Final Engineering Report

Buffalo Business Park

Voluntary Clean Up Program

Prepared for:

Buffalo Business Park

1800 Broadway Avenue

Buffalo, New York

Prepared by:

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1.0 PROJECT DESCRIPTION

1.1 Introduction

American Consulting Professionals of New York, PLLC (American) has prepared this Final Engineering Report (FER) to document the remedial activities that have been implemented at the Buffalo Business Park (BBP) located at 1800 Broadway Avenue in Buffalo, New York. Buffalo Business Park, acting as an Innocent Landowner, agreed to participate in the New York State Department of Environmental Conservation (NYSDEC) Voluntary Cleanup Program (VCP) and entered into a Voluntary Cleanup Agreement (VCA) for remedial investigation/remedial action under Voluntary Cleanup Site No. V00663-9 and Index No. B9-0637-03-06 (Appendix A). This VCA was initiated upon BBP's submittal of a VCA application to the NYSDEC on May 23, 2003.

A subsurface characterization was conducted at the site from 2001 until 2008 and consisted of soil, groundwater and soil vapor investigations. Soil remedial activities were completed in May of 2006 and were followed by groundwater remediation activities, consisting of pump and treat, in August of 2008, and the installation of a soil vapor intercept system in late 2008.

The following sections of this report summarize site characteristics, along with the investigative and remedial work that has been completed at the site.

1.2 Property Description

The site is located at in the Buffalo Business Park, at 1800 Broadway Avenue in Buffalo, New York (Figure 1). The boundaries of the original project area were identified in the Voluntary Cleanup Agreement (VCA Index No. B9-0637-03-06) as as, "ALL THAT TRACT OF LAND situated in the City of Buffalo, County of Erie and State of New York, being part of Lot 42, Township 11, Range 7 of the Holland Land Company's survey, and being more particularly bounded and described as follows:

- Beginning at a point on the north line of Broadway (99 feet wide, and formerly known as Batavia Street), which point is 1,380.94 feet east of the east line of Bailey Avenue (66 feet wide); thence northerly at an interior angle of 89º 41' 18" a distance of 74.40 feet to the TRUE POINT OF BEGINNING; thence easterly at an interior angle of 89º 51' 07" a distance of 190.86 feet to a point; thence northerly, along the west face of a brick building, at an interior angle of 90º 52' 19" a distance of 16.67 feet to a point; thence easterly, along the north face of a brick building, at an interior angle of 269º 06' 19" a distance of 57.01 feet to a point, thence northerly at an interior angle of 90^0 10' 15" a distance of 162.91 feet, thence westerly at an interior angle of 90º07' 58" a distance of 248.09 feet to a point; thence southerly at an interior angle of 89º52' 02" a distance of 180.81 feet to the point and place of beginning."

A survey map of the site area described in the VCA is provided as Figure 2.

The original area of the site designated as OU-1 above was a 1.004 acre area where soil contamination was found. This area was called out in the VCA. Based on data from monitoring wells MW-4, MW-3 and MW-2 collected as part of subsequent investigations it was found that there was groundwater contamination in the southwest corner of the site beyond the originally defined area. Installation of additional wells revealed that groundwater contamination was present on the adjacent property (MW-5and MW-7. Monitoring wells MW-1 and MW-6 showed that contamination did not extend eastward on the property.
Because of the presence of contaminated groundwater in the vicinity of the New York Frame building, sub-slab venting was installed in the western most part of the building. In view of this venting system and existing groundwater contamination, the original property bounds as outlined in the VCA do not cover all the area of the site requiring remediation. Accordingly, the area covered by the voluntary cleanup and the Site Management Plan (SMP) developed for the site has been expanded to encompass all remedial activities.

The boundaries of the site covered by the remedial activities and the SMP are shown on Figure 2A and are:

ALL THAT TRACT OR PARCEL OF LAND, situate in the City of Buffalo, County of Erie and State of New York, being part of Lot No. 42,Township 11, Range 7 of the Holland Land Company's Survey, bounded and described as follows;
Beginning at a point in the northerly line of Broadway (as a street 99 feet wide), a distance of 1380.94 feet easterly of the intersection of same with the easterly line of Bailey Avenue (as a street 66 feet wide), said point of beginning being the southwesterly corner of land deeded to Robert Boasberg by deed recorded in the Erie County Clerk's Office in Liber 7796 of Deeds at page 119;
Thence northerly and along the westerly line of said lands so deeded to Robert Boasberg, said line forming an exterior angle of 89°41' 18" as measured in the northwesterly quadrant with the northerly line of Broadway, a distance of 250.00 feet;

Thence easterly on a line parallel with the northerly line of Broadway and forming an interior angle of 89°41' 18" as measured in the southeasterly quadrant with the last described line, a distance of 250.00 feet;
Thence southerly on a line parallel with the westerly line of the aforementioned lands deeded to Robert Boasberg, forming an interior angle of 90°18'42" as measured in the southwesterly quadrant with the last described line, a distance of 240.49 feet to a point in the northerly line of lands acquired by the State of New York for highway purposes, designated as Map No. 3, Parcel No.3 on a map recorded in the Erie County Clerk's Office in Liber 6400 of Deeds at page 329;
Thence southwesterly and along the northerly line of the aforesaid lands, forming an interior angle of 92°31' 18" as measured in the northwesterly quadrant with the last described line, a distance of 192.41 feet to a point in the aforementioned northerly line of Broadway (as a street 99 feet wide);
Thence westerly and along said northerly line of Broadway, forming an interior angle of 177°10'00" with the last described line, a distance of 57.77 feet to the point or place of beginning.
Containing an area of 61,580± Sq. Ft. or 1.4137 ± Acres

1.3 Project Background

Project background data has been supplemented by previous draft reports provided by Golder Associates. The following reports have been relied on for information regarding site history (and are appended to this report).

- Draft: Report on Remedial Activities at Operable Unit #1, Buffalo Business Park, 1800 Broadway, Buffalo, New York; Golder Associates Inc. July 26, 2006 (Appendix B).

- Draft: Report on Remedial Activities at Operable Unit #2, Buffalo Business Park, 1800 Broadway, Buffalo, New York; Golder Associates Inc. November 2007 (Appendix C).

According to historic Sanborn maps, as described in Golder's report entitled, "Remedial Activities at Operating Unit #1; Buffalo Business Park, 1800 Broadway Avenue, Buffalo, New York; July 26, 2006", the Site and the vicinity were historically used for railroad transport/tracks associated with the Pullman Car Company from 1900 until at least 1950. Starting in 1961, the Site and vicinity were converted to the Buffalo Industrial Park, followed by conversion to the Buffalo Business Park. Golder's report is included in the Final Engineering Report for the site.

In December 1999, a Phase I Environmental Site Assessment (ESA) was reportedly completed which led to the recommendation and completion of a Phase II soil and groundwater investigation. During 2001 and 2002, additional soil and groundwater investigations were completed, consisting of the advancement of 27 test borings that subsequently were converted to 27 groundwater monitoring points (three permanent and 24 temporary). Soil and groundwater samples were collected and analyzed for volatile organic compounds (VOCs). In addition, some of these samples were also analyzed for RCRA metals and semi-volatile organic compounds (SVOCs). The investigations identified the presence of VOCs in site soils and groundwater including tetrachloroethene in soil, and tetrachloroethene, trichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene, methylene chloride and vinyl chloride in groundwater. Based on this information, the site was divided into two operable units for purposes of investigation and remediation:

- Operable Unit #1, consisting of that area of site with defined contaminated soils; and
- Operable Unit #2, consisting of that area of the site with defined groundwater contamination.

In October 2003, a remedial action work plan (RAWP) was prepared to excavate soils from Operable Unit #1 at the site, described as an area of soil contamination. This remedy proposed the excavation of impacted soils and treatment in an ex-situ soil vapor extraction system. This RAWP was submitted to the NYSDEC for review and was subsequently approved on August 10, 2005. The approved remedy was subsequently reviewed and modified to consist of excavation of contaminated soil with off-site disposal. The revised RAWP was subsequently approved by the NYSDEC on January 10, 2006.

2.0 REMEDIAL ACTIVITIES AT OPERABLE UNIT #1

Remedial activities associated with Operable Unit #1 (OU #1) consisted of the removal and disposal of contaminated soils from the site. LTP Services, Inc. acted as the on-site

agent for BBP, while Golder provided personnel to: observe and document field activities; collect soil samples; review and evaluate results of analytical testing of soil samples; and to prepare a summary of remedial activities which is included as Appendix B. Wargo Enterprises, Inc (Wargo) was contracted by BBP to provide the excavation and backfill services.

The limit of the excavation was determined by LTP/BBP based on laboratory analytical results of soil samples. BBP arranged for disposal of contaminated soils in advance of remedial activities, permits for the discharge of groundwater to the Buffalo Sewer Authority, and for the completion of site restoration activities. Based on the previous work performed, the zone targeted for excavation and off-site disposal was from 10 to 14 feet below ground surface (BGS). Excavated soils were broken into three groups:

- Shallow overburden soils with no analysis that were stockpiled on site (surface to six feet BGS);
- Medium depth overburden soils to be sampled and analyzed for impacts, also stockpiled on site (six to 10 feet BGS); and

- Presumed contaminated overburden soils directly overlying bedrock (10 to 14 feet BGS).

During the excavation activities, three abandoned municipal sewer lines were breached, causing a small volume of liquid to be discharged into the excavation. The liquid was subsequently pumped out of the excavation, and the sewer lines were repaired prior to backfilling of the excavation.

Once bedrock was encountered, confirmation samples for analysis were collected from the side walls of the excavation, and were analyzed for VOCs. Based on soil analytical results, additional excavation was completed in two areas approximately six to eight feet from the initial edge of the excavation. Confirmation soil samples were again collected from the side walls of the newly excavated areas, and analyzed for VOCs to verify that contaminated soils had been removed (Figure 3). Contaminated soils were largely removed to a level below the TAGM 4046 Recommended Soil Cleanup Objectives.

Contaminated soils were transported to the BFIWSNA Sanitary Landfill located in Niagara Falls, NY. Prior to transport, appropriate approvals were obtained by BFIWSNA from NYSDEC in accordance with the facilities Solid Waste Permit. A total of 23 tandem dump truck loads were transported for off-site disposal at the BFIWSNA facility. Copies of the manifests are provided in Appendix B of the Operable Unit #1 Remedial Report.

Following excavation activities, the clean stockpiled overburden soils in Piles #1 and #2 were placed back into the excavated pit in lifts and were compacted with a smooth drum roller. Clean, recycled, concrete fill was then placed over the soil backfill to bring the excavation up to grade. The clean concrete fill was obtained from SWIFT River Associates River Rd. facility and consisted of 2" minus recycled concrete. Copies of the backfill data is provided in Appendix E of the Operable Unit #1 Remedial Report which is attached as Appendix B of this Final Engineering Report.

