwater flow paths as well as downward because it is more dense than water. There is, as a result, a strong possibility that TCE from Plant 2 is migrating into the Magothy Aquifer which is the primary source of drinking water in the area. Some of the public supply wells located due south of the site (Bethpage Water District) have been impacted by the plume(s) emanating from the Grumman, NWIRP, and RUCO Polymer sites. Treatment systems have been installed at these wells, and the water distributed to the community is monitored on a routine basis to ensure that it meets the requirements of the NYSDOH. As a result of this treatment and monitoring, an ingestion pathway does not exist, however, a pathway would exist if the treatment at the water district was discontinued. This is further aided by implementing the SVE remedy at Plant 2 during which a source of groundwater contamination will be removed.

If it is confirmed that a source area exists at Plant 15, then there is a potential that this contamination could impact the Magothy Aquifer. Again, since the public supply wells are monitored on a routine basis and treated when required, an ingestion pathway does not exist. By removing the contamination at Plant 15 (assuming there is a source area at this plant), an additional threat to groundwater quality will be removed.

5.4: Summary of Environmental Exposure Pathways:

Based upon a review of the data generated during the RI, it was concluded that there is a negligible risk to wildlife at the site.

SECTION 6: SUMMARY OF REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process presented in 6 NYCRR Part 375-1.10. These goals have been established under the guideline of meeting all Standards, Criteria, and Guidance values (SCGs) and protecting human health and the environment.

At a minimum, the remedy selected should eliminate or mitigate all significant threats to the public health and to the environment presented by the hazardous waste disposed of at the site through the proper application of scientific and engineering principles.

During the RI, one confirmed source area and one potential source area were identified. The remedial goal for these areas is the protection of groundwater from further impacts from these areas. The NYSDEC has developed clean-up goals for VOCs and other contaminants in soil with this goal in mind. These clean-up goals are presented in the NYSDEC Division of Hazardous Waste Remediation's Technical and Administrative Guidance Memorandum #HWR-94-4046 (January 1994). These clean-up goals are: 0.7 ppm (in soil) for TCE and 1.4 ppm (in soil) for PCE.

SECTION 7: INTERIM REMEDIAL MEASURES

Based upon the results of the soil gas survey, soil sampling and groundwater sampling at the Plant 2 TCE source area, it was determined that an Interim Remedial Measure (IRM) would be conducted in this area to remediate the TCE-contaminated soils. The soil vapor extraction technology was selected as the remedial technology. This technology is consistently used by the United States Environmental Protection Agency (EPA) and the NYSDEC at sites such as the Grumman site where VOC contamination exists in unsaturated soils. A work plan for this action was prepared in August 1993. A pilot test was conducted at the source area on November 1, 1993. The system design is incorporated in a report entitled: Interim Remedial Measure, Grumman Aerospace Corporation, Bethpage, New York dated March 1994. These documents were prepared by Geraghty & Miller Inc. on behalf of Grumman. Construction activities began in March 1994 and concluded in October 1994.

A map of the Plant 2 source area and a schematic drawing of the soil vapor extraction (SVE) system are presented on Figures 3, 5, and 6. A vacuum is created in the soils by a blower (pump) thus causing air to move through the pores of the soil matrix towards the extraction well (Figure 3). As the air moves through the soil, VOCs, in this case TCE, volatilize into the air and are thus extracted with the air in the extraction well. The extracted air, along with the VOCs, is then pushed through two carbon canisters, operating in series, where the VOCs adsorb onto granules of activated carbon. The cleaned air is vented into the atmosphere via the stack on the second carbon canister. These air emissions will be monitored on a regular basis to ensure that the emissions are in conformance with the emission limits presented in the approved design. This system went on line on December 6, 1994. It is anticipated that the clean-up goals will be reached in less than a year.

SECTION 8: SUMMARY OF THE EVALUATION OF ALTERNATIVES

It has not been confirmed that there is a source area at Plant 15. Additional investigatory work will be conducted inside the plant in order to determine the source of the PCE contamination detected in soil gas samples collected adjacent to

the loading dock (see Figure 4). If this area is determined to be a source area, then, at the completion of the remedial program at the Plant 2 TCE source area, the SVE system used at Plant 2 will be installed and operated at Plant 15.

Due to the existing design for the Plant 2 TCE spill, and the similarity between the Plant 2 and Plant 15 source areas, there is no need to evaluate further potential remedial alternatives for addressing source areas at the Grumman Aerospace site at this time. A Feasibility Study to evaluate remedial alternatives for on-site source controls is, therefore, not necessary. Should the ongoing remediation not achieve the remediation goals, then the NYSDEC will require that additional remedial alternatives be evaluated.

A Feasibility Study to evaluate groundwater remediation at the Grumman, NWIRP-Bethpage, and RUCO Polymer sites is being conducted, and it is anticipated that this will be completed by late 1995.

Community Acceptance

Concerns of the community regarding the RI report and the Proposed Remedial Action Plan were evaluated. A Responsiveness Summary was prepared (see Exhibit B) in which comments received from the public are presented along with the State's responses to the comments. This is the same remedy as proposed in the Proposed Remedial Action Plan.

SECTION 9: SUMMARY OF THE SELECTED REMEDY

Based upon the results of the Remedial Investigation, the NYSDEC is proposing that the soil vapor extraction IRM constitute the final remedy for the contaminated soils at the Plant 2 source area and that additional investigatory work be conducted at Plant 15. If it is confirmed that the Plant 15 area is a source area of VOC contamination, then at the completion of the Plant 2 remedial work, the soil vapor extraction system will be installed and operated at the Plant 15 site.

This remedy is in compliance with federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. This proposed remedy is protective of public health and the environment, and is in compliance with New York State Standards, Criteria, and Guidance values (SCGs). Due to the nature of the soils, it is anticipated that VOC contamination in the soils will be reduced to levels below the clean-up goals set for this site.

The costs for these remedies are presented below:

Plant 2 Source Area:

