Interim Remedial Measures Work Plan
Former Allegany Bitumens Belmont Asphalt Plant
Brownfield Cleanup Program
Site # C902019
5392 State Route 19
Amity, Allegany County, New York

Prepared for:

New York State Department of
Environmental Conservation
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Prepared on behalf of:

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October 2011

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RE: Final Interim Remedial Measures Work Plan
Brownfield Cleanup Program Site # C902019
Former Allegany Bitumens Belmont Asphalt Plant
5392 State Route 19, Amity, New York

Dear Tony:

On behalf of Blades Holding Company, Inc., Stantec Consulting Services Inc., has prepared this Interim Remedial Measures Work Plan for the former Allegany Bitumens Belmont Asphalt Plant, located at 5392 State Route 19 in the Town of Amity, Allegany County, New York. This final Work Plan has been modified to incorporate comments received from the NYSDEC and NYSDOH on September 22, September 23, and October 12, 2011.

Should you have any questions or require further information, please do not hesitate to call.

Sincerely,

STANTEC CONSULTING SERVICES INC.

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INTERIM REMEDIAL MEASURES WORK PLAN
Former Allegany Bitumens Asphalt Plant
Belmont, NY
BCP Site #C902019
October 2011

CERTIFICATION

I, Michael Hopkins, certify that I am currently a New York State-registered professional engineer and that this Work Plan was prepared in accordance with applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

STATE OF NEW YORK
MICHAEL E. HOPKINS
No. 064389-1
LICENSED PROFESSIONAL ENGINEER

10/13/11

Signature

Date

Executive Summary

This document presents an Interim Remedial Measures Work Plan (IRMWP) for the Former Allegany Bitumens Belmont Asphalt Plant Site (the “Site) located in the Town of Amity, Allegany County, New York. The Site is currently vacant. The IRMWP was prepared on behalf of Blades Holding Company, Inc., the current owner of the property, pursuant to their October 2010 Brownfield Cleanup Program (BCP) Agreement with the New York State Department of Environmental Conservation (NYSDEC).

Environmental investigations have identified the presence of contamination in soil and groundwater at the Site. The contaminants include petroleum-related and solvent-related volatile organic compounds (VOCs) in soil and/or groundwater at levels that warrant Interim Remedial Measures (IRMs). To provide a timely response to these findings, IRMs are proposed herein that will minimize the potential for further migration of contaminants and facilitate potential redevelopment of this currently vacant property.

Subsurface explorations and laboratory testing were performed during the BCP Remedial Investigation (RI) and during a prior Phase II Environmental Site Assessment performed in association with a potential property transaction. As a result of these investigations three remedial areas of concern (RAOCs) have been identified and characterized. A detailed discussion of these findings was included in the RI report, which has been provided to NYSDEC for review.

RAOC-1 is located in the vicinity of the laboratory building in the northwest corner of the site. Chlorinated VOCs (CVOCs) are present in soil and groundwater. Several compounds exceed the NYSDEC Restricted Soil Cleanup Objectives (SCOs) for Protection of Groundwater. A similar suite of CVOCs is present in groundwater at concentrations in excess of NYSDEC’s Class GA Groundwater Standards. The contamination has migrated with groundwater flow toward the north, east and south from the source area, and extends off-site to the northeast.

RAOC-2 is located immediately east of RAOC-1, between the lab building and the asphalt plant works. RAOC-3 is located in close proximity to the asphalt plant works and its adjacent storage tank pad. Both RAOC-2 and RAOC-3 contain petroleum-impacted soils to approximate depths of up to 1.5 ft and 4 ft. below existing ground surface, respectively. Although the observed contaminant levels did not exceed the restricted SCOs for Commercial or Industrial usage, nuisance characteristics (strong odors, oil staining) were observed, and therefore remedial action would be required. Groundwater impact was not seen in either RAOC-2 or RAOC-3, thus no remedial measures are proposed for groundwater in these two areas.

Demolition is planned for the existing structures on the Site to facilitate more thorough access to the site and to the contamination in each RAOC. As part of the planning for demolition, testing was performed for the presence of asbestos-containing building materials (ACBM). A limited amount of ACBM was identified in certain structures; this material was removed in accordance with applicable regulations in preparation for performing the demolition.

None of the contaminants in soil in any one of the three RAOCs were detected at levels above the Part 375 Commercial SCOs. Source area soil removal is proposed for RAOC-1 for the purpose of achieving the Protection of Groundwater SCOs to the extent practical and feasible. The proposed soil removal in RAOC-2 and RAOC-3 is required due to the documented nuisance characteristics. The site owner intends to pursue Brownfield Cleanup Track 2 for the site. Track 2 allows incorporation of land use and groundwater use restrictions. The intended use of the site upon completion of the IRMs is for commercial/industrial use. Accordingly, the Restricted Use Soil Cleanup Objectives for Commercial Property (as contained in 6 NYCRR part 375, Table 6.8(b)) will be applied during the Interim Remedial Measures program.

Proposed groundwater remediation for RAOC-1 would involve in-situ remediation via enhanced reductive dechlorination (ERD). This would be facilitated though installation of an appropriate carbon substrate material (electron donor) by direct placement into the RAOC-1 source-area excavation and plume-area excavation(s) prior to backfill. The exact materials and quantities to be used are presently being determined through a bench-scale study. Placement of the substrate in the impacted plume area beyond the source area will be accomplished via placement into excavated trench(s). The effectiveness of the ERD in RAOC-1 will be assessed through several rounds of post-injection groundwater monitoring.

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1.0 Introduction

1.1 PURPOSE AND CONTENT OF REPORT

In accordance with the May 2010 DER-10 Technical Guidance for Site Investigation and Remediation (DER-10) published by the New York State Department of Environmental Conservation (NYSDEC) and the May 2004 Draft Brownfield Cleanup Program Guidelines, this document presents the Interim Remedial Measures Work Plan (IRMWP) for the Former Allegany Bitumens Belmont Asphalt Plant Site (Site) located in the Town of Amity, Allegany County, New York (Figure 1). The IRMWP was prepared by Stantec Consulting Services Inc. (Stantec) on behalf of Blades Holding Company, Inc. (Blades), the current owner of the property, pursuant to their October 2010 Brownfield Cleanup Program (BCP) Agreement with the NYSDEC.

Environmental investigations have identified the presence of contamination in soil and groundwater at the Site. The contaminants include petroleum-related and solvent-related volatile organic compounds (VOCs) in soil and/or groundwater at levels that warrant Interim Remedial Measures (IRMs). In particular, chlorinated VOCs (CVOCs) have been detected in the vicinity of the laboratory building in the northwest corner of the site at concentrations in soil up to 37,500 micrograms per kilogram and in groundwater up to 12,400 micrograms per liter. CVOCs have migrated in groundwater toward the north, east and south from the source area, and extend off-site to the northeast. In addition, shallow, petroleum-impacted soils have been identified in two areas to the east of the laboratory building and in close proximity to the former asphalt plant works. Groundwater does not appear to have been impacted in these two areas.

To provide a timely response to these findings, IRMs are proposed herein that will minimize the potential for further migration of contaminants and facilitate potential redevelopment of this currently vacant property.

Consistent with Sections 1.11 and 5.3 of the DER-10 document, this IRMWP includes the following items:

- A summary of environmental investigation findings and a description of the three Areas of Concern identified by these investigations;
- A description of the proposed interim remedial measures, remedial technologies and associated sampling and monitoring;
- A listing of applicable soil cleanup objectives (SCOs) and groundwater standards relating to the work;
- Health and Safety and Community Air Monitoring Plans that describe monitoring procedures and vapor, odor and dust control to be implemented during remedial activities;

- A discussion of demolition and/or dismantling and removal of structures and equipment from the site;
- Plans for waste characterization, including a “Contained-in Demonstration” to be conducted in accordance with Technical and Administrative Guidance Memorandum 3028, and offsite disposal;
- A schedule for implementation and reporting; and
- Professional Engineer’s certification.

As mentioned above, these IRMs are being proposed to provide timely response to the investigation findings and to minimize the potential for further migration of contamination in soil and groundwater at the Site. The RI program has also identified the presence of minor quantities of miscellaneous debris mixed in with soil berms that exist along the eastern and southern property boundaries. Although this material does not appear to be significant enough in volume to warrant remedial measures, it will be addressed in the Alternatives Analysis Report which will be prepared in accordance with BCP requirements.

1.2 SITE DESCRIPTION AND HISTORY

A detailed description of the Site and its history is provided in the July 2011 Remedial Investigation (RI) report. A summary of the highlights from that description is provided here (Site features are show on Figure 2):

> The Site is a $4.9^{\pm}$ acre parcel located at 5392 State Route 19 in the Town of Amity, Allegany County, New York (see Figure 1). The property (Tax Parcel No. 171-1-60) is currently occupied by an inactive asphalt plant, which ceased operations in 2005. Redevelopment of the site is anticipated to involve commercial or industrial use.
>
> The Site was used for agricultural purposes or was undeveloped prior to 1960. In March 1960, A.L. Blades and Sons, Inc. (now known as Blades Holding Company, Inc.) acquired the property and then conveyed the property to its affiliate Allegany Bitumens, Inc.
>
> An asphalt plant was constructed at the Site by Allegany Bitumens, Inc. circa 1960 and was operated by Allegany Bitumens, Inc. and, after a 1995 merger, by A.L. Blades and Sons, Inc. until A.L. Blades and Sons, Inc. discontinued the asphalt plant operations in 2005. Since 2005, the facility has been unoccupied, although buildings and stationary asphalt manufacturing equipment remain.
>
> Structures currently located on the Site include the former asphalt plant works, empty asphalt above-ground storage tanks (ASTS), a control tower, truck scale, scale house, office and laboratory building, oil storage house, and maintenance garage. A gravel-surfaced aggregate stockpile area is located south of the asphalt manufacturing plant structures. Ground surface elevation ranges from approximately 1,380 feet above mean sea level (amsl) along Route 19 to approximately 1,369 ft amsl on the eastern property line. Surface

water drainage from the asphalt manufacturing area is towards a basin adjacent to the feeder hoppers for the asphalt plant aggregate conveyor, and this basin acts as a detention pond. An embankment up to 15 feet high exists along the northern and eastern property lines; this limits runoff along these property lines from the remaining, gravel-surfaced areas of the Site.

The Site has a water well that supplied water for Site operations and on-Site sanitary uses until plant operations ceased in 2005. The well, which is approximately 180 ft. deep, is located in the approximate center of the north half of the Site adjacent to the northeast corner of the asphalt plant structure.

Septic systems reportedly exist at the former maintenance garage and laboratory buildings. The specific location of the garage septic system is not known; the laboratory building septic system is reportedly located in the area south of the lab building and east of the scale house.

Land use in the surrounding area is primarily agricultural. Agricultural fields occupy the adjacent property to the east. Agricultural farm houses and barns and single family non-farm residences are located along Route 19 to the north and southeast of the property and along Friendship Hill Road (Tuckers Corner Road) to the west. The property located immediately opposite from the site on the west side of Route 19 is also owned by Blades, and is the site of a vehicle and equipment maintenance shop and small office building which are both currently not in use.

The northern limits of the Village of Belmont are located approximately one-half mile southeast of the property. Undeveloped wooded property is located to the southwest of the property along Tuckers Creek and its small tributaries.

1.3 PROPOSED SITE DEVELOPMENT

Although a specific Site development plan does not currently exist, it is anticipated that future site use will be commercial or industrial in nature. To facilitate such development, Blades intends to demolish the existing Site structures/concrete slabs, and remove the abandoned equipment. Removal of these structures and equipment will also facilitate cleanup of the Site and allow for an evaluation of additional potential impacts that may be present beneath the structures. Portions of this work (Scale House and Lab Building demolition) will be performed as the first step of the Interim Remedial Measures proposed herein.

As described in the RI report, a Hazardous Materials Survey was performed at the site. Materials identified in the Hazardous Material Survey will be removed and disposed offsite in accordance with applicable regulations. In addition, a pre-demolition survey involving sampling and analysis of suspect asbestos-containing building materials (ACBM) has been completed for the structures present on the Site. ACBMs identified include floor tile and underlying mastic and window caulk in the scale house, and roofing shingles in the control tower. ACBMs identified in the survey have been removed and disposed offsite by a certified ACBM contractor to facilitate demolition.

If concrete slab removal results in significant ground surface depressions, they will be backfilled with approved onsite aggregate following an evaluation of subsurface conditions. Onsite aggregate proposed for use as backfill will be chemically tested and NYSDEC approval obtained prior to use.

1.4 IDENTIFICATION OF SCGS

Regulatory Standards, Criteria and Guidelines (SCGs) have been established for environmental media at the Site, as discussed below.

Soil: Soil results are compared to New York Codes, Rules and Regulations (NYCRR) Part 375 Restricted Use Soil Cleanup Objectives (SCOs) for Commercial Use. In order to be conservative, subsurface soil analytical results are also compared to the Part 375 SCOs for the Protection of Groundwater (POGW). These borehole subsurface soil samples are compared to the POGW SCOs due to contraventions of the groundwater standards for chlorinated VOCs in the area of the laboratory building (See Section 4.3.5). However, pursuant to 6 NYCRR 375-6.5, the POGW SCOs may not be applicable because:

- the groundwater standard contravention is the result of an on-site source which will be addressed by an Interim Remedial Measure (IRM) program,
- an environmental easement is expected to be put in place for the Site which will restrict groundwater use;
- contaminated groundwater at the site is migrating off-site; but the IRM will include controls or treatment to address off-site migration, and
- as a result of the IRM, the groundwater quality will improve over time.

Groundwater: Groundwater results are compared to Class GA standards and guidance values listed in NYSDEC's Ambient Water Quality Standards and Guidance Values, Division of Water Technical and Operational Guidance Series (TOGS 1.1.1) Memorandum dated October 22, 1993, Reissued June 1998, and addenda dated April 2000 and June 2004.

2.0 Summary of Prior Investigations

This section briefly summarizes the findings of previous environmental investigations conducted for the Site.

- A Phase I Environmental Site Assessment (ESA) was completed by Stantec in the Fall of 2009 (report date December 2009) in connection with real estate due diligence activities. The Phase I ESA identified the following recognized environmental condition (REC) at the Site:

- Trichloroethylene (TCE) was used onsite as a solvent in asphalt testing operations in the laboratory building up until the early 1980s. The potential for historic releases of TCE via the laboratory building septic system or an asphalt-paved exterior storage pad adjacent to the east end of the laboratory building was identified as an REC, and it was recommended that a soil boring program be conducted in that area.

- A Phase II ESA was conducted by Stantec in December 2009. Four soil test borings and four temporary monitoring wells were installed to collect soil and groundwater samples adjacent to and downgradient from the former laboratory building and its septic system. Results indicated the presence of TCE and related chlorinated volatile organic compounds (CVOCs) in an area northeast and east of the laboratory building. These CVOCs were detected in subsurface soil at levels below NYSDEC 6 NYCRR Part 375 Soil Cleanup Objectives for Restricted Commercial/Industrial Use, but above Protection of Groundwater Objectives. CVOCs were detected in groundwater at concentrations above NYSDEC Class GA Water Quality Standards and Guidance Values for groundwater. Indications of soil contamination were encountered at approximate depths of 5 to 10 feet below ground surface (bgs) in two test borings and TCE was detected in soil samples at concentrations of up to 37,500 parts per billion (ppb). The water table in the laboratory building area was encountered at depths ranging between approximately 4 to 9 feet below ground surface (depending on location), and TCE was detected in groundwater samples at concentrations ranging from 0.001 to 2.1 ppm.

- A Remedial Investigation (RI) has been performed by Stantec for the Site in accordance with a NYSDEC-approved RI Work Plan (*October 2010*). A detailed description of the RI program and findings is presented in the July 2011 RI report. The RI field program included several field sampling events conducted during the period October 2010 through June 2011. An abbreviated summary of the primary RI program elements is presented below:

    - Physical Conditions Assessment and Hazardous Materials Survey – This was an assessment of the overall site conditions via additional literature and records search and a Site inspection of structures, equipment and stored materials.

- Assessment of Area Water Wells – A survey was performed to identify the location, use, and construction of private water supply wells in close proximity to the Site. Responses were obtained from most local residents, however several residents did not respond.
- Surface Soil Sampling – 14 surface soil samples were collected across the Site and analyzed for a variety of chemical parameters, depending on the area of concern.
- Test Pit Excavation and Subsurface Soil Sampling – 18 test pits were excavated across the site to assess subsurface conditions and facilitate subsurface soil sampling.
- Passive Soil Gas Survey – 28 soil gas samples were obtained from three investigation areas to assess the potential for VOCs to exist in shallow soil vapor.
- Assessment and Sampling of Existing Water Supply Well – The submersible pump and associated piping were removed from the onsite water supply well, the well bore was videotaped, and a groundwater sample was obtained and analyzed.
- Test Boring and Monitoring Well Installation, with Soil and Groundwater Sampling – 28 soil test borings were drilled and 16 groundwater monitoring wells were installed across the site. 34 subsurface soil samples and 19 groundwater samples (including three from previously-installed Phase II ESA wells) were initially submitted for laboratory analysis. Groundwater samples from 10 select wells were submitted and analyzed in a second sampling event.
- Ecological Survey – A qualitative exposure assessment of potential impacts to fish and wildlife resources was performed in accordance with DER-10. This included a site reconnaissance, a written request for review to the NYSDEC Natural Heritage Program, and an online search of the U.S. Fish and Wildlife Service database.

Figure 3 shows the exploration and sampling locations for the Phase II and RI investigations.

2.1 SUMMARY OF IMPACTS: REMEDIAL AREAS OF CONCERN (RAOCs)

As indicated above, the RI findings are summarized in detail in the previously-submitted Draft RI report. This section provides a focused summary of impacts for the three areas where the following impacts were observed (not all impacts were observed in each area):

- RAOC-1: Contaminants were found in subsurface soil at levels below NYSDEC 6 NYCRR Part 375 Restricted Commercial/Industrial Use Soil Cleanup Objectives, but above Protection of Groundwater Objectives;
- RAOC-1: Contaminants were found in groundwater at levels above NYSDEC Class GA Water Quality Standards and Guidance Values for groundwater; and
- RAOC-2 and RAOC-3: Nuisance characteristics (strong odors, staining) were observed in soil.

Figure 4 shows the estimated limits of each RAOC.

2.1.1 RAOC-1 – Impacted Soil and Groundwater – Former Laboratory Building Area

As discussed above, CVOCs were detected in samples of soil and groundwater in RAOC-1 during the Phase II ESA. The extent of CVOC impacts were assessed through soil vapor, soil and groundwater sampling and analysis during both the Phase II ESA and RI work.

Soil

The primary CVOC identified was TCE, which was historically used in the laboratory facility, as detailed in the RI report. Figure 5 shows the CVOC concentrations observed in soil in RAOC-1. TCE concentrations in analyzed soil samples ranged up to 37,500 ppb. Two other CVOCs (1,1,1-trichlorethane and 1,1-dichloroethane) were detected in soil samples at levels exceeding the respective Part 375 Cleanup Objectives for Protection of Groundwater. These compounds are generally produced in the environmental through natural, anaerobic biological breakdown (reductive dechlorination) of TCE. Their presence is indicative that natural attenuation of the TCE is occurring at the Site.

The "footprint" of impacted soil in RAOC-1 appears to be an elongated area with maximum length and width of approximately 85 ft and 45 ft, respectively. The area of impact is situated immediately to the east of the former laboratory building, and appears to extend beneath the east end of the building. Based on field screening of soil samples and laboratory analytical results, approximately the upper four ft. of soil in this area does not appear to exhibit significant impact of CVOCs. Impacted soil appears to exist primarily between 4 and 12 ft. bgs. (with some variation due to uneven ground surface in this area).

Based on dimensions of 85 ft long x 45 ft wide x 8 ft thick (see Figures 4 and 10), it is estimated that up to approximately 1,125 cubic yards (cy) of soil may be impacted by CVOCs at levels above the Part 375 Restricted Soil Cleanup Objectives for Protection of Groundwater. This includes approximately 425 cubic yards (cy), equivalent to approximately 720 tons of soil above the water table (during recorded low water table conditions) and an additional 700 cy or 1260 tons (accounting for saturated soil density) of similarly-impacted soil may exist below the water table.

Groundwater

Depth-to-water readings in monitoring wells installed in RAOC-1 were measured in January, February, April, and September 2011. As would be expected, water levels were highest in April and lowest in September. The water levels ranged between 4.5 and 4.6 ft. bgs in April, and between 7.5 and 11.0 ft bgs in September (See Table 2). This represents a variation of up to approximately 4.6 ft. The water table surface appears to dip toward the north and northeast in this area, which is generally consistent with the ground surface contours.

CVOCs at levels in excess of NYSDEC's TOGS 1.1.1 Groundwater Standards were observed in several wells in RAOC-1. Total CVOC concentrations above groundwater standards ranged from 8.5 ppb in well MW-8 to 12,401 ppb in well BS-2.

The approximate area of groundwater impact is shown on Figures 6 and 7, which provide CVOC concentration contours for sampling events in January/February 2011 and April 2011, respectively. As indicated by the figures and the analytical data in Table 1 (excerpted from the RI tables), CVOC concentrations dropped one to two orders of magnitude between these sampling events. This is likely due to a dilution effect resulting from heavy surface water infiltration during a period of heavy precipitation prior to the April sampling event.

2.1.2 RAOC-2 – Impacted Shallow Soil – B-31/MW-27 Area

During the RI sampling program, shallow soils encountered in two test borings (B-31 and MW-27 – see Figure 4) drilled approximately midway between the asphalt plant and the laboratory building, exhibited nuisance petroleum odors. Laboratory analyses of samples from these borings detected several CoCs (acetone, ethylbenzene, xylene, methylene chloride, cyclohexane and methylcyclohexane) at levels that were below Part 375 Restricted Soil Cleanup Objectives for Commercial or Industrial site usage; however the odors and visible oil contamination are considered a nuisance characteristic in accordance with NYSDEC's CP-51 Soil Cleanup Guidance (2010). Accordingly, these soils will require remedial action.

The impacted soil in these two borings in RAOC-2 appears to be within approximately 1.5 ft of existing grade. The estimated area of impact is approximately 20 by 40 ft in plan view (see Figure 4), and the estimated volume of impacted soil is 45 cubic yards (cy) or approximately 75 tons. Groundwater in this RAOC has not been impacted.

2.1.3 RAOC-3 – Impacted Shallow Soil - Asphalt Storage Tank Area

A soil sample from test pit TP-14 (see Figure 4) in the Asphalt Storage Tank area encountered asphalt pieces with an oily appearance, PID readings up to 804 ppm and a strong petroleum odor at approximately 3 ft bgs. In addition, the passive soil vapor sampling performed for this area (See RI report Appendix H) indicated the presence of total petroleum hydrocarbons (TPH) in soil vapor. Although laboratory analyses of a sample from TP-14 did not detect CoCs at levels that exceed Part 375 Restricted Soil Cleanup Objectives for Commercial or Industrial Property, the odors and visible oil contamination are considered a nuisance characteristic in accordance with NYSDEC's CP-51 Soil Cleanup Guidance (2010). Accordingly, these soils will require remedial action.

The impacted soil appears to be limited to within approximately 3 to 4 ft of existing grade. The area of impact is estimated to be approximately 30 by 60 ft in plan view (generally surrounding the concrete asphalt tank support structure - see Figure 4), and the estimated volume of impacted soil is 233 cy, or approximately 400 tons. Groundwater in this RAOC has not been impacted. The concrete structure beneath the asphalt tanks will be demolished to facilitate access to the impacted soil; this concrete will be staged and properly characterized for disposal in accordance with applicable regulations.

3.0 Interim Remedial Measures and Remedial Technology

In Section 2.0, three RAOCs were discussed where identified contaminants will require remedial action. This section discusses the proposed IRM for each RAOC, based on the area of apparent impact, the contaminants of concern, and the affected media for each location.

3.1 RAOC-1

As summarized above (and as described in greater detail in the August 2011 draft RI Report), CVOCs are present in soil at levels above the Part 375 Soil Cleanup Objectives for Protection of Groundwater, and in groundwater at levels in excess of NYSDEC Class GA Water Quality Standards and Guidance Values in a limited area near the east end of the laboratory building. IRMs are proposed herein for both of these media. Pre-remedial demolition of the former Scale House and Laboratory Building is planned to allow complete and unimpeded access to RAOC-1 and its impacted soils.

3.1.1 Source Area Soil Removal/Disposal

Figure 8 shows the approximate limits of soil and groundwater impact for RAOC-1. Figure 11 provides a cross-section view of the impacted soil area. Source area-soil excavation is proposed to significantly reduce the potential for future migration of CVOCs from soil into groundwater. Although the impacted soil may extend somewhat deeper than can be practicably accessed for removal, excavation of the accessible impacted soil mass will provide an immediate remedial benefit.

It is currently anticipated that the following sequence of IRM activities would be performed in RAOC-1:

- Relocation of a portion of the property line berm that partially covers the proposed RAOC-1 source-area excavation (see Figure 8). It is not anticipated that wastes will be present, however if encountered, they will be properly stockpiled, characterized as needed, and disposed of at an approved solid waste disposal facility. If the berm material is comprised of soil, with no evidence of impacts or fill material, it is proposed to relocate this material on-site within another portion of the berm immediately to the east.
- Removal of the septic tank and leach field lines. The contents of the septic tank will be sampled and analyzed for VOCs prior to disposal. If TCE or other VOCs are detected at levels of concern, the disposal will be at a facility properly permitted to receive the waste.
- Excavation and staging of clean soils situated above CVOC-impacted soil;
- Excavation of CVOC-impacted soil to the greatest practicable depth below the water table; this may include excavation slightly beyond the northern property line onto the adjacent property.

- Removal and containerizing of groundwater accumulated in the excavation in an on-site storage tank. Dewatering will be accomplished by maintaining a temporary sump in the base of the excavation to which groundwater entering the excavation can be directed and removed with a submersible pump. All water pumped from the excavation will remain in the storage tank until it is characterized via laboratory analysis for either: 1) onsite treatment with a granular activated carbon system involving two 55-gallon drums in series, and onsite discharge following laboratory analyses of a treated sample; or 2) offsite disposal at a permitted disposal facility. Analytical results required for the proposed treatment or disposal method will be submitted to NYSDEC for approval prior to implementation.
- Collection and laboratory analysis of confirmatory sidewall and bottom samples;
- Placement of a carbon substrate material designed to facilitate in-situ remediation of remaining CVOCs in source-area soil and groundwater through enhanced reductive chlorination (ERD). Bench-scale testing is being performed to confirm the viability of this technology, which is discussed further in the section below on groundwater remediation for RAOC-1;
- Excavation of narrow trenches into the top of the water table for subsurface placement of the carbon substrate material at locations outside the excavation footprint but within the footprint of impacted groundwater. The use of trenches is proposed to facilitate distribution of the carbon substrate in the relatively fine-grained soils of the plume area. It is proposed to stage the excavation soils on poly sheeting adjacent to the trenches, place the additive in the bottom of the trenches and then backfill the trench with the spoils;
- Backfilling of the source area excavation to original grade with previously-excavated, non-impacted soil and clean aggregate obtained from an on-site borrow area;
- Installation of one replacement monitoring well within the excavation footprint; and
- Offsite disposal of excavated soil (currently presumed to be non-hazardous, subject to confirmation through laboratory analyses for waste characterization and a Contained-In Demonstration to be performed, in accordance with NYSDEC TAGM 3028. A Contained-In Demonstration Work Plan for the disposal of CVOC impacted soils was submitted to NYSDEC under separate cover on October 11, 2011). Based on the analytical results obtained for RI soil samples, it is currently presumed the excavated soil will be landfilled.

3.1.2 Groundwater - Enhanced Reductive Dechlorination

Background

In order to address the impacts to groundwater (and source area soil not able to be accessed through excavation), a program of in-situ remediation is proposed. The program would be designed to provide rapid breakdown of CVOCs in groundwater to minimize the potential for further migration of the contamination plume identified by the RI.

As discussed above in Section 2.1.1, the groundwater analytical data indicate naturally reductive dechlorination is occurring in groundwater in RAOC-1. Reductive dechlorination is a process whereby contaminant compounds are broken down in biochemical processes into harmless byproducts; this can occur naturally in the environment when the proper native bacteria and chemical conditions are present in the subsurface. Contaminant degradation is dependent on the presence of the appropriate microorganisms, nutrients, and energy sources. The biochemical transformation of contaminants is the result of enzymes produced by the microorganisms that act as catalysts for the degradation reactions.

These reactions are biologically driven and will proceed only if the indigenous bacteria in the subsurface are capable of producing the desired biochemical reactions. Bacteria such as *dehalospirillum multivorans*, *dehalobacter restrictus, desulfitobacterium, clostricium bifermentans, desulfuromonas, dehalococcoides ethenogenes* and others are responsible for the degradation of chlorinated solvents in subsurface environments. *Dehalococcoides ethenogenes* is the microbe that is generally most effective in terms of reductive dechlorination of TCE. Vinyl chloride (VC) was detected in some of the soil and groundwater samples; this is typically indicative of breakdown of 1,2-DCA to VC by *Dehalococcoides.* This indicates that a *dehalococcoides* population likely exists at the Site, but it does not confirm a site-wide spatial population.

In this process, the chlorinated solvent compound serves as an electron acceptor (or weak oxidizing agent) that is reduced by electrochemical reactions with other chemicals in the groundwater that serve as electron donors. Typical naturally-occurring electron donors include natural organic carbon, dissolved hydrocarbon gases and dissolved hydrogen.

For reductive dechlorination to occur, the supply of electron donors must meet or exceed the concentration of chlorinated solvents in the groundwater when evaluated in terms of an electron balance. The available electron donors must also be capable of driving the desired biochemical reactions without interferences from other electron acceptors. At sites with higher concentrations of chlorinated solvents, natural reductive processes often are limited by an inadequate supply of electron donors. At these sites, enhanced reductive chlorination (ERD) can be accomplished by adding a supplemental electron donor into the groundwater to balance the electrochemistry.

The artificial electron donor should be carbon-based so that it also provides the substrate necessary to fuel biological growth. This carbon source may consist of carbohydrates, organic acids, alcohols, alkanes, aromatics, glycerides, or other hydrocarbons that possess some degree of aqueous solubility. Carbohydrates or lactate are most often added to the subsurface to increase the availability of electron donors to enhance reductive dechlorination, but other carbon-based electron donors may also be used.

Treatability Bench-Scale Study

Prior to implementing an ERD program, a bench-scale test program is being performed using samples of soil and groundwater from RAOC-1 to determine the apparent effectiveness of ERD on the CoCs present. The treatability study includes obtaining baseline population data for *dehalococcoides* as part of the bench-scale test. The analysis includes groundwater samples from the planned treatment area tested for polymerase chain reaction (PCR) to detect specific target sequences of DNA unique to the 16s ribosomal ribonucleic acid (rRNA) gene of *dehalococcoides* bacteria.

Bench-scale testing can determine if low populations of *dehalococcoides* (i.e. false negatives by PCR analysis due to low cell count) can be stimulated under reducing conditions. Therefore a portion of the treatability study will focus on *in-situ* chemical enhancements to increase the kinetics of reductive dechlorination by indigenous bacteria rather than bacteria identification.

ERD Implementation

Assuming the bench-scale test indicates ERD to be a viable IRM method, Stantec proposes the following implementation sequence for RAOC-1:

- Excavation and disposal of CVOC-impacted soil (discussed above in Section 3.1.1);
- Application of the chosen electron donor substrate into the subsurface (directly into the excavation(s) prior to backfill, and via narrow trenches in the plume area outside the source area) to facilitate ERD.
- Backfill to grade with clean granular fill soil; and
- Groundwater Quality Monitoring – Quarterly groundwater sampling to confirm the effectiveness of the ERD program.

Groundwater Quality Monitoring and Reporting

- Replacement Monitoring Well Installation: Since existing monitoring wells located within the excavation footprint will be destroyed by the excavation, a replacement well will be installed near the BS-2 location (where soil and groundwater CVOC concentrations have been highest). This will be accomplished by using drilling equipment and methods after backfilling is complete. The well will be constructed as a conventional 2-in. diameter PVC monitoring well with a slotted screen section, which can be modified to serve as an injection well in the future if needed. An annular seal of concrete will be placed above the screened interval.
- Quarterly Groundwater Monitoring:

  Quarterly post-excavation groundwater monitoring will be conducted in RAOC-1 to evaluate the effectiveness of the IRM program in addressing CVOCs in groundwater.

