PHASE II
ENVIRONMENTAL SITE ASSESSMENT

Prepared for:

For Property Located at:

750 East Ferry Street
Buffalo, New York

Submitted by:

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1. INTRODUCTION

Richard A. Bui and Associates, Inc. (RAB) was contracted to perform a Phase II subsurface investigation at the Buflovak LLC facility located at 750 East Ferry Street, Erie County, Buffalo, NY. The investigation was performed as part of the due diligence process for a pending real estate transaction and serves to augment a previous Limited Phase II Environmental Site Assessment (ESA) performed for the facility by RAB during August, 2001. This report is a summary of field activities, investigative findings, and results of direct-push investigations conducted at the Buflovak LLC site located on June 21-22, 2005. The location of the Buflovak study area is shown on Figure 1.

1.1 INVESTIGATION OBJECTIVES AND PURPOSE

The direct-push investigation was developed to address potential areas of concern as identified in the August 2001 Limited Phase II ESA performed by RAB. The objectives of this investigation include the following:

- Investigate potential subsurface impacts to soil and groundwater in the area of two former above ground storage tank (AST) installations: a former 20,000-gallon fuel oil AST located on the northwestern portion of the subject property and a former 10,000-gallon fuel oil AST on the northeast portion of the property.

- Collect subsurface soil samples from the approximate areas identified by the August 2001 Phase I ESA as having elevated heavy metal concentrations in surface soils.,

- Advance a soil boring and obtain samples from an undisturbed portion of the property, believed to have been beyond the extent of facility process operations, to establish local background soil concentrations.

The following investigation tasks were performed to address the objectives of the investigation:

- **Direct-Push Soil Borings** - A total of 10 direct-push borings were advanced in areas identified as potential areas of concern during the RAB August 2001 Phase I ESA or in an attempt to delineate conditions encountered in the field.

- **Soil Sampling** - Single soil samples were collected from each of the boring locations SB-1 through SB-8 and submitted for laboratory analysis for either heavy metal or volatile and semi-volatile organic compound concentrations Borings SB-9 and SB-10 were added to the original works scope in an attempt to delineate potential hydrocarbon impacts observed in the area of the former 10,000-gallon AST during the field activities. Soils encountered in borings SB-9 and SB-10 were screened with a photoionization detector (PID) although no confirmatory samples were submitted for laboratory analysis.

- **Groundwater Sampling** - temporary PVC screen and casing was installed in each of the borings SB-1 through SB-8 to allow for groundwater sampling if the borings generated sufficient water within the timeframe of the field activities. The work scope allotted for a total of two ground water samples. One groundwater sample was obtained from SB-2 and submitted to the laboratory for heavy metals analysis. The other groundwater sample was obtained from SB-6 and submitted for VOC and SVOC analysis.

1.2 REPORT ORGANIZATION

This section of the report provides an introduction. Section 2 provides a summary of the field activities conducted as part of the direct-push investigations. Section 3 provides a summary of findings and results associated with each investigation task. The soil boring logs are presented as Appendix A and the complete laboratory analytical reports are presented as Appendix B.

2. SUMMARY OF FIELD ACTIVITIES

This section provides a summary of the field activities performed as part of the Phase II investigation activities conducted at the Buflovak Site on June 21 and 22, 2005. A total of 10 soil borings were advanced to identify overburden geology and

to obtain soil samples from the vicinity of two former above ground storage tank (AST) installations, areas identified during previous investigations as having elevated concentrations of heavy metals or petroleum hydrocarbons in surface soils, and to establish site background soil conditions from a non-process area of the Buflovak property. Soil borings were completed as temporary groundwater monitoring points in order to assess the potential for hydrocarbon and heavy metal impacts to groundwater.

The location of the direct-push soil borings and significant site features are shown on Figure 1. The details associated with the soil and groundwater investigations are summarized below.

2.1 BUFLOVAK DIRECT-PUSH SOIL AND GROUNDWATER INVESTIGATION

2.1.1 Direct-Push Soil Boring Investigation

A total of 10 direct-push soil borings (SB-1 through SB-10) were advanced on June 21, 2005 by SJB Services, Inc., of Hamburg, NY under the direct supervision of an RAB Field Geologist. Prior to the start of drilling activities, local utility providers were contacted to confirm the presence/absence of utilities at each drilling location. Additionally, Buflovak Facilities Manager and Environmental Coordinator, Mr. Marc Willer, provided access to facility grounds and approved all boring locations prior to installation.

