Phase II Environmental Site Assessment

Subsurface Sampling Investigation

May 28, 1997

97-128A

conducted at:

The Judson Art Warehouse
49-20 Fifth Street
Long Island City, New York 11101

prepared for:

The Fortress Corporation
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Suite 715
Boston, MA 02210-2313

user:

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1.0 INTRODUCTION

This investigation was conducted to define what, if any, chemical contaminants have impacted the environmental quality of the property located at 49-20 Fifth Street, Long Island City, New York, herein identified as the subject property (see Plate #1, Project Location Map, Long Island City, New York). Specifically, this assessment was conducted to provide data to determine what, if any, organic and/or inorganic contaminants have impacted the subject property from the past on-site storage and handling of hazardous substances.

The scope of this investigation was based upon the following documents: 1) the New York State Department of Environmental Conservation (NYSDEC) document , Spill Prevention Operations Technology Series (SPOTS), Memo 14; 2) the NYSDEC Spill Technology and Remediation Series (STARS), Memo #1; 3) the Phase I Environmental Site Assessment (ESA) conducted on the subject property by Fred C. Hart Associates, Inc. dated March 2, 1990; 4) the Phase II ESA conducted on the subject property by Impact Environmental Consulting, Inc. dated April 10, 1996; and 5) the Phase I ESA conducted on the subject property by Impact Environmental Consulting, Inc. dated May 20, 1997.

Various aspects of the subject property's environmental quality were investigated and identified during this Phase II Environmental Site Assessment (ESA), Selective Sampling Investigation which included:

1.0 INTRODUCTION

2.0 SUMMARY OF PREVIOUS ENVIRONMENTAL SITE ASSESSMENTS

3.0 SCOPE OF INVESTIGATION

4.0 RESULTS OF ANALYSIS

5.0 CONCLUSIONS

Presented herein are the results of the Phase II Environmental Site Assessment conducted by Impact Environmental Consulting, Inc. on the subject property dated May 28, 1997. The investigation activities were designed, performed and reported by Richard Parrish, P.G., Keith Franzen, James Mulvey, William Hark, C.E.I., and Chris McGuire.

