Response Action Plan and Construction Contingency Plan

Proposed American Square Apartments
3701 American Boulevard East
Bloomington, Minnesota

Prepared for

Ron Clark Construction, Inc.

Bloomington QOZ, LLC

and

Kaeding Management

Project B1909819.00
March 20, 2020

Braun Intertec Corporation

BRAUN INTERTEC
The Science You Build On.

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March 20, 2020 Project B1909819.00

Mr. Mike Roebuck
Ron Clark Construction, Inc.
7500 West 78th Street
Edina, MN 55439

Re: Response Action Plan and Construction Contingency Plan
Proposed American Square Apartments
3701 American Boulevard East
Bloomington, Minnesota

Mr. Roebuck:

Braun Intertec Corporation has prepared this Response Action Plan and Construction Contingency Plan (RAP/CCP) for the above-referenced project (Site) in accordance with the authorized scope of services. The RAP portion describes the environmental procedures and requirements for Site redevelopment including management of contaminated soils. The CCP portion outlines procedures for addressing any unexpected environmental conditions that may be encountered during construction. Vapor intrusion mitigation controls, if required, will be provided in an amendment to this RAP/CCP.

The RAP/CCP is being submitted to the Minnesota Pollution Control Agency (MPCA) Brownfields Redevelopment Program for review and approval prior to the start of the proposed Site renovation activities.

We appreciate the opportunity to provide our services on this project. If you have any questions or comments regarding this report or the project in general, please call Jason Kunze at 952.995.2436.

Sincerely,

BRAUN INTERTEC CORPORATION

Jason J. Kunze
Senior Scientist

Mark A. Ciampone, PG
Group Manager, Senior Scientist

Attachment: Response Action Plan and Construction Contingency Plan

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A. Introduction

Braun Intertec Corporation has prepared this Response Action Plan and Construction Contingency Plan (RAP/CCP), on behalf of Bloomington QOZ, LLC, Kaeding Management, and Ron Clark Construction, Inc., for the proposed redevelopment of the property located at 3701 American Boulevard East in Bloomington, Minnesota (Site). A Site location map is included as Figure 1 and a Site Sketch is included as Figure 2.

The RAP portion of this document describes the segregation, management and disposal procedures for contaminated soil removed as part of the proposed excavation work, as well as environmental monitoring/testing and documentation requirements. The CCP portion of this document outlines procedures for addressing unexpected environmental conditions, if encountered during construction.

An addendum to the RAP will be prepared that provides a description of vapor intrusion mitigation controls to be installed for the proposed new apartment building at the Site to minimize the potential for soil vapor intrusion. When completed, the RAP addendum will be provided to the MPCA for review and comment prior to installation of the vapor intrusion mitigation controls.

B. Background

B.1. Site Location and Description

The Site is located at 3701 American Boulevard East (see Figure 1). The Site is located within the southeast quarter of the northwest quarter of Section 6, Township 27 North, Range 23 West, in the city of Bloomington, Hennepin County, Minnesota.

The Site consists of an irregular-shaped parcel approximately 3.81 acres in size. Presently, the Site consists of a paved parking area located on roughly the northern half of the parcel with grass and wooded areas on the south and east portions. No buildings exist on the Site. A paved entry road is located on the far west side of the Site that enters from the north off American Boulevard East and serves as an entry road to other off-site properties to the southwest.

Please note that this definition of the "Site" differs from that defined in the recent Phase I environmental site assessment (ESA) and Phase II ESA prepared for the area including the Site by Braun Intertec.

In the Phase I ESA and Phase II ESA, the Site was defined as the four separate but adjoining parcels at 3601 American Boulevard East (a multi-level parking ramp, PID 0602723240008), 6 Appletree Square (a paved parking lot, PID 0602723240009), 8101 - 36th Avenue South (an undeveloped and wooded lot, PID 0602723240015), and the currently defined Site at 3701 American Boulevard East (PID 0602723240014).

B.2. Proposed Redevelopment

We understand this project will include the construction of a multi-story apartment building on the eastern portion of the Site with underground parking and a footprint of roughly 50,000 square feet. A proposed redevelopment plan is included as Appendix A. We also understand that construction of a second apartment building is being considered for some point in the future at the parcel at 6 Appletree Square located on the southwest side of the Site. However, that is not part of the current phase of redevelopment of the Site. Also, the existing multi-level parking ramp to the west at 3601 American Boulevard East will remain. A layout of the proposed development is included in Appendix A.

C. Previous Site Investigations

C.1. Phase I ESA – October 2019

Braun Intertec completed a Phase I ESA at the Site in October, 2019 the results of which are presented in the report entitled: *Phase I Environmental Site Assessment, Crown Plaza Parking Parcel, 3601 American Boulevard East, Bloomington, Minnesota*, prepared by Braun Intertec, dated October 7, 2019 (Project B1909819) (2019 Phase I ESA).

The Phase I ESA identified the following recognized environmental conditions (RECs) in connection with the Site:

- Aerial photographs and topographic maps indicate that deep gullies historically cut across the Site and that the Site was used as a gravel pit in approximately the early-1960s. Recently completed geotechnical borings indicate that fill soils were identified over the entire site and buried materials in the fill were reported in central locations on the Site. Geotechnical borings reportedly encountered concrete rubble at depths of 15 to 20 feet bgs and noted a petroleum-like odor in sample cores taken from 12 to 24 feet bgs. Based on the presence of the debris and indications of petroleum impacted soil, there is a potential to encounter fill and/or petroleum impacted soil during redevelopment of the Site. This potential represents a recognized environmental condition.

- Our review of the government database report identified One Appletree Square, 8009 34th Avenue South, which is the office tower on the adjoining property west of the Site, on the Minnesota Pollution Control Agency (MPCA) registered underground storage tank (UST) and the Leaking Underground Storage Tank (LUST) databases. The government database report indicates that the facility had two 12,000-gallon USTs for fuel oil installed in 1973 and removed in 1986. A release was reported on December 15, 1995; 150 cubic yards of petroleum contaminated soil was excavated and removed; and the MPCA closed the file regarding this release on December 3, 1996. The closed status indicates that the MPCA determined that remaining contamination, if any, did not present a significant threat to human health or the environment: however, does not indicate that no contamination remains. Based on the adjoining location of the reported release and since earthwork will be conducted as part of the proposed redevelopment of the Site, there is a potential to encounter petroleum contamination related to this release. This potential represents a recognized environmental condition.

- Our review of the government database report identified General Dynamics, 3101 American Boulevard East, located approximately 0.2 mile west of the Site. The government database report identified this facility on the on the MPCA Voluntary Investigation and Cleanup (VIC) database (VP19271). The MPCA website information includes a copy of a "No Association" letter to a bank that indicates that a release was identified at this location and included: arsenic and lead in soil; trichloroethene (TCE); tetrachloroethene (PCE); 1,1-dichloroethene; 1,1,1-trichloroethane; and methyl ethyl ketone in groundwater; and TCE and PCE in soil vapors. Based on the proximity to the Site and location with respect to the reported direction of regional groundwater flow, there appears to be a potential for the identified release at this facility to impact groundwater and/or soil vapor at the Site. This potential represents a recognized environmental condition.

C.2. Phase II ESA – February 2020

Braun Intertec completed a Phase II ESA at the Site in February 2020 the results of which are presented in the report entitled: *Phase II Environmental Site Assessment, Crown Plaza Site, 3601 American Boulevard East, Bloomington, Minnesota*, prepared by Braun Intertec, dated February 12, 2020 (Project B1909819) (2020 Phase II ESA).

Nine soil borings, one temporary groundwater monitoring well, four test pits, four soil vapor probes and three sub-slab vapor points were advanced at the Site as part of the Phase II ESA Investigation. The soil vapor samples were collected on November 26, 2019 during the "heating season" as defined by the MPCA.

The following conclusions were drawn from completion of the Phase II ESA:

- Fill soils were encountered across the Site from the ground surface to depths of 1 to 39 feet bgs. The depth of fill soils was generally shallowest in the southwest corner of the Site, and increased in depth to the east-northeast across the Site. This trend appears to correspond with the locations of the deep ravines historically present at the Site. The fill soils contained intermixed debris consisting of asphalt and concrete pieces to depths of approximately 5 to 39 feet bgs.

- Petroleum and non-petroleum soil contamination was identified within fill soils at the Site at depths greater than 10 feet. The locations where contaminated fill soils were identified (ST-117, ST-118, ST-120, ST-121 and TP-3) correspond to the areas of deepest fill in the east-northeast portions of the Site. These locations are presumably associated with the filling of historical ravines. The analytical results of these samples confirmed the REC identified in the 2019 Phase I ESA regarding fill and petroleum impacted soils at the Site.

- Petroleum impacts (DRO) were identified in groundwater at the Site. Since groundwater was encountered in the soil borings at depths as shallow as 3 feet bgs, dewatering may be required during redevelopment. If groundwater is encountered during redevelopment activities it should be managed in accordance with an MPCA approved Response Action Plan for the project.

- Benzene, ethylbenzene and PCE were detected at concentrations above the Residential ISVs in soil vapor samples at the Site. The source of these ISV exceedances in the soil vapors is presumably related to the presence of extensive fill soils at the Site. Since no TCE was detected in any soil vapors at the Site, it is unlikely that off-site impacts from the nearby General Dynamics facility (identified as a REC in the 2019 Phase I ESA) are the source of the ISV exceedances present in soil vapors at the Site.

- The results of the Phase II ESA indicate that both petroleum and non-petroleum impacts to soil and soil vapor are present in fill soils at the Site. Large scale placement of fill soils at the Site occurred to fill in former gravel pits and existing ravines. The source of DRO in groundwater at the Site could not be determined from the data collected and it may also be related to the extensive fill soils present.

C.3. Supplemental Soil Vapor Evaluation – March 2020

Braun Intertec completed a supplemental soil vapor evaluation at the Site in late-February 2020, the results of which are presented in the report entitled: *Supplemental Soil Vapor Evaluation Report; American Square Apartments (Crowne Plaza); 3601 American Boulevard East; Bloomington, Minnesota*, prepared by Braun Intertec, dated March 17, 2020 (Project B1909819.00).

Nine soil vapor probes (SV-121 through SV-129) were advanced at the Site on February 26, 2020 to further evaluate subsurface vapors identified as part of our recent Phase II ESA in accordance with current MPCA vapor investigation guidelines. Soil vapor samples were collected and submitted for laboratory analysis of VOCs using EPA Method TO-15.

Based on the sampling conducted for the Phase II ESA on November 26, 2019 and the additional sampling conducted on February 26, 2020, various petroleum and non-petroleum related VOCs were detected in the soil vapor samples at concentrations less than 33X Residential Intrusion Screening Values (ISVs), with the exception of vinyl chloride. One soil vapor sample (SV-125) had a detection of vinyl chloride at a concentration just above 33X the Residential ISV.

The following provides a summary of the soil vapor analytical results.

- Various petroleum and non-petroleum related VOCs were identified in the soil vapor samples at concentrations less than 33X Residential ISVs.

- Benzene as well as ethylbenzene, n-heptane, n-hexane and 2-propanol (isopropyl alcohol) were detected at concentrations above their Residential ISVs but below 33X the ISVs in most of the soil vapor samples collected.

- The non-petroleum VOC vinyl chloride was detected in soil vapor sample SV-125 at a concentration of 64 $\mu g/m^3$, which exceeded the 33x Residential ISV of 57 $\mu g/m^3$. Vinyl chloride was not detected at concentrations at or above laboratory reporting limits (RLs) in the other eight samples. In addition, PCE and TCE were not detected in any of the samples at or above the laboratory RLs.

Based on the results of the supplemental soil vapor evaluation, the following recommendations were provided:

- To obtain MPCA assurances and approvals, a second seasonal (non-heating season) soil vapor sampling event should be completed at the Site between April 1 and October 31, 2020.

- Vinyl chloride was detected at a concentration greater than 33X the Residential ISV in soil vapor sample SV-125. A Site with contaminant concentrations greater than 33X ISV would typically require mitigation. As part of the second seasonal sampling event, further investigation should be conducted in the area of SV-125 to evaluate the extent of potential vapor impacts.

- Following completion of the second seasonal soil vapor sampling event, a Response Action Plan (RAP) and Construction Contingency Plan (RAP/CCP) should be prepared for the proposed multi-family housing redevelopment on the eastern portion of the Site. The RAP/CCP should include a vapor mitigation design for any new proposed structures/buildings at the Site.

D. Site Conceptual Model

D.1. Geology and Hydrogeology

The soil borings completed at the Site and nearby properties as part of the 2020 Phase II ESA encountered the following geologic conditions:

- Fill soils, consisting of poorly graded sand with silt, silty sand, clayey sand and sandy lean clay, were encountered from the ground surface to depths of 1 to 39 feet bgs. Underlying the fill soil were apparent native soils consisting mainly of poorly graded sand with silt, sandy silt and poorly graded sand.

- Groundwater was encountered in a soil boring (ST-113) located immediately west of the Site (the paved parking lot at 6 Appletree Square) at a depth of approximately 7 feet bgs. Taking into account the difference in elevation between that parking lot and the Site, and assuming the groundwater elevation is similar/continuous across both adjoining properties, groundwater is anticipated to be present approximately 27 feet bgs within the central paved parking area of the Site near previous boring location ST-118.

D.2. Nature and Extent of Contamination

The following is a summary of contaminants identified at the Site:

- Results of soil borings completed at the Site as part of the 2020 Phase II ESA indicated fill soils in the upper 5 to 10 feet across the Site overlaying more significantly contaminated fill soil and buried debris (e.g., bituminous and concrete). The debris was observed primarily at depths ranging from 5 to 39 feet bgs.

- Field monitoring of soil from the borings identified slight or faint petroleum-like odors were noted in the following five soil borings: ST-117 from the 12 to 23 feet bgs with PID readings ranging from 0.4 to 28.2 ppm; ST-118 from 7 to 19 feet and at 25 feet bgs with PID readings ranging from 0.6 to 3.6 ppm; ST-119 at 20 and 25 feet bgs with PID readings ranging from 2.3 to 4.0 ppm; ST-120 from 12 to 19 feet bgs with PID readings ranging from 0.0 to 0.6 ppm; and ST-121 at 20 feet bgs with a PID reading of 0.9 ppm.

- Laboratory analysis identified both petroleum and non-petroleum related soil contamination at the Site including PAHs (BaP Equivalent), DRO, and GRO. The BaP equivalent of three soil samples collected along the south end of the Site and at a depth of 11 feet bgs or greater exceeded the Residential SRVs and/or SLVs. DRO and GRO concentrations above the MPCA unregulated fill criterion of 100 mg/kg[1] were encountered across the Site, but in general at depths greater than 11 feet bgs. The majority of significant soil impacts were identified at depths around 20 feet bgs.

- Vinyl chloride was detected at a concentration greater than 33X the Residential ISV in soil vapor sample SV-125. A Site with contaminant concentrations greater than 33X ISV would typically require mitigation. As part of the second seasonal sampling event, further investigation should be conducted in the area of SV-125 to evaluate the extent of potential vapor impacts.

[1] Best Management Practices for the Off-Site Reuse of Unregulated Fill, dated February 2012, prepared by the Minnesota Pollution Control Agency (the 2012 MPCA Unregulated Fill Guidance).

- As detailed previously, groundwater was encountered in a soil boring (ST-113) located immediately west of the Site (the paved parking lot at 6 Appletree Square) at a depth of approximately 7 feet bgs. Depth to groundwater at the Site is anticipated to be present approximately 27 feet bgs. Identified groundwater impacts at the off-site location included low level DRO at 390 micrograms per liter (µg/L), however no drinking water criteria for DRO has been established.

D.3. Exposure Pathways and Receptors

Based on the results of the recent investigations and the proposed redevelopment plans, the potential future contaminant exposure pathways and receptors include:

- **Direct contact with contaminated soil via the combined dermal, ingestion, and inhalation pathway.** Soil excavation as part of planned redevelopment activities will include soil removal for a one story underground parking garage, the finished floor of which is anticipated to be about 10 feet below existing grade at the current paved parking area. Also, installation of new underground utilities will involve the need to excavate soils from the new apartment building north to below American Boulevard East. The response actions are designed to minimize potential direct exposure to contaminated soil by establishing appropriate separation distances between potential contaminated soil remaining in-place and potential receptors after redevelopment.

- **Exposure to contaminated vapors via vapor intrusion into the building.** Based on the previous investigation data, various (although limited in concentration) petroleum and non-petroleum VOCs were detected in the soil vapor samples collected at the Site. Vapors may enter structures via the soil-to-soil gas exposure pathways. Lateral vent piping as part of an active sub-slab depressurization (SSD) soil vapor intrusion mitigation system will be installed beneath the new apartment building. An addendum to the RAP will be prepared that provides a description of vapor intrusion mitigation controls to be installed for the proposed new apartment building at the Site to minimize the potential for soil vapor intrusion. When completed, the RAP addendum will be provided to the MPCA for review and comment prior to installation of the vapor intrusion mitigation controls.

Based on the anticipated depth to groundwater of approximately 27 feet below ground surface, and since groundwater at the Site will not be utilized (municipal water service will be made available), no exposure risk for contaminated groundwater is present.

E. RAP Objectives

Implementation of this construction-related RAP/CCP is intended to achieve the following redevelopment objectives at the Site:

- Provide environmental monitoring and sampling/laboratory analyses as necessary during construction-related excavation activities that may encounter contaminated and/or debris-containing soil.
- Manage soils excavated for redevelopment in a manner consistent with current MPCA guidelines.
- Provide an organized plan/means to properly manage unanticipated contamination and/or debris that may be encountered during redevelopment, including potential asbestos-containing material (ACM) in buried debris.
- Provide data and documentation to support issuance by the MPCA of a RAP Implementation approval letter following the proposed renovation/redevelopment activities.

F. Response Actions

F.1. Environmental Monitoring, Sampling and Testing

Environmental monitoring will be conducted during soil excavation activities to assist in identifying contaminated and potentially contaminated soil that requires segregating and off-site disposal. Contaminated soil will be segregated from adjacent clean materials using a combination of visual and/or olfactory observations, organic vapor screening results, and existing analytical testing results. During monitoring, excavated soils will be observed continuously by an environmental professional for visual and olfactory evidence of significant contamination (e.g. debris, staining or discoloration, or chemical odors), and screened for organic vapors using a PID equipped with a 10.6 eV lamp. The PID will be calibrated to an isobutylene standard to read in parts-per-million (ppm) benzene.

Soil analytical data from the Phase II ESA will be used to obtain landfill disposal facility approvals for the project.

F.2. Soil Response Actions

In general, the MPCA unregulated fill criteria will be used to determine the potential for on-site reuse or off-site disposal for soils excavated as part of this project. Specifically, the following cleanup and reuse criteria will be applied to this project:

- Fill soil excavated for construction which have no visible debris and with PID headspace readings less than 10 ppm will be reused on-site in accordance with current MPCA guidance, provided there is sufficient room on-site and it is geotechnically suitable for its intended use.

- Soils excavated during construction which have no visible debris, but which have PID headspace readings greater than 10 ppm, will be removed and properly disposed of at a permitted landfill.

- If contaminated soils are encountered below the footprint of the new apartment building or during the installation of underground utilities, which exhibit PID readings greater than 10 ppm, they will be segregated and properly disposed of at a permitted landfill. If contamination remains in a utility trench at or above 10 ppm, a vapor barrier will be installed in the affected utility trench.

- Excavated fill soil with significant amounts of intermixed debris (and thus does not meet the MPCA unregulated fill criteria) will be disposed of off-site at a permitted landfill.

F.3. Soil Vapor Intrusion Controls

Elevated concentrations of VOCs in soil vapor have been detected in the subsurface at the Site, and have the potential to accumulate below and within structures.

An addendum to the RAP will be prepared that provides a description of vapor intrusion mitigation controls to be installed for the proposed new apartment building at the Site to minimize the potential for soil vapor intrusion. The addendum will be prepared subsequent to the completion of the second seasonal round of soil vapor sampling at the Site. When completed, the RAP addendum will be provided to the MPCA for review and comment prior to installation of the vapor intrusion mitigation controls. In general, the proposed soil vapor mitigation system will incorporate the guidelines detailed in "Best Management Practices for Vapor Investigation and Building Mitigation Decisions" issued by the MPCA dated October 2016.

