



June 20, 2006

**Mr. Jeff Flanigan-Architect**

153 West 27 Street, Suite 900A  
NY, NY10001

**Re: Results of Subsurface Environmental Investigations Conducted at  
198 Douglass Street  
Brooklyn, New York  
AMEC Project # 76750000**

Dear Mr. Flannigan:

This letter presents the results of the preliminary soil, air and ground water investigation conducted at the referenced property (Site) by AMEC Earth & Environmental, Inc. (AMEC) during the week of June 2, 2006. The investigation was conducted as outlined in our proposal dated May 19, 2006. .

**Project Background**

The Site is located adjacent to the Gowanus Canal, which has historically served as an industrial transportation center. The Gowanus Canal is characterized by poor surface water and ground water quality, and the sediments within the canal are known to have been contaminated with a variety of inorganic and organic constituents<sup>1</sup>. Numerous contaminated sites are present in the immediate vicinity of the canal, some of which are the subject of ongoing remedial projects.

According to a 1998 the Environmental Assessment and Report by AA Services, LLC<sup>2</sup>, former owners/operators of the Site have included, Paramount Plumbing (approx. 1995 to 1998), O.Z. Electric & Manufacturing Company (approx. 1960 to 1995), the Knickerbockers Ice Company (1930's), a gravel/crushed stone yard (approx. 1900 to 1930), and the P.H. Hughes Lime, Brick and Lath Yard (approx. 1887 to 1900).

The Site is currently undergoing construction within an existing one-story warehouse. General contractors are currently installing mini-piles within the warehouse for a vertical expansion of the building structure. A total of 18 mini-piles have been installed to a depth of approximately 52 feet. During the mini-piles installation, the general contractor complained of an odor being

---

<sup>1</sup> Gowanus Canal And Bay Ecosystem Restoration Brooklyn, Kings County, New York  
Phase I Upland Site Assessment. U.S. Army Corps of Engineers, New York District (CENAN-PL-ES)  
26 Federal Plaza, New York, New York 10278-0090, May 2004

<sup>2</sup> Environmental Assessment and Report for Property Located at 198 Douglass Street, Brooklyn New York. AA Services, LLC, Monroe, New York., August 11, 1998.

emitted from the soil spoils and/or presence of oil within the soil spoils. AMEC has visited the site to evaluate the environmental conditions. During our site visit a slight petroleum hydrocarbons was detected within the warehouse. However, no oil product or petroleum hydrocarbons was observed within the soil spoils as most of the soil was mixed concrete for the installation of mini-piles. AMEC was contacted to investigate environmental conditions at the site and to determine what additional health and safety procedures (if any) should be implemented at the Site during future construction activities.

### **Investigative Methods**

On June 2, 2006, AMEC performed a subsurface investigation at the Site in order to characterize the nature of the environmental concerns present within the soil and ground water, and to further evaluate the magnitude of the contaminants within the previously identified areas of environmental concern (AOCs) during construction activities. Additionally, an air monitoring and sampling program was performed within the warehouse to assess the air quality within the work area.

One subsurface soil boring (SB-1) was installed to total depth of 48 feet below the ground surface (bgs), using a track-mounted Geoprobe™ rig equipped with Macrocore™ a sampler. Continuous soil cores were collected, which were field screened using a PID. The soils were classified according to Burmeister System and detailed soil boring logs were prepared. One soil sample was collected from a depth interval of 36 to 37 feet bgs, based the highest recorded PID/FID readings. A ground water sample was subsequently collected from a depth interval of 24 to 28 feet bgs using a Hydropunch™ sampler. The soil sample and the ground water sample were both submitted to the laboratory for analysis of Priority Pollutants +40 and Total Petroleum Hydrocarbons (TPHC).

A grab indoor air sample was collected within the warehouse using a 6-liter, stainless steel SUMA canister within the boreholes. Additionally, air-quality measurements were taken at 15-minute intervals using photo-ionization detector (PID) to detect volatile organic compounds, and a 4-gas Flame Ionization Detector (Landtec GA-90) was used to monitor methane, hydrogen sulfide, carbon monoxide, and oxygen levels within the work area.

