TECHNICAL MEMORANDUM
SOIL REMEDIATION / SOIL VAPOR ISSUE
BUILDING NO. (PLANT) 3
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP)
BETHPAGE, NEW YORK
REGISTRY OF INACTIVE HAZARDOUS WASTE SITES # 1-30-003B

This technical memorandum consists of two sections. The soil remediation/soil vapor issue associated with Plant No. 3 is summarized in the Executive Summary. Section 1.0 presents a more detailed discussion. Attachments are presented to support the findings. Figures include color coding. A black and white copy should not be used for review.

PREPARED BY

TETRA TECH NUS, INC.

FOR

NAVAL FACILITIES ENGINEERING COMMAND

ENGINEERING FIELD ACTIVITY NORTHEAST

AND

NAVAL AIR SYSTEMS COMMAND

OCTOBER 2003

1/29/03 Navy Meeting

HISTORY OF VOC INVESTIGATION
NEAR EAST END OF PLANT 3
NWIRP BETHPAGE, NEW YORK

1991 – Soil gas investigation at adjacent Installation Restoration Site 1, identifies potential source of VOCs at Site 1. Some evidence that soil gas detections may extend under concrete roadway and Plant 3 (Sheets A-1 to A-4).

Also in 1991 investigation, groundwater monitoring well to the southwest of Plant 3 (HN24) was found to contain chlorinated solvents at 58,000 ug/l. This finding launched an investigation within Plant 3 to search for a source of this contamination. The likely source of this contamination was later identified (1997) within building near the HN24 area, and was excavated by Northrop Grumman in the 1997/98 time frame. Concentration of solvents in this well is currently about 270 ug/l.

1992/1993 – A soil gas survey within Plant 3 was conducted. Initial program (Stage 1) was conducted with hand probe and OVA meter. This investigation limited further testing (Stage 2) to Heat Treat Area and east end of Plant (Honeycomb Pretreatment Area and Flow Coat Area). Stage 2 investigation used GC methods for individual solvents and found relatively high concentrations under the floor at Honeycomb Pretreatment (5000 ug/l PCE) and Flow Coat Area (570 ug/l PCE)(Sheets B-1 to B-8).

1994 - Navy/New York State determined that there was sufficient data to proceed with a cleanup at Site 1. At the time, the need for soil cleanup under Plant 3 was uncertain. Rather than delay cleanup and conduct a Phase 3 remedial investigation, it was decided to proceed with a record of decision and leave some details to the remedial design.

1995 – Navy/New York State sign a record of decision (ROD) that identifies cleanup levels for solvents in soils (Sheets C-1 to C-3).

1995 – Conducted predesign soil sampling in Plant 3 to determine the extent of AS/SVE system. 120 soil samples collected for field screening with a photoionization detector (PID) in

nine borings. Samples were collected on 5 foot centers from near surface to 62 feet below ground surface. PID readings ranged from 0 (non detect) to 50 ppm, (Sheets D-1 to D-12).

27 samples with the highest PID readings were analyzed for VOCs. Maximum detection of PCE was 20 ug/kg and maximum detection of trichloroethene was 6 ug/kg, which are less than ROD levels of 81 ug/kg and 30 ug/kg, respectively. These detections are also significantly less than NYSDEC TAGM values of 1,400 ug/kg and 700 ug/kg, respectively.

Based on this data, it was concluded that significant sources of VOCs were not present in this area under Plant No. 3 and that extension of the AS/SVE system to this area was not required. This recommendation was included in the Navy's 1997 Design Analysis Report and concurred with by NYSDEC. As a result, design of the AS/SVE system was focused beneath Site 1 only.

1997/2002 – Navy operated an AS/SVE system at Site 1. Removed 4,500 pounds of VOCs through spring of 2002. Groundwater concentrations in area have decreased from approximately 19,000 ug/l in 1991 to less than 50 ug/l in 2002.

2001 – Navy conducted indoor air sampling within Plant 3 in response to a comment made by NYSDOH regarding Navy's FOST for Bethpage. Relevant maximum detections and applicable industrial standards are as follows, (see Sheets E-1 and E-2).

Parameter	**Maximum Detected Indoor Air Concentration (ug/m^3)**	**OSHA Standards (ug/m^3)**
1,1,1- Trichloroethane	2.8	1,900,000
Trichloroethene	15.3	537,000
Tetrachloroethene	2.8	678,000
Freon 113	16.2	7,664,000

Results of air testing found indoor air quality to be significantly less than applicable standards for an industrial setting. These results were submitted to NYSDOH and NYSDEC at a meeting

held in Albany, New York on April 11, 2001. Since then, no other correspondence regarding the results of this indoor air sampling program was received by the Navy. As such, the Navy concluded that indoor air quality was no longer an issue with regards to transfer of the property and proceeded with finalization of the Bethpage FOST.

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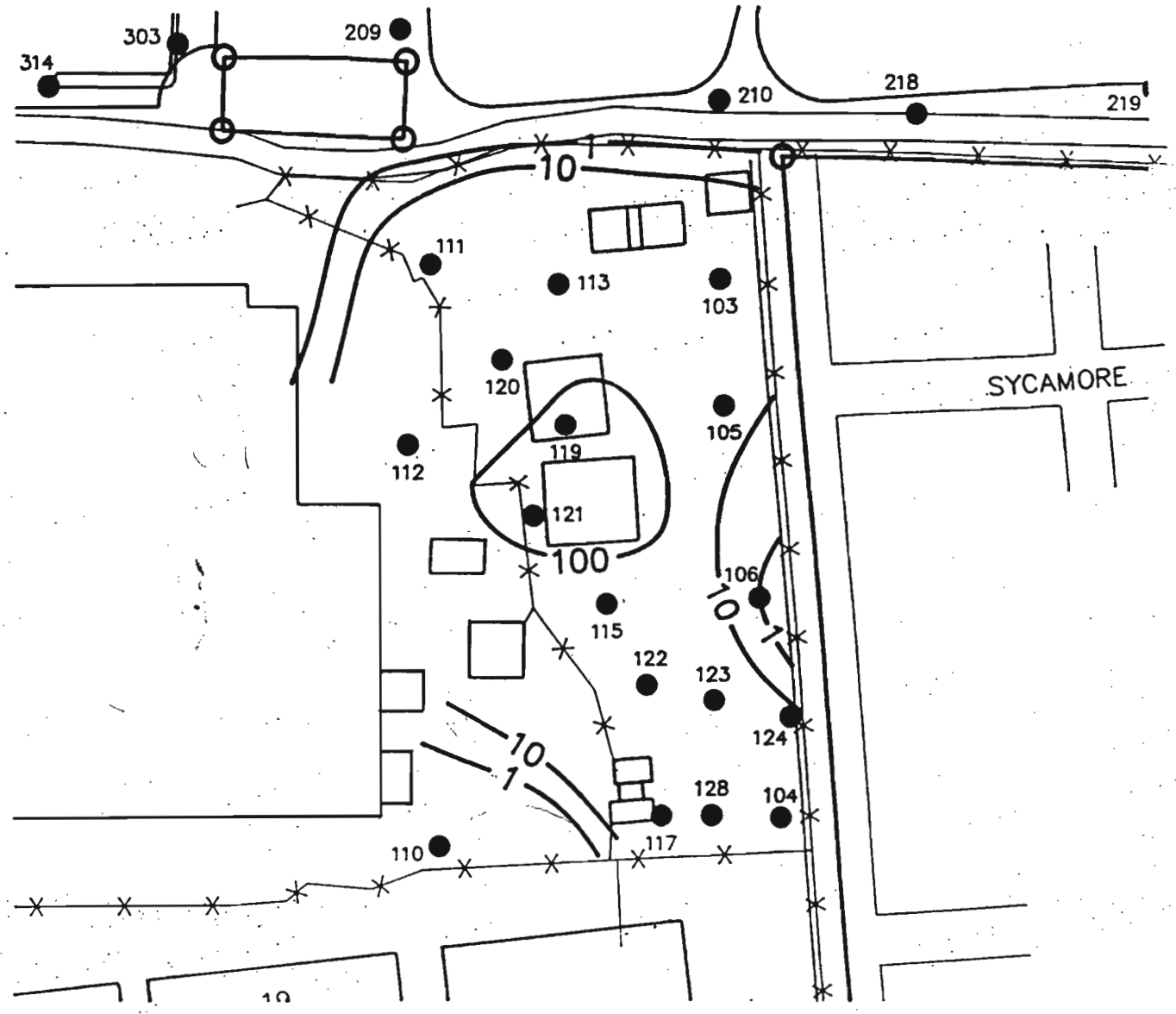

LEGEND

● SOIL GAS LOCATIONS

—10— TCE AND PCE (ug/l)

0 150 300

SCALE IN FEET

FIGURE 4-1

1991 SOIL GAS RESULTS – SHALLOW
REMEDIAL INVESTIGATION
NWIRP, BETHPAGE, NEW YORK

HALLIBURTON NUS
Environmental Corporation

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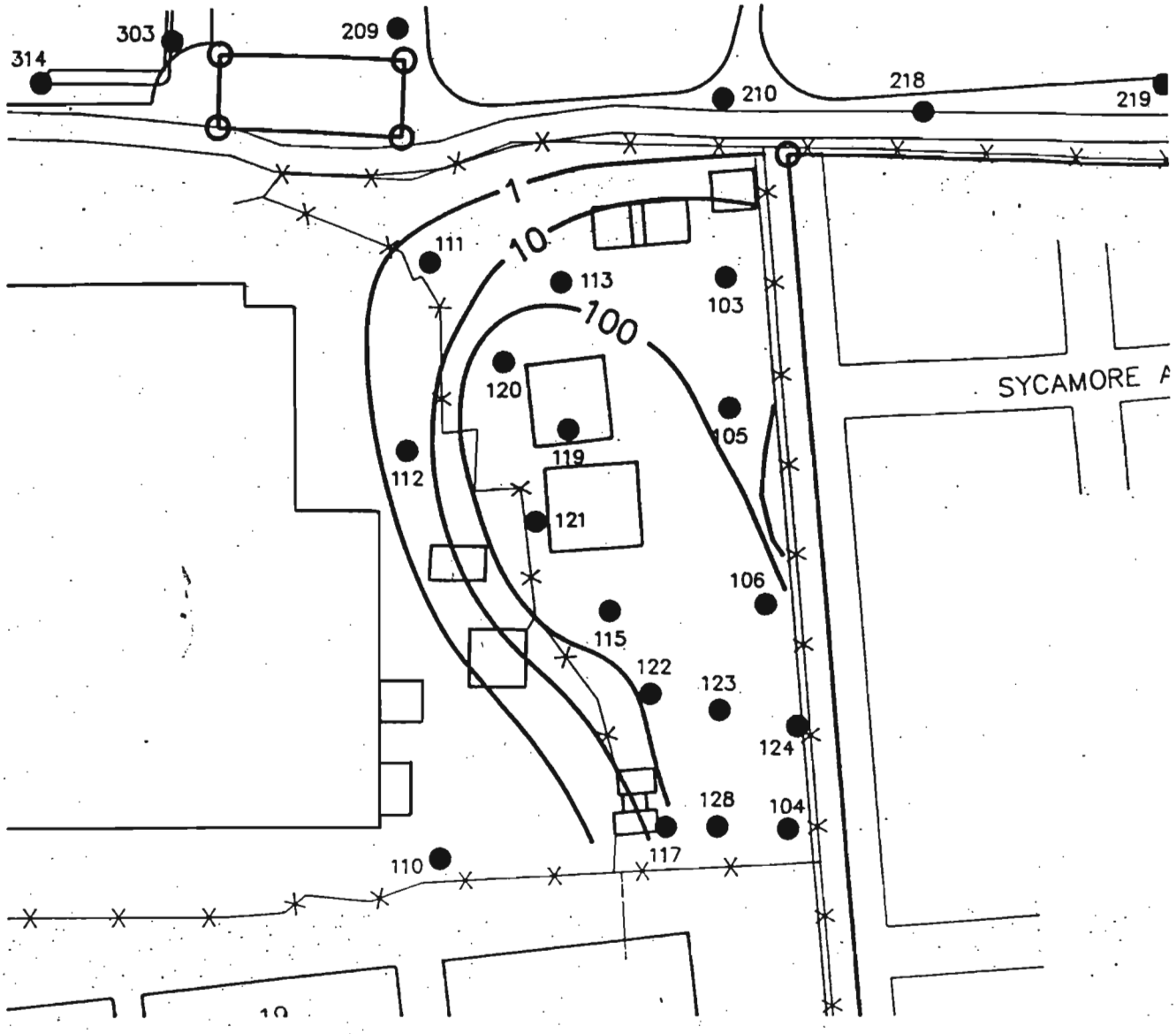

LEGEND

● SOIL GAS LOCATIONS

—10— TCE AND PCE (ug/l)

0 150 300

SCALE IN FEET

FIGURE 4-2

1991 SOIL GAS RESULTS – DEEP
REMEDIAL INVESTIGATION
NWIRP, BETHPAGE, NEW YORK

HALLIBURTON NUS
Environmental Corporation

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TABLE 4-1
SOIL-GAS RESULTS - SITE 1 (ug/l)
NWIRP, BETHPAGE, NY

Sample	11DCE	t12DCE	11DCA	c12DCE	111TCA	TCE	PCE
103D	192	<1.0	2.7	1.6	18	15	11
103S	44	<1.0	<1.0	3.6	5.6	13	9.6
104D	7.4	<1.0	3.7	<1.0	89	143	5.7
104S	<1.0	<1.0	<1.0	<1.0	0.31	0.68	<0.05
105D	244	<1.0	<1.0	<1.0	14	9.7	27
105S	187	<1.0	<1.0	<1.0	9.9	7.7	19
106D	<1.0	<1.0	<1.0	<1.0	0.22	1.2	0.12
106S	6.1	<1.0	<1.0	<1.0	1.6	3.5	3.5
110D	3.6	<1.0	<1.0	<1.0	0.11	<0.10	0.78
110S	<1.0	<1.0	<1.0	<1.0	<1.0	<0.10	0.65
111D	59	<1.0	<1.0	<1.0	6.4	6.7	3.6
111S	125	<1.0	<1.0	<1.0	8.8	7.8	1.9
112D	85	<1.0	1.7	<1.0	9.0	4.9	6.7
112S	61	<1.0	<1.0	<1.0	9.4	3.7	9.4
113D	174	<1.0	<1.0	<1.0	15	11	16
113S	131	<1.0	<1.0	<1.0	8.3	15	12
115D*	80	<1.0	2.4	4.4	8.8	18	<0.05
115S	20	<1.0	<1.0	<1.0	9.5	14	70
117D	14	<1.0	<1.0	<1.0	26	40	21
117S	7.4	<1.0	<1.0	<1.0	10	18	14
119D	165	<1.0	3.1	26	24	21	70
119S	626	<1.0	6.9	37	70	63	138
120D	728	<1.0	18	16	107	45	174
120S	832	<1.0	30	48	122	68	479
121D	558	<1.0	19	50	101	96	617
121S	568	<1.0	21	48	125	159	765
122D	46	<1.0	<1.0	<1.0	19	19	77
122S	8.6	<1.0	<1.0	<1.0	6.4	17	35
123D	11	<1.0	3.9	<1.0	78	139	19
123S	4.9	<1.0	<1.0	<1.0	39	56	14
124D	11	<1.0	<1.0	<1.0	13	16	20
124S	2.7	<1.0	<1.0	<1.0	2.4	1.2	4.8

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TABLE 4-1
SOIL-GAS RESULTS - SITE 1 (ug/l)
PAGE TWO

Sample	11DCE	t12DCE	11DCA	c12DCE	111TCA	TCE	PCE
FIELD CONTROL SAMPLES							
101	<1.0	<1.0	<1.0	<1.0	<0.10	<0.10	<0.05
102	<1.0	<1.0	<1.0	<1.0	<0.10	0.14	<0.05
107	<1.0	<1.0	<1.0	<1.0	<0.10	0.11	<0.05
108	<1.0	<1.0	<1.0	<1.0	<0.10	<0.10	<0.05
109	<1.0	<1.0	<1.0	<1.0	<0.10	<0.10	<0.05
114	<1.0	<1.0	<1.0	<1.0	<0.10	<0.1	0.09
125	<1.0	<1.0	<1.0	<1.0	<0.10	<0.10	0.40
LABORATORY DUPLICATE ANALYSES							
106D	<1.0	<1.0	<1.0	<1.0	0.22	1.2	0.12
106DR	<1.0	<1.0	<1.0	<1.0	0.20	1.3	0.13
110D	3.6	<1.0	<1.0.	<1.0	0.11	<0.10	0.78
110DR	3.1	<1.0	<1.0	<1.0	<0.10	<0.10	0.47
113D	174	<1.0	<1.0	<1.0	15	11	16
113DR	165	<1.0	<1.0	<1.0	14	7.4	15
LABORATORY BLANKS							
106DB	<1.0	<1.0	<1.0	<1.0	<0.10	<0.10	<0.05
110DB	<1.0	<1.0	<1.0	<1.0	<0.10	<0.10	<0.05
113DB	<1.0	<1.0	<1.0	<1.0	<0.10	<0.10	<0.05

* = SAMPLES MAY CONTAIN HIGHER CONCENTRATIONS OF 111TCA, TCE, AND/OR PCE

11DCE = 1,1-dichloroethene
t12DCE = trans-1,2-dichloroethene
11DCA = 1,1-dichloroethane
c12DCE = cis-1,2-dichloroethene
111TCA = 1,1,1-trichloroethane
TCE = trichloroethene
PCE = tetrachloroethene

S = Shallow
D = Deep

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4.4.4 Summary

TCE is a significant groundwater contaminant in this area and is associated with a dense clay layer at a depth of approximately 135 feet bgs. However, direct sampling and analysis of this clay did not find similar levels of contamination. The source of the TCE contamination is not likely to be Site 1, the former coal pile area, Plant No. 10, or the Hooker/RUCO Superfund Site. Potential sources include Plant No. 3 and the drum area near the northern warehouses. These areas are discussed in Sections 4.5 and 4.6.

Solvent contamination was found in the NWIRP and Grumman production wells. Contamination of the NWIRP wells has likely been caused by a combination of Site 1 sources, recharge basin water, and the Hooker/RUCO Superfund Site.

4.5 PLANT NO. 3

4.5.1 Soil Gas Survey

A two stage soil gas program was conducted to determine if there are sources of solvent contamination in Plant No. 3. Additionally, this data was used to supplement the Phase 1 RI soil gas survey and determine the need for remediation of soils under and near Plant No. 3. The first stage of the Phase 2 soil gas program was semi-quantitative using an OVA to provide real-time readings of the concentration of total organic compounds in the soil gas at each sampling location. This soil gas survey was designed to be a relatively non-intrusive, preliminary field screening technique. The second stage soil gas program was quantitative with a field GC used to determine chemical-specific soil gas concentrations.

First Stage Soil Gas Program

A total of 32 soil gas readings were obtained in or near each of the known or suspected areas where solvents were used and/or stored in Plant No. 3. Sampling locations are shown on Figure 4-10. To determine the relative significance of positive soil gas detections, the readings were compared to background OVA readings obtained from presumably clean areas of Plant No. 3. Of the 32 sampling locations, five points were used to determine background soil gas levels in Plant No. 3. The background soil gas samples were obtained in roughly the four corners of the plant, the north central portion of the plant, and at least 100 feet away from any potential source area.

During the testing it was reported that currently the structures at the honeycomb cleaning area are significantly different than those present during historic operations. At this time, the area is an open bay with no significant surface features. It was reported that the area used to consist of processing equipment in a recessed area, approximately 8 feet deep. During the dismantling of this unit, the recessed area was filled with soil and a concrete cap (current plant floor) was placed over it. The soil

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gas results obtained were from within this capped area and therefore may not reflect conditions below the sump area.

The results of the soil gas survey are presented on Table 4-9 and Figure 4-10. Areas of highest soil gas readings included the former honeycomb cleaning area (29 to 88 ppm), paint tunnel number 4 (18 ppm), paint tunnel number 6 (30 ppm), the zyglo inspection area (11 ppm), the flo-coat line (>100 ppm), and the tetrachloroethene (PCE) recovery area (2.4 to 12 ppm). Readings of greater than 10 ppm were obtained from all of these areas. Readings of about 10 ppm or less were not considered significant, because of natural organics such as methane and offgasing from contaminated groundwater in this area.

The evaluation of the soil gas results includes a comparison of the chemicals used at each area versus the chemical TCE found in HN-24I, the volume and method of solvent use, and the soil-gas result obtained relative to background conditions.

The paint tunnels use non-chlorinated solvents such a toluene and methyl ethyl ketone as a paint thinner. The paints are sprayed onto parts and allowed to dry. A water-based spray curtain is used to treat the paint overspray and air for the ventilation system. Solvents are present in this area in 55-gallon drums.

The zyglo process may use a 1,1,1-trichloroethane-based or a non-chlorinated based solution, (TCE and PCE are not believed to be used in this process). Parts are dipped into the solution and then visually evaluated for surface defects under specific light conditions.

The former honeycomb cleaning area is reported to have used significant quantities of TCE (13,000 gallons per year). The exact process and configuration is uncertain.

The flo-coat area and PCE recovery area currently use and recover PCE, respectively. Parts are dipped into tanks containing the flo-coat material. The flo-coat material consists of a mixture of PCE and a rubbery material. The mixture is a thick viscous semi-fluid. Excess material is allowed in drip off back into the tank as well as onto the concrete floor adjacent to the tank. The coating is allowed to dry (PCE is volatilized) and baked. The PCE recovery system treats the off gas from the flo-coat line.

The findings from the Stage 1 soil gas program are as follows.

1) Based on the history of the facility and soil gas results, most areas of Plant No. 3 can be eliminated as potential sources of the contamination at HN-24I. These areas are as follows.

- Alodine, Former Heat Treat, and Plating Shop Area
- Wash and Degrease Area
- Former Printed Circuit Area
- Zyglo Inspection Area

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- Paint Tunnels
- Former Paint Tunnels
- Former Chem Mill Area
- PCE Recovery and Former Sulfuric Acid Anodize Area

2) The only potential source area of HN-24I contamination from within Plant No. 3 identified during this study is the Former Honeycomb Cleaning Area. The testing in this area did not penetrate a reported sump and as a result it is uncertain if contamination exists underneath the sump.

3) Final conclusions cannot be developed for the Heat Treat Area, because testing was not conducted. However, soil gas results from an area within 50 feet and hydraulically downgradient of the Heat Treat Area sump were 0.5 ppm and less. This indicates that the Heat Treat Area sump may not be a potential source of HN-24I contamination.

4) The elevated soil gas readings at the Flo-Coat Area may result from PCE used in the process. Also note that this area is immediately adjacent to Site 1, which was found to have similar elevated soil gas results.

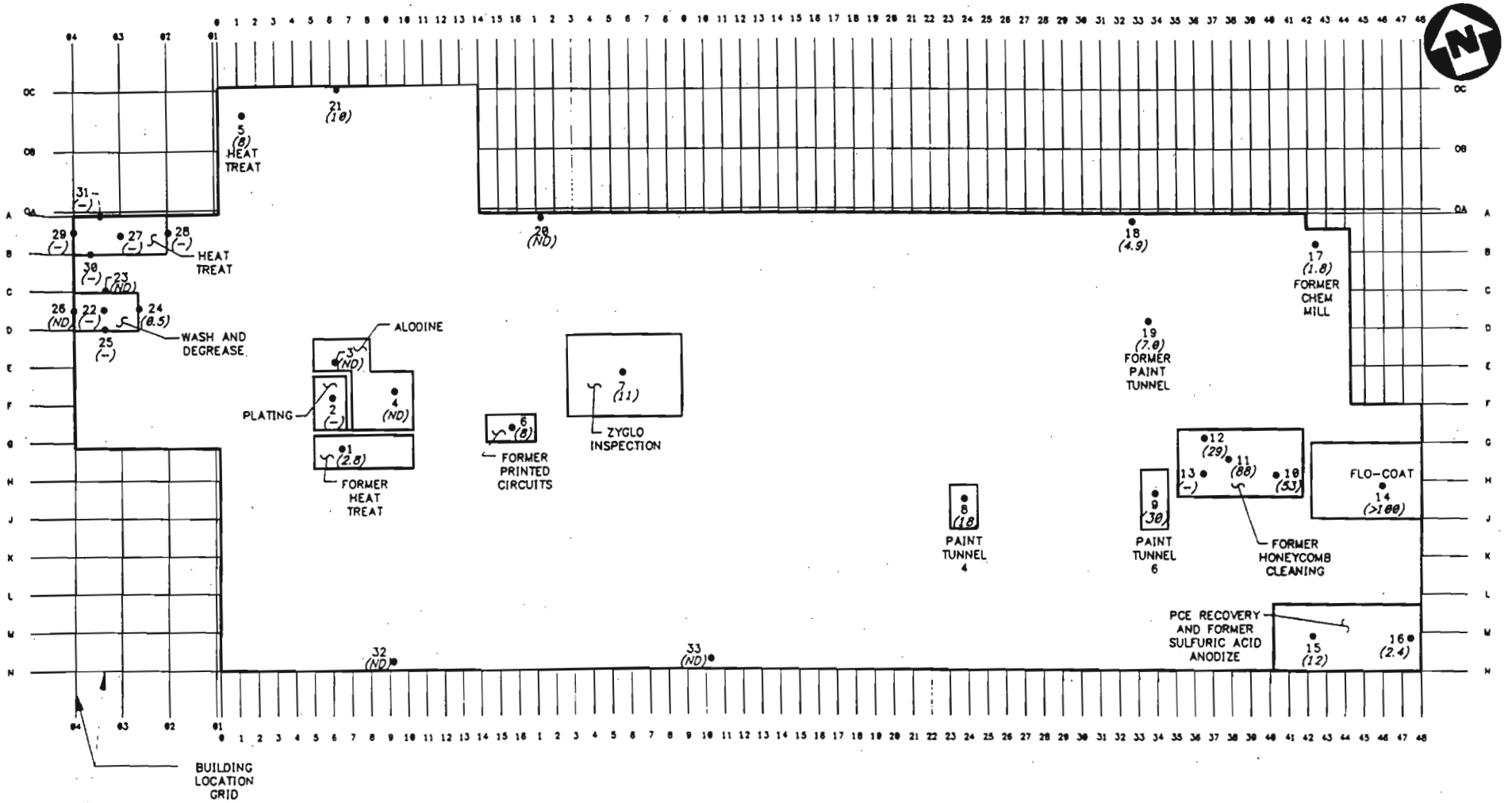
5) The stage 2 soil gas program will be used to resolve these issues.

Second Stage Soil Gas Program

A total of 7 soil gas readings were obtained within and immediately outside of Plant No. 3. Sampling locations are shown on Figure 4-11. The samples located within Plant No. 3 were taken to quantify the nature of the contamination that was discovered during the first stage soil gas program. The samples located immediately outside of the plant were taken to either identify or eliminate two former TCE tank areas as sources of volatile organic contamination; these areas were not investigated during the first stage soil gas program.

The results of the second stage soil gas program are presented in Table 4-10. Significant volatile organic contamination was detected at the honeycomb cleaning area. Sample SG-11, located in the southeastern corner of the former sump area, contained PCE at 5,000 ug/l, TCE at 280 ug/l, and TCA at 120 ug/l. Sample SG-10, located in the north-central portion of the former sump, contained PCE at 490 ug/l and TCA at 13 ug/l. Samples SG-38 and SG-39 were taken outside (south) of the former sump. These samples contained PCE at 240 ug/l and 990 ug/l, respectively, and TCA at 14 ug/l and 120 ug/l, respectively. Neither of these samples contained TCE at detectable levels.

The soil gas results indicate that the honeycomb cleaning area is a probable source area of volatile organic contamination. The high levels of contamination detected outside of the former sump area apparently indicate that not all of the volatile organic compounds used during this process were captured or contained by the sump. However, because the honeycomb cleaning area is located



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- ● 20 SAMPLING LOCATION
- (4.2) OVA READING – ppm
- (-) NOT MEASURED
- (ND) NON DETECT

STAGE 1 – SOIL GAS RESULTS
PLANT 3
PHASE 2 – REMEDIAL INVESTIGATION/FEASIBILITY STUDY
NWIRP, BETHPAGE, NEW YORK

APPROXIMATE SCALE
0 100 200
SCALE IN FEET

FIGURE 4-10

HALLIBURTON NUS
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13-4

TABLE 4-9

FIRST STAGE SOIL GAS SURVEY RESULTS - PLANT NO. 3
NWIRP BETHPAGE, NEW YORK

SAMPLE LOCATION	BUILDING COORDINATE	OVA (ppm)	DEPTH (ft)	COMMENTS
1	G6	2.8	2.5	Former heat treat area
2	F6	--	--	Concrete >18 inches thick, no sample taken
3	E6	ND	2.5	Alodine area
4	F9	ND	2.5	Alodine area
5	OC1	8.0	3.0	Adjacent to heat treat area; above ground tanks located outside
6	G14	8.0	3.0	Former printed circuits area, adjacent to paint locker
7	E6	11.0	2.5	Zyglo inspection area
8	H23	18	3.0	Paint tunnel #4; methyl ethyl ketone (MEK)
9	H32	30.0	3.0	Paint tunnel #6; MEK; zeroed out 5 ppm background in air
10	H40	53.0	3.0	Former honeycomb cleaning area; backfilled containment unit
11	H38	88.0	2.5	Same as above; obstruction at 2.5 feet
12	G36	29.0	3.0	Same as above; thin concrete (4-inches)
13	--	--	--	Same as above; no sample taken
14	H45	>100 [60]	3.0	Chem mill, flo-coat line; drilled through the drip-dry floor; 60 ppm sustained reading (100 ppm peak); 6 ppm background in air
15	M42	12.0	3.0	Former sulfuric acid anodize area; current PCE recovery area
16	M48	2.4	3.0	Same as above
17	B42	1.8	2.5	Former chem mill, current shot peen area
18	A32	4.9	3.0	Background sample taken in machine shop near Permasol-60 drum
19	D33	7.0	3.0	Machine shop, flammable waste drum marshalling area
20	A1	ND	3.0	Background sample; near outside doors
21	OC6	10.0	3.0	Background sample; machine shop
22	A04	--	--	TCE solvent tanks; wash and degrease pit; floor; concrete >18 inches thick;no sample
23	A04	ND	3.0	Same as above; south wall
24	A04	0.5	3.0	Same as above, east wall
25	A04	--	--	Same as above; north wall; concrete >18 inches thick; no sample
26	A04	ND	3.0	Same as above; west wall
27	A02	--	--	Heat treat area; pit floor; concrete >18 inches thick; no sample

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TABLE 4-9 (Continued)
FIRST STAGE SOIL GAS SURVEY - PLANT NO. 3
PAGE 2

SAMPLE LOCATION	BUILDING COORDINATE	OVA (ppm)	DEPTH (ft)	COMMENTS
28	A02	--	--	Same as above; wall; no sample
29	A02	--	--	Same as above; wall; no sample
30	A02	--	--	Same as above; wall; no sample
31	A02	--	--	Same as above; wall; no sample
32	N9	ND	3.0	Background sample; behind stairwell near outside doors
33	N10	ND	3.0	Background sample; drill and rivet shop

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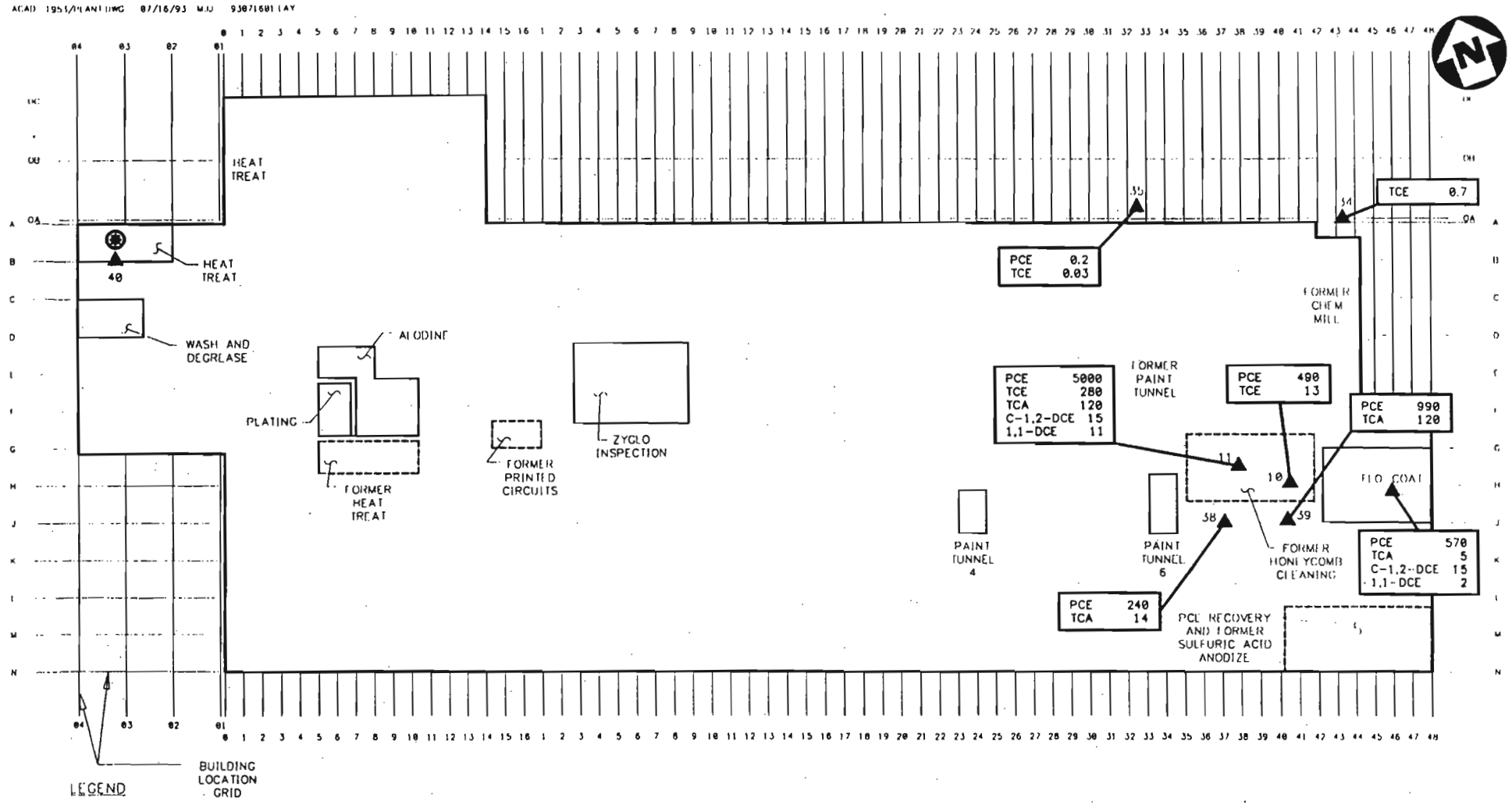

SOIL GAS SURVEY SAMPLE LOCATIONS AND RESULTS (ug/l)
INSIDE PLANT No. 3
PHASE 2 REMEDIAL INVESTIGATION/FEASIBILITY STUDY
NWIRP, BETHPAGE, NEW YORK

APPROXIMATE SCALE
0 100 200
SCALE IN FEET

FIGURE 4-11

HALLIBURTON NUS
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TABLE 4-10

SECOND STAGE SOIL GAS SURVEY RESULTS - PLANT NO. 3
NWIRP BETHPAGE, NEW YORK
(ug/l)

SAMPLE	DEPTH (FEET)	1,1-DCE	1,1-DCA	C-1,2-DCE	1,2-DCA	TCA	TCE	PCE	VINYL CHLORIDE	COMMENTS
SG-10	3	<96	<510	<280	<180	13	<3	490	<1	Honeycomb area; within former sump.
SG-11	3	11	<1	15	<140	120	280	5000	<1	Honeycomb area; within former sump.
SG-38	6	<96	<510	<280	<180	14	<3	240	<1	Honeycomb area; south of sump; general plant floor.
SG-39	6	<96	<510	<280	<180	120	<3	990	<1	Honeycomb area; south of sump; concrete "pad".
SG-FC	2.5	2	<3	15	<180	5	<3	570	<1	Active Flo-Coat area.
SG-40	..	..	..	..	..	..	..	..	..	Active TCE containment sump. No sample taken.
SG-34	3	<0.5	<3	<1	<0.9	<0.01	0.7	<0.02	<1	Former TCE tank area.
SG-35	3	<0.5	<3	<1	<0.9	<0.01	0.03	0.2	<1	Former TCE tank area.
N_2 Blank	...	<0.02	<0.1	<0.07	<0.05	<0.0006	<0.0008	<0.001	<0.5	---
H_2O Blank	...	<5	<26	<14	<9	<0.1	<0.2	<0.2	<110	---
System Blank	...	<0.02	<0.1	<0.07	<0.05	<0.0006	<0.0008	<0.001	<0.5	---
Air	...	<0.02	<0.1	<0.07	<0.05	<0.0006	<0.0008	<0.001	<0.5	---
Air	...	<0.05	<0.3	<0.1	<0.09	<0.001	<0.002	0.02	<0.5	---

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DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Naval Weapons Industrial Reserve Plant (NWIRP), Bethpage
Town of Oyster Bay
Nassau County, New York
New York Registry Number: 1-30-003B
Funding Source: Defense Environmental Restoration Account (DERA)

STATEMENT OF BASIS AND PURPOSE

The selected remedial action for the NWIRP Bethpage site 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 (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986. The factual and legal bases for selecting the remedy for this site is summarized in this decision document.

