SUPPLEMENTAL PHASE II
ENVIRONMENTAL SITE ASSESSMENT REPORT
REVISION 0.0
ST. ALBANS MUNICIPAL PARKING LOT #1 &
FORMER BRICKYARD TAVERN (RFA 08149)
KINGMAN, FEDERAL, LAKE & N. MAIN STREETS
ST. ALBANS, VERMONT 05478

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EXECUTIVE SUMMARY

The professional hydrogeologic and environmental consulting firm of Leggette, Brashears & Graham, Inc. (LBG) is pleased to present the results of the recent Supplemental Phase II Environmental Site Investigation at the St. Albans Municipal Parking Lot #1 and Former Brickyard Tavern property located along Kingman, Federal, Lake and North Main Streets in the City of St. Albans, Vermont (the Site). LBG was notified by the Northwest Regional Planning Commission (NRPC) of their selection to complete the Supplemental work during the summer of 2009 following the submittal of a work plan dated April 29, 2009. Prior to entering into an agreement with the NRPC the project was delayed over the summer of 2009. LBG entered into an agreement to conduct the work in late October 2009.

For this investigation, test pits were excavated to provide a more expansive search for two suspect underground storage tanks (USTs) within the Site. The test pits excavated during the search for the suspect UST (UST 2) adjacent to MW-12, revealed a buried concrete slab and buried metal and building debris. These items were likely part of the remains of a former building. No evidence of a UST was observed. The second search area was located adjacent to MW-10 and the excavation revealed an abandoned UST (UST 1). The soil surrounding the tank was stained dark gray, saturated with product that offered a distinct weathered gasoline odor; however, the southern end of the tank revealed two copper fuel lines (one was broken) indicative of a heating oil tank. The copper lines were marked with a painted grade stake and the excavation was backfilled. At the conclusion of the physical search for suspected USTs, two additional USTs (UST 3 and UST 4) are suspected. UST 3 may be located near the north side of the former Napoli building and UST 4 was identified on a Sanborn Fire Insurance map near MW-1.

In addition, a series of soil borings were installed to further investigate the soil quality along the eastern portion of the municipal parking lot in the area down gradient of MW-9. Due to the buried natural gas and power lines and water force main in the immediate area as well as overhead power lines, LBG selected safe and accessible locations to install the soil borings down gradient of MW-9. The results of the soil samples collected from four soil borings for laboratory analysis of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and select metals (iron, manganese and molybdenum) do not exhibit concentrations above the US EPA Region 9 Preliminary Remediation Goals (PRGs) for industrial properties for the analytes tested.

These soil borings were completed as monitor wells and groundwater samples were collected from existing and new monitor wells on-Site. Following the collection of groundwater samples, the NRPC contacted LBG and requested that the data collected from MW-9 be withheld since this well may not be located on City property.

Groundwater flow direction has been interpreted to be westerly. Groundwater samples were collected from the four newly installed wells for analysis of VOCs. Low level VOCs were detected, although no concentrations exceeded the Vermont Groundwater Enforcement Standard (VGES). Of all existing and newly installed on-Site

wells sampled for SVOC analysis, benzo(a)pyrene was detected above the VGES in MW-104 (located in the central area of the municipal parking lot in a former automobile storage area). Benzo(a)pyrene, a polycyclic aromatic hydrocarbon (PAH) compound, is typically found in areas of urban fill where coal and ash are commonly found. Analytical results show total iron detected above the VGES across the Site and manganese detected above the VGES in several wells on-Site. Potential sources of iron and manganese on-Site may be the past use of a portion of the Site as a foundry, urban fill, and/or local geology. Low levels of molybdenum were detected, although concentrations did not exceed the VGES.

LBG recommends confirming the presence of the third suspected tank, UST 3. Additionally, LBG recommends that UST 1 be cleaned, removed and disposed of properly. Based on initial observations of this leaking tank, a subsurface investigation should be conducted to determine the degree and extent of petroleum contamination resulting from this tank. However, the Site property boundaries should be defined prior to investigating these tanks to determine if they are on the subject Site.

The types of contaminates identified in the assessments conducted at the Site are consistent with urban areas and the available data has not identified high risk contaminates in the samples collected and analyzed from the borings and wells that may warrant active remediation. However, the release from UST 1 has reportedly impacted the soil and possible the groundwater underlying the former Napoli Store building. Further assessment of the release from UST 1 may necessitate active remediation.

A Corrective Action Plan should be developed for areas that will be disturbed to facilitate future redevelopment. Any renovations to the former Brickyard Tavern building should be done in compliance with the requirements of OSHA 29 CFR 1910.120 (hazardous waste operations and emergency response), 29 CFR 1910.1025 (lead), 29 CFR 1926.62 (lead), 29 CFR 1910.1001 (asbestos), 29 CFR 1926.1101 (asbestos), Vermont Regulations for Asbestos Control (V.S.A. Title 18, Chapter 26) and Vermont Regulations for Lead Control (V.S.A. Title 18, Chapter 38). Future excavations may require waste stream characterization sampling and testing prior to moving any materials off-Site. Dewatering prior to excavation may also be necessary. Treatment of the groundwater removed from excavations may be required prior to discharge. A Corrective Action Plan should be prepared once the site redevelopment plans are established and all environmental assessments are complete. A Notice to Land Records regarding residual soil and groundwater contamination may be required prior to redevelopment and may also be warranted following the construction and redevelopment as the residual contamination effecting the soil and groundwater may still exist.

1.0 INTRODUCTION & BACKGROUND

LBG has completed the supplemental investigation at the St. Albans Municipal Parking Lot #1 and Former Brickyard Tavern property located along Kingman, Federal, Lake and North Main Streets in the City of St. Albans, Vermont (the Site). The Site location is depicted on ***Figure 1***, Site Location Map.

Background – Phase I ESAs

A Phase I Environmental Site Assessment (ESA) of the Municipal Parking Lot No. 1, located at 25, 39, and 41 Federal Street, 28 Kingman Street, and 19-27 Lake Street in the City of St. Albans was completed by Weston and Sampson Engineers, Inc. of Waterbury, VT in October 2007. According to the Phase I ESA Report, the Site has been used as a parking lot for approximately fifty (50) years. Prior to this, the Site and surrounding properties were used for industrial, commercial, and residential purposes. Land uses have included a foundry, automotive dealerships and garages, and a sheet metal shop. Weston and Sampson Engineers, Inc. identified one (1) *recognized environmental condition* regarding the Site, including potential contaminants of concern from industrial and commercial activities on the Site. Potential contaminants of concern include: metals, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), petroleum distillates, solvents, and polychlorinated biphenyls (PCBs). The Phase I ESA recommended a Phase II ESA to investigate the *recognized environmental condition*. Weston & Sampson Engineers, Inc. identified two data gaps in their Phase I report; one regarding questionnaires that were not returned but considered "insignificant", and the other being the approximate property boundaries. Weston & Sampson Engineers, Inc. concluded that the approximate boundaries were considered "insignificant" for the Phase I ESA but would consider it "significant" as part of a Phase II ESA subsurface investigation. Weston & Sampson Engineers, Inc. recommended the installation of twelve monitoring wells and borings spaced equally apart and the property owner approve the locations of all boring locations (2008).

A Phase I ESA of the Former Brickyard Tavern Building located at 29-33 Federal Street in St. Albans was completed by The Johnson Company of Montpelier, VT in May 2008. Reportedly, the building has been vacant since 2007. Based on the Phase I ESA Report, historical uses of the property included paint, photo, tailor and sheet metal shops, as well as a fruit and tobacco store, confectionary, and restaurant. The Johnson Company identified a *recognized environmental condition* due to the historical use of the Site as a sheet metal shop, as it poses a potential risk for historic releases of degreasers or solvents. The Phase I ESA also included an inspection of the on-site building's interior, which concluded the likely presence of lead-based paint to exist within the building and identified several suspect asbestos-containing materials (ACMs) within the building. The Phase I ESA recommended evaluation of the groundwater, soil and soil vapor and a lead and asbestos assessment (The Johnson Company, 2008).

Background – Phase II ESA

TRC Environmental Corporation (TRC) of Lowell, Massachusetts completed a Phase II ESA in February 2009. The Phase II ESA consisted of a geophysical survey, ground-water monitor well installations, the collection of soil and ground-water samples for laboratory analysis, and a building materials survey. The Phase II ESA concluded that the Site is underlain by surficial layers of urban fill material comprised of brick fragments, coal, and coal ash. Two potential underground storage tanks (USTs) were identified during the geophysical survey; one in the southern portion of the lot (near Lake Street), and the other in the southwest portion of the lot. Analytical results from TRC's Phase II ESA identified five polycyclic aromatic hydrocarbon (PAHs) [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene] and four metals (arsenic, iron, manganese, and lead) above the applicable U.S. EPA Region 9 Preliminary Remediation Goals (PRGs) in the majority of the soil samples analyzed. Two metals (manganese and molybdenum) were found by TRC to exceed the Vermont Groundwater Enforcement Standards (VGES) in two on-Site monitoring wells, MW-9 and MW-12 (TRC, 2009).

In addition, the Phase II ESA by TRC confirmed the presence of multiple ACMs within the Former Brickyard Tavern Building. Lead was also confirmed in 60 of the 108 paint samples collected. The Phase II ESA indicated that low levels (less than 50 parts per million) of PCBs are present in window glazing samples collected from third-floor windows of the Former Brickyard Tavern Building (TRC, 2009).

The State of Vermont Department of Environmental Conservation, Waste Management Division requested additional environmental work at the Site as recommended by TRC.

2.0 SCOPE OF WORK

2.1 Quality Assurance Project Plan (QAPP)

A QAPP Modification was recommended so that the previously approved QAPP could be utilized. Upon approval of the Work Scope and Cost Estimate, LBG began preparation of the QAPP Modification, which followed the US EPA *Quality Assurance Guidance for Conducting Brownfields Site Assessments* and the *EPA Requirements for Quality Assurance Project Plans*. Our plan focuses on the types of sample media, collection methodologies analytical methods, contaminant types, method detection limits and other data quality objectives (DQOs).

2.2 Supplemental Subsurface Investigation

The scope of work for this supplemental investigation was based on recommendations derived from TRC's Site Investigation Report dated 2009. This supplemental investigation does not address lead paint and asbestos containing materials. LBG proposed the installation of four (4) soil borings using a drill rig to advance hollow stem augers, while collecting continuous split spoon samples and screening the soils for

VOCs with a photoionization detector (PID). The proposed soil boring locations were along the eastern side of the municipal parking lot in the area down gradient of MW-9 to further evaluate soil and groundwater quality.

In addition, LBG proposed excavating shallow test pits in an effort to confirm or refute the presence of possible underground storage tanks based on geophysical anomalies identified by TRC's subcontractor, Hager-Richter Geosciences (Hager-Richter). Two geophysical anomalies were identified by Hager-Richter demonstrating the potential to be USTs. LBG also agreed to re-cement a road box covering MW-13 that had broken loose and confirm the presence of an AST in the Former Brickyard Tavern Building.

2.3 Sampling and Analytical Testing

LBG anticipated the collection of four (4) soil samples from the soil borings for laboratory analysis for VOCs, SVOCs, and metals (iron, manganese and molybdenum) to determine if past on-Site activities have caused or contributed impact to the shallow soil.

LBG proposed to collect groundwater samples from all eleven (11) wells (seven existing and four new) for laboratory analysis of SVOCs by U.S. EPA Method 8270 (full list) and total metals (iron, manganese and molybdenum). If the VGES is exceeded for metals, analysis of dissolved metals is proposed. In addition, LBG proposed groundwater analysis of select wells for VOCs via U.S. EPA Method 8260.

2.4 Reporting

Upon completion of all field work and receipt of the analytical data, LBG prepared a report including summaries, findings, and recommendations relevant to the Site. The report includes data tables, figures, graphical depiction of data, and a copy of the complete analytical report. Prior to accepting analytical data into the report, LBG validated the laboratory data. Dissolved metals analysis prompted by the exceedence of the VGES for two metals has not been received at the time of this report submittal. The additional data will be presented as an amendment to this report upon receipt.

3.0 CONCEPTUAL MODEL

The ~2.4 acre site is located on a slope dipping to the west and has been developed for approximately 150 years. Past and current property uses include both industrial and commercial use and are proximate to the St. Albans rail yard that has been in use since the mid 1800's. The study area is shallow to the overburden aquifer that slopes to the west consistent with the site topography. The shallow soils consist of glacial till underlying urban fill that has been redistributed as a result of many redevelopment activities. The bedrock in the area is described as slate with local thin lenses of limestone and dolomite (Doll, 1961). Vermont slates are known to contain iron indicated by red to purple mottling (State of Vermont). Municipal water and sewer serve the area and a storm drain system serves the parking lot and surrounding properties. The

closest tributary is Stevens Brook to the west that ultimately drains to St. Albans Bay of Lake Champlain.

Based on two previous Phase I ESA studies the suspected contaminants from past on-Site and off-Site uses may include VOCs, metals, SVOCs, PCBs, ACMs and lead-based paint (Weston & Sampson Engineers, Inc., 2007 and The Johnson Company, 2008).

The Phase II ESA conducted by TRC included a geophysical survey to possibly identify any potential USTs or buried drums and a hazardous building materials survey followed by a subsurface investigation, including the installation of soil borings and groundwater monitoring wells which were subsequently sampled. Groundwater was sampled and analyzed for contaminants of concern identified in the earlier Phase I studies. The building materials survey indicated multiple materials (floor tiles, glues, flashing tar on the roof, rib sealant, and mastic) within the former Brickyard Tavern Building contain ACM, with concentrations from non-detect to 80% chrysotile (TRC Environmental Corporation, 2009).