IMPACT ENVIRONMENTAL
46 East Northport Road
Kings Park, New York

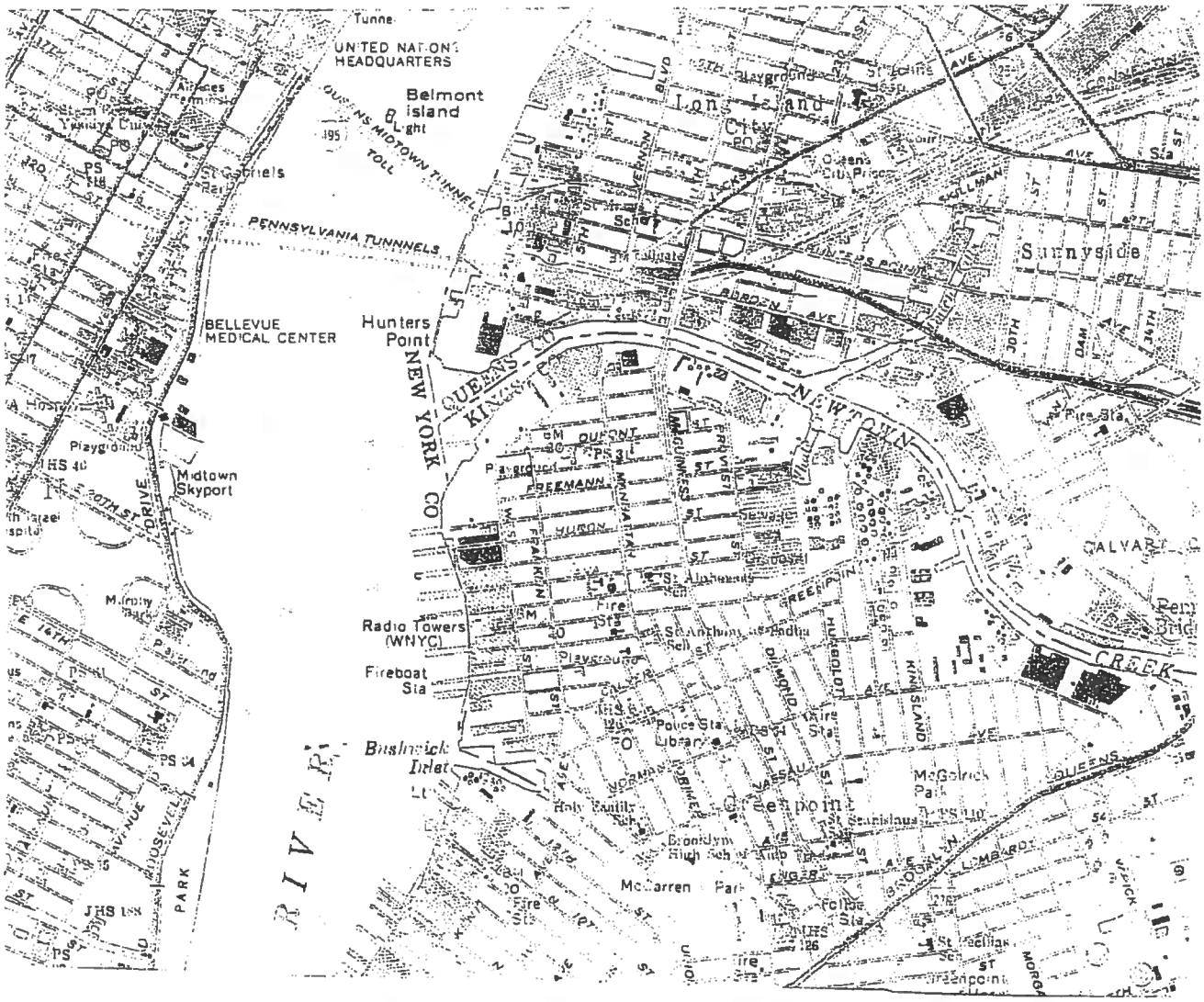
Plate #1: Project Location Map

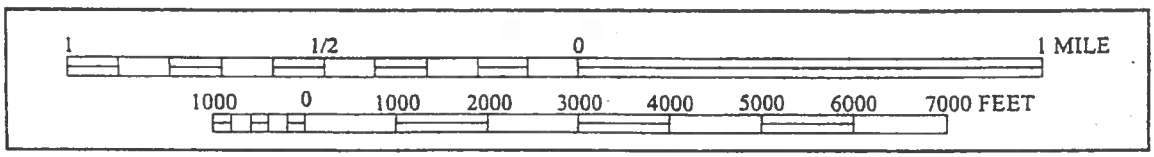
Long Island City, New York

Scale: as shown **97-128** *KQ*

United States
Department of the Interior
Geological Survey
BROOKLYN QUADRANGLE
7.5 Minute Series
(Topographical)

NORTH





2.0 SUMMARY OF PREVIOUS ENVIRONMENTAL SITE ASSESSMENTS

2.1 Background Conditions

The areal extent of the subject property was approximately 125,000 square feet. The subject property contained the following structures: 1) one two-story masonry building with an approximate footprint of 36,500 square feet composed of six interconnected buildings; 2) one two-story masonry building with an approximate footprint of 17,000 square feet; and 3) one masonry structure with an approximate footprint of 750 square feet used as a vent and escape tunnel for the subway.

The subject property is situated on the western edge of Long Island approximately fifteen hundred feet east of the East River. The surface area of the subject property consisted of asphalt parking areas, concrete walkways, exposed soils, and sparse vegetation. The subject property exhibited low topographic relief (less than three percent slopes). The elevation of the subject property, as presented on the United States Geologic Survey (USGS), Brooklyn Quadrangle Map, approximates fifteen feet above sea level. The elevation of the water table is anticipated to fluctuate between five and ten feet above sea level due to the tidal influence of the East River. Consequently, the water is anticipated to have a high salinity.

2.2 Recognized Environmental Conditions

The interior of the 36,500 square foot building was used for the storage of museum collection items by the Judson Art Warehouse. The interior of the 17,000 square foot building was used for the storage of packing materials and various electrical, mechanical and interior design materials that appeared to be water damaged (leaking roof) and abandoned. The building floor contained a subsurface structure that was tentatively identified as an underground injection well (UIW). The presence of a UIW was identified by Impact Environmental Consulting, Inc. to represent a recognized environmental condition pursuant to ASTM specifications (E-1527).