The final excavation boundaries resembled an ellipse approximately 50 feet long (east-west) and 45 feet (north-south) as shown on Figure 3. Based on a 14-foot deep excavation, an estimated 920 cubic yards of soil were excavated. Based on these dimensions an estimated 400 cubic yards in Pile #1 were re-placed in the excavation; and, approximately 260 cubic yards from Pile #2 were re-placed in the excavation. Approximately 260 cubic yards were disposed of off-site. Waste manifests provided as an Appendix to the OU#1 report estimates that 460 cubic yards of soil were removed and disposed of off-site. The volume increase from in-place calculations is likely due to soil bulking during stockpiling.

Maps, tabulated analytical data, manifests, photographs, and certifications for recycled concrete are contained in Golder's July 26, 2006 report entitled, "Remedial Activities at Operating Unit #1; Buffalo Business Park, 1800 Broadway Avenue, Buffalo New York, which is attached as Appendix B.

3.0 INVESTIGATIVE ACTIVITIES AT OPERATING UNIT #2

3.1 Groundwater Investigation

In 2007, a groundwater investigation was completed to further characterize groundwater conditions as part of Operable Unit #2, and was comprised of the following scope of work:

- Installation and survey of four additional groundwater monitoring wells into bedrock;
- Develop and sample the four newly installed bedrock wells;
- Collect groundwater elevation information from the four newly installed bedrock wells and four existing bedrock wells;
- Evaluate groundwater analytical results for the four newly installed wells; and
- Prepare a site investigation/remedial alternatives report (SI/RAR) summarizing work performed with recommendations for a remedial alternative for groundwater (OU #2).

It should be noted that in selecting the location of the four new wells one of the desirable locations selected was between the front building and Broadway. Upon field investigation it was determined that the corridor between Broadway and the building was a heavily used utility corridor (Sewer, telephone, water, electric etc.) and that drilling in this area would risk disruption of services and potential damage to these utilities. The final selected location for the well in this area (MW6-BR) was selected to get as close to the utility corridor as possible. In order to install this well a special drill rig was mobilized that would enable the well to be installed inside the warehousing area of the building. The well was located as far west as possible within the building.

The four new groundwater monitoring wells were subsequently developed and sampled. Groundwater samples were analyzed for target compound list VOCs by USEPA method 8260 with NYSDEC ASP Category B deliverable reporting. Groundwater sample results were compared to New York State Ambient Water Quality Standards/Guidance Values (TOGS 1.1.1) Groundwater Action Levels.

Analytical results indicated six organic compounds were noted as exceeding TOGS 1.1.1 values in at least one sample. 1,2-dichloroethene (total), tetrachloroethene, and

trichloroethene were detected in samples VCA-MW5-BR and VCA-MW7-BR at concentrations in exceedance of TOGS 1.1.1 guidance values. 1,1-Dichloroethene and vinyl chloride were detected in sample VCA-MW-5-BR at concentrations in exceedance of TOGS 1.1.1 guidance values. Methylene chloride was detected in sample VCA-MW7-BR at concentrations in exceedance of TOGS 1.1.1 guidance values.

Golder's summary report entitled, "Draft report on Remedial Activities at Operating Unit #2, Buffalo Business Park, November 2007 is attached as Appendix C and provides a detailed discussion of the procedures that were used to install the monitoring wells, sample the wells, and the results of groundwater sampling analysis.

A potentiometric surface map was also constructed to illustrate groundwater flow conditions in the project area (Figure 4). Golder's report concluded that the groundwater table is relatively flat with a low gradient across most of the Site with flow from north to south. As groundwater approaches the southernmost portion of the Site, groundwater flow direction turns toward the southeast. The groundwater table is steeply inclined in the southeast corner of the Site with very high gradients, likely in response to the Broadway Underpass, which is approximately 15 to 20 feet lower than the Site along the southeastern corner of the Site. This area of Broadway likely acts as a groundwater sink, and therefore, contaminated groundwater from OU #2 is not likely to reach residents across Broadway Avenue.

Note: Off-site groundwater investigations were also conducted by NYSDEC in 2008 and 2009. The results of those investigations are available in a separate report.

3.2 Soil Vapor Intrusion Investigation

Per the NYSDEC approved Investigative Work Plan, a soil vapor intrusion study was also completed, consisting of:

- One sub-slab vapor sample;
- One indoor air sample; and
- One outdoor background sample.

Sample collection locations are described on Figure 5 and details of onsite conditions and methods used to complete the soil vapor intrusion study are found in Golder's draft report on remedial activities at OU #2 (Appendix C).

Twenty-seven VOCs were detected in the sub-slab sample, 23 VOCs were detected in the indoor air sample, and 15 VOCs were detected in the outdoor sample. At the time of the study, the New York State Department of Health (NYSDOH) vapor intrusion document provided guidance for seven VOCs, as described on two matrices within the 2006 NYSDOH Guidance document for vapor intrusion. There were three VOCs that were addressed by the NYSDOH vapor intrusion Matrix #1. Trichloroethene (Matrix 1) was detected in the subslab, indoor air, and outdoor air samples. cis-1,1-Dichloroethene (Matrix 2) was detected in the sub-slab sample, but was not detected in the indoor air or outdoor samples. Tetrachloroethene (Matrix 2) was detected in both the sub-slab and indoor air samples.

3.3 Qualitative Risk Assessment

A qualitative risk assessment was also completed by Golder as part of the OU #2 investigation, which concluded that:

- Contaminated soils from OU #1 were excavated from the Site, and confirmatory soil sample results indicated that contaminated soils have been removed. The excavation was backfilled with clean fill, so there should be no potential; exposure concerns associated with soils at OU #1.
- Collectively, the groundwater data indicates that the potential for exposure to contaminated groundwater north, west and south of OU #1 and OU #2 is unlikely. In addition, the likelihood of exposure to contaminated groundwater to the east of the site is unlikely, since the underpass area of Broadway Avenue appears to be a groundwater sink. However there is potential for exposure for municipal workers when working on buried utilities within the underground utilities corridor that is present along the southern property boundary just north of Broadway Avenue.
- The vapor intrusion study that was completed shows some evidence that within the westernmost section of the south site building (New York Frame), there is a potential for exposure to trichloroethene (TCE) through the inhalation of this VOC via the vapor intrusion pathway. The potential exposure is thought to be geographically very limited, since there was no TCE detected in groundwater at newly installed monitoring well VCA-MW6-BR.

3.4 Golder Report Recommendations

Golder's report recommended a second vapor intrusion sampling event that was to be conducted during the winter months. Golder also recommended no additional soil or groundwater investigation activities.

4.0 REMEDIAL ACTIVITIES AT OU #2

In December 2007, a meeting took place between the NYSDEC and BBP, wherein the NYSDEC requested additional investigative work be completed. In order to expedite completion of the voluntary cleanup activities, BBP agreed instead to implement interim remedial measures to effect control of groundwater contaminant migration, and to provide venting of the west end of the New York Frame building. Appendix E provides a copy of the Interim Remedial Measures Work Plan (LTP Services, Inc., April 2007) that was submitted to the NYSDEC for approval.

4.1 Groundwater Contaminant Levels

Upon approval of the Interim Remedial Measures Work Plan by the NYSDEC, BBP implemented a groundwater interim remedial measure consisting of:

- Additional groundwater sampling;
- Installation of a pumping system in existing groundwater monitoring well (VCA-MW4-BR);
- Ongoing groundwater pumping from VCA-MW4-BR; and
- Follow up monitoring to demonstrate contaminant control by either reduction in contamination levels, hydraulic control, or both.

The following provides details of these work elements.

Additional Sampling

Additional groundwater sampling events were completed on the following dates to assess if the IRM has been effectively containing the residual contamination:

- May, 2008;
- October 2008; and
- April 2009
- October 2009

Groundwater elevations measurements for the April 2009 sampling event are presented in Table 1 and on Figure 8 at the end of this report. The field data is available in Appendix D. Three key VOCs are present in MW4-BR (cis-1,2-dichloroethene, Trichloroethene, and Tetrachloroethene). These three compounds have historically been present at the highest concentrations of all detected VOCs, and are part of the chlorinated solvent decomposition process. These compounds are considered indicator compounds when evaluating for the effectiveness of the IRM. Comparison of the three VOCs indicates a general reduction in concentrations as summarized in Table 4.1 below. A summary of all detected compound concentrations is presented in Table 2 at the end of this report. The laboratory analytical report for April 2009 is provided in Appendix F.

Table 4.1

	Before GW Pumping	**Before GW Pumping**	**After GW Pumping**	**After GW Pumping**
Location Identifier	MW4-BR	MW4-BR	MW4-BR	MW4-BR
Sample Date	2/15/2006	5/1/2008	10/13/2008	4/13/2009
Compound				
cis-1,2-dichloroethene	1,400	1,000	620	630
Trichloroethene	3,600	3,500	980	1,400
Tetrachloroethene	30,000	31,000	4,300	14,000

All concentrations are reported in ug/L.

The results of the groundwater analysis indicate that the system has been effective in containing the residual contamination on-site. The two sampling events prior to implementing the IRM indicated the following average contaminant concentrations:

- 1,200 ug/L cis-1,2-dichloroethene
- 3,550 ug/L Trichloroethene
- 30,500 ug/L Tetrachloroethene

The average contaminant concentrations of the same compounds in the last two sampling events following IRM were:

- 625 ug/L cis-1,2-dichloroethene (a 48% reduction)
- 1,190 ug/L Trichloroethene (a 66.5% reduction)
- 9,150 ug/L Tetrachloroethene (a 70% reduction)

A review of data for well MW-2 BR showed that there was a decrease of contaminant levels from 2004 to 2006 (without any pumping) and an increase in contaminant levels from 2006 to 2009 (after pumping had begun). It is not uncommon to see variability in groundwater contamination levels in bedrock pumping systems for wells that are located some distance from the pumping well. Because of the noted increase in levels, an additional sample was taken on 10/2/2009. Results for this sample showed a decrease in contaminant levels, although not to the levels shown in the 2006 sampling but close to the levels found in the results from 9/17/2004. Because of this variability in contaminant levels and to further assure that any residual contamination in the vicinity of MW2-BR would be controlled, it was determined that MW2-BR would be converted into a pumping well (see section 4.3.2 below).

Table 4.2

	Before GW Pumping	**Before GW Pumping**	**After GW Pumping**	**After GW Pumping**
Location Identifier	MW2-BR	MW2-BR	MW2-BR	MW2-BR
Sample Date	9/17/2004	2/15/2006	4/13/2009	10/2/2009
Compound				
cis-1,2-dichloroethene	ND	ND	ND	ND
Trichloroethene	ND	30	75	64
Tetrachloroethene	4,600	2,600	9,600	5,200

Note: Detection limits for the 9/17/2004 sampling event were 500ug/L

4.2 Installation/Operation of Pumping System

4.2.1 Installation in Monitoring Well VCA-MW4-BR

BBP converted groundwater monitoring well VCA-MW4-BR into a pumping well on August 7, 2008. The following work elements were implemented to convert VCA-MW4-BR into a pumping well:

- The area around the well was excavated and a precast vault was installed around the well;
- A submersible pump (Grundfos REDI-FLO3-100) and associated controller was installed in the well (Figure 6);
- A discharge line with a totalizer was installed from the pumping well to a location at the northwest corner of the New York Frame building where a Buffalo Sewer Authority manhole is available (Figure 7); and
- A discharge permit from the Buffalo Sewer Authority (dated August 11, 2008) was acquired for purposes of discharging groundwater to the Buffalo sewer system.

