-FINAL-

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER BAIE VERTE ASBESTOS MINE
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

Submitted to:

Department of Natural Resources
Mineral Development Division
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EXECUTIVE SUMMARY

AMEC Earth & Environmental, a division of AMEC Americas Limited (AMEC), was retained by the Department of Natural Resources, Mineral Development Division (DNRMD), in June 2006, to conduct a Phase II Environmental Site Assessment (ESA) at the Former Baie Verte Asbestos Mine Property located off Highway 410, Baie Verte, Newfoundland and Labrador (NL), herein referred to as the Site. The assessment was requested as a follow-up to a Phase I ESA completed for the Site in March 2005. The purpose of this investigation was to collect the necessary information to confirm the presence / absence of environmental contamination as a results of concerns identified at the Site as presented in the Phase I ESA report.

For reporting purposes, the Site was divided into the following six areas:

- Area A: Northco Area;
- Area B: Mill Area;
- Area C: Dock and Warehouse Area;
- Area D: Tailings Pile;
- Area E: Waste Rock and Pit Area; and
- Area F: Marine and Freshwater Resources.

The Northco Area, encompassing the Mine Dry building, Erection and Repair (E & R) building and the Northco office building, was not assessed at the time of the Phase I ESA because it was being leased to Northco Forest Products Limited (Northco). Please note that since the completion of the Phase I ESA, the Northco lease of the property has been terminated. To assess the presence / absence of environmental concerns at the former Northco property, a Phase I ESA walkover survey was completed prior to proceeding with any Phase II ESA activities at that area of the Site. Please note that since the Northco office building remains the property of Northco, it was excluded from the current investigation.

Based on the findings of the Phase I ESA and an initial site inspection carried out by AMEC on June 23, 2006, AMEC designed and carried out a Phase II ESA sampling program at the Site that included the collection of asbestos, paint, air, soil, surface water and sediment samples for select chemical analyses. The Phase II ESA sampling program was carried out at the Site during the period of September 20 to 28, 2006.

Based on the findings of the Phase II ESA conducted at the Site by AMEC in September 2006, the following conclusions can be made with respect to the environmental status of the subject property:

- Lead and mercury containing paints were identified at the Northco Area, Mill Area and Dock and Warehouse Area;
- Lead containing paints were identified at the Tailings Area and the Waste Rock and Pit Area;

- Polychlorinated biphenyl (PCB) containing paint was identified at the Warehouse and Dock Area;
- Asbestos containing building materials (i.e. floor tiles, siding, ceiling tiles, pipe insulation, brick mortar, etc.) were identified at the Northco Area, Mill Area and Dock and Warehouse Area ;
- Concentrations of asbestos fibres detected in all air samples (indoor and outdoor) collected at the Site during the current investigation did not exceed the applicable assessment criterion of 0.1 fibres/cm^3;
- Findings of the florescent light ballast inspection were inconclusive, however, given the age of the Site buildings, it is likely that PCB containing light ballasts are present at the Site;
- Petroleum hydrocarbon impacts in soil were identified at the following locations:
  - Northco Area: Former Tank Farm;
  - Northco Area: Downgradient of the Bunker C Tank Farm;
  - Mill Area: South side of the Dry Mill;
  - Mill Area: Southwest corner of the Power Centre; and
  - Waste Rock and Pit Area: North Pit access road, approximately 200 m northwest of the Primary Crusher of the Mill Area.
- Approximately 2.0 cm free phase petroleum hydrocarbon product was observed on the water table at the Mill Area, along the south side of the Dry Mill;
- Metal impacts were detected in all soil samples analyzed during the current investigation. Most notably, concentrations of nickel and chromium detected in all soil samples analyzed exceeded the applicable assessment criteria. A few exceedances of copper, iron and arsenic were also reported under the same applicable assessment criteria. The nickel and chromium impacts in soil may be related to background geology conditions in the area;
- Concentrations of polycyclic aromatic hydrocarbons (PAHs) and PCBs in all soil samples analyzed were either non-detect or detected at levels below the applicable assessment criteria;
- Concentrations of a combination of metals detected in all six surface water samples collected from Lower Duck Island Cove Brook exceeded the applicable assessment criteria; and
- Concentrations of asbestos, and a combination of metals detected in all freshwater sediment samples collected from Lower Duck Island Cove Brook as well as marine sediment samples collected from Duck Island Cove exceeded the applicable assessment criteria. The concentration of fluoranthene detected in one of the three marine sediment samples collected at the Site also exceeded the applicable assessment criterion.

Based on the findings of the Phase II ESA, AMEC indicates the following Phase III ESA requirements for the Site at this time:

Northco Area

- Excavate six to 10 additional test pits to further delineate the vertical and horizontal extent of petroleum hydrocarbon contaminated soil identified within and downgradient of the former Tank Farm;
- Install a minimum of three boreholes/monitoring wells downgradient of the former Tank Farm to assess the presence/absence of groundwater impacts and potential free phase petroleum hydrocarbon product at this location of the Site;
- Excavate three to five additional test pits along the perimeter of the former E&R building and collect soil samples for volatile organic compound (VOC) analyses;
- In the event that the Site buildings are to be demolished and/or removed for the Site, a Hazardous Materials Assessment (HMA) should be implemented to identify any additional hazardous materials which may be present within the structures. This information can then be used to assess demolition and/or disposal options for the Site buildings (as required);
- All ASTs and USTs identified at the Site should be decommissioned in accordance with the most recent Storage and Handling of Gasoline and Associated Products Regulations; and
- In the event that the pad-mounted and pole-mounted transformers present at the Site are to be removed from the property, the dielectric fluids within the transformers must be tested for PCBs to assess transportation and disposal requirements.

Mill Area

- Excavate three to five additional test pits to further delineate the vertical and horizontal extent of petroleum hydrocarbon contaminated soil identified along the south side of the Dry Mill;
- Install a minimum of three boreholes/monitoring wells along the south side of the Dry Mill to assess the presence/absence of groundwater impacts and potential free phase petroleum hydrocarbon product at this location of the Site;
- Excavate three additional test pits to further delineate the vertical and horizontal extent of petroleum hydrocarbon contaminated soil identified at the southeast corner of the Power Centre;
- Install a minimum of three boreholes/monitoring wells along the southeast corner of the Power Centre and downgradient of the Bunker C AST (i.e. Day Tank) to assess the presence/absence of groundwater impacts and potential free phase petroleum hydrocarbon product at this location of the Site;
- In the event that the Site buildings are to be demolished and/or removed for the Site, a Hazardous Materials Assessment (HMA) should be implemented to identify any additional hazardous materials which may be present within the structures. This information can then be used to assess demolition and/or disposal options for the Site buildings (as required);
- All ASTs and USTs identified at the Site should be decommissioned in accordance with the most recent Storage and Handling of Gasoline and Associated Products Regulations; and

- In the event that the pole-mounted transformer present at the Site is to be removed from the property, the dielectric fluids within the transformer must be tested for PCBs to assess transportation and disposal requirements.

<u>Warehouse and Dock Area</u>

- In the event that the Site buildings are to be demolished and/or removed for the Site, a Hazardous Materials Assessment (HMA) should be implemented to identify any additional hazardous materials which may be present within the structures. This information can then be used to assess demolition and/or disposal options for the Site buildings (as required); and
- In the event that the pole-mounted transformer present at the Site is to be removed from the property, the dielectric fluids within the transformer must be tested for PCBs to assess transportation and disposal requirements.

<u>Waste Rock and Pit Area</u>

- Excavate three to five additional test pits to further delineate the vertical and horizontal extent of petroleum hydrocarbon contaminated soil identified along the North Pit access road; and
- Install a minimum of one borehole/monitoring well downgradient the area of stained soil identified along the North Pit access road to assess the presence/absence of groundwater impacts and potential free phase petroleum hydrocarbon product at this location of the Site.

Based testing completed at the time of the Phase II ESA, no petroleum hydrocarbon or PCB impacts were identified in the tailings presents at the Tailings Area. Therefore, no Phase III ESA activities are recommended for the Tailings Area at this time. However, it is important to note that since the tailings present at the Site are reported to contain approximately 2% asbestos fibres, additional assessment maybe required at this area in the future.

Please note that due to safety concerns (i.e. rough terrain, steep slopes, etc.) access was not gained to following areas of the Site during the Phase II ESA:

- Lower levels of the Primarily Crusher Building;
- Former pit office located on the Saddle;
- Partially buried USTs along the south wall of the West Pit;
- Area along the toe of the waste rock pile containing discarded tires, equipment and drums; and
- Area of the waste rock pile at which a potential discarded transformer was observed.

Enhanced safety protocols, including but not limited to confined space entry, fall arrest and evaluation of alternative access routes and sampling techniques, should be implemented at the Site to safely assess the presence/absence of environmental contamination at these areas of the Site (if possible).

SECTION 1.0

INTRODUCTION

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APPENDICES

1.0 INTRODUCTION

AMEC Earth & Environmental, a division of AMEC Americas Limited (AMEC), was retained by the Department of Natural Resources, Mineral Development Division (DNRMD), in June 2006, to conduct a Phase II Environmental Site Assessment (ESA) at the Former Baie Verte Asbestos Mine Property located off Highway 410, Baie Verte, Newfoundland and Labrador (NL), herein referred to as the Site (refer to Figures 1.1 and 1.2, Appendix A-1). The assessment was requested as a follow-up to a Phase I ESA completed for the Site in March 2005.

The purpose of this investigation was to collect the necessary information to confirm the presence / absence of environmental contamination as a result of concerns identified at the Site as presented in the Phase I ESA report. Also, since the completion of the Phase I ESA, the Northco Forest Products Limited (Northco) 20-year lease of the property encompassing the Mine Dry building, Erection and Repair (E & R) building and the Northco office building has been terminated. To assess the presence / absence of environmental concerns at the former Northco property, a Phase I ESA walkover survey was completed by AMEC prior to proceeding with any Phase II ESA activities at that area of the Site. Please note that since the Northco office building remains the property of Northco, it was excluded from the current investigation. Also, since the ground surfaces of the property were snow covered at the time of the Phase I ESA, a site walkover of the entire Site was also carried out prior to the completion of any Phase II ESA activities.

For reporting purposes, the Site was divided into the following six areas:

- Area A: Northco Area;
- Area B: Mill Area;
- Area C: Dock and Warehouse;
- Area D: Tailings Pile;
- Area E: Waste Rock and Pit Area; and
- Area F: Marine and Freshwater Resources.

1.1 SITE DESCRIPTION

As indicated above, all six areas of the Site were assessed during the current investigation. A general description of each of these areas is presented in this section.

1.1.1 Area A: Northco

This area of the Site is located directly west of the Mill Area and was most recently the location of a saw mill operation owned and operated by Northco. Structures present at the Site include the former Mine Dry building, Erection and Repair (E & R) building and Northco office building (refer to Figure 1.3, Appendix A-1 and Photos 1 to 3, Appendix B-1). Other features present at the Site include a former Tank Farm, fire hydrant, several pole-mounted transformers and a former equipment refuelling station (refer to Figure 1.3, Appendix A-1). Please note that since the office building remains the property of Northco, it was excluded from the current investigation.

The Mine Dry building was historically used for general office administration and for workers of the mine to change and shower before leaving the Site. The E&R building was historically used as a mechanical garage and machine shop for the maintenance and repairs to mining equipment. Most recently, the E&R building was used for saw milling operations and maintenance and repairs to forestry type equipment.

1.1.2 Area B: Mill Area

The Mill Area contains all Site buildings and infrastructure formerly used during the processing of asbestos product at the Site. Buildings present at this area of the Site include the primary crusher, secondary crusher, power centre, dry rock storage facility, dry mill and wet mill (refer to Figure 1.4, Appendix A-1 and Photos 4 to 7, Appendix B-1). Brief descriptions of each of these buildings are presented below:

- **Primary Crusher**: This facility was formerly used in the primary crushing of crude asbestos ore, the first stage of processing asbestos fibre at the Site. The building measures approximately 15 m x 35 m. It is six storeys high and extends another five or six storeys underground. The structure is constructed of a metal frame with corrugated asbestos sheeting walls on a poured concrete foundation. The interior walls consist of asbestos sheeting, concrete cinder blocks and wood. The roof is constructed of galvanized metal.
- **Secondary Crusher**: This facility was formerly used to dry and further crush the ore after it was processed at the primary crusher. The building measures approximately 60 m x 70 m and at it highest point, is approximately 10 storeys high. The structure is constructed of a metal frame with corrugated metal and asbestos sheeting walls on a poured concrete foundation. The interior walls consist of metal and asbestos sheeting, concrete cinder blocks and wood. The roof is constructed of galvanized metal.
- **Power Centre**: This facility is attached to the northwest corner of the secondary crusher. The building measures approximately 10 m x 20 m and is approximately two storeys high. The structure is constructed of a metal frame with corrugated asbestos sheeting walls on a poured concrete foundation. The interior walls consist of asbestos sheeting, concrete cinder blocks and wood. The roof is constructed of galvanized metal. No floor drains were observed throughout the building. A network of utility towers is located directly south and adjacent to the facility.
- **Dry Rock Storage Facility**: This facility was formerly used as a storage facility for ore crushed at the secondary crusher. The mill used ore stored at the facility during times when the crushers were shutdown for maintenance or repairs. The facility consists of two separate buildings, the furnace/blower building and the dry rock storage building:
  - The furnace/blower building measures approximately 10 m x 15 m and is approximately

five storeys high. The structure is constructed of a metal frame with corrugated metal sheeting walls on a poured concrete foundation. The interior walls consist of metal sheeting and concrete cinder blocks. The roof is constructed of galvanized metal.

- The dry rock storage building measures approximately 15 m x 40 m and is approximately five storeys high. The structure is constructed of a metal frame with corrugated asbestos and metal sheeting walls. Due to the poor structural condition of the building and the large volume of crushed ore (asbestos) stored within the facility, field personnel were not able to enter the building at the time of the Site inspection.

- **Dry Mill**: This facility was formerly used to remove the asbestos fibres from the ore after it was processed at the secondary crusher. The building measures approximately 50 m x 60 m and is approximately twelve storeys high. The structure is constructed of a metal frame with corrugated asbestos sheeting walls on a poured concrete foundation. The interior walls consist of asbestos sheeting, concrete cinder blocks and wood. The roof is constructed of galvanized metal.
- **Wet Mill**: This facility is the newest facility at the Site, constructed in the early 1990s. During the wet milling process, asbestos fibre was recovered from the mill tailings stockpile as a water-borne slurry. The building measures approximately 30 m x 70 m and at it highest point, is approximately five storeys high. The structure is constructed of a metal frame with corrugated metal sheeting walls on a poured concrete foundation. The interior walls consist of metal sheeting and concrete cinder blocks. The roof is constructed of aluminum metal.

1.1.3 Area C: Dock and Warehouse

The Dock and Warehouse Area is located along the shoreline of Duck Island Cove, approximately 2.3 km east of the Mill Area (refer to Figures 1.2 and 1.5, Appendix A-1).

The dock is currently in a state of disrepair and no longer in use (refer to Photo 8, Appendix B-1). Historically, the dock provided two berths for marine vessels, one 70 m in length and the other at 150 m in length. The dock itself is constructed of sheet metal piling (20 m deep) and is rock filled. The top of the apron is located approximately 4 m above the low-water level and is topped with concrete, which served as the loading platform.

The warehouse is located approximately 10 m from the edge of the dock (refer Photo 9, Appendix B-1). The structure measures approximately 96 m x 98 m and has a height clearance of approximately 7 m. It had a storage capacity of 26,000 tonnes of asbestos product. The warehouse was used to store finished asbestos product before delivery to market. The building is currently vacant with some asbestos product still remaining inside.

Another small building and two large propane ASTs were observed at the northwest corner of the dock (refer to Figure 5, Appendix A-1 and Photo 10, Appendix B-1). Reportedly, this building was formerly used as a lunchroom facility and the propane tanks were used to heat Bunker C fuel, previously stored in a large AST at the Site (refer Figure 1.5, Appendix A-1). The AST has been removed from the Site.

1.1.4 Area D: Tailings Pile

The Tailings Pile, located southeast of the Mill Area, is estimated to contain over 40 million tonnes of tailings and contain approximately 2.2% asbestos fibre (refer to Figure 1.6, Appendix A-1 and Photo 11, Appendix B-1). This material was deposited at the Site between the early 1960s and the late 1980s. At the time of the Site inspection, a large slump was observed on the eastern slope of the tailings pile (refer to Figure 1.6, Appendix A-1 and Photo 12, Appendix B-1). It appears that this slump was a result of surface run-off and/or the presence of a stream flowing underneath the Tailings Pile.

Two buildings (i.e. Conveyor House and Grease Shack) were identified at the Tailings Pile area of the Site during the current investigation (refer Figure 1.6, Appendix A-1 and Photos 13 and 14, Appendix B-1). Also, a vast network of conveyors and transfer stations was observed throughout the tailings piles.

1.1.5 Area E: Waste Rock and Pit Area

There are three large stockpiles of waste rock present at the Site (refer Figure 1.7, Appendix A-1) containing approximately 190 million tonnes of material. The largest of the three waste rock stockpiles is located northeast of the north pit. The smallest is located between the west pit and Steam Bath Pond. The other stockpile is located northwest of the north pit and is bounded to the west by the Fleur de Lys Highway. These stockpiles consist of waste rock (i.e. overburden) that was removed from the pits while mining the ore for use in the production of asbestos (refer Photo 15, Appendix B-1).

There are two open mining pits present at the Site: North Pit and West Pit. The two pits are located side-by-side and are separated by a body of waste rock designated as the “saddle area” (refer to Figure 1.7, Appendix A-1). The saddle has a thickness of approximately 45 m and consists of compacted mine rejects over the underlying bedrock. At the time of the Site inspection, both pits were partially filled with water (refer to Photo 16, Appendix B-1).

1.1.6 Area F: Marine and Freshwater Resources

Marine resources present at the Site are limited to marine environment of Duck Island Cove, located along the eastern boundary of the Site (refer Figure 1.2, Appendix A-1). Reportedly, during operation of the mine, vessel activity was frequent within the harbour, both for the export asbestos product and delivery of Bunker C fuel and other materials to the Site.

Freshwater resources present at the Site include Steam Bath Pond, Lower Duck Island Cove Brook and Upper Duck Island Cove Brook (refer Figure1. 2, Appendix A-1). Steam Bath Pond is located near the entrance to the Site, at the southwest corner of the property. Lower Duck Island Cove Brook extends from Steam Bath Pond, through the Site and discharges into the waters of Duck Island Cove. Upper Duck Island Cove Brook travels just north of the waste rock piles and discharges into Duck Island Cove.

1.2 BACKGROUND INFORMATION

Large-scale mining operations were conducted at the Site from 1962 until its closure in 1994. The production of asbestos fibre at the Site was initially achieved using a dry-milling process and subsequently accomplished using a wet-milling process. Over 49 million tonnes of ore were processed through the dry mill between 1963 and 1991 to produce 1.6 million tonnes of asbestos fibre. The operation produced approximately 190 million tonnes of waste rock and 47 million tonnes of tailings. The wet mill operated intermittently over a five-year period between 1990 and 1994 at a peak performance of some 30,000 tonnes of fibre per year. The following bullets present a summary of history of mining at the Site.

- **Advocate Mines Limited**: In August 1955, prospectors George McNaughton and Norman Peters discovered the asbestos deposit at the property. In December of that year, Advocate Mines Limited assumed control of the property. After a detailed examination of the Site was completed in 1959, a small test plant was constructed and a bulk sample of 5,000 tonnes of ore was processed. In September 1960, the decision was made to bring the property into production. On June 30, 1963, the first ore was processed through the mill. In 1981, Advocate Mines Limited ceased mining because of reported financial difficulties and lack of markets. After provincial and federal government intervention and assistance, the property was assigned to Transpacific Asbestos Incorporated.

- **Baie Verte Mines Incorporated**: After taking control of the property, Baie Verte Mines Incorporated was formed as a subsidiary of Transpacific Asbestos Incorporated and the mine was reopened in September 1982. In August 1987, Transpacific Asbestos Incorporated sold Baie Verte Mines Incorporated to Mineral Commodities Limited of Australia. In January 1989, Cliff Resources, a Toronto-based company, bought Baie Verte Incorporated. Subsequently, on February 4, 1991, the mine was closed due to frequent equipment failure and a lack of financial flexibility.

- **Baie Verte Mines Reprocessing Incorporated**: In November 1988, construction began on the wet-milling facility with the assistance of the Atlantic Canada Opportunities Agency (ACOA). Baie Verte Mines Reprocessing Incorporated, with Cliff Resources as the parent company, started up the wet-mill process in May 1990. In August 1990, Baie Verte Mines Reprocessing Incorporated defaulted on a bank loan and the operation was placed into receivership in July 1990. The plant ran uneconomically from July 1990 to December 1990, operated by the receiver who subsequently put the assets up for sale.

- **Terranov Mining Corporation**: Terranov Mining Corporation, a subsidiary of Princeton Mining Corporation, was created for the purpose of purchasing the wet-milling process. It acquired the assets of Baie Verte Mines Reprocessing Incorporated in July 1991 and commenced production in August 1991. The company operated until December 1991 when it was closed for the winter months due to the freezing of the tailings. The plant operated for approximately eight months in 1992 and seven months in 1993. During October 1992, a limited number of modifications in the plant led to a significant improvement in the quality of the fibre recovered. Black Hills Minerals Limited purchased 50% of Terranov Mining Corporation in December 1993, with Cliff Resources Corporation acquiring the remaining

50% interest in May 1994. In November 1994, the plant closed for the winter months but failed to re-open in 1995 due to financial difficulties and has remained closed since.

- **Mineral Rights**: On November 1, 1996, six months after the termination of the Surface Lease, the Site became the property of the Crown, pursuant to Section 36(2) of the Mineral Act and the responsibility for the management of the Site and assets was assigned to the NL Department of Mines and Energy. In 1998, the Department invited proposals for the mineral or industrial development of all or part of the property. In May 1998, mineral rights were awarded to Canadian Magnesium Corporation (CMC) to investigate the possibility of recovering magnesium from the tailings. CMC did not seek renewal of its extended mineral license after its analysis indicated that it was not cost effective to recover magnesium from the tailings at Baie Verte. The mineral rights, for a portion of the area, was then obtained by British Canadian Mines Limited under License 9821M, but has since expired. Mineral Rights to the tailing area belong to George Walsh under Mineral License 010466M.

1.2.1 Findings of Phase I ESA - March 2005

The Phase I ESA completed for the Site revealed the following potential environmental concerns at the Site:

- **Asbestos**: Potential asbestos containing materials (ACMs) observed at the Site include building materials (i.e. asbestos sheeting, pipe insulation, brick mortar, etc.), finished asbestos product, partially processed asbestos containing materials within processing equipment, stockpiled materials, etc. Due to nature and poor condition of these materials, they have been considered to be a potential source of airborne asbestos fibres at the Site. In the absence of evidence to the contrary, it is likely that airborne asbestos fibres are present at the Site.
- **Fuel Handling and Storage**: Bunker C fuel was delivered to the Site by marine vessels and other types of fuel (i.e. diesel, gasoline, heating oil and propane) were delivered to the Site by tanker trucks. Several aboveground storage tanks (ASTs) and one underground storage tank (UST) was observed at the Site. Additional ASTs and USTs were reported to have been historically present at the Site (i.e. equipment refueling stations). Consideration should be given to the potential for surface and subsurface contamination as a result of previous fuel handling and storage practices at the Site, especially at the former locations of equipment refueling stations and pit office areas.
- **Spills and Leaks**: Results of the regulatory search revealed three incidents of fuel spills at the Site, all at the dock site. Discussions with former employees of the mine revealed that occurrences of diesel fuel spills were frequent at the Site. Diesel fuel was spilled from fuel tanks of damaged equipment and during the refueling the haul trucks, loaders, tractors, drills, etc. A moderate hydrocarbon odour was observed in the ground floor washroom facility of the dry mill. This may potentially be a result of former fuel spills at the Site. Consideration should be given to the potential presence of surface, subsurface and marine sediment impacts as a result of historical fuel spills and leaks at the Site.

- **Chemical Use, Handling and Storage**: Several hundred 200 L (45-gallon) drums, of unknown product, were observed inside the mill buildings at the time of the Site inspection. It is likely that these drums were used to store hydraulic and other fluids used by various types of machinery at the mine. Labels were not visible on the drums.

- **Potential Lead, Mercury and PCB Containing Paints**: The exterior walls and interior walls of most Site buildings contained painted surfaces. Based on the reported date of construction of the Site buildings (i.e. 1960s), with the exception of the wet mill (constructed in the late 1980s and early 1990s), lead, mercury and PCB containing paints may potentially be present at the Site.

- **Transformers**: Insulating fluids and cooling oils in transformers often contained PCBs until around 1980. A total of five transformers were observed at the Site at the time of the Site inspection. Three of the five transformers were previously sampled and analyzed to PCBs. Results provided by the NLDOEC revealed that the concentrations of PCB in the three transfers sampled were below the applicable criterion of 50 ppm. Several locations at which transformers may have historically existed at the Site were also observed (i.e. south of power centre and dry mill, tailings conveyor system, north of west pit, and etc.).

- **Fluorescent Light Fixtures**: Insulating fluids and cooling oils in fluorescent light ballasts often contained PCBs until around 1980. Florescent lights were observed inside the primary crusher, secondary crusher, power centre, dry mill, tailings buildings and dock warehouse. Also, high intensity lights were observed on the exterior of the tailings buildings and dock warehouse. Based on the reported date of construction of the Site buildings (i.e. 1960s), the light ballasts and high intensity lights at the Site may contain PCBs.

- **PCB Storage Facility**: From 1995 to 1999, the power centre was used to store a variety of PCB contaminated items associated with the operation of the Site. From 1999 to late 2000, several transformers located throughout the Site were drained of fluid and prepared for off-Site disposal. Several of these transformers were temporality stored inside the power centre on individual steel trays. Consideration should be given to the potential presence of surface and subsurface impacts as a result of historical PCB containing equipment inside the power centre.

- **Potential Mercury Containing Equipment**: Minor amounts of mercury are commonly found in a variety of building materials including mercury vapour lamps, thermostats and other electrical control switches. The potential exists for mercury to be present within the processing equipment at the Site (i.e. electrical control switches, gauges, and etc.). Consideration should be given to the potential presence of mercury containing equipment at the Site.

- **Radioactive Materials**: At the time of the Site inspection, field personnel observed a Texas Nuclear (Model 5201) Density Gauge on the first floor of the wet mill building. This radioactive device is known to contain Cesium-137. In 1998, the “source housing” portion of the density gauge was removed the wet mill and transported to a license disposal company. No other potential radioactive devices were observed at the Site during the Site inspection, however, other radioactive devices may be present at the Site.

- **Waste Disposal Sites**: Based on discussions with former employees of the mine, all solid waste generated at the Site was landfilled at the Site. It was reported that waste generated at the facility was limited to metal debris, plastics, wood and typical domestic waste. The waste was collected by a garbage truck, dumped into a pit and covered with waste rock. It was reported that the location of the waste disposal sites varied over time.
- **Septic Discharge Fields**: Based on discussions with former employees of the mine, it was reported that the washroom facilities at the Site were connected to septic systems. The number and location of abandoned septic discharge fields at the Site is not known at this time.
- **Air Quality**: Field personnel inspected the interior areas of the Site buildings for air quality issues. There is a high potential for airborne asbestos fibres within the Site buildings. There is also a potential for elevated levels of lead, mercury and PCBs in the air due to the potential presence of lead, mercury and PCB containing paints at the Site. The majority of the painted surfaces within the Site buildings are in poor condition and considered to be a potential source of airborne dust and particles.
- **Freshwater Resources**: Freshwater resources observed at the Site include Steam Bath Pond, Upper Duck Island Cove Brook and Lower Duck Island Cove Brook. It is likely that the waters and sediments of Lower Duck Island Brook have been impacted with asbestos containing materials.
- **Marine Sediment**: It is typical to find certain amounts of debris and other contaminants, such as hydrocarbons (diesel, gasoline, etc.) in sediments around vessel berthage Sites. These impacts are a result of various activities associated with berthage Sites, but not limited to indiscriminate dumping, accidental spills during refueling and general usage waste. Tailings from the tailings pile are continuously being eroded into the waters of Lower Duck Island Cove Brook. A large amount of tailings and sediment was observed at the mouth of the brook, where it enters the waters of Duck Island Cove. It is likely that the harbour sediments are contaminated with asbestos containing materials.

Based on the findings of the Phase I ESA, AMEC recommended that a Phase II ESA be carried out to assess the presence/absence of environmental contamination at the Site. Recommended further actions included the following:

- Paint Sampling Program;
- Asbestos Sampling Program;
- Soil Sampling Program;
- Surface Water Sampling Program;
- Sediment Sampling Program;
- Air Sampling program; and
- Inspection of Potential PCB Containing Equipment.

1.3 OBJECTIVES

The specific objectives of this report, as identified in the Request for Proposals (RFP) dated May 2006, include the following:

- Perform the necessary Phase I ESA activities at the former Northco property that was excluded from the previous Phase I ESA completed for the Site in March 2005;
- Conduct an initial site inspection to verify surface conditions that could not be examined during the previous Phase I ESA due to snow cover;
- Develop and implement a detailed Phase II ESA sampling program to confirm the presence / absence of contamination present at the Site;
- Prepare a final list of petroleum storage tanks, in the area to be assessed, to be removed under a separate contract as per the 2003 Storage and Handling of Gasoline and Associated Products Regulations; and
- Provide a detailed report outlining the methodologies, findings, conclusions and recommendations of the investigation.

The limitations of this work are provided in Appendix D-1.

1.4 REGULATORY FRAMEWORK

The federal and provincial governments have various Acts and Regulations in place to regulate and control the release of contaminants to the environment. The primary legislation relevant to the investigation of contaminants and contaminated sites include the following:

- Canadian Environmental Protection Act;
- Fisheries Act; and
- Newfoundland Environment Protection Act.

Each of these Acts and associated Regulations have a direct bearing on the classification of contaminants and the measures to be taken when a contaminant is released to the environment in an unacceptable quantity.

The various governments in Canada (federal and provincial), the Canadian Standards Association (CSA) and the Canadian Council of Ministers of the Environment (CCME) have prepared and/or adopted numerous guidelines, policies, and procedures related to protection of the environment and the investigation of potentially contaminated sites. Several of these documents are listed below:

- CSA Z768-01 Phase I Environmental Site Assessments, CSA (revised 2001);
- CSA Z769-00 Phase II Environmental Site Assessment, CSA (2000);
- National Guidelines for Decommissioning Industrial Sites, CCME (1991);

- Subsurface Assessment Handbook for Contaminated Sites, CCME (1994);
- Guidance Manual on Sampling, Analysis and Data Management for Contaminated Sites Volumes I and II, CCME (1993);
- Technical Assistance Bulletins (TAB) 1-29, Environment Canada (1989-1995);
- Atlantic RBCA (Risk Based Corrective Action) Reference Documentation for Petroleum Impacted Sites, Version 2.0, Atlantic Partnership in RBCA Implementation (PIRI - October 2003);
- Government of Newfoundland and Labrador Guidance Document for the Management of Impacted Sites, December 2004, Version 1.0;
- Guidance Manual for Developing Site-Specific Soil Quality Remediation Objectives for Contaminated Sites in Canada (1996); and
- Canadian Environmental Quality Guidelines (CEQG), CCME (revised 2004).

AMEC has considered all of the above in conducting the investigative activities described in this report.

1.4.1 Selection of Applicable Environmental Quality Guidelines/Standards

The Site is considered to be industrial based on past Site use activities. Site soils are considered to be coarse-grained and groundwater resources are not used for human consumption and therefore considered to be non-potable.

Asbestos sample analyses results were compared to the "1998 Newfoundland and Labrador Asbestos Abatement Regulations (Nfld. Reg. 111/98). Under these regulations, materials containing greater than 1% asbestos fibers are considered asbestos-containing and should be managed in accordance with the applicable regulations.

Asbestos in air results were compared to the 2006 occupational exposure Threshold Limit Value (TLV) of 0.1 fibres/cm^3, as indicated by the American Conference of Governmental Industrial Hygienists (ACGIH)[1].

Paint samples were compared to the Federal Hazardous Products Act (HPA) criteria which have recently been set to new, lower acceptable levels for lead in paints for exposure. Under the Act, the lead content limit has been reduced from 5,000 mg/kg to 600 mg/kg for surface coating materials used in or around the home or other premises where children or pregnant women may become exposed. The new limit for lead in paint came into effect on April 19, 2005 and is used to assess the potential for human health concerns associated with lead in paint. This new limit of 600 mg/kg was used for this property to assess lead concentrations in paint. Since it is the intention of the DNRMD to demolish the Site buildings and infrastructures, in areas where the

[1] Documentation of the Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices, ACGIH Worldwide Signature Publications, Cincinnati, OH, 2006.

lead concentrations exceed 600 mg/kg, special health and safety measures should be taken during demolition.

In order to determine disposal options, should disposal be required, the former Federal HPA criteria of 5,000 mg/kg lead in paint is typically used to determine whether or not the paint chip samples would be submitted for a leachate analysis. Paint chip samples that contain less than 5,000 mg/kg are not likely to be leachable and therefore may be disposed of at an approved landfill facility, pending regulatory approval. This was confirmed with Ms. Marie Ryan of the Newfoundland and Labrador Department of the Environment and Conservation (NLDOEC). Paint samples with lead concentrations in excess of 5,000 mg/kg were subjected to leachability testing during this program. The provincial guideline for leachable toxic waste[2] and the federal regulation for the Transportation of Dangerous Goods (TDG) for lead (5.0 mg/L) were used to assess the results of the leachability testing to determine disposal options for any lead-containing paint to be removed during renovations/demolition of painted surfaces at the Site.