We propose to sample the following five existing and one newly-installed replacement ("R") well located to monitor the impacted area (see locations, Figure 8):

- BS-2R
- BS-3
- MW-25
- MW-27
- MW-28D
- MW-8

As with the RI, sampling will be conducted using low-flow sampling methodology, to the extent practicable based on rate of recovery for any individual well. For those wells where low-flow techniques are not feasible, conventional bailing techniques will be used.

Prior to sampling, water quality field parameters (i.e. turbidity, pH, specific conductance, temperature, and oxidation-reduction potential) will be monitored in accordance with generally-accepted practice.

The groundwater monitoring program will include analyses for the following parameters:

- Target Compound List VOCs plus Tentatively Identified Compounds (TICs) (USEPA Method 8260B; and
- ERD-related analyses will include such parameters as pH, ORP, VOCs and dissolved metals; however the proposed parameters list may be modified based on results of the bench-scale evaluation, and the substrate material chosen for ERD.

Sampling and analyses will be performed in accordance with the Quality Assurance Project Plan (QAPP) included in Appendix A. The results of each sampling event will be provided to NYSDEC in a Quarterly Sampling Summary Report.

After two to three quarterly sampling events, the data will be reviewed with the NYSDEC to assess the effectiveness and to determine if additional IRMs or monitoring are appropriate.

3.2 RAOC-2

Based on the limited areal and vertical extent of impact in RAOC-2, excavation and offsite disposal of the "nuisance characteristic" petroleum-impacted soil for this area is proposed. The work will include:

- Excavation of petroleum-impacted soil to a depth of approximately 1.5 ft bgs;
- Collection and laboratory analysis of confirmatory sidewall and bottom samples;
- Offsite disposal of excavated soil (currently presumed to be non-hazardous, subject to confirmation); and
- Backfill to grade with clean granular fill soil.

3.3 RAOC-3

Based on the limited areal and vertical extent of impact in RAOC-3, excavation and offsite disposal of the "nuisance characteristic" petroleum-impacted soil for this area is proposed. The work will include:

- Demolition of the concrete cradle structure beneath the former asphalt tanks;
- Excavation of petroleum-impacted soil to a depth of approximately 3 to 4 ft. bgs;
- Collection and laboratory analysis of confirmatory sidewall and bottom samples;
- Offsite disposal of excavated soil (confirmed to be non-hazardous via waste characterization sampling conducted in September 2011, which was reported to NYSDEC in Progress Report #12);
- Offsite-disposal of the demolished concrete (currently presumed to be non-hazardous; subject to confirmation); and
- Backfill to grade with clean granular fill soil.

3.4 IRM CONSTRUCTION FACILITIES

3.4.1 Decontamination Facilities

A temporary aboveground storage tank will be provided for storage of water to be used for decontamination activities.

The Contractor and the well abandonment drilling contractor will construct temporary decontamination pads that will be used to decontaminate drilling and earthwork-related equipment. Trucks leaving the site will have their tires cleaned prior to entering the highway.

The decontamination pad shall be constructed of polyethylene sheeting with a sump for the purposes of collecting wash water, if needed. The decontamination pad will be covered when not in use to limit collection of rainwater. Wash water will be stored in 55-gallon drums or a storage tank and properly disposed of off-Site at the end of the project. Accumulated sediments will be disposed of with the impacted Site soil. The decontamination pad construction materials will be disposed of off-Site at the completion of the project.

3.4.2 Impacted Soil Staging Area

The Contractor will construct and maintain staging areas comprised of a bermed layer of polyethylene (poly) sheeting for staging the excavated impacted soil. The Contractor will cover the staged materials during non-working hours with a layer of poly sheeting. The poly cover will be anchored or weighted at the edges to prevent stormwater and wind erosion. If soil excavated from below the water table contains sufficient free liquid that it drains from the soil, measures will be taken to collect and contain the fluid in the on-site storage tank (see Section 3.4.3 below regarding dewatering).

Figure 8 shows the proposed locations of the equipment decontamination and soil staging areas. Waste disposal is discussed below in Section 3.7.

3.4.3 Dewatering Area

If field conditions are such that groundwater is encountered during earthwork activities, measures will be taken to pump and temporarily containerize groundwater in a frac tank or drums, as necessary. Containerized groundwater will be sampled and characterized as necessary prior to transportation and disposal.

3.4.4 Temporary Fence Installation - Excavation and Staged Soil Pile Areas

The Contractor will erect temporary construction fence around the perimeter of proposed Site-related work, the staged soil piles and the proposed excavation areas described in Sections 3.1 to 3.3 and Figure 8. The purpose of the fencing will be to prevent unauthorized entry into the remediation work areas. Backfilling will be performed as soon as is reasonably practicable following completion of excavation; however fencing shall be in place at all times should any excavation be left temporarily open to await confirmatory soil sample results. The fencing shall remain in place until final backfilling of the area is completed.

3.4.5 Location of Remedial Treatment Units

Depending on the contaminant concentrations present in containerized groundwater and the quantity of water, on-site treatment with granular activated carbon (GAC) may be appropriate. If deemed feasible, appropriate and approved by the Department the GAC treatment system will be a temporary installation consisting of two 55-gallon canisters of GAC, placed in the vicinity of RAOC-1 and adjacent to the temporary water storage tank.

3.5 EXCAVATION CONFIRMATORY SOIL SAMPLES

Confirmation soil samples will be obtained in each excavation to demonstrate sufficient removal of impacted soils. Samples will be obtained at the frequencies required by the DER-10 document section 5.4.2(ii)(2). Samples will be obtained at the frequency of one sidewall sample for every 30 linear ft. of sidewall and one bottom sample for every 900 sq ft of excavation bottom.

All confirmatory soil samples plus the required quality assurance/quality control (QA/QC samples, including MS/MSD and blind field duplicates) will be submitted to a New York State Department of Health (NYSDOH) ELAP-certified laboratory for analysis as follows:

- RAOC-1
    - TCL VOCs plus TICs using USEPA Method 8260B;

- RAOC-2
    - TCL VOCs plus TICs using USEPA Method 8260B; and
    - TCL SVOCs plus TICs using USEPA Method 8270.

- RAOC-3
    - TCL VOCs plus TICs using USEPA Method 8260B; and
    - TCL SVOCs plus TICs using USEPA Method 8270.

These soil analyses results will be reported using ASP Category B deliverables.

3.6 RESIDUAL CONTAMINANTS IN EXCESS OF SCGS

None of the contaminants in soil in any one of the three ROAC-s were detected at levels above the Part 375 Commercial SCOs. The proposed soil removal in RAOC-1 is driven by the intent to achieve the Protection of Groundwater SCOs to the extent practical and feasible, which requires addressing the source-area soils. The proposed soil removal in RAOC-2 and RAOC-3 is required due to the documented nuisance characteristics.

The site owner intends to pursue Brownfield Cleanup Track 2 for the Site. Track 2 allows incorporation of land use and groundwater use restrictions. The intended use of the site upon completion of the IRMs is for commercial/industrial use. Accordingly, the Restricted Use Soil Cleanup Objectives for Commercial Property (as contained in 6 NYCRR Part 375, Table 6.8(b)) will be applied during the Interim Remedial Measures program.

Cleanup levels will be reevaluated once the remediation has been managed to the limits of the technology. The cleanup cannot be considered completed unless it is demonstrated that on-site contamination will not migrate off-site at concentrations that adversely impact the ability of off-site groundwater to meet NYSDEC Class GA Water Quality Standards. If the remediation is conducted to its practical limits, and the Department approves ceasing its application and/or continuation, then additional measures may need to be evaluated to contain these contaminants on-site. These technologies must include appropriate engineering and institutional controls and be protective of public health and the environment.

3.7 WASTE DISPOSAL

Wastes generated during the IRM program are anticipated to include the following:

- Building demolition debris;
- Septic tank contents
- Excavated soil (impacted with either CVOCs or petroleum-related VOCs/SVOCs) ;
- Soil cuttings ;

- Containerized groundwater resulting from excavation dewatering or monitoring well sampling;
- Decontamination fluids; and
- Polyethylene sheeting.

Disposal of wastes will be conducted in accordance with applicable regulations. It is currently anticipated that all waste materials will be non-hazardous; however this will be confirmed through appropriate analyses. As discussed above, disposal of the CVOC-impacted soil excavated from RAOC-1 will be done in accordance with the Contained-In Demonstration (CID) Work Plan, which was submitted to the NYSDEC under separate cover on October 11, 2011. Analyses performed on other waste streams will be dictated by requirements of the disposal facility(s). Excavated soils from RAOC-1 will be stockpiled in manageable units to facilitate discrete sampling for characterization analyses in accordance with the CID Work Plan and disposal facility requirements. Soils from RAOC-2 and RAOC-3 may be “live-loaded for disposal; however if this material is stockpiled it will not be commingled with RAOC-1 soils. Wastes will be transported only by permitted haulers.

3.8 SITE MANAGEMENT PLAN

Based on the site conditions identified, it is likely that some residual contamination will remain at the site after the IRM program has been completed. In order to minimize the potential for future intrusive site activities to exacerbate the spread of contamination or create potential exposure to impacted media, a Site Management Plan (SMP) will be developed. The SMP will be prepared after the IRMs have been performed and will provide guidance for planning and executing future site activities (such as excavation, grading, drilling, etc.) that could encounter impacted soil or groundwater. The SMP will provide guidance on monitoring and screening soils for potential CoCs, and handling/ characterizing/disposal of impacted media.

3.9 WETLANDS, STREAMS AND OTHER HABITATS

Based on previous investigations and current knowledge of the Site, there have been no wetlands, streams or other habitats identified that would be impacted by the proposed IRMs.

3.10 SITE RESTORATION

The Site restoration activities include:

- Construction and Demolition Debris Disposal: C&D materials generated during demolition of site structures will be disposed in accordance with applicable regulations. If feasible, concrete C&D material may be reused on site as excavation backfill.

- Excavation Backfill: The excavations (whether related to demolition or remediation) will be partially backfilled with onsite, non-impacted excavated soils. The remainder of the backfill material will be obtained onsite from previously-imported aggregate that was intended for use in the former asphalt production process; this material is stockpiled in the western portion of the Site (see Figure 8). This material will be demonstrated to be sufficiently free of contamination through existing analytical data and additional sampling and analysis. It is proposed that the additional sampling be conducted via three test pits. Soil sampling from these test pits would be comprised of: (1) one grab sample for analysis of TCL VOC + TICs by EPA Method 8260, and (2) one 3-point composite samples for analysis of TCL SVOCs + TICs by EPA Method 8270, TCL pesticides/polychlorinated biphenyls (PCBS) by EPA Method 8081/8082) and Target Analyte List (TAL) Inorganics by Methods 6010/7471. The sampling and analytical results will be provided to NYSDEC. Upon receipt of acceptable results and NYSDEC approval, a stockpile of this aggregate may be constructed for use by the remedial contractor. It is anticipated that there may be the need for approximately 1,500 cy of this on-site aggregate. The excavated borrow area will ultimately be re-graded to blend with existing site contours and minimize the existence of significant depressions.

- Contaminated Waste Disposal:

  - Staged, excavated soil will be disposed offsite in accordance with applicable regulations at a permitted disposal facility. It is currently assumed the excavated soil will be non-hazardous; however this will be confirmed through appropriate testing.

  - Impacted, containerized groundwater will most likely be treated on site with a temporary granular activated carbon (GAC) system. Depending on the contaminant concentrations present in containerized groundwater and the quantity of water, on-site treatment with granular activated carbon (GAC) may be appropriate. If deemed feasible, appropriate and approved by the Department the GAC treatment system will be a temporary installation consisting of two 55-gallon canisters of GAC, placed in the vicinity of RAOC-1 and adjacent to the temporary water storage tank. Discharge on-site will be done in accordance with applicable requirements.

    Alternatively, depending on the contaminant levels in the water, and the volume of water, it may be disposed offsite at a permitted treatment/storage/disposal facility. Appropriate testing will be performed on the water before disposal.

  - Solid waste generated during remedial activities will be disposed offsite at a NYSDEC-Part 360 permitted disposal landfill.

- Well Decommissioning: Monitoring wells that are not proposed to be used as part of the groundwater monitoring program will be closed in accordance with Commissioner's Policy CP-43. The wells to be removed are listed on Table 3. At present, it is not planned to decommission the on-Site water supply well because it is possible a future developer/owner of the Site could have a need for such a well for industrial/commercial (non-potable) purposes.

3.11 SOIL AND SEDIMENT CONTROL

Figures 9 and 10 shows erosion and sediment control measures to be taken. The locations of these features may be adjusted in the field based on existing conditions. A silt fence (Mirafi 100X or equivalent) will be installed, and will be “keyed into” the existing ground along the downslope side of the proposed excavations or areas of soil disturbance. Alternatively, compost socks may be used in place of silt fence. The silt fence/compost sock will remain in place until the Summer of 2012 at which time it will be removed and disposed. Straw bales will be placed in front of the inlet of the storm sewer that drains from the central portion of the site to Tuckers Creek.

In addition, residual soil on the tires of trucks leaving the site will be removed before they enter the highway. Should soils be tracked off-site by haul trucks, the soils will be cleaned from the road surface.

3.12 STORM WATER MANAGEMENT AND MONITORING

Due to the relatively shallow nature of the RAOC-2 and RAOC-3 excavations (1.5 to 3 ft bgs) and the observed depth to groundwater (at least 7 ft bgs), groundwater is not anticipated to be encountered within these excavations. It is anticipated however that the excavation for RAOC-1 will extend below the water table at that location. Accordingly, any accumulated groundwater (or precipitation) that requires removal from the excavation will be temporarily containerized on site and will be handled as described in Sections 3.1.1, 3.4.5 and 3.10. Steel or poly storage tanks of sufficient capacity will be kept on site during the excavation of RAOC-1.

Since excavated soils will be staged on site during the IRM program, measures will be taken to prevent erosion of these piles by wind or precipitation so that onsite or offsite impacts by stormwater will not occur. In addition, if liquid drains from soil excavated below the water table, such water will containerized. Containerized fluids will be disposed off offsite in accordance with applicable regulations and with appropriate waste characterization analyses.

3.13 SURVEY CONTROL

The replacement monitoring well will be surveyed for horizontal and vertical control by a licensed surveyor. The actual limits of excavation for RAOCs-1 through 3 will be established in the field at completion using a handheld GPS unit, such as the GeoXT, with sub-meter accuracy.

3.14 QUALITY ASSURANCE (QAPP)

A Quality Assurance Project Plan (QAPP) is included as Appendix A of this IRMWP.

3.15 DATA USABILITY SUMMARY REPORT

The confirmatory sampling analytical data will undergo a data usability evaluation (DUSR). The data usability evaluation will be performed in accordance with the NYSDEC's "Guidance for the

Development of Data Usability Summary Reports," revised 1997, and DER-10. Analytical summary tables will be prepared which summarize the data and compare them to New York State Standards, Objectives and Guidance. This will include, as applicable: NYSDEC 6 NYCRR Part 375 Commercial/Industrial Restricted Use and Protection of Groundwater Soil Cleanup Objectives for subsurface soil; and NYSDEC Class GA Water Quality Standards and Guidance Values for groundwater.

3.16 HEALTH AND SAFETY PLAN AND COMMUNITY AIR MONITORING PLANS

A Health and Safety Plan (HASP) to be used by Stantec workers involved in the IRM activities is included as Appendix B. Contractors working on-site will be required to prepare their own HASPs for their employees. Potential presence of dust, odors and organic vapors generated by the remedial activities, and mitigative actions, if necessary are described in accordance with the Community Air Monitoring Plan (CAMP) included herein as Appendix C.

3.17 OPERATIONS, MAINTENANCE & MONITORING (OM&M) PLAN

Provisions for periodic certifications and identification of restrictions for site use, soil excavations and groundwater use will be included as part of the Site Management Plan, which will be provided following completion of the IRMs.

3.18 PROJECT MANAGEMENT

The Project Manager will have primary responsibility for the development and implementation of the BCP IRM Work Plan, including coordination among the task leaders. The Project Manager will identify staff requirements, direct and monitor site progress, and be responsible for project performance within the established budget and schedule. He or she will also coordinate the activities of the task leaders, support staff, acquisition of engineering or specialized technical support, and other aspects of the day-to-day activities associated with the project.

The Project Manager, with assistance from the Project Engineer will be responsible for overseeing implementation of remedial activities, in addition to overall project quality. The Project Geologist or Environmental Technician will also be responsible for on-site oversight and documentation of remedial activities. The Project Engineer will report directly to the Project Manager and will perform periodic review of technical information and provide recommendations for modifications, if appropriate.

One or more ELAP-accredited analytical laboratories will provide analytical services during the IRM program.

A specialty environmental contractor, who is knowledgeable about soil excavation and application of in-situ, bio-augmentation additives, will perform the remediation. The Contractor will be responsible for execution of the IRMs, under the full-time observation by the Owner’s Representative.

3.19 PERMITS

The required permits, if any, will be obtained from the appropriate agencies or municipalities by the Contractor or Stantec prior to commencement of work. These may include (but may not be limited to) a demolition permit, an excavation permit, and a water discharge permit. In addition, wastes removed from the site, whether hazardous or non-hazardous, will be transported by a permitted waste hauler(s).

3.20 SCHEDULE

The anticipated project schedule for implementation of remedial activities at the Site is shown in Figure 12. As indicated on the figure, we have assumed a relatively aggressive schedule for implementation, in hopes that a Certificate of Completion can be obtained in 2012. It has been assumed that no significant delays will be experienced in obtaining the required permits and agency approvals.

3.21 INSTITUTIONAL CONTROLS

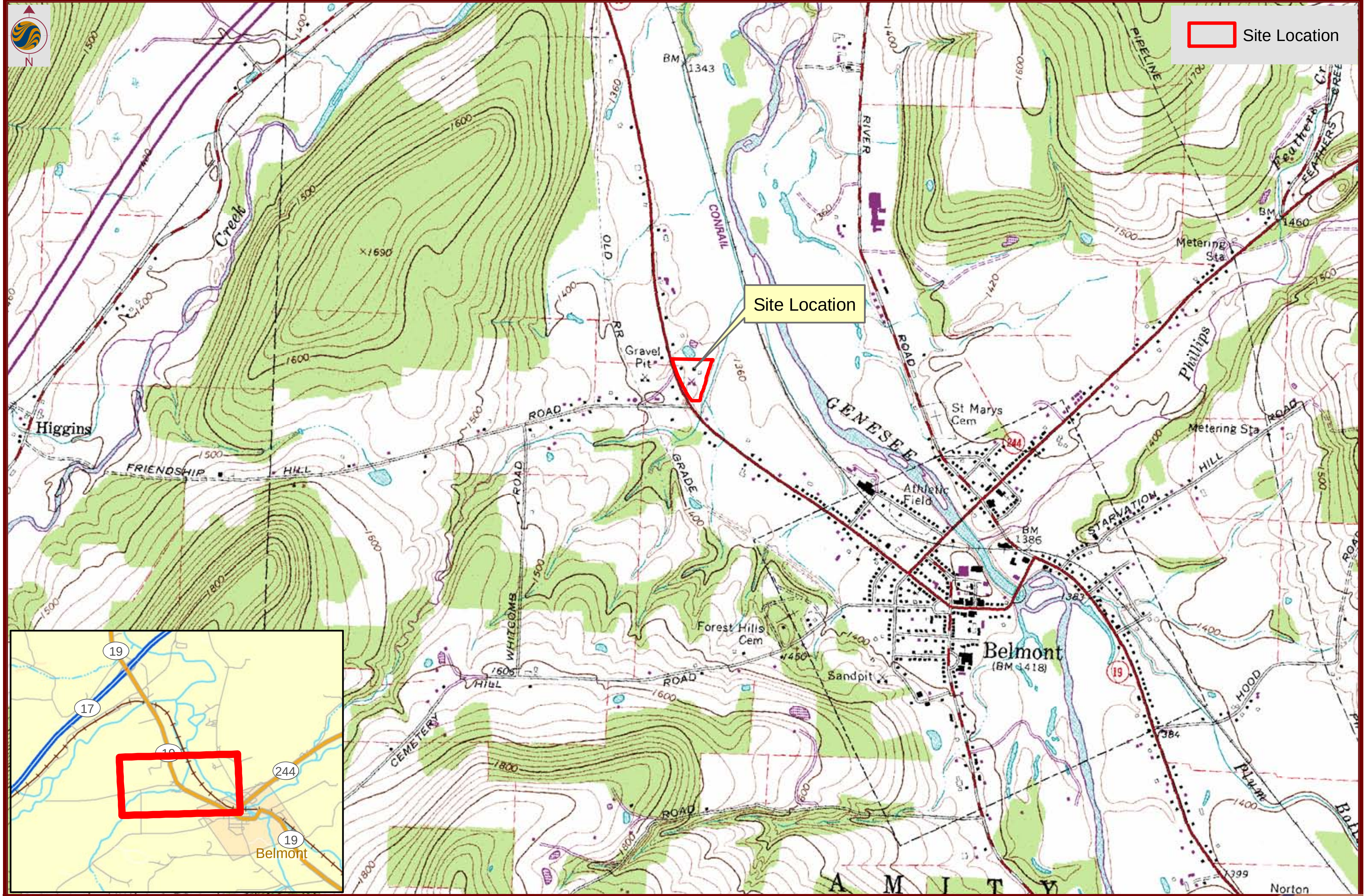
An environmental easement will be granted to the Department restricting use of the Site to commercial/industrial uses and prohibiting the use of the groundwater until the IRMs are completed with the Department’s approval.

In addition, a Site Management Plan (SMP) will be prepared for any future excavations at the Site. The SMP will be submitted to NYSDEC for review/approval.

Given the lack of use of the property for a number of years, there is no adverse impact to current land use anticipated as a result of the recommended IRM. Following completion of the IRM, it is anticipated the property will be able to be reused for commercial or industrial purposes. Any potential limitations associated with limited, residual low-level contaminants, as defined in an Environmental Easement, are not expected to adversely affect such future land uses.

IRM Work Plan

Figures



Geographic Information Systems

Map Source : NYSGIS Clearinghouse Web Site

Cartographic Design By: Andrew Less

June 29,2011
U:\190500593\drawing\RI Report Figures\Figure 1_Site Location Map.mxd

Stantec
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1 inch = 2,000 feet

0 1,000 2,000 4,000 Feet

Allegany Bitumens Belmont Asphalt Plant Site

FIGURE 1 : Site Location Map Showing USGS Topographic Information

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Legend

Notes

1. MAP REFERENCE : INFORMATION ON THIS MAP IS REFERENCED FROM MAP ENTITLED "PLAN OF LANDS OWNED BY: ALLEGANY BITUMENS, INC , SITUATE IN THE TOWN OF AMITY, COUNTY OF ALLEGANY, STATE OF NEW YORK, AND BEING A PORTION OF GREAT LOT # 18, TOWNSHIP #3, RANGE #2 OF THE ROBERT MORRIS RESERVE.

2. AERIAL MAPPING OBTAINED FROM THE NEW YORK STATE CLEARINGHOUSE GIS WEB SITE. PHOTO DATED 2007.

IRM WORK PLAN	RJM	MPS	11.08
RI REPORT	SRS	MPS	11.07
Issued	By	Appd.	YY.MM.DD

File Name: Figure 2 Site Plan

Permit-Seal

Project/ Client

ALLEGANY BITUMENS
BELMONT ASPHALT PLANT

BLADES HOLDING COMPANY, INC.

Title

SITE PLAN

Project No.
190500593

Scale
AS SHOWN

Drawing No.
FIG. 2

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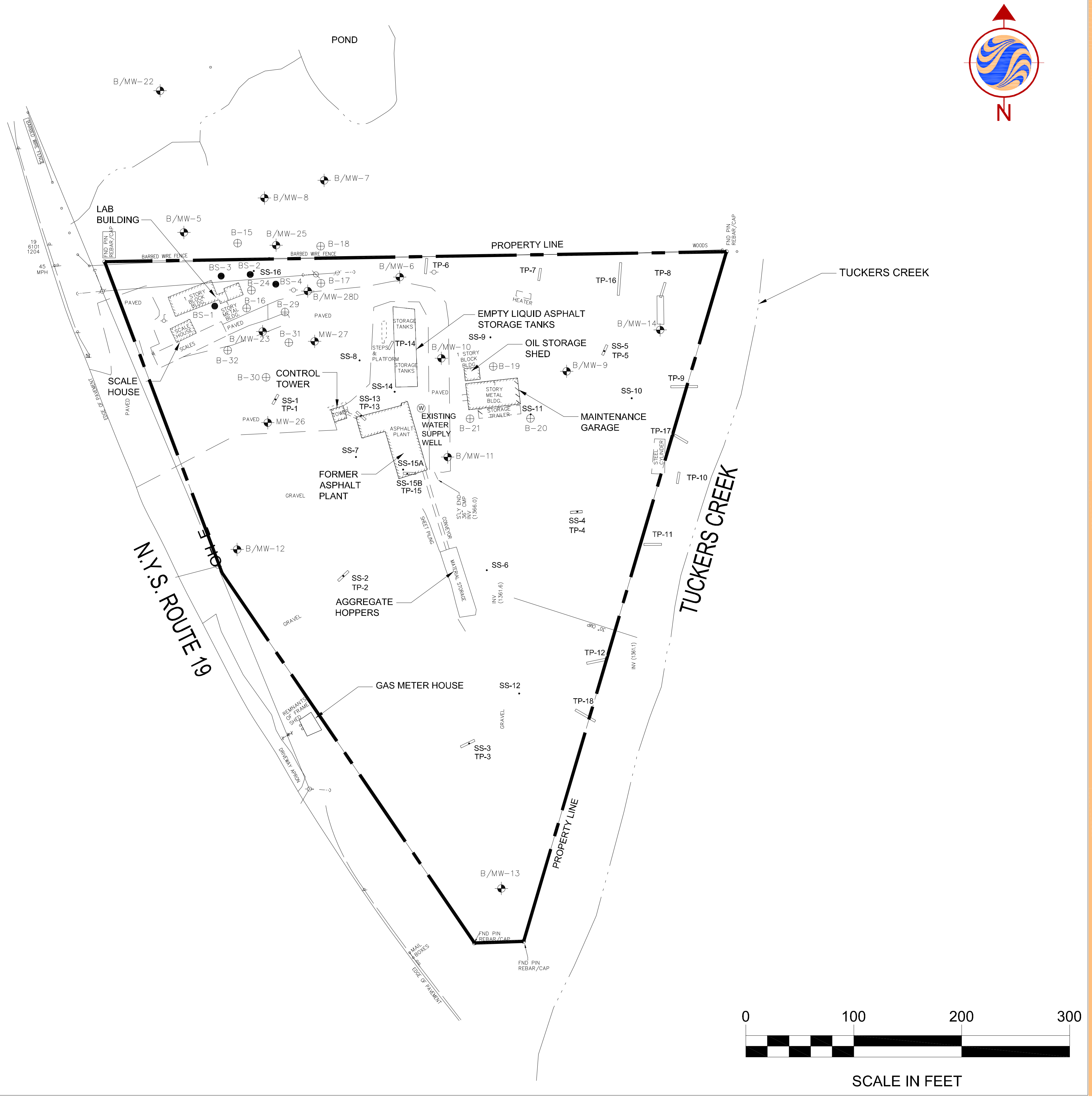
of

Revision



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●	PHASE II TEST BORING/WELL (2009)
⊕	RI TEST BORING
⊕	RI TEST BORING/MONITORING WELL
•	SURFACE SOIL SAMPLE
▬	TEST PIT
Ⓦ	EXISTING WATER SUPPLY WELL

Notes

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IRM WORK PLAN	RJM	MPS	11.08
RI REPORT	SRS	MPS	11.07
Issued	By	Appd.	YY.MM.DD

File Name: Figure 3 Surface and Subsurface Sampling Location Map

Permit-Seal

Project/ Client

ALLEGANY BITUMENS
BELMONT ASPHALT PLANT

BLADES HOLDING COMPANY, INC.

Title

SURFACE AND SUBSURFACE
SAMPLE LOCATION MAP

Project No.
190500593

Scale
AS SHOWN

Drawing No.
FIG. 3

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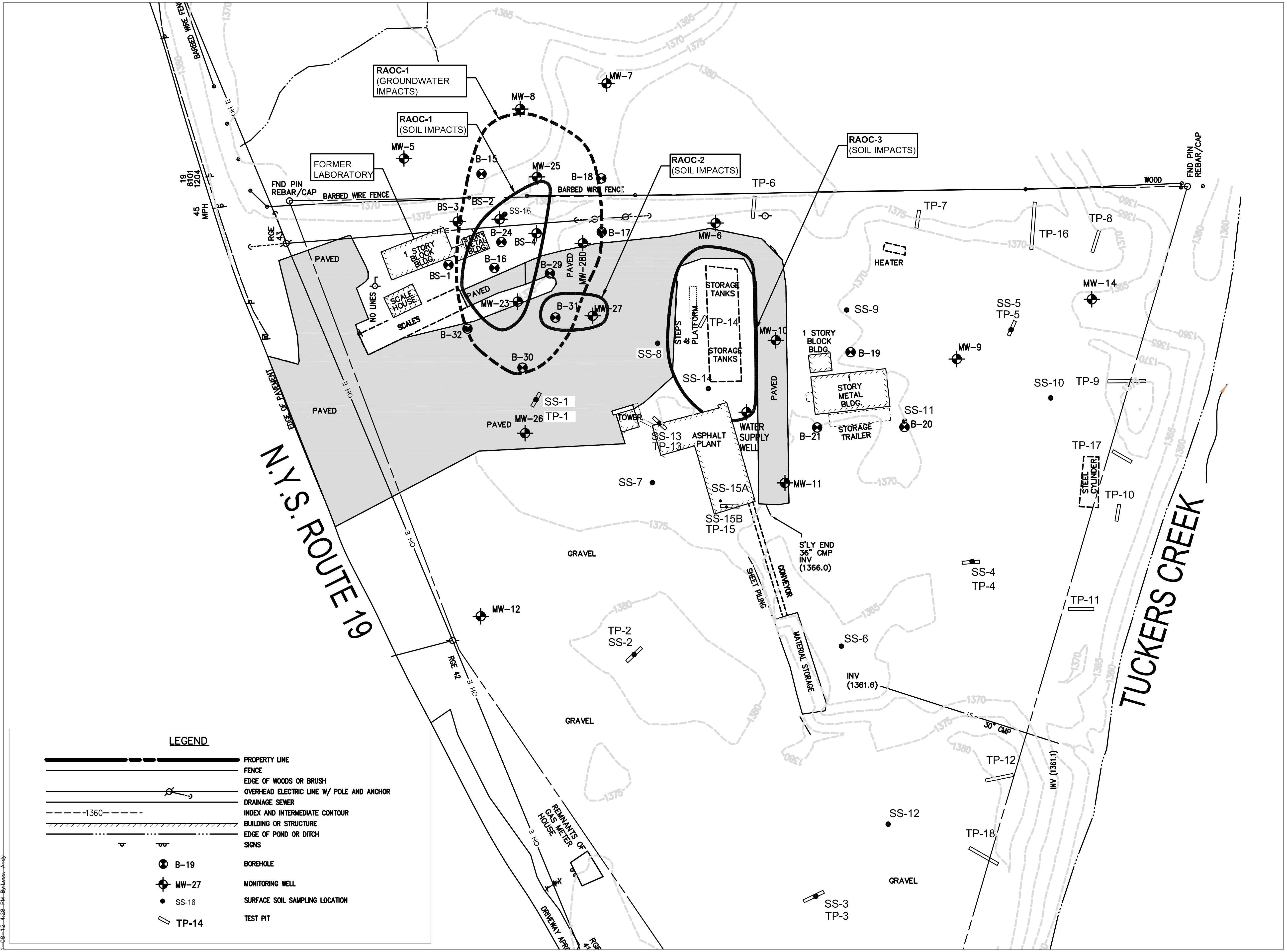

LEGEND

▬▬▬	PROPERTY LINE
───	FENCE
	EDGE OF WOODS OR BRUSH
	OVERHEAD ELECTRIC LINE W/ POLE AND ANCHOR
	DRAINAGE SEWER
———1360———	INDEX AND INTERMEDIATE CONTOUR
▨	BUILDING OR STRUCTURE
	EDGE OF POND OR DITCH
	SIGNS
B-19	BOREHOLE
MW-27	MONITORING WELL
● SS-16	SURFACE SOIL SAMPLING LOCATION
TP-14	TEST PIT

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2011-08-12 4:28 PM By:Less, Andy

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▬▬▬ ESTIMATED LIMIT OF SOIL IMPACT

- - - - - ESTIMATED LIMIT OF GROUNDWATER IMPACT

Notes

1. LIMITS OF RAOCS ARE ESTIMATED

Revision	By	Appd.	YY.MM.DD

Issued	By	Appd.	YY.MM.DD
FOR REVIEW	MJG	JWP	11.02.08

File Name: Figure 4 Remedial Areas of Concern.dwg	Dwn.	Chkd.	Dsgn.	YY.MM.DD
	MJG	JWP		11.02.07

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JOSEPH WESLEY MADDOCK
050405

Project/ Client

ALLEGANY BITUMENS
BELMONT ASPHALT PLANT

BLADES HOLDING COMPANY, INC.

