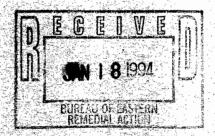
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INTERIM REMEDIAL MEASURE PILOT TEST REPORT GRUMMAN AEROSPACE BETHPAGE, NEW YORK



January 1993

Prepared for

Grumman Aerospace Corporation Bethpage, New York

Prepared by

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INTERIM REMEDIAL MEASURE PILOT TEST REPORT GRUMMAN AEROSPACE CORPORATION BETHPAGE, NEW YORK

January 17, 1994

GMCE of New York, P.C. is submitting this report to the Grumman Aerospace corporation on the pilot test performed at the Grumman Aerospace corporation plant at Bethpage, New York. The report was prepared in conformance with GMCE's strict quality assurance/quality control procedures to ensure that the pilot test report meets industry standards in terms of the methods used and the information presented. If you have any questions or comments concerning the pilot test report, please contact one of the individuals listed below.

Respectfully submitted,

GMCE OF NEW YORK, P.C.

Richard C. Miller, P.E.

Principal Engineer

CSG/RCM/AJB:MDR

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INTERIM REMEDIAL MEASURE PILOT TEST REPORT GRUMMAN AEROSPACE BETHPAGE, NEW YORK

INTRODUCTION

Geraghty & Miller Consulting Engineers New York, P.C. (Geraghty & Miller) has in accordance with the New York State Department of Environmental Conservation (NYSDEC) approved work plan "Interim Remedial Measure, Pilot Test Work Plan, Grumman Aerospace Corporation, Bethpage, New York" dated September 1, 1993, as approved by the NYSDEC in their letter dated September 21, 1993 (Appendix A), conducted a pilot test for an Interim Remedial Measure (IRM) at the Grumman Aerospace facility in Bethpage, New York. A Remedial Investigation/Feasibility Study (RI/FS) is underway at the site, with Phase II of the RI recently being completed.

Soil-gas and soil sampling results generated during Phase I of the RI indicated that an aboveground trichloroethylene (TCE) storage tank near Plant 2 may be a source of contamination to the soil and the groundwater. In Phase II, additional sampling was conducted, including the collection of soil samples from a boring and the installation and sampling of a groundwater monitoring well. The results of the Phase II sampling indicated that soil near the tank had been impacted; the highest concentrations of TCE were detected in the sample from 8 to 10 feet below land surface. The results of the analysis of the groundwater sample indicated that groundwater has also been impacted, but to a lesser extent than the soil.

Because of the TCE concentrations detected in soil and the possibility for groundwater to be impacted to a greater extent in the future, Grumman has decided to undertake an IRM to mitigate the soil contamination. Groundwater contamination at this location and site-wide will be addressed as part of the overall remedy for the facility.

The IRM will be soil vapor extraction (SVE), which will be used to remove the contaminants from the soil. In its simplest form, SVE consists of applying a vacuum to an extraction well installed into the contaminated zone. Because TCE is relatively volatile, it will migrate with the extracted soil gases to the extraction well. The soil gases and vapors can then be treated to state standards (Air Guide 1) before they are discharged to the atmosphere.

The pilot test was performed to generate sufficient data to design the final SVE system. The pilot test consisted of applying different levels of vacuum to the extraction well and monitoring changes in performance parameters in the extraction and monitoring wells.

BACKGROUND

In Phase I of the RI, soil-gas samples were taken at several locations around the TCE tank. The locations of these samples are shown on Figure 1, and the results are provided in Table 1. Three soil samples were also taken during Phase I, one from each of three borings, labelled B-1, B-2, and B-3. These samples were taken at three different locations around the tank, at depths of 0 to 2.5, 2 to 4, and 8 to 10 feet below land surface, and analyzed for volatile organic compounds (VOCs). The boring locations are shown on Figure 1 and the sample results are in Table 2.

To determine if this area was a source of TCE that would require localized remediation, a boring (B-5) was drilled to 10 feet below the water table during Phase II. This boring was then completed as a monitoring well (Well GM-32S). Three soil samples were collected during the drilling of B-5 and submitted for laboratory analysis for VOCs. The samples were selected based on analyses of the headspace in the soil samples using a portable gas chromatograph (GC). After the installation and development of Well GM-32S, a groundwater sample was collected and submitted to the laboratory for VOC analysis. The location of B-5/GM-32S is shown on Figure 1, and the analytical results of the soil and groundwater samples are in Table 3.

As indicated in Table 3, the soil, particularly the sample from the 8- to 10-foot interval, which contained 1,200,000 micrograms per kilogram (ug/kg) of TCE, has been impacted. TCE was also detected at 640 ug/kg in the 18- to 20-foot interval and in the groundwater sample at 140 micrograms per liter (ug/L). However, although this area has been shown to be a TCE source, most of the TCE has been detected at depths that are less than 20 feet.

REMEDIAL APPROACH

Grumman has decided to undertake an IRM to mitigate the soil contamination associated with the TCE tank because it will serve as an ongoing source of groundwater contamination and will, therefore, be counterproductive to the overall groundwater remedy for the site. Soil vapor extraction was selected as the remedial technology for this area because of the favorable hydraulic properties of the formation (i.e., relatively high permeability) and the relatively localized distribution of contaminants. Prior to the design of the final SVE system, a pilot test was conducted to determine the optimal operating parameters.

METHODOLOGY

This section describes the methodology that was employed to conduct the SVE pilot test. The parameters collected during the pilot test will be used to design the final SVE system.

INSTALLATION OF SOIL VAPOR EXTRACTION WELL SVE-1

The Soil Vapor Extraction Well SVE-1 was installed in accordance with the NYSDEC approved workplan at the location shown on Figure 2. The well was installed using the hollow stem-auger drilling technique. A 10.5-inch borehole was advanced and split-spoon samples were collected at 5-foot intervals. The soil samples were screened with a photoionization detector (PID) and geologically logged by a Geraghty & Miller engineer. This data is recorded in Appendix B. In addition to the PID screening, samples were collected and analyzed with a portable gas chromatograph (GC) calibrated for trichloroethylene. The GC analytical data is given on Table 4.

The boring was terminated at a depth of 45 feet below land surface (bls) due to the detection of groundwater at 43 feet bls. The borehole was backfilled with clean silica sand to a height of 39 feet bls where the base of the soil vapor extraction well (SVE-1) was set.

The soil vapor extraction well was constructed of 5-foot sections of 4-inch diameter, schedule 40 PVC well screen (0.020-inch slot) alternating with 5-foot section of 4-inch diameter schedule 40 PVC casing. The upper 5 feet of the well was casing. The annulus around the well was filled to within 4 feet of land surface with a clean silica sand. Three feet of bentonite topped by a 1-foot concrete collar sealed the soil vapor extraction well at the surface. A well construction log for the soil vapor extraction well SVE-1 is given in Appendix B.

INSTALLATION OF SOIL VAPOR EXTRACTION MONITORING WELLS

Six soil vapor extraction monitoring wells were installed at the locations shown on Figure 2. Monitoring Wells MP-1 through MP-5 were constructed of 1.25-inch diameter schedule 40 PVC well screen (0.020-inch slot) and casing, installed in a 4.25-inch borehole in accordance with the NYSDEC approved workplan. The hollow-stem auger drilling technique was used for the installation. The annulus around the well was filled with clean silica sand to a height of 1 foot above the top of the screen. A 2-foot bentonite seal was emplaced above the silica sand to seal the well to the surface. The remainder of the annulus was backfilled with drill cuttings to a height of 1 foot bls where a 1-foot concrete collar was installed. The wells were completed at the surface with a 1.25-inch schedule 40 PVC cap.