The Federal HPA was used to evaluate mercury concentrations in paint. The maximum acceptable concentration of mercury in paint, under the HPA, is 0.001 percent (equivalent to 10.0 mg/kg) in or around the home or other premises where children or pregnant women may become exposed. Since it is the intention of the DNRMD to demolish the Site buildings and infrastructures, in areas where the mercury concentrations exceed 10.0 mg/kg, special health and safety measures should be taken during demolition.

In order to determine disposal options, should disposal be required, concentrations of mercury in paint were also compared to the CCME-Canadian Environmental Quality Guidelines (CEQGs) for mercury in soil at a commercial site (24.0 mg/kg). Paint samples that contained a mercury concentration in excess of 24.0 mg/kg were subjected to leachability testing. The provincial guideline for leachable toxic waste[1] and the federal regulation for the TDG for mercury (0.10 mg/L) were used to assess the results of the leachability testing to determine disposal options for any mercury-containing paint removed during renovations/demolition of painted surfaces at the Site.

The CCME-CEQG for PCB in soil at a commercial/industrial site (33.0 mg/kg) was used to evaluate PCB concentrations in paint. In areas where the PCB concentration exceeds 33 mg/kg, measures should be taken to ensure that the paint is encapsulated or removed. Paint samples that contained a PCB concentration in excess of 33.0 mg/kg should be subjected to leachability testing. The federal regulation for the TDG for mercury (0.3 mg/L) was used to assess the results of the leachability testing to determine disposal options for any PCB-containing paint removed during renovations/demolition of painted surfaces at the Site.

The analytical results for benzene, toluene, ethylbenzene and xylene (BTEX) in soil were compared to the CCME-CEQGs (revised 2005) for industrial sites and the 2003 Atlantic PIRI

[2] Newfoundland and Labrador Department of Environment and Conservation, November 2003. Guidance Document: Leachable Toxic Waste, Testing and Disposal (GD-PPD-26.1).

Tier I Risk Base Corrective Action (RBCA) Risk Based Screening Levels (RBSLs) for commercial sites with coarse-grained soil and non-potable groundwater. Analytical results for modified total petroleum hydrocarbon (TPH) in soil were compared to the 2003 Atlantic PIRI Tier I RBCA RBSLs for commercial sites with coarse-grained soil and non-potable groundwater. Please note that the 2003 Atlantic PIRI Tier I RBCA RBSLs are human health based guidelines and therefore are not protective of ecological receptors. Since there are several potential sensitive ecological habitats (i.e. wetlands habitats, aquatic habitats, forest habitats, etc.) in close proximity to the Site, the CCME-CEQGs should supersede the 2003 Atlantic PIRI Tier I RBCA RBSLs when assessing potential ecological impacts at the Site. A RBCA Tier I Checklist for Ecological Receptor Assessment is attached in Appendix C-1.

Soil analytical results for metals plus hydrides, PAHs, PCBs were compared to the CCME-CEQGs (revised 2005) for industrial sites.

Criteria from the CCME-CEQG (revised 2005) for the protection of Freshwater Aquatic Life (FAL) were used to assess surface water quality for benzene, toluene, ethylbenzene, metals, PAHs and general water chemistry. Since CCME-FAL does not list criteria for xylene and TPH, the 2003 Atlantic PIRI Tier I RBSLs, Version 2.0, for commercial sites with coarse-grained soil and non-potable groundwater were used to assess the concentrations of these two parameters in groundwater.

Freshwater sediment sample analytical results for metals, PCBs and PAHs are compared to the CCME-CEQGs. The Interim Sediment Quality Guidelines (CCME-ISQGs) and Probable Effect Levels (CCME-PELs) for freshwater sediments were used to evaluate the sediment quality. There are no guidelines to assess the concentration of petroleum hydrocarbons (BTEX/TPH) in sediment. BTEX and TPH in sediment were assessed based on presence / absence.

Marine sediment sample analytical results for metals, PCBs and PAHs are compared to the CCME-CEQGs. The CCME-ISQGs and CCME-PELs for marine sediments were used to evaluate the sediment quality. There are no guidelines to assess the concentration of petroleum hydrocarbons (BTEX/TPH) in sediment. BTEX and TPH in sediment were assessed based on presence / absence.

1.5 METHODOLOGY

The methodologies used to conduct the field investigations and collection of paint, asbestos, air, soil, sediment and surface water samples are described in this section.

1.5.1 Paint Sampling Program

Samples were collected from painted surfaces present at the Site by cutting and scraping areas of flaking paint using clean knives and scrapers. Samples were collected down to bare substrate (i.e. concrete, wood, etc.). A minimum of five grams (where possible) of paint was obtained from each sampling location and stored in Ziploc^{TM} plastic bags. A total of 50 paint samples were collected at the Site during the current investigation.

1.5.2 Asbestos Sampling Program

Samples were collected by removing a 2.0 cm by 2.0 cm piece of material (where possible) from suspect asbestos containing building materials and placing them into Ziploc^{TM} plastic bags. Sampling locations which contained potentially friable asbestos materials were sealed with duct tape adhesive after the completion of sampling. A total of 15 asbestos samples were collected at the Site during the current investigation.

1.5.3 Air Sampling Program

A total of 12 air samples were collected at the Site on September 20 to 26, 2006. Air samples were collected using air sampling pumps calibrated to a flow rate of 3.25 liters/minute. The samples were collected using 0.8 µm pore size, 25 mm diameter mixed cellulose ester (MCE) membrane filters, held by black, anti-static, 2-inch open-faced filter holder. The samples were analyzed for total fibre content by the phase contrast microscopy (PCM) method of detection in accordance with U.S. National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods, Method 7400, Issue 2 Asbestos and other Fibres by PCM (August 15, 1994).

1.5.4 Test Pit Soil Sampling Program

The test pit soil sampling program was carried out on September 20 to 28, 2006 and consisted of excavating a total of 71 test pits at various locations throughout the Site. Test pits were excavated using a track-mounted excavator owned and operated by Barkers Construction Limited. Several surface soil samples, collected in the vicinity of pole-mounted transformers identified at the Site, were excavated using a stainless steel spade to a nominal depth of 0.3 m below the ground surface (bgs).

Soil samples were collected at 1.0 m intervals (where possible) during excavation. All soil samples were placed in pre-cleaned laboratory supplied sample containers and stored in coolers with ice for shipment to the laboratory. Duplicate soil samples, for field screening, were collected at all sample locations and transferred to 0.5 L Ziploc^{TM} freezer bags. The samples were geologically logged by experienced AMEC staff.

1.5.5 Soil Vapour Headspace Screening

Field screening consisted of measuring soil vapour headspace (SVH) concentrations of volatile organic vapours in clear plastic bags 1/3 filled with site soils. The SVH concentrations were measured with a hand-held (HNU DL101) photo ionization detector (PID) calibrated to a benzene referenced isobutylene standard. Prior to analysis, the soil samples were warmed to room temperature for 30 minutes and then shaken to enhance volatilization. The headspace measurement was taken by inserting the tip of the sampling instrument into the bag without contacting the soil or the side of the bag. The SVH readings were used to assist with the selection of soil samples for laboratory analyses.

1.5.6 Surface Water Sampling Program

The surface water sampling program consisted of collecting a total of six surface water samples from Lower Duck Island Brook and the drainage ditch leading from the North Pit into the waters of Lower Duck Island Brook on September 25, 2006. Surface water samples were collected directly into pre-cleaned lab supplied sample bottles from a depth of approximately 0 to 10 cm below the water surface. All surface water samples were collected from the shoreline.

1.5.7 Sediment Sampling Program

The sediment sampling program consisted of collecting a total of six freshwater sediment samples and three marine sediment samples at the Site on September 25, 26 and 28, 2006. The program consisted of collecting surface sediments (0.0 – 0.30 m) using both a marine vessel and ponar grab sampler or a stainless steel spade from the shoreline, depending upon water depth and access. Marine sediment samples were collected from a boat and freshwater sediment samples were collected form the shoreline.

The ponar grab sampler was positioned at the desired location and allowed to advance through the water column and into the bottom at a uniform and quick rate of descent. The sampler was then gently retrieved back to the surface. The sediment samples were then sub-divided as necessary and stored in precleaned laboratory-supplied jars, maintained in cool storage with ice and submitted to the laboratory for select chemical analyses.

1.5.8 GPS Coordinates

AMEC recorded coordinates for all sampling locations using a handheld global positioning system (GPS) unit with an accuracy of +/- 5 m. All GPS coordinates were recorded in UTM NAD27.

1.5.9 Laboratory Analytical Program

The AMEC Earth & Environmental analytical laboratory in Mississauga, Ontario was used to conduct the paint, asbestos, air, soil, sediment and surface water sample analyses for the project. The laboratory meets the requirements of ISO/IEC Guide 25 (General Requirements for the Competence of Calibration and Testing Laboratories), and is an accredited member of the Canadian Association for Environmental Analytical Laboratories (CAEAL). The detailed laboratory analytical program is outlined in Table 1-1 below.

Table 1-1: Detailed Laboratory Analytical Program

Media	Sample ID	Analyses
Area A: Northco		
Paint	NC-PS1, NC-PS2, NC-PS3, NC-PS4, NC-PS5, NC-PS6, NC-PS7, NC-PS8, NC-PS9, NC-PS10, NC-PS11, NC-PS12, NC-PS13, NC-PS14, NC-PS15, PS-DUP1, PS-DUP3	Lead and Mercury
	NC-PS1, NC-PS2, NC-PS5, NC-PS8, NC-PS11	PCB
	NC-PS2, NC-PS6, NC-PS7	Lead Leachate (TCLP)
	NC-PS5, NC-PS9	Mercury Leachate (TCLP)
Asbestos	NC-ASB1, NC-ASB2, NC-ASB3, NC-ASB4, NC-ASB5, NC-ASB6, NC-ASB7	Asbestos
Air	NC#1, NC#2	
Soil	NC-TP1-SS4, NC-TP2-SS2, NC-TP3-SS3, NC-TP4-SS3, NC-TP5-SS1, NC-TP6-SS1, NC-TP7-SS3, NC-TP8-SS3, NC-TP9-SS1, NC-TP10-SS1, NC-TP11-SS2, NC-TP12-SS2, NC-TP15-SS1, NC-TP16-SS1, NC-TP20-SS1, NC-TP21-SS1, NC-TP22-SS1, NC-TP23-SS1, NC-TP24-SS1, NC-TP25-SS3, NC-TP26-SS2, NC-TP27-SS3	BTEX/TPH
	NC-TP2-SS2, NC-TP4-SS3, NC-TP12-SS2, NC-TP15-SS1, NC-TP16-SS1, NC-TP22-SS1, NC-TP23-SS1, NC-TP24-SS1	Metals Plus Hydrides and PAH
	NC-TP4-SS3, NC-TP6-SS1, NC-TP13-SS1, NC-TP14-SS1, NC-TP15-SS1, NC-TP16-SS1, NC-TP17-SS1, NC-TP18-SS1, NC-TP19-SS1	PCB
	DUP 7	BTEX/TPH and PCB
	DUP 8	BTEX/TPH, Metals Plus Hydrides and PAH
	DUP10	BTEX/TPH, Metals Plus Hydrides PAHs and PCBs
Area B: Mill Area		
Paint	ML-PS1, ML-PS2, ML-PS3, ML-PS4, ML-PS5, ML-PS6, ML-PS7, ML-PS8, ML-PS9, ML-PS10, ML-PS11, ML-PS12, ML-PS13, ML-PS14, ML-PS15, ML-PS16, ML-PS17, ML-PS18, ML-PS19, ML-PS20, ML-PS21 ML-PS22, ML-PS24, ML-PS23, ML-PS25, PS-DUP4, PS-DUP5, PS-DUP6	Lead and Mercury
	ML-PS2, ML-PS4, ML-PS5, ML-PS10, ML-PS12, ML-PS13, ML-PS21, ML-PS22, PS-DUP2	PCB
	ML-PS4, ML-PS5, ML-PS7, ML-PS8, ML-PS12, ML-PS13, ML-PS14	Lead Leachate (TCLP)
	ML-PS17	Mercury Leachate (TCLP)
Asbestos	ML-ASB1, ML-ASB2, ML-ASB3, ML-ASB4	Asbestos
Air	ML#1, ML#2, ML#3, ML#4, ML#5, ML#6	

Media	Sample ID	Analyses
Soil	ML-TP1-SS1, ML-TP2-SS3, ML-TP3-SS1, ML-TP4-SS1, ML-TP5-SS1, ML-TP6-SS2, ML-TP7-SS2, ML-TP8-SS4, ML-TP9-SS3, ML-TP10-SS1, ML-TP11-SS2, ML-TP12-SS1, ML-TP13-SS3, ML-TP14-SS1, ML-TP15-SS1, ML-TP18, SS1, ML-TP19-SS2, ML-TP20-SS3, ML-TP22-SS1, DUP 3	BTEX/TPH
	ML-TP7-SS2, ML-TP8-SS4, ML-TP13-SS3, ML-TP14-SS1, ML-TP15-SS1, ML-TP18, SS1, ML-TP19-SS2, ML-TP20-SS3	Metals Plus Hydrides
	ML-TP2-SS3, ML-TP7-SS2, ML-TP13-SS3, ML-TP14-SS1, ML-TP18, SS1, ML-TP19-SS2, ML-TP20-SS3, ML-23-SS1, DUP 6	PAHs
	ML-TP2-SS3, ML-TP4-SS1, ML-TP7-SS2, ML-TP9-SS3, ML-TP10-SS1, ML-TP11-SS2, ML-TP15-SS1, ML-TP16-SS1, ML-TP17-SS1, ML-TP21-SS1, ML-TP22-SS1, ML-TP23-SS1, DUP 5	PCB
	DUP 4	BTEX/TPH and Metals Plus Hydrides
Area C: Dock Warehouse Area		
Paint	WH-PS1, WH-PS2, WH-PS3, WH-PS4, WH-PS5, WHL-PS6, WH-PS7	Lead and Mercury
	WH-PS1, WH-PS2, WH-PS3, WH-PS4, WHL-PS6, WH-PS7	Lead Leachate (TCLP)
	WH-PS1, WH-PS7	PCB and PCB Leachate (TCLP)
Asbestos	WH-ASB1, WH-ASB2, WH-ASB3	Asbestos
Air	WH#1	
Soil	WH-TP1-SS2, WH-TP2-SS1, WH-TP3-SS1, WH-TP4-SS1, WH-TP5-SS3, WH-TP6-SS1, WH-TP7-SS3, WH-TP9-SS1, WH-TP10-SS1, WH-TP11-SS1, WH-TP12-SS2, WH-TP13-SS1, WH-TP14-SS2, DUP 2	BTEX/TPH, Metals Plus Hydrides and PAHs
	DUP 1	BTEX/TPH
	WH-TP8-SS1	PCBs
Area D: Tailings Pile		
Paint	SP-PS1, SP-PS2	Lead and Mercury
Asbestos	SP-ASB1	Asbestos
Air	SP#1	
Soil	SP-TP2-SS1	BTEX/TPH, Metals Plus Hydrides, PAH and PCB
	SP-TP1-SS1	PCB
Area E: Waste Rock – Pit Area		
Paint	WR-PS1	Lead and Mercury
Air	WR#1	Asbestos
Soil	WR-TP1-SS2, WR-TP2-SS1, WR-TP3-SS1, WR-TP4-SS1, WR-TP5-SS1	BTEX/TPH
	WR-TP5-SS1	Metals Plus Hydrides and PAH
	WR-TP1-SS2, WR-TP2-SS1	PCBs

Media	Sample ID	Analyses
Area F: Freshwater and Marine Resources		
Surface Water	SW1, SW2, SW3, SW4, SW5, SW6, DUP 11	BTEX/TPH, Metals Plus Hydrides and PCB
Freshwater Sediment	SED1, SED2, SED3, SED4, SED5, SED6, DUP 9	BTEX/TPH, Metals Plus Hydrides, PCB and Asbestos
Marine Sediment	SED7, SED8, SED9	BTEX/TPH, Metals Plus Hydrides, PCB, PAH and Asbestos

1.5.10 Quality Assurance/Quality Control Program

QA/QC samples were analyzed for approximately 10% of the total samples analyzed. A total of 17 field duplicate samples (DUP 1 to DUP 11 and PS-DUP1 to PS-DUP6) were submitted to the laboratory during the field program for select chemical analyses. The Quality Assurance/Quality Control (QA/QC) results are reported on the Laboratory Certificates of Analyses and discussed in detail in Section 11.0.

In order to minimize cross contamination during sampling, a field QA/QC program was followed, which included the following measures:

- Latex gloves were worn during all sampling (i.e. new pair of gloves for each sample);
- All soil sampling equipment was thoroughly cleaned and rinsed with distilled water prior to sampling to ensure that samples were unaffected by cross-contamination from previous samples;
- Pre-cleaned laboratory supplied jars and bottles were used to collect soil and groundwater samples; and
- Samples were stored in a cooler with ice to prevent freezing while onsite and to keep cool during shipment to the laboratory.

The AMEC Laboratory has an extensive QA/QC program in place to ensure that reliable results are consistently obtained. Specific laboratory QA/QC measures include:

- Chain of Custody and sample integrity inspection;
- Strict documentation control and files;
- Trained personnel prepare and analyze samples according to Standard Operating Procedures;
- All analytical methods are based on accepted (i.e. MOE, US EPA, ASTM) Procedures and are fully validated prior to use;
- Precision is monitored by performing replicate analysis of samples within each batch;
- Accuracy is verified by analyzing spiked samples and reference materials within each batch;

- Instrument calibration integrity is ensured by analyzing calibration check standards within each run sequence;
- Matrix effects in organic analyses are assessed with surrogate fortification of each sample;
- Extensive use is made of reference material for routine procedure evaluation;
- Highest available purity analytical standards;
- Predefined analytical sequences ensure all results are traceable to calibration and QC data;
- Hard copy reports displaying all of the required data are generated for each instrument;
- Analytical results are determined only from instrument responses that fall within the calibration range;
- Acceptable QA/QC performance must be demonstrated prior to data authorization (data are subject to three levels of QA/QC review: chemist, supervisor and manager);
- On-going method and instrument performance records are maintained for all analyses;
- Records containing all pertinent data are securely archived for three years; and
- A full-time Quality Assurance Scientist evaluates the QA/QC program on an on-going basis.

1.5.11 Personnel Protective Equipment (PPE) and Decontamination Program

Since large-scale mining operations were carried at the Site from 1962 until its closure in 1994, the potential for exposure to asbestos fibres at the Site during the current intrusive investigation was considered. In order to mitigate the exposure of field staff and the general public to asbestos fibres during the current investigation, the following procedures were implemented at the Site:

- gate was locked at all times to prevent the general public from accessing the Site;
- two tyvec hooded suits, boot covers, gloves and respirators with asbestos filters were worn by field staff, including subcontractors, at all times;
- field staff and subcontractors were “fit tested” by a licensed contractor for respirators prior to entering the Site to ensure their respirators fit properly;
- excessive disturbance of friable asbestos containing materials was avoided, where possible;
- no personal vehicles were allowed to access the Site, instead an all terrain vehicle (ATV) rented from a local hazardous materials abatement contractor was used; and
- decontamination of field staff and all equipment prior to leaving the Site.

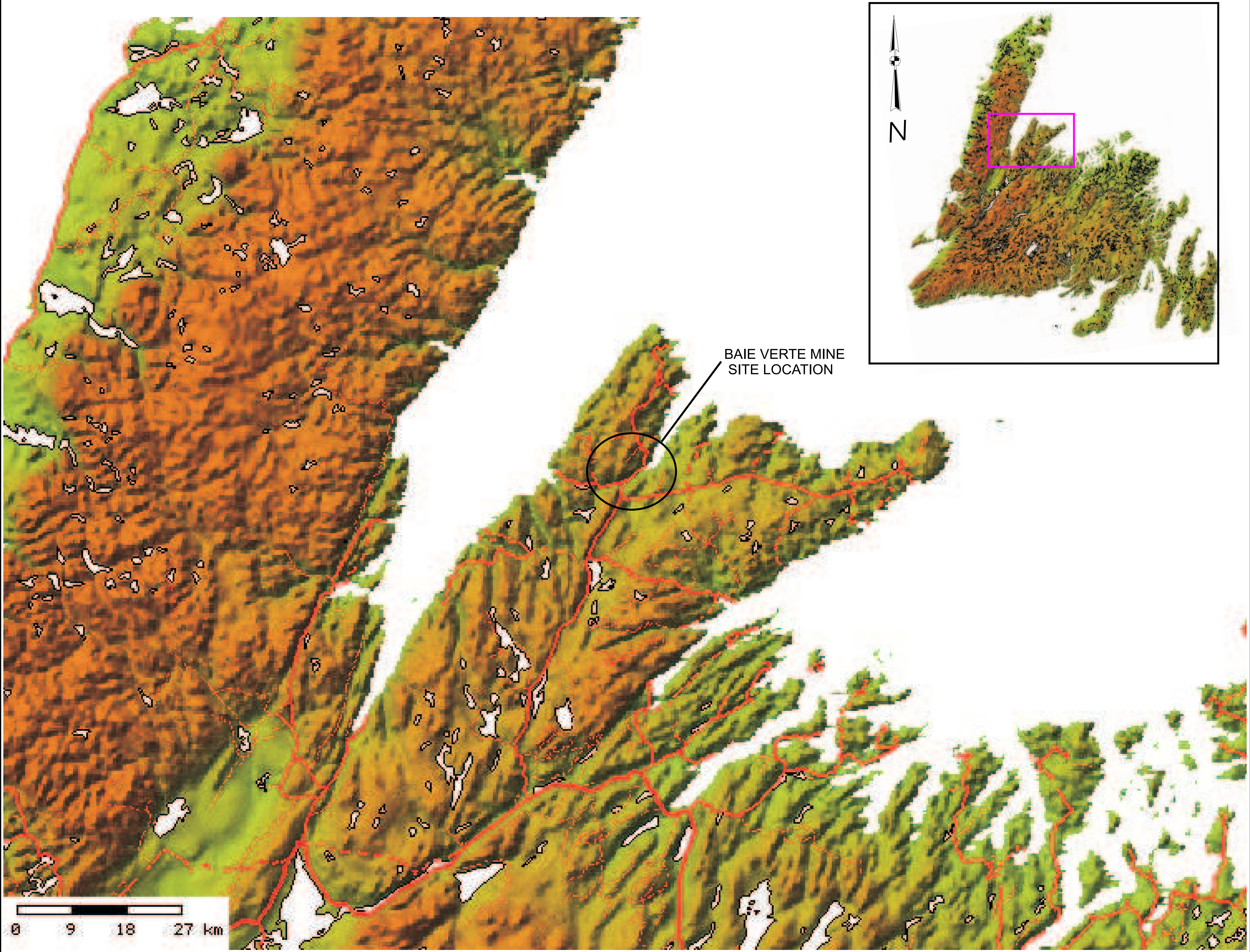
A decontamination trailer, provided by a local hazardous materials abatement contractor, was set up near the entrance to the Site for the field staff and subcontractors to put on their PPE and decontaminate themselves of any asbestos fibres at the end of the work day, prior to leaving the Site. The trailer was divided into three distinct rooms: 1) Dirty Room, 2) Shower Room and 3) Clean Room. Power was provided to the facility by a generator and water for showering was provided by an internal water tank.

Decontamination procedures implemented at the Site during the duration of the current investigation are summarized below:

1. At the beginning of each day, workers entered the clean room and removed all street clothes and personal belongings and changed into clean work clothes and PPE. A respirator was put on and checked for fit and proper operation. Workers then passed through the shower room into the dirty room and entered the Site;
2. Upon leaving the work area at the end of the work day, but before entering the dirty room, the workers removed the outer tyvec suit and place it in plastic bags or bins for disposal;
3. In the dirty room, workers removed all protective clothing and equipment, except for the worker's respirator. Any waste material was placed inside plastic bags and bins for disposal;
4. Workers then entered the shower room and showered while wearing their respirators. After the worker's head and the respirator's face piece and associated harness had been thoroughly rinsed, the respirator was removed and the shower completed. An adequate supply of water, soap and shampoo was provided;
5. After showering, the workers entered the clean room and dressed into street clothes. Respirators were thoroughly cleaned, disinfected and stored in plastic zip-lock bags until required;
6. The excavator and ATV used during the current investigation were cleaned by a local hazardous materials abatement contractor before leaving the Site; and
7. At the end of the investigation, all field equipment and waste were placed inside the dirty room of the decontamination facility and transported to a local hazardous materials abatement contractor for proper cleaning and/or disposal (as necessary).

APPENDIX A-1

Figures



NOTES

1. THIS DRAWING IS BASED ON MAPPING OBTAINED FROM THE NEWFOUNDLAND DEPARTMENT OF MINES AND ENERGY WEB PAGE.
2. IT IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION IN SUPPORT OF THIS REPORT.
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CLIENT

DEPARTMENT OF NATURAL RESOURCES

PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER BAIE VERTE ASBESTOS MINE PROPERTY
BAIE VERTE, NEWFOUNDLAND LABRADOR.

TITLE

SITE LOCATION PLAN

DRAWN: KC	SCALE: NTS
CHECKED: GW	FIG. NO.: 1.1
DATE: JANUARY 2007	FILENO.: TF 6126509

NOTES

THIS DRAWING IS BASED ON 1:12,500 AERIAL PHOTOGRAPHS.

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AERIAL PHOTOGRAPH INFORMATION:

ROLL: 99016, # 179 & #181. 1999
99017, # 015 & #017. 1999

SCALE: 1:12,500.

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DEPARTMENT OF NATURAL RESOURCES

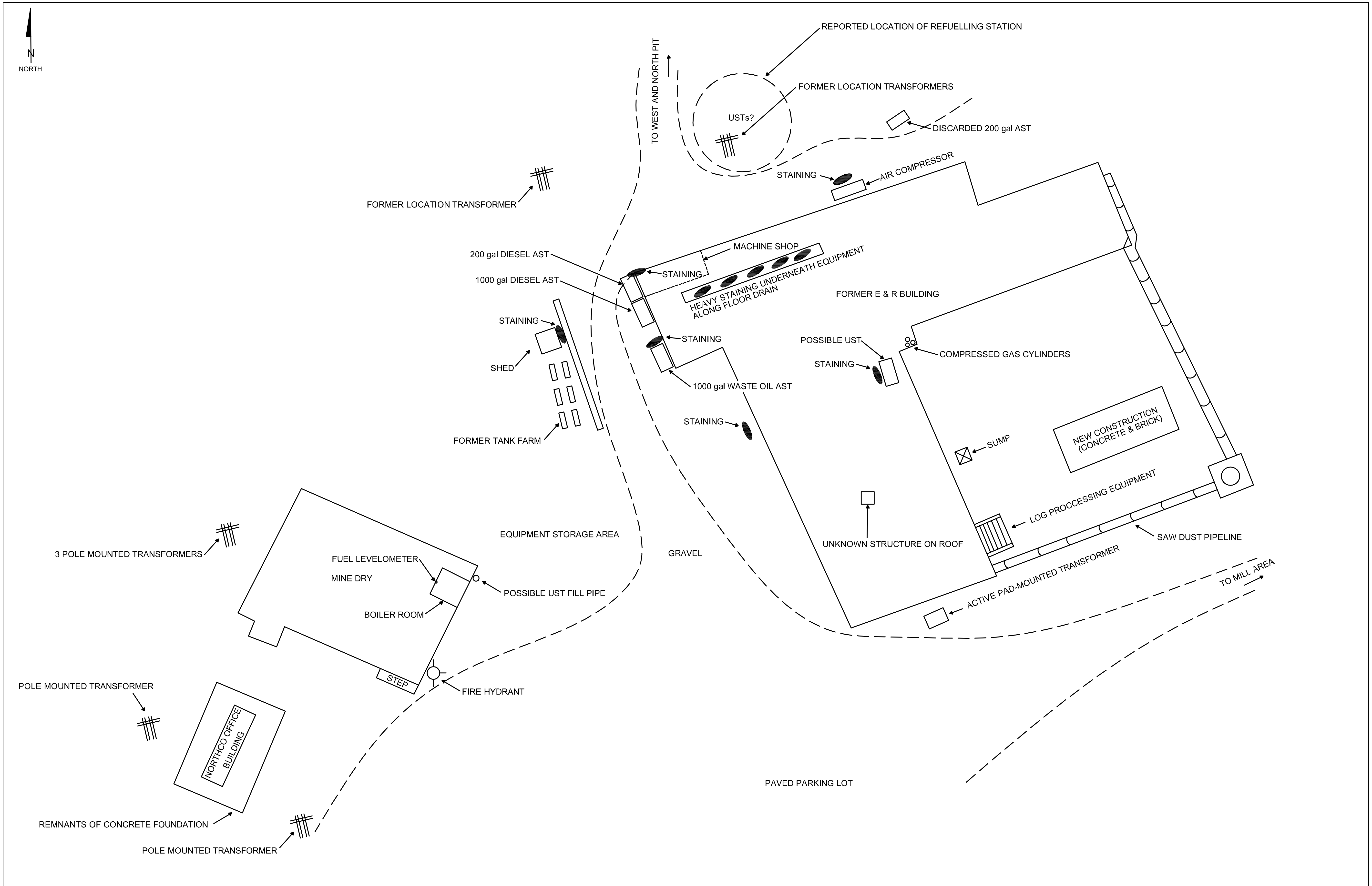
PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER BAIE VERTE ASBESTOS MINE PROPOERTY
BAIE VERTE, NEWFOUNDLAND LABRADOR

TITLE

DETAILED SITE LOCATION PLAN

DRAWN KC	SCALE NTS
CHECKED GW	FIG. NO. 1.2
DATE JANUARY 2007	FILE NO. TF 6126509



NOTES

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM FIGURE.
3. THIS FIGURE IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
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LEGEND

GRAVEL ACCESS ROADS

CLIENT

DEPARTMENT OF NATURAL RESOURCES

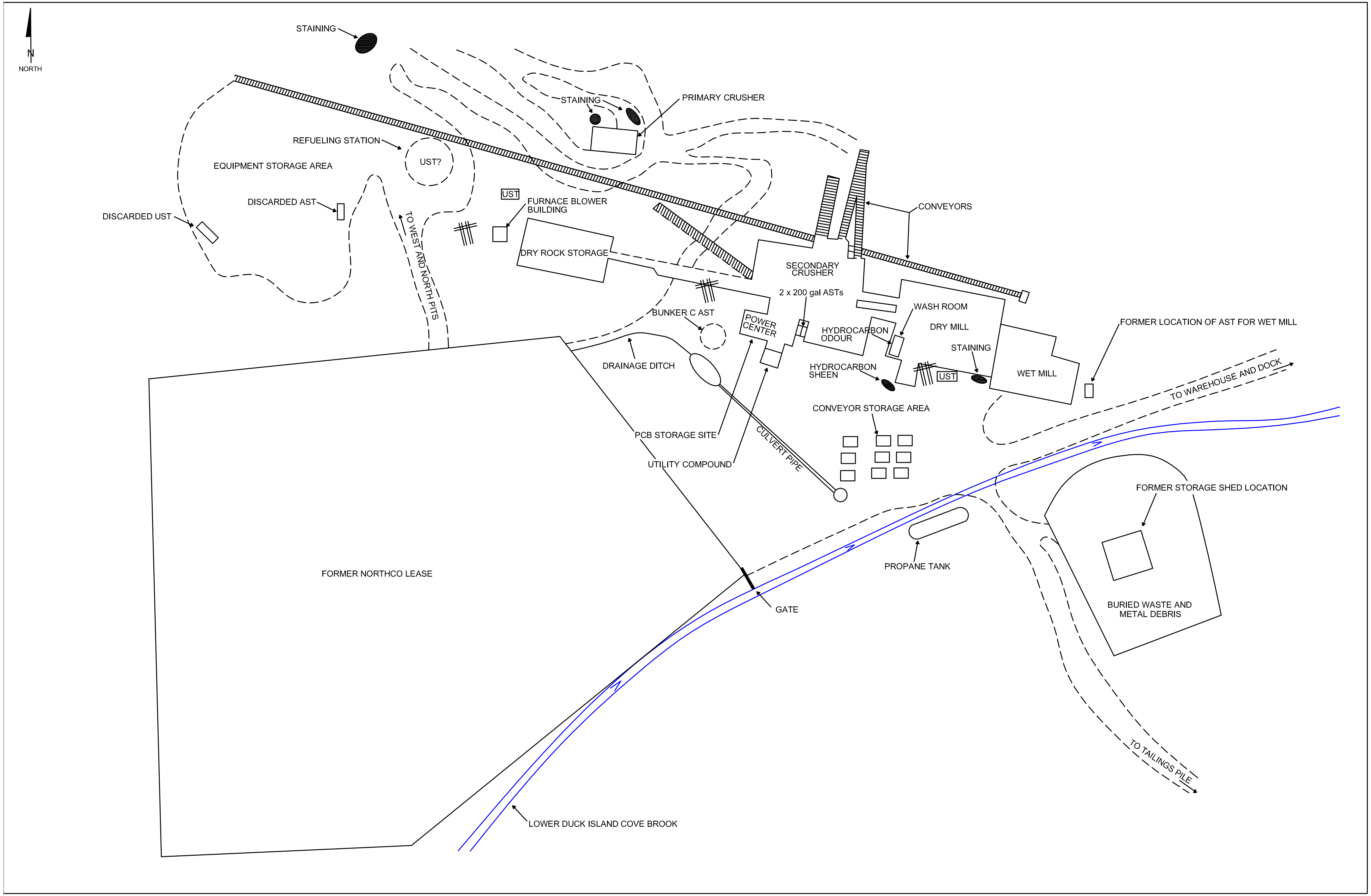
PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER BAIE VERTE ASBESTOS MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

FORMER NORTHCO PROPERTY

SCALE	PROJECT NUMBER	
NTS	TF6126509	
DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	
DRAWING NO.	DATE	REV
1.3	January 2007	



NOTES

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM FIGURE.
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LEGEND