Prior to the current land use, the subject property was used for a variety of industrial applications by operators that included: 1) Crown Oil Products Corporation, which used the site to process, store and distribute vegetable oil products; 2) F.O. Pierce Company, which used the site for the manufacture, storage and distribution of oil and water based paints; 3) A. Tod Hunter which used the site for the manufacture, storage and distribution of ornamental iron products; 4) Scientific Production Corporation, which used the site for the manufacture, storage and distribution of oil and water based paints; 5) The New York and Long Island Rail Road Company which used the

site for the storage of construction equipment and building materials for the Belmont Subway Tunnel; 6) Pratt & Lambert Varnish Works, which used the site for the manufacture, storage and distribution of varnishes; and 7) Keystone Varnish Company which used the site for the manufacture, storage and distribution of varnishes. These former land use applications were identified by Impact Environmental Consulting, Inc. to represent a recognized environmental condition pursuant to ASTM specifications (E-1527).

The Phase I ESAs identified four above ground storage tanks and several portable storage containers of assorted hazardous substances present and apparently abandoned on the subject property. The presence of these tanks on the subject property was identified by Impact Environmental Consulting, Inc. to represent a recognized environmental condition pursuant to ASTM specifications (E-1527).

The Phase I ESAs identified that two underground heating oil storage tanks, eight above ground vegetable/fish oil storage tanks and four above ground mineral spirits storage tanks were formerly located on the subject property. The former operation of these tanks and the lack of information regarding the date and procedure used in the decommissioning of the tanks was identified by Impact Environmental Consulting, Inc. to represent a recognized environmental condition pursuant to ASTM specifications (E-1527).

2.3 Results of Previous Subsurface Sampling Investigations

The previous Phase II ESA (April 1996) was performed to determine if the operation of the former mineral spirits tanks acted to degrade the environmental quality of the subject property. Mineral spirits is noted to contain a fraction of volatile organic compounds (toluene, xylene, acetone, methanol and methyl ethyl ketone), therefore, mineral spirits is considered a hazardous substance[1]. As vegetable oil and fish oil are not considered hazardous substances, the subsurface investigation did not include sampling or analysis for these compounds. The results of the Phase II ESA demonstrated that the subsurface soil and groundwater systems of the subject property were not impacted by the storage and handling of mineral spirits.

Additionally, the previous Phase II ESA identified that the former operation of the underground heating oil tanks actuated the release of heating oil to the subsurface soil and groundwater systems of the subject property.

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[1] Compilation, Merck and Co., Inc., The Merck Index Compendium, December 1996.

3.0 SCOPE OF INVESTIGATION

This investigation was designed to confirm that the former storage and handling of mineral spirits did not act to degrade the environmental quality of the subject property. Additionally, the investigation was designed to redefine the horizontal extent of the contamination originating from the release of heating oil from the former tanks. This information was required to design a remediation plan that will mitigate all of the detected contaminants. Finally, this investigation was performed to confirm or refute the presence of an UIW within the interior of one of the buildings located on the subject property.

3.1 Sample Acquisition

Four (4) soil borings, identified as SP-1, SP-2, SP-3 and SP-4, were installed on the subject property (see Plate #2, Sample Acquisition Plan, Long Island City, New York). The soil borings were installed with a four and one-half inch diameter hollow stem auger. The anulus of the auger was used to facilitate the installation of a split spoon sampler. Borings SP-1 and SP-2 were installed at locations hydraulically down gradient of the former underground heating oil tanks.

Two (2) soil samples were secured from each of these borings. These samples represented the soil existing on the subject property at intervals of one to three (1-3) and three to six (3-6) feet below existing grade (see Appendix A, Test Boring Logs, Long Island City, New York). The water table was situated at a depth of approximately six feet below existing grade. Samples were analyzed from these borings to determine if the horizontal extent of the heating oil plume detected in the previous Phase II ESA has increased. The samples secured from these borings yielded a response from head space analysis.

Boring SP-3 was installed at a location identified to facilitate the storage and handling of mineral spirits. One (1) soil sample was secured from the boring. The sample represented the soil existing on the subject property at an interval of three to six (3-6) feet below existing grade (see Appendix A, Test Boring Logs, Long Island City, New York). This area was not sampled during the previous Phase II ESA. The sample was secured to confirm that the storage and handling of mineral spirits did not degrade the environmental quality of the subject property. The sample secured from the boring yielded a response from head space analysis.

Boring SP-4 was installed within the center of the interior structure tentatively identified as being a UIW. Prior to the installation of the boring, the concrete above the structure was excavated. Inspection of the structure revealed it to be a vertical underground storage tank as evident by the

presence of standing fluid two inches below grade. The liquid was noted to have a petrochemical odor they yielded a response from head space analysis. The tank appeared to have been partially backfilled with soil. This boring was installed with a hand auger. The sample secured from the boring yielded a response from head space analysis.