Soil borings were advanced to investigate overburden geology and to obtain soil samples from the vicinity of a known non-process area of the facility, two discrete former AST installations, and areas previously identified with elevated heavy metal or petroleum hydrocarbon concentrations in surface soils. The locations of these borings are shown on Figure 1 and the rationale for the selection of boring locations is described as follows:

- Soil boring SB-1 was advanced in a grassy area south of the Office Building. This area was reported by Mr. Willer to have been beyond the extent of historical facility process operations and therefore considered to represent local or site background conditions.

- Soil borings SB-2, SB-4, and SB-5 were advanced in areas where previous investigations had indicated elevated heavy metal concentrations in surface soils.

- Soil boring SB-3 was advanced near the southeast corner of a concrete secondary containment structure for a former 20,000-gallon fuel oil AST where previous investigations had indicated elevated petroleum hydrocarbons in surface soils.

- Soil borings SB-6, SB-8, SB-9, and SB-10 were advanced in areas nearby or adjacent to a concrete secondary containment structure for a former 10,000-gallon fuel oil AST. The location of these borings was in part dictated by the presence of Scajaquada Creek. Scajaquada Creek is enclosed within a subsurface culvert, which transects the subject property in a generally west to east direction (Figure 1). The majority of the AST secondary containment structure directly overlies Scajaquada Creek and reasonable distances were maintained to prevent damage to the culvert by the drilling equipment. Due to elevated PID readings, apparent soil staining, and petroleum odors encountered during the advancement of SB-6, borings SB-8 through SB-10 were advanced in an attempt to delineate potential hydrocarbon impacts to soils.

- Soil boring SB-7 was advanced on the eastern portion of the property in an area reported by previous investigations to have elevated petroleum hydrocarbon concentrations in surface soils.

At each of the 10 locations, the soil borings were advanced using a truck-mounted, hydraulic-operated Geoprobe® 5410 direct-push drill rig. Continuous soil samples were collected using a Macro-Core® (2-in. diameter, 4-ft length) sampler and internal dedicated acetate sleeves until contact with groundwater or probe refusal was encountered. Acetate sleeves were not reused following the collection of each soil sample. The characteristics of each soil sample recovered, along with any other pertinent information, were logged in accordance with American Society for Testing and Materials Method (ASTM) D 2488-93, and on the soil boring logs provided in Appendix A. Closed-container headspace monitoring of soils encountered during drilling was conducted in accordance with the procedures detailed in RAB Standard Operating Procedures, with a GasTech® 2000 photoionization detector (PID) and 10.6 eV lamp. The PID was calibrated prior to

use in accordance with the manufacturer's specifications. The PID measurement results were recorded on the soil boring logs provided in Appendix A.

For boring locations advanced to investigate heavy metal concentrations, soil samples were collected and submitted for laboratory analysis, generally from the apparent interface of slag/ash fill materials and native soils or just above the groundwater table at the discretion of the RAB Field Geologist. Samples were collected and compared to New York State Department of Environmental Conservation (NYSDEC) Heavy Metals Soil Cleanup Criteria Table (TAGM# 4046). Soil samples were transferred, on ice, to Severn Trent Laboratories, Inc., a NELAC certified laboratory, via courier and analyzed for Target Analyte List metals by EPA Method 6010B. Analytical results are summarized in Table 1 and further discussed in Section 3

Soil samples collected from borings advanced to investigate for petroleum hydrocarbon concentrations were selected based upon PID readings or to represent the soils from just above the groundwater table. Samples were prepared according to EPA Method 5035 and submitted to the laboratory for VOC analysis by EPA Method 5035/8260B and SVOC analysis by EPA Method 8270C. Analytical results are summarized and further discussed in Section 3. It is noted that no samples collected from borings SB-9 and SB-10 were submitted for laboratory analysis. Soils from SB-9 and SB-10 were screened for organic vapors using a PID in an attempt to approximately define the extent of potential petroleum hydrocarbon impacts observed in the vicinity of the former 10,000-gallon AST installation. Results of the PID screening are presented on the boring logs presented in Appendix A and are further discussed in Section 3.

2.1.2 Groundwater Investigation

Soil borings SB-1 through SB-8 were completed with temporary 1" diameter Schedule 40 PVC screen and flush-threaded riser pipe as temporary monitoring points. Monitoring points were installed to facilitate the collection of groundwater samples if water developed in the borings. At the end of the groundwater sampling activities, the temporary monitoring points were removed and all borings were backfilled via natural collapse and bentonite pellets.