G. RAP Implementation Report

Following completion of the construction-related response actions for the proposed redevelopment, a RAP Implementation Report will be prepared and submitted to the MPCA for review and approval. The RAP Implementation Report will include the following at a minimum:

- An overview of environmental response actions performed.
- Environmental monitoring procedures and results.
- Figure showing the locations of contaminated fill soil excavated and/or left in place.
- Documentation for final disposition of contaminated soil (including manifests and weigh tickets).
- Installation documentation for vapor controls.
- Operation and Maintenance Plan for vapor controls.
- Descriptions and documentation related to any contingency actions (if any) completed during construction.

H. Construction Contingency Plan

The purpose of this Construction Contingency Plan (CCP) is to outline procedures for addressing unexpected environmental conditions encountered during construction. When the environmental professional is not present on-site, it will be the responsibility of the owner and Site contractors to ensure that appropriate response actions are carried out in accordance with this section. Specifically, if any unexpected condition is encountered, excavation activities will cease until the situation has been properly assessed and a plan of action is developed. Potential contingency events could include encountering previously unknown soil contamination, underground storage tanks (USTs), drums, debris, wells, oily substances, and/or suspect asbestos containing material (ACM).

The following steps will be taken if a contingency event occurs:

1. The situation will be assessed by the environmental professional to determine the nature of the issue and the potential risks involved. The MPCA staff assigned to the project will be notified of the potential issue, as appropriate.

2. Samples of the suspect contaminated materials will be collected for laboratory analysis as appropriate. The analytical parameters will be selected based on the nature of the suspected contamination and input by the MPCA. Further actions will depend on the test results and discussions with MPCA staff.

3. In the event that debris suspected of containing asbestos is encountered during earthwork activities, it will be evaluated in-situ for the presence of asbestos by bulk sampling and analysis by polar light microscopy (PLM). If ACM is identified, protocol outlined in the October 2013 MPCA *Asbestos Guidance on Excavation Projects* will be followed, including implementation of the Emissions Control Plan (ECP) provided in Appendix C, if required. All findings will be incorporated into the RAP Implementation Report prepared for the Site.

I. Site Responsibilities and Coordination

Specific responsibilities of the parties involved in the development of the Site include:

Owner

Bloomington QOZ, LLC
Attn: Mr. Mike Roebuck
7500 West 78th Street
Edina, MN 55439
Phone: 952.947.3028 (direct)
Mike@ronclark.com

General Contractor

Weis Builders, Inc.
Mr. Chris Ehalt
7645 Lyndale Avenue South
Minneapolis, MN 55423
Phone: 612.243.4650 (direct)
ChrisEhalt@weisbuilders.com

Environmental Consultant

Braun Intertec is the environmental consultant and will be responsible for environmental monitoring and sampling, contaminated media characterization, documentation and reporting of environmental activities in connection with the project.

Braun Intertec Corporation
Jason Kunze Senior Scientist
1826 Buerkle Road
St. Paul, MN 55110
Phone: 612.360.0727 (mobile)
Jkunze@braunintertec.com

Minnesota Pollution Control Agency

The project will be conducted through the MPCA Brownfields Redevelopment Program. The MPCA has authority over all environmental response actions, and are responsible for all review and approval of environmental activities performed at the Site.

Minnesota Pollution Control Agency
Project Manager to be Determined
520 Lafayette Road North
St. Paul, MN 55155-4194
Phone: To Be Determined
Email: To Be Determined

Braun Intertec will coordinate with the General Contractor regarding the construction schedule.
It is anticipated that Braun Intertec will conduct environmental monitoring and sampling on behalf of the owner to help ensure that any contaminated materials encountered as part of redevelopment activities are properly identified and managed. Braun Intertec will communicate with the MPCA, and other interested parties as necessary regarding environmental monitoring results and any necessary environmental actions.

J. Project Schedule

It is anticipated that renovation of the interior of the existing Site building and earthwork activities will begin in mid-2020.

K. Standard of Care

In performing its services, Braun Intertec used that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession currently practicing in the same locality. No warranty, express or implied, is made.

Figures

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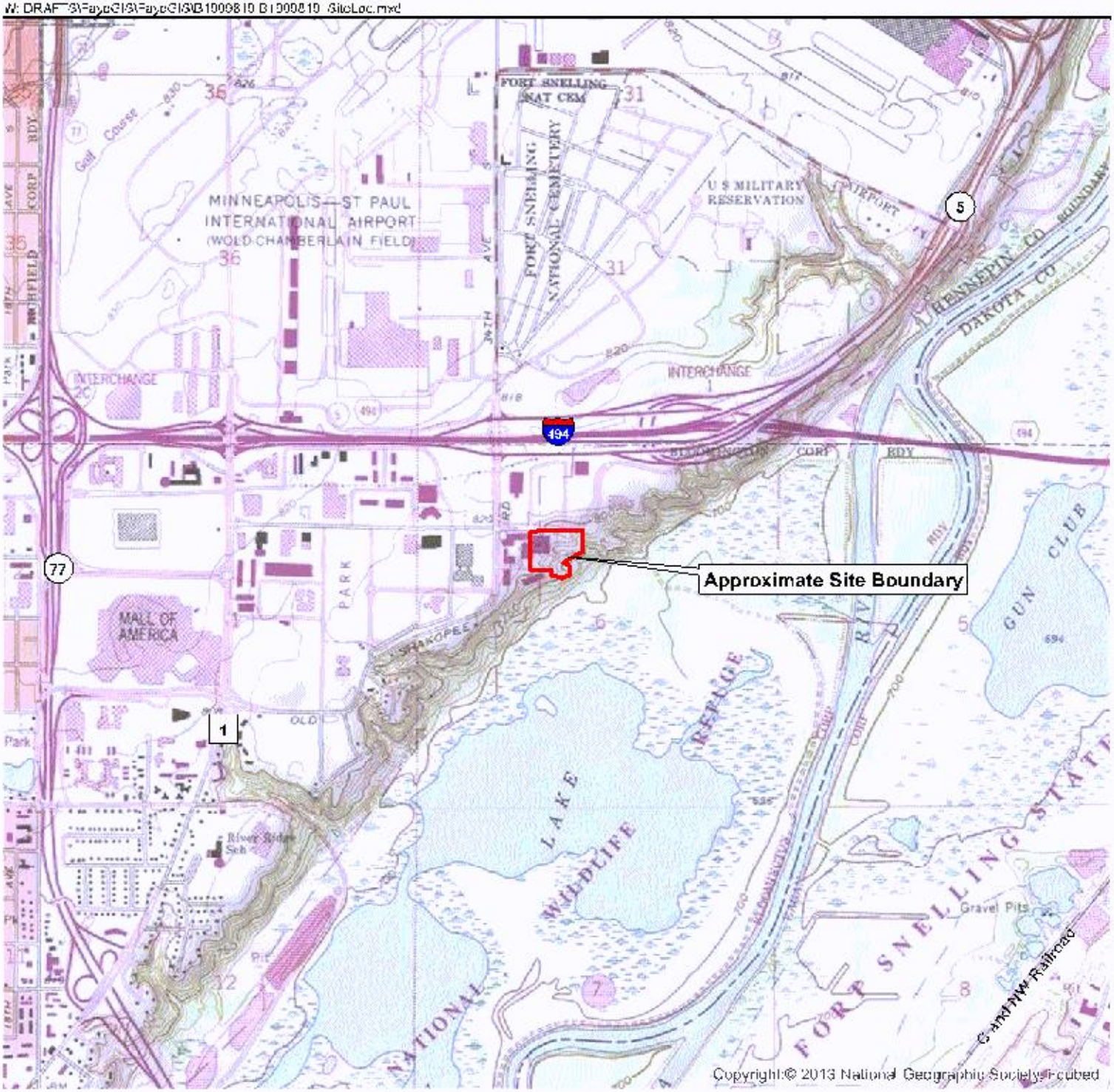


Approximate Site Boundary

Data Source:
USGS Quadrangle

0 1,000 2,000
Feet

BRAUN INTERTEC
The Business You Build On.

Project No:
B1909819

Drawing No:
B1909819_SiteLoc

Drawn By:	TDR
Date Drawn:	08/2019
Checked By:	MFC
Last Modified:	08/2019

Crown Plaza Site

3001 American Boulevard East

Bloomington, Minnesota

Site Location Map

Figure 1

F: 2015 B19098 9.Jv.g.Phase I.10/7/2019 6:05:20 AM

75' 0 150'

SCALE: 1" = 150'

BRAUN INTERTEC

11001 Hampshire Avenue S
Minneapolis, MN 55438
952.995.2000
braunintertec.com

Project No: B1909819

Drawing No: B1909819

Drawn By: JWS
Date Drawn: 10/7/19
Checked By: MPT
Last Modified: 10/7/19

Crowne Plaza Site

3601 American Boulevard E

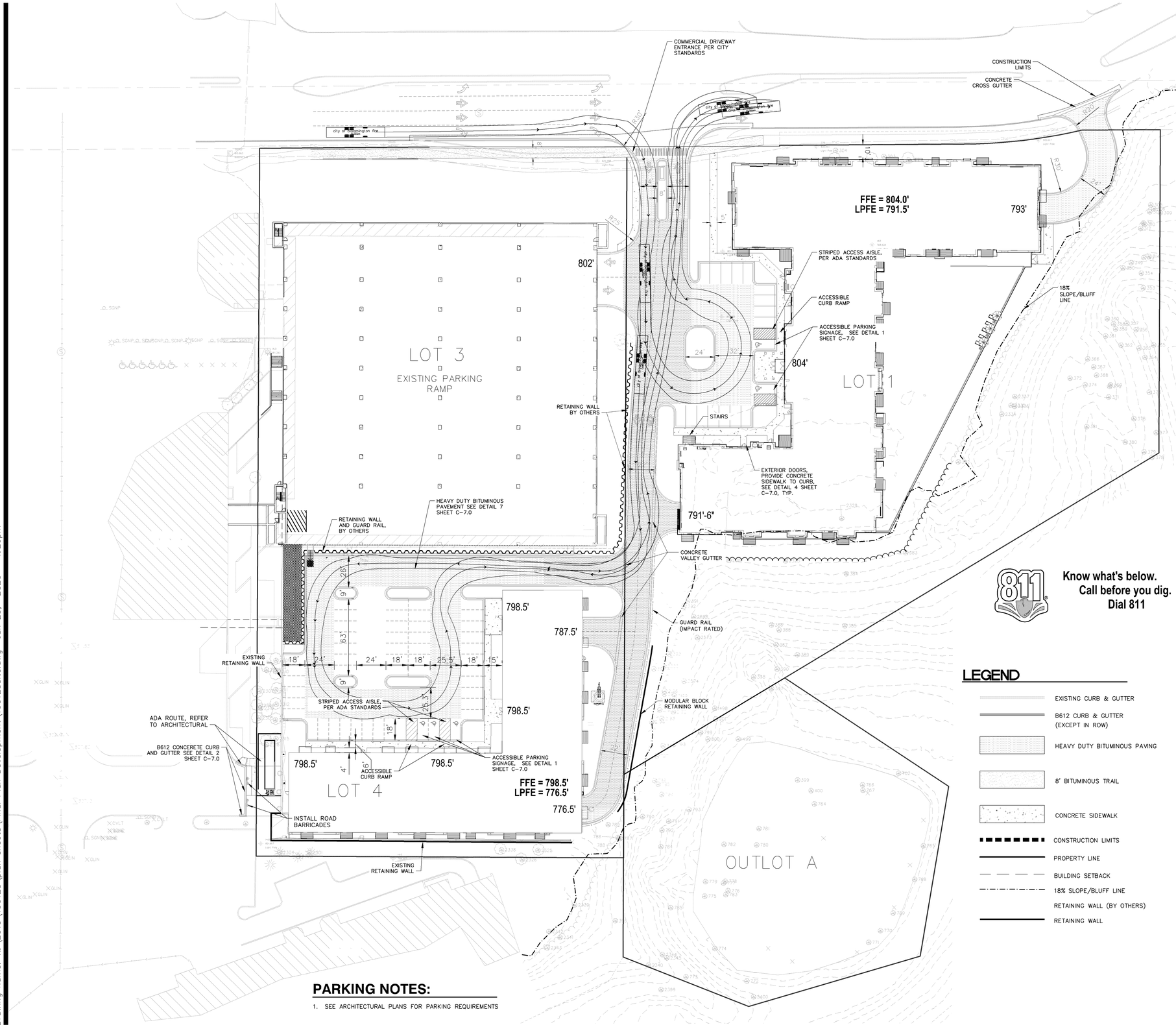
Bloomington, Minnesota

Site Sketch

Figure 2

Appendix A

Proposed Redevelopment Plan



NOTES

1. DIMENSIONS ARE TO TOP FACE OF CURB, EDGE OF SIDEWALK OR EXTERIOR OF BUILDING UNLESS OTHERWISE NOTED. REFER TO ARCHITECTURAL DRAWINGS FOR BUILDING DIMENSIONS AND SPECIFICATION FOR LOCATION OF EXITS, RAMPS, CONCRETE APRONS AND STOOPS.
2. ALL CONCRETE CURB AND GUTTER ADJACENT TO CONCRETE WALK TO BE SEPARATED BY A 1/2 INCH EXPANSION JOINT.
3. ALL STRIPING SHALL BE 4 INCH WHITE PAVEMENT STRIPING, PER GOVERNING AGENCY STANDARDS.
4. ALL WORK WITHIN THE R.O.W. SHALL COMPLY WITH THE CITY OF BLOOMINGTON ENGINEERING DESIGN STANDARDS.
5. ALL CURB AND GUTTER TO BE CONCRETE B612 CURB UNLESS NOTED OTHERWISE, PER CITY STANDARDS.
6. CONTINUOUS CONCRETE CURB & GUTTER WHICH CHANGES TYPE SHALL HAVE A FIVE FOOT TRANSITION.
7. BITUMINOUS PAVEMENT SECTION DESIGN TO BE IN ACCORDANCE WITH LOCAL CONSTRUCTION STANDARDS. REFER TO GEOTECHNICAL REPORT AND DETAIL SHEET.
8. CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES AND TOPOGRAPHIC FEATURES, SUCH AS EXISTING GUTTER GRADES AT THE PROPOSED DRIVEWAYS, PRIOR TO THE START OF SITE GRADING. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES OF VARIATIONS FROM THE PLANS.
9. ACCESSIBLE ROUTE SHALL BE PROVIDED FROM ACCESSIBLE STALLS TO BUILDING ENTRANCE. (SEE MN ACCESSIBILITY CODE). POLE MOUNT APPROVED SIGNS, ONE VAN ACCESSIBLE, CENTER ON STALL, LOCATION PER GENERAL CONTRACTOR. PAINT INTERNATIONAL SYMBOL OF ACCESSIBILITY WHITE ON BLUE BACKGROUND. G.C. TO ENSURE SLOPE OF PAVEMENT AT ACCESSIBLE PARKING STALLS & ACCESS AISLE DOES NOT EXCEED 2% IN ALL DIRECTIONS.
10. REFER TO PHOTOMETRIC PLAN FOR LIGHT LOCATIONS, FOOTCANDLE PRINT OUT AND SPECIFICATIONS. FOUNDATION BY CONTRACTOR. CONTRACTOR TO FIELD VERIFY LOCATION OF PROPOSED LIGHT POLE WITH OWNER & G.C. AND THAT THERE ARE NO CONFLICTS WITH EXISTING & PROPOSED UTILITIES.
11. CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE AND INSTALL TRENCHING AND PVC SLEEVING UNDER ANY PAVEMENT AS REQUIRED FOR IRRIGATION, LIGHTING, SIGNS ETC. AS NEEDED PRIOR TO PAVING.

GENERAL NOTES:

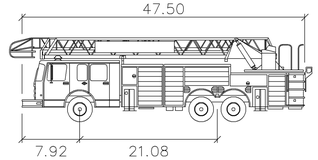
1. PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE TO MAKE SURE THAT ALL REQUIRED PERMITS AND APPROVALS HAVE BEEN OBTAINED. NO CONSTRUCTION OR FABRICATION SHALL BEGIN UNTIL THE CONTRACTOR HAS RECEIVED AND THOROUGHLY REVIEWED ALL PLANS AND OTHER DOCUMENTS APPROVED BY ALL OF THE PERMITTING AUTHORITIES.
2. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS AND THE REQUIREMENTS AND STANDARDS OF THE LOCAL GOVERNING AUTHORITY.
3. CONTRACTOR IS RESPONSIBLE FOR DEMOLITION AND REMOVAL OF ALL EXISTING STRUCTURES WHICH INTERFERE WITH NEW WORK AS SHOWN.
4. ALL DIMENSIONS, GRADES, EXISTING AND PROPOSED INFORMATION SHOWN ON THE PLANS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER IF ANY DISCREPANCIES EXIST PRIOR TO PROCEEDING WITH CONSTRUCTION FOR NECESSARY PLAN OR GRADE CHANGES. NO EXTRA COMPENSATION SHALL BE PAID TO THE CONTRACTOR FOR WORK HAVING TO BE REDONE DUE TO INFORMATION SHOWN INCORRECTLY ON THESE PLANS IF SUCH NOTIFICATION HAS NOT BEEN GIVEN.
5. CONTRACTOR SHALL PROTECT ADJOINING PROPERTIES AND STRUCTURES FROM HAZARDS ASSOCIATED WITH HIS CONSTRUCTION ACTIVITIES & SHALL BE RESPONSIBLE FOR ALL DAMAGES TO PROPERTIES AND STRUCTURES THAT OCCUR AS A RESULT OF THESE ACTIVITIES.
6. CONTRACTOR SHALL NOT IMPEDE EXISTING TRAFFIC CIRCULATION TO ADJACENT PROPERTIES.
7. CONTRACTOR SHALL PERFORM SWEEPING ON PRIVATE PARKING AREAS AND PUBLIC STREETS AT LEAST ONCE A WEEK, IF NEEDED. AND IN ADVANCE OF ALL RAIN EVENTS.
8. CONTRACTOR SHALL BE HELD FULLY RESPONSIBLE TO PREVENT AND ELIMINATE ANY DUST NUISANCE OCCASIONED BY AND DURING CONSTRUCTION, UNTIL THE PROJECT HAS BEEN COMPLETED.
9. CONTRACTOR SHALL PROVIDE TEMPORARY STREET SIGNS, LIGHTING, AND ADDRESSES DURING CONSTRUCTION PERIOD.
10. ALL PUBLIC SIDEWALKS SHALL NOT BE OBSTRUCTED DURING CONSTRUCTION UNLESS APPROVED BY CITY ENGINEER.
11. STORAGE OF MATERIALS OR EQUIPMENT SHALL NOT BE ALLOWED ON PUBLIC STREETS OR WITHIN PUBLIC RIGHT OF WAY.
12. CONTRACTOR TO PROVIDE TEMPORARY TRAFFIC CONTROL IN COMPLIANCE WITH MnDOT "TEMPORARY TRAFFIC CONTROL ZONE LAYOUT-FIELD MANUAL, LATEST EDITION, FOR ANY CONSTRUCTION IN PUBLIC ROW.

811 Know what's below. Call before you dig. Dial 811

LEGEND

- EXISTING CURB & GUTTER
- B612 CURB & GUTTER (EXCEPT IN ROW)
- HEAVY DUTY BITUMINOUS PAVING
- 8' BITUMINOUS TRAIL
- CONCRETE SIDEWALK
- CONSTRUCTION LIMITS
- PROPERTY LINE
- BUILDING SETBACK
- 18% SLOPE/BLUFF LINE
- RETAINING WALL (BY OTHERS)
- RETAINING WALL

FIRE TRUCK DIMENSIONS



city of bloomington fire

Width	: 8.33 feet
Track	: 7.92
Lock to Lock Time	: 6.0
Steering Angle	: 33.3

FOR REVIEW ONLY
PRELIMINARY
NOT FOR CONSTRUCTION

N

0 20 40 80
SCALE IN FEET

PARKING NOTES:

1. SEE ARCHITECTURAL PLANS FOR PARKING REQUIREMENTS

ALLIANT ENGINEERING
733 Marquette Avenue
Suite 700
Minneapolis, MN 55402
612.758.3080
www.alliant-inc.com

AMERICAN SQUARE APARTMENTS
BLOOMINGTON, MN
AMERICAN BOULEVARD E. AND 34TH AVE SOUTH
3601 AMERICAN BOULEVARD EAST

FINAL DEVELPOMENT PLAN

SITE PLAN

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed PROFESSIONAL ENGINEER under the laws of the State of MINNESOTA

DAVID NASH, PE
12-30-19
Date License No.