Client contracted with D.K. Drilling of NY, Inc. in Bayside, New York for the subsurface drilling work. The chemical laboratory analysis of the soil and ground water samples was performed by a New York State certified laboratory (STL Edison, Laboratory Certification 11452). The air sample was shipped to an STL Edison affiliate (Severn Trent Laboratories) in Burlington Vermont for air laboratory analysis.

### **Findings**

The results of the soil and ground water analyses are summarized in Tables 1 and 2 respectively. A photograph showing the location of soil boring SB-1, and a corresponding soil boring log are provided as Attachments A and B respectively.

As shown in the soil boring log, the soils, encountered beneath the Site consisted of a sequence of fill material extending to a depth of approximately 10 feet, which consisted of variable

proportions of sand, silt, clay, gravel, and construction/demolition debris (e.g., concrete, brick, rock fragments, and wood). Beneath the fill, a sequence of inter-bedded silty, clay, sand, and peat layers was encountered within an interval of approximately 10 to 36 feet bgs. Below this interval, was a sequence of brown fine to coarse-grained sand was noted to a depth of 48 feet, at which point refusal was encountered. Ground water was encountered at a depth of approximately 9 feet. The PID readings obtained from the soil cores ranged from 0 to 15 parts per million (ppm) of which the highest reading (15 ppm) was obtained from soils collected at the 36-37 foot interval. An odor of weathered petroleum was noted in some of the soil cores.

An initial attempt to obtain a ground water sample from the 36-37 foot interval was unsuccessful, due to clogging of sampling screen with material collapsed from the sides of the borehole. A ground water sample was subsequently obtained from the 24 to 28 foot depth interval. A sheen layer suggestive of the presence of petroleum was noted in the groundwater sample. However, no free floating product was encountered within the groundwater sample.

Traces of volatile organic compounds (tetrachloroethene, ethylbenzene, and xylene) were detected in the soil sample, along with several tentatively identified compounds (TICs). However, the results were below the applicable New York State Department of Environmental Conservation (NYSDEC) Technical and Administrative Guidance Memorandum guidelines<sup>3</sup> (Table 1). The TPHC laboratory analytical result was detected at 219 mg/kg, which suggests a relatively low concentration of petroleum hydrocarbons in the sample collected during this study. No pesticides or polychlorinated biphenyls (PCBs) were detected in the soil sample.

Benzene and tetrachloroethene were detected in the ground water sample at concentrations above the applicable NYSDEC Ambient Groundwater standards<sup>4</sup> (Table 2). A variety of targeted semivolatile organic compounds (SVOCs) were also detected in the sample at concentrations above the applicable ground water standards, which are commonly associated with petroleum hydrocarbons. The results for arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, and zinc were all above the corresponding ground water standards. However the results may be related in part to suspended solids present in the ground water sample due to the alternative groundwater sampling method. No pesticides, PCBs, cyanide, or phenols were detected in the sample.

An air quality evaluation was performed by AMEC representative during the drilling activities to evaluate potential hazardous and/or combustible concentrations of volatile organic vapors or gases. The screening volatile organic compounds were observed to range from not detected to 15 parts per million (ppm). Percentage of lower explosion limits (LEL) was not detected. Percent of oxygen was detected to range from 20.8 % to 20.9%. Hydrogen Sulfide (H<sub>2</sub>S) was not detected during the field activities. Carbon monoxide (CO) was detected to range from 21 ppm to 30 ppm.

The air results revealed various volatile organic compounds above the detection limits. These compounds consisted of benzene, tetrachloroethene (PCE), trichloroethylene (TCE),

---

<sup>3</sup> TAGM 4046 Determination of Soil Cleanup Objectives and Cleanup Levels.