Head space analysis was performed on each of the samples acquired from each of the soil borings to provide precursory data regarding hydrocarbon contamination. Head space analysis was performed utilizing a portable photo ionization detection meter to measure what, if any, hydrocarbon concentrations were present in isolated portions of the secured samples.

Head space analysis was conducted by partially filling a wide-mouth glass container with sample aliquot and sealing the top with aluminum foil, thereby creating a void. This void is referred to as the sample head space. To facilitate the detection of any hydrocarbons contained within the sample head space, the container was agitated for a period of thirty (30) seconds.

The probe of the vapor analyzer was then injected through the foil into the head space to measure the hydrocarbon concentrations present. A Photovac Micro Tip II photo ionization detection meter (PID) was the organic vapor analyzer selected for the head space analysis. A PID utilizes the principle of photo ionization for detection and measurement of hydrocarbon compounds. A PID does not respond to all compounds similarly; rather, each compound has its own response factor relative to its calibration. For this investigation, the PID was calibrated to isobutylene. Hydrocarbon relative response factors for a PID calibrated to isobutylene are published by the manufacturer. Head space analysis was performed by Geologist James Mulvey (see Appendix A, Test Boring Logs, Long Island City, New York).

The results of the analysis were used to adjust the sampling and analysis program to yield the most accurate and representative results with respect to defining the vertical extent of the detected contaminants at each soil boring. The samples secured from each boring that yielded the highest results during head space analysis were retained for subsequent laboratory analysis. The samples were labeled for identification purposes as follows.

Boring Location	Sample Depth	Sample Secured for Analysis
SP-1	3-6	97-128A-SP-1
SP-2	3-6	97-128A-SP-2
SP-3	3-6	97-128A-SP-3
SP-4	5-1	97-128A-SP-4

3.2 Quality Assurance and Quality Control Protocol

The following sampling QA/QC protocol is in accordance with the USEPA accepted sampling procedures for hazardous waste streams [Municipal Research Laboratory, 1980, Sampling and Analysis Procedures for Hazardous Material Waste Streams, Office of Emergency and Remedial Response, Cincinnati, Ohio. EPA-600/280-018] and the USEPA Document, Quality Assurance Project Plan for Class V Underground Injection Wells, dated May 31, 1990.

3.2.1 Sampling Personnel

All samples were secured by or under the auspices of a USEPA Office of Emergency and Remedial Response, Certified Sampler for Hazardous Materials. Sample staff (samplers) possessed a minimum of a B.A. Degree in the Earth and Space Sciences or a B.S. Degree in Engineering. Samplers had a minimum of one (1) year experience in environmental/geological field work. Additionally, all samplers had received mandatory forty-hour Occupational Safety and Health Administration (OSHA) training on working with potentially hazardous materials.

3.2.2 Sampling Equipment

Separate QA/QC measures were implemented for each of the instruments used in the performance of the SAP.

3.2.2.1 Hollow Stem Auger

Prior to arrival on the subject property and between sample locations, the augers were decontaminated by washing them with a detergent (Alconox/Liquinox) and potable water solution and rinsing them with distilled water.

3.2.2.2 Sample Vessels

All sample vessels were "level A" certified decontaminated containers supplied by a New York State Certified Commercial Laboratory. Samples analyzed for hydrocarbons were placed in containers with Teflon lined caps. All samples were preserved by cooling them to a temperature of approximately 4 degrees Celsius.

3.2.3 Sample Documentation

A sample represents physical evidence. An essential part of liability reduction is the proper control of gathered evidence. To establish proper control, the following sample identification and chain-of custody procedures were followed.

3.2.3.1 Sample Identification

Sample identification was executed by use of a sample tag, log book and chain-of-custody form. Said documentation provided the following information:

1. Project Code
2. Sample Laboratory Number
3. Sample Preservation
4. Instrument Used For Source Sample Grabs
5. Composite Medium Used For Source Sample Grabs
6. Date Sample Was Secured From Source Media
7. Time Sample Was Secured From Source Media
8. Person Who Secured Sample From Source Media

3.2.3.3 Chain-of-Custody Procedures

Due to the evidential nature of samples, possession was traceable from the time the samples were collected until they were received by the testing laboratory. A sample was considered under custody if it: was in a person's possession; it was in a person's view, after being in possession; if it was in a person's possession and they locked it up; or, it was in a designated secure area. When transferring custody, the individuals relinquishing and receiving the samples signed, dated and noted the time on the Chain-of-Custody Form.