The pumping system was adjusted to achieve a maximum sustainable pumping rate from the well. Since installation the system has pumped an average of 460 gallons per day, or 0.32 gallons per minute. Groundwater analytical results from the pumping well suggest that groundwater contamination is decreasing, as shown on Table 4.1 above.

Groundwater table information suggests that pumping activities at VCA-MW4-BR are capturing contaminated groundwater in the southwest corner of the Site. Using groundwater table elevation information for October 2008, a potentiometric surface map was constructed that shows a cone of depression in the water table from groundwater pumping activities at VCA-MW4-BR. When compared to the potentiometric surface prior to pumping activities, Figure 8 shows groundwater capture along the western site boundary, as well as capture of contamination from the area of OU #1, both areas of the site with the highest concentrations of groundwater contamination.

4.2.2 Installation in Monitoring Well VCA-MW2-BR

Although the potentiometric contour map clearly shows capture in the vicinity of MW-4BR, the contour lines also show there is a small potential for groundwater to cross the site property line between MW2-BR and MW3-BR. Because of this small potential, coupled with the variability of contaminant concentrations at MW2-BR (i.e. increase after initiation of pumping and subsequent decrease) Buffalo Business Park has elected to convert MW2-BR into a pumping well with the same configuration and pump as MW4-BR. Installation of a pump will be accomplished as described in section 4.3.1 above. MW2-BR will be operated in a fashion similar to MW4-BR. Construction activities for the MW2-BR conversion has been complete in December of 2009.

4.2.3 Installation of new Monitoring Well VCA-MW5A-BR

Although the potentiometric contour map clearly shows capture in the vicinity of MW-4BR, the available data is not conclusive with regard to contaminant levels downgradient of MW4-BR. To address this uncertainty, Buffalo Business Park has elected to install an additional bedrock well (MW5A-BR) in the same hydraulic horizon as MW2-BR and MW4-BR. It will be operated as a pumping well with the same configuration and pump as MW4-BR and will be operated in a fashion similar to MW4-BR. MW5A-BR will be located approximately 15 to 20 feet due east of MW5-BR as shown in Figure 11. It is anticipated that the installation of this additional well will provide highly effective capture of any contaminated groundwater along the western and southwestern property line of Buffalo Business Park property.

Installation of the new well and associated pumping appurtenances has been completed in October, 2010.

An operation and maintenance plan for the groundwater pumping system was also provided as part of the Interim Remedial Work Plan (Attachment III of Appendix E)

4.3 Installation of the Vapor Intercept System

A sub slab depressurization system was installed in the western end of the New York frame building consisting of two active vents approximately equidistant from the north and south walls of the building and spaced approximately 60 and 120 feet east of the west wall of the building (Figure 9).

Each vent is comprised of a four-inch hole through the concrete floor slab that is extended approximately one-foot below the slab. Once drilled, the one-foot distance below the slab was filled with #1 washed stone. A four-inch PVC pipe was then installed in the hole and run through the suspended ceiling. The joint between the concrete slab and the PVC was then sealed with silicone adhesive sealant (Figure 10). A Festa Radon technology extraction fan (Model AMG Fury) was then installed above the ceiling and below the roof line. The outlet of the extraction fan was then connected to another four-inch PVC pipe which penetrates the roof. A 180º elbow was installed at the end of the PVC pipe to prevent rain intrusion. Details of the vapor intercept system are included as part of Appendix E, Attachment II.

SUMMARY AND CONCLUSIONS

Buffalo Business Park has addressed the required elements of the Voluntary Cleanup Agreement by completing the following:

- Removal of the on site source of soil and groundwater by excavation and disposal of contaminated soils located on site at OU #1;
- Characterization of on site groundwater contamination. Installation of a total of three (3) groundwater pumping wells to capture contaminated groundwater and discharge captured groundwater for treatment via the Buffalo Sewer system; and
- Installation of a sub slab vapor intercept system in the western part of the New York Frame building to protect occupants from potential inhalation of volatile organic compounds.

Furthermore, BBP's operation of the IRM pumping system is achieving its goal of:

1. Containment control of contaminants;
2. Reduction of contaminant levels; and
3. Providing hydraulic control of the groundwater beneath the site.

The installation of two additional pumping wells (MW2-BR and MW-5ABR)has further acted to control groundwater and prevent contamination from leaving the BBP site.

RECOMMENDATIONS

American recommends the following activities as a result of the data that is presented in this report:

1. Continue to operate both the groundwater pumping system and the vapor extraction system on an ongoing basis; and
2. Complete annual groundwater sampling and elevation monitoring on an ongoing basis (completed per the protocol in the IRM).
3. If the sample of VCA-MW4-BR shows continued reduction of contaminant levels, BBP may conduct another round of samples of the sub-slab air quality to determine if operation of the depressurization system is necessary.

The annual groundwater sampling and groundwater elevation measurements will be reviewed to confirm that:

1. There is no increase in contaminant levels; and
2. Groundwater capture along the western site boundary between VCA-MW4-BR, VCAMW2-BR,VCA-MW3-BR, VCA-MW5-BR and VCA-MW5A-BR is still being achieved.

A Site Management Plan for operation of the pumping system is provided as a separate document. Annually, BBP will evaluate the status of the pumping system and subsurface conditions to determine if the continual operation of the pumping system is necessary. BBP will notify the NYSDEC of its operation request at that time.

6.0 ENGINEER'S CERTIFICATION

Please note that initial site work and assessment was completed by Golder Associates, Inc. in conjunction with NYSDEC oversight of the project under the V.C.P. program. Golder has provided the documentation of this work in Draft Reports. As such the conclusions of the reports cannot be specifically relied upon; however the data collected during these activities has been used to help develop the conclusions of this certification. The data demonstrates that the remediation requirements set forth for the site have been achieved:

- That contaminated soils in Operable Unit #1 have been removed to a level substantially in compliance with NYSDEC clean-up levels.
- A ground water pump system has been installed at well VCA-MW4-BR. Pumped groundwater is discharged to the City of Buffalo Sewer System under permit #08-03-BU124. Pumping is resulting in a decrease in the levels of contaminants in the groundwater. To assure effective capture BBP has converted MW2-BR into a pumping well and has installed an additional pumping well (MW5A-BR) in the vicinity of MW5-BR. Pumping of these three wells achieves the objective of containing groundwater contaminants in the vicinity of OU#1 and is expected to reduce contaminants to acceptable levels.
- A vapor interception system has been installed consisting of two active vents in the New York Frame building which are discharging vapors to the atmosphere.

In accordance with article 145 of Education law to practice the profession of engineering;

"I, Frank Shattuck, residing at 9288 Sauer Rd., Eden, New York, 14057 am a licensed and registered professional engineer in New York State. I certify that the remedial work was implemented and that all construction activities were completed in substantial conformance with the Department approved Interim Remedial Measure Plan.

The data submitted to the Department demonstrates that the remediation requirements set forth in the Interim Remedial Measures plan and any other relevant provisions of ECL 27-1419 have been or will be achieved in accordance with the time frames, if any, established in the Interim Remedial Measures plan.

A site management plan in the format specified by the NYSDEC has been approved by the NYSDEC for the continual and proper operation, maintenance, and monitoring of any engineering controls employed at the site including the proper maintenance of any remaining monitoring wells."

Signed: Frank Shattuck, PE

Frank Shattuck, PE 1/27/11

TABLES

TABLE 1
GROUNDWATER ELEVATION MEASUREMENTS
BUFFALO BUSINESS PARK/VCP

LOCATION ID	NORTHING	EASTING	MEAS.POINT(RISER) ELEV. (FT)	DATE	DEPTH TO WATER (FT)	GROUNDWATER ELEVATION (FT)
MW1-BR	1056088.4	1088090.7	624.44	04/13/09	5.71	618.73
MW2-BR	1056103.7	1087873.3	625.04	04/13/09	6.62	618.42
MW3-BR	1056031.5	1087884.1	623.99	04/13/09	8.06	615.93
MW4-BR	1055985.2	1087914.9	622.79	04/13/09	15.68	607.11
MW5-BR	1055924.8	1087863.1	622.42	04/13/09	7.44	614.98
MW6-BR	1055978.3	1088137.5	623.57	04/13/09	10.14	613.43
MW7-BR	1056043	1087797.6	623.34	04/13/09	7.42	615.92
MW8-BR	1056167.7	1087808.4	625.87	04/13/09	8.19	617.68

TABLE 2

SUMMARY OF DETECTED GROUNDWATER RESULTS- APRIL 2009

BUFFALO BUSINESS PARK/VCP

Location ID			MW1-BR	MW2-BR	MW3-BR	MW4-BR	MW4-BR	MW5-BR	MW6-BR	MW7-BR	MW8-BR
Field Sample ID			MW1-BR	MW2-BR	MW3-BR	MW4-BR-DUP	MW4-BR	MW5-BR	MW6-BR	MW7-BR	MW8-BR
Matrix			WG	WG	WG	WG	WG	WG	WG	WG	WG
Sample Depth (ft)			-	-	-	-	-	-	-	-	-
Logdate			04/13/09	04/13/09	04/13/09	04/13/09	04/13/09	04/13/09	04/13/09	04/13/09	04/13/09
Parameter	Units	Criteria									
Volatile Organic Compounds											
1,1-Dichloroethene	ug/l	5		3.2 J		**6.7**		**17**			
1,2-Dichloroethene (cis)	ug/l	5	**87**	**11**	**620**	**600**	**630**	**1,100**	3.5 J	**5.6**	
1,2-Dichloroethene (trans)	ug/l	5	3.6 J		**12 J**	**39**	**38 J**	**48**		0.28 J	
Benzene	ug/l	1		0.32 J							
Carbon disulfide	ug/l	60		0.94 J		0.56 J		0.37 J	0.24 J		0.66 J
Cyclohexane	ug/l	-		69						0.58 J	0.62 J
Ethylbenzene	ug/l	5		1.2 J		0.47 J		0.57 J			
Methylcyclohexane	ug/l	-		26							0.51 J
Methylene chloride	ug/l	5			**70**		**250**				
Tetrachloroethene	ug/l	5		**9,600**	**2,200 M**	**14,000**	**13,000**	**15,000**		3.1 J	0.76 J
Toluene	ug/l	5		1.4 J		1.3 J		1.5 J			
Trichloroethene	ug/l	5	**22**	**78**	**570**	**1,400**	**1,400**			3.4 J	
Vinyl chloride	ug/l	2	**7**		**130**	**70**	**85 J**	**260**		0.98 J	
Xylene (total)	ug/l	5		1.7 J		0.87 J		1.1 J			