Monitoring Well MP-6 had to be driven with a tripod due to the lack of access between the TCE tank and Plant 2. The well consisted of a 1.25-inch stainless steel drive point (0.020-inch slot) 5 feet in length coupled to a 1.25-inch schedule 40 black steel riser. The well was driven into the ground with a 140 pound tripod mounted slide hammer. The well was completed with a 1.25-inch schedule 40 PVC cap.

Monitoring wells MP-1, MP-3, and MP-5 were situated in a triangular pattern around the soil vapor extraction well at a distance of approximately 10 feet. Monitoring wells MP-2 and MP-4 were installed approximately 20 feet from the extraction well, and MP-6 was installed approximately 15 feet from the extraction well. The screen settings and construction details for each monitoring well are given in Appendix B.

EQUIPMENT CONFIGURATION

The equipment configuration used during the soil vapor extraction pilot test is shown on Figure 3. A 10-foot section of 4-inch diameter schedule 40 PVC pipe was coupled at one end to the soil vapor extraction well and at the other end to the influent port of an EG&G Rotron, 2-horsepower regenerative blower (model DR 505); a magnehelic gauge was connected to the soil vapor extraction well head to measure induced vacuum. An 1/8-inch double walled stainless steel pitot tube (Dwyer Instruments) was installed 6 feet from the soil vapor extraction wellhead on the influent line and connected to a magnehelic gauge to measure the extracted soil gas flow rate. A dilution valve was also installed on the influent line after the pitot tube to regulate the applied vacuum and to dilute the contaminated process stream. The blower's effluent port was connected to two 200-pound vapor phase carbon canisters (Carbtrol model G-2). Sample ports were installed prior to, between, and after the carbon canisters.

PILOT TEST METHODOLOGY

The approved Pilot Test Work Plan submitted by Geraghty & Miller indicated that the Pilot Test would be conducted in a series of four steps. These steps included applying a vacuum of 5, 10, 15, and 20 inches of water column (in.w.c.) to the soil vapor extraction wellhead and monitoring operational parameters. However, it was determined after the blower was activated on the day of the pilot test that the formation does not require such high vacuums to induce air flow. With the dilution valve completely closed, the maximum vacuum achievable was 3 in.w.c. For this reason the procedures specified in the work plan were reviewed and the pilot test was run with NYSDEC approval in three steps (1, 2, and 3 in.w.c.) of vacuum applied to the soil vapor extraction wellhead in order to induce air flow.

The blower and ancillary piping were connected to the soil vapor extraction well (SVE-1). The blower was activated and the dilution valve was adjusted to deliver a vacuum of 1 in.w.c. to the well head. The soil vapor extraction well was allowed to develop for a period of 1 hour when the following parameters were recorded:

- Vacuum at the soil vapor extraction wellhead.
- Differential pressure at the Pitot Tube (data used to calculate the extracted soil gas flow rate).
- Induced vacuum influence at the surrounding monitoring wells.
- Total volatile organic compound (VOC) concentration, percent Oxygen, and percent lower explosive limit (LEL) measured from the sample ports prior to, between, and after the carbon canisters.

The first step of the pilot test lasted for a duration of 2 hours with the operational parameters being recorded every hour. The second and third step of the test followed the same procedure described above. However, the dilution valve was adjusted to deliver a vacuum to the wellhead of 2 in.w.c. (step 2) and 3 in.w.c. (step 3). Samples for laboratory analysis at VOCs were collected from the sample port prior to the treatment system at the end of each step of the test.

SOIL VAPOR EXTRACTION PILOT TEST DATA REVIEW AND EVALUATION

This section presents the review and discussion of the pilot test results.

AIR FLOW RATES VERSUS WELLHEAD VACUUM

The air flow rates achieved during the test at different levels of vacuum were calculated based on pitot tube measurements and on comparison between the VOCs measured at the sample port prior to treatment with the dilution valve fully closed and the vapor concentrations measured with the dilution valve adjusted to a certain vacuum at the wellhead. For example, the air flow rate from step 3 (3 in.w.c.) with the dilution valve fully closed, was 149 cubic feet per minute (cfm) (based on the Pitot tube readings). A reduction in the extracted soil gas flow rate from the Soil Vapor Extraction Well SVE-1 resulted in a subsequent reduction in the vapor concentrations. The field data and the calculated soil gas flow rates for each of the 3 tests are shown on Table 5.

INDUCED VACUUM INFLUENCE

The induced vacuum influence at 1 in.w.c. was 0.21 in.w.c. at Monitoring Wells MP-2 and 0.185 in.w.c. at MP-4, which were located approximately 20 feet from the wellhead. Monitoring Wells MP-1, MP-3 and MP-5, located approximately 10 feet from the wellhead, exhibited vacuum influence of 0.23, 0.29 and 0.22 in.w.c. respectively. Well MP-6, which was located 15 feet from the wellhead, did not exhibit vacuum influence. The areal anisotropy of Well MP-6 noted for each test is probably the result of the method of installation, as previously discussed.

The induced vacuum influence at 2 and 3 in.w.c. applied to the soil vapor extraction wellhead are shown on Table 5.

The induced vacuum influence in the monitoring wells generally increased with increases in the applied vacuum to the soil vapor extraction wellhead. Vacuum influence is an indication that air flow is present at the monitoring location. Lines of approximately equal vacuum influence for the three tests are shown on Figure 4. The vacuum influence measurement data from Well MP-6 appears to have been effected by the method of installation as previously discussed and therefore is not used to establish the lines of approximately equal vacuum influence as shown on Figure 4. An analysis of the data indicates a radius of influence of approximately 40 feet from SVE-1. This may be effected by the building foundations associated with Plant #2 on the south and east side of the TCE tank.

CHEMICAL COMPOSITION OF SOIL GAS

Three soil-gas samples were collected from the blower discharge prior to carbon treatment at the end of each test. The samples were submitted to Microseeps, Ltd. of Pittsburgh, Pennsylvania for laboratory analysis. The analysis performed was Microseeps Analytical Method AM4.01. Analytical Method AM4.01 is a modification of USEPA Method

3810 (Headspace) and 8000 (Gas Chromatography). Modifications implemented are to accommodate the gas phase sample type only. The samples collected were analyzed for 30 specific compounds (624 scan). The compounds included in the 624 scan are given in Appendix C.

The analytical results indicate that TCE was the VOC present in the highest concentrations in the three samples collected. In Test 1, (l in.w.c.) TCE was detected at a concentration of 45.334 parts per million by volume (PPMV). In Test 2 (2 in..w.c.) TCE was detected at a concentration of 66.19 PPMV. In Test 3 (3 in.w.c.) TCE was detected at a concentration of 76.236 PPMV. The analytical data is given on Table 6.

TCE concentrations in the extracted soil gas increased with an increase in the applied wellhead vacuum. As described in the induced vacuum influence section, as the applied wellhead vacuum was increased (higher air flow rates), the induced vacuum influence also increased (more air flow in areas remote from the extraction well).

CONCLUSIONS

Based on the results of the vacuum extraction pilot test performed at Grumman Aerospace Corporation, located in Bethpage, New York, by Geraghty & Miller, the following conclusions can be made:

- The response of the formation to the application of vacuum can be characterized as exhibiting low vacuum/high flow conditions;
- The vacuum influence was induced within a relatively large area around the Soil Vapor Extraction Well SVE-1 during each test. The estimated radius of influence based on the monitoring data is approximately 40 feet;

The monitoring data and laboratory sample analysis indicate that the existing contaminants can be extracted from the subsurface using the technology of soil vapor extraction.