3.3 Laboratory Analysis

3.3.1 Analytical Test Methods

The soil samples were transported to a New York State Certified Commercial Laboratory for analysis (American Analytical Laboratories, Inc.). Selection of the analytical test methods for the sediment samples was based on the NYSDEC STARS Memorandum and the NYSDEC TAGM 4046.

The analysis performed on the soil samples secured from borings SP-1 and SP-2 consisted of USEPA Test Method 8270 for total semivolatile organic compounds. The analysis performed on the soil samples secured from borings SP-3 and SP-4 consisted of USEPA Test Method 8240 for total volatile organic compounds and USEPA Test Method 8270 for total semivolatile organic compounds. The analysis on soil boring SP-4 also included USEPA Test Method 6010 series for priority pollutant heavy metals.

4.0 RESULTS OF ANALYSIS

The laboratory analysis detected concentrations of volatile and semivolatile organic contaminants in the soil samples collected from the subject property. The data regarding the detected organic (volatile and semivolatile) contaminants have been compiled in Table #1: Detected Organic Contaminants, Long Island City, New York. In this table the target compounds detected in the soil samples from borings SP-1, SP-2 and SP-3 are compared against the NYSDEC STARS Groundwater Protection Values and the NYSDEC TAGM 4046 Determination of Soil Cleanup Objectives action levels. The target compounds detected in the soil sample from boring SP-4 were compared against NYSDEC TAGM 3028 Contained-In Criteria for determination of hazardous wastes.

The data regarding the detected inorganic (heavy metal) contaminants have been compiled in Table #2: Detected Inorganic Contaminants, Long Island City, New York. In this table the target compounds are compared against the NYSDEC TAGM 4046 Determination of Soil Cleanup Objectives action levels.

The original laboratory analysis sheets as prepared by American Analytical Laboratories, Inc. are presented in Appendix B of this document.

Table 1: Detected Organic Contaminants in Soil
Long Island City, New York
97-0128A

Sample ID	SP-1	SP-2	SP-3	STARS Regulatory Level	TAGM 4046 Guidance Value	SP-4	TAGM 3028
Unit	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Phenanthrene	424	548	ND	1,000	220,000	655	N/A
Fluoranthene	ND	668	ND	1,000	1,900,000	566	3,000
Pyrene	ND	575	ND	1,000	665,000	534	2,000
Chrysene	ND	392	70	N/A	400	323	N/A
Benzo-b-Fluoroanthene	ND	206	ND	220	1,100	ND	---
Benzo-k-Fluoroanthene	ND	211	ND	220	1,100	ND	---
Benzo-a-Pyrene	ND	**160**	ND	61	11,000	ND	---
Indeno(1,2,3-c,d)Pyrene	ND	123	ND	N/A	3,200	ND	---
Dibenzo-a,h-Anthracene	ND	84	ND	1,000	165,000	ND	---
Acetone	NT	NT	ND	N/A	110	230	8,000
Benzene	NT	NT	ND	14	0.6	8	24
2-Butanone	NT	NT	ND	N/A	300	1,024	4,000
Ethylbenzene	NT	NT	ND	100	5,500	7	8,000

Bold values represent concentrations above guidance values.
ND = Not present above laboratory detection limits.
NT = Not a target compound.
N/A = Not Applicable

Table 2: Detected Inorganic Contaminants in Soil
Long Island City, New York
97-0128A

Sample ID	SP-4	TAGM 4046 Guidance Value	Soil Background Levels
Unit	Mg/Kg	Mg/Kg	Mg/Kg
Barium	42.6	300 or SB	15.0-600.0
Copper	4.71	25 or SB	10.0-80.0
Nickel	2.47	13 or SB	0.5-25
Zinc	236	20 or SB	10.0-300.0
Iron	3,529	2,000 or SB	2,000-550,000
Manganese	53.5	SB	50.0-5,000
Lead	79.8	SB	10.0-37.0
Chromium	7.2	10 or SB	1.5-40.0

Bold values represent concentrations above guidance values.