QUALITY ASSURANCE/CONTROL

BY DATE

DATE	ISSUE
01-29-20	CITY SUBMITTAL

PROJECT TEAM DATA

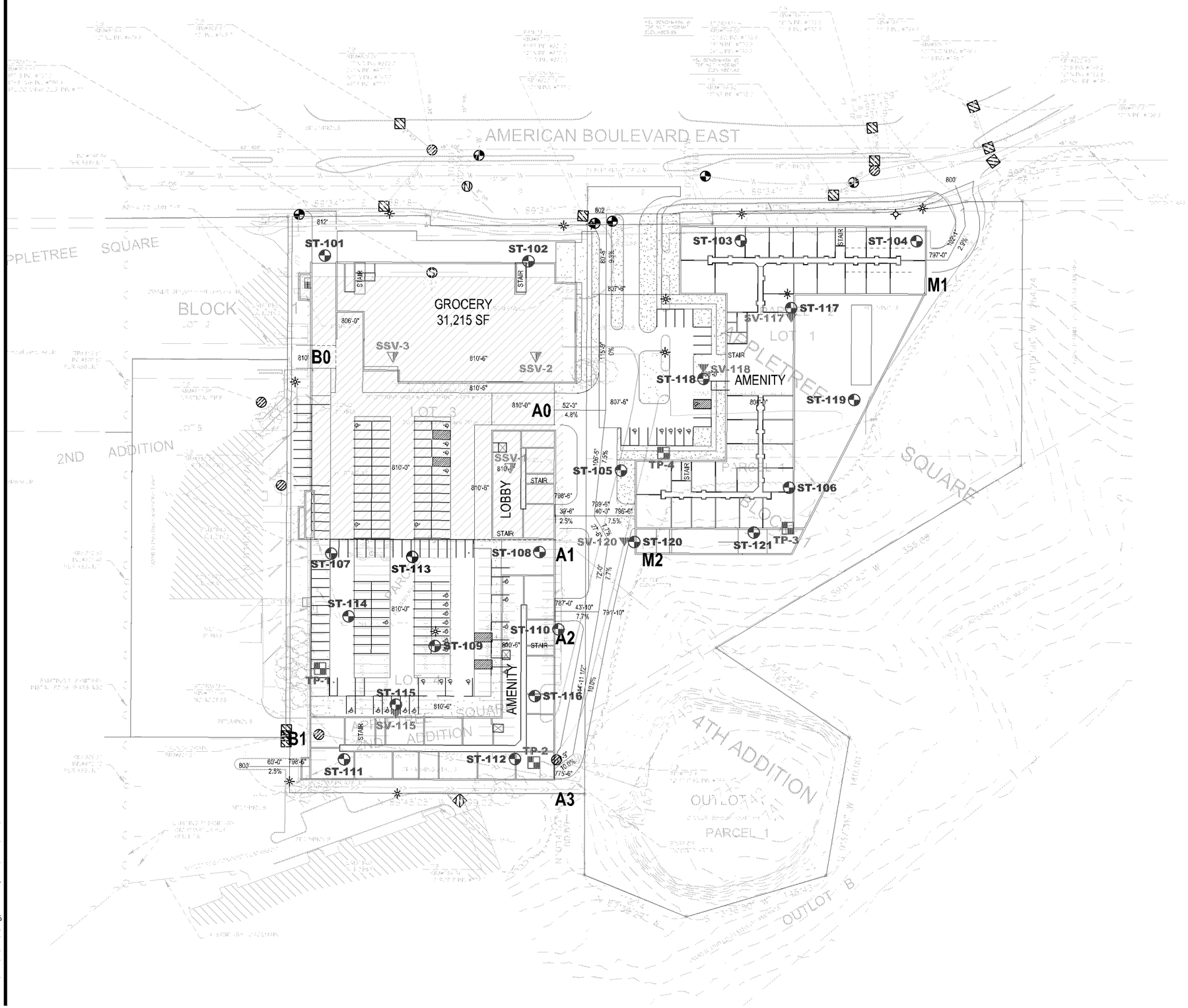
DESIGNED:	DMS/DJN
DRAWN:	KDB/DMS
PROJECT NO:	190123

C-4.0

Drawing name: X:\2019\190123\plan sheets\Final Plan Development\190123site.dwg Jan 29, 2020 - 1:26pm

Appendix B

Prior Investigation Results



DENOTES APPROXIMATE LOCATION OF TEST PIT

DENOTES APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING

DENOTES APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING WITH GROUNDWATER SAMPLE

DENOTES APPROXIMATE LOCATION OF SOIL VAPOR PROBE

DENOTES APPROXIMATE LOCATION OF SUB-SLAB VAPOR POINT

50' 0 100'

SCALE: 1"= 100'

BRAUN INTERTEC
The Science You Build On.
11001 Hampshire Avenue S
Minneapolis, MN 55438
952.995.2000
braunintertec.com

Drawing Information

Project No:	B1909819
Drawing No:	B1909819
Drawn By:	LAO
Date Drawn:	9/18/19
Checked By:	BR
Last Modified:	12/19/19

Project Information

Crowne Plaza Site

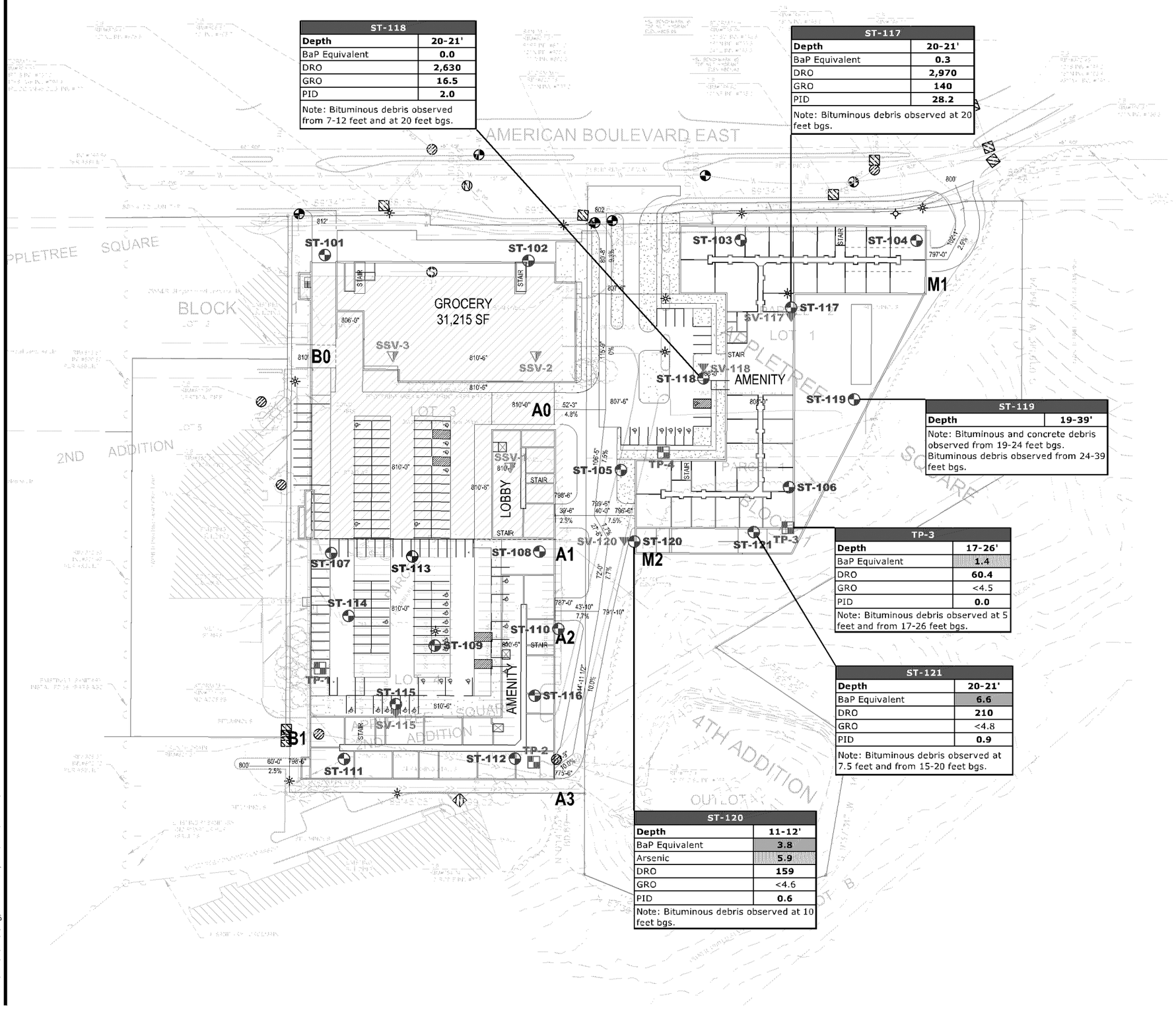
3601 American Boulevard E.

Bloomington, Minnesota

Investigation Locations Sketch

Figure 2

F:\2019\B1909819.dwg,Inv Locs,12/19/2019 8:09:20 AM



ST-118	
Depth	**20-21'**
BaP Equivalent	**0.0**
DRO	**2,630**
GRO	**16.5**
PID	**2.0**
Note: Bituminous debris observed from 7-12 feet and at 20 feet bgs.	

ST-117	
Depth	**20-21'**
BaP Equivalent	**0.3**
DRO	**2,970**
GRO	**140**
PID	**28.2**
Note: Bituminous debris observed at 20 feet bgs.	

ST-119	
Depth	**19-39'**
Note: Bituminous and concrete debris observed from 19-24 feet bgs. Bituminous debris observed from 24-39 feet bgs.	

TP-3	
Depth	**17-26'**
BaP Equivalent	**1.4**
DRO	**60.4**
GRO	<4.5
PID	**0.0**
Note: Bituminous debris observed at 5 feet and from 17-26 feet bgs.	

ST-121	
Depth	**20-21'**
BaP Equivalent	**6.6**
DRO	**210**
GRO	<4.8
PID	**0.9**
Note: Bituminous debris observed at 7.5 feet and from 15-20 feet bgs.	

ST-120	
Depth	**11-12'**
BaP Equivalent	**3.8**
Arsenic	**5.9**
DRO	**159**
GRO	<4.6
PID	**0.6**
Note: Bituminous debris observed at 10 feet bgs.	

NOTES

Minnesota Pollution Control Agency (MPCA) SRVs updated June 2009 and SLVs updated June 2013.
Analytical results in milligrams per kilogram (mg/kg)
PID readings in parts per million (ppm)
Indicated depth is feet below ground surface.
BaP Equivalent = Benzo(a)pyrene (BaP) equivalent is calculated based on the concentration and weighted toxicity of carcinogenic PAHs.
< = Not detected at or above the laboratory reporting limit indicated.
[f] = DRO/GRO concentrations greater than 100 mg/kg are not suitable for reuse as unregulated fill per February 2012 MPCA guidance c-rem1-01.
DRO = Diesel Range Organics
GRO = Gasoline Range Organics
mg/kg = Milligrams per kilogram
SLV = Soil Leaching Value
SRV =Soil Reference Value

Arsenic Screening SLV = 5.8 mg/kg
BaP Equivalent Residential SRV = 2 mg/kg
BaP Equivalent Industrial SRV = 3 mg/kg
BaP Equivalent Screening SLV = 1.4 mg/kg

Exceeds Residential SRV
Exceeds Industrial SRV
Exceeds Screening SLV
Exceeds 100 mg/kg for DRO/GRO[f] or 10 ppm for PID

DENOTES APPROXIMATE LOCATION OF TEST PIT

DENOTES APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING

DENOTES APPROXIMATE LOCATION OF STANDARD PENETRATION TEST BORING WITH GROUNDWATER SAMPLE

DENOTES APPROXIMATE LOCATION OF SOIL VAPOR PROBE

DENOTES APPROXIMATE LOCATION OF SUB-SLAB VAPOR POINT

50' 0 100'
SCALE: 1"= 100'

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The Science You Build On.
11001 Hampshire Avenue S
Minneapolis, MN 55438
952.995.2000
braunintertec.com

Drawing Information

Project No: B1909819
Drawing No: B1909819
Drawn By: LAO
Date Drawn: 9/18/19
Checked By: BR
Last Modified: 12/19/19

Project Information

Crowne Plaza Site

3601 American Boulevard E.

Bloomington, Minnesota

Soil Analytical Results: Regulatory Exceedances

Figure 3

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Table 1
Investigation Locations
and Analytical Testing Summary
Crown Plaza Site
Bloomington, Minnesota
Project: B1909819

Boring/ Test Pit/ Vapor Point ID	Total Depth of Boring/ Test Pit (feet bgs)	Soil Sampling Intervals and Analytical Testing Parameters	Observed Groundwater Depth (feet bgs)	Groundwater Analytical Testing Parameters	Soil Vapor Sample Analytical Testing Parameters/Depth (feet bgs)
ST-113	31	(2-3') VOCs, DRO, GRO, PAHs, 8 RCRA metals	6	VOCs, SVOCs, DRO, GRO, dissolved RCRA metals	---
ST-114	31	(2-3.5') VOCs, DRO, GRO, PAHs, 8 RCRA metals	3	---	---
ST-115	31	(4.5-5.5') VOCs, DRO, GRO, PAHs, 8 RCRA metals	4	---	---
ST-116	31	(4.5-6') VOCs, DRO, GRO, PAHs, 8 RCRA metals	17	---	---
ST-117	31	(5-6') and (20-21') VOCs, DRO, GRO, PAHs, 8 RCRA metals	---	---	---
ST-118	41	(7-8') and (20-21') VOCs, DRO, GRO, PAHs, PCBs, 8 RCRA metals	---	---	---
ST-119	46	(2-3.5') VOCs, DRO, GRO, PAHs, 8 RCRA metals	---	---	---
ST-120	31	(2-3') and (11-12') VOCs, DRO, GRO, PAHs, 8 RCRA metals	28	---	---
ST-121	31	(8-8.5') and (20-21') VOCs, DRO, GRO, PAHs, PCBs, 8 RCRA metals	---	---	---
TP-1	6	(2-4') VOCs, DRO, GRO, PAHs, 8 RCRA metals	---	---	---
TP-2	10	(0.5-2') VOCs, DRO, GRO, PAHs, 8 RCRA metals	---	---	---
TP-3	26	(17-26') VOCs, DRO, GRO, PAHs, 8 RCRA metals	---	---	---
TP-4	26	(4-6') VOCs, DRO, GRO, PAHs, 8 RCRA metals	---	---	---
SV-115	1.5	---	---	---	VOCs
SV-117	3	---	---	---	VOCs
SV-118	3	---	---	---	VOCs
SV-120	3	---	---	---	VOCs
SSV-1	Sub-Slab	---	---	---	VOCs
SSV-2	Sub-Slab	---	---	---	VOCs
SSV-3	Sub-Slab	---	---	---	VOCs

Notes:

bgs = Below ground surface

VOCs = Volatile organic compounds

SVOCs = Semi-volatile organic compounds

PAHs = Polycyclic Aromatic Hydrocarbons

RCRA = Resource Conservation and Recovery Act

DRO = Diesel range organics

GRO = Gasoline range organics

PCBs = Polychlorinated biphenyls

--- = Not analyzed or calculated for this parameter, not observed or not applicable.

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Table 2
Soil Analytical Results- Soil Borings
Crown Plaza Site
Bloomington, Minnesota
Project B1909819