<sup>4</sup>6 NYCRR Part 703 Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations

chloroethane, ethylbenzene, xylenes, etc. These compounds are related to chlorinated solvents and petroleum hydrocarbons. Benzene, PCE, chloroethane, 1,3 Butadiene, Methylene chloride were identified in excess of the USEPA Region 3 Ambient Air Exposure Levels, which is based on a residential exposure (i.e., 24 hours/day for 350 days/year). The air targeted concentrations were detected below the OSHA Permissible Exposure Limits (PELs), which are based on an 8 hour TLV worker exposure. The ambient air concentration of PCE (48 ug/m<sup>3</sup>) was detected in excess of NYSDOH of 5ug/m<sup>3</sup>. The laboratory analytical results of grab air sample are summarized in Table 3.

### **Conclusions**

The soil analytical results indicate that traces of tetrachloroethene (PCE) (e.g. an organic chlorinated solvent) and petroleum hydrocarbons are present in the soil, but at relatively low concentrations. The groundwater results show evidence of groundwater contamination at the site, which include both chlorinated solvents (tetrachloroethene) and petroleum constituents. Heavy metals may also be present as groundwater contaminants; however the initial sampling results may be inconclusive, due to the presence of suspended solids in the ground water sample.

Given the relatively low contaminant concentrations detected in the soil, the depth of groundwater contamination, and the inferred direction of the shallow ground water flow (toward the Gowanus Canal) it is likely that the contaminants detected at the site are potentially derived from off-site sources. Additional soil and ground water sampling program would be required to verify this observation.

The air analytical results indicate that traces of chlorinated solvents (e.g. PCE, TCE, methylene chloride) and petroleum hydrocarbons (e.g. benzene) are present within the air sample collected for this evaluation. It is likely that these contaminants are emanating from the soil/groundwater impacts identified in the subsurface potentially derived from off site sources. Clearly, future use of this facility could result in environmental obligations that need to be addressed in accordance with the NYSDEC/DOH requirements.

### **Recommendations**

AMEC recommends that the following procedures and practices be implemented when performing invasive (e.g., subsurface drilling or excavation activities) at the Site:

1. Any contractors performing invasive the work at the Site should be certified as having the OSHA<sup>5</sup> required health & safety training for Hazardous Waste Operations And Emergency Response (HAZWOPER), in accordance with 29 CFR 1910.120.
2. A site specific Health & Safety Plan (HASP) must be developed by the contractor in accordance with OSHA regulations, which include the health and safety procedures to be followed, the personal protective equipment to be worn, decontamination procedures for personnel and field equipment, and procedures for monitoring air quality in the work place.

---

<sup>5</sup> Occupational Health and Safety Administration

3. A third party air quality monitoring engineer is recommended at a minimum, initially to evaluate the air quality conditions during mini pile installation activities to eliminate future claims for any environmental concerns that exists at the site. This air monitoring program will be implemented on 8 hour weighted average within the breathing zone of personnel.
4. As the preliminary air sampling results have indicated targeted contaminants above USEPA Region 3 RBCs, which are based on residential area for an adult exposure. Clearly, future uses of this warehouse will need to be re evaluated for long term potential vapor accumulation and/or exposure.
5. To mitigate the petroleum hydrocarbons odors or vapors generated from the compressor and/or drilling equipment during future mini piles installation activities, AMEC recommends that a proper ventilation system be installed within the warehouse or negative pressure ventilation within the work area to eliminate any accumulation of vapor odors. A typical indoor air quality will be implemented based on the initial results of initial screening sampling using either summa canister for air laboratory analysis for benzene, tetrachloroethene and total VOCs in accordance with the generally acceptable practice of American of Governmental Industrial Hygienist's threshold limits or NYSDOH to minimize the potential of personnel exposure.
6. The drilling of mini piles for the proposed construction activities will likely result in excess of impacted soil/groundwater. The impacted soil spoils and/or groundwater will require appropriate control measures to eliminate direct dermal contact with the materials. AMEC recommends that any excess material to be segregated during the drilling activities and containerized in a dumpster on site for classification and future disposal off site in accordance with the NYSDEC waste regulations.
7. There are laws and regulations in New York State that require releases of hazardous materials to be reported. These laws and regulations place a burden on property owners and others with knowledge of the release. The NYSDEC recommends that anyone with knowledge of such a release call the NYSDEC Spill Hotline at 1-800-457-7362 as soon as possible, to report the incident. Based on the known presence of soil/ground water contaminants at the Site, AMEC has concluded that there is evidence of environmental contamination at the Site, which is subject to the notification requirements outlined above. Therefore AMEC recommends that you contact the NYSDEC Spill Hotline to report these findings as soon as possible.
8. Additional soil/groundwater sampling is recommended to verify that the contaminants detected in the soil/groundwater are derived from off-site sources. This would include the installation of three or more monitoring wells (either permanent or temporary, as required), including at least one up-gradient well located at the northwest property boundary. Obviously, it is important that the owner understands the off site sources may have impacted this property. These additional environmental conditions will be required to identify off site sources of concern and eliminate future financial responsibilities to clean up this property as may be required by the NYSDEC.