Title

REMEDIAL AREAS OF CONCERN

Project No. 190500593

Scale 1"=40'

Drawing No. Figure 4

Sheet 1 of 1

Revision 0

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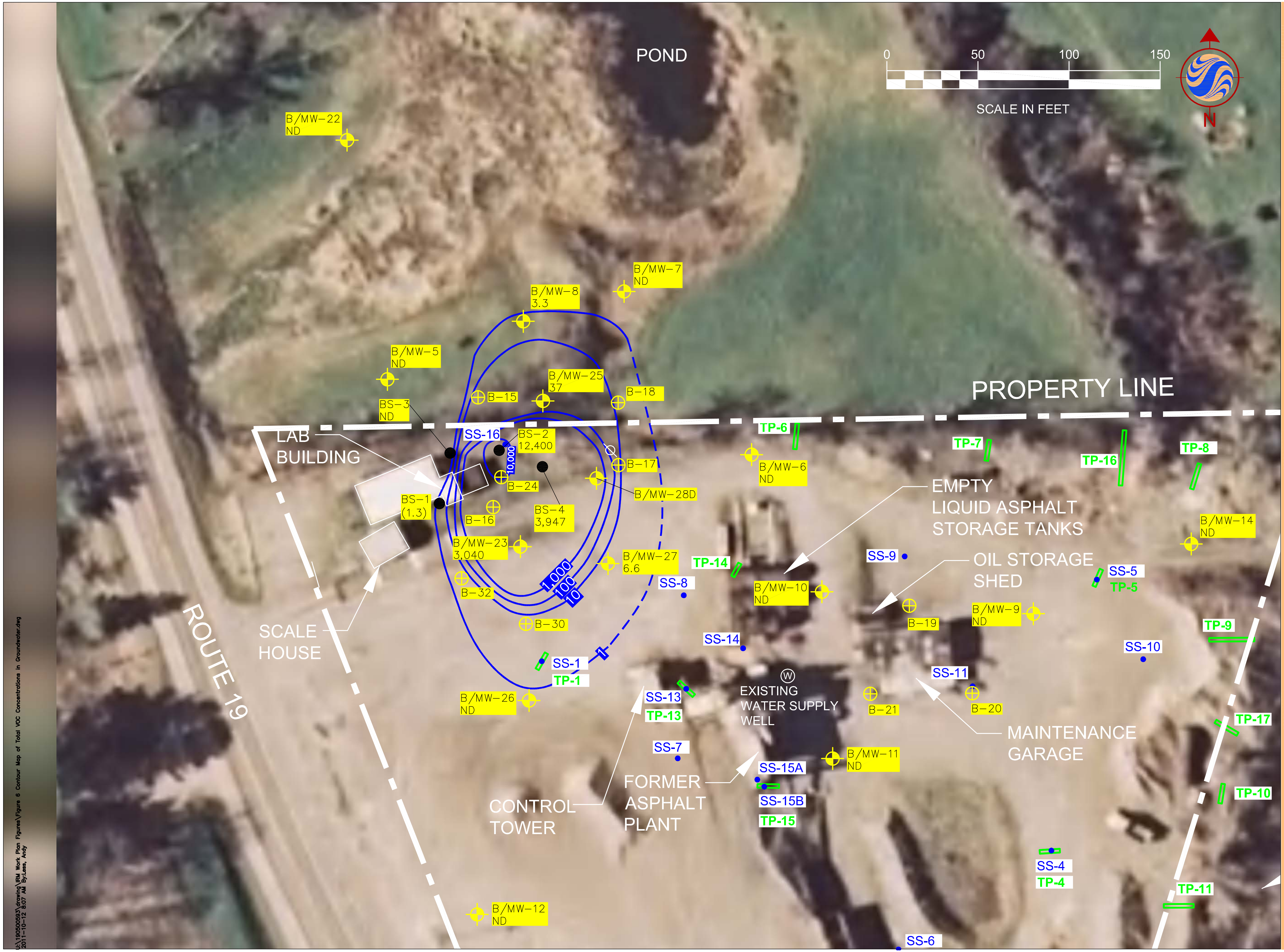

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● BS–2	PREVIOUS TEST BORING / SHALLOW WELL (2009 PHASE II ESA)
Ⓦ	EXISTING WATER SUPPLY WELL
B–17 ⊕	RI TEST BORING LOCATION
B/MW–5 ⊕	RI TEST BORING/MONITORING WELL LOCATION
6.6	JAN. – FEB. 2011 CHLORINATED VOC CONCENTRATION (ug/L) (ND INDICATES NOT DETECTED)
(1.3)	DEC. 2009 CHLORINATED VOC CONCENTRATION (ug/L)
SS-1 ●	SURFACE SOIL SAMPLE
TP-1 ▭	TEST PIT
	TOTAL CHLORINATED VOCs IN SOIL CONTOUR (ug/L) (DASHED WHERE INFERRED)

Notes

1. MAP REFERENCE : INFORMATION ON THIS MAP IS REFERENCED FROM MAP ENTITLED "PLAN OF LANDS OWNED BY: ALLEGANY BITUMENS, INC , SITUATE IN THE TOWN OF AMITY, COUNTY OF ALLEGANY, STATE OF NEW YORK, AND BEING A PORTION OF GREAT LOT # 18, TOWNSHIP #3, RANGE #2 OF THE ROBERT MORRIS RESERVE.

2. AERIAL MAPPING OBTAINED FROM THE NEW YORK STATE CLEARINGHOUSE GIS WEB SITE. PHOTO DATED 2007.

3. * WITH THE EXCEPTION OF BS–1, WHICH WAS A TEMPORARY DEC. 2009 PHASE II WELL, ALL DATA CONTOURED ARE JAN TO FEB. 2011 RI DATA.

4. CONCENTRATIONS INCLUDE CHLORINATED ETHENES & ETHANES.

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RI REPORT	SRS	MPS	11.07

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File Name: Figure 6 Contour Map of Total VOC Concentrations in Groundwater

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Project/ Client

ALLEGANY BITUMENS
BELMONT ASPHALT PLANT

BLADES HOLDING COMPANY, INC.

Title

CONTOUR MAP OF
TOTAL CHLORINATED VOC
CONCENTRATIONS IN SHALLOW
GROUNDWATER (ug / L), JAN - FEB 2011 *

Project No.
190500593

Scale
AS SHOWN

Drawing No.
FIG. 6

Sheet
of

Revision

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Legend

● BS-2	PREVIOUS TEST BORING / SHALLOW WELL (2009 PHASE II ESA)
Ⓦ	EXISTING WATER SUPPLY WELL
B-17 ⊕	RI TEST BORING LOCATION
B/MW-5 ⊕	RI TEST BORING/MONITORING WELL LOCATION
8.5	APRIL 2011 CHLORINATED VOC CONCENTRATION (ug/L) (ND INDICATES NOT DETECTED)
(1.3)	CHLORINATED VOC CONCENTRATION (ug/L) FROM SAMPLING ROUND PRIOR TO APRIL 2011 (ND INDICATES NOT DETECTED)
SS-1 ●	SURFACE SOIL SAMPLE
TP-1 ▭	TEST PIT
∼	TOTAL CHLORINATED VOCs IN SOIL CONTOUR (ug/L) (DASHED WHERE INFERRED)

Notes

1. MAP REFERENCE : INFORMATION ON THIS MAP IS REFERENCED FROM MAP ENTITLED "PLAN OF LANDS OWNED BY: ALLEGANY BITUMENS, INC , SITUATE IN THE TOWN OF AMITY, COUNTY OF ALLEGANY, STATE OF NEW YORK, AND BEING A PORTION OF GREAT LOT # 18, TOWNSHIP #3, RANGE #2 OF THE ROBERT MORRIS RESERVE.

2. AERIAL MAPPING OBTAINED FROM THE NEW YORK STATE CLEARINGHOUSE GIS WEB SITE. PHOTO DATED 2007.

3. * APRIL 2011 CONCENTRATIONS ARE PRESENTED WHERE SAMPLES WERE TAKEN. WHERE SAMPLES WERE NOT TAKEN , CONCENTRATIONS FROM PREVIOUS (DEC 2009 TO FEB 2011) SAMPLING ROUNDS ARE PRESENTED IN PARENTHESES.

4. CONCENTRATIONS INCLUDE CHLORINATED ETHENES AND ETHANES.

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File Name: Figure 7 Total Chlorinated VOC in Groundwater April 2011

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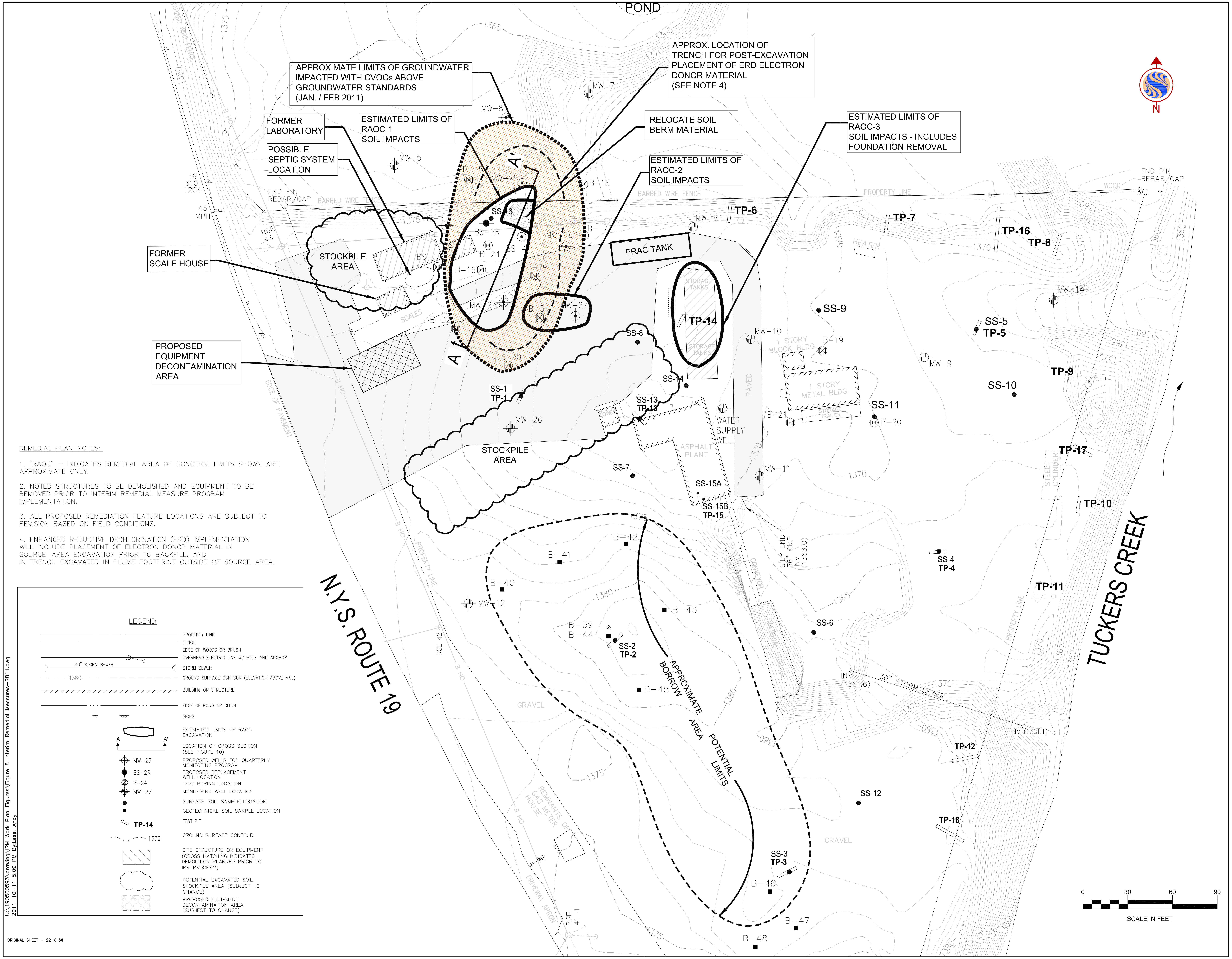
ALLEGANY BITUMENS
BELMONT ASPHALT PLANT

BLADES HOLDING COMPANY, INC.

Title
CONTOUR MAP OF
TOTAL CHLORINATED VOC
CONCENTRATIONS IN SHALLOW
GROUNDWATER (ug / L), APRIL 2011

Project No. 190500593
Scale AS SHOWN

Drawing No. FIG. 7
Sheet of
Revision



REMEDIAL PLAN NOTES:

1. "RAOC" – INDICATES REMEDIAL AREA OF CONCERN. LIMITS SHOWN ARE APPROXIMATE ONLY.

2. NOTED STRUCTURES TO BE DEMOLISHED AND EQUIPMENT TO BE REMOVED PRIOR TO INTERIM REMEDIAL MEASURE PROGRAM IMPLEMENTATION.

3. ALL PROPOSED REMEDIATION FEATURE LOCATIONS ARE SUBJECT TO REVISION BASED ON FIELD CONDITIONS.

4. ENHANCED REDUCTIVE DECHLORINATION (ERD) IMPLEMENTATION WILL INCLUDE PLACEMENT OF ELECTRON DONOR MATERIAL IN SOURCE–AREA EXCAVATION PRIOR TO BACKFILL, AND IN TRENCH EXCAVATED IN PLUME FOOTPRINT OUTSIDE OF SOURCE AREA.

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▬	ESTIMATED LIMIT OF SOIL IMPACT
╍	ESTIMATED LIMIT OF GROUNDWATER IMPACT

Notes

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BASEMAP REVIEW	MJG	JWP	11.08.08

File Name: Figure 8 Interim Remedial Measures–R811.dwg	Dwn.	Chkd.	Dsgn.	YY.MM.DD
				11.02.07

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Project/ Client

ALLEGANY BITUMENS
BELMONT ASPHALT PLANT

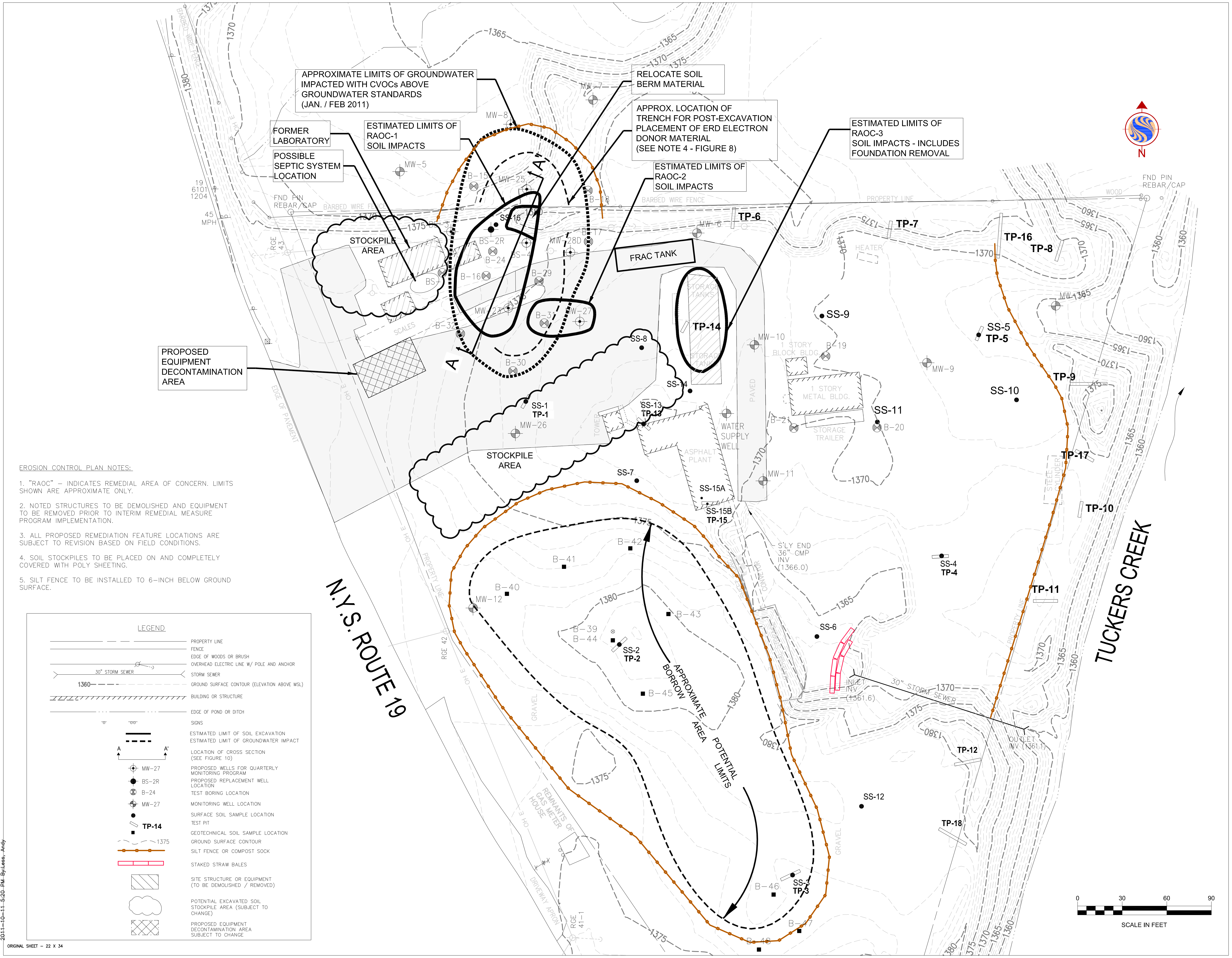
BLADES HOLDING COMPANY, INC.

Title

INTERIM REMEDIAL MEASURES -
PROPOSED REMEDIATION PLAN

Project No. 190500593
Scale 1"=30'

Drawing No. Figure 8
Sheet 1 of 1
Revision 0



EROSION CONTROL PLAN NOTES:

1. "RAOC" – INDICATES REMEDIAL AREA OF CONCERN. LIMITS SHOWN ARE APPROXIMATE ONLY.

2. NOTED STRUCTURES TO BE DEMOLISHED AND EQUIPMENT TO BE REMOVED PRIOR TO INTERIM REMEDIAL MEASURE PROGRAM IMPLEMENTATION.

3. ALL PROPOSED REMEDIATION FEATURE LOCATIONS ARE SUBJECT TO REVISION BASED ON FIELD CONDITIONS.

4. SOIL STOCKPILES TO BE PLACED ON AND COMPLETELY COVERED WITH POLY SHEETING.

5. SILT FENCE TO BE INSTALLED TO 6-INCH BELOW GROUND SURFACE.

LEGEND

	PROPERTY LINE
	FENCE
	EDGE OF WOODS OR BRUSH
	OVERHEAD ELECTRIC LINE W/ POLE AND ANCHOR
30" STORM SEWER	STORM SEWER
1360	GROUND SURFACE CONTOUR (ELEVATION ABOVE MSL)
	BUILDING OR STRUCTURE
	EDGE OF POND OR DITCH
	SIGNS
	ESTIMATED LIMIT OF SOIL EXCAVATION
	ESTIMATED LIMIT OF GROUNDWATER IMPACT
A A'	LOCATION OF CROSS SECTION (SEE FIGURE 10)
MW-27	PROPOSED WELLS FOR QUARTERLY MONITORING PROGRAM
BS-2R	PROPOSED REPLACEMENT WELL LOCATION
B-24	TEST BORING LOCATION
MW-27	MONITORING WELL LOCATION
●	SURFACE SOIL SAMPLE LOCATION
TP-14	TEST PIT
■	GEOTECHNICAL SOIL SAMPLE LOCATION
1375	GROUND SURFACE CONTOUR
	SILT FENCE OR COMPOST SOCK
	STAKED STRAW BALES
▨	SITE STRUCTURE OR EQUIPMENT (TO BE DEMOLISHED / REMOVED)
	POTENTIAL EXCAVATED SOIL STOCKPILE AREA (SUBJECT TO CHANGE)
	PROPOSED EQUIPMENT DECONTAMINATION AREA SUBJECT TO CHANGE

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File Name: Figure 9 Erosion Control Plan–R811.dwg				11.02.07
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Project/ Client

ALLEGANY BITUMENS
BELMONT ASPHALT PLANT

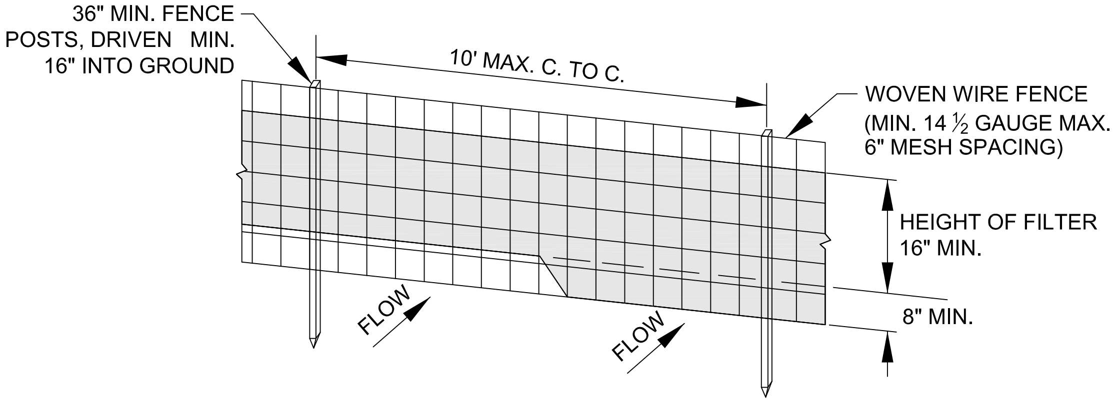
BLADES HOLDING COMPANY, INC.

Title

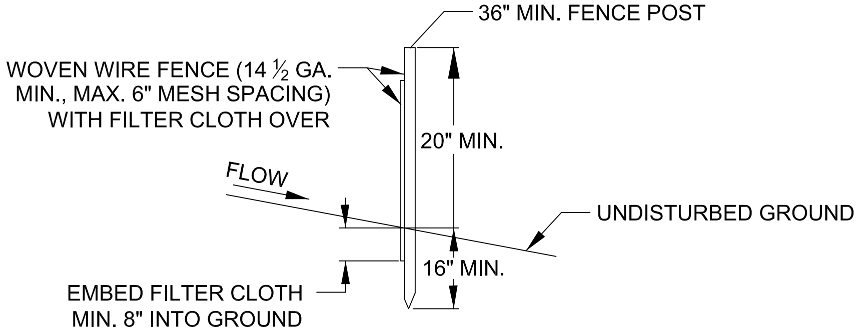
INTERIM REMEDIAL MEASURES -
PROPOSED EROSION CONTROL PLAN

Project No.	Scale
190500593	1"=30'

Drawing No.	Sheet	Revision
Figure 9	1 of 1	0



PERSPECTIVE VIEW



SECTION

CONSTRUCTION NOTES FOR FABRICATED FENCE:

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE WITH WIRE TIES OR STAPLES.
2. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVER-LAPPED BY SIX INCHES AND FOLDED.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

POSTS: STEEL EITHER T OR U TYPE 2" HARDWOOD
FENCE: WOVEN WIRE, 14 GA. 6" MAX. MESH OPENING FILTER
CLOTH: FILTER X, MIRAFI 100X, STABILINKA T140N OR APPROVED EQUAL

PREFABRICATED UNIT: GEOFAB, ENVIROFENCE, OR APPROVED EQUAL

SILT FENCE

N.T.S.

SEED, FERTILIZER AND MULCH NOTES:

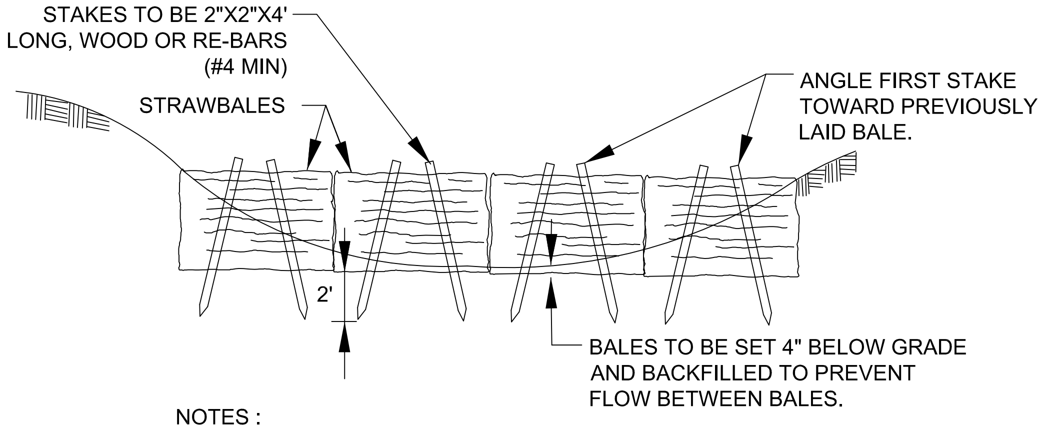
1. SEED MIXTURES APPLY TO AREAS AS DIRECTED BY OWNER'S REPRESENTATIVE.APPLY AT A RATE RECOMMENDED FOR EACH MIX, USING THE FOLLOWING :

SEED MIX A : LAWN AREAS (RATE: 6 LBS PER 1,000 SQ. FT.)
25% MANHATTAN 4 PERENNIAL RYEGRASS
25% KENTUCKY BLUEGRASS (BROOKLAWN)
25% JASPER II RED FESCUE
25% PIZZAZZ PERENNIAL RYEGRASS

2. APPLY STARTER FERTILIZER 18-24-12 WITH 50% SLOW RELEASE NITROGEN AT THE RATE OF 6 LBS PER 1,000 S.F. (LAWN FERTILIZER TO BE APPLIED AT A RATE OF 250 LB. / ACRE PER YEAR.)

3. HYDROSEEDING APPLICATION : SEED, FERTILIZER, HYDROMULCH FIBER, HYDROSEEDING AND WATER SHALL BE PLACED IN THE HYDRO-SEEDING MIXTURE TANK. RATES OF APPLICATION ARE AS FOLLOWS:

SEED	AS NOTED ABOVE
FERTILIZER	50 POUNDS OF NITROGEN PER ACRE
HYDROMULCH	2000 POUNDS PER ACRE
WATER	2500 GALLONS PER ACRE MINIMUM
INOCULANT (IF NECESSARY)	4 TIMES MANUFACTURER'S RATE



NOTES :

1. STRAWBALES TO BE REPLACED AS NECESSARY DUE TO DAMAGE OR CLOGGING WITH SILT. SILT TO BE REMOVED IN FRONT OF BALES REGULARLY TO PREVENT EXCESSIVE SOIL BEARING WEIGHT ON THE BALES.
2. STRAWBALES TO BE PLACED ON EXISTING GRADE IN WETLAND AREAS.

STAKED STRAWBALE

N.T.S.

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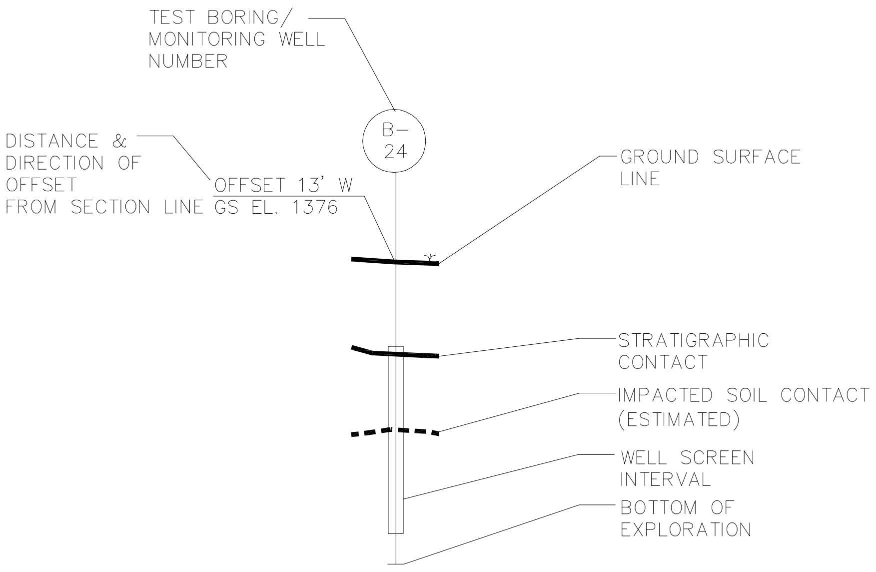
Project/ Client
ALLEGANY BITUMENS
BELMONT ASPHALT PLANT

BLADES HOLDING COMPANY, INC.

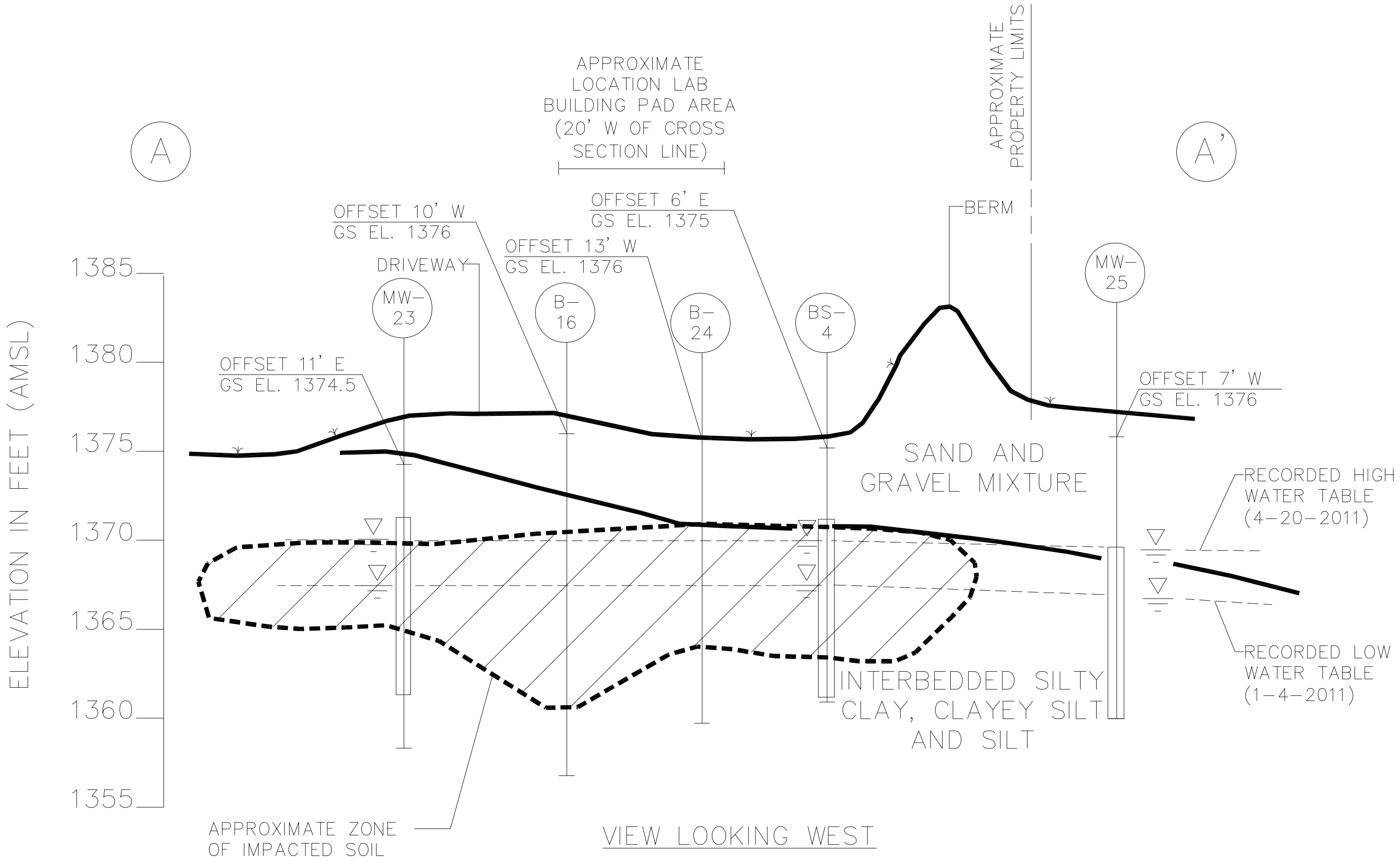
Title
INTERIM REMEDIAL MEASURES -
PROPOSED EROSION CONTROL DETAILS

Project No.	Scale	
190500593	NONE	
Drawing No.	Sheet	Revision
Figure 10	of	0

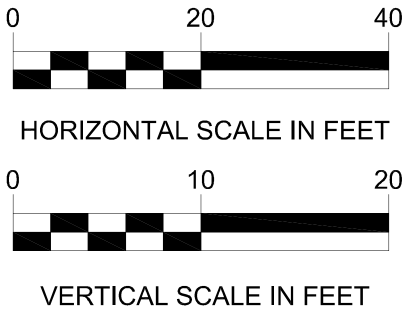


LEGEND

NOTE:
SEE FIGURE 8 FOR THE LOCATION OF CROSS SECTION A-A'



VIEW LOOKING WEST



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File Name: Figure 11 Cross Section-R811.dwg	MJG	JWP		11.02.07
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Project/ Client
ALLEGANY BITUMENS
BELMONT ASPHALT PLANT

BLADES HOLDING COMPANY, INC.