The results of the geophysical survey suggested two potential USTs (UST 1 and UST 2) were located at the Site (TRC Environmental Corporation, 2009).

The Phase II ESA subsurface investigation conducted by TRC in 2009 did not identify VOCs, total petroleum hydrocarbons (TPH) or PCBs above the applicable PRGs in the soil. The TRC report did show that SVOCs (five PAH compounds) and four metals (arsenic, iron, lead and manganese) were detected above their respective PRGs in the soils samples analyzed. The TRC report attributed these contaminants to the presence of urban fill (2009).

The recent supplemental assessment conducted by LBG, did not find any VOCs, SVOCs or metals (iron, manganese and molybdenum) above the applicable PRGs in the four soil samples collected from soil borings installed down gradient of MW-9.

Groundwater analytical results reported by TRC did not identify any VOCs and SVOCs greater than the VGES, while concentrations of manganese and molybdenum were found above the VGES as reported by TRC (2009).

The supplemental round of groundwater quality samples collected by LBG identified iron and manganese concentrations above the VGES, while low levels of molybdenum were detected below the VGES.

Similarly, TRC attributed the PAH compounds in groundwater to urban fill containing coal and ash (2009). Likewise, the elevated concentrations of manganese may be a result of the past use of a portion of the Site as a foundry, urban fill, and/or local geology. Also, “natural dolomites often contain impurities such as Mn, Fe, ...” (Wright et al., 2002), while the urban fill containing any remnants from previous foundry operations on-Site can cause elevated iron particles from corrosion. Manganese concentrations

detected on-Site appear to fall within the levels observed by the USGS, although manganese concentrations in groundwater were detected above the VGES (Shacklette and Boerngenm, 1984 and Gustavsson et al., 2001).

Since the majority of the Site is paved with asphalt direct exposure to potential surface soil contaminants is limited. A smaller gravel parking lot exists on the southern side of the Site with a layer of crushed stone. Limited exposure to potential surface soil contaminants may exist at this location.

As mentioned above, the Site is located in the City of St. Albans and served by municipal water, so the use of and exposure to area groundwater is unlikely. The proposed future use of the Site does not increase exposure to potential subsurface contaminants following completion of construction. However, during construction activities, exposure to soil and groundwater will be of concern.

4.0 SUBSURFACE INVESTIGATION

LBG submitted an amendment to the existing QAPP to the EPA in November 2009 for review and comment. Following the QAPP approval on January 5 2010 LBG notified the Northwest Regional Planning Commission (NRPC) of the proposed field work schedule. LBG pre-marked the Site, which was cleared by Dig Safe, identifying member utilities on-Site, prior to any subsurface activities. The Dig Safe-assigned ticket numbers for the Site are 20100302205, 20100302211, and 20100302173. LBG also contacted the City of St. Albans Department of Public Works (DPW) to identify water and sewer underground utilities. Due to the snow and ice cover the locations of the previously installed wells were not apparent.

4.1 Soil Boring Installation

On January 15, 2010, LBG returned to the Site to oversee the advancement of four (4) soil borings in the area of MW-9; however, the location of MW-9 was not apparent during the drilling event. The underground utilities marked out by the Dig Safe network identified buried natural gas and power lines in the immediate area and the St. Albans DPW indicated a water force main traversed this area as well. In addition, overhead power lines crossed the area. Considering the underground and overhead hazards in the area LBG selected safe and accessible locations to install the soil borings down gradient of MW-9.

LBG oversaw the advancement of four (4) soil borings on-Site (as close to MW-9 as possible) by Crawford Drilling Services using a drill rig with hollow stem augers. Soil boring depths range from 10 to 13 feet below ground surface (bgs). Each boring was advanced into the water table. As each soil boring was advanced, soil samples were collected using continuous split spoon samplers which were screened for VOCs with a PID using conventional headspaces techniques.

The Ionscience Phocheck 1000 PID with a 10.6 eV lamp was calibrated to a 100 isobutylene standard referenced to benzene prior to screening. PID readings ranged from 0.4 parts per million by volume (ppmv) to 0.9 ppmv in borings SB-102 through SB-101. Geologic Logs describing materials encountered from each borehole are provided in ***Appendix 1*** and photo documentation is provided in ***Appendix 2***.

Soil encountered beneath the central and eastern portion of the parking lot included sand and gravel layers over a dense, gray till. Groundwater was encountered during this boring program at depths ranging from 6 – 8 feet bgs. Boring locations are depicted on the Site Plan, ***Figure 2***.

4.2 Soil Sample Collection

During drilling activities on January 15th, soil samples were collected from select intervals of soil borings by LBG. Soil samples were collected from the top of the approximate water table observed while drilling. Since no elevated PID readings were observed, samples were also collected at depths similar to the previously observed elevated PID readings from MW-9. Grab soil samples were collected and placed in laboratory-provided glassware (40 milliliter glass vials preserved with methanol and with lab reagent water and magnetic stir bar) for VOC analysis. The remaining soil sample from the 2-foot split spoon sampler was placed in a stainless steel bowl and homogenized before placing the soil into laboratory-provided glassware including 8 oz. glass and amber glass jars. All soil samples were submitted for VOC, SVOC and metal (iron, manganese, and molybdenum) analyses.

All soil samples were stored and transported to TestAmerica of South Burlington, Vermont in a cooler, on ice, under Chain-of-Custody. The SVOC analysis was subcontracted to TestAmerica in Pittsburg, Pennsylvania.

4.3 Suspect UST Search

On January 15, 2010, LBG oversaw the excavation of test pits, by R.J. Weston Excavating in the two areas, previously identified by Hager-Richter's geophysical survey, potentially containing abandoned underground storage tanks (USTs). The two suspect USTs (UST 1 and UST 2) investigated were noted to be located adjacent to wells MW-10 and MW-12. Photo documentation of the test pit excavations are provided in ***Appendix 2***.

LBG spoke with the owner of the former Napoli building prior to conducting any work. Mr. Keith Tauski indicated to LBG that the area of the suspected tank was owned by him and that he and the City had disputed the boundary but he agreed to allow testing on the disputed area.

Suspect UST 1 was confirmed in a test pit along the former Napoli Variety Store building, adjacent to MW-10. Upon discovery, UST 1 was found to have failed as holes were noted on the exposed portion of the tank. Petroleum impact to soil within the excavation was obvious. LBG collected soil samples from around the tank to field screen

for the presence of VOCs using conventional headspace techniques. PID readings from soil samples collected for headspace screening ranged from less than 0.1 ppmv to 104.4 ppmv. The steel single wall UST was 48 inches in diameter and a single steel riser pipe was attached to the top of the tank terminating at grade. The riser pipe was 14 inches long which puts the bottom of the tank at approximately 62 inches below grade. The soil was stained dark gray, saturated with product that offered a distinct weathered gasoline odor. The southern end of the tank revealed two copper fuel lines (one was broken) indicative of a heating oil tank. Groundwater was encountered at about five feet below the ground surface. The copper lines were marked with a painted grade stake and the excavation was backfilled.

Suspect UST 2 was not located along the western side of the salon building (17 Lake Street) near MW-12. A buried concrete slab and several large pieces of metal were identified adjacent to the building, which may be the subsurface anomaly identified during the geophysical survey. An uncased electrical power line was encountered during the excavation which required the work to stop until CVPS could verify whether or not the line was active. Mr. Doug Mason of CVPS determined that the line was not active and was abandoned. LBG could not locate MW-12.

During the UST search, construction workers renovating the interior of the former Napoli Variety Store building (adjacent to MW-10) indicated that petroleum odors were observed when soil was excavated from inside the building for the purposes of constructing column footings. In addition, the workers stated that another UST (UST 3) is located off the north side of the former Napoli Variety Store building, which was reportedly exposed when excavating to allow their engineer to assess the building foundation. One worker stated that he was aware of historic photographs showing gasoline pumps near where the tank was exposed.

Based on this new information, LBG reviewed the Weston & Sampson's *Phase I Environmental Site Assessment Report*, to verify that no tanks were identified in this area on the Sanborn Fire Insurance maps. Although, this suspect UST 3 was not identified on any of the Sanborn fire insurance maps, another gasoline tank (UST 4) was depicted on the 1926 and 1946 maps. This UST 4 was depicted just southeast of MW-1 near a former storage building. All confirmed and suspected USTs are depicted on ***Figure 2***, Site Plan.

LBG reported this information to Ms. Greta Brunswick of the NRPC who informed the City and the VTDEC. Mr. Becker of the VTDEC did not require further investigation of the presence of UST 4.

4.4 Site Geology

Subsurface materials encountered beneath the municipal parking lot included sand and gravel layers (likely urban fill) with traces of brick and coal over a dense, gray till. The till layer is encountered at depths ranging from 8 to 10 feet bgs.

The Soil Survey of Franklin County, Vermont describes the area soil as Georgia stony loam with 3-8% slopes. The Georgia stony loam is described as moderately well drained in areas on glacial till.

According to the 1961 *Centennial Geologic Map of Vermont*, the underlying bedrock at the Site is mapped as Morses line formation – a calcareous and non-calcareous slate with local, thin lenses of limestone and dolomite (Doll, 1961).

4.5 Well Installation

All four soil borings were completed as 2-inch groundwater monitoring wells. Each well is constructed with Schedule 40 PVC solid riser and a Schedule 40 PVC 0.010 machine slotted screen with a No. 0 sand pack. A bentonite seal is placed above the screened potion of each well. The well screens were installed to straddle the water table.

All wells are finished at grade with a flush mounted well box. The cement collar around the flush mounted well guards is sloped away from the well. Each well is fitted with a water tight expansion plug. Following completion, each newly installed well was developed using a peristaltic pump in an effort hydraulically connect the well with the aquifer to allow for more accurate representation of *in situ* conditions and to remove materials introduced into the well during construction. Purge water was discharged to the ground surface. Geologic Logs with well construction details can be found in ***Appendix 1***.

4.6 Site Plan

A Site Plan, ***Figure 2***, has been developed by LBG (based on a distance and elevation survey conducted by LBG and 1926, 1946 and 1959 Sanborn fire insurance maps. A Topcon AT-F6 auto level was used to perform a stadia survey to identify the location of the newly installed monitor wells with respect to existing Site and area features. Due in part to the snow and ice cover and the frozen ground, LBG spent considerable time and effort attempting to locate the existing monitoring wells. The existing site plan consisted of an out of focus aerial photograph with boring and well locations plotted in approximate locations. LBG surveyed the entire well network since the previous site plan was found to be inaccurate.

5.0 GROUNDWATER SAMPLE COLLECTION

Based on the difficulty locating wells experienced during the UST search and soil boring and monitor well installation events, LBG returned to the Site on January 25, 2010 with a jack hammer, generator, metal detectors, maps and other hand tools to search for and locate the monitor wells. MW-9 was found more than twenty feet from its mapped location and MW-12 was never located. MW-12 appeared to be located in an area where snow is plowed and may have possibly been destroyed. MW-10 was found to be damaged with its expansion plug and road box missing.

Following the January 2010 groundwater monitoring event, our client (NRPC) notified LBG and stated that MW-9 (previously installed by others) is not located on the subject Site. As per our client's request, the data collected in the field from off-Site well, MW-9, has not been included in this report. In addition, although groundwater samples were collected from MW-9 during this sampling event and submitted to the laboratory, the analytical results were not reported by the laboratory as requested.

5.1 Groundwater Elevations and Flow Direction

Depth to water measurements recorded on January 26, 2010 show a groundwater elevation difference of 14.86 feet between MW-14 and MW-101, respectively. The depth to water from the top of the PVC well ranges from 2.27 to 5.20 feet. Based on the data collected, the groundwater flow direction is interpreted to be westerly with a corresponding horizontal hydraulic gradient of 0.043 feet per foot. ***Figure 3***, Groundwater Contour Plan, shows groundwater flow, elevations, and contours. The table below further details data collected in the field.

Table 5.1- 1 Groundwater Elevations

Well Identification	Top of Casing Elevation (feet)	Total Depth of Well (feet)	Depth to Product (feet)	Depth to Water (feet)	Water Table Elevation (feet)
MW-1	90.56	12.65	ND	4.70	85.86
MW-2	84.23	12.76	ND	5.04	79.19
MW-9	NR	NR	NR	NR	NR
MW-10	85.75	9.79	ND	2.27	83.48
MW-12	NL	NL	NL	NL	NL
MW-13	84.67	11.65	ND	4.43	80.24
MW-14	82.83	12.75	ND	5.20	77.63
MW-101	94.76	12.72	ND	2.27	92.49
MW-102	94.00	11.22	ND	2.69	91.31
MW-103	91.45	8.63	ND	3.33	88.12
MW-104	91.68	9.54	ND	2.85	88.83

Notes:
1. Well elevations are referenced to an arbitrary benchmark set at 100 feet.
2. NL - not located; NM - not measured; ND - not detected; NR - not reported.
3. Data recorded are referenced to the highest point of the well casing.
4. Depth to water and product measurements were obtained with a Solinst oil / water interface probe.