A list of documents that comprise the Administrative Record for the site is presented in Exhibit A. The documents in the Administrative Record provide the bases of 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 human health and the environment.

DESCRIPTION OF THE SELECTED REMEDY

Major components of the selected remedy include the following:

1. A **remedial design** to verify the components and provide the details necessary for the construction and implementation of a soil excavation and disposal program as well as a vapor extraction and air sparging (VE/AS) program. This will include delineation of the arsenic-contaminated soil area and the PCB-contaminated soil area. During the design process, an appropriate off-site incineration facility will be chosen which will accept that volume of soil contaminated with PCBs at concentrations in excess of 500 ppm. Also, an appropriate landfill will be chosen which will accept that volume of soil contaminated with PCBs at concentrations between 10 ppm and 500 ppm.

   The design will also provide for the development and implementation of an Operation and Maintenance Plan for the VE/AS system.

2. **Active remediation of the contaminated soils** by (1) excavating the arsenic-contaminated soils and fixating them either on-site or off-site and then disposing of the fixated product in an appropriate off-site landfill; (2) excavating the PCB-contaminated soils and incinerating (off-site) those soils with concentrations above 500 ppm and landfilling (off-site) those soils with concentrations between 10 ppm and 500 ppm. The Navy, at its discretion, may elect to incinerate PCB-contaminated soils with concentrations that are below 500 ppm, depending upon the volume. Pre-excavation sampling and analysis will be conducted to try and initially determine the volume of soils which should be included into each of the different disposal categories. During excavation, adjustments to the initial volumes may be made by using field screening kits. Confirmatory sampling will be conducted to determine when the excavation of soils is complete.

C-1

Active remediation of the VOC-contaminated soils will be accomplished by using a vapor extraction/air sparging (VE/AS) technology. This technology will address the VOC-contaminated vapor plume which exists in the unsaturated soils beneath portions of both Site 1 and Plant 3. The areas to be treated will have VOC concentrations equal to or greater than those shown in Table 3. Confirmatory sampling will be conducted to determine when these levels have been achieved. Please note that these levels are equal to three times the preliminary remediation goals (PRGs) for VOCs found in Table 1. The concentrations for VOCs which are to remain in place which exceed the PRGs are not expected to recontaminate the groundwater in excess of Federal or State standards and will eventually be flushed out of the unsaturated soils over a period of years via natural attenuation.

3. **Indirect remediation of groundwater** will be achieved by excavation and treatment of the sources of groundwater contamination, namely, the contaminated soils. In addition, the upper layers of the aquifer will be partially remediated via the air sparging technology.

4. The following **institutional controls** will be implemented:

   a. A 6-inch permeable gravel and/or vegetated soil cover will be installed on top of those areas where residual metal and organic contamination is expected to remain in place. This will ensure that the exposure pathways are eliminated from contact with the residual contamination. The permeability is required in order to promote rain water infiltration and natural attenuation of the residual VOCs.

   b. Deed restrictions will have to be invoked to restrict certain types of activities in areas where the residual contamination is expected to remain.

5. This Record of Decision also provides for an **interim remedial measure (IRM)**. Specifically, the Navy will reimburse the Bethpage Water District (BWD) for costs that have been determined to be fair and reasonable which are associated with providing a groundwater treatment system to the public water supply wells located at the Bethpage Water District's Plant #5. This treatment system is required to address anticipated future impact to BWD Plant #5 as a result of past VOC contamination emanating from the Navy's property. It will be the decision of the Bethpage Water District as to the type of treatment which will be provided to Plant #5. A determination of what is considered fair and reasonable will be made after a Navy review of the treatment system's plans and specifications and subsequent negotiations with the Bethpage Water District. The expenditure of funds associated with the reimbursement process is what will be considered as the Navy's IRM.

DECLARATION

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment to the maximum extent practicable. Because this remedy will not allow for unlimited use and unrestricted exposure within five years after commencement of remedial action, a five year policy review will be conducted. This evaluation will be conducted within five years after completion of the construction of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

CAPTAIN S. R. BEATTIE
by direction of the
Commander, Naval Air Systems Command

7/5/95
Date

Michael J. O'Toole, Jr.
Director, Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation

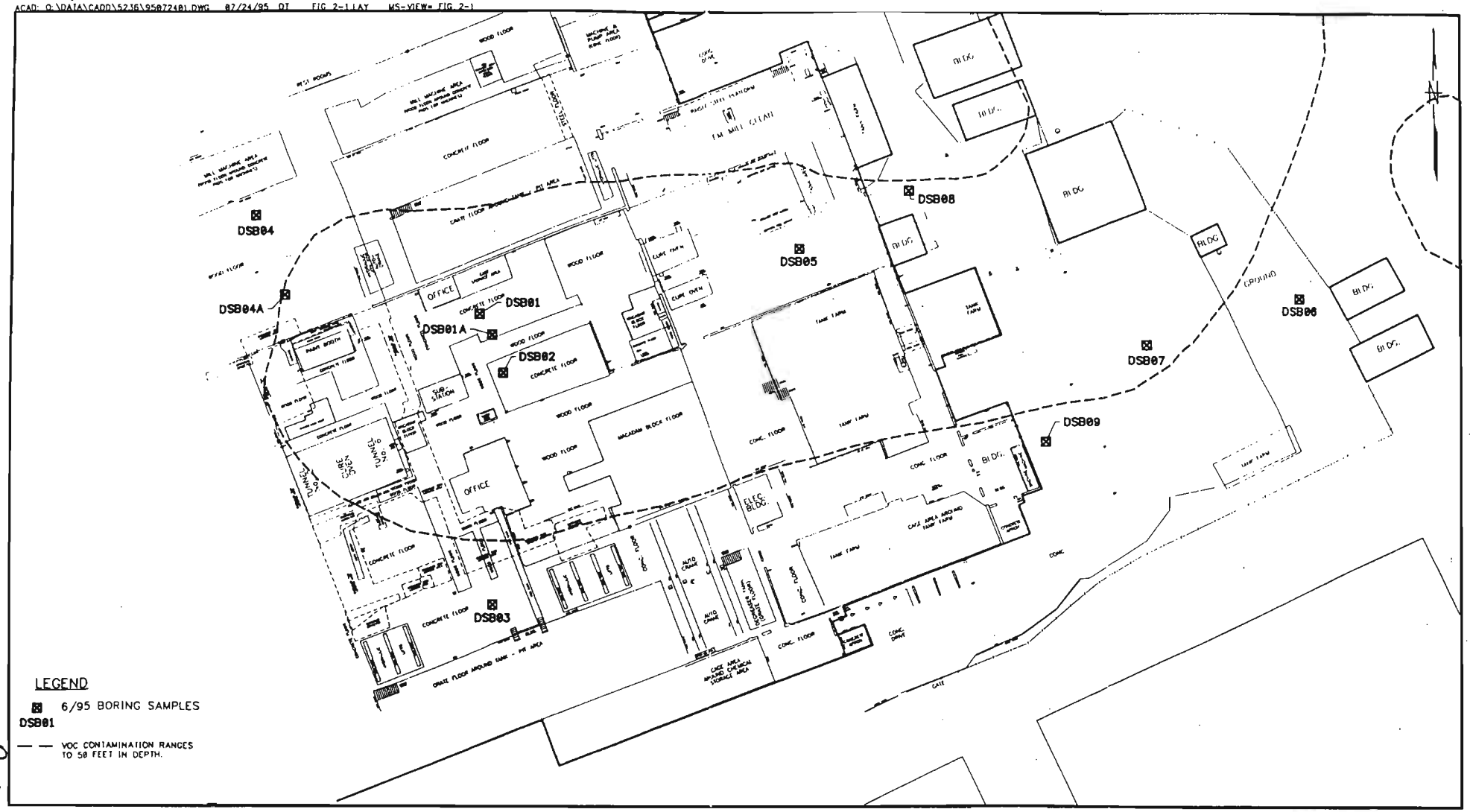
C-2

PROPOSED REMEDIAL ACTIONS
NWIRP CALVERTON, NY

SITE 1 - SOILS

Chemical of Concern	Proposed Remedial Action					
	Fixation/Offsite Landfilling	Offsite Incineration	Vapor Extraction	Offsite Landfilling	Natural Flushing[1]	Permeable Cover and Deed Restrictions
Trichloroethene			>0.030 mg/kg		0.01 to 0.03 mg/kg	0.01 to 0.03 mg/kg
Tetrachloroethene			>0.081 mg/kg		0.027 to 0.081 mg/kg	0.027 to 0.081 mg/kg
1,1,1-Trichloroethane			>0.030 mg/kg		0.01 to 0.03 mg/kg	0.01 to 0.03 mg/kg
Chlordane						>0.206 mg/kg
Total Aroclors		>500 mg/kg		10 to 500 mg/kg		1 to 10 mg/kg
Benzo(a)anthracene						>0.33 mg/kg
Chrysene						>0.33 mg/kg
Benzo(b)fluoranthene						>0.33 mg/kg
Benzo(k)fluoranthene						>0.33 mg/kg
Benzo(a)pyrene						>0.33 mg/kg
Indeno(1,2,3-cd)pyrene						>0.33 mg/kg
Dibenzo(a,h)anthracene						>0.33 mg/kg
Arsenic	TCLP As > 5 mg/l in the CCWE[2].					>5.4 mg/kg
Manganese						>142 mg/kg

ACAD: Q:\DATA\CADD\5236\9507248.DWG 07/24/95 DT FIG 2-1.LAY MS-VIEW= FIG 2-1



1-0

FIGURE 2-1

0 50 100
SCALE IN FEET

BORING LOCATIONS
NWIRP, BETHPAGE, NEW YORK

C.F. BRAUN
ENGINEERING CORP.

TABLE 3-1

HNu READINGS FROM JUNE 1995 SAMPLING EVENT
NWIRP BETHPAGE, NEW YORK

Soil Boring	Depth of Sample (feet)	HNu Reading (ppm)	
		Split Spoon	Head Space
DSB01	0.5 to 2.5	6	0
	5.0 to 5.5	16	NR
DSB01A	5.0 to 7.0	12	5
	10 to 12	4	1
	15 to 17	4	4
	20 to 22	8	18
	25 to 27	20	50
	30 to 32	9	7
	35 to 37	3	5
	40 to 42	5	5
	45 to 47	4	4
	50 to 52	3	4
	55 to 57	40	20
	60 to 62	0	0
DSB02	0.5 to 2.5	4	0
	5.0 to 7.0	0	0
	10 to 12	0	0
	15 to 17	0	1
	20 to 22	0	0
	25 to 27	0	1
	30 to 32	1	0
	35 to 37	0	0
	40 to 42	0	0
	45 to 47	0	0
	50 to 52	0	0
	55 to 57	0	0
	60 to 62	0	NR

10-2

TABLE 3-1 (Continued)
HNu READINGS FROM JUNE 1995 SAMPLING EVENT
NWIRP BETHPAGE, NEW YORK

Soil Boring	Depth of Sample (feet)	HNu Reading (ppm)	
		Split Spoon	Head Space
DSB03	0.5 to 2.5	0	0
	5.0 to 7.0	0	0
	10 to 12	0	0
	15 to 17	0	1
	20 to 22	0	0
	25 to 27	0	0
	30 to 32	0	0
	35 to 37	2	2
	40 to 42	0	0
	45 to 47	0	0
	50 to 52	0	0
	55 to 57	0	0
	60 to 62	2	NR
DSB04	1.0 to 3.0	0	0
	5.0 to 6.5	0	1
DSB04A	5.0 to 7.0	0	0
	10 to 12	0	1
	15 to 17	0	0
	20 to 22	0	2
	25 to 27	NR	NR
	30 to 32	18	10
	35 to 37	10	7
	40 to 42	2	3
	45 to 47	0	2
	50 to 52	2	4
	55 to 57	4	8
	60 to 62	0	2.5

D-3

TABLE 3-1 (Continued)
HNu READINGS FROM JUNE 1995 SAMPLING EVENT
NWIRP BETHPAGE, NEW YORK

Soil Boring	Depth of Sample (feet)	HNu Reading (ppm)	
		Split Spoon	Head Space
DSB05	0 to 2	3	6
	5 to 7	0	1.5
	10 to 12	2	4
	15 to 17	13	24
	20 to 22	10	12
	25 to 27	6	1
	30 to 32	6	0
	35 to 37	6	6
	40 to 42	3	1
	45 to 47	5	4
	50 to 52	3	3
	55 to 57	16	3
	57 to 59	0	NR
	60 to 62	0	NR
DSB06	0 to 2	0	0
	5 to 7	0	1
	10 to 12	0	0
	15 to 17	0	0
	20 to 22	19	20
	25 to 27	1	5
	30 to 32	0	0
	35 to 37	0	0
	40 to 42	0	0
	45 to 47	0	4.8
	50 to 52	0	2
	55 to 57	6	15
	60 to 62	0	NR

D-4

TABLE 3-1 (Continued)
HNu READINGS FROM JUNE 1995 SAMPLING EVENT
NWIRP BETHPAGE, NEW YORK

Soil Boring	Depth of Sample (feet)	HNu Reading (ppm)	
		Split Spoon	Head Space
DSB07	1.0 to 2.5	1	0
	5.0 to 7.0	NR	1
	10 to 12	NR	NR
	15 to 17	0	1
	20 to 22	5	25
	26 to 28	1.4	7
	30 to 32	1	5
	35 to 37	5	6
	40 to 42	4	11
	45 to 47	5	6
	50 to 52	7	6
	55 to 57	5	10.6
	60 to 62	0	NR
DSB08	1.0 to 3.0	1	2
	5.0 to 7.0	5	2.5
	10 to 12	1	1
	15 to 17	7	14
	20 to 22	4	3
	25 to 27	1	4
	30 to 32	0	4.6
	35 to 37	0	7
	40 to 42	0	3
	45 to 47	1.8	2.5
	50 to 52	NR	NR
	55 to 57	4	5
	60 to 62	NR	NR

D-5

TABLE 3-1 (Continued)
HNu READINGS FROM JUNE 1995 SAMPLING EVENT
NWIRP BETHPAGE, NEW YORK

Soil Boring	Depth of Sample (feet)	HNu Reading (ppm)	
		Split Spoon	Head Space
DSB09	1.3 to 2.8	0	0
	5.0 to 6.5	0	0
	10 to 11.5	0	0
	15 to 16.5	0	0
	20 to 21.5	0	14.5
	25 to 26.5	14	4
	30 to 31.5	1	2
	35 to 36.5	2	10
	40 to 41.5	0.8	1.8
	45 to 46.5	1	6
	50 to 51.5	0	0
	55 to 56.5	3	1
	60 to 61.5	0	NR

NR - No Reading Taken

D-6

TABLE 3-3

SOIL SAMPLE ANALYTICAL RESULTS
JUNE, 1995 SAMPLING EVENT
NWIRP BETHPAGE, NEW YORK

	Acetone	Trichloroethene (TCE)	Tetrachloroethene (PCE)
Soil Boring #1 (DSB01)			
0.5' to 2.5'	BDL	BDL	BDL
Soil Boring #1A (DSB01A)			
25' to 27'	BDL	BDL	BDL
55' to 57'	BDL	BDL	BDL
Soil Boring #2 (DSB02)			
0.5' to 2.5'	BDL	BDL	BDL
15' to 17'	BDL	BDL	BDL
60' to 62'	BDL	BDL	BDL
Soil Boring #3 (DSB03)			
5' to 7'	BDL	BDL	BDL
35' to 37'	BDL	BDL	BDL
55' to 57'	BDL	BDL	BDL
Soil Boring #4 (DSB04)			
1' to 3'	BDL	BDL	BDL
Soil Boring #4A (DSB04A)			
30' to 32'	BDL	BDL	BDL
55' to 57'	BDL	BDL	BDL
Soil Boring #5 (DSB05)			
0' to 2'	BDL	6 µg/Kg	20 µg/Kg
15' to 17'	BDL	BDL	BDL
55' to 57'	BDL	BDL	BDL
Soil Boring #6 (DSB06)			
0' to 2'	BDL	BDL	BDL
20' to 22'	BDL	BDL	BDL
55' to 57'	BDL	BDL	BDL
Soil Boring #7 (DSB07)			
1.0' to 2.5'	BDL	BDL	BDL
20' to 22'	BDL	BDL	BDL
55' to 57'	BDL	BDL	BDL

D-7

TABLE 3-3 (Continued)
SOIL SAMPLE ANALYTICAL RESULTS
JUNE, 1995 SAMPLING EVENT
NWIRP BETHPAGE, NEW YORK

	Acetone	Trichloroethene (TCE)	Tetrachloroethene (PCE)
Soil Boring #8 (DSB08)			
1' to 3'	BDL	BDL	19 µg/Kg
15' to 17'	BDL	BDL	BDL
55' to 57'	37 µg/Kg	BDL	BDL
Soil Boring #9 (DSB09)			
1.3' to 2.8'	BDL	BDL	BDL
35' to 37'	BDL	BDL	BDL
55' to 57'	25 J µg/Kg	BDL	BDL

BDL Below Detection Limit
J Estimated Value

D-8

2.0 FIELD INVESTIGATION

This section describes the field investigation activities conducted at Site 1 - Former Drum Marshaling Area, NWIRP, Bethpage, New York. The field investigation activities included the drilling of nine soil borings to groundwater, three soil borings to refusal at six feet deep, and the collection and analysis of 39 subsurface soil samples.

2.1 SOIL BORINGS AND SUBSURFACE SOIL SAMPLING

The soil boring locations for the pre-design investigation are shown in Figure 2-1. The borings locations were selected to verify levels of contamination under Plant Number 3 and in the area to the east of Plant Number 3. The borings within Plant Number 3 were selected to verify soil gas samples collected during the Phase II RI and also to verify the extent of the VOC contamination shown previously in Figure 1-3. The high soil gas reading collected during the Phase II RI were in an area referred to as the former Honeycomb Cleaning Area. This area was decommissioned, backfilled with soil and a concrete floor was installed to match the existing Plant Number 3 floor. This area used a high volume of solvents and is a potential VOC contamination source. Based on this information, boring DSB01 was proposed to be drilled within the former Honeycomb Cleaning Area.

A total of nine soil borings (DSB01 through DSB09) were proposed during this investigation. In the attempt to drill in the locations of boring number 1 (DSB01) and boring number 4 (DSB04), which were located inside of Building Number 3, subsurface concrete was encountered at a depth of approximately six feet. Attempts to penetrate the subsurface concrete were unsuccessful because of the presences of reinforcing steel, therefore new locations for these borings were selected in the field. A soil sample was collected from both of these original locations between the subsurface concrete and the building's concrete floor. DSB01 was located in the area of the former Honeycomb Cleaning Area. The dimensions of the Honeycomb Cleaning Area were approximately 20 feet by 40 feet and could be visually distinguished via breaks in the building floor. The alternate location for the boring (labeled DSB01A) was relocated directly outside and down gradient of the former Honeycomb Cleaning Area. DSB04 was not located in an area expected to have subsurface concrete. An attempt to move the boring three feet from the initial boring attempt also hit subsurface concrete. After the necessary utility clearances were performed the boring was relocated approximately forty five feet down gradient of the original location. This boring, labeled DSB04A, was successfully drilled to the water table.

D-9

The soil borings were drilled with 3¼-inch inside diameter hollow stem augers. Soil samples were collected at 5-foot intervals with 2-inch outside diameter split-barrel samplers. Physical characteristics (density, color, lithology, and moisture content) of each sample were recorded on boring logs maintained by Halliburton NUS. Boring logs are provided in Appendix A. The headspace from each soil sample was field screened with an HNu organic vapor monitor, and the readings were recorded on the boring logs.

A total of 39 soil samples were collected for analysis. Three soil samples from each soil boring (27 total) were collected and analyzed for Target Compound List (TCL) volatile organic compounds (VOC). One sample was collected from the first two feet below the ground surface and another sample was collected in the middle of each boring in the location which had the highest headspace reading; the third sample from each boring was collected from immediately above the soil/groundwater interface. Three soil samples from four soil borings (12 total) were collected for geotechnical parameters (Soil Classification-ASTM D2487). These samples were selected in order to provide representative data of the subsurface lithology. A record of the samples collected is provided in Appendix B and the chain of custody form associated with these samples are provided in Appendix C.

All down hole drilling equipment and the rear of the drilling rig were decontaminated with pressurized steam prior to drilling, between boreholes, and prior to leaving the site. Decontamination was conducted at a decontamination pad. All sampling equipment (split-barrel samplers and stainless steel trowels) were decontaminated in accordance with the Field and Sampling Plan. All decontamination fluids were collected and disposed on site at the Waste Water Disposal Facility. All boreholes were backfilled with the soil cuttings. Any remaining soil cuttings were containerized in 55-gallon, DOT-approved drums and stored on site. A record of the daily activities were recorded and a copy of these forms are provided in Appendix D.

D-10

sieve sizes range from 1 inch openings to the number 200 sieve (0.0029 inch openings). This sieve analysis is used to perform the classification analysis.

- Sand is defined as; particles of rock that pass the No. 4 sieve but are retained on the number 200 sieve. The results indicate medium to fine grained sand.

- Gravel is defined as particles of rock that pass the 3 inch sieve but are retained on a No. 4 sieve. The results of these samples indicate some areas contain fine grained gravel but most do not.

The Atterberg Limits test (ASTM 4318) determines the plasticity of soils. The plasticity of soils is the relationship between water content and soil behavior is defined as the amount of deformation a soil can withstand without breaking. Plastic soils contain fines such as silt and clay which fill the voids between grains. Sandy soils typically break or crack under minor stress and are non-plastic. The results of the tests indicate the soils are non-plastic. This is consistent with sandy soils.

The results of the soil analysis indicate that sandy soil is typical for the Site 1 area and is usually well drained due to the voids present between the grains of sand. The use of air sparging/vapor extraction is well suited to sandy soils, due to these associated void spaces.

3.2.2 Chemical Results

Soil samples were collected from the 11 soil boring locations as shown on Figure 3-1. Two of the locations (DSB01 and DSB04) were only sampled from the top interval due to difficulties in drilling through subsurface concrete. The subsurface concrete contained re-bar and could not be penetrated with the available equipment, therefore the drill rig was relocated down gradient and drilling continued at the new locations. Samples from the two new locations (DSB01A and DSB04A) were collected from the middle and bottom intervals of these borings.

The results of all the chemical testing are provided in Table 3-3. As shown in Table 3-3 there was minimal contamination was found at the locations sampled. Only two borings (DSB05 and DSB08) contained chlorinated organics at concentrations above detection limits. Both samples were collected from the top interval just below the Plant Number 3 Floor. The concentrations detected at these locations are below the Remedial Action Levels identified in Table 1-1. DSB08 and DSB09 detected the presence of acetone in the bottom (55 to 57 feet) interval. Currently, there is no remedial action level for acetone in soil.

D-11

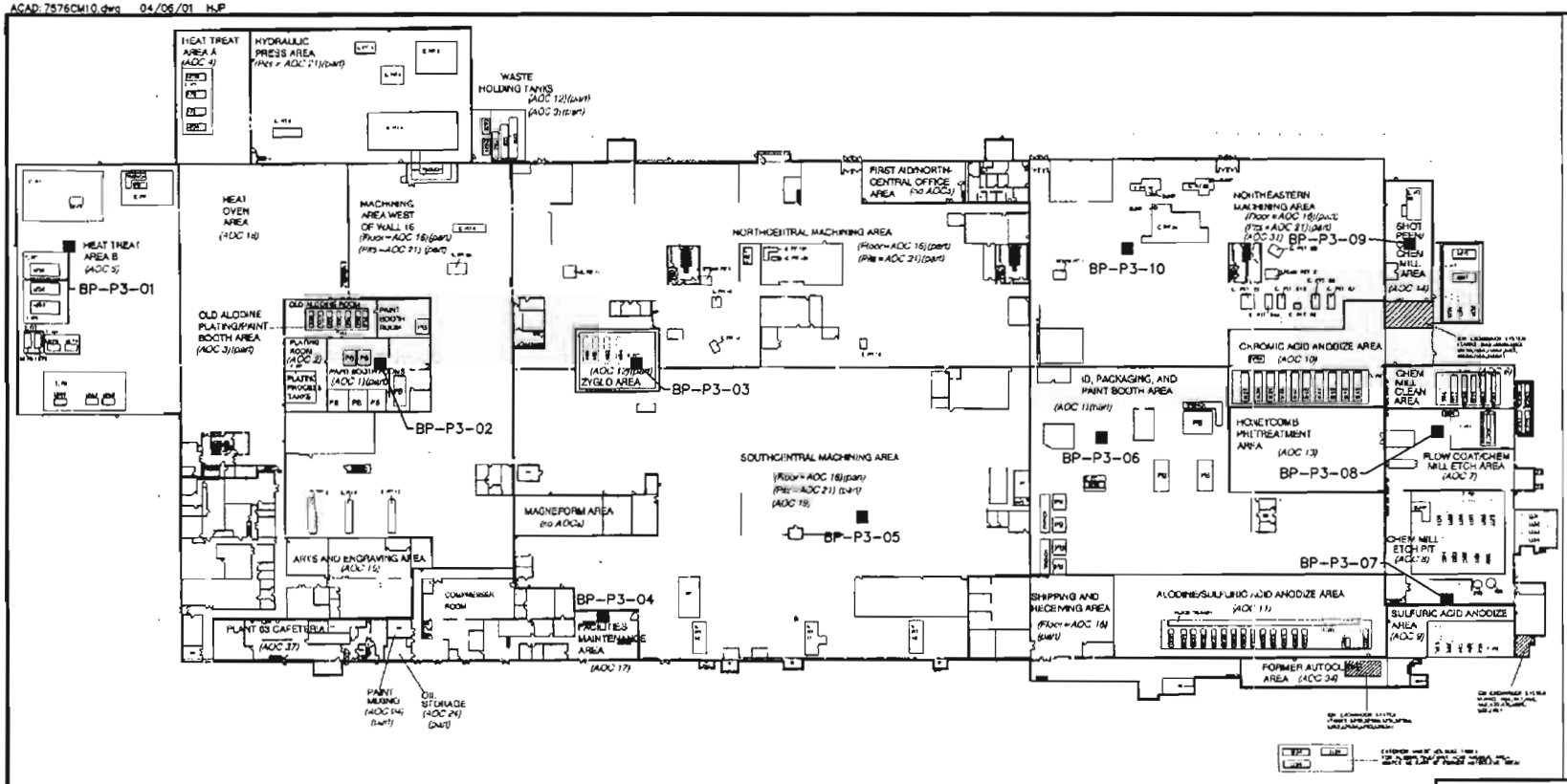
The sample for DSB08 was analyzed eight days after collection which is one day over the required holding time for VOCs, according to the New York State Department of Environmental Conservation (NYSDEC) Regulation. The first analysis of the sample had a low internal standard and had to be rerun, therefore the second time the sample was analyzed it was out of compliance. The result of the first analysis with a low internal standard was 41 μg/kg for PCE. The result of the second analysis was 19 μg/kg for PCE. The value of 19 μg/kg would receive a J qualifier if the data was validated and would be considered an estimated value due to the missed holding time. Complete analytical information provided from the laboratory is provided in Appendix G.

During the collection of the samples, field readings using an HNu were recorded (see Table 3-1). Field readings were minimal and correlate with the laboratory data indicating that no major source of contamination was located.

The results of the Site 1, Remedial Design, Phase II sampling effort are summarized on Figure 3-1 along with historic data above action levels. The soil samples collected inside of Plant Number 3 were collected from the general area from which elevated soil gas samples had been collected during previous investigations. The soil samples do not confirm that a VOC source is present in the area. DSB01 was placed within the honeycomb cleaning area where the elevated soil gas readings were obtained. The results of DSB01 were below detection limits for the VOCs. DSB01A was located immediately down gradient of the former honeycomb cleaning area and did not detect any VOC contamination. Additionally, the sample collected at the bottom of DSB01A was collected at the groundwater interface and contained a moisture content of 16 percent. This sample would be expected to contain VOCs if the former Honeycomb cleaning area is a significant source and is impacting the groundwater.

D-12

ACAD: 7576CM10.dwg 04/06/01 HJP



Spring 2001

LEGEND

■ AIR SAMPLING LOCATION

0 110 220

APPROXIMATE SCALE IN FEET

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY HJP DATE 3/19/01

CHECKED BY DATE

COST/SCHED-AREA

SCALE AS NOTED

Tetra Tech NUS, Inc.

INTERIOR AIR SAMPLING LOCATIONS
PLANT 3 – BUILDING 03-01
NWIRP BETHPAGE, NEW YORK

CONTRACT NO. 7576

OWNER NO.

APPROVED BY DATE

APPROVED BY DATE

DRAWING NO. FIGURE 2-1

REV. 0

TABLE 3-1

AIR SAMPLING ANALYTICAL RESULTS
PLANT 3
NWIRP BETHPAGE, NEW YORK

PARAMETER	BP-P3-01 (AVG)	BP-P3-02	BP-P3-03	BP-P3-04	BP-P3-05	BP-P3-06	BP-P3-07	BP-P3-08 (AVG)	BP-P3-09	BP-P3-10	BP-P3-11	BP-P3-12	BP-P3-13	BP-P3-14
Volatile Organic Compounds ($\mu g/m^3$)														
1,1,1-TRICHLOROETHANE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.8 J	ND	ND
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	ND	ND	ND	ND	ND	ND	16.2	ND	ND	ND	ND	ND	ND	ND
ACETONE	13.2	ND	8.1 J	6.9 J	10.7 J	7.1 J	7.4 J	6.4 J	7.4 J	8.3 J	ND	ND	ND	ND
CIS-1,2-DICHLOROETHENE	ND	ND	ND	ND	ND	ND	4 J	ND	ND	ND	ND	ND	ND	ND
METHYLENE CHLORIDE	5 J	13.4	5.9 J	5.9 J	6.2 J	5.5 J	8.3	5 J	6.2 J	5.5 J	4.1 J	3.8 J	3.4 J	3.8 J
TETRACHLOROETHENE	0.49	ND	ND	ND	ND	ND	2.8	0.93	0.98 J	0.68 J	ND	ND	ND	ND
TOLUENE	6.9	4.4 J	3.7 J	3.5 J	4.1 J	3.7 J	3.5 J	3	3.6 J	4.4 J	ND	3.2 J	ND	ND
TRICHLOROETHENE	4.6 J	6.8 J	6.3 J	6.3 J	6.8 J	6.8 J	15.3	6.1 J	12.6	6.8 J	ND	6.3 J	ND	ND
TRICHLOROFLUOROMETHANE	6.9	10.6 J	3.9 J	3.2 J	3.5 J	3.2 J	2.9 J	ND	3.1 J	3.3 J	ND	6.1 J	ND	ND
XYLENES (TOTAL)	2.8	ND	ND	ND	ND	ND	ND	ND	ND	4.8 J	ND	ND	ND	ND

Notes:
Only detected analytes are shown.
J = Estimated value.
ND = Not detected.

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL # of pages ► 3

To STEVE SCHARF	From Jim COLTER
Dept./Agency NYSDEC	Phone #
Fax # 518-402-9627	Fax #

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

ENCLOSURE 2

ENVIRONMENTAL COVENANTS, CONDITIONS, RESERVATIONS, and RESTRICTIONS

ENVIRONMENTAL COVENANTS, CONDITIONS, RESERVATIONS, and RESTRICTIONS

105-ACRE PARCEL

1. Notice of Environmental Condition: Information concerning the environmental condition of the 105-Acre Parcel is contained in the documents known as the Environmental Baseline Survey to Transfer, 105-Acre Parcel, September 2000, at the former Naval Weapons Industrial Reserve Plant, Bethpage, NY, which is incorporated herein by reference, and the receipt of which are hereby acknowledged by the GRANTEE.

2. Covenant required by Title 42, United States Code at section 9620(h)(3)(B): In accordance with the requirements and limitations contained in *Title 42, United States Code at section 9620(h)(3)(B)*, the GRANTOR hereby warrants that:

(a) all remedial action necessary to protect human health and the environment with respect to any hazardous substances remaining on the 105-Acre Parcel has been taken, and

(b) any additional remedial action found to be necessary after delivery of this Deed shall be conducted by the GRANTOR.

3. Reservation of Access by Title, 42 United States Code at the section 9620(h)(3)(C): In accordance with the requirements and limitations contained in *Title42, United States Code at section 9620(h)(3)(C)*, the GRANTOR expressly reserves all reasonable and appropriate rights of access to the 105-Acre Parcel described herein when remedial action or corrective action is found to be necessary after delivery of this Deed. The right of access described herein shall include the right to conduct tests, investigations, and surveys, including, where necessary, drilling, testpitting, boring, and other similar activities. Such rights shall also include the right to conduct, operate, maintain or undertake any other response or remedial action as required or necessary including, but not limited to, monitoring wells, pumping wells, and treatment facilities. Said activities shall also be performed with necessary precautions, including appropriate monitoring and controls, to ensure that these are done in a manner protective of human health and environment. GRANTEE agrees to comply with activities of the GRANTOR in furtherance of these covenants and will take no action to interfere with future necessary remedial and investigative actions of the GRANTOR. Any such entry, including such activities, responses or remedial actions, shall be coordinated with the GRANTEE or its successors and assigns, and shall be performed in a manner which minimizes (a) any damage to any structures on the 105-Acre Parcel and (b) any disruptions of the use and enjoyment of the 105-Acre Parcel.