Notes:

ug/l- micrograms per liter

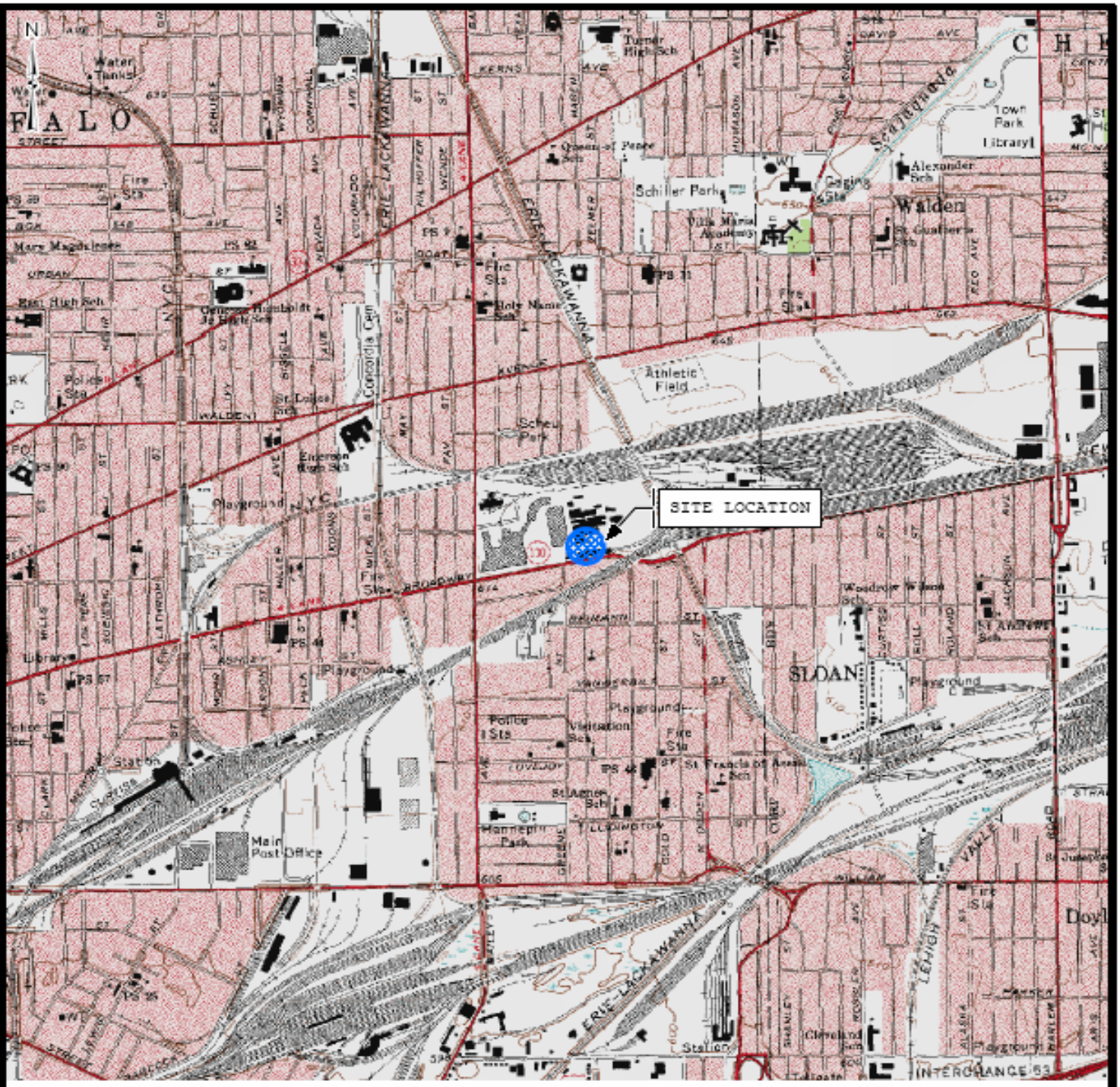
Only Detected Results Reported

Concentration Exceeds Criteria

Criteria- NYDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidence Values and Groundwater Effluent Limitations, April 2000, Class GA.

FIGURES

Figure 1- Site Location Map



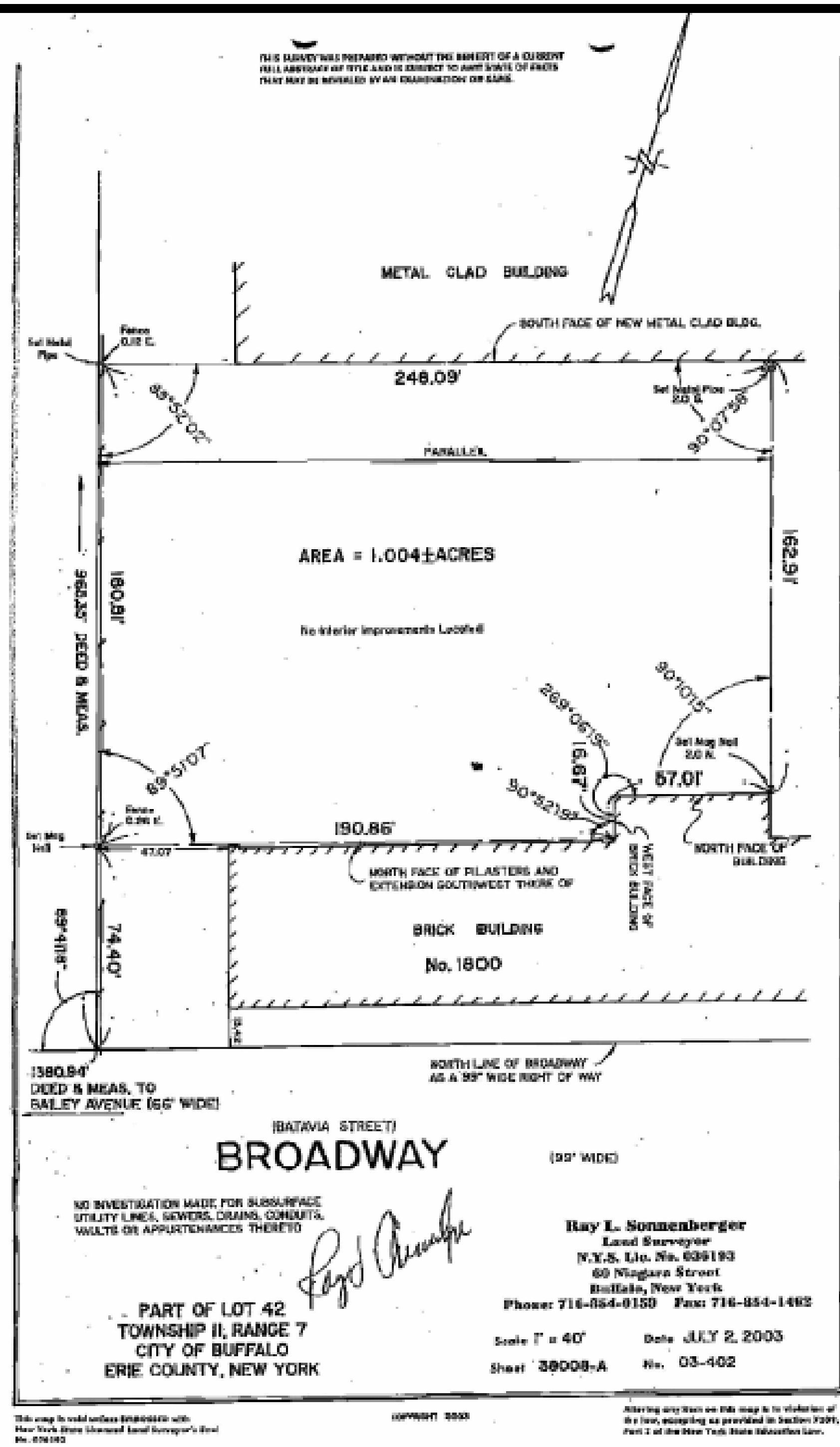
SOURCE: USGS 7.5' Quadrangle - Buffalo NE, New York - 1985.

0 1,000 2,000 4,000 Feet

BUFFALO BUSINESS PARK	SITE LOCATION MAP	
American Consulting Professionals of New York, PLLC	BUFFALO BUSINESS PARK/VCP	FIGURE 1

ACP-NY F:\PROJECTS\50k\0037 BBP\GIS\ArcMap\SiteLocation.mxd Date: 8/11/2008 4:47 AM Name: Smoake

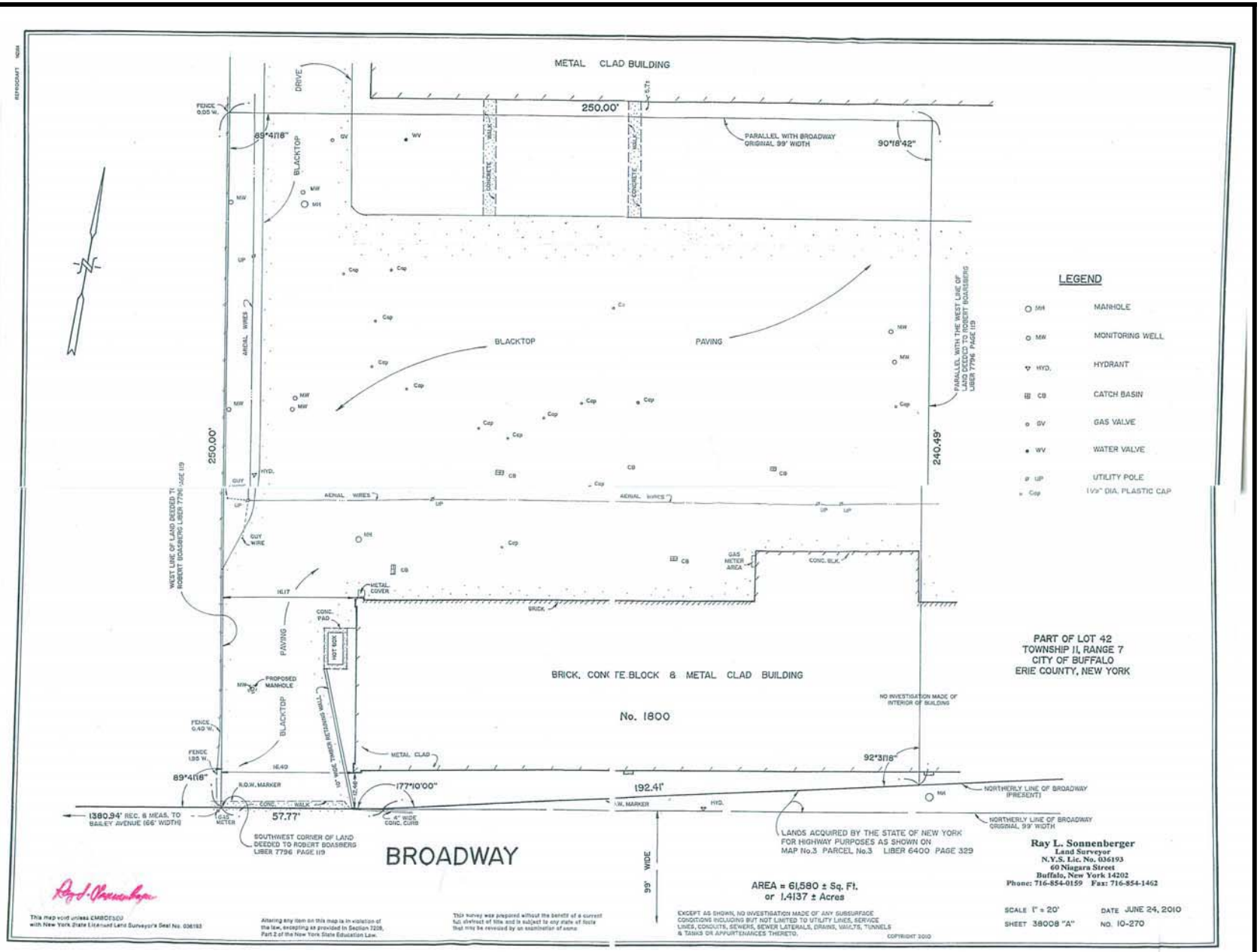
Figure 2- VCA Site Map



SOURCE: Brownfields Site Cleanup Agreement (BSCA) - 2003.