Capital Costs:	$ 94,000
Operational Costs:	$ 20,000
Present Worth Cost:	$114,000

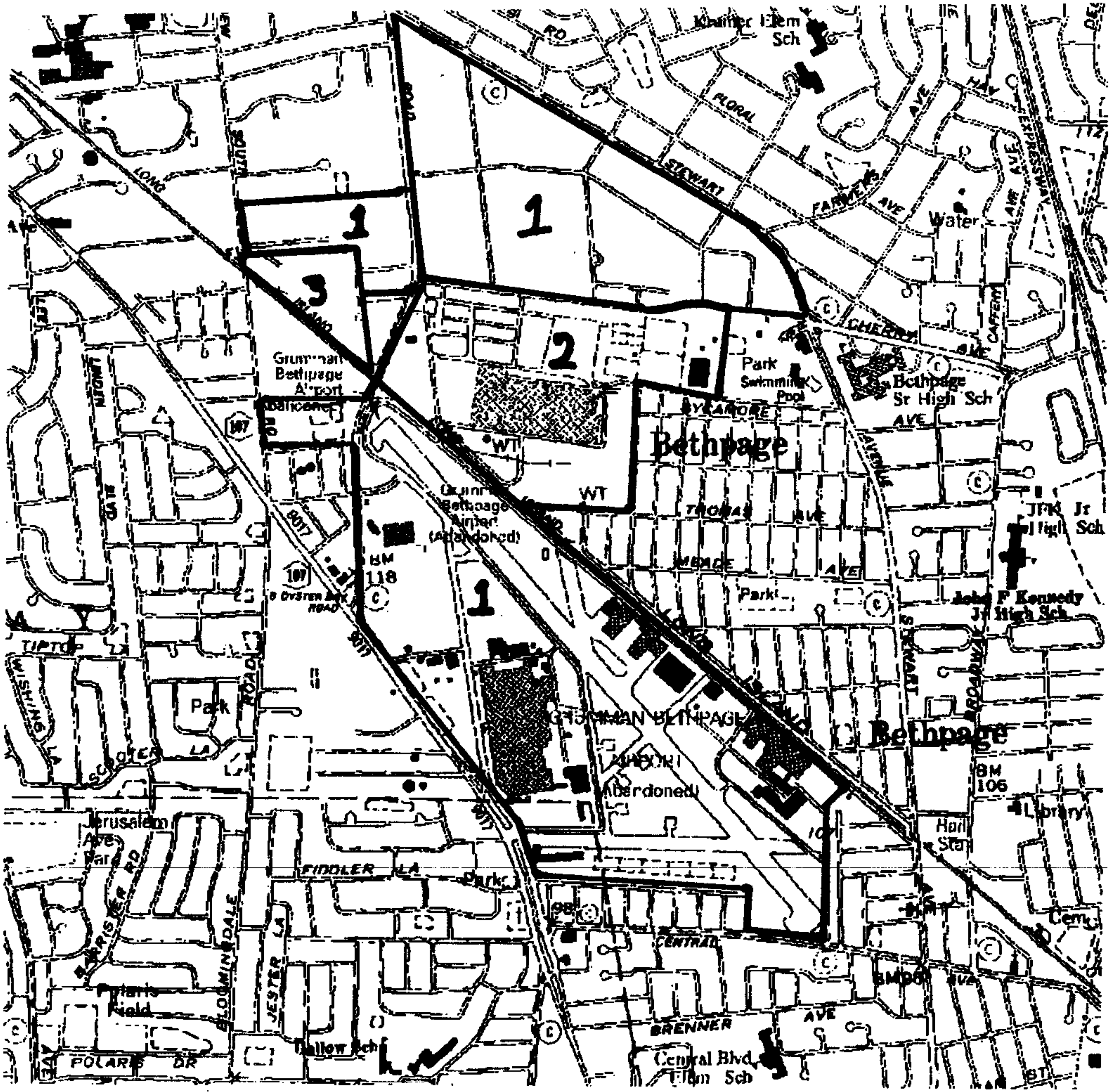
Plant 15 Source Area:

Capital Costs:	$ 35,000
Operational Costs:	$ 25,000
Present Worth Cost:	$ 60,000

Engineering, sampling, and construction costs are included in the capital costs presented above. Since the same soil vapor extraction system will be used at both source areas, the design costs incorporated into the capital cost for the Plant 2 source area do not need to be included in the capital cost for the Plant 15 source area.

GLOSSARY OF ACRONYMS

CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
ECL	Environmental Conservation Law
IRM	Interim Remedial Measure
NWIRP	Naval Weapons Industrial Reserve Plant
6 NYCRR	Title 6 of the Official Compilation of Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PCE	tetrachloroethylene
ppb	parts per billion (for water samples - μg/l)
ppm	parts per million (for water samples - mg/l, for soil samples - mg/kg)
ppmv	parts per million vapor (gas samples)
PRAP	Proposed Remedial Action Plan
RI/FS	Remedial Investigation/Feasibility Study
SARA	Superfund Amendments Reauthorization Act
SCGs	Standards, Criteria, and Guidance values
SVE	soil vapor extraction
TCE	trichloroethylene
USEPA	United States Environmental Protection Agency
VOCs	volatile organic compounds



DECGIS

Figure 1:

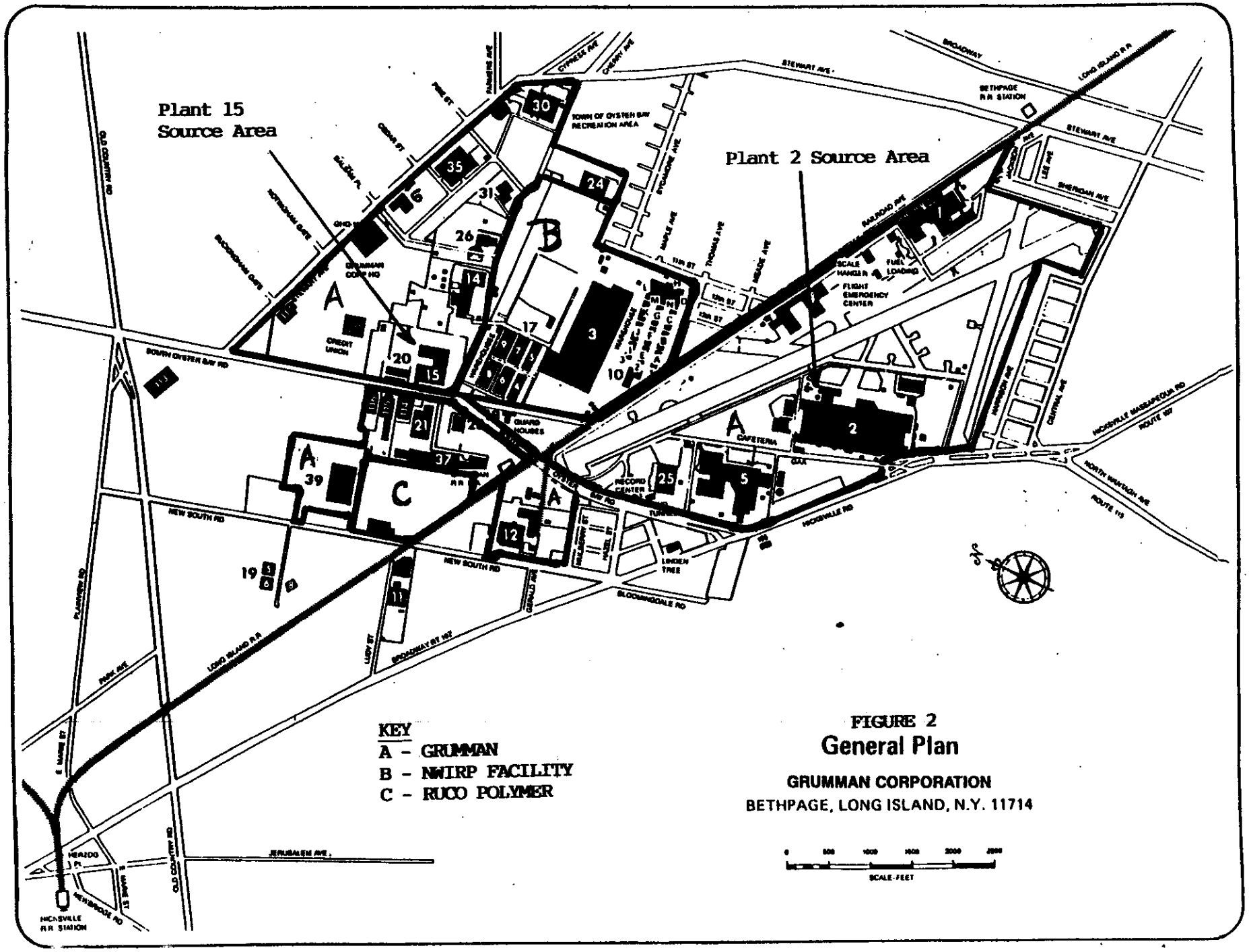
Site Location

1. Grumman Aerospace Corporation

2. Naval Weapons Industrial Reserve Plant – Bethpage

3. RUCO Polymer Site

1080 feet


Plant 15
Source Area
Plant 2 Source Area
STEWART AVE
BROADWAY
LONG ISLAND R.R.
BETHPAGE R.R. STATION
TOWN OF OYSTER BAY RECREATION AREA
SOUTH OYSTER BAY RD
NEW SOUTH RD
OLD COUNTRY RD
PLAINVIEW RD
SERVICE HANGER
FUEL LOADING
FLIGHT EMERGENCY CENTER
CREDIT UNION
CAFETERIA
RECORD CENTER
LINDEN TREE
HICKSVILLE RD
BLOOMINGDALE RD
NORTH WANTAGH AVE
ROUTE 107
ROUTE 135
JERUSALEM AVE.
HICKSVILLE R.R. STATION
KEY
A - GRUMMAN
B - NWIRP FACILITY
C - RUCO POLYMER
FIGURE 2
General Plan
GRUMMAN CORPORATION
BETHPAGE, LONG ISLAND, N.Y. 11714
SCALE - FEET