RECOMMENDATIONS

The results of the pilot test indicate that the use of SVE is an appropriate IRM for remediation of the area around the aboveground TCE storage tank near Plant 2. Geraghty & Miller recommends the installation of a SVE system utilizing the SVE extraction well and monitoring points installed for the pilot system. Additional monitoring wells may be required to monitor the performance of the system. The system would consist of a small building containing a regenerative blower and appropriate off-gas treatment. A source of power is readily available at the site. Weekly monitoring will be required to ensure the system is operating properly.

Table 1. Results of Soil-Gas Survey by Plant 2, Phase I Remedial Investigation, Grumman Aerospace Corporation, Bethpage, New York.

Sample Identification	Date Sempled	Vinyl chloride (ppmv)	trans-1,2- Dichloroethene (ppmv)	cis-1,2- Dichloroethene (ppmv)	Trichloroethene (ppmv)	Tetrachloroethene (ppmv)	Total VOCs (ppmv)
SG-4A	4/29/91	6.0>	<0.3	6	100	0.5	109.5
SG-4B	4/29/91	6.0>	<0.3	10	100	<0.2	110
SG-4C	4/29/91	6.0>	<0.3	5	100	<0.2	105
SG-4D	4/29/91	6.0>	<0.3	01	09	<0.2	70

ppmv Parts per million by volume, VOCs Volatile organic compounds.

All samples were analyzed using a portable gas chromatograph.

Table 2. Trichloroethene Detected in Soil Samples by Plant 2, Phase I Remedial Investigation, Grumman Aerospace Corporation, Bethpage, New York.

			ď	i	i	ı
Sample Designation:	E O	B-2	20 .	Field Blank	I rip biank	
Sample Depth (feet bls):	8-10	2-4	0-2.5			
Sample Date:	6/20/91	6/20/91	6/20/91	8/25/92	8/25/92	
Laboratory:	ΙĘΑ	IEA	ΙΕΑ			
Units:	ug/kg	ng/kg	ug/kg	√Sn	√P,ng/L	
Parameter						
Chloromethane	< 10	<10	<7,700 J	<10	<10	
Bromomethane	< 10	<10	<7,700 J	< 10	< 10	
Vind chloride	< 10	<10	<7,700 J	<10	<10	
Chloroethane	× 10	<10	<7,700 J	01 >	< 10	
Methylene chloride	< 2	3 J	<3,800 J	<10	<10	
Acetone	13	7 J	<7,700 J	<10	<10	
Carbon disulfide	< 5	<5	<3,800 J	<10	< 10	
1,1-Dichloroethene	< 5	<5	<3,800 J	<10	<10	
1,1-Dichloroethane	< 5	< 5	<3,800 J	<10	<10	
1,2-Dichloroethene (total)	< 2	ß	< 3,800 J	< 10	<10	
Chloroform	< 5	<5	< 3,800 J	ot >	3.5	
1,2-Dichloroethane	< 5	<5	< 3,800 J	<10	< 10	
2-Butanone	× 10	ot >	œ	<10	<10	
1,1,1-Trichloroethane	< 5	<5	< 3,800 J	<10	<10	
Carbon tetrachloride	< 5	<5	< 3,800 J	<10	< 10	
Vinyl acetate	< 10	<10	<7,700 J	<10	<10	
Bromodichloromethane	< 2	< 5	< 3,800 J	<10	<10	
1,2-Dichloropropane	< 5	<5	<3,800 J	<10	<10	
cis-1,3-Dichloropropene	< 5	< 5	<3,800 J	<10	<10	
Trichloroethene	48	44	130,000 J	<10	<10	
Dibromochloromethane	< 5	<5	<3,800 J	<10	<10	
1,1,2-Trichloroethane	< 5	< 5	< 3,800 J	<10	<10	
Benzene	< 5	<5	<3,800 J	< 10	<10	
trans-1,3-Dichloropropene	< 5	<5	<3,800 J	< 10	<10	
Bromoform	< 5	<5	< 3,800 J	<10	<10	
4-Methyi-2-pentanone	< 10	<10	<7,700 J	<10	<10	
2-Hexanone	<10	<10	<7,700 J	<10	<10	
Tetrachloroethene	< 5	<5	<3,800 J	<10	<10	
1,1,2,2-Tetrachloroethane	< 5	<5	< 3,800 J	<10	<10	
Toluene	< 5	<5	< 3,800 J	<10	<10	
Chlorobenzene	< 5	< 5	<3,800 J	<10	<10	
Ethylbenzene	< 5	< 5	<3,800 J	<10	< 10	
Styrena	< 5	<5	<3,800 J	< 10	<10	
Xylene (total)	<5	<5	<3,800 J	<10	<10	
	;			,		
Total VOCs:	61	59	130,000	0	m	

Micrograms per liter. Volatile organic compounds. Industrial Environmental Analysts, Monroe, Connecticut. Micrograms per kilogram. ug/kg ug/L VOCs ΙĒΑ

Below land surface, Samples collected in shallow soil borings. Estimated value. bls B-1, B-2, B-3

Table 3. Results of Soil Borings and Ground-Water Sampling by Plant 2, Phase II Remedial Investigation, Grumman Aerospace Corporation, Bethpage, New York.