GRAVEL ACCESS ROADS

FORMER TRANSFORMER LOCATION

FLOW DIRECTION

CLIENT

DEPARTMENT OF NATURAL RESOURCES

PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER BAIE VERTE ASBESTOS MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

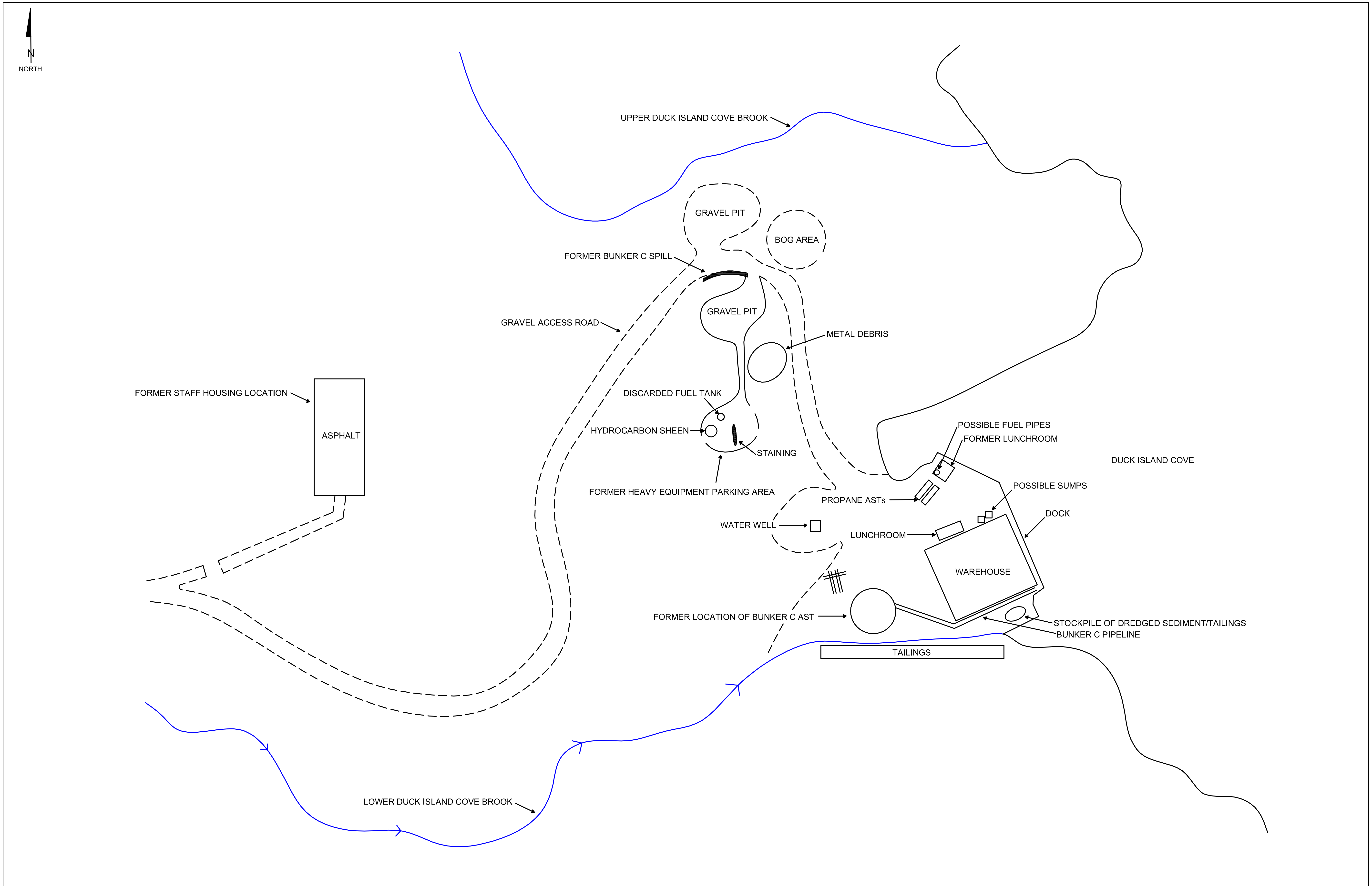
DRAWING TITLE

MILL BUILDINGS

SCALE	PROJECT NUMBER
NTS	TF6126509

DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	

DRAWING NO.	DATE	REV
1.4	January 2007	



NOTES

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM FIGURE.
3. THIS FIGURE IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
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LEGEND

GRAVEL ACCESS ROADS

TRANSFORMER LOCATION

FLOW DIRECTION

CLIENT

DEPARTMENT OF NATURAL RESOURCES

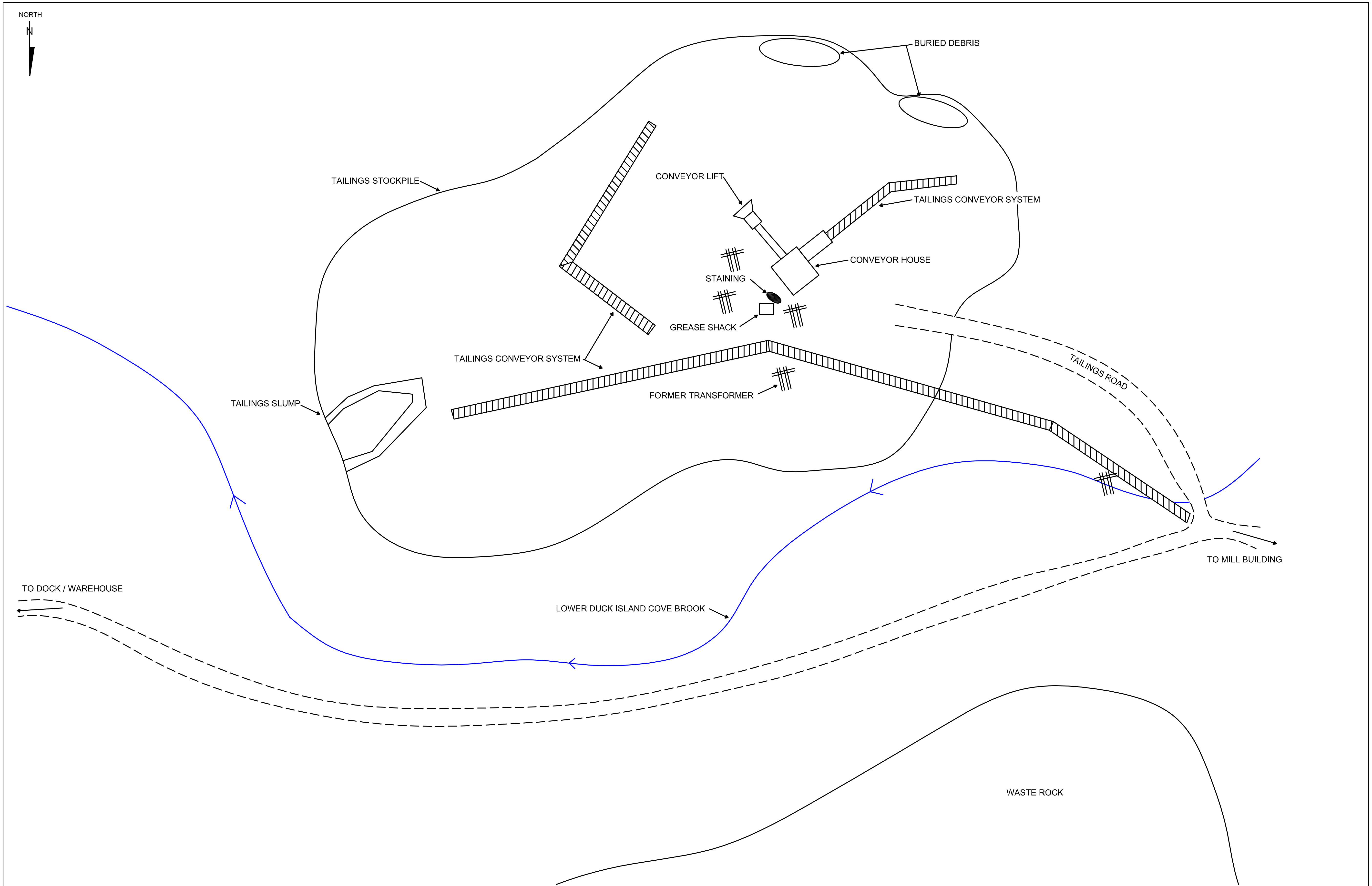
PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER BAIE VERTE ASBESTOS MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

DOCK / WAREHOUSE AREA

SCALE	PROJECT NUMBER	
NTS	TF6126509	
DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	
DRAWING NO.	DATE	REV
1.5	January 2007	



NOTES

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LEGEND

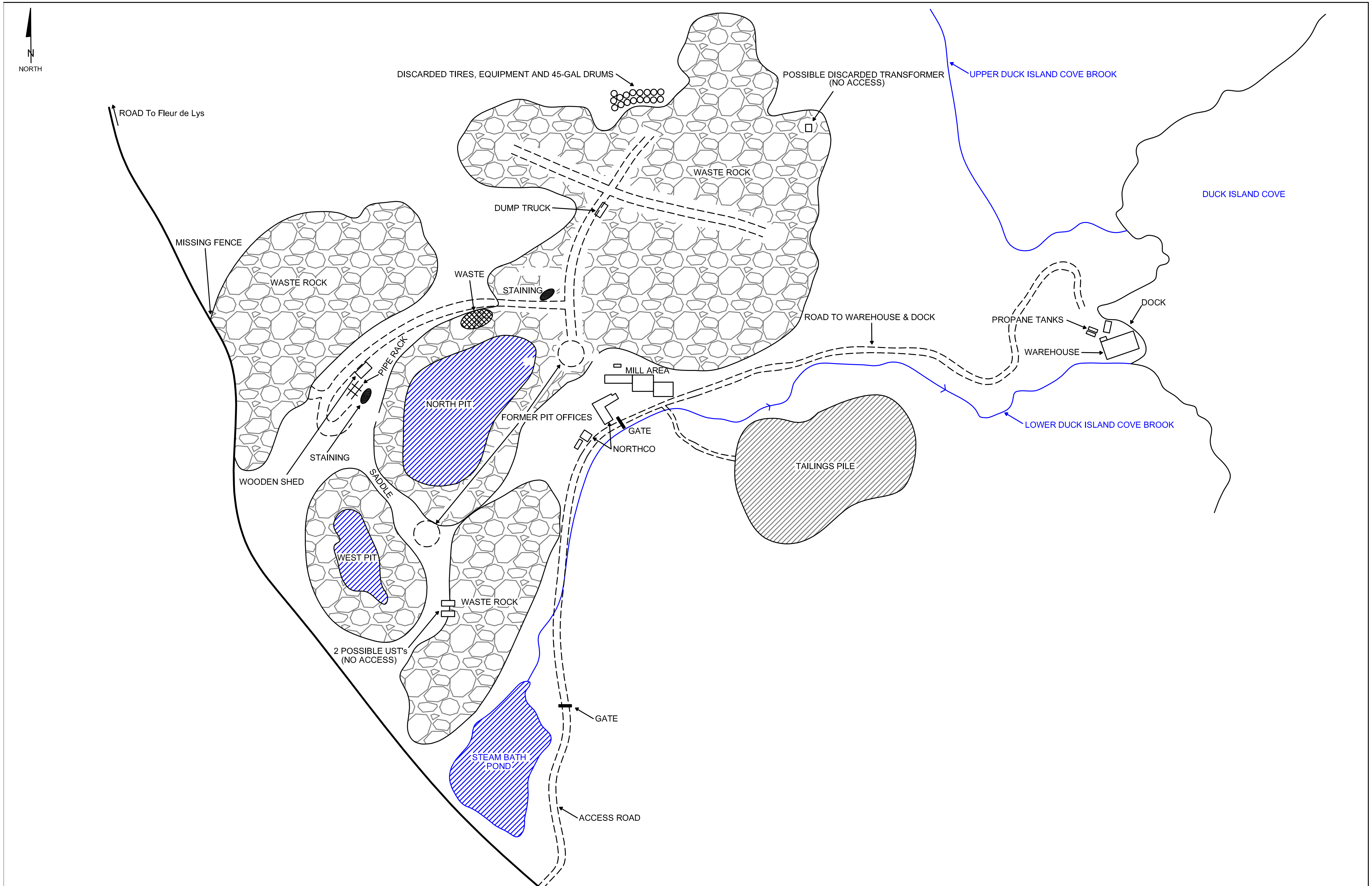
GRAVEL ACCESS ROADS
UTILITY POLE LOCATIONS
FLOW DIRECTION

CLIENT
DEPARTMENT OF NATURAL RESOURCES

PROJECT
PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER BAIE VERTE ASBESTOS MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE
TAILINGS STOCKPILE AREA

SCALE	PROJECT NUMBER	
NTS	TF6126509	
DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	
DRAWING NO.	DATE	REV
1.6	January 2007	



NOTES

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LEGEND

GRAVEL ACCESS ROADS

FLOW DIRECTION

CLIENT

DEPARTMENT OF NATURAL RESOURCES

PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER BAIE VERTE ASBESTOS MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

WASTE ROCK AND PIT AREAS

SCALE	PROJECT NUMBER	
NTS	TF6126509	
DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	
DRAWING NO.	DATE	REV
1.7	January 2007	

APPENDIX B-1

Photographic Record

Photo 1: Mine Dry Building.
(Northco Area)

Photo 2: E & R Building.
(Northco Area)

Photo 3: Northco Office Building.
(Northco Area)

Photo 4: Primary Crusher.
(Mill Area)

Photo 5: Dry Rock Storage.
(Mill Area)

Photo 6: Secondary Crusher, Dry Mill and Power Centre.
(Mill Area)

Photo 7: Wet Mill – December 2004.
(Mill Area)

Photo 8: Dock – Poor Condition.
(Dock and Warehouse Area)

Photo 9: Warehouse.
(Dock and Warehouse Area)

Photo 10: Propane ASTs and Former Lunchroom.
(Dock and Warehouse Area)

Photo 11: Tailings Pile.
(Photo Taken From Waste Rock Pile – Looking South)

Photo 12: Slump – Tailings Pile.

Photo 13: Conveyor House.
(Tailings Pile)

Photo 14: Grease Shack.
(Tailings Pile)

Photo 15: Typical Waste Rock.

Photo 16: North Pit – Filled with Water.

APPENDIX C-1

RBCA Tier I Checklist for Ecological Receptor Assessment

APPENDIX 1
Atlantic RBCA Version 2

REFERENCE GUIDELINES TIER ONE CHECK LIST

FOR

ECOLOGICAL RECEPTOR ASSESSMENT

IN ATLANTIC CANADA

ATLANTIC PARTNERS IN RBCA IMPLEMENTATION

June 2003

PURPOSE

This document provides guidance for conducting a TIER 1 screening Ecological Risk Assessment (ERA) at a simple site impacted with hydrocarbons. This is a qualitative evaluation designed to determine whether or not additional data is required to quantify risks to ecological receptors through a tiered Ecological Risk Assessment.
This protocol is to be used in conjunction with the TIER 1 or TIER 2 Human Health Risk Assessment, RBCA tool kit, for Atlantic Canada.

The components of this assessment consist of a check list format to identify the potential receptors at risk and the presence of exposure pathways.

These practices are consistent with the recommended tiered approach from the National Contaminated Sites Remediation Program (NCSRP) as published by Environment Canada

The following guidelines are intended to be the minimum requirements for a preliminary assessment. They should in no way be construed as limiting, if your professional judgment determines that additional or different evaluation is required for a particular site.

INTRODUCTION

The components of this evaluation are divided in two steps. Step 1 identifies presence of ecological receptors on or adjacent to the site, within a suggested distance of about 150 meters. This distance is subject to professional judgment.
Step 2 determines the potential for the ecological receptors to be exposed to release hydrocarbons. Risks to ecological receptors essentially require presence of receptors, potential pathways and presence of toxicity. Further ERA activities should not be required if one of these conditions is missing.

1) ECOLOGICAL HABITAT
(within 150 meters of the site)

YES/NO

- Wetland habitats such as marshes, swamps , tidal flats, beaches Yes
- Aquatic habitats such as rivers, lakes or streams Yes
- Forested habitats (50 acres or more) Yes
- Grassland habitats No
- Provincial/National parks or ecological reserve No
- Rare, threatened or endangered species populations No
- Other critical or sensitive habitat for wildlife, migratory species NO

If the answer is **"NO"** to ALL questions, then no species of concern are identified. There is no further action required.

If the answer to any one question is YES, then proceed to the next step.

2) EXPOSURE ASSESSMENT **YES/NO**

- Can dissolved hydrocarbons in groundwater reach any receptor habitat identified above now or in the future? Yes
- Can LNAPL (Light Non Aqueous Phase Liquids) reach receptor habitat identified above? Yes
- Can hydrocarbons reach receptor habitat identified above via surface runoffs? Yes

If the site is under building or pavement, skip the next two questions.

- Is there a potential for direct absorption of contaminants through skin? Yes
- Is there a potential for oral consumption of contaminated soils, water, plants? Yes
- Have hydrocarbons, associated by the site being investigated, been known to be present in any of the soils, sediments, surface water of the receptor habitats identified above at concentrations greater than CCME ecologically-based guidelines? Yes

If the answer to any questions above is YES, then further assessment is required. Additional data should be gathered to enhance the knowledge of the site-specific situation such as; fate and transport of contaminants, description of the receptor of concerns, preliminary toxicity estimates and mitigation options. (Tiered ERA)

The results of this screening assessment should be documented in writing in the Atlantic RBCA report. It should detail answers to the questions above and provides documentation or rationale for the answers provided

References;

1) ASTM, RBCA Draft Provisional Standard (RBCA II), Appendix x5 qualitative ecological exposure assessment, ASTM publication, 1997

2) BRITISH COLUMBIA Ministry of Environment, Lands and Parks, 1998. Guidance and Checklist for Tier 1 Ecological Risk Assessment of Contaminated Sites in British Columbia. Landis et al. January 1998.

3) ENVIRONMENT CANADA, 1994, A Framework for Ecological Risk Assessment at Contaminated Sites in Canada: Review and Recommendations. Scientific series No 199., C. Gaudet, EVS Environment Consultants , ESSA Environmental and Social Systems Analysts, Ottawa Ont. 1994

APPENDIX D-1

Report Limitations

LIMITATIONS

1. The work performed in this report was carried out in accordance with the Standard Terms of Conditions made part of our contract. The conclusions presented herein are based solely upon the scope of services and time and budgetary limitations described in our contract.
2. The report was prepared in accordance with generally accepted environmental study and/or engineering practices for the exclusive use of the Department of Natural Resources. No other warranties, either expressed or implied, are made as to the professional services provided under the terms of our contract and included in this report.
3. Third party information reviewed and used to develop the opinions and conclusions contained in this report is assumed to be complete and correct. This information was used in good faith and AMEC does not accept any responsibility for deficiencies, misinterpretation or incompleteness of the information contained in documents prepared by third parties.
4. The services performed and outlined in this report were based, in part, upon visual observations of the site and attendant structures. Our opinion cannot be extended to portions of the site which were unavailable for direct observation, reasonably beyond our control.
5. The objective of this report was to assess environmental conditions at the site, within the context of our contract and existing environmental regulations within the applicable jurisdiction. Evaluating compliance of past or future owners with applicable local, provincial and federal government laws and regulations was not included in our contract for services.
6. Our observations relating to the condition of environmental media at the site are described in this report. It should be noted that compounds or materials other than those described could be present in the site environment.
7. The findings and conclusions presented in this report are based exclusively on the field parameters measured and the chemical parameters tested at specific locations. It should be recognized that subsurface conditions between and beyond the sample locations may vary. AMEC cannot expressly guarantee that subsurface conditions between and beyond the sample locations do not vary from the results determined at the sample locations. Notwithstanding these limitations, this report is believed to provide a reasonable representation of site conditions at the date of issue.
8. The contents of this report are based on the information collected during the monitoring and investigation activities, our understanding of the actual site conditions, and our professional opinion according to the information available at the time of preparation of this report. This report gives a professional opinion and, by consequence, no guarantee is attached to the conclusions or expert advice depicted in this report. This report does not provide a legal opinion in regards to Regulations and applicable Laws.
9. Any use of this report by a third party and any decision made based on the information contained in this report by the third party is the sole responsibility of the third party. AMEC will not accept any responsibility for damages resulting from a decision or an action made by a third party based on the information contained in this report.

SECTION 2.0

NORTHCO AREA

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Appendix C-2	Test Pit Logs
Appendix D-2	Soil Vapour Headspace Readings
Appendix E-2	GPS Coordinates
Appendix F-2	Laboratory Analyses Tables

2.0 AREA A – NORTHCO

2.1 SITE DESCRIPTION

This area of the Site is located directly west of the Mill Area and was most recently the location of a saw mill operation, owned and operated by Northco Forest Products Limited (Northco). Structures present at the Site include the former Mine Dry building, Erection and Repair (E & R) building and Northco office building (refer to Figure 2.1, Appendix A-2 and Photos 1 to 3, Appendix B-2). Other features present at the Site include a former tank farm, fire hydrant, several pole mounted transformers and a former equipment refuelling station (refer to Figure 2.1, Appendix A-2). Please note that since the Northco office building remains the property of Northco, it was excluded from this investigation.

The Mine Dry building was historically used for general office administration and for workers of the mine to change and shower before leaving the Site. The E&R building was historically used as a mechanical garage and machine shop for the maintenance and repairs to mining equipment. Most recently, the E&R building was used for saw milling operations and maintenance and repairs to forestry type equipment.

2.2 INITIAL SITE INSPECTION – AMEC JUNE 2006

Since the Northco property was not assessed during the previous Phase I ESA completed for the Site in March 2005, the DNRMD requested that AMEC conduct an initial site inspection to identify any potential environmental concerns and develop a Phase II ESA sampling program for the Site.

The initial site inspection was carried out at the Site by Gary Warren, M.A.Sc., Rod Winsor, P.Eng., Kelly Curtis, CET of AMEC on June 23, 2006. Findings of the assessment are presented in this section.

2.2.1 Exterior Property

The following observations and information were recorded by AMEC at the time of the initial site inspection of the exterior property:

- A former tank farm was identified approximately 15 m west of the former E&R building (refer to Figure 2.1, Appendix A-2 and Photo 4, Appendix B-2). The location of the former ASTs was confirmed by the presence of concrete AST holding cradles at the Site and through a review of photographs obtained from the Newfoundland and Labrador Department of Environment and Conservation (NLDOEC) (refer to Photos 4 and 5, Appendix B-2);
- A 1,000-galllon waste oil AST was observed at the northwest corner of the former E&R building (refer to Figure 2.1, Appendix A-2 and Photo 6, Appendix B-2). Staining was observed on the asphalt present underneath the AST;
- Two ASTs (1,000-gallon and 200-gallon) were observed at the northwest corner of the former E&R building (refer to Figure 2.1, Appendix A-2 and Photo 7, Appendix B-2). Staining was observed on the asphalt present underneath the ASTs;

- An area of stained soil was observed along the northwest corner of the former E&R building, adjacent to 1,000-gallon and 200-gallon ASTs (refer to Figure 2.1, Appendix A-2 and Photo 8, Appendix B-2);
- An area of stained soil/asphalt was observed underneath an air compressor unit located along the north side of the former E&R building (refer to Figure 2.1, Appendix A-2 and Photo 9, Appendix B-2);
- A discarded 200-gallon tank (empty) was observed approximately 10 m north of the former E&R building (refer to Figure 2.1, Appendix A-2 and Photo 10, Appendix B-2). The former location of the discarded AST is not known at this time;
- Several stockpiles of saw dust and bark were observed east of the former E&R building (refer to Photos 11 and 12, Appendix B-2);
- A possible sump was observed along the east side of the former E&R building (refer to Figure 2.1, Appendix A-2 and Photos 13 and 14, Appendix B-2). AMEC personnel were not able to open the possible sump at the time of the site inspection;
- Evidence of new construction, consisting of a concrete foundation and partially constructed cinder-block walls, was observed along the east side of the former E&R building (refer to Figure 2.1, Appendix A-2 and Photo 15, Appendix B-2);
- A pad-mounted transformer (active) was observed along the south side of the former E&R building (refer to Figure 2.1, Appendix A-2 and Photo 16, Appendix B-2);
- An area of stained soil was observed in front of a loading bay door along the west side of the former E&R building (refer to Figure 2.1, Appendix A-2 and Photo 17, Appendix B-2);
- A possible fill/vent pipe of an UST was observed at the southeast corner of Mine Dry building, adjacent to the boiler room (refer to Figure 2.1, Appendix A-2 and Photo 18, Appendix B-2); and
- Several pole-mounted transformers and several former locations of pole-mounted transformers were observed throughout the Site (refer to Figure 2.1, Appendix A-2).

A review of the Phase I ESA completed for the Site in March 2005 revealed the potential presence of a former equipment refuelling station approximately 10 m north of the former E&R building, on the east side of the pit access road. ASTs and/or USTs may have been historically present at this location of the Site.

2.2.2 Mine Dry Building

The following observations and information were recorded by AMEC at the time of the initial site inspection of the Mine Dry building:

- Based on the reported date of construction of the Site building (late 1970s), the potential exists for painted surfaces of the structure to contain lead, mercury and PCBs;
- Based on the reported date of construction of the Site building (late 1970s), the potential exists for asbestos containing materials (ACMs) to be present within the structure. Some potential ACMs identified within the Site building include pipe and boiler insulation, floor tiles, ceiling tiles, gyproc and joint compound, window sealant caulking, brick mortar, cement parging, etc. (refer to Photos 19 to 21, Appendix B-2);

- Mould growth was observed on the ceiling tiles, pipe insulation and boiler insulation present within the basement of the Site building (refer to Photos 21 and 22, Appendix B-2). Several areas of the basement were flooded at the time of the site inspection;
- Mercury containing thermostats were observed inside the Site building (refer to Photo 23, Appendix B-2);
- Several types of florescent light fixtures were observed inside the Site building (refer to Photos 24 to 26, Appendix B-2). The ballasts within these light fixtures may contain PCBs and the light tubes may contain mercury;
- A fuel levelometer was observed in the boiler room of the Site building (refer to Photo 27, Appendix B-2). This is evidence that an UST may have existed at the Site; and
- Fiberglass insulation was observed on the main floor of the Site building (refer to Photo 28, Appendix B-2).

2.2.3 Former E&R Building

The following observations and information were recorded by AMEC at the time of the initial site inspection of the former E&R building:

- Based on the reported date of construction of the Site building (1960s), the potential exists for painted surfaces of the structure to contain lead, mercury and PCBs;
- Based on the reported date of construction of the Site building (late 1960s), the potential exists for asbestos containing materials (ACMs) to be present within the structure. Some potential ACMs identified within the Site building include pipe insulation, ceiling tile, brick mortar, cement parging, window sealant caulking, gyproc sheeting, plaster joint compound, exterior siding, etc. (refer to Photos 29 to 32, Appendix B-2);
- Florescent light fixtures and high intensity discharge (HID) lights were observed inside the Site building (refer to Photos 33 to 34, Appendix B-2). The ballasts within the fluorescent light fixtures may contain PCBs and the arc tubes within the lights may contain mercury;
- A potential UST was observed inside the Site building (refer to Figure 2.1, Appendix A-2 and Photo 35, Appendix B-2). A stain area, measuring approximately 2 m x 3 m, was observed on the concrete floor at this area;
- Several stain areas were observed in the vicinity of the floor drains present within the Site building. Stains appeared to be a result of spillage from wood hauling equipment being stored inside the structure (refer to Figure 2.1, Appendix A-2 and Photos 36 and 37, Appendix B-2);
- A machine shop was observed at the northwest corner of the building (refer to Figure 2.1, Appendix A-2 and Photo 38, Appendix B-2);
- Several cylinders of compressed gas were observed inside the Site building (refer to Figure 2.1, Appendix A-2 and Photo 39, Appendix B-2);
- Several automotive type batteries were observed inside the Site building (refer to Photo 40, Appendix B-2); and
- Several pieces of saw milling type equipment was observed throughout the Site building (refer to Photos 41 to 43, Appendix B-2).

2.3 PHASE II ENVIRONMENTAL SITE ASSESSMENT

The Phase II ESA was carried out in accordance with the DNRMD RFP dated May 2006, AMEC's proposal dated May 26, 2006 and AMEC's Proposed Phase II ESA Sampling Program dated August 21, 2006. Field work was carried out at the Site by Kelly Curtis, CET and Sheldon Adey, CET of AMEC during the period of September 19 to 28, 2006. Sample locations for the investigation were selected in consultation with the DNRMD Project Manager and based on the findings of the previous Phase I ESA and the initial site inspection carried out at the Site. The methodologies used to conduct the field investigations carried out at the Site during the current investigation are described in Section 1.5.

2.3.1 Scope of Work

Based on the information and observations recorded during the initial site inspection, the scope of work for this area of the Site included the following Phase II ESA activities:

- Collecting one ceiling tile sample (NC-ASB1), one brick mortar sample (NC-ASB2), one pipe insulation sample (NC-ASB3) and one exterior siding sample (NC-ASB5) from the former E&R building for asbestos analyses;
- Collecting one floor tile sample (NC-ASB4), one ceiling tile sample (NC-ASB6) and one boiler insulation sample (NC-ASB7) from the Mine Dry building for asbestos analyses;
- Collecting two air samples (NC#1 to NC#2) at various locations throughout the Site for asbestos analyses;
- Collecting 15 paint chip samples (NC-PS1 to NC-PS15) from painted surfaces present at the Site for a combination of lead, lead leachate, mercury, mercury leachate and PCB analyses;
- Excavating 12 test pits (NC-TP1 to NC-TP12) along the perimeter of the former E&R building and collecting soil samples for BTEX/TPH, metals plus hydrides, PAH and PCB analyses;
- Excavating two test pits (NC-TP13 and NC-TP14) in the vicinity of former pole-mounted transformers previously located north of the former E&R building and collecting surface soil samples for PCB analyses;
- Excavating two test pits (NC-TP15 and NC-TP16) at the former tank farm located west of the former E&R building and collecting surface soil samples for BTEX/TPH, metals plus hydrides and PAH analyses;
- Excavating three test pits (NC-TP17 to NC-TP19) underneath several pole-mounted transformers located in the vicinity of the Mine Dry building and Northco office building and collecting surface soil samples for PCB analyses;
- Excavating two test pits (NC-TP20 and NC-TP21) in the vicinity of the former equipment refuelling station reported to have been located north of the former E&R building and collecting soil samples for BTEX/TPH analyses;
- Excavating three test pits (NC-TP22 to NC-TP24) downgradient of the former tank farm and collecting soil samples for BTEX/TPH, metals plus hydrides and PAH analyses;
- Excavating three test pits (NC-TP25 to NC-TP27) downgradient the potential fill/vent pipe located at the southeast corner of the Mine Dry building and collecting soil samples for BTEX/TPH analyses;
- Recording GPS coordinates for all sample locations; and

- Preparing a comprehensive report outlining the methodologies, findings, conclusions and recommendations of the investigation.

All sample locations are presented on Figures 2.2 and 2.3, Appendix A-2.

2.3.2 Field Observations

Detailed field observations pertaining to soil stratigraphy, soil vapour headspace, groundwater conditions and contaminant observations are discussed in this section.

2.3.2.1 Stratigraphy

The soil stratigraphy generally consisted primarily of variable thickness grey, brown and reddish brown sand and gravel with some boulders, cobbles and trace organics and fines overlying glacial till consisting of grey sand and gravel with some boulders, cobbles and fines. Thickness of the soil identified at the Site ranged from approximately 0.9 m (NC-TP5 and NC-TP9) to at least 4.8 m below the ground surface (bgs) (NC-TP1). Detailed soil descriptions and sampling depths are provided in the test pit logs presented in Appendix C-2.

2.3.2.2 Soil Vapour Concentrations

All soil samples collected at the Site were tested using a hand-held PID for SVH. SVH readings report the concentrations of ionizable vapours being released from the soils. SVH readings ranged from 0.0 parts per million (ppm) to 299 ppm (refer to Appendix D-2). The SVH readings were used to assist with the selection of soil samples for laboratory analyses.

2.3.2.3 Groundwater Conditions

Groundwater was encountered in 15 (NC-TP1, NC-TP7, NC-TP8, NC-TP10 to NC-TP12, NC-TP15, NC-TP16, NC-TP20 to NC-TP25 and NC-TP27) of the 27 test pits excavated at the Site at depths of ranging from 0.25 m (NC-TP15 and NC-TP16) to 4.5 m (NC-TP1) bgs (refer to test pit logs presented in Appendix D-2). Based on the topography of the Site, groundwater flow direction at the Site has been inferred to be in a south-easterly direction, towards Lower Duck Island Cove Brook.

2.3.2.4 Contaminant Observations

<u>Petroleum Hydrocarbon Odours</u>
Petroleum hydrocarbon odours were observed during the excavation of test pits NC-TP2, NC-TP7, NC-TP11, NC-TP15, NC-TP16 and NC-TP22 to NC-TP24 (refer to Figure 2.3, Appendix A-2). Please note that since full face respirators were worn by field staff during excavation, olfactory evidence of petroleum hydrocarbons may have been present in other test pits excavated at the Site, however, these may not have been detected by field staff.

<u>Free Phase Petroleum Hydrocarbon Product</u>
No free phase petroleum hydrocarbon product was observed on the water table within any of the test pits excavated at the Site. A petroleum hydrocarbon sheen was observed on the water table within test

pit NC-TP23, excavated downgradient of the former tank farm (refer to Figure 2.3, Appendix A-2 and Photo 44, Appendix B-2).

2.3.3 Florescent Light Ballasts

Three florescent light fixtures present on the main floor of the Mine Dry were inspected during the current investigation. Others were not inspected due to height restrictions and safety concerns. Please note that serial numbers were not visible on ballasts within two of the light fixtures and there was no ballast present within the third light fixture (refer to Photos 45 to 47, Appendix B-2). Therefore, the inspection of florescent light ballasts for PCBs is inconclusive at this time.