4. Lead-Based Paint: The GRANTEE covenants and agrees, on behalf of itself, its successors and assigns, that it will comply with all Federal, state, and local laws relating to lead-based paint in its use and occupancy of the 105-Acre Parcel (including demolition and disposal of existing improvements). The GRANTEE shall hold harmless and indemnify the GRANTOR from and against any and all loss, judgement, claims, demands, expenses, or damages or whatever nature or kind which might arise or be made against the GRANTOR as a result of lead-based paint having been present on the 105-Acre Parcel herein described. Improvements on the 105-Acre Parcel were constructed prior to 1978 and, as with all such improvements, a lead-based paint hazard may be present.

5. Presence of Asbestos: The GRANTEE, its successors and assigns, are hereby warned and do acknowledge that certain portions of the improvements on the 105-Acre Parcel subject to this Deed are thought to contain asbestos-laden materials. The GRANTEE, by acceptance of this Deed, covenants and agrees, for itself, its successors and assigns, that in its use and occupancy of the 105-Acre Parcel (including demolition and disposal of existing improvements) it will comply with all Federal, state, and local laws relating to asbestos and that the GRANTOR assumes no liability for damages for personal injury, illness, disability or death to the GRANTEEOR, or to GRANTEE's successors, assigns, employees, invitees, or any other person, including members of the general public, arising from or incident to the purchase, transportation, removal, handling, use, disposition, or other activity causing or leading to contact of any kind whatsoever with asbestos on the 105-Acre Parcel, whether the GRANTEE, its successors or assigns, has properly warned or failed to properly warn the individual(s) injured. Section 101-47.304-13 of the Federal Property Management Regulations contains complete warnings and responsibilities relating to asbestos-laden materials.

6. Groundwater: The GRANTEE, its successors and assigns are hereby warned and do acknowledge that use of the groundwater on the 105-Acre Parcel subject to this Deed is restricted. The GRANTEE, by acceptance of this Deed, covenants and agrees, for itself, its successors and assigns, that it will comply with the groundwater use restriction described below:

> An **institutional control** consisting of the placement of a restriction in the deed of transfer to the County of Nassau, New York prohibiting extraction of groundwater from within the boundaries of the 105-acre parcel located at the Navy's former Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage facility. In order to aid in the compliance with the deed restriction, the Navy has completed the abandonment of the seven (7) deep production wells formerly located on the 105-acre parcel. The production wells were used for the extraction of groundwater as non-contact cooling water to support operations conducted by NGC during a time when Northrop Grumman leased the 105-acres from the Navy. If a future occupant of the Navy's 105-acre parcel wishes to pursue groundwater extraction, GRANTEE hereby convenants, on behalf of itself, its successors, and its assigns, to furnish prior notification and secure written permission from the Nassau County Department of Health and/or New York State Department of Environmental Conservation.

7. Excavation: The GRANTEE, its successors, and its assigns are hereby notified that residual chemicals exist at various Areas of Concern (AOCs) throughout the 105-acre parcel in subsurface soils at various depths but no shallower than 6-inches below land surface. The locations of these AOCs are identified and summary information regarding each AOC can be found, in Appendix A of the Final FOST for NWIRP Bethpage dated January 2003. The GRANTEE, its successors, and its assigns are hereby notified that these residual chemicals, in some instances, do exceed NYSDEC TAGM 4046 State Recommended Soil Cleanup Objectives. In response, the GRANTOR hereby notifies the GRANTEE that for all AOCs, a barrier of either soil, gravel, concrete, or a combination of same is currently in place in order to eliminate potential exposure pathways to these residual chemicals. GRANTEE hereby convenants, on behalf of itself, its successors, and its assigns, that a request shall be submitted to NYSDEC and NYSDOH for review and approval before excavating, or otherwise disturbing subsurface soils at designated AOC areas. Any contaminated soils that are excavated from the 105-Acre Parcel must be properly disposed at appropriate off-site locations.

8. Covenant and Restriction Regarding Development for Permanent Residential Use: GRANTEE hereby covenants, on behalf of itself, its successors, and its assigns, that the 105-Acre Parcel will not be used for non-industrial purposes such as residential, recreational, and child day care land uses (it being understood that the preferred land reuse for this Parcel is commercial/industrial as outlined in the Navy's Final Environmental Impact Statement (FEIS) dated April 2000).

9. Vapor Intrusion: The GRANTEE, its successors and assigns do hereby acknowledge that the latest use with the existing floor plan of Plant 3, located on the Navy's 105-acre parcel, was non-residential and that the current quality of the indoor air within Plant 3 meets those standards for occupancy of a commercial/industrial building as set forth by the Occupational Safety and Health Administration (OSHA). The GRANTEE, by acceptance of this Deed, covenants and agrees, for itself, its successors and assigns, that if a change in the use of Plant 3 building pursued for uses other than commercial/industrial or a change in the existing floor plan of Plant 3, prior notification and written permission must first be secured from the New York State Department of Environmental Conservation. The GRANTEE further covenants and agrees, for itself, its successors and assigns, that in order to prevent any potential impacts to indoor air quality, any new structures built on the 105-Acre Parcel shall, if deemed necessary by the New York State Department of Environmental Conservation, include a sub-slab venting/depressurization system designed by an engineer licensed to practice in New York State.

DEPARTMENT OF THE NAVY
ENGINEERING FIELD ACTIVITY, NORTHEAST
NAVAL FACILITIES ENGINEERING COMMAND
10 INDUSTRIAL HIGHWAY
MAIL STOP, #82
LESTER, PA 19113-2090

RECEIVED
OCT 14 2003

IN REPLY REFER TO
5090
Code EV21/JLC

09 OCT 2003

Mr. Steve Scharf
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233-1010

Dear Steve:

Subj: Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage, New York
New York Registry of Inactive Hazardous Waste Sites #1-30-003B

The Navy is in receipt of your letter dated July 25, 2003, in which it is stated that New York State has no further comments with regards to the Navy's Finding of Suitability to Transfer (FOST) document that was submitted in January 2003 for 96 acres of the Navy's NWIRP Bethpage facility. The Navy appreciates receiving this letter and is confident that it can now successfully pursue conveyance of the Navy's property to Nassau County, New York.

Your July 25, 2003 letter further indicates that NYSDEC action on the Navy's request to modify the boundaries of Site 1-30-003B in NYSDEC's Registry of Inactive Hazardous Waste Sites awaits further input from the Navy on questions of soil vapor analyses and a potential for soil vapor intrusion in Plant 3 as discussed at a January 29, 2003 meeting between the Navy and New York State personnel. The enclosed Technical Memorandum addresses those questions. It clarifies past Navy actions regarding soil contamination and soil vapor analysis and further compares existing condition data with draft EPA guidance regarding soil vapor intrusion. The Technical Memorandum shows that the condition of the building (Plant 3) is protective of human health and the environment by all existing standards. In addition, the Navy will include restrictive language in the upcoming deed of transfer to Nassau County, as shown in the enclosed deed excerpt, that requires reassessment of the potential vapor intrusion pathway if any change in building use is proposed by future owners.

As you know, the requested boundary modification is needed to effect the final transfer of the remediated portion of NWIRP Bethpage to Nassau County, New York for economic redevelopment. Both the Navy and Nassau County desire this transfer to occur as soon as possible. Please review the enclosed information and advise the Navy if the boundaries of the Inactive Hazardous Waste Site #1-30-003B can now be modified so that the Navy may proceed with the property transfer.

If you have any questions, please give me a call at (610) 595-0567, extension 163.

Sincerely,

JAMES L. COLTER
Remedial Project Manager
By Direction of the
Commanding Officer

Enclosures: (1) Technical Memorandum Soil Remediation/Soil Vapor Issue Building (Plant) 3 dated October 2003
(2) Deed Restrictions for NWIRP Bethpage (see Item 9)

Distribution:
NYSDEC (Albany), Erin M. Crotty (Commissioner)
NYSDEC (Albany), Dennis Farrar
NYSDEC (Albany), Henry Wilkie
NYSDEC (Stony Brook), Stan Farkas
NYSDOH, Becky Mitchell
EPA Region II, Carol Stein
EPA Region II, Carla Struble
Nassau County Health, John Lovejoy

Bethpage RAB Distribution:
Nassau County DPW, Tim Kelly
Town of Oyster Bay, Hon. John Venditto
Town of Oyster Bay DPW, Tom Clark
Community Co-Chair, Jim McBride
Community RAB Member, Hon. Ed Mangano
Community RAB Member, Linda Mangano
Community RAB Member, Ed Resch
Community RAB Member, Charles Bevilacqua
Community RAB Member, Roy Tringali
Community RAB Member, Rosemary Styne

Copy to: (w/o enclosures)
NAVAIR, Joe Kaminski
J.A. Jones, Al Taormina

ENVIRONMENTAL COVENANTS, CONDITIONS, RESERVATIONS, and RESTRICTIONS

105-ACRE PARCEL

1. Notice of Environmental Condition: Information concerning the environmental condition of the 105-Acre Parcel is contained in the documents known as the Environmental Baseline Survey to Transfer, 105-Acre Parcel, September 2000, at the former Naval Weapons Industrial Reserve Plant, Bethpage, NY, which is incorporated herein by reference, and the receipt of which are hereby acknowledged by the GRANTEE.

2. Covenant required by Title 42, United States Code at section 9620(h)(3)(B): In accordance with the requirements and limitations contained in *Title 42, United States Code at section 9620(h)(3)(B)*, the GRANTOR hereby warrants that:

(a) all remedial action necessary to protect human health and the environment with respect to any hazardous substances remaining on the 105-Acre Parcel has been taken, and

(b) any additional remedial action found to be necessary after delivery of this Deed shall be conducted by the GRANTOR.

3. Reservation of Access by Title, 42 United States Code at the section 9620(h)(3)(C): In accordance with the requirements and limitations contained in *Title42, United States Code at section 9620(h)(3)(C),* the GRANTOR expressly reserves all reasonable and appropriate rights of access to the 105-Acre Parcel described herein when remedial action or corrective action is found to be necessary after delivery of this Deed. The right of access described herein shall include the right to conduct tests, investigations, and surveys, including, where necessary, drilling, testpitting, boring, and other similar activities. Such rights shall also include the right to conduct, operate, maintain or undertake any other response or remedial action as required or necessary including, but not limited to, monitoring wells, pumping wells, and treatment facilities. Said activities shall also be performed with necessary precautions, including appropriate monitoring and controls, to ensure that these are done in a manner protective of human health and environment. GRANTEE agrees to comply with activities of the GRANTOR in furtherance of these covenants and will take no action to interfere with future necessary remedial and investigative actions of the GRANTOR. Any such entry, including such activities, responses or remedial actions, shall be coordinated with the GRANTEE or its successors and assigns, and shall be performed in a manner which minimizes (a) any damage to any structures on the 105-Acre Parcel and (b) any disruptions of the use and enjoyment of the 105-Acre Parcel.

4. Lead-Based Paint: The GRANTEE covenants and agrees, on behalf of itself, its successors and assigns, that it will comply with all Federal, state, and local laws relating to lead-based paint in its use and occupancy of the 105-Acre Parcel (including demolition and disposal of existing improvements). The GRANTEE shall hold harmless and indemnify the GRANTOR from and against any and all loss, judgement, claims, demands, expenses, or damages or whatever nature or kind which might arise or be made against the GRANTOR as a result of lead-based paint having been present on the 105-Acre Parcel herein described. Improvements on the 105-Acre Parcel were constructed prior to 1978 and, as with all such improvements, a lead-based paint hazard may be present.

5. Presence of Asbestos: The GRANTEE, its successors and assigns, are hereby warned and do acknowledge that certain portions of the improvements on the 105-Acre Parcel subject to this Deed are thought to contain asbestos-laden materials. The GRANTEE, by acceptance of this Deed, covenants and agrees, for itself, its successors and assigns, that in its use and occupancy of the 105-Acre Parcel (including demolition and disposal of existing improvements) it will comply with all Federal, state, and local laws relating to asbestos and that the GRANTOR assumes no liability for damages for personal injury, illness, disability or death to the GRANTEEOR, or to GRANTEE's successors, assigns, employees, invitees, or any other person, including members of the general public, arising from or incident to the purchase, transportation, removal, handling, use, disposition, or other activity causing or leading to contact of any kind whatsoever with asbestos on the 105-Acre Parcel, whether the GRANTEE, its successors or assigns, has properly warned or failed to properly warn the individual(s) injured. Section 101-47.304-13 of the Federal Property Management Regulations contains complete warnings and responsibilities relating to asbestos-laden materials.

6. Groundwater: The GRANTEE, its successors and assigns are hereby warned and do acknowledge that use of the groundwater on the 105-Acre Parcel subject to this Deed is restricted. The GRANTEE, by acceptance of this Deed, covenants and agrees, for itself, its successors and assigns, that it will comply with the groundwater use restriction described below:

> An **institutional control** consisting of the placement of a restriction in the deed of transfer to the County of Nassau, New York prohibiting extraction of groundwater from within the boundaries of the 105-acre parcel located at the Navy's former Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage facility. In order to aid in the compliance with the deed restriction, the Navy has completed the abandonment of the seven (7) deep production wells formerly located on the 105-acre parcel. The production wells were used for the extraction of groundwater as non-contact cooling water to support operations conducted by NGC during a time when Northrop Grumman leased the 105-acres from the Navy. If a future occupant of the Navy's 105-acre parcel wishes to pursue groundwater extraction, GRANTEE hereby convenants, on behalf of itself, its successors, and its assigns, to furnish prior notification and secure written permission from the Nassau County Department of Health and/or New York State Department of Environmental Conservation.

7. Excavation: The GRANTEE, its successors, and its assigns are hereby notified that residual chemicals exist at various Areas of Concern (AOCs) throughout the 105-acre parcel in subsurface soils at various depths but no shallower than 6-inches below land surface. The locations of these AOCs are identified and summary information regarding each AOC can be found, in Appendix A of the Final FOST for NWIRP Bethpage dated January 2003. The GRANTEE, its successors, and its assigns are hereby notified that these residual chemicals, in some instances, do exceed NYSDEC TAGM 4046 State Recommended Soil Cleanup Objectives. In response, the GRANTOR hereby notifies the GRANTEE that for all AOCs, a barrier of either soil, gravel, concrete, or a combination of same is currently in place in order to eliminate potential exposure pathways to these residual chemicals. GRANTEE hereby convenants, on behalf of itself, its successors, and its assigns, that a request shall be submitted to NYSDEC and NYSDOH for review and approval before excavating, or otherwise disturbing subsurface soils at designated AOC areas. Any contaminated soils that are excavated from the 105-Acre Parcel must be properly disposed at appropriate off-site locations.

8. Covenant and Restriction Regarding Development for Permanent Residential Use: GRANTEE hereby covenants, on behalf of itself, its successors, and its assigns, that the 105-Acre Parcel will not be used for non-industrial purposes such as residential, recreational, and child day care land uses (it being understood that the preferred land reuse for this Parcel is commercial/industrial as outlined in the Navy's Final Environmental Impact Statement (FEIS) dated April 2000).

9. Vapor Intrusion: The GRANTEE, its successors and assigns do hereby acknowledge that the latest use of Plant 3, located on the Navy's 105-acre parcel, was non-residential and that the current quality of the indoor air within Plant 3 meets those standards for occupancy of a commercial/industrial building as set forth by the Occupational Safety and Health Administration (OSHA). The GRANTEE, by acceptance of this Deed, covenants and agrees, for itself, its successors and assigns, that if a change in the use of the Plant 3 building is pursued for uses other than commercial/industrial, prior notification and written permission must first be secured from the New York State Department of Environmental Conservation/New York State Department of Health and/or the Nassau County Department of Health.

STATE OF NEW YORK
DEPARTMENT OF HEALTH

Flanigan Square, 547 River Street, Troy, New York 12180-2216

Antonia C. Novello, M.D., M.P.H., Dr.P.H.
Commissioner

Dennis P. Whalen
Executive Deputy Commissioner

October 30, 2003

Mr. Steven Scharf, P.E.
Division of Environmental Remediation
New York State Department of Environmental Conservation
Remedial Action Bureau A, 11th Floor
625 Broadway, Albany, New York 12233-7015

Re: **Technical Memorandum for**
Soil Remediation and Soil Vapor
Naval Weapons Industrial Research Plant 3
Site# 130003B
Bethpage, Nassau County

Dear Mr. Scharf:

I have reviewed the October 2003 Technical Memorandum for Soil Remediation and Soil Vapor for the above referenced site and have the following comments:

1. **SVE System:**

Soil gas samples were collected and analyzed before the SVE system was started, yet no confirmatory soil gas samples were collected after the SVE system was shut down. Confirmatory soil gas samples need to be collected to confirm the effectiveness of the SVE system.

2. **Indoor air results:**
   a. The sequence of events in Table 1 shows that indoor air samples were collected while the soil vapor extraction (SVE) system was still running. Since the SVE system has been shut down, indoor air samples need to be collected to confirm that there has been no rebound of contaminated vapors. This sampling must include an ambient air sample.

   b. The locations where the indoor air samples were collected are not provided. A map showing where the samples were collected needs to be provided.

c. Raw data for the indoor air results, ambient air sample results and general environmental conditions when the indoor air sampling was conducted are not provided in the report. This information needs to be provided.

2. **OSHA standards:**
OSHA is the regulating agency that deals with occupational exposures when an employee is exposed to chemicals used in the work place. However, OSHA rules do not apply when employees are potentially exposed to contaminants that are not being used in the work environment.

3. **Deed Restriction:**
The use of a deed restriction to deal with vapor intrusion without first characterizing the current potential for exposures is unacceptable. All efforts should be made to address potential vapor intrusion before using a deed restriction.

If you have any questions about my comments, please call me at (518) 402-7870.

Sincerely,

Ian Ushe
Assistant Sanitary Engineer
Bureau of Environmental Exposure Investigation

cc: Mr. G. Litwin/Mr. R. Fedigan/File
Mr. C. Vasudevan – NYSDEC
Mr. L. Rosenmann - NYSDEC
Mr. W. Parish – NYSDEC Reg. 1
Mr. R. Weitzman - NCDOH

DAVID M. ACK
COMMIS

RECEIVED
NOV - 4 2003
BUREAU OF EASTERN
REMEDIAL ACTION

COUNTY OF NASSAU
DEPARTMENT OF HEALTH
240 OLD COUNTRY ROAD
MINEOLA, N.Y. 11501-4250

October 31, 2003

THOMAS R. SUOZZI
COUNTY EXECUTIVE

8-402-7859
uchard Fedigan
w York State Department of Health
lanigan Square, 547 River Street
Troy, New York 12180-2216

Re: Technical Memorandum
Soil Remediation/ Soil Vapor Issue
Naval Weapons Industrial Reserve Plant
(NWIRP Site 1-30-003B)
Bethpage, New York

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Dear Mr. Fedigan:

As requested by Mr. Steven Scharf of the NYSDEC, we have reviewed the Technical Memorandum - Soil Remediation/Soil Vapor Issue, Plant 3 of the NWIRP. On the basis of this review, we agree that soil gas testing beneath and immediately east of Plant 3 must be conducted as explained in Mr. William Gilday's letter of September 27, 2002.

The testing of soil gas samples should be conducted promptly in order to eval the potential for future volatile organic chemical contamination of the indoor air at 3 and to evaluate the effectiveness of soil remediation actions both beneath and in immediate vicinity of Plant 3.

The argument that soil gas testing is not necessary because soil reme occurred is not convincing. Although soil gas testing may be used to ident contamination, the remediation of soil in a particular location does not contamination has been eliminated. The findings of high levels of TC contamination in soil gas samples collected from beneath the buildi extraction wells from SVE points nearest the building, as well as t organic chemical contamination in the indoor building air, provi justification for proceeding with soil vapor testing. The detecti remediation has not been adequately completed or that oth contamination have not been identified.

Copies:

NYSDEC
Attn: Steven Scharf, P.E.

NYSDOH
Attn: Rebecca Mitchell
Attn: Ian Ushe

TECHNICAL MEMORANDUM
SOIL REMEDIATION / SOIL VAPOR ISSUE
BUILDING NO. (PLANT) 3
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP)
BETHPAGE, NEW YORK
REGISTRY OF INACTIVE HAZARDOUS WASTE SITES # 1-30-003B

This technical memorandum consists of two sections. The soil remediation/soil vapor issue associated with Plant No. 3 is summarized in the Executive Summary. Section 1.0 presents a more detailed discussion. Attachments are presented to support the findings. Figures include color coding. A black and white copy should not be used for review.

PREPARED BY
TETRA TECH NUS, INC.
FOR
NAVAL FACILITIES ENGINEERING COMMAND
ENGINEERING FIELD ACTIVITY NORTHEAST
AND
NAVAL AIR SYSTEMS COMMAND

OCTOBER 2003

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EXECUTIVE SUMMARY

The Navy has been authorized by Congress to give to Nassau County, New York, the real property (land and buildings) formerly known as the Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage (see Photo 1). The property is listed on the New York State Registry of Inactive Hazardous Waste Sites. A five-acre parcel has already been deeded to the County. The Navy has found that an additional ninety-six (96) acres has been remediated and is now suitable for transfer, but that nine acres must remain under Navy ownership until environmental remediation is complete.

By letter dated May 31, 2002 to the New York State Department of Environmental Conservation (NYSDEC), the Navy requested that the boundary of the inactive hazardous waste site be modified to coincide with the property to be retained by the Navy. This action is needed to facilitate transfer of the rest of the property to Nassau County. By letter dated September 27, 2002, the New York State Department of Health (NYSDOH) provided comments to NYSDEC on the Navy's request. The comments suggested that soil gas beneath a portion of a building, known as Plant 3, needed to be tested to confirm that remediation had been accomplished. The comments were linked to a potential for indoor air to contain volatile organic compounds that might adversely impact human heath.

As a result of a meeting held between Navy and NYSDEC/NYSDOH personnel in January 2003, and in response to a NYSDEC letter dated July 23, 2003, the Navy has prepared this technical memorandum to address concerns raised by the NYSDOH regarding this issue. The correspondence leading up to the development of this technical memorandum is contained in Appendix A.

This memorandum explains that the Navy previously used soil vapor analyses only as a screening indicator of where to look for actual soil contamination. However, when the Navy analyzed the soil, none of the detectable concentrations in the soil were above the remediation goals established in the Record of Decision that governed soil cleanup. Therefore, it was concluded that actions were not necessary to remediate soil beneath Plant 3. Consequently, confirmation sampling of soil vapor to show completion of remediation of soil was not needed. This technical memorandum goes on to present the results of indoor air sampling that the Navy voluntarily conducted after a request from NYSDOH and shows a comparison of these results

with Draft EPA guidance for human health protection from potential vapor intrusion into non-residential buildings. The Navy also used this data to conduct a standard EPA risk analysis. In each of these comparisons, the results show that there is no threat to human health for the intended use of the building. The use for which the building qualifies (commercial/industrial) will be recorded in the deed as the only allowable use.

Based on the information presented in this technical memorandum it is again requested that the boundary of Inactive Hazardous Waste Site #1-30-003B be modified to coincide with the property to be retained by the Navy as shown on Figure 1.

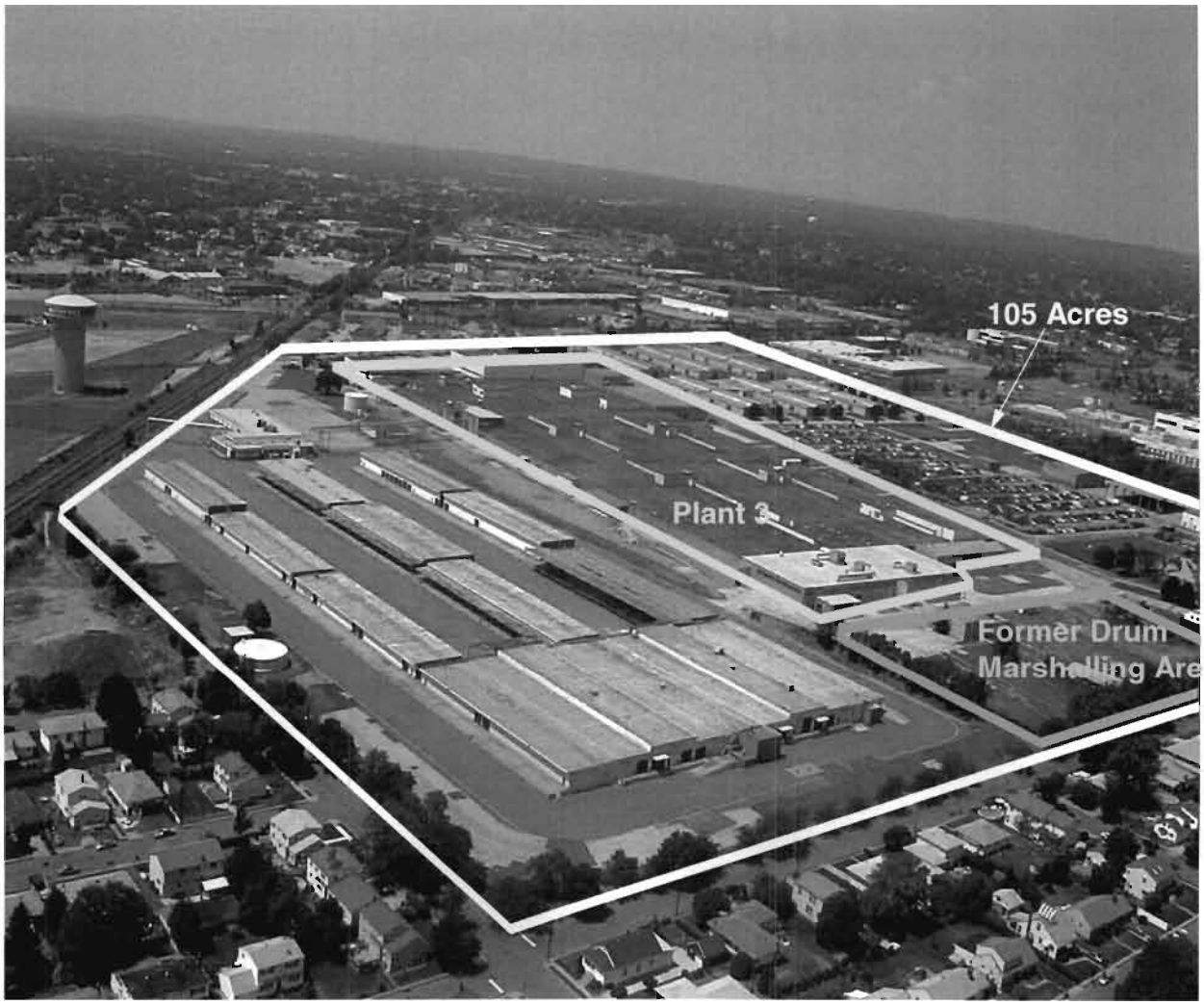

Photo 1

NWIRP Bethpage (looking Northwest)

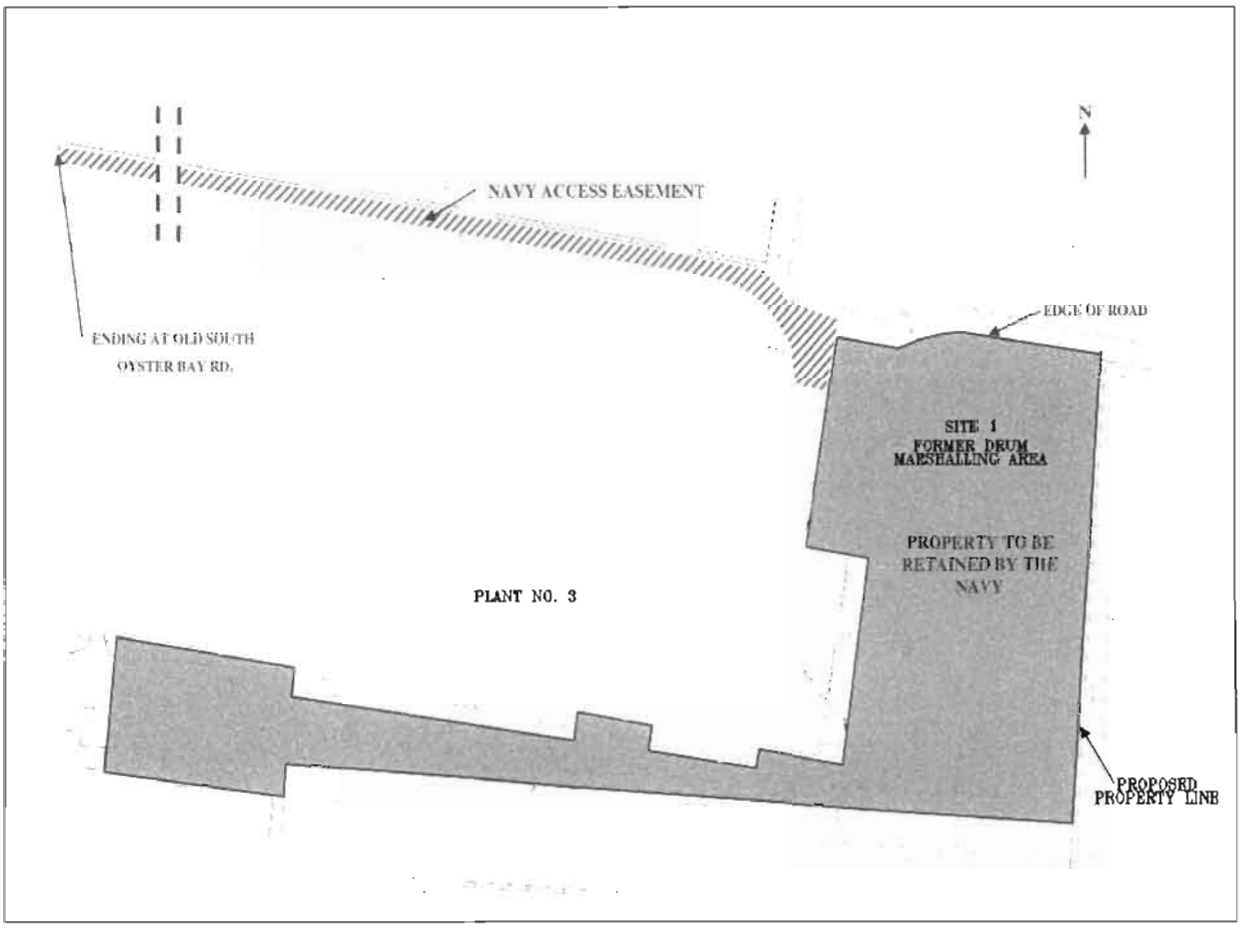

Figure 1

9-Acre Parcel Being Retained by Navy

DETAILED DISCUSSION

1.0 INTRODUCTION: Public Law 105-85 allows the Secretary of the Navy to convey NWIRP Bethpage property, including Plant 3, to Nassau County, New York without compensation for economic redevelopment. The Navy has concluded that RCRA corrective actions have been completed for 96 acres out of the total 105-acre complex and wants to convey that part to Nassau County. The Navy will retain the remaining 9 acres that still require remediation (see Photo 1 and Figure 1). As such, the Navy has requested that the site boundaries that depict the inactive hazardous waste site (#1-30-003B) be reduced to match the 9-acre parcel that the Navy will be retaining. This will alleviate any concerns that Nassau County may have in accepting the 96-acre property.

1.1 Plant 3 is an 800,000 square-foot building that was used for the manufacturing of aircraft from the early 1940s to the mid-1990s and is currently closed and vacant (see Photos 1 & 2). The facility is still owned by the U.S. Government but was operated by Northrop Grumman (formerly Grumman Aerospace) until the time the facility was closed in 1998. Operations conducted within Plant 3 included acid, solvent, and chromate rinsing, painting, and metal working processes. From 1992 to 1995, the Navy conducted studies within Plant 3 under the Navy's Installation Restoration (IR) Program to address potential contamination from historic operations.

1.2 In 1995, the Navy issued the "Record of Decision, Naval Weapons Industrial Reserve Plant Bethpage, New York, Sites 1, 2, 3, NYS Registry: 1-30-003B, May 1995" (Operable Unit 1 Soils ROD). The OU 1 Soils ROD was issued by the Navy pursuant to authority delegated to the Department of Defense under Section 104 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and was co-signed by NYSDEC. The ROD was primarily directed at a former drum marshalling area just east of Plant 3 that contained known contamination; however, soil vapor screening samples indicated that a potential source of contamination might also be present beneath the eastern end of Plant 3 (see Photo 1 and Figures 2 & 3). Between 1995 and today the Navy has been conducting remediation as required by the OU 1 Soils ROD.

Photo 2

Inside Plant No. 3 Southeast Corner

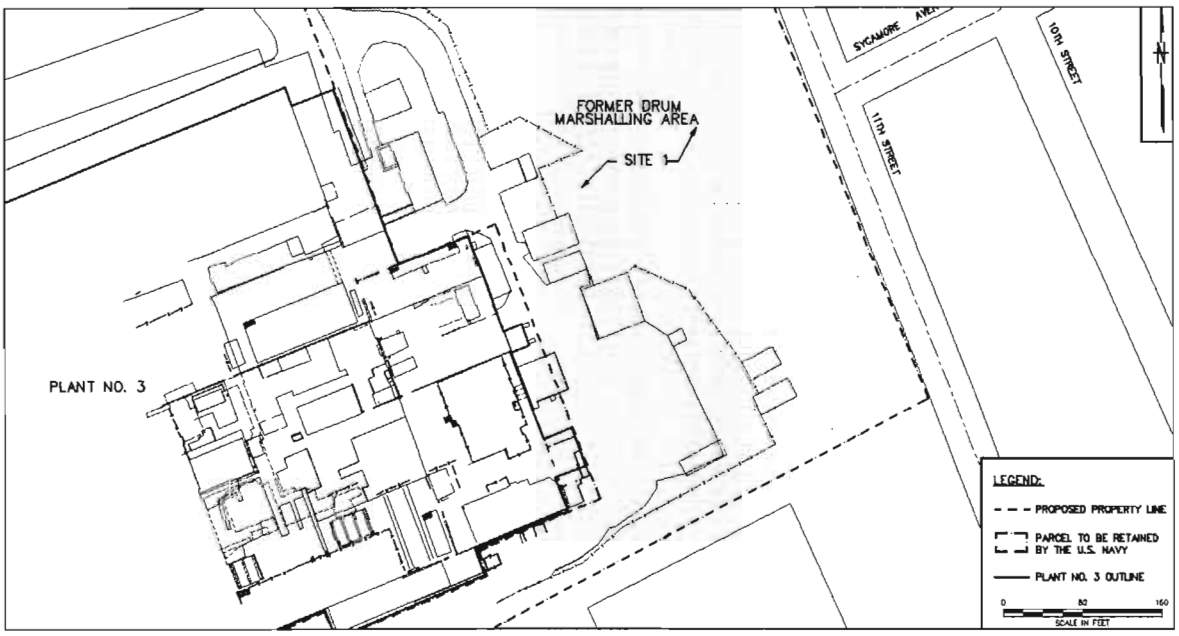

Figure 2

Site Layout Map

Figure 3
Extent of VOC-Contaminated Soils

1.3 In 1997 and 1998, Northrop Grumman identified potential areas of concern throughout the entire 105-acre complex, including Plant 3. They then conducted soil testing and excavated and disposed of metal- and organic-contaminated soils as appropriate. The work was conducted under a RCRA permit and all corrective actions were reviewed and approved by NYSDEC. Excavated areas in the eastern portion of Plant 3 are presented on Figure 4. NYSDEC approval letters for closure of these areas are presented in Appendix B.

1.4 In early 2002, the Navy concluded that all environmental actions, including investigation and remedial actions, associated with 96 of the 105 acres were complete and on May 31, 2002, submitted a formal request to NYSDEC to modify the boundary of the facility to eliminate those areas from the RCRA permit. The Navy would retain the RCRA permit and property that requires additional environmental actions (IR Site 1 and some adjacent property).