Parameter Sample Date: 2.0.2 8.10 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20 18-20	Sample Designation:	ation: B-5	8-5	8-5	GM-32S	Field	Trip	Trip
Sample Delect S12552 S125522	Sample Depth (1		8-10	18-20		Blank	Blank	Blank
Management Management Marcogenest Ma	Sample I		8/25/92	8/25/92	1/25/93	8/25/92	8/25/92	1/25/93
Units: ug/kg	Labora		NET	NET	EcoTest	NET	NET	EcoTest
Colorada			ug/kg	ug/kg	ng/L	ng/L	ng/L	ng/L
Mainthean	Paramater							
Colorabidication Colorabidia	Chloromethane	< 5500	<71000	<52	Ν	۸ 10	× 10	Z
Comparison	Bromomethane	< 5500	<71000	<52	٧Z	< 10	01>	A N
Activities	Viny chloride	< 5500	<71000	<52	A N	ot >	> 10	Y Z
Activation Comment C	Chloroethane	< 5500	<71000	<52	A Z	<10	< 10	A N
Color Colo	Methylene chloride	< 2200	< 71000	<52	A N	< 10	^ 10	4 2
Action of the properties Color of the pr	Acetone	< 5500	<71000	<52	A A	< 10	<10	N A
historian parallel (1998) (2500 < 771000 < 622 NA < 100 NA (100 NA (10	Carbon disulfide	< 5500	<71000	<52	∢ Z	ot >	010	Y :
Continue	1,1-Dichloroethene	< 5500	<71000	<52	∢ :	< 10	× 10	Υ ·
1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300 1300	1,1-Dichloroethane	< 2200	<71000	<52	Y :	010	010	4
Second Communication	1,2-Dichloroethene (total)		<71000	<52	Y S	0.0		2 2
Tricklocostrane	Chloroform	<5500	<71000	<52	4 •	0.0		2 2
Micrograms per liter. Micr	1,2-Dichloroethane	0056>	0001/>	< 52 / F3	2 2	2 2	0.7	2 2
Interdiocentaries CSSOO CT1000 C	2-Butanone	¥ (< 32 < F.1	2 2	2 5	2 5	(d
Activation Act	I, I, I - I richioroethane	> 3300	71000	< 52	(4	V V	× 10	Y Y
Second Control Contr	Carbon tetrachioride	> 5500	< 71000	< 52	(4	< 10	, v 10	ζ ζ
Section Sect	1 2-Dichloropropage	< 5500	<71000	< 52	N V	01 >	< 10	Y Z
Second	cis-1,3-Dichloropropene	< 5500	<71000	<52	AN	< 10	01 >	AN
Name	Trichloroethene	36000	1200000	640	140	01 >	01 >	^
Trickloroethane	Dibromochloromethane	< 5500	<71000	<52	A N	<10	< 10	A A N
Accordance Compared Compare	1,1,2-Trichloroethane	< 5500	<71000	<52	4 2	< 10	<10	42
1,3-Dichloroptopen	Benzene	<5500	<71000	<52	ΝΑ	<10	<10	Y Y
Vocation	trans-1,3-Dichloropropene	<5500	<71000	<52	∢ Z	ot >	<10	Y Y
NA NA NA NA NA NA NA NA	Bromoform	<5500	<71000	<52	∀ Z	<10	010	Y Z
Autorograms per liter. Micrograms per liter. Micrograms per liter. Volatile organic compounds. Aibliousethene C5500 C71000 C52 NA C10 C10 C10 C10 C10 C10 C10 C1	4-Methyl-2-pentanone	<5200	<71000	<52	V Z	× 10	× 10	۷ : 2 :
2.Tetrachloroethene	2-Hexanone	<5500	<71000	<52	۷ ·	01>	010	Ψ.
2. Tetrachloroethane	Tetrachloroethene	<5500	0001/>	<52 713	· :	010	0 ;	
National Environmental Testing, Inc., Bedford, Massachusetts. S5500	1,1,2,2-Tetrachloroethane	< 5500 \ 5500	×71000	<52 <52	4 4 2 2	2 2	V V	ζ 4 2 2
National Environmental Testing, Inc., Bedford, Massachusetts. B-5 Soil sample. National Environmental Testing. National Environmental		× 5500	000177	< 5.5 < 5.7	(4	2 0	0 0	(4 2 Z
VOCs: C	Chioropenzene Fibythenzene	< 5500	<71000	< 52	(4 ? Z	01.0	× 10	(4
VOCe: 37300 <71000 <52 NA <10 <10 NA VOCe: 37300 1200000 640 140 0 3 Micrograms per liter. Micrograms per kilogram. J Estimated value. J Estimated value. Volatile organic compounds. R Unusable value. R Unusable value. National Environmental Testing, Inc., Bedford, Massachusetts. B-5 Soil sample.	Stylene	< 5500	<71000	<52	¥ Z	ot >	<10	A N
Micrograms per liter. Micrograms per kilogram. Volatile organic compounds. Volatile organic compounds. National Environmental Testing, Inc., Bedford, Massachusetts. B.5 Soil sample.	Xylene (total)	< 5500	<71000	<52	A A	<10	< 10	Y Y
Micrograms per liter. Micrograms per kilogram. Volatile organic compounds. National Environmental Testing, Inc., Bedford, Massachusetts. Micrograms of analyzed. Retired value. Retired sample.	Total VOCs:	37300	1200000	640	140	0	က	0
Micrograms per kilogram. Volatile organic compounds. National Environmental Testing, Inc., Bedford, Massachusetts. B-5 Soil sample.			AN N	Not analyzed.				
Micrograms per kilogram. Volatile organic compounds. National Environmental Testing, Inc., Bedford, Massachusetts. B-5 Soil sample.			-	Total Arcon				
Volatile organic compounds. National Environmental Testing, Inc., Bedford, Massachusetts. B-5 Soil sample.			ם כ	Estimated value.				
National Environmental Testing, Inc., BedTod, Massachusetts.								
		ng, inc., Bediord, Massac					;	,

Table 4. Gas Chromatograph Analytical Data Collected From Boring SVE-1, November 2, 1993, Grumman Aerospace Corporation, Bethpage, New York.

SAMPLE CORE ID:	SAMPLE CORE DEPTH (FEET BELOW LAND SURFACE)	TCE CONCENTRATION (PPMV)
SVE 1-1	5	130
SVE 1-2	10	160
SVE 1-3	15	110
SVE 1-4	22	670
SVE 1-5	25	130
SVE 1-7	35	26
SVE 1-8	40	<6
SVE 1-9	45	67

TCE - Trichloroethylene

Table 5. Pilot Test Data Collected on November 1, 1993, Grumman Aerospace, Bethpage, New York.

						MP-6		0.0	0.015	0.0		0.08	0.07		0.04	90.0
	ence					MP-5		-	0.22			0.40	0.36		0.50	0.50
	Induced Vacuum Influence	(.c.)				MP4		0.12 0.27 0.17 0.24	0.26 0.18	0.29 0.185 0.22		0.28	0.32		0.40	0.41
	ed Vacu	(in.w.c.)						0.27	0.26	0.29		0.50	0.46		0.58	0.68
	Induc					MP-1 MP-2 MP-3		0.12	0.16	0.21		0.30	0.30		0.45	0.38
						MP-1		0.2	0.2	0.23		20.5 0.36 0.30	20.5 0.36		20.5 0.45	0.45
		ns			05	(%)		21	20.5	20.5		20.5	20.5		20.5	20.5
Carbon	Effluent	Concentrations			LEL	(%)		0	0	0		0	0		0	0
0	Щ	Conc			PID	(PPMV)		0	0	0		0	0		0	0
		us		_	05	(%)	#1	21	20.5	20.5	#2	20.5	20.5	#3	20.5	20.5
Post Carbon	Drum #1	Concentrations			LEL	(%)	STEP#1	0	0	0	STEP #2	0	0	STEP#3	0	0
Post	Ā	Conc			PID	(PPMV)		0	0	0		0	0		0	0
	B	ıs			05	(%)		20.5	20.5	20.5		20.5	20.5		20.5	20.5
Influent	Process Stream	Concentrations			LEL	(%)		0	1	1		1	1		2	2
uĮ	Proce	Conce			PID	(PPMV)		20	140	148		144	160		180	180
			Extracted	Soil Gas	Flow Rate	(CFM)		68	107	117		121	126		144	149
			Applied	Suction	To SVE-1	(in.w.c.)		1	1	1		2	2		3	3
				Elapsed	Time	(Min.)		5	09	120*		09	120*		09	120*

Laboratory samples collected at this time interval.

Inches of water column. in.w.c. PPMV

Parts per million by volume.