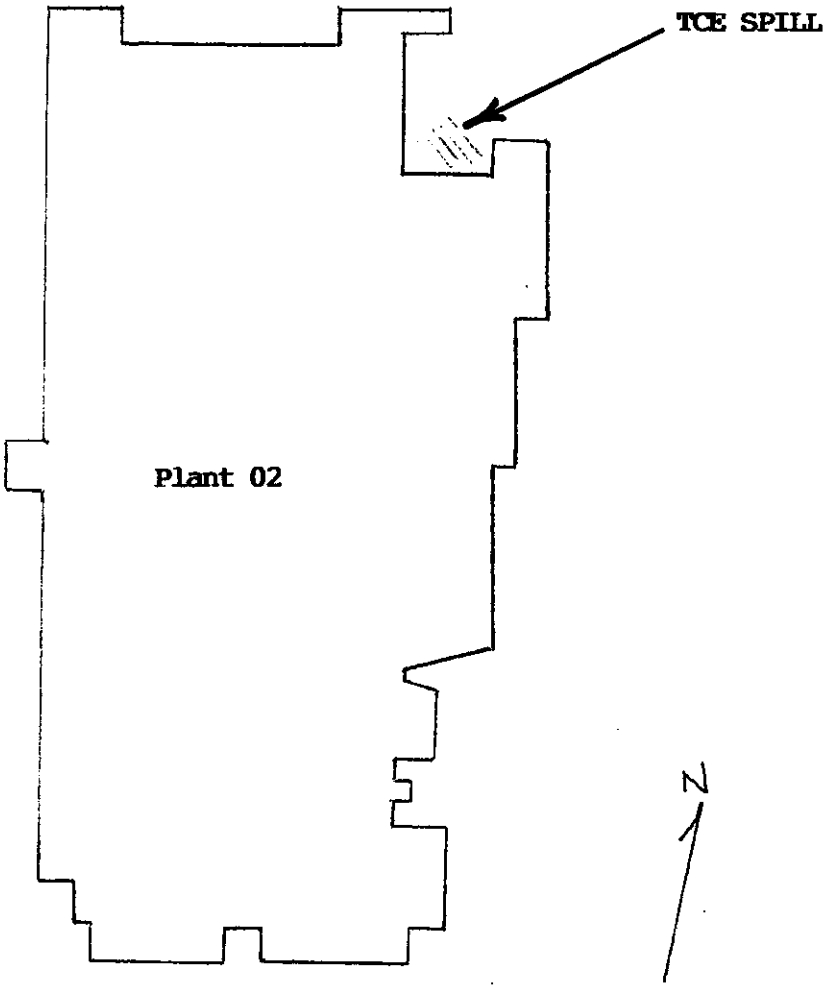
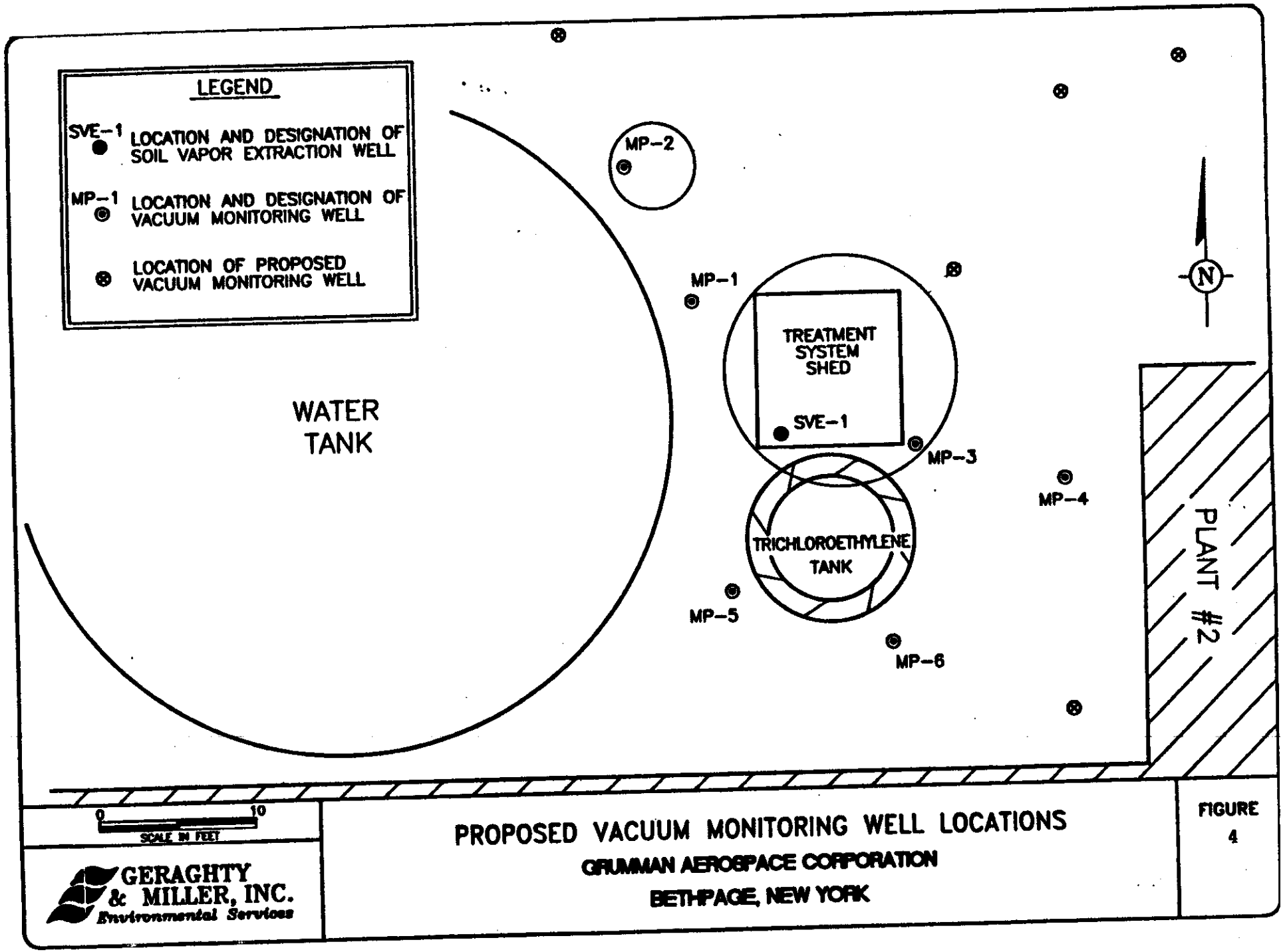
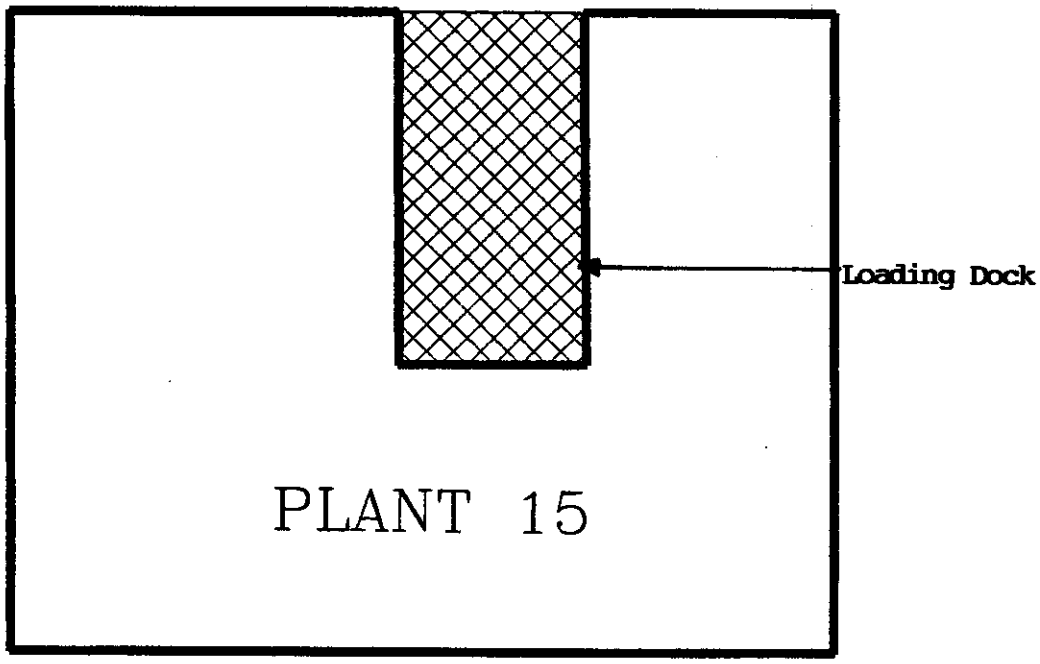