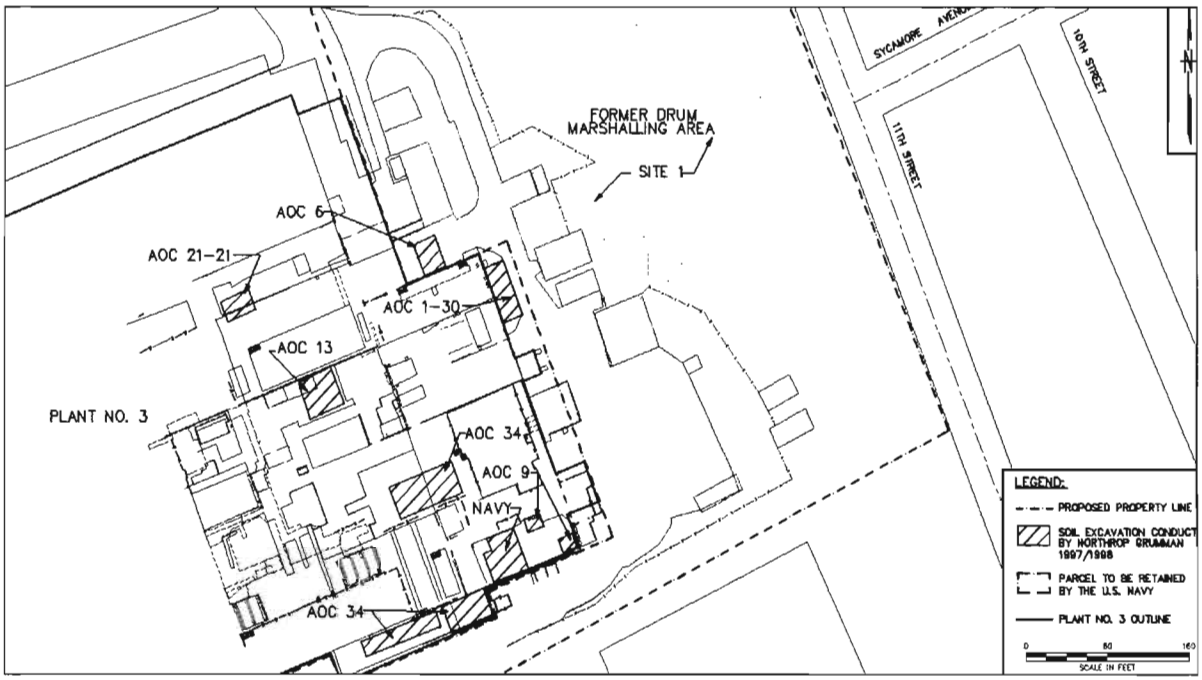

Figure 4

Areas of Soil Excavation by Northrop Grumman

1.5 Mr. William Gilday of the New York State Department of Health (NYSDOH) issued a letter to Mr. Steven Scharf and Mr. Henry Wilkie of NYSDEC on September 27, 2002, in response to the above request (Appendix A). This letter expressed concern that based on indoor air testing conducted by the Navy in 2001, volatile organic contamination may be present underneath Plant 3 and requested that additional soil vapor testing be conducted. As a result, the issue has become whether the Navy has completed remedial actions related to soil vapor underneath Plant 3. A Navy response to Mr. Gilday's comments were submitted to the NYSDEC in a letter dated December 27, 2002, and discussed at a meeting held in Albany, New York on January 29, 2003. The result of that meeting was that the Navy needed to submit additional justification regarding the Navy's position. Submission of this technical memorandum provides that additional justification. Events leading up to the submittal of this technical memorandum out outlined in Table 1.

1.6 Currently, the Navy is taking environmentally related real estate actions required by CERCLA Section 120(h) in order to transfer the former NWIRP property to Nassau County. This includes preparing a Finding of Suitability to Transfer (FOST) and securing a boundary modification to New York State's Registry of Inactive Hazardous Waste Sites (delisting).

Table 1
Sequence of Events related to
Soil Remediation at NWIRP Bethpage

1942	Plant 3 constructed and continuously operated for manufacture of aircraft parts
1986	Hazardous Solid Waste Act
1986	Navy Initial Assessment Study
1991	Navy Remedial Investigation Work Plan/Quality Assurance Plan
1992	Remedial Investigation Report, Soil-to-Groundwater established as Pathway of Concern
1992/1993	Navy Soil Screening
1995	Navy Soil ROD – media remediation goals determined
1995	Navy pre-design soil delineation
1995	Plant Closure announced, NGC remediation efforts began
1997	Navy submits design
1997	NYSDEC approves design
1998	Navy begins soil vapor extraction (SVE) required only outside Plant 3
1998	NGC soil excavations within Plant 3 approved by NYSDEC
1998	PL105-85 authorizes Navy to give Plant to Nassau County for economic redevelopment
2000	Navy decision to convey uncontaminated Plant 3 and 96 acres to Nassau County but retain 9 contaminated acres until remedy complete (draft FOST)
2002	SVE on 9 acres outside Plant 3 concludes
2002	Navy conveys Plants 5 (building only) and 20 (all real estate) to Nassau County
2002	Navy requests delisting of 96 acres to be transferred to Nassau County allowing for retention of listing for 9 acres to be kept by Navy
2002	NYSDEC Comment letter
2002	Comments answered
2003	Meeting
Oct. 2003	Navy submits Tech Memo rational for Action Complete

CERCLA Section 120(h) requires the Navy to show that the presence of residual contamination in soils, including those underneath Plant 3, does not represent a threat to human health and the environment. The Navy has made this determination, including addressing all applicable comments, in the Final Finding of Suitability to Transfer, 105 Acre Parcel, Naval Weapons Industrial Reserve Plant Bethpage, Nassau County, New York, dated January 2003. Recently, a letter dated July 23, 2003 was sent by NYSDEC stating that "Based on the review of the January 2003 revised FOST, the State of New York has no further comments". A copy of this letter is included in Appendix A. In a separate, but related action, Northrop Grumman submitted a Request for a Major Modification to their Part 373 Permit to Operate a Hazardous Waste Facility in December 2000. This request was also predicated on the fact that corrective actions had been completed on 96 acres of the Navy's property and that the Part 373 Permit should

only include that property that would be retained by the Navy (9 acres) pending completion of additional remedial actions.

2.0 DEFINING THE REMEDIATION REQUIREMENT: When the Navy began its Remedial Investigation under the Installation Restoration (IR) Program in 1991, it encountered an ongoing manufacturing operation that had used solvents for some 50 years and was suspected of causing VOC contamination of soils in a field adjacent to Plant No. 3 at what became known as Site 1 - Former Drum Marshalling Area. It was further expected that these operations had contributed to the VOC contamination of the sole source aquifer supplying all public water in the Bethpage area. By that time, two water district supply wells to the south of the facility had been impacted by volatile organic contaminants and required treatment and a third supply well was projected to be impacted in the near future.

2.1 In 1992, the Navy established a Technical Review Committee (TRC) that included NYSDEC and NYSDOH to gain input and concurrence with evolving actions. With input from the TRC, soil contaminants leaching to groundwater and associated migration of contaminated groundwater pathway was identified as the most critical pathway. Therefore, the Soils ROD was developed primarily to remediate VOCs in soil to protect groundwater. During the development of the preliminary remediation goals (PRGs) for soils, other contaminant-to-receptor pathways including incidental ingestion and inhalation were evaluated and it was determined that soil-to-groundwater protection-based PRGs for VOCs in soil would also protect human health through other environmental pathways. Soil vapor was not identified as media of concern requiring treatment. Soil gas/vapor was only discussed in the ROD because the selected remedy for VOC- contaminated soils (Soil Vapor Extraction) used the extraction of soil vapor as a means to decontaminate soil to protect groundwater and because soil gas analysis was used as a screening tool to identify areas that may be impacted and would require additional investigation.

2.2 Industry standard practice is to use soil gas results as an indicator that a potentially significant source of soil or groundwater VOC contamination may be present. The technique allows a relatively large area to be screened very quickly and cost effectively for volatile organics. However, because false positive results are common, the data must be used with caution. The Navy has consistently used soil gas testing as a screening tool. For example, the

"Final Remedial Investigation Quality Assurance Plan (August 1991) for investigation at Sites 1, 2, and 3 at NWIRP Bethpage states the following.

> *"The first phase will be a soil-gas survey to identify potential areas of soil and groundwater contamination. The soil gas samples will be analyzed at an onsite mobile field GC laboratory. Locations for the Phase 2 activities will be selected at the areas found to have high soil-gas contaminant concentrations. The second phase will consist of soil sampling, waste sampling (if encountered), and a temporary monitoring well groundwater sampling investigation."*

The 1991 Quality Assurance Plan for this project clearly identifies soil gas testing as a screening technique.

3.0 <u>SOILS ROD DEVELOPMENT</u>: In 1995 the Record of Decision, Naval Weapons Industrial Reserve Plant Bethpage, NY Sites 1, 2 and 3 (the Soils ROD) was issued with the concurrence of NYSDEC. The ROD contains the following statement:

> *"VOCs are distributed in the vadose zone over much of the site at concentrations below NYSDEC clean-up guidelines, except for Hot Spots at Site 1 and below Plant 3."*

3.1 Contaminated soils and related groundwater contamination had already been confirmed at Site 1. As a result, a Vapor Extraction/Air Sparging (VE/AS) system was planned for Site 1. At that time, it was the Navy's belief that contaminated soils associated with the soil gas results would be identified under Plant 3 and that the soils under Plant No. 3 could be treated concurrent with the Site 1 VE/AS system. The ROD goes on to state:

> *"Active remediation of the VOC-contaminated soils will be accomplished by using a vapor extraction/air sparging (VE/AS) technology. This technology will address the VOC-contaminated vapor plume which exists in the unsaturated soils beneath portions of Site 1 and Plant 3. The areas to be treated will have VOC concentrations equal to or greater than those shown in Table 3. Confirmatory sampling will be conducted to determine when these levels have been achieved."*

This statement should be understood to refer to the cleanup of soil by vapor extraction, not the cleanup of vapor in and of itself.

4.0 SOILS ROD IMPLEMENTATION: In 1995, the Navy conducted pre-design soil testing underneath and adjacent to Plant No. 3 to identify the area for VE/AS treatment in accordance with the Soils ROD. Prior to this pre-design testing, the area suspected to contain VOC-contaminated soils was believed to extend under Plant No. 3, see Figure 2 in Section 1.0. This program included testing of approximately 120 soil samples from underneath Plant 3. These soil samples were screened in the field for volatile organic contamination. Based on the field results, the 27 most contaminated soil samples (based on the highest field VOC readings) were submitted to a fixed base laboratory for analytical testing, see Appendix E. The concentration of VOCs in soil that would trigger a remediation requirement was stated in the ROD as follows:

> *"The areas to be treated will have VOC concentrations equal to or greater than those shown in Table 3".*

4.1 The laboratory soil test results did not find VOCs at concentrations greater than ROD-specified action levels underneath Plant No. 3, (see Appendix E for a copy of the ROD - Table 3). These results were recorded in a draft report dated July 1995 which was used by the Navy to develop the Pilot-Scale Air Sparging/Soil Vapor Extraction System Work Plan, dated March 1997, and submitted to the NYSDEC for information in a letter to Mr. George Heitzman dated 15 May 1997. This Work Plan concluded that, contrary to prior beliefs, VOCs in the soils underneath Plant 3 were already below concentrations that would adversely impact groundwater. In accordance with Table 3 of the Soils ROD, treatment of these soils via VE/AS system was not required.

4.2 The Pilot-Scale VE/AS system was installed in accordance with the Work Plan referenced above and the data collected from the pilot system was used to develop the Design Analysis Report for AS/SVE System at Site 1 dated September 1997. This Design Report, which documented the size of the full-scale VE/AS, including the number of extraction, injection and monitoring wells, was submitted to NYSDEC on 25 September 1997. Specifically, Figures D-1 and D-2 of the September 1997 Design Analysis Report showed that the Navy was only planning to construct the VE/AS system at IR Site 1 and not beneath any portion of Plant 3 (see Figure 5). In a letter to the Navy dated October 23, 1997, the NYSDEC gave their approval of

the Navy's design. Since it was agreed by all parties that no treatment of the soils underneath Plant No. 3 was necessary, confirmation of treatment was not necessary.

Figure 5

Area Requiring Treatment of Soil for VOCs

5.0 **REMEDIAL ACTION BY NORTHROP GRUMMAN:** During the Northrop Grumman cleanup of the Plant 3 property in 1997/1998 under the NYSDEC RCRA program large quantities of soil were excavated within the area of Plant 3 addressed by this Technical Memorandum. End point sampling was primarily for metals. Figure 4 shows locations and Appendix B contains documentation of Northrop Grumman actions that were independent from Navy ROD efforts. .

5.1 At one Northrop Grumman site, AOC 21-21, tetrachloroethene (PCE) and trichloroethene (TCE) were detected in soil samples below a machine pit (see Figure 4). These soils were excavated to a depth of 12 feet below grade. Endpoint samples at 12 feet below

grade detected PCE and TCE at 14,000 and 10,000 micrograms per kilogram, respectively. Because of the depth of the remaining contamination, the presence of a concrete cap that limits both upward migration of vapors and downward migration from precipitation infiltration, and the presence of a downgradient groundwater containment system, Northrop Grumman requested and NYSDEC approved allowing this soil to remain in place.

5.2 Considering the cap provided by the building prevents a soil-to-groundwater VOC contamination, this decision is consistent with NYSDEC TAGM 4046 criteria that references USEPA Health Based Levels of 14,000 and 64,000 micrograms per kilogram for PCE and TCE, respectively as protective of human health through the ingestion and inhalation pathways. As described below, confirming the NYSDEC decision, these residual concentrations of PCE and TCE do not have any significant impact on indoor air quality.

6.0 **INDOOR AIR TESTING:** Based on the above findings, the Navy concludes that actions for soils underneath Plant No. 3 have been completed in accordance with the Soils ROD and other existing criteria and that no additional action is required. To further support this conclusion and address the potential organic vapor issue raised by the NYSDOH, the Navy conducted indoor air testing within the Plant No. 3 in February 2001. Test locations were selected jointly by the Navy and the NYSDOH. The test results were below applicable occupational standards established by Occupational Safety and Health Administration for the use of Plant 3 as restricted by deed (see Appendix D). In addition, a human health risk assessment was conducted that found the air quality within Plant No. 3 to be within a risk range found to be acceptable by the United States Environmental Protection Agency, (see Appendix C).

6.1 The USEPA's Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway (USEPA, 2002) recommends that people exposed in occupational settings should be evaluated under OSHA (i.e., using occupational standards) rather than risk-based standards. The draft guidance goes on to say that:

> *OSHA and EPA have agreed that OSHA generally will take the lead role in addressing occupational exposures. Workers will generally understand the workplace (e.g., Occupational Safety and Health Administration, OSHA) regulations (and monitoring, as needed) that already apply and provide for their protection. For example, workplaces are*

subject to a written Hazard Communication and Monitoring Plan. In general, therefore, EPA does not expect this guidance be used for settings that are primarily occupational.

7.0 **CONCLUSION:** It is concluded that while detectable levels of VOCs may exist with Plant No. 3, there are no current human health criteria applicable to the designated future industrial use of the building that are in jeopardy of being exceeded. Absent such applicable standards or regulations, the Federal Anti-deficiency Act prevents the Navy from spending appropriated funds on any additional effort associated with the environmental stewardship of this site. Should future human health determinations lead to different standards, CERCLA section 120(h)(3)(A)(ii) provides a way for the Navy to reexamine this determination.

7.1 To ensure protection of human health and the environment and as shown by example in Appendix D and Enclosure 2 to the transmittal letter, all known contamination and restrictions associated with future use of the property will be made part of the deed transaction. By way of information, Plant 3 is in a closed, unmaintained status. Without imminent transfer to Nassau County its value will rapidly diminish.

APPENDIX C

INDOOR AIR ANALYSIS

MEMORANDUM

To: Jim Colter (RPM, EFANE NAVFACENGCOM)

From: Jason Speicher (RA, EFANE NAVFACENGCOM)

Cc: Deb Felton (EFANE NAVFACENGCOM)

Date: June 19, 2003

Re: Evaluation of concentrations found in ambient air sampling within and around Plant 3, Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage, Bethpage, NY

At your request, I conducted an evaluation of the volatile organic compound (VOC) contaminant concentrations detected in sampling conducted by Tetra Tech NUS in February of 2001. This evaluation included the following:

- Evaluation of maximum detected VOC concentrations compared to industrial health and safety standards (i.e., OSHA PELs) to evaluate potential reuse of Plant 3.
- Comparison of maximum detected VOC concentrations to USEPA Region III Ambient Air Risk Based Concentrations (RBCs) to identify contaminants of potential concern (COPCs).
- For VOCs that had maximum detected concentrations above their respective RBC values, calculating an exposure point concentration (based on 95% UCL on the mean and the average of all concentrations) and subsequently evaluating the potential risks to receptors based on reuse (i.e., industrial/commercial worker) of Plant 3. The determination of potential risks was calculated using standard EPA guidance (USEPA, 1989), default exposure assumptions, and exposure assumptions derived from EPA's Exposure Factors Handbook (USEPA, 1997).
- Lastly, a review of applicable pertinent USEPA guidance was conducted to provide perspective on the intended reuse (i.e., industrial/commercial use) of Plant 3.

RESULTS

The results of the my evaluation are as follows:

- Maximum concentrations of VOCs detected in Plant 3 ambient air do not exceed their representative industrial health and safety standards.
- In comparing (see Attachment 1) maximum detected concentrations of VOCs to their representative USEPA Region III RBCs (USEPA, 2003), three VOCs (i.e., Methylene Chloride, Tetrachloroethene, and Trichloroethene) were identified as COPCs and were carried forward to calculate potential risks based on reuse (i.e., potential risks to industrial/commercial worker).

- The evaluation (see Attachment 1) of potential carcinogenic risks to the industrial/commercial worker included calculating risks based on the reasonable maximum exposure (using an exposure point concentration based on 95%UCL on mean of all concentrations) and the central tendency exposure (using an exposure point concentration based on an average of all concentrations). For the reasonable maximum exposure (RME) potential carcinogenic risks from the three VOCs was calculated to be 5.5E-6. For the central tendency exposure (CTE) potential carcinogenic risks were calculated to be 3.60E-06. Both of these results fall within the USEPA's target carcinogenic risk range of 1E-04 to 1E-06. Therefore, no unacceptable risks to the commercial/industrial worker are anticipated as a result of potential exposure to the concentrations detected in Plant 3 indoor air. In must be noted, that EPA's Integrated Risk Information System (IRIS) does not currently contain a cancer slope factor for Trichloroethene. Therefore, to evaluate potential carcinogenic risks to Trichloroethene the cancer slope factor used in the evaluation was obtained from USEPA's External Review Draft: Trichloroethylene Health Risk Assessment: Synthesis and Characterization (USEPA, Aug. 2001). The slope factor (2E-02 mg/kg-day) used in my evaluation was derived based occupational inhalation exposure.

- In completion of this evaluation USEPA's Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway (USEPA, 2002) was also reviewed for pertinent information as it relates to the reuse (i.e., industrial/commercial) of Plant 3. The draft guidance recommends that people exposed in occupational settings should be evaluated under OSHA (i.e., using occupational standards) rather than risk-based standards. The draft guidance goes on to say that:

  > *OSHA and EPA have agreed that OSHA generally will take the lead role in addressing occupational exposures. Workers will generally understand the workplace (e.g., Occupational Safety and Health Administration, OSHA) regulations (and monitoring, as needed) that already apply and provide for their protection. For example, workplaces are subject to a written Hazard Communication and Monitoring Plan. In general, therefore, EPA does not expect this guidance be used for settings that are primarily occupational.*

CONCLUSIONS

Based on the evaluations, the concentrations of VOCs found in air samples taken in Plant 3 in February of 2001 do not exceed applicable OSHA standards (i.e., PELs). In addition, the evaluation of potential risks based on reuse (i.e., potential risks to the industrial/commercial worker) does not show that unacceptable (i.e., risks are within EPA's target risk range) carcinogenic risks would be anticipated based on the concentrations measured.

REFERENCES

USEPA, 1989. *Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A).* EPA/540/1-89/002. December 1989.

USEPA, 1997. *Exposure Factors Handbook.* EPA/600/P-95/022Fa. August 1997

USEPA, 2001. *External Review Draft: Trichloroethylene Health Risk Assessment: Synthesis and Characterization.* EPA/600/P-01/002A. August 2001.

USEPA Region III, 2003. EPA *Region III Risk-Based Concentration Table.* April 2003.

ATTACHMENT 1
INDUSTRIAL HUMAN HEALTH RISK ASSESSMENT (HHRA) SCREEN OF COPCs
PLANT 3 AIR SAMPLING
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK

PARAMETER	Maximum Concentration	Sample with Maximum Concentration	U.S. EPA Region 3 Ambient Air RBCs[1]	OSHA PELs[2]	Does Max Exceed RBC?	Does Max Exceed PEL?
Volatile Organic Compounds ($\mu g/m^3$)						
1,1,1-TRICHLOROETHANE	2.8	BP-P3-12	2300	1,910,000	NO	NO
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	16.2	BP-P3-07	31000	7,665,000	NO	NO
ACETONE	13.2	BP-P3-01 (AVG)	370	2,376,000	NO	NO
CIS-1,2-DICHLOROETHENE	4	BP-P3-07	37	793,000	NO	NO
METHYLENE CHLORIDE	13.4	BP-P3-02	3.8	4,945,000	YES	NO
TETRACHLOROETHENE	2.8	BP-P3-07	0.31	678,000	YES	NO
TOLUENE	6.9	BP-P3-01 (AVG)	420	753,000	NO	NO
TRICHLOROETHENE	15.3	BP-P3-07	0.016	537,000	YES	NO
TRICHLOROFLUOROMETHANE	10.6	BP-P3-02	730	5,620,000	NO	NO
XYLENES (TOTAL)	4.8	BP-P3-10	110	434,000	NO	NO

1. U. S. EPA Region 3, Risk-Based Concentration Table, April 25, 2003.
2. OSHA Permissible Exposure Limits, 29 CFR 1910.1000, Table Z-1, 1971.
OSHA PELs based on an 8-hour exposure concentration limit.

ATTACHMENT 1
INDUSTRIAL HUMAN HEALTH RISK ASSESSMENT (HHRA) REASONABLE MAXIMUM EXPOSURE
PLANT 3 AIR SAMPLING
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK

EQUATION FOR INTAKE = ADI = CAxIRxETxEFxED/BWxAT

ADI = AVERAGE DAILY INTAKE (mg/kg-day)
CA = CONTAMINANT CONCENTRATION IN AIR (mg/m^3)
IR= INHALATION RATE (M^3/hour)
ET = EXPOSURE TIME (hours/day)
ED = EXPOSURE DURATION (years)
BW = BODY WEIGHT (kg)
AT = AVERAGING TIME (period over which exposure is averaged - days)

INDUSTRIAL/COMMERCIAL WORKER

Exposure Assumptions

IR	ET[1]	EF[2]	ED[3]	BW[4]	AT
0.83	8	250	25	70	25550

Chemical	CONCENTRATION IN AIR (mg/m^3)[5]	Average Daily Intake (mg/kg-day)	SLOPE FACTOR[6]	INHALATION RISK
METHYLENE CHLORIDE	0.009	0.000208834	0.0017	3.55E-07
TETRACHLOROETHENE	0.00092	2.13475E-05	0.002	4.27E-08
TRICHLOROETHENE	0.011	0.000255242	0.02	5.10E-06
			Total=	5.50E-06

FOOTNOTES
1 - Based on a 8 hour work day
2 - Standard Default Exposure Variable for Commercial/Industrial workers (USEPA Region III, April 1999)
3 - Standard Default Exposure Variable for Commercial/Industrial workers (USEPA Region III, ,
4 - Standard Default Exposure Variable for Adult Body Weight (USEPA Region III, April 1999)
5 - Exposure concentration is equal to 95% UCL on the mean. For non-detects 1/2 Reporting Limit was used for calculation of 95%UCL.
6 - Cancer Slope Factor recommended for inhalation of TCE as reported in USEPA External Review Draft: Trichloroethylene Health Risk Assessment: Synthesis and Characterization (USEPA, Aug. 2001)

ATTACHMENT 1
INDUSTRIAL HUMAN HEALTH RISK ASSESSMENT (HHRA) REASONABLE MAXIMUM EXPOSURE
PLANT 3 AIR SAMPLING
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
BETHPAGE, NEW YORK

EQUATION FOR INTAKE = ADI = CAxIRxETxEFxED/BWxAT

ADI = AVERAGE DAILY INTAKE (mg/kg-day)
CA = CONTAMINANT CONCENTRATION IN AIR (mg/m^3)
IR= INHALATION RATE (M^3/hour)
ET = EXPOSURE TIME (hours/day)
ED = EXPOSURE DURATION (years)
BW = BODY WEIGHT (kg)
AT = AVERAGING TIME (period over which exposure is averaged - days)

INDUSTRIAL/COMMERCIAL WORKER

Exposure Assumptions

IR	ET[1]	EF[2]	ED[3]	BW[4]	AT
0.83	8	250	25	70	25550

Chemical	CONCENTRATION IN AIR (mg/m^3)[5]	Average Daily Intake (mg/kg-day)	SLOPE FACTOR[6]	INHALATION RISK
METHYLENE CHLORIDE	0.0059	0.000136902	0.0017	2.33E-07
TETRACHLOROETHENE	0.00058	0.000013458	0.002	2.69E-08
TRICHLOROETHENE	0.0072	0.000167067	0.02	3.34E-06
			Total=	3.60E-06

FOOTNOTES
1 - Based on a 8 hour work day
2 - Standard Default Exposure Variable for Commercial/Industrial workers (USEPA Region III, April 1999)
3 - Standard Default Exposure Variable for Commercial/Industrial workers (USEPA Region III, April 1999)
4 - Standard Default Exposure Variable for Adult Body Weight (USEPA Region III, April 1999)
5 - Exposure concentration is equal to average of all concentrations. For non-detects 1/2 Reporting Limit was used for calculation of average.
6 - Cancer Slope Factor recommended for inhalation of TCE as reported in USEPA External Review Draft: Trichloroethylene Health Risk Assessment: Synthesis and Characterization (USEPA, Aug. 2001)

APPENDIX A

CORRESPONDANCE

DEPARTMENT OF THE NAVY
ENGINEERING FIELD ACTIVITY, NORTHEAST
NAVAL FACILITIES ENGINEERING COMMAND
10 INDUSTRIAL HIGHWAY
MAIL STOP, #82
LESTER, PA 19113-2090

IN REPLY REFER TO

5090
Code EV21/JLC

31 MAY 2002

Ms. Erin M. Crotty
Commissioner
New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233-1010

Dear Ms. Crotty:

Subj: NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP) BETHPAGE, NASSAU COUNTY, NEW YORK; NYS REGISTRY #1-30-003B

The Navy is forwarding this letter to petition NYSDEC to reclassify the subject site in the Registry of Inactive Hazardous Waste Sites in New York State. This petition comes as a result of the Navy's decision to convey all property associated with NWIRP Bethpage to the County of Nassau, New York.

NWIRP Bethpage was a government-owned/contractor operated (GOCO) facility, owned by the Department of Navy through the Naval Air Systems Command (NAVAIRSYSCOM) and, until September 1998, operated by the Northrop Grumman Corporation (formerly Grumman Aerospace Corporation). NWIRP Bethpage is comprised of property included in two, non-contiguous parcels; the main 105-acre parcel and a separate 4.6-acre parcel of land known as the Plant 20 Parcel. NWIRP Bethpage also consists of a 632,000 SF research and engineering building, known as Plant 05, that is owned by the Navy but is located on land owned by the Northrop Grumman Corporation within their former 605-acre campus that, at one time, surrounded the Navy's 105-acre Parcel.

Since the inception of NWIRP Bethpage in 1933, the main mission of the facility was the research prototyping, testing, design engineering, fabrication, and primary assembly of military aircraft. NWIRP Bethpage's mission was carried out primarily on the 105-acre parcel that, in addition to Plant 03, also included quality control laboratories, two warehouse complexes, three water recharge basins, and an industrial wastewater treatment plant.

There were three (3) distinct areas within the 105-acre parcel that were the subject of environmental investigations conducted since the early 1990's as part of the Navy's Installation Restoration (IR) Program. The site names are:

- IR Site 1 - Former Drum Marshaling Area
- IR Site 2 - Recharge Basin Area
- IR Site 3 - Salvage Storage Area

All appropriate documentation related to the IR Program has been previously submitted to NYSDEC for information, review, and comment including a Record of Decision issued by the Navy in July 1995 for Soils at IR Sites 1, 2 and 3 labeled as Operable Unit 1. All components of the July 1995 OU 1 ROD have been completed at IR Sites 2 and 3 including a permeable soil cover that was recently applied over IR Sites 2 and 3. Attached is a Construction Completion Report, dated May 2002, that describes, in detail, all activities conducted as part of the application of the soil cover.

Work associated with the OU 1 ROD is currently underway at IR Site 1 but has not been completed. Since it is anticipated that work at IR Site 1 will not be completed before the property is to be conveyed to Nassau County, this 8.7-acre parcel will not be part of the initial transfer of property but will be retained by the Navy pending completion of soil-related activities. As such, this site is not being included as part of this petition.

A property survey was prepared to support the upcoming conveyance of land to Nassau County including legal descriptions of the property to be conveyed as well as for the property to be retained. A copy of the survey and legal descriptions for both the 105-acre Parcel and the Plant 20 Parcel have also been included with this petition.

A complete description of the parcels to be transferred and retained can be found in a Statement of Basis for a Major Modification of the Bethpage Facility Part 373 Permit. This document, entitled *Removal of the 105-Acre GOCO Site*, dated August 2000 and Revised February 2001, was developed by Dvirka and Bartilucci Consulting Engineers on behalf of Northrop Grumman and was submitted to NYSDEC for consideration on February 23, 2001. This petition should be considered part of the Major Modification and included in the Statement of Basis.

After Northrop Grumman operationally vacated the Navy's property, the Navy conducted a basewide Environmental Baseline Survey (EBS). This two-phase report documented operational, regulatory, and remedial histories associated with the Navy's 105-acre property and the Plant 20 Parcel and was heavily based on numerous site assessment reports prepared independently by Northrop Grumman. A Final Phase I EBS was submitted to NYSDEC in January 1998. Draft and Final versions of a Phase II EBS were submitted in March and December 1999, respectively. NYSDEC submitted numerous comments in a letter dated February 10, 2000. The Navy responded to these comments in a letter to NYSDEC on 2 October 2000. Additional comments from the NYSDOH were submitted during a meeting held in Albany on April 11, 2001 which prompted the Navy to prepare a revision to the Final Phase II EBS that was recently submitted to NYSDEC on May 30, 2002. A copy of the Revised Final Phase II EBS is also attached to this petition.

The Navy also submitted a Draft Finding of Suitability to Transfer (FOST) document to NYSDEC and NYSDOH for review on 28 September 2000. NYSDEC and NYSDOH comments on the Draft FOST were also a topic of discussion at the April 11th meeting. The Navy's responses to comments made at that meeting were incorporated into a Draft-Final FOST issued to NYSDEC and NYSDOH on 20 February 2002. The Navy also updated the Draft-Final FOST to reflect the current status of the Groundwater Operable Unit by incorporating language regarding the OU 2 ROD issued by NYSDEC on March 29, 2001.

To date, the Navy has not received any correspondence regarding this latest submission.

It is the Navy's intention to have Engineering Field Activity, Northeast's Commanding Officer, an engineer with a P.E. certification, sign the FOST document stating that the site is suitable for transfer and that all remedial activity has been completed for the parcel(s) of land that are to be transferred. This will not include the 8.7-acre parcel that will be retained by the Navy. A separate FOST document will be prepared for that parcel when appropriate.

By issuance of this letter, the Navy is requesting that the boundaries that currently define Site 1-30-003B on New York State's Registry of Inactive Hazardous Waste Sites be modified to only include the 8.7-acre parcel that is to be retained by the Department of Navy in order to complete soil-related activities.

If you have any questions, please give me a call at (610) 595-0567, extension 163.

Sincerely,

JAMES L. COLTER
Remedial Project Manager
By direction of the
Commanding Officer

Enclosures: (1) Construction Completion Report for IR Sites 2 and 3
(2) Property Survey for 105-Acre Parcel
(3) Property Survey for Plant 20 Parcel
(4) Final Phase II EBS (Revision I dated May 2002)

Copy to:
NYSDEC
Bureau of Hazardous Site Control
11th Floor
625 Broadway
Albany, New York 12233-7014
ATTN: Dennis Farrar (3 copies of all enclosures)

Copy to: (Enclosure 1 only)
NAVAIR, Joe Kaminski
NYSDEC (Albany), Gerard Burke
NYSDEC (Albany), Steve Scharf
NYSDEC (Albany), Henry Wilkie
NYSDEC (Stony Brook), Stan Farkas
NYSDOH, Bill Gilday
USEPA Region II, Dale Carpenter
USEPA Region II, Carla Struble
Northrop Grumman, Larry Leskovian
Northrop Grumman, John Cofman
Nassau County DPW, Tim Kelly
J.A. Jones, Al Taormina
RAB Co-Chair, Jim McBride (3 copies)
Information Repository, Bethpage Library

STATE OF NEW YORK
DEPARTMENT OF HEALTH

Flanigan Square, 547 River Street, Troy, New York 12180-2216

Antonia C. Novello, M.D., M.P.H., Dr.P.H.
Commissioner

Dennis P. Whalen
Executive Deputy Commissioner

September 27, 2002

Steven Scharf
NYS Dept. of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 11th Floor
Albany, NY 12233-7014

Henry Wikie
NYS Dept. of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 8th Floor
Albany, NY 12233-7252

RE: NWIRP (Site #130003b)
Bethpage, Nassau County

Dear Mr. Scharf and Mr. Wilkie:

I have reviewed the documentation record of remedial/corrective action activities for the Naval Weapons Industrial Reserve Plant (NWIRP), Bethpage in conjunction with the U.S. Navy petition, dated May 31, 2002, to reclassify portions of the NWIRP. The Navy petition includes four supporting documents as enclosures. I offer the following comments on the petition and associated enclosures, with reference to other relevant documents as noted in my comments.

Petition

1. The Petition should reference the Air Sampling Results and Report, dated April 10, 2001, for the 105-acre parcel. Alternatively the Air Report could be included as, or within, a supporting document.

2. Re: Air Sampling Results and Report

Indoor air sampling results indicate the presence of trichloroethene (TCE) at levels above typical background concentrations in most of Plant 3; in most cases (all but locations BP-P3-07 and BP-P3-09) the levels were only slightly elevated. These results indicate the presence of one or more TCE sources within or beneath Plant 3 and possibly in the vicinity of the 17-S warehouses. These results may be indicative of vapor intrusion from residual subsurface vapor contaminants and/or may represent residual TCE sources within the buildings (e.g., historic leaks into cracks or TCE sorbed onto construction materials).

Previous soil gas testing beneath Plant 3 identified TCE and tetrachloroethene (PCE) at levels up to about 600,000 $\mu g/m^3$ and 5,000,000 $\mu g/m^3$, respectively. Remediation of volatile organic compound (VOC)-contaminated soil has since occurred as part of facility closure activities. However, no post-remediation soil vapor testing has been done. Soil gas must be re-tested beneath Plant 3, particularly the eastern portion of the building, to determine if the pre-remediation soil vapor contaminants have dissipated. Such testing will also aid in determining if the levels of TCE detected in indoor air in the building are from internal sources and whether any subsequent building reconstruction/reuse scenarios may result in indoor air quality impacts. The testing should include at least one point near E. Pit 23 in the Northeastern Machining Area. Soil vapor should also be tested between the southeast corner of Plant 3 and over to (and in the vicinity of) the 17-S warehouse (identified as "BLDG. 19" on the 105-acre property survey) that air sample BP-P3-11 was obtained from.