Title
CROSS SECTION A--A'

Project No.
190500593

Scale
1"=40'

Drawing No.
Figure 11

Sheet
1 of 1

Revision
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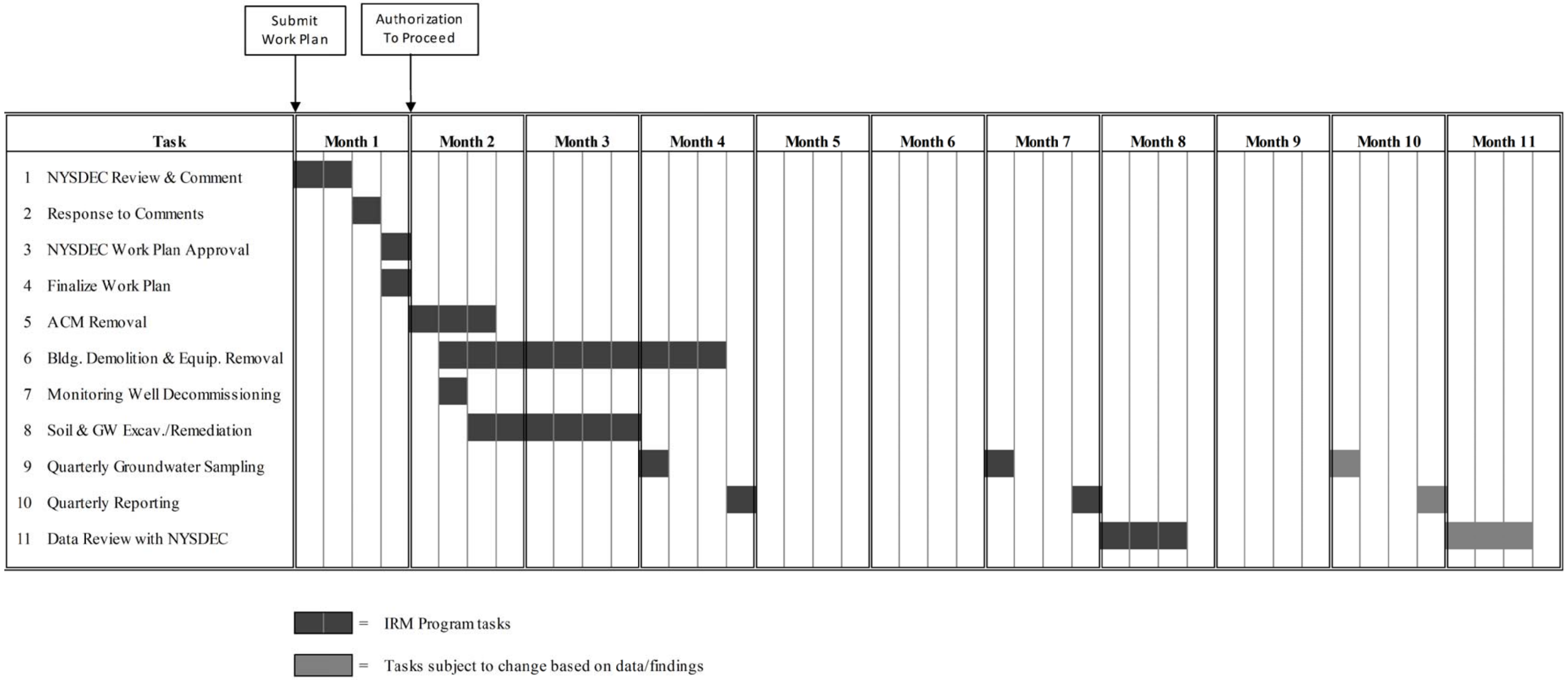

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File Name: Figure 12 Project schedule.dwg	MJG	JWP		11.02.07
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Project/ Client

FORMER ALLEGANY BITUMENS
BELMONT ASPHALT PLANT

BLADES HOLDING COMPANY, INC.

Title

IRM - PROJECT SCHEDULE

Project No.
190500593

Scale

Drawing No.
Figure 12

Sheet
1 of 1

Revision
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IRM Work Plan

Tables

Table 1
Summary of Analytical Results in Groundwater
Phase II (2009) and Remediation Investigation (2010-2011)
Former Allegany Bitumens Belmont Asphalt Plant
Amity, New York

Sample Location			**BS-1**	**BS-2**			**BS-3**			**BS-4**			**B/MW-5**		**B/MW-6**		**B/MW-7**		**B/MW-8**		**B/MW-9**	
Sample Date			**10-Dec-09**	**10-Dec-09**	**5-Jan-11**	**21-Apr-11**	**11-Dec-09**	**5-Jan-11**	**21-Apr-11**	**11-Dec-09**	**4-Jan-11**	**21-Apr-11**	**5-Jan-11**	**20-Apr-11**	**6-Jan-11**	**21-Apr-11**	**5-Jan-11**	**20-Apr-11**	**7-Jan-11**	**20-Apr-11**	**5-Jan-11**	**5-Jan-11**
Sample ID			**BS-GW-1**	**BS-GW-2**	**BA-BS2-W**	**BA-BS2-R2-W**	**BS-GW-3**	**BA-BS3-W**	**BA-BS3-R2-W**	**BS-GW-4**	**BA-BS4-W**	**BA-BS4-R2-W**	**BA-MW5-W**	**BA-MW5-R2-W**	**BA-MW6-W**	**BA-MW6-R2-W**	**BA-MW7-W**	**BA-MW7-R2-W**	**BA-MW8-W**	**BA-MW8-R2-W**	**BA-MW9-W**	**BA-MW9-W/D**
Sampling Company			**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**
Laboratory			**SPECTRUM**	**SPECTRUM**	**TALAM**	**TALAM**	**SPECTRUM**	**TALAM**	**TALAM**	**SPECTRUM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**
Laboratory Work Order			**SB05469**	**SB05469**	**480-548-1**	**480-4050-1**	**SB05538**	**480-548-1**	**480-4050-1**	**SB05538**	**480-548-1**	**480-4050-1**	**480-548-1**	**480-4050-1**	**480-548-1**	**480-4050-1**	**480-548-1**	**480-4050-1**	**480-548-1**	**480-4050-1**	**480-548-1**	**480-548-1**
Laboratory Sample ID			**SB05469-03**	**SB05469-04**	**480-633-6**	**480-4050-7**	**SB05538-02**	**480-633-5**	**480-4050-8**	**SB05538-04**	**480-548-3**	**480-4050-9**	**480-633-4**	**480-4050-4**	**480-689-5**	**480-4050-10**	**480-633-2**	**480-4050-5**	**480-689-7**	**480-4050-2**	**480-548-5**	**480-548-6**
Sample Type	**Units**	**TOGS**																				**Field Duplicate**
Volatile Organic Compounds																						
Acetone	µg/L	50^{A}	4.6 U	45.8 U	10 U	10 U	4.6 U	10 U	10 U	22.9 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acrylonitrile	µg/L	5_{**}^{B}	0.5 U	4.8 U	5.0 U	-	0.5 U	5.0 U	-	2.4 U	5.0 U	-	5.0 U	-	5.0 U	-	5.0 U	-	5.0 U	-	5.0 U	5.0 U
Benzene	µg/L	1^{B}	0.5 U	***4.9 U***	1.0 U	1.0 U	0.5 U	1.0 U	1.0 U	***2.4 U***	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromobenzene	µg/L	5_{**}^{B}	0.5 U	4.7 U	-	-	0.5 U	-	-	2.4 U	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	µg/L	50^{A}	0.5 U	4.9 U	1.0 U	1.0 U	0.5 U	1.0 U	1.0 U	2.4 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform (tribromomethane)	µg/L	50^{A}	1.0 U	9.7 U	1.0 U	1.0 U J	1.0 U	1.0 U	1.0 U J	4.8 U	1.0 U	1.0 U J	1.0 U	1.0 U	1.0 U	1.0 U J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	µg/L	5_{**}^{B}	1.2 U	***12.5 U***	1.0 U	1.0 U	1.2 U	1.0 U	1.0 U	***6.2 U***	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Butylbenzene, n-	µg/L	5_{**}^{B}	0.8 U	***8.3 U***	-	-	0.8 U	-	-	4.2 U	-	-	-	-	-	-	-	-	-	-	-	-
Butylbenzene, tert-	µg/L	5_{**}^{B}	0.5 U	***5.1 U***	-	-	0.5 U	-	-	2.6 U	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Disulfide	µg/L	60^{A}	0.9 U	8.9 U	1.0 U	1.0 U	0.9 U	1.0 U	1.0 U	4.4 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Tetrachloride (Tetrachloromethane)	µg/L	5^{B}	0.8 U	***8.5 U***	1.0 U	1.0 U	0.8 U	1.0 U	1.0 U	4.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorinated Fluorocarbon (Freon 113)	µg/L	5_{**}^{B}	1.0 U	***9.9 U***	-	1.0 U	1.0 U	-	1.0 U	5.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	-
Chlorobenzene (Monochlorobenzene)	µg/L	5_{**}^{B}	0.5 U	5.0 U	1.0 U	1.0 U	0.5 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobromomethane	µg/L	5_{**}^{B}	1.0 U	***9.5 U***	1.0 U	-	1.0 U	1.0 U	-	4.8 U	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	1.0 U
Chloroethane (Ethyl Chloride)	µg/L	5_{**}^{B}	1.1 U	***11.0 U***	1.0 U	1.0 U	1.1 U	1.0 U	1.0 U	***5.5 U***	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	µg/L	7^{B}	0.8 U	***8.1 U***	1.0 U	1.0 U	0.8 U	1.0 U	1.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane	µg/L	5_{**}^{B}	0.9 U	***8.8 U***	1.0 U	1.0 U	0.9 U	1.0 U	1.0 U	4.4 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorotoluene, 2-	µg/L	5_{**}^{B}	0.7 U	***6.7 U***	-	-	0.7 U	-	-	3.4 U	-	-	-	-	-	-	-	-	-	-	-	-
Chlorotoluene, 4-	µg/L	5_{**}^{B}	0.5 U	***5.3 U***	-	-	0.5 U	-	-	2.6 U	-	-	-	-	-	-	-	-	-	-	-	-
Cyclohexane	µg/L	n/v	-	-	-	1.0 U	-	-	1.0 U	-	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	-
Cymene (p-Isopropyltoluene)	µg/L	5_{**}^{B}	0.5 U	***5.1 U***	-	-	0.5 U	-	-	2.6 U	-	-	-	-	-	-	-	-	-	-	-	-
Dibromo-3-Chloropropane (DBCP), 1,2-	µg/L	0.04^{B}	***1.7 U***	***16.6 U***	***1.0 U***	***1.0 U***	***1.7 U***	***1.0 U***	***1.0 U***	***8.3 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***
Dibromochloromethane	µg/L	50^{A}	0.4 U	4.4 U	1.0 U	1.0 U J	0.4 U	1.0 U	1.0 U J	2.2 U	1.0 U	1.0 U J	1.0 U	1.0 U	1.0 U	1.0 U J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromomethane (Methylene Bromide)	µg/L	5_{**}^{B}	0.7 U	***6.7 U***	1.0 U	-	0.7 U	1.0 U	-	3.4 U	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	1.0 U
Dichlorobenzene, 1,2-	µg/L	3^{B}	0.4 U	***4.5 U***	1.0 U	1.0 U	0.4 U	1.0 U	1.0 U	2.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorobenzene, 1,3-	µg/L	3^{B}	0.5 U	***5.4 U***	-	1.0 U	0.5 U	-	1.0 U	2.7 U	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	-
Dichlorobenzene, 1,4-	µg/L	3^{B}	0.5 U	***5.2 U***	1.0 U	1.0 U	0.5 U	1.0 U	1.0 U	2.6 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorobutene, trans-1,4-	µg/L	n/v	2.8 U	27.7 U	5.0 U	-	2.8 U	5.0 U	-	13.8 U	5.0 U	-	5.0 U	-	5.0 U	-	5.0 U	-	5.0 U	-	5.0 U	5.0 U
Dichlorodifluoromethane	µg/L	5_{**}^{B}	0.9 U	***8.8 U***	-	1.0 U	0.9 U	-	1.0 U	4.4 U	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	-
Dichloroethane, 1,1-	µg/L	5_{**}^{B}	0.6 U	**8.4 J^{B}**	**200^{B}**	1.0 U	0.6 U	1.0 U	1.0 U	**110^{B}**	**190^{B}**	**1.2**	1.0 U	1.0 U	1.0 U	**1.0**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichloroethane, 1,2-	µg/L	0.6^{B}	0.6 U	***6.3 U***	***1.0 U***	***1.0 U***	0.6 U	***1.0 U***	***1.0 U***	***3.2 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***
Dichloroethylene, 1,1-	µg/L	5_{**}^{B}	0.7 U	***7.2 U***	**28^{B}**	1.0 U	0.7 U	1.0 U	1.0 U	**25.6^{B}**	**120^{B}**	**2.5**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichloroethylene, cis-1,2-	µg/L	5_{**}^{B}	0.6 U	**6.6 J^{B}**	**160^{B}**	**1.4**	0.6 U	1.0 U	1.0 U	**8.0^{B}**	**12^{B}**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichloroethylene, trans-1,2-	µg/L	5_{**}^{B}	0.9 U	***9.1 U***	**1.7**	1.0 U	0.9 U	1.0 U	1.0 U	4.6 U	**1.4**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichloropropane, 1,2-	µg/L	1^{B}	0.5 U	***5.3 U***	1.0 U	1.0 U	0.5 U	1.0 U	1.0 U	***2.6 U***	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichloropropane, 1,3-	µg/L	5_{**}^{B}	0.7 U	***6.6 U***	-	-	0.7 U	-	-	3.3 U	-	-	-	-	-	-	-	-	-	-	-	-
Dichloropropane, 2,2-	µg/L	5_{**}^{B}	0.6 U	***6.2 U***	-	-	0.6 U	-	-	3.1 U	-	-	-	-	-	-	-	-	-	-	-	-
Dichloropropene, 1,1-	µg/L	5_{**}^{B}	0.8 U	***7.8 U***	-	-	0.8 U	-	-	3.9 U	-	-	-	-	-	-	-	-	-	-	-	-
Dichloropropene, cis-1,3-	µg/L	0.4_{p}^{B}	0.4 U	***4.0 U***	***1.0 U***	***1.0 U***	0.4 U	***1.0 U***	***1.0 U***	***2.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***
Dichloropropene, trans-1,3-	µg/L	0.4_{p}^{B}	0.4 U	***3.9 U***	***1.0 U***	***1.0 U***	0.4 U	***1.0 U***	***1.0 U***	***2.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***
Diisopropyl Ether	µg/L	n/v	0.6 U	5.5 U	-	-	0.6 U	-	-	2.8 U	-	-	-	-	-	-	-	-	-	-	-	-
Dioxane, 1,4-	µg/L	n/v	20.0 U	200 U	-	-	20.0 U	-	-	100 U	-	-	-	-	-	-	-	-	-	-	-	-
Ethanol	µg/L	n/v	37.7 U	377 U	-	-	37.7 U	-	-	189 U	-	-	-	-	-	-	-	-	-	-	-	-
Ethyl Ether	µg/L	n/v	0.6 U	6.4 U	-	-	0.6 U	-	-	3.2 U	-	-	-	-	-	-	-	-	-	-	-	-
Ethyl Tert Butyl Ether	µg/L	n/v	0.5 U	5.4 U	-	-	0.5 U	-	-	2.7 U	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/L	5_{**}^{B}	0.5 U	5.0 U	1.0 U	1.0 U	0.5 U	1.0 U	1.0 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

See last page for notes.

Table 1
Summary of Analytical Results in Groundwater
Phase II (2009) and Remediation Investigation (2010-2011)
Former Allegany Bitumens Belmont Asphalt Plant
Amity, New York

Sample Location			**BS-1**	**BS-2**			**BS-3**			**BS-4**			**B/MW-5**		**B/MW-6**		**B/MW-7**		**B/MW-8**		**B/MW-9**	
Sample Date			**10-Dec-09**	**10-Dec-09**	**5-Jan-11**	**21-Apr-11**	**11-Dec-09**	**5-Jan-11**	**21-Apr-11**	**11-Dec-09**	**4-Jan-11**	**21-Apr-11**	**5-Jan-11**	**20-Apr-11**	**6-Jan-11**	**21-Apr-11**	**5-Jan-11**	**20-Apr-11**	**7-Jan-11**	**20-Apr-11**	**5-Jan-11**	**5-Jan-11**
Sample ID			**BS-GW-1**	**BS-GW-2**	**BA-BS2-W**	**BA-BS2-R2-W**	**BS-GW-3**	**BA-BS3-W**	**BA-BS3-R2-W**	**BS-GW-4**	**BA-BS4-W**	**BA-BS4-R2-W**	**BA-MW5-W**	**BA-MW5-R2-W**	**BA-MW6-W**	**BA-MW6-R2-W**	**BA-MW7-W**	**BA-MW7-R2-W**	**BA-MW8-W**	**BA-MW8-R2-W**	**BA-MW9-W**	**BA-MW9-W/D**
Sampling Company			**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**
Laboratory			**SPECTRUM**	**SPECTRUM**	**TALAM**	**TALAM**	**SPECTRUM**	**TALAM**	**TALAM**	**SPECTRUM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**
Laboratory Work Order			**SB05469**	**SB05469**	**480-548-1**	**480-4050-1**	**SB05538**	**480-548-1**	**480-4050-1**	**SB05538**	**480-548-1**	**480-4050-1**	**480-548-1**	**480-4050-1**	**480-548-1**	**480-4050-1**	**480-548-1**	**480-4050-1**	**480-548-1**	**480-4050-1**	**480-548-1**	**480-548-1**
Laboratory Sample ID			**SB05469-03**	**SB05469-04**	**480-633-6**	**480-4050-7**	**SB05538-02**	**480-633-5**	**480-4050-8**	**SB05538-04**	**480-548-3**	**480-4050-9**	**480-633-4**	**480-4050-4**	**480-689-5**	**480-4050-10**	**480-633-2**	**480-4050-5**	**480-689-7**	**480-4050-2**	**480-548-5**	**480-548-6**
Sample Type	**Units**	**TOGS**																				**Field Duplicate**
Volatile Organic Compounds (cont'd)																						
Ethylene Dibromide (Dibromoethane, 1,2-)	µg/L	0.0006^{B}	***0.5 U***	***4.9 U***	***1.0 U***	***1.0 U***	***0.5 U***	***1.0 U***	***1.0 U***	***2.4 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***
Hexachlorobutadiene	µg/L	0.5^{B}	0.5 U	***4.9 U***	-	-	0.5 U	-	-	***2.4 U***	-	-	-	-	-	-	-	-	-	-	-	-
Hexanone, 2-	µg/L	50^{A}	2.7 U	26.8 U	5.0 U	5.0 U	2.7 U	5.0 U	5.0 U	13.4 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Iodomethane	µg/L	5_{**}^{B}	-	-	1.0 U	-	-	1.0 U	-	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	1.0 U
Isopropylbenzene	µg/L	5_{**}^{B}	0.5 U	***5.2 U***	-	1.0 U	0.5 U	-	1.0 U	2.6 U	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	-
Methyl Acetate	µg/L	n/v	-	-	-	1.0 U	-	-	1.0 U	-	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	-
Methyl Ethyl Ketone (MEK)	µg/L	50^{A}	4.1 U	40.8 U	10 U	10 U	4.1 U	10 U	10 U	20.4 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl Isobutyl Ketone (MIBK)	µg/L	n/v	1.1 U	10.9 U	5.0 U	5.0 U	1.1 U	5.0 U	5.0 U	5.4 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methyl tert-butyl ether (MTBE)	µg/L	10^{A}	0.8 U	8.5 U	-	1.0 U	0.8 U	-	1.0 U	4.2 U	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	-
Methylcyclohexane	µg/L	n/v	-	-	-	1.0 U	-	-	1.0 U	-	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	-
Methylene Chloride (Dichloromethane)	µg/L	5_{**}^{B}	0.6 U	***6.4 U***	1.0 U	1.0 U	0.6 U	1.0 U	1.0 U	3.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Naphthalene	µg/L	10^{B}	1.0 U	9.6 U	-	-	1.0 U	-	-	4.8 U	-	-	-	-	-	-	-	-	-	-	-	-
Phenylbutane, 2- (sec-Butylbenzene)	µg/L	5_{**}^{B}	0.5 U	***5.4 U***	-	-	0.5 U	-	-	2.7 U	-	-	-	-	-	-	-	-	-	-	-	-
Propylbenzene, n-	µg/L	5_{**}^{B}	0.5 U	***5.3 U***	-	-	0.5 U	-	-	2.6 U	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	µg/L	5_{**}^{B}	0.9 U	***9.2 U***	1.0 U	1.0 U	0.9 U	1.0 U	1.0 U	4.6 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tert Amyl Methyl Ether	µg/L	n/v	0.6 U	6.4 U	-	-	0.6 U	-	-	3.2 U	-	-	-	-	-	-	-	-	-	-	-	-
Tert-Butyl Alcohol	µg/L	n/v	9.6 U	96.4 U	-	-	9.6 U	-	-	48.2 U	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethane, 1,1,1,2-	µg/L	5_{**}^{B}	0.5 U	***5.4 U***	1.0 U	-	0.5 U	1.0 U	-	2.7 U	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	1.0 U
Tetrachloroethane, 1,1,2,2-	µg/L	5_{**}^{B}	0.5 U	4.6 U	1.0 U	1.0 U	0.5 U	1.0 U	1.0 U	2.3 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethylene (PCE)	µg/L	5_{**}^{B}	0.7 U	***7.2 U***	**5.6^{B}**	**1.6**	0.7 U	1.0 U	1.0 U	3.6 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrahydrofuran	µg/L	50^{A}	2.4 U	24.2 U	-	-	2.4 U	-	-	12.1 U	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	µg/L	5_{**}^{B}	0.8 U	***7.6 U***	**1.2**	1.0 U	**1.6**	1.0 U	1.0 U	3.8 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorobenzene, 1,2,3-	µg/L	5_{**}^{B}	0.6 U	***5.7 U***	-	-	0.6 U	-	-	2.8 U	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorobenzene, 1,2,4-	µg/L	5_{**}^{B}	0.6 U	***5.9 U***	-	1.0 U	0.6 U	-	1.0 U	3.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	1.0 U	-	-
Trichlorobenzene, 1,3,5-	µg/L	5_{**}^{B}	0.5 U	***5.4 U***	-	-	0.5 U	-	-	2.7 U	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethane, 1,1,1-	µg/L	5_{**}^{B}	0.6 U	**80.3^{B}**	**4.6**	**4.7**	**1.5**	1.0 U	1.0 U	**12.8^{B}**	**22^{B}**	**9.7^{B}**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**1.9**	1.0 U	1.0 U
Trichloroethane, 1,1,2-	µg/L	1^{B}	0.7 U	***7.3 U***	1.0 U	1.0 U	0.7 U	1.0 U	1.0 U	***3.6 U***	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethylene (TCE)	µg/L	5_{**}^{B}	**1.3**	**611^{B}**	**12000^{B}**	**46^{B}**	**8.2^{B}**	1.0 U	1.0 U	**2080^{B}**	**3600^{B}**	**91^{B}**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**3.3**	**6.6 J^{B}**	1.0 U	1.0 U
Trichlorofluoromethane (Freon 11)	µg/L	5_{**}^{B}	0.7 U	***6.9 U***	1.0 U	1.0 U	0.7 U	1.0 U	1.0 U	3.4 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloropropane, 1,2,3-	µg/L	0.04^{B}	***0.9 U***	***9.3 U***	***1.0 U***	-	***0.9 U***	***1.0 U***	-	***4.6 U***	***1.0 U***	-	***1.0 U***	-	***1.0 U***	-	***1.0 U***	-	***1.0 U***	-	***1.0 U***	***1.0 U***
Trimethylbenzene, 1,2,4-	µg/L	5_{**}^{B}	0.4 U	4.5 U	-	-	0.4 U	-	-	2.2 U	-	-	-	-	-	-	-	-	-	-	-	-
Trimethylbenzene, 1,3,5-	µg/L	5_{**}^{B}	0.5 U	5.0 U	-	-	0.5 U	-	-	2.5 U	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Acetate	µg/L	n/v	-	-	5.0 U	-	-	5.0 U	-	-	5.0 U	-	5.0 U	-	5.0 U	-	5.0 U	-	5.0 U	-	5.0 U	5.0 U
Vinyl chloride	µg/L	2^{B}	0.9 U	***8.6 U***	1.0 U	1.0 U	0.9 U	1.0 U	1.0 U	***4.3 U***	**1.6**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylene, m & p-	µg/L	5_{**}^{B}	1.0 U	***9.8 U***	-	-	1.0 U	-	-	4.9 U	-	-	-	-	-	-	-	-	-	-	-	-
Xylene, o-	µg/L	5_{**}^{B}	0.5 U	4.9 U	-	-	0.5 U	-	-	2.4 U	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, Total	µg/L	5_{**}^{B}	-	-	2.0 U	2.0 U	-	2.0 U	2.0 U	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Total VOC	µg/L	n/v	**1.3**	**706.3**	**12401.1**	**53.7**	**11.3**	**ND**	**ND**	**2236.4**	**3947**	**104.4**	**ND**	**ND**	**ND**	**1**	**ND**	**ND**	**3.3**	**8.5**	**ND**	**ND**

See last page for notes.

Table 1
Summary of Analytical Results in Groundwater
Phase II (2009) and Remediation Investigation (2010-2011)
Former Allegany Bitumens Belmont Asphalt Plant
Amity, New York

Sample Location			**B/MW-10**	**B/MW-11**	**B/MW-12**	**B/MW-13**	**B/MW-14**	**B/MW-22**		**B/MW-23**			**B/MW-25**		**B/MW-26**	**B/MW-27**		**B/MW-28D**	**WSW**	**TP-RB**
Sample Date			**6-Jan-11**	**6-Jan-11**	**6-Jan-11**	**6-Jan-11**	**6-Jan-11**	**5-Jan-11**	**20-Apr-11**	**7-Jan-11**	**21-Apr-11**	**21-Apr-11**	**4-Jan-11**	**20-Apr-11**	**22-Feb-11**	**22-Feb-11**	**22-Feb-11**	**22-Feb-11**	**7-Dec-10**	**26-Oct-10**
Sample ID			**BA-MW10-W**	**BA-MW11-W**	**BA-MW12-W**	**BA-MW13-W***	**BA-MW14-W**	**BA-MW22-W**	**BA-MW22-R2-W**	**BA-MW23-W**	**BA-MW23-R2-W**	**BA-MW23-R2-W/D**	**BA-MW25-W**	**BA-MW25-R2-W**	**BA-MW26-W**	**BA-MW27-W**	**BA-MW27-W/D**	**BA-MW28D-W**	**BA-WSW-W**	**BA-TP-RB-W**
Sampling Company			**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**
Laboratory			**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**
Laboratory Work Order			**480-548-1**	**480-548-1**	**480-548-1**	**480-548-1**	**480-548-1**	**480-548-1**	**480-4050-1**	**480-548-1**	**480-4050-1**	**480-4050-1**	**480-548-1**	**480-4050-1**	**480-1891-1**	**480-1891-1**	**480-1891-1**	**480-1891-1**	**RTL0627**	**RTJ1956**
Laboratory Sample ID			**480-689-1**	**480-633-7**	**480-689-3**	**480-689-4**	**480-689-2**	**480-633-3**	**480-4050-3**	**480-689-6**	**480-4050-11**	**480-4050-12**	**480-548-2**	**480-4050-6**	**480-1891-1**	**480-1891-2**	**480-1891-4**	**480-1891-3**	**RTL0627-01**	**RTJ1956-13**
Sample Type	**Units**	**TOGS**										**Field Duplicate**					**Field Duplicate**			**Material Rinse Blank**
Volatile Organic Compounds																				
Acetone	µg/L	50^{A}	10 U	10 U	10 U	**46 J**	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acrylonitrile	µg/L	5_{**}^{B}	5.0 U	5.0 U	5.0 U	***25 U***	5.0 U	5.0 U	-	5.0 U	-	-	5.0 U	-	5.0 U	5.0 U	5.0 U	5.0 U	-	-
Benzene	µg/L	1^{B}	1.0 U	1.0 U	1.0 U	***5.0 U***	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromobenzene	µg/L	5_{**}^{B}	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	µg/L	50^{A}	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform (tribromomethane)	µg/L	50^{A}	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U J
Bromomethane (Methyl bromide)	µg/L	5_{**}^{B}	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Butylbenzene, n-	µg/L	5_{**}^{B}	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butylbenzene, tert-	µg/L	5_{**}^{B}	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Disulfide	µg/L	60^{A}	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**1.0**	1.0 U	1.0 U
Carbon Tetrachloride (Tetrachloromethane)	µg/L	5^{B}	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorinated Fluorocarbon (Freon 113)	µg/L	5_{**}^{B}	-	-	-	-	-	-	1.0 U	-	1.0 U	1.0 U	-	1.0 U	-	-	-	-	1.0 U J	1.0 U
Chlorobenzene (Monochlorobenzene)	µg/L	5_{**}^{B}	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobromomethane	µg/L	5_{**}^{B}	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	-	1.0 U	-	-	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	-	-
Chloroethane (Ethyl Chloride)	µg/L	5_{**}^{B}	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	µg/L	7^{B}	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane	µg/L	5_{**}^{B}	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorotoluene, 2-	µg/L	5_{**}^{B}	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorotoluene, 4-	µg/L	5_{**}^{B}	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyclohexane	µg/L	n/v	-	-	-	-	-	-	1.0 U	-	1.0 U	1.0 U	-	1.0 U	-	-	-	-	1.0 U	1.0 U
Cymene (p-Isopropyltoluene)	µg/L	5_{**}^{B}	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromo-3-Chloropropane (DBCP), 1,2-	µg/L	0.04^{B}	***1.0 U***	***1.0 U***	***1.0 U***	***5.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***
Dibromochloromethane	µg/L	50^{A}	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U J	1.0 U J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromomethane (Methylene Bromide)	µg/L	5_{**}^{B}	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	-	1.0 U	-	-	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	-	-
Dichlorobenzene, 1,2-	µg/L	3^{B}	1.0 U	1.0 U	1.0 U	***5.0 U***	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorobenzene, 1,3-	µg/L	3^{B}	-	-	-	-	-	-	1.0 U	-	1.0 U	1.0 U	-	1.0 U	-	-	-	-	1.0 U	1.0 U
Dichlorobenzene, 1,4-	µg/L	3^{B}	1.0 U	1.0 U	1.0 U	***5.0 U***	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorobutene, trans-1,4-	µg/L	n/v	5.0 U	5.0 U	5.0 U	25 U	5.0 U	5.0 U	-	5.0 U	-	-	5.0 U	-	50 U	50 U	50 U	50 U	-	-
Dichlorodifluoromethane	µg/L	5_{**}^{B}	-	-	-	-	-	-	1.0 U	-	1.0 U	1.0 U	-	1.0 U	-	-	-	-	1.0 U	1.0 U
Dichloroethane, 1,1-	µg/L	5_{**}^{B}	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	**71**^{B}	1.0 U	1.0 U	**4.6**	1.0 U	1.0 U	**2.4**	**2.4**	1.0 U	1.0 U	1.0 U
Dichloroethane, 1,2-	µg/L	0.6^{B}	***1.0 U***	***1.0 U***	***1.0 U***	***5.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***
Dichloroethylene, 1,1-	µg/L	5_{**}^{B}	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	**71**^{B}	1.0 U	1.0 U	**1.3**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichloroethylene, cis-1,2-	µg/L	5_{**}^{B}	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	**6.0**^{B}	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**1.4**	**1.2**	1.0 U	1.0 U	1.0 U
Dichloroethylene, trans-1,2-	µg/L	5_{**}^{B}	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichloropropane, 1,2-	µg/L	1^{B}	1.0 U	1.0 U	1.0 U	***5.0 U***	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichloropropane, 1,3-	µg/L	5_{**}^{B}	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloropropane, 2,2-	µg/L	5_{**}^{B}	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloropropene, 1,1-	µg/L	5_{**}^{B}	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloropropene, cis-1,3-	µg/L	0.4_{p}^{B}	***1.0 U***	***1.0 U***	***1.0 U***	***5.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***
Dichloropropene, trans-1,3-	µg/L	0.4_{p}^{B}	***1.0 U***	***1.0 U***	***1.0 U***	***5.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***
Diisopropyl Ether	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dioxane, 1,4-	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethanol	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyl Ether	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyl Tert Butyl Ether	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/L	5_{**}^{B}	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

See last page for notes.