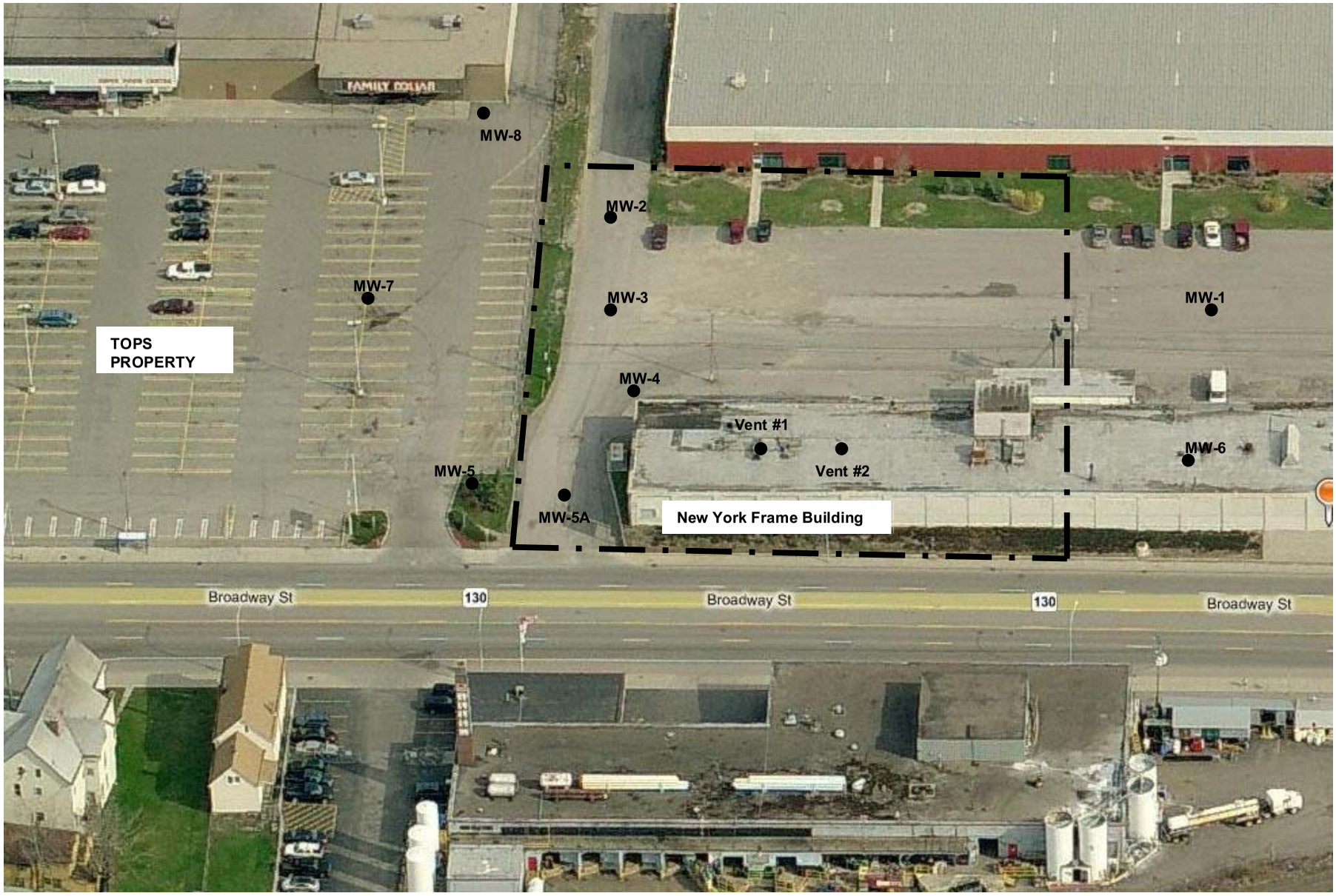
BUFFALO BUSINESS PARK	SITE MAP	
American Consulting Professionals of New York, PLLC	BUFFALO BUSINESS PARK/VCP	FIGURE 2

Figure 2A- Area Subject to SMP and Deed Restriction



Buffalo Business Park	Survey of Area Subject to Deed Restriction	
	BUFFALO BUSINESS PARK/VCP	Figure 2A

Figure 2B- Aerial Photograph of Area Subject to SMP and Deed Restriction



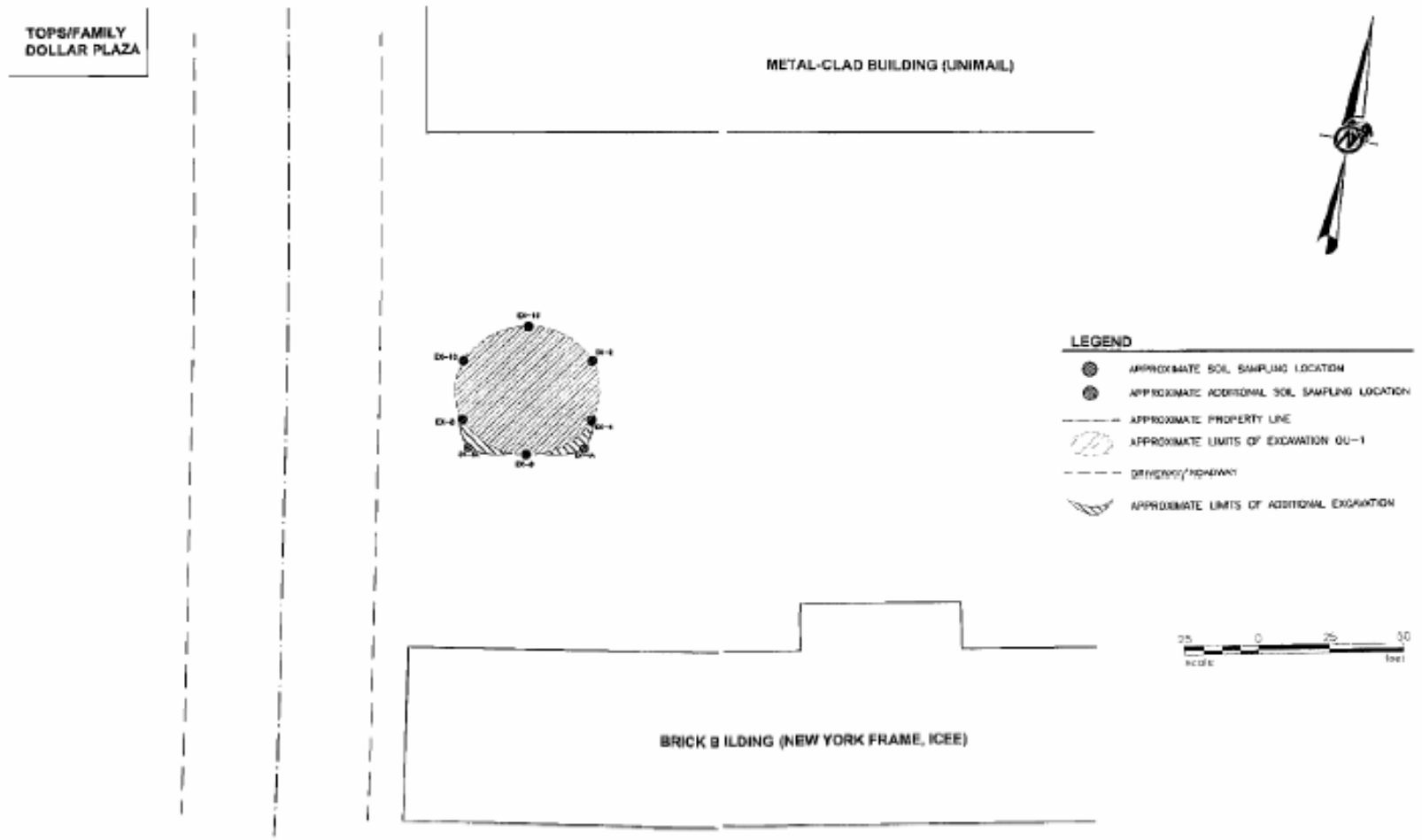
MW-7 Well/ Building Vent

Limits On-Site OU#2

Figure 2B

Figure 3- Limits of Excavation and Confirmation Sampling Locations

ACP-NY F:\PROJECT\509NY037_BBP\GIS\ArcMap\SamplingLocations.mxd Date: 8/11/2009 8:47:34 AM Name: Smccabe