5.2 Groundwater Sample Collection

On January 26th and 27th, prior to sample collection, groundwater was purged from the wells in order to obtain a representative groundwater sample using a low flow submersible pump. Once the stabilization of parameters such as temperature, turbidity,

specific conductance, oxidation reduction potential and pH occurred, samples were collected.

Purge water was discharged to the ground surface. The groundwater samples were placed in the appropriate laboratory-preserved and -provided glassware. All samples were analyzed for SVOCs by US EPA Method 8270C and select metals (iron, manganese and molybdenum). Samples from the newly installed wells MW-101, MW-102, MW-103 and MW-104 were analyzed for VOCs by US EPA Method 8260B. In addition, samples from all wells were filtered using an in-line 0.45 micron filter for dissolved metals analysis, which was to be conducted if total metals were found to exceed the VGES.

Sample glassware included 40 milliliter glass vials preserved with hydrochloric acid (HCl) for samples collected for VOC analysis, 1 liter amber glass jars were provided for samples collected for SVOC analysis, and 500 milliliter plastic containers preserved with nitric acid (HNO_3) for metals analysis. Matrix spike and duplicates, a trip blank and duplicate samples (labeled DUP, DUP1 and DUP2), were collected for Quality Assurance/Quality Control (QA/QC) purposes. All samples were transported on ice, under Chain-of-Custody to TestAmerica of South Burlington, Vermont for analysis. The SVOC analysis was subcontracted to TestAmerica of Pittsburg, Pennsylvania.

6.0 ANALYTICAL RESULTS

6.1 Soil Results

The following sections summarize the results of laboratory analyses and the complete laboratory reports are attached as ***Attachment 1*** and soil analytical results are summarized in the tables below.

The analytical data results are compared to the US EPA Region 9 PRGs for industrial properties, since the Site's future use is proposed as a multi-tiered parking garage with potential office space. If future development of the Site includes residential use, then the data should be compared to residential standards.

6.1.1 Volatile Organic Compounds

The results of the four soil boring samples, provided by TestAmerica, exhibited multiple VOCs detected above quantitation limits (QLs) for the compounds tested; however, no analytes were detected above the PRGs for industrial properties.

The soil quality results are summarized in the following table.

Table 6.1.1- 1 Soil Results - VOCs

Volatile Organic Compounds							
	Compound	Acetone	2-Butanone (MEK)	Carbon Disulfide	1,2,4-Trichlorobenzene	1,2,3-Trichlorobenzene	Total VOCs
Sample Identification	Corresponding Well ID	Concentration in mg/kg					
SB-101, 8-10'	**MW-101**	0.014	<0.00078	<0.000048	<0.000069	<0.00013	0.014
SB-101, 8-10' REP	**MW-101**	0.016	<0.00078	<0.000048	<0.000069	<0.00013	0.016
SB-102, 8-10'	**MW-102**	0.055	0.0096	<0.000048	0.00097	0.001	0.0666
SB-102, 8-10' REP	**MW-102**	0.12	0.022	0.0014	0.00099	0.00085	0.1452
SB-103, 6-8'	**MW-103**	0.014	<0.00078	0.00085	<0.000069	<0.00013	0.0149
SB-104, 6-8'	**MW-104**	0.012	<0.00078	<0.000048	<0.000069	<0.00013	0.012
SB-104, 6-8' REP	**MW-104**	0.012	<0.00078	<0.000048	<0.000069	<0.00013	0.012
Trip Blank	**--**	0.012	<0.00078	<0.000048	<0.000069	<0.00013	0.012
DUP	**MW-103**	0.011	<0.00078	<0.000048	<0.000069	<0.00013	0.011
	PRG	**54,000**	**110,000**	**720**	**220**	**NE**	

Notes: 1. All samples analyzed by US EPA Method 8260B.
2. PRG – US EPA Region 9 Preliminary Remediation Goals for Industrial Properties; bold and italicized values in heavily outlined cells exceed the PRG.
3. Concentration is reported in units of mg/kg – milligrams per kilogram.
4. NS – not sampled; NT – not tested; ND – not detected above method detection limits; NE – PRG not established.
5. VOCs – volatile organic compounds analyzed; MDLs – method detection limits.
6. DUP – duplicate sample collected from SB-103, 6-8' for QA/QC purposes.

6.1.2 Semi-Volatile Organic Compounds

The results of the four soil boring samples, provided by TestAmerica, exhibited multiple SVOCs detected above QLs for the compounds tested; however, no analytes were detected above the PRGs for industrial properties.

The soil quality results are summarized in the following table.

Table 6.1.2- 1

Semi-Volatile Organic Compounds						
Sample ID	SB-101, 8-10'	SB-102, 8-10'	SB-103, 6-8'	SB-104, 6-8'	DUP	
Corresponding Well ID	MW-101	MW-102	MW-103	MW-104	MW-103	PRG
Parameter	Concentration in mg/kg					
1,1'-Biphenyl	<0.076	0.0074*	<0.074	<0.072	<0.074	23,000
2-Methylnaphthalene	0.0075*	0.024	<0.015	<0.015	<0.015	NE
Acenapthene	<0.015	0.051	<0.015	<0.015	<0.015	29,000
Acenaphthylene	<0.015	0.009*	<0.015	<0.015	<0.015	NE
Anthracene	0.0038*	0.14	0.0034*	0.0032*	0.0031*	100,000
Benzaldehyde	<0.076	0.051*	0.047*	<0.072	<0.074	62,000
Benzo(a)anthracene	0.01*	0.20	0.009*	0.0055*	0.0079*	2.1
Benzo(a)pyrene	0.0096*	0.15	<0.015	0.005*	0.0057*	0.21
Benzo(b)fluoranthene	0.012*	0.20	0.0071*	0.007*	0.0085*	2.1
Benzo(g,h,i)perylene	0.0073*	0.077	0.0049*	<0.015	0.0053*	NE
bis(2-ethylhexyl)phthalate	0.16	0.051*	0.038*	0.03*	0.12	120
Butyl benzyl phthalate	0.11	0.10	0.10	0.088	0.12	100,000
Caprolactam	0.041*	0.022*	0.019*	0.021*	0.02*	100,000
Carbazole	0.0026*	0.07	<0.015	<0.015	<0.015	86
Chrysene	0.02	0.18	0.0068*	0.0056*	0.007*	210
Dibenzo(a,h)anthracene	<0.015	0.019	<0.015	<0.015	<0.015	0.21
Dibenzofuran	<0.076	0.046*	<0.074	<0.072	<0.074	1,600
Diethyl phthalate	0.0048*	<0.073	<0.074	<0.072	0.006*	100,000
Di-n-butyl phthalate	0.013*	0.011*	0.009*	0.01*	0.016*	NE
Fluoranthene	0.027	0.46	0.016	0.0096*	0.015	22,000
Fluorene	0.0042*	0.065	<0.015	<0.015	<0.015	26,000
Indeno(1,2,3-cd)pyrene	0.0061*	0.072	<0.015	<0.015	0.0037*	2.1
Naphthalene	0.012*	0.041	<0.015	<0.015	<0.015	190
Pentachlorophenol	<0.076	<0.073	<0.074	0.038*	<0.074	9.0
Phenanthrene	0.019	0.42	0.016	0.0094*	0.012*	NE
Pyrene	0.016	0.24	0.0098*	0.0061*	0.009*	29,000

Notes:
1. All samples analyzed by US EPA Method 8270C.
2. PRG - US EPA Region 9 Preliminary Remediation Goals for Industrial Properties; bold and italicized values in heavily outlined cells exceed the PRG.
3. Concentration is reported in units of mg/kg - milligrams per kilogram.
4. * Indicates J value, which is below the quantitation limit, but above the method detection limit and the value is an estimate.
5. DUP – duplicate sample collected from SB-103, 6-8' for QA/QC purposes.

6.1.3 Metals

The results of the four soil boring samples, provided by TestAmerica, exhibited multiple metals detected above QLs for the compounds tested; however, no analytes were detected above the PRGs for industrial properties.

The soil quality results are summarized in the following table.

Table 6.1.3- 1

Metals				
	Compound	Iron	Manganese	Molybdenum
Sample Identification	Corresponding Well ID	Concentration mg/Kg		
SB-101, 8-10'	**MW-101**	17,000	315	0.39
SB-102, 8-10'	**MW-102**	18,300	274	0.38
SB-103, 6-8'	**MW-103**	15,200	355	0.39
SB-104, 6-8'	**MW-104**	14,800	310	0.47
DUP	**MW-103**	13,700	284	0.36
	PRG	**100,000**	**19,000**	**5,100**

Notes: 1. All samples analyzed by US EPA Method 6010B.
2. PRG - US EPA Region 9 Preliminary Remediation Goals for Industrial Properties; bold and italicized values in heavily outlined cells exceed the PRG.
3. Concentration is reported in units of mg/kg - milligrams per kilogram.
4. DUP – duplicate sample collected from SB-103, 6-8' for QA/QC purposes.

6.2 Groundwater Quality Results

Groundwater data were compared to the VGES. The following sections summarize the results of laboratory analyses and the complete laboratory reports are attached as ***Attachment 1***. LBG requested that the laboratory provide "j" values to determine if multiple compounds were present above the detection limits, but below the QLs for those compounds with QLs exceeding applicable standards.

A comparison between the previous groundwater quality data (October 2008) conducted by TRC and this groundwater quality data is provided as ***Appendix 3***.

6.2.1 Volatile Organic Compounds

Of the four well samples analyzed for VOCs, all four wells (MW-101, MW-102, MW-103 and MW-104) contained detectable concentrations of one or more VOCs. However, concentrations did not exceed the VGES during this sampling event. The detected VOCs in the groundwater samples are summarized in the table below.

Table 6.2.1- 1

Well Identification	Chloromethane	Acetone	Carbon Disulfide	2-Butanone (MEK)	Trichloroethene	2-Hexanone	Total Xylenes	Total VOCs
MW-101	<1.0	20	0.62*	<5.0	0.75*	<5.0	0.27*	22
MW-101 RE	<1.0	21	0.68*	<5.0	0.65*	<5.0	0.31*	23
MW-102	0.33*	36	0.43*	3.0*	<1.0	<5.0	<2.0	40
MW-103	0.32*	8.0	<1.0	<5.0	<1.0	<5.0	<2.0	8.3
MW-104	<1.0	7.3	<1.0	<5.0	<1.0	<5.0	<2.0	7.3
DUP	0.31*	22	0.30*	<5.0	0.35*	1.8*	<2.0	25
Trip Blank	0.25*	2.3*	<1.0	<5.0	<1.0	<5.0	<2.0	2.6
Concentration in µg/L								
VGES	**3.0**	**700**	**NE**	**4,200**	**5.0**	**NE**	**10,000**	

Notes:
1. VGES - Vermont Groundwater Enforcement Standard.
2. Samples were analyzed by US EPA Method 8260B.
3. NS - not sampled; NT - not tested; ND - not detected above method detection limits; NE - VGES not established.
4. VOCs - volatile organic compounds analyzed; RE - reanalyzed.
5. Trip Blank sample collected for QA/QC.
6. DUP - duplicate sample of MW-101 collected for QA/QC.
7. Concentration is reported in units of ug/L - micrograms per liter - unless otherwise noted.

* Estimated value detected above the method detection limit and below the reporting limit.

6.2.2 Semi-Volatile Organic Compounds

The results of the groundwater samples collected from all on-Site monitor wells analyzed for SVOCs provided by TestAmerica, exhibited only one SVOC detected above the VGES for the compounds tested. Benzo(a)pyrene, a PAH compound was detected in MW-104 at a concentration exceeding the VGES. The detected SVOCs in the groundwater samples are summarized in the table below.