Compound/Parameter	CAS No.	Sample Identifier and Date Collected													Residential Soil Reference Value (SRV) (mg/kg)	Industrial Soil Reference Value (SRV) (mg/kg)	Screening Soil Leaching Value (SLV) (mg/kg)
		ST-113 (2-3)	ST-114 (2-3.5)	ST-115 (4.5-5.5)	ST-116 (4.5-6)	ST-117 (5-6)	ST-117 (20-21)	ST-118 (7-8)	ST-118 (20-21)	ST-119 (2-3.5)	ST-120 (2-3)	ST-120 (11-12)	ST-121 (8-8.5)	ST-121 (20-21)			
		11/25/2019	11/22/2019	11/25/2019	11/22/2019	11/25/2019	11/25/2019	11/25/2019	11/25/2019	11/22/2019	11/26/2019	11/26/2019	11/26/2019	11/26/2019			
Volatile Organic Compounds (VOCs) (mg/kg)																	
n-Butylbenzene	104-51-8	<0.0559	<0.0551	<0.0574	<0.0557	<0.0653	**0.347**	<0.0557	**0.0821**	<0.0576	<0.0543	<0.0650	<0.0663	<0.0587	30	92	NE
sec-Butylbenzene	135-98-8	<0.0559	<0.0551	<0.0574	<0.0557	<0.0653	**0.158**	<0.0557	<0.0557	<0.0576	<0.0543	<0.0650	<0.0663	<0.0587	25	70	NE
p-isopropyltoluene	99-87-6	<0.0559	<0.0551	<0.0574	<0.0557	<0.0653	**0.186**	<0.0557	<0.0557	<0.0576	<0.0543	<0.0650	<0.0663	<0.0587	NE	NE	NE
Naphthalene	91-20-3	<0.223	<0.220	<0.229	<0.223	<0.261	**1.07**	<0.223	**0.917**	<0.230	<0.217	**1.29**	<0.265	**1.06**	10	28	4.5
n-Propylbenzene	103-65-1	<0.0559	<0.0551	<0.0574	<0.0557	<0.0653	**0.082**	<0.0557	<0.0557	<0.0576	<0.0543	<0.0650	<0.0663	<0.0587	30	93	NE
1,2,4-Trimethylbenzene	95-63-6	<0.0559	<0.0551	<0.0574	<0.0557	<0.0653	**0.487**	<0.0557	**0.0823**	<0.0576	<0.0543	<0.0650	<0.0663	<0.0587	8	25	2.7
1,3,5-Trimethylbenzene	108-67-8	<0.0559	<0.0551	<0.0574	<0.0557	<0.0653	**0.147**	<0.0557	<0.0557	<0.0576	<0.0543	<0.0650	<0.0663	<0.0587	3	10	2.7
Xylenes, total	1330-20-7	<0.168	<0.165	<0.172	<0.167	<0.196	**0.207**	<0.167	<0.167	<0.173	<0.163	<0.195	<0.199	<0.176	45[b]	130[b]	5.4[b]
All other reported VOCs	---	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	---	---	---
Polycyclic Aromatic Hydrocarbons (PAHs) (mg/kg)																	
Acenaphthene	83-32-9	<0.0116	<0.0115	<0.0113	<0.0107	<0.0117	**0.307**	<0.0110	<0.217	<0.0113	<0.0114	**0.59**	<0.0119	**1.5**	1,200	5,260	81
Acenaphthylene	208-96-8	<0.0116	<0.0115	<0.0113	<0.0107	<0.0117	<0.215	<0.0110	<0.217	<0.0113	**0.0123**	**0.279**	<0.0119	**0.448**	NE	NE	NE
Anthracene	120-12-7	<0.0116	<0.0115	<0.0113	<0.0107	<0.0117	<0.215	<0.0110	<0.217	<0.0113	<0.0114	**2.18**	<0.0119	**4.09**	7,880	45,400	1,300
Benz(a)anthracene	56-55-3	<0.0116	<0.0115	<0.0113	**0.029**	<0.0117	**0.247**	**0.013**	**0.265**	<0.0113	**0.0255**	**3.33**	<0.0119	**5.76**	cPAH	cPAH	cPAH
Benzo(b)fluoranthene	205-99-2	<0.0116	<0.0115	<0.0113	**0.0202**	<0.0117	<0.215	**0.0235**	<0.217	<0.0113	**0.0363**	**3.15**	<0.0119	**5.4**	cPAH	cPAH	cPAH
Benzo(k)fluoranthene	207-08-9	<0.0116	<0.0115	<0.0113	<0.0107	<0.0117	<0.215	<0.0110	<0.217	<0.0113	<0.0114	**1.39**	<0.0119	**2.43**	cPAH	cPAH	cPAH
Benzo(a)pyrene	50-32-8	<0.0116	<0.0115	<0.0113	**0.0153**	<0.0117	**0.264**	**0.0176**	<0.217	<0.0113	**0.0277**	**2.63**	<0.0119	**4.55**	cPAH	cPAH	cPAH
Benzo(g,h,i)perylene	191-24-2	<0.0116	<0.0115	<0.0113	**0.0373**	<0.0117	<0.215	**0.0169**	<0.217	<0.0113	**0.0207**	**1.46**	<0.0119	**2.44**	NE	NE	NE
Chrysene	218-01-9	<0.0116	<0.0115	<0.0113	**0.015**	<0.0117	**0.644**	**0.0244**	**0.59**	<0.0113	**0.025**	**2.85**	<0.0119	**4.82**	cPAH	cPAH	cPAH
Dibenz(a,h)anthracene	53-70-3	<0.0116	<0.0115	<0.0113	<0.0107	<0.0117	<0.215	<0.0110	<0.217	<0.0113	<0.0114	**0.472**	<0.0119	**0.806**	cPAH	cPAH	cPAH
Fluoranthene	206-44-0	<0.0116	<0.0115	<0.0113	**0.0152**	<0.0117	<0.215	**0.028**	<0.217	<0.0113	**0.0427**	**7.28**	<0.0119	**14.5**	1,080	6,800	670
Fluorene	86-73-7	<0.0116	<0.0115	<0.0113	<0.0107	<0.0117	**0.574**	**0.012**	**0.54**	<0.0113	<0.0114	**1.17**	<0.0119	**2.58**	850	4,120	110
Indeno(1,2,3-cd)pyrene	193-39-5	<0.0116	<0.0115	<0.0113	**0.0152**	<0.0117	<0.215	**0.0126**	<0.217	<0.0113	<0.0114	**1.27**	<0.0119	**2.19**	cPAH	cPAH	cPAH
Naphthalene	91-20-3	<0.0116	<0.0115	<0.0113	<0.0107	<0.0117	**0.519**	<0.0110	**0.385**	<0.0113	<0.0114	**0.522**	<0.0119	**1.18**	10	28	4.5
Phenanthrene	85-01-8	<0.0116	<0.0115	<0.0113	**0.0168**	<0.0117	**1.54**	**0.0306**	**1.6**	<0.0113	**0.0167**	**6.75**	<0.0119	**13.0**	NE	NE	NE
Pyrene	129-00-0	<0.0116	<0.0115	<0.0113	**0.0264**	<0.0117	**0.669**	**0.0253**	**0.553**	<0.0113	**0.0381**	**5.72**	<0.0119	**11.2**	890	5,800	440
All other reported PAHs	---	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	---	---	---
BaP Equivalent[c]	---	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.3**	**0.0**	**0.0**	**0.0**	**0.0**	3.8	**0.0**	6.6	2	3	1.4
Polychlorinated Biphenyls (PCBs) (mg/kg)																	
PCB 1016	12674-11-2	---	---	---	---	---	---	<0.0365	---	---	---	---	---	<0.0382	NE	NE	NE
PCB 1221	11104-28-2	---	---	---	---	---	---	<0.0365	---	---	---	---	---	<0.0382	NE	NE	NE
PCB 1232	11141-16-5	---	---	---	---	---	---	<0.0365	---	---	---	---	---	<0.0382	NE	NE	NE
PCB 1242	53469-21-9	---	---	---	---	---	---	<0.0365	---	---	---	---	---	<0.0382	NE	NE	NE
PCB 1248	12672-29-6	---	---	---	---	---	---	<0.0365	---	---	---	---	---	<0.0382	NE	NE	NE
PCB 1254	11097-69-1	---	---	---	---	---	---	<0.0365	---	---	---	---	---	<0.0382	NE	NE	NE
PCB 1260	11096-82-5	---	---	---	---	---	---	<0.0365	---	---	---	---	---	<0.0382	NE	NE	NE
PCB 1262	37324-23-5	---	---	---	---	---	---	<0.0365	---	---	---	---	---	<0.0382	NE	NE	NE
PCB 1268	11100-14-4	---	---	---	---	---	---	<0.0365	---	---	---	---	---	<0.0382	NE	NE	NE
Total reported PCBs	1336-36-3	---	---	---	---	---	---	<RL	---	---	---	---	---	<RL	1.2	8	0.13
Metals (mg/kg)																	
Arsenic, Total	7440-38-2	**2.8**	**1.8**	**3.4**	**1.6**	**2.9**	**4.1**	**3.3**	**4.1**	**3.3**	**3.6**	5.9	**3.5**	**1.6**	9	20	5.8
Barium, Total	7440-39-3	**51.6**	**36.8**	**42.8**	**36.7**	**58.3**	**44.3**	**54.6**	**46.0**	**63.9**	**72.9**	**63.0**	**65.3**	**49.4**	1,100	18,000	1,700
Cadmium, Total	7440-43-9	<0.16	<0.16	<0.16	<0.15	<0.17	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.18	<0.17	25	200	8.8
Chromium, Total[e]	7440-47-3	**5.9**	**6.4**	**8.1**	**5.3**	**17.9**	**7.8**	**11.2**	**9.3**	**10.2**	**20.4**	**12.5**	**23.7**	**7.1**	44,000/87[e]	100,000/650[e]	1,000,000,000/36[e]
Lead, Total	7439-92-1	**5.9**	**2.3**	**3.6**	**2.3**	**4.4**	**7.1**	**10.7**	**9.4**	**5.7**	**5.7**	**16.3**	**5.5**	**4.5**	300	700	2,700
Mercury, Total	7439-97-6	<0.020	<0.021	<0.022	<0.021	<0.023	**0.025**	**0.021**	<0.021	<0.021	<0.021	**0.025**	<0.022	**0.033**	0.5	1.5	3.3
Selenium, Total	7782-49-2	<1.1	<1.1	<1.1	<1.0	<1.2	<1.0	<1.0	<1.1	<1.1	<1.0	<1.1	<1.2	<1.1	160	1,300	2.6
Silver, Total	7440-22-4	<0.54	<0.53	<0.54	<0.51	<0.58	<0.52	<0.52	<0.53	<0.54	<0.52	<0.54	<0.60	<0.57	160	1,300	7.9
Other Parameters (mg/kg)																	
Diesel Range Organics (DRO)- Silica Gel	---	**28.5**	**8.0** [1]	<9.2	**99.0** [1]	<9.3	**2,970**	**81.5**	**2,630**	**22.8** [1]	<9.6	**159**	<9.6	**210**	NE[f]	NE[f]	NE[f]
Gasoline Range Organics (GRO)	---	<5.2	<4.8	<4.7	<4.4	<4.8	**140** [2]	**18.4** [2]	**16.5** [2]	<4.7	<5.0	<4.6	<6.0	<4.8	NE[f]	NE[f]	NE[f]

Notes

Minnesota Pollution Control Agency (MPCA) SRVs updated June 2009 and SLVs updated June 2013.

mg/kg = Milligrams per kilogram.

< = Not detected at or above the laboratory reporting limit indicated.

--- = Not analyzed or calculated for this parameter or not applicable.

RL = Reporting limits for other parameters that are not listed individually in this table because their concentrations were below reporting limits provided in the laboratory report.

NE = Regulatory limit not established for this parameter.

cPAH = Individual regulatory limit not established for this carcinogenic PAH; included in BaP equivalent calculation.

[b] = Regulatory limit for combination of m-, p-, and o-xylenes.

[c] = Benzo(a)pyrene (BaP) equivalent is calculated based on the concentration and weighted toxicity of cPAHs; MPCA; 2009. If no cPAHs were detected above reasonable laboratory reporting limits the BaP equivalent is reported as 0 mg/kg per MPCA Remediation Division Policy; June 2011.

[e] = Reported result is total chromium, regulatory limit for chromium III and chromium VI are provided.

[f] = DRO/GRO concentrations greater than 100 mg/kg are not suitable for reuse as unregulated fill per MPCA Guidance Document c-rem1-01 "Best Management Practices for the Off-Site Reuse of Unregulated Fill" (February 2012).

[1] [T6] High boiling point hydrocarbons are present in the sample.

[2] [G+] Late peaks present outside the GRO window.

Exceeds Industrial SRV
Exceeds Screening SLV
Exceeds 100 mg/kg for DRO/GRO

BRAUN INTERTEC

Table 3
Soil Analytical Results- Test Pits
Crown Plaza Site
Bloomington, Minnesota
Project B1909819

Compound/Parameter	CAS No.	Sample Identifier and Date Collected					Residential Soil Reference Value (SRV) (mg/kg)	Industrial Soil Reference Value (SRV) (mg/kg)	Screening Soil Leaching Value (SLV) (mg/kg)
		TP-1 (2.0-4.0)	TP-2 (0.5-2.0)	TP-3 (5.0-7.0)	TP-3 (17.0-26.0)	TP-4 (4-6)			
		11/21/2019	11/21/2019	11/21/2019	11/21/2019	11/21/2019			
Volatile Organic Compounds (VOCs) (mg/kg)									
Naphthalene	91-20-3	<0.239	<0.215	<0.237	**0.34**	<0.225	10	28	4.5
1,2,4-Trimethylbenzene	95-63-6	**0.153**	<0.0538	<0.0593	<0.0550	<0.0563	8	25	2.7
All other reported VOCs	---	<RL	<RL	<RL	<RL	<RL	---	---	---
Polycyclic Aromatic Hydrocarbons (PAHs) (mg/kg)									
Acenaphthene	83-32-9	<0.0116	<0.0109	<0.0115	**0.125**	<0.0116	1,200	5,260	81
Acenaphthylene	208-96-8	<0.0116	<0.0109	<0.0115	**0.218**	<0.0116	NE	NE	NE
Anthracene	120-12-7	<0.0116	<0.0109	<0.0115	**0.578**	<0.0116	7,880	45,400	1,300
Benz(a)anthracene	56-55-3	<0.0116	<0.0109	<0.0115	**1.17**	<0.0116	cPAH	cPAH	cPAH
Benzo(b)fluoranthene	205-99-2	<0.0116	<0.0109	<0.0115	**1.19**	<0.0116	cPAH	cPAH	cPAH
Benzo(k)fluoranthene	207-08-9	<0.0116	<0.0109	<0.0115	**0.478**	<0.0116	cPAH	cPAH	cPAH
Benzo(a)pyrene	50-32-8	<0.0116	<0.0109	<0.0115	**0.927**	<0.0116	cPAH	cPAH	cPAH
Benzo(g,h,i)perylene	191-24-2	<0.0116	<0.0109	<0.0115	**0.496**	<0.0116	NE	NE	NE
Chrysene	218-01-9	<0.0116	<0.0109	<0.0115	**1.06**	<0.0116	cPAH	cPAH	cPAH
Dibenz(a,h)anthracene	53-70-3	<0.0116	<0.0109	<0.0115	**0.193**	<0.0116	cPAH	cPAH	cPAH
Fluoranthene	206-44-0	<0.0116	<0.0109	<0.0115	**2.63**	<0.0116	1,080	6,800	670
Fluorene	86-73-7	<0.0116	<0.0109	<0.0115	**0.307**	<0.0116	850	4,120	110
Indeno(1,2,3-cd)pyrene	193-39-5	<0.0116	<0.0109	<0.0115	**0.473**	<0.0116	cPAH	cPAH	cPAH
Naphthalene	91-20-3	<0.0116	<0.0109	<0.0115	**0.07**	<0.0116	10	28	4.5
Phenanthrene	85-01-8	<0.0116	<0.0109	<0.0115	**2.05**	<0.0116	NE	NE	NE
Pyrene	129-00-0	<0.0116	<0.0109	<0.0115	**2.0**	<0.0116	890	5,800	440
All other reported PAHs	---	<RL	<RL	<RL	<RL	<RL	---	---	---
BaP Equivalent[c]	---	**0.0**	**0.0**	**0.0**	**1.4**	**0.0**	2	3	1.4
Metals (mg/kg)									
Arsenic, Total	7440-38-2	**1.8**	**3.2**	**3.0**	**2.7**	**4.3**	9	20	5.8
Barium, Total	7440-39-3	**30.0**	**48.8**	**58.1**	**44.2**	**65.0**	1,100	18,000	1,700
Cadmium, Total	7440-43-9	<0.17	<0.16	<0.16	<0.16	**0.23**	25	200	8.8
Chromium, Total[e]	7440-47-3	**6.1**	**7.5**	**19.1**	**7.6**	**9.7**	44,000/87[e]	100,000/650[e]	1,000,000,000/36[e]
Lead, Total	7439-92-1	**2.4**	**5.8**	**18.1**	**8.6**	**5.6**	300	700	2,700
Mercury, Total	7439-97-6	<0.021	<0.020	<0.022	<0.020	<0.023	0.5	1.5	3.3
Selenium, Total	7782-49-2	<1.1	<1.0	<1.0	<1.1	<1.1	160	1,300	2.6
Silver, Total	7440-22-4	<0.55	<0.52	<0.52	<0.53	<0.56	160	1,300	7.9
Other Parameters (mg/kg)									
Diesel Range Organics (DRO)- Silica Gel	---	<9.2	<8.9	<9.4	**60.4** [3]	<8.9	NE[f]	NE[f]	NE[f]
Gasoline Range Organics (GRO)	---	<4.8	<4.5	<4.8	<4.5 [1]	<4.8	NE[f]	NE[f]	NE[f]

Notes

Minnesota Pollution Control Agency (MPCA) SRVs updated June 2009 and SLVs updated June 2013.

mg/kg = Milligrams per kilogram.

< = Not detected at or above the laboratory reporting limit indicated.

--- = Not analyzed or calculated for this parameter or not applicable.

RL = Reporting limits for other parameters that are not listed individually in this table because their concentrations were below reporting limits provided in the laboratory report.

NE = Regulatory limit not established for this parameter.

cPAH = Individual regulatory limit not established for this carcinogenic PAH; included in BaP equivalent calculation.

[c] = Benzo(a)pyrene (BaP) equivalent is calculated based on the concentration and weighted toxicity of cPAHs; MPCA; 2009. If no cPAHs were detected above reasonable laboratory reporting limits the BaP equivalent is reported as 0 mg/kg per MPCA Remediation Division Policy; June 2011.

[e] = Reported result is total chromium, regulatory limit for chromium III and chromium VI are provided.

[f] = DRO/GRO concentrations greater than 100 mg/kg are not suitable for reuse as unregulated fill per MPCA Guidance Document c-rem1-01 "Best Management Practices for the Off-Site Reuse of Unregulated Fill" (February 2012).

[1] [G+] Late peaks present outside the GRO window.

[3] [T6] High boiling point hydrocarbons are present in the sample.

Exceeds Screening SLV

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Table 4
Groundwater Analytical Results
Crown Plaza Site
Bloomington, Minnesota
Project B1909819

Compound/Parameter	CAS No.	Sample Identifier, Depth to Groundwater, and Date Collected	Drinking Water Criteria (µg/L)	Source-Date
		GW-113		
		6'		
		11/25/2019		
Volatile Organic Compounds (VOCs) (µg/L)				
All reported VOCs	---	<RL	---	---
Semi-Volatile Organic Compounds (SVOCs) (µg/L)				
Acenaphthene	83-32-9	**0.11**	100	HRL-18
Acenaphthylene	208-96-8	<0.039	NE	---
Anthracene	120-12-7	**0.048**	2,000	HRL-93
Benz(a)anthracene	56-55-3	<0.039	cPAH	---
Benzo(a)pyrene	50-32-8	<0.039	cPAH	---
Benzo(b)fluoranthene	205-99-2	<0.039	cPAH	---
Benzo(g,h,i)perylene	191-24-2	<0.039	NE	---
Benzo(k)fluoranthene	207-08-9	<0.039	cPAH	---
Chrysene	218-01-9	**0.044**	cPAH	---
Dibenz(a,h)anthracene	53-70-3	<0.039	cPAH	---
Fluorene	86-73-7	**0.16**	300	HRL-93
Indeno(1,2,3-cd)pyrene	193-39-5	<0.039	cPAH	---
4-Methylphenol (p-Cresol)	106-44-5	---	3	HRL-94
Total Cresols	1319-77-3	---	3[b]	HRL-94
Naphthalene	91-20-3	**0.2**	70	HRL-13
Phenanthrene	85-01-8	**0.31**	NE	---
Pyrene	129-00-0	**0.1**	50	HRL-18
All other reported SVOCs	---	<RL	---	---
BaP Equivalent[c]	---	**0.0**	0.1	HBV-18
Metals (µg/L)				
Arsenic, Dissolved	7440-38-2	<20.0	10	MCL
Barium, Dissolved	7440-39-3	**309**	2,000	HRL-93
Cadmium, Dissolved	7440-43-9	<3.0	0.5	HRL-15
Chromium, Dissolved[d]	7440-47-3	<10.0	20,000/100[d]	HRL-94
Lead, Dissolved	7439-92-1	<10.0	15	MCL
Mercury, Dissolved	7439-97-6	<0.20	2	MCL
Selenium, Dissolved	7782-49-2	<20.0	30	HRL-93
Silver, Dissolved	7440-22-4	<10.0	30	HRL-93
Other Parameters (µg/L)				
Diesel Range Organics (DRO)	---	**390** [1]	NE[e]	---
Gasoline Range Organics (GRO)	---	<100	NE[e]	---

Notes

Drinking Water Criteria = The most conservative value for chronic or cancer exposures provided from the following sources including the Minnesota Department of Health (MDH) Health Risk Limit (HRL), MDH Health Based Value (HBV), MDH Risk Assessment Advice (RAA) or Maximum Contaminant Level (MCL). The date of promulgation is provided, if available. Values updated April 2019.

µg/L = Micrograms per liter.

< = Not detected at or above the laboratory reporting limit indicated.

--- = Not analyzed or calculated for this parameter or not applicable.

RL = Reporting limits for other parameters that are not listed individually in this table because their concentrations were below reporting limits provided in the laboratory report.

NE = Regulatory limit not established for this parameter.

cPAH = Individual regulatory limit not established for this carcinogenic PAH; included in BaP equivalent calculation.

[b] = Regulatory limit for 4-methylphenol only.

[c] = Benzo[a]pyrene (BaP) equivalent is calculated based on the concentration and weighted toxicity of cPAHs; Minnesota Pollution Control Agency; 2009. If no cPAHs were detected above reasonable laboratory reporting limits the BaP equivalent is reported as 0 mg/kg per MPCA Remediation Division Policy; June 2011.

[d] = Reported result is total chromium, criteria for chromium III and chromium VI are provided.

[e] = No applicable standard exists. When sampling water directly from drinking water wells, refer to the Minnesota Department of Health's (MDH's) document entitled *Guidance for Evaluating Health Risks for Gasoline and Diesel Contaminated Drinking Water,* dated November 2018.