Due to height restrictions and safety concerns, the florescent light ballasts present inside the former E&R building were not assessed for PCBs during the current investigation.

2.3.4 GPS Coordinates

AMEC recorded coordinates for all sampling locations using a handheld global positioning system (GPS) unit with an accuracy of +/- 5 m. All GPS coordinates were recorded in UTM NAD27 and are presented in Appendix E-2.

2.3.5 Laboratory Analytical Program

The detailed laboratory analytical program for the Phase II ESA completed at the Northco Property is outlined in Table 2-1 below.

Table 2-1: Detailed Laboratory Analytical Program

<table>
<tr><th>Media</th><th>Sample ID</th><th>Analyses</th></tr>
<tr><td rowspan="4">Paint</td><td>NC-PS1, NC-PS2, NC-PS3, NC-PS4, NC-PS5, NC-PS6, NC-PS7, NC-PS8, NC-PS9, NC-PS10, NC-PS11, NC-PS12, NC-PS13, NC-PS14, NC-PS15, PS-DUP1, PS-DUP3</td><td>Lead and Mercury</td></tr>
<tr><td>NC-PS1, NC-PS2, NC-PS5, NC-PS8, NC-PS11</td><td>PCB</td></tr>
<tr><td>NC-PS2, NC-PS6, NC-PS7</td><td>Lead Leachate (TCLP)</td></tr>
<tr><td>NC-PS5, NC-PS9</td><td>Mercury Leachate (TCLP)</td></tr>
<tr><td>Asbestos</td><td>NC-ASB1, NC-ASB2, NC-ASB3, NC-ASB4, NC-ASB5, NC-ASB6, NC-ASB7</td><td rowspan="2">Asbestos</td></tr>
<tr><td>Air</td><td>NC#1, MC#2</td></tr>
<tr><td rowspan="2">Soil</td><td>NC-TP1-SS4, NC-TP2-SS2, NC-TP3-SS3, NC-TP4-SS3, NC-TP5-SS1, NC-TP6-SS1, NC-TP7-SS3, NC-TP8-SS3, NC-TP9-SS1, NC-TP10-SS1, NC-TP11-SS2, NC-TP12-SS2, NC-TP15-SS1, NC-TP16-SS1, NC-TP20-SS1, NC-TP21-SS1, NC-TP22-SS1, NC-TP23-SS1, NC-TP24-SS1, NC-TP25-SS3, NC-TP26-SS2, NC-TP27-SS3</td><td>BTEX/TPH</td></tr>
<tr><td>NC-TP2-SS2, NC-TP4-SS3, NC-TP12-SS2, NC-TP15-SS1, NC-TP16-SS1, NC-TP22-SS1, NC-TP23-SS1, NC-TP24-SS1</td><td>Metals Plus Hydrides and PAH</td></tr>
</table>

Media	Sample ID	Analyses
Soil	NC-TP4-SS3, NC-TP6-SS1, NC-TP13-SS1, NC-TP14-SS1, NC-TP15-SS1, NC-TP16-SS1, NC-TP17-SS1, NC-TP18-SS1, NC-TP19-SS1	PCB
	DUP 7	BTEX/TPH and PCB
	DUP 8	BTEX/TPH, Metals Plus Hydrides and PAH
	DUP10	BTEX/TPH, Metals Plus Hydrides PAHs and PCBs

Notes:
PS-DUP1 is a blind field duplicate of paint sample NC-PS2 for lead and mercury analyses
PS-DUP3 is a blind field duplicate of paint sample NC-PS15 for lead and mercury analyses
DUP 7 is a blind field duplicate of soil sample NC-TP6-SS1 for BTEX/TPH and PCB analyses
DUP 8 is a blind field duplicate of soil sample NC-TP12-SS2 for BTEX/TPH, metals plus hydrides and PAH analyses
DUP 10 is a blind field duplicate of soil sample NC-TP16-SS1 for BTEX/TPH, metals plus hydrides, PAH and PCB analyses

2.4 LABORATORY ANALYTICAL RESULTS

This section provides a summary of laboratory analytical results for asbestos, air, paint and soil samples collected at the Site during the current investigation. Tables summarizing the analytical results and applicable guidelines are presented in Appendix F-2. Sample locations are presented on Figures 3.2 and 3.3, Appendix A-2 and the Laboratory Certificates of Analyses are presented in Section 11.0.

2.4.1 Asbestos Sample Results

There are over 3,000 asbestos containing materials (ACMs), which can be divided into two broad categories: friable and non-friable.

- **Friable ACMs** are defined as materials that can be crumbled, pulverized and reduced to powder when dry using hand pressure. Typical friable materials include acoustical or decorative spray applications, fireproofing and thermal insulation; and
- **Non-friable ACMs** are hard or manufactured products such as floor tiles, fire blankets, pre-formed manufactured cementitious insulation and wallboards, pipes, and siding, wherein the asbestos fibres are bound to the substrate.

A total of seven building material samples (NC-ASB1 to NC-ASB7) collected from the Mine Dry and the former E&R buildings present at the Site were analyzed for asbestos (refer to Figure 3.2, Appendix A-2). The laboratory results for asbestos are presented in Table 2-1, Appendix F-2. The results were compared to the “The Asbestos Abatement Regulations”, 1998 (Nfld. Reg. 111/98) criterion of 1% asbestos fibres.

Analytical results revealed that concentrations of asbestos detected in samples NC-ASB1 (20% chrysotile), NC-ASB2 (2% chrysotile), NC-ASB4 (3% chrysotile), NC-ASB5 (25% chrysotile) and NC-ASB6 (5% amosite) exceeded the applicable assessment criterion of 1%. Sample NC-ASB1 consisted of ceiling tile collected from the former E&R building, sample NC-ASB2 consisted of brick mortar collected from the former E&R building, sample NC-ASB4 consisted of floor tile collected from the Mine Dry building, sample NC-ASB5 consisted of exterior siding collected from the former E&R

building and sample NC-ASB6 consisted of ceiling tile collected from the Mine Dry building. Asbestos was not detected in the pipe insulation (NC-ASB3) of the former E&R building and the boiler insulation (NC-ASB7) of the Mine Dry building.

2.4.2 Air Sample Results

2.4.2.1 Asbestos in Air

A total of two air samples (NC#1 and NC#2) collected at the Site were analyzed for asbestos (refer to Figure 2, Appendix A-2). Sample NC#1 was collected on the east side of the former E&R building and sample NC#2 was collected inside the former E&R building. Weather conditions at the time of sampling were overcast with light winds. The analytical results are presented in Table 2-2, Appendix F-2. The results were compared to the 2006 Occupational Exposure Threshold Limit Value (TLV) of 0.1 fibres/cm^3 as indicated by the American Conference of Governmental Industrial Hygienists (ACGIH)[1].

Asbestos fibre was not detected (<0.002 fibres/cm^3) in either of the two air samples collected at the Site and therefore are below the applicable assessment criterion of 0.1 fibres/cm^3.

2.4.3 Paint Sample Results

2.4.3.1 Lead in Paint

A total of 15 paint samples (NC-PS1 to NC-PS15), plus two blind field duplicate samples (PS-DUP1 and PS-DUP3), collected from the painted surfaces present at the Site were submitted to the laboratory for lead analyses. The laboratory results for lead in paint are presented in Table 2-3, Appendix F-2. The results were compared to the Federal HPA criterion of 600 mg/kg and former Federal HPA criterion of 5,000 mg/kg.

Results of the paint sampling program revealed that concentrations of lead detected in paint samples NC-PS1 (2,870 mg/kg), NC-PS2 (6,200 mg/kg), NC-PS5 (1,880 mg/kg), NC-PS6 (27,400 mg/kg), NC-PS7 (26,400 mg/kg), NC-PS8 (996 mg/kg), NC-PS10 (796 mg/kg), NC-PS12 (930 mg/kg), NC-PS13 (673 mg/kg) and NC-PS14 (685 mg/kg) exceeded the Federal HPA criterion of 600 mg/kg and are therefore considered to be a health hazard during any renovation/demolition activities at the Site.

Concentrations of lead detected in paint samples NC-PS2 (6,200 mg/kg), NC-PS6 (27,400 mg/kg) and NC-PS7 (26,400 mg/kg) also exceeded the former Federal HPA criterion of 5,000 mg/kg.

2.4.3.2 Mercury in Paint

A total of 15 paint samples (NC-PS1 to NC-PS15), plus two blind field duplicate samples (PS-DUP1 and PS-DUP3), collected from the painted surfaces present at the Site were submitted to the laboratory for mercury analyses. The laboratory results for mercury in paint are presented in Table 2-4, Appendix

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[1] Documentation of the Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices, ACGIH Worldwide Signature Publications, Cincinnati, OH, 2006.

F-2. The results are compared to the Federal HPA criterion of 10 mg/kg and the CCME-CEQG of 24 mg/kg for mercury in soil at a commercial site.

Results of the paint sampling program revealed that concentrations of mercury detected in paint samples NC-PS2 (19.7 mg/kg), NC-PS5 (32.2 mg/kg), NC-PS9 (54.7 mg/kg) and PS-DUP3 (13.4 mg/kg) exceeded the Federal HPA criterion of 10 mg/kg and are therefore considered to be a health hazard during any renovation/demolition activities at the Site.

Concentrations of mercury detected in paint samples NC-PS5 (32.2 mg/kg) and NC-PS9 (54.7 mg/kg) also exceeded the CCME-CEQG for mercury in soil at a commercial site (24 mg/kg).

2.4.3.3 PCBs in Paint

A total of five paint samples (NC-PS1, NC-PS2, NC-PS5, NC-PS8 and NC-PS11) collected from the painted surfaces present at the Site were submitted to the laboratory for PCB analyses. The laboratory results for PCB in paint are presented in Table 2-5, Appendix F-2. The results were compared to the CCME-CEQG of 33 mg/kg for PCB in soil at a commercial site.

Results of the paint sampling program revealed that concentrations of PCB in all paint samples analyzed were detected a levels below the applicable CCME-CEQG of 33 mg/kg. Concentrations of PCBs detected in paint ranged from 0.53 mg/kg (NC-PS11) to 3.39 mg/kg (NC-PS1).

2.4.3.4 Lead Leachate in Paint

Since concentrations of lead in paint samples NC-PS2, NC-PS6 and NC-PS7 exceeded the applicable former Federal HPA criterion of 5,000 mg/kg, these paint samples were also analyzed using the Toxicity Characteristic Leaching Procedure (TCLP) for lead leachate to determine whether or not these paints would be considered hazardous waste upon removal from the Site. The laboratory results for lead leachate in paint are presented in Table 2-6, Appendix F-2. The results were compared to the provincial guideline for leachable toxic waste[2] and the federal regulation for the TDG criterion of 5 mg/L.

Results revealed that the concentrations of lead leachate detected in all paint samples analyzed did not exceed the applicable assessment criterion of 5.0 mg/L. Therefore, these paints, if removed from the Site, may be disposed of at an approved landfill facility.

2.4.3.5 Mercury Leachate in Paint

Since concentrations of mercury in paint samples NC-PS5 and NC-PS9 exceeded the applicable CCME-CEQG of 24 mg/kg for mercury in soil at a commercial site, these paint samples were also analyzed using the TCLP for mercury leachate to determine whether or not these paints would be considered hazardous waste upon removal from the Site. The laboratory results for mercury leachate in paint are presented in Table 2-7, Appendix F-2. The results were compared to the provincial guideline for leachable toxic waste[2] and the federal regulation for the TDG criterion of 0.1 mg/L.

Results revealed that the concentrations of mercury leachate detected in all paint samples analyzed did not exceed the applicable assessment criterion of 0.1 mg/L. Therefore, these paints, if removed from the Site, may be disposed of at an approved landfill facility.

2.4.4 Soil Sample Results

2.4.4.1 Petroleum Hydrocarbons in Soil

A total of 22 soil samples, plus two blind field duplicate sample (DUP 7 and DUP 8), collected at the Site were analyzed for BTEX/TPH. The analytical results are presented in Tables 2-8 to 2-12, Appendix F-2. The results were compared to the CCME-CEQG for commercial sites and the 2003 Atlantic PIRI Tier I RBSLs for commercial sites with coarse-grained soil and non-potable groundwater.

Concentrations of ethylbenzene detected in soil samples NC-TP7-SS3 (0.16 mg/kg) and NC-TP23-SS1 (0.51 mg/kg) exceeded the CCME-CEQG of 0.08 mg/kg, but did not exceed the 2003 Atlantic Tier I RBSL of 430 mg/kg. Concentrations of BTEX in all other soil samples analyzed were either non-detect or detected at levels below the applicable assessment criteria.

Concentrations of modified TPH detected in soil samples NC-TP15-SS1 (<22,400 mg/kg) and NC-TP16-SS1 (<13,000 mg/kg) exceeded the 2003 Atlantic PIRI Tier I RBSL criterion of 7,400 mg/kg for diesel fuel in soil at a commercial site with coarse-grained soil and non-potable groundwater. Hydrocarbons detected in soil resembled weathered diesel fuel and heavy oil. Concentrations of modified TPH in all other soil samples analyzed were either non-detect or detected at levels below the applicable assessment criteria.

2.4.4.2 Metals in Soil

A total of eight soil samples, plus one blind field duplicate sample (DUP 8), collected at the Site were analyzed for metals plus hydrides. The analytical results are presented in Tables 2-13 and 2-14, Appendix F-2. The results were compared to the CCME-CEQG for commercial/industrial sites.

Concentrations of chromium detected in all soil samples analyzed exceeded the applicable CCME-CEQG of 87 mg/kg. Concentrations of chromium detected in soil ranged from 344 mg/kg (NC-TP24-SS1) to 810 mg/kg (NC-TP22-SS1).

The concentration of copper detected in soil sample DUP 8 (95 mg/kg) exceeded the applicable CCME-CEQG of 91 mg/kg.

Concentrations of nickel detected in all soil samples analyzed exceeded the applicable CCME-CEQG of 50 mg/kg. Concentrations of nickel detected in soil ranged from 387 mg/kg (NC-TP16-SS1) to 1,470 mg/kg (NC-TP2-SS2).

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[2] Newfoundland and Labrador Department of Environment and Conservation, November 2003. Guidance Document: Leachable Toxic Waste, Testing and Disposal (GD-PPD-26.1).

2.4.4.3 PAHs in Soil

A total of eight soil samples, plus one blind field duplicate sample (DUP 8), collected at the Site were analyzed for PAHs. The analytical results are presented in Tables 2-15 and 2-16, Appendix F-2. The results were compared to the CCME-CEQG for commercial/industrial sites.

Concentrations of PAHs in all soil samples analyzed were either non-detect or detected at levels below the applicable assessment criteria.

2.4.4.4 PCBs in Soil

A total of nine soil samples, plus one blind field duplicate sample (DUP 7), collected at the Site were analyzed for PCBs. The analytical result is presented in Tables 2-17 and 2-18, Appendix F-2. The results were compared to the CCME-CEQG for commercial/industrial sites.

Concentrations of PCBs in all soil samples analyzed were either non-detect or detected at levels below the applicable assessment criteria of 33 mg/kg.

2.5 DISCUSSION OF CONTAMINANTS OF CONCERN

Based on the findings of this Phase II ESA the following discussions of contaminants of concern (COC) investigated are provided.

2.5.1 Asbestos

Asbestos was detected in the ceiling tile, brick mortar and exterior siding of the former E&R building and in the ceiling tile and floor tile of the Mine Dry building. Asbestos fibres in ceiling tile are considered to be friable and asbestos fibres in floor tile, brick mortar and exterior siding are considered to be "non-friable", unless disturbed.

Asbestos fibres was not detected (<0.002 fibres/cm^3) in the two air samples collected at the Site during the current investigation and therefore are below the applicable assessment criterion of 0.1 fibres/cm^3. However, please note that these findings are based on one sampling event and that the concentrations of asbestos fibres in air may vary (i.e. increase or decrease) over time, especially during dry periods and periods of activity at the Site.

2.5.2 Paint

Lead

Results of the paint sampling program revealed that concentrations of lead detected in 10 of the 15 paint samples analyzed exceeded the Federal HPA criterion of 600 mg/kg and therefore considered to be a health hazard during any renovation/demolition activities at the Site. Concentrations of lead detected three of the 15 paint samples analyzed also exceeded the former Federal HPA criterion of 5,000 mg/kg.

Concentrations of lead leachate detected in all paint samples analyzed did not exceed the applicable assessment criterion of 5.0 mg/L. Therefore, these paints, if removed from the Site, may be disposed of at an approved landfill facility.

Mercury

Results of the paint sampling program revealed that concentrations of mercury detected in three of the 15 paint samples analyzed exceeded the Federal HPA criterion of 10.0 mg/kg and are therefore considered to be a health hazard during any renovation/demolition activities at the Site. Concentrations of mercury detected two of the 15 paint samples analyzed also exceeded CCME-CEQG of 24.0 mg/kg for mercury in soil at a commercial site.

Results revealed that the concentrations of mercury leachate detected in all paint samples analyzed did not exceed the applicable assessment criterion of 0.1 mg/L. Therefore, these paints, if removed from the Site, may be disposed of at an approved landfill facility.

2.5.3 PCBs

Findings of the florescent light ballast inspection were inconclusive. However, given the age of the Site buildings, it is likely that PCB containing light ballasts are present at the Site.

2.5.4 Petroleum Hydrocarbons

A petroleum hydrocarbon sheen was observed on the water table within test pit NC-TP23, excavated downgradient (east) of the former tank farm.

Concentrations of ethylbenzene detected in soil samples NC-TP7-SS3 (0.16 mg/kg) and NC-TP23-SS1 (0.51 mg/kg) exceeded the CCME-CEQG of 0.08 mg/kg, but did not exceed the 2003 Atlantic Tier I RBSL of 430 mg/kg. Soil sample NC-TP7-SS3 was collected adjacent to the waste oil AST located at the northwest corner of the former E&R building and soil sample NC-TP23-SS1 was collected downgradient (east) of the former tank farm.

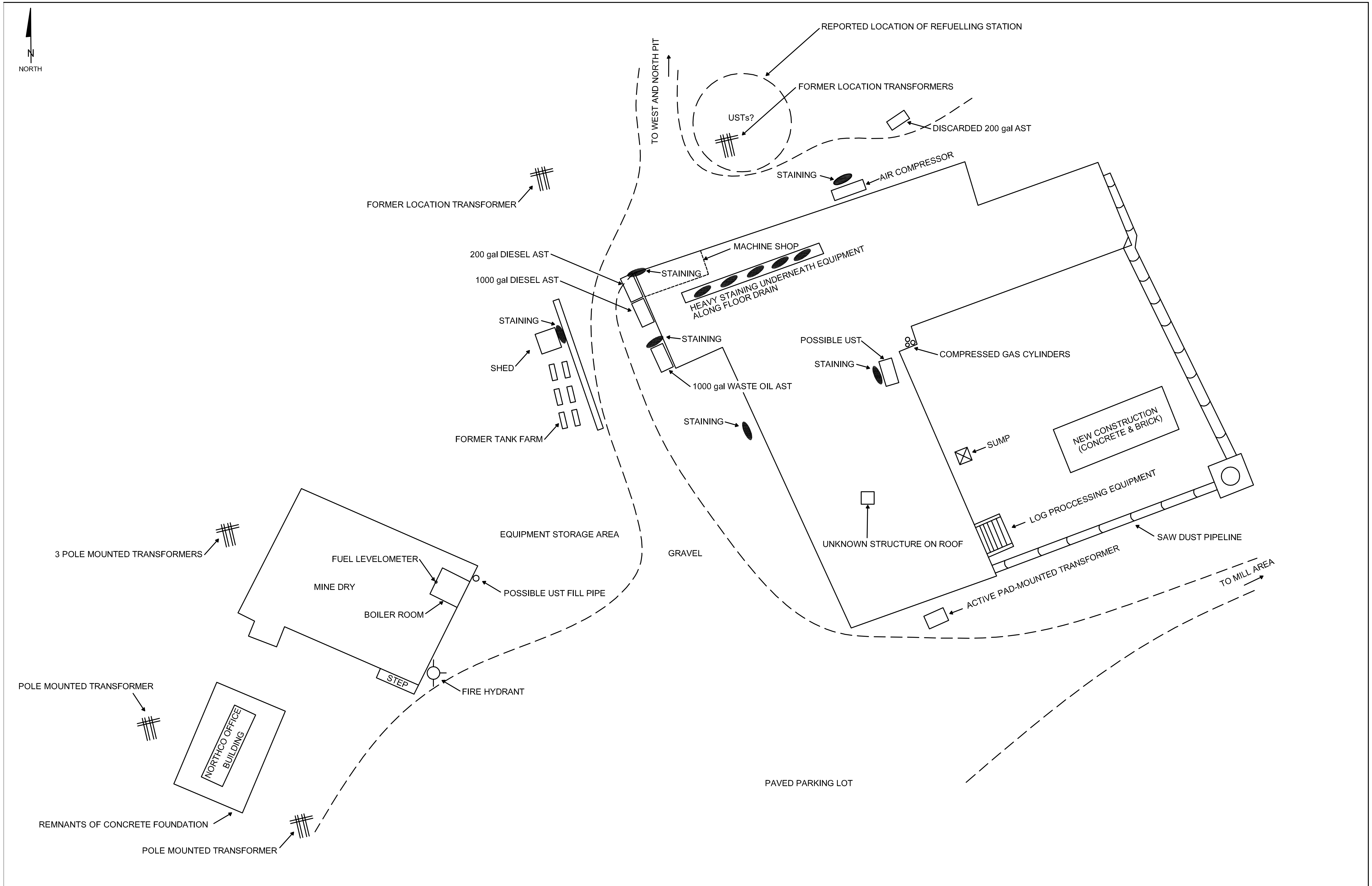
Concentrations of modified TPH detected in surface soil samples NC-TP15-SS1 (<22,400 mg/kg) and NC-TP16-SS1 (<13,000 mg/kg) exceeded the 2003 Atlantic PIRI Tier I RBSL criterion of 7,400 mg/kg for diesel fuel in soil at a commercial site with coarse-grained soil and non-potable groundwater. Soil samples NC-TP15-SS1 and NC-TP16-SS1 were collected at the former tank farm, located west of the former E&R building.

2.5.5 Metals

Concentrations of chromium and nickel detected in all eight soil samples collected at the Site exceeded the applicable assessment criteria for metals in soil at industrial sites. The concentration of copper detected in one of the eight soil samples analyzed also exceeded the applicable assessment criteria for metals. Based on the testing completed, chromium and nickel impacts in soil are considered to be widespread throughout the Site.

APPENDIX A-2

FIGURES



NOTES

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM FIGURE.
3. THIS FIGURE IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
5. THIS FIGURE SHOULD NOT BE USED FOR PURPOSES OTHER THAN THOSE OUTLINED ABOVE.
6. THIS FIGURE CONTAINS INTELLECTUAL PROPERTY OF THE DEPARTMENT OF NATURAL RESOURCES AND MAY NOT BE REPRODUCED OR COPIED WITHOUT THEIR WRITTEN CONSENT.
7. THIS FIGURE WAS PRODUCED FROM DOCUMENTS SUPPLIED BY THE CLIENT AND VISUAL OBSERVATIONS.

LEGEND

GRAVEL ACCESS ROADS

CLIENT

DEPARTMENT OF NATURAL RESOURCES

PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER BAIE VERTE ASBESTOS MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

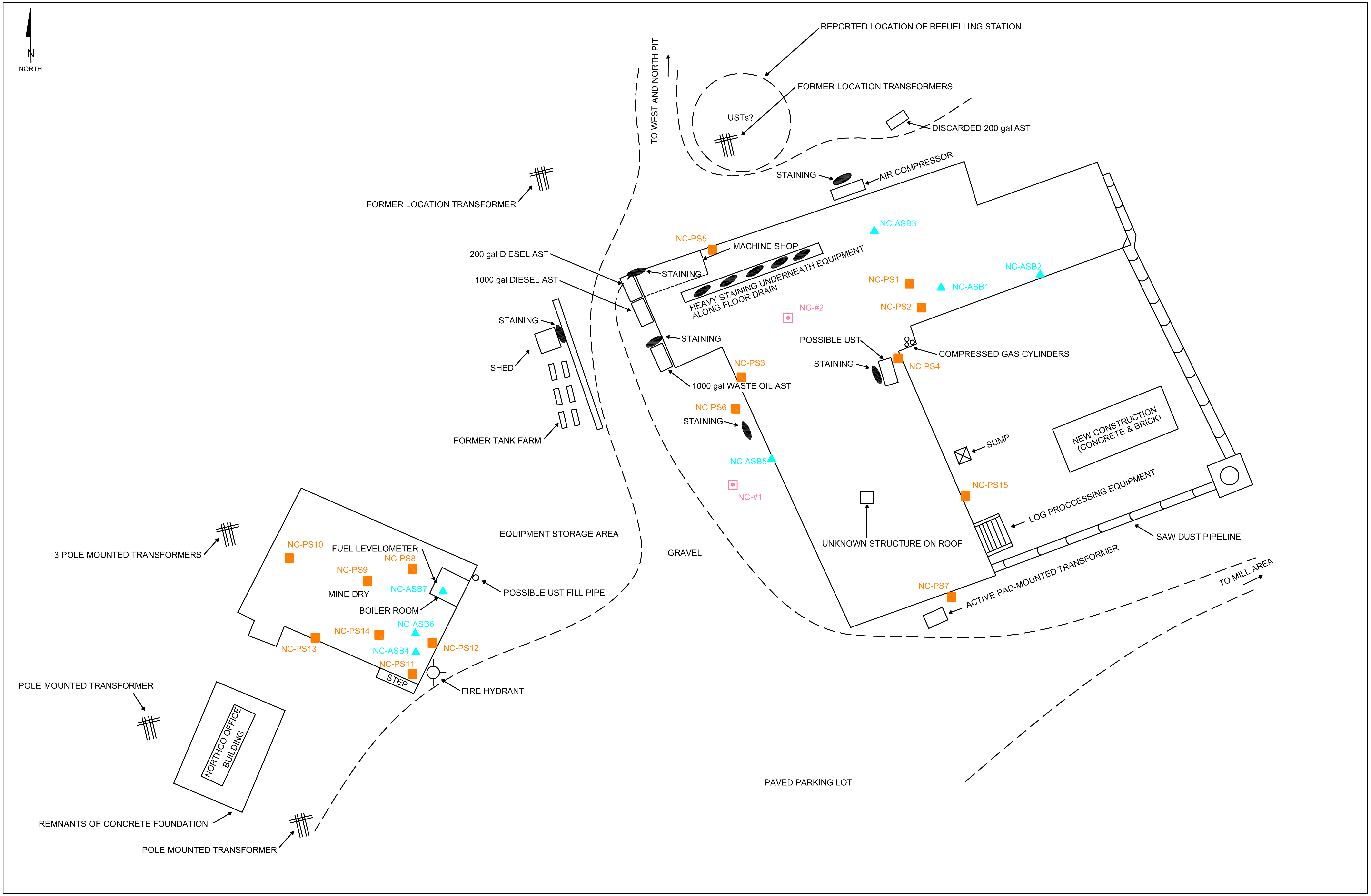
DRAWING TITLE

FORMER NORTHCO PROPERTY

SCALE	PROJECT NUMBER
NTS	TF6126509

DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	

DRAWING NO.	DATE	REV
2.1	January 2007	



NOTES

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2. DO NOT SCALE FROM FIGURE.
3. THIS FIGURE IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
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LEGEND

- GRAVEL ACCESS ROADS
- ASBESTOS SAMPLE
- PAINT SAMPLE
- AIR SAMPLE

CLIENT

DEPARTMENT OF NATURAL RESOURCES

PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER BAIE VERTE ASBESTOS MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

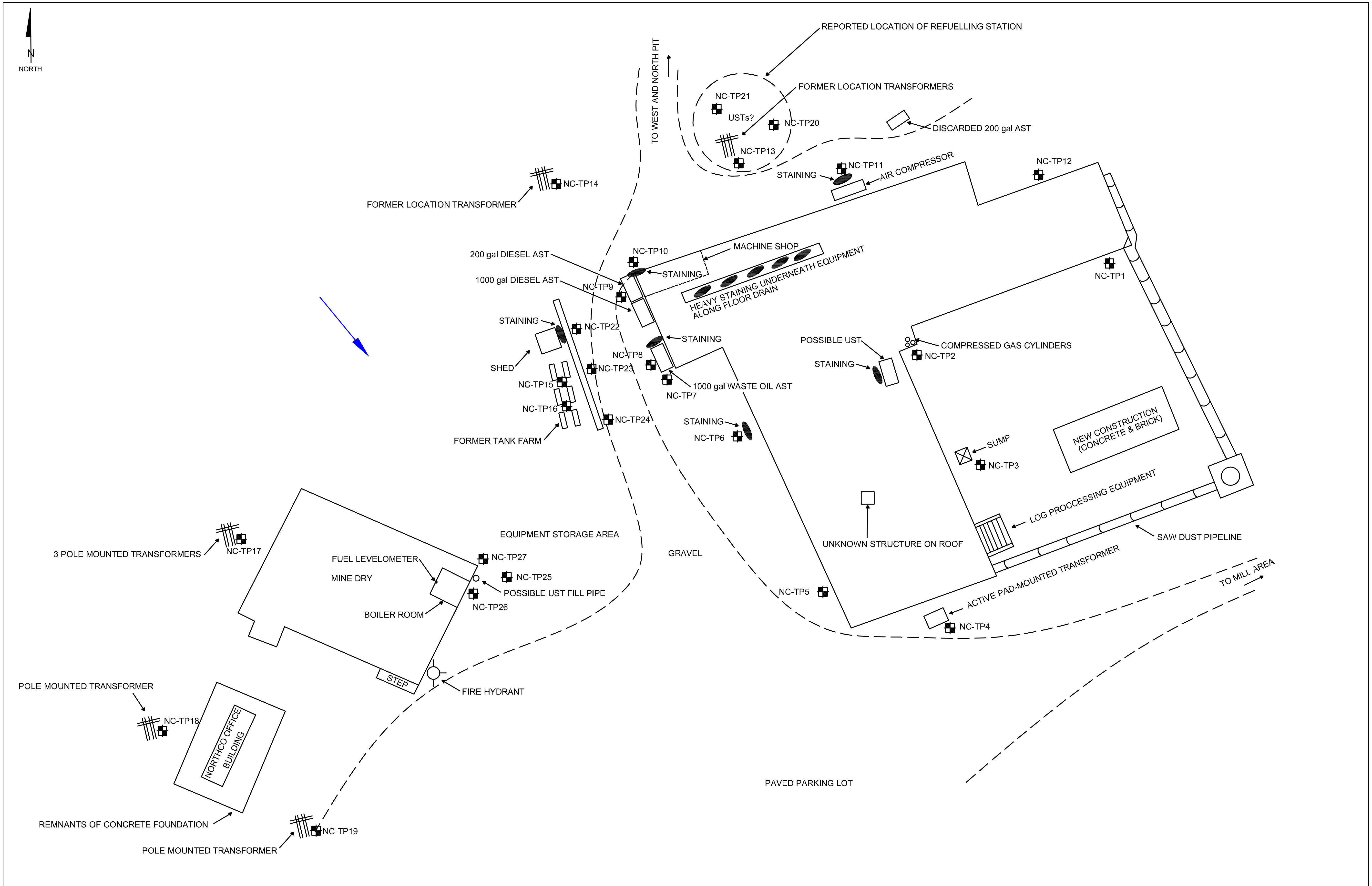
DRAWING TITLE

FORMER NORTHCO PROPERTY
AIR, ASBESTOS AND PAINT SAMPLE LOCATIONS

SCALE	PROJECT NUMBER	
NTS	TF6126509	

DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	

DRAWING NO.	DATE	REV
2.2	January 2007	



NOTES

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM FIGURE.
3. THIS FIGURE IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
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LEGEND

GRAVEL ACCESS ROADS

TEST PIT LOCATION

ASSUMED GROUNDWATER FLOW DIRECTION

CLIENT

DEPARTMENT OF NATURAL RESOURCES

PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER BAIE VERTE ASBESTOS MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

FORMER NORTHCO PROPERTY
TEST PIT LOCATIONS

SCALE	PROJECT NUMBER	
NTS	TF6126509	
DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	
DRAWING NO.	DATE	REV
2.3	January 2007	

APPENDIX B-2

PHOTOGRAPHIC RECORD

Photo 1: Mine Dry Building.

Photo 2: Former E&R Building.

Photo 3: Northco Office Building.
(Excluded From Assessment)

Photo 4: Former Tank Farm.

Photo 5: Former Tank Farm.
(Photo Obtained from NLDOEC – 1990)

Photo 6: 1,000-Gallon Waste Oil AST – Adjacent Former E&R Building. (Note Staining on Asphalt)

Photo 7: 1,000-Gallon and 200-Gallon Diesel Fuel ASTs – Adjacent Former E&R Building. (Note Staining on Asphalt)

Photo 8: Stained Soil – Northwest Corner of the Former E&R Building.

Photo 9: Staining Underneath Air Compressor.
(North Side of the Former E&R Building)

Photo 10: Empty Discarded AST – North of Former E&R Building.

Photo 11: Stockpile of Saw Dust and Bark.
(Northeast of the Former E&R Building)

Photo 12: Stockpile of Saw Dust.
(Southeast of the Former E&R Building)

Photo 13: Possible Sump.
(East Side of the Former E&R Building)

Photo 14: Close-up of Possible Sump.
(East Side of the Former E&R Building)

Photo 15: Evidence of New Construction – Cinder Block.
(East Side of the Former E&R Building)

Photo 16: Pad-Mounted Transformer.
(South Side of the Former E&R Building)


Photo 17: Staining along of Bay Door.
(West Side of the Former E&R Building)


Photo 18: Possible UST Fill/Vent Pipe – Adjacent to Boiler Room.
(Southeast Corner of Mine Dry Building)


Photo 19: Floor Tiles – Basement of Mine Dry.


Photo 20: Ceiling Tiles – Basement of Mine Dry.