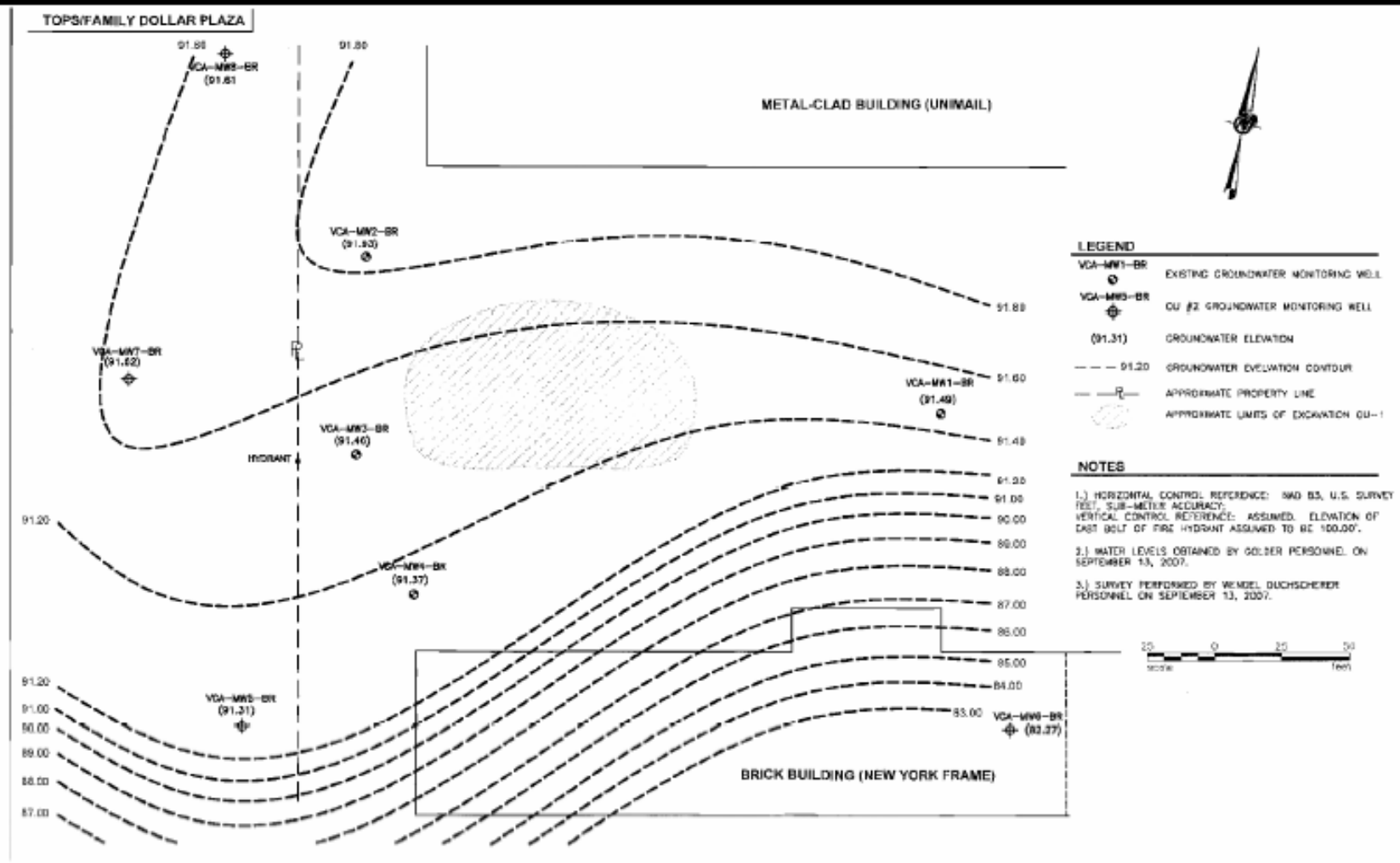


SOURCE: Remedial Activities at Operating Unit #1 - Golder Associates Inc. (July 2006).

BUFFALO BUSINESS PARK	LIMITS OF EXCAVATION AND CONFIRMATION SAMPLING LOCATIONS	
American Consulting Professionals of New York, PLLC	BUFFALO BUSINESS PARK/VCP	FIGURE 3

Figure 4- Groundwater Potentiometric Surface – OU #2 (Prior to Pumping)

ACP-NY F:\PROJECT\609NY037_BBP\GIS\ArcMap\GroundwaterContours.mxd Date: 8/11/2009 9:48:50 AM Name: Smccabe

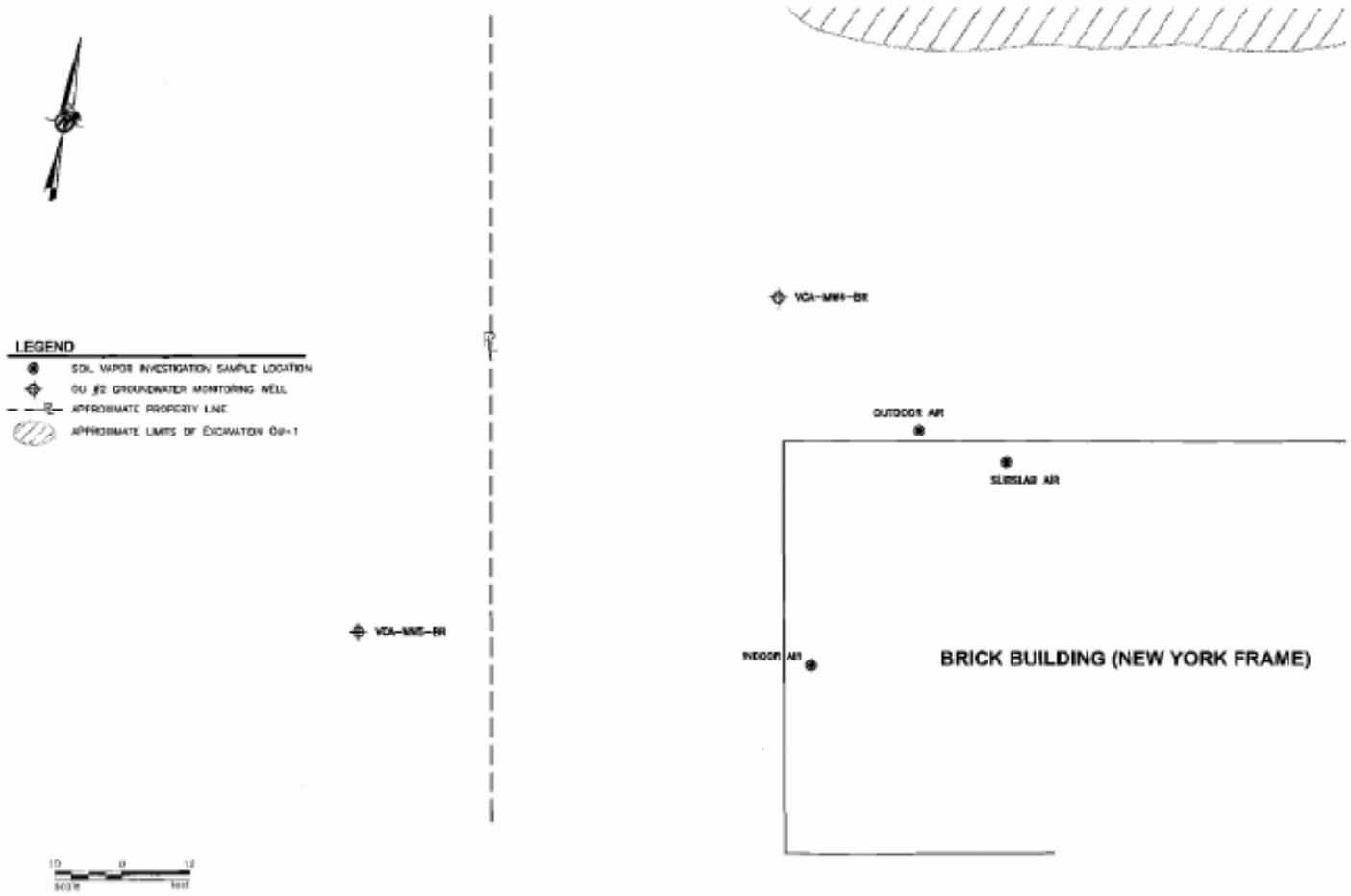


SOURCE: Remedial Activities at Operating Unit #2 - Golder Associates Inc. (November 2007).

BUFFALO BUSINESS PARK	GROUNDWATER POTENTIOMETRIC SURFACE OPERABLE UNIT #2 (PRIOR TO PUMPING)
American Consulting Professionals of New York, PLLC	BUFFALO BUSINESS PARK/VCP — FIGURE 4

Figure 5- Vapor Intrusion Sample Locations

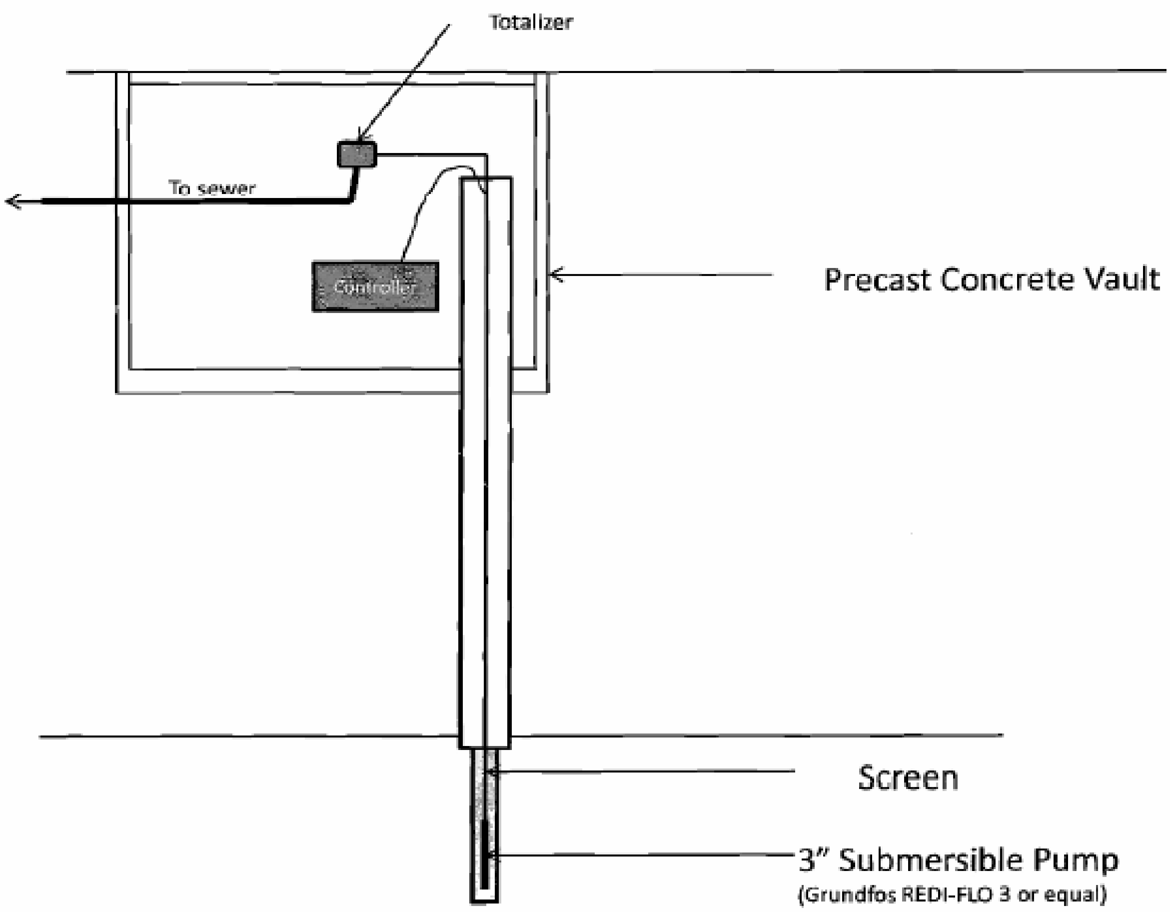
ACP-NY F:\PROJECT\508NY037_BBP\GIS\ArcMap\VaporIntrusion.mxd Date: 8/11/2009 10:17:21 AM Name: Smccabe



SOURCE: Remedial Activities at Operating Unit #2 - Golder Associates Inc. (November 2007).