Table 6.2.2- 1

		Well ID									
	VGES	MW-1	MW-2	MW-10	MW-13	MW-14	MW-101	MW-102	MW-103	MW-104	DUP1
Compounds	Concentration ug/L										
Acetophenone	NE	<0.95	<0.98	0.62*	0.062*	0.067*	<0.96	0.082*	0.094*	0.11*	<0.96
Anthracene	2,100	0.013*	<0.20	0.036*	<0.20	<0.20	<0.19	<0.19	<0.19	0.096*	<0.19
Benzaldehyde	NE	<0.95	<0.98	<0.94	<1.0	<0.98	<0.96	<0.96	0.16*	0.11*	<0.96
Benzo(a)anthracene	NE	<0.19	<0.20	<0.19	<0.20	<0.20	<0.19	<0.19	<0.19	0.57	<0.19
Benzo(a)pyrene	0.2	<0.19	<0.20	<0.19	<0.20	<0.20	<0.19	<0.19	<0.19	***0.46***	<0.19
Benzo(b)fluoranthene	NE	<0.19	<0.20	<0.19	<0.20	<0.20	<0.19	<0.19	<0.19	1.2	<0.19
Benzo(g,h,i)perylene	NE	<0.19	<0.20	<0.19	<0.20	<0.20	<0.19	<0.19	<0.19	1.5	<0.19
Benzo(k)fluoranthene	NE	<0.19	<0.20	<0.19	<0.20	<0.20	<0.19	<0.19	<0.19	1.2	<0.19
bis(2-Ethylhexyl) phthalate	6.0	0.64*	0.32*	0.60*	0.37*	0.40*	3.6	0.41*	0.35*	1.1	0.47*
Butyl benzyl phthalate	NE	<0.95	0.48*	0.39*	0.46*	0.34*	1.7	1.2	1.0	1.5	1.0
Caprolactam	NE	<4.8	<4.9	<4.7	<5.0	<4.9	1.2*	0.69*	<4.8	<4.8	<4.8
Chrysene	NE	<0.19	<0.20	<0.19	<0.20	<0.20	<0.19	<0.19	<0.19	1.2	<0.19
Dibenz(a,h)anthracene	NE	<0.19	<0.20	<0.19	<0.20	<0.20	<0.19	<0.19	<0.19	1.3	<0.19
Dibenzofuran	NE	<0.95	0.057*	0.037*	0.036*	<0.98	0.047*	<0.96	<0.95	<0.95	<0.96
Diethyl phthalate	NE	<0.95	<0.98	<0.94	<1.0	<0.98	<0.96	<0.96	<0.95	0.44*	<0.96
Di-n-butyl phthalate	NE	0.084*	0.17*	0.16*	0.16*	0.13*	0.58*	0.89*	0.36*	0.43*	0.81*
Di-n-octyl phthalate	NE	<0.95	<0.98	<0.94	<1.0	<0.98	<0.96	<0.96	<0.95	0.59*	<0.96
Fluoranthene	280	0.027*	0.036*	0.16*	0.029*	<0.20	0.18*	0.050*	<0.19	0.21	0.064*
Fluorene	280	<0.19	0.040*	0.039*	0.031*	<0.20	0.044*	<0.19	<0.19	<0.19	<0.19
Indeno(1,2,3-cd)pyrene	NE	<0.19	<0.20	<0.19	<0.20	<0.20	<0.19	<0.19	<0.19	1.3	<0.19
2-Methylnaphthalene	NE	<0.19	<0.20	0.037*	<0.20	<0.20	<0.19	<0.19	<0.19	<0.19	<0.19
2-Methylphenol	NE	<0.95	<0.98	<0.94	<1.0	<0.98	<0.96	0.035*	<0.95	<0.95	<0.96
Naphthalene	20	<0.19	<0.20	0.042*	<0.20	<0.20	<0.19	<0.19	0.059*	<0.19	<0.19
Phenanthrene	NE	0.049*	0.30	0.21	0.25	0.16*	0.36	0.085*	0.13*	0.11*	0.097*
Phenol	4,000	<0.19	<0.20	<0.19	<0.20	<0.20	<0.19	0.15*	<0.19	0.22	<0.19
Pyrene	NE	0.025*	0.033*	0.13*	<0.20	<0.20	0.11*	<0.19	<0.19	0.097*	0.036*
Total SVOCs	NE	0.84	1.4	2.5	1.4	1.1	7.8	3.6	2.2	14	2.5

Notes: 1. VGES - Vermont Groundwater Enforcement Standard; bold and italicized values in heavily outlined cells exceed VGES.

2. Samples were analyzed by US EPA Method 8270C.

3. NS - not sampled; NT - not tested; ND - not detected above method detection limits; NE - VGES not established; SVOCs - semi-volatile organic compounds analyzed.

4. DUP1 - duplicate sample of MW-102 collected for QA/QC; RE - reanalyzed.

5. Concentration is reported in units of ug/L - micrograms per liter - unless noted otherwise.

* Estimated value detected above the method detection limit and below the reporting limit.

6.2.3 Metals

Total iron was detected in all sampled on-Site wells at concentrations exceeding the VGES while total manganese concentrations exceeded the VGES in the majority of the wells sampled. Molybdenum was detected above the QLs in each sample analyzed; however, concentrations were not observed to exceed the VGES. The results of the metals analysis of the groundwater samples are summarized in the table below.

Table 6.2.3- 1

Well Identification	Iron	Manganese	Molybdenum
MW-1	***644***	***6,410***	6.4
MW-2	***3,780***	80.2	19.0
MW-10	***2,840***	173	7.9
MW-13	***768***	56.6	2.5
MW-14	***3,140***	***2,430***	14.5
MW-101	***4,020***	***447***	7.5
MW-102	***2,130***	***1,340***	12.8
MW-103	***855***	***909***	5.7
MW-104	***3,300***	***497***	16.6
DUP2	***1,260***	94.3	4.4
Concentration in µg/L			
VGES	**300***	**300**	**40**

Notes: 1. VGES - Vermont Groundwater Enforcement Standard; bold and italicized values in heavily outlined cells exceed the VGES.
2. Samples were analyzed by US EPA Method 6010B for metals unless noted otherwise.
3. NT - not tested; ND - not detected above method detection limits.
4. Concentration is reported in units of ug/L - micrograms per liter - unless noted otherwise.
5. DUP2 – duplicate sample from MW-13 for QA/QC purposes.
* Value represents Vermont Secondary Groundwater Quality Standard.

Since concentrations of total iron and manganese exceeded the VGES, additional analysis of dissolved iron and manganese were requested. The results of the dissolved metals were not available at the time this report was prepared. LBG will submit the dissolved metals results under a separate cover as soon as the data is available.

7.0 QUALITY ASSURANCE/QUALITY CONTROL

7.1 Field Quality Control

The Ionscience Phocheck 1000 PID with a 10.6 eV lamp was properly calibrated to a 100 isobutylene standard referenced to benzene prior to screening.

The submersible pump used for groundwater sampling was cleaned with Liquinox® detergent and water and allowed to air dry between different sampling locations.

Prior to groundwater sample collection, the Horiba U-22 (water quality meter) and LaMotte 2020 turbidity meter were calibrated.

All samples collected, including soil and groundwater, were placed in new laboratory provided containers. Ice was added to the sample coolers and the coolers temperature remained at 4°C or lower while in the custody of LBG. These samples were received at the laboratory within 48 hours of sample collection.

7.1.1 Soil

A Trip Blank was provided by the laboratory with the glassware for the soil VOC analysis for QA/QC purposes. The Trip Blank remained in the sample cooler. The analytical results of the Trip Blank show acetone detected above the QLs. Acetone is known to be a common laboratory contaminant and was detected in the associated method blank. Acetone was also detected in every soil sample analyzed. Based on the Trip Blank analytical results, no contaminants were introduced during sample transport.

7.1.2 Groundwater

A Trip Blank was collected for QA/QC purposes for the groundwater sampling event. The Trip Blank was prepared and provided by the lab and remained in the sample cooler. The VOC analytical results of Trip Blank show acetone and chloromethane detected above the QLs. Both, acetone and chloromethane are known to be common laboratory contaminants; however, no target contaminants were detected in the method blank. Acetone was detected in every groundwater sample analyzed, while chloromethane was detected in two of the four wells as well as in the DUP. Based on the Trip Blank analytical results, acetone and chloromethane may have been introduced during sample transport or from the glassware and shipping containers originating from the lab. The analytical results indicate no other contaminants introduced during sample transport.

7.1.3 Field Notes

During subsurface activities, soils were logged in the field notebook. The field notes were reviewed following boring activities and summarized in the Geologic Logs provided in ***Appendix 1***.

Groundwater samples were collected using low flow techniques. Sample times were recorded in the field notebook and parameters that were measured in the field prior to sample collection were recorded onto pre-printed worksheets.

7.2 Laboratory Quality Control

The QA/QC sample results are reviewed to determine if the acceptance criteria was met. The trip blank is assessed for contamination introduced during transport while

the method blank is evaluated for contamination introduced at the laboratory. The surrogates and spikes are used to evaluate biases introduced at the laboratory. To evaluate precision, duplicate samples are used. Field duplicates are used for evaluation of precision after sample collection, and laboratory duplicates are used for assessing analytical precision. The field duplicates will ensure precision and that the results are accurate and therefore, the data is practical for comparison to the PRGs and VGES. During data validation, any corrective actions taken, any samples affected, and the potential effect of the actions on the validity of the data are documented.

7.2.1 Soil Results

Surrogates are used to evaluate biases introduced at the laboratory. For the soil samples analyses, the laboratory reported surrogate recoveries for the VOC and SVOC analyses. High surrogate recoveries were reported for VOC analysis of samples SB-101 (8-10'), SB-102 (8-10') and SB-104 (6-8') indicating the results may be biased high. High surrogate recoveries were also reported for SVOC analysis of samples SB-102 (8-10') and SB-104 (6-8') matrix spike duplicate (MSD) signifying the results may be biased high.

For QA/QC purposes, LBG collected additional soil samples for matrix spike / matrix spike duplicate (MS/MSD) for SVOC analysis and MS/Duplicate for metals analysis. Spikes are used to evaluate biases introduced at the laboratory. The percent recoveries for caprolactam were reported low for both MS and MSD, while percent recoveries for several SVOCs were reported high for the MSD.

Duplicate samples are used to evaluate precision. Field duplicates are used for evaluation of precision after sample collection, and laboratory duplicates are used for assessing analytical precision. The field duplicates will ensure precision and that the results are accurate and therefore, the data is practical for comparison to the applicable standard.

The duplicate sample analysis for iron and manganese of all soil samples were not within control limits indicating the potential for uncertainty. However, all iron and manganese concentrations are well below the PRGs.

A field duplicate (DUP) from SB-103, 6-8' was also collected for VOC, SVOC and metals analyses. The relative percent difference (RPD) between SB-103, 6-8' and DUP was not calculated for VOCs and SVOCs since the results were not 2x the QLs. The RPD of 10.6% was calculated for iron and manganese since these results were at least 5x the QLs. A RPD of 10.6% is within acceptance limits.

The method blank is evaluated for contamination introduced at the laboratory. Acetone and 1,2,3-trichlorobenzene was detected in the method blank; however, concentration were below the PRGs.

Calibration was reported without exceptions. In addition, the lab control samples (LCS) and LCS duplicate (LCSD) were reported within acceptance limits for the VOC, SVOC, and metals analyses.

The following table summarizes laboratory quality control results for soil samples.

Table 7.2.1- 1

Sample IDs	Compounds	Potential Bias	Data Usability
All	Acetone	High	Method Blank contaminated with acetone; however, acetone concentrations did not exceed the PRG.
SB-101, 8-10' SB-102, 8-10' SB-104, 6-8'	VOCs	High	Surrogate recoveries outside acceptance limits; however, VOC concentrations were either not detected above the MDL or did not exceed the PRG.
SB-102, 8-10' SB-104, 6-8'	SVOCs	High	Surrogate recoveries outside acceptance limits; however, SVOC concentrations were either not detected above the MDL or did not exceed the PRG.
SB-104, 6-8'	Caprolactam	Low	Low recoveries in MS/MSD. The reported result is significantly lower than PRG.
SB-104, 6-8'	4-Chloro-3-methylphenol Acenaphthene 4-Nitrophenol 2,4-Dinitrotoluene 2,4,5-Trichlorophenol Dimethyl phthalate Dibenzofuran Diethyl phthalate Fluorene 4-Nitroaniline Phenanthrene Anthracene Carbazole Di-n-butyl phthalate Fluoranthene 2,3,4,6-Tetrachlorophenol	High	High recoveries in MSD. The results are significantly lower than the PRGs. PRG has not been established for 4-Chloro-3-methylphenol or 4-Nitrophenol.
SB-104, 6-8'	Benzaldehyde	Low	Low recovery in MS. The reported result is significantly lower than PRG.

7.2.2 Groundwater Results

For the groundwater analyses, the laboratory reported surrogate recoveries for VOC and SVOC analyses were within the acceptance limits with the exception of the

reanalysis of MW-101. MW-101 was reanalyzed for VOCs due to the Internal Standard recoveries being outside acceptance criteria and the multiple surrogate recoveries were low indicating the reanalyzed VOC results may be biased low. The reanalysis of MW-101 again resulted in low recoveries for the Internal Standard confirming the suspicion that the results were indicative of the sample matrix itself; therefore, the VOC results for MW-101 may be biased high. All VOC concentrations for MW-101 were below the VGES.

For QA/QC purposes, LBG collected additional groundwater samples for MS/MSD for SVOC analysis. Spikes are used to evaluate biases introduced at the laboratory. The percent recoveries for several SVOC analytes were reported low for both MS and MSD indicating that the compounds may be biased low. The RPD between the MS and MSD was outside acceptance limits for 3,3'-dichlorobenzidine signifying the potential for uncertainty; however, 3,3'-dichlorobenzidine was not detected above the QLs in any sample. A VGES has not yet been established for 3,3'-dichlorobenzidine.

Additionally, LBG collected groundwater samples for MS/Duplicate for metals analysis. The MS recovery for iron was reported high signifying that iron concentrations may be biased high; however, iron concentrations were significantly greater than the VGES. RPDs for iron and manganese between the MS and Duplicate were reported outside acceptance limits indicating the potential for uncertainty. The iron results were well above the VGES for all samples and the majority of the manganese results were well above or below the VGES. The manganese concentrations for MW-10 and MW-101 should be used cautiously as these results were nearest the VGES.

Field duplicate samples were collected for VOC, SVOC and metals analyses. The RPD between MW-101 and DUP for acetone (the only VOC with a concentration at least 2x the QL) was calculated to be 9.5%, which is within acceptance limits. The RPD between MW-102 and DUP1 was not calculated for SVOCs since the results were not 2x the QLs. The RPD of 47% was calculated for iron and manganese since these results were at least 5x the QLs. A RPD of 47% is above acceptance limits indicating the potential for uncertainty. As mentioned above, the iron results were well above the VGES for all samples and the majority of the manganese results were well above or below the VGES. The manganese concentrations for MW-10 and MW-101 should be used cautiously as these results were nearest the VGES.

Method blanks were reported without exceptions. Calibration associated with metals analyses was reported without exceptions. Continuing calibration during VOC analysis indicated 1,4-dioxane was outside acceptance limits and continuing calibration during SVOC analysis indicated several compounds were outside acceptance limits; however, the compounds were reported within the expected performance range.