4.1 Heating Oil Tanks

Laboratory analysis performed on the sample secured from a depth immediately above the water table from soil borings SP-1 and SP-2 detected semivolatile organic target compounds associated with heating oil contamination[2]. The semivolatile organic compounds were identified to have migrated hydraulically down gradient beneath the 17,000 square foot building.

Soil boring SP-1 was installed hydraulically down and side gradient of the former heating oil tank field. The concentrations of the semivolatile organic compounds detected in the soil at boring SP-1 were below the groundwater protection values provided in the NYSDEC STARS Memorandum. Accordingly, the soil is not sufficiently contaminated to warrant remediation.

Soil boring SP-2 was installed hydraulically down gradient of the former heating oil tank field. The concentration of the semivolatile organic compounds detected in the soil at boring SP-2 were in excess of the groundwater protection values provided in the NYSDEC STARS Memorandum. Accordingly, the soil is sufficiently contaminated to warrant remediation.

4.2 Confirmation Soil Sample

Laboratory analysis performed on the sample secured from an area of the property formerly used for the storage and handling of mineral spirits failed to detect any hazardous substances associated with the manufacture of paints. These results confirm the findings of the previous Phase II ESA Performed by Impact Environmental Consulting, Inc. dated April 10, 1996.

4.3 Tentatively Identified Underground Injection Well

Excavation activities were performed within the interior of the 17,000 square foot building to identify the structure within the concrete slab floor. Upon removal of the concrete, the cylindrical structure identified in the Phase I ESA was found to be a vertical steel tank. The tank appears to have been partially backfilled with soil prior to being capped with concrete. The tank maintained its structural integrity as evident from the presence of standing liquid within the tank. Laboratory analysis of the liquid saturated soil from boring SP-4 identified the presence of several common paint solvents including methyl ethyl ketone (2-butanone), acetone and benzene.

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[2] Division of Water, NYSDEC, Sampling Guidelines and Protocols, Technological Background and Quality Control Quality Assurance for NYSDEC Spill Response Program, September, 1992, p. 2-13.

The soil also contained concentrations of some semivolatile organic compounds. These compounds are consistent with heating oil contamination. The detection of these compounds within the soil appears to indicate that the soil used to backfill the tank was contaminated with heating oil.

The concentration of metals in the soil sample were within the expected background range for regional uncontaminated soil[3].

Finally, the concentration of organic contaminants contained within the soil within the tank are below the NYSDEC TAGM 3028 Contained-In Criteria Values for determination of hazardous waste. Therefore, the soil within the tank is not a hazardous waste and can be regulated as non-hazardous solid waste.

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[3] McGovern, Carol, E., Background Concentrations of 20 Elements In Soils with Special Regard for New York State, NYSDEC Wildlife Pathology Unit, Delmar, New York, 1987, pp 1-20.

5.0 Conclusions

Impact Environmental Consulting, Inc. has performed a Phase II Environmental Sit on the subject property in accordance with good commercial and customary practice and generally accepted protocols within the consulting industry.

Based upon this assessment, dated May 28, 1997, and the previous assessment dated April 10, 1996, Impact Environmental Consulting, Inc. concludes the following:

1. The subject property has been degraded from the release of heating oil from two underground heating oil storage tanks previously used on the subject property. The contamiants have formed a plume that is moving westerly towards the East River. It has been demonstrated that the plume has migrated below the western building.

2. The use of the subject property for the storage and handling of mineral spirits has not acted to degrade the environmental quality of the subject property. This same conclusion was made in the previous Phase II ESA performed on the subject property and is confirmed by the results of this assessment.

3. The subsurface structure identified within the interior of the 17,000 square foot building on the western side of the subject property has been identified to be an underground storage tank. The tank appears to have been used for the storage of paint solvents. The tank was backfilled with soil and capped with concrete at an unspecified time. The structure has a solid bottom and does not function as an underground injection well.

DISCLAIMER

The purpose of this investigation was to identify potential sources of contamination at the subject property, and to satisfy the all appropriate inquiry standard set forth in Section 9601 (b) of CERCLA. The findings and conclusions set forth in this report are based upon information that was available to Impact Environmental Consulting, Inc. prior to this date. If new information becomes available concerning the property after this date, or if the property is used in the future in a manner other than that which is identified in this report, the findings and conclusions contained herein may have to be modified. Additionally, while this investigation was performed in accordance with good commercial and customary practice and generally accepted protocols within the consulting industry, Impact Environmental Consulting, Inc. can not guarantee that the property is completely free of hazardous substances or other materials or conditions that could be subject the user to potential liability.