Photo 21: Boiler and Pipe Insulation – Boiler Room of Mine Dry. (Note Mold Growth)


Photo 22: Mold Growth on Ceiling Tile – Basement of Mine Dry.


Photo 23: Typical Mercury Containing Thermostat – Main Floor of Mine Dry.


Photo 24: Typical Florescent Light Fixture – Mine Dry.

Photo 25: Typical Florescent Light Fixture – Mine Dry.

Photo 26: Typical Florescent Light Fixture – Mine Dry.

Photo 27: Fuel Levelometer in Boiler Room of Mine Dry.
(Fuel Capacity of 13,367 Litres)

Photo 28: Fiberglass Insulation – Main Floor of Mine Dry.


Photo 29: Pipe Insulation – Former E&R Building.


Photo 30: Ceiling Tile – Former E&R Building.


Photo 31: Brick Mortar – Former E&R Building.


Photo 32: Exterior Siding – Former E&R Building.


Photo 33: Typical Florescent Light Fixture – Former E&R Building.

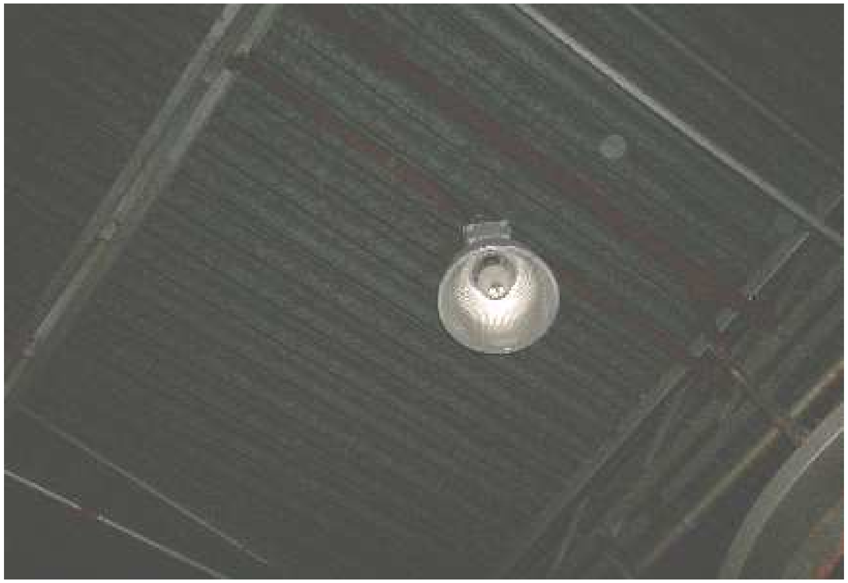
Photo 34: Typical HID Light Fixture – Former E&R Building.


Photo 35: Possible UST inside Former E&R Building – East Side.
(Note Staining)


Photo 36: Staining Underneath Equipment Along Floor Drains –
Former E&R Building.

Photo 37: Staining Underneath Equipment Along Floor Drains – Former E&R Building.

Photo 38: Machine Shop – Northwest Corner of Former E&R Building.

Photo 39: Typical Compressed Gas Cylinders – Former E&R Building.

Photo 40: Automotive Batteries – Former E&R Building.

Photo 41: Typical Equipment – Former E&R Building.

Photo 42: Typical Equipment – Former E&R Building.

Photo 43: Typical Equipment – Former E&R Building.

Photo 44: Petroleum Hydrocarbon Sheen – Test Pit NC-TP23.

Photo 45: Florescent Light Ballast – Main Floor of Mine Dry.

Photo 46: Florescent Light Ballast – Main Floor of Mine Dry.

Photo 47: Light Fixture with no Florescent Light Ballast –
Main Floor of Mine Dry.

APPENDIX C-2

TEST PIT LOGS

Department of Natural Resources
Phase II Environmental Site Assessment
Baie Verte Asbestos Mine – Northco Property

Test Pit Identification Number	Depth From – To (m)	Soil Description
NC-TP1	0.0 - 0.1	ASPHALT
	0.1 - 0.2	FILL - Class “A” material
	0.2 - 0.3	FILL - Dark grey, SAND and GRAVEL with some fines, wood and metal debris, moist, loose.
	0.3 - 0.4	FILL - Reddish brown, SAND and GRAVEL with some fines, cobbles, wood debris, moist, loose.
	0.4 - 4.8	FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, loose to compact.
	4.8	Test pit terminated on Bedrock.
		Note: 1) Groundwater encountered at 4.5 m depth. 2) No hydrocarbon odour present during excavation.
NC-TP2	0.0 - 0.1	ASPHALT
	0.1 - 0.6	FILL - Reddish brown, SAND and GRAVEL with some fines, cobbles, moist, loose.
	0.6 - 3.1	FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact. Yellow and Black staining in test pit.
	3.1	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) Hydrocarbon odour present during excavation.
NC-TP3	0.0 - 0.1	ASPHALT
	0.1 - 1.2	FILL - Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact.
	1.2 - 2.9	GLACIAL TILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	2.9	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.

Test Pit Identification Number	Depth From – To (m)	Soil Description
NC-TP4	0.0 - 1.1	FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact.
	1.1 - 1.9	FILL - Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	1.9 - 3.0	GLACIAL TILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	3.0	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
NC-TP5	0.0 - 0.1	FILL - Brown, SAND and GRAVEL with some fines, cobbles, moist, loose.
	0.1 - 0.9	FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	0.9	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
NC-TP6	0.0 - 0.1	ASPHALT
	0.1 - 0.2	FILL - Class “A” material.
	0.2 - 1.0	FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	1.0	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
NC-TP7	0.0 - 0.1	ASPHALT
	0.1 - 0.5	FILL - Class “A” material.
	0.5 - 3.5	FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, compact.
	3.5	Test pit terminated on Bedrock.
		Note: 1) Groundwater encountered at 3.1 m depth. 2) Hydrocarbon odour present during excavation.

Test Pit Identification Number	Depth From – To (m)	Soil Description
NC-TP8	0.0 - 0.1	ASPHALT
	0.1 - 0.2	FILL - Class “A” material.
	0.2 - 0.5	FILL - Grey, SAND and GRAVEL with some fines, cobbles, moist, loose.
	0.5 - 3.5	GLACIAL TILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, compact.
	3.5	Test pit terminated on Bedrock.
		Note: 1) Groundwater encountered at 2.7 m depth. 2) No hydrocarbon odour present during excavation.
NC-TP9	0.0 - 0.7	FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	0.7 - 1.1	GLACIAL TILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	1.1	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
NC-TP10	0.0 0.1	ASPHALT
	0.1 - 0.4	FILL - Class “A” material.
	0.4 - 0.7	FILL - Brown, SAND and GRAVEL with some fines, cobbles, moist, loose.
	0.7 - 0.9	FILL - Brown, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, compact.
	0.9	Test pit terminated on Bedrock.
		Note: 1) Groundwater encountered at 0.9 m depth. 2) No hydrocarbon odour present during excavation.

Test Pit Identification Number	Depth From – To (m)	Soil Description
NC-TP11	0.0 - 0.1	ASPHALT
	0.1 - 0.2	FILL - Class “A” material.
	0.2 - 1.7	FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, loose to compact.
	1.7	Test pit terminated in Fill.
		Note: 1) Groundwater encountered at 1.7 m depth. 2) Hydrocarbon odour present during excavation.
NC-TP12	0.0 - 0.6	FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, wood debris, moist, loose.
	0.6 - 0.9	FILL - Light brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	0.9 - 2.7	FILL - Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	2.7 - 3.5	FILL - Dark grey, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, compact.
	3.5	Test pit terminated in Fill.
		Note: 1) Groundwater encountered at 3.1 m depth. 2) No hydrocarbon odour present during excavation.
NC-TP13	0.0 - 0.3	FILL - Grey, SAND and GRAVEL with some fines, cobbles, asbestos fibers, moist, loose.
	0.3	Test pit terminated in Fill.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation. 3) Test pit hand dug at the location of a former pole-mounted transformer.
NC-TP14	0.0 - 0.3	FILL - Brown, SAND and GRAVEL with some fines, cobbles, organics, moist, loose.
	0.3	Test pit terminated in Fill.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation. 3) Test pit hand dug at the location of a former pole-mounted transformer.

Test Pit Identification Number	Depth From – To (m)	Soil Description
NC-TP15	0.0 - 0.3 0.3	FILL - Brown, SAND and GRAVEL with some fines, cobbles, moist to saturated, loose. Test pit terminated in Fill. Note: 1) Groundwater encountered at 0.25 m depth. 2) Hydrocarbon odour present during excavation. 3) Test pit hand dug due to no excavator access.
NC-TP16	0.0 - 0.2 0.2 - 0.3 0.3	FILL - White asbestos fiber/paste. FILL - Brown, SAND and GRAVEL with some fines, cobbles, moist to saturated, loose. Test pit terminated in Fill. Note: 1) Groundwater encountered at 0.25 m depth. 2) Hydrocarbon odour present during excavation. 3) Test pit hand dug due to no excavator access.
NC-TP17	0.0 - 0.3 0.3	FILL - Brown, SAND and GRAVEL with some fines, cobbles, organics, moist, loose. Test pit terminated in Fill. Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation. 3) Test pit hand dug underneath a pole-mounted transformer.
NC-TP18	0.0 - 0.3 0.3	FILL - Brown, SAND and GRAVEL with some fines, cobbles, organics, moist, loose. Test pit terminated in Fill. Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation. 3) Test pit hand dug underneath a pole-mounted transformer.

Test Pit Identification Number	Depth From – To (m)	Soil Description
NC-TP19	0.0 - 0.3 0.3	FILL - Brown, SAND and GRAVEL with some fines, cobbles, organics, moist, loose. Test pit terminated in Fill. Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation. 3) Test pit hand dug underneath a pole-mounted transformer.
NC-TP20	0.0 - 1.0 1.0	FILL - Brown, SAND and GRAVEL with some fines, cobbles, wood and metal debris, moist to saturated, loose. Test pit terminated in Fill. Note: 1) Groundwater encountered at 0.6 m depth. 2) No hydrocarbon odour present during excavation.
NC-TP21	0.0 - 1.1 1.1	FILL - Grey, SAND and GRAVEL with some fines, cobbles, moist to saturated, loose. Test pit terminated in Fill. Note: 1) Groundwater encountered at 1.0 m depth. 2) No hydrocarbon odour present during excavation.
NC-TP22	0.0 - 0.2 0.2 - 1.0 1.0	FILL - Brown, SAND and GRAVEL with some fines, cobbles, moist, loose. FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, loose. Test pit terminated on Bedrock. Note: 1) Groundwater encountered at 1.0 m depth. 2) Hydrocarbon odour present during excavation.

Test Pit Identification Number	Depth From – To (m)	Soil Description
NC-TP23	0.0 - 0.6	FILL - Brown, SAND and GRAVEL with some fines, cobbles, wood debris, moist, loose.
	0.6 - 2.0	FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, loose.
	2.0	Test pit terminated on Bedrock.
		Note: 1) Groundwater encountered at 1.8 m depth. 2) Hydrocarbon odour present during excavation. 3) Hydrocarbon sheen visible on water surface.
NC-TP24	0.0 - 1.0	FILL - Brown, SAND and GRAVEL with some fines, cobbles, wood debris, moist, loose.
	1.0	Test pit terminated in Fill.
		Note: 1) Groundwater encountered at 1.8 m depth. 2) Hydrocarbon odour present during excavation.
NC-TP25	0.0 - 0.2	ASPHALT
	0.2 - 0.7	FILL - Class “A” material.
	0.7 - 1.5	FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	1.5 - 1.8	FILL - Brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact.
	1.8 - 4.0	FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, compact.
	4.0	Test pit terminated on Bedrock.
		Note: 1) Groundwater encountered at 3.7 m depth. 2) No hydrocarbon odour present during excavation. 3) Encountered waterline at 1.8 m depth.

Test Pit Identification Number	Depth From – To (m)	Soil Description
NC-TP26	0.0 - 0.2	ASPHALT
	0.2 - 0.8	FILL - Class “A” material.
	0.8 - 2.7	FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, yellow fibers at depth, moist, loose.
	2.7	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
NC-TP27	0.0 - 0.2	ASPHALT
	0.2 - 2.0	FILL - Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact.
	2.0 - 4.3	FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, loose.
	4.3	Test pit terminated on Bedrock.
		Note: 1) Groundwater encountered at 4.0 m 2) Hydrocarbon odour present during excavation.

APPENDIX D-2

SOIL VAPOUR HEADSPACE READINGS

SVH READINGS OF SOIL SAMPLES – NORTHCO

SAMPLING LOCATION	SOIL SAMPLE ID	SAMPLING DEPTH (m)	PID SVH (PPM)
NC-TP1	NC-TP1-SS1	0.0 – 1.0	0.0
	NC-TP1-SS2	1.0 – 2.0	0.0
	NC-TP2-SS3	2.0 – 3.0	0.0
	NC-TP2-SS4	3.5 – 4.8	0.0
NC-TP2	NC-TP2-SS1	0.0 – 1.0	53.7
	NC-TP2-SS2	1.0 – 2.0	101.0
	NC-TP3-SS3	2.0 – 3.1	32.4
NC-TP3	NC-TP3-SS1	0.0 – 1.0	0.0
	NC-TP3-SS2	1.0 – 2.0	0.0
	NC-TP3-SS3	2.0 – 2.9	0.0
NC-TP4	NC-TP4-SS1	0.0 – 1.0	0.0
	NC-TP4-SS2	1.0 – 2.0	0.0
	NC-TP4-SS3	2.0 – 3.0	0.0
NC-TP5	NC-TP5-SS1	0.0 – 0.9	0.0
NC-TP6	NC-TP6-SS1	0.0 – 1.0	55.8
NC-TP7	NC-TP7-SS1	0.5 – 1.5	0.0
	NC-TP7-SS2	1.5 – 2.5	0.0
	NC-TP7-SS3	2.5 – 3.5	143.0
NC-TP8	NC-TP8-SS1	0.2 – 1.2	0.0
	NC-TP8-SS2	1.2 – 2.2	0.0
	NC-TP8-SS3	2.2 – 3.2	37.4
NC-TP9	NC-TP9-SS1	0.0 – 1.1	1.7
NC-TP10	NC-TP10-SS1	0.0 – 0.9	18.8
NC-TP11	NC-TP11-SS1	0.0 – 1.0	203.0
	NC-TP11-SS2	1.0 – 1.7	252.0
NC-TP12	NC-TP12-SS1	0.0 – 1.0	42.6
	NC-TP12-SS2	1.0 – 2.0	151.0
	NC-TP12-SS3	2.5 – 3.5	0.0
NC-TP13	NC-TP13-SS1	0.0 – 0.3	0.9
NC-TP14	NC-TP14-SS1	0.0 – 0.3	2.2
NC-TP15	NC-TP15-SS1	0.0 – 0.3	67
NC-TP16	NC-TP16-SS1	0.0 – 0.3	81
NC-TP17	NC-TP17-SS1	0.0 – 0.3	1.3
NC-TP18	NC-TP18-SS1	0.0 – 0.3	1.8
NC-TP19	NC-TP19-SS1	0.0 – 0.3	0.7
NC-TP20	NC-TP20-SS1	0.0 – 1.0	11.1
NC-TP21	NC-TP21-SS1	0.0 – 1.1	47.8
NC-TP22	NC-TP22-SS1	0.0 – 1.0	150.0
NC-TP23	NC-TP23-SS1	0.0 – 1.0	233.0
	NC-TP23-SS2	1.0 – 2.0	194.0

Notes:
Shaded cells mean sample submitted for analyses.

SAMPLING LOCATION	SOIL SAMPLE ID	SAMPLING DEPTH (m)	PID SVH (PPM)
NC-TP24	NC-TP24-SS1	0.0 – 1.0	142.0
NC-TP25	NC-TP25-SS1	0.0 – 1.0	43.8
	NC-TP25-SS2	1.0 – 2.0	37.4
	NC-TP25-SS3	2.0 – 3.0	45.4
	NC-TP25-SS4	3.0 – 4.0	10.8
NC-TP26	NC-TP26-SS1	0.0 – 1.0	11.5
	NC-TP26-SS2	1.0 – 2.0	17.6
	NC-TP26-SS3	2.0 – 2.7	6.8
NC-TP27	NC-TP27-SS1	0.0 – 1.0	0.0
	NC-TP27-SS2	1.0 – 2.0	0.0
	NC-TP27-SS3	2.0 – 3.0	299.0
	NC-TP27-SS4	3.0 – 4.0	14.4

Notes:
Shaded cells mean sample submitted for analyses.

APPENDIX E-2

GPS COORDINATES

GPS COORDINATES - NAD27 - NORTHCO

Location	Northing	Easting
NC-TP1	558710	5537162
NC-TP2	558676	5537144
NC-TP3	558685	5537122
NC-TP4	558690	5537054
NC-TP5	558644	5537073
NC-TP6	558628	5537118
NC-TP7	558626	5537119
NC-TP8	558607	5538141
NC-TP9	558592	5537137
NC-TP10	558617	5537160
NC-TP11	558632	5537173
NC-TP12	558697	5537203
NC-TP13	558635	5537194
NC-TP14	558603	5537184
NC-TP15	558582	5537101
NC-TP16	558593	5537101
NC-TP17	558561	5537047
NC-TP18	558528	5537015
NC-TP20	558645	5537193
NC-TP21	558635	5537206
NC-TP22	558610	5537127
NC-TP23	558610	5537113
NC-TP24	558619	5537102
NC-TP25	558628	5537034
NC-TP26	558630	5537030
NC-TP27	558617	5537043

APPENDIX F-2

LABORATORY ANALYSES TABLES

Table 2-1: Summary of Building Materials Samples and Asbestos Analysis - Northco

Sample ID	Sample Location	Sample Type	Asbestos Fibre %		
			Chrysotile	Amosite	other asbestos fibres
NC-ASB1	Former E & R Building - Level I	Ceiling Tile	20	nd	nd
NC-ASB2	Former E & R Building - Level I	Brick Mortar	2	nd	nd
NC-ASB3	Former E & R Building - Level II	Pipe Insulation	nd	nd	nd
NC-ASB4	Mine Dry - Main Floor	Floor Tile	3	nd	nd
NC-ASB5	Former E & R Building	Exterior Siding	25	nd	nd
NC-ASB6	Mine Dry - Main Floor	Ceiling Tile	nd	5	nd
NC-ASB7	Mine Dry - Basement	Boiler Insulation	nd	nd	nd

Note: Shaded results are above maximum as outlined under “The Asbestos Abatement Regulations, 1998 (Nfld. Reg. 111/98) of 1 % asbestos fibers.

trace: <1%

nd: not detected

Table 2-2: Asbestos in Air - Mill Area

Sample ID	Sample Location	Sample Type	Airborne Concentration (fibres/cm^3)
NC#1	Former E&R Building - Outside	Air	<0.002
NC#2	Former E&R Building - Inside	Air	<0.002

Note: Shaded results are above maximum as outlined under “2006 Occupational Exposure Threshold Limit Value (TLV) of 0.1 fibres/cm^3 (ACGIH)

Table 2-3. Lead in Paint - Northco

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/kg)	Total Lead (mg/kg)
S2006-12095	NC-PS1	Former E & R Building - Ceiling	Gyproc	White Paint	5	**2870**
S2006-12096	NC-PS2	Former E & R Building - Interior Wall	Gyproc	Grey Paint	5	**6200**
S2006-12097	NC-PS3	Former E & R Building - Interior Wall	Concrete	Green Paint	5	385
S2006-12135	PS-DUP1	Former E & R Building - Interior Wall	Concrete	Green Paint	5	268
S2006-12098	NC-PS4	Former E & R Building - Steel Columns	Metal	Blue on White Paint	5	131
S2006-12099	NC-PS5	Former E & R Building - Interior Wall	Concrete	Beige on Grey Paint	5	**1880**
S2006-12100	NC-PS6	Former E & R Building - Exterior	Metal	Yellow Paint	5	**27400**
S2006-12101	NC-PS7	Former E & R Building - Exterior Wall	Concrete	Green Paint	5	**26400**
S2006-12102	NC-PS8	Mine Dry - Floor	Concrete	Grey Paint	5	**996**
S2006-12103	NC-PS9	Mine Dry - Interior Wall	Metal	Beige Paint	5	237
S2006-12104	NC-PS10	Mine Dry - Interior Door Frame	Metal	Brown Paint	5	**796**
S2006-12105	NC-PS11	Mine Dry - Interior Wall	Brick	Pale Yellow Paint	5	406
S2006-12106	NC-PS12	Mine Dry - Interior Wall	Brick	Cream on Yellow Paint	5	**930**
S2006-12107	NC-PS13	Mine Dry - Interior Wall	Gyproc	Yellow - Cream Paint	5	**673**
S2006-12108	NC-PS14	Mine Dry - Interior Door	Metal	Orange on Grey Paint	5	**685**
S2006-12109	NC-PS15	Former E & R Building - Exterior Door	Wood	Blue Paint	5	<5
S2006-12137	PS-DUP3	Former E & R Building - Exterior Door	Wood	Blue Paint	5	<5

Notes:
MDL: Method detection limit
<X: Below MDL
Data in brackets: Laboratory replicate results
Bold and underlined results indicate that lead concentration is above the relevant Federal Hazardous Products Act criterion of 600 mg/kg
Shaded results indicate that lead concentration is above the former Federal Hazardous Products Act criterion of 5000 mg/kg
PS-DUP1 is a blind field duplicate of paint sample NC-PS3
PS-DUP3 is a blind field duplicate of paint sample NC-PS15

Table 2-4. Mercury in Paint - Northco

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/kg)	Total Mercury (mg/kg)
S2006-12095	NC-PS1	Former E & R Building - Ceiling	Gyproc	White Paint	0.01	3.59
S2006-12096	NC-PS2	Former E & R Building - Interior Wall	Gyproc	Grey Paint	0.01	3.99
S2006-12097	NC-PS3	Former E & R Building - Interior Wall	Concrete	Green Paint	0.01	**19.7**
S2006-12135	PS-DUP1	Former E & R Building - Interior Wall	Concrete	Green Paint	0.01	**13.4**
S2006-12098	NC-PS4	Former E & R Building - Steel Columns	Metal	Blue on White Paint	0.01	2.61
S2006-12099	NC-PS5	Former E & R Building - Interior Wall	Concrete	Beige on Grey Paint	0.01	**32.2**
S2006-12100	NC-PS6	Former E & R Building - Exterior	Metal	Yellow Paint	0.01	3.14
S2006-12101	NC-PS7	Former E & R Building - Exterior Wall	Concrete	Green Paint	0.01	0.99
S2006-12102	NC-PS8	Mine Dry - Floor	Concrete	Grey Paint	0.01	0.97
S2006-12103	NC-PS9	Mine Dry - Interior Wall	Metal	Beige Paint	0.01	**54.7**
S2006-12104	NC-PS10	Mine Dry - Interior Door Frame	Metal	Brown Paint	0.01	3.44
S2006-12105	NC-PS11	Mine Dry - Interior Wall	Brick	Pale Yellow Paint	0.01	5.44
S2006-12106	NC-PS12	Mine Dry - Interior Wall	Brick	Cream on Yellow Paint	0.01	0.81
S2006-12107	NC-PS13	Mine Dry - Interior Wall	Gyproc	Yellow - Cream Paint	0.01	0.17
S2006-12108	NC-PS14	Mine Dry - Interior Door	Metal	Orange on Grey Paint	0.01	1.09
S2006-12109	NC-PS15	Former E & R Building - Exterior Door	Wood	Blue Paint	0.01	<0.01
S2006-12137	PS-DUP3	Former E & R Building - Exterior Door	Wood	Blue Paint	0.01	0.04

Notes:
MDL: Method detection limit
<X: Below MDL
Data in brackets: Laboratory replicate results
Bold and and underlined results indicate that mercury concentration is above the Federal Hazardous Products Act criterion of 10 mg/kg
Shaded results indicate that mercury concentration is above the CCME-CEQG for a commercial property (24 mg/kg)
PS-DUP1 is a blind field duplicate of paint sample NC-PS3
PS-DUP3 is a blind field duplicate of paint sample NC-PS15

Table 2-5. PCB in Paint - Northco

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/kg)	PCB (mg/kg)
S2006-12095	NC-PS1	Former E & R Building - Ceiling	Gyproc	White Paint	0.005	3.39
S2006-12096	NC-PS2	Former E & R Building - Interior Wall	Gyproc	Grey Paint	0.005	1.88
S2006-12099	NC-PS5	Former E & R Building - Interior Wall	Concrete	Beige on Grey Paint	0.005	2.01
S2006-12102	NC-PS8	Mine Dry - Floor	Concrete	Grey Paint	0.005	2.55
S2006-12105	NC-PS11	Mine Dry - Interior Wall	Brick	Pale Yellow Paint	0.005	0.53

Notes:
MDL: Method detection limit
<X: Below MDL
Shaded results indicate that PCB concentration is above the CCME-CEQG for a commercial property (33 mg/kg)

Table 2-6. Lead Leachate in Paint - Northco

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/L)	TCLP Lead (mg/L)
S2006-12096	NC-PS2	Former E & R Building - Interior Wall	Gyproc	Grey Paint	0.002	0.188
S2006-10993	NC-PS6	Former E & R Building - Exterior	Metal	Yellow Paint	0.002	1.540
S2006-10996	NC-PS7	Former E & R Building - Exterior Wall	Concrete	Green Paint	0.002	2.960

Notes:
MDL: Method detection limit
<X: Below MDL
Shaded results indicate that lead concentration is above the relevant Transportation of Dangerous Good Act (Updated 2002) criterion of 5.0 mg/L

Table 2-7. Mercury Leachate in Paint - Northco

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/L)	TCLP Mercury (mg/L)
S2006-12099	NC-PS5	Former E & R Building - Interior Wall	Concrete	Beige on Grey Paint	0.0001	0.0005
S2006-12103	NC-PS9	Mine Dry - Interior Wall	Concrete	Beige Paint	0.0001	0.0009

Notes:
MDL: Method detection limit
<X: Below MDL
Shaded results indicate that lead concentration is above the relevant Transportation of Dangerous Good Act (Updated 2002) criterion of 0.1 mg/L

Table 2-8: BTEX/TPH in Soil - Northco

		DATA					GUIDELINES			
AVERAGE SAMPLING DEPTH (m)			3.5 - 4.8	1.0 - 2.0	2.0 - 2.9	2.0 - 3.0	1999 CCME-CEQG (Updated 2005) INDUSTRIAL SITES	2003 ATLANTIC PIRI TIER I RBSL[1]		
LAB ID		Lab Blank	S2006-11596	S2006-11597	S2006-11598	S2006-11599				
FIELD ID			NC-TP1-SS4	NC-TP2-SS2	NC-TP3-SS3	NC-TP4-SS3				
DATE (D/M/Y)			23-Sep-06	23-Sep-06	23-Sep-06	23-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	<0.01	<0.01	0.03	<0.01	<0.01	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	<0.02	<0.02	<0.02	0.03	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	<0.06	<0.06	0.53	<0.06	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	<10	<10	97.00	<10	<10	**-**	**-**	**-**	**-**
TPH (>C10-C21)	10	<10	<100 ***	1240	61	102	**-**	**-**	**-**	**-**
TPH (>C21-C32)	50	<50	1540	4170	172	373	**-**	**-**	**-**	**-**
Modified TPH (C6-C32)	70	<70	<1650	<5510	<243	<485	**-**	**450**	**7400**	**10000**
Hydrocarbon Identification		-	-	Chromatogram resembles diesel and heavy oil	Chromatogram resembles heavy oil	Chromatogram resembles heavy oil				

Notes:

MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
Data in brackets: Laboratory replicate results
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable
*** Higher MDL reported due to sample dilution factor

Table 2-9: BTEX/TPH in Soil - Northco

		DATA					GUIDELINES			
AVERAGE SAMPLING DEPTH (m)		0.0 - 0.9	0.0 - 1.0	0.0 - 1.0	2.5 - 3.5	2.2 - 3.2	1999 CCME-CEQG	2003 ATLANTIC PIRI		
LAB ID		S2006-11600	S2006-11601	S2006-11607	S2006-11602	S2006-11603	(Updated 2005)	TIER I RBSL[1]		
FIELD ID		NC-TP5-SS1	NC-TP6-SS1	DUP 7	NC-TP7-SS3	NC-TP8-SS3	INDUSTRIAL SITES			
DATE (D/M/Y)		23-Sep-06	23-Sep-06	23-Sep-06	23-Sep-06	23-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	<0.01	0.02	<0.01	<0.01	0.01	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	<0.02	<0.02	<0.02	**<u>0.16</u>**	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	<0.06	<0.06	<0.06	0.20	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	<10	38	29	171	22	-	-	-	-
TPH (>C10-C21)	10	<10	966	710	2720	1260	-	-	-	-
TPH (>C21-C32)	50	<50	631	524	2080	846	-	-	-	-
Modified TPH (C6-C32)	70	<70	<1640	<1260	<4970	<2130	-	**450**	**7400**	**10000**
Hydrocarbon Identification		-	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil				

<u>Notes:</u>
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
Data in brackets: Laboratory replicate results
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
<u>Bold and underlined data exceeds the CCME-CEQGs</u>
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable
DUP 7 is a blind field duplicate of soil sample NC-TP6-SS1

Table 2-10: BTEX/TPH in Soil - Northco

		DATA					GUIDELINES			
AVERAGE SAMPLING DEPTH (m)		0.0 - 1.1	0.0 - 0.9	1.0 - 1.7	1.0 - 2.0	1.0 - 2.0	1999 CCME-CEQG	2003 ATLANTIC PIRI TIER I RBSL[1]		
LAB ID		S2006-11630	S2006-11631	S2006-11632	S2006-11633	S2006-11628	(Updated 2005)			
FIELD ID		NC-TP9-SS1	NC-TP10-SS1	NC-TP11-SS2	NC-TP12-SS2	DUP 8	INDUSTRIAL SITES			
DATE (D/M/Y)		24-Sep-06	24-Sep-06	24-Sep-06	24-Sep-06	24-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	0.01	0.02	0.01	<0.01	<0.01	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	<0.06	<0.04	<0.06	<0.06	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	<10	<10	103	11	17	**-**	**-**	**-**	**-**
TPH (>C10-C21)	10	28	<10	3480	572	444	**-**	**-**	**-**	**-**
TPH (>C21-C32)	50	62	<50	<50	379	442	**-**	**-**	**-**	**-**
Modified TPH (C6-C32)	70	<100	<70	<3630	<962	<903	**-**	**450**	**7400**	**10000**
Hydrocarbon Identification		Chromatogram resembles diesel and heavy oil	-	Chromatogram resembles diesel	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil heavy oil				

Notes:
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
Data in brackets: Laboratory replicate results
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable
DUP 8 is a blind field duplicate of soil sample NC-TP12-SS2

Table 2-11: BTEX/TPH in Soil - Northco

		DATA					GUIDELINES			
AVERAGE SAMPLING DEPTH (m)		0.0 - 0.3	0.0 - 0.3	0.0 - 1.0	0.0 - 1.1	0.0 - 1.0	1999 CCME-CEQG	2003 ATLANTIC PIRI		
LAB ID		S2006-11692	S2006-11693	S2006-11634	S2006-11635	S2006-11636	(Updated 2005)	TIER I RBSL[1]		
FIELD ID		NC-TP15-SS1	NC-TP16-SS1	NC-TP20-SS1	NC-TP21-SS1	NC-TP22-SS1	INDUSTRIAL SITES			
DATE (D/M/Y)		28-Sep-06	28-Sep-06	24-Sep-06	24-Sep-06	24-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	<0.06	<0.06	<0.06	<0.06	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	<10	<10	<10	<10	12	-	-	-	-
TPH (>C10-C21)	10	1670	1340	209	179	591	-	-	-	-
TPH (>C21-C32)	50	20700	11700	789	2100	77	-	-	-	-
Modified TPH (C6-C32)	70	**<22400**	**<13000**	<1010	<2290	<680	-	**450**	**7400**	**10000**
Hydrocarbon Identification		Chromatogram resembles weathered diesel and heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil				

Notes:
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
Data in brackets: Laboratory replicate results
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable

Table 2-12: BTEX/TPH in Soil - Northco

		DATA					GUIDELINES			
AVERAGE SAMPLING DEPTH (m)		0.0 - 1.0	0.0 - 1.0	2.0 - 3.0	1.0 - 2.0	2.0 - 3.0	1999 CCME-CEQG (Updated 2005) INDUSTRIAL SITES	2003 ATLANTIC PIRI TIER I RBSL[1]		
LAB ID		S2006-11637	S2006-11638	S2006-11639	S2006-11640	S2006-11641				
FIELD ID		NC-TP23-SS1	NC-TP24-SS1	NC-TP25-SS3	NC-TP26-SS2	NC-TP27-SS3				
DATE (D/M/Y)		24-Sep-06	24-Sep-06	24-Sep-06	24-Sep-06	24-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	0.04	0.02	<0.01	<0.01	<0.01	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	**0.51**	0.03	<0.02	<0.02	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	1.27	0.17	<0.06	<0.06	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	63	62	<10	<10	15	**-**	**-**	**-**	**-**
TPH (>C10-C21)	10	1790	1730	<10	<10	167	**-**	**-**	**-**	**-**
TPH (>C21-C32)	50	974	1570	<50	<50	<50	**-**	**-**	**-**	**-**
Modified TPH (C6-C32)	70	<2830	<3360	<70	<70	<232	**-**	**450**	**7400**	**10000**
Hydrocarbon Identification		Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	-	-	Chromatogram resembles diesel				

Notes:
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
Data in brackets: Laboratory replicate results
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable