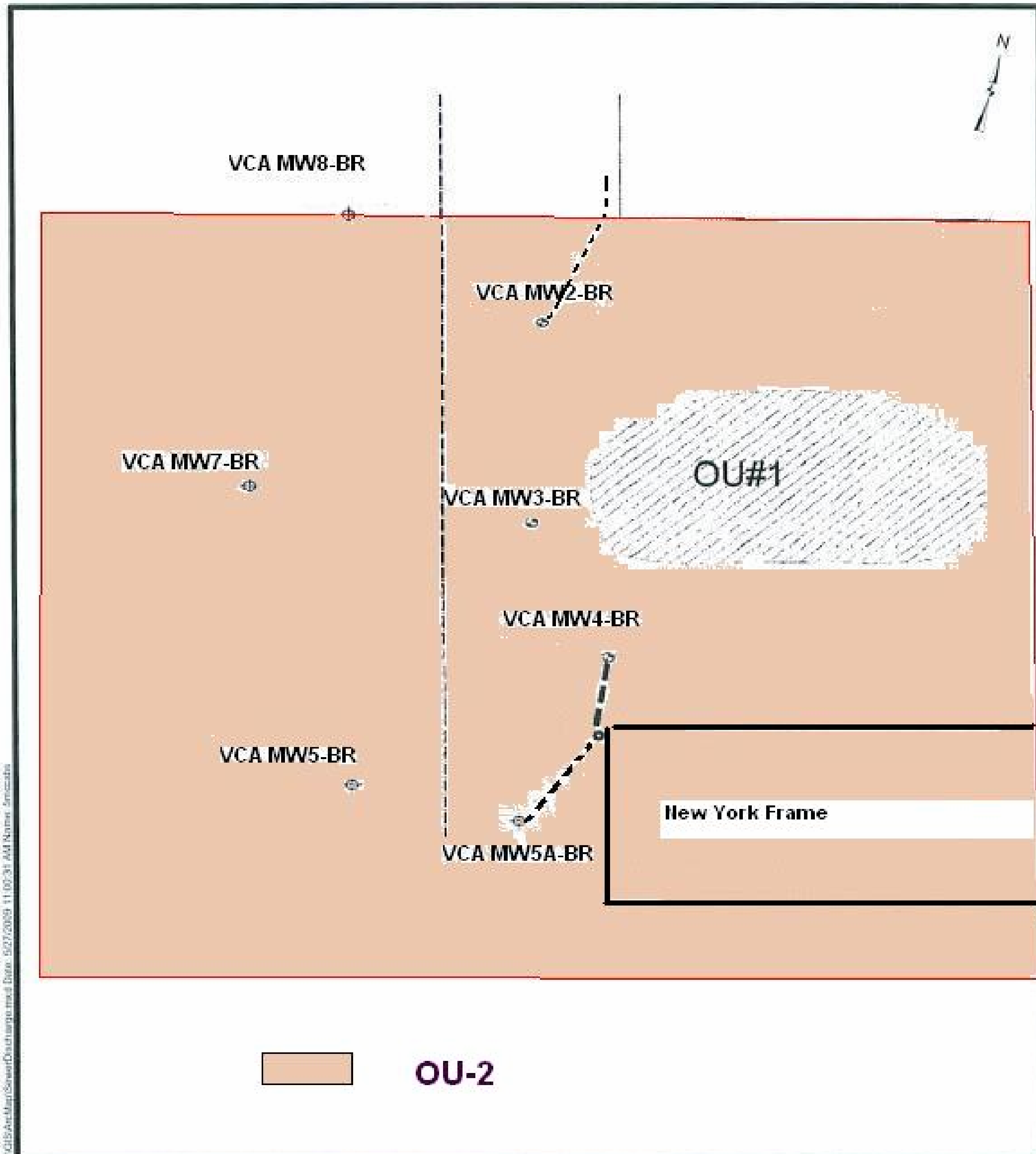
BUFFALO BUSINESS PARK	VAPOR INTRUSION SAMPLING LOCATIONS	
American Consulting Professionals of New York, PLLC	BUFFALO BUSINESS PARK/VCP	FIGURE 5

Figure 6- Pumping Well Schematic



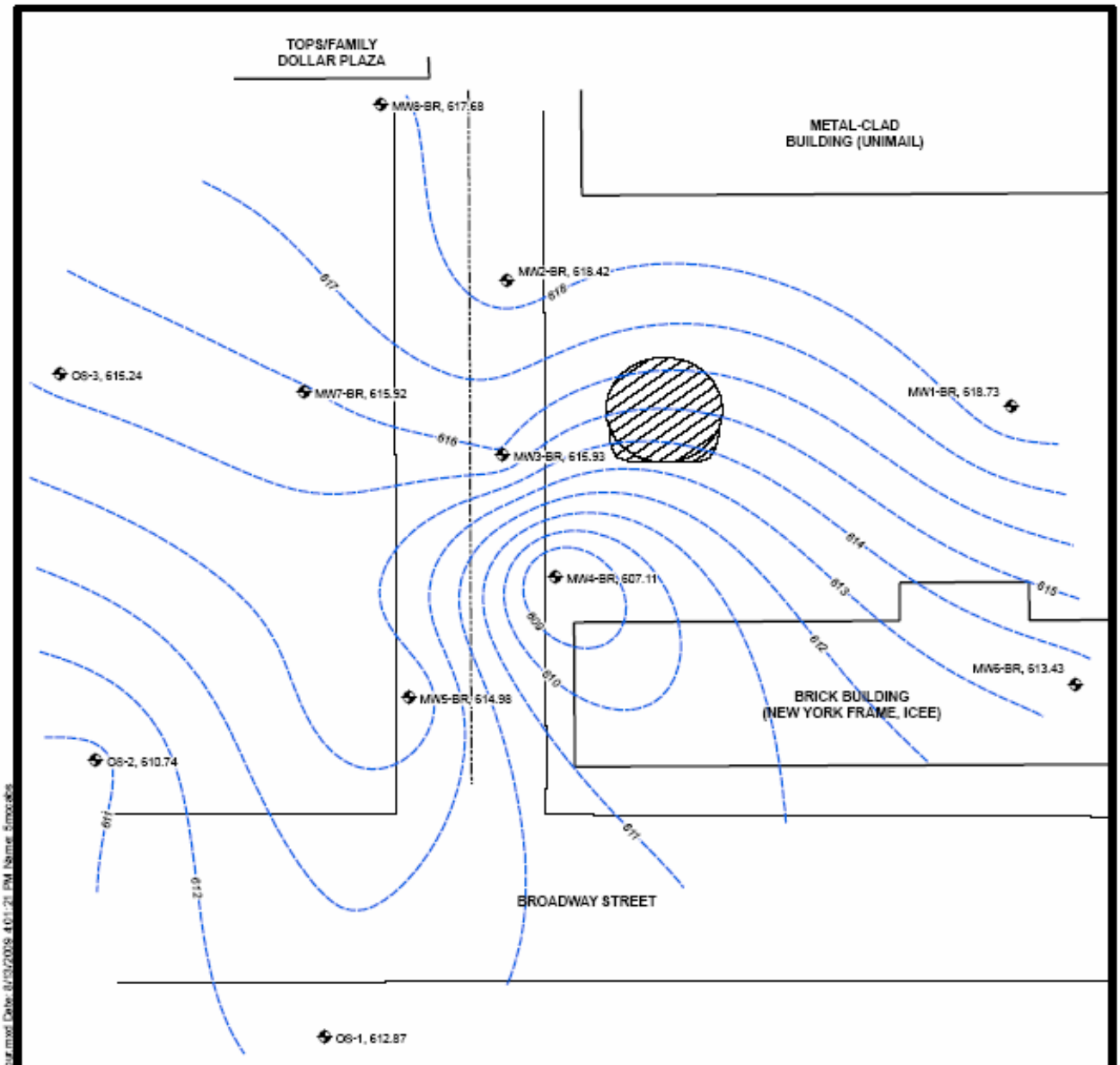
BUFFALO BUSINESS PARK	PUMPING WELL SCHEMATIC	
American Consulting Professionals of New York, PLLC	BUFFALO BUSINESS PARK/VCP	FIGURE 6

Figure 7- Schematic of Sewer Discharge Line



BUFFALO BUSINESS PARK	SCHEMATIC OF SEWER DISCHARGE LINE	
American Consulting Professionals of New York, PLLC	BUFFALO BUSINESS PARK/VCP	FIGURE 7

Figure 8- Groundwater Potentiometric Surface – April 13, 2009
(Post Pumping)



Legend

- Monitoring Well
- 612 — Groundwater Elevation Contour
- Approximate Limits of Excavation

MW5-BR, 614.98
Location ID
Groundwater Elevation (ft amsl)