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Table 5
Soil Vapor Analytical Results
Crown Plaza Site
Bloomington, Minnesota
Project B1909819

Compound/Parameter	CAS No.	Sample Identifier and Date Collected							Residential ISV ($\mu g/m^3$)	33X Residential ISV ($\mu g/m^3$)	Commercial/ Industrial ISV ($\mu g/m^3$)	33X Commercial/ Industrial ISV ($\mu g/m^3$)
		Sub-Slab Vapor Points			Soil Vapor Probes							
		SSV-1	SSV-2	SSV-3	SV-115	SV-117	SV-118	SV-120				
		11/26/2019	11/26/2019	11/26/2019	11/26/2019	11/26/2019	11/26/2019	11/26/2019				
Volatile Organic Compounds (VOCs) ($\mu g/m^3$)												
Acetone	67-64-1	**540**	**123**	**176**	**89.1**	**35.4**	**162**	**23.7**	32,000	1,100,000	110,000	3,700,000
Benzene	71-43-2	**3.7**	**1.7**	**2.4**	**39.1**	**11.2**	**44.1**	**1.2**	4.6	150	45	1,500
2-Butanone (Methyl ethyl ketone, MEK)	78-93-3	**10.6**	**5.8**	**12.9**	<5.1	**17.5**	**70.7**	<5.4	5,200	170,000	18,000	600,000
Carbon disulfide	75-15-0	<1.2	**30.4**	<1.1	**6.0**	**5.9**	**14.0**	<1.1	830	28,000	2,800	93,000
Chloroform	67-66-3	**10.2**	**54.4**	<0.88	<0.85	<0.85	<0.83	<0.89	100	3,300	350	12,000
Chloromethane	74-87-3	**0.9**	<0.76	<0.74	<0.72	<0.72	**2.5**	<0.76	94	3,100	320	11,000
Cyclohexane	110-82-7	**8.2**	**4.7**	**7.0**	**27.1**	**5.0**	**43.7**	<3.2	6,300	210,000	21,000	700,000
Dichlorodifluoromethane (Freon 12)	75-71-8	**51.7**	**97.2**	**158**	**142**	<1.7	**2.0**	<1.8	NE	NE	NE	NE
cis-1,2-Dichloroethene	156-59-2	<1.5	<1.5	<1.4	<1.4	<1.4	**1.6**	<1.5	NE	NE	NE	NE
Ethanol	64-17-5	**17.2**	**21.4**	**9.9**	**7.2**	**9.2**	**11.8**	<3.5	NE	NE	NE	NE
Ethyl acetate	141-78-6	<1.4	<1.3	<1.3	**8.8**	<1.3	**5.0**	<1.3	73	2,400	250	8,300
Ethylbenzene	100-41-4	**2.8**	**2.8**	**4.4**	**19.0**	**4.8**	**9.0**	<1.6	4.1	140	39	1,300
n-Heptane	142-82-5	**2.6**	**6.4**	**3.8**	<1.4	**8.5**	**35.1**	**2.2**	420	14,000	1,400	47,000
n-Hexane	110-54-3	**7.0**	**12.5**	**6.9**	**48.9**	**10.5**	**35.0**	**3.8**	730	24,000	2,500	83,000
Methylene chloride (Dichloromethane)	75-09-2	**11.5**	**11.9**	**9.5**	**7.3**	**6.0**	**14.4**	<6.4	630	21,000	2,100	70,000
2-Propanol (Isopropyl alcohol)	67-63-0	**12.6**	**10.8**	**13.7**	**17.8**	**30.7**	**34.1**	**56.3**	210	7,000	700	23,000
Propylene	115-07-1	<0.65	**33.7**	<0.62	<0.60	<0.60	**455** [1]	<0.63	3,100	100,000	11,000	370,000
Styrene	100-42-5	<1.6	<1.6	<1.5	**5.2**	<1.5	**3.9**	<1.6	940	31,000	3,200	110,000
Tetrachloroethene (Perchloroethene, PCE)	127-18-4	**18.4**	<1.2	<1.2	<1.2	<1.2	**1.3**	<1.2	3.4	110	33	1,100
Tetrahydrofuran	109-99-9	**13.9**	**16.3**	**63.2**	<1.0	<1.0	<1.0	<1.1	2,100	70,000	7,000	230,000
Toluene	108-88-3	**6.6**	**4.5**	**6.1**	**51.8**	**14.3**	**45.3**	<1.4	4,200	140,000	14,000	470,000
Trichlorofluoromethane (Freon 11)	75-69-4	**3.8**	**10.7**	**13.5**	**2.4**	<1.9	<1.9	<2.1	1,000	33,000	3,500	120,000
1,2,4-Trimethylbenzene	95-63-6	**2.0**	<1.8	**2.1**	**3.2**	<1.7	**2.9**	<1.8	63	2,100	210	7,000
Xylenes, m- & p-	179601-23-1	**5.0**	**3.4**	**4.3**	**15.0**	**5.1**	**14.8**	<3.2	100[d]	3,300[d]	350[d]	12,000[d]
Xylene, o-	95-47-6	**2.4**	**1.6**	**2.4**	**5.4**	**1.9**	**5.5**	<1.6	100[d]	3,300[d]	350[d]	12,000[d]
All other reported VOCs	---	<RL	<RL	<RL	<RL	<RL	<RL	<RL	---	---	---	---

Notes

Minnesota Pollution Control Agency (MPCA) Intrusion Screening Values (ISVs) were updated 5/29/2019.

$\mu g/m^3$ = Micrograms per cubic meter.

< = Not detected at or above the laboratory reporting limit indicated.

--- = Not analyzed or calculated for this parameter or not applicable.

RL = Reporting limits for other parameters that are not listed individually in this table because their concentrations were below reporting limits provided in the laboratory report.

NE = Regulatory limit not established for this parameter.

[d] = Regulatory limit for combination of m-, p-, and o-xylenes.

[1] [E] Analyte concentration exceeded the calibration range. The reported result is estimated.

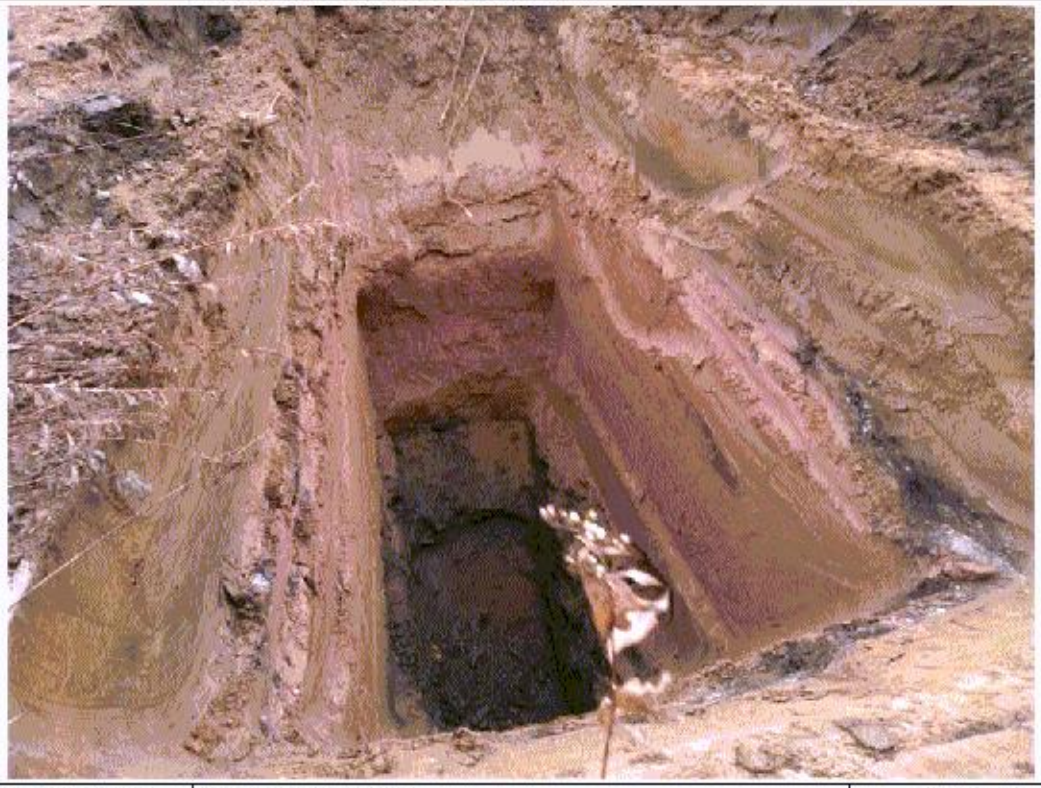
Exceeds Residential ISV
Exceeds 33X Residential ISV
Exceeds Commercial/Industrial ISV
Exceeds 33X Commercial/Industrial ISV

BRAUN INTERTEC

Photograph #1	Crown Plaza Site	B1909819
Date:	November 21, 2019	BRAUN INTERTEC
Direction:	Facing West	
Subject:	Soils in TP-1 excavated to 6 feet bgs to expose existing parking structure footing.	

Photograph #2	Crown Plaza Site	B1909819
Date:	November 21, 2019	BRAUN INTERTEC
Direction:	NA	
Subject:	Native soil exposed below fill materials in TP-2.	

Photograph #3	Crown Plaza Site	B1909819
Date:	November 21, 2019	BRAUN INTERTEC
Direction:	Facing East	
Subject:	Buried layer of bituminous material at approximately 5 feet bgs in TP-3.	



Photograph #4	Crown Plaza Site	B1909819
Date:	November 21, 2019	BRAUN INTERTEC
Direction:	Facing Southeast	
Subject:	Dark colored fill soils with bituminous material visible at 17 feet to the end of TP-3 at 26 feet bgs.	

Photograph #5	Crown Plaza Site	B1909819
Date:	November 21, 2019	BRAUN INTERTEC
Direction:	Facing Northwest	
Subject:	TP-4 excavated to 26 feet bgs.	

Photograph #6	Crown Plaza Site	B1909819
Date:	November 21, 2019	BRAUN INTERTEC
Direction:	Facing North	
Subject:	Fill soils with bituminous materials present at 16 feet to the end of TP-4 at 26 feet bgs.	

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1909819
Geotechnical & Environmental Evaluation
Crown Plaza Site
3601 American Boulevard E
Bloomington, Minnesota

BORING: **ST-113**

LOCATION: See attached sketch

NORTHING: 124308 EASTING: 542164

DRILLER: C. McClain | LOGGED BY: R. Braun | START DATE: 11/25/19 | END DATE: 11/25/19

SURFACE ELEVATION: 778.3 ft | RIG: 7514 | METHOD: 3 1/4" HSA | SURFACING: Bituminous | WEATHER: Clear

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
777.4		PAVEMENT, 5 inches of bituminous over 6 inches of aggregate base					
0.9		FILL: POORLY GRADED SAND with SILT (SP-SM), fine to medium-grained Sand, brown, moist to wet		3-7-6 (13) 11"	0.0	5	Soil sample ST-113 (2-3') @ 08:25 collected for VOCs, GRO, DRO, PAHs and 8 RCRA metals
			5	3-7-7 (14) 6"	0.0	22	
	▼			2-2-2 (4) 6"	0.0	18	P200=7%
769.3							
9.0		POORLY GRADED SAND with SILT (SP-SM), fine to coarse-grained Sand, trace Gravel, brown, wet, loose to medium dense (ALLUVIUM)	10	1-1-2 (3) 8"	0.0		Installed piezometer at 10 feet. Screen set from 6.5 to 11.5 feet. Water measured at 6 feet in piezometer. Water sample GW-113 @ 08:40 collected for VOCs, GRO, DRO, SVOCs and dissolved RCRA metals.
				5-9-11 (20) 10"	0.0		
			15	1-12-12 (24) 5"	0.1		
			20	5-7-8 (15) 12"	0.0		
			25	5-7-9 (16) 8"	0.1		

Continued on next page

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1909819
Geotechnical & Environmental Evaluation
Crown Plaza Site
3601 American Boulevard E
Bloomington, Minnesota

BORING: **ST-113**

LOCATION: See attached sketch

NORTHING: 124308 EASTING: 542164

DRILLER: C. McClain | LOGGED BY: R. Braun | START DATE: 11/25/19 | END DATE: 11/25/19

SURFACE ELEVATION: 778.3 ft | RIG: 7514 | METHOD: 3 1/4" HSA | SURFACING: Bituminous | WEATHER: Clear

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
749.3		POORLY GRADED SAND with SILT (SP-SM), fine to coarse-grained Sand, trace Gravel, brown, wet, loose to medium dense (ALLUVIUM)					
29.0			30	1-4-6 (10) 6"	0.0		
747.3		SANDY SILT (ML), brown, wet, loose (ALLUVIUM)					
31.0		END OF BORING					Water observed at 7.0 feet with 7.0 feet of tooling in the ground while drilling.
		Boring immediately grouted					Water observed at 7.0 feet with 30.0 feet of tooling in the ground at end of drilling.
			35				
			40				
			45				
			50				
			55				

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1909819
Geotechnical & Environmental Evaluation
Crown Plaza Site
3601 American Boulevard E
Bloomington, Minnesota

BORING: **ST-114**
LOCATION: See attached sketch
NORTHING: 124248 EASTING: 542100
START DATE: 11/22/19 END DATE: 11/22/19
SURFACE ELEVATION: 777.2 ft RIG: 7514 METHOD: 3 1/4" HSA
SURFACING: Bituminous WEATHER: Clear
DRILLER: C. McClain LOGGED BY: R. Braun

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
776.2		PAVEMENT, 5 inches of bituminous over 7 inches of aggregate base					
1.0	▼	FILL: POORLY GRADED SAND (SP), fine to medium-grained Sand, brown, wet		4-5-5 (10) 9"	0.1	17	P200=4% Soil sample ST-114 (2-3.5') @ 08:20 collected for VOCs, GRO, DRO, PAHs and 8 RCRA metals
	▽		5	3-3-7 (10) 8"	0.2	19	
770.2							
7.0		POORLY GRADED SAND with SILT (SP-SM), fine to coarse-grained Sand, trace Gravel, brown, wet, loose to medium dense (ALLUVIUM)		2-5-5 (10) 9"	0.2		
	▼		10	2-14-8 (22) 18"	0.0		
				4-7-9 (16) 18"	0.0		
			15	3-8-8 (16) 18"	0.3		
			20	6-5-8 (13) 6"	0.5		
			25	1-4-6 (10) 10"	0.4		
751.2							
26.0		SANDY SILT (ML), brown, moist, medium dense (ALLUVIUM)					

Continued on next page

BRAUN INTERTEC
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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1909819
Geotechnical & Environmental Evaluation
Crown Plaza Site
3601 American Boulevard E
Bloomington, Minnesota

BORING: **ST-114**

LOCATION: See attached sketch

NORTHING: 124248 EASTING: 542100

DRILLER: C. McClain | LOGGED BY: R. Braun | START DATE: 11/22/19 | END DATE: 11/22/19

SURFACE ELEVATION: 777.2 ft | RIG: 7514 | METHOD: 3 1/4" HSA | SURFACING: Bituminous | WEATHER: Clear

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
		SANDY SILT (ML), brown, moist, medium dense (ALLUVIUM)					
746.2			30	1-3-8 (11) 6"	0.4		
31.0		END OF BORING Boring immediately grouted					Water observed at 5.0 feet with 5.0 feet of tooling in the ground while drilling. Water observed at 10.0 feet with 30.0 feet of tooling in the ground at end of drilling. Water observed at 3.0 feet with a cave-in depth of 3.0 feet immediately after withdrawal of auger.
			35				
			40				
			45				
			50				
			55				

BRAUN INTERTEC
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See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1909819
Geotechnical & Environmental Evaluation
Crown Plaza Site
3601 American Boulevard E
Bloomington, Minnesota

BORING: **ST-115**
LOCATION: See attached sketch
NORTHING: 124160 EASTING: 542147
DRILLER: C. McClain LOGGED BY: R. Braun START DATE: 11/25/19 END DATE: 11/25/19
SURFACE ELEVATION: 775.7 ft RIG: 7514 METHOD: 3 1/4" HSA SURFACING: Bituminous WEATHER: Clear

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
774.9		PAVEMENT, 5 inches of bituminous over 4 inches of aggregate base					
0.8		FILL: SILTY SAND (SM), fine to medium-grained Sand, brown, moist		4-7-8 (15) 12"	0.0	11	
771.7	▼						
4.0		FILL: SANDY LEAN CLAY (CL), brown, moist	5	7-8-5 (13) 10"	0.0	29	Soil sample ST-115 (4.5-5.5') @ 10:25 collected for VOCs, GRO, DRO, PAHs and 8 RCRA metals
768.7							
7.0		POORLY GRADED SAND with SILT (SP-SM), fine to coarse-grained Sand, trace Gravel, brown, wet, loose to medium dense (ALLUVIUM)		7-6-5 (11) 12"	0.0		
			10	3-5-5 (10) 14"	0.0		
763.7							
12.0		POORLY GRADED SAND (SP), fine to coarse-grained Sand, trace Gravel, brown, wet, loose to medium dense (ALLUVIUM)		3-4-6 (10) 6"	0.0		
			15	2-5-13 (18) 12"	0.0		
756.7							
19.0		SANDY SILT (ML), brown, wet, very loose to medium dense (ALLUVIUM)	20	1-1-3 (4) 6"	0.0		
			25	3-3-5 (8) 14"	0.0		

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BRAUN INTERTEC
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See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1909819
Geotechnical & Environmental Evaluation
Crown Plaza Site
3601 American Boulevard E
Bloomington, Minnesota

BORING: **ST-115**

LOCATION: See attached sketch

NORTHING: 124160 EASTING: 542147

DRILLER: C. McClain | LOGGED BY: R. Braun | START DATE: 11/25/19 | END DATE: 11/25/19

SURFACE ELEVATION: 775.7 ft | RIG: 7514 | METHOD: 3 1/4" HSA | SURFACING: Bituminous | WEATHER: Clear

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
		SANDY SILT (ML), brown, wet, very loose to medium dense (ALLUVIUM)	30	5-7-8 (15) 18"	0.0		
744.7 31.0		END OF BORING Boring immediately grouted					Water observed at 7.0 feet with 7.0 feet of tooling in the ground while drilling. Water observed at 4.0 feet with 30.0 feet of tooling in the ground at end of drilling. Water observed at 4.0 feet with a cave-in depth of 5.0 feet immediately after withdrawal of auger.
			35				
			40				
			45				
			50				
			55				

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See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1909819
Geotechnical & Environmental Evaluation
Crown Plaza Site
3601 American Boulevard E
Bloomington, Minnesota

BORING: **ST-116**
LOCATION: See attached sketch
NORTHING: 124168 EASTING: 542286
START DATE: 11/22/19 END DATE: 11/22/19
SURFACE ELEVATION: 774.6 ft RIG: 7514 METHOD: 3 1/4" HSA
SURFACING: Bituminous WEATHER: Clear
DRILLER: C. McClain LOGGED BY: R. Braun

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
773.9		PAVEMENT, 5 inches of bituminous over 3 inches of aggregate base					
0.7		FILL: SILTY SAND (SM), fine to medium-grained Sand, brown, moist		4-10-11 (21) 12"	0.3	5	
			5	8-13-13 (26) 12"	0.5	5	P200=13% Soil sample ST-116 (4.5-6') @ 10:00 collected for VOCs, GRO, DRO, PAHs and 8 RCRA metals
				6-10-15 (25) 14"	0.7	7	
			10	5-8-14 (22) 16"	0.3		
				5-9-12 (21) 14"	0.4		
			15	8-12-14 (26) 16"	0.5		
	▼						
755.6							
19.0		SANDY SILT (ML), brown, wet, loose to medium dense (ALLUVIUM)	20	1-4-11 (15) 12"	0.7		
			25	2-3-3 (6) 14"	0.9		

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BRAUN INTERTEC
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See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1909819
Geotechnical & Environmental Evaluation
Crown Plaza Site
3601 American Boulevard E
Bloomington, Minnesota

BORING: **ST-116**

LOCATION: See attached sketch

NORTHING: 124168 EASTING: 542286

DRILLER: C. McClain | LOGGED BY: R. Braun | START DATE: 11/22/19 | END DATE: 11/22/19

SURFACE ELEVATION: 774.6 ft | RIG: 7514 | METHOD: 3 1/4" HSA | SURFACING: Bituminous | WEATHER: Clear

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
		SANDY SILT (ML), brown, wet, loose to medium dense (ALLUVIUM)					
743.6			30	2-5-6 (11) 18"	0.2		
31.0		END OF BORING					Water not observed while drilling.
		Boring immediately grouted					Water observed at 17.0 feet with 30.0 feet of tooling in the ground at end of drilling.
			35				Water not observed to cave-in depth of 7.0 feet immediately after withdrawal of auger.
			40				
			45				
			50				
			55				

BRAUN INTERTEC
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See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1909819
Geotechnical & Environmental Evaluation
Crown Plaza Site
3601 American Boulevard E
Bloomington, Minnesota

BORING: **ST-117**
LOCATION: See attached sketch
NORTHING: 124556 EASTING: 542542
START DATE: 11/25/19 END DATE: 11/25/19
SURFACE ELEVATION: 798.3 ft RIG: 7514 METHOD: 3 1/4" HSA
SURFACING: Bituminous WEATHER: Clear
DRILLER: C. McClain LOGGED BY: R. Braun

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
797.5		PAVEMENT, 3 inches of bituminous over 7 inches of aggregate base					
0.8		FILL: SILTY SAND (SM), fine to medium-grained Sand, trace Gravel, brown, moist		1-3-3 (6) 8"	0.0	7	P200=16%
			5	5-4-6 (10) 14"	0.0	12	Soil sample ST-117 (5-6') @ 14:00 collected for VOCs, GRO, DRO, PAHs and 8 RCRA metals
789.3				5-9-9 (18) 6"	0.1		
9.0		FILL: POORLY GRADED SAND with SILT (SP-SM), fine to medium-grained Sand, gray, moist	10	5-7-12 (19) 10"	0.2		
786.3							
12.0		FILL: SILTY SAND (SM), fine to medium-grained Sand, black to gray, moist		3-3-4 (7) 6"	0.4		
		Slight petroleum-like odor from 12 to 23 feet	15	1-9-15 (24) 12"	5.9		
		Bituminous debris at 20 feet	20	8-10-17 (27) 8"	28.2		Soil sample ST-117 (20-21') @ 14:15 collected for VOCs, GRO, DRO, PAHs and 8 RCRA metals
			25	1-1-2 (3) 13"	0.6		
770.3							
28.0		Continued on next page					

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See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1909819
Geotechnical & Environmental Evaluation
Crown Plaza Site
3601 American Boulevard E
Bloomington, Minnesota

BORING: **ST-117**

LOCATION: See attached sketch

NORTHING: 124556	EASTING: 542542		
DRILLER: C. McClain	LOGGED BY: R. Braun	START DATE: 11/25/19	END DATE: 11/25/19
SURFACE ELEVATION: 798.3 ft	RIG: 7514	METHOD: 3 1/4" HSA	SURFACING: Bituminous	WEATHER: Clear

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
		POORLY GRADED SAND (SP), fine to medium-grained Sand, trace Gravel, brown, moist, loose (ALLUVIUM)					
767.3				1-2-5 (7) 8"	0.0		
31.0		END OF BORING					Water not observed while drilling.
		Boring immediately grouted					Water not observed at end of drilling.
							Water not observed to cave-in depth of 14.0 feet immediately after withdrawal of auger.