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Summary of Analytical Results in Groundwater
Phase II (2009) and Remediation Investigation (2010-2011)
Former Allegany Bitumens Belmont Asphalt Plant
Amity, New York

Sample Location			**B/MW-10**	**B/MW-11**	**B/MW-12**	**B/MW-13**	**B/MW-14**	**B/MW-22**		**B/MW-23**			**B/MW-25**		**B/MW-26**	**B/MW-27**		**B/MW-28D**	**WSW**	**TP-RB**
Sample Date			**6-Jan-11**	**6-Jan-11**	**6-Jan-11**	**6-Jan-11**	**6-Jan-11**	**5-Jan-11**	**20-Apr-11**	**7-Jan-11**	**21-Apr-11**	**21-Apr-11**	**4-Jan-11**	**20-Apr-11**	**22-Feb-11**	**22-Feb-11**	**22-Feb-11**	**22-Feb-11**	**7-Dec-10**	**26-Oct-10**
Sample ID			**BA-MW10-W**	**BA-MW11-W**	**BA-MW12-W**	**BA-MW13-W***	**BA-MW14-W**	**BA-MW22-W**	**BA-MW22-R2-W**	**BA-MW23-W**	**BA-MW23-R2-W**	**BA-MW23-R2-W/D**	**BA-MW25-W**	**BA-MW25-R2-W**	**BA-MW26-W**	**BA-MW27-W**	**BA-MW27-W/D**	**BA-MW28D-W**	**BA-WSW-W**	**BA-TP-RB-W**
Sampling Company			**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**
Laboratory			**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**
Laboratory Work Order			**480-548-1**	**480-548-1**	**480-548-1**	**480-548-1**	**480-548-1**	**480-548-1**	**480-4050-1**	**480-548-1**	**480-4050-1**	**480-4050-1**	**480-548-1**	**480-4050-1**	**480-1891-1**	**480-1891-1**	**480-1891-1**	**480-1891-1**	**RTL0627**	**RTJ1956**
Laboratory Sample ID			**480-689-1**	**480-633-7**	**480-689-3**	**480-689-4**	**480-689-2**	**480-633-3**	**480-4050-3**	**480-689-6**	**480-4050-11**	**480-4050-12**	**480-548-2**	**480-4050-6**	**480-1891-1**	**480-1891-2**	**480-1891-4**	**480-1891-3**	**RTL0627-01**	**RTJ1956-13**
Sample Type	**Units**	**TOGS**										**Field Duplicate**					**Field Duplicate**			**Material Rinse Blank**
Volatile Organic Compounds (cont'd)																				
Ethylene Dibromide (Dibromoethane, 1,2-)	µg/L	0.0006[B]	***1.0 U***	***1.0 U***	***1.0 U***	***5.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***
Hexachlorobutadiene	µg/L	0.5[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexanone, 2-	µg/L	50[A]	5.0 U	5.0 U	5.0 U	25 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Iodomethane	µg/L	5**[B]	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	-	1.0 U	-	-	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	-	-
Isopropylbenzene	µg/L	5**[B]	-	-	-	-	-	-	1.0 U	-	1.0 U	1.0 U	-	1.0 U	-	-	-	-	1.0 U	1.0 U
Methyl Acetate	µg/L	n/v	-	-	-	-	-	-	1.0 U	-	1.0 U	1.0 U	-	1.0 U	-	-	-	-	1.0 U	1.0 U
Methyl Ethyl Ketone (MEK)	µg/L	50[A]	10 U	10 U	10 U	50 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl Isobutyl Ketone (MIBK)	µg/L	n/v	5.0 U	5.0 U	5.0 U	25 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methyl tert-butyl ether (MTBE)	µg/L	10[A]	-	-	-	-	-	-	1.0 U	-	1.0 U	1.0 U	-	1.0 U	-	-	-	-	1.0 U	1.0 U
Methylcyclohexane	µg/L	n/v	-	-	-	-	-	-	1.0 U	-	1.0 U	1.0 U	-	1.0 U	-	-	-	-	1.0 U	1.0 U
Methylene Chloride (Dichloromethane)	µg/L	5**[B]	1.0 U	1.0 U	1.0 U	**3.1 J**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Naphthalene	µg/L	10[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenylbutane, 2- (sec-Butylbenzene)	µg/L	5**[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Propylbenzene, n-	µg/L	5**[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	µg/L	5**[B]	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tert Amyl Methyl Ether	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tert-Butyl Alcohol	µg/L	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethane, 1,1,1,2-	µg/L	5**[B]	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	-	1.0 U	-	-	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	-	-
Tetrachloroethane, 1,1,2,2-	µg/L	5**[B]	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethylene (PCE)	µg/L	5**[B]	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	**1.7**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrahydrofuran	µg/L	50[A]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	µg/L	5**[B]	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorobenzene, 1,2,3-	µg/L	5**[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorobenzene, 1,2,4-	µg/L	5**[B]	-	-	-	-	-	-	1.0 U	-	1.0 U	1.0 U	-	1.0 U	-	-	-	-	1.0 U	1.0 U
Trichlorobenzene, 1,3,5-	µg/L	5**[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethane, 1,1,1-	µg/L	5**[B]	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	**290[B]**	1.0 U	1.0 U	**2.3**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethane, 1,1,2-	µg/L	1[B]	1.0 U	1.0 U	1.0 U	***5.0 U***	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethylene (TCE)	µg/L	5**[B]	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	**2600[B]**	**2.9**	**3.5**	**29[B]**	**12[B]**	1.0 U	**2.8**	**3.0**	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (Freon 11)	µg/L	5**[B]	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloropropane, 1,2,3-	µg/L	0.04[B]	***1.0 U***	***1.0 U***	***1.0 U***	***5.0 U***	***1.0 U***	***1.0 U***	-	***1.0 U***	-	-	***1.0 U***	-	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	-	-
Trimethylbenzene, 1,2,4-	µg/L	5**[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trimethylbenzene, 1,3,5-	µg/L	5**[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Acetate	µg/L	n/v	5.0 U	5.0 U	5.0 U	25 U	5.0 U	5.0 U	-	5.0 U	-	-	5.0 U	-	5.0 U	5.0 U	5.0 U	5.0 U	-	-
Vinyl chloride	µg/L	2[B]	1.0 U	1.0 U	1.0 U	***5.0 U***	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylene, m & p-	µg/L	5**[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylene, o-	µg/L	5**[B]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylenes, Total	µg/L	5**[B]	2.0 U	2.0 U	2.0 U	10 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Total VOC	µg/L	n/v	**ND**	**ND**	**ND**	**49.1**	**ND**	**ND**	**ND**	**3039.7**	**2.9**	**3.5**	**37.2**	**12**	**ND**	**6.6**	**6.6**	**1**	**ND**	**ND**

See last page for notes.

Table 1
Summary of Analytical Results in Groundwater
Phase II (2009) and Remediation Investigation (2010-2011)
Former Allegany Bitumens Belmont Asphalt Plant
Amity, New York

Sample Location			**Trip Blank**							
Sample Date			**8-Dec-09**	**11-Dec-09**	**7-Dec-10**	**4-Jan-11**	**5-Jan-11**	**6-Jan-11**	**22-Feb-11**	**20-Apr-11**
Sample ID			**TRIP BLANK**	**TRIP BLANK**	**BA-TB**	**BA-TB010411-W**	**BA-TB010511-W**	**BA-TB010611-W**	**BA-TB-022211-W**	**BA-TB-042011-W**
Sampling Company			**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**
Laboratory			**SPECTRUM**	**SPECTRUM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**
Laboratory Work Order			**SB05470**	**SB05538**	**RTL0627**	**480-548-1**	**480-548-1**	**480-548-1**	**480-1891-1**	**480-4050-1**
Laboratory Sample ID			**SB05470-10**	**SB05538-05**	**RTL0627-04**	**480-548-1**	**480-633-1**	**480-689-8**	**480-1891-5**	**480-4050-1**
Sample Type	**Units**	**TOGS**	**Trip Blank**	**Trip Blank**	**Trip Blank**	**Trip Blank**	**Trip Blank**	**Trip Blank**	**Trip Blank**	**Trip Blank**
Volatile Organic Compounds										
Acetone	µg/L	50^{A}	4.6 U	4.6 U	10 U	10 U	10 U	10 U	10 U	10 U
Acrylonitrile	µg/L	5_{**}^{B}	0.5 U	0.5 U	-	5.0 U	5.0 U	5.0 U	5.0 U	-
Benzene	µg/L	1^{B}	0.5 U	0.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromobenzene	µg/L	5_{**}^{B}	0.5 U	0.5 U	-	-	-	-	-	-
Bromodichloromethane	µg/L	50^{A}	0.5 U	0.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform (tribromomethane)	µg/L	50^{A}	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	µg/L	5_{**}^{B}	1.2 U	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Butylbenzene, n-	µg/L	5_{**}^{B}	0.8 U	0.8 U	-	-	-	-	-	-
Butylbenzene, tert-	µg/L	5_{**}^{B}	0.5 U	0.5 U	-	-	-	-	-	-
Carbon Disulfide	µg/L	60^{A}	0.9 U	0.9 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Tetrachloride (Tetrachloromethane)	µg/L	5^{B}	0.8 U	0.8 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorinated Fluorocarbon (Freon 113)	µg/L	5_{**}^{B}	1.0 U	1.0 U	1.0 U J	-	-	-	-	1.0 U
Chlorobenzene (Monochlorobenzene)	µg/L	5_{**}^{B}	0.5 U	0.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobromomethane	µg/L	5_{**}^{B}	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	-
Chloroethane (Ethyl Chloride)	µg/L	5_{**}^{B}	1.1 U	1.1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	µg/L	7^{B}	0.8 U	0.8 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane	µg/L	5_{**}^{B}	**1.2**	**1.6**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorotoluene, 2-	µg/L	5_{**}^{B}	0.7 U	0.7 U	-	-	-	-	-	-
Chlorotoluene, 4-	µg/L	5_{**}^{B}	0.5 U	0.5 U	-	-	-	-	-	-
Cyclohexane	µg/L	n/v	-	-	1.0 U	-	-	-	-	1.0 U
Cymene (p-Isopropyltoluene)	µg/L	5_{**}^{B}	0.5 U	0.5 U	-	-	-	-	-	-
Dibromo-3-Chloropropane (DBCP), 1,2-	µg/L	0.04^{B}	***1.7 U***	***1.7 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***
Dibromochloromethane	µg/L	50^{A}	0.4 U	0.4 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromomethane (Methylene Bromide)	µg/L	5_{**}^{B}	0.7 U	0.7 U	-	1.0 U	1.0 U	1.0 U	1.0 U	-
Dichlorobenzene, 1,2-	µg/L	3^{B}	0.4 U	0.4 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorobenzene, 1,3-	µg/L	3^{B}	0.5 U	0.5 U	1.0 U	-	-	-	-	1.0 U
Dichlorobenzene, 1,4-	µg/L	3^{B}	0.5 U	0.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorobutene, trans-1,4-	µg/L	n/v	2.8 U	2.8 U	-	5.0 U	5.0 U	5.0 U	50 U	-
Dichlorodifluoromethane	µg/L	5_{**}^{B}	0.9 U	0.9 U	1.0 U	-	-	-	-	1.0 U
Dichloroethane, 1,1-	µg/L	5_{**}^{B}	0.6 U	0.6 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichloroethane, 1,2-	µg/L	0.6^{B}	0.6 U	0.6 U	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***
Dichloroethylene, 1,1-	µg/L	5_{**}^{B}	0.7 U	0.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichloroethylene, cis-1,2-	µg/L	5_{**}^{B}	0.6 U	0.6 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichloroethylene, trans-1,2-	µg/L	5_{**}^{B}	0.9 U	0.9 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichloropropane, 1,2-	µg/L	1^{B}	0.5 U	0.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichloropropane, 1,3-	µg/L	5_{**}^{B}	0.7 U	0.7 U	-	-	-	-	-	-
Dichloropropane, 2,2-	µg/L	5_{**}^{B}	0.6 U	0.6 U	-	-	-	-	-	-
Dichloropropene, 1,1-	µg/L	5_{**}^{B}	0.8 U	0.8 U	-	-	-	-	-	-
Dichloropropene, cis-1,3-	µg/L	0.4_{p}^{B}	0.4 U	0.4 U	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***
Dichloropropene, trans-1,3-	µg/L	0.4_{p}^{B}	0.4 U	0.4 U	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***
Diisopropyl Ether	µg/L	n/v	0.6 U	0.6 U	-	-	-	-	-	-
Dioxane, 1,4-	µg/L	n/v	20.0 U	20.0 U	-	-	-	-	-	-
Ethanol	µg/L	n/v	37.7 U	37.7 U	-	-	-	-	-	-
Ethyl Ether	µg/L	n/v	0.6 U	0.6 U	-	-	-	-	-	-
Ethyl Tert Butyl Ether	µg/L	n/v	0.5 U	0.5 U	-	-	-	-	-	-
Ethylbenzene	µg/L	5_{**}^{B}	0.5 U	0.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

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Sampling Company			**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**	**STANTEC**
Laboratory			**SPECTRUM**	**SPECTRUM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**	**TALAM**
Laboratory Work Order			**SB05470**	**SB05538**	**RTL0627**	**480-548-1**	**480-548-1**	**480-548-1**	**480-1891-1**	**480-4050-1**
Laboratory Sample ID			**SB05470-10**	**SB05538-05**	**RTL0627-04**	**480-548-1**	**480-633-1**	**480-689-8**	**480-1891-5**	**480-4050-1**
Sample Type	**Units**	**TOGS**	**Trip Blank**	**Trip Blank**	**Trip Blank**	**Trip Blank**	**Trip Blank**	**Trip Blank**	**Trip Blank**	**Trip Blank**
Volatile Organic Compounds (cont'd)										
Ethylene Dibromide (Dibromoethane, 1,2-)	µg/L	0.0006^{B}	***0.5 U***	***0.5 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***
Hexachlorobutadiene	µg/L	0.5^{B}	0.5 U	0.5 U	-	-	-	-	-	-
Hexanone, 2-	µg/L	50^{A}	2.7 U	2.7 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Iodomethane	µg/L	5_{**}^{B}	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U	-
Isopropylbenzene	µg/L	5_{**}^{B}	0.5 U	0.5 U	1.0 U	-	-	-	-	1.0 U
Methyl Acetate	µg/L	n/v	-	-	1.0 U	-	-	-	-	1.0 U
Methyl Ethyl Ketone (MEK)	µg/L	50^{A}	4.1 U	4.1 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl Isobutyl Ketone (MIBK)	µg/L	n/v	1.1 U	1.1 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methyl tert-butyl ether (MTBE)	µg/L	10^{A}	0.8 U	0.8 U	1.0 U	-	-	-	-	1.0 U
Methylcyclohexane	µg/L	n/v	-	-	1.0 U	-	-	-	-	1.0 U
Methylene Chloride (Dichloromethane)	µg/L	5_{**}^{B}	0.6 U	0.6 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Naphthalene	µg/L	10^{B}	1.0 U	1.0 U	-	-	-	-	-	-
Phenylbutane, 2- (sec-Butylbenzene)	µg/L	5_{**}^{B}	0.5 U	0.5 U	-	-	-	-	-	-
Propylbenzene, n-	µg/L	5_{**}^{B}	0.5 U	0.5 U	-	-	-	-	-	-
Styrene	µg/L	5_{**}^{B}	0.9 U	0.9 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tert Amyl Methyl Ether	µg/L	n/v	0.6 U	0.6 U	-	-	-	-	-	-
Tert-Butyl Alcohol	µg/L	n/v	9.6 U	9.6 U	-	-	-	-	-	-
Tetrachloroethane, 1,1,1,2-	µg/L	5_{**}^{B}	0.5 U	0.5 U	-	1.0 U	1.0 U	1.0 U	1.0 U	-
Tetrachloroethane, 1,1,2,2-	µg/L	5_{**}^{B}	0.5 U	0.5 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethylene (PCE)	µg/L	5_{**}^{B}	0.7 U	0.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrahydrofuran	µg/L	50^{A}	2.4 U	2.4 U	-	-	-	-	-	-
Toluene	µg/L	5_{**}^{B}	0.8 U	**3.0**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorobenzene, 1,2,3-	µg/L	5_{**}^{B}	0.6 U	0.6 U	-	-	-	-	-	-
Trichlorobenzene, 1,2,4-	µg/L	5_{**}^{B}	0.6 U	0.6 U	1.0 U	-	-	-	-	1.0 U
Trichlorobenzene, 1,3,5-	µg/L	5_{**}^{B}	0.5 U	0.5 U	-	-	-	-	-	-
Trichloroethane, 1,1,1-	µg/L	5_{**}^{B}	0.6 U	0.6 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethane, 1,1,2-	µg/L	1^{B}	0.7 U	0.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethylene (TCE)	µg/L	5_{**}^{B}	0.6 U	0.6 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (Freon 11)	µg/L	5_{**}^{B}	0.7 U	0.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloropropane, 1,2,3-	µg/L	0.04^{B}	***0.9 U***	***0.9 U***	-	***1.0 U***	***1.0 U***	***1.0 U***	***1.0 U***	-
Trimethylbenzene, 1,2,4-	µg/L	5_{**}^{B}	0.4 U	0.4 U	-	-	-	-	-	-
Trimethylbenzene, 1,3,5-	µg/L	5_{**}^{B}	0.5 U	0.5 U	-	-	-	-	-	-
Vinyl Acetate	µg/L	n/v	-	-	-	5.0 U	5.0 U	5.0 U	5.0 U	-
Vinyl chloride	µg/L	2^{B}	0.9 U	0.9 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylene, m & p-	µg/L	5_{**}^{B}	1.0 U	1.0 U	-	-	-	-	-	-
Xylene, o-	µg/L	5_{**}^{B}	0.5 U	0.5 U	-	-	-	-	-	-
Xylenes, Total	µg/L	5_{**}^{B}	-	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Total VOC	µg/L	n/v	**1.2**	**4.6**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**

Notes:

TOGS	NYSDEC Technical and Operational Guideline Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guideline Values and Groundwater Effluent Limitations (Reissued June 1998 with errata in January 1999 and addenda in April 2000 and June 2004)
A	TOGS 1.1.1 - Table 1 - Ambient Water Quality Standards and Guidance Values, Division of Water, Technical and Operational Guidance Series (TOGS 1.1.1); Guidance
B	TOGS 1.1.1 - Table 1 - Ambient Water Quality Standards and Guidance Values, Division of Water, Technical and Operational Guidance Series (TOGS 1.1.1); Standards
6.5^{A}	Concentration exceeds the indicated standard.
15.2	Concentration was detected but did not exceed applicable standards.
0.50 U	Laboratory estimated quantitation limit exceeded standard.
0.03 U	The analyte was not detected above the laboratory estimated quantitation limit.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.

**	The principal organic contaminant standard for groundwater of 5 ug/L (described elsewhere in the TOGS table) applies to this substance.
p	Applies to the sum of cis- and trans-1,3-dichloropropene.
E	Compound was over the calibration range.
J	Indicates estimated value.
SPECTRUM	Spectrum Analytical Inc., Agawam, MA
TALAM	Test America Laboratories Inc., Amherst, NY
ND	Not detected
*	Subsequent to receipt of laboratory report and the Data Usability Summary Report, reporting limits for the diluted sample BA-MW13-W were recalculated by the laboratory based on the practical quantitation limit.

Former Allegany Bitumens Belmont Asphalt Plant Brownfield Cleanup Program Site
Belmont, NY
Interim Remedial Measures Implementation

Table 2
Monitoring Well Water Level Reading Summary

Well ID	Ground Elevation (ft AMSL)	TOIC Elevation (ft AMSL)	Well Type	January 4, 2011		February 22, 2011		April 20, 2011		September 19, 2011	
				Water Level (ft BTOIC)	Water Elevation (ft AMSL)	Water Level (ft BTOIC)	Water Elevation (ft AMSL)	Water Level (ft BTOIC)	Water Elevation (ft AMSL)	Water Level (ft BTOIC)	Water Elevation (ft AMSL)
BS-2	1375.39	1378.06	Shallow	11.28	1366.78	11.49	1366.57	8.08	1369.98	12.23	1365.83
BS-3	1376.00	1379.24	Shallow	10.43	1368.81	11.00	1368.24	9.51	1369.74	10.75	1368.49
BS-4	1375.28	1378.31	Shallow	11.27	1367.04	11.18	1367.13	8.35	1369.96	12.39	1365.92
MW-5	1367.57	1370.24	Shallow	4.09	1366.15	4.73	1365.51	3.18	1367.06	NM	NM
MW-6	1372.72	1375.40	Shallow	9.93	1365.47	10.29	1365.11	8.61	1366.79	10.80	1364.60
MW-7	1375.64	1378.68	Shallow	12.79	1365.89	13.36	1365.32	9.04	1369.64	NM	NM
MW-8	1365.91	1368.70	Shallow	3.18	1365.52	Frozen at 3.80	Frozen at 1364.90	2.55	1366.15	4.20	1364.50
MW-9	1368.80	1371.68	Shallow	7.68	1364.00	8.09	1363.59	6.40	1365.28	NM	NM
MW-10	1370.90	1373.76	Shallow	7.48	1366.28	7.13	1366.63	6.64	1367.12	NM	NM
MW-11	1369.87	1372.39	Shallow	6.09	1366.30	6.76	1365.63	5.29	1367.1	NM	NM
MW-12	1378.46	1381.50	Shallow	12.24	1369.26	12.63	1368.87	11.32	1370.18	NM	NM
MW-13	1371.24	1374.00	Shallow	17.54	1356.46	17.84	1356.16	15.87	1358.13	NM	NM
MW-14	1363.62	1366.54	Shallow	13.64	1352.90	14.32	1352.22	12.26	1354.28	NM	NM
MW-22	1365.66	1368.32	Shallow	3.48	1364.84	4.02	1364.3	2.96	1365.36	NM	NM
MW-23	1374.46	1377.59	Shallow	10.34	1367.25	8.82	1368.77	7.58	1370.01	11.02	1366.57
MW-25	1376.07	1378.52	Shallow	11.69	1366.83	11.26	1367.26	8.88	1369.64	13.48	1365.04
MW-26	1373.07	1375.79	Shallow	NM	NM	7.61	1368.18	6.18	1369.61	NM	NM
MW-27	1372.76	1375.28	Shallow	NM	NM	7.41	1367.87	5.85	1369.43	9.06	1366.22
MW-28D	1374.40	1377.17	Deep	NM	NM	18.93	1358.24	16.90	1360.27	18.07	1359.10
WSW	1370.79	1371.01	Deep	NM	NM	12.15	1358.86	10.85	1360.16	NM	NM

Notes:

DTW	Depth to water
ft AMSL	Feet above mean sea level (NAVD 88)
ft BTOIC	Feet below top of inner casing
NM	Not measured
TOIC	Top of inner casing

Former Allegany Bitumens Asphalt Plant Brownfield Cleanup Program Site
Belmont, New Yok
Interim Remedial Measures Implementation

TABLE 3
Monitoring Well Decommissioning Summary

Well ID	Installation Date	Northing	Easting	Ground Elevation (ft AMSL)	TOIC Elevation (ft AMSL)	Well Diameter (in)	Total Depth (ft bgs)	Screen Interval (ft bgs)	Sand Interval (ft bgs)	Bentonite Interval (ft bgs)
Wells to Be Decommissioned										
MW-5	12/2/2010	814117.55	1292546.17	1367.57	1370.24	2.0	13	3 - 13	2.5 - 13	1.5 - 2.5
MW-6	12/1/2010	814076.20	1292746.04	1372.72	1375.40	2.0	13	3 - 13	2.3 - 13	1.5 - 2.3
MW-7	12/2/2010	814165.77	1292676.08	1375.64	1378.68	2.0	14	4 - 14	3 - 14	1.5 - 3
MW-9	11/30/2010	813988.92	1292900.73	1368.80	1371.68	2.0	13	3 - 13	2.5 - 13	1.5 - 2.5
MW-10	11/30/2010	814000.98	1292784.66	1370.90	1373.76	2.0	13	3 - 13	2.4 - 13	1.5 - 2.4
MW-11	11/30/2010	813909.43	1292790.53	1369.87	1372.39	2.0	13	3 - 13	2.5 - 13	1.5 - 2.5
MW-12	11/29/2010	813823.90	1292595.43	1378.46	1381.50	2.0	16	6 - 16	4 - 16	1.6 - 4
MW-13	11/29/2010	813509.88	1292840.19	1371.24	1374.00	2.0	16	6 - 16	3.8 - 16	2 - 3.8
MW-14	11/30/2010	814027.22	1292987.36	1363.62	1366.54	2.0	20	10 - 20	7.5 - 20	5.3 - 7.5
MW-22	12/3/2010	814248.82	1292524.03	1365.66	1368.32	2.0	13	3 - 13	2.5 - 13	1.5 - 2.5
MW-26	2/4/2011	813941.31	1292623.84	1373.07	1375.79	2.0	15	5 - 15	3.2 - 15	2 - 3.2
Wells to Be Removed by Excavation in RAOC-1										
BS-4	12/11/2009	814069.57	1292631.24	1375.28	1378.31*	1.0	14	4 - 14	2 - 14	0 - 2
MW-23	12/7/2010	814025.72	1292619.12	1374.46	1377.59	2.0	13	3 - 13	2.4 - 13	1.5 - 2.4
Wells to Remain in Place										
BS-2	12/10/2009	814078.59	1292607.50	1375.39	1378.06*	1.0	14	4 - 14	2 - 14	0 - 2
BS-3	12/11/2009	814077.11	1292580.60	1376.00	1379.24*	1.0	14	4 - 14	2 - 14	0 - 2
MW-8	12/1/2010	814149.38	1292620.72	1365.91	1368.70	2.0	13	3 - 13	2.5 - 13	1.4 - 2.5
MW-25	12/6/2010	814105.71	1292631.54	1376.07	1378.52	2.0	16	6 - 16	4 - 16	2 - 4
MW-27	2/3/2011	814016.67	1292667.17	1372.76	1375.28	2.0	15	5 - 15	3.1 - 15	2 - 3.1
MW-28D	2/1/2011	814063.23	1292660.84	1374.40	1377.17	2.0	40	30 - 40	27.7 - 40	25 - 27.7

Notes:

TOIC	Top of Inner Casing
ft AMSL	Feet above mean sea level (NAVD 88)
ft bgs	Feet below ground surface
in	Inches
RI	Remedial Investigation

U:\190500593\IRM Implementation\cost est\[Tables 2 & 3 - WLs&Well Construction.xls]Table 2-WL Summary

IRM Work Plan
Appendix A

Quality Assurance Project Plan

APPENDIX A

QUALITY ASSURANCE PROJECT PLAN
INTERIM REMEDIAL MEASURES
FORMER ALLEGANY BITUMENS BELMONT ASPHALT PLANT
5392 STATE ROUTE 19
TOWN OF AMITY, ALLEGANY COUNTY, NEW YORK

September 2011

Prepared for:

NEW YORK STATE DEPARTMENT OF
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Stantec

QUALITY ASSURANCE PROJECT PLAN
FOR
INTERIM REMEDIAL MEASURES WORK PLAN
FORMER ALLEGANY BITUMENS BELMONT ASPHALT PLANT
5392 STATE ROUTE 19
TOWN OF AMITY, ALLEGANY COUNTY, NEW YORK

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1.0 Introduction

This Quality Assurance Project Plan (QAPP) is to be used in conjunction with the Interim Remedial Measures (IRM) Work Plan (Work Plan) for the Former Allegany Bitumens Belmont Asphalt Plant located at 5392 State Route 19 in the Town of Amity, Allegany County, New York (Site) (Figure 1). This QAPP presents the policies, organization, objectives, functional activities, and specific quality assurance and quality control activities to ensure the validity of data generated in the completion of the investigation. The purpose of this QAPP program is to ensure that all technical data generated are accurate and representative.

Quality assurance (QA) is a management system for ensuring that all information, data, and decisions resulting from investigation and environmental monitoring programs are technically sound, and properly documented. Quality control (QC) is the functional mechanism through which quality assurance achieves its goals. Quality control programs, for example, define the frequency and methods of checks, audits, and reviews necessary to identify problems and dictate corrective actions to resolve these problems, thus ensuring high quality data. As such, a quality assurance and quality control program pertains to all data collection, evaluation, and review activities which are part of the investigation.

All QA/QC procedures will be in accordance with applicable professional technical standards, government regulations and guidelines, and specific project goals and requirements. This QAPP has been prepared in accordance with New York State Department of Environmental Conservation (NYSDEC) and United States Environmental Protection Agency (EPA) Region II guidance documents.

The QAPP incorporates the following activities:

- Sample collection, control, chain-of-custody, and analysis;
- Document control;
- Laboratory instrumentation, analysis, and control; and
- Review of project reports.

Laboratory analysis of all project samples will be performed by an independent laboratory with the experience and certifications appropriate to the analyses to be performed. All analyses will be performed by laboratories accredited pursuant to the NYSDOH Environmental Laboratory Accreditation Program (ELAP) for the category of parameters to be analyzed by the laboratory. The specific environmental laboratory or laboratories to be used will be determined at the time the monitoring activities are scheduled.

Duplicates, replicates, and spiked samples will be used to identify the quality of the analytical data. Field audits may be conducted to verify that proper sampling techniques and chain-of-custody procedures are followed. Field data compilation, tabulation, and analysis will be checked for accuracy. Calculations and other post-field tasks will be reviewed by senior project personnel. Equipment used to take field measurements will be maintained and calibrated in accordance with established procedures. Records of calibration and maintenance will be kept by assigned personnel. Field testing and data acquisition will be performed following strict guidelines as described herein.

Document control procedures will be used to coordinate the distribution, coding, storage, retrieval, and review of all data collected during all sampling tasks.

A Data Usability Summary Report (DUSR) will be prepared for analytical results from each monitoring activity. The DUSR will be prepared by an independent consultant with the required experience, in accordance with NYSDEC's "Guidance for the Development of Data Usability

Summary Reports," revised 1997 and NYSDEC's DER-10 "Technical Guidance for Site Investigation and Remediation," May 2010 (DER-10).