FIGURE 3: PLANT 02 TCE SPILL AREA

0 ——— 2400 ft

Scale : 1" = 2400 feet


LEGEND
SVE-1 LOCATION AND DESIGNATION OF SOIL VAPOR EXTRACTION WELL
MP-1 LOCATION AND DESIGNATION OF VACUUM MONITORING WELL
LOCATION OF PROPOSED VACUUM MONITORING WELL
WATER TANK
MP-2
MP-1
TREATMENT SYSTEM SHED
SVE-1
MP-3
MP-4
TRICHLOROETHYLENE TANK
MP-5
MP-6
PLANT #2
N
0
10
SCALE IN FEET
GERAGHTY & MILLER, INC.
Environmental Services
PROPOSED VACUUM MONITORING WELL LOCATIONS
GRUMMAN AEROSPACE CORPORATION
BETHPAGE, NEW YORK
FIGURE 4



EXPLANATION

INVESTIGATION AREA FOR PHASE 2 SOIL-GAS SURVEY

0 300 FT

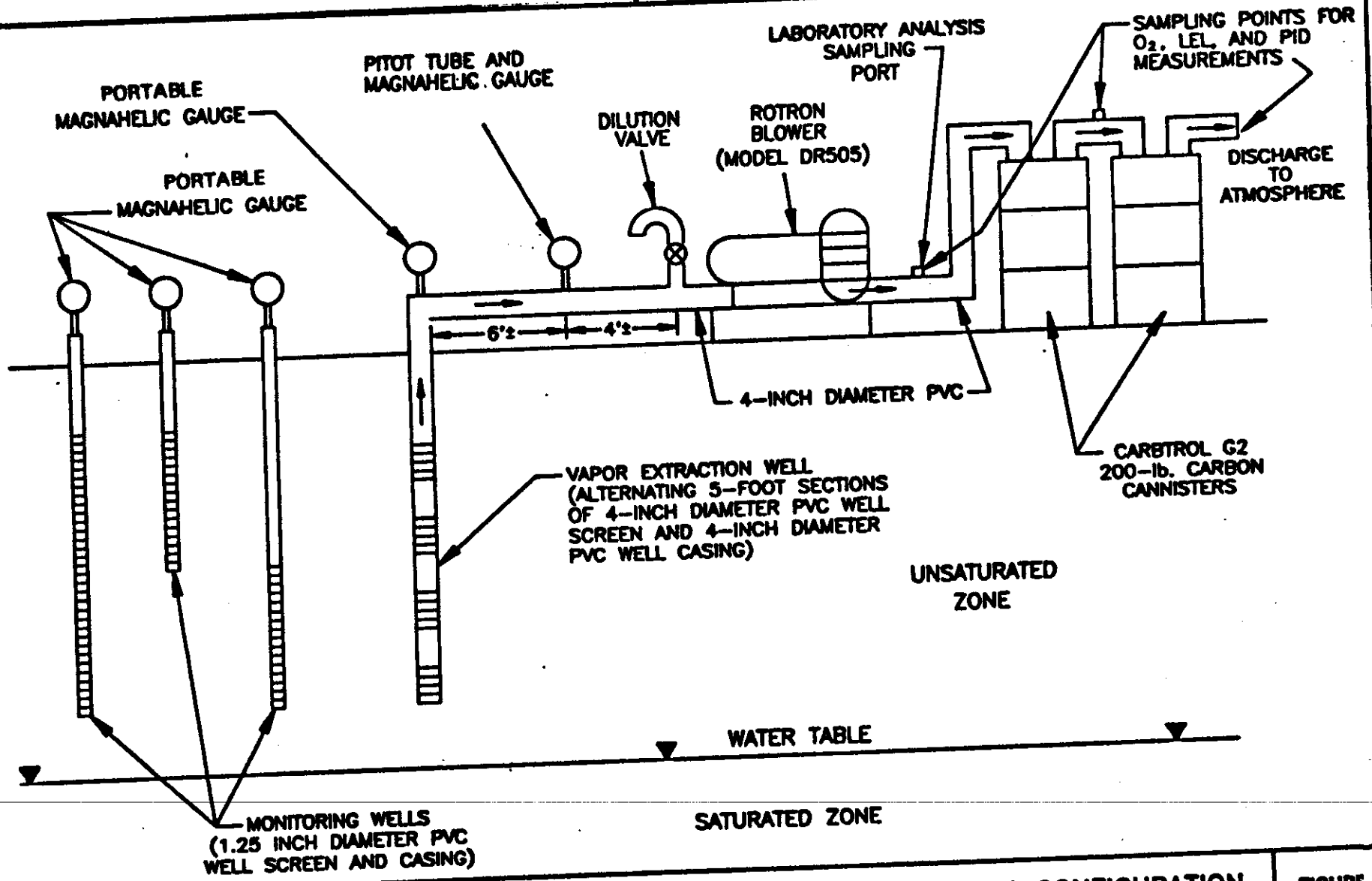
GERAGHTY & MILLER, INC.
Environmental Services

PROPOSED SOIL-GAS SURVEY FOR PLANT 15

GRUMMAN AEROSPACE CORPORATION
BETHPAGE, NEW YORK

FIGURE 5

DWG DATE: 9-13-94 | PRJCT NO.: NY000B049 | FILE NO.: 1469 | DRAWING: PLANT15 | CHECKED: JS | APPROVED: CSG | DRAFTER: GS



SCALE: NONE

GERAGHTY & MILLER, INC.
Environmental Services

SOIL VAPOR EXTRACTION PILOT TEST EQUIPMENT CONFIGURATION

GRUMMAN AEROSPACE CORPORATION
BETHPAGE, NEW YORK

FIGURE
6

Table 1

WASTE STORAGE, TREATMENT, AND DISPOSAL LOCATIONS, GRUMMAN CORPORATION, BETHPAGE, NEW YORK

Waste Storage, Treatment, or Disposal Locations	Owner	Operation and/or Process	Date	Wastes Stored, Treated, or Disposed	Estimated Quanity of Wastes Stored, Treated, or Disposed
Plant 02 Industrial Waste Treatment Plant	Grumman	Industrial waste-water treatment	Late 1940s to Present	Bethpage plant wastewater	50,000 to 250,000 gal/day
Plant 02 Waste TCE Storage/ Recycling Facility	Grumman	Storage/ Recycling of waste TCE	1940s to 1977	Waste TCE from degreasing tanks	Recycling Capacity of 50 gal/hour
South Recharge Basins	Grumman	Disposal of treated Bethpage plant wastewater	Mid-1940s to 1981	Treated Bethpage plant wastewater	50,000 to 250,000 gal/day

Source: Remedial Investigation Report, September 1994 prepared by Geraghty & Miller, Inc.