The LCS for VOC and metals analyses were within acceptance limits. For SVOCs, the LCS met acceptance limits except for benzyl alcohol; however, this is not a compound of concern.

The following table summarizes laboratory quality control results for groundwater samples.

Table 7.2.2- 1

Sample IDs	Compounds	Potential Bias	Data Usability
MW-101 RE	VOCs	Low	Surrogate recoveries outside acceptance limits; however, VOC concentrations were significantly lower than the VGES.
MW-101	4-Nitrophenol Hexachlorocyclopentadiene 3,3'-Dichlorobenzidine bis(2-Ethylhexyl) phthalate	Low	Low recoveries in MS/MSD. The reported results are significantly lower than the VGES.
MW-101	Phenol 4-Chloro-3-methylphenol	Low	Low recoveries in MS. The reported results are significantly lower than the VGES.
MW-14	Iron	High	High recoveries in MS. The results are significantly higher than the VGES.

Note: RE – reanalyzed.

7.3 Assessment/Oversight

The LBG Project Manager was either on-Site or in contact with staff on-Site to oversee all subsurface investigation activities to ensure DQO and sampling protocol outlined in the QAPP were followed. No modifications to the SOPs were noted.

The following list includes the minor changes in the scope of work due to circumstances encountered in the field and specific requests from our client.

- During the advancement of soil borings in the area of MW-9, the underground utilities marked out by the Dig Safe network identified buried natural gas and power lines in the immediate area and the St. Albans DPW indicated a water force main traversed this area as well. Additionally, overhead power lines crossed the area. Considering the underground and overhead hazards in the area LBG selected safe and accessible locations to install the wells / soil borings down gradient of MW-9. It should also be noted that MW-9 could not be located during the drilling event due to an inaccurate map.
- MW-12 could not be located during the sampling event, so samples could not be collected from this well. It is presumed that MW-12 is destroyed.
- The data collected from MW-9 has been withheld from this report at the request of our client as this well appears to be located on an adjacent property.

7.4 Data Evaluation and Usability

The field QC, laboratory QC, and assessment/oversight were evaluated as described above.

In addition, all laboratory data has been validated for the following parameters prior to acceptance:

- Correct sample identification;
- Correct reporting limits;
- Analysis within the method specified holding time;
- Acceptable detection limit multipliers;
- RPD between a sample and its duplicate, where applicable;
- Acceptable matrix spike and spike duplicates, where applicable; and,
- Acceptable surrogate recoveries, where applicable.

Copies of the LBG Data Validation Check Lists are provided as ***Appendix 4***.

All samples were received by the laboratory at 4±2° C within 48 hours of sample collection.

The laboratory data for VOC analysis of groundwater samples showed QLs for 1,2-dibromo-3-chloropropane, bromodichloromethane and cis-1,3-dichloropropene above the VGES; however, the method detection limits for these compounds were below the VGES. For all target compounds the laboratory provided "j" values to determine if compounds were present above the method detection limits, but below the QLs.

All field notes, data tables, geologic logs, were reviewed to check for duplicate re-keying of data and to identify data entry errors prior to inclusion in this report. In addition, this entire report has undergone internal LBG peer review.

The analytical results of the Trip Blank included with the soil samples analyzed for VOCs shows acetone contamination, which was also present in the method blank. Based on the Trip Blank analytical results, no contaminants were introduced during sample transport.

The analytical results of the Trip Blank included with the groundwater samples analyzed for VOCs shows acetone and chloromethane contamination. These compounds are known to be common lab contaminants, although they were not detected in the method blank. Acetone and chloromethane concentrations detected in groundwater samples were below the VGES. No other contaminants were found to be introduced during sample transport.

Several surrogate recoveries and MS/MSD were reported outside of the acceptance limits (see **Section 7.2**, above) and therefore may be biased.

The duplicate sample analysis for iron and manganese of all soil samples were not within control limits indicating the potential for uncertainty. However, all iron and manganese concentrations are well below the PRGs.

In the groundwater samples, RPDs for iron and manganese between the MS and Duplicate were reported outside acceptance limits indicating the potential for uncertainty. The iron results were well above the VGES for all samples and the majority of the manganese results were well above or below the VGES. The manganese concentrations for MW-10 and MW-101 should be used cautiously as these results were nearest the VGES.

Following our collection, testing and evaluation of all the data gathered, we believe the data to be valid and can be relied upon.

8.0 FINDINGS & CONCLUSIONS

Based on this supplemental investigation, LBG summarizes the following findings:

- Results of the physical search for 2 suspected USTs confirmed the presence of one of the USTs (UST 1 which has failed) but did not confirm the location of the second UST. The UST 1 is located against the east wall foundation of the Napoli building. LBG is unclear as to the actual property boundary in this area. The subsurface anomaly (UST 2) reported adjacent to the salon on Lake Street during the geophysical survey was likely due to a buried concrete slab and metal debris.

- Two additional USTs (UST 3 and UST 4) are suspected. UST 3 may be located near the north side of the former Napoli building and UST 4 may be located near MW-1.

- Based on the samples collected from the soil borings the subsurface soil conditions encountered within the central / eastern portion of the municipal parking lot are consistent with urban fill (sand and gravel with traces of brick and coal) over a dense gray till located at approximately 8-10 feet bgs. Bedrock in the area is described as Morses line formation – a calcareous and non-calcareous slate with local thin lenses of limestone and dolomite (Doll, 1961).

- The results of the soil samples collected from four soil borings proximate to MW-9 and for laboratory analysis of VOCs, SVOCs and select metals (iron, manganese and molybdenum) do not exhibited concentrations above the US EPA Region 9 PRGs for industrial properties for the analytes tested.

- Soil observations logged from split spoon samplers identified saturated soil from approximately 6-8 feet bgs in each boring during drilling activities. Each boring was completed as a groundwater monitoring well. Groundwater elevations measured prior to purging and sampling 11 days after well construction were much higher than observed during drilling. Groundwater flow direction has been interpreted to be westerly with a horizontal hydraulic gradient of 0.043 feet per foot.

- Following the collection of groundwater samples, the NRPC contacted LBG and requested that the data collected from MW-9 be withheld since this well may not be located on City property. The NRPC also instructed LBG to wait until further notice to re-cement MW-13.

- Groundwater samples were collected from the four newly installed wells for analysis of VOCs. Low level VOCs were detected, although no concentrations exceeded the VGES.

- Of all existing and newly installed on-Site wells sampled for SVOC analysis, benzo(a)pyrene was detected above the VGES in MW-104. This well is located in the central area of the municipal parking lot in a former automobile storage area.

- Iron was detected at concentrations exceeding the VGES in all wells sampled, while manganese was detected at concentrations exceeding the VGES in most wells. Low levels of molybdenum were detected, although concentrations were did not exceed the VGES.

In conclusion, the subsurface soil conditions encountered in the municipal parking lot during this recent supplemental investigation did not exhibit VOC, SVOC or metals concentrations above the US EPA Region 9 PRGs for industrial properties, although previously, the presence of SVOCs (five PAH compounds) and metals in soil at concentrations above the PRGs were identified on-Site at different locations. The results of this recent groundwater monitoring event showed low level VOCs, SVOCs and total metals above method QLs. A single SVOC (Benzo(a)pyrene), total iron and total manganese exceeded the VGES in groundwater. Additionally, asbestos containing materials and lead based paint were previously identified in the former Brickyard Tavern building.

Benzo(a)pyrene, a PAH compound, is typically found in areas of urban fill where coal and ash are commonly found.

Analytical results show total iron detected above the VGES across the Site and manganese detected above the VGES in several wells on-Site. Potential sources of iron and manganese on-Site may be the past use of a portion of the Site as a foundry, urban fill, and/or local geology. The bedrock in the area is described as Morses line formation – a calcareous and non-calcareous slate with local thin lenses of limestone and dolomite (Doll, 1961). According to the State of Vermont, Agency of Natural Resources, Geology and Mineral Resources Division, Vermont Geological Survey website "Vermont slates are generally black, green, purple or mottled, depending on the amounts of chlorite (green) and iron (red to purple) they contain" (State of Vermont). Additionally, "natural dolomites often contain impurities such as Mn, Fe, ..." (Wright et al., 2002), while the urban fill containing any remnants from previous foundry operations on-Site can cause elevated iron particles from corrosion. Manganese concentrations previously detected within the soil at the Site ranged from 271 to 704 mg/Kg or ppm, which are comparable

to the USGS concentrations referenced in USGS Professional Paper 1270 (Shacklette and Boerngenm, 1984) and USGS Professional Paper 1648 (Gustavsson et al., 2001). The most recent manganese concentrations detected in groundwater beneath the Site range from 0.0566 to 6.41 mg/L or ppm. Manganese concentrations detected on-Site appear to fall within the levels observed by the USGS, although manganese concentrations in groundwater were detected above the VGES.

The majority of the Site is paved with asphalt, limiting exposure to potential surface soil contaminants. A smaller gravel parking lot exists on the southern side of the Site with a layer of crushed stone. Limited exposure to potential surface soil contaminants may exist at this location. The Site is served by municipal water, so the use of and exposure to area groundwater is unlikely. The proposed future use of the Site will not increase exposure to potential subsurface contaminants as long as there is appropriate isolation from the subsurface contaminates. During construction activities, exposed soil and groundwater should be managed appropriately.

Groundwater sampling was conducted using low stress methods during both rounds of sampling, and therefore provides data representative of groundwater concentrations at the time of sampling. However, contaminant concentrations particularly inorganic constituents may fluctuate in groundwater and are governed by a host of environmental conditions, such as oxidation-reduction reactions, acid-base reactions, solution-precipitation reactions and precipitation recharge events among others. Disturbance of the subsurface materials may alter the geochemistry of certain contaminants resulting in fluctuating concentrations. Concentrations will likely fluctuate seasonally, as environmental conditions on-Site alter the solubility of contaminants, and may exceed the VGES on occasion.

9.0 RECOMMENDATIONS

LBG recommends that UST 1 be cleaned, removed and disposed of properly. Based on initial observations of this leaking tank, a subsurface investigation should be conducted to determine the degree and extent of petroleum contamination resulting from this tank. Prior to implementing the tank removal and subsurface investigation, the property boundary should be defined and site accessibility to down gradient areas for investigation of the degree and extent of contamination should be sought.

In addition, LBG recommends confirming the presence of the third suspected tanks, UST 3. However, the Site property boundaries should be defined prior to investigating these tanks to determine if they are on the subject Site.

The types of contaminates identified in the Environmental Assessments conducted at the Site are consistent with urban areas. Aside from the lead-based paint and asbestos containing materials, the available subsurface data reported to date has not identified high risk contaminates from the soil and groundwater that may warrant active remediation. However, the presence of UST 1 was confirmed and the release from this tank has reportedly impacted the soil and possible the groundwater underlying the former

Napoli Store building. Further assessment of the release from UST 1 may necessitate active remediation.

A Corrective Action Plan should be developed for areas that will be disturbed to facilitate future redevelopment. Any renovations to the former Brickyard Tavern building should be done in compliance with the requirements of OSHA 29 CFR 1910.120 (hazardous waste operations and emergency response), 29 CFR 1910.1025 (lead), 29 CFR 1926.62 (lead), 29 CFR 1910.1001 (asbestos), 29 CFR 1926.1101 (asbestos), Vermont Regulations for Asbestos Control (V.S.A. Title 18, Chapter 26) and Vermont Regulations for Lead Control (V.S.A. Title 18, Chapter 38). Future excavations may require waste stream characterization sampling and testing prior to moving any materials off-Site. Dewatering prior to excavation may also be necessary. Treatment of the groundwater removed from excavations may be required prior to discharge. A Corrective Action Plan should be prepared once the site redevelopment plans are established and all environmental assessments are complete. Design of building foundations that minimize disturbance of soil will be more cost effective in terms of environmental remediation. Sub-grade structures that require perpetual dewatering should be avoided as the discharge of the water may require pre-treatment. A Notice to Land Records regarding residual soil and groundwater contamination may be required prior to redevelopment and may also be warranted following the construction and redevelopment as the residual contamination effecting the soil and groundwater may still exist.

10.0 LIMITATIONS

No attempt was made to determine the compliance of present or former owners or operators of the Site with federal, state, or municipal environmental or land use laws or regulations.

Due to the fact that geological and soil formations are inherently random, variable and indeterminate (heterogeneous) in nature, the professional services and opinions provided by LBG under this agreement are not guaranteed to be a representation of complete Site conditions, which are subject to change with time as a result of natural or man-made processes. Although the services are extensive, findings and conclusions are limited to and by the information obtained. LBG makes no expressed or implied representations or warranties regarding any changes in condition of the premises after the dates of the respective sampling events. In addition, further subsurface investigatory methods are available that could further define the soil and groundwater conditions. Any qualitative or quantitative information regarding the Site that was not available to LBG at the time of this assessment may result in a modification of the representations made in this report.