**Jeff Flanigan-Architect**

June 20, 2006

Page 6

AMEC would like to thank you for the opportunity to provide you with our professional services and we look forward to working with you again in the future.

Please do not hesitate to call me if you have any questions.

Sincerely,

**AMEC Earth & Environmental, Inc**

Djamel E Lekmine, Ph.D.

Unit Manager

Direct Tel.: 732-302-9500, Extension 117

Direct Fax: 732-302-9504

E-mail: [djamel.lekmine@amec.com](mailto:djamel.lekmine@amec.com)



**Soil** Table 2  
**Summary of Ground Water Analytical Results - 06/02/06**  
**198 Douglass Street, Brooklyn, New York**

Sample ID	SB-1 36-37	<b>New York TAGM Rec. Soil Cleanup Objective Criteria mg/kg<sup>1</sup></b>
Lab Sample No.	741465	
Sampling Date	06/02/06	
Matrix	SOIL	
Units	ug/L	
<b>PESTICIDES (mg/kg)</b>		
Aldrin	0.0074 U	0.041
alpha-BHC	0.0074 U	0.11
beta-BHC	0.0074 U	0.2
delta-BHC	0.0074 U	0.3
gamma-BHC (Lindane)	0.0074 U	0.06
Chlordane	0.074 U	0.54
4,4'-DDD	0.0074 U	2.9
4,4'-DDE	0.0074 U	2.1
4,4'-DDT	0.0074 U	2.1
Dieldrin	0.0074 U	0.044
Endosulfan I	0.0074 U	0.9
Endosulfan II	0.0074 U	0.9
Endosulfan sulfate	0.0074 U	1
Endrin	0.0074 U	0.1
Endrin aldehyde	0.0074 U	NA
Heptachlor	0.0074 U	0.1
Heptachlor epoxide	0.0074 U	0.02
Toxaphene	0.074 U	NA
<b>PCBs (mg/kg)</b>		
Aroclor-1016	0.074 U	NA
Aroclor-1221	0.074 U	NA
Aroclor-1232	0.074 U	NA
Aroclor-1242	0.074 U	NA
Aroclor-1248	0.074 U	NA
Aroclor-1254	0.074 U	NA
Aroclor-1260	0.074 U	NA
Aroclor-1262	0.074 U	NA
Aroclor-1268	0.074 U	NA
<b>WET CHEMISTRY (mg/kg)</b>		
Total Petroleum Hydrocarbons (418.1)	219	NA

notes:

U - The compound was not detected at the indicated concentration.

NA - Not applicable or not established.

1 - New York State Department of Environmental Conservation Technical and Administrative Guidance Memorandum (TAGM #4046)