Table 2

Outside Solvent Storage Areas Investigated During the Initial On-Site Field Investigation, Grumman Aerospace Corporation, Bethpage, New York

Storage Area Number	Location of Storage Area	Material(s) Stored
S-14	Plant 1	Paint thinners and halogenated solvents
S-020	Plant 2	Turco 5351 thin stripper
S-022	Plant 2	Paint thinners, trichloroethylene, and halogenated solvents
S-41	Plant 4	Halogenated solvents, organic solvents CEEBEE C50 and varsol, methylbutyl ketone 1,1,1-trichloroethane, and monoethanolamine
S-42	Plant 4	Acrylic anti-corrosion solution
S-123	Plant 12	Halogenated solvents and ketones
S-125	Plant 12	Latex paint
S-126	Plant 12	Methylethyl ketone, methylene chloride, methanol, acetone, 1,1,1-trichloroethane, toluene, carbon tetrachloride, varsol (organic solvent), and laquer thinner
S-142	Plant 14	Isopropanol and halogenated solvents
S-151	Plant 15	Napthalene and perchloroethane
S-261	Plant 26	Varsol (organic solvent), ketone, trichloroethylene, acetone, isopropanol, halogenated solvents, and 1,1,1-trichloroethane

Source: Remedial Investigation Report, September 1994 prepared by Geraghty & Miller, Inc.

Table 3

Outside Solvent Storage Tanks Investigated During the Initial On-Site, Field Investigation, Grumman Aerospace Corporation, Bethpage, New York

Tank Number	Location of Tank	Material(s) Stored
T-1111	Plant 1	Paint water (chrome)
T-10	Plant 2	Trichloroethylene
T-594	Plant 2	Kolene
T-209A	Plant 15	Waste photographic solution

Source: Remedial Investigation Report, September 1994 prepared by Geraghty & Miller, Inc.

Table 4

Results of Soil-Gas Survey, Phase 1 and 2 Remedial Investigations, Grumman Aerospace Corporation, Bethpage, NY

PLANT 2 SOURCE AREA

Sample Identification	Vinyl Chloride (ppmv)	trans-1,2-DCE (ppmv)	cis-1,2-DCE (ppmv)	TCE (ppmv)	PCE (ppmv)
SG-4A	<0.9	<0.3	9	100	0.5
SG-4B	<0.9	<0.3	10	100	<0.2
SG-4C	<0.9	<0.3	5	100	<0.2
SG-4D	<0.9	<0.3	10	60	<0.2

PLANT 15 SOURCE AREA

Sample Identification	Vinyl Chloride (ppmv)	trans-1,2-DCE (ppmv)	cis-1,2- DCE (ppmv)	TCE (ppmb)	PCE (ppmv)
SG-10A	<0.9	<0.3	0.4	3	400
SG-10B	<0.9	<0.3	<0.4	2	300
SG-10C	<0.9	<0.3	<0.4	0.3	10
SG-11A	<0.9	<0.3	<0.4	<0.3	1
SG-11B	<0.9	<0.3	<0.4	<0.3	3
SG-11C	<0.9	<0.3	<0.4	<0.3	0.6

DCE = dichloroethylene
TCE = trichloroethylene
PCE = tetrachloroethylene
ppmv = parts per million vapor

EXHIBIT A

ADMINISTRATIVE RECORD
GRUMMAN AEROSPACE - BETHPAGE FACILITY
SITE NUMBER: 130003A

I - REPORTS

1. Remedial Investigation/Feasibility Study Work Plan, Grumman Aerospace Corporation, Bethpage, New York, prepared by Geraghty & Miller, Inc., March 1990, four volumes.

   Addenda to the Work Plan:

   Letter from J. Ohlmann (Grumman) to Mr. John D. Barnes (NYSDEC) dated June 1, 1990. Attached to this letter:

   i. Letter of Addendum to Grumman Aerospace RI/FS Work Plan signed by John Barnes and J. Ohlmann. Date on letter: May 16, 1990.

   ii. Revised Appendix J - Citizen Participation Plan, Grumman Aerospace Corporation, Bethpage, N.Y.

   iii. Revised Parameter Table (Table F-1).

   iv. Resumes for Data Validation Personnel.

2. Data Report, Phase I Remedial Investigation, Grumman Aerospace Corporation, Bethpage, New York, prepared by Geraghty & Miller, Inc., January 1992, two volumes.

3. Phase II Remedial Investigation Work Plan, Grumman Aerospace Corporation, Bethpage, New York, prepared by Geraghty & Miller, Inc., April 1992.

4. Interim Remedial Measure, Pilot Test Work Plan, Grumman Aerospace Corporation, Bethpage, New York, prepared by Geraghty & Miller, Inc., August 1993

5. Interim Remedial Measure, Pilot Test Report, Grumman Aerospace, Bethpage, New York, prepared by GMCE of New York, P.C., January 1994.

6. Interim Remedial Measure, Soil Vapor Extraction System, Grumman Aerospace Corporation, Bethpage, New York, prepared by GMCE of New York, P.C., March 1994.

7. Remedial Investigation Report, Grumman Aerospace Corporation, Bethpage, New York, prepared by Geraghty & Miller, Inc,. September 1994, three volumes.

8. Proposed Remedial Action Plan, Grumman Aerospace - Bethpage Facility, Site Number: 1-30-003A, prepared by the New York State Department of Environmental Conservation, October 1994.

II - CLEAN-UP GOALS

9. Technical and Administrative Guidance Memorandum #HWR-94-4046: Determination of Soil Cleanup Objectives and Cleanup Levels, NYSDEC Division of Hazardous Waste Remediation, January 24, 1994.

III - DOCUMENTS PERTAINING TO THE REMEDIAL INVESTIGATION

10. Letter to John Barnes (NYSDEC) from Scott Glash and Carlo San Giovanni (Geraghty & Miller, Inc. - G&M) dated June 4, 1990.

11. Letter to John Barnes from Scott Glash and Andrew Barber (G&M) dated June 6, 1990.

12. Order on Consent dated October 25, 1990.

13. Letter to John Ohlmann (Grumman) from John Barnes dated November 6, 1990.

14. Letter to Joshua Epstein (NYSDEC) from Edward Naughton - undated (postmarked on December 24, 1990).

15. Letter to John Barnes from Frank T. Adam dated December 31, 1990.

16. Letter to John Barnes from Mrs. Marilyn Humphrey dated January 1, 1991.

17. Letter to the NYSDEC from Brian Bofill - undated (postmarked on January 28, 1991).

18. Letter to John Barnes from Anthony Sabino (representing the Bethpage Water District) dated January 30, 1991.

19. Letter to Carlo San Giovanni (G&M) from John Barnes dated February 1, 1991.

20. Letter to Carlo San Giovanni (G&M) from John Barnes dated February 1, 1991.
Attached to letter:

    i. Letter to John Barnes from Carlo San Giovanni dated January 22, 1991
    ii. Revisions to Appendix I, Health and Safety Plan

21. Letter to John Barnes from Carlo San Giovanni dated February 20, 1991.

22/23. Two letters to John Barnes from Carlo San Giovanni dated February 21, 1991.

24. Letter to John Barnes from Carlo San Giovanni and Andrew Barber dated March 5, 1991.

25. Letter to Carlo San Giovanni from John Barnes dated March 15, 1991.

26. Memorandum to Joshua Epstein from John Barnes dated March 27, 1991.

27. Letter to John Barnes from Carlo San Giovanni and Andrew Barber dated March 29, 1991.

28. Letter to John Barnes from Ms. Irene Vera and Carlo San Giovanni dated April 2, 1991.

29. Letter to John Barnes from Carlo San Giovanni dated April 16, 1991.

30. Letter to Joshua Epstein from George Proios (New York State Legislative Commission on Water Resource Needs of Long Island) dated April 25, 1991.

31. Letter to John Barnes from Kenneth Litfin (Acres International Corporation) dated May 8, 1991.

    Attached to this letter: Analytical data from the split-samples collected during the recharge basin sampling event - March 1991).