11.0 REFERENCES

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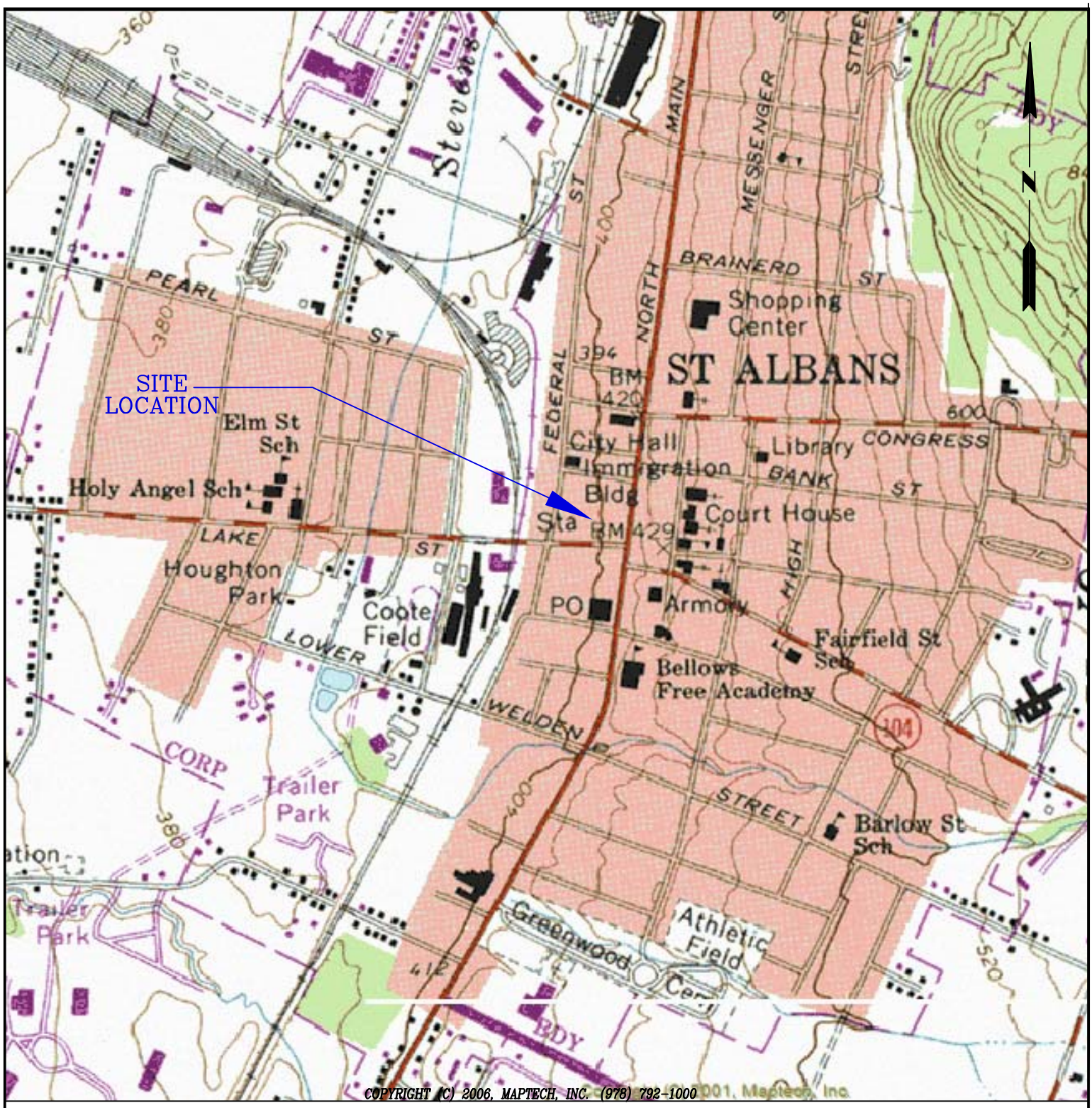
FIGURES



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SCALE IN FEET

SOURCE: United States Geological Survey 7.5 Minute Topographic Map for the St. Albans, VT Quadrangle

ST. ALBANS MUNICIPAL LOT #1 &
FORMER BRICKYARD TAVERN
ST. ALBANS, VERMONT

SITE LOCATION MAP

PREPARED BY:
LEGGETTE, BRASHEARS & GRAHAM, INC.
Professional Groundwater and Environmental Services
76 Pearl Street, Suite 203
Essex Junction, VT 05452
(802) 288-9600

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			FIGURE: 1

KINGMAN STREET

FEDERAL STREET

NORTH MAIN STREET

LAKE STREET

FORMER BRICKYARD TAVERN

MW-1 90.56

MW-2 84.23

MW-13 84.67

MW-14 82.83

UST 4

MW-102 94.00

MW-103 91.45

MW-104 91.68

MW-101 94.76

MW-9

GRAVEL

SIDEWALK

EATON'S

CHOW BELLA

DEBRIS PILE

UST 3

FORMER VARIETY STORE

MW-10 85.75

UST 1

ROYAL ORDER OF THE MOOSE

GRAVEL PARKING LOT

MW-12 (DESTROYED)

UST 2

SALON

TD BANK

P

T

LEGEND

- DUMPSTER (APPROXIMATE)
- ABANDONED UST (APPROXIMATE)
- SUSPECT ABANDONED UST (APPROXIMATE)
- ANOMALY (NOT CONFIRMED BY LBG AS UST, LOCATION APPROXIMATE)
- BURIED WATER LINE (APPROXIMATE)
- BURIED NATURAL GAS LINE (APPROXIMATE)
- BURIED POWER LINE (APPROXIMATE)
- PROPERTY LINE (APPROXIMATE)
- GUARD RAIL (APPROXIMATE)
- PAD-MOUNTED TRANSFORMER (APPROXIMATE)
- PROPANE AST (APPROXIMATE)
- GROUNDWATER MONITOR WELL WITH WELL CASING ELEVATION REFERENCED TO A TBM OF 100' (99.15')
- FORMER BUILDING (APPROXIMATE)
- UTILITY POLE (APPROXIMATE)
- OVERHEAD LINE (APPROXIMATE)
- FIRE HYDRANT (TBM)

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

REFERENCES:

1. ELEVATION AND DISTANCE SURVEY CONDUCTED BY LBG ON JANUARY 26, 2010.
2. GOOGLE EARTH (C) 2005.
3. 1926, 1946 & 1959 SANBORN FIRE INSURANCE MAPS.

NO.	DATE	DESCRIPTION	BY

ST. ALBANS MUNICIPAL LOT #1 & FORMER BRICKYARD TAVERN ST. ALBANS, VERMONT

SITE PLAN

PREPARED BY:
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76 Pearl Street, Suite 203
Essex Junction, VT 05452
(802) 288-9600

DATE: 02/02/10

FILE:Q:\EnvProj\NRPC\St.A | DRAWN BY: DDR | CHECKED BY: JRD | FIGURE: 2

KINGMAN STREET

FEDERAL STREET

NORTH MAIN STREET

LAKE STREET

FORMER BRICKYARD TAVERN

FORMER VARIETY STORE

DEBRIS PILE

UST 3

UST 1

UST 4

UST 2

ROYAL ORDER OF THE MOOSE

GRAVEL PARKING LOT

MW-12 (DESTROYED)

SALON

TD BANK

CHOW BELLA

EATON'S

GRAVEL

SIDEWALK

MW-1 85.86

MW-2 79.19

MW-9

MW-10 83.48

MW-13 80.24

MW-14 77.63

MW-101 92.49

MW-102 91.31

MW-103 88.12

MW-104 88.83

78'

80'

82'

84'

86'

88'

90'

76'

LEGEND

- DUMPSTER (APPROXIMATE)
- ABANDONED UST (APPROXIMATE)
- SUSPECT ABANDONED UST (APPROXIMATE)
- ANOMALY (NOT CONFIRMED BY LBG AS UST, LOCATION APPROXIMATE)
- BURIED WATER LINE (APPROXIMATE)
- BURIED NATURAL GAS LINE (APPROXIMATE)
- BURIED POWER LINE (APPROXIMATE)
- PROPERTY LINE (APPROXIMATE)
- GUARD RAIL (APPROXIMATE)
- PAD-MOUNTED TRANSFORMER (APPROXIMATE)
- PROPANE AST (APPROXIMATE)
- 89.15 GROUNDWATER MONITOR WELL WITH GROUNDWATER ELEVATION IN UNITS OF FEET
- FORMER BUILDING (APPROXIMATE)
- UTILITY POLE (APPROXIMATE)
- OVERHEAD LINE (APPROXIMATE)
- FIRE HYDRANT (TBM)
- 99' GROUNDWATER CONTOUR LINE
- GROUNDWATER FLOW DIRECTION

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

REFERENCES:

1. ELEVATION AND DISTANCE SURVEY CONDUCTED BY LBG ON JANUARY 26, 2010.
2. GOOGLE EARTH (C) 2005.
3. 1926, 1946 & 1959 SANBORN FIRE INSURANCE MAPS.

NO.	DATE	DESCRIPTION	BY

ST. ALBANS MUNICIPAL LOT #1 & FORMER BRICKYARD TAVERN ST. ALBANS, VERMONT

GROUNDWATER CONTOUR PLAN

JANUARY 26, 2010 DATA

PREPARED BY:
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DATE: 02/03/10

FILE:Q:\EnvProj\NRPC\St.A | DRAWN BY: DDR | CHECKED BY: JRD | FIGURE: 3

APPENDIX 1

Leggette, Brashears & Graham, Inc.
76 Pearl Street, Suite 203
Essex Junction, VT 05452
www.lbgweb.com

SITE: St. Albans Municipal Parking Lot #1 & Former Brickyard Tavern

WELL NO.: SB-101 / MW-101

GEOLOGIC LOG

SITE LOCATION: Municipal Parking Lot Kingman, Federal, Lake & N. Main Streets, St. Albans, VT	**SCREEN TYPE:** Schedule 40 PVC **DIAMETER:** 2" **SLOT NO.:** 0.010 **SETTING:** 3' – 13' bgs
DATE COMPLETED: January 15, 2010	**SAND PACK SIZE:** WG#0
	SETTING: 2'-13' bgs
DRILLING COMPANY: Crawford Drilling Services	**CASING TYPE**: Schedule 40 PVC **DIAMETER:** 2"
DRILLING METHOD: Hollow stem auger	**SETTING:** 0.25'-3' bgs
SAMPLING METHOD: Split spoon	**SEAL TYPE:** Bentonite
OBSERVER: Deirdra Ritzer	**SETTING**: 1'-2' bgs
REFERENCE POINT (RP): Top of casing	**BACKFILL TYPE**: Sand
ELEVATION OF RP: 94.76	**STATIC WATER LEVEL:** 2.27' btoc **DATE:** 1/26/10
SURFACE COMPLETION: Flush mount, well cap	**DEVELOPMENT METHOD**: Peristaltic pump
COMMENTS: btoc=below top of casing	**DURATION**: Until groundwater cleared or well ran dry.

ABBREVIATIONS: SS=split spoon W=wash C=cuttings G=grab bfg=below floor grade bgs=below ground surface EOB=End of boring

DEPTH (FEET) FROM	DEPTH (FEET) TO	SAMPLE TYPE	RECOVERY/ BLOW COUNT	PID	DESCRIPTION
0"	2'	24" Split spoon	18" / 51,21,7,5	0.9 ppmv	Used augers to drill through 3" of ASPHALT. 0" – 6" SAND, brown, gravel and angular stone, dry. 6" – 12" SAND, brown, gravel, dry. 12" – 18" SAND, dark brown, gravel.
2'	4'	24" Split spoon	12" / 3,5,4,5	0.6 ppmv	0" – 3" SILT, dark brown, some sand, little gravel, dry. 3" – 12" SAND, brown, some gravel and angular stone, loose, dry.
4'	6'	24" Split spoon	6" / 6,5,5,7	0.7 ppmv	0" – 6" SAND, brown, gravel, loose, dry.
6'	8'	24" Split spoon	18" / 10,17,15,17	0.5 ppmv	0" – 4" SAND, brown, some silt, moist. 4" – 6" SAND, brown, some gravel, trace silt, moist. 6" – 18" TILL (sand, silt, gravel), medium dense, dry to moist with depth.
8'	10'	24" Split spoon	12" / 27,58,44,64	0.5 ppmv	0" – 4" GRAVEL, stone, some sand, brown, saturated. 4" – 12" SAND, brown, some silt, trace clay, dense, saturated.

Leggette, Brashears & Graham, Inc. 76 Pearl Street, Suite 203 Essex Junction, VT 05452 www.lbgweb.com	**SITE:** St. Albans Municipal Parking Lot #1 & Former Brickyard Tavern **WELL NO.:** SB-101 / MW-101 **GEOLOGIC LOG** **PAGE:** 2 **of** 2 **PAGES**

10'	12'	24" Split spoon	20" / 22,43,60,61	0.4 ppmv	0" – 14" TILL (sand, silt, gravel), brown, dense, saturated. 14" – 20" TILL (silt, sand, gravel), grey, hard, dry.
12'	13'	24" Split spoon	NM	NM	TILL (silt, sand, gravel), grey, hard, dry. EOB.