The depth to groundwater below ground surface (bgs) was gauged in temporary monitoring points SB-1 through SB-7 using a Solonist Interface Meter, capable of distinguishing between water and non-aqueous phase liquids within 0.01 feet. Depths to water ranged from 4.11 ft. bgs in SB-2 to 8.61 ft. bgs in SB-6. All other monitoring points were dry or produced insufficient water to obtain a sample with the exception of SB-3 at 7.97 ft. bgs. Based on the gauging data and boring locations, SB-2 and SB-6 were selected for groundwater sampling.

Prior to sampling, the wells were purged a minimum of three well volumes using dedicated disposable bailers. Ground water samples were collected according to ASTM Standard D 4448. Samples were transferred with zero headspace into the appropriate laboratory supplied sample containers, wrapped with bubble packing, placed on ice to maintain a temperature of 4° C, and secured in a shipping cooler. Ground water samples were delivered to Severn Trent Laboratories, Inc. for analysis. A chain-of-custody was maintained between RAB and the laboratory. The groundwater sample from SB-2 was submitted for analysis of Target Analyte List (TAL) Metals by EPA Method 6010B/7470A and the sample from SB-6 was submitted for VOC and SVOC analysis by EPA Methods 8260B and 8270C respectively.

3. SUMMARY OF FINDINGS AND RESULTS

This section provides a summary of the findings and results of the Buflovak soil and groundwater sampling activities. These activities were completed to provide information regarding the current subsurface conditions at the Buflovak Site. A detailed discussion of the subsurface investigation findings and analytical results associated with the investigations are provided below.

3.1 GEOLOGICAL AND HYDROGEOLOGICAL INTERPRETATIONS

This subsection provides a discussion of the subsurface physical characteristics of the Buflovak study area. Descriptions of the subsurface physical features, including geology and hydrogeology, are based primarily on the findings of this direct-push soil boring and groundwater investigation. Supplemental geologic information was also obtained from a Pre-Design Investigation Report (PDIR)

prepared by the URS Corporation for the NYSDEC during October 2004 which includes geological interpretations of nearby areas.

3.1.1 Site Geology

According to the PDIR, the subject site area is located in the Erie-Ontario Physiographic Province of New York State, which is characterized by low plains with little relief. Overburden deposits in the region have been mapped as lake silts and clays with the underlying bedrock consisting of the Middle Devonian aged Onondaga Limestone. Information obtained from the advancement of soil borings during this investigation shows a stratigraphic sequence consisting of fill material overlying clayey silts with fill layers often intermixed. Fill was encountered to some degree in every boring and bedrock was not encountered in any of the borings due to probe refusal in tight clay/silts. Sand and gravel, believed to be associated with Scajaquada Creek, were encountered in the area of SB-6 through SB-10 at depths ranging from 8 to 10 feet bgs. These borings were terminated at depths in apparent contact with groundwater.

Fill material thickness and consistency varied between borings but generally consisted of either black ash, cinders and foundry sands; black cinders; reddish brown or gray brown silty clays with trace amounts of ash, cinder, slag, coal, brick; white/gray/black ash, cinders, and slag; or red/brown foundry sands and iron filings. The fill layers and stratigraphic sequences present at specific boring locations are presented in the boring logs (Appendix A).

3.1.2 Site Hydrogeology and Groundwater Flow Patterns

Groundwater was encountered at the Buflovak site in borings SB-2, SB-3, and SB-6 through SB-10 in either fill materials or the backfilled excavation of the Scajaquada Creek Drain. The Scajaquada Creek Drain was constructed by the City of Buffalo and is comprised primarily of concrete and brick. The drain directs flow generally from east to west across the Buflovak Property with approximate reported dimensions of 33 feet width by 15 feet height. The drain is floored in bedrock and, according to the PDIR, occurs at an approximate depth of 11 feet below the ground surface.

A reference elevation survey was not performed as part of this investigation and therefore mapping of the potentiometric surface was not possible. However, due to the proximity of Scajaquada Creek and local information provided in the PDIR, groundwater flow in the overburden materials appears to be directed towards Scajaquada Creek although this could not be definitively confirmed within the scope of this investigation.