Freon 113 was detected in air sample BP-P3-07 at a level higher than typically found in indoor air samples. Freon 113 is commonly used as a refrigerant and its presence in the building may be related to air cooling units. The Navy may wish to consult a ventilation contractor to evaluate the condition of cooling units in the building and to test for Freon leaks.

3. Re: Effects of Installation Restoration (IR) Site 1 Soil Vapor Extraction (SVE) System on vadose zone vapors beneath Plant 3

The May 1995 Record of Decision (ROD) for the NWIRP Sites 1, 2, 3 makes reference to the presence of VOC "hot spots" in the vadose zone at Site 1 and beneath Plant 3 (see Page 27 of 41 in the ROD). The selected remedy in the 1995 ROD, Alternative 6, includes in-situ soil vapor extraction (SVE) for VOC-contaminated soil at Site 1 and underneath Plant No.3 (see page ii and Page 30 of 41, 1995 ROD). Consistent with this, the Major Modification of the Bethpage Facility Part 373 Permit - Removal of the 105-Acre GOCO Site Statement of Basis dated August 2000 notes that the ROD requirement for SVE includes removal of VOCs from the vadose zone soil below IR Site 1 and beneath Plant 3.

Information contained in the Close-Out Report for the Air Sparging/Soil Vapor Extraction System, IR Site 1 NWIRP, dated March 30, 2001, indicates that contaminated vapors have been collected at depth east of Plant 3. However, the Close-Out Report provides no definitive information concerning the removal of contaminated soil vapors from beneath Plant 3. The most recent extraction well-specific data from the SVE points nearest the building indicate that between about 6,000 to 45,000 $\mu g/m^3$ of PCE and up to about 5,000 $\mu g/m^3$ of TCE are present in soil vapor captured from the extraction wells nearest Plant 3. More recent data from SVE influent analyses, reported in the February 2002 Monthly Operations Summary for the VE/AS system, dated April 8, 2002, suggest that these concentrations may be somewhat lower at the present time. However, data presented in the Operations Summary (see the Concentration vs. Time plot) also indicate that average vadose zone vapor concentrations for TCE and PCE in the vicinity of the VE/AS system continue to rebound to approximately 18,000 $\mu g/m^3$ and 50,000 $\mu g/m^3$, respectively, after each period of system shutdown.

Consistent with comment 2 above, soil vapor testing beneath and immediately east of Plant 3 will provide definitive information as to the effects of remedial activities on subsurface VOC vapors that were present prior to commencement of the activities.

Petition Enclosure 1: The Construction Completion Report for IR Sites 2 and 3

4. Appendix A of the Construction Completion Report contains surface soil sampling results from Sites 2 and 3. Delineation of PCB-contaminated soil around the perimeter of each Site must be done to levels of less than 1 milligram per kilogram (mg/kg or ppm). This level of delineation appears to be sufficiently achieved for Site 3 and for the eastern and western lot lines of Site 2. Additional surface soil sampling (0-2") should be done at the north fenceline of Site 2 and along the grassy strip immediately south of the access road at the southern part of Site 2. For consistency with the ongoing off-site PCB surface soil investigations along the access road, one surface soil sample should be collected in the grassy strip opposite each of the four residential properties.

5. The Navy proposes to rely on Grumman's remedial activities at Site 3 as an equivalent implementation of the ROD requirements. While this seems reasonable, DEC should confirm that a ROD amendment is not necessary.

6. Figure 2-1 of the Completion Report should specify the units for the [apparent] excavation depth values (i.e., clarify if the depths noted are inches or feet). Delineation and endpoint sample results associated with the soil removal should also be included in the Completion Report.

7. The Completion Report would be improved if previous soil testing results for Sites 2 and 3, particularly those from the remedial investigation, were included for reference.

Petition Enclosure 2: Property Survey for 105-Acre Parcel

8. Information contained in the Environmental Baseline Survey to Transfer, Revision 1 – February 2002 (EBST), particularly on Page 8, suggests that AOC 34 - Former Autoclave Area will be included in the revised boundary definition for IR Site 1. However, the Former Autoclave Area does not appear to be the portion of the Plant 3 building included within the revised property line for the 105-Acre Parcel (compare with Features 35 and 36 on EBST Figure 8). Neither Figure 8 nor the property survey appears to agree with the building lines as depicted in Figure 10 of the EBST.

Petition Enclosure 3: Property Survey for Plant 20 Parcel

No comments.

Petition Enclosure 4: Final Phase II EBS (Revision I dated May 2002)

9. Inclusion of Tables 9-1 through 9-6, along with Figures 8A and 9A, is an excellent feature of the EBS and the EBST documents. Comparison of the residual contaminant concentrations tabulated in these tables with the pre-remedial concentrations demonstrates that substantial amounts of contaminated soil have been removed from various areas of concern (AOCs) across

the site. Because some residual contaminants remain at concentrations in excess of NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives (RSCOs) that could present a potential exposure concern under certain scenarios, deed restrictions will be necessary at the site. These tables and the corresponding maps will provide a useful reference tool for evaluating future proposals for ground-intrusive activities at the site with respect to the need for investigation and/or protective measures.

10. Figure 9A of the EBST should include hatching at the appropriate locations of IR Sites 2 and 3 (i.e., those locations with residual contaminant concentrations in excess of TAGM 4046 RSCOs). Figure 9A should also identify the "hatching" as is done in Figure 8A.

11. The Phase I EBS identified a ditch within the wooded area at the northeastern perimeter of the 105-acre parcel. This ditch apparently connected a landfill area north of the site to a landfill area east of the site. According to the Phase II EBS (Page 3-50), soil samples from the ditch were tested for metals. Given recent information about PCB-contamination of soil associated with former fill areas in the vicinity of Plant 3, surface soil samples should be collected from the ditch and tested for PCBs. This testing could be done in conjunction with that recommended in Comment 4 above.

12. Re: Statements in the Phase II EBS and the October 2, 2000 Navy Response to NYSDEC Comments Regarding the Draft Phase II EBS Report for the NWIRP

a. TAGM 4046 does not include a RSCO of 10 ppm for carcinogenic PAHs (cPAHs). Other factors, such as benzo(a)pyrene equivalents and local background concentrations of cPAHs , must be considered when selecting appropriate cleanup objectives. For this reason, and based upon a review of post-remedial analytical data, deed restrictions (as are proposed) will be necessary for several locations at the 105-acre parcel.

b. If residual contaminant levels exceed RSCOs, the inability to leach (e.g. no TCLP failures) to groundwater does not mean deed restrictions can be waived. Potential exposure routes other than using contaminated groundwater may be present now or in the future, thereby requiring implementation of appropriate deed restrictions (similar to that proposed). In the case of VOCs, elevated levels of subsurface contaminants could also lead to exposure via subsurface vapor migration into overlying or nearby structures. This latter issue should be addressed pursuant to comments 2 and 3 above.

Re: Finding of Suitability to Transfer (FOST) – 105-Acre Parcel, Revision dated February 2002

13. Paragraph 3 of the Environmental Covenants, Conditions, Reservations, and Restrictions (ECCRRs, also commonly referred to as "deed restrictions"), Enclosure 2 of the FOST, should have a statement, second to last sentence, similar to the following:

> "Said activities shall also be performed with necessary precautions, including appropriate monitoring and controls, to ensure that these are done in a manner protective of public health and the environment."

14. The reference to NYSDEC TAGM 4046 levels should describe these as Recommended Soil Cleanup Objectives. Paragraph 7 of the ECCRRs should clarify which party prepares the written permission for excavation. Paragraph 7 should also clarify if only contaminated soil that is excavated must be disposed of off-site, or all soil (contaminated and non-contaminated alike) that is excavated.

15. The ECCRRs must require future owners to annually certify to NYSDEC that:

- protective covers and any other engineering controls associated with site remedies and corrective actions have been maintained; and
- the conditions at the site are fully protective of public health and the environment in accordance with specifications of the 1995 ROD, the FOST, the EBST, SEQRA Findings, and any other remedial decision documents, as appropriate.

16. The ECCRRs should include a clause that allows the owner, with agency approval, to remove certain conditions and restrictions in the event that additional remediation done in the future renders the restrictions no longer necessary.

Re: Finding of Suitability to Transfer (FOST) - Plant 20, June 2002

17. Nassau County Department of Health should be consulted to determine if the revised FOST – Plant 20 satisfactorily addresses the concerns raised in their letter dated March 20, 2002.

Thank you for the opportunity to review this petition and to provide comments on the supporting documentation. If you have any questions about this correspondence, please contact me at 518-402-7880.

Sincerely,

William Gilday
Senior Sanitary Engineer
Bureau of Environmental Exposure Investigation

cc: Mr. G. Litwin/Mr. R. Fedigan/File
Mr. C. Vasudevan
Mr. E. Dassatti
Mr. R. Knizek/Mr. G. Burke
Mr. R. Marino/Mr. B. Pine
Mr. W. Parish (NYSDEC Reg.1)
Mr. A. Cava/Mr. S. Farkas (NYSDEC Reg 1)
Mr. R. Weitzman (NCDOH)
Mr. T. Kelly (NCDPW)

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New York State Department of Environmental Conservation
Division of Environmental Remediation
Bureau of Eastern Remedial Action, 11th Floor
625 Broadway, Albany, New York 12233-7015
Phone: (518) 402-9620 FAX: (518) 402-9022

Erin M. Crotty
Commissioner

October 1, 2002

James Colter
Dept. Of the Navy, Northern Division
Naval Facilities Engineering Command (NAVFAC),
10 Industrial Highway, Mail Stop No. 82
Lester, PA 19113-2090

Dear Mr. Colter:

RE: Naval Weapons Industrial Research Plant (NWIRP), Nassau County Site No. 1-30-003B.

By means of this letter, the New York State Department of Environmental Conservation (NYSDEC) is transmitting the New York State Department of Health (NYSDOH) (9/27/02 Gilday to Scharf/Wilkie) comments directly to the Department of the Navy regarding the Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage Site. More specifically, the comments contained in Mr. Gilday's letter cover the Finding of Suitability to Transfer (FOST) for Plants 3 (88 acres) and 20, the Construction Completion Report for Installation and Restoration (IR) Sites 2 and 3, the Phase II Environmental Baseline Survey, NWIRP, Bethpage and the petition to delist portions of the 105 acre facility and Plant 20 from the NYSDEC Registry of Inactive Hazardous Waste Disposal Sites.

Once you have had the opportunity to review the enclosed comment letter, please contact me at (518)402-9620 so that a conference call to discuss these outstanding issues can be arranged.

Sincerely,

Steven M. Scharf, P.E.
Project Engineer
Bureau of Eastern Remedial Action
Division of Environmental Remediation

(Coltefost.wpd)

Enclosure
c/w/enc: W. Gilday, NYSDOH (via e-mail)
J. Lovejoy, NCDOH
T. Kelly, NCPDW
J. Cofman, Northrop Grumman

New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Action Bureau A, 11th Floor
625 Broadway, Albany, New York 12233-7015
Phone: (518) 402-9620 FAX: (518) 402-9022

July 23, 2003

James Colter
Dept. Of the Navy, Northern Division
Naval Facilities Engineering Command (NAVFAC),
10 Industrial Highway, Mail Stop No. 82
Lester, PA 19113-2090

RE: Naval Weapons Industrial Research Plant (NWIRP) Bethpage Operable Unit 2 (OU2) Record of Decision, Groundwater Remedy, Nassau County Site No. 1-30-003B.

Dear Mr. Colter:

The Department of the Navy (the Navy) submitted a revised copy of the Naval Weapons Industrial Reserve Plant (NWIRP) Site Finding of Suitability to Transfer, 105 Acre Parcel (NWIRP), dated January 2003. This FOST has been reviewed by the New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH). Based on the review of the January 2003 revised FOST, The State of New York has no further comments.

Boundary Modification of Plant 3

Analytical data compiled as part of the Plant 3 Phase II Environmental Baseline Survey (EBS) and the subsequent FOST indicates the presence of trichloroethene (TCE) at levels above typical background concentrations for indoor air. As we have discussed during our July 18, 2003 telephone conversation, these results may be indicative of potential vapor intrusion from residual subsurface vapor contaminants and/or may represent residual TCE sources within the buildings (e.g., historic leaks into cracks or TCE sorbed onto construction materials). Previous soil gas testing beneath the Plant 3 slab identified TCE and tetrachloroethene (PCE) at levels up to about 600,000 $\mu g/m^3$ and 5,000,000 $\mu g/m^3$ respectively in the eastern area of the building. Remediation of volatile

organic compound (VOC)-contaminated soil has since occurred as part of facility closure activities. However, no post-remediation soil vapor testing has been done.

In order to address these potential indoor air intrusion concerns, The Department of the Navy (Navy) has tentatively agreed to submit a proposal on this subject. This proposal will be consistent with USEPA guidance on the subject. The USEPA maintains the following website that contains some of the latest guidance on the subject:

http://www.epa.gov/epaoswer/hazwaste/ca/eis/vapor.htm

In the meantime, if you have any questions, please contact me at (518)402-9620.

Sincerely,

Steven M. Scharf

Steven M. Scharf, P.E.
Project Engineer
Remedial Action Bureau A
Division of Environmental Remediation

c:

W. Parish, Region 1 (Via E-mail)
J. Lovejoy, NCDH (Via E-mail)
D. Brayack, TTNUS (Via e-mail)
J. Cofman, Northrop Grumman (Via e-mail)
D. Stern, Arcadis G&M (Via e-mail)
C. Struble, USEPA (Via e-mail)
I. Ushe, NYSDOH (Via e-mail)
T. Kelly, (Via e-mail) (Colterrod2.wpd)

The attached electronic copy regardingNWIRP was signed by Steven M. Scharf on July 25, 2003. *This email copies you on correspondence from the New York State Department of Environmental Conservation, Division of Environmental Remediation. Electronic attachments may be attached. A hard copy version will not follow in the mail. Please contact* ***Steven Scharf*** *at (518) 402-9620 if you experience problems with this transmission.*

APPENDIX B

NORTHROP GRUMMAN AND

NYSDEC CORRESPONDANCE

NORTHROP GRUMMAN

Electronics & Systems Integration Division
Northrop Grumman Corporation
South Oyster Bay Road
Bethpage, New York 11714-3580

May 7, 1998
ETC98-122

Mr. Stan Farkas
NYS Department of Environmental Conservation
SUNY - Building 40
Stony Brook, New York 11794

Subject: **Northrop Grumman Corporation - Building 03, Bethpage Site**
Area of Concern 21-21 - Equipment Pit
Remediation End Point Sample Results

Enclosure
1) End Point Soil Sample Location Drawing
2) End Point Soil Sample Data

Dear Mr. Farkas:

As you know, Northrop Grumman has been conducting environmental remediation at the Bethpage Building 03 location for Areas of Concern (AOCs) that have significant exceedances of the TAGM 4046 soil criteria. One such location, AOC 21-21 - Equipment Pit, was recently excavated to a depth of approximately twelve (12) feet below grade surface (bgs). A sketch showing the excavated area and end point sample locations is provided in Enclosure 1.

In a previous meeting, we agreed to sample and analyze the side wall samples prior to excavation. This sampling methodology was chosen to ensure that the horizontal extent of impacted soil for each AOC was accurately defined.

The end point sample results are presented in Enclosure 2. All samples were analyzed for Volatile Organic Compounds (VOCs). The data indicates that there are no exceedances of the TAGM criteria except for one floor sample. Tetrachloroethene was detected at a concentration of 14,000 µg/kg in sample AOC 21-21G (12'). A TCLP extraction procedure was conducted on sample AOC 21-21G (12') to determine if PCE was present at a sufficient concentration to be considered a characteristic hazardous waste. The TCLP result, shown on page 7 of Enclosure 2, indicates that the soil at the bottom of AOC 21-21 is not characteristically hazardous.

It is important to note that AOC 21-21 is located within Plant 03 and, following backfilling, will remain capped with concrete. Consequently, residual PCE would not likely migrate to the groundwater table which is located 60 feet bgs. In addition, VOC contamination, including PCE, present in the groundwater has been widely studied and documented throughout the Bethpage/Hicksville area. As part of a Record of Decision (ROD) with the NYSDEC, Northrop Grumman has designed and installed an Interim Remedial Measure (IRM) groundwater treatment system. The IRM groundwater system was designed specifically to remediate VOCs, including PCE. Therefore, any potential groundwater plume containing PCE resulting from AOC 21-21 would be captured and treated by the on-site IRM system.

In summary, Northrop Grumman effectively removed, transported, and disposed of impacted soils at AOC 21-21. With only one exception, the end point analysis results demonstrate that soils immediately adjacent to the excavated areas do not exceed the TAGM criteria. Because AOC 21-21 will remain capped with concrete and potentially impacted groundwater resulting from this area would be remediated by our IRM ground water system, we believe the environmental impacts are minimal. It is therefore recommended that no further action is warranted at AOC 21-21.

Upon your review and approval of the attached data and these recommendations, Northrop Grumman will backfill the excavation area with certified clean bank-run sand and restore the area to match existing conditions. A complete engineering report documenting all field activities, laboratory data analysis, and waste disposal manifests shall be sent to your office at the completion of this project.

We have put together an ambitious schedule for the completion of the remediation work at the 105-Acre GOCO site and would appreciate your expeditious review and approval of this letter report.

If you have any questions, please call me at 516/575-2333 or A. Postyn, of this office, at 516/575-1566.

Very truly yours,

NORTHROP GRUMMAN CORPORATION

Larry L. Leskovjan, Manager
Environmental Technology and Compliance
M/S: D08-001

cc: w/enclosure
S. Kaminski, NYSDEC; H. Wilkie, NYSDEC; T. Mulvihill, NCDH; T. Kelly, NCDPW
w/o enclosure
J. Lovejoy, NCDH; B. Mackay, NCDH

bcc: w/enclosure
J. Colter
J. Hare
M. Hill
J. Kaminski
A. Postyn
A. Taormina

w/o enclosure
P. Siegel
J. Cofman
R. Patac

ENCLOSURE 1

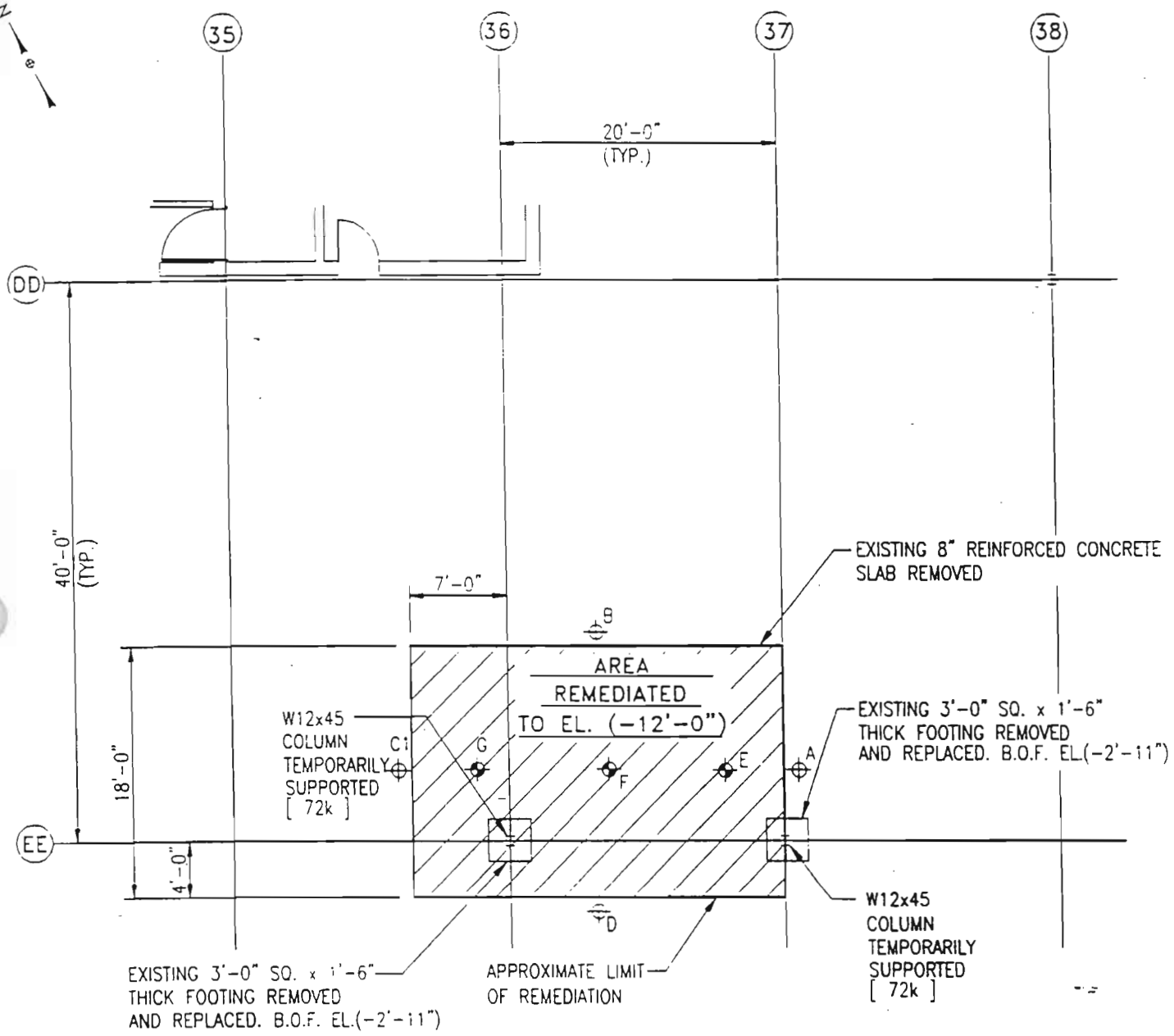
NOTES.

1. SOIL SAMPLES ANALYZED FOR VOLATILE ORGANIC COMPOUNDS

LEGEND:

⊕ IN-SITU SIDEWALL SAMPLE

⊕ POST REMEDIATION FLOOR SAMPLE



POST REMEDIATION PLAN AOC 21-21

N.T.S.

DWG. DATE -98 PROJECT NO. NY000008.0140 FILE: C:\APROJECT\GRUMMAN\NY0008.01 DRAWING: AOC 21-21 CHECKED: GH APPROVED: GH DRAFT

ARCADIS GERAGHTY & MILLER

88 DURYEA ROAD
MELVILLE, NY 11747
Tel: 516/249-7600 Fax: 516/249-7610

AOC 21-21

PLANT 3
NORTHROP GRUMMAN CORPORATION
BETHPAGE, NEW YORK

PROJECT NUMBER
NY000008.0140

FIGURE NUMBER
15

New York State Department of Environmental Conservation
Division of Solid & Hazardous Materials, Region One
Building 40 - SUNY, Stony Brook, New York 11790-2356
Phone: (516) 444-0375 FAX: (516) 444-0231

John P. Cahill
Commissioner

June 23, 1998

Mr. Larry Leskovjan, Manager
Environmental, Health & Safety
M/S D16-001
Northrup Grumman Corporation
South Oyster Bay Rd.
Bethpage, NY 11714-3583

RE: Authorization to Backfill Various Areas of Concern
Grumman-Bethpage NYD002047967

Dear Mr. Leskovjan:

The Division of Solid and Hazardous Materials (DSHM) has completed its review of the following submissions concerning remediation of various Areas of Concern (AOCs) located within the Naval Weapons Industrial Reserve Plant at the Northrup Grumman Corp. in Bethpage. Based on our review of the sampling data, inspection of the designated areas and discussions with your engineers, the DSHM approves your requests for No Further Action (NFA) based upon achievement of TAGM criteria and hereby approves the backfilling of the excavations associated with the AOCs listed.

Date of Submittal	Description	DSHM Response
3/23/98	Plant 3, Various AOCs (36) - Request for NFA	Verbal O.K. 6/9/98
3/30/98	Plants 10/17 South, Various AOCs (4) - Request for NFA	Verbal O.K. 6/9/98
4/17/98	Plant 3, AOC 24 - Request for NFA/ Backfilling	None
4/28/98	Plant 3, AOC 9 - Request for NFA/ Backfilling	None
4/28/98	Plant 3, AOC 27 - Request for NFA/ Backfilling	Verbal O.K. 5/12/98
4/29/98	Plant 3, AOC 2 - Request for NFA/ Backfilling	None

5/5/98	Plant 3, AOC 21-21 - Request for NFA/ Backfilling	Verbal O.K. 5/12/98
5/13/98	Plant 3, AOC 33-09 - Request for NFA/ Backfilling	Verbal O.K. 5/15/98
5/13/98	Plant 3, AOC 33-11/12 - Request for NFA/ Backfilling	Verbal O.K. 5/15/98
5/5/98	Plant 3, AOC 1-08 - Request for NFA/ Backfilling	Verbal O.K. 5/12/98
5/5/98	Plant 3, AOC 1-20 - Request for NFA/ Backfilling	Verbal O.K. 5/12/98
5/13/98	Plant 3, AOC 6 - Request for NFA/ Backfilling	Verbal O.K. 5/15/98
5/13/98	Plant 3, AOC 34 - Request for NFA/ Backfilling	Verbal O.K. 5/15/98

We have also received submissions dated 5/22/98, for Plant 3, AOC 20-24, and 6/4/98 for Plant 10 Degreaser Pit which are still under review.

Please advise the Department of your schedule for filling the approved AOCs. We also recommend your receiving approval from the Nassau County Department of Health. If you have any questions, please do hesitate to contact me at (518) 444-0379 or Mr. Henry Wilkie at (518) 457-9255.

Yours truly,

Stanley Farkas, P.E.
Environmental Engineer II

SF:ek

cc: A. Postyn, Northrup Grumman
S. Kaminski, NYSDEC
H. Wilkie, NYSDEC
J. Lovejoy, NCDH

NORTHROP GRUMMAN

Electronics & Systems Integration Division
Northrop Grumman Corporation
South Oyster Bay Road
Bethpage, New York 11714-3580

April 14, 1998
ETC98-097

Mr. Stan Farkas
NYS Department of Environmental Conservation
SUNY - Building 40
Stony Brook, New York 11794

Subject: **Northrop Grumman Corporation - Building 03, Bethpage Site**
Area of Concern 13 - Former Honeycomb Pretreatment
Area of Concern 33-19 - Former Waste Accumulation Area
Remediation End Point Sample Results

Enclosures:
1) End Point Soil Sample Location Drawings
2) End Point Soil Sample Data

Dear Mr. Farkas:

As you know, Northrop Grumman has been conducting environmental remediation at the Bethpage Building 03 location for Areas of Concern (AOCs) that have significant exceedances of the TAGM 4046 soil criteria. One such location, AOC 13 - Former Honeycomb Pretreatment, was recently excavated to a depth of approximately twelve (12) feet below grade surface (bgs). Another location, AOC 33-19 - Former Waste Accumulation Area, was also recently excavated to a depth of about ten (10) feet bgs. Sketches showing the excavated areas and end point sample locations for AOCs 13 and 33-19 are provided in Enclosure 1.

In a previous meeting, we agreed to sample and analyze the side wall samples prior to excavation. This sampling methodology was chosen to ensure that the horizontal extent of impacted soil for each AOC was accurately defined.

All end point samples for AOC 13 were analyzed for priority pollutant metals by methods 6010/7471. Similarly, the end point samples for AOC 33-19 were analyzed for semi-volatile organic compounds (SVOCs) by method 8270. The end point sample results are presented for your review in Enclosure 2. The data indicates that there are no exceedances of the TAGM criteria.

In summary, Northrop Grumman has effectively removed, transported, and disposed of impacted soils at AOCs 13 and 33-19. The end point analysis results demonstrate that soils immediately adjacent to the excavated areas do not exceed the TAGM criteria. It is therefore recommended that No Further Action is warranted at AOCs 13 and 33-19.

Upon your review and approval of the attached data and these recommendations, Northrop Grumman will backfill the excavation areas with certified clean bank-run sand and restore the area to match existing conditions. A complete engineering report documenting all field activities, laboratory data analysis, and waste disposal manifests shall be sent to your office at the completion of this project.

We have put together an ambitious schedule for the completion of the remediation work at the 105-Acre GOCO site and would appreciate your expeditious review and approval of this letter report.

If you have any questions, please call me at 516/575-2333 or A. Postyn, of this office, at 516/575-1566.

Very truly yours,

NORTHROP GRUMMAN CORPORATION

Larry L. Leskovjan, Manager
Environmental Technology and Compliance
M/S: D08-001

cc: w/enclosure
T. John, NYSDEC; S. Kaminski, NYSDEC; T. Mulvihill, NCDH; T. Kelly, NCDPW
D. Langer, Beveridge & Diamond, P.C.

w/o enclosure
J. Lovejoy, NCDH; B. Mackay, NCDH

bcc: w/enclosure
J. Hare, J. Colter, J. Kaminski, A. Taormina, A. Postyn, M. Hill

w/o enclosure
P. Siegel, J. Cofman, R. Patac

ENCLOSURE 1

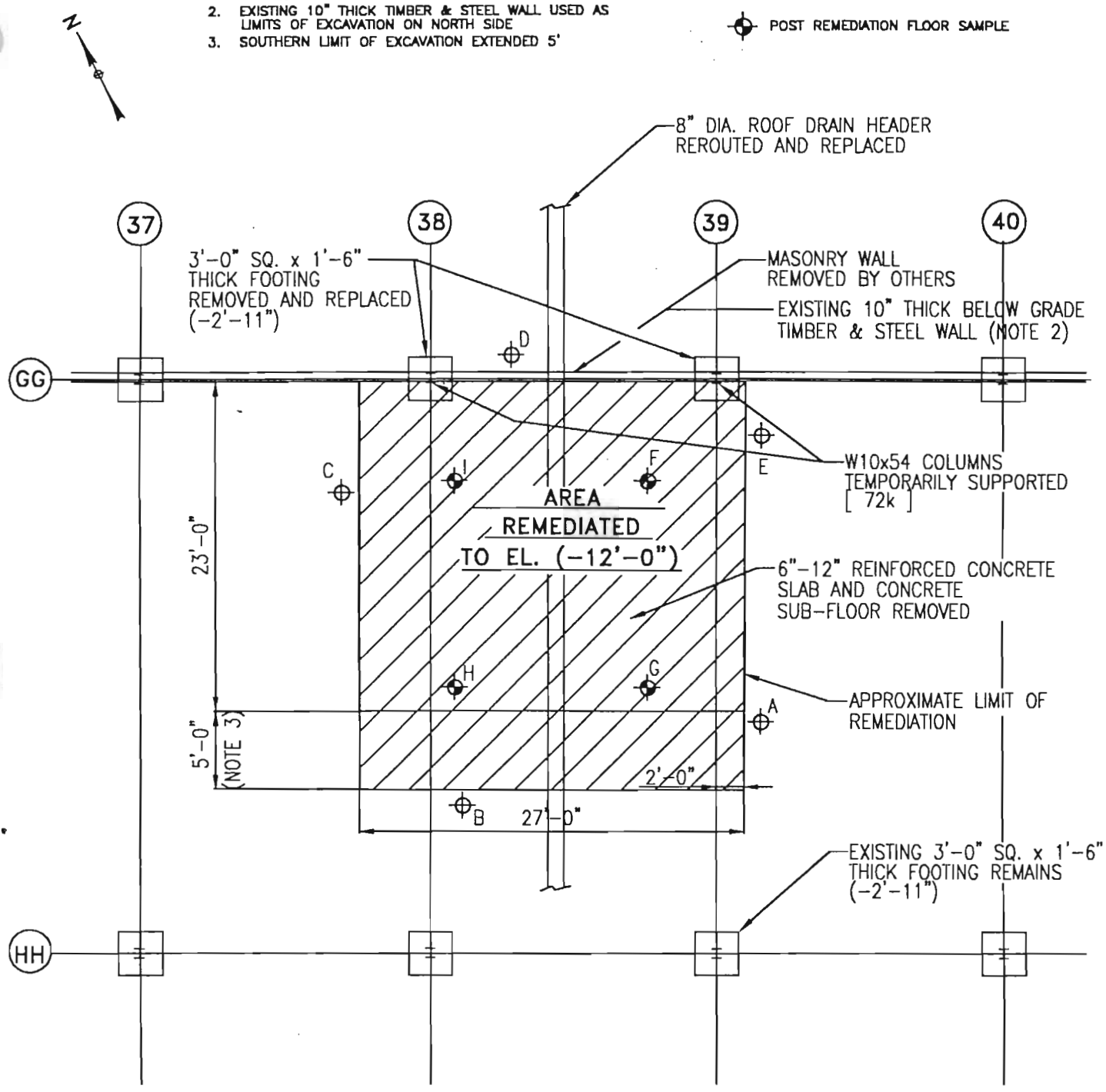
NOTES:

1. SOIL SAMPLES ANALYZED FOR PRIORITY POLLUTANT METALS
2. EXISTING 10" THICK TIMBER & STEEL WALL USED AS LIMITS OF EXCAVATION ON NORTH SIDE
3. SOUTHERN LIMIT OF EXCAVATION EXTENDED 5'

LEGEND:

IN-SITU SIDEWALL SAMPLE

POST REMEDIATION FLOOR SAMPLE



POST REMEDIATION PLAN – AOC 13

N.T.S.