Determination of Soil Cleanup Objectives and Cleanup Levels



**Table 2**  
**Summary of Ground Water Analytical Results - 06/02/06**  
**198 Douglass Street, Brooklyn, New York**

Sample ID	SB-1-GW	Water Quality NYSDEC Ambient Criteria <sup>1</sup>
Lab Sample No.	741466	
Sampling Date	06/02/06	
Matrix	WATER	
Units	ug/L	
<b>VOLATILE ORGANIC COMPOUNDS - GC/MS (ug/L)</b>		
Chloromethane	2.9 U	NA
Bromomethane	3.2 U	5
Vinyl Chloride	2.8 U	2
Chloroethane	2.4 U	5
Methylene Chloride	5.1 U	5
Trichlorofluoromethane	2.5 U	5
1,1-Dichloroethene	3.5 U	5
1,1-Dichloroethane	3.2 U	5
trans-1,2-Dichloroethene	4.3 U	5
cis-1,2-Dichloroethene	4.3 U	5
Chloroform	5.2 U	7
1,2-Dichloroethane	2.9 U	0.6
1,1,1-Trichloroethane	3.4 U	5
Carbon Tetrachloride	3.1 U	5
Bromodichloromethane	3.2 U	NA
1,2-Dichloropropane	2.9 U	1
cis-1,3-Dichloropropene	2.4 U	NA
Trichloroethene	3.7 U	5
Dibromochloromethane	2.7 U	5
1,1,2-Trichloroethane	3.3 U	1
Benzene	14	1
trans-1,3-Dichloropropene	2.4 U	0.4
2-Chloroethyl Vinyl Ether	4.2 U	NA
Bromoform	2.2 U	NA
Tetrachloroethene	1600	5
1,1,2,2-Tetrachloroethane	3.4 U	5
Toluene	4 U	5
Chlorobenzene	4.5 U	5
Ethylbenzene	4.6 U	5
Xylene (Total)	3.8 U	5
Total Confident Conc.	1614	NA
Total Estimated Conc. (TICs)	0	NA

**Table 2**  
**Summary of Ground Water Analytical Results - 06/02/06**  
**198 Douglass Street, Brooklyn, New York**

Sample ID	SB-1-GW	Water Quality NYSDEC Ambient Criteria <sup>1</sup>
Lab Sample No.	741466	
Sampling Date	06/02/06	
Matrix	WATER	
Units	ug/L	
<b>SEMIVOLATILE ORGANIC COMPOUNDS - GC/MS (ug/L)</b>		
Phenol	3.8	1
2-Chlorophenol	5.4 U	1
2-Nitrophenol	7.8 U	1
2,4-Dimethylphenol	10 U	1
2,4-Dichlorophenol	7.2 U	1
4-Chloro-3-methylphenol	8.2 U	1
2,4,6-Trichlorophenol	11 U	1
2,4-Dinitrophenol	4.4 U	1
4-Nitrophenol	4.4 U	1
4,6-Dinitro-2-methylphenol	6.2 U	1
Pentachlorophenol	10 U	1
N-Nitrosodimethylamine	3.7 U	NA
bis(2-Chloroethyl)ether	4.4 U	5
1,3-Dichlorobenzene	4.8 U	3
1,4-Dichlorobenzene	4.5 U	3
1,2-Dichlorobenzene	5.4 U	3
bis(2-chloroisopropyl)ether	4.2 U	1
N-Nitroso-di-n-propylamine	3.7 U	NA
Hexachloroethane	4.5 U	5
Nitrobenzene	4.8 U	0.4
Isophorone	4.7 U	NA
bis(2-Chloroethoxy)methane	4.3 U	NA
1,2,4-Trichlorobenzene	4.6 U	5
Naphthalene	120	10
Hexachlorobutadiene	3 U	0.5
Hexachlorocyclopentadiene	3.2 U	5
2-Chloronaphthalene	5.4 U	5
Dimethylphthalate	5.4 U	NA