Table 2-13: Metals in Soil - Northco

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m) LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	1.0 - 2.0 S2006-11597 NC-TP2- SS2 23-Sep-06	2.0 - 3.0 S2006-11599 NC-TP4- SS3 23-Sep-06	1.0 - 2.0 S2006-11633 NC-TP12- SS2 24-Sep-06	1.0 - 2.0 S2006-11628 DUP 8 24-Sep-06	1999 CCME RECOMMENDED SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	5	<5	1860	18000	16800	16200	**-**
Antimony	0.5	<0.5	2.5	2.8	2.5	2.6	**40**
Arsenic	0.5	<0.5	0.1	2.9	5.5	5.4	**12**
Barium	0.5	<0.5	5.4	16.5	13.5	16.4	**2000**
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	**8**
Bismuth	0.2	<0.2	1.1	0.4	0.5	0.7	**-**
Cadmium	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**22**
Calcium	25	<25	7190	7010	5460	5200	**-**
Chromium	1	<1	**501**	**520**	**426**	**412**	**87**
Cobalt	1	<1	48	34	34	56	**300**
Copper	1	<1	6	42	73	**95**	**91**
Iron	5	<5	27000	43700	41500	46400	**-**
Lead	5	<5	6	7	6	13	**600**
Magnesium	10	<10	198000	75400	76700	71900	**-**
Manganese	1	<1	537	904	623	664	**-**
Mercury	0.01	<0.01	0.02	0.03	<0.01	<0.01	**50**
Molybdenum	2	<2	<2	<2	<2	<2	**40**
Nickel	5	<5	**1470**	**569**	**416**	**593**	**50**
Phosphorus	5	<5	50	492	493	686	**-**
Potassium	10	<10	112	679	954	1110	**-**
Selenium	0.1	<0.1	<0.1	<0.1	0.1	0.3	**3.9**
Silver	0.25	<0.25	<0.25	<0.25	<0.25	<0.25	**40**
Sodium	25	<25	127	190	621	698	**-**
Vanadium	5	<5	8	73	63	55	**130**
Zinc	2	<2	19	46	48	53	**360**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.
DUP 8 is a blind field duplicate of soil sample NC-TP12-SS2

Table 2-14: Metals in Soil - Northco

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m)		0.0 - 0.3	0.0 - 0.3	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	1999 CCME RECOMMENDED SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
LAB ID		S2006-11692	S2006-11693	S2006-11636	S2006-11637	S2006-11638	
FIELD ID		NC-TP15-SS1	NC-TP16-SS1	NC-TP22-SS1	NC-TP23-SS1	NC-TP24-SS1	
DATE (D/M/Y)		28-Sep-06	28-Sep-06	24-Sep-06	24-Sep-06	24-Sep-06	
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	5	11000	13400	8830	13200	12100	**-**
Antimony	0.5	2.3	3.0	3.5	2.5	1.7	**40**
Arsenic	0.5	2.3	3.1	6.2	3.6	5.3	**12**
Barium	0.5	14.7	13.1	9.4	48.6	7.0	**2000**
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	**8**
Bismuth	0.2	0.6	0.6	1.1	0.6	0.5	**-**
Cadmium	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**22**
Calcium	25	2730	2100	6920	3790	21900	**-**
Chromium	1	**413**	**639**	**810**	**473**	**344**	**87**
Cobalt	1	30	27	50	40	33	**300**
Copper	1	30	25	29	48	51	**91**
Iron	5	29600	34200	33000	37800	25000	**-**
Lead	5	<5	<5	<5	12	<5	**600**
Magnesium	10	88600	67500	187000	116000	97500	**-**
Manganese	1	469	456	614	683	501	**-**
Mercury	0.01	0.02	<0.01	<0.01	0.02	<0.01	**50**
Molybdenum	2	<2	<2	<2	<2	<2	**40**
Nickel	5	**580**	**387**	**1350**	**964**	**744**	**50**
Phosphorus	5	383	383	162	542	134	**-**
Potassium	10	723	635	511	1700	418	**-**
Selenium	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**3.9**
Silver	0.25	<0.25	<0.25	<0.25	<0.25	<0.25	**40**
Sodium	25	167	172	167	180	147	**-**
Vanadium	5	36	43	23	38	27	**130**
Zinc	2	156	144	33	58	29	**360**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 2-15: PAHs in Soil - Northco

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m) Lab ID FIELD ID DATE (D/M/Y)		Lab Blank	1.0 - 2.0 S2006-11597 NC-TP2-SS2 23-Sep-06	2.0 - 3.0 S2006-11599 NC-TP4-SS3 23-Sep-06	1.0 - 2.0 S2006-11633 NC-TP12-SS2 24-Sep-06	1.0 - 2.0 S2006-11628 DUP 8 24-Sep-06	1999 CCME RECOMMENDED SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Naphthalene	0.002	<0.002	0.166	<0.002	<0.002	<0.002	**22**
Acenaphthylene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Acenaphthene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	**-**
Fluorene	0.001	<0.001	0.034	<0.001	0.067	<0.001	**-**
Phenanthrene	0.001	<0.001	0.149	<0.001	0.256	0.300	**50**
Anthracene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Fluoranthene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Pyrene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	**100**
Benzo(a)anthracene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**10**
Chrysene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Benzo(b)fluoranthene	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	**10**
Benzo(k)fluoranthene	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	**10**
Benzo(a)pyrene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	**0.7**
Indeno(123 cd.)pyrene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	**10**
Dibenzo(ah)anthracene	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	**10**
Benzo(ghi)perylene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	**-**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.
DUP 8 is a blind field duplicate of soil sample NC-TP12-SS2

Table 2-16: PAHs in Soil - Northco

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m)		0.0 - 0.3	0.0 - 0.3	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	1999 CCME RECOMMENDED
Lab ID		S2006-11692	S2006-11693	S2006-11636	S2006-11637	S2006-11638	SOIL QUALITY GUIDELINES
FIELD ID		NC-TP15-SS1	NC-TP16-SS1	NC-TP22-SS1	NC-TP23-SS1	NC-TP24-SS1	INDUSTRIAL (REVISED 2005)
DATE (D/M/Y)		28-Sep-06	28-Sep-06	24-Sep-06	24-Sep-06	24-Sep-06	
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Naphthalene	0.002	<0.02	<0.02	0.098	3.98	0.710	**22**
Acenaphthylene	0.001	<0.01	<0.01	<0.001	<0.001	<0.001	**-**
Acenaphthene	0.002	<0.02	<0.02	<0.002	<0.002	<0.002	**-**
Fluorene	0.001	<0.01	<0.01	0.164	1.25	0.373	**-**
Phenanthrene	0.001	<0.01	<0.01	0.327	1.80	0.803	**50**
Anthracene	0.001	<0.01	<0.01	<0.001	<0.001	<0.001	**-**
Fluoranthene	0.001	<0.01	<0.01	<0.001	<0.001	<0.001	**-**
Pyrene	0.003	<0.03	<0.03	0.003	0.075	<0.003	**100**
Benzo(a)anthracene	0.001	<0.01	<0.01	<0.001	<0.001	<0.001	**10**
Chrysene	0.001	<0.01	<0.01	<0.001	<0.001	<0.001	**-**
Benzo(b)fluoranthene	0.004	<0.04	<0.04	<0.004	<0.004	<0.004	**10**
Benzo(k)fluoranthene	0.004	<0.04	<0.04	<0.004	<0.004	<0.004	**10**
Benzo(a)pyrene	0.003	<0.03	<0.03	<0.003	<0.003	<0.003	**0.7**
Indeno(123 cd.)pyrene	0.003	<0.03	<0.03	<0.003	<0.003	<0.003	**10**
Dibenzo(ah)anthracene	0.004	<0.04	<0.04	<0.004	<0.004	<0.004	**10**
Benzo(ghi)perylene	0.002	<0.02	<0.02	<0.002	<0.002	<0.002	**-**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 2-17: PCBs in Soil - Northco

		DATA						GUIDELINES
AVERAGE SAMPLING DEPTH (m) LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	2.0 - 3.0 S2006-11599 NC-TP4-SS3 23-Sep-06	0.0 - 1.0 S2006-11601 NC-TP6-SS1 23-Sep-06	0.0 - 1.0 S2006-11607 DUP 7 23-Sep-06	0.0 - 0.3 S2006-11690 NC-TP13-SS1 28-Sep-06	0.0 - 0.3 S2006-11691 NC-TP14-SS1 28-Sep-06	1999 CCME RECOMMENDED SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Polychlorinated Biphenyls	0.005	<0.005	<0.005	0.033	0.036	<0.005	<0.005	**33**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.
DUP 7 is a blind field duplicate of soil sample NC-TP6-SS1

Table 2-18: PCBs in Soil - Northco

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m)		0.0 - 0.3	0.0 - 0.3	0.0 - 0.3	0.0 - 0.3	0.0 - 0.3	1999 CCME RECOMMENDED SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
LAB ID		S2006-11692	S2006-11693	S2006-11694	S2006-11646	S2006-11695	
FIELD ID		NC-TP15-SS1	NC-TP16-SS1	NC-TP17-SS1	NC-TP18	NC-TP19-SS1	
DATE (D/M/Y)		28-Sep-06	28-Sep-06	28-Sep-06	24-Sep-06	28-Sep-06	
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Polychlorinated Biphenyls	0.005	<0.005	0.036	<0.005	0.051	<0.005	**33**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

SECTION 3.0

MILL AREA

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APPENDICES

3.0 AREA B – MILL AREA

3.1 SITE DESCRIPTION

This area contains all Site buildings and infrastructure used in the processing of asbestos product at the Site. Buildings present at this area of the Site include the primary crusher, secondary crusher, power centre, dry rock storage facility, dry mill and wet mill (refer to Figure 3.1, Appendix A-3 and Photos 1 to 4, Appendix B-3). Brief descriptions of these buildings are presented below:

- **Primary Crusher**: This facility was formerly used in the primary crushing of crude asbestos ore, the first stage of processing asbestos fibre at the Site. The building measures approximately 15 m x 35 m. It is six storeys high and extends another five or six storeys underground. The structure is constructed of a metal frame with corrugated asbestos sheeting walls on a poured concrete foundation. The interior walls consist of asbestos sheeting, concrete cinder blocks and wood. The roof is constructed of galvanized metal.
- **Secondary Crusher**: This facility was formerly used to dry and further crush the ore after it was processed at the primary crusher. The building measures approximately 60 m x 70 m and at it highest point, is approximately 10 storeys high. The structure is constructed of a metal frame with corrugated metal and asbestos sheeting walls on a poured concrete foundation. The interior walls consist of metal and asbestos sheeting, concrete cinder blocks and wood. The roof is constructed of galvanized metal.
- **Power Centre**: This facility is attached to the northwest corner of the secondary crusher. The building measures approximately 10 m x 20 m and is approximately two storeys high. The structure is constructed of a metal frame with corrugated asbestos sheeting walls on a poured concrete foundation. The interior walls consist of asbestos sheeting, concrete cinder blocks and wood. The roof is constructed of galvanized metal. No floor drains were observed throughout the building. A network of utility towers is located directly south and adjacent to the facility.
- **Dry Rock Storage Facility**: This facility was formerly used as a storage facility for ore crushed at the secondary crusher. The mill used ore stored at the facility during times when the crushers were shutdown for maintenance or repairs. The facility consists of two separate buildings, the furnace/blower building and the dry rock storage building:
  - The furnace/blower building measures approximately 10 m x 15 m and is approximately five storeys high. The structure is constructed of a metal frame with corrugated metal sheeting walls on a poured concrete foundation. The interior walls consist of metal sheeting and concrete cinder blocks. The roof is constructed of galvanized metal.
  - The dry rock storage building measures approximately 15 m x 40 m and is approximately five storeys high. The structure is constructed of a metal frame with corrugated asbestos and metal sheeting walls. Due to the poor structural condition of the building and the large volume of crushed ore (asbestos) stored within the facility, field personnel were not able to enter the building at the time of the Site inspection.
- **Dry Mill**: This facility was formerly used to remove the asbestos fibres from the ore after it was processed at the secondary crusher. The building measures approximately 50 m x 60 m and is approximately twelve storeys high. The structure is constructed of a metal frame with corrugated

asbestos sheeting walls on a poured concrete foundation. The interior walls consist of asbestos sheeting, concrete cinder blocks and wood. The roof is constructed of galvanized metal.

- **Wet Mill**: This facility is the newest facility at the Site, constructed in the early 1990s. During the wet milling process, asbestos fibre was recovered from the mill tailings stockpile as a water-borne slurry. The building measures approximately 30 m x 70 m and at it highest point, is approximately five storeys high. The structure is constructed of a metal frame with corrugated metal sheeting walls on a poured concrete foundation. The interior walls consist of metal sheeting and concrete cinder blocks. The roof is constructed of aluminum metal.

3.2 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

3.2.1 Phase I ESA, March 2005

A review of the Phase I ESA completed at the Site revealed the following potential environmental concerns at this area of the Site:

- Potential presence of asbestos containing materials (ACMs) within the Site buildings in the form of building materials (i.e. pipe insulation, asbestos sheeting, brick mortar, floor tiles and etc.);
- Actual ACMs in the form of finished asbestos product and partially processed ore within the conveyors and processing equipment associated with the Site buildings;
- Potential for airborne asbestos fibres due to the presence of exposed friable ACMs at the Site;
- Based on the reported date of construction of the Site buildings (i.e. 1960s), with the exception of the wet mill (constructed in early 1990s), lead, mercury and PCB containing paints may be present at the Site;
- Fluorescent light fixtures were observed inside the primary crusher, secondary crusher, power centre and dry mill. Based on the reported date of construction of the Site buildings (i.e. 1960s), light ballasts present at the Site may contain PCBs;
- The potential exists for mercury to be present within the processing equipment at the Site (i.e. electrical control switches, gauges, and etc.);
- A Texas Nuclear (Model 5201) Density Gauge was observed on the first floor of the wet mill building. This radioactive device is known to contain Cesium-137. In 1998, the “source housing” portion of the density gauge was removed from the wet mill and transported to a licensed disposal company. No other potential radioactive devices were observed at the Site; however, other radioactive devices may be present;
- Several hundred 200 L (45-gallon) drums, of unknown product, were observed inside the mill buildings. It is likely that these drums were used to store hydraulic and other fluids used by various types of machinery at the mine Site. Labels were not visible on the drums;
- A moderate hydrocarbon odour was observed in the ground floor washroom facility of the dry mill. This may potentially be a result of former fuel spills at the Site (refer to Figure 3.1, Appendix A-3);
- Potentials for fuel spills from several fuel storage tanks (ASTs and USTs) and a former equipment refuelling station identified at the Site (refer to Figure 3.1, Appendix A-3);

- Discussions with former employees of the mine revealed that occurrences of diesel fuel spills were frequent at the Site. Diesel fuel was spilled from fuel tanks of damaged equipment and during the refuelling the haul trucks, loaders, tractors, drills and etc.;
- Potential for PCB impacted soil in the vicinity of existing and former locations of transformers at the Site and downgradient of the former PCB Storage Area of the power centre (refer to Figure 3.1, Appendix A-3); and
- An area of buried waste and metal debris was identified at the location of a former storage shed, located southeast of the wet mill, on the south side of Lower Duck Island Cove Brook (refer to Figure 3.1, Appendix A-3).

Based on the findings of the Phase I ESA, a Phase II ESA Intrusive Investigation consisting of a series of test pits and the subsequent collection of paint, asbestos and soil samples was recommended to assess the presence/absence of environmental impacts at the Site.

3.3 INITIAL SITE INSPECTION – AMEC JUNE 2006

The DNRMD requested that AMEC conduct an initial site inspection to verify surface conditions at the Site that could not be examined during the previous Phase I ESA completed for the Site in March 2005 due to snow cover and to confirm the findings presented in the Phase I ESA report prior to proceeding with the Phase II ESA at the Site. Information gathered during the initial site inspection was used to develop a Phase II ESA sampling program for the Site.

The initial site inspection was carried out at the Site by Gary Warren, M.A.Sc., Rod Winsor, P.Eng., Kelly Curtis, CET of AMEC on June 23, 2006. Additional environmental concerns and observations recorded by AMEC at the time of the initial site inspection include the following:

- An area of stained soil was observed west of the gravel access to the primary crusher building (refer to Figure 3.1, Appendix A-3);
- Two areas of stained soil were observed north of the primary crusher building (refer to Figure 3.1, Appendix A-3 and Photos 5 and 6, Appendix B-3);
- An area of stained soil was observed at the southeast corner of the dry mill building, near the reported location of a former UST (refer to Figure 3.1, Appendix A-3 and Photo 7, Appendix B-3);
- A petroleum hydrocarbon sheen was observed on the surface of a pool of standing water located near the southwest corner of the dry mill building (refer to Figure 3.1, Appendix A-3 and Photo 8, Appendix B-3). Due to the abundance of saw dust in the area, it was not possible to assess the arial extent of the sheen;
- The Bunker C AST (i.e. day tank) present at the southwest corner of the power centre could not be located due to the present of a large stockpile of saw dust at that area of the Site (refer to Figure 3.1, Appendix A-3 and Photos 9 and 10, Appendix B-3). AMEC can only assume that the tank still exists at the Site; and
- A discarded 200-gallon AST and a discarded 10,000 gallon UST was observed at the equipment storage area of the Site (refer to Figure 3.1, Appendix A-3 and Photos 11 and 12, Appendix B-3).

Please note that a photograph obtained from the Newfoundland and Labrador Department of Environment and Conservation (NLDOEC) revealed the former presence of an AST on the east side of the wet mill building (refer to Figure 3.1, Appendix A-3 and Photo 13, Appendix B-3).

3.4 PHASE II ENVIRONMENTAL SITE ASSESSMENT

The Phase II ESA was carried out in accordance with the DNRMD RFP dated May 2006, AMEC's proposal dated May 26, 2006 and AMEC's Proposed Phase II ESA Sampling Program dated August 21, 2006. Field work was carried out at the Site by Kelly Curtis, CET and Sheldon Adey, CET of AMEC during the period of September 19 to 28, 2006. Sample locations for the investigation were selected in consultation with the DNRMD Project Manager and based on the findings of the previous Phase I ESA and the initial site inspection carried out at the Site. The methodologies used to conduct the field investigations carried out at the Site during the current investigation are described in Section 1.5.

3.4.1 Scope of Work

Based on the information and observations recorded during the Phase I ESA site inspection, the scope of work for this area of the Site included the following Phase II ESA activities:

- Collecting a total of four building material (pipe insulation, floor tile, and brick mortar) samples (ML-ASB1 to ML-ASB4) from the Site buildings for asbestos analyses;
- Collecting a total of six air samples (ML#1 to ML#6) at various locations throughout the Site for asbestos analyses;
- Collecting 25 paint chip samples (ML-PS1 to ML-PS25) from painted surfaces present at the Site for a combination of lead, lead leachate, mercury, mercury leachate and PCB analyses;
- Excavating one test pit (ML-TP1) in the vicinity of the former AST located east of the wet mill building and collecting soil samples for BTEX/TPH analyses;
- Excavating one test pit (ML-TP2) within the area of stained soil observed at the southeast corner of the dry mill building and collecting soil samples for BTEX/TPH, PAH and PCB analyses;
- Excavating one test pit (ML-TP3) in the vicinity of the reported UST located along the south side of the dry mill building and collecting soil samples for BTEX/TPH analyses;
- Excavating one test pit (ML-TP4) in the vicinity of a former pole-mounted transformer located along the south side of the dry mill building and collecting soil samples for BTEX/TPH and PCB analyses;
- Excavating one test pit (ML-TP5) within the hydrocarbon sheen observed on a pool of standing water located near the southwest corner of the dry mill building and collecting soil samples for BTEX/TPH analyses;
- Excavating one test pit (ML-TP6) adjacent to the washroom facility of the dry mill building (west side) and collecting soil samples for BTEX/TPH analyses. A strong hydrocarbon odour was reported at this location of the Site at the time of the Phase I ESA;

- Excavating one test pit (ML-TP7) within the area of buried waste and metal debris identified at the former location of a storage shed located southwest of the wet mill building and collecting soil samples for BTEX/TPH, metals plus hydrides, PAH and PCB analyses;
- Excavating one test pit (ML-TP8) adjacent to the UST identified at the northwest corner of the dry rock storage building and collecting soil samples for BTEX/TPH and metals plus hydrides analyses;
- Excavating two test pits (ML-TP9 and ML-TP10) within the two areas of stained soil identified along the north side of the primary crusher building and collecting soil samples for BTEX/TPH and PCB analyses;
- Excavating one test pit (ML-TP11) within the area of stained soil identified west of the gravel access road to the primary crusher building and collecting soil samples for BTEX/TPH and PCB analyses;
- Excavating two test pits (ML-TP12 and ML-TP13) in the vicinity of the former equipment refuelling station reported to have been located northwest of the dry rock storage building and collecting soil samples for BTEX/TPH analyses;
- Excavating two test pits (ML-TP14 and ML-TP15) within the equipment storage area located west of the dry rock storage facility and collecting soil samples for BTEX/TPH, metals plus hydrides, PAH and PCB analyses. Test pits were excavated in the vicinity of the discarded 10,000 gallon UST (ML-TP14) and 200-gallon AST (ML-TP15) identified at the equipment storage area;
- Excavating one test pit (ML-TP16) underneath a pole-mounted transformer located west of the dry rock storage facility and collecting soil samples for PCB analyses;
- Excavating one test pit (ML-TP17) in the vicinity of a former pole-mounted transformer located between the dry rock storage and secondary crusher buildings and collecting soil samples for PCB analyses;
- Excavating three test pits (ML-TP18 and ML-TP20) in the vicinity of the Bunker C AST (i.e. day tank) and collecting soil samples for BTEX/TPH, metals plus hydrides and PAH analyses. Please note that several attempts were made using an excavator to locate the AST; however, due the depth and unstable nature of the stockpile of the saw dust present at this location of the Site, the exact location of the AST was not confirmed during the current investigation; and
- Excavating three test pits (ML-TP21 and ML-TP23) downgradient of the power centre and collecting soil samples for BTEX/TPH, PAH and PCB analyses. Please note that test pit ML-TP22 was excavated downgradient to the two 200-gallon ASTs located along the east wall of the power centre;
- Recording GPS coordinates for all sample locations; and
- Preparing a comprehensive report outlining the methodologies, findings, conclusions and recommendations of the investigation.

All sample locations are presented on Figures 3.2 and 3.3, Appendix A-3.

3.4.2 Field Observations

Detailed field observations pertaining to soil stratigraphy, soil vapour headspace, groundwater conditions and contaminant observations are discussed in this section.

3.4.2.1 Stratigraphy

The soil stratigraphy generally consisted primarily of variable thickness grey, brown and reddish brown sand and gravel with some boulders, cobbles and trace organics and fines overlying glacial till consisting of grey sand and gravel with some boulders, cobbles and fines. Thickness of the soil identified at the Site ranged from approximately 1.0 m (ML-TP22) to at least 5.0 m below the ground surface (bgs) (ML-TP13). Detailed soil descriptions and sampling depths are provided in the test pit logs presented in Appendix C-3.

3.4.2.2 Soil Vapour Concentrations

All soil samples collected at the Site were tested using a hand-held PID for SVH. SVH readings report the concentrations of ionizable vapours being released from the soils. SVH readings ranged from 0.0 parts per million (ppm) to 182 ppm (refer to Appendix D-3). The SVH readings were used to assist with the selection of soil samples for laboratory analyses.

3.4.2.3 Groundwater Conditions

Groundwater was encountered in 10 (ML-TP2, MLTP3, ML-TP5, ML-TP6, ML-TP7, ML-TP12, ML-TP13, ML-TP15, ML-TP18 and ML-TP19) of the 23 test pits excavated at the Site at depths of ranging from 0.1 m (ML-TP5 and ML-TP6) to 5.1 m (ML-TP7) bgs (refer to test pit logs presented in Appendix C-3). Based on the topography of the Site, groundwater flow direction at the Site has been inferred to be in a south-easterly direction, towards Lower Duck Island Cove Brook.

3.4.2.4 Contaminant Observations

<u>Friable Asbestos</u>
Exposed friable asbestos products were observed at various locations throughout the Site, including, but not limited to, the dry rock storage facility, conveyors, processing equipment, damaged bags of finished product and scattered throughout the exterior property (refer to Photos 14 to 18, Appendix B-3).

<u>Petroleum Hydrocarbon Odours</u>
Petroleum hydrocarbon odours were observed during the excavation of test pits ML-TP2, ML-TP3 and ML-TP18 (refer to Figure 3.3, Appendix A-3). Please note that since full face respirators were worn by field staff during excavation, olfactory evidence of petroleum hydrocarbons may have been present in other test pits excavated at the Site, however these may not have been detected by field staff.

<u>Free Phase Petroleum Hydrocarbon Product</u>
Approximately 2.0 cm free phase petroleum hydrocarbon product was observed on the water table within test pit ML-TP3 excavated at the Site (refer to Photo 19, Appendix B-3). This test pit ML-TP3 was excavated in the vicinity of a former UST reported to have been located along the south side of the dry mill building. A petroleum hydrocarbon sheen was also observed on the water table within test pit ML-TP18, excavated in the vicinity of the Bunker C AST (i.e. day tank) present at the southwest corner of the power centre (refer to Photo 20, Appendix B-3).

3.4.3 Florescent Light Ballasts

Due to height restrictions and safety concerns, the florescent light ballasts present inside the Site buildings were not assessed for PCBs during the current investigation (refer to Photos 21 and 22, Appendix B-3).

3.4.4 GPS Coordinates

AMEC recorded coordinates for all sampling locations using a handheld global positioning system (GPS) unit with an accuracy of +/- 5 m. All GPS coordinates were recorded in UTM NAD27 and are presented in Appendix E-3.

3.4.5 Laboratory Analytical Program

The detailed laboratory analytical program for the Phase II ESA completed at the Mill Area is outlined in Table 3-1 below.

Table 3-1: Detailed Laboratory Analytical Program

Media	Sample ID	Analyses
Paint	ML-PS1, ML-PS2, ML-PS3, ML-PS4, ML-PS5, ML-PS6, ML-PS7, ML-PS8, ML-PS9, ML-PS10, ML-PS11, ML-PS12, ML-PS13, ML-PS14, ML-PS15, ML-PS16, ML-PS17, ML-PS18, ML-PS19, ML-PS20, ML-PS21 ML-PS22, ML-PS23, ML-PS24, ML-PS25, PS-DUP4, PS-DUP5, PS-DUP6	Lead and Mercury
	ML-PS2, ML-PS4, ML-PS5, ML-PS10, ML-PS12, ML-PS13, ML-PS21, ML-PS22, PS-DUP2	PCB
	ML-PS4, ML-PS5, ML-PS7, ML-PS8, ML-PS12, ML-PS13, ML-PS14	Lead Leachate (TCLP)
	ML-PS17	Mercury Leachate (TCLP)
Asbestos	ML-ASB1, ML-ASB2, ML-ASB3, ML-ASB4	Asbestos
Air	ML#1, ML#2, ML#3, ML#4, ML#5, ML#6	
Soil	ML-TP1-SS1, ML-TP2-SS3, ML-TP3-SS1, ML-TP4-SS1, ML-TP5-SS1, ML-TP6-SS2, ML-TP7-SS2, ML-TP8-SS4, ML-TP9-SS3, ML-TP10-SS1, ML-TP11-SS2, ML-TP12-SS1, ML-TP13-SS3, ML-TP14-SS1, ML-TP15-SS1, ML-TP18, SS1, ML-TP19-SS2, ML-TP20-SS3, ML-TP22-SS1, DUP 3	BTEX/TPH
	ML-TP7-SS2, ML-TP8-SS4, ML-TP13-SS3, ML-TP14-SS1, ML-TP15-SS1, ML-TP18, SS1, ML-TP19-SS2, ML-TP20-SS3	Metals Plus Hydrides
	ML-TP2-SS3, ML-TP7-SS2, ML-TP13-SS3, ML-TP14-SS1, ML-TP18, SS1, ML-TP19-SS2, ML-TP20-SS3, ML-23-SS1, DUP 6	PAHs

Media	Sample ID	Analyses
Soil	ML-TP2-SS3, ML-TP4-SS1, ML-TP7-SS2, ML-TP9-SS3, ML-TP10-SS1, ML-TP11-SS2, ML-TP15-SS1, ML-TP16-SS1, ML-TP17-SS1, ML-TP21-SS1, ML-TP22-SS1, ML-TP23-SS1, DUP 5	PCB
	DUP 4	BTEX/TPH and Metals Plus Hydrides

Notes:
PS-DUP2 is a blind field duplicate of paint sample ML-PS22 for PCB analyses
PS-DUP4 is a blind field duplicate of paint sample ML-PS24 for lead and mercury analyses
PS-DUP5 is a blind field duplicate of paint sample ML-PS7 for lead and mercury analyses
PS-DUP6 is a blind field duplicate of paint sample ML-PS19 for lead and mercury analyses
DUP 3 is a blind field duplicate of soil sample ML-TP11-SS2 for BTEX/TPH analysis
DUP 4 is a blind field duplicate of soil sample NL-TP8-SS4 for BTEX/TPH and metals plus hydrides analyses
DUP 5 is a blind field duplicate of soil sample ML-TP17-SS1 for PCB analysis
DUP 6 is a blind field duplicate of soil sample ML-TP23-SS1 for PAH analysis

3.5 LABORATORY ANALYTICAL RESULTS

This section provides a summary of laboratory analytical results for asbestos, air, paint and soil samples collected at the Site during the current investigation. Tables summarizing the analytical results and applicable guidelines are presented in Appendix F-3. Sample locations are presented on Figures 3.2 and 3.3, Appendix A-3 and the Laboratory Certificates of Analyses are presented in Section 11.0.

3.5.1 Asbestos Sample Results

There are over 3,000 asbestos containing materials (ACMs), which can be divided into two broad categories: friable and non-friable.

- **Friable ACMs** are defined as materials that can be crumbled, pulverized and reduced to powder when dry using hand pressure. Typical friable materials include acoustical or decorative spray applications, fireproofing and thermal insulation; and
- **Non-friable ACMs** are hard or manufactured products such as floor tiles, fire blankets, pre-formed manufactured cementitious insulation and wallboards, pipes, and siding, wherein the asbestos fibres are bound to the substrate.

A total of four building material samples (ML-ASB1 to ML-ASB4) collected from the mill buildings present at the Site were analyzed for asbestos (refer to Figure 3.2, Appendix A-3). The laboratory results for asbestos are presented in Table 3-1, Appendix F-3. The results were compared to the "The Asbestos Abatement Regulations", 1998 (Nfld. Reg. 111/98) criterion of 1% asbestos fibres.

The analytical results revealed that concentrations of asbestos detected in samples ML-ASB1 (50% amosite), ML-ASB2 (55% amosite), ML-ASB3 (5% chrysotile) and ML-ASB4 (2% chrysotile) exceeded the applicable assessment criterion of 1%. Sample ML-ASB1 consisted of pipe insulation collected from the dry mill, sample ML-ASB2 consisted of pipe insulation collected from the secondary crusher, sample ML-ASB3 consisted of floor tile collected from the primary crusher and sample ML-ASB4 consisted of brick mortar collected from the dry rock storage facility. Pipe insulation is considered to be friable and floor tile and brick mortar are considered to be non-friable, unless disturbed.

3.5.2 Air Sample Results

3.5.2.1 Asbestos in Air

A total of six air samples (ML#1 to NML#6) collected at the Site was analyzed for asbestos (refer to Figure 3.2, Appendix A-3). Sample ML#1 was collected inside the dry mill, sample ML#2 was collected inside the wet mill, sample ML#3 was collected inside the secondary crusher, sample ML#4 was collected inside the furnace room of the dry rock storage facility, sample ML#5 was collected adjacent to the secondary crusher and sample ML#6 was collected adjacent to the primary crusher. Weather conditions at the time of collecting air samples ML#1 and ML#2 were overcast with showers and light winds, ML#3 and ML#4 were overcast with sunny breaks and moderate winds and ML#5 and ML#6 were sunny with moderate winds. The analytical results are presented in Table 3-2, Appendix F-3. The results were compared to the 2006 Occupational Exposure Threshold Limit Value (TLV) of 0.1 fibres/cm^3 as indicated by the American Conference of Governmental Industrial Hygienists (ACGIH)[1].

Concentrations of asbestos fibres in all air samples analyzed were either non-detect or detected at levels below the applicable assessment criterion of 0.1 fibres/cm^3. Asbestos fibres were detected in two of the six air samples at concentrations in the range of 0.003 fibres/cm^3 (ML#5) to 0.004 fibres/cm^3 (ML#1).

3.5.3 Paint Sample Results

3.5.3.1 Lead in Paint

A total of 25 paint samples (ML-PS1 to ML-PS25), plus three blind field duplicate samples (PS-DUP4 to PS-DUP6), collected from the painted surfaces present at the Site were submitted to the laboratory for lead analyses (refer to Figure 3.2, Appendix A-3). The laboratory results for lead in paint are presented in Table 3-3, Appendix F-3. The results were compared to the Federal HPA criterion of 600 mg/kg and former Federal HPA criterion of 5,000 mg/kg.

Results of the paint sampling program revealed that concentrations of lead detected in paint samples ML-PS2 (1,080 mg/kg), ML-PS4 (158,000 mg/kg), ML-PS5 (42,100 mg/kg), ML-PS6 (1,370 mg/kg), ML-PS7 (57,900 mg/kg), ML-PS8 (23,000 mg/kg), ML-PS9 (1,930 mg/kg), ML-PS10 (1,820 mg/kg), ML-PS11 (1,520 mg/kg), ML-PS12 (5,800 mg/kg), ML-PS13 (7,240 mg/kg), ML-PS14 (10,300 mg/kg), ML-PS16 (3,750 mg/kg), ML-PS17 (975 mg/kg), ML-PS19 (4,150 mg/kg), ML-PS20 (2,500 mg/kg), ML-PS21 (2,070 mg/kg), ML-PS22 (2,140 mg/kg), ML-PS25 (1,670 mg/kg), PS-DUP4 (909 mg/kg), PS-DUP5 (54,500 mg/kg) and PS-DUP6 (3,630 mg/kg) exceeded the Federal HPA criterion of 600 mg/kg and are therefore considered to be a health hazard during any renovation/demolition activities at the Site.