Percent of the lower explosive limit. Photo Ionization Dectector

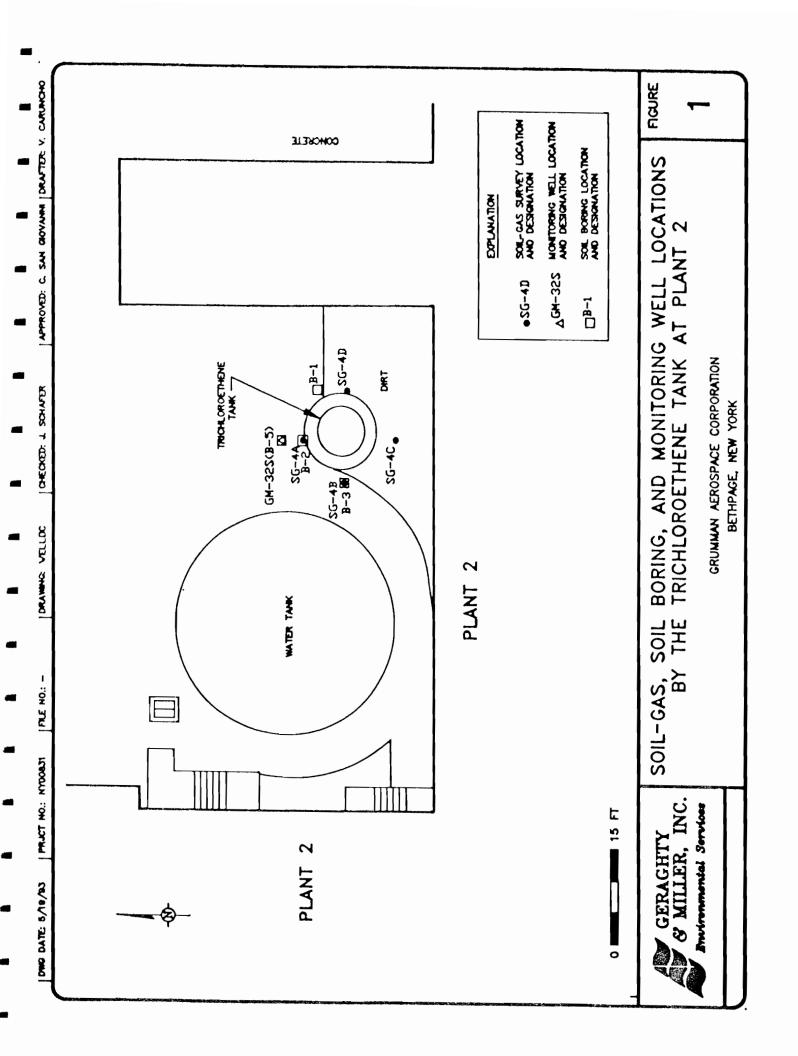
Percent oxygen level. PID LEL 02 CFM

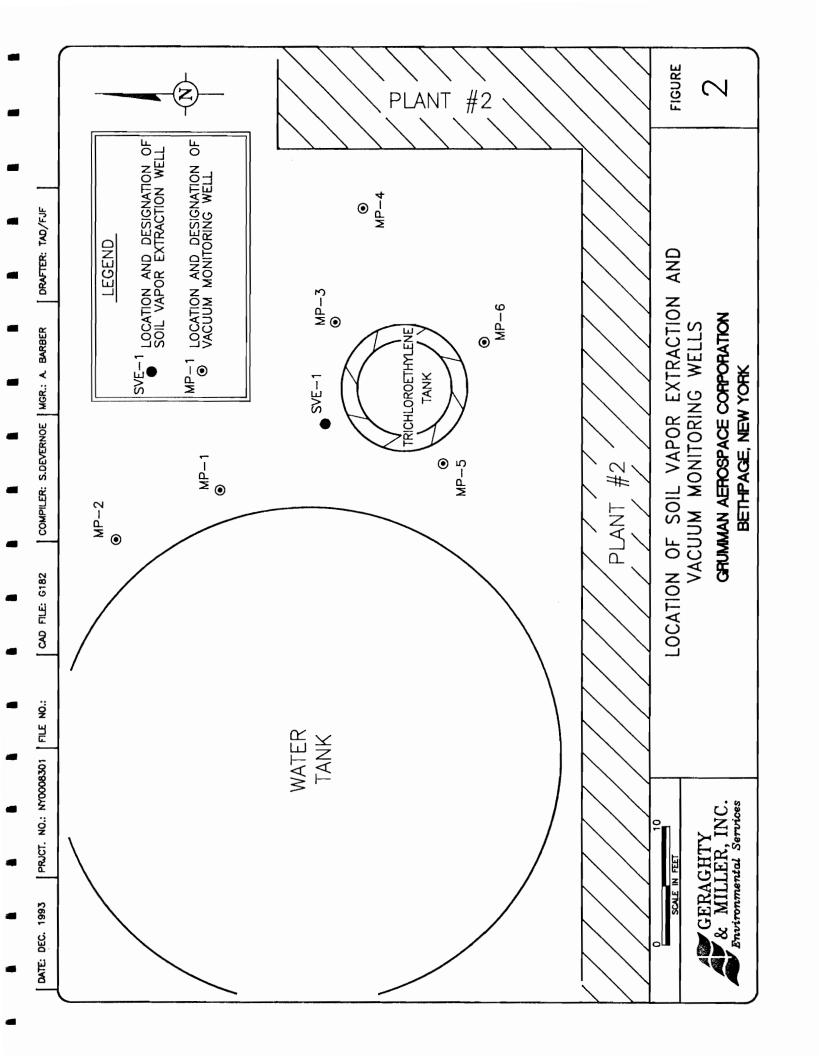
Cubic feet per minute.

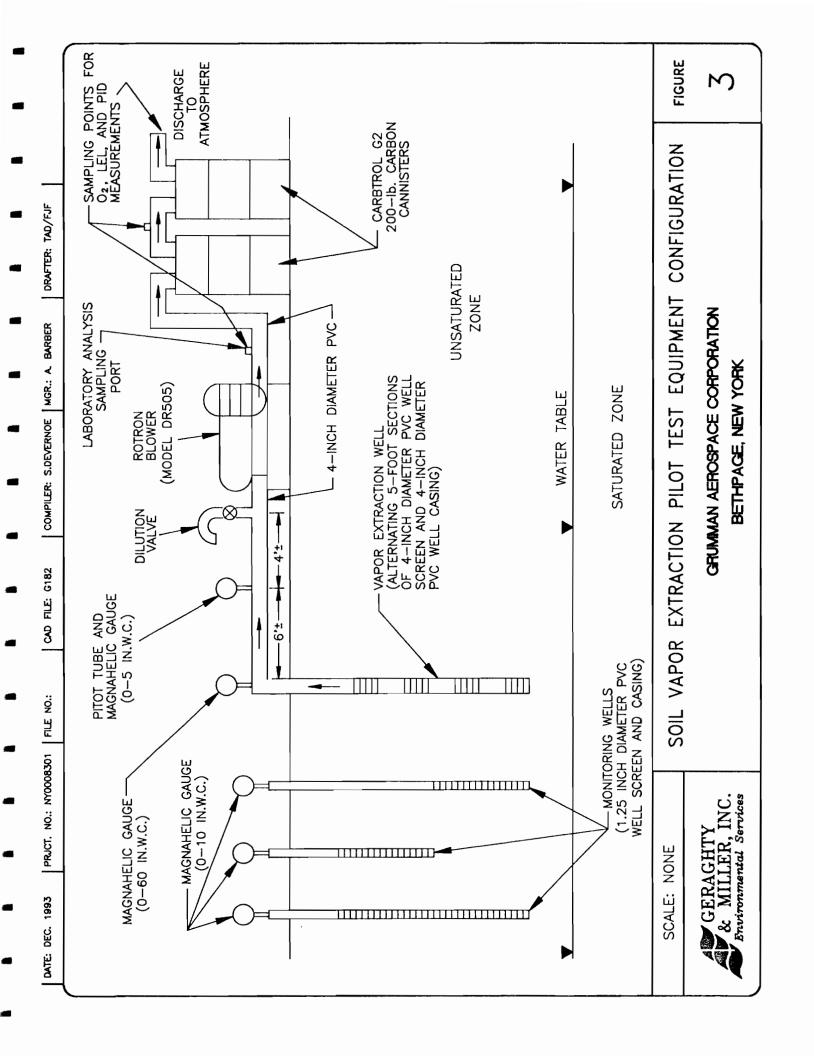
Table 6. Soil Gas Contaminant Concentration Collected From the Soil Vapor Extraction Pilot Test on November 1, 1993, Grumman Aerospace Corporation, Bethpage, New York.