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See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1909819
Geotechnical & Environmental Evaluation
Crown Plaza Site
3601 American Boulevard E
Bloomington, Minnesota

BORING: **ST-118**
LOCATION: See attached sketch
NORTHING: 124485 EASTING: 542455
START DATE: 11/25/19 END DATE: 11/25/19
SURFACE ELEVATION: 798.0 ft RIG: 7514 METHOD: 3 1/4" HSA
SURFACING: Bituminous WEATHER: Clear
DRILLER: C. McClain LOGGED BY: R. Braun

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
~~797.7~~ 0.3		SILTY SAND (SM), fine to medium-grained Sand, brown, moist (TOPSOIL FILL)					
		FILL: CLAYEY SAND (SC), trace Gravel, brown, moist		3-5-5 (10) 8"	0.0	13	
794.0 4.0		FILL: SILTY SAND (SM), fine to medium-grained Sand, black, moist	5	3-3-5 (8) 14"	0.0		
		Bituminous debris from 7 to 12 feet *Slight petroleum-like odor from 7 to 19 feet*		6-8-9 (17) 6"	3.6		Soil sample ST-118 (7-8') @ 12:20 collected for VOCs, GRO, DRO, PAHs, PCBs and 8 RCRA metals
			10	5-4-2 (6) 5"	1.7		
				5-9-7 (16) 8"	0.9		
			15	1-2-2 (4) 5"	0.6		
		Bituminous debris at 20 feet	20	3-6-12 (18) 12"	2.0		Soil sample ST-118 (20-21') @ 13:00 collected for VOCs, GRO, DRO, PAHs and 8 RCRA metals
		Slight petroleum-like odor at 25 feet	25	8-6-5 (11) 10"	1.3		

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BRAUN INTERTEC
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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1909819
Geotechnical & Environmental Evaluation
Crown Plaza Site
3601 American Boulevard E
Bloomington, Minnesota

BORING: **ST-118**
LOCATION: See attached sketch
NORTHING: 124485 EASTING: 542455
START DATE: 11/25/19 END DATE: 11/25/19
DRILLER: C. McClain LOGGED BY: R. Braun
SURFACE ELEVATION: 798.0 ft RIG: 7514 METHOD: 3 1/4" HSA
SURFACING: Bituminous WEATHER: Clear

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
		FILL: SILTY SAND (SM), fine to medium-grained Sand, black, moist	30	1-2-4 (6)	0.5		
			35	1-6-10 (16) 18"	0.2		
760.0 38.0		POORLY GRADED SAND with SILT (SP-SM), fine to medium-grained Sand, trace Gravel, gray, moist, medium dense (ALLUVIUM)	40	1-12-16 (28) 10"	0.0		
757.0 41.0		END OF BORING Boring immediately grouted	45				Water not observed while drilling. Water not observed at end of drilling. Water not observed to cave-in depth of 19.0 feet immediately after withdrawal of auger.
			50				
			55				

BRAUN INTERTEC
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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1909819
Geotechnical & Environmental Evaluation
Crown Plaza Site
3601 American Boulevard E
Bloomington, Minnesota

BORING: **ST-119**
LOCATION: See attached sketch
NORTHING: 124464 EASTING: 542605
START DATE: 11/22/19 END DATE: 11/22/19
SURFACE ELEVATION: 797.5 ft RIG: 7514 METHOD: 3 1/4" HSA
SURFACING: Bituminous WEATHER: Clear
DRILLER: C. McClain LOGGED BY: R. Braun

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
796.7		PAVEMENT, 3 inches of bituminous over 6 inches of aggregate base					
0.8		FILL: SILTY SAND (SM), fine to medium-grained Sand, dark brown, moist		4-9-8 (17) 12"	0.8		Soil sample ST-119 (2-3.5') @ 11:35 collected for VOCs, GRO, DRO, PAHs and 8 RCRA metals
793.5							
4.0		FILL: CLAYEY SAND (SC), trace Gravel, brown to dark brown, moist	5	8-11-10 (21) 16"	0.9	16	
				3-5-5 (10) 18"	0.3	13	
			10	4-2-7 (9) 14"	0.1		
785.5							
12.0		FILL: SILTY SAND (SM), fine to medium-grained Sand, dark brown, moist		2-3-6 (9) 14"	0.9		
		Slight chemical-like odor at 15 feet	15	2-4-4 (8) 14"	8.9		
778.5							
19.0		FILL: CLAYEY SAND (SC), with concrete and bituminous debris, black, moist *Faint petroleum-like odor*	20	7-21-8 (29) 18"	4.0		
773.5							
24.0		FILL: SILTY SAND (SM), fine to medium-grained Sand, with bituminous debris, black, moist *Faint petroleum-like odor*	25	4-9-11 (20) 14"	2.3		

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BRAUN INTERTEC
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See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1909819
Geotechnical & Environmental Evaluation
Crown Plaza Site
3601 American Boulevard E
Bloomington, Minnesota

BORING: **ST-119**

LOCATION: See attached sketch

NORTHING: 124464 EASTING: 542605

DRILLER: C. McClain | LOGGED BY: R. Braun | START DATE: 11/22/19 | END DATE: 11/22/19

SURFACE ELEVATION: 797.5 ft | RIG: 7514 | METHOD: 3 1/4" HSA | SURFACING: Bituminous | WEATHER: Clear

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
		FILL: SILTY SAND (SM), fine to medium-grained Sand, with bituminous debris, black, moist	30	1-4-5 (9) 13"	2.3		
		Slight chemical-like odor at 35 feet	35	1-6-6 (12) 12"	1.6		
758.5							
39.0		SANDY SILT (ML), gray, moist, loose (ALLUVIUM)	40	1-3-3 (6) 13"	0.9		
754.5							
43.0		POORLY GRADED SAND (SP), fine to medium-grained Sand, trace Gravel, brown, moist, medium dense (ALLUVIUM)	45	1-6-8 (14) 9"	0.6		
751.5							
46.0		END OF BORING					Water not observed while drilling.
		Boring immediately grouted					Water not observed at end of drilling.
			50				Water not observed to cave-in depth of 19.0 feet immediately after withdrawal of auger.
			55				

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See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1909819
Geotechnical & Environmental Evaluation
Crown Plaza Site
3601 American Boulevard E
Bloomington, Minnesota

BORING: **ST-120**
LOCATION: See attached sketch
NORTHING: 124322 EASTING: 542385
START DATE: 11/26/19 END DATE: 11/26/19
SURFACE ELEVATION: 789.2 ft RIG: 7514 METHOD: 3 1/4" HSA
SURFACING: Bituminous WEATHER: Cloudy
DRILLER: C. McClain LOGGED BY: R. Braun

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
788.1		PAVEMENT, 5 inches of bituminous over 8 inches of aggregate base					
1.1		FILL: CLAYEY SAND (SC), brown, moist		1-3-6 (9) 15"	0.0	15	Soil sample ST-120 (2-3') @ 10:15 collected for VOCs, GRO, DRO, PAHs and 8 RCRA metals
			5	3-3-6 (9) 9"	0.0		
				2-3-3 (6) 15"	0.0	12	
780.2							
9.0		FILL: SILTY SAND (SM), fine to medium-grained Sand, dark brown to black, moist *Bituminous debris at 10 feet*	10	12-25-19 (44) 18"	0.0 0.6		
		Faint petroleum-like odor from 12 to 19 feet		3-3-3 (6) 13"	0.3		Soil sample ST-120 (11-12') @ 10:25 collected for VOCs, GRO, DRO, PAHs and 8 RCRA metals
			15	1-2-2 (4) 12"	0.0		
770.2							
19.0		POORLY GRADED SAND (SP), fine to medium-grained Sand, trace Gravel, brown, moist to wet, loose to medium dense (ALLUVIUM)	20	1-2-4 (6) 10"	0.0		
			25	3-5-5 (10) 13"	0.0		

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See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1909819
Geotechnical & Environmental Evaluation
Crown Plaza Site
3601 American Boulevard E
Bloomington, Minnesota

BORING: **ST-120**

LOCATION: See attached sketch

NORTHING: 124322	EASTING: 542385		
DRILLER: C. McClain	LOGGED BY: R. Braun	START DATE: 11/26/19	END DATE: 11/26/19
SURFACE ELEVATION: 789.2 ft	RIG: 7514	METHOD: 3 1/4" HSA	SURFACING: Bituminous	WEATHER: Cloudy

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
	▽	POORLY GRADED SAND (SP), fine to medium-grained Sand, trace Gravel, brown, moist to wet, loose to medium dense (ALLUVIUM)		2-7-12 (19) 14"	0.0		
758.2							
31.0		END OF BORING					Water observed at 30.0 feet with 30.0 feet of tooling in the ground while drilling.
		Boring immediately grouted					Water observed at 28.0 feet with 30.0 feet of tooling in the ground at end of drilling.
							Water not observed to cave-in depth of 13.0 feet immediately after withdrawal of auger.

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See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1909819
Geotechnical & Environmental Evaluation
Crown Plaza Site
3601 American Boulevard E
Bloomington, Minnesota

BORING: **ST-121**
LOCATION: See attached sketch
NORTHING: 124332 EASTING: 542505
DRILLER: C. McClain LOGGED BY: R. Braun START DATE: 11/26/19 END DATE: 11/26/19
SURFACE ELEVATION: 792.4 ft RIG: 7514 METHOD: 3 1/4" HSA SURFACING: Grass WEATHER: Cloudy

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
791.1		SILTY SAND (SM), fine to medium-grained Sand, black, moist (TOPSOIL FILL)					
1.3 788.4		FILL: CLAYEY SAND (SC), fine to medium-grained Sand, brown, moist		2-5-7 (12) 14"	0.1	12	
4.0 785.4		FILL: SILTY SAND (SM), fine-grained Sand, brown, moist	5	3-3-2 (5) 12"	0.0	17	
7.0 783.4		FILL: SANDY LEAN CLAY (CL), brown, moist *Bituminous debris at 7 1/2 feet*		12-4-3 (7) 11"	0.2 0.0		Soil sample ST-121 (8-8.5') @ 09:00 collected for VOCs, GRO, DRO, PAHs and 8 RCRA metals
9.0 780.4		FILL: SILTY SAND (SM), fine-grained Sand, brown, moist	10	3-4-13 (17) 10"	0.0		
12.0 778.4		FILL: POORLY GRADED SAND (SP), fine to medium-grained Sand, brown, moist *Bituminous debris at 12 1/2 feet*		3-3-2 (5) 7"	0.0		
14.0		FILL: SILTY SAND (SM), fine to medium-grained Sand, dark brown, moist *Bituminous debris from 15 to 20 feet*	15	3-10-12 (22) 14"	0.0 0.2		
		Slight petroleum-like odor at 20 feet	20	7-8-12 (20) 16"	0.9		Soil sample ST-121 (20-21') @ 09:20 collected for VOCs, GRO, DRO, PAHs, PCBs and 8 RCRA metals
768.4							
24.0		SILTY SAND (SM), fine-grained Sand, gray, moist, loose (ALLUVIUM)	25	1-2-3 (5) 10"	0.1		

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See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1909819
Geotechnical & Environmental Evaluation
Crown Plaza Site
3601 American Boulevard E
Bloomington, Minnesota

BORING: **ST-121**

LOCATION: See attached sketch

NORTHING: 124332 EASTING: 542505

DRILLER: C. McClain | LOGGED BY: R. Braun | START DATE: 11/26/19 | END DATE: 11/26/19

SURFACE ELEVATION: 792.4 ft | RIG: 7514 | METHOD: 3 1/4" HSA | SURFACING: Grass | WEATHER: Cloudy

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
		SILTY SAND (SM), fine-grained Sand, gray, moist, loose (ALLUVIUM)					
761.4			30	1-2-4 (6) 14"	0.0		
31.0		END OF BORING					Water not observed while drilling.
		Boring immediately grouted					Water not observed at end of drilling.
							Water not observed to cave-in depth of 14.0 feet immediately after withdrawal of auger.
			35				
			40				
			45				
			50				
			55				

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LOG OF TEST PIT

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1909819
Geotechnical & Environmental Evaluation
Crown Plaza Site
3601 American Boulevard E
Bloomington, Minnesota

BORING: **TP-1**

LOCATION: See attached sketch

NORTHING: | EASTING:

DRILLER:	Bolander	LOGGED BY:	R. Braun	START DATE: 11/21/19	END DATE: 11/21/19
SURFACE ELEVATION:		RIG: Excavator	METHOD:	SURFACING: Asphalt	WEATHER: Snow

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
1.0		PAVEMENT, 6 inches of bituminous over 6 inches of aggregate base			0.0		Nearest Boring: ST-107
		FILL: SILTY SAND (SM), brown, wet					
					0.0		Soil sample TP-1 (2-4') @ 08:15 collected for VOCs, GRO, DRO, PAHs and 8 RCRA metals
4.0							
		FILL: POORLY GRADED SAND with SILT (SP-SM), fine to medium-grained Sand, trace Gravel, brown, wet			0.0		
6.0		END OF BORING					
		Test pit then backfilled with spoils					

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LOG OF TEST PIT

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1909819
Geotechnical & Environmental Evaluation
Crown Plaza Site
3601 American Boulevard E
Bloomington, Minnesota

BORING: **TP-2**

LOCATION: See attached sketch

NORTHING: | EASTING:

DRILLER:	Bolander	LOGGED BY:	R. Braun	START DATE:	11/21/19	END DATE:	11/21/19
SURFACE ELEVATION:		RIG:	Excavator	METHOD:		SURFACING:	Asphalt	WEATHER:	Snow

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
1.0		PAVEMENT, 6 inches of bituminous over 6 inches of aggregate base			0.0		Nearest Boring: ST-112
		FILL: POORLY GRADED SAND (SP-SM), fine to medium-grained Sand, trace Gravel, brown, moist					Soil sample TP-2 (0.5-2') @ 09:40 collected for VOCs, GRO, DRO, PAHs and 8 RCRA metals
3.5					0.0		
		POORLY GRADED SAND (SP), fine to medium-grained Sand, light brown, moist (ALLUVIUM)					
5					0.0		
10.0					0.0		
10		END OF BORING Test pit then backfilled with spoils					
15							
20							
25							

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LOG OF TEST PIT

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1909819
Geotechnical & Environmental Evaluation
Crown Plaza Site
3601 American Boulevard E
Bloomington, Minnesota

BORING: **TP-3**
LOCATION: See attached sketch
NORTHING: EASTING:
DRILLER: Bolander | LOGGED BY: R. Braun | START DATE: 11/21/19 | END DATE: 11/21/19
SURFACE ELEVATION: | RIG: Excavator | METHOD: | SURFACING: Tall grass | WEATHER: Snow

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
0.5		SILTY SAND (SM), fine to medium-grained Sand, black, moist (TOPSOIL FILL)			0.0		Nearest Boring: ST-106
		FILL: SILTY SAND (SM), fine to medium-grained Sand, trace Gravel, brown, moist			0.0		
		Bituminous layer from 5-7 feet	5				Soil sample TP-3 (5-7') @ 10:50 collected for VOCs, GRO, DRO, PAHs and 8 RCRA metals
6.0		FILL: CLAYEY SAND (SC), trace Gravel, reddish brown, moist			0.0		
					0.0		
			10				
					0.0		
15.0			15				
		FILL: SILTY SAND (SM), fine to medium-grained Sand, trace Gravel, brown, moist			0.0		
17.0		FILL: POORLY GRADED SAND with SILT (SP-SM), fine to medium-grained Sand, trace Gravel, gray, moist					Soil sample TP-3 (17-26') @ 11:10 collected for VOCs, GRO, DRO, PAHs and 8 RCRA metals
		With bituminous debris	20				
					0.0		
			25				
26.0		END OF BORING					
		Test pit then backfilled with spoils					

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LOG OF TEST PIT

See Descriptive Terminology sheet for explanation of abbreviations

Project Number B1909819
Geotechnical & Environmental Evaluation
Crown Plaza Site
3601 American Boulevard E
Bloomington, Minnesota

BORING: **TP-4**
LOCATION: See attached sketch
NORTHING: EASTING:
DRILLER: Bolander | LOGGED BY: R. Braun | START DATE: 11/21/19 | END DATE: 11/21/19
SURFACE ELEVATION: | RIG: Excavator | METHOD: | SURFACING: Tall grass | WEATHER: Snow

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
0.5		CLAYEY SAND (SC), trace Gravel, dark brown, moist (TOPSOIL FILL)					Nearest Boring: ST-105
		FILL: SILTY SAND (SM), fine to medium-grained Sand, brown, moist			0.2		Soil sample TP-4 (4-6') @ 12:45 collected for VOCs, GRO, DRO, PAHs and 8 RCRA metals
6.0		FILL: POORLY GRADED SAND with SILT (SP-SM), fine to medium-grained Sand, trace Gravel, gray to reddish brown, moist			0.1		
13.0		FILL: CLAYEY SAND (SC), trace Gravel, black, moist			0.4		
16.0		FILL: POORLY GRADED SAND with SILT (SP-SM), fine to medium-grained Sand, trace Gravel, black to dark brown, moist *With bituminous debris*			1.2		
26.0		END OF BORING Test pit then backfilled with spoils					

Appendix C

Emissions Control Plan

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Braun Intertec Corporation
1826 Buerkle Road
Saint Paul, MN 55110

Phone: 651.487.3245
Fax: 651.487.1812
Web: braunintertec.com

March 20, 2020 Project B1909819.00

Mr. Mike Roebuck
Ron Clark Construction, Inc.
7500 West 78th Street
Edina, MN 55439

Re: Emissions Control Plan
Proposed American Square Apartments
3701 American Boulevard East
Bloomington, Minnesota

Dear Mr. Roebuck:

Braun Intertec Corporation has prepared this Emissions Control Plan (ECP) to outline procedures to address potential regulated asbestos-containing waste materials (RACM) that may be encountered during redevelopment activities and Response Action Plan (RAP) Implementation activities at the referenced facility (Site). All activities completed at the Site in relation to identified RACM will follow the requirements and procedures described in the Minnesota Pollution Control Agency (MPCA) guidance document Voluntary Investigation and Cleanup Program Guidance for Investigating and Remediating Asbestos Containing Waste Materials dated July 2004, a copy of which is included as Attachment 1.