2.0 Project Description

This QAPP pertains to the completion of field activities and subsequent laboratory and data analysis associated with the IRM at the Former Allegany Bitumens Belmont Asphalt Plant located at 5392 State Route 19 in the Town of Amity, Allegany County, New York. The remedial activities are described in detail in the IRM Work Plan.

Blades Holding Company, Inc. has entered into a Brownfield Cleanup Agreement with the NYSDEC. A Remedial Investigation has been conducted under this agreement. The objective of the proposed project is to implement interim remedial measures to address contamination identified during the RI and the prior Phase II Environmental Site Assessment (ESA). The remedial measures will be implemented so as to attain conditions at the Site which are protective of commercial or industrial use and of public health, the environment, and fish and wildlife resources in on- and off-site areas affected by contamination and its migration.

2.1 Site Description

The Site is a 4.9± acre parcel located at 5392 State Route 19 in the Town of Amity, Allegany County, New York (see Figure 1). The property (Tax Parcel No. 171-1-60) is currently occupied by a non-operational asphalt plant. Operations at this asphalt plant ceased in 2005. Redevelopment of the site is anticipated to involve a commercial or industrial use.

2.2 Previous Investigations

A Phase I ESA was completed by Stantec in December 2010 in connection with real estate due diligence activities. The Phase I ESA identified one recognized environmental condition associated with the subject property:

- A former on-site laboratory is located in the northwest corner of the Site. The laboratory was used for testing of aggregate and asphalt materials manufactured on site to determine whether the materials complied with NYSDOT or customer specifications. Trichloroethylene (TCE) was reportedly used as a solvent in the testing operations. Regular use of TCE at the site was reported to have been discontinued approximately 10 years ago; however, a drum containing approximately 10 gallons of fresh (unused) TCE was present in the laboratory at the time of the Phase I ESA site visit.

  The laboratory building has its own septic system, which reportedly received waste from the sinks and toilet in the laboratory. At the time of the site visit, several empty small- to medium-sized containers were present on an outdoor asphalt-paved pad attached to the east end of the laboratory building. Plant personnel indicated that the pad had not been used for outdoor storage of solvent or waste containers.

  No records or knowledge of releases were identified during the Phase I ESA. However, given the potential for historic releases of TCE, it was recommended that a soil boring program be conducted in the area of the septic system.

Stantec conducted a Phase II ESA in December 2010. Four soil test borings and four temporary monitoring wells were installed for the purposes of collecting soil and groundwater samples adjacent to and downgradient from the former laboratory building and its septic system. The Phase II ESA test boring and monitoring locations are shown on Figure 2. Results indicated the presence of TCE and related volatile organic compounds (VOCs) in an area northeast of the laboratory building. These VOCs were detected in shallow soil and groundwater at levels above NYSDEC's soil cleanup objectives and groundwater standards. Indications of soil contamination were encountered at depths of 5 to 10 feet below ground surface (bgs) in test borings BS-2 and BS-4, and TCE was detected in soil samples from these borings at concentrations of up to 37.5 parts per million (ppm). The water table at the site was encountered at depths of 9 to 10 feet below ground surface, and TCE was detected in BS-2 and BS-4 groundwater samples at concentrations of 0.6 to 2.1 ppm, respectively. Traces of TCE (0.001 to 0.008 ppm) were detected in the groundwater samples from the BS-1 and BS-3 locations.

A RI was performed by Stantec for the Site in accordance with a NYSDEC-approved RI Work Plan (October 2010). A detailed description of the RI program and findings is presented in the August 2011 RI report. The RI field program included several field sampling events conducted during the period October 2010 through June 2011. An abbreviated summary of the primary RI program elements is presented below:

- Physical Conditions Assessment and Hazardous Materials Survey – This was an assessment of the overall site conditions via additional literature and records search and a Site inspection of structures, equipment and stored materials.
- Assessment of Area Water Wells – A survey was performed to identify the location, use, and construction of private water supply wells in close proximity to the Site. Responses were obtained from most local residents, however several residents did not respond.
- Surface Soil Sampling – 14 surface soil samples were collected across the Site and analyzed for a variety of chemical parameters, depending on the area of concern.
- Test Pit Excavation and Subsurface Soil Sampling – 18 test pits were excavated across the site to assess subsurface conditions and facilitate subsurface soil sampling.
- Passive Soil Gas Survey – 28 soil gas samples were obtained from three investigation areas to assess the potential for VOCs to exist in shallow soil vapor.
- Assessment and Sampling of Existing Water Supply Well – The submersible pump and associated piping was removed from the onsite water supply well, the well bore was videotaped, and a groundwater sample was obtained and analyzed.
- Test Boring and Monitoring Well Installation, with Soil and Groundwater Sampling – 28 soil test borings were drilled and 16 groundwater monitoring wells were installed across the site. 34 subsurface soil samples and 19 groundwater samples (including three from previously-installed Phase II ESA wells) were initially submitted for laboratory analysis. Groundwater samples from 10 select wells were submitted and analyzed in a second sampling event.
- Ecological Survey – A qualitative exposure assessment of potential impacts to fish and wildlife resources was performed in accordance with DER-10. This included a site reconnaissance, a written request for review to the NYSDEC Natural Heritage Program, and an online search of the U.S. Fish and Wildlife Service database.

3.0 Project Organization and Responsibility

This QAPP provides for designated qualified personnel to review products and provide guidance on QA matters. This QAPP also outlines the approach to be followed to ensure that products of sufficient quality are obtained. Figure 2 illustrates the QA program organization. This structure will provide for direct and constant operational responsibility, clear lines of authority, and the integration of QA activities. The various QA functions of the project positions are explained in the following subsections.

Project Manager

The project manager will have overall responsibility for ensuring that the project meets the objectives and quality standards as presented in the IRM Work Plan and this QAPP. He/She will be responsible for implementing the project and will have the authority to commit the resources necessary to meet project objectives and requirements. The project manager's primary function is to ensure that technical, financial, and scheduling objectives are achieved successfully. The project manager will provide the major point of contact and control for matters concerning the project. In addition, he/she will be responsible for technical quality control and project oversight.

Team Leaders

The project manager will be supported by a team leader or leaders who will be responsible for leading and coordinating the day-to-day activities of the various resource specialists under their supervision. The team leader is a highly experienced environmental professional who will report directly to the project manager.

Technical Staff

The technical staff (team members) for this project will be drawn from corporate resources and appropriately qualified subcontractors. The technical team staff will be used to gather and analyze data, and to prepare various task reports and support materials. All of the designated technical team members will be experienced professionals who possess the degree of specialization and technical competence required to effectively and efficiently perform the required work.

Project QA Director

The Project QA Director will be responsible for maintaining QA for the project.

Laboratory Director

The laboratory director will be responsible for all analytical work and works in conjunction with the QA unit. He/She maintains liaison with the QA officer regarding QA and custody requirements.

Laboratory Manager

The laboratory manager will maintain liaison with the laboratory director regarding QA elements of specific sample analyses tasks. He/She will report to the laboratory director and work in conjunction with the laboratory QA unit.

Laboratory QA Coordinator

The Laboratory QA officer will be responsible for overseeing the QA program within the laboratory and for maintaining all QC documentation. He/She reports directly to the laboratory director.

Laboratory Staff

Each member of the laboratory staff will perform an assigned QA or analytical function that is pertinent to and within the scope of his or her knowledge, experience, training, and aptitude. An individual will be assigned the responsibility for checking, reviewing, or otherwise verifying that a sample analysis activity has been correctly performed.

Laboratory Facilities
All laboratory work will be performed in accordance with guidelines established by NYSDEC, United States Environmental Protection Agency (USEPA), the Water Pollution Control Federation, and/or the American Society for Testing and Materials (ASTM). In case of conflict, these guidelines and protocols will be considered in the order shown (i.e., NYSDEC criteria is of primary precedence). In addition, QA and QC programs will be maintained for the instruments and the analytical procedures used. A NYSDOH ELAP certified laboratory capable of providing (NYSDEC Analytical Services Protocol (ASP) Category B deliverables will be identified to provide laboratory services for this project. The laboratory's preventative maintenance procedures will be provided and outlined in their Laboratory Quality Assurance Manual.

4.0 QA Objectives for Data Measurement

All measurements will be made to ensure that analytical results are representative of the media and conditions measured. Unless otherwise specified, all data will be calculated and reported in units consistent with other organizations who report similar data to allow comparability of databases among organizations.

The key considerations for the QA assessment of generated data are accuracy, precision, completeness, representativeness, and comparability. These characteristics are defined below:

Accuracy: Accuracy is the degree of agreement of a measurement or average of measurements with an accepted reference or "true" value and is a measure of bias in the system.

Precision: Precision is the degree of mutual agreement among individual measurements of a given parameter.

Completeness: Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount expected to be obtained under correct normal conditions.

Representativeness: Representativeness expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition.

Comparability: Comparability expresses the confidence with which one data set can be compared to another.

4.1 Goals

The QA/QC goal will focus on controlling measurement error within the limits established and will ultimately provide a database for estimating the actual uncertainty in the measurement data.

Target values for detection limit, percent spike recovery and percent "true" value of known check standards, and RPD of duplicates/replicates are provided in the referenced analytical procedures. It should be noted that target values are not always attainable. Instances may arise where high sample concentrations, non-homogeneity of samples, or matrix interferences preclude achievement of target detection limits or other quality control criteria. In such instances, the laboratory will report reasons for deviations from these detection limits or noncompliance with quality control criteria.

5.0 Sampling Procedures

The sampling of various environmental media will be completed as part of IRM activities. Table 1 presents the location, type, and analytical requirements of samples to be collected as part of the IRM Activities.

5.1 Sampling Protocol

The sampling and field procedures for the following activities are described in the IRM Work Plan:

- Bench-scale soil and groundwater testing;
- Sampling of soils from proposed borrow area;
- Confirmatory sidewall and bottom soil sampling from excavations;
- Sampling of soils from disposal stockpiles per disposal facility requirements; and
- Quarterly groundwater sampling.

The sample containers that will be used are identified in Table 2. The sample containers will be labeled in accordance with Section 6.2. Sample handling, packaging and shipping procedures are presented in Section 6.3.

5.2 Field Quality Control Samples

Field quality control samples will consist of trip blanks, field blanks, field duplicates, matrix spikes and matrix spike duplicates, as shown on Table 3.

5.2.1 Field Duplicates

Field quality control samples will be collected to verify reproducibility of the sampling and analytical methods. Field duplicates will be obtained at a rate of one per 20 original field samples, as outlined in Table 3.

5.2.2 Trip Blanks

Trip blanks will be used to assess whether groundwater has been exposed to volatile constituents during sample storage and transport. The trip blanks for water samples will consist of a container filled by the laboratory with analyte-free water. The trip blanks will remain unopened throughout the sampling event and will only be analyzed for volatile organics. The trip blanks will be collected as outlined in Table 3.

5.2.3 Matrix Spike/Matrix Spike Duplicates

Matrix Spike/Matrix Spike Duplicates (MS/MSD) will be obtained to determine if the matrix is interfering with the sample analysis. MS/MSDs will be collected at a rate of one per 20 original field samples, as outlined on Table 3.

5.2.4 Rinsate Blanks

Rinsate blanks will be used to assess decontamination procedures for non-dedicated equipment. Rinse blanks will be collected as outlined in Table 3.

5.2.5 Laboratory Quality Control Checks

Internal laboratory quality control checks will be used to monitor data integrity. These checks include method (equipment) blanks, spike blanks, internal standards, surrogate samples, calibration standards, and reference standards.

5.3 Sample Containers

The volumes and containers required for the sampling activities are included in Table 2. Pre-washed sample containers will be provided by the laboratory. All bottles are to be prepared in accordance with EPA bottle washing procedures.

5.4 Decontamination

Dedicated and/or disposable sampling equipment will be used to the extent possible to minimize decontamination requirements and the possibility of cross-contamination.

Split spoon samplers and hand augers are examples of sampling equipment to be used at more than one location. The water level indicator will be decontaminated between locations by using the following decontamination procedures:

- Initial cleaning of any foreign matter with paper towels, if needed;
- Low phosphate detergent wash;
- De-ionized water rinse; and
- Air dry.

If a Geoprobe is used to install monitoring wells, the Geoprobe, Geoprobe rods, and Macrocore® samplers utilized to install borings will be decontaminated with a bucket wash consisting of a low phosphate detergent wash followed by water rinse. The backhoe bucket, drill rig, augers, rods, split spoon samplers, and/or other related downhole equipment will be decontaminated using high pressure steam prior to initiating the excavation and well installation programs. This decontamination procedure will also be used on the downhole equipment between each boring. Steam cleaning will be performed in a designated on-site decontamination area. Throughout and after the cleaning processes, direct contact between the equipment and the ground surface will not be permitted. Decontamination waste water will be collected in 55-gallon drums. The drill rig and associated equipment will also be cleaned upon completion of the investigation prior to departure from the site using the following methods:

- Initial cleaning of all foreign matter; and
- Wash down with high pressure, high temperature spray to remove and/or volatilize organic contamination.

5.5 Levels of Protection/Site Safety

All sampling will be conducted under a documented Health and Safety Plan. On the basis of air monitoring, the level of protection may be downgraded or upgraded at the discretion of the site safety officer. Crew members will stand upwind of open boreholes or wellheads during the collection of samples, when possible.

All work will initially be conducted in Level D (refer to Site Specific Health and Safety Plan). Air purifying respirators (APRs) will be available if monitoring indicates an upgrade to Level C is appropriate.

6.0 Sample Custody

This section describes standard operating procedures for sample identification and chain-of-custody to be used for all field activities. The purpose of these procedures is to ensure that the quality of the samples is maintained during collection, transportation, storage, and analysis. All chain-of-custody requirements comply with standard operating procedures indicated in USEPA and NYSDEC sample-handling protocol.

Sample identification documents must be carefully prepared so that sample identification and chain-of-custody can be maintained and sample disposition controlled. Sample identification documents include:

- Field records,
- Sample label,
- Custody seals, and
- Chain-of-custody records.

6.1 Chain-Of-Custody

The primary objective of the chain-of-custody procedures is to provide an accurate written or computerized record that can be used to trace the possession and handling of a sample from collection to completion of all required analyses.

6.1.1 Sample Labels

Sample labels attached to, or affixed around, the sample container must be used to properly identify all samples collected in the field. To the extent possible, the sample labels are to be placed on the bottles so as not to obscure any QA/QC lot numbers on the bottles. Sample information must be printed in a legible manner using waterproof ink. Field identification must be sufficient to enable cross-reference with the field sampling records or sample logbook. For chain-of-custody purposes, all QC samples are subject to exactly the same custodial procedures and documentation as "real" samples.

6.1.2 Custody Seals

Custody seals are preprinted adhesive-backed seals often with security slots which are designed to break if the seals are disturbed. Sample shipping containers (coolers, cardboard boxes, etc., as appropriate) are sealed in as many places as necessary to ensure security. Seals must be signed and dated before use. On receipt at the laboratory, the custodian must check (and certify, by completing logbook entries) that seals on shipping containers are intact. Strapping tape should be placed over the seals to ensure that seals on shipping containers are not accidentally broken during shipment.

6.1.3 Chain-Of-Custody Record

The chain-of-custody record must be fully completed at least in duplicate by the field technician who has been designated by the project manager as being responsible for sample shipment to the appropriate laboratory for analysis. In addition, if samples are known to require rapid turnaround in the laboratory because of project time constraints or analytical concerns (e.g., extraction time or sample retention period limitations, etc.), the person completing the chain-of-custody record should note these constraints in the "Remarks" section of the custody record.

6.1.4 Field Custody Procedures

- As few persons as possible should handle samples.
- Sample bottles will be obtained pre-cleaned by the laboratory and shipped to the sampling personnel in charge of the field activities. Coolers or boxes containing cleaned bottles should be sealed with a custody tape seal during transport to the field or while in storage prior to use.
- The sample collector is personally responsible for the care and custody of samples collected until they are transferred to another person or dispatched properly under chain-of-custody rules.
- The sample collector will record sample data in a controlled field notebook and/or on appropriate field sampling records.
- The site team leader will determine whether proper custody procedures were followed during the fieldwork and decide if additional samples are required.

6.2 Documentation

6.2.1 Sample Identification

All containers of samples collected from the project will be identified using the following format on a label or tag fixed to the sample container:

BA-XX-Y

- BA - This set of initials indicates the Former Allegany Bitumens Belmont Asphalt Plant project.
- XX - These initials identify the sample. Actual sample locations will be recorded on the sampling record. Field duplicates, field blanks and rinsate blanks will be assigned unique sample numbers.
- Y - These initials identify the sample matrix in accordance with the following abbreviations:

W – Water Sample
S – Soil or Sediment Sample
A – Air

Each sample will be labeled, chemically preserved, if required, and sealed immediately after collection. To minimize handling of sample containers, labels will be filled out prior to sample collection to the extent possible. The sample label will be filled out using waterproof ink and will be firmly affixed to the sample containers. The sample label will give the following information:

- Name or initials of sampler;
- Date (and time, if possible) of collection;
- Sample number;
- Intended analysis; and
- Preservation performed.

6.2.2 Daily Logs

Daily logs and data forms are necessary to provide sufficient data and observations to enable participants to reconstruct events that occurred during the project. All daily logs will be kept in a notebook and consecutively numbered. All entries will be made in waterproof ink, dated, and signed. Sampling data will be recorded in the sampling records. All information will be completed in waterproof ink. Corrections will be made according to the procedures given at the end of this section.

6.3 Sample Handling, Packaging, and Shipping

The transportation and handling of samples must be accomplished in a manner that not only protects the integrity of the sample, but also prevents any detrimental effects due to the possible hazardous nature of samples. Regulations for packaging, marking, labeling, and shipping hazardous materials are promulgated by the United States Department of Transportation (DOT) in the Code of Federal Regulations, 49 CFR 171 through 177.

All chain-of-custody requirements must comply with standard operating procedures in the NYSDEC and USEPA sample handling protocol. Field personnel will make arrangements for transportation of samples to the laboratory. When custody is relinquished to a shipper, field personnel will ensure that the laboratory custodian or project manager is aware of the expected time of arrival of the sample shipment and of any time constraints on sample analysis(es). All samples will be delivered to the laboratory in a timely manner to help ensure that holding times are followed.

7.0 Calibration Procedures and Frequency

All instruments and equipment used during sampling and analysis will be operated, calibrated, and maintained according to the manufacturer's guidelines and recommendations as well as criteria set forth in the applicable analytical methodology references.

7.1 Field Instruments

A calibration program will be implemented to ensure that routine calibration is performed on all field instruments. Field team members familiar with the field calibration and operations of the equipment will maintain proficiency and perform the prescribed calibration procedures outlined in the Operation and Field Manuals accompanying the respective instruments. Calibration records for each field instrument used on the project will be maintained on-site during the respective field activities and a copy will be kept in the project files.

7.1.1 Portable Total Organic Vapor Monitor

Any vapor monitor used will undergo routine maintenance and calibration prior to shipment to the project site. Daily calibration and instrument checks will be performed by a trained team member at the start of each day. Daily calibrations will be performed according to the manufacturer's specifications and are to include the following:

Battery check: If the equipment fails the battery check, recharge the battery.

- Gas standard: The gauge should display an accurate reading when a standard gas is used.

- Cleaning: If proper calibration cannot be achieved, then the instrument ports must be cleaned.

7.1.2 pH and Specific Conductance

The following steps should be observed by personnel engaged in groundwater sampling for pH and specific conductance:

- The operation of the instrument should be checked, and calibrated if needed, with fresh standard buffer solution (pH 4, pH 7 and pH 10) prior to each day's sampling.
- The specific conductance meter should be calibrated prior to each sampling event using a standard solution of known specific conductance.

More frequent calibrations may be performed as necessary to maintain analytical integrity. Calibration records for each field instrument used on the project should be maintained and a copy kept in the project files.

7.2 Laboratory Instruments

Laboratory calibration procedures are addressed in detail in the laboratory Quality Assurance Manual (QAM), which can be provided upon selection of a laboratory. All calibration procedures will be consistent with the method used for analysis.

8.0 Analytical Procedures

8.1 Field

On-site procedures for analysis of total organic vapor and other field parameters are addressed in the Remedial Investigation Work Plan.

8.2 Laboratory

Specific analytical methods for constituents of interest in soil and groundwater are listed in Table 2. The laboratory will maintain and have available for the appropriate operators standard operating procedures relating to sample preparation and analysis according to the methods stipulated in Table 2.

9.0 Data Reduction and Reporting

QA/QC requirements will be strictly adhered to during sampling and analytical work. All data generated will be reviewed by comparing and interpreting results from chromatograms (responses, stability of retention times), accuracy (mean percent recovery of spiked samples), and precision (reproducibility of results). Refer to Section 10 for a discussion of QA/QC protocol.

Data storage and documentation will be maintained using logbooks and data sheets that will be kept on file. Analytical QC will be documented and included in the analytical testing report. A central file will be maintained for the sampling and analytical effort after the final laboratory report is issued.

All calculations and data manipulations are included in the appropriate methodology references. Control charts and calibration curves will be used to review the data and identify outlying results. Prior to the submission of the report to the client, all data will be evaluated for precision, accuracy, and completeness. Sections 4.0, 8.0, and 13.0 of this document include some of the QC criteria to be used in the data evaluation process.

Laboratory reports will be reviewed by the laboratory supervisor, the QA officer, laboratory manager and/or director, and the project manager. Analytical reports will contain a data tabulation including results and supporting QC information will be provided. Raw data will be available for later inspection, if required, and maintained in the control job file.

All data will be reported to NYSDEC in electronic format in accordance with DER-10 and the NYSDEC's Environmental Data Submission requirements.

10.0 Internal Quality Control Checks

QC data are necessary to determine precision and accuracy and to demonstrate the absence of interferences and/or contamination of glassware and reagents. The procedures to be followed for internal quality control checks are consistent with NYSDEC ASP protocols.

11.0 Performance and System Audits

11.1 Field Audits

The Project QA Director may conduct episodic audits of the operations at the site to ensure that work is being performed in accordance with the work plan and associated standard operating practice. The audit will cover, but not necessarily be limited to, such areas as:

- Conformance to standard operating procedures
- Completeness and accuracy of documentation
- Chain of custody procedures
- Construction specifications

11.2 Laboratory Audits

In addition to any audits required by the NYSDEC, the Project QA Director may chose to audit the laboratory. These additional audits may take the form of performance evaluation samples or on-site inspections of the laboratory. Performance evaluation samples may be either blind samples or samples of known origin to the laboratory. Reasonable notice will be provided if the audit is to include an on-site inspection of the laboratory.

12.0 Preventive Maintenance

12.1 Field

Field personnel assigned to complete the work will be responsible for preventative maintenance of all field instruments. The field sampling personnel will protect the portable total organic vapor monitors, water quality meter, etc. by placing them in portable boxes and/or protective cases.

All field equipment will be subject to a routine maintenance program, prior to and after each use. The routine maintenance program for each piece of equipment will be in accordance with the manufacturer's operations and maintenance manual. All equipment will be cleaned and checked for integrity after each use. Necessary repairs will be performed immediately after any defects are observed, and before the item of equipment is used again. Equipment parts with a limited life (such as batteries, membranes and some electronic components) will be periodically checked and replaced or recharged as necessary according to the manufacturer's specifications.

12.2 Laboratory

The laboratory's preventative maintenance procedures can be provided as outlined in their Laboratory Quality Assurance Manual.

13.0 Data Assessment Procedures

Performance of the following calculations will be completed to evaluate the accuracy, precision and completeness of collected measurement data.

13.1 Precision

Precision of a particular analysis is measured by assessing its performance with duplicate or replicate samples. Duplicate samples are pairs of samples taken in the field and transported to the laboratory as distinct samples. Their identity as duplicates is sometimes not known to the laboratory and usually not known to bench analysts, so their usefulness for monitoring analytical precision at bench level is limited. For most purposes, precision is determined by the analysis of replicate pairs (i.e., two samples prepared at the laboratory from one original sample). Often in replicate analysis the sample chosen for replication does not contain target analytes so that quantification of precision is impossible. Replicate pairs of spiked samples, known as matrix spike/matrix spike duplicate samples, are used for precision studies. This has the advantage that two real positive values for a target analyte can be compared.

Precision is calculated in terms of Relative Percent Difference (RPD), which is expressed as follows:

$$RPD = \frac{(X_1 - X_2)}{(X1 + X2)/2} \times 100$$

where X_1 and X_2 represent the individual values found for the target analyte in the two replicate analyses or in the matrix spike/matrix spike duplicate analyses.

RPDs must be compared to the method RPD for the analysis. The analyst or his supervisor must investigate the cause of RPDs outside stated acceptance limits. This may include a visual inspection of the sample for non-homogeneity, analysis of check samples, etc. Follow-up action may include sample re-analysis or flagging of the data as suspect if problems cannot be resolved.

13.2 Accuracy

Accuracy of a particular analysis is measured by assessing its performance with "known" samples. These "knowns" can take the form of EPA or NBS traceable standards (usually spiked into a pure water matrix), or laboratory prepared solutions of target analytes into a pure water or sample matrix; or (in the case of GC or GC/MS analyses) solutions of surrogate compounds which can be spiked into every sample and are designed to mimic the behavior of target analytes without interfering with their determination. In each case the recovery of the analyte is measured as a percentage, corrected for analytes known to be present in the original sample if necessary, as in the case of a matrix spike analysis. For EPA or NBS supplied known solutions, this recovery is compared to the published data that accompany the solution. For prepared solutions, the recovery is compared to EPA-developed data or historical data as available. For surrogate compounds, recoveries are compared to USEPA CLP acceptable recovery tables. If recoveries do not meet required criteria, then the analytical data for the batch (or, in the case of surrogate compounds, for the individual sample) are considered potentially inaccurate.

For highly contaminated samples, recovery of matrix spike may depend on sample homogeneity. As a rule, analyses are not corrected for recovery of matrix spike or surrogate compounds.

13.3 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the total amount expected to be obtained under normal conditions. Completeness for each parameter is calculated as:

$$\text{Completeness} = \frac{\text{Number of successful analyses x 100}}{\text{Number of requested analyses}}$$

Target value for completeness for all parameters is 100%. A completeness value of 95% will be considered acceptable. Incomplete results will be reported to the client project officer.

13.4 Representativeness

The characteristic of representativeness is not quantifiable. Subjective factors to be taken into account are as follows:

- The degree of homogeneity of a site;
- The degree of homogeneity of a sample taken from one point in a site; and
- The available information on which a sampling plan is based.

To maximize representativeness of results, sampling techniques and sample locations will be carefully chosen so that they provide laboratory samples representative of the site and the specific area.

14.0 Corrective Action

Corrective actions can be initiated as a result of performance and system audits, laboratory and interfield comparison studies, data validation, and/or a QA program audit. They may also be required as a result of a request from project representatives. All corrective action necessary to resolve analytical problems will be taken. Success or failure of corrective actions will be reported with an estimate of effect on data quality, if any.

Corrective actions may include altering procedures in the field, conducting subsequent audits, or modifying project protocol. Time and type of corrective action, if needed, will depend on the severity of the problem and relative overall project importance. The project manager is responsible for initiating corrective action and the team leader is responsible for its implementation in the correction of field non-conformance corrective actions.

15.0 Quality Assurance Reports

Upon completion of a project sampling effort, analytical and QC data will be included in a Data Usability Summary Report (DUSR) that summarizes the work and provides a data evaluation. A discussion of the usability of the results in the context of QA/QC procedures will be made, as well as a summation of the QA/QC activity. The DUSR will be performed in accordance with the DEC's "Guidance for the Development of Data Usability Summary Reports," revised 1997 and DER-10.

Serious analytical problems will be reported. Time and type of corrective action, if needed, will depend on the severity of the problem and relative overall project importance. Corrective actions may include altering procedures in the field, conducting an audit, or modifying laboratory protocol. All corrective action will be implemented after notification of the project representatives.

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TABLES

TABLE 1
SAMPLE SUMMARY
Former Allegany Bitumens Belmont Asphalt Plant IRM
5392 State Route 19
Amity, NY

Sample Type	Sample Location	Sample Matrix	Analytical Parameters
Bench-Scale Testing	RAOC-1	Soil	TBD
		Groundwater	TBD
Borrow Area soil	Western Portion of Site	Soil	TBD
Confirmatory Sidewall and Bottom Sampling	RAOC-1	Soil	TCL VOCs + TICs (USEPA Method 8260B)
	RAOC-2	Soil	TCL VOCs + TICs (USEPA Method 8260B) TLC SVOCs (USEPA Method 8260B)
	RAOC-3	Soil	TCL VOCs + TICs (USEPA Method 8260B) TLC SVOCs (USEPA Method 8260B)
Soil Stockpiles for Disposal	RAOC-1	Soil	TBD
	RAOC-2	Soil	TBD
	RAOC-3	Soil	TBD
Quarterly Groundwater Sampling	BS-2R	Groundwater	TCL VOCs + TICs (USEPA Method 8260B) ERD Parameters
	BS-3	Groundwater	
	BS-4R	Groundwater	
	MW-23	Groundwater	
	MW-25	Groundwater	
	MW-27	Groundwater	
	MW-28D	Groundwater	
	MW-8	Groundwater	

Key:

ERD = Enhanced reductive dechlorination
RAOC = Remedial Areas of Concern
SVOCs = Semivolatile Organic Compounds
TBD = To be determined
TCL = Target Compound List
TICs = Tentatively Identified Compounds
USEPA = United State Environmental Protection Agency
VOCs = Volatile Organic Compounds

TABLE 2
REQUIRED SAMPLE CONTAINERS, VOLUMES, PRESERVATION, AND HOLDING TIMES
Interim Remedial Measures
Former Allegany Bitumens Belmont Asphalt Plant
Amity, New York

Media	Type of Analysis	Method	Required Container(s)	Preferred Sample Volume	Preservation	Maximum Holding Time
Soil	TCL VOCs + TICs	EPA 8260	(2) 2 oz.cwm	4 oz.	Cool 4°C	VTSR* + 10 days
	TCL SVOCs	EPA 8270	4 oz.cwm	4 oz.	Cool 4°C	VTSR* + 5 days
	Bench Scale Testing and Soil Diposal Analyses -- To Be Determined					
Water	TCL VOCs + TICs	EPA 8260	(3) 40 ml glass vials	80 ml	pH<2, HCl	VTSR* + 10 days
	Bench Scale Testing and Enhanced Reductive Dechlorination Analyses -- To Be Determined					

Notes:

*Samples have to be received by the lab within 48 hours of the first sample being taken.