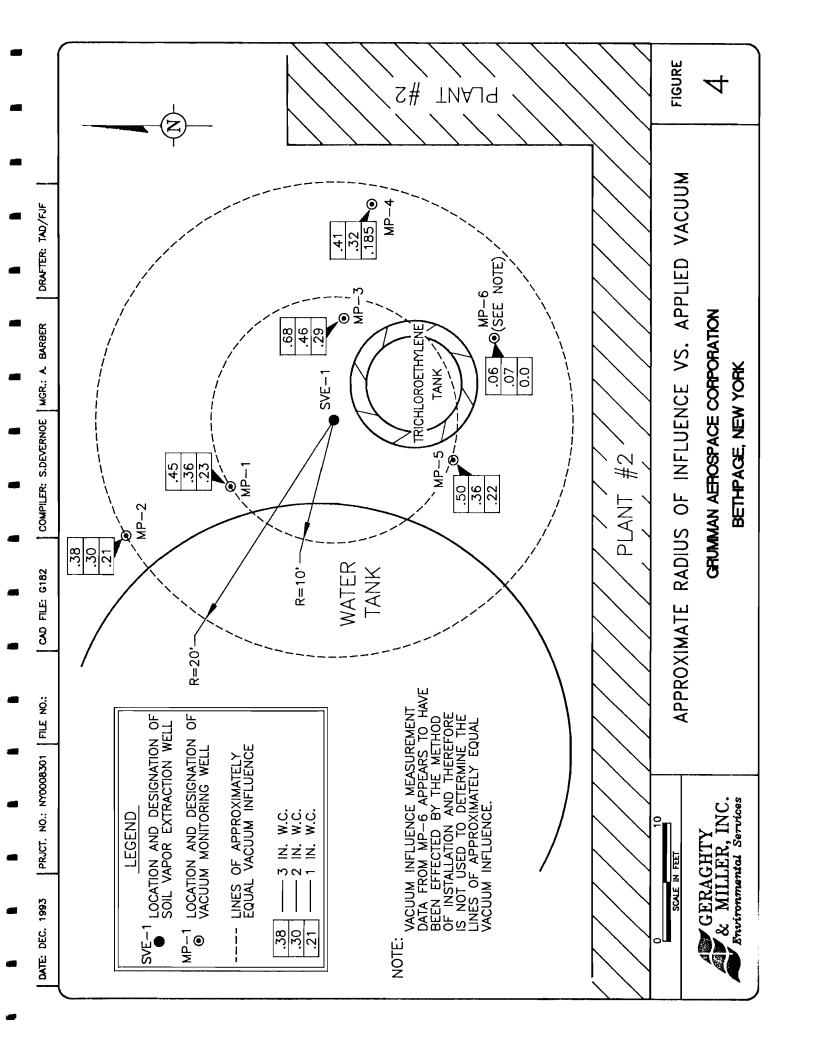
Compound Name	VET-1	VET-2	VET-3	Lower Detection Limit
Chloromethane	<1	< 1	<1	1
Vinyl Chloride	< 1	< 1	<1	1
Bromomethane/Chloroethane*	< 1	< 1	<1	1
Fluorotrichloromethane	< .005	0.006	0.010	0.005
1,1 Dichloroethylene	< .01	< .01	<.01	0.01
Methylene Chloride	< 1	< 1	< 1	1.0
Trans-1,2 Dichloroethylene	0.04	0.06	0.08	0.01
1,1 Dichloroethane	<.01	< .01	<.01	0.01
Chloroform	0.006	0.008	0.011	0.005
1,1,1 Trichloroethane	0.028	0.043	0.051	0.005
Carbon Tetrachloride	< .005	< .005	< .005	< .005
Benzene	< .07	< .07	< .07	0.07
1,2 Dichloroethane	< .01	< .01	<.01	0.01
Trichloroethylene	45.334	66.149	76.236	0.005
1,2 Dichloropropane	<.01	<.01	<.01	0.01
Bromodichloromethane	< .005	< .005	< .005	0.005
2-Chloroethyl Vinyl Ether	< 5	< 5	< 5	5.0
Cis-1,3 Dichloropropylene	<.01	< .01	< .01	0.01
Toluene	<.07	< .07	< .07	0.07
Trans-1,3 Dichloropropylene	< .01	< .01	<.01	0.01
1,1,2 Trichloroethane	< .005	< .005	< .005	0.005
Tetrachloroethylene	0.081	0.129	0.158	0.005
Chlorodibromomethane	< .005	< .005	< .005	0.005
Chlorobenzene	< .07	< .07	< .07	0.07
Ethyl Benzene	<.07	< .07	<.07	0.07
Bromoform	<.005	< .005	< .005	0.005
1,1,2,2 Tetrachloroethane	<.005	< .005	< .005	0.005
1,3 Dichlorobenzene	< .07	< .07	< .07	0.07
1,4 Dichlorobenzene	< .07	< .07	< .07	0.07
1,2 Dichlorobenzene	<u><.07</u>	<u><.07</u>	<u><.07</u>	0.07
Total VOCs	45.49	66.40	78.55	

^{*} Compounds elute together on ECD: Values represent either or a combination of both. Analysis performed by Miocroseeps, Ltd., Pittsburgh, Pennsylvania.









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•	APPENDIX A
	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
•	LETTER DATED SEPTEMBER 21, 1993
•	LETTER DATED SEPTEMBER 21, 1993
•	LETTER DATED SEPTEMBER 21, 1993
	LETTER DATED SEPTEMBER 21, 1993

GMCE of New York, P.C.

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



September 21, 1993

Mr. John H. Ohlmann, P.E. Director, Corporate Environmental Protection Grumman Corporation
Bethpage, NY 11714-3580

Dear Mr. Ohlmann:

RE: <u>GRUMMAN CORPORATION</u> SITE NUMBER 130003A

The revised work plan dated September 1, 1993 for the IRM at the aboveground TCE tank adjacent to Plant #02 is hereby approved. Please notify this office five business days in advance of commencing field work. If you have any questions regarding this matter, please feel free to contact me at (518) 457-3395.

Very truly yours,

John D. Barnes, P.E.
Environmental Engineer 2
Bureau of Eastern Remedial Action

Div. of Hazardous Waste Remediation

JB/dd grum46

c: S. Ervolina

S. McCormick

R. Knizek/D. Evans

L. Wilson

A. Barber (G&M)

APPENDIX B SOIL BORING AND WELL CONSTRUCTION LOGS

GMCE of New York, P.C.

SOIL BORING LOG

Boring/Wel	SVE-I		Project No.		NY0008031	/Grumman				Page		of_	1
Site Location	Plant 2 Tri	chorcethyene Tank	Aros	Drilli	ing Started	11:42 AM			Drilling C	ompleted	5:20 PM	1	
Total Depth	Drilled	45		feet	Hole Diameter	10.5		inches		Sample/ Device	Split Spoo	n	
Length and of Coring I		2 ft. x	2 in.						Sampling	Interval	5	<u></u>	feet
Land-Surfa Elevation		N/A		feet	1	Surveyed		Estimated		Datum	N/A		
Drilling Flu	aid Used	None						Drilling	Method		Hollow S	tem A	nger
Drilling Co	ntractor	Delta '	Well & Pump			Dril	ller	Wilson		Helper			
Prepared By		Steve	Deverno e			······································		Hammer Weight	140#	Hammer Drop	30		inches
Sample/Co (feet below la From	-	Core Recovery (feet)	Time/Hyd Pressur Blows p inche	e or er 6			Sam	ple/Core De	scription			Re	PID adings PMV
,			40	20		.							22
-	6		4-8-11-	28	1.1ghl brow	n fine to medium	Sand,	trace Gravel.					22
9	11		7-9-11-	21	Light brow	n fine to coarse Sa	and, so	me Gravel.					20
14	16		6-9-16-	18	Light brow	n fine to coarse Se	and, G	ravel.				· -	22
19	21		6-8-14-	26	No recover	y, large piece of (Gravel	in spoon.					N/A
21	23		32		Light brow	n fine to coarse Sa	and, so	ome Gravel.					50
24	26		13-17-3	2-29	Light brow	n fine to coarse Sa	and, so	ome Gravel.					20
										_			
29	31		19-21-2	8-35	No recover	у							N/A
31	33		52		No recover	ry.							N/A
34	36		21-25-3			n fine to coarse Si	and, so	ome Gravel.					28
39	41		12-17-2	3-27	Light brow	n fine Sand.							21
44	46		9-11-15			rown fine to coan	se Sano	1.					26
	1				-								
								_					
						-							
													