Concentrations of lead detected in paint samples ML-PS4 (158,000 mg/kg), ML-PS5 (42,100 mg/kg), ML-PS7 (57,900 mg/kg), ML-PS8 (23,000 mg/kg), ML-PS12 (5,800 mg/kg), ML-PS13 (7,240 mg/kg), ML-PS14 (10,300 mg/kg) and PS-DUP5 (54,500 mg/kg) also exceeded the former Federal HPA criterion of 5,000 mg/kg.

3.5.3.2 Mercury in Paint

A total of 25 paint samples (ML-PS1 to ML-PS25), plus three blind field duplicate samples (PS-DUP4 to PS-DUP6), collected from the painted surfaces present at the Site were submitted to the laboratory for mercury analyses (refer to Figure 3.2, Appendix A-3). The laboratory results for mercury in paint are presented in Table 3-4, Appendix F-3. The results are compared to the Federal HPA criterion of 10.0 mg/kg and the CCME-CEQG of 24.0 mg/kg for mercury in soil at a commercial site.

Results of the paint sampling program revealed that concentrations of mercury detected in paint samples ML-PS7 (17.3 mg/kg), ML-PS17 (25.2 mg/kg) and PS-DUP5 (17.3 mg/kg) exceeded the Federal HPA criterion of 10.0 mg/kg and are therefore considered to be a health hazard during any renovation/demolition activities at the Site.

The concentration of mercury detected in paint sample ML-PS17 (25.5 mg/kg) also exceeded the CCME-CEQG of 24.0 mg/kg for mercury in soil at a commercial site.

3.5.3.3 PCB in Paint

A total of eight paint samples (ML-PS2, ML-PS4, ML-PS5, ML-PS10, ML-PS12, ML-PS13, ML-PS21 and ML-PS22), plus one blind field duplicate sample (PS-DUP2), collected from the painted surfaces present at the Site were submitted to the laboratory for PCB analyses (refer to Figure 3.2, Appendix A-3). The laboratory results for PCB in paint are presented in Table 3-5, Appendix F-3. The results were compared to the CCME-CEQG of 33.0 mg/kg for PCB in soil at a commercial site.

Results of the paint sampling program revealed that concentrations of PCB in all paint samples analyzed were detected a levels below the applicable CCME-CEQG of 33.0 mg/kg. Concentrations of PCBs detected in paint ranged from 1.26 mg/kg (ML-PS4) to 29.5 mg/kg (ML-PS21).

3.5.3.4 Lead Leachate in Paint

Since concentrations of lead in paint samples ML-PS4, ML-PS5, ML-PS7, ML-PS8, ML-PS12, ML-PS13 and ML-PS14 exceeded the applicable former Federal HPA criterion of 5,000 mg/kg, these paint samples were also analyzed using the Toxicity Characteristic Leaching Procedure (TCLP) for lead leachate to determine whether or not these paints would be considered hazardous waste upon removal from the Site. The laboratory results for lead leachate in paint are presented in Table 3-6, Appendix F-3. The results were compared to the provincial guideline for leachable toxic waste[2] and the federal regulation for the TDG criterion of 5 mg/L.

Results revealed that the concentrations of lead leachate detected in paint samples ML-PS5 (8.51 mg/L) and ML-PS14 (116.0 mg/L) exceeded the applicable assessment criterion of 5.0 mg/L. Since the concentrations of lead leachate in these paints are at levels considered hazardous, in the

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[1] Documentation of the Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices, ACGIH Worldwide Signature Publications, Cincinnati, OH, 2006.
[2] Newfoundland and Labrador Department of Environment and Conservation, November 2003. Guidance Document: Leachable Toxic Waste, Testing and Disposal (GD-PPD-26.1).

absence of further rationalization (i.e. dilute with substrate), these paints, if removed from the Site, must be disposed of as hazardous waste.

3.5.3.5 Mercury Leachate in Paint

Since concentration of mercury in paint sample ML-PS17 exceeded the applicable CCME-CEQG of 24.0 mg/kg for mercury in soil at a commercial site, this paint sample was also analyzed using the TCLP for mercury leachate to determine whether or not this paint would be considered hazardous waste upon removal from the Site. The laboratory result for mercury leachate in paint is presented in Table 3-7, Appendix F-3. The result was compared to the provincial guideline for leachable toxic waste[2] and the federal regulation for the TDG criterion of 0.1 mg/L.

The concentrations of mercury leachate detected in paint sample ML-PS17 (0.0008 mg/L) did not exceed the applicable assessment criterion of 0.1 mg/L. Therefore, this paint, if removed from the Site, may be disposed of at an approved landfill facility.

3.5.4 Soil Sample Results

3.5.4.1 Petroleum Hydrocarbons in Soil

A total of 21 soil samples, including two blind field duplicate samples (DUP 3 and DUP 4), collected at the Site were analyzed for BTEX/TPH. The analytical results are presented in Tables 3-8 to 3-11, Appendix F-3. The results were compared to the CCME-CEQG for industrial sites and the 2003 Atlantic PIRI Tier I RBSLs for commercial sites with coarse-grained soil and non-potable groundwater.

Concentrations of ethylbenzene detected in soil samples ML-TP2-SS3 (1.10 mg/kg) and ML-TP3-SS1 (0.17 mg/kg) exceeded the CCME-CEQG of 0.08 mg/kg, but did not exceed the 2003 Atlantic Tier I RBSL of 430 mg/kg. Concentrations of BTEX in all other soil samples analyzed were either non-detect or detected at levels below the applicable assessment criteria.

Concentrations of modified TPH detected in soil samples ML-TP3-SS1 (<66,500 mg/kg) and ML-TP18-SS1 (<18,800 mg/kg) exceeded the 2003 Atlantic PIRI Tier I RBSL criterion of 7,400 mg/kg for diesel fuel in soil at a commercial site with coarse-grained soil and non-potable groundwater. Hydrocarbons detected in soil resembled weathered diesel fuel and heavy oil. Concentrations of modified TPH in all other soil samples analyzed were either non-detect or detected at levels below the applicable assessment criteria.

3.5.4.2 Metals in Soil

A total of eight soil samples, plus one blind field duplicate sample (DUP 4), collected at the Site were analyzed for metals plus hydrides. The analytical results are presented in Tables 3-12 and 3-13, Appendix F-3. The results were compared to the CCME-CEQG for industrial sites.

The concentration of arsenic detected in soil sample ML-TP7-SS2 (374 mg/kg) exceeded the applicable CCME-CEQG of 12 mg/kg.

Concentrations of chromium detected in all soil samples analyzed exceeded the applicable CCME-CEQG of 87 mg/kg. Concentrations of chromium detected in soil ranged from 365 mg/kg (ML-TP7-SS2) to 775 mg/kg (ML-TP18-SS1).

Concentrations of nickel detected in all soil samples analyzed exceeded the applicable CCME-CEQG of 50 mg/kg. Concentrations of nickel detected in soil ranged from 494 mg/kg (ML-TP8-SS4) to 1,450 mg/kg (ML-TP15-SS1).

3.5.4.3 PAHs in Soil

A total of eight soil samples, plus one blind field duplicate sample (DUP 6), collected at the Site were analyzed for PAHs. The analytical results are presented in Tables 3-14 and 3-15, Appendix F-3. The results were compared to the CCME-CEQG for industrial sites.

Concentrations of PAHs in all soil samples analyzed were either non-detect or detected at levels below the applicable assessment criteria.

3.5.4.4 PCBs in Soil

A total of 13 soil samples, plus one blind field duplicate sample (DUP 5), collected at the Site were analyzed for PCBs. The analytical result is presented in Tables 3-16 to 3-18, Appendix F-3. The results were compared to the CCME-CEQG for industrial sites.

Concentrations of PCBs in all soil samples analyzed were either non-detect or detected at levels below the applicable assessment criteria of 33.0 mg/kg.

3.6 DISCUSSION OF CONTAMINANTS OF CONCERN

Based on the findings of this Phase II ESA the following discussions of contaminants of concern (COC) investigated are provided.

3.6.1 Asbestos

Asbestos was detected in the pipe insulation present inside the dry mill and wet mill, floor tiles present inside the primary crusher and the brick mortar of the dry rock storage building. Asbestos fibres in pipe insulation are considered to be friable and asbestos fibres in floor tile and brick mortar are considered to be “non-friable”, unless disturbed.

Exposed friable asbestos products were observed at various locations throughout the Site, including, but not limited to, the dry rock storage facility, conveyors, processing equipment, damaged bags of finished product and scattered throughout the exterior property. The conveyors and processing equipment present throughout the Site were not emptied of asbestos products upon closure of the mine.

Concentrations of asbestos fibres in all six air samples collected at the Site during the current investigation were either non-detect or detected at levels below the applicable assessment criterion of

0.1 fibres/cm^3. However, please note that these findings are based on one sampling event and that the concentrations of asbestos fibres in air may vary (i.e. increase or decrease) over time, especially during dry times and periods of activity at the Site.

3.6.2 Lead and Mercury in Paint

Lead

Results of the paint sampling program revealed that concentrations of lead detected in 18 of the 25 paint samples analyzed exceeded the Federal HPA criterion of 600 mg/kg and are therefore considered to be a health hazard during any renovation/demolition activities at the Site. Concentrations of lead detected seven of the 25 paint samples analyzed also exceeded the former Federal HPA criterion of 5,000 mg/kg.

Concentrations of lead leachate detected in paint samples ML-PS4 (orange paint collected from the steel columns of the dry mill building) and ML-PS14 (grey paint collected from mechanical equipment inside the furnace building of the dry rock storage facility) exceeded the applicable assessment criterion of 5.0 mg/L. Since the concentrations of lead leachate in these paints are at levels considered hazardous, in the absence of further rationalization (i.e. dilute with substrate), these paints, if removed from the Site, must be disposed of as hazardous waste.

Mercury

Results of the paint sampling program revealed that concentrations of mercury detected in two of the 25 paint samples analyzed exceeded the Federal HPA criterion of 10.0 mg/kg and are therefore considered to be a health hazard during any renovation/demolition activities at the Site. Concentrations of mercury detected one of the 25 paint samples analyzed also exceeded CCME-CEQG of 24.0 mg/kg for mercury in soil at a commercial site.

The concentration of mercury leachate detected in paint samples ML-17 (white paint collected from mechanical equipment inside the primary crusher building) did not exceed the applicable assessment criterion of 0.1 mg/L. Since the concentration of mercury leachate in this paint is not at a level considered hazardous, this paint, if removed from the Site, may be disposed of at an approved landfill facility.

3.6.3 PCBs

Due to height restrictions and safety concerns, the florescent light ballast present inside the Site buildings were not assessed for PCBs during the current investigation. However, given the age of the Site buildings, it is likely that PCB containing light ballasts are present at the Site.

3.6.4 Petroleum Hydrocarbons

Approximately 2.0 cm free phase petroleum hydrocarbon product was observed on the water table within test pit ML-TP3, excavated in the vicinity of a former UST reported to have been located along the south side of the dry mill building. A petroleum hydrocarbon sheen was observed on the water table within test pit ML-TP18, excavated in the vicinity of the Bunker C AST (i.e. day tank) present at the southwest corner of the power centre.

Concentrations of ethylbenzene detected in soil samples ML-TP2-SS3 (0.1.10 mg/kg) and ML-TP3-SS1 (0.17 mg/kg) exceeded the CCME-CEQG of 0.08 mg/kg, but did not exceed the 2003 Atlantic Tier I RBSL of 430 mg/kg. Soil samples ML-TP2-SS3 and ML-TP3-SS1 were collected along the south side of the dry mill building.

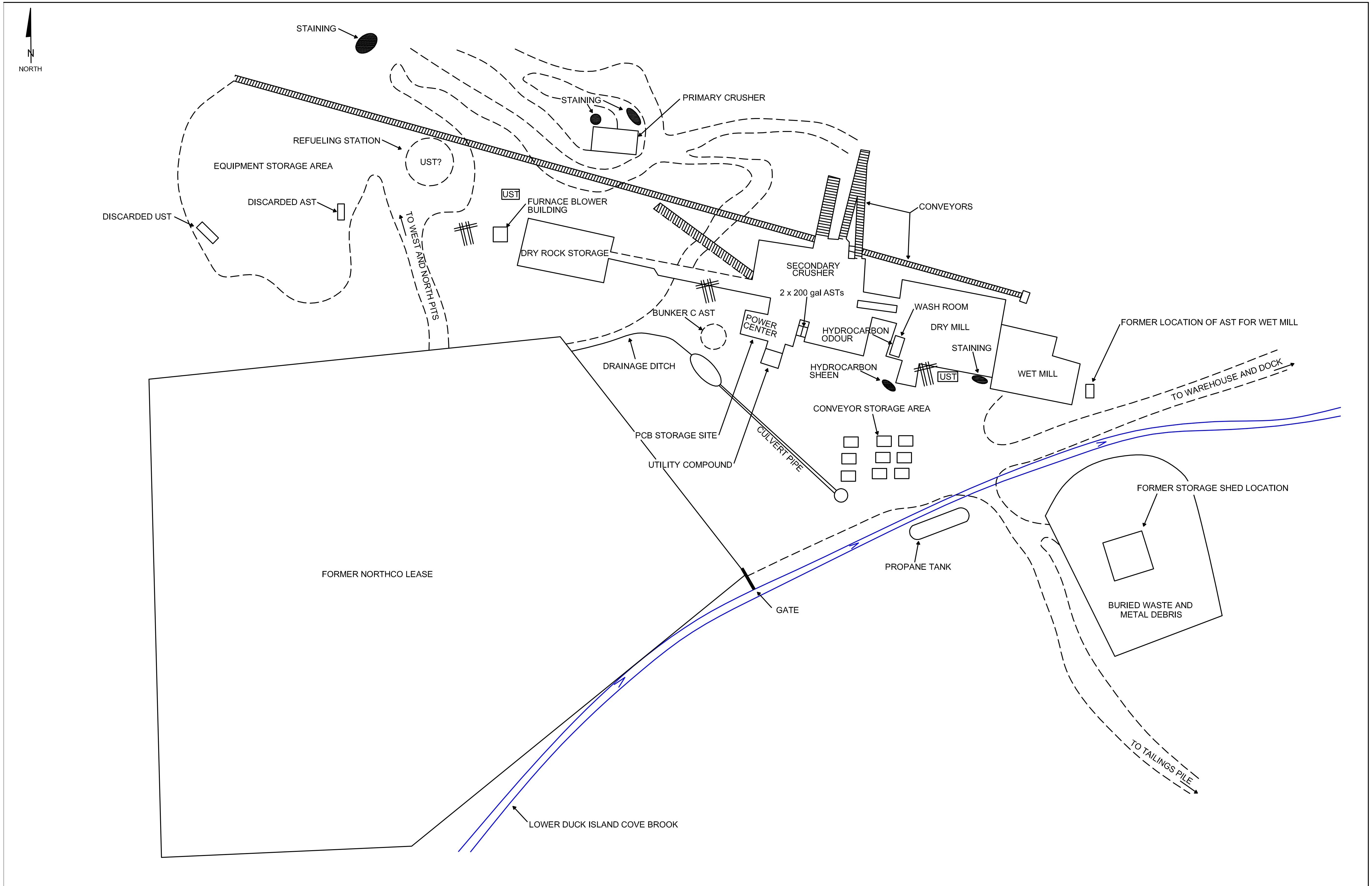
Concentrations of modified TPH detected in soil samples ML-TP3-SS1 (<66,500 mg/kg) and ML-TP18-SS1 (<18,800 mg/kg) exceeded the 2003 Atlantic PIRI Tier I RBSL criterion of 7,400 mg/kg for diesel fuel in soil at a commercial site with coarse-grained soil and non-potable groundwater. Soil sample ML-TP3-SS1 was collected in the vicinity of the former UST located along the south side of the dry mill building and soil sample ML-TP18-SS1 was collected southwest of the power centre, in the vicinity of the Bunker C AST (i.e. day tank).

3.6.5 Metals

Concentrations of chromium and nickel detected in all eight soil samples collected at the Site exceeded the applicable assessment criteria for metals in soil at industrial sites. The concentration of arsenic detected in soil sample ML-TP7-SS2 (374 mg/kg) also exceeded the applicable CCME-CEQG of 12.0 mg/kg. Based on the testing completed, metal impacts in soil are considered to be widespread throughout the Site.

APPENDIX A-3

FIGURES



NOTES

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM FIGURE.
3. THIS FIGURE IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
5. THIS FIGURE SHOULD NOT BE USED FOR PURPOSES OTHER THAN THOSE OUTLINED ABOVE.
6. THIS FIGURE CONTAINS INTELLECTUAL PROPERTY OF THE DEPARTMENT OF NATURAL RESOURCES AND MAY NOT BE REPRODUCED OR COPIED WITHOUT THEIR WRITTEN CONSENT.
7. THIS FIGURE WAS PRODUCED FROM DOCUMENTS SUPPLIED BY THE CLIENT AND VISUAL OBSERVATIONS.

LEGEND

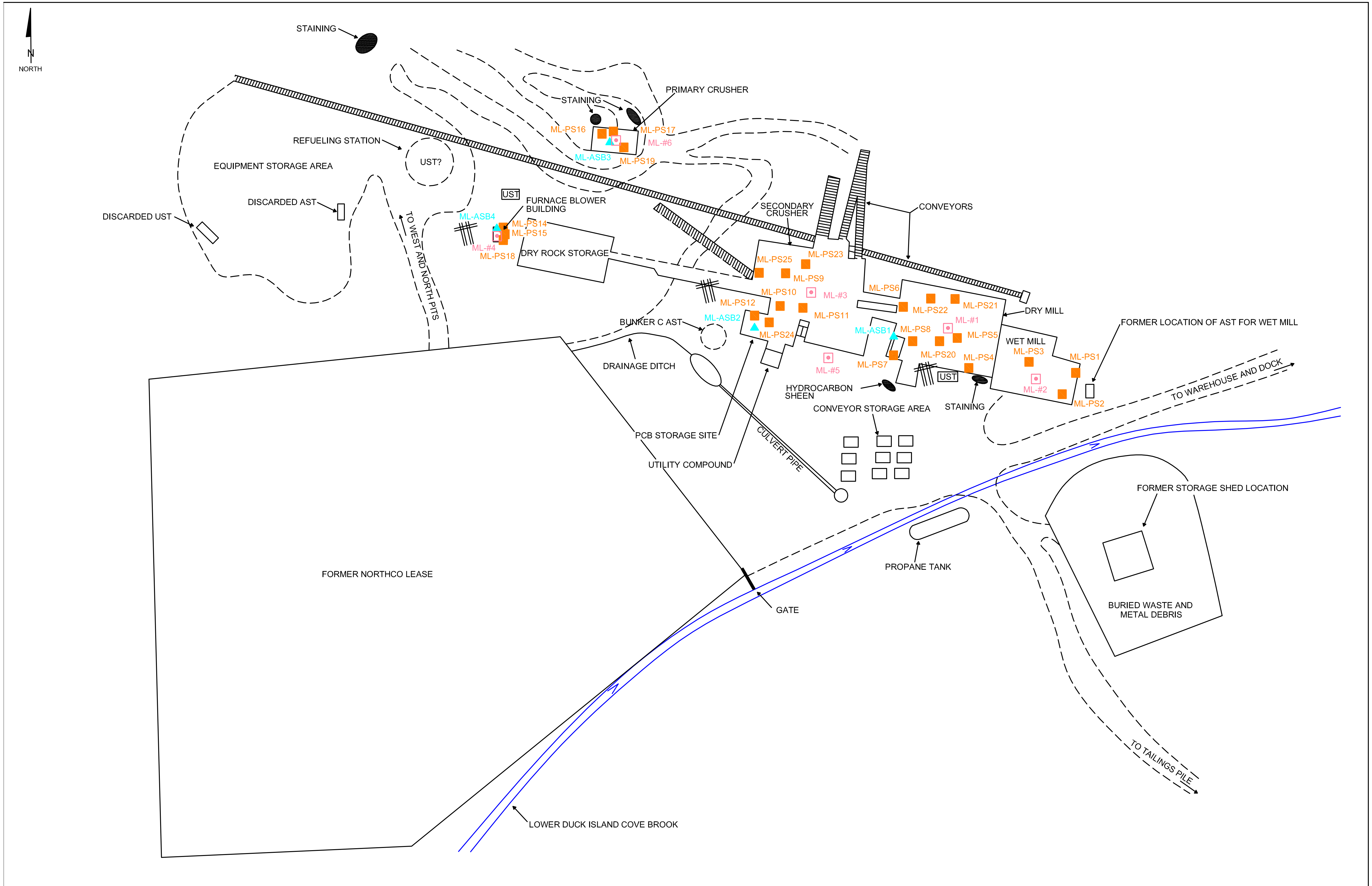
GRAVEL ACCESS ROADS
FORMER TRANSFORMER LOCATION
FLOW DIRECTION

CLIENT
DEPARTMENT OF NATURAL RESOURCES

PROJECT
PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER BAIE VERTE ASBESTOS MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE
MILL BUILDINGS

SCALE	PROJECT NUMBER	
NTS	TF6126509	
DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	
DRAWING NO.	DATE	REV
3.1	January 2007	



NOTES

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM FIGURE.
3. THIS FIGURE IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
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7. THIS FIGURE WAS PRODUCED FROM DOCUMENTS SUPPLIED BY THE CLIENT AND VISUAL OBSERVATIONS.

LEGEND

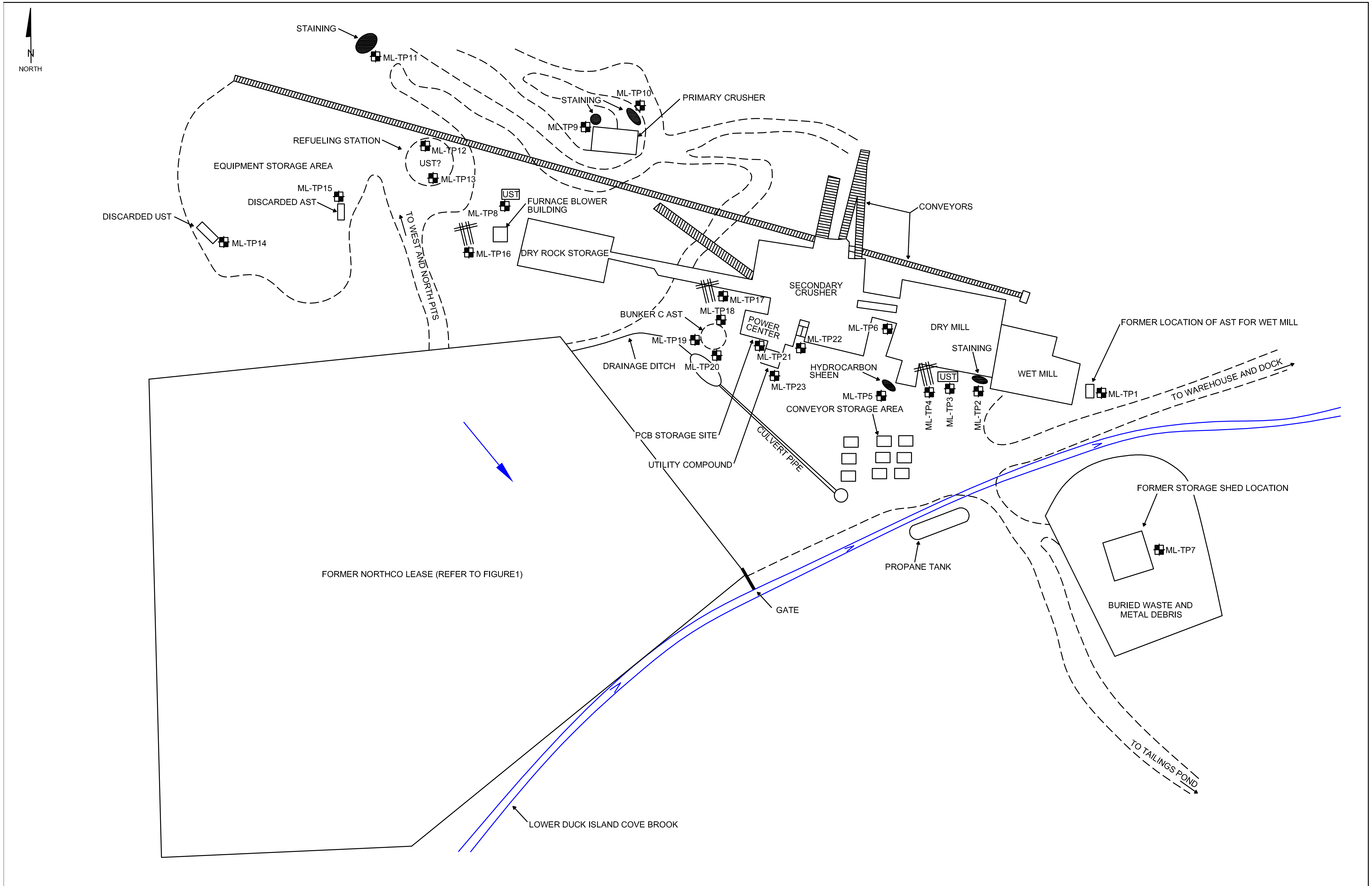
GRAVEL ACCESS ROADS
FORMER TRANSFORMER LOCATION
FLOW DIRECTION
ASBESTOS SAMPLE
PAINT SAMPLE
AIR SAMPLES

CLIENT
DEPARTMENT OF NATURAL RESOURCES

PROJECT
PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER BAIE VERTE ASBESTOS MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE
MILL BUILDINGS
AIR, ASBESTOS AND PAINT SAMPLE LOCATIONS

SCALE	PROJECT NUMBER	
NTS	TF6126509	
DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	
DRAWING NO.	DATE	REV
3.2	January 2007	



NOTES

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM FIGURE.
3. THIS FIGURE IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
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7. THIS FIGURE WAS PRODUCED FROM DOCUMENTS SUPPLIED BY THE CLIENT AND VISUAL OBSERVATIONS.

LEGEND

GRAVEL ACCESS ROADS
FORMER TRANSFORMER LOCATION
FLOW DIRECTION
TEST PIT LOCATION
ASSUMED GROUNDWATER FLOW DIRECTION

CLIENT
DEPARTMENT OF NATURAL RESOURCES

PROJECT
PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER BAIE VERTE ASBESTOS MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE
MILL BUILDINGS
TEST PIT LOCATIONS

SCALE	PROJECT NUMBER	
NTS	TF6126509	
DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	
DRAWING NO.	DATE	REV
3.3	January 2007	

APPENDIX B-3

PHOTOGRAPHIC RECORD


Photo 1: Primary Crusher.


Photo 2: Dry Rock Storage.


Photo 3: Secondary Crusher, Dry Mill and Power Centre.


Photo 4: Wet Mill – December 2004.

Photo 5: Stain Area Located Northwest of Primary Crusher.

Photo 6: Stain Area Located Northeast of Primary Crusher.

Photo 7: Stain Area Located at Southeast Corner of Dry Mill.

Photo 8: Hydrocarbon Sheen located Southwest of Dry Mill.

Photo 9: Approximate Location of Bunker C Day Tank.
(Completely Covered with Saw Dust)

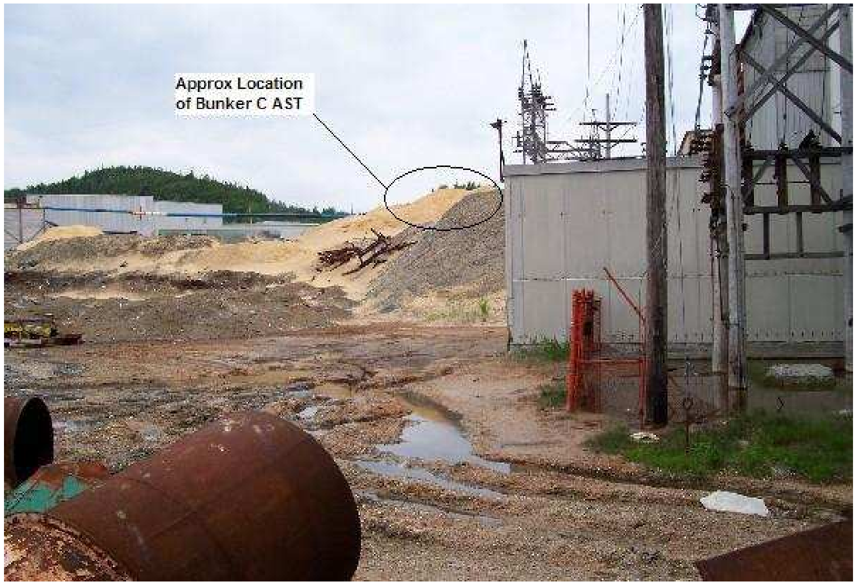

Photo 10: Approximate Location of Bunker C Day Tank.
(Completely Covered with Saw Dust)

Photograph 11. Discarded 10,000-Gallon UST
(Equipment Storage Area)

Photograph 12. Discarded 200-Gallon AST.
(Equipment Storage Area)

Photo 13: Former AST associated with the Wet Mill.
(Photo Obtained From NLDOEC)

Photo 14: Exposed Friable Asbestos – Dry Rock Storage Facility.

Photo 15: Exposed Friable Asbestos – Dry Rock Storage Facility and Associated Conveyor.

Photo 16: Exposed Friable Asbestos – Conveyor on Northside of Secondary Crusher Building.

Photo 17: Damaged Bags of Asbestos Product – Southside of Wet Mill.

Photo 18: Exposed Friable Asbestos – Between Dry Rock Storage Facility and Secondary Crusher Building.

Photo 19: Free Product – Test Pit ML-TP3.
(Southside of Dry Mill Building)

Photo 20: Petroleum Hydrocarbon Sheen – Test Pit ML-TP18.
(Southwest of the Power Centre)

Photo 21: Typical Florescent Lighting inside the Dry Mill.

Photo 22: Typical Florescent Lighting inside the Wet Mill.

APPENDIX C-3

TEST PIT LOGS

Department of Natural Resources
Phase II Environmental Site Assessment
Baie Verte Asbestos Mine – Mill Area

Test Pit Identification Number	Depth From – To (m)	Soil Description
ML-TP1	0.0 – 0.5	FILL – Grey, BOULDERS and COBBLES with some sand and gravel, organics, moist, loose.
	0.5 – 2.7	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	2.7 – 3.0	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact to dense.
	3.0	Test pit terminated in Fill.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
ML-TP2	0.0 – 0.1	FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles, wood debris, moist, loose.
	0.1 – 3.1	FILL – Grey to dark grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	3.1	Test pit terminated on Bedrock.
		Note: 1) Groundwater encountered at 2.7 m depth. 2) Hydrocarbon odour present during excavation.
ML-TP3	0.0 – 0.1	FILL – Brown, SAND and GRAVEL with some fines, wood and metal debris, moist, loose.
	0.1 – 1.0	FILL – Dark grey, SAND and GRAVEL with some fines, cobbles and boulders, wood debris, moist to saturated, loose.
	1.0	Test pit terminated in Fill.
		Note: 1) Groundwater encountered at 0.7 m depth. 2) Hydrocarbon odour present during excavation. 3) Approximately 2.0 cm of free product on water surface.

Test Pit Identification Number	Depth From – To (m)	Soil Description
ML-TP4	0.0 – 0.3 0.3 – 0.4 0.4 – 1.0 1.0	FILL – Grey, SAND and GRAVEL with some fines, wood and metal debris, moist, loose. ASPHALT FILL – Brown / grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact. Test pit terminated in Fill. Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation
ML-TP5	0.0 – 0.7 0.7	FILL – Grey, COBBLES and BOULDERS with some sand and gravel, wood debris, saturated, loose. Test pit terminated in Fill. Note: 1) Groundwater encountered at 0.1 m depth. 2) No hydrocarbon odour present during excavation.
ML-TP6	0.0 – 0.1 0.1 – 1.0 1.0 – 2.1 2.1	ASPHALT FILL – Brown, SAND and GRAVEL with some fines, cobbles and boulders, saturated, loose to compact. GLACIAL TILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, saturated, compact. Test pit terminated on Bedrock. Note: 1) Groundwater encountered at 0.1 m depth. 2) No hydrocarbon odour present during excavation.
ML-TP–7	0.0 – 5.2 5.2	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, loose to compact. Test pit terminated on Bedrock. Note: 1) Groundwater encountered at 5.1 m depth. 2) Hydrocarbon odour present during excavation.

Test Pit Identification Number	Depth From – To (m)	Soil Description
ML-TP8	0.0 – 5.0 5.0	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact. Test pit terminated on Bedrock. Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
ML-TP9	0.0 – 0.3 0.3 – 1.0 1.0 – 3.0 3.1	FILL – Reddish brown, SAND and GRAVEL with fines, cobbles, metal debris, moist, loose. FILL – Brown to grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact. GLACIAL TILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact. Test pit terminated in Glacial till. Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
ML-TP10	0.0 – 0.9 0.9 – 3.3 3.3	FILL – Grey with some yellow layers, SAND and GRAVEL with some fines, cobbles and boulders, metal debris, moist, loose. FILL – Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact. Test pit terminated on Bedrock. Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
ML-TP11	0.0 – 2.0 2.0 – 2.8 2.8	FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact. FILL – Grey, SAND and GRAVEL with some fines, cobbles and boulders, asbestos fibers, moist, loose to compact. Test pit terminated on Bedrock. Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.