32. Letter to Mrs. Marilyn Humphrey from Kim Mann (New York State Department of Health - NYSDOH) dated May 29, 1991.

33. Letter to Brian Bofill from Kim Mann dated May 30, 1991.

34. Letter to Frank Adam from Kim Mann dated May 31, 1991.

35. Letter to John Barnes from Carlo San Giovanni dated August 1, 1991.

36. Letter to Carlo San Giovanni from John Barnes dated May 13, 1992.

37. Letter to John Barnes from Carlo San Giovanni dated June 1, 1992.

38. Letter to John Barnes from Ms. Christine M. Enwright (National Environmental Testing, Inc.) dated July 28, 1993.

39. Letter to John Ohlmann (Grumman) from John Barnes dated September 21, 1993.

40. Letter to John Barnes from Richard Miller (G&M) dated March 29, 1994.

    Attached to this letter:

    i. Agreement dated March 21, 1994 signed by John Barnes and Richard Miller

41. Letter to John Barnes from Carlo San Giovanni and Andrew Barber dated September 13, 1994.

42. Letter to John Ohlmann from John Barnes dated September 22, 1994.

43. Letter of Transmittal to John Barnes from John Schafer (G&M) dated January 23, 1995.

    Attached to this letter:

    i. Results of the October 1994 soil gas survey at Plant 15.

IV - DELISTING PETITIONS

44. Building 113, dated November 27, 1991.

45. 789 South Broadway, Hicksville, NY, dated March 23 1992.

46. Ballfield Site, dated March 23, 1992.

47. Parking Lot Adjacent to Bethpage Fire Department, dated March 23, 1992.

48. 801 and 805 South Broadway, Hicksville, NY, dated November 10, 1992.

49. Bethpage Federal Credit Union Property, dated February 12, 1993.

50. Plant 5, Hicksville, NY, dated February 23, 1993.

51. Site 6 (Runway), Hicksville, NY, dated February 26, 1993.

52. Site 8 (Plant 12/East), Hicksville, NY, dated February 26, 1993.

53. Site 9 (Plant 18), Hicksville, NY, dated March 12, 1993.

54. Hangar 7, Hicksville, NY, dated April 15, 1993.

55. Central Avenue, Hicksville, NY, dated June 13, 1994

56. Buildings 30 and 35, Hicksville, NY, dated June 13, 1994.

57. Site 10 (Buildings 21, 28, 37, 114, 115, and 116), dated September 15, 1994.

58. South Runway, Hicksville, NY, dated January 24, 1995.

V - DOCUMENTS PERTAINING TO THE DELISTING PETITIONS OR PROPERTY TRANSFERS

59. Letter to Commissioner Jorling (NYSDEC) from J. Ohlmann dated August 17, 1990.

60. Letter to John Ohlmann from John Barnes dated March 8, 1991.

61. Letter to the Bethpage Fire District from Ms. Marilyn Marlek (Grumman) dated May 7, 1992.

63. Letter to John Ohlmann from Michael O'Toole (NYSDEC) dated February 5, 1992.

64. Letter to J. Ohlmann from Charles Goddard (NYSDEC) dated July 21, 1992

Attached to letter:

i. Letter to Commissioner Jorling from J. Ohlmann dated March 23, 1992.

65. Letter to J. Ohlmann form Earl Barcomb (NYSDEC) dated August 3, 1992.

66. Letter to John Ohlmann from Robert Marino (NYSDEC) dated April 6, 1993.

    Attached to letter: Copy of the Registry listing for the Grumman site.

67. Letter to John Ohlmann from Robert Marino dated July 28, 1993.

    Attached to letter: Copy of the Registry listing for the Grumman site.

68. Letter to John Ohlmann from Michael O'Toole dated September 29, 1993.

69. Letter to Michael O'Toole from John Ohlmann dated October 19, 1993.

70. Letter to Robert Marino from J. Ohlmann dated December 9, 1993.

71. Letter to M. O'Toole from J. Ohlmann dated February 7, 1994.

72. Letter to John Barnes from J. Ohlmann dated February 18, 1994.

73. Letter to John Ohlmann from Michael O'Toole dated March 11, 1994.

74. Letter to Commissioner Marsh (NYSDEC) from J. Ohlmann dated August 2, 1994.

75. Letter to John Ohlmann from Michael O'Toole dated August 18, 1994.

    Attached to letter:

    i. Letter to John Ohlmann from Michael O'Toole dated September 29, 1993.
    ii. Letter to Commissioner Jorling from J. Ohlmann dated March 12, 1993.

76. Letter to John Ohlmann from Michael O'Toole dated September 30, 1994.

    Attached to letter:

    i. Letter to Michael O'Toole from J. Ohlmann dated June 23, 1994.
    ii. Letter to Commissioner Jorling from John Ohlmann dated February 23, 1993.
    iii. Two (2) letters to Commissioner Jorling from John. Ohlmann dated February 26, 1993.
    iv. Letter to John Ohlmann from Michael O'Toole dated September 29, 1993.

77. Letter to John Ohlmann from Michael O'Toole dated September 30, 1994.

    Attached to letter:

    i. Letter to L. Marsh (NYSDEC) from J. Ohlmann dated June 22, 1994.

78. Letter to John Ohlmann from Robert Marino dated February 13, 1995.

EXHIBIT B

RESPONSIVENESS SUMMARY
PROPOSED REMEDIAL ACTION PLAN
GRUMMAN AEROSPACE - BETHPAGE FACILITY
SITE NUMBER: 130003A

The issues addressed below were raised during the public meeting held on October 26, 1994 at the Bethpage High School, Bethpage, Nassau County, and in letters received from commentors. The purpose of the meeting was to present the Proposed Remedial Action Plan (PRAP) for the site to the public and to receive comments on the PRAP for consideration during the final selection of a remedy. The transcript of the meeting and copies of the written comments are included in the administrative record for this site (Exhibit A) and are available for public review at the document repositories. The public comment period for the PRAP extended from October 11, 1994 through December 9, 1994.

The following is a list of comment letters received by the NYSDEC during the public comment period:

1. Letter dated November 18, 1994 from Mr. Anthony Sabino (representing the Bethpage Water District) to Mr. John Barnes (NYSDEC) regarding groundwater pumpage and treatment at the Grumman facility.

2. Letter dated November 22, 1994 from Mrs. Marilyn Humphrey to John Barnes regarding the Bethpage Community Park and other properties formerly owned by Grumman.

3. Letter dated November 28, 1994 from Dr. Alan Weston (Occidental Chemical Corporation) to Mr. John D. Barnes regarding the Remedial Investigation and the proposed remedy.

4. Letter dated November 29, 1994 from Mr. Anthony Sabino (representing the Bethpage Water District) to Mr. John Barnes regarding the proposed remedy.

The comments which have been received by the NYSDEC and the corresponding responses have been divided into three categories:

A. Comments from the general public.
B. Comments from the Bethpage Water District.
C. Comments from the Occidental Chemical Corporation.

A. Comments from the General Public

1. **What is an inactive hazardous waste site as opposed to an active site?**

There are two laws under which hazardous waste is regulated in this State:

1 - Resource Conservation and Recovery Act (RCRA): Facilities currently generating hazardous wastes ("active sites") are regulated under this Act. These facilities generally

operate under a permit (there are some exceptions). Grumman operates under a permit jointly issued by the United States Environmental Protection Agency (USEPA) and the New York State Department of Environmental Conservation (NYSDEC). Any chemical spills which occur during the time that this permit is in effect would be cleaned up under the supervision of the USEPA or NYSDEC RCRA programs.

2 - Title 13, Article 27 of the Environmental Conservation Law (State Superfund): Facilities where the disposal of hazardous wastes occurred prior to being permitted are regulated under this Article. These facilities are called inactive facilities (or sites). The RCRA permit for Grumman (and the Navy) came into effect in 1984. Any disposal of hazardous waste (via discharges to recharge basins or leaks from tanks, etc.) prior to 1984 are covered under this Article.