		Project	Grumi	nan Ae	rospace Co	rp.	Aveil 2AE-1
pro-ma 4		Town/City	Bethpa	ge.			
1	0 ft.	County	Nassa	J		State	New York
	/ Land Surface	Permit No.					***************************************
	_	Land-Surfac	e Elevat	ion			**********
	10.5 inch diameter drilled hole	and Datum	N/A		feet		Surveyed Estimated
		Installation	Date(s)		October 2	5, 1993	
	Well Casing	Drilling Met		***********	w Stem Au	· · · · · · · · · · · · · · · · · · ·	
	4 inch diameter,	Drilling Con	tracto r			np	
	Schedule 40 PVC	Drilling Fluid	j	None	**********************		
	x Backfill Grout	Developmer No		-	and Date(s Required)	
	1 ft.*	Fluid Loss D	Durina D	rillina	None		gallons
5		Water Remo	_	-		None	gallons
	Bentonite slurry	Static Depti			-	**********	feet below M.P.
	4 ft. x pellets	Pumping De			N/A	week errore to the total of the	feet below M.P.
mr		Pumping Du	uration		N/A	hours	,
	5 ft. NOTE	Yield	N/A	gpm	N/A	Date N/A	
■		Specific Ca				gpm/ft.	
	Well Screen			***************************************			
	4 inch diameter	Well Purpos	e	Soil	Vapor Extra	ction Well	
	PVC .020 slot						
	x Gravel Pack			*****			
	Sand Pack	Remark s	Groud	water	was encoun	itered at 44 fe	et. Set casin g
	Formation Collapse	5 ft above (groundw	ater at	39 ft. Soil	samples were	collected
		at every 5 f	t interva	l and a	inalyzed for	TCE with a po	rtable GC.
	39 ft.						
	45 ft.						
Moss	uring Point is			************	***************************************	······································	
Top of	uring Point is f Well Casing	KC	••••••	······································			
	s Otherwise Noted. th Below Land Surface	Prepared by	,	Stev	e Deverno e		
		8			********	*******	*****

*NOTE: 5 foot sections of well screen alternating with 5 foot sections of casing make up the construction of the soil vapor extraction well with the top 5 feet being casing.

			man Aerospa ce Cor p.		Well MP-1
m	↑ 0 ft.	County Name	age	Ctoto	Nou Vork
	Land Surface	Permit No.	U	State	New York
	Cand Surface	Land-Surface Elevat	ion		·····
	4.25 inch diameter drilled hole	and Datum N/A			Surveyed Estimated
			October 25,	1 99 3	***************************************
	Well Casing	Drilling Method	Hollow Stem Auge	r	
	1.25 inch diameter,	Drilling Contractor	Delta Well & Pump		
	Schedule 40 PVC	Drilling Fluid	None	و المعادلة	*****************************
	x Backfill Grout	Development Techn	nique(s) and Date(s) oment Required		
	7 ft.*	Fluid Loss During D	rilling None ring Development		gallons
	Bentonite slurry	}	ter N/A	***************************************	feet below M.P.
	9 ft. x pellets	Pumping Depth to \	Water N/A		feet below M.P.
	\	Pumping Duration	N/A	hours	
	10 ft		gpm N/A	Date N/A	
	-			gpm/ft.	
	Well Screen				
	1.25 inch diameter	Well Purpose	Soil Vapor Extracti	on Monitorir	ng Well
	PVC .020 slot				
	x Gravel Pack				
	Sand Pack	Remark s			
	Formation Collapse				
	20_ft.				
	20 ft.				
£					
Meas	uring Point is			***************************************	***************************************
	of Well Casing				
-	s Otherwise Noted.				
	oth Below Land Surface	Prepared by	Steve Deverno e		
	}			*******************	

	Toyect Groninan Aerospace Corp.	VVEII IVIF-Z
T 1 0 4	Town/City Bethpage	CA-A No Varie
0 ft.		State New York
Land Surface	Permit No. Land-Surface Elevation	
4.25 inch diameter drilled hole	and Datum N/A feet	Surveyed Estimated
Well Coning	Installation Date(s) October 26, 1993	
Well Casing		
1.25 inch diameter, Schedule 40 PVC	Drilling Contractor Delta Well & Pump Drilling Fluid None	
x Backfill Grout	Development Technique(s) and Date(s) No Development Required	
7 ft.*	Fluid Loss During Drilling None	gallons
Bentonite slurry 9 ft.* x pellets		Von e gallons
Bentonite slurry	Static Depth to Water N/A	feet below M.P.
9 ft. x pellets	Pumping Depth to Water N/A	feet below M.P.
10.6	Pumping Duration N/A Yield N/A gpm N/A Date I	hours
10 ft	Yield N/A gpm N/A Date I Specific Capacity N/A gpm/f	***************************************
Well Screen		
1.25 inch diameter PVC .020 slot	Well Purpose Soil Vapor Extraction Mo	nitoring Well
x Gravel Pack Sand Pack Formation Collapse	Remarks	
40 ft.		
40 ft.		
Measuring Point is		***************************************
Top of Well Casing Unless Otherwise Noted.		
Depth Below Land Surface	Prepared by Steve Devernoe	

		Project	Grumn	nan Aei	rospace Cor	ρ.	Well M	IP-3		
نسا	A	Town/City	Bethpa	ge		C4 - 4 -		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
	0 ft.	County	Nassau]		State	N	ew York		
	Land Surface	Permit No.								
		Land-Surface								
	4.25 inch diameter	and Datum	N/A	***********	feet			urveyed		
	drilled hole						E	stimated		
	Well Contact	Installation C	Date(s)		October 26	, 1993		****************************		
	Well Casing	Drilling Meth	100	Hollo	W Stem Aug	jer		•••••		
	1.25 inch diameter,					ip		· · · · · · · · · · · · · · · · · · ·		
	Schedule 40 PVC	Drilling Fluid	***************************************	None						
		Dovelopmen	t Tocho	iaualel	and Data(s)					
	x Backfill	Development Technique(s) and Date(s) No Development Required								
	Grout		Develop		icqui ca		***************	***************************************		
			***********		***********	***********************	بطبيعة الدواد ال	ennember et et et en		
	17 ft.*	Fluid Loss D	uring Di	rilling	None			gallons		
19 F		Water Remo	ved Dur	ing Dev	velopment	None	••••••	gallons		
	Bentonite slurry	Static Depth	to Wat	er	N/A			elow M.P.		
	19 ft. x pellets	Pumping De	pth to V	Vater	N/A		feet b	elow M.P.		
		Pumping Du	ration		N/A	hours				
	20 ft				N/A		333 over 11 of 12 to \$1000	****************		
		Specific Cap								
	Well Screen									
	1.25 inch diameter	Well Purposi	е	Soil \	/apor Extrac	tion Monitorin	ng Well			
	PVC .020 slot				****************			~****		
		<u></u>	***************************************							
	x Gravel Pack									
	Sand Pack	Remarks						•••••		
	Formation Collapse					***************************************				
	40 ft.		****	**********				******************		
						•••••				
	40 ft.			•••••••						
£	and			*************	ala ini a ala alam a propositi a ala alaba mani ini a		************	***************************************		
Meas	uring Point is	***************************************	***********	***********		******************************	************	****************		
	of Well Casing		•••••••		***************************************		•••••			
	ss Otherwise Noted.									
* Der	oth Below Land Surface	Prepared by		Steve	e Devernoe					
201		a . ropulou by	***********			******************************				