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www.lbgweb.com

SITE: St. Albans Municipal Parking Lot #1 & Former Brickyard Tavern

WELL NO.: SB-102 / MW-102

GEOLOGIC LOG

SITE LOCATION: Municipal Parking Lot Kingman, Federal, Lake & N. Main Streets, St. Albans, VT	**SCREEN TYPE:** Schedule 40 PVC **DIAMETER:** 2" **SLOT NO.:** 0.010 **SETTING:** 2' – 12' bgs
DATE COMPLETED: January 15, 2010	**SAND PACK SIZE:** WG#0 **SETTING:** 1'-12' bgs
DRILLING COMPANY: Crawford Drilling Services	**CASING TYPE**: Schedule 40 PVC **DIAMETER:** 2"
DRILLING METHOD: Hollow stem auger	**SETTING:** 0.25'-2' bgs
SAMPLING METHOD: Split spoon	**SEAL TYPE:** Bentonite
OBSERVER: Deirdra Ritzer	**SETTING**: 0.3'-1' bgs
REFERENCE POINT (RP): Top of casing	**BACKFILL TYPE**: Sand
ELEVATION OF RP: 94.00	**STATIC WATER LEVEL:** 2.69' btoc **DATE:** 1/26/10
SURFACE COMPLETION: Flush mount, well cap	**DEVELOPMENT METHOD**: Peristaltic pump
COMMENTS: btoc=below top of casing	**DURATION**: Until groundwater cleared or well ran dry.

ABBREVIATIONS: SS=split spoon W=wash C=cuttings G=grab bfg=below floor grade bgs=below ground surface EOB=End of boring

DEPTH (FEET) FROM	DEPTH (FEET) TO	SAMPLE TYPE	RECOVERY/ BLOW COUNT	PID	DESCRIPTION
0"	2'	24" Split spoon	15" / 10,6,7,7	0.4 ppmv	Used augers to drill through 3" of ASPHALT. 0" – 15" SAND, black, gravel.
2'	4'	24" Split spoon	12" / 5,6,6,7	0.4 ppmv	0" – 2" SAND, black, gravel. 2" – 12" TILL (sand, gravel silt), tan/brown, medium dense, dry.
4'	6'	24" Split spoon	18" / 6,7,4,6	0.4 ppmv	0" – 6" SAND, black, gravel, medium dense, dry. 6" – 18" TILL (sand, silt, gravel), tan/brown, moist.
6'	8'	24" Split spoon	24" / 27,37,24,23	0.4 ppmv	0" – 10" SAND, brown, some silt, some gravel, loose, moist to wet. 10" – 24" TILL (sand, silt, gravel), brown, medium dense, moist.
8'	10'	24" Split spoon	24" / 16,28,47,48	0.6 ppmv	0" – 6" TILL (silt, sand, gravel), soft, saturated. 6" – 22" TILL (silt, sand, gravel), tan/brown, moist. 22" – 24" TILL (silt, sand, gravel), grey, dry.

Leggette, Brashears & Graham, Inc. 76 Pearl Street, Suite 203 Essex Junction, VT 05452 www.lbgweb.com	**SITE:** St. Albans Municipal Parking Lot #1 & Former Brickyard Tavern **WELL NO.:** SB-102 / MW-102 **GEOLOGIC LOG** **PAGE:** 2 **of** 2 **PAGES**

10’	12’	24” Split spoon	24” / 7,25,33,60	0.4 ppmv	0” – 4” Silty SAND, dark brown, some gravel, loose, saturated. 4” – 12” TILL (silt, sand, gravel), tan/brown, very stiff, moist to dry. 12” – 18” TILL (silt, little gravel, little sand), brown/grey, very stiff. 18” – 24” TILL, grey, hard. EOB.

Leggette, Brashears & Graham, Inc.
76 Pearl Street, Suite 203
Essex Junction, VT 05452
www.lbgweb.com

SITE: St. Albans Municipal Parking Lot #1 & Former Brickyard Tavern

WELL NO.: SB-103 / MW-103

GEOLOGIC LOG

SITE LOCATION: Municipal Parking Lot Kingman, Federal, Lake & N. Main Streets, St. Albans, VT	**SCREEN TYPE:** Schedule 40 PVC **DIAMETER:** 2" **SLOT NO.:** 0.010 **SETTING:** 3' – 9' bgs
DATE COMPLETED: January 15, 2010	**SAND PACK SIZE:** WG#0
	SETTING: 2'-9' bgs
DRILLING COMPANY: Crawford Drilling Services	**CASING TYPE**: Schedule 40 PVC **DIAMETER:** 2"
DRILLING METHOD: Hollow stem auger	**SETTING:** 0.25'-3' bgs
SAMPLING METHOD: Split spoon	**SEAL TYPE:** Bentonite
OBSERVER: Deirdra Ritzer	**SETTING**: 1'-2' bgs
REFERENCE POINT (RP): Top of casing	**BACKFILL TYPE**: Sand
ELEVATION OF RP: 91.45	**STATIC WATER LEVEL:** 3.33' btoc **DATE:** 1/26/10
SURFACE COMPLETION: Flush mount, well cap	**DEVELOPMENT METHOD**: Peristaltic pump
COMMENTS: btoc=below top of casing	**DURATION**: Until groundwater cleared or well ran dry.

ABBREVIATIONS: SS=split spoon W=wash C=cuttings G=grab bfg=below floor grade bgs=below ground surface EOB=End of boring

DEPTH (FEET) FROM	DEPTH (FEET) TO	SAMPLE TYPE	RECOVERY/ BLOW COUNT	PID	DESCRIPTION
0"	2'	24" Split spoon	18" / 12,14,8,7	0.6 ppmv	Used augers to drill through 3" of ASPHALT. 0" – 14" SAND, black, gravel. Coal cinders at 14". 14" – 17" SAND, brown. 17" – 18" SAND, coarse, orange/brown, loose.
2'	4'	24" Split spoon	11" / 3,7,7,5	0.5 ppmv	0" – 1" SAND, coarse, orange/brown, loose. 1" – 11" SAND, brown, some gravel, trace silt, loose, moist.
4'	6'	24" Split spoon	20" / 6,3,10,13	0.6 ppmv	0" – 2" GRAVEL, black, sand, cinders. 2" – 6" SAND, brown, loose, moist. 6" – 8" SAND, black, gravel, rock. 8" QUARTZ, white. 8" – 20" TILL (sand, gravel, silt), brown, loose, moist to wet.
6'	8'	24" Split spoon	22" / 20,21,23,29	0.6 ppmv	0" – 6" TILL (silt, sand, some gravel) brown, soft, saturated. 6" – 20" TILL (sand, silt, gravel), brown, dense, moist. 20" – 22" SCHIST, white.

Leggette, Brashears & Graham, Inc. 76 Pearl Street, Suite 203 Essex Junction, VT 05452 www.lbgweb.com	**SITE:** St. Albans Municipal Parking Lot #1 & Former Brickyard Tavern **WELL NO.:** SB-103 / MW-103 **GEOLOGIC LOG** **PAGE:** 2 **of** 2 **PAGES**

8'	10'	24" Split spoon	24" / 39,81,104,77	0.6 ppmv	0" – 2" GRAVEL, sand, brown, loose, saturated. 2" – 10" TILL (sand, gravel, silt), brown, very dense, moist. 10" – 24" TILL (sand, gravel, silt), brown/grey/iron mottled, very dense, dry. EOB.

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76 Pearl Street, Suite 203
Essex Junction, VT 05452
www.lbgweb.com

SITE: St. Albans Municipal Parking Lot #1 & Former Brickyard Tavern

WELL NO.: SB-104 / MW-104

GEOLOGIC LOG

SITE LOCATION: Municipal Parking Lot Kingman, Federal, Lake & N. Main Streets, St. Albans, VT	**SCREEN TYPE:** Schedule 40 PVC **DIAMETER:** 2" **SLOT NO.:** 0.010 **SETTING:** 3' – 10' bgs
DATE COMPLETED: January 15, 2010	**SAND PACK SIZE:** WG#0 **SETTING:** 2'-10' bgs
DRILLING COMPANY: Crawford Drilling Services	**CASING TYPE**: Schedule 40 PVC **DIAMETER:** 2"
DRILLING METHOD: Hollow stem auger	**SETTING:** 0.25'-3' bgs
SAMPLING METHOD: Split spoon	**SEAL TYPE:** Bentonite
OBSERVER: Deirdra Ritzer	**SETTING**: 1'-2' bgs
REFERENCE POINT (RP): Top of casing	**BACKFILL TYPE**: Sand
ELEVATION OF RP: 91.68	**STATIC WATER LEVEL:** 2.85' btoc **DATE:** 1/26/10
SURFACE COMPLETION: Flush mount, well cap	**DEVELOPMENT METHOD**: Peristaltic pump
COMMENTS: btoc=below top of casing	**DURATION**: Until groundwater cleared or well ran dry.

ABBREVIATIONS: SS=split spoon W=wash C=cuttings G=grab bfg=below floor grade bgs=below ground surface EOB=End of boring

DEPTH (FEET) FROM	DEPTH (FEET) TO	SAMPLE TYPE	RECOVERY/ BLOW COUNT	PID	DESCRIPTION
0"	2'	24" Split spoon	12" / 32,9,3,4	0.7 ppmv	Used augers to drill through 3" of ASPHALT. 0" – 12" SAND, brown, some gravel, dry. Black at bottom.
2'	4'	24" Split spoon	10" / 7,8,6,6	0.6 ppmv	0" – 4" TILL (sand, silt, gravel) brown, loose. 4" – 10" TILL (sand, silt, gravel), brown, loose, moist.
4'	6'	24" Split spoon	20" / 3,5,4,5	0.6 ppmv	0" – 2" GRAVEL, dark brown, sand, loose, dry. 2" – 6" SAND, brown, gravel, loose, dry. 6" – 12" SAND, brown, gravel, some silt, loose, moist. 12" – 20" TILL (sand silt, gravel), brown, medium dense, saturated.
6'	8'	24" Split spoon	18" / 9,25,31,23	0.8 ppmv	0" – 6" TILL (sand, silt, gravel), brown, loose, saturated. 6" – 14" TILL (sand, silt, gravel), brown, medium dense, moist. 14" SCHIST, grey. 14" – 18" TILL (sand, silt, gravel), brown, dense, dry.

Leggette, Brashears & Graham, Inc. 76 Pearl Street, Suite 203 Essex Junction, VT 05452 www.lbgweb.com	**SITE:** St. Albans Municipal Parking Lot #1 & Former Brickyard Tavern **WELL NO.:** SB-104 / MW-104 **GEOLOGIC LOG** **PAGE:** 2 **of** 2 **PAGES**

8'	10'	24" Split spoon	23" / 43,81,96,77	0.7 ppmv	0" – 4" SAND, dark brown, gravel, loose, saturated. 4" – 12" TILL (sand, silt, gravel), brown, dense, dry. 12" – 23" TILL (sand, silt, gravel), grey, very dense, dry. EOB

APPENDIX 2

St. Albans Municipal Parking Lot #1 & Former Brickyard Tavern
St. Albans, Vermont

1. Excavating test pit near MW-10, searching for suspected UST 1.

2. Petroleum contaminated soil from test pit near MW-10.

St. Albans Municipal Parking Lot #1 & Former Brickyard Tavern
St. Albans, Vermont

3. Copper lines associated with confirmed UST 1 in petroleum contaminated test pit.

4. Top of confirmed UST 1 located south of MW-10.

St. Albans Municipal Parking Lot #1 & Former Brickyard Tavern
St. Albans, Vermont

5. Top of UST 1 with plastic covering the fill pipe.

6. Test pit backfilled and orange grade stake marks the location of UST 1.

St. Albans Municipal Parking Lot #1 & Former Brickyard Tavern
St. Albans, Vermont

7. Beginning test pit excavation near MW-12, searching for suspected UST 2.

8. Concrete slab of former building in test pit adjacent to MW-12.

St. Albans Municipal Parking Lot #1 & Former Brickyard Tavern
St. Albans, Vermont

9. Building debris excavated from test pit near MW-12.

10. Excavating near MW-12, searching for suspected UST 2.

St. Albans Municipal Parking Lot #1 & Former Brickyard Tavern
St. Albans, Vermont

11. Backfilling test pit after revealing concrete slab and no signs of suspected UST 2.

12. Excavation near MW-12 completely backfilled.

St. Albans Municipal Parking Lot #1 & Former Brickyard Tavern
St. Albans, Vermont

13. Dig Safe markings indicating buried natural gas and power lines near MW-9.

14. Dig Safe markings indicating buried natural gas and power lines near MW-9.

St. Albans Municipal Parking Lot #1 & Former Brickyard Tavern
St. Albans, Vermont

15. MW-101 prior to setting road box with a concrete collar.

16. Drilling MW-102.

APPENDIX 3

SUMMARY OF GROUNDWATER QUALITY

St. Albans Municipal Parking Lot #1 & Former Brickyard Tavern
St. Albans, Vermont