**Table 2**  
**Summary of Ground Water Analytical Results - 06/02/06**  
**198 Douglass Street, Brooklyn, New York**

Sample ID	SB-1-GW	Water Quality NYSDEC Ambient Criteria <sup>1</sup>
Lab Sample No.	741466	
Sampling Date	06/02/06	
Matrix	WATER	
Units	ug/L	
Acenaphthylene	21	NA
2,6-Dinitrotoluene	6.4 U	5
Acenaphthene	83	20
2,4-Dinitrotoluene	5.7 U	5
Diethylphthalate	3.9 U	50
4-Chlorophenyl-phenylether	5.2 U	5
Fluorene	26	50
N-Nitrosodiphenylamine	5.3 U	NA
4-Bromophenyl-phenylether	6 U	5
Hexachlorobenzene	1.6 U	0.04
Phenanthrene	180	50
Anthracene	52	50
Di-n-butylphthalate	5 U	NA
Fluoranthene	160	50
Pyrene	160	50
Benzdine	36 U	NA
Butylbenzylphthalate	5.2 U	NA
3,3'-Dichlorobenzidine	25 U	5
Benzo(a)anthracene	75	0.002
Chrysene	76	0.002
bis(2-Ethylhexyl)phthalate	13	5
Di-n-octylphthalate	5 U	NA
Benzo(b)fluoranthene	47	0.002
Benzo(k)fluoranthene	56	0.002
Benzo(a)pyrene	74	NA
Indeno(1,2,3-cd)pyrene	36	0.002
Dibenz(a,h)anthracene	12	50
Benzo(g,h,i)perylene	43	0.002
<b>Total Confident Conc.</b>	<b>1237.8</b>	<b>NA</b>
<b>Total Estimated Conc. (TICs)</b>	<b>2629</b>	<b>NA</b>

**Table 2**  
**Summary of Ground Water Analytical Results - 06/02/06**  
**198 Douglass Street, Brooklyn, New York**

Sample ID	SB-1-GW	Water Quality NYSDEC Ambient Criteria <sup>1</sup>
Lab Sample No.	741466	
Sampling Date	06/02/06	
Matrix	WATER	
Units	ug/L	
<b>PESTICIDES (ug/L)</b>		
Aldrin	0.01 U	ND
alpha-BHC	0.01 U	NA
beta-BHC	0.01 U	NA
delta-BHC	0.01 U	NA
gamma-BHC (Lindane)	0.01 U	NA
Chlordane	0.4 U	0.1
4,4'-DDD	0.01 U	0.3
4,4'-DDE	0.01 U	0.2
4,4'-DDT	0.01 U	0.2
Dieldrin	0.01 U	0.0004
Endosulfan I	0.01 U	NA
Endosulfan II	0.01 U	NA
Endosulfan sulfate	0.01 U	NA
Endrin	0.03 U	ND
Endrin aldehyde	0.01 U	5
Heptachlor	0.01 U	0.04
Heptachlor epoxide	0.01 U	0.03
Toxaphene	0.2 U	0.06
<b>PCBs (ug/L)</b>		
Aroclor-1016	0.2 U	NA
Aroclor-1221	0.3 U	NA
Aroclor-1232	0.2 U	NA
Aroclor-1242	0.3 U	NA
Aroclor-1248	0.2 U	NA
Aroclor-1254	0.2 U	NA
Aroclor-1260	0.3 U	NA
Aroclor-1262	0.3 U	NA
Aroclor-1268	0.3 U	NA

**Table 2**  
**Summary of Ground Water Analytical Results - 06/02/06**  
**198 Douglass Street, Brooklyn, New York**

Sample ID	SB-1-GW	Water Quality NYSDEC Ambient Criteria <sup>1</sup>
Lab Sample No.	741466	
Sampling Date	06/02/06	
Matrix	WATER	
Units	ug/L	
<b>METALS (ug/L)</b>		
Antimony	58 U	3
Arsenic	250	25
Beryllium	49	3
Cadmium	24.4	5
Chromium	1590	50
Copper	1390	200
Lead	1860	25
Mercury	9.2	0.7
Nickel	1420	100
Selenium	11.4	10
Silver	2.8 U	50
Thallium	9.4 U	0.5
Zinc	3920	NA
<b>WET CHEMISTRY (mg/L)</b>		
Total Cyanide	0.01 U	400
Total Phenols	0.05 U	2

notes:

U - The compound was not detected at the indicated concentration.

NA - Not applicable or not established.

(1) 6 NYCRR Part 703, Class GA Standards and Guidance

(Results above the NYSDEC Guidance are highlighted in yellow)