DWG DATE: 98 PROJECT. NO. NY000008.0140 FILE: C:\APROJECT\GRUMMAN\NY0008.0140\C DRAWING: AOC 13 CHECKED: GN APPROVED: GN D MS

ARCADIS GERAGHTY & MILLER

88 DURYEA ROAD
MELVILLE, NY 11747
Tel: 516/240-7800 Fax: 516/240-7810

AOC 13

PLANT 3
NORTHROP GRUMMAN CORPORATION
BETHPAGE, NEW YORK

PROJECT NUMBER
NY000008.0140

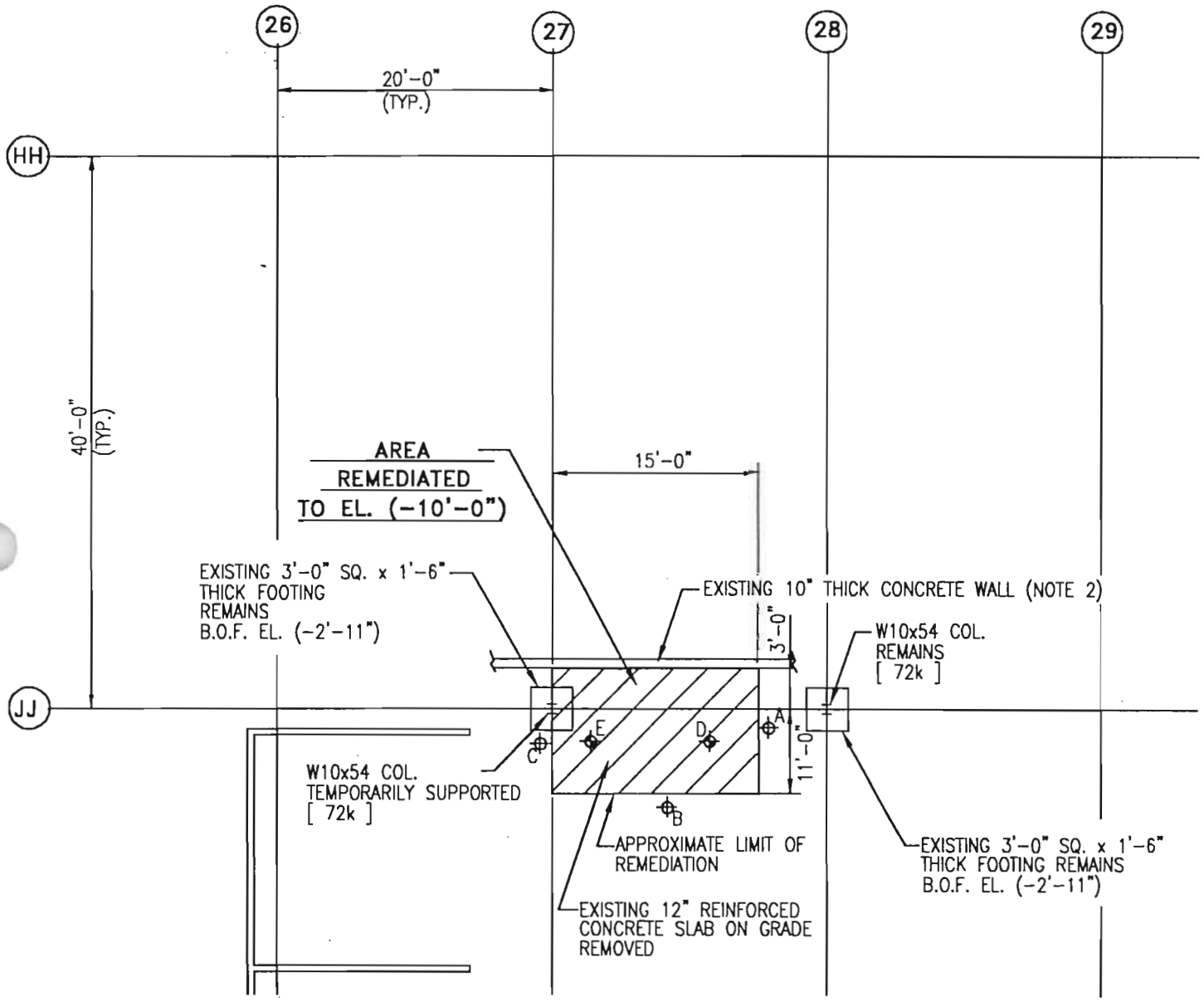
FIGURE NUMBER
4

NOTES:

1. SOIL SAMPLES ANALYZED FOR SEMI-VOLATILE ORGANIC COMPOUNDS
2. EXISTING 10" CONCRETE WALL USED AS LIMIT OF EXCAVATION ON NORTH SIDE (NO SIDEWALL SAMPLES TAKEN)

LEGEND:

- IN-SITU SIDEWALL SAMPLE
- POST REMEDIATION FLOOR SAMPLE



POST REMEDIATION PLAN – AOC 33-19

N.T.S.

DWG DATE: 98 PROJECT. NO. NY000008.0140 FILE: G:\APROJECT\GRUMMAN\NY0008.0140\ DRAWING: AOC 33-19 CHECKED: GN APPROVED: GN R: MS

ARCADIS GERAGHTY & MILLER

88 DURYEA ROAD
MELVILLE, NY 11747
Tel: 516/249-7600 Fax: 516/249-7610

AOC 33-19

PLANT 3
NORTHROP GRUMMAN CORPORATION
BETHPAGE, NEW YORK

PROJECT NUMBER
NY000008.0140

FIGURE NUMBER
8

New York State Department of Environmental Conservation
Division of Solid & Hazardous Materials, Region One
Building 40 - SUNY, Stony Brook, New York 11790-2356
Phone: (516) 444-0375 FAX: (516) 444-0231

John P. Cahill
Commissioner

May 13, 1998

Mr. Larry Leskovjan, Manager
Environmental, Health & Safety
M/S D16-001
Northrup Grumman Corporation
South Oyster Bay Rd.
Bethpage, NY 11714-3583

RE: Authorization to Backfill Various Areas of Concern
Grumman-Bethpage NYD002047967

Dear Mr. Leskovjan:

The Division of Solid and Hazardous Materials (DSHM) has completed its review of the following submissions concerning remediation of various Areas of Concern (AOCs) located within the Naval Weapons Industrial Reserve Plant at the Northrup Grumman Corp. in Bethpage:

Date of Letter	Description
3/24/98	Plant 3, AOC 1-29
3/24/98	Plant 9, AOC 1-30
3/31/98	Plant 10, AOC 3
3/31/98	Plant 17 North AOCs, 2 and 12
4/01/98	Plant 3, AOC 1-05/06
4/14/98	Plant 3, AOC 13
4/14/98	Plant 3, AOC 33-19
4/28/98	Plant 3, AOC 19
4/28/98	Plant 3, AOC 14

Based on our review of the sampling data, inspection of the designated areas and discussions with your engineers, the DSHM approves your requests for no further action based upon achievement of TAGM criteria and hereby approves the backfilling of the excavations associated with the AOCs listed.

Please advise the Department of your schedule for filling these areas. We also recommend your receiving approval from the Nassau County Department of Health. If you have any questions, please do hesitate to contact me at (516) 444-0379 or Mr. Henry Wilkie at (518) 457-9255.

Yours truly,

Stanley Farkas, P.E.
Environmental Engineer II

SF:ek

cc: A. Postyn, Northrup Grumman
S. Kaminski, NYSDEC
H. Wilkie, NYSDEC
J. Lovejoy, NCDH

NORTHROP GRUMMAN

Electronics & Systems Integration Division
Northrop Grumman Corporation
[illegible] Bay Road
Bethpage, New York [illegible]-3630

May 13, 1998
ETC98-126

Mr. Stan Farkas
NYS Department of Environmental Conservation
SUNY - Building 40
Stony Brook, New York 11794

Subject: **Northrop Grumman Corporation - Building 03, Bethpage Site**
Area of Concern 33-09 - Former Waste Accumulation Area
Area of Concern 34 - Old Autoclave Area
Area of Concern 33-11/12 - Former Waste Accumulation Area
Area of Concern 6 - Chem Mill Clean Area
Remediation End Point Sample Results

Enclosures:
1) End Point Soil Sample Location Drawings
2) End Point Soil Sample Data for AOC 33-09
3) End Point Soil Sample Data for AOC 34
4) End Point Soil Sample Data for AOC 33-11/12
5) End Point Soil Sample Data for AOC 6

Dear Mr. Farkas:

As you know, Northrop Grumman has been conducting environmental remediation at the Bethpage Building 03 location for Areas of Concern (AOCs) that have significant exceedances of the TAGM 4046 soil criteria. One such location, AOC 33-09 - Former Waste Accumulation Area, was recently excavated to depths of eight and twelve feet below grade surface (bgs). Another location, AOC 34 - Old Autoclave Area, was excavated to depths of thirty and sixteen feet bgs. Similarly, AOC 33-11/12 - Former Waste Accumulation Area, was also excavated to depths of eight and ten feet. Lastly, AOC 6 - Chem Mill Clean Area, was excavated to depths of four and twelve feet bgs. Sketches showing the excavated areas and end point sample locations for AOCs 33-09, 34, 33-11/12, and 6 are provided in Enclosure 1.

In a previous meeting, we agreed to sample and analyze the side wall samples prior to excavation. This sampling methodology was chosen to ensure that the horizontal extent of impacted soil for each AOC was accurately defined. A few sidewall samples at the 2'-4' interval for AOC 33-11/12 were not collected because the sidewall sample locations were taken within a 5-foot thick concrete floor slab.

The following Table illustrates the end point analysis conducted for each of the AOCs remediated. The end point sample results are presented for your review in Enclosures 2 through 4.

AOC	Analysis	Method Number
33-09	VOCs	8270
	SVOCs	8240
34	PCBs	8082
	SVOCs	8270
33-11/12	Priority Pollutant Metals	6010/7471
	SVOCs	8270
6[illegible]	Priority Pollutant Metals	6010/7471

AOC 33-09 - Former Waste Accumulation Area

The end point sample results for AOC 33-09 are provided in Enclosure 2. There are no VOC exceedances of the TAGM criteria. There are, however, minor exceedances of individual SVOCs constituents in sidewall sample AOC 33-09C and floor sample AOC 33-09M. Because the total concentration of carcinogenic SVOCs are well below the TAGM criteria of 10,000 µg/kg for these samples, the environmental impacts are negligible.

AOC 34- Old Autoclave

The end point sample results for AOC 34 are provided in Enclosure 3. The endpoint data does not indicate any PCBs or SVOCs exceedances of the TAGM criteria.

AOC 33-11/12 - Former Waste Accumulation Area

The end point sample results for AOC 33-11/12 are provided in Enclosure 4. There are no priority pollutant metal exceedances of the TAGM criteria. Sample AOC 33-12A_{12} (2.5'-4') exhibited individual exceedances of the following SVOCs: benzo (a) anthracene, chrysene, benzo (b) fluoranthene, benzo (k) fluoranthene, and benzo (a) pyrene. However, the average concentration of these constituents for the 2-4 foot interval was well below each of the individual SVOC TAGM criteria. It is important to note that the extract for samples AOC 33-11/12 C_{FL}, E_{FL}, I_{FL}, and H_{FL} was re-analyzed after performing a silica gel clean-up procedure (method 3630C). This clean-up procedure was utilized to reduce the method detection limit (MDL) associated with the polycyclic aromatic hydrocarbons (PAHs). It is believed that heavy end hydrocarbons caused interference during the initial scan of these samples resulting in a MDL that was about two orders of magnitude above acceptable limits.

AOC 6 - Chem Mill Clean Area

The end point sample results for AOC 6 are provided in Enclosure 5. The data indicates that there is only one exceedance of the priority pollutant metal TAGM criteria. Floor sample AOC 6F exhibited a concentration of chromium of 250 mg/kg. As a result of this exceedance, the sample was re-analyzed for hexavalent chromium. The data on page 3 of Enclosure 5 shows that the hexavalent chromium concentration of sample AOC 6F is 4.8 mg/kg. Since the hexavalent chromium concentration is well below the TAGM criteria of 50 mg/kg for total chromium, no further action is warranted for AOC 6.

In summary, Northrop Grumman effectively removed, transported, and disposed of impacted soils at AOCs 33-09, 34, 33-11/12, and 6. The end point analysis results demonstrate that soils immediately adjacent to the excavated areas do not exceed the TAGM criteria. It is therefore recommended that No Further Action is warranted at AOCs 33-09, 34, 33-11/12, and 6.

Upon your review and approval of the attached data and these recommendations, Northrop Grumman will backfill the excavation areas with certified clean bank-run sand and restore the area to match existing conditions. A complete engineering report documenting all field activities, laboratory data analysis, and waste disposal manifests shall be sent to your office at the completion of this project.

We have put together an ambitious schedule for the completion of the remediation work at the 105-Acre GOCO site and would appreciate your expeditious review and approval of this letter report.

If you have any questions, please call me at 516/575-2333 or A. Postyn, of this office, at 516/575-1566.

Very truly yours,

NORTHROP GRUMMAN CORPORATION

Larry L. Teskovjan, Manager
Environmental Technology and Compliance
M/S: D08-001

cc: w/enclosure
S. Kaminski, NYSDEC, H. Wilkie, NYSDEC, T. Mulvihill, NCDH; T. Kelly, NCDPW

w/o enclosure
J. Lovejoy, NCDH; B. Mackay, NCDH

bcc: w/enclosure
J. Colter
J. Hare
M. Hill
A. Postyn
J. Kaminski
A. Taormina

w/o enclosure
P. Siegel
J. Cofman
R. Patac
G. Netuschil (G&M)

ENCLOSURE 1

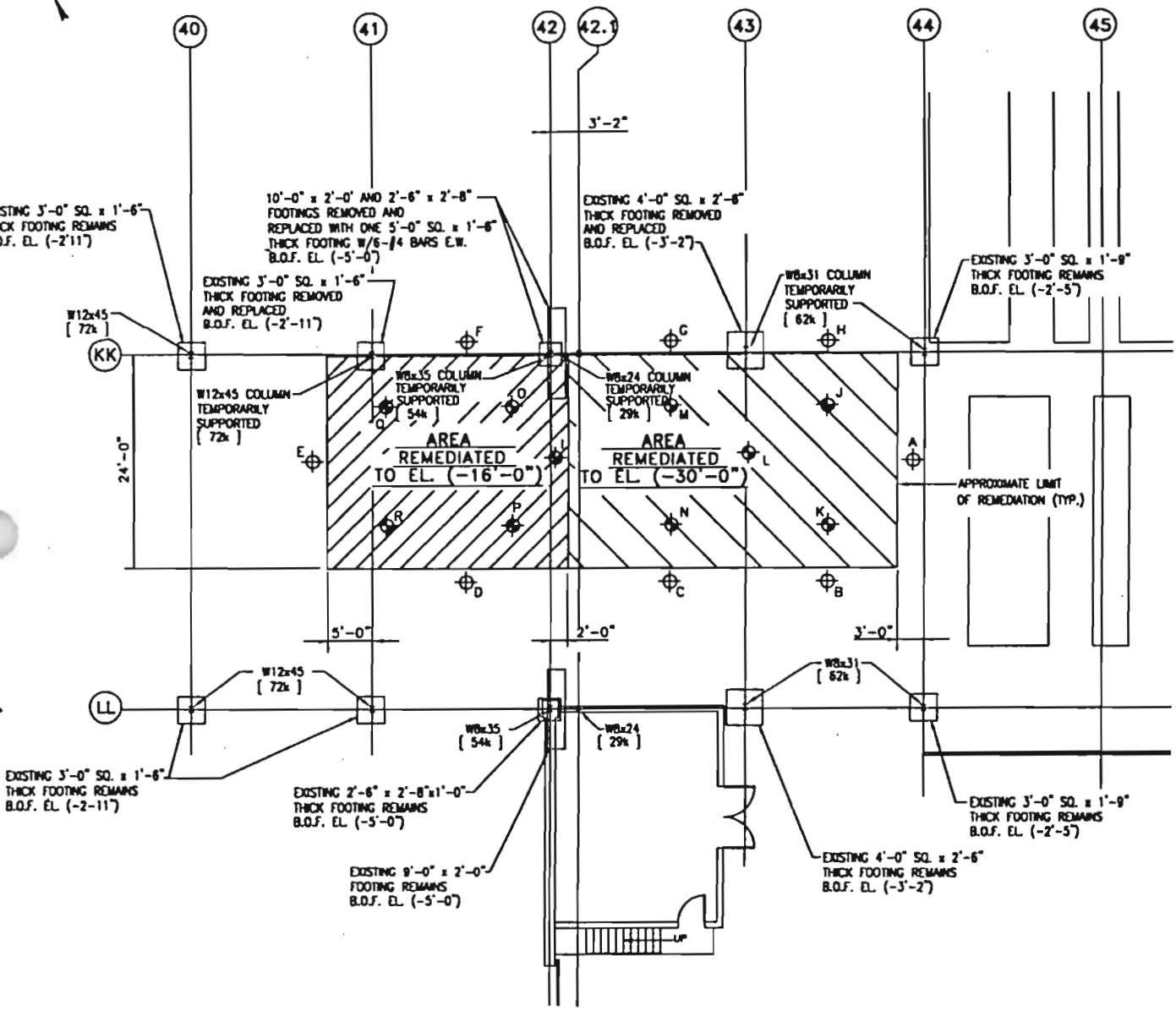
NOTES:

1. SOIL SAMPLES ANALYZED FOR SEMI-VOLATILE ORGANIC COMPOUNDS

LEGEND:

⊕ IN-SITU SIDEWALL SAMPLE

⊕ POST REMEDIATION FLOOR SAMPLE



POST REMEDIATION PLAN – AOC 34

N.T.S.

ARCADIS GERAGHTY & MILLER

88 DURYEA ROAD
MELVILLE, NY 11747
Tel: 516/249-7600 Fax: 516/249-7610

AOC 34

PLANT 3
NORTHROP GRUMMAN CORPORATION
BETHPAGE, NEW YORK

PROJECT NUMBER
NY000008.0140

FIGURE NUMBER
9

New York State Department of Environmental Conservation
Division of Solid & Hazardous Materials, Region One
Building 40 - SUNY, Stony Brook, New York 11790-2356
Phone: (516) 444-0375 FAX: (516) 444-0231

John P. Cahill
Commissioner

June 23, 1998

Mr. Larry Leskovjan, Manager
Environmental, Health & Safety
M/S D16-001
Northrup Grumman Corporation
South Oyster Bay Rd.
Bethpage, NY 11714-3583

RE: Authorization to Backfill Various Areas of Concern
Grumman-Bethpage NYD002047967

Dear Mr. Leskovjan:

The Division of Solid and Hazardous Materials (DSHM) has completed its review of the following submissions concerning remediation of various Areas of Concern (AOCs) located within the Naval Weapons Industrial Reserve Plant at the Northrup Grumman Corp. in Bethpage. Based on our review of the sampling data, inspection of the designated areas and discussions with your engineers, the DSHM approves your requests for No Further Action (NFA) based upon achievement of TAGM criteria and hereby approves the backfilling of the excavations associated with the AOCs listed.

Date of Submittal	Description	DSHM Response
3/23/98	Plant 3, Various AOCs (36) - Request for NFA	Verbal O.K. 6/9/98
3/30/98	Plants 10/17 South, Various AOCs (4) - Request for NFA	Verbal O.K. 6/9/98
4/17/98	Plant 3, AOC 24 - Request for NFA/ Backfilling	None
4/28/98	Plant 3, AOC 9 - Request for NFA/ Backfilling	None
4/28/98	Plant 3, AOC 27 - Request for NFA/ Backfilling	Verbal O.K. 5/12/98
4/29/98	Plant 3, AOC 2 - Request for NFA/ Backfilling	None

5/5/98	Plant 3, AOC 21-21 - Request for NFA/ Backfilling	Verbal O.K. 5/12/98
5/13/98	Plant 3, AOC 33-09 - Request for NFA/ Backfilling	Verbal O.K. 5/15/98
5/13/98	Plant 3, AOC 33-11/12 - Request for NFA/ Backfilling	Verbal O.K. 5/15/98
5/5/98	Plant 3, AOC 1-08 - Request for NFA/ Backfilling	Verbal O.K. 5/12/98
5/5/98	Plant 3, AOC 1-20 - Request for NFA/ Backfilling	Verbal O.K. 5/12/98
5/13/98	Plant 3, AOC 6 - Request for NFA/ Backfilling	Verbal O.K. 5/15/98
5/13/98	Plant 3, AOC 34 - Request for NFA/ Backfilling	Verbal O.K. 5/15/98

We have also received submissions dated 5/21/98, for Plant 3, AOC 20-24, and 6/4/98 for Plant 10 Degreaser Pit which are still under review.

Please advise the Department of your schedule for filling the approved AOCs. We also recommend your receiving approval from the Nassau County Department of Health. If you have any questions, please do hesitate to contact me at (516) 444-0379 or Mr. Henry Wilkie at (518) 457-9255.

Yours truly,

Stanley Farkas, P.E.
Environmental Engineer II

SF:ek

cc: A. Postyn, Northrup Grumman
S. Kaminski, NYSDEC
H. Wilkie, NYSDEC
J. Lovejoy, NCDH

NORTHROP GRUMMAN

Electronics & Systems Integration Division
Northrop Grumman Corporation
South Oyster Bay Road
Bethpage, New York 11714-3580

April 28, 1998
ETC98-107

Mr. Stan Farkas
NYS Department of Environmental Conservation
SUNY - Building 40
Stony Brook, New York 11794

Subject: **Northrop Grumman Corporation - Building 03, Bethpage Site**
Area of Concern 9 - Sulfuric Acid Anodize
Area of Concern 19 - Historic Drywell
Area of Concern 27 - Scrap Metal Storage Shed
Area of Concern 14 - Old Chem Mill Line
Remediation End Point Sample Results

Enclosure 1) End Point Soil Sample Location Drawings
2) End Point Soil Sample Data.

Dear Mr. Farkas:

As you know, Northrop Grumman has been conducting environmental remediation at the Bethpage Building 03 location for Areas of Concern (AOCs) that have significant exceedances of the TAGM 4046 soil criteria. One such location, AOC 9 - Sulfuric Acid Anodize, was recently excavated to varying depths of approximately four, eight, and ten feet below grade surface (bgs). Another location, AOC 19 - Historic Drywell, was also recently excavated to a depth of about 22 feet bgs. Similarly, AOC 27 - Scrap Metal Storage Shed, was excavated to a depth of about 16 feet bgs. Lastly, two areas within AOC 14 - Old Chem Mill Line, were also excavated to depths of six and ten feet bgs. Sketches showing the excavated areas and end point sample locations, for AOCs 9, 19, 27, and 14 are provided in Enclosure 1.

In a previous meeting, we agreed to sample and analyze the side wall samples prior to excavation. This sampling methodology was chosen to ensure that the horizontal extent of impacted soil, for each AOC, was accurately defined. In most cases, this sampling practice was followed except where the excavations were located in close proximity to the building foundation. For these instances, the sidewall samples adjacent to building foundations were not collected.

The following Table illustrates the end point analysis conducted for each of the AOCs remediated. The end point sample results are presented for your review in Enclosure 2.

AOC	Analysis	Method Number
9	Priority Pollutant Metals	6010/7471
19	SVOCs	8270
	Priority Pollutant Metals	6010/7471
	VOCs	8240
27	STARS VOCs (Total & TCLP)	8021
	STARS SVOCs (Total & TCLP)	8270
14	Priority Pollutant Metals	6010/7471

AOC 9 - Sulfuric Acid Anodize

The end point analysis results, presented in Enclosure 2, indicate no exceedances of the TAGM criteria.

AOC 19 - Historic Drywell

The SVOC end point analysis results show slight exceedances of individual constituents. However, the values for total carcinogenic SVOCs and overall total SVOCs were well below the levels presented in TAGM 4046 of 10,000 µg/kg and 500,000 µg/kg, respectively. The end point results for priority pollutant metals and VOC analysis indicated no exceedances of the TAGM criteria.

AOC 27 - Scrap Metal Storage Shed

The end point results indicated no exceedances of the STARS VOCs Human Health Guidance Values (totals basis). There were, however, minor exceedances of individual STARS SVOCs Human Health Guidance Values (totals basis). It is important to note that the value of total carcinogenic SVOCs were well below the TAGM criteria of 10,000 µg/kg. In addition, all STARS TCLP results for VOCs and SVOCs were below the method detection limits.

AOC 14 - Old Chem Mill Line

All end point sample results were below the TAGM criteria with the exception of two locations. Zinc was detected in sidewall sample AOC 14NE C (2') at a concentration of 110 mg/kg. Chromium was also detected in floor sample AOC 14 NE E at a concentration of 68 mg/kg. Since these exceedances are minor, No Further Action is recommended for AOC 14.

In summary, Northrop Grumman effectively removed, transported, and disposed of impacted soils at AOCs 9, 19, 27, and 14. With only two exceptions (AOC 14), the end point analysis results demonstrate that soils immediately adjacent to the excavated areas do not exceed the TAGM criteria. Because the two exceedances at AOC 14 are minor in nature, we believe the environmental impacts are minimal. It is therefore recommended that No Further Action is warranted at AOCs 9, 19, 27, and 14.

Upon your review and approval of the attached data and these recommendations, Northrop Grumman will backfill the excavation areas with certified clean bank-run sand and restore the area to match existing conditions. A complete engineering report documenting all field activities, laboratory data analysis, and waste disposal manifests shall be sent to your office at the completion of this project.

We have put together an ambitious schedule for the completion of the remediation work at the 105-Acre GOCO site and would appreciate your expeditious review and approval of this letter report.

If you have any questions, please call me at 516/575-2333 or A. Postyn, of this office, at 516/575-1566.

Very truly yours,

NORTHROP GRUMMAN CORPORATION

Larry L. Leskovjan, Manager
Environmental Technology and Compliance
M/S: D08-001

cc: w/enclosure
S. Kaminski, NYSDEC; H. Wilkie, NYSDEC; T. Mulvihill, NCDH; T. Kelly, NCDPW

w/o enclosure
J. Loveloy, NCDH; B. Mackay, NCDH

ENCLOSURE 1

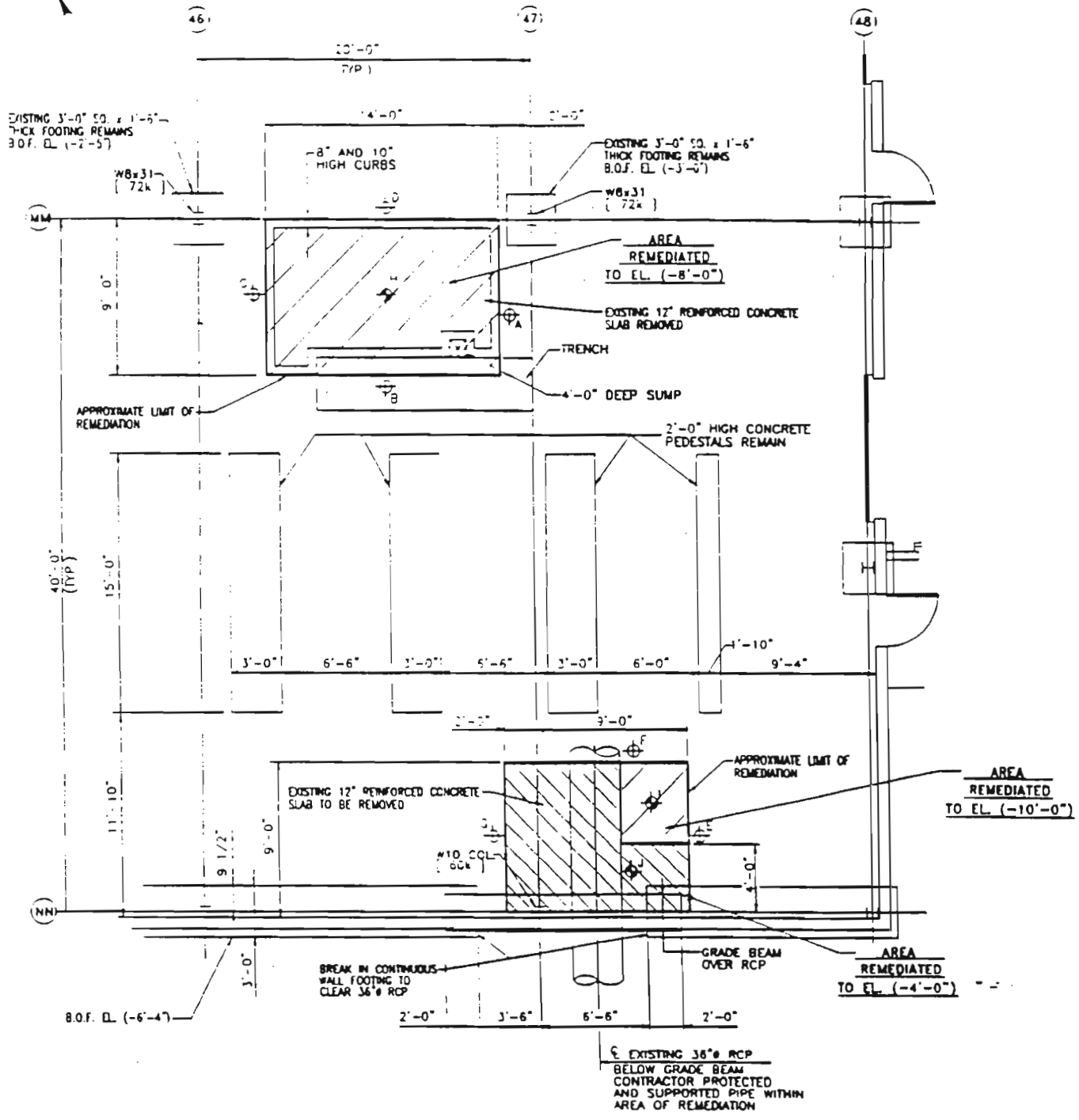
NOTES

1. SOIL SAMPLES ANALYZED FOR PRIORITY POLLUTANT METALS

LEGEND:

IN-SITU SIDEWALL SAMPLE

POST REMEDIATION FLOOR SAMPLE



POST REMEDIATION PLAN - AOC 9

N.T.S.

ARCADIS GERAGHTY & MILLER

58 DURYEA ROAD
MELVILLE, NY 11747

AOC 9

PLANT 3
NORTHROP GRUMMAN CORPORATION
BETHPAGE, NEW YORK

PROJECT NUMBER

FIGURE NUMBER
12

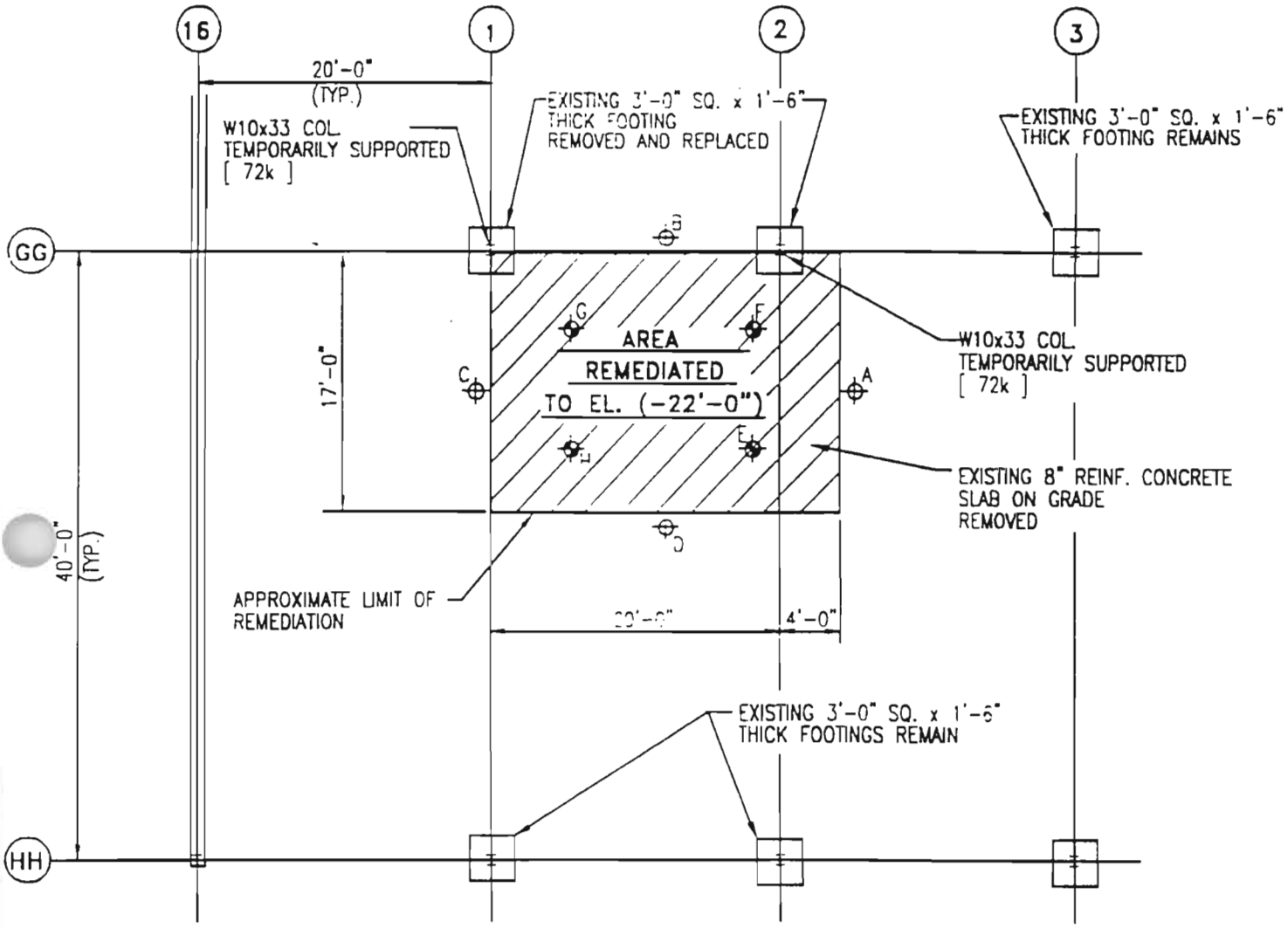
NOTES:

1. SOIL SAMPLES ANALYZED FOR VOLATILE ORGANIC COMPOUNDS, SEMI-VOLATILE ORGANIC COMPOUNDS, AND PRIORITY POLLUTANT METALS

LEGEND:

IN-SITU SIDEWALL SAMPLE

POST REMEDIATION FLOOR SAMPLE



POST REMEDIATION PLAN – AOC 19

N.T.S.

ARCADIS GERAGHTY & MILLER

88 DURYEA ROAD
MELVILLE, NY 11747
Tel: 516/249-7600 Fax: 516/3

AOC 19

PLANT 3
NORTHROP GRUMMAN CORPORATION
BETHPAGE, NEW YORK

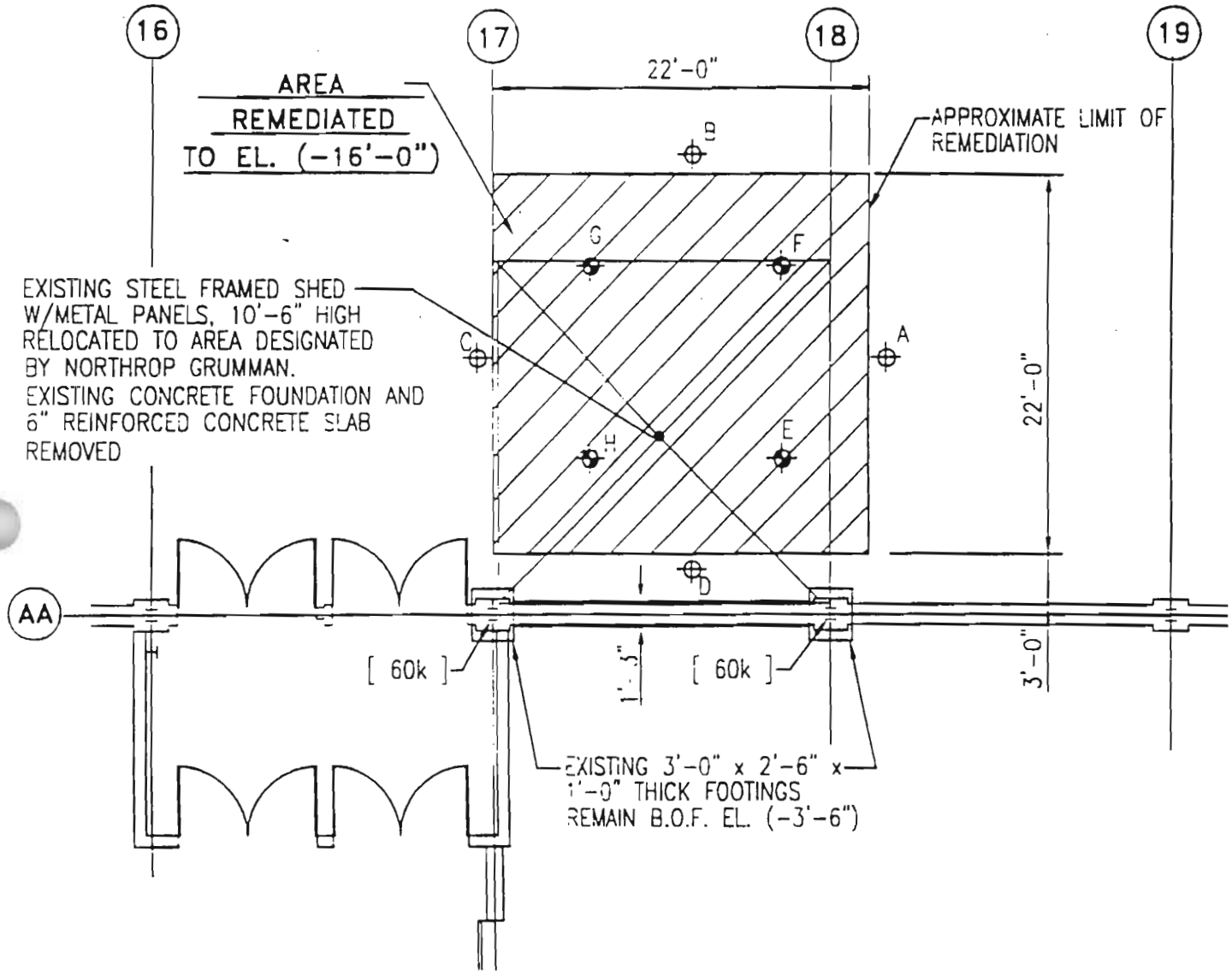
PROJECT NUMBER

FIGURE NUMBER
7

1. SOIL SAMPLES ANALYZED FOR STARS TOTAL VOCs EPA METHOD 8021 AND STARS TOTAL SVOCs EPA METHOD 8270

IN-SITU SIDEWALL SAMPLE

POST REMEDIATION FLOOR SAMPLE



POST REMEDIATION PLAN – AOC 27

N.T.S.