		Well ID														
		MW-1		MW-2		MW-10		MW-12	MW-13		MW-14		MW-101	MW-102	MW-103	MW-104
	VGES	Oct-08	Jan-10	Oct-08	Jan-10	Oct-08	Jan-10	Oct-10	Oct-08	Jan-10	Oct-08	Jan-10	Jan-10	Jan-10	Jan-10	Jan-10
Compounds	Concentration ug/L															
Acenaphthene	NE	NS	<0.19	NS	<0.20	**0.026***	<0.19	<0.20	NS	<0.20	<0.21	<0.20	<0.19	<0.19	<0.19	<0.19
Acetophenone	NE	NS	<0.95	NS	<0.98	<1.0	**0.62***	<1.0	NS	**0.062***	**0.027***	**0.067***	<0.96	**0.082***	**0.094***	**0.11***
Anthracene	2,100	NS	**0.013***	NS	<0.20	<0.20	**0.036***	<0.20	NS	<0.20	<0.21	<0.20	<0.19	<0.19	<0.19	**0.096***
Benzaldehyde	NE	NS	<0.95	NS	<0.98	**1.3**	<0.94	**1.3**	NS	<1.0	<1.0	<0.98	<0.96	<0.96	**0.16***	**0.11***
Benzo(a)anthracene	NE	NS	<0.19	NS	<0.20	<0.20	<0.19	<0.20	NS	<0.20	<0.21	<0.20	<0.19	<0.19	<0.19	**0.57**
Benzo(a)pyrene	0.2	NS	<0.19	NS	<0.20	<0.20	<0.19	<0.20	NS	<0.20	<0.21	<0.20	<0.19	<0.19	<0.19	***0.46***
Benzo(b)fluoranthene	NE	NS	<0.19	NS	<0.20	<0.20	<0.19	<0.20	NS	<0.20	<0.21	<0.20	<0.19	<0.19	<0.19	**1.2**
Benzo(g,h,i)perylene	NE	NS	<0.19	NS	<0.20	<0.20	<0.19	<0.20	NS	<0.20	<0.21	<0.20	<0.19	<0.19	<0.19	**1.5**
Benzo(k)fluoranthene	NE	NS	<0.19	NS	<0.20	<0.20	<0.19	<0.20	NS	<0.20	<0.21	<0.20	<0.19	<0.19	<0.19	**1.2**
1,1'-Biphenyl	NE	NS	<0.95	NS	<0.98	**0.025*^**	<0.94	**0.023*^**	NS	<1.0	**0.031*^**	<0.98	<0.96	<0.96	<0.95	<0.95
bis(2-Ethylhexyl) phthalate	6.0	NS	**0.64***	NS	**0.32***	**0.21***	**0.60***	**0.30***	NS	**0.37***	<1.0	**0.40***	**3.6**	**0.41***	**0.35***	**1.1**
Butyl benzyl phthalate	NE	NS	<0.95	NS	**0.48***	<1.0	**0.39***	<1.0	NS	**0.46***	<1.0	**0.34***	**1.7**	**1.2**	**1.0**	**1.5**
Caprolactam	NE	NS	<4.8	NS	<4.9	<5.0	<4.7	<5.0	NS	<5.0	<5.2	<4.9	**1.2***	**0.69***	<4.8	<4.8
Chrysene	NE	NS	<0.19	NS	<0.20	<0.20	<0.19	<0.20	NS	<0.20	<0.21	<0.20	<0.19	<0.19	<0.19	**1.2**
Dibenz(a,h)anthracene	NE	NS	<0.19	NS	<0.20	<0.20	<0.19	<0.20	NS	<0.20	<0.21	<0.20	<0.19	<0.19	<0.19	**1.3**
Dibenzofuran	NE	NS	<0.95	NS	**0.057***	**0.040*^**	**0.037***	**0.036*^**	NS	**0.036***	**0.041*^**	<0.98	**0.047***	<0.96	<0.95	<0.95
Diethyl phthalate	NE	NS	<0.95	NS	<0.98	**0.087*^**	<0.94	**0.30*^**	NS	<1.0	**0.10*^**	<0.98	<0.96	<0.96	<0.95	**0.44***
Di-n-butyl phthalate	NE	NS	**0.084***	NS	**0.17***	**0.081*^**	**0.16***	**0.13*^**	NS	**0.16***	<1.0	**0.13***	**0.58***	**0.89***	**0.36***	**0.43***
Di-n-octyl phthalate	NE	NS	<0.95	NS	<0.98	<1.0	<0.94	<1.0	NS	<1.0	<1.0	<0.98	<0.96	<0.96	<0.95	**0.59***
Fluoranthene	280	NS	**0.027***	NS	**0.036***	<0.20	**0.16***	<0.20	NS	**0.029***	<0.21	<0.20	**0.18***	**0.050***	<0.19	**0.21**
Fluorene	280	NS	<0.19	NS	**0.040***	**0.025***	**0.039***	**0.028***	NS	**0.031***	**0.035***	<0.20	**0.044***	<0.19	<0.19	<0.19
Indeno(1,2,3-cd)pyrene	NE	NS	<0.19	NS	<0.20	<0.20	<0.19	<0.20	NS	<0.20	<0.21	<0.20	<0.19	<0.19	<0.19	**1.3**
2-Methylnaphthalene	NE	NS	<0.19	NS	<0.20	<0.20	**0.037***	<0.20	NS	<0.20	**0.016***	<0.20	<0.19	<0.19	<0.19	<0.19
2-Methylphenol	NE	NS	<0.95	NS	<0.98	<1.0	<0.94	<1.0	NS	<1.0	<1.0	<0.98	<0.96	**0.035***	<0.95	<0.95
4-Methylphenol	NE	NS	<0.95	NS	<0.98	<1.0	<0.94	<1.0	NS	<1.0	**0.021***	<0.98	<0.96	<0.96	<0.95	<0.95
Naphthalene	20	NS	<0.19	NS	<0.20	<0.20	**0.042***	<0.20	NS	<0.20	<0.21	<0.20	<0.19	<0.19	**0.059***	<0.19
2-Nitrophenol	NE	NS	<0.95	NS	<0.98	<1.0	<0.94	**0.017***	NS	<1.0	<1.0	<0.98	<0.96	<0.96	<0.95	<0.95
Phenanthrene	NE	NS	**0.049***	NS	**0.30**	**0.10*^**	**0.21**	**0.082*^**	NS	**0.25**	**0.092*^**	**0.16***	**0.36**	**0.085***	**0.13***	**0.11***
Phenol	4,000	NS	<0.19	NS	<0.20	<0.20	<0.19	<0.20	NS	<0.20	<0.21	<0.20	<0.19	**0.15***	<0.19	**0.22**
Pyrene	NE	NS	**0.025***	NS	**0.033***	<0.20	**0.13***	**0.016***	NS	<0.20	<0.21	<0.20	**0.11***	<0.19	<0.19	**0.097***
Total SVOCs	NE	NS	**0.84**	NS	**1.4**	**1.9**	**2.5**	**2.2**	NS	**1.4**	**0.4**	**1.1**	**7.8**	**3.6**	**2.2**	**14**
Antimony	6	**1.3*^**	NT	**1.4*^**	NT	**1.4*^**	NT	**1.6*^**	**1.4*^**	NT	**1.4*^**	NT	NT	NT	NT	NT
Arsenic	10	<10	NT	<10	NT	<10	NT	<10	<10	NT	<10	NT	NT	NT	NT	NT
Barium	2,000	<200	NT	<200	NT	<200	NT	**215**	<200	NT	<200	NT	NT	NT	NT	NT
Beryllium	4	<2.0	NT	<2.0	NT	<2.0	NT	<2.0	<2.0	NT	<2.0	NT	NT	NT	NT	NT
Cadmium	5	<5.0	NT	<5.0	NT	<5.0	NT	<5.0	<5.0	NT	<5.0	NT	NT	NT	NT	NT
Chromium	100	<10	NT	<10	NT	<10	NT	<10	<10	NT	<10	NT	NT	NT	NT	NT
Copper	1,300	<25	NT	<25	NT	<25	NT	<25	<25	NT	<25	NT	NT	NT	NT	NT
Iron	300	NT	***644***	NT	***3,780***	NT	***2,840***	NT	NT	***768***	NT	***3,140***	***4,020***	***2,130***	***855***	***3,300***
Lead	15	<10	NT	<10	NT	<10	NT	**11.4**	<10	NT	<10	NT	NT	NT	NT	NT
Manganese	300	***6,230***	***6,410***	**34.4**	**80.2**	***1,100***	**173**	**279**	***332***	**56.6**	***1,070***	***2,430***	***447***	***1,340***	***909***	***497***
Mercury	2	<0.20	NT	<0.20	NT	<0.20	NT	<0.20	<0.20	NT	<0.20	NT	NT	NT	NT	NT
Molybdenum	40	<10	**6.4**	<10	**19**	<10	**7.9**	***42.9***	<10	**2.5**	<10	**14.5**	**7.5**	**12.8**	**5.7**	**16.6**
Nickel	100	<40	NT	<40	NT	<40	NT	<40	<40	NT	<40	NT	NT	NT	NT	NT
Selenium	50	<35	NT	<35	NT	<35	NT	<35	<35	NT	<35	NT	NT	NT	NT	NT
Silver	100	<10	NT	<10	NT	<10	NT	<10	<10	NT	<10	NT	NT	NT	NT	NT
Zinc	5,000	<20	NT	<20	NT	<20	NT	**28.8**	<20	NT	<20	NT	NT	NT	NT	NT

Notes: 1. VGES - Vermont Groundwater Enforcement Standard; bold and italicized values in heavily outlined cells exceed the VGES; bold values are above the method detection limits.
2. Vermont Secondary Groundwater Enforcement Standard used for Iron, silver and zinc.
3. NS - not sampled; NT - not tested; ND - not detected above method detection limits; NE - VGES not established.
4. SVOCs - semi-volatile organic compounds analyzed.
5. October 2008 samples were collected & reported by TRC Environmental Corporation; January 2010 samples were collected & reported by LBG.
6. Concentration is reported in units of ug/L - micrograms per liter - unless noted otherwise.
7. * Estimated value detected above the method detection limit and below the reporting limit.
8. ^ Compound also detected in associated method blank.

APPENDIX 4

LAB DATA VALIDATION CHECK LIST

LEGGETTE, BRASHEARS & GRAHAM, INC.
76 Pearl Street, Suite 203
Essex Jct., Vermont 05452
PHONE (802) 288-9600
FAX (802) 288-9881
www.lbgweb.com

PROJECT: St. Albans Municipal Parking Lot #1 & Former Brickyard Tavern

SAMPLE DATE: 1/15/2010

DATE LAB RECEIVED SAMPLES: 1/16/2010

(SOIL)

ITEMS	YES	NO	DESCRIPTION
Correct Sample IDs	✓		
Holding Time met	✓		
Units	✓		
Method Detection Limits			
Adequate Preservation	✓		
Acceptable Matrix Spikes	✓	✓	SVOCs - SB-104 compounds out.
Acceptable Surrogate Recoveries	✓	✓	VOCs - SB-101 1 surr. out, SB-102 2 surr. out, SB-104 1 surr. out. SVOCs - SB-102 & SB-104 MSD had surr. out.
Field Blank / Trip	✓	✓	VOCs - acetone detected
DUP Relative Percent Difference (SB-103, 6-8')	✓		VOCs - carbon disulfide detected in SB-103 (estimated), not in DUP. Fe+Mn = 10.6%, VOCs not 2x QLs, SVOCs not 2x QLs

OTHER NOTES:

VOC Method Blank - acetone detected & 1,2,3-trichlorobenzene detected.

VOCs - acetone detected in all samples. 1,2,3-trichlorobenzene detected in SB-102. Internal Standard Area → CB2 low in SB-102(R), DCB low in SB-102, SB-102(R), SB-101(R) + SB-104(R)

Metals - Fe & Mn duplicate analysis outside control limits. Mn values estimated due to interference. MO values < Reporting Limit & > method detection limits in all samples. Fe & Mn duplicate analysis outside control limits for SB-104 MS/DUP.

SVOCs - wrong sample date & times. SB-102 → 2 surrogate recoveries outside limits. SB-104 → 1 surr. outside limits. SB-104 MS/MSD 18 of 80 spike recoveries outside limits. & 1 RPD outside.

CHECKED BY: Deidre Ritzer DATE: 2/17/2010

*Lab report revised & re-issued due to wrong sample dates & times for SVOCs analysis & missing dibenz(ah)anthracene for SB-104 6-8'.

LAB DATA VALIDATION CHECK LIST

LEGGETTE, BRASHEARS & GRAHAM, INC.
76 Pearl Street, Suite 203
Essex Jct., Vermont 05452
PHONE (802) 288-9600
FAX (802) 288-9881
www.lbgweb.com

PROJECT: St. Albans Municipal Parking Lot#1 & Former Brickyard Tavern

SAMPLE DATE: 1/26/2010 + 1/27/2010

DATE LAB RECEIVED SAMPLES: 1/28/2010

(GROUNDWATER)

ITEMS	YES	NO	DESCRIPTION
Correct Sample IDs	✓		
Holding Time met	✓		
Units	✓		
Method Detection Limits	✓		
Adequate Preservation	✓		
Acceptable Matrix Spikes	✓	✓	MS outside for all samples for Fe. MS for MW-101 outside limits for SVOCs.
Acceptable Surrogate Recoveries	✓	✓	MW-101 surr outside. Reanalyzed + surr continues to be outside. 8260 SVOCs look good.
Field Blank / Trip Blank	✓	✓	chloromethane + acetone found in Trip Blank.
DUP Relative Percent Difference	✓	✓	MW-101, VOCs, DUP. MW-102, SVOCs, DUP1. MW-13, Metals, DUP2. Fe+Mn RPD 47%, VOC acetone RPD 9.5%, SVOCs not calculated since results < 2x QLs.

OTHER NOTES:

Metals - MS/DUP of MW-14 RPD exceeded control criteria. For all samples the duplicate sample analysis was outside control limits for Fe+Mn and MS was outside limits for Fe.

VOCs - Continuing calibration for 1,4-dioxane outside limits of %D.

SVOCs - LCS above limits for benzyl alcohol. MS for several cmpds outside limits in MW-101. RPD out for 3,3-dichlorobenzidine (MW-101). Continuing cal. for several cmpds outside limits for %D.

CHECKED BY: Denise Ritger DATE: 3/2/2010

ATTACHMENT 1