Background Information

Braun Intertec has prepared a Response Action Plan and Construction Contingency Plan (RAP-CCP) dated March 20, 2020 for the Site (2020 RAP-CCP). The project includes removal of an existing paved parking lot and construction of a multi-level apartment building with underground parking. Other Site improvements include new underground utilities (e.g., sanitary, storm, electric), green space/landscaped areas and paved/concrete parking areas and walkways. This ECP has been prepared as a supplement to the 2020 RAP-CCP.

A Phase II environmental site assessment (ESA) performed at the Site in 2020 by Braun Intertec documented petroleum and non-petroleum soil contamination identified within fill soils at the Site at depths greater than 10 feet. Debris also was present in the fill soils primarily including asphalt and concrete. Suspect asbestos-containing materials (ACM) were not identified in the fill soils.

Limited earthwork activities are anticipated to start at the Site sometime in mid-2020.

Project Contacts

The following are the contacts for this project:

Owner
Bloomington QOZ, LLC
Attn: Mr. Mike Roebuck
7500 West 78th Street
Edina, MN 55439
Phone: 952.947.3028 (direct)
Mike@ronclark.com

General Contractor
Weis Builders, Inc.
Mr. Chris Ehalt
7645 Lyndale Avenue South
Minneapolis, MN 55423
Phone: 612.243.4650 (direct)
ChrisEhalt@weisbuilders.com

Environmental Consultant
Jason Kunze, Senior Project Manager
1826 Buerkle Road
St. Paul, MN 55110
Phone: 612.360.0727 (mobile)
Jkunze@braunintertec.com

Minnesota Pollution Control Agency
Project Manager To Be Determined
520 Lafayette Road North
St. Paul, MN 55155-4194
Phone: TBD
Email: TBD

Definitions of RACM

RACM that may be encountered during development activities could include the following categories of ACM:

- Friable ACM (defined as any material that contains greater than one percent asbestos, and which can be crumbled, pulverized, or reduced to powder by hand pressure).
- Category I non-friable ACM means asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than one percent asbestos that has been subjected to sanding, grinding, cutting or abrading.
- Category II non-friable ACM (means any material, excluding Category I non-friable ACM, containing more than one percent asbestos that, when dry, cannot be crumbled, pulverized, or reduced to a powder by hand pressure, but has a high probability of becoming or has become crumbled, pulverized or reduced to powder by the forces expected to act on the material in the course of demolition or facility renovation).

Cleanup Procedures

A Minnesota Department of Health (MDH) licensed asbestos abatement contractor will be present on-site for coordination of the excavation of any RACM from affected soil and/or debris encountered at the Site; including adequately wetting the material during excavation and proper containerization. The abatement contractor will coordinate the proper disposal and transport of affected soil/debris as RACM waste as described in the sections below.

Site Security

Only authorized personnel will be allowed on-site. Areas where RACM are encountered will be cordoned off using red or yellow caution tape. Asbestos warning signs will be posted at all of the entrances to the area where RACM is located. The asbestos warning signs will be consistent with signs described in MDH Asbestos Abatement Rules 4620.3568 Subpart 5. Only personnel with proper personal protective equipment (PPE) will be allowed into the areas containing RACM.

Emissions Control Procedures

An MDH licensed asbestos abatement contractor will be present on-site for coordination excavation activities where RACM is encountered and disturbed. The asbestos abatement contractor will apply an adequate water spray to minimize and control emissions during Site work disturbing RACM. The emissions control procedures will follow the requirements and procedures described under Section 5 of the attached MPCA guidance document. Such procedures include adequate wetting of the excavated material and no visible emissions from the RACM.

Excavation/Removal Activities

Any RACM that is encountered during the Site work will be placed in polyethylene lined and covered trucks or containers for transport to the selected end disposal facility. Excavation operations will be conducted so that the trucks will not drive through the contamination zone. All equipment leaving the contamination zone will be rinsed down prior to exiting the zone. All excavation activities involving RACM will follow the requirements and procedures described under Section 5 in the attached MPCA guidance document.

Air Monitoring

Air monitoring will consist of personal monitoring of the tracked backhoe operator and/or any asbestos workers present during excavation activities. The personal monitoring will follow the requirements of the OSHA Asbestos Standards (29 CFR 1910.1001 and 1926.1101). Data from personal monitoring will be used to evaluate the emission control procedures discussed above.

Containerization/Transport

Waste handling requirements of 40 CFR 61.150 will be implemented including adequate material wetting, leak tight packaging, polyethylene lined and covered trucks or containers, and proper labeling and manifesting.

Documentation of Residual RACM

Following Site redevelopment activities, Braun Intertec will prepare a RAP-CCP Implementation Report for submittal to the MPCA Brownfields Redevelopment Program which documents soil remediation activities that are completed at the Site. The RAP-CCP Implementation Report will include a summary of the impacted soil with RACM which is removed and disposed, and document any impacted soil with known or potential RACM left in place. It is noted that if impacted soil with known or potential RACM is left in-place, institutional controls (e.g. an environmental covenant) may be required for the Site.

Transport/Disposal Information

The earthwork/excavation contractor has yet to be determined. The end-disposal landfill facility also has yet to be determined. Disposal of the excavated material will be conducted in accordance with the requirements of 40 CFR 61.154.

Closing Remarks

Should you have any questions regarding this ECP, please contact Jason Kunze at 952.995.2436.

Sincerely,

BRAUN INTERTEC CORPORATION

Jason J. Kunze
Senior Scientist

Robert E. Nordby
Group Manager, Senior Scientist

Attachment:
MPCA Voluntary Investigation and Cleanup Program Guidance for Investigating and Remediating Asbestos Containing Waste Materials, dated July 2004

Minnesota Pollution Control Agency
Voluntary Investigation and Cleanup
Guidance Document #9

Voluntary Investigation and Cleanup Program Guidance for Investigating and Remediating Asbestos Containing Waste Materials

1.0 Purpose and Introduction

This guidance document summarizes MPCA Voluntary Investigation and Cleanup (VIC) Program requirements associated with investigation and remediation of sites with buried asbestos containing waste materials. Asbestos containing materials are a common waste product encountered at former dumps and within fill at VIC Sites and must be handled in accordance with the appropriate federal and state regulations. The scope of VIC Projects includes threatened or known releases to the environment under the Minnesota Environmental Release and Liability Act (MERLA), and includes releases or threatened releases of buried asbestos containing materials. This guidance is designed to supplement the MPCA VIC Fact Sheet "Asbestos Containing Waste Materials at VIC Sites," the MPCA's Superfund Section's Risk Based Site Evaluation Guidance, other MPCA VIC Guidance Documents pertaining to site investigations and remediation, and the guidance provided through the MPCA's Asbestos Compliance Program (Asbestos Program). This guidance emphasizes the VIC Program's and the Asbestos Program's coordinated role in ensuring that the appropriate regulations are followed, public health and safety are protected, and long term environmental risks are properly managed. Asbestos abatement from buildings and building demolition activities are not within the scope of VIC projects and the MPCA Asbestos Program staff should be contacted for questions related to these activities (see contact information at the end of this document).

2.0 Asbestos Occurrence and Hazards

2.1 Types and Uses of Asbestos Containing Material

Asbestos is a common hazardous substance encountered at abandoned dumps and in fill material. The term "dump" refers broadly to buried mixed municipal waste, refuse and demolition wastes. Abandoned dumps will be discussed in more detail in the soon to be revised VIC Guidance Document #19. Asbestos is a naturally occurring substance comprised of separable fibers and occurs in two different forms as part of two mineral groups– serpentine and amphibole. The U.S. Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA) recognize six asbestos minerals: chrysotile (the type of serpentine mineral with long and flexible fibers); and five amphibole minerals (with relatively short brittle fibers), which are actinolite, tremolite, anthophyllite, crocidolite, and amosite asbestos.

Asbestos has been used extensively in industry due to its durability, ability to be woven, and heat resistant properties. The term "Asbestos Containing Material" (ACM) refers to materials that contain at least 1% asbestos. ACM may be found in a variety of building materials including: floor and ceiling tile, floor tile mastic, pipe insulation, adhesives, gaskets, roofing materials, friction products (automobile parts, i.e. in clutches, brakes and transmissions), asbestos cement products (i.e. transite), corrugated ACM paper (referred to sometimes as "air cell"), duct wrap,

and vermiculite (used in insulation and as a soil amendment). Thermal System Insulation (TSI) includes the broad class of friable ACM products applied to pipes, fittings, boilers, tanks, ducts or other structural components to prevent heat loss or gain (sometimes referred to as "mag"). Transite is the name for ACM cement boards and pipes and is typically gray, dense, and easily broken. Chrysotile makes up 90% to 95% of all asbestos used in building materials in the U.S, although the percentage of amphibole asbestos minerals may be high in some ACM. Frequently used definitions pertaining to ACM include the following:

Asbestos Containing Waste Material (ACWM) – generally refers to ACM that is no longer in use but rather occurs as waste products and typically is encountered in subsurface fill at remediation Sites. Buried ACM is more typically referred to as ACWM.

Category I Nonfriable ACM – includes asbestos-containing packing, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos that cannot be crumbled to powder by hand pressure. Category I ACM is considered pliable rather than brittle, breaks by tearing rather than fracturing, and does not easily release asbestos fibers upon breaking.

Category II Nonfriable ACM – refers to any material, excluding Category I nonfriable ACM, containing more than 1 percent asbestos that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure. Transite is an example of Category II ACM. Category II ACM is not pliable, breaks by fracturing rather than tearing, and does release some asbestos fibers upon breaking.

Friable ACM – refers to ACM that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. Nonfriable materials may become friable during grinding, cutting, burning, crushing, and similar operations, including some types of building demolition which may generate and release asbestos fibers.

Nonfriable Asbestos Containing Material – refers to ACM that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure. Nonfriable asbestos may be either Category I or Category II ACM.

Regulated Asbestos-Containing Material (RACM) – refers to (a) Friable ACM, (b) Category I ACM that has become friable, (c) Category I ACM that will be or has been subjected to sanding, grinding, cutting, or abrading, or (d) Category II ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or facility renovation.

2.2 Health Risks Associated With Asbestos

The health risks associated with asbestos result from the inhalation of microscopic asbestos fibers that become airborne due to the disturbance of ACM. Asbestos is a recognized human carcinogen and its exposure can lead to lung cancer and mesothelioma, which is cancer of the pleural membrane of the lung. No known safe level of exposure to asbestos fibers is known.

Asbestosis is a disease caused by scarring of the lung tissue due to inhalation of asbestos fibers. Although less common, medical evidence suggests that ingesting asbestos may result in cancers of the esophagus, larynx, oral cavity, stomach, colon and kidney.

2.3 Asbestos Air Standards

Due to the ability of asbestos fibers to be transported easily in air, fibers are found in ambient air at concentrations ranging from 0.00001 to 0.0001 fibers per milliliter (fiber/mL). OSHA has set a time weighted average (TWA) permissible exposure limit for working conditions at 0.1 fibers per cubic centimeter (f/cc or f/mL) averaged over a 30 minute period. The Minnesota Department of Health (MDH) has set the Clean Indoor Air Standard for Minnesota at 0.01 f/cc. Although these standards apply to working conditions, they may be also be used as a guide in the evaluation of asbestos air emissions during air monitoring at remediation sites. Neither the MPCA nor the U.S. EPA has, however, specified an acceptable exposure or ambient air standard for asbestos.

2.4 Asbestos Detection Methods

The most accurate method to detect asbestos and estimate concentrations that may become airborne typically combines the use of polarizing light microscopy (PLM), electron microscopy, and energy dispersive X-ray analysis. PLM also is the recommended detection method specified in the federal regulations for abandoned waste sites (see Section 3). Although transmission electron microscopy (TEM) is extensively used in research to identify smaller concentrations of asbestos fibers, it is not currently in widespread use or required for use in soil and air sampling at remediation sites.

2.5 Buried Asbestos Containing Materials

Asbestos Containing Waste Material (ACWM) is waste ACM that has been removed from buildings and is commonly encountered within demolition materials buried as part of former abandoned dumps or within fill. Abandoned dumps may be identified as part of routine Phase I Investigations, although in many cases buried ACWM is associated with smaller undocumented dumping areas or granular fill containing ACWM rather than large former municipal dumps. Many properties in urban areas were constructed and graded several decades ago using imported fill from undocumented sources. Such fill may contain varying amounts of debris and ACWM.

Demolition debris and other solid waste encountered in dumps or fill are also considered as solid waste that has been improperly disposed of, whether ACWM is present or not. Voluntary parties and their consultants need to investigate such sites carefully, following both VIC and Asbestos Program requirements, to avoid exacerbating site hazards and regulatory enforcement.

3.0 Regulatory Background

3.1 Federal NESHAP Standard

A property on which the disturbance and excavation of ACWM takes place is strictly regulated through National Emission Standards for Hazardous Air Pollutants (NESHAP), as codified in Title 40 Code of Federal Regulations Part 61. NESHAP was established in accordance with Section 112 of the Clean Air Act, which required the U.S. EPA to develop and enforce regulations to protect the general public from exposure to airborne contaminants that are known to be hazardous to human health. These regulations were first developed in 1973 and subsequently, have been amended several times.

The purpose of NESHAP is to protect the public health by minimizing the release of asbestos when facilities that contain ACM are demolished or renovated. The MPCA considers a property that has buried ACWM incorporated as part fill or debris as an Inactive Waste Disposal Site under NESHAP. Disturbance or excavation of buried ACWM at Inactive Waste Disposal Sites is considered a renovation under NESHAP. In addition, historically approved disposal sites that have not accepted ACWM within the past year and unpermitted dumps containing ACM are considered an Inactive Waste Disposal Site.

The Federal NESHAP standards are adopted by reference into Minnesota Rules in Minnesota Rules, part 7011.9920. The MPCA Asbestos Program is the delegated authority in Minnesota to enforce federal NESHAP regulations. The method specified in NESHAP for asbestos detection (Appendix E, subpart E, 40 CFR part 763, section 1) is PLM.

3.2 Regulated Nature of ACWM

All buried ACWM at VIC Sites is considered by the MPCA to be Regulated Asbestos Containing Material (RACM). RACM includes ACM that may have been used within buildings as non-friable Category I or Category II ACM but has now been incorporated into waste or fill and buried. Whether asbestos was friable or nonfriable, waste ACM may have been crumbled, abraded, pulverized, or powdered by the original demolition activities or through the act of dumping or burial. Once ACWM is identified within debris, all ACM and impacted demolition debris or solid waste materials are regarded as RACM and regulated by the NESHAP.

NESHAP requires that if RACM is removed from an Inactive Waste Disposal Site, the removal must be conducted by a licensed asbestos abatement contractor using an MPCA-approved Emissions Control Plan. The MPCA Asbestos Program must review and approve, in advance, any Emission Control Plans prepared to fulfill NESHAP requirements for proposed activities at VIC Sites. Further guidance related to the Emission Control Plan requirement is provided in Sections 4 and 5 in this document.

3.3 Other Applicable Regulations Pertaining to ACWM

Asbestos work is regulated by several state programs to ensure that the public is protected. Asbestos associated with subsurface soils through past disposal or filling is considered to be a

hazardous substance under the Minnesota Environmental Response and Liability Act (MERLA). Proper management and handling of ACWM during site work is required in order to remain eligible for MPCA VIC Program assurances under MERLA.

The MPCA Asbestos Program has prepared the "Asbestos Guidance on Excavation Projects," dated July 1999, which must be followed if a site contains RACM and is considered to be an Inactive Waste Disposal Site under the NESHAP. Prior to a renovation or demolition, all buildings must be evaluated by an asbestos inspector certified by the Minnesota Department of Health (MDH) under the Asbestos Hazardous Emergency Response Act (AHERA). Parties are required to submit the completed "Notification of Intent To Perform A Demolition" form to the MPCA Asbestos Program staff a minimum of 10 working days prior to conducting a building demolition. Asbestos monitoring and sampling conducted at sites regulated under the NESHAP must be conducted by an MDH/AHERA-certified asbestos inspector (Asbestos Inspector). Remedial excavation or reconsolidation activities of suspect ACWM must be conducted by a MDH/AHERA-licensed asbestos contractor (Asbestos Contractor).

The Asbestos Unit of the Division of Environmental Health at the MDH specifies work practices to identify and manage asbestos, and to safely remove, encapsulate, or enclose asbestos-containing materials. MDH is responsible for the licensing of asbestos contractors and the certification of asbestos workers, site supervisors, inspectors, management planners, and project designers to ensure that properly trained personnel perform asbestos work or management. The "Notifications of Asbestos Air Monitoring" within structures must be provided to the MDH Asbestos Unit at least 5 calendar days prior to beginning a project. The "Notification of Asbestos Related Work" must be provided to both the MDH and the Asbestos Coordinator of the MPCA within 10 working days of the beginning of work.

County and city environmental departments may have additional regulations or ordinances pertaining to asbestos or solid waste. Parties conducting response actions are responsible for contacting the appropriate county and city representatives before initiating a remediation project involving asbestos or solid waste to determine whether additional requirements exist.

The Minnesota Department of Labor and Industry is responsible for administering the federal OSHA requirements to protect workers from asbestos exposure. The OSHA Construction Standard for Asbestos is 29 CFR 1926.1101.

U.S. EPA's Worker Protection Rule, 40 CFR 763, Subpart G, extended the OSHA standard to state and local employees who perform asbestos work and who are not covered by the OSHA Asbestos Standards, or by a state OSHA plan. The OSHA Standard is incorporated by reference. People who plan to renovate or remove asbestos from a building of a certain size, or who plan to demolish any building, are required to notify the appropriate federal, state and local agencies, and to follow all federal, state, and local requirements for removal and disposal of RACM.

4.0 Investigating VIC Sites With Suspected ACWM

4.1 Phase I Investigations

A Phase I Investigation is required for most sites for which technical assistance is sought and is an explicit requirement if the voluntary party is pursuing a No Action Determination or a Certificate of Completion. The purpose of a Phase I Investigation is to determine, whether, based upon a physical site survey and research of available historical documents and environmental databases, the site may have been the subject of a release or threatened release of a hazardous substance, pollutant, or contaminant. The Phase I Investigation also determines the types of additional inquiry that should be included in the Phase II Investigation Work Plan. The Voluntary Party is requested to refer to VIC Guidance Document #8, for guidance on preparation of Phase I Investigations.

Particularly useful resources for accessing the potential of ACWM at properties include: aerial photographs that may identify past dumping activities; evidence of historic areas of lower topography which may have been filled; areas of higher topography that may contain excess fill; city directories describing past businesses; insurance maps documenting past building and property details; documentation of past on-site building demolition; facility inspection reports; and interviews with former employees. The historical practice of demolishing buildings and burying most of the materials in-place is one of the most common sources of buried ACWM. Old utility lines made of transite or wrapped with asbestos material may be indicated on old city records, building plans or fire insurance maps. Records of buried dumps or fill material on a property also are common indications that asbestos may be present.

4.2 Phase II Investigations

Properties where buried ACWM is suspected should undergo a thorough Phase II Investigation to determine the nature, type and distribution of the ACWM present in the subsurface, and whether the ACWM will be disturbed or left on-site. Phase II Investigations should be conducted in accordance with an MPCA approved Phase II Investigation Work Plan. The MPCA VIC Program staff will consider all properties that contain fill with debris or refuse, even at low percentages, to have the potential for ACWM to be encountered or present in the subsurface. For such suspect properties, a Phase II Investigation should be designed and conducted to determine the amount, type and distribution of the debris at the site and the presence of pollutants, contaminants or hazardous substances, including ACWM. To appropriately evaluate debris and ACWM, test pits or test trenches should be conducted rather than or in addition to the use of soil borings to delineate the lateral and vertical extent of fill impacted by debris (including ACWM). The number of test pits/trenches required will vary depending on the aerial extent of the fill, the thickness, and the heterogeneity of the type of debris and distribution of ACWM. It is important that a sufficient number of exploratory test pits/trenches and sampling be conducted to characterize and document the variety and distribution of waste through the aerial and vertical extent of the fill.