It should be noted for the record that the NYSDEC RCRA and the Superfund programs worked together on this project so that a comprehensive site investigation took place.

2. **What is a SPDES permit, and has one been issued to Grumman?**

The State Pollutant Discharge Elimination System (SPDES) program was authorized under Article 17 of the Environmental Conservation Law. This program is designed to eliminate the pollution of New York State waters and maintain the highest quality water possible - consistent with public health, propagation of fish and wildlife, and industrial development. The average and maximum concentrations of chemicals allowed to be discharged at a facility are specified in a SPDES permit.

A SPDES permit has been issued to Grumman. The current permit was issued on March 1, 1991 and expires on March 1, 1996.

3. **Why does the NYSDEC not force Grumman to install wells and stripping towers along the property boundary and treat the contaminated groundwater now?**

Grumman is treating some of the contaminated groundwater now. They currently pump 3-8 million gallons of water per day for noncontact cooling purposes. What this means is that this water flows through pipes in heat exchangers, etc. in order to cool process streams or equipment. This water does not come into contact with any chemicals. However, the source of this water is contaminated groundwater. Before this water can be discharged into one of the on-site recharge basins, it must be treated in order to meet the discharge limits specified in the SPDES permit.

The NYSDEC has approached Grumman regarding an Interim Remedial Measure (IRM) which could be implemented during the time period when the regional groundwater feasibility study and remedial design work are being conducted. Such an IRM could be designed to further reduce the mass of contamination migrating off site while the groundwater remedial program is being developed and designed. This is currently being evaluated.

4. **Why will it take another year to develop a proposed remedy to address the groundwater contamination?**

There are three tasks which need to be completed before a proposed remedy can be developed. First, additional data needs to be gathered. This involves work currently being conducted by the Occidental Chemical Corporation at the RUCO Polymer site. Second, a groundwater model has to be developed. This task is essentially complete pending the data from the work being conducted at the RUCO Polymer site. The final task will be the development and evaluation of remedial strategies for addressing the groundwater contamination. These tasks are technically complex and will take time to complete.

In the meantime, the NYSDEC is not ignoring the impacted or potentially impacted water supplies. The impacted Bethpage Water District wells either already have treatment systems on line or are under design. These systems have been (or will be) funded by Grumman and the Navy.

The Bethpage, Hicksville, and Levittown Water Districts have been invited to attend meetings being held regarding the on-going groundwater Feasibility Study and will be copied on correspondence regarding this study.

5. **Now that Northrop has purchased Grumman, is Grumman still responsible for remediating their site?**

Yes.

6. **Is it possible to determine which company is the source of the various chemicals in the groundwater?**

Similar compounds were used at the Grumman/Navy facility and the RUCO Polymer site. As a result, it is very difficult to determine which chemical contaminants each party released into the environment.

7. **Had a remedy been put in place several years ago, how much less pollution would have migrated off-site, and how much less of a problem would we be facing today?**

Certainly additional contamination has migrated off site over the past few years. However, in the opinion of the NYSDEC, the overall magnitude of the problem has not increased significantly. This is due to the on-site pumping and recharge of groundwater (as explained in question #3). Grumman has historically pumped 3 to 12 million gallons of water per day from the deeper portions of the aquifer for the past several decades. Most of this water has been recharged to the groundwater via the on-site recharge basins. (NOTE: Currently this water is treated before it enters the basins.) This process of pumping/recharge has created an artificial hydraulic barrier which prevents most, but not all, of the contamination from migrating off-site. An independent study has estimated that 2/3 of the plume remains on-site due to the pumping and recharge of groundwater.

8. **Why is a consultant working for Grumman developing a remedy for addressing the groundwater contamination?**

In one of the conditions set forth in the Consent Order signed by Grumman in 1989, Grumman agreed to obtain the services of a consultant qualified to conduct Remedial Investigations/ Feasibility Studies. Geraghty & Miller, Inc. is qualified to conduct this work. The work that

they conducted in this matter has been reviewed and approved by the NYSDEC. In addition, the field work conducted during this project was overseen by the NYSDEC to the extent possible.

9. **Have any cancer studies been conducted in the Bethpage area?**

No. The New York State Department of Health (NYSDOH) conducted a cancer study on Long Island as a whole a few years ago. The Centers for Disease Control in Atlanta is currently conducting a follow-up study.

10. **Has a study been conducted in the Bethpage community to determine at what levels the contaminants of concern at the Grumman site are found in members of the community?**

No. In order for the NYSDOH to conduct such a study, there must be a route of exposure from which the contaminants can enter the human body. Such a route of exposure has not been identified at this time. A possible route of exposure is the consumption of contaminated groundwater. This pathway has been ruled out because the local municipal water supplies routinely monitor the water distributed to the community to make sure that the drinking water standards promulgated by the NYSDOH are met.

11. **Is the contamination emanating from the Grumman site contaminating vegetables grown in gardens in the Bethpage area?**

No. The contamination migrating off of the Grumman property is in the groundwater. The groundwater table (top of the groundwater) is 40 to 50 feet below the land surface in the areas surrounding the site. The roots of vegetables do not grow that deep.

12. **Does Grumman have air permits, and what are the health effects of their air emissions?**

Grumman currently does have a permit to discharge pollutants into the atmosphere. The emissions levels contained in the permit were developed by the NYSDEC's Division of Air with concurrence from the NYSDOH. Questions regarding air emissions at Grumman may be directed to the NYSDEC Division of Air in Stony Brook at (516) 444-0205.

13. **During the public meeting, a question was raised regarding the air emissions from the vacuum extraction system operating at Plant 2: Has a study been conducted by the NYSDOH to determine if the emission levels are protective of the surrounding community?**

The NYSDOH reviewed the design report and air permit application for this unit and determined that the post air treatment air emission levels proposed for this unit are sufficiently protective of the surrounding community.

14. **Will the vacuum extraction system be a noise nuisance to the surrounding community?**

No. The vacuum extraction system is housed in a shed. This, coupled with the fact that the system is located several hundred feet from the nearest public area, the community will not be able to hear it operating. In addition, with cultural noise sources (such as traffic and other noises in the community), one would not be able to single out any noise generated by the treatment system. No noise complaints have been received by the NYSDEC to date.

15. **During the public meeting, a question was raised regarding the use of a portion of the site for senior citizen housing.**

Over the past few years, Grumman has submitted approximately 14 petitions to the NYSDEC requesting that various portions of the site be removed from the Registry of Inactive Hazardous Waste Sites in New York State (Registry) so that those portions of their property could be used for other purposes such as housing or economic development. In order for these petitions to be approved, Grumman must prove that hazardous wastes were not disposed of on the land parcels in question. These petitions must be approved by both the NYSDEC and the NYSDOH before any portion of the site is removed from the Registry. To date, twelve petitions have been approved by both State agencies. The NYSDEC has not been informed of Grumman's plans for all of these 12 parcels.

16. **Prior to 1947, chromic acid wastes were discharged into the southern recharge basins on the site. These discharges ceased after chromium was detected in a supply well south of the Grumman property. A system for treating the chromic acid wastes was installed in 1949. During the public meeting, a member of the community asked how the past chromium discharges were addressed during the Remedial Investigation.**

The NYSDEC was aware of the past chromium discharges, and required Grumman to analyze soil, sediment, surface water, and groundwater samples for chromium as well as other metals. Based upon the data collected, the NYSDEC has determined that groundwater beneath the site as well as off-site is not contaminated with metals.

17. **During the public meeting, there was a question regarding the rationale for selecting sampling locations.**

Soil gas surveys were conducted in areas where solvents were stored. Where there were positive hits of contaminants in the soil gas, soil samples were taken. Two source areas were located as a result of these surveys.

Monitoring wells were installed downgradient of potential source areas. The thought process behind this strategy was that if contamination was detected in a water table well, then the areas upgradient of that well would be considered a potential source area and would be investigated. (See question 27 for further details.)