3.3 SUMMARY OF ANALYTICAL RESULTS

The following subsection provides a summary of analytical results for soil and groundwater samples collected as part of the Buflovak direct-push soil boring and groundwater investigation.

Analytical results for soil and groundwater samples and associated QA/QC samples are provided in Table 1 or are discussed below. Soil and groundwater samples were submitted for laboratory analysis and compared with recommended cleanup criteria presented in the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046 or Title 6 of the New York Codes, Rules and Regulations Part 703 "Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations". The complete laboratory analytical reports are included as Appendix B.

3.3.1 Soil Results

Soil samples were collected from the soil borings and submitted for laboratory analysis to obtain site specific background concentrations and to assess potential subsurface impacts from heavy metals and petroleum hydrocarbons.

Soil samples collected from SB-1, SB-2, SB-4, and SB-5 were analyzed for Target Analyte List Metals by EPA Method 6010B/7471A. Table 4 of the NYSDEC TAGM #4046 presents recommended soil cleanup objectives for heavy metals in parts per million (ppm) or milligrams per kilogram (mg/kg). Also provided in Table 4 are general background soil concentrations for the eastern United States or New York State background concentrations. In order to provide site specific background concentrations, the soil sample from SB-1 was collected at a depth of 6-8 feet in an area of the Buflovak Property believed to represent natural,

undisturbed conditions. For purposes of this investigation, the sample obtained from SB-1 is considered site specific background and was used for comparison with the remaining samples.

Given the three sources for background concentrations listed above, analytic results were evaluated for exceedance of the highest applicable background concentration or the NYSDEC recommended soil cleanup objective. A summary of the soil metals analytical data and evaluation criteria is presented as Table 1. Analytical results indicate that the concentration of heavy metals from all soil samples analyzed were below published background concentration, site specific background concentration (SB-1), or the NYSDEC recommended soil cleanup objective with the exception of the following:

- SB-2 for magnesium
- SB-2 for lead
- SB-5 for nickel

The NYSDEC recommended soil cleanup objective for magnesium is site background and published average site background for the eastern US ranges widely between 100-5,000 mg/kg. The site specific background concentration obtained from SB-1 is 14,000 mg/kg with the concentration in the sample obtained from SB-2 at 22,000mg/kg. Boring SB-2 was advanced near the northern extent of the Buflovak property just east of the Machine Shop in order to investigate a relatively small surface area (approximately 3 feet by 5 feet) of discolored soil which exhibited the appearance of reddish brown foundry sands mixed with iron filings and lacking vegetative cover. This strata continued to a depth of approximately 3 feet below ground surface, followed by approximately one foot of brown silt with some clay and traces of brick, two feet of gray/white cinders and ash, and ultimately to red brown clayey silt which continued to the end of the boring at approximately 10 feet bgs. The sample from SB-2 was obtained as a composite of soils from a depth of 2.5 to 4 feet bgs and includes the gray/white cinder and ash fill material. The PDIR also indicated gray white cinder and ash fill material along the backfill of the Scajaquada Creek Drain and the lateral extent of such fill material is assumed to be unevenly distributed along the drain at varying thicknesses. It does not appear however that this fill material is a result of Buflovak site activities but rather fill placement associate with the construction of the Scajaquada Creek Drain. Additionally, lead concentrations in the sample from SB-

2 are indicated at 52 mg/kg with the site specific background concentration derived from SB-1 at 8.9 mg/kg. In general, background concentrations for lead vary widely from 4-61 mg/kg in rural soils to 200-500 mg/kg in suburban or suburban areas. Based on these factors, the lead concentrations observed in the soil samples collected as part of this investigation do not appear to represent an elevated source area above site background.

Nickel concentrations in the sample from SB-2 were reported at 33 mg/kg and the site specific background concentration derived from SB-1 was 31 mg/kg. Published background concentrations for eastern US soils range between 0.5-25 mg/kg. Therefore, the concentration of nickel observed in the sample from SB-2 does not appear to vary significantly from site background conditions.