DWG. DATE: 9/8 PROJECT NO. NY000008.0140 FILE: G:\APROJECT\GRUMMAN\NY0008.0140\CADD DRAWING NO. 27 DRAWN BY: ARCADIS

ARCADIS GERAGHTY & MILLER

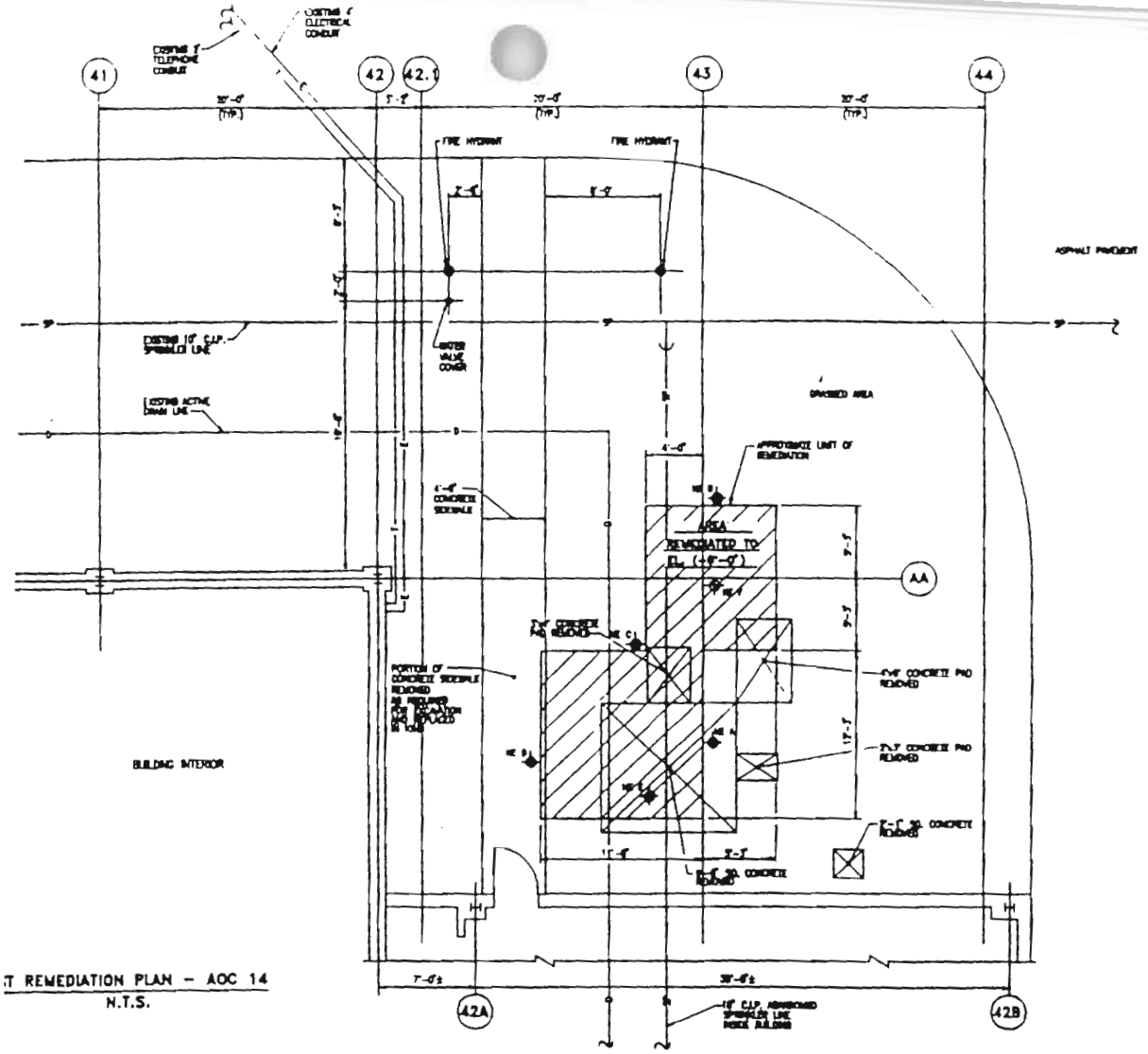
80 DUPONT ROAD
MELVILLE, NY 11747
Tel: 516/249-7600 Fax: 516/249-7610

AOC 27

PLANT 3
NORTHROP GRUMMAN CORPORATION
BETHPAGE, NEW YORK

PROJECT NUMBER

FIGURE NUMBER
8



IN-SITU SOIL SAMPLE

POST REMEDIATION SIDEWALL SAMPLE

POST REMEDIATION FLOOR SAMPLE

NOTES:

1. SOIL SAMPLES ANALYZED FOR PRIORITY POLLUTANT METALS

T REMEDIATION PLAN – AOC 14
N.T.S.

GERAGHTY & MILLER

AOC 14

PLANT 3
NORTHROP GRUMMAN CORPORATION
BETHPAGE, NEW YORK

DRAWN	DATE
MS	4/7/98

PROJECT MANAGER	DEPARTMENT
DB	TL
LEAD DESIGN PROF.	CHECKED
GH	GH
PROJECT NUMBER	DRAWING NUM
NY000008.0140	5

New York State Department of Environmental Conservation
Division of Solid & Hazardous Materials, Region One
Building 40 - SUNY, Stony Brook, New York 11790-2356
Phone: (516) 444-0375 FAX: (516) 444-0231

John P. Cahill
Commissioner

June 23, 1998

Mr. Larry Leskovjan, Manager
Environmental, Health & Safety
M/S D16-001
Northrup Grumman Corporation
South Oyster Bay Rd.
Bethpage, NY 11714-3583

RE: Authorization to Backfill Various Areas of Concern
Grumman-Bethpage NYD002047967

Dear Mr. Leskovjan:

The Division of Solid and Hazardous Materials (DSHM) has completed its review of the following submissions concerning remediation of various Areas of Concern (AOCs) located within the Naval Weapons Industrial Reserve Plant at the Northrup Grumman Corp. in Bethpage. Based on our review of the sampling data, inspection of the designated areas and discussions with your engineers, the DSHM approves your requests for No Further Action (NFA) based upon achievement of TAGM criteria and hereby approves the backfilling of the excavations associated with the AOCs listed.

Date of Submittal	Description	DSHM Response
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3/30/98	Plants 10/17 South, Various AOCs (4) - Request for NFA	Verbal O.K. 6/9/98
4/17/98	Plant 3, AOC 24 - Request for NFA/ Backfilling	None
4/28/98	Plant 3, AOC 9 - Request for NFA/ Backfilling	None
4/28/98	Plant 3, AOC 27 - Request for NFA/ Backfilling	Verbal O.K. 5/12/98
4/29/98	Plant 3, AOC 2 - Request for NFA/ Backfilling	None

5/5/98	Plant 3, AOC 21-21 - Request for NFA/ Backfilling	Verbal O.K. 5/12/98
5/13/98	Plant 3, AOC 33-09 - Request for NFA/ Backfilling	Verbal O.K. 5/15/98
5/13/98	Plant 3, AOC 33-11/12 - Request for NFA/ Backfilling	Verbal O.K. 5/15/98
5/5/98	Plant 3, AOC 1-08 - Request for NFA/ Backfilling	Verbal O.K. 5/12/98
5/5/98	Plant 3, AOC 1-20 - Request for NFA/ Backfilling	Verbal O.K. 5/12/98
5/13/98	Plant 3, AOC 6 - Request for NFA/ Backfilling	Verbal O.K. 5/15/98
5/13/98	Plant 3, AOC 34 - Request for NFA/ Backfilling	Verbal O.K. 5/15/98

We have also received submissions dated 5/21/98, for Plant 3, AOC 20-24, and 6/4/98 for Plant 10 Degreaser Pit which are still under review.

Please advise the Department of your schedule for filling the approved AOCs. We also recommend your receiving approval from the Nassau County Department of Health. If you have any questions, please do hesitate to contact me at (516) 444-0379 or Mr. Henry Wilkie at (518) 457-9255.

Yours truly,

Stanley Farkas, P.E.
Environmental Engineer II

SF:ek

cc: A. Postyn, Northrup Grumman
S. Kaminski, NYSDEC
H. Wilkie, NYSDEC
J. Lovejoy, NCDH

NORTHROP GRUMMAN

Electronics & Systems Integration Division
Northrop Grumman Corporation
South Oyster Bay Road
Bethpage, New York 11714-3580

January 30, 1998
ETC98-025

Mr. Stan Farkas
NYS Department of Environmental Conservation
SUNY - Building 40
Stony Brook, New York 11794

Subject: **Northrop Grumman Corporation**
Building 03, Bethpage Site
Phase III Environmental Remediation Summary
Area of Concern (AOC) 9

Enclosures:
1) Drawing of the Excavation Area and Endpoint Sample Locations for AOC 9
2) Endpoint Soil Sample Analysis Data (2 sheets)

Dear Mr. Farkas:

As you know, Northrop Grumman has been conducting Phase II environmental sampling at the Bethpage Building 03 location in accordance with the recommendations set out in the Phase I Environmental Assessment Report dated April 11, 1997 and submitted to the NYSDEC on April 23, 1997.

Soil and concrete sampling conducted in the vicinity of Area of Concern (AOC) 9, known as the Sulfuric Acid Anodize Process Line, indicated levels of metals that exceeded the TAGM criteria. The drawing provided as Enclosure 1 illustrates the extent of impacted soils at AOC 9. The area shown in Enclosure 1 represents the portion of AOC 9 that is associated with the Navy's process line. It is important to note that Northrop Grumman will be remediating an area of AOC 9 located immediately east of the Navy's process line on or about March 1, 1998.

The remediation activities for the old Sulfuric Acid Anodize area consisted of two phases; a demolition phase and an excavation phase. The demolition phase consisted of the demolition and disposal of the concrete floor, and the surrounding curb and trench. Soil excavation included removing four (4) feet of soil over an area of approximately 440 square feet, as shown in Enclosure 1.

At the completion of soil excavation, sidewall and bottom endpoint soil samples were taken from the locations shown on the drawing provided as Enclosure 1. Sidewall samples were collected at a depth of approximately 2 feet below grade surface. All samples were analyzed for priority pollutant metals by method 6010/7471. The endpoint soil analysis results are provided for your review in Enclosure 2. The data indicate that the south sidewall sample 03-09-03RW-1 exceeded the TAGM criteria for chromium, copper, and zinc.

Recycled paper

As a result of this sidewall exceedance, further excavation was conducted along the south end of the excavation pit, as shown in Enclosure 1. It was determined that the excavation along the south wall would extend approximately eight (8) feet to the edge of the foundation of Building 03, approximately 160 square feet by four (4) feet deep. An additional endpoint soil sample (03-09-05RB-1) was collected from the bottom of the newly excavated area adjacent to the south wall as shown in Enclosure 1. This sample was analyzed for priority pollutant metals by method 6010/7471. The data presented in Enclosure 2 indicate no exceedances of the TAGM criteria for this additional endpoint sample.

In summary, we believe that all soil that exceeded the TAGM criteria in the vicinity of the Navy's portion of the Old Sulfuric Anodize Area (AOC 9) has been removed. Upon your review and approval of the attached data, Northrop Grumman will backfill the excavation pit with certified clean bank-run sand and restore the concrete slab to match existing conditions. A complete engineering report documenting all field activities and laboratory data analysis will be sent to your office at the completion of this project.

We have put together an ambitious schedule for the completion of the environmental assessment and remediation work at the 105 Acre GOCO site and would appreciate your expeditious review and approval of this letter report.

If you have any questions, please call me at 516/575-2333 or A. Postyn, of this office, at 516/575-1566.

Very truly yours,

NORTHROP GRUMMAN CORPORATION

Larry L. Leskovjan, Manager
Environmental, Health, Safety
& Medical Services
M/S: D16-001

cc: w/enclosure
T. John, NYSDEC; S. Kaminski, NYSDEC; T. Mulvihill, NCDH
w/o enclosure
J. Lovejoy, NCDH; B. Mackay, NCDH

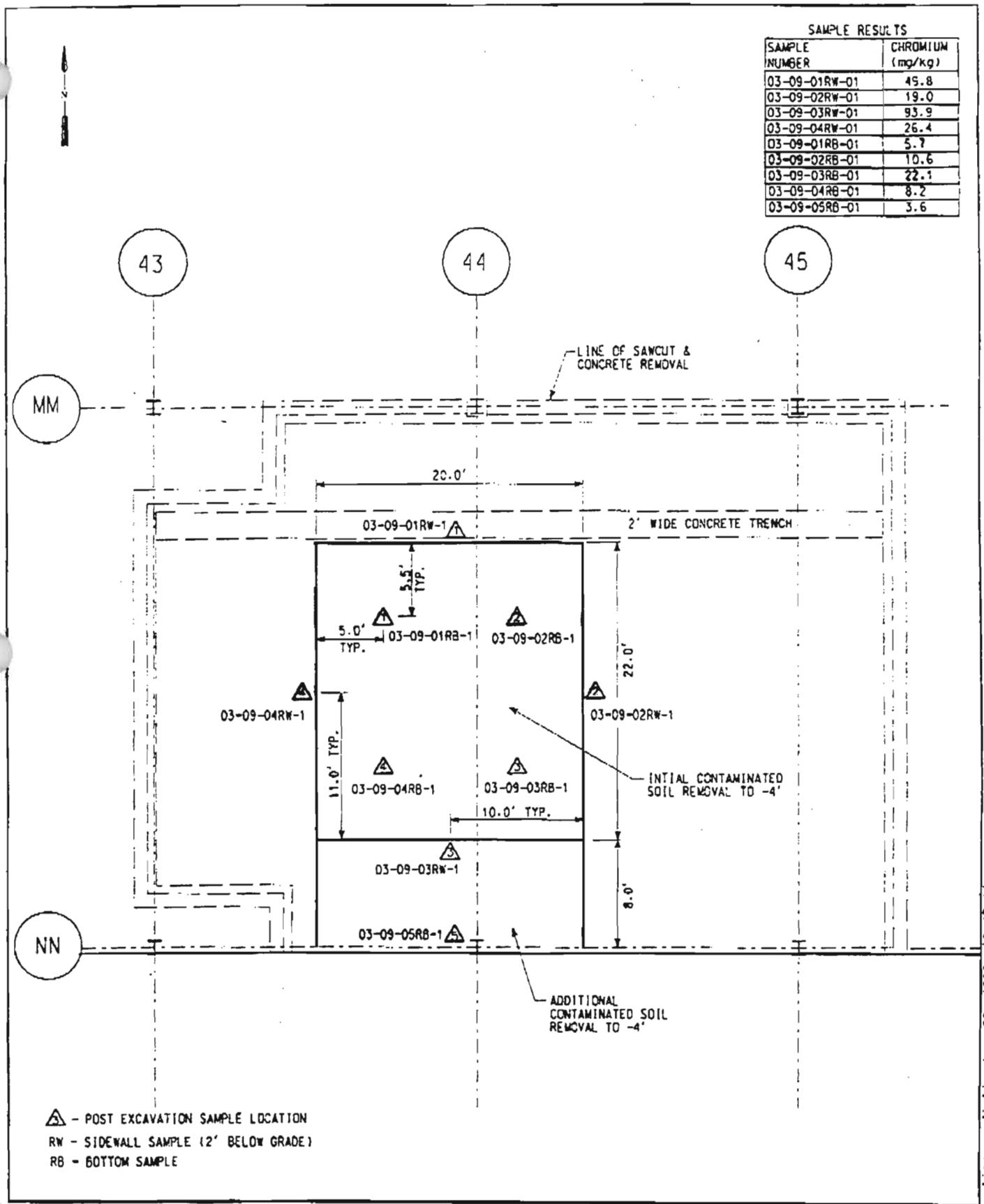
bcc: w/enclosure
J. Hare
J. Colter
J. Kaminski
A. Taormina

w/o enclosure
P. Siegel
J. Cofman
R. Patac
A. Postyn

ENCLOSURE 1

SAMPLE RESULTS

SAMPLE NUMBER	CHROMIUM (mg/kg)
03-09-01RW-01	45.8
03-09-02RW-01	19.0
03-09-03RW-01	93.9
03-09-04RW-01	26.4
03-09-01RB-01	5.7
03-09-02RB-01	10.6
03-09-03RB-01	22.1
03-09-04RB-01	8.2
03-09-05RB-01	3.6



△ - POST EXCAVATION SAMPLE LOCATION
RW - SIDEWALL SAMPLE (2' BELOW GRADE)
RB - BOTTOM SAMPLE

AOC 9 - Old Sulfuric Anodize Area
Post Excavation Sampling Locations

c:\jal\files\construction\remediati Jan. 29, 1998 12:46:14

New York State Department of Environmental Conservation
Division of Solid and Hazardous Materials
Building 40, SUNY, Stony Brook, New York 11790-2356
Telephone: (516) 444-0375
Facsimile: (516) 444-0231

John P. Cahill
Commissioner

February 24, 1998

Mr. Larry Leskovjan, Manager
Environmental, Health, safety & Medical Services
M/S: D16-001
Northrup Grumman Corporation
South Oyster Bay Rd
Bethpage, NY 11714-3580

RE: Endpoint Soil Sample Analysis Data for AOC 9 Excavation Area;
Building 03
Grumman-Bethpage
NYD002047967

Dear Mr. Leskovjan:

The Division of Solid and Hazardous Materials (DSHM)) has reviewed the end point sample analytical data for the above referenced area known as the Sulfuric Acid Anodize Process Line submitted in your letter dated January 30, 1998.

Based on our review of the sampling data, the DSHM has no objection to your backfilling the excavated area listed below. We also recommend your receiving approval from Nassau County Department of Health prior to beginning the work. This area is identified in the Phase I Environmental Assessment Report dated April 11, 1997.

1. Area of Concern 9, Sulfuric acid anodize (30'x 20'x 4')

Verbal approval to backfill this area was given at a meeting on February 9. If you have any questions, please contact me or Thomas John.

Yours truly,

Stanley Farkas, P.E.
Environmental Engineer II

cc: A. Postyn, Northrup Grumman
S. Kaminski, NYSDEC
T. John, NYSDEC
J. Lovejoy, NCDH

NORTHROP GRUMMAN

Electronics & Systems Integration Division
Northrop Grumman Corporation
[illegible] Oyster Bay Road
Bethpage, New York 11714-3580

May 13, 1998
ETC98-126

Mr. Stan Farkas
NYS Department of Environmental Conservation
SUNY - Building 40
Stony Brook, New York 11794

Subject: **Northrop Grumman Corporation - Building 03, Bethpage Site**
Area of Concern 33-09 - Former Waste Accumulation Area
Area of Concern 34 - Old Autoclave Area
Area of Concern 33-11/12 - Former Waste Accumulation Area
Area of Concern 6 - Chem Mill Clean Area
Remediation End Point Sample Results

Enclosures:
1) End Point Soil Sample Location Drawings
2) End Point Soil Sample Data for AOC 33-09
3) End Point Soil Sample Data for AOC 34
4) End Point Soil Sample Data for AOC 33-11/12
5) End Point Soil Sample Data for AOC 6

Dear Mr. Farkas:

As you know, Northrop Grumman has been conducting environmental remediation at the Bethpage Building 03 location for Areas of Concern (AOCs) that have significant exceedances of the TAGM 4046 soil criteria. One such location, AOC 33-09 - Former Waste Accumulation Area, was recently excavated to depths of eight and twelve feet below grade surface (bgs). Another location, AOC 34 - Old Autoclave Area, was excavated to depths of thirty and sixteen feet bgs. Similarly, AOC 33-11/12 - Former Waste Accumulation Area, was also excavated to depths of eight and ten feet. Lastly, AOC 6 - Chem Mill Clean Area, was excavated to depths of four and twelve feet bgs. Sketches showing the excavated areas and end point sample locations for AOCs 33-09, 34, 33-11/12, and 6 are provided in Enclosure 1.

In a previous meeting, we agreed to sample and analyze the side wall samples prior to excavation. This sampling methodology was chosen to ensure that the horizontal extent of impacted soil for each AOC was accurately defined. A few sidewall samples at the 2'-4' interval for AOC 33-11/12 were not collected because the sidewall sample locations were taken within a 5-foot thick concrete floor slab.

The following Table illustrates the end point analysis conducted for each of the AOCs remediated. The end point sample results are presented for your review in Enclosures 2 through 4.

AOC	Analysis	Method Number
33-09	VOCs	8270
	SVOCs	8240
34	PCBs	8082
	SVOCs	8270
33-11/12	Priority Pollutant Metals	6010/7471
	SVOCs	8270
6	Priority Pollutant Metals	6010/7471

AOC 33-09 - Former Waste Accumulation Area

The end point sample results for AOC 33-09 are provided in Enclosure 2. There are no VOC exceedances of the TAGM criteria. There are, however, minor exceedances of individual SVOCs constituents in sidewall sample AOC 33-09C and floor sample AOC 33-09M. Because the total concentration of carcinogenic SVOCs are well below the TAGM criteria of 10,000 µg/kg for these samples, the environmental impacts are negligible.

AOC 34- Old Autoclave

The end point sample results for AOC 34 are provided in Enclosure 3. The endpoint data does not indicate any PCBs or SVOCs exceedances of the TAGM criteria.

AOC 33-11/12 - Former Waste Accumulation Area

The end point sample results for AOC 33-11/12 are provided in Enclosure 4. There are no priority pollutant metal exceedances of the TAGM criteria. Sample AOC 33-12A_{12} (2.5'-4') exhibited individual exceedances of the following SVOCs: benzo (a) anthracene, chrysene, benzo (b) fluoranthene, benzo (k) fluoranthene, and benzo (a) pyrene. However, the average concentration of these constituents for the 2-4 foot interval was well below each of the individual SVOC TAGM criteria. It is important to note that the extract for samples AOC 33-11/12 C_{FL}, E_{FL}, I_{FL}, and H_{FL} was re-analyzed after performing a silica gel clean-up procedure (method 3630C). This clean-up procedure was utilized to reduce the method detection limit (MDL) associated with the polycyclic aromatic hydrocarbons (PAHs). It is believed that heavy end hydrocarbons caused interference during the initial scan of these samples resulting in a MDL that was about two orders of magnitude above acceptable limits.

AOC 6 - Chem Mill Clean Area

The end point sample results for AOC 6 are provided in Enclosure 5. The data indicates that there is only one exceedance of the priority pollutant metal TAGM criteria. Floor sample AOC 6F exhibited a concentration of chromium of 250 mg/kg. As a result of this exceedance, the sample was re-analyzed for hexavalent chromium. The data on page 3 of Enclosure 5 shows that the hexavalent chromium concentration of sample AOC 6F is 4.8 mg/kg. Since the hexavalent chromium concentration is well below the TAGM criteria of 50 mg/kg for total chromium, no further action is warranted for AOC 6.

In summary, Northrop Grumman effectively removed, transported, and disposed of impacted soils at AOCs 33-09, 34, 33-11/12, and 6. The end point analysis results demonstrate that soils immediately adjacent to the excavated areas do not exceed the TAGM criteria. It is therefore recommended that No Further Action is warranted at AOCs 33-09, 34, 33-11/12, and 6.

Upon your review and approval of the attached data and these recommendations, Northrop Grumman will backfill the excavation areas with certified clean bank-run sand and restore the area to match existing conditions. A complete engineering report documenting all field activities, laboratory data analysis, and waste disposal manifests shall be sent to your office at the completion of this project.

We have put together an ambitious schedule for the completion of the remediation work at the 105-Acre GOCO site and would appreciate your expeditious review and approval of this letter report.

If you have any questions, please call me at 516/575-2333 or A. Postyn, of this office, at 516/575-1566.

Very truly yours,

NORTHROP GRUMMAN CORPORATION

Larry L. Teskovjan, Manager
Environmental Technology and Compliance
M/S: D08-001

cc: w/enclosure
S. Kaminski, NYSDEC; H. Wilkie, NYSDEC; T. Mulvihill, NCDH; T. Kelly, NCDPW

w/o enclosure
J. Lovejoy, NCDH; B. Mackay, NCDH

bcc: w/enclosure
J. Colter
J. Hare
M. Hill
A. Postyn
J. Kaminski
A. Taormina

w/o enclosure
P. Siegel
J. Cofman
R. Patac
G. Netuschil (G&M)

ENCLOSURE 1

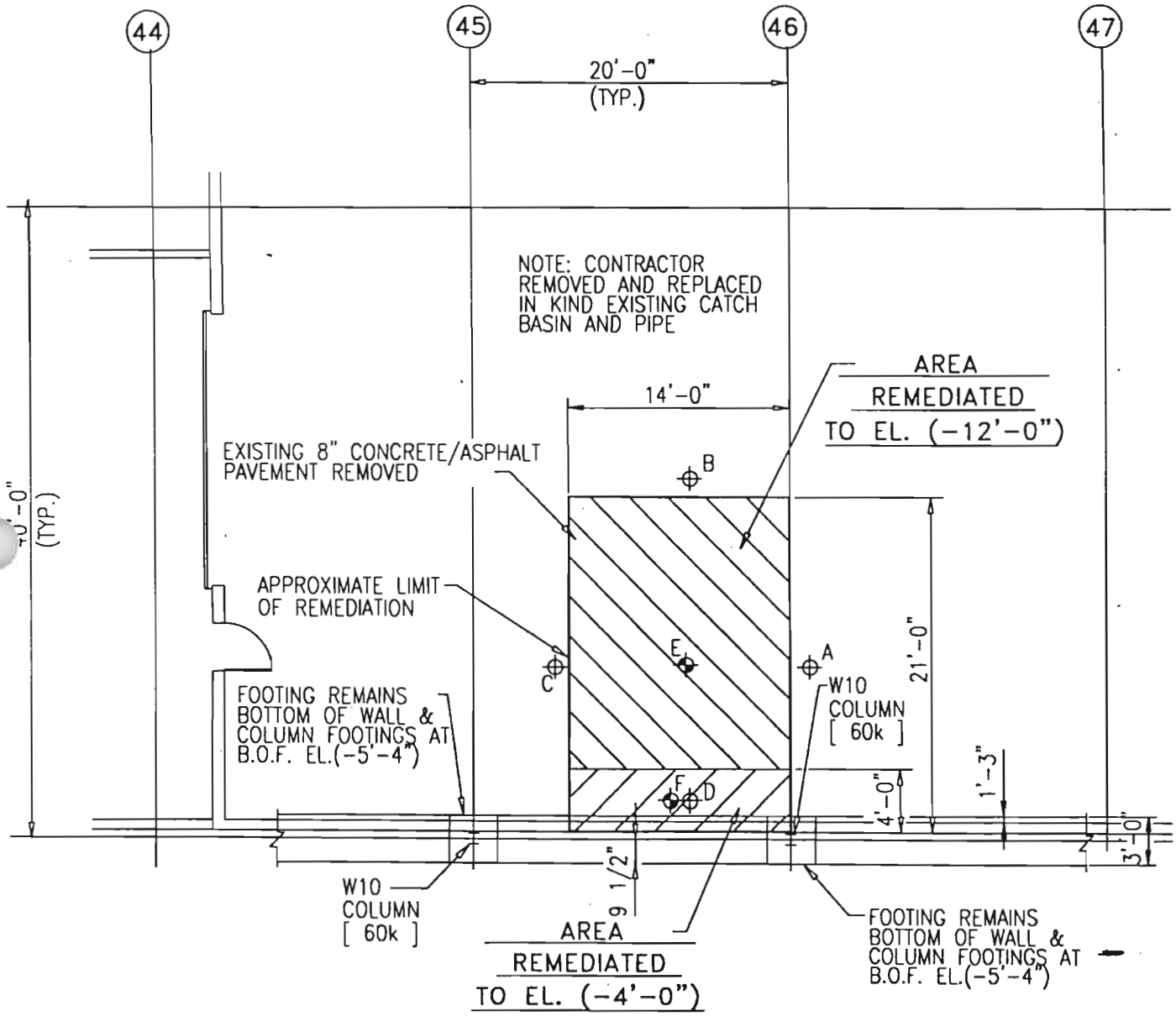
NOTES:

1. SOIL SAMPLES ANALYZED FOR PRIORITY POLLUTANT METALS

LEGEND:

IN-SITU SIDEWALL SAMPLE

POST REMEDIATION FLOOR SAMPLE –



POST REMEDIATION PLAN – AOC 6

N.T.S.

ARCADIS GERAGHTY & MILLER

88 DURYEA ROAD
MELVILLE, NY 11747
Tel: 516/249-7600 Fax: 516/249-7610

AOC 6

PLANT 3
NORTHROP GRUMMAN CORPORATION
BETHPAGE, NEW YORK

PROJECT NUMBER
NY000008.0140

FIGURE NUMBER
11

New York State Department of Environmental Conservation
Division of Solid & Hazardous Materials, Region One
Building 40 - SUNY, Stony Brook, New York 11790-2356
Phone: (516) 444-0375 FAX: (516) 444-0231

John P. Cahill
Commissioner

June 23, 1998

Mr. Larry Leskovjan, Manager
Environmental, Health & Safety
M/S D16-001
Northrup Grumman Corporation
South Oyster Bay Rd.
Bethpage, NY 11714-3583

RE: Authorization to Backfill Various Areas of Concern
Grumman-Bethpage NYD002047967

Dear Mr. Leskovjan:

The Division of Solid and Hazardous Materials (DSHM) has completed its review of the following submissions concerning remediation of various Areas of Concern (AOCs) located within the Naval Weapons Industrial Reserve Plant at the Northrup Grumman Corp. in Bethpage. Based on our review of the sampling data, inspection of the designated areas and discussions with your engineers, the DSHM approves your requests for No Further Action (NFA) based upon achievement of TAGM criteria and hereby approves the backfilling of the excavations associated with the AOCs listed.

Date of Submittal	Description	DSHM Response
3/23/98	Plant 3, Various AOCs (36) - Request for NFA	Verbal O.K. 6/9/98
3/30/98	Plants 10/17 South, Various AOCs (4) - Request for NFA	Verbal O.K. 6/9/98
4/17/98	Plant 3, AOC 24 - Request for NFA/ Backfilling	None
4/28/98	Plant 3, AOC 9 - Request for NFA/ Backfilling	None
4/28/98	Plant 3, AOC 27 - Request for NFA/ Backfilling	Verbal O.K. 5/12/98
4/29/98	Plant 3, AOC 2 - Request for NFA/ Backfilling	None

5/5/98	Plant 3, AOC 21-21 - Request for NFA/ Backfilling	Verbal O.K. 5/12/98
5/13/98	Plant 3, AOC 33-09 - Request for NFA/ Backfilling	Verbal O.K. 5/15/98
5/13/98	Plant 3, AOC 33-11/12 - Request for NFA/ Backfilling	Verbal O.K. 5/15/98
5/5/98	Plant 3, AOC 1-08 - Request for NFA/ Backfilling	Verbal O.K. 5/12/98
5/5/98	Plant 3, AOC 1-20 - Request for NFA/ Backfilling	Verbal O.K. 5/12/98
5/13/98	Plant 3, AOC 6 - Request for NFA/ Backfilling	Verbal O.K. 5/15/98
5/13/98	Plant 3, AOC 34 - Request for NFA/ Backfilling	Verbal O.K. 5/15/98

We have also received submissions dated 5/21/98, for Plant 3, AOC 20-24, and 6/4/98 for Plant 10 Degreaser Pit which are still under review.

Please advise the Department of your schedule for filling the approved AOCs. We also recommend your receiving approval from the Nassau County Department of Health. If you have any questions, please do hesitate to contact me at (516) 444-0379 or Mr. Henry Wilkie at (518) 457-9255.

Yours truly,

Stanley Farkas, P.E.
Environmental Engineer II

SF:ek

cc: A. Postyn, Northrup Grumman
S. Kaminski, NYSDEC
H. Wilkie, NYSDEC
J. Lovejoy, NCDH

NORTHROP GRUMMAN

Electronics & Systems Integration Division
Northrop Grumman Corporation
South Oyster Bay Road
Bethpage, New York 11714-3580

April 14, 1998
ETC98-097

Mr. Stan Farkas
NYS Department of Environmental Conservation
SUNY - Building 40
Stony Brook, New York 11794

Subject: **Northrop Grumman Corporation - Building 03, Bethpage Site**
Area of Concern 13 - Former Honeycomb Pretreatment
Area of Concern 33-19 - Former Waste Accumulation Area
Remediation End Point Sample Results

Enclosures:
1) End Point Soil Sample Location Drawings
2) End Point Soil Sample Data

Dear Mr. Farkas:

As you know, Northrop Grumman has been conducting environmental remediation at the Bethpage Building 03 location for Areas of Concern (AOCs) that have significant exceedances of the TAGM 4046 soil criteria. One such location, AOC 13 - Former Honeycomb Pretreatment, was recently excavated to a depth of approximately twelve (12) feet below grade surface (bgs). Another location, AOC 33-19 - Former Waste Accumulation Area, was also recently excavated to a depth of about ten (10) feet bgs. Sketches showing the excavated areas and end point sample locations for AOCs 13 and 33-19 are provided in Enclosure 1.

In a previous meeting, we agreed to sample and analyze the side wall samples prior to excavation. This sampling methodology was chosen to ensure that the horizontal extent of impacted soil for each AOC was accurately defined.

All end point samples for AOC 13 were analyzed for priority pollutant metals by methods 6010/7471. Similarly, the end point samples for AOC 33-19 were analyzed for semi-volatile organic compounds (SVOCs) by method 8270. The end point sample results are presented for your review in Enclosure 2. The data indicates that there are no exceedances of the TAGM criteria.

In summary, Northrop Grumman has effectively removed, transported, and disposed of impacted soils at AOCs 13 and 33-19. The end point analysis results demonstrate that soils immediately adjacent to the excavated areas do not exceed the TAGM criteria. It is therefore recommended that No Further Action is warranted at AOCs 13 and 33-19.

Upon your review and approval of the attached data and these recommendations, Northrop Grumman will backfill the excavation areas with certified clean bank-run sand and restore the area to match existing conditions. A complete engineering report documenting all field activities, laboratory data analysis, and waste disposal manifests shall be sent to your office at the completion of this project.