18. **Why does the groundwater contamination cover an area of 1500 acres?**

There are three known sites which contain sources of the groundwater contamination: Grumman Corporation (#130003A); the Naval Weapons Industrial Reserve Plant (#130003B); and RUCO Polymer (#130004). These sites alone cover an area of approximately 620 acres. The rest of the plume acreage comes as a result of the migration of groundwater. The maximum east-west width of the three sites combined is approximately 1.5 miles. So, as the plume migrates southward, the acreage impacted by the plumes quickly increases.

19. **Is the NYSDEC confident that all of the sources on the Grumman site have been isolated?**

Yes. However, we will continue to monitor many of the monitoring wells on-site. If contamination levels are observed that are inconsistent with the data generated to date, further investigations will be conducted.

20. **What happens when the groundwater contamination overwhelms the treatment systems at the municipal supply wells?**

As the groundwater Feasibility Study progresses, the potentially impacted water districts will be kept up-to-date on the proceedings, and will be invited to any meetings which are held on that subject. Estimates of future contaminant loads at the municipal supply wells will be developed as part of the ongoing groundwater Feasibility Study. It is the NYSDEC's intention to have the final groundwater remedy designed such that the treatment systems will never be "overwhelmed" by the groundwater contamination.

21. **Who will be responsible for funding treatment at the supply wells?**

Grumman has funded treatment systems at two of the three Bethpage Water District well fields located to the south of the Grumman/Navy facility. The Navy has agreed to fund the treatment at the third well field. It is possible that additional parties may also be responsible for the contamination impacting or potentially impacting these well fields and the Hicksville and Levittown well fields.

22. **Will the Bethpage Water District have to permanently treat the water pumped from the wells south of the Grumman site?**

The water district will need to treat the water for a long period of time. It is difficult to develop a time estimate at this time. The groundwater Feasibility Study will be used as a guide by the NYSDEC in making this estimate in the near future.

23. **Is there any benefit to installing a filter system or water purifier on residential water taps?**

No. The water supplied to the community meets the NYSDOH drinking water standards. Water filters or purifiers are not necessary.

24. **Have there been any investigations of properties formerly owned by Grumman (e.g., Bethpage Community Park)? Are there any additional properties owned by Grumman which need to be investigated?**

A direct investigation of the Bethpage Community Park was not conducted. However, monitoring wells were installed immediately downgradient (south) of the Park. Based upon the current data, the Park is not considered to be a source area.

All potential source areas which were owned/operated by Grumman in the Bethpage area have been identified and investigated.

B. Comments from the Bethpage Water District

25. **The Water District requested that a treatment system at Grumman's Plant 15, if necessary, be installed and operate concurrently with the system at Grumman's Plant 2.**

The NYSDEC considered this request, but chose to follow the course outlined in the Proposed Remedial Action Plan for the following reasons:

1 - The supplementary investigation at Plant 15 was inconclusive and additional work is required to determine the source of the perchloroethylene contamination which has been detected during two soil gas surveys.

2 - Based upon the data generated during the early stages of the Plant 2 remedial program, it appears that the soil vapor extraction system is working well enough that remediation could be completed by the summer of 1995. Therefore, very little time would be saved by performing the two remedial programs concurrently.

3 - It would be cost effective to conduct the remedial work at the two plants in a consecutive manner.

26. **The Water District requested that the site be remediated "sufficiently to allow a residential level of development".**

The soils beneath the site are ideal for the soil vapor extraction technology which is being employed at Plant 2 (and potentially at Plant 15). At the end of the remedial program(s), the residual volatile organic contamination would be low enough to allow these areas to be used for residential purposes.

C. Comments from the Occidental Chemical Corporation

27. **The Occidental Chemical Corporation (OCC) commented on the differences in the approaches used to investigate the RUCO Polymer and Grumman sites.**

There are two general approaches for investigating inactive hazardous waste sites. The first is a direct method during which an aggressive sampling of various media is conducted. This is what the USEPA did at the RUCO Polymer site.

At the Grumman site, the NYSDEC chose an indirect approach to locate potential source areas. Monitoring wells were installed downgradient of potential source areas. The thought process behind this strategy was that if contamination was detected in a water table well, then the areas upgradient of that well would be investigated to determine the source of the contamination in the well. If no contamination was found at a water table well, then it was concluded that a source area did not exist immediately upgradient of that well.

Soil gas surveys were conducted in areas where solvents were stored. Two source areas were located as a result of these surveys.

The NYSDEC has used direct and indirect strategies when investigating inactive hazardous waste sites. Both approaches are valid. The decision on which strategy will be used at a particular site is primarily based upon the professional judgement of the NYSDEC's project manager.

28. **It is OCC's opinion that Plant 14 is a possible source of trichloroethylene (TCE) based upon their review of the groundwater analytical data from the GM-2 and GM-7 monitoring well clusters.**

It is OCC's position that groundwater flows from the GM-2 well cluster southward, underneath Plant 14, and on towards the GM-7 well cluster.

The NYSDEC disagrees with OCC's position. The GM-7 well cluster is downgradient of the Navy's recharge basin, not the GM-2 well cluster or Plant 14. This assessment is based upon a review of the piezometric maps developed by Grumman's consultant (Figures 4-7 and 4-8 of the Remedial Investigation Report). In the opinion of the NYSDEC, the TCE detected in the GM-7 well cluster came from the Navy's recharge basins. The source of this TCE is most likely contaminated groundwater from one of the on-site production wells which was then recharged back into the aquifer via the recharge basins. The basins themselves are no longer considered to be sources of groundwater contamination.

29. **In Section 5.3 of the Proposed Remedial Action Plan (PRAP), it states that there is no direct human exposure to the contaminated soils (Plants 2 and 15).**

According to OCC, the State did not "mention the future exposure potential when the asphalt is removed. Existing pavement does not reduce the concentration or toxicity of the compounds present at the Grumman facility. Because the compounds would remain on site, the condition of the asphalt cap would require long-term inspection and, if necessary, maintenance. An asphalt cap is not considered a permanent remedy...:".

In addition, OCC inquired as to why a risk assessment was not conducted at the Grumman site?

There would be an exposure route to workers involved in excavation activites if the IRM activities were not conducted. However, since the contamination is being removed via the IRM activities, no risks due to this exposure route exist. Therefore, a risk assessment was not required.

A risk assessment was conducted at the NWIRP-Bethpage site. This was deemed necessary due to the levels and extent of contamination found at that site.

30. **Issues regarding the RUCO Polymer and NWIRP-Bethpage sites were discussed at the public meeting. Why?**

Statements regarding the remedial activities at the RUCO Polymer and NWIRP-Bethpage sites were made at the October 26, 1994 public meeting in order to adequately inform the public. The groundwater contamination in the Bethpage area is attributable to all three sites; therefore, it is

very difficult to discuss the actions at one of the sites without discussing actions at the other two sites.

31. **During the public meeting, the NYSDEC presented a map on which the areas impacted by the groundwater plumes were shown. According to OCC, that map contained information that had "not been substantiated in any detail".**

Figure 5.2 of the RI Report was displayed at the aforementioned public meeting. At that meeting, the NYSDEC pointed out two areas where a plume was not shown due to a lack of data in those areas. The first area was the southern portion of the site near the south recharge basins. It is highly likely that the groundwater zones in that area are contaminated. The second area was located to the south and southwest of the RUCO Polymer site. This second area is currently being investigated by the Occidental Chemical Corporation.

Otherwise, the map in question is accurate in the opinion of the NYSDEC.

32. **During the public meeting, the NYSDEC Project Manager stated that the Navy and RUCO Polymer are the major contributors to the plumes in the area.**

Based upon a review of the existing data set, the NYSDEC believes that this statement is correct. However, this assessment may change as additional data becomes available.

It should be noted that Grumman is one of the responsible parties at the Navy site. The waste storage activities at the Grumman/Navy complex occurred on the Navy site, and it is not surprising that the Navy site, albeit smaller than the Grumman site, is a major source area of groundwater contamination.