Key:

cwm =clear wide mouth jar.
EPA = U.S. Environmental Protection Agency.
ml = milliliter.
SVOCs = Semivolatile organic compounds.
TCL = Target compound list.
VOCs = Volatile organic compounds.
VTSR = Verified Time of Sample Receipt at laboratory

TABLE 3
SUMMARY OF QUALITY CONTROL CHECKS
Interim Remedial Measures
Former Allegany Bitumens Belmont Asphalt Plant
Amity, New York

Type of QC Check	Frequency	Min. Number Required	Remarks
Laboratory Quality Control Guidelines			
Method Blanks	1 per sample batch	1 or 5% of batch size	Batch may include samples from other projects
Reagent/Solvent Blanks	1 per lot	1	
Standard Reference Blanks	1 per sample batch	1 or 5% of batch size	Batch may include samples from other projects
Matrix Spike Blanks	1 per sample batch	1 or 5% of batch size	Batch may include samples from other projects
Matrix Spike/Matrix Spike Duplicate	1 per 20 field samples per media	1	
Field Quality Control Guidelines			
Field Duplicates	1 per 20 field samples per media	1	Sample to be selected based on field screening
Trip Blanks	1 per shpiment for each cooler in which aqueous samples for VOC analysis are shipped	1	
Rinsate Blanks	1 per non-dedicated equipment set	1	
Laboratory Replicates	1 per batch	1	None planned but may be required to perform additional analyses on a sample

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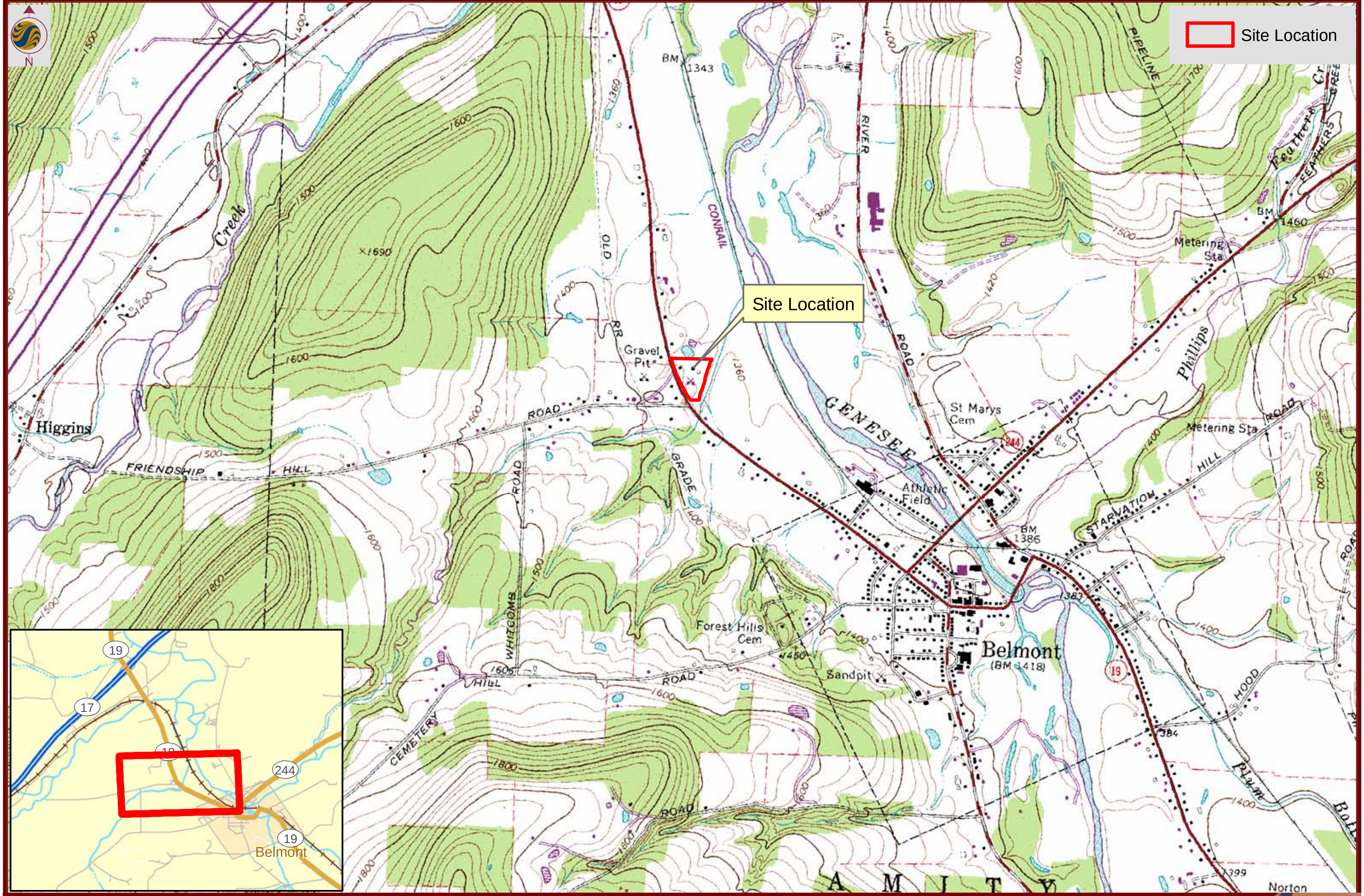
FIGURES



Geographic Information Systems
Map Source : NYSGIS Clearinghouse Web Site
Cartographic Design By: Andrew Less
June 29,2011
U:\190500593\drawing\RI Report Figures\Figure 1_Site Location Map.mxd

Stantec
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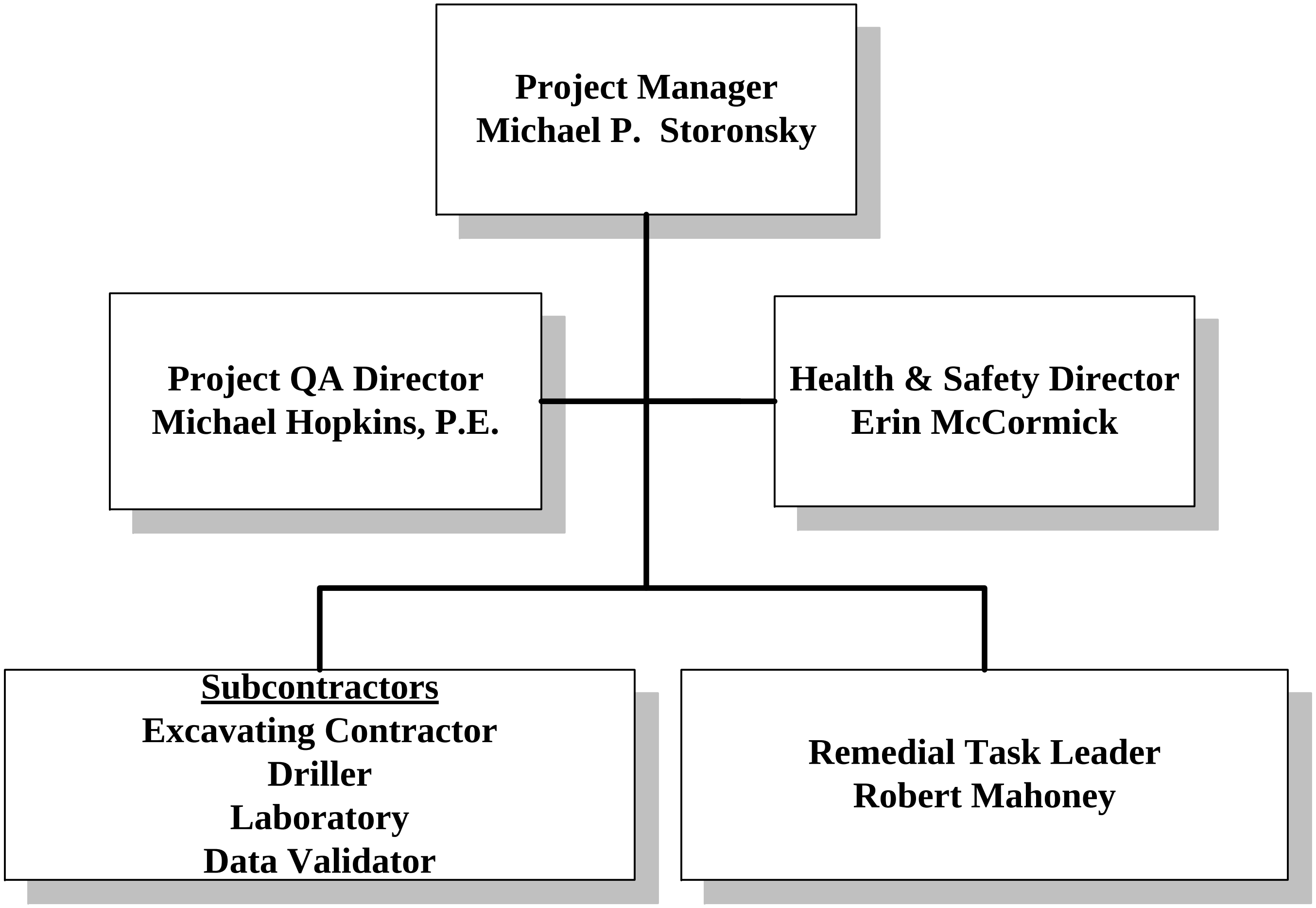
1 inch = 2,000 feet

0 1,000 2,000 4,000
Feet

Allegany Bitumens Belmont Asphalt Plant Site

FIGURE 1 : Site Location Map Showing USGS Topographic Information

FIGURE 2
PROJECT ORGANIZATIONAL CHART



IRM Work Plan
Appendix B

Health and Safety Plan

APPENDIX B

HEALTH AND SAFETY PLAN
INTERIM REMEDIAL MEASURES
FORMER ALLEGANY BITUMENS BELMONT ASPHALT PLANT
5392 STATE ROUTE 19
TOWN OF AMITY, ALLEGANY COUNTY, NEW YORK

September 2011

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1.0 INTRODUCTION

The following Health and Safety Plan (HASP) describes personal safety protection standards and procedures to be followed by Stantec staff during planned Interim Remedial Measures activities at the Former Allegany Bitumens Belmont Asphalt Plant site located in the Town of Amity, Allegany County, New York (Figure 1). This work will include:

- oversight of
  - soil excavation,
  - placement of material designed to facilitate in-situ remediation,
  - backfilling of excavations,
  - transportation off-site of excavated materials,
  - monitoring well installations; and
  - monitoring well decommissioning
- subsurface soil sampling from excavations;
- sampling of soil and groundwater for bench-scale testing; and
- groundwater sampling.

This HASP establishes mandatory safety procedures and personal protection standards pursuant to the Occupational Safety and Health Administration (OSHA) regulations 29 Code of Federal Regulations (CFR) 1910.120. The HASP applies to all Stantec personnel conducting any site work, as defined in 29 CFR 1910.120(a). All personnel involved in the mentioned activities must familiarize themselves with this HASP, comply with its requirements and have completed the required health and safety training and medical surveillance program participation pursuant to 29 CFR 1910.120 prior to beginning any work on site.

THIS HASP IS FOR THE EXPRESS USE OF STANTEC EMPLOYEES. ALL OTHER CONTRACTORS TO BE WORKING IN THE EXCLUSION AREAS ARE REQUIRED BY LAW TO DEVELOP THEIR OWN HASP, AS WELL TO MEET ALL PERTINENT ASPECTS OF OSHA REGULATIONS. STANTEC RESERVES THE RIGHT TO STOP ANY SITE WORK WHICH IS DEEMED TO POSE A HEALTH AND SAFETY THREAT TO ITS STAFF.

1.1 Background

This project is being performed as part of a Brownfield Cleanup Program. The objective of the proposed project is to implement interim remedial measures to address contamination identified during prior investigations.

Site Background

The Former Allegany Bitumens Belmont Asphalt Plant is a 4.9± acre parcel located at 5392 State Route 19 in the Town of Amity, Allegany County, New York. A hot-mix asphalt plant started operations at this location in approximately 1960. From about 1960 to 1995, Allegany Bitumens, Inc. operated the site. Allegany Bitumens was merged into Blades in 1995. Blades operated the site from 1995 till 2005, when operation at the site ceased. The operations at the asphalt plant included quality control testing at an on-site laboratory.

The subject property is currently improved with a non-operational asphalt plant, control tower, truck scale, scale house, office and laboratory building, oil storage buildings, maintenance shop and maintenance garage. A gravel-surfaced aggregate stockpile area is located south of the asphalt manufacturing plant structures. Paved parking and staging areas are provided adjacent to the asphalt plant and the laboratory and maintenance shop buildings.

Land use in the surrounding area is dominated by agricultural uses. The northern limits of the Village of Belmont are located approximately one-half mile southeast of the property. Undeveloped wooded property is located to the southwest of the property along Tucker's Creek and its small tributaries.

Phase I and II Environmental Site Assessments were performed at the site in 2009. A Remedial Investigation (RI) was performed at the site in 2010-2011. These investigations revealed the presence of volatile organic compounds (VOCs) in soil and groundwater at levels exceeding applicable NYSDEC cleanup objectives and standards or guidance values.

1.2 Site-Specific Chemicals of Concern

VOCs

The primary volatile compounds of concern that are documented to be present in the soil and groundwater at the Former Allegany Bitumens Belmont Asphalt Plant Site are listed in Table 1. Material Safety Data Sheets (MSDSs) for these compounds are presented in Appendix A. The air monitoring action levels will be based on one-half of the current Threshold Limit Valve (TLV) or Permissible Exposure Limit (PEL) for 1,1-dichloroethene (1,1-DCE) with a margin of safety built into the action levels to account for the non-specificity of the field monitoring instruments. Exposure limits for less hazardous compounds will be satisfied by meeting the more stringent exposure limits for 1,1-DCE. Table 1 summarizes health and safety data for the volatile compounds of primary concern.

PAHs in Asphalt

The past use of the site for storage and production of asphalt products indicate it is likely that polycyclic aromatic hydrocarbons (PAHs), which are semi-volatile organic compounds that are components of asphalt, may be present in soil, sediment, groundwater or surface water. Because the potential for encountering liquid asphalt at the site is low, and because the solubility of PAHs in water is low, the primary risk for exposure to PAHs at the site is likely to be from ingestion or inhalation of soil particles contaminated with PAHs.

The Department of Health and Human Services (DHHS) has determined that some PAHs may be carcinogens. Some people who have breathed or touched mixtures of PAHs and other chemicals for long periods of time have developed cancer. Some PAHs have caused cancer in laboratory animals when they breathed air containing them (lung cancer), ingested them in food (stomach cancer), or had them applied to their skin (skin cancer).

The Occupational Safety and Health Administration (OSHA) has set a limit of 0.2 milligrams of PAHs per cubic meter of air (0.2 mg/m3). Therefore, adherence to the provisions specified in the Community Air Monitoring Plan for the project (CAMP, Appendix C of the RI Work Plan to which this HASP is attached) for monitoring and suppression of fugitive dust during drilling, test pitting, and other intrusive sampling or interim remedial activities, with the conservative action level of 150 micrograms per cubic meter for airborne dust, will achieve compliance with exposure limits for PAHs.

Table 1
Health and Safety Data for Volatile Contaminants of Concern

Compound	PEL/ TWA	Physical Description	Odor Threshold	Route of Exposure	Symptoms	Target Organs
1,1-Dichloroethane (1,1-DCA)	100 ppm	Colorless, oily liquid with a chloroform-like odor.	255 ppm	inhalation, ingestion, skin and/or eye contact	irritation skin; central nervous system depression; liver, kidney, lung damage	Skin, liver, kidneys, lungs, central nervous system
1,1-Dichloroethene (1,1-DCE)	1 ppm	Colorless liquid or gas (above 89°F) with a mild, sweet, chloroform-like odor.	35.5 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	irritation eyes, skin, throat; dizziness, headache, nausea, dyspnea (breathing difficulty); liver, kidney disturbance; pneumonitis; [potential occupational carcinogen]	Eyes, skin, respiratory system, central nervous system, liver, kidneys
cis- 1,2-Dichloroethene (cis-1,2-DCE)	200 ppm	Colorless liquid (usually a mixture of the cis & trans isomers) with a slightly acrid, chloroform-like odor.	19.1 ppm	inhalation, ingestion, skin and/or eye contact	Irritation eyes, respiratory system; central nervous system depression	Eyes, respiratory system, central nervous system
Tetrachloroethene (PCE)	100 ppm	Colorless liquid with a mild chloroform-like odor.	6.17 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination; headache, drowsiness; skin erythema (skin redness); liver damage; [potential occupational carcinogen]	Eyes, skin, respiratory system, liver, kidneys, central nervous system
1,1,1-trichloroethane (1,1,1-TCA)	350 ppm	Colorless liquid with a mild, chloroform-like odor.	22.4 ppm	inhalation, ingestion, skin and/or eye contact	irritation eyes, skin; headache, lassitude (weakness, exhaustion), central nervous system depression, poor equilibrium; dermatitis; cardiac arrhythmias; liver damage	Eyes, skin, central nervous system, cardiovascular system, liver
Trichloroethylene (TCE)	100 ppm	Colorless liquid with a chloroform-like odor.	1.36 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen]	Eyes, skin, respiratory system, heart, liver, kidneys, central nervous system

Notes:

PEL	-	permissible exposure limits
TWA	-	time weighted average, 8-hour workday
mg/m^3	-	milligrams per cubic meter.
ppm	-	parts per million, in air

2.0 STANTEC PERSONNEL ORGANIZATION

The following Stantec personnel will be involved in health and safety operations at the Former Allegany Bitumens Belmont Asphalt Plant Site:

2.1 Project Manager

Mr. Michael Storonsky, Senior Associate, is the Project Manager. Mr. Storonsky is responsible for ensuring that all Stantec procedures and methods are carried out, and that all Stantec personnel abide by the provisions of this Health and Safety Plan.

2.2 Site Safety Officer/Field Team Leader

The field team leader (FTL) and Site Safety Officer (SSO) will report directly to the Project Manager and will be responsible for the implementation of this HASP as well as daily calibration of Stantec's safety monitoring instruments. The FTL/SSO will keep a log book of all calibration data and instrument readings for the Site. The FTL/SSO will be determined at the time when the field work is scheduled.

2.3 Health and Safety Coordinator

Ms. Erin McCormick will be the Health and Safety Coordinator. Ms. McCormick will be responsible for overall coordination of Health and Safety issues on the project.

2.4 Daily Meetings

All Stantec personnel and contractors working within the exclusion zone will be required to read this document and sign off on the daily safety meeting form presented in Appendix B.

3.0 MEDICAL SURVEILLANCE REQUIREMENTS

3.1 Introduction

A. Hazardous waste site workers can often experience high levels of physical and chemical stress. Their daily tasks may expose them to toxic chemicals, physical hazards, biologic hazards, or radiation. They may develop heat stress while wearing protective equipment or working under temperature extremes, or face life-threatening emergencies such as explosions and fires. Therefore, a medical program is essential to: assess and monitor worker's health and fitness both prior to employment and during the course of the work; provide emergency and other treatment as needed; and keep accurate records for future reference. In addition, OSHA requires a medical evaluation for employees that may be required to work on hazardous waste sites and/or wear a respirator (29 CFR Part 1910.120 and 1910.134), and certain OSHA standards include specific medical surveillance requirements (e.g., 29 CFR Part 1926.62, Part 1910.95 and Parts 1910.1001 through 1910.1045).

3.2 Medical Examinations

A. All Stantec personnel working in areas of the site where site-related contaminants may be present shall have been examined by a licensed physician as prescribed in 29 CFR Part 1910.120, and determined to be medically fit to perform their duties for work conditions which require respirators. Employees will be provided with medical examinations as outlined below:

- Pre-job physical examination
- Annually thereafter if contract duration exceeds 1 year;
- Termination of employment;
- Upon reassignment in accordance with CFR 29 Part 1910.120(e)(3)(i)(C);
- If the employee develops signs or symptoms of illness related to workplace exposures;
- If the physician determines examinations need to be conducted more often than once a year; and
- When an employee develops a lost time injury or illness during the Contract period.

B. Examinations will be performed by, or under the supervision of a licensed physician, preferably one knowledgeable in occupational medicine, and will be provided without cost to the employee, without loss of pay and at a reasonable time and place. Medical surveillance protocols and examination and test results shall be reviewed by the Occupational Physician.

4.0 ON-SITE HAZARDS

4.1 Chemical Hazards

The primary potential chemical hazards on-site are expected to be exposure to the VOCs detailed in Table 1. Material safety data sheets for the documented VOCs are presented in Appendix A.

The soil and groundwater contaminants are volatile; therefore, any activity at the site which causes physical disturbance of the soil can potentially allow the release of contaminants into the air. For volatiles, this can include release of organic vapors into the air. Such an occurrence may be recognized by noticeable chemical odors. Field personnel should be aware of the odor threshold for these chemicals and their relation to the action levels and Permissible Exposure Limits.

Symptoms of overexposure to primary compounds of concern are detailed in Table 1. To prevent exposure to these chemicals, dermal contact will be minimized by using disposable surgical gloves with work gloves (as appropriate) when handling soil, groundwater equipment or samples. Real time, breathing zone levels of total VOCs will be monitored using a portable photoionization detector (PID). If ambient levels exceed action levels, all site activities will be performed using level C personal protection until ambient concentrations dissipate. Where levels exceed 50 ppm, work will cease and the project manager will be notified immediately. Intrusive work may also be halted where required by action levels detailed in the Community Air Monitoring Plan (CAMP), Appendix D of the RI Work Plan.

In addition, depending on seasonal conditions, disturbance of the site soils may cause the particulate contaminants to become airborne as dust. Therefore, particulates will be monitored as discussed in Section 6.1 and dust-suppression methods used where appropriate as discussed in Section 6.2, or in the CAMP.

Finally, aeration of the groundwater may cause volatilization of chemicals into the air, particularly VOCs. Table 2 summarizes first aid instructions for exposure pathways for the compounds of concern.

Table 2

Exposure Pathways and First Aid Response for Contaminants of Concern

Substance	**Exposure Pathways**	**First-Aid Instructions**
VOCs listed in Table 1	Eye	irrigate immediately
	Dermal	soap wash promptly (soap flush immediately for 1,1-DCE)
	Inhalation	respiratory support
	Ingestion	medical attention immediately

4.2 Physical Hazards

Hazards typically encountered at construction sites with drilling and excavation activities will be a concern at this site. These hazards include slippery ground surfaces, holes, and operation of heavy machinery and equipment. Field team members will wear the basic safety apparel such as steel-toed shoes, hard hat and safety glasses during all appropriate activities.

Under no circumstances will Stantec personnel approach the borehole during active drilling operation. All field personnel working around the rig will be shown the location and operation of kill switches, which are to be tested daily. Stantec personnel will not enter excavations.

Multi-purpose fire extinguishers, functional and within annual inspection period, will be staged and readily accessible for use.

The use of electrical equipment in any established exclusion zones will be limited to areas verified as containing non-explosive atmospheres (<10% LEL) prior to operation, unless the equipment has been previously demonstrated or designed to be FM or UL rated as intrinsically safe. Care will be taken to avoid an ignition source while working in the presence of vapors.

The driller and excavating contractor shall make all necessary contacts with utilities and/or underground utility locator hotlines prior to drilling or excavating, and shall meet OSHA requirements for distances between the drilling rig and overhead utilities. No drilling work will be carried out where the drill rig chassis has not been stabilized and the rig is not to be moved between locations with its boom in a vertical position.

4.2.1 Noise

The use of heavy machinery/equipment and operation may result in noise exposures, which require hearing protection. Exposure to noise can result in temporary hearing losses, interference with speech communication, interference with complicated tasks or permanent hearing loss due to repeated exposure to noise.

During the investigative activities, all Stantec field team members will use hearing protection when sound levels are in excess of 90 dB TWA.

4.2.2 Heat and Cold Stress Exposure

Heat is a potential threat to the health and safety of site personnel. The Site Safety Officer under the direction of the Project Manager will determine the schedule of work and rest. These schedules will be employed as necessary so that personnel do not suffer adverse effects from heat. Table 3 summarizes exposure symptoms and first aid instructions for heat stress. Non-caffeinated, thirst replenishment liquids will be available on-site.

Cold stress is also a potential threat to the health and safety of site personnel. Symptoms of cold stress include, shivering, blanching of the extremities, numbness or burning sensations, blue, purple or gray discoloration of hands and feet, frostbite, hypothermia, and loss of consciousness. Cold stress can be prevented by acclimatizing one's self to the cold, increasing fluid intake, avoiding caffeine and alcohol, maintaining proper salt and electrolyte intake, eating a well-balanced diet, wearing proper clothing, building heated enclosures to work in, and taking regular breaks to warm up. If any of the above symptoms are encountered the person should be removed from the cold area. Depending on the severity of the cold stress, 911 should be contacted and first aid administered. No fluids should be given to an unconscious person.

Table 3
Exposure Symptoms and First Aid for Heat Exposure

Hazard	Exposure Symptoms	First-Aid Instructions
Heat Stress	Fatigue, sweating, irritability	rest; take fluids
	Dizziness, disorientation, perspiration ceases, loss of consciousness	remove from hot area, activate 911, administer first aid, no fluids to be administered to unconscious victim.

4.2.3 Roadway Hazards

Field activities are planned to take place near active roadways. Where such work zones are established, personnel shall assure that protective measures including signage, cones, and shielding through use of vehicles parked at workmen perimeter, are in place. All contractors shall be responsible for meeting signage requirements of DOT. Fluorescent safety vests shall be worn by all personnel during activities in or adjacent to roadways and driveways.

4.2.4 Electrical Work

Site work involving electrical installation or energized equipment must be performed by a qualified electrician. All electrical work will be performed in accordance with the OSHA electrical safety requirements found in 29 CFR 1926.400 through 1926.449. Workers are not permitted to work near electrical power circuits unless the worker is protected against electric shock by de-energizing and grounding the circuit or by guarding or barricading the circuit and providing proper personal protective equipment. All electrical installations must comply with NEC regulations. All electrical wiring and equipment used must be listed by a nationally recognized testing laboratory.

All electrical circuits and equipment must be grounded in accordance with the NEC regulations. The path to ground from circuits, equipment, and enclosures will be permanent and continuous. Ground fault circuit interrupters (GFCIs) are required on all 120-volt, single phase, 15- and 20-amp outlets in work areas that are not part of the permanent wiring of the building or structure. A GFCI is required when using an extension cord. GFCIs must be tested regularly with a GFCI tester.

Heavy-duty extension cords will be used; flat-type extension cords are not allowed. All extension cords must be the three-wire type, and designed for hard/extra hard usage. Electrical wire or cords passing through work areas must be protected from water and damage. Worn, frayed, or damaged cords and cables will not be used. Walkways and work spaces will be kept clear of cords and cables to prevent a tripping hazard. Extension cords and cables may not be secured with staples, hung from nails, or otherwise temporarily secured. Cords or cables passing through holes in covers, outlet boxes, etc., will be protected by bushings or fittings.

All lamps used in temporary lighting will be protected from accidental contact and breakage. Metal shell and paper-lined lamp holders are not permitted. Fixtures, lamp holders, lamps, receptacles, etc. are not permitted to have live parts. Workers must not have wet hands while plugging/unplugging energized equipment. Plugs and receptacles will be kept out of water (unless they are approved for submersion).

4.2.5 Lock-Out/Tag-Out

Before a worker sets up, services, or repairs a system where unexpected energizing (or release of stored energy) could occur and cause injury or electrocution, the circuits energizing the parts must be locked-out and tagged. Only authorized personnel will perform lock-out/tag-out procedures. All workers affected by the lock-out/tag-out will be notified prior to, and upon completion of, the lock-out/tag-out procedure.

Lock-out/tag-out devices must be capable of withstanding the environment to which they are exposed. Locks will be attached in such a way as to prevent other personnel from operating the equipment, circuit, or control, or from removing the lock unless they resort to excessive force. Tags will identify the worker who attached the device, and contain information, which warns against the hazardous condition that will result from the system's unauthorized start-up. Tags must be legible and understood by all affected workers and incidental personnel. The procedures for attaching and removing lock-out/tag-out devices include the steps outlined in the following table.

If maintenance work is required, the electrical supply to the equipment must be disconnected. Turning off the MAIN breaker using the disconnect switch will disconnect all power to the system. Once the disconnect switch has been turned off, the switch will be locked-out using the steps outlined below.

STEP	LOCK-OUT/TAG-OUT PROCEDURES
1	Disconnect the circuits and/or equipment to be worked on from all electrical energy sources.
2	Ensure that the system is completely isolated so that it cannot be operated at that shut-off point or at any other location.
3	Release stored electrical energy.
4	Block or relieve stored non-electrical energy.
5	Place a lock on each shut-off or disconnect point necessary to isolate all potential energy sources. Place the lock in such a manner that it will maintain the shut-off/disconnect in the off position.
6	Place a tag on each shut-off or disconnect point. The tag must contain a statement prohibiting the unauthorized re-start or re-connect of the energy source and the removal of the tag, and the identity of the individual performing the tag and lock-out.
7	Workers who will be working on the system must place their own lock and tag on each lock-out point.
8	A qualified person must verify the system cannot be re-started or re-connected, and de-energizing of the system has been accomplished.

Once the service or repairs have been made on the system:	
1	A qualified person will conduct an inspection of the work area, to verify that all tools, jumpers, shorts, grounds, etc., have been removed so that the system can then be safely re-energized.
2	All workers stand clear of the system.
3	Each lock and tag will be removed by the worker who attached it. If the worker has left the site, then the lock and tag may be removed by a qualified person under the following circumstances:
	a. The qualified person ensures the worker who placed the lock and tag has left the site; and
	b. The qualified person ensures the worker is aware the lock and tag has been removed before the worker resumes work on-site.

4.2.6 Ladders

One-third of worker deaths in construction result from falls. Many falls occur because ladders are not placed or used safely. Ladder use will comply with OSHA 1926.1053 through 1926.1060, including the following safety requirements.

STEP	PROPER LADDER USE PROCEDURE
1	Choose the right ladder for the task--the proper type and size, with a sufficient rating for the task.
2	Check the condition of the ladder before climbing. • Do not use a ladder with broken, loose, or cracked rails or rungs. • Do not use a ladder with oil, grease, or dirt on its rungs. • The ladder should have safety feet.
3	Place the ladder on firm footing, with a four-to-one pitch.
4	Support the ladder by: • Tying it off; • Using ladder outrigger stabilizers; or • Have another worker hold the ladder at the bottom. If another worker holds the ladder, they must: • Wear a hard hat; • Hold the ladder with both hands; • Brace the ladder with their feet; and • Not look up.
5	Keep the areas around the top and bottom of the ladder clear.
6	Extend the top of the ladder at least 36 inches (3 feet) above the landing.
7	Climb the ladder carefully - facing it - and use both hands. • Use a tool belt and hand-line to carry material to the top or bottom of the ladder. • Wear shoes in good repair with clean soles.
8	Inspect the ladder every day, prior to use, for the following problems: • Rail or rung damage • Broken feet • Rope or pulley damage • Rung lock defects or damage • Excessive dirt, oil, or grease If the ladder fails inspection, it must be removed from service and tagged with a "Do Not Use" sign.

Ladders with non-conductive side rails must be used when working near electrical conductors, equipment, or other sources. Ladders will not be used horizontally for platforms, runways, or scaffolds.

4.2.7 Hand and Power Tools

All hand and power tools will be maintained in a safe condition and in good repair. Hand and power tools will be used in accordance with 29 CFR 1926, Subpart I (1926.300 through 1926.307). Neither Stantec or its subcontractors will issue unsafe tools, and workers are not permitted to bring unsafe tools on-site. All tools will be used, inspected, and maintained in accordance with the manufacturer's instructions. Throwing tools or dropping tools to lower levels is prohibited. Hand and power tools will be inspected, tested, and determined to be in safe operating condition prior to each use. Periodic safety inspections of all tools will be conducted to assure that the tools are in good condition, all guards are in place, and the tools are being properly maintained. Any tool that fails an inspection will be immediately removed from service and tagged with a "Do Not Use" sign.

Workers using hand and power tools, who are exposed to falling, flying, abrasive, or splashing hazards will be required to wear personal protective equipment (PPE). Eye protection must always be worn when working on-site. Additional eye and face protection, such as safety goggles or face shields, may also be required when working with specific hand and power tools. Workers, when on-site, will wear hard hats. Additional hearing protection may be required when working with certain power tools. Workers using tools, which may subject their hands to an injury, such as cuts, abrasions, punctures, or burns, will wear protective gloves. Loose or frayed clothing, dangling jewelry, or loose long hair will not be worn when working with power tools.

Electric power-operated tools will be double insulated or grounded, and equipped with an on/off switch. Guards must be provided to protect the operator and other nearby workers from hazards such as in-going nip points, rotating parts, flying chips, and sparks. All reciprocating, rotating and moving parts of tools will be guarded if contact is possible. Removing machine guards is prohibited.

Abrasive wheels will only be used on equipment provided with safety guards. Safety guards must be strong enough to withstand the effect of a bursting wheel. Abrasive wheels will not be operated in excess of their rated speed. Work or tool rests will not be adjusted while the wheel is in motion. All abrasive wheels will be closely inspected and ring tested before each use, and any cracked or damaged wheels will be removed immediately and destroyed.

Circular saws must be equipped with guards that completely enclose the cutting edges and have anti-kickback devices. All planer and joiner blades must be fully guarded. The use of cracked, bent, or otherwise defective parts is prohibited. Chain saws must have an automatic chain brake or kickback device. The worker operating the chain saw will hold it with both hands during cutting operations. A chain saw must never be used to cut above the operator's shoulder height. Chain saws will not be re-fueled while running or hot. Power saws will not be left unattended.

Only qualified workers will operate pneumatic tools, powder-actuated tools, and abrasive blasting tools.