We have put together an ambitious schedule for the completion of the remediation work at the 105-Acre GOCO-site and would appreciate your expeditious review and approval of this letter report.

If you have any questions, please call me at 516/575-2333 or A. Postyn, of this office, at 516/575-1566.

Very truly yours,

NORTHROP GRUMMAN CORPORATION

Larry L. Leskovjan, Manager
Environmental Technology and Compliance
M/S: D08-001

cc: w/enclosure
T. John, NYSDEC; S. Kaminski, NYSDEC; T. Mulvihill, NCDH; T. Kelly, NCDPW
D. Langer, Beveridge & Diamond, P.C.

w/o enclosure
J. Lovejoy, NCDH; B. Mackay, NCDH

bcc: w/enclosure
J. Hare, J. Colter, J. Kaminski, A. Taormina, A. Postyn, M. Hill

w/o enclosure
P. Siegel, J. Cofman, R. Patac

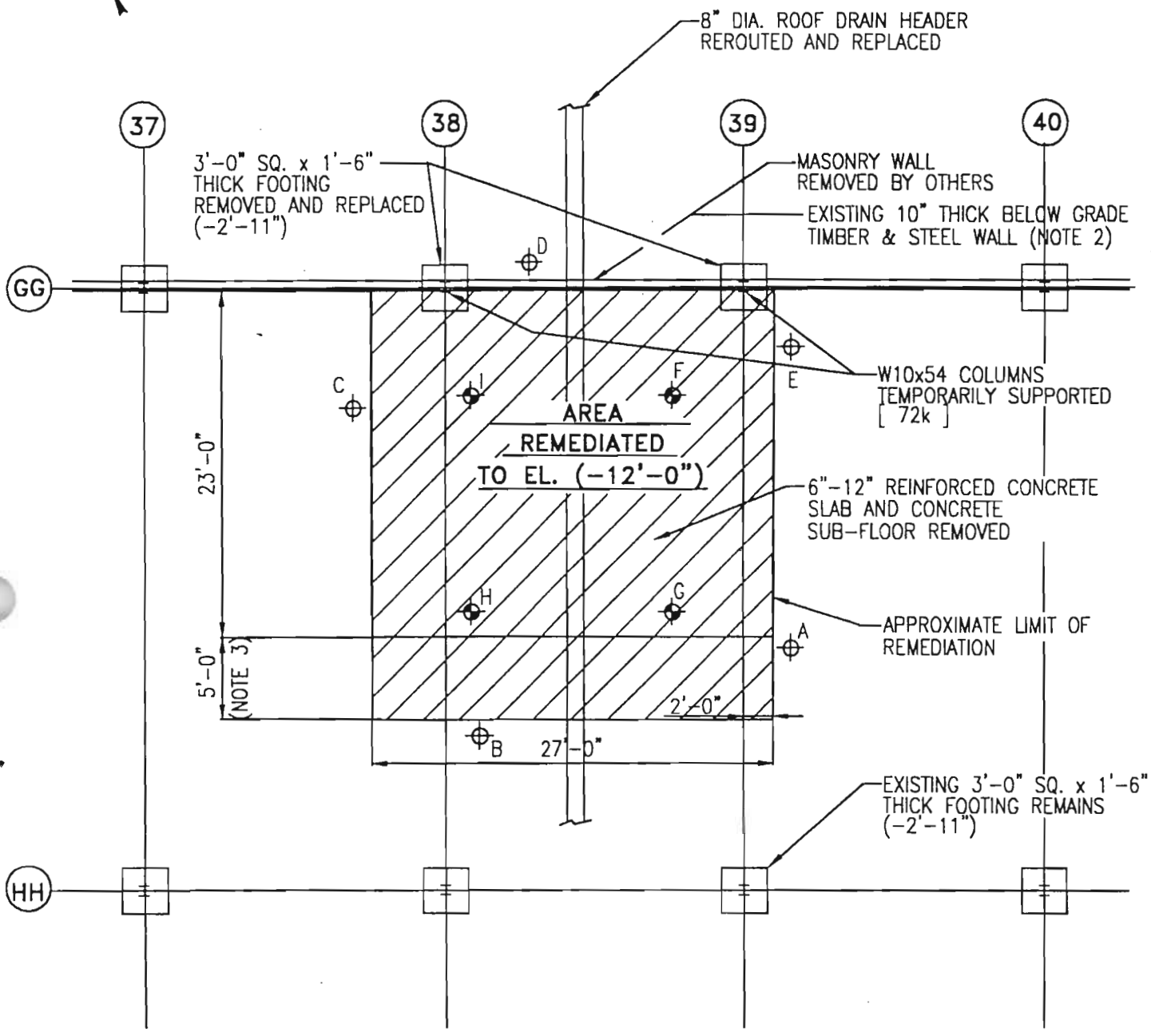
ENCLOSURE 1

NOTES:

1. SOIL SAMPLES ANALYZED FOR PRIORITY POLLUTANT METALS
2. EXISTING 10" THICK TIMBER & STEEL WALL USED AS LIMITS OF EXCAVATION ON NORTH SIDE
3. SOUTHERN LIMIT OF EXCAVATION EXTENDED 5'

LEGEND:

- IN-SITU SIDEWALL SAMPLE
- POST REMEDIATION FLOOR SAMPLE



POST REMEDIATION PLAN – AOC 13

N.T.S.

DWG DATE: 98 PROJECT. NO. NY000008.0140 FILE: G:\APROJECT\GRUMMAN\NY0008.014D\C DRAWING: AOC 13 CHECKED: GN APPROVED: GN DRAWER: MS

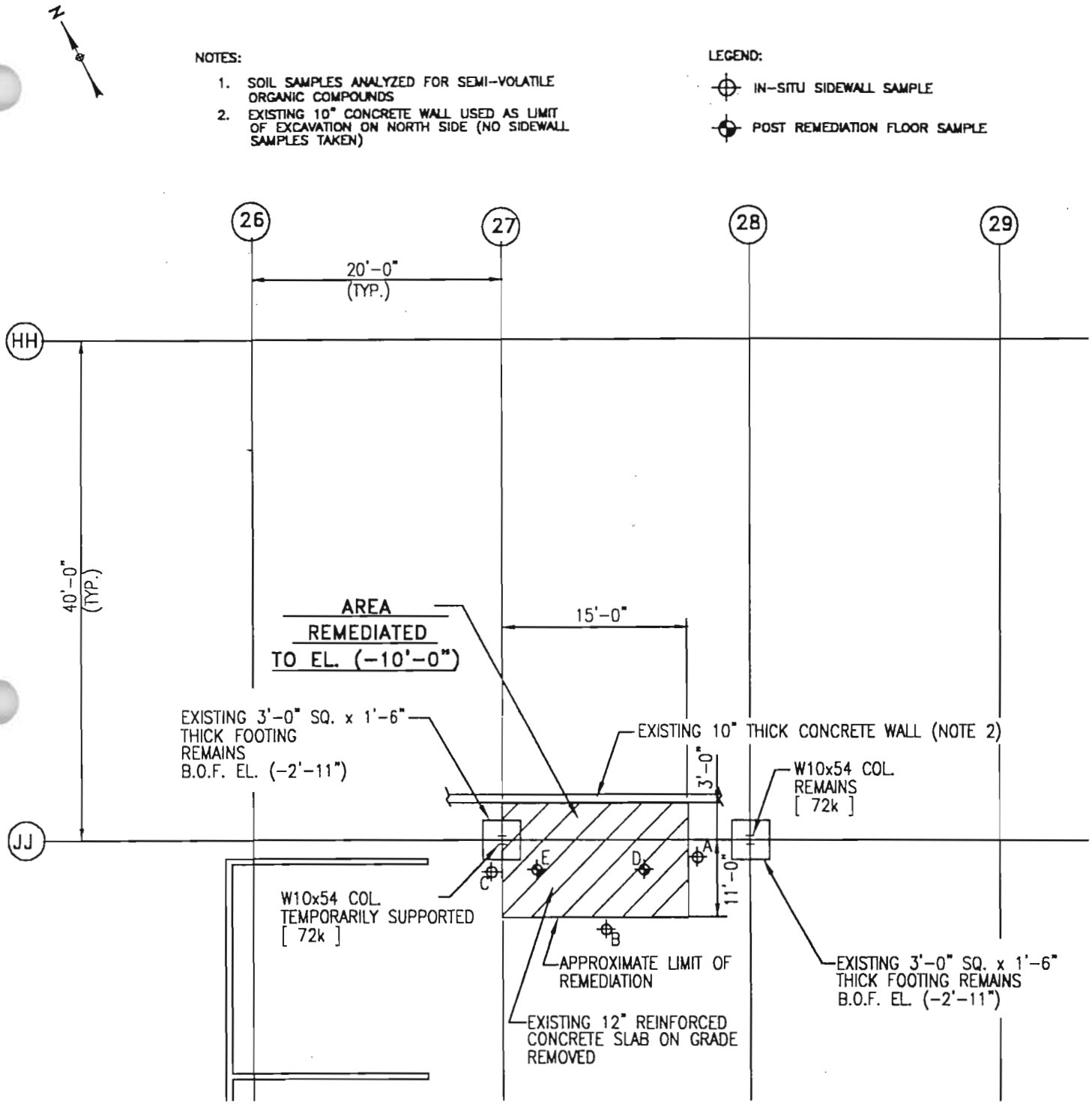
ARCADIS GERAGHTY & MILLER
88 DURYEA ROAD
MELVILLE, NY 11747
Tel: 516/249-7600 Fax: 516/249-7610

AOC 13

PLANT 3
NORTHROP GRUMMAN CORPORATION
BETHPAGE, NEW YORK

PROJECT NUMBER NY000008.0140

FIGURE NUMBER 4



POST REMEDIATION PLAN – AOC 33-19

N.T.S.

DRAWING: AOC 33-19 CHECKED: GN APPROVED: GN
FILE: C:\APROJECT\GRUMMAN\NY0008.0140\
PROJECT. NO. NY000008.0140
DWG DATE: 98

ARCADIS GERAGHTY & MILLER
88 DURYEA ROAD
MELVILLE, NY 11747
Tel: 516/249-7600 Fax: 516/249-7610

AOC 33-19
PLANT 3
NORTHROP GRUMMAN CORPORATION
BETHPAGE, NEW YORK

PROJECT NUMBER NY000008.0140
FIGURE NUMBER 8

New York State Department of Environmental Conservation
Division of Solid & Hazardous Materials, Region One
Building 40 - SUNY, Stony Brook, New York 11790-2356
Phone: (516) 444-0375 FAX: (516) 444-0231

John P. Cahill
Commissioner

May 13, 1998

Mr. Larry Leskovjan, Manager
Environmental, Health & Safety
M/S D16-001
Northrup Grumman Corporation
South Oyster Bay Rd.
Bethpage, NY 11714-3583

RE: Authorization to Backfill Various Areas of Concern
Grumman-Bethpage NYD002047967

Dear Mr. Leskovjan:

The Division of Solid and Hazardous Materials (DSHM) has completed its review of the following submissions concerning remediation of various Areas of Concern (AOCs) located within the Naval Weapons Industrial Reserve Plant at the Northrup Grumman Corp. in Bethpage:

Date of Letter	Description
3/24/98	Plant 3, AOC 1-29
3/24/98	Plant 9, AOC 1-30
3/31/98	Plant 10, AOC 3
3/31/98	Plant 17 North AOCs, 2 and 12
4/01/98	Plant 3, AOC 1-05/06
4/14/98	Plant 3, AOC 13
4/14/98	Plant 3, AOC 33-19
4/28/98	Plant 3, AOC 19
4/28/98	Plant 3, AOC 14

Based on our review of the sampling data, inspection of the designated areas and discussions with your engineers, the DSHM approves your requests for no further action based upon achievement of TAGM criteria and hereby approves the backfilling of the excavations associated with the AOCs listed.

Please advise the Department of your schedule for filling these areas. We also recommend your receiving approval from the Nassau County Department of Health. If you have any questions, please do hesitate to contact me at (516) 444-0379 or Mr. Henry Wilkie at (518) 457-9255.

Yours truly,

Stanley Farkas, P.E.
Environmental Engineer II

SF:ek

cc: A. Postyn, Northrup Grumman
S. Kaminski, NYSDEC
H. Wilkie, NYSDEC
J. Lovejoy, NCDH

APPENDIX D

EXAMPLE QUITCLAIM DEED

QUITCLAIM DEED

THIS INDENTURE, made this **10th** day of **December, 2002** between the UNITED STATES OF AMERICA, acting by and through the Commanding Officer, Engineering Field Activity Northeast, Naval Facilities Engineering Command, 10 Industrial Highway, MSC 82, Lester, Pennsylvania 19113-2090, hereinafter referred to as the "GOVERNMENT", and the County of Nassau, One West Street, Mineola, New York 11501, hereinafter referred to as the "GRANTEE".

WHEREAS, the GOVERNMENT has determined that certain portions of the facility known as the Naval Weapons Industrial Reserve Plant, Plant No. 464, Oyster Bay, New York (hereinafter NWIRP), are not needed for a public purpose; and

WHEREAS, United States Public Law 105-85 §2852, hereinafter referred to as "Public Law", provides the Secretary of the Navy the authority to convey the NWIRP to the GRANTEE pursuant to certain conditions, restrictions and limitations contained in the Public Law, and is incorporated by reference herein.

WITNESSETH: That the GOVERNMENT in accordance with the Public Law does, subject to any easements and encumbrances of record and subject to the reservations, exceptions, notices, covenants, conditions and restrictions expressly contained herein, remise, release and quitclaim unto the GRANTEE, its successors and assigns, to have and to hold forever, except as specifically described below and as specifically required by Title 42, United States Code at Section 9620(h)(3)(A) and as provided herein, without any warranty express or implied, except as otherwise provided herein, all right, title and interest, which the GOVERNMENT has in and to the premises more fully described below and to the underlying estate, buildings, structures, improvements and related personal property situated thereon together with the real property, collectively referred to herein as the "Plant 20 Parcel" more fully described as follows:

All that certain piece or parcel of land together with all the improvements thereon, situated, lying and being at Bethpage, Town of Oyster Bay, County of Nassau, State of New York, identified as Section 46, Block G, Tax Lot 9, Building 20, more particularly bounded and described as follows:

Beginning at the point on the easterly side of South Oyster Bay Road (as now open and in use) distant 1808.87 feet southerly from the southerly end of a curve connecting said easterly side of South Oyster Bay Road and the southerly side of Stewart Avenue;

Running thence North 84 degrees 16 minutes 14 seconds East, 600.00 feet;

Thence South 5 degrees 43 minutes 46 seconds East, 340.00 feet;

Thence South 84 degrees 16 minutes 14 seconds West, 599.21 feet to the easterly side of South Oyster Bay Road;

Thence along the easterly side of South Oyster Bay Road, North 5 degrees 55 minutes 06 seconds West, 238.95 feet;

Thence continuing along the easterly side of South Oyster Bay Road, North 5 degrees 43 minutes 46 seconds West, 101.05 feet to the Point or Place of Beginning.

Above described parcel contains 4.6810 Acres, more or less.

REVERSIONARY INTEREST, NOTICES, COVENANTS, CONDITIONS, RESERVATIONS AND RESTRICTIONS

Reversionary Interest: In accordance with the requirements as set forth in the Public Law, if at any time during the five-year period beginning on the date of conveyance herein, the Secretary of the Navy, Department of the Navy, United States of America, determines that the Plant 20 Parcel is not being used for economic redevelopment purposes or such other public purposes as the GRANTEE determines appropriate as set forth in subsection (b) of the Public Law, all right, title and interest in and to the Plant 20 Parcel shall revert to the GOVERNMENT and the GOVERNMENT shall have the right of immediate entry thereon.

Notice of Environmental Condition: Information concerning the environmental condition of Plant 20 Parcel is contained in the documents known as the Environmental Baseline Survey to Transfer (EBST), Plant 20 Parcel, Naval Weapons Industrial Reserve Plant, Bethpage, New York, dated May 2002, and the Finding of Suitability to Transfer (FOST) for Plant 20 Parcel (4.5 Acres), at the former Naval Weapons Industrial Reserve Plant, Bethpage, New York, dated 10 June 2002, which are incorporated by reference and made a part hereof as if set out in length, and the receipt of which are hereby acknowledged by the GRANTEE.

Covenant required by Title 42, United States Code at Section 9620(h)(3)(A): In accordance with the requirements and limitations contained in *Title 42, United States Code at Section 9620(h)(3)(A)(ii)*, the GOVERNMENT hereby warrants to the GRANTEE, its successors and assigns that –

(a) all remedial action necessary to protect human health and the environment with respect to any hazardous substances remaining on property conveyed herein has been taken, and

(b) any additional remedial action found to be necessary after delivery of this Quitclaim Deed, not the result of actions conducted by future occupants of the property, shall be conducted by the GOVERNMENT.

Reservation of Access required by Title 42, United States Code at Section 9620(h)(3)(A): In accordance with the requirements and limitations contained in *Title 42, United States Code at Section 9620(h)(3)(A)(iii)* the GOVERNMENT expressly reserves for itself and the New York State Department of Environmental Conservation all reasonable and appropriate rights of access to the property described as Plant 20 Parcel herein when remedial action or corrective action is found to be necessary after delivery of this Quitclaim Deed. The right of access described herein shall include the right to conduct tests, investigations and surveys, including, where necessary, drilling, testpitting, boring and other similar activities. Such right shall also include the right to conduct, operate, maintain or undertake any other response or remedial action as required or necessary including, but not limited to, monitoring wells, pumping wells and treatment facilities. GRANTEE agrees to comply with activities of the GOVERNMENT in furtherance of these covenants and will take no action to interfere with future necessary remedial and investigative actions of the GOVERNMENT. The GOVERNMENT shall provide the GRANTEE reasonable notice prior to any entry made pursuant to this reservation. Any such entry, including the aforementioned activities, responses or remedial actions, shall be coordinated with the GRANTEE or its successors and assigns, and shall be performed in a manner which minimizes (a) any damage to any structures on the property and (b) any disruption or disturbance of the use and enjoyment of the property.

Notices and Restrictions on Use Pursuant to CERCLA 120(h)(3)(A): In accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), Section 120(h)(3)(A), notice is required to be given where hazardous substances were known to have been released, disposed of, or stored for one year or more. Pursuant to this requirement, the GRANTEE, its successors and assigns, are hereby notified that the GOVERNMENT conducted Phase I and Phase II Environmental Baseline Surveys (EBS) and prepared Sections 4.4 and 4.5, Table 4-1, and Figure 4-1 of the Environmental Baseline Survey for Transfer (EBST), which in combination serve as notice as to the type of hazardous substances that were stored on the Plant 20 Parcel and also those substances where releases had occurred but it was determined that no remedial action was required.

Covenant and Restriction Regarding Excavation: The GRANTEE, its successors and assigns are hereby notified that certain residual chemicals exist in subsurface soils at depths greater than two (2) feet below grade and located in the areas identified as Areas of Concern (AOC) 3 and 4, and Leaching Pools (LP) 3 and 12, which are more fully described in the document known as the Environmental Baseline Survey for Transfer. The GRANTEE hereby covenants that it shall not excavate or disturb the subsurface soils at AOC 3 or 4 and LP 3 or 12, without the prior written approval of the New York State Department of Environmental Conservation and the New York State Department of Health. This covenant hereby attaches to the Plant 20 Parcel and shall run with the land and be binding upon all successors and assigns in title thereto.

Covenant and Restriction Regarding Use of Groundwater: The GRANTEE hereby covenants and agrees that groundwater drawn from any wells situated on the Plant 20 Parcel shall not be used or made available for human consumption. This covenant hereby attaches to the Plant 20 Parcel and shall run with the land and be binding upon all successors and assigns in title thereto.

Covenant and Restriction Regarding Development for Residential Use: The GRANTEE covenants and agrees that no permanent residences shall be constructed or otherwise developed on the Plant 20 Parcel and that no portion of the Plant 20 Parcel shall be used as a permanent residence. This covenant hereby attaches to the Plant 20 Parcel and shall run with the land and be binding upon all successors and assigns in title thereto.

Lead Based Paint and Asbestos Covenant: The GRANTEE is hereby on notice that the Plant 20 Parcel may contain asbestos and lead based paint. The GRANTEE covenants and agrees that it will comply with all Federal, state, and local laws relating to asbestos and lead-based paint in its use and occupancy of the Plant 20 Parcel (including demolition and disposal of existing improvements). This covenant hereby attaches to the Plant 20 Parcel and shall run with the land and be binding upon all successors and assigns in title thereto.

FAA Construction: The GRANTEE covenants and agrees that all construction, alterations, or improvements on the Plant 20 Parcel, of whatever type or nature, are subject to the formal advance approval of the Federal Aviation Administration (FAA) for compliance with the regulations set forth in *14 CFR Part 77,* entitled "Objects Affecting Navigable Airspace," and issued under the authority of the Federal Aviation Act of 1958, as amended. This covenant hereby attaches to the Plant 20 Parcel and shall run with the land and be binding upon all successors and assigns in title thereto.

Non-Discrimination: The GRANTEE covenants and agrees that it shall not discriminate upon the basis of race, age, color, sex, religion, or national origin in the use, occupancy, sale or lease of the property described herein, or in employment practices conducted thereon. This covenant hereby attaches to the Plant 20 Parcel and shall run with the land and be binding upon all heirs, successors and assigns and every successor in interest to the property hereby conveyed, or any part thereof. This covenant shall not apply, however, to the lease or rental of a room or rooms within a family dwelling unit; nor shall it apply with respect to religion to premises used primarily for religious purposes. The GOVERNMENT shall be deemed a beneficiary of this covenant without regard to whether it remains the owner of any land or interest therein in the locality of the property hereby conveyed and shall have the sole right to enforce this covenant in any court of competent jurisdiction.

AS IS, WHERE IS: Except as expressly provided for in this Quitclaim Deed, or as a matter of law, Plant 20 Parcel described herein is conveyed "AS IS and WHERE IS" without representation, warranty or guaranty as to quality, quantity, character, condition, size or kind, or that the same is in a condition, or fit, to be used for the purpose for which intended.

IN WITNESS WHEREOF, I, GREGORY C. PRESTON acting pursuant to my authority as Real Estate Contracting Officer, on behalf of the United States of America, have hereunto executed this Quitclaim Deed the day and year first written above.

UNITED STATES OF AMERICA

By: _____
GREGORY C. PRESTON
Realty Officer
Real Estate Contracting Officer

WITNESS:

_____

GOVERNMENT ACKNOWLEDGEMENT

State of Pennsylvania, County of Delaware, ss.

On the **10th** day of **December,** in the year **2002**, before me, the undersigned, personally appeared GREGORY C. PRESTON, personally known to me or proved to me on the basis of satisfactory evidence to be the individual whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his capacity, that by his signature on the instrument, the individual or the person upon behalf of which the individual acted, executed the instrument, and that such individual made such appearance before the undersigned in the Town of Lester, County of Delaware, State of Pennsylvania.

_____
Notary Public

SECTION
BLOCK
LOT
COUNTY OR TOWN

APPENDIX E

SOIL ROD TABLE 3

1995 SOIL DATA

TA [illegible]3

PROPOSED REMEDIAL ACTIONS

SITE 1 - SOILS

Chemical of Concern	Proposed Remedial Action					
	Fixation/Offsite Landfilling	Offsite Incineration	Vapor Extraction	Offsite Landfilling	Natural Flushing[1]	Permeable Cover and Deed Restrictions
Trichloroethene			>0.030 mg/kg		0.01 to 0.03 mg/kg	0.01 to 0.03 mg/kg
Tetrachloroethene			>0.081 mg/kg		0.027 to 0.081 mg/kg	0.027 to 0.081 mg/kg
1,1,1-Trichloroethane			>0.030 mg/kg		0.01 to 0.03 mg/kg	0.01 to 0.03 mg/kg
Chlordane						>0.206 mg/kg
Total Aroclors		>500 mg/kg		10 to 500 mg/kg		1 to 10 mg/kg
Benzo(a)anthracene						>0.33 mg/kg
Chrysene						>0.33 mg/kg
Benzo(b)fluoranthene						>0.33 mg/kg
Benzo(k)fluoranthene						>0.33 mg/kg
Benzo(a)pyrene						>0.33 mg/kg
Indeno(1,2,3-cd)pyrene						>0.33 mg/kg
Dibenzo(a,h)anthracene						>0.33 mg/kg
Arsenic	TCLP As > 5 mg/l in the CCWE[2].					>5.4 mg/kg
Manganese						>142 mg/kg

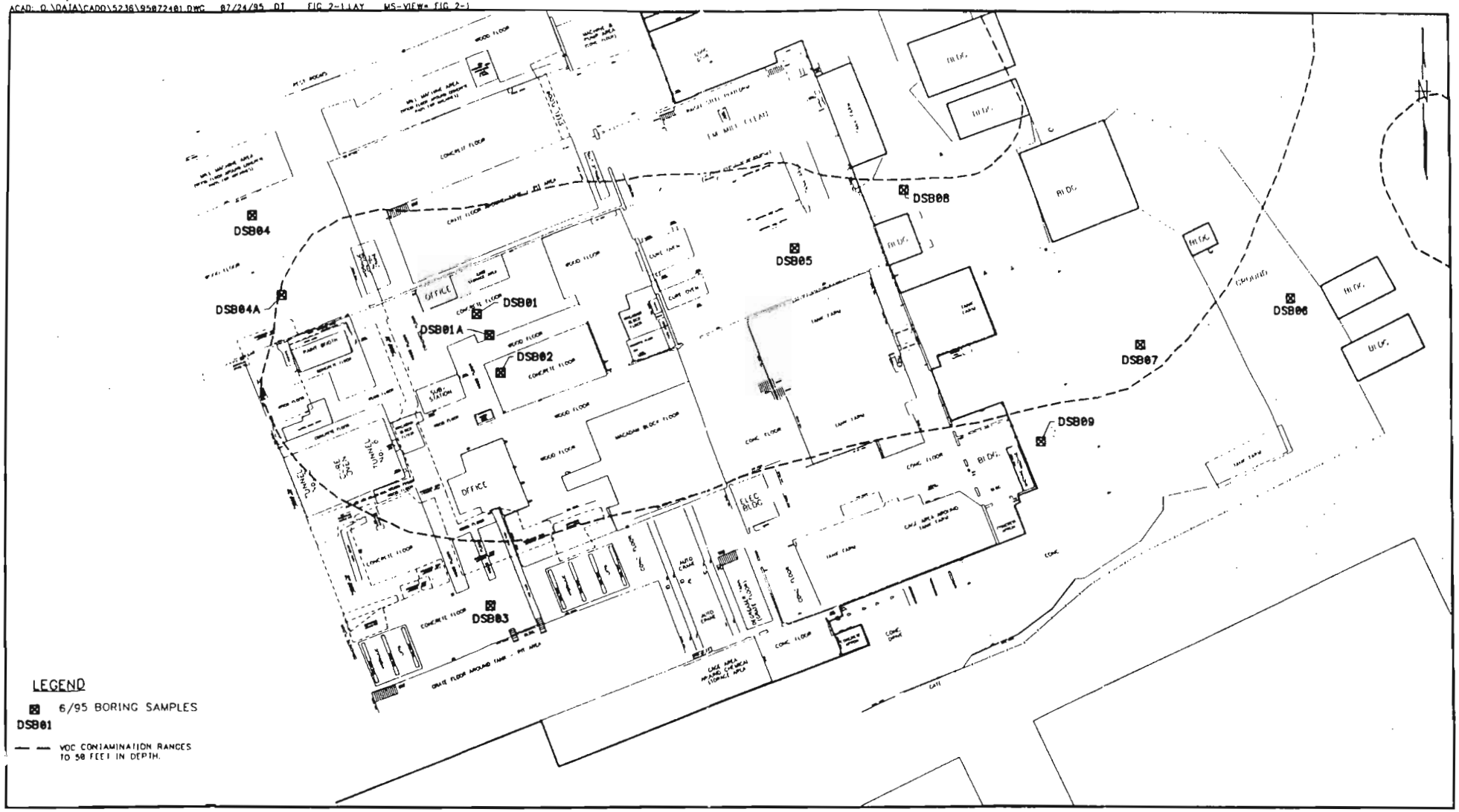


FIGURE 2-1

BORING LOCATIONS
NWIRP, BETHPAGE, NEW YORK

C.F. BRAUN
ENGINEERING CORP.

TABLE 3-1

HNu READINGS FROM JUNE 1995 SAMPLING EVENT
NWIRP BETHPAGE, NEW YORK

Soil Boring	Depth of Sample (feet)	HNu Reading (ppm)	
		Split Spoon	Head Space
DSB01	0.5 to 2.5	6	0
	5.0 to 5.5	16	NR
DSB01A	5.0 to 7.0	12	5
	10 to 12	4	1
	15 to 17	4	4
	20 to 22	8	18
	25 to 27	20	50
	30 to 32	9	7
	35 to 37	3	5
	40 to 42	5	5
	45 to 47	4	4
	50 to 52	3	4
	55 to 57	40	20
	60 to 62	0	0
DSB02	0.5 to 2.5	4	0
	5.0 to 7.0	0	0
	10 to 12	0	0
	15 to 17	0	1
	20 to 22	0	0
	25 to 27	0	1
	30 to 32	1	0
	35 to 37	0	0
	40 to 42	0	0
	45 to 47	0	0
	50 to 52	0	0
	55 to 57	0	0
	60 to 62	0	NR

TABLE 3-1 (Continued)
HNu READINGS FROM JUNE 1995 SAMPLING EVENT
NWIRP BETHPAGE, NEW YORK

Soil Boring	Depth of Sample (feet)	HNu Reading (ppm)	
		Split Spoon	Head Space
DSB03	0.5 to 2.5	0	0
	5.0 to 7.0	0	0
	10 to 12	0	0
	15 to 17	0	1
	20 to 22	0	0
	25 to 27	0	0
	30 to 32	0	0
	35 to 37	2	2
	40 to 42	0	0
	45 to 47	0	0
	50 to 52	0	0
	55 to 57	0	0
	60 to 62	2	NR
DSB04	1.0 to 3.0	0	0
	5.0 to 6.5	0	1
DSB04A	5.0 to 7.0	0	0
	10 to 12	0	1
	15 to 17	0	0
	20 to 22	0	2
	25 to 27	NR	NR
	30 to 32	18	10
	35 to 37	10	7
	40 to 42	2	3
	45 to 47	0	2
	50 to 52	2	4
	55 to 57	4	8
	60 to 62	0	2.5

TABLE 3-1 (Continued)
HNu READINGS FROM JUNE 1995 SAMPLING EVENT
NWIRP BETHPAGE, NEW YORK

Soil Boring	Depth of Sample (feet)	HNu Reading (ppm)	
		Split Spoon	Head Space
DSB05	0 to 2	3	6
	5 to 7	0	1.5
	10 to 12	2	4
	15 to 17	13	24
	20 to 22	10	12
	25 to 27	6	1
	30 to 32	6	0
	35 to 37	6	6
	40 to 42	3	1
	45 to 47	5	4
	50 to 52	3	3
	55 to 57	16	3
	57 to 59	0	NR
	60 to 62	0	NR
DSB06	0 to 2	0	0
	5 to 7	0	1
	10 to 12	0	0
	15 to 17	0	0
	20 to 22	19	20
	25 to 27	1	5
	30 to 32	0	0
	35 to 37	0	0
	40 to 42	0	0
	45 to 47	0	4.8
	50 to 52	0	2
	55 to 57	6	15
	60 to 62	0	NR

TABLE 3-1 (Continued)
HNu READINGS FROM JUNE 1995 SAMPLING EVENT
NWIRP BETHPAGE, NEW YORK

Soil Boring	Depth of Sample (feet)	HNu Reading (ppm)	
		Split Spoon	Head Space
DSB07	1.0 to 2.5	1	0
	5.0 to 7.0	NR	1
	10 to 12	NR	NR
	15 to 17	0	1
	20 to 22	5	25
	26 to 28	1.4	7
	30 to 32	1	5
	35 to 37	5	6
	40 to 42	4	11
	45 to 47	5	6
	50 to 52	7	6
	55 to 57	5	10.6
	60 to 62	0	NR
DSB08	1.0 to 3.0	1	2
	5.0 to 7.0	5	2.5
	10 to 12	1	1
	15 to 17	7	14
	20 to 22	4	3
	25 to 27	1	4
	30 to 32	0	4.6
	35 to 37	0	7
	40 to 42	0	3
	45 to 47	1.8	2.5
	50 to 52	NR	NR
	55 to 57	4	5
	60 to 62	NR	NR

TABLE 3-1 (Continued)
HNu READINGS FROM JUNE 1995 SAMPLING EVENT
NWIRP BETHPAGE, NEW YORK

Soil Boring	Depth of Sample (feet)	HNu Reading (ppm)	
		Split Spoon	Head Space
DSB09	1.3 to 2.8	0	0
	5.0 to 6.5	0	0
	10 to 11.5	0	0
	15 to 16.5	0	0
	20 to 21.5	0	14.5
	25 to 26.5	14	4
	30 to 31.5	1	2
	35 to 36.5	2	10
	40 to 41.5	0.8	1.8
	45 to 46.5	1	6
	50 to 51.5	0	0
	55 to 56.5	3	1
	60 to 61.5	0	NR

NR - No Reading Taken

TABLE 3-3

SOIL SAMPLE ANALYTICAL RESULTS
JUNE, 1995 SAMPLING EVENT
NWIRP BETHPAGE, NEW YORK

	Acetone	Trichloroethene (TCE)	Tetrachloroethene (PCE)
Soil Boring #1 (DSB01)			
0.5' to 2.5'	BDL	BDL	BDL
Soil Boring #1A (DSB01A)			
25' to 27'	BDL	BDL	BDL
55' to 57'	BDL	BDL	BDL
Soil Boring #2 (DSB02)			
0.5' to 2.5'	BDL	BDL	BDL
15' to 17'	BDL	BDL	BDL
60' to 62'	BDL	BDL	BDL
Soil Boring #3 (DSB03)			
5' to 7'	BDL	BDL	BDL
35' to 37'	BDL	BDL	BDL
55' to 57'	BDL	BDL	BDL
Soil Boring #4 (DSB04)			
1' to 3'	BDL	BDL	BDL
Soil Boring #4A (DSB04A)			
30' to 32'	BDL	BDL	BDL
55' to 57'	BDL	BDL	BDL
Soil Boring #5 (DSB05)			
0' to 2'	BDL	6 µg/Kg	20 µg/Kg
15' to 17'	BDL	BDL	BDL
55' to 57'	BDL	BDL	BDL
Soil Boring #6 (DSB06)			
0' to 2'	BDL	BDL	BDL
20' to 22'	BDL	BDL	BDL
55' to 57'	BDL	BDL	BDL
Soil Boring #7 (DSB07)			
1.0' to 2.5'	BDL	BDL	BDL
20' to 22'	BDL	BDL	BDL
55' to 57'	BDL	BDL	BDL

TABLE 3-3 (Continued)
SOIL SAMPLE ANALYTICAL RESULTS
JUNE, 1995 SAMPLING EVENT
NWIRP BETHPAGE, NEW YORK

	Acetone	Trichloroethene (TCE)	Tetrachloroethene (PCE)
Soil Boring #8 (DSB08)			
1' to 3'	BDL	BDL	19 µg/Kg
15' to 17'	BDL	BDL	BDL
55' to 57'	37 µg/Kg	BDL	BDL
Soil Boring #9 (DSB09)			
1.3' to 2.8'	BDL	BDL	BDL
35' to 37'	BDL	BDL	BDL
55' to 57'	25 J µg/Kg	BDL	BDL

BDL Below Detection Limit
J Estimated Value