	Project	Grumii	an Aer	ospace Corp) .	vveii MP-4
,	Town/City	Bethpa	ge			
↑ 0 ft.	County	Nassau		***************************************	State	New York
Land Surface	Permit No.					***************************************
	Land-Surface					
4.25 inch diameter drilled hole	and Datum	N/A		feet		Surveyed Estimated
	Installation D			October 26	, 1993	ACCOUNTY.
Well Casing	Drilling Meth	od				
1.25 inch diameter,	Drilling Conti	ractor	Delta	Well & Pum		~~~~
Schedule 40 PVC	Drilling Fluid		None		50,5 500. * *** ***** ****** ****** ***	
	Development	t Techni	que(s)	and Date(s)		
x Backfill	No	h e on differ a de distriction nad distriction who was				
Grout		~~~~~~	***************************************			~~~~
7 ft.*	Fluid Loss D	uring Dr	illing	None		gallons
	Water Remo	ved Duri	ng Dev			gallons
Bentonite slurry	Static Depth	to Wate	er	N/A		feet below M.P
9 ft.* x pellets	Pumping Dep		'a te r	N/A		feet below M.P
	Pumping Du	ration		N/A	hours	
10 ft	Yield	N/A	gpm	N/A	Date N/A	
	Specific Cap	acity	N/A		_gpm/ft.	
Well Screen						
1.25 inch diameter	Well Purpose	e	Soil V	apor Extract	tion Monitorin	ıg Well
PVC .020 slot	**************************************					
x Gravel Pack	61/44/8864444444444	***********	***************************************		anna seat canno sono set especialmente.	***************************************
Sand Pack	Remark s					
Formation Collapse		************		***************************************		· · · · · · · · · · · · · · · · · · ·
40 ft.				***************************************		
40 ft.						
	***************************************	*************				***************************************
Measuring Point is						
Top of Well Casing Unless Otherwise Noted.						
* Depth Below Land Surface	Prepared by	***********	Steve	Deverno e		

		Project					Well MP-5
□ 1	O ft.	Town/City					
	***************************************	County Permit No.	IVassau			State	New TOIK
	Land Surface	Land-Surface					
	4.25 inch diameter	and Datum			foot		Surveyed
	drilled hole	and Datom			1001		Estimated
	drined field	Installation D	Date(s)		October 26,	1993	Lottinated
8	Well Casing					· • • • • • • • • • • • • • • • • • • •	
	1.25 inch diameter,	Drilling Contr	ractor	Delta \	Well & Pump	 I	
	Schedule 40 PVC	Drilling Fluid					
			***************************************				***************************************
	<u>}</u>	Development	t Technic	que(s) a	•		
	x Backfill	•	Develop				
	Grout						

	7 ft.*	Fluid Loss D	uring Dri	lling	None		gallons
		Water Remo	ved Duri	ng Dev	elopmen t	None	gallons
	∕Bentonit e slurry	Static Depth	to Wate	er	N/A	*************	feet below M.P
N A	9 ft.* x pellets	Pumping Dep	pth to W	ater	N/A		feet below M.F
		Pumping Du	ration		N/A	hours	
	10 ft	Yield	N/A	gpm	N/A	Date N/A	***************************************
	17.0	Specific Cap	acity	N/A		gpm/ft.	
	Well Screen						
	1.25 inch diameter	Well Purpose	e	Soil V	apor Extracti	on Monitorir	ng Well
	PVC .020 slot	***************************************					*******************************
	· · · · · ·		********	***************************************			
	x Gravel Pack						
	Sand Pack	Remark s					
	Formation Collapse		*****				
	30 ft.						***************************************
			••••••				
	30 ft.						
house	more than		***************************************				
Measu	ring Point is	***************************************	***************************************	********			
			•••••••••	***************************************		•••••••••••••	
Unless	Otherwise Noted.	vac or a constant					
* Dept	th Below Land Surface	Prepared by		Steve	Deverno e		
			***********	*******		******	************

WELL CONSTRUCTION LOG

(UNCONSOLIDATED)

	***************************************	Project	Grumn	nan Aer	rospace Cor	p.	Well MP-6		
	, A	Town/City Bethpage				~			
	0.5 ft.	County	Nassai	J		State	New York		
	Land Surface	Permit No.							
%		Land-Surface							
	4.25 inch diameter drilled hole	and Datum			feet		Surveyed Estimated		
		Installation D			October 2	7, 199 3			
	Well Casing	Drilling Meth	od		Point (Tri-p				
	1.25 inch diameter,	Drilling Conti	ractor	Delta	Well & Pun	np			
	Schedule 40 Steel	Drilling Fluid					/////*********************************		
	Backfill Grout	Development No		•	and Date(s) Required				
	ft.*	Fluid Loss D	uring Dr	rilling	None		gallons		
*	* ¥6	Water Remo	_	-	velonment	None	gallons		
	Bentonite slurry	Static Depth				***************************************	feet below M.P.		
	ft. pellets	Pumping Der			N/A	************	feet below M.P.		
~		Pumping Dur			N/A	hours			
	20 ft	Yield			N/A	Date N/A			
		Specific Cap	acity	N/A		gpm/ft.			
	Well Screen				***************************************				
	1.25 inch diameter	Well Purpose	•	Soil V	/apor Extrac	tion Monitorin	g Well		
	Steel .020 slot								
***************************************	Gravel Pack								
	Sand Pack	Remarks	MP-6	was ins	stalled with	a tri-pod due t	o limited		
	× Formation Collapse	Remarks MP-6 was installed with a tri-pod due to limited access between the tank and Plant-2.							

***	25 ft.	************************		territario concesso qualitati	nder betrette der der eine eine der der der der der der der der der de	***************************************	ATTENNA OF THE REAL PROPERTY OF THE PROPERTY O		

	25 ft.								
			************	***********	***********	*******************************			
	Measuring Point is								
	Top of Well Casing								
(Top of Well Casing Unless Otherwise Noted. * Depth Below Land Surface								
	Depth Below Land Surface	Prepared by		Steve	e Devernoe	~~~~	**********************************		

APPENDIX C
624 SCAN COMPOUND LIST

		Lower Detection	
Compound	Blank	Limit	
Chloromethane	ND ND	1	
Vinyl Chloride	ND	1	
Bromomethane/Chloroethane*	ND	1	
Flurorotrichloromethane	ND	0.005	
1,1 Dichloroethylene	ND	0.01	
Methylene Chloride	ND	1.00	
Transe-1,2 Dichloroethylene	ND	0.10	
1,1 Dichloroethane	ND	0.01	
Chloroform	ND	0.005	
1,1,1 Trichloroethane	ND	0.005	
Carbon Tetrachloride	ND	0.005	
Benzene	ND	0.07	
1,2 Dichloroethane	ND	0.01	
Trichloroethylene	ND	0.005	
1,2 Dichloropropane	ND	0.01	
Bromodichloromethane	ND	0.005	
Cis-1,3 Dichloropropylene	ND	0.01	
Toulene	ND	0.07	
Trans-1,3 Dichloropropylene	ND	0.01	
1,1,2 Trichloroethane	ND	0.005	
Tetrachloroethylene	ND	0.005	
Chlorodibromoethane	ND	0.005	
Chlorobenzene	ND	0.07	
Ethyl Benzene	ND ·	0.07	
Bromoform	ND	0.005	
1,1,2,2 Tetrachloroethane	ND	0.005	
1,3 Dichlorobenzene	ND	0.07	
1,4 Dichlorobenzene	ND	0.07	
1,2 Dichlorobenzene	ND	0.07	

^{*} Compounds elute together on ECD - Values represent either or a combination of both.

^{**} Compounds elute together on FID - Value represents a combination of both.