The Phase II Investigation Work Plan should take into account the nature of the proposed property use or redevelopment plans, and the remedial objectives and closure requirements. If the involved parties do not desire to use institutional controls to manage residual contamination on-site, then the investigation must be designed to ensure that the full extent of the on-site waste is determined and fully characterized. The location of proposed green spaces, paving areas, building footprints, and the type of access future workers and the public will have to the site represent information that better describes potential exposure scenarios, which, if known, can assist in focusing the Phase II Investigation.

If ACWM is suspected at a site but has not yet been confirmed and soils are proposed to be disturbed and temporarily excavated through the use of test pits, test trenches, or surface grading activities, an Asbestos Inspector must be involved in the project to inspect the site wastes for the presence of ACWM. If suspect ACWM is identified, the Asbestos Inspector must collect samples of the waste or suspect soils to confirm the presence, the type and the amount of asbestos present in the materials. The MPCA VIC staff also may require representative samples of soil or debris associated with suspect ACWM to be collected and analyzed. Soil associated with identified or suspect ACWM must also be treated as if it contains ACWM, and the Asbestos Inspector should evaluate such soils visually. If friable asbestos has been identified, the Asbestos Inspector should also collect and analyze soil samples.

A Phase II Investigation Work Plan must include a Contingency Plan, if test pits, test trenches or other exploratory excavations are proposed and the potential to encounter ACWM exists. In general, the greater the likelihood of encountering ACWM during an investigation, the more likely the MPCA VIC Program shall require that an Emissions Control Plan be submitted and approved in advance as part of the Phase II Investigation Work Plan (see Section 5.2). In the event ACWM is encountered during investigatory excavation activities and no appropriate contingencies have been approved in advance by the MPCA, excavation activities should cease and the MPCA VIC Project and Asbestos Program staff should be contacted as soon as possible to determine the appropriate waste management procedures. Once ACWM is confirmed, the property and all subsequent excavation activities are regulated under NESHAP as an Inactive Waste Disposal Site and must follow the appropriate regulations.

Soil and debris temporarily excavated from test trenches and pits may be stockpiled and covered adjacent to the excavation during Phase II Investigations if conducted in accordance with an approved work plan and the oversight of an environmental consultant and an Asbestos Inspector. Response actions involving excavation of soil and debris for off-site disposal or on-site reconfiguration, however, may be conducted only under the direction of an Asbestos Contractor.

Exploratory excavations conducted during Phase II Investigations without a certified Asbestos Contractor should: a) be approved in advanced by the MPCA; b) be conducted only if appropriate wetting procedures are proposed and implemented; c) replace and cover all excavated wastes back in the excavation during the same working day; and d) ensure all temporary stockpiles are placed on and are covered with plastic during the excavation activities. If wastes excavated are of limited volume, localized and can be easily disposed, the MPCA VIC or Asbestos Program staff may require that an Asbestos Contractor be involved and that the wastes not be replaced in the excavation, but be properly disposed.

5.0 Requirements for Excavation or Disturbance of ACWM

5.1 Excavation Requirements based on the NESHAP

The Asbestos Program at the MPCA has prepared the "Asbestos Guidance on Excavation Projects" (NESHAP Guidance) to summarize the requirements which must be followed when ACWM is excavated at Inactive Waste Disposal Sites. The Asbestos and VIC Program strongly encourage the party to utilize qualified environmental consultants and technicians to ensure that appropriate regulations are followed and hazardous emissions are prevented during site investigation and remediation activities.

The VIC Program strongly encourages environmental consultants to closely coordinate with the Asbestos Program staff to ensure that the NESHAP is appropriately followed. A summary of these requirements is briefly outlined below:

- A "Notification of Asbestos Related Work" (Notice) must be completed and submitted to the Asbestos Program within 10 working days of initiating the project. The advance notice may be waived, if RACM unexpectedly is encountered during an excavation in progress.
- An Emission Control Plan (ECP) must be prepared and submitted to the Asbestos Program for review and approval pursuant to 40 CFR 61.145. The minimum requirements for an ECP are summarized in Section 6.0.
- The area of proposed asbestos excavation must be secured and clearly marked by asbestos warning signs that are visible at all entrances and exits to the area.
- RACM must be adequately wetted to minimize emissions during excavations and loaded into trucks or containers lined and covered by polyethylene. If excess water is generated due to the required wetting of the soil, ensure that wastes transported off-site to the landfill do not contain any free liquids. The shipments must be properly manifested and must contain a waste generator label and warning signs.
- Stockpiling of ACWM impacted soils should be done on-site and within the zone of contamination.
- If ACWM is present at the surface, trucks/excavation equipment must be decontaminated prior to leaving the zone of contamination or clean granular fill must be placed over the area.
- Off-site disposal of RACM is only allowed at approved landfills that are permitted by the MPCA to accept RACM as part of their Solid Waste Management Plan.
- The excavated area of the site must be visually inspected by an Asbestos Inspector. Inspection frequency, though at the discretion of the Inspector, should be sufficiently frequent to thoroughly inspect the excavation area and the materials excavated.

An Asbestos Contractor should be retained and be present for on-site coordination of all excavation activities where ACWM is known to exist or is suspect. If excavation activities are being conducted through use of an MPCA approved Contingency Plan the Asbestos Contractor may not be required to be on-site during excavation activities at locations where Phase II

Investigation results indicate that ACWM is not present. The Asbestos Contractor, must, however, be on call to respond to observations of an on-site Asbestos Inspector.

Excavating ACWM without the use of an approved ECP, contrary to an approved ECP, or without oversight from an Asbestos Contractor may be considered to be a significant violation of NESHAP and MPCA requirements and may lead to enforcement actions and the levying of fines.

5.2 Emissions Control Plan Requirements

An ECP must be prepared and approved by the MPCA Asbestos Program staff before RACM can be excavated from an Inactive Waste Disposal Site. The regulated party may provide this ECP directly to the Asbestos Program staff for review or may coordinate this review through the VIC Project staff. Approved ECPs utilized at a VIC Project form an integral component of the project's work plan or response action plan.

Many ECPs have very similar formats and content, however, each ECP will require site specific project details. Every ECP must, at a minimum, include the following:

Project and Site Description
Include a detailed description of the project with the name of project, the address, a site location map, an estimate of the amount of RACM present at the site and the amount of RACM to be excavated. The site map should have an accurate scale and include a location map of the area impacted by RACM and the area proposed to be excavated or disturbed. The project description should briefly describe the nature of the project (emergency response action, redevelopment proposed, utility work, etc.) and the proposed schedule, including the proposed start date. Indicate in this section when the "Notification of Asbestos-Related Work" was or will be submitted to the MPCA Asbestos Compliance Program staff. General site information should describe the slope of the site surface, the site's lateral proximity to surface water, the vertical depth to ground water, and a description of on-site and surrounding land use and potential receptors.

Description of the Waste/RACM
Provide a narrative description of the type of RACM and other waste to be encountered, including representative test pit/trench or soil boring logs. Include information regarding any other known or suspected contamination associated with the waste/RACM and/or other risk factors (i.e. volatile vapors, methane gas, heavy metals, etc.) and how these issues are being addressed as part of the project.

Project Contacts Information
List names, contact information, and responsibilities for the site owner, the site project manager, the licensed asbestos inspectors and contractors, and the disposal facility involved in the project. Also, provide a list of regulatory contacts (i.e. VIC staff, Asbestos Program staff, as well as city, county, and MDH staff, if applicable) associated with the site.

Site Security
Describe the required signs that will be used to demarcate the area contaminated by RACM. Discuss how site security will be established, so that access to the site will be restricted to authorized personnel during excavation activities and when RACM is potentially accessible or exposed.

Emission Control Procedures
Provide a detailed description of the type of emission control procedures to be utilized during all phases of the work or when site conditions may generate emissions. Such conditions include the following: a) RACM is exposed at the surface; b) digging of test pits or test trenches; c) active excavation activities or site grading of soils containing RACM; d) loading of RACM into containers or trucks; and e) removal of RACM from trucks for disposal at a permitted landfill. This section must include the wetting practices that will be used to minimize emissions.

Excavation/Removal Activities
Discuss the portion of the site, upon which excavation or removal activities will take place. Describe the methods and type of equipment to be used during excavation and loading activities and how such equipment will be decontaminated. Trucks and equipment must be decontaminated prior to leaving the zone of contamination.

Air Monitoring
Describe the type of air monitoring proposed for the project and list the personnel conducting this work.

Containerization/Transport
Describe the type of containers to be used for storage and for transport of RACM off-site to an approved disposal facility. The ECP should describe the type of signs the transport trucks shall display during loading/unloading of the RACM. In addition, the container must be lined with plastic and covered during transport.

Description of Residual RACM/Waste
Provide detailed information regarding the type, amount and location of any and all RACM proposed to be left on-site, any vertical buffers proposed, and the type of institutional controls (such as restrictive covenants or an affidavit) proposed to document and/or restrict access to this material.

Transport/Disposal Information
Provide the name, address and contact information for the transportation contractor and the landfill or other disposal facility accepting the RACM and the type of manifests utilized during the transport.

Other Project Specific Details
The requirements provided above are not meant to be exhaustive, but should form the core component of every ECP. Other information, that should be provided, if pertinent, includes identified community concerns, other known site hazards, or any other factors that the Asbestos Program or VIC staff should be aware of prior to initiation of the project.

5.3 Perimeter Air Monitoring Requirements

Air monitoring of ambient air along the perimeter of sites or work areas may be required, if the project activities have the potential for generating fugitive dust containing asbestos fibers. Such activities may include Phase II Investigations involving the digging of test pits, site grading activities, and excavation of suspect ACWM as part of response actions. The use of a properly designed ECP should minimize or prevent the emission of asbestos fibers from excavation projects dealing with ACWM. Depending on the volume of materials disturbed or the nature of the waste, the MPCA may require perimeter air monitoring for asbestos, which would consist of collecting potential fibers on a filter and analyzing the fibers with PLM. In such cases, air monitoring plans will be a required component of the RAP.

6.0 Cleanup Requirements for Sites with ACWM

A Response Action Plan (RAP) must be prepared and submitted to the MPCA for review and approval prior to conducting ACWM excavation activities that involve off-site disposal or on-site reconsolidation or reburial of ACWM waste. A RAP is a detailed report specifying remedial objectives, how the objectives will be achieved, and remedial design specifications. The detailed elements of the remedial design may be submitted separate from a more conceptual RAP; however, an approved RAP is required prior to initiating remedial actions at VIC Sites.

If a RAP is required and implemented, a RAP Implementation Report or documentation report must be submitted and approved in order for the VIC Program to issue either a No Action Determination or a Certificate of Completion. Refer to VIC Guidance Document #18 for future guidance pertaining to preparation of a RAP and a RAP Implementation Report. If ACWM excavation and disturbance is a component of the remedial actions, the approved ECP will be considered a component of the RAP and should be appended to the RAP. A Focused Feasibility Study (FFS) should be completed as an interim step, prior to developing a RAP, particularly at complex sites or when several potentially acceptable remedial options are available.

Contingency Plans are required as a component of the RAP, if site redevelopment or excavation activities have the potential to encounter ACWM. The Contingency Plan should clearly indicate under what conditions the ECP is to be utilized. The ECP will address emission control requirements; however, the RAP must describe measures that will be taken to segregate, stockpile and properly characterize suspect materials that may contain asbestos, other contaminated soil, suspect debris or other hazardous materials. Compliance with a Contingency Plan should allow construction to continue while suspect materials are characterized.

6.1 Overview of Cleanup Alternatives

The best alternative for remediation of an abandoned dump, when financially and technically feasible, is to dig up the dump or refuse materials and dispose of the waste in a permitted landfill. Due to the expense and potential risks of excavating large volumes of impacted refuse, risk-based site closures that involve leaving ACWM on-site may be more practicable. Generally there are two types of cleanups that are conducted at properties with ACWM: a) complete removal of the asbestos materials with disposal at an approved landfill; and b) risk-based closure in which

residual ACWM is left on-site in the subsurface and long term management and risks are largely addressed through the combined use of engineering controls, institutional controls, and a Contingency Plan. For Sites with smaller volumes of localized ACWM whose lateral and vertical extent can be determined a complete removal may be the preferred option. For such removal actions the Asbestos Inspector should inspect the excavation and collect soil samples for analysis to document that no asbestos fibers remain in the soil.

6.2 Risk-Based Closures at Sites Containing ACWM

It may not be practicable for all ACWM to be excavated and removed from all sites, especially at sites containing large volumes of waste or on which ACWM is very deeply buried. The VIC Program may allow some or all ACWM to remain on-site if appropriate vertical separation distances and institutional controls are utilized. Residual ACWM waste remaining at a site must be managed in a manner consistent with the "Guidance on Incorporation of Planned Property Use into Site Decisions" (Property Use Guidance), which forms part of the MPCA's Risk Based Site Evaluation (RBSE) Manual. The two principal requirements are the use of institutional controls and the appropriate use of vertical separation distances between the surface soils and the buried waste. Other considerations that are discussed below are recommendations on the physical segregation of wastes, mechanical sorting of debris that may contain ACWM, reconfiguring and reuse of wastes, and long term maintenance requirements at sites where ACWM is suspect.

Institutional Controls
Minnesota Statute, § 115B.02, subd. 9a defines institutional controls as legally enforceable restrictions, conditions, or controls on the use of real property, ground water, or surface water located at or adjacent to a facility where response actions are taken. Institutional Controls include real property notification, affidavits, contractual agreements (including consent orders), easements, and environmental restrictive covenants.

The MPCA allows the use of institutional controls, in addition to treatment, containment, or removal of contaminants, as part of an overall site remedy. Institutional controls are intended to ensure that the response (cleanup) actions remain protective of public health and the environment. Institutional Controls document the presence of contamination at a particular parcel and provide notice through recording in official property records so that interested parties become aware of residual contamination and any accompanying property use conditions and restrictions. Institutional Controls may also include easements to ensure access to property for purposes such as maintaining response actions or long-term monitoring.

MPCA continues to prefer measures that reduce the need for use restrictions and long-term monitoring/maintenance activities. General guidance on the application of the institutional controls that are within MPCA's authority to require or seek is summarized in "Guidance on Incorporation of Planned Property Use Into Site Decisions" (Property Use Document) which is a component of the MPCA's Risk Based Site Evaluation Manual.

An acceptable site remedy, which incorporates long term management of buried ACWM, requires the use of institutional controls – either a Declaration of Restrictions and Covenants (Restrictive Covenant) or a Real Property Affidavit (Deed Notice). The type of institutional control required will depend upon the proposed land use and the volume, characteristics, and depth of burial of the

ACWM. If the remedial objectives at a site require unrestricted future use of the property (e.g. residential use) then long term management of buried ACWM will not be considered an acceptable remedy.

Vertical Separation Requirement
ACWM waste or impacted fill remaining on-site as part of remedial design must be buried an appropriate depth beneath the surface. This burial depth, or vertical separation distance, will depend upon the proposed land use for the site and on whether the waste materials are buried beneath an engineering control or not. An engineering control is a relatively impervious structure that is utilized as a component of a RAP to assist in restricting direct access to subsurface soils and reducing the potential for erosion of the cover. Common engineering controls include pavement, sidewalks, building footprints, and engineered caps. The soil within this vertical separation must not pose an unacceptable human health risk as determined by the RBSE Manual. The burial of ACWM waste allows the potential risks to be decreased to acceptable levels by an appropriate depth of burial and use of institutional controls and engineering controls. Minimum vertical separation distances considered appropriate for industrial and restricted commercial properties with little or no slope are as follows:

Beneath Green Space	4-feet
Beneath Paving and Sidewalks	2- to 4-feet
Beneath Building Floors	1- to 2-feet

The above vertical separation distances correspond to the approximate vertical intervals of the "accessible zone" as described in the Property Use Document. The accessible zone is considered the interval that is considered most likely to be accessed in the future. A range in distances is provided because what represents the "accessible zone" may vary between sites. If the ACWM is buried deep enough to be considered a remotely accessible depth (see Property Use Guidance), a Deed Notice and not a Restrictive Covenant possibly may be used as the institutional control.

Clean cover used for vertical separation in green space areas without any impervious engineered surfaces ideally should be well vegetated only by shallow rooting plants (i.e. grasses, shrubs). Exceptions to this recommendation may be considered, if the ACWM is buried deeper than four feet below the surface.

Reconfiguring Waste
The reconfiguration or reconsolidation of solid wastes and debris is sometimes appropriate as a remedial strategy in order to reduce the aerial footprint of waste or, under certain conditions, to relocate wastes to other portions of a site. If the wastes being reconfigured include potential ACWM, the activities will require the use of an Asbestos Contractor and an approved ECP and RAP. The MPCA VIC and Asbestos Programs may allow the reconfiguration of solid waste, if it takes place within the existing footprint of the buried on-site waste or debris, meets the appropriate vertical separation distance, includes placement of a Restrictive Covenant on the property deed, and does not violate other municipal or county requirements. Placement of solid waste outside the existing footprint of a dump is not an acceptable reconsolidation solution and is considered a violation of the Minnesota solid waste rules and may result in enforcement actions. As is the case with all solid wastes, no reconsolidation of ACWM is allowed within five feet of the water table or near surface water.

Reuse and Screening of Site Waste Materials or Fill
On-site fill contaminated with ACWM cannot be reutilized as controlled fill except under very limited conditions and only with the advance approval of the MPCA. It is never appropriate to use such fill or any fill with solid waste as off-site controlled fill. Solid waste within fill can be mechanically sorted and separated by use of a bar screen. The resulting waste-free fill may be usable as controlled engineered fill on-site or for limited off-site uses, such as road aggregate.

The mechanical screening of fill with debris is allowed under certain conditions as a means of reducing the volume of debris requiring off-site disposal at a landfill. If mechanical screening is conducted, it is recommended that a bar screen with a maximum one-inch opening be used. Solid waste and fill that does not pass through the screen must be handled or disposed of properly. Mechanical screening of fill containing ACWM is not acceptable, as no practicable means of controlling asbestos emissions exists in this case. Therefore, it is very important that fill be well characterized before any mechanical screening is attempted. In such cases, a Contingency Plan and ECP containing directives for ceasing screening activities if ACWM is identified in this material must be utilized during such screening activities.

If no ACWM is found during the mechanical screening of fill and debris, the screened granular fill may be left on-site, although it will need to be buried with appropriate vertical separation distances. The need for institutional controls to restrict or document such screened fill material will be evaluated by the MPCA VIC staff on a site by site basis.

Long Term O&M Requirements
Long term operation and maintenance requirements may not be necessary if the use of a Restrictive Covenant appropriately restricts access to subsurface wastes. However, if engineering controls are used to restrict or minimize access, operation and maintenance (O&M) of the engineering controls may be required (e.g. the maintenance of paving surfaces, building floors, vegetated surfaces, or engineered caps). Contingency Plans that serve as work plans in the event of site redevelopment activities or site disturbance in the future are sometimes appropriate and may be considered a type of long term O&M. In such cases, these plans are considered to be part of an ongoing response action and may require the use of a voluntary response action agreement in order for VIC assurances to be issued.

7.0 References and Resources

MPCA's Asbestos Program Web Site:
http://www.pca.state.mn.us/programs/asbestos_p.html

MPCA's Risk Based Site Evaluation Manual
http://www.pca.state.mn.us/cleanup/riskbasedoc.html

MPCA VIC Program Web Site:
http://www.pca.state.mn.us/cleanup/vic.html

MDH's Asbestos Program Web Site:
http://www.dehs.umn.edu/ihsd/asbestos/

- Asbestos Program Publications:
    - Guidance for the Removal, Transport, and Disposal of Category I Asbestos-Containing Materials," MPCA Air Quality/Asbestos Program/#4.04/December 2000;
    - "Asbestos Guidance on Excavation Projects," Air Quality/Asbestos Program/#4.03/July 1999;
- Asbestos Program/Asbestos Hotline: 651-297-8685
- MN Department of Health: 651-215-0900