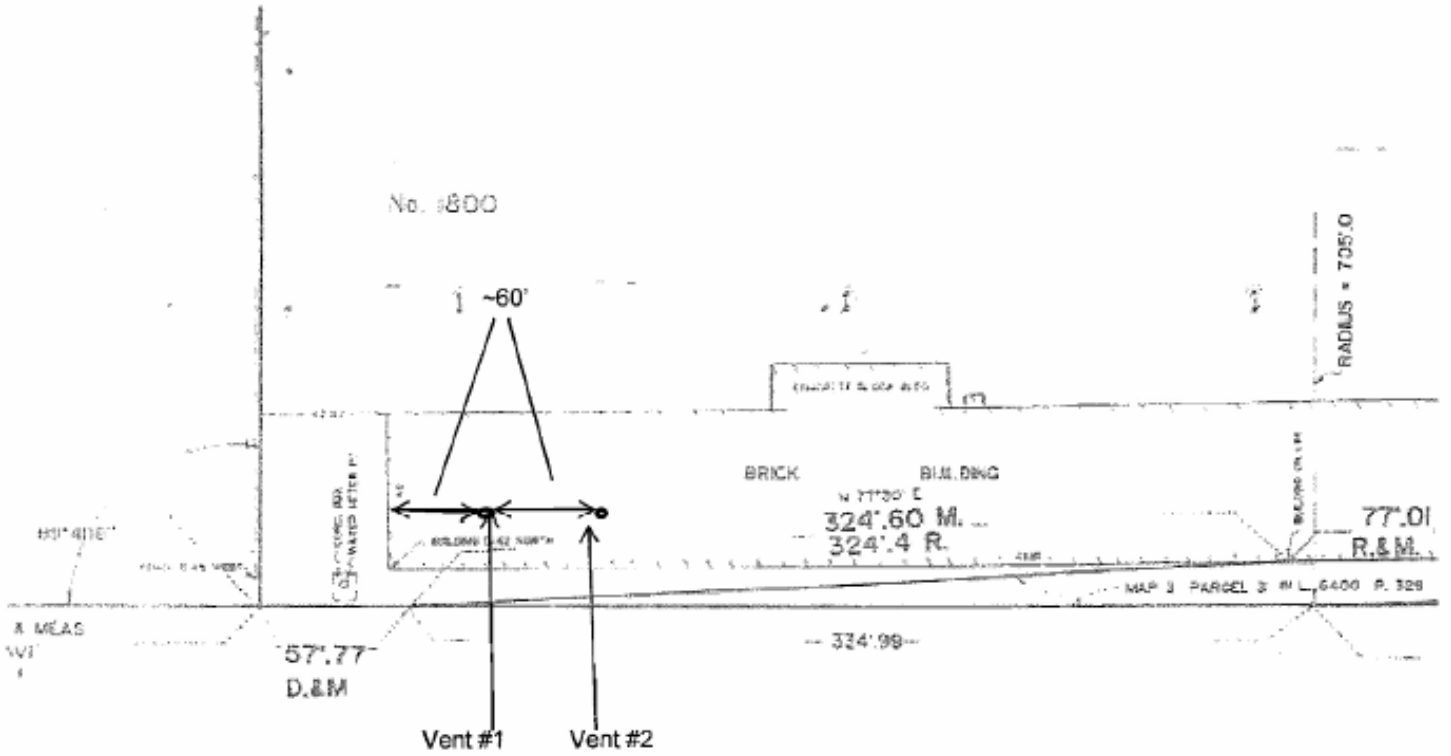
SOURCE: Basemap from - Remedial Activities at Operating Unit #2 - Golder Associates Inc. (November 2007).

BUFFALO BUSINESS PARK	GROUNDWATER POTENTIOMETRIC SURFACE APRIL 13, 2009	
American Consulting Professionals of New York, PLLC	BUFFALO BUSINESS PARK/VCP	FIGURE 8

ACP-NY F:\PROJECTS\09NY017 BBP\GIS\ArcMap\041309 GroundwaterContour.mxd Date: 6/3/2009 4:01:21 PM fahmer Associates

Figure 9- Sub-Slab Depressurization Locations

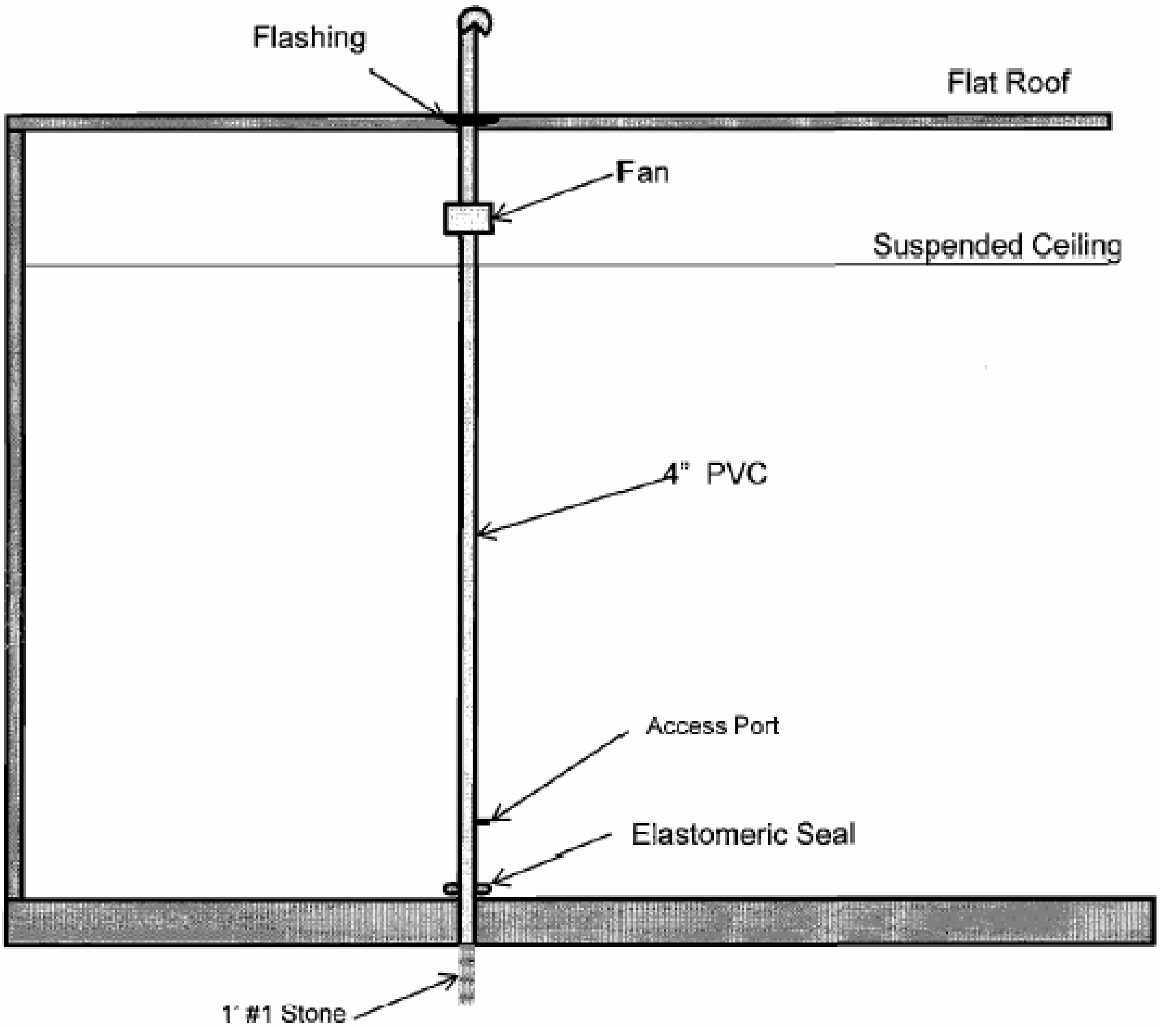
ACP-NY F:\PROJECT\509NY037_BBP\GIS\ArcMap\SbSlabLocatios.mxd Date: 5/27/2009 10:4:26 AM Name: Smccabs



Sub slab depressurization vents
Located no closer than 20 feet from
outside wall

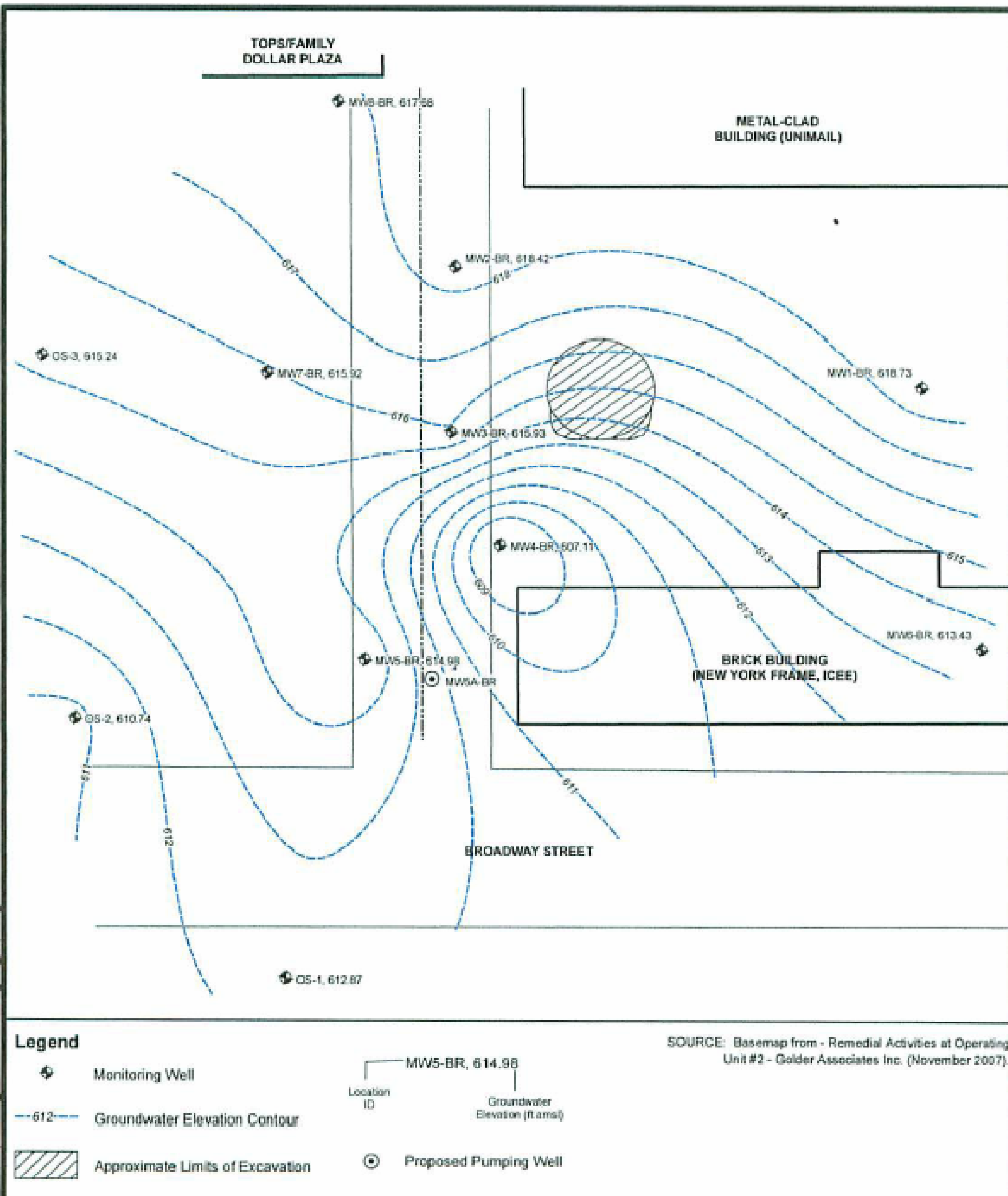
BUFFALO BUSINESS PARK	SUB-SLAB DEPRESSURIZATION LOCATIONS	
American Consulting Professionals of New York, PLLC	BUFFALO BUSINESS PARK/VCP	FIGURE 9

Figure 10- Depressurization Vent Schematic



BUFFALO BUSINESS PARK	DEPRESSURIZATION VENT SCHEMATIC	
American Consulting Professionals of New York, PLLC	BUFFALO BUSINESS PARK/VCP	FIGURE 10

Figure 11- Location of new pumping well MW5A-BR



BUFFALO BUSINESS PARK	Location of new pumping well MW5A-BR
American Consulting Professionals of New York, PLLC	BUFFALO BUSINESS PARK/VCP — FIGURE 11