Soil samples collected from SB-3, SB-6, SB-7, and SB-8 were analyzed for VOC's and SVOC's by EPA Methods 8260B and 8270C. These samples were collected to investigate for potential impacts to soils from petroleum hydrocarbons which may have been released in the vicinity of the AST installations described previously (SB-6, SB-8) or in areas described during previous investigations as having elevated total petroleum hydrocarbon (TPH) concentrations in surface soils (SB-3, SB-7). Analytical results indicate that all soil samples were below minimum laboratory detection limits (MDL) or NYSDEC TAGM # 4046 recommended cleanup objectives. Low level detections of the VOC ethylbenzene were reported at 9.4 micrograms per kilogram (µg/kg or ppb) in SB-6, well below the cleanup objective of 5,500 µg/kg. Low level detection of the SVOC 2-methylnaphthalene was reported from SB-6 at a concentration of 2,500µg/kg, well below the cleanup objective of 36,400 µg/kg. Low level detections of the SVOC Phenanthrene were reported in the sample obtained from SB-6 at 770 µg/kg and from SB-8 at 380 µg/kg, well below the cleanup objective of 50,000 µg/kg.

3.3.2 Groundwater Results

Groundwater samples were obtained from sampling locations SB-2 and SB-6 to investigate for possible impacts to groundwater from heavy metals and petroleum hydrocarbons. The sample obtained from SB-2 was analyzed for TAL Metals by EPA Method 6010B and the sample obtained from SB-6 was analyzed for VOC and SVOC concentrations by EPA Methods 8260B and 8270C respectively.

Analytical results from the groundwater sample obtained from SB-2 indicate concentrations of several heavy metals above NYSDEC regulatory standards listed in Title 6 of the New York Codes, Rules and Regulations Part 703 "Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations". The following is a listing of the analytes which exceeded NYSDEC standards, the analytical result, and the applicable NYSDEC standard for groundwater (all concentrations are presented in µg/L):

Analyte	**Result**	**NYSDEC Standard**
Aluminum	12,000	100
Cobalt	26	5
Copper	350	200
Iron	18,000	300*
Manganese	3,000	300*
Nickel	820	100
Lead	260	25
Zinc	210	66

* Denotes combined standard for Iron and Manganese at 300 individual or 500 combined.

The source for elevated metals concentrations in groundwater is unknown, particularly since there appears to be little correlation between corresponding analyte concentrations encountered during the soil sampling program. Groundwater may be affected by leachate from soil intervals not investigated as part of this soil boring program or may represent background conditions or influence from upgradient sources. It is also possible that the groundwater sample from SB-2 may be affected by communication with the Scajaquada Creek aquifer. To investigate this possibility, RAB obtained excerpts of a report prepared by the Buffalo Sewer Authority which contains water quality monitoring data of the Scajaquada Creek Drain. The Sewer Authority report contains sampling results from both wet and dry weather conditions at points upstream of the Buflovak site area. Comparison of the analyte concentrations found during this study with those in the Sewer Authority report suggest the possibility of unidentified upgradient sources for elevated metals concentrations in the Scajaquada Creek Drain. Since water encountered during this investigation is believed to be associated with the backfill materials of the Scajaquada Creek Drain at least some part of the elevated

metals concentrations may be attributed to this relationship. The excerpt tables from the Sewer Authority report are included as Appendix C. The complete Sewer Authority Report was not available to RAB within the timeframe of this report however further investigation is warranted. Since no contributing source area was identified during the soil sampling program, further investigation as to local groundwater conditions and possible contributing sources for heavy metals may also be warranted.

Analytical results from the groundwater sample obtained from SB-6 indicate low level detections of the VOC's ethylbenzene and total xylenes. Ethylbenzene was detected in SB-6 at a concentration of 5.2µg/L with the NYSDEC groundwater standard of 5 µg/L. Total xylenes were detected in SB-6 at a concentration of 4.2 µg/L with the NYSDEC standard for each of the three individual forms of xylene at 5 µg/L (15 µg/L collectively).

The only SVOC detected in groundwater above laboratory minimum detection limits from SB-6 was Phenanthrene at a concentration of 220 µg/L. The NYSDEC regulatory groundwater standard for Phenanthrene is 50 µg/L . SB-6 was advanced at the northwest corner of the former 10,000-gallon AST installation near the eastern edge of the Buflovak site, directly adjacent to the Scajaquada Creek Drain. The low level detection of the VOC's ethylbenzene and total xylenes and the elevated Phenanthrene concentrations indicate petroleum impacts to groundwater above NYSDEC standards. However, Phenanthrene concentrations observed in soil samples obtained from SB-6 and SB-8 do not indicate an elevated source area in soils. ISS may wish to perform additional investigations to more accurately delineate subsurface petroleum impacts in the area of the former 10,000-gallon AST.