4.2.8 Manual Lifting

Back injuries are among the leading occupational injuries reported by industrial workers. Back injuries such as pulls and disc impairments can be reduced by using proper manual lifting techniques. Leg muscles are stronger than back muscles, so workers should lift with their legs and not with their back. Proper manual lifting techniques include the following steps:

STEP	PROPER MANUAL LIFTING PROCEDURE
1	Plan the lift before lifting the load. Take into consideration the weight, size, and shape of the load.
2	Preview the intended path of travel and the destination to ensure there are no tripping hazards along the path.
3	Wear heavy-duty work gloves to protect hands and fingers from rough edges, sharp corners, and metal straps. Also, keep hands away from potential pinch points between the load and other objects.
4	Get the load close to your ankles, and spread your feet apart. Keep your back straight and do not bend your back too far; instead bend at your knees.
5	Feel the weight; test it.
6	Lift the load smoothly, and let your legs do the lifting. If you must pivot, do not swing just the load; instead, move your feet and body with the load.

If the load is too heavy, then do not lift it alone. Lifting is always easier when performed with another person. Assistance should always be used when it is available.

4.2.9 Weather-Related Hazards

Weather-related hazards include the potential for heat or cold stress, electrical storms, treacherous weather-related working conditions, or limited visibility. These hazards correlate with the season in which site activities occur. Outside work will be suspended during electrical storms. In the event of other adverse weather conditions, the Site Safety Officer will determine if work can continue without endangering the health and safety of site personnel.

5.0 SITE WORK ZONES

The following work zones will be physically delineated by Stantec during the investigation activities.

5.1 Control Zones

Control boundaries will be established within the areas of site activities. Examples of boundary zones include the exclusion and decontamination zone. All boundaries will be dynamic, and will be determined by the planned activities for the day. The Field Team Leader will record the names of any visitors to the site.

5.2 Exclusion Zone

The controlled portion of the site will be delineated to identify the exclusion zone, wherein a higher level of personal protective equipment may be required for entry during intrusive activities. The limits of the exclusion zone will be designated at each work location appropriately. A decontamination zone will be located immediately outside the entrance to the exclusion zone. All personnel leaving the exclusion zone will be required to adhere to proper decontamination procedures.

A "super exclusion" zone will be established around the borehole which will not be entered by Stantec personnel at any time during any active drilling, slambar, cathead, silica sand dumping, or other related activities. The drilling contractor will be directed to stop such activity when Stantec site team members have a need to enter this zone.

5.3 Decontamination Zone

The decontamination zone will be located immediately outside the entrance to the exclusion zone on its apparent upwind side, if feasible, and will be delineated with caution tape and traffic cones as needed. This zone will contain the necessary decontamination materials for personnel decontamination. Decontamination procedures are outlined in Section 8.0 of this plan.

6.0 SITE MONITORING/ACTION LEVELS

6.1 Site Monitoring

Field activities associated with drilling, excavation, and sampling may create potentially hazardous conditions due to the migration of contaminants into the breathing zone. These substances may be in the form of mists, vapors, dusts, or fumes that can enter the body through ingestion, inhalation, absorption, and direct dermal contact. Monitoring for VOCs and particulates will be performed to ensure appropriate personal protective measures are employed during site activities.

A separate Community Air Monitoring Plan (CAMP) has also been developed (Appendix C of the Work Plan) to protect the surrounding neighborhood.

Although the concentrations of anticipated contaminants in soil/groundwater should not present an explosive hazard, explosive environments or conditions may be encountered unexpectedly during the course of this project. Monitoring for explosivity in the atmosphere will be routinely conducted during site activities as a precautionary measure to ensure site personnel are not subjected to any dangerous conditions.

The following describes the conditions that will be monitored for during the investigation activities. All background and site readings will be logged, and all instrument calibrations, etc., will be logged.

Organic Vapor Concentrations - Organic vapors will be monitored continuously in the breathing zone in the work area with a portable photoionization detector (PID), such as a miniRAE Model 2000 with a 10.2 eV lamp. The instrument will be calibrated daily or as per the manufacturer’s recommendations. PID readings will be used as the criteria for upgrading or downgrading protective equipment and for implementing additional precautions or procedures.

Split spoons or other soil sampling devices will be monitored using the PID at the time they are opened, with appropriate PPE to be used where soils exhibit measurable volatile organic compound levels.

Explosivity - Explosivity will be monitored continuously during active drilling operations. Measurements obtained from this monitoring instrument will also be used as criteria for implementation of work stoppage or site evacuation. A combination combustible gas/oxygen (CGO_2) instrument, calibrated per manufacturer's recommendations, will be used.

Particulates - Should subsurface conditions be observed to be dry, Stantec will perform particulate monitoring with a MIE PDM-3 Miniram aerosol monitor, within the work area to monitor personal exposures to particulates and to compare work area readings with downwind and upwind readings. The first readings of the day will be obtained prior to the commencement of work to obtain a daily background reading, and the instrument will be zeroed daily and calibrated to manufacturer's specifications. Readings will be recorded every 30 minutes thereafter. If the work area particulate levels exceed the background levels by more than 0.15 mg/m^3, the Contractor will be instructed to implement dust suppression measures.

6.2 Action Levels

During the course of any activity, as long as PID readings in the breathing zone are less than 5 ppm above background, Level D protection will be considered adequate. Level C protection will be required when VOC concentrations in ambient air in the work zone exceed 5 ppm total VOCs above background but remain below 50 ppm total VOCs.

If concentrations in the work zone exceed 50 ppm for a period of 5 minutes or longer, work will immediately be terminated by the Site Safety Officer. Options to allow continued drilling would then be discussed amongst all parties. Supplied-air respiratory protection is generally required for drilling to resume under these conditions. If Level B protection is not used, work may resume in Level C once monitoring concentrations have decreased below 50 ppm and conditions outlined in the CAMP are met.

If the monitoring of fugitive particulate levels within the work area exceeds 0.15 mg/m^3 above background, then the drilling Contractor will be directed to implement fugitive dust control measures which may include use of engineering controls such as water spray at the borehole.

7.0 PERSONAL PROTECTIVE EQUIPMENT

Based on an evaluation of the hazards at the site, personal protective equipment (PPE) will be required for all personnel and visitors entering the drilling exclusion zone(s). It is anticipated that all Stantec oversight work will be performed in Level D. All contractors will be responsible for selection and implementation of PPE for their personnel.

7.1 Protective Clothing/Respiratory Protection:

Protective equipment for each level of protection is as follows:

If PID readings are above 50 ppm, requiring an upgrade to Level B, site work will be halted pending review of conditions and options by Stantec and other involved parties.

When PID readings range between 5 and 50 ppm, upgrade to Level C:

<u>Level C</u>

- Full face, air purifying respirator with organic/HEPA cartridge;
- Disposable chemical resistant one-piece suit (Tyvek or Saranex, as appropriate);
- Inner and outer chemical resistant gloves;
- Hard hat;
- Steel-toed boots; and
- Disposable booties.

When PID readings range between background and 5 ppm use Level D:

<u>Level D</u>

- Safety glasses;
- Steel-toed boots;
- Protective cotton, latex or leather gloves depending on site duties;
- Hard hat; and
- Tyvek coverall (optional).

8.0 DECONTAMINATION

8.1 Personnel Decontamination

For complete decontamination, all personnel will observe the following procedures upon leaving the exclusion zone:

1. Remove outer boots and outer gloves and place in disposal drum.

2. If using a respirator, remove respirator, dispose of cartridges if necessary, and set aside for later cleaning.

3. Remove disposable chemical resistant suits and dispose of in drum.

4. Remove and dispose of inner gloves.

Decontamination solutions shall be supplied at the decontamination zone. The wash solution will consist of water and detergent such as Alconox or trisodium phosphate (TSP), and the rinse solution will consist of clean water.

Contaminated wash solutions shall be collected in drums for disposal. All other disposable health and safety equipment will be decontaminated and disposed of as non-hazardous waste.

8.2 Equipment Decontamination

If equipment is used during field activities, it will be properly washed or steam-cleaned prior to exiting the decontamination zone. Pre- or post-use rinsing using solvents will be done wearing appropriate PPE.

Monitoring instruments will be either wrapped in poly sheeting or carried by personnel not involved in handling contaminated materials, to reduce the need for decontamination. All instruments will be wet-wiped prior to removal from the work zone.

9.0 EMERGENCY PROCEDURES

The Site Safety Officer will coordinate emergency procedures and will be responsible for initiating emergency response activities. Emergency communications at the site will be conducted verbally and by means of an air or vehicle horn. All personnel will be informed of the location of the cellular telephone and horn. Three blasts on the air or vehicle horn will be used to signal distress.

9.1 List of Emergency Contacts

Ambulance: 911
Hospital: Jones Memorial Hospital, Wellsville, NY: (585) 593-1100
Fire Department: 911
Police: 911
Poison Control Center: (585) 222-1222
RG&E Utility Emergency: 911 or (800) 743-1702

9.2 Directions to Hospital

A map presenting directions to the hospital is included in the back of the document (Figure 2). The route shall be reviewed at the initial site safety meeting on site.

9.3 Accident Investigation and Reporting

A. All accidents requiring first aid, which occur incidental to activities onsite, will be investigated. The investigation format will be as follows:

- interviews with witnesses,
- pictures, if applicable, and
- necessary actions to alleviate the problem.

B. In the event that an accident or some other incident such as an explosion or exposure to toxic chemicals occurs during the course of the project, the Project Health and Safety Officer will be telephoned as soon as possible and receive a written notification within 24 hours. The report will include the following items:

- Name of injured;
- Name and title of person(s) reporting;
- Date and time of accident/incident;
- Location of accident/incident, building number, facility name;
- Brief summary of accident/incident giving pertinent details including type of operation ongoing at the time of the accident/incident;
- Cause of accident/incident;
- Casualties (fatalities, disabling injuries), hospitalizations;
- Details of any existing chemical hazard or contamination;
- Estimated property damage, if applicable;
- Nature of damage; effect on contract schedule;
- Action taken to insure safety and security; and
- Other damage or injuries sustained (public or private).

Where reportable injuries, hospitalizations or fatalities occur amongst Stantec personnel, the necessary document required by OSHA will be submitted within timeframes allowed by law.

The accident report form is illustrated in Table 4.

TABLE 4
ACCIDENT REPORT

Project_Allegany Bitumens Belmont Asphalt Plant Site__ Date of Occurrence______________________

Location __5392 State Route 19, Amity, NY, 14813__________________________________
____

Type of Occurrence: (check all that Apply)

☐Disabling Injury
☐Property Damage
☐Chemical Exposure
☐Explosion
☐Other (explain)____
____

☐Other Injury
☐Equip. Failure
☐Fire
☐Vehicle Accident

Witnesses to Accident/Injury:

________________________ __________________
________________________ __________________
________________________ __________________

Injuries:
Name of Injured ____

What was being done at the time of the accident/injury?

____
____

What corrective actions will be taken to prevent recurrence? ____________________________
____
____

SIGNATURES

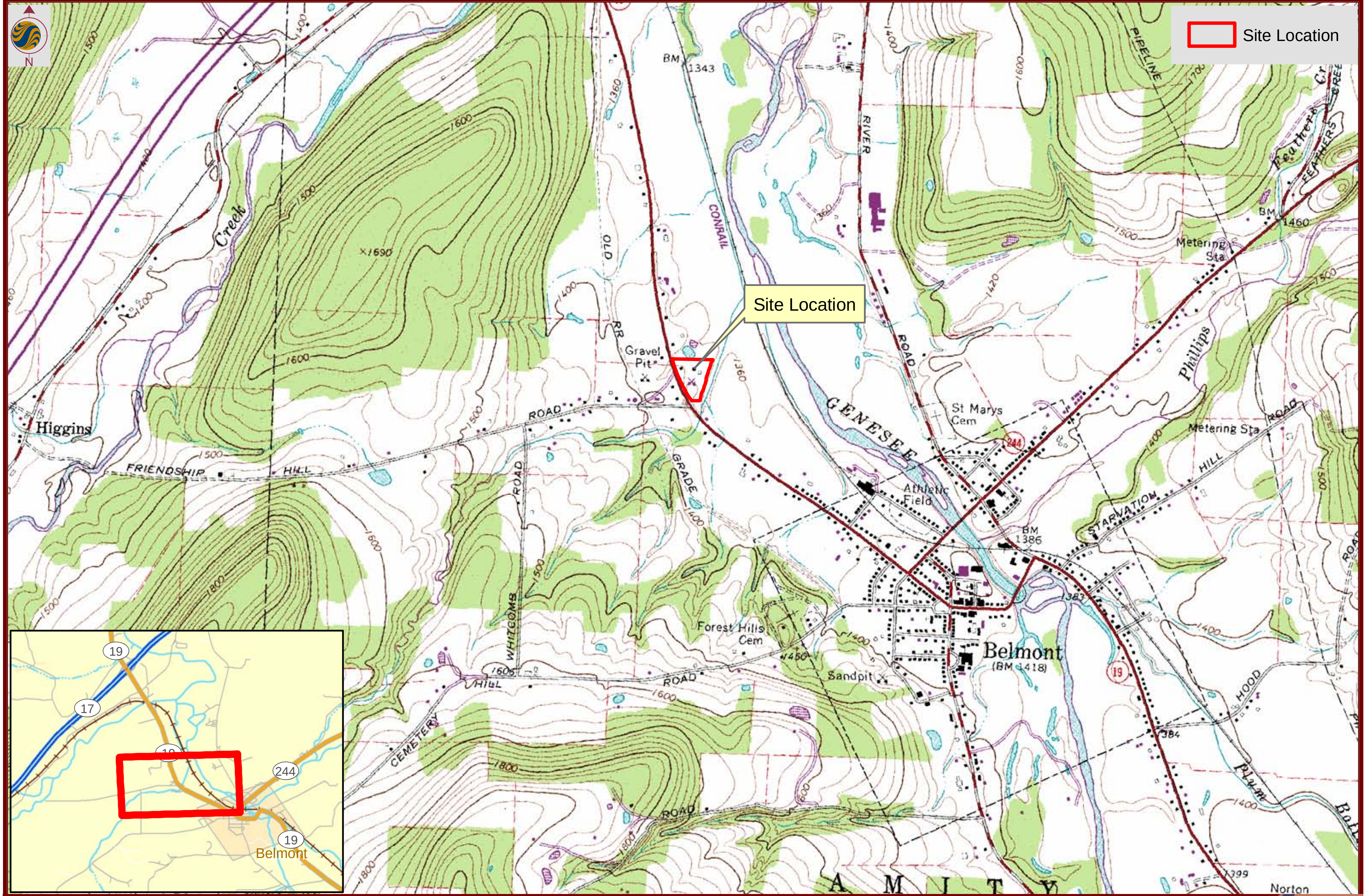
Health and Safety Officer ____________________ Date ___________________________

Project Manager __________________________ Date ___________________________

Reviewer ________________________________ Date ___________________________

Comments by reviewer ____
____
____

FIGURES



Geographic Information Systems

Map Source : NYSGIS Clearinghouse Web Site

Cartographic Design By: Andrew Less

June 29,2011
U:\190500593\drawing\RI Report Figures\Figure 1_Site Location Map.mxd

Stantec

Stantec Consulting
61 Commercial Street
Rochester, NY 14614
Phone 585.475.1440 Fax 585.272.1814
www.stantec.com

1 inch = 2,000 feet

0 1,000 2,000 4,000 Feet

Allegany Bitumens Belmont Asphalt Plant Site

FIGURE 1 : Site Location Map Showing USGS Topographic Information

FIGURE 2

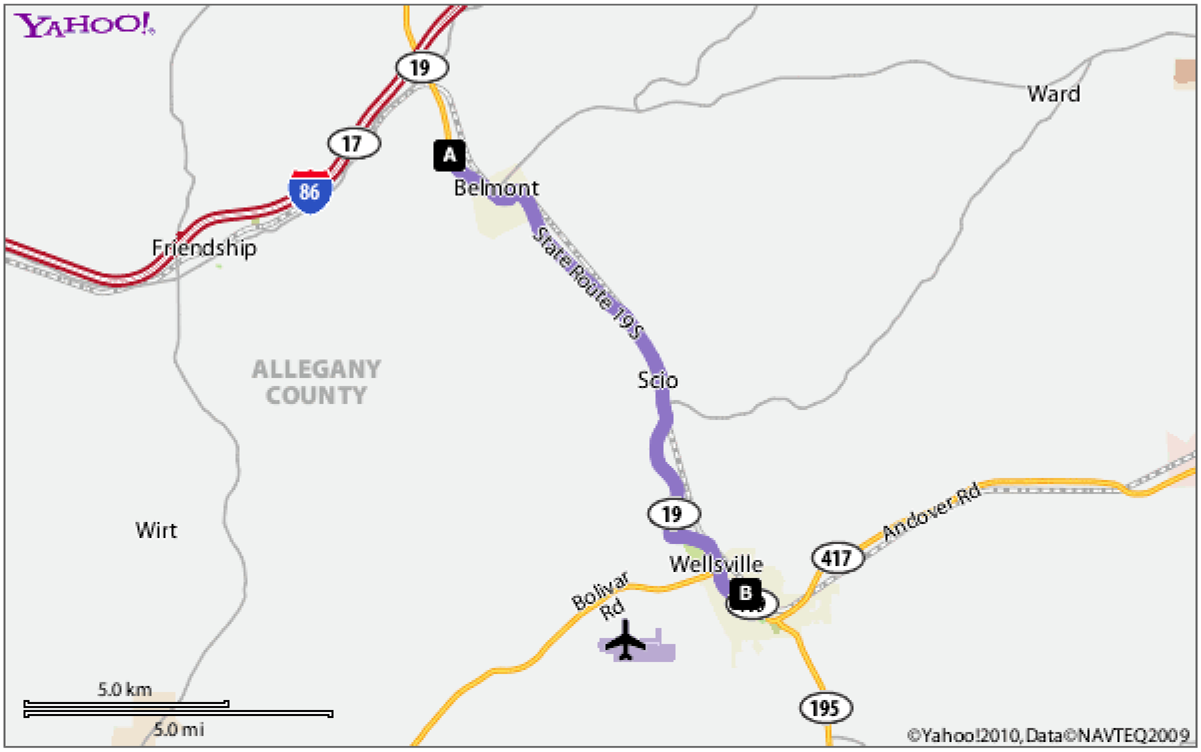
Directions and Map from the Site to Jones Memorial Hospital, Wellsville, NY

Directions to 191 N Main St, Wellsville, NY 14895-1150

Total Time: 19 mins, Total Distance: 11.03 mi

		Distance
A	1. **Start at 5392 RT-19, AMITY going toward TUCKERS CORNER RD**	go **0.74** mi
	2. Continue on **RT-19**	go **10.09** mi
	3. Turn L on **W MADISON ST**	go **75** ft
	4. Turn L on **PARK AVE**	go **0.12** mi
	5. Continue on **W PEARL ST**	go **197** ft
	6. Turn L on **N MAIN ST**	go **125** ft
B	7. **Arrive at 191 N MAIN ST, WELLSVILLE, on the** L	

Time: 19 mins, Distance: 11.03 mi



When using any driving directions or map, it's a good idea to do a reality check and make sure the road still exists, watch out for construction, and follow all traffic safety precautions. This is only to be used as an aid in planning.

Figure 2 - Directions and Map from the site to Jones Memorial Hospital, Wellsville, NY

APPENDIX A
MATERIAL SAFETY DATA SHEETS

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September 2005

NIOSH Publication Number 2005-149

Search the Pocket Guide

SEARCH

Enter search terms separated by spaces.

1,1-Dichloroethane

Synonyms & Trade Names Asymmetrical dichloroethane; Ethylidene chloride; 1,1-Ethylidene dichloride

CAS No. 75-34-3	**RTECS No.** KI0175000	**DOT ID & Guide** 2362 130
Formula $CHCl_2CH_3$	**Conversion** 1 ppm = 4.05 mg/m^3	**IDLH** 3000 ppm See: 75343

Exposure Limits

NIOSH REL : TWA 100 ppm (400 mg/m^3) See Appendix C (Chloroethanes)

OSHA PEL : TWA 100 ppm (400 mg/m^3)

Measurement Methods
NIOSH 1003 ;
OSHA 7
See: NMAM or OSHA Methods

Physical Description Colorless, oily liquid with a chloroform-like odor.

MW: 99.0	**BP:** 135°F	**FRZ:** -143°F	**Sol:** 0.6%	**VP:** 182 mmHg	**IP:** 11.06 eV
Sp.Gr: 1.18	**Fl.P:** 2°F	**UEL:** 11.4%	**LEL:** 5.4%		

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities Strong oxidizers, strong caustics

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms irritation skin; central nervous system depression; liver, kidney, lung damage

Target Organs Skin, liver, kidneys, lungs, central nervous system

Personal Protection/Sanitation (See protection codes)
Skin: Prevent skin contact
Eyes: Prevent eye contact

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap flush promptly

Wash skin: When contaminated **Remove:** When wet (flammable) **Change:** No recommendation	**Breathing:** Respiratory support **Swallow:** Medical attention immediately

Respirator Recommendations

NIOSH/OSHA

Up to 1000 ppm:
(APF = 10) Any supplied-air respirator

Up to 2500 ppm:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode

Up to 3000 ppm:
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection

See also: INTRODUCTION See ICSC CARD: 0249

Page last reviewed: February 3, 2009
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Content source: National Institute for Occupational Safety and Health (NIOSH) Education and Information Division

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Vinylidene chloride

Synonyms & Trade Names 1,1-DCE; 1,1-Dichloroethene; 1,1-Dichloroethylene; VDC; Vinylidene chloride monomer; Vinylidene dichloride

CAS No. 75-35-4	**RTECS No.** KV9275000	**DOT ID & Guide** 1303 130P (inhibited)
Formula $CH_2=CCl_2$	**Conversion**	**IDLH** Ca [N.D.] See: IDLH INDEX
Exposure Limits **NIOSH REL** : Ca See Appendix A **OSHA PEL** †: none		**Measurement Methods** **NIOSH** 1015 ; **OSHA** 19 See: NMAM or OSHA Methods

Physical Description Colorless liquid or gas (above 89°F) with a mild, sweet, chloroform-like odor.

MW: 96.9	**BP:** 89°F	**FRZ:** -189°F	**Sol:** 0.04%	**VP:** 500 mmHg	**IP:** 10.00 eV
Sp.Gr: 1.21	**Fl.P:** -2°F	**UEL:** 15.5%	**LEL:** 6.5%		

Class IA Flammable Liquid: Fl.P. below 73°F and BP below 100°F.

Incompatibilities & Reactivities Aluminum, sunlight, air, copper, heat [Note: Polymerization may occur if exposed to oxidizers, chlorosulfonic acid, nitric acid, or oleum. Inhibitors such as the monomethyl ether of hydroquinone are added to prevent polymerization.]

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, throat; dizziness, headache, nausea, dyspnea (breathing difficulty); liver, kidney disturbance; pneumonitis; [potential occupational carcinogen]

Target Organs Eyes, skin, respiratory system, central nervous system, liver, kidneys	
Cancer Site [in animals: liver & kidney tumors]	
Personal Protection/Sanitation (See protection codes) **Skin:** Prevent skin contact **Eyes:** Prevent eye contact **Wash skin:** When contaminated **Remove:** When wet (flammable) **Change:** No recommendation **Provide:** Eyewash, Quick drench	**First Aid** (See procedures) **Eye:** Irrigate immediately **Skin:** Soap flush immediately **Breathing:** Respiratory support **Swallow:** Medical attention immediately

Respirator Recommendations

NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection

See also: INTRODUCTION See ICSC CARD: 0083

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NIOSH Pocket Guide to Chemical Hazards

1,2-Dichloroethylene

ClCH=CHCl

CAS

540-59-0

RTECS

KV9360000

DOT ID & Guide

1150 130P

Synonyms & Trade Names

Acetylene dichloride, cis-Acetylene dichloride, trans-Acetylene dichloride, sym-Dichloroethylene

Exposure Limits

NIOSH REL: TWA 200 ppm (790 mg/m^3)

OSHA PEL: TWA 200 ppm (790 mg/m^3)

IDLH

1000 ppm See: 540590

Conversion

1 ppm = 3.97 mg/m^3

Physical Description

Colorless liquid (usually a mixture of the cis & trans isomers) with a slightly acrid, chloroform-like odor.

MW: 97.0
BP: 118-140°F
FRZ: -57 to -115°F
Sol: 0.4%
VP: 180-265 mmHg
IP: 9.65 eV
Sp.Gr(77°F): 1.27
Fl.P: 36-39°F
UEL: 12.8%
LEL: 5.6%

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities

Strong oxidizers, strong alkalis, potassium hydroxide, copper [Note: Usually contains inhibitors to prevent polymerization.]

Measurement Methods

NIOSH 1003; OSHA 7
See: NMAM or OSHA Methods

Personal Protection & Sanitation

(See protection)
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet (flammable)
Change: No recommendation

First Aid

(See procedures)
Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations

NIOSH/OSHA
Up to 2000 ppm:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode$^{\pounds}$
(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)$^{\pounds}$
(APF = 50) Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s)
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece
Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes

inhalation, ingestion, skin and/or eye contact

Symptoms

Irritation eyes, respiratory system; central nervous system depression

Target Organs

Eyes, respiratory system, central nervous system

See also: INTRODUCTION See ICSC CARD: 0436

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SEARCH

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Tetrachloroethylene

Synonyms & Trade Names

Perchlorethylene, Perchloroethylene, Perk, Tetrachlorethylene

CAS No.	RTECS No.	DOT ID & Guide
127-18-4	KX3850000	1897 160

Formula	Conversion	IDLH
$Cl_2C=CCl_2$	1 ppm = 6.78 mg/m^3	Ca [150 ppm] See: 127184

Exposure Limits

NIOSH REL

: Ca Minimize workplace exposure concentrations. See Appendix A

OSHA PEL

†: TWA 100 ppm
C 200 ppm (for 5 minutes in any 3-hour period), with a maximum peak of 300 ppm

Measurement Methods

NIOSH 1003 ;
OSHA 1001
See: NMAM or OSHA Methods

Physical Description

Colorless liquid with a mild, chloroform-like odor.

MW:	BP:	FRZ:	Sol:	VP:	IP:
165.8	250°F	-2°F	0.02%	14 mmHg	9.32 eV

Sp.Gr:	Fl.P:	UEL:	LEL:
1.62	NA	NA	NA

Noncombustible Liquid, but decomposes in a fire to hydrogen chloride and phosgene.

Incompatibilities & Reactivities

Strong oxidizers; chemically-active metals such as lithium, beryllium & barium; caustic soda; sodium hydroxide; potash

Exposure Routes

inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms

irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination; headache, drowsiness; skin erythema (skin redness); liver damage; [potential occupational carcinogen]

Target Organs

Eyes, skin, respiratory system, liver, kidneys, central nervous system

Cancer Site

[in animals: liver tumors]

Personal Protection/Sanitation

(See protection codes)
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: No recommendation
Provide: Eyewash, Quick drench

First Aid

(See procedures)
Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations

NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection

See also: INTRODUCTION See ICSC CARD: 0076 See MEDICAL TESTS: 0179

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Page last updated: November 18, 2010
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September 2005

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Methyl chloroform

Synonyms & Trade Names Chlorothene; 1,1,1-Trichloroethane; 1,1,1-Trichloroethane (stabilized)

CAS No. 71-55-6

RTECS No. KJ2975000

DOT ID & Guide 2831 160

Formula CH_3CCl_3

Conversion 1 ppm = 5.46 mg/m^3

IDLH 700 ppm
See: 71556

Exposure Limits

NIOSH REL : C 350 ppm (1900 mg/m^3) [15-minute] See Appendix C (Chloroethanes)
OSHA PEL †: TWA 350 ppm (1900 mg/m^3)

Measurement Methods
NIOSH 1003
See: NMAM or OSHA Methods

Physical Description Colorless liquid with a mild, chloroform-like odor.

MW: 133.4

BP: 165°F

FRZ: -23°F

Sol: 0.4%

VP: 100 mmHg

IP: 11.00 eV

Sp.Gr: 1.34

Fl.P: ?

UEL: 12.5%

LEL: 7.5%

Combustible Liquid, but burns with difficulty.

Incompatibilities & Reactivities Strong caustics; strong oxidizers; chemically-active metals such as zinc, aluminum, magnesium powders, sodium & potassium; water [Note: Reacts slowly with water to form hydrochloric acid.]

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin; headache, lassitude (weakness, exhaustion), central nervous system depression, poor equilibrium; dermatitis; cardiac arrhythmias; liver damage

Target Organs Eyes, skin, central nervous system, cardiovascular system, liver

Personal Protection/Sanitation (See protection codes)
Skin: Prevent skin contact

First Aid (See procedures)
Eye: Irrigate immediately

Eyes: Prevent eye contact **Wash skin:** When contaminated **Remove:** When wet or contaminated **Change:** No recommendation	**Skin:** Soap wash promptly **Breathing:** Respiratory support **Swallow:** Medical attention immediately

Respirator Recommendations

NIOSH/OSHA

Up to 700 ppm:
(APF = 10) Any supplied-air respirator*
(APF = 50) Any self-contained breathing apparatus with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection

See also: INTRODUCTION See ICSC CARD: 0079 See MEDICAL TESTS: 0141

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Page last updated: February 3, 2009
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NIOSH Pocket Guide to Chemical Hazards

NPG Home | Introduction | Synonyms & Trade Names | Chemical Names | CAS Numbers | RTECS Numbers | Appendices | Search

Trichloroethylene

$\mathrm{ClCH{=}CCl_2}$

CAS

79-01-6

RTECS

KX4550000

Synonyms & Trade Names

Ethylene trichloride, TCE, Trichloroethene, Trilene

DOT ID & Guide

1710 160

Exposure Limits

NIOSH REL: Ca See Appendix A See Appendix C

OSHA PEL†: TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 2 hours)

IDLH

Ca [1000 ppm] See: 79016

Conversion

1 ppm = 5.37 mg/m^3

Physical Description

Colorless liquid (unless dyed blue) with a chloroform-like odor.

MW: 131.4	BP: 189°F	FRZ: -99°F	Sol(77°F): 0.1%
VP: 58 mmHg	IP: 9.45 eV		Sp.Gr: 1.46
Fl.P: ?	UEL(77°F): 10.5%	LEL(77°F): 8%	

Combustible Liquid, but burns with difficulty.

Incompatibilities & Reactivities

Strong caustics & alkalis; chemically-active metals (such as barium, lithium, sodium, magnesium, titanium & beryllium)

Measurement Methods

NIOSH 1022, 3800; OSHA 1001

See: NMAM or OSHA Methods

Personal Protection & Sanitation

(See protection)
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: No recommendation
Provide: Eyewash, Quick drench

First Aid

(See procedures)
Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations

NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes

inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms

Irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen]

Target Organs

Eyes, skin, respiratory system, heart, liver, kidneys, central nervous system

Cancer Site

[in animals: liver & kidney cancer]

See also: INTRODUCTION See ICSC CARD: 0081 See MEDICAL TESTS: 0236

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APPENDIX B
ON-SITE SAFETY MEETING FORMS

ON-SITE SAFETY MEETING

Project: Allegany Bitumens Belmont Asphalt Plant Site
Date:______________ Time:______________ Job No.: 190500593
Address: 5392 State Route 19, Amity, NY, 14813

Scope of Work:______________________________

Weather Temp:______________ Wind direction/speed: ______________
Sky Conditions:______________ Humidity:______________
Weather Conditions affecting work: ______________

Safety Topics Discussed

Protective Clothing/Equipment: Level D (steel toe boots, hard hat with overhead hazards, etc.)

Chemical Hazards:______________

Physical Hazardous: Slip/trip/fall; weather/heat/cold; overhead hazards during drilling rig and excavator Operation; and noise during drilling

Personnel/Equipment Decontamination: Alconox solution and water rinse or high pressure wash

Personnel/Job Functions: ______________

Emergency Procedures: Emergency will be signaled verbally or with air or vehicle horn. Appropriate authorities will be contacted and after event, accident reporting procedures will be followed, as appropriate.

Special Equipment: ______________

Other: ______________

Emergency Phone Numbers/Addresses

Ambulance: 911
Hospital: Jones Memorial Hospital (585) 593-1100
Police: 911
Fire Department: 911

On-Site Safety Meeting
ATTENDEES

Name Printed	Signature	Job Function
____________	____________	____________
____________	____________	____________
____________	____________	____________
____________	____________	____________

Meeting Conducted By: ____________________ ____________________

Name Printed Signature

Site Safety Officer ____________________ ____________________

Team Leader ____________________ ____________________

IRM Work Plan
Appendix C

Community Air Monitoring Plan

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

> **Continuous monitoring** will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.
>
> **Periodic monitoring** for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

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Appendix 1B
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50^{o} C (14 to 122^{o} F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.