Test Pit Identification Number	Depth From – To (m)	Soil Description
ML-TP12	0.0 – 1.0 1.0	FILL – Grey, Sand and GRAVEL with some fines, cobbles and boulders, moist to saturated, loose to compact. Test pit terminated in Fill. Note: 1) Groundwater encountered at 0.8 m depth. 2) No hydrocarbon odour present during excavation.
ML-TP13	0.0 – 0.2 0.2 – 3.0 3.0 – 5.0 5.0	FILL – Reddish brown, Sand and GRAVEL with some fines, cobbles and boulders, moist, loose. FILL – Grey, Sand and GRAVEL with some fines, cobbles and boulders, moist, loose to compact. FILL – Grey, Sand and GRAVEL with some fines, cobbles and boulders, moist to saturated, compact. Test pit terminated on possible Bedrock. Note: 1) Groundwater encountered at 4.5 m depth. 2) No hydrocarbon odour present during excavation.
ML-TP14	0.0 - 2.0 2.0	FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact. Test pit terminated on possible Bedrock. Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
ML-TP15	0.0 - 1.3 1.3	FILL - Grey, BOULDERS and COBBLES with some sand and gravel, moist to saturated, loose. Test pit terminated in Fill. Note: 1) Groundwater encountered at 1.0 m depth. 2) No hydrocarbon odour present during excavation.
ML-TP16	0.0 - 0.3 0.3	FILL - Grey, SAND and GRAVEL with some fines, cobbles, moist, loose to compact. Test pit terminated in Fill. Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.

Test Pit Identification Number	Depth From – To (m)	Soil Description
ML-TP17	0.0 - 0.3	FILL - Grey, SAND and GRAVEL with some fines, cobbles, moist, loose to compact.
	0.3	Test pit terminated in Fill.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
ML-TP18	0.0 - 0.1	ASPHALT
	0.1 - 0.3	FILL - Class “A” material.
	0.3 - 2.0	FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, loose to compact.
	2.0	Test pit terminated in Fill.
		Note: 1) Groundwater encountered at 1.8 m depth. 2) Hydrocarbon odour present during excavation. 3) Sheen on water surface.
ML-TP19	0.0 - 0.1	FILL - Reddish brown, SAND and GRAVEL with some fines, metal and wood debris, moist, loose.
	0.1 - 0.9	FILL - Brown, SAND and GRAVEL with some fines, cobbles, moist, loose to compact.
	0.9 - 1.4	FILL - Light grey, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, compact.
	1.4 - 3.0	GLACIAL TILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, saturated, compact to dense.
	3.0	Test pit terminated in Glacial till.
		Note: 1) Groundwater encountered at 2.7 m depth. 2) No hydrocarbon odour present during excavation.
ML-TP20	0.0 - 0.1	FILL - Reddish brown, SAND and GRAVEL with some fines, moist, loose.
	0.1 - 3.0	FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact.
	3.0	Test pit terminated in Fill.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.

Test Pit Identification Number	Depth From – To (m)	Soil Description
ML-TP21	0.0 - 1.5	SAWDUST and WOODCHIPS
	1.5 - 2.5	FILL - Brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact.
	2.5 - 3.2	BOULDERS and COBBLES - Grey, some sand and gravel, moist, loose.
	3.2 - 4.0	FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, asbestos fibers, moist, compact.
	4.0	Test pit terminated in Fill.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
ML-TP22	0.0 - 1.0	FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	1.0	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
ML-TP23	0.0 - 0.4	SAWDUST
	0.4 - 1.3	FILL - Brown, SAND and GRAVEL with some fines, cobbles and boulders, organics, moist, loose. Encountered old power cable.
	1.3	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.

APPENDIX D-3

SOIL VAPOUR HEADSPACE READINGS

SVH READINGS OF SOIL SAMPLES – MILL AREA

SAMPLING LOCATION	SOIL SAMPLE ID	SAMPLING DEPTH (m)	PID SVH (PPM)
ML-TP1	ML-TP1-SS1	0.0 – 1.0	16.4
	ML-TP1-SS2	1.0 – 2.0	6.8
	ML-TP1-SS3	2.0 – 3.0	10.1
ML-TP2	ML-TP2-SS1	0.0 – 1.0	48.5
	ML-TP2-SS2	1.0 – 2.0	132.0
	ML-TP2-SS3	2.0 – 3.1	163.0
ML-TP3	ML-TP3-SS3	0.0 – 1.0	105.0
ML-TP4	ML-TP4-SS1	0.0 – 1.0	16.4
ML-TP5	ML-TP5-SS1	0.0 – 0.7	7.4
ML-TP6	ML-TP6-SS1	0.0 – 1.0	3.1
	ML-TP6-SS2	1.0 – 2.1	6.4
ML-TP7	ML-TP7-SS1	0.0 – 1.0	7.9
	ML-TP7-SS2	1.0 – 2.0	50.8
	ML-TP7-SS3	2.0 – 3.0	25.6
	ML-TP7-SS4	3.0 – 4.0	35.1
	ML-TP7-SS5	4.0 – 5.0	10.7
ML-TP8	ML-TP8-SS1	0.0 – 1.0	0.0
	ML-TP8-SS2	1.0 – 2.0	15.2
	ML-TP8-SS3	2.0 – 3.0	27.0
	ML-TP8-SS4	3.0 – 4.0	27.5
	ML-TP8-SS5	4.0 – 5.0	1.3
ML-TP9	ML-TP9-SS1	0.0 – 1.0	24.6
	ML-TP9-SS2	1.0 – 2.0	31.9
	ML-TP9-SS3	2.0 – 3.0	45.0
ML-TP10	ML-TP10-SS1	0.0 – 1.0	18.9
	ML-TP10-SS2	1.0 – 2.0	0.0
	ML-TP10-SS3	2.0 – 3.0	2.7
	ML-TP10-SS4	3.0 – 3.3	0.0
ML-TP11	ML-TP11-SS1	0.0 – 1.0	63.8
	ML-TP11-SS2	1.0 – 2.0	182.0
	ML-TP11-SS3	2.0 – 2.8	50.7
ML-TP12	ML-TP12-SS1	0.0 – 1.0	0.0
ML-TP13	ML-TP13-SS1	0.0 – 1.0	0.0
	ML-TP13-SS2	3.0 – 4.0	0.0
	ML-TP13-SS3	4.0 – 5.0	0.0
ML-TP14	ML-TP14-SS1	0.0 – 1.0	0.0
	ML-TP14-SS2	1.0 – 2.0	0.0
ML-TP15	ML-TP15-SS1	0.3 – 1.3	0.0
ML-TP16	ML-TP16-SS1	0.0 – 0.3	5.2
ML-TP17	ML-TP17-SS1	0.0 – 0.3	6.0

Notes:
Shaded cells mean sample submitted for analyses.

SAMPLING LOCATION	SOIL SAMPLE ID	SAMPLING DEPTH (m)	PID SVH (PPM)
ML-TP18	ML-TP18-SS1	0.0 – 1.0	5.9
	ML-TP18-SS2	1.0 – 2.0	4.3
	ML-TP18-SS3	2.5 – 3.0	0.0
ML-TP19	ML-TP19-SS1	0.0 – 1.0	1.3
	ML-TP19-SS2	1.0 – 2.0	8.8
	ML-TP19-SS3	2.5 – 3.0	0.0
ML-TP20	ML-TP20-SS1	0.0 – 1.0	0.0
	ML-TP20-SS2	1.0 – 2.0	0.0
	ML-TP20-SS3	2.0– 3.0	0.0
ML-TP21	ML-TP21-SS1	1.5– 2.5	0.2
	ML-TP21-SS2	3.2 – 4.0	0.0
ML-TP22	ML-TP22-SS1	0.0 – 1.0	0.0
ML-TP23	ML-TP23-SS1	0.4 – 1.3	0.0

Notes:
Shaded cells mean sample submitted for analyses.

APPENDIX E-3

GPS COORDINATES

GPS COORDINATES - NAD27 - MILL AREA

Location	Northing	Easting
ML-TP1	558941	5537170
ML-TP2	558860	5537161
ML-TP3	558874	5537183
ML-TP4	558846	5537181
ML-TP5	558811	5537263
ML-TP6	558808	5537199
ML-TP7	558964	5537109
ML-TP8	558649	5537263
ML-TP9	558697	5537312
ML-TP10	558709	5537309
ML-TP11	558594	5537311
ML-TP12	558602	5537294
ML-TP13	558617	5537270
ML-TP14	558560	5537211
ML-TP15	558570	5537234
ML-TP16	558628	5537257
ML-TP17	558755	5537228
ML-TP18	558756	5537238
ML-TP19	558739	5537187
ML-TP20	558764	5537156
ML-TP21	558771	5537162
NC-TP22	558800	5537196
NC-TP23	558803	5537192

APPENDIX F-3

LABORATORY ANALYSES TABLES

Table 3-1: Summary of Building Materials Samples and Asbestos Analysis - Mill Area

Sample ID	Sample Location	Sample Type	Asbestos Fibre % Chrysotile	Asbestos Fibre % Amosite	Asbestos Fibre % other asbestos fibres
ML-ASB1	Dry Mill Building - Level I	Pipe Insulation	nd	50	nd
ML-ASB2	Secondary Crusher Building - Boiler Room	Pipe Insulation	nd	55	nd
ML-ASB3	Primary Crusher Building - Control Room	Floor Tile	5	nd	nd
ML-ASB4	Dry Rock Storage Building - Interior Wall	Mortar	2	nd	nd

Note: Shaded results are above maximum as outlined under "The Asbestos Abatement Regulations, 1998 (Nfld. Reg. 111/98) of 1 % asbestos fibers.
trace: <1%
nd: not detected

Table 3-2: Asbestos in Air - Mill Area

Sample ID	Sample Location	Sample Type	Airborne Fibre Concentration (fibres/cm^3)
ML#1	Dry Mill Building - Interior	Air	0.004
ML#2	Wet Mill Building - Interior	Air	<0.002
ML#3	Secondary Crusher Building - Interior	Air	<0.002
ML#4	Dry Rock Storage Building - Interior	Air	<0.003
ML#5	Secondary Crusher Building - Exterior	Air	0.003
ML#6	Primary Crusher Building - Interior	Air	<0.003

Note: Shaded results are above maximum as outlined under “2006 Occupational Exposure Threshold Limit Value (TLV) of 0.1 fibres/cm^3 (ACGIH)

Table 3-3. Lead in Paint - Mill Area

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/kg)	Total Lead (mg/kg)
S2006-12110	ML-PS1	Wet Mill Building - Interior Wall	Concrete	White Paint	5	12
S2006-12111	ML-PS2	Wet Mill Building - Metal Equipment	Metal	Dark Blue on Light Blue on Red Paint	5	**1080**
S2006-12112	ML-PS3	Wet Mill Building - Mechanical Equipment	Metal	Light Blue Paint	5	13
S2006-12113	ML-PS4	Dry Mill Building - Steel Column	Metal	Orange on Grey Paint	5	**158000**
S2006-12114	ML-PS5	Dry Mill Building - Mechanical Equipment	Metal	Yellow on Grey Paint	5	**42100**
S2006-12115	ML-PS6	Dry Mill Building - Interior Wall	Wood	Light Blue on Cream on White Paint	5	**1370**
S2006-12116	ML-PS7	Dry Mill Building - Exterior Door	Wood	Light Green on Dark Green on Blue on Grey Paint	5	**57900**
S2006-12139	PS-DUP5	Dry Mill Building - Exterior Door	Wood	Light Green on Dark Green on Blue on Grey Paint	5	**54500**
S2006-12117	ML-PS8	Dry Mill Building - Steel Column	Metal	Grey Paint	5	**23000**
S2006-12118	ML-PS9	Secondary Crusher Building - Mechanical Equipment	Metal	Grey on Sliver Paint	5	**1930**
S2006-12119	ML-PS10	Secondary Crusher Building - Interior Door	Wood	Light Blue on Blue Paint	5	**1820**
S2006-12120	ML-PS11	Secondary Crusher Building - Ceiling	Wood	Layers of White on Cream Paint	5	**1520**
S2006-12121	ML-PS12	Secondary Crusher Building - Interior Door	Wood	Blue-Grey on White Paint	5	**5800**
S2006-12122	ML-PS13	Secondary Crusher Building - Exterior Wall	Sheeting	Light Gree on Cream Paint	5	**7240**
S2006-12123	ML-PS14	Dry Rock Storage Building - Mechanical Equipment	Metal	Light Grey on Red Paint	5	**10300**
S2006-12124	ML-PS15	Dry Rock Storage Building - Floor	Concrete	Grey Paint	5	537
S2006-12125	ML-PS16	PrimaryCrusher Building - Interior Door	Wood	Blue on Pink on Brown on Blue on Grey Paint	5	**3750**
S2006-12126	ML-PS17	PrimaryCrusher Building - Mechanical Equipment	Metal	White on Grey Paint	5	**975**
S2006-12127	ML-PS18	Dry Rock Storage Building - Interior Door	Metal	Blue Paint	5	48.4
S2006-12128	ML-PS19	PrimaryCrusher Building - Mechanical Equipment	Metal	Grey Paint	5	**4150**
S2006-12140	PS-DUP6	PrimaryCrusher Building - Mechanical Equipment	Metal	Grey Paint	5	**3630**
S2006-12129	ML-PS20	Dry Mill Building - Mechanical Equipment	Metal	Pink on Grey Paint	5	**2500**
S2006-12130	ML-PS21	Dry Mill Building - Ceiling	Wood	White Paint	5	**2070**
S2006-12131	ML-PS22	Dry Mill Building - Metal Equipment	Metal	Light Blue on Grey Paint	5	**2140**
S2006-12132	ML-PS23	Secondary Crusher Building - Interior Piping	Metal	Grey Metallic Paint	5	160
S2006-12133	ML-PS24	Secondary Crusher Building - Interior Wall	Wood	Light Blue on Green Paint	5	83
S2006-12138	PS-DUP4	Secondary Crusher Building - Interior Wall	Wood	Light Blue on Green Paint	5	**909**
S2006-12134	ML-PS25	Secondary Crusher Building - Floor	Concrete	Light Grey	5	**1670**

Notes:
MDL: Method detection limit
<X: Below MDL
Data in brackets: Laboratory replicate results
Bold and underlined results indicate that lead concentration is above the relevant Federal Hazardous Products Act criterion of 600 mg/kg
Shaded results indicate that lead concentration is above the former Federal Hazardous Products Act criterion of 5000 mg/kg
PS-DUP4 is a blind field duplicate of paint sample ML-PS24
PS-DUP5 is a blind field duplicate of paint sample ML-PS7
PS-DUP6 is a blind field duplicate of paint sample ML-PS19

Table 3-4. Mercury in Paint - Mill Area

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/kg)	Total Mercury (mg/kg)
S2006-12110	ML-PS1	Wet Mill Building - Interior Wall	Concrete	White Paint	0.01	<0.01
S2006-12111	ML-PS2	Wet Mill Building - Metal Equipment	Metal	Dark Blue on Light Blue on Red Paint	0.01	0.18
S2006-12112	ML-PS3	Wet Mill Building - Mechanical Equipment	Metal	Light Blue Paint	0.01	<0.01
S2006-12113	ML-PS4	Dry Mill Building - Steel Column	Metal	Orange on Grey Paint	0.01	0.27
S2006-12114	ML-PS5	Dry Mill Building - Mechanical Equipment	Metal	Yellow on Grey Paint	0.01	0.47
S2006-12115	ML-PS6	Dry Mill Building - Interior Wall	Wood	Light Blue on Cream on White Paint	0.01	2.25
S2006-12116	ML-PS7	Dry Mill Building - Exterior Door	Wood	Light Green on Dark Green on Blue on Grey Paint	0.01	**<u>17.3</u>**
S2006-12139	PS-DUP5	Dry Mill Building - Exterior Door	Wood	Light Green on Dark Green on Blue on Grey Paint	0.01	**<u>17.3</u>**
S2006-12117	ML-PS8	Dry Mill Building - Steel Column	Metal	Grey Paint	0.01	0.87
S2006-12118	ML-PS9	Secondary Crusher Building - Mechanical Equipment	Metal	Grey on Sliver Paint	0.01	1.2
S2006-12119	ML-PS10	Secondary Crusher Building - Interior Door	Wood	Light Blue on Blue Paint	0.01	0.87
S2006-12120	ML-PS11	Secondary Crusher Building - Ceiling	Wood	Layers of White on Cream Paint	0.01	5.02
S2006-12121	ML-PS12	Secondary Crusher Building - Interior Door	Wood	Blue-Grey on White Paint	0.01	2.15
S2006-12122	ML-PS13	Secondary Crusher Building - Exterior Wall	Sheeting	Light Gree on Cream Paint	0.01	0.57
S2006-12123	ML-PS14	Dry Rock Storage Building - Mechanical Equipment	Metal	Light Grey on Red Paint	0.01	0.11
S2006-12124	ML-PS15	Dry Rock Storage Building - Floor	Concrete	Grey Paint	0.01	0.02
S2006-12125	ML-PS16	PrimaryCrusher Building - Interior Door	Wood	Blue on Pink on Brown on Blue on Grey Paint	0.01	0.39
S2006-12126	ML-PS17	PrimaryCrusher Building - Mechanical Equipment	Metal	White on Grey Paint	0.01	**<u>25.2</u>**
S2006-12127	ML-PS18	Dry Rock Storage Building - Interior Door	Metal	Blue Paint	0.01	0.21
S2006-12128	ML-PS19	PrimaryCrusher Building - Mechanical Equipment	Metal	Grey Paint	0.01	0.54
S2006-12140	PS-DUP6	PrimaryCrusher Building - Mechanical Equipment	Metal	Grey Paint	0.01	0.54
S2006-12129	ML-PS20	Dry Mill Building - Mechanical Equipment	Metal	Pink on Grey Paint	0.01	1.75
S2006-12130	ML-PS21	Dry Mill Building - Ceiling	Wood	White Paint	0.01	0.87
S2006-12131	ML-PS22	Dry Mill Building - Metal Equipment	Metal	Light Blue on Grey Paint	0.01	0.68
S2006-12132	ML-PS23	Secondary Crusher Building - Interior Piping	Metal	Grey Metallic Paint	0.01	0.46
S2006-12133	ML-PS24	Secondary Crusher Building - Interior Wall	Wood	Light Blue on Green Paint	0.01	0.69
S2006-12138	PS-DUP4	Secondary Crusher Building - Interior Wall	Wood	Light Blue on Green Paint	0.01	0.69
S2006-12134	ML-PS25	Secondary Crusher Building - Floor	Concrete	Light Grey	0.01	0.19

<u>Notes:</u>
MDL: Method detection limit
<X: Below MDL
Data in brackets: Laboratory replicate results
<u>Bold and and underlined results indicate that mercury concentration is above the Federal Hazardous Products Act criterion of 10 mg/kg</u>
Shaded results indicate that mercury concentration is above the CCME-CEQG for a commercial property (24 mg/kg)
PS-DUP4 is a blind field duplicate of paint sample ML-PS24
PS-DUP5 is a blind field duplicate of paint sample ML-PS7
PS-DUP6 is a blind field duplicate of paint sample ML-PS19

Table 3-5. PCB in Paint - Mill Area

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/kg)	PCB (mg/kg)
S2006-12111	ML-PS2	Wet Mill Building - Metal Equipment	Metal	Dark Blue on Light Blue on Red Paint	0.005	1.45
S2006-12113	ML-PS4	Dry Mill Building - Steel Column	Metal	Orange on Grey Paint	0.005	1.26
S2006-12114	ML-PS5	Dry Mill Building - Mechanical Equipment	Metal	Yellow on Grey Paint	0.005	1.75
S2006-12119	ML-PS10	Secondary Crusher Building - Interior Door	Wood	Light Blue on Blue Paint	0.005	2.53
S2006-12121	ML-PS12	Secondary Crusher Building - Interior Door	Wood	Blue-Grey on White Paint	0.005	17.5
S2006-12122	ML-PS13	Secondary Crusher Building - Exterior Wall	Sheeting	Light Gree on Cream Paint	0.005	17.6
S2006-12130	ML-PS21	Dry Mill Building - Ceiling	Wood	White Paint	0.005	29.5
S2006-12131	ML-PS22	Dry Mill Building - Metal Equipment	Metal	Light Blue on Grey Paint	0.005	2.64
S2006-12136	PS-DUP2	Dry Mill Building - Metal Equipment	Metal	Light Blue on Grey Paint	0.005	3.77

Notes:
MDL: Method detection limit
<X: Below MDL
Shaded results indicate that PCB concentration is above the CCME-CEQG for a commercial property (33 mg/kg)
PS-DUP2 is a blind field duplicate of paint sample ML-PS22

Table 3-6. Lead Leachate in Paint - Mill Area

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/L)	TCLP Lead (mg/L)
S2006-12113	ML-PS4	Dry Mill Building - Steel Column	Metal	Orange on Grey Paint	0.002	4.78
S2006-12114	ML-PS5	Dry Mill Building - Mechanical Equipment	Metal	Yellow on Grey Paint		**8.51**
S2006-12116	ML-PS7	Dry Mill Building - Exterior Door	Wood	Light Green on Dark Green on Blue on Grey Paint	0.002	0.204
S2006-12117	ML-PS8	Dry Mill Building - Steel Column	Metal	Grey Paint	0.002	0.996
S2006-12121	ML-PS12	Secondary Crusher Building - Interior Door	Wood	Blue-Grey on White Paint	0.002	0.258
S2006-12122	ML-PS13	Secondary Crusher Building - Exterior Wall	Sheeting	Light Gree on Cream Paint	0.002	2.800
S2006-12123	ML-PS14	Dry Rock Storage Building - Mechanical Equipment	Metal	Light Grey on Red Paint	0.002	**116.0**

Notes:
MDL: Method detection limit
<X: Below MDL
Shaded results indicate that lead concentration is above the relevant Transportation of Dangerous Good Act (Updated 2002) criterion of 5.0 mg/L

Table 3-7. Mercury Leachate in Paint - Mill Area

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/L)	TCLP Mercury (mg/L)
S2006-12126	ML-PS17	Primary Crusher Building - Mechanical Equipment	Metal	White on Grey Paint	0.0001	0.0008

Notes:
MDL: Method detection limit
<X: Below MDL
Shaded results indicate that lead concentration is above the relevant Transportation of Dangerous Good Act (Updated 2002) criterion of 0.1 mg/L

Table 3-8: BTEX/TPH in Soil - Mill Area

		DATA						GUIDELINES			
AVERAGE SAMPLING DEPTH (m)			0.0 - 1.0	2.0 - 3.1	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	1999 CCME-CEQG	2003 ATLANTIC PIRI		
LAB ID		Lab	S2006-11364	S2006-11365	S2006-11366	S2006-11371	S2006-11367	(Updated 2005)	TIER I RBSL[1]		
FIELD ID		Blank	ML-TP1-SS1	ML-TP2-SS3	ML-TP3-SS1	DUP 3	ML-TP4-SS1	Industrial Sites			
DATE (D/M/Y)			21-Sep-06	21-Sep-06	21-Sep-06	22-Sep-06	21-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	<0.02	<0.02	**<u>1.10</u>**	**<u>0.17</u>**	<0.02	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	<0.06	<0.06	2.32	1.11	1.33	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	<10	<10	131	80	69	<10	**-**	**-**	**-**	**-**
TPH (>C10-C21)	10	<10	<10	1610	30300	2640	56	**-**	**-**	**-**	**-**
TPH (>C21-C32)	50	<50	<50	1740	36100	3320	177	**-**	**-**	**-**	**-**
Modified TPH (C6-C32)	70	<70	<70	<3480	**<66500**	<6030	<243	**-**	**450**	**7400**	**10000**
Hydrocarbon Identification		-	-	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil				

<u>Notes:</u>
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
Data in brackets: Laboratory replicate results
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
<u>Bold and underlined data exceeds the CCME-CEQGs</u>
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable
DUP 3 is a blind field duplicate of soil sample ML-TP3-SS1

Table 3-9: BTEX/TPH in Soil - Mill Area

		DATA						GUIDELINES			
AVERAGE SAMPLING DEPTH (m)		0.0 - 0.7	1.0 - 2.1	1.0 - 2.0	3.0 - 4.0	3.0 - 4.0	2.0 - 3.0	1999 CCME-CEQG (Updated 2005) Industrial Sites	2003 ATLANTIC PIRI TIER I RBSL[1]		
LAB ID		S2006-11368	S2006-11369	S2006-11370	S2006-11581	S2006-11604	S2006-11582				
FIELD ID		ML-TP5-SS1	ML-TP6-SS2	ML-TP7-SS2	ML-TP8-SS4	DUP 4	ML-TP9-SS3				
DATE (D/M/Y)		21-Sep-06	21-Sep-06	21-Sep-06	22-Sep-06	22-Sep-06	22-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	0.07	<0.06	<0.06	<0.06	<0.06	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	<10	<10	<10	<10	<10	<10	**-**	**-**	**-**	**-**
TPH (>C10-C21)	10	<10	<10	846	260	176	<10	**-**	**-**	**-**	**-**
TPH (>C21-C32)	50	<50	<50	116	<50	<50	4400	**-**	**-**	**-**	**-**
Modified TPH (C6-C32)	70	<70	<1640	<972	<320	<236	<4420	**-**	**450**	**7400**	**10000**
Hydrocarbon Identification		-	-	Chromatogram resembles diesel and heavy oil	Chromatogram resembles weathered diesel	Chromatogram resembles weathered diesel	Chromatogram resembles heavy oil				

Notes:
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
Data in brackets: Laboratory replicate results
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable
DUP 4 is a blind field duplicate of soil sample ML-TP8-SS4

Table 3-10: BTEX/TPH in Soil - Mill Area

		DATA					GUIDELINES			
AVERAGE SAMPLING DEPTH (m)		0.0 - 1.0	1.0 - 2.0	0.0 - 1.0	4.0 - 5.0	0.0 - 1.0	1999 CCME-CEQG	2003 ATLANTIC PIRI		
LAB ID		S2006-11583	S2006-11584	S2006-11585	S2006-11586	S2006-11587	(Updated 2005)	TIER I RBSL[1]		
FIELD ID		ML-TP10-SS1	ML-TP11-SS2	ML-TP12-SS1	ML-TP13-SS3	ML-TP14-SS1	Industrial Sites			
DATE (D/M/Y)		22-Sep-06	22-Sep-06	22-Sep-06	22-Sep-06	22-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	<0.02	<0.02	0.03	<0.02	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	<0.06	1.1	<0.06	<0.06	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	<10	110	<10	<10	<10	**-**	**-**	**-**	**-**
TPH (>C10-C21)	10	442	3830	<10	<10	29	**-**	**-**	**-**	**-**
TPH (>C21-C32)	50	5910	530	<50	<50	302	**-**	**-**	**-**	**-**
Modified TPH (C6-C32)	70	<6360	<4470	<70	<70	<341	**-**	**450**	**7400**	**10000**
Hydrocarbon Identification		Chromatogram resembles heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel	-	Chromatogram resembles heavy oil				

Notes:
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable

Table 3-11: BTEX/TPH in Soil - Mill Area

		DATA					GUIDELINES			
AVERAGE SAMPLING DEPTH (m)		0.3 - 1.3	0.0 - 1.0	1.0 - 2.0	2.0 - 3.0	0.0 - 1.0	1999 CCME-CEQG	2003 ATLANTIC PIRI		
LAB ID		S2006-11588	S2006-11591	S2006-11592	S2006-11593	S2006-11608	(Updated 2005)	TIER I RBSL[1]		
FIELD ID		ML-TP15-SS1	ML-TP18-SS1	ML-TP19-SS2	ML-TP20-SS3	ML-TP22-SS1	Industrial Sites			
DATE (D/M/Y)		22-Sep-06	23-Sep-06	23-Sep-06	23-Sep-06	23-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	0.02	0.02	<0.01	<0.01	<0.01	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	<0.06	<0.06	<0.06	<0.06	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	<10	<10	<10	<10	<10	**-**	**-**	**-**	**-**
TPH (>C10-C21)	10	304	5610	14	1040	101	**-**	**-**	**-**	**-**
TPH (>C21-C32)	50	429	13200	91	2870	141	**-**	**-**	**-**	**-**
Modified TPH (C6-C32)	70	<743	**<18800**	<115	<3920	<252	**-**	**450**	**7400**	**10000**
Hydrocarbon Identification		Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles weathered diesel and heavy oil				

Notes:
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
Data in brackets: Laboratory replicate results
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable

Table 3-12: Metals in Soil - Mill Area

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m) LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	1.0 - 2.0 S2006-11370 ML-TP7- SS2 21-Sep-06	3.0 - 4.0 S2006-11581 ML-TP8- SS4 22-Sep-06	3.0 - 4.0 S2006-11604 DUP 4 22-Sep-06	4.0 - 5.0 S2006-11586 ML-TP13- SS3 22-Sep-06	1999 CCME RECOMMENDED SOIL QUALITY GUIDELINES INDUSTRIAL (Revised 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	5	<5	13900	22900	18900	16200	**-**
Antimony	0.5	<0.5	2.0	2.8	3.4	3.0	**40**
Arsenic	0.5	<0.5	**374**	7.8	6.9	4.4	**12**
Barium	0.5	<0.5	36.0	4.2	3.3	19.6	**2000**
Beryllium	0.2	<0.2	<0.2	0.3	0.2	0.2	**8**
Bismuth	0.2	<0.2	0.6	0.3	0.5	0.7	**-**
Cadmium	0.5	<0.5	1.6	<0.5	<0.5	<0.5	**22**
Calcium	25	<25	6370	29300	18500	4000	**-**
Chromium	1	<1	**365**	**514**	**620**	**516**	**87**
Cobalt	1	<1	31	31	37	43	**300**
Copper	1	<1	36	60	46	57	**91**
Iron	5	<5	37800	51800	48500	38000	**-**
Lead	5	<5	5	30	16	5	**600**
Magnesium	10	<10	107000	69700	108000	59600	**-**
Manganese	1	<1	746	1310	1250	959	**-**
Mercury	0.01	<0.01	0.04	0.02	0.03	0.02	**50**
Molybdenum	2	<2	<2	<2	<2	<2	**40**
Nickel	5	<5	**550**	**494**	**679**	**671**	**50**
Phosphorus	5	<5	404	769	452	697	**-**
Potassium	10	<10	981	555	442	756	**-**
Selenium	0.1	<0.1	0.1	0.1	<0.1	<0.1	**3.9**
Silver	0.25	<0.25	<0.25	<0.25	<0.25	<0.25	**40**
Sodium	25	<25	139	135	133	185	**-**
Vanadium	5	<5	45	79	73	38	**130**
Zinc	2	<2	48	87	62	43	**360**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.
[1] = CCME Value for Lead in Soil at an Industrial Site
DUP 4 is a blind field duplicate of soil sample ML-TP8-SS4

Table 3-13: Metals in Soil - Mill Area

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m) LAB ID FIELD ID DATE (D/M/Y)		0.0 - 1.0 S2006-11587 ML-TP14- SS1 22-Sep-06	0.3 - 1.3 S2006-11588 ML-TP15- SS1 22-Sep-06	0.0 - 1.0 S2006-11591 ML-TP18- SS1 23-Sep-06	1.0 - 2.0 S2006-11592 ML-TP19- SS2 23-Sep-06	2.0 - 3.0 S2006-11593 ML-TP20- SS3 23-Sep-06	1999 CCME RECOMMENDED SOIL QUALITY GUIDELINES INDUSTRIAL (Revised 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	5	4110	3100	10100	16600	10600	**-**
Antimony	0.5	2.7	2.6	4.0	2.5	3.4	**40**
Arsenic	0.5	<0.1	0.1	1.0	6.8	1.0	**12**
Barium	0.5	5.1	4.3	31.8	12.4	23.3	**2000**
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	**8**
Bismuth	0.2	1.2	1.2	0.9	0.5	0.8	**-**
Cadmium	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**22**
Calcium	25	3170	4510	4910	5400	6560	**-**
Chromium	1	**585**	**454**	**775**	**421**	**647**	**87**
Cobalt	1	45	48	42	35	41	**300**
Copper	1	11	9	28	40	31	**91**
Iron	5	32700	33300	41800	43400	34200	**-**
Lead	5	<5	<5	8	<5	8	**600**
Magnesium	10	179000	184000	158000	68600	138000	**-**
Manganese	1	728	659	702	779	687	**-**
Mercury	0.01	0.02	0.02	0.03	0.03	0.04	**50**
Molybdenum	2	<2	<2	<2	<2	<2	**40**
Nickel	5	**1400**	**1450**	**1090**	**545**	**1150**	**50**
Phosphorus	5	82	53	187	519	146	**-**
Potassium	10	150	76	410	717	375	**-**
Selenium	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**3.9**
Silver	0.25	<0.25	<0.25	<0.25	<0.25	<0.25	**40**
Sodium	25	115	134	183	177	141	**-**
Vanadium	5	13	11	51	69	40	**130**
Zinc	2	26	23	47	42	44	**360**

<u>Notes:</u>
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.
[1] = CCME Value for Lead in Soil at an Industrial Site

Table 3-14: PAHs in Soil - Mill Area

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m) Lab ID FIELD ID DATE (D/M/Y)		Lab Blank	2.0 - 3.1 S2006-11365 ML-TP2-SS3 21-Sep-06	1.0 - 2.0 S2006-11370 ML-TP7-SS2 21-Sep-06	4.0 - 5.0 S2006-11586 ML-TP13-SS3 22-Sep-06	0.0 - 1.0 S2006-11587 ML-TP14-SS1 22-Sep-06	SOIL QUALITY GUIDELINES INDUSTRIAL (Revised 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Naphthalene	0.002	<0.002	0.355	<0.002	<0.002	<0.002	**22**
Acenaphthylene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Acenaphthene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	**-**
Fluorene	0.001	<0.001	0.144	<0.001	<0.001	<0.001	**-**
Phenanthrene	0.001	<0.001	0.203	0.264	<0.001	<0.001	**50**
Anthracene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Fluoranthene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Pyrene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	**100**
Benzo(a)anthracene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**10**
Chrysene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Benzo(b)fluoranthene	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	**10**
Benzo(k)fluoranthene	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	**10**
Benzo(a)pyrene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	**0.7**
Indeno(123 cd.)pyrene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	**10**
Dibenzo(ah)anthracene	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	**10**
Benzo(ghi)perylene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	**-**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 3-15: PAHs in Soil - Mill Area

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m)		0.0 - 1.0	1.0 - 2.0	2.0 -3.0	0.4 - 1.3	0.4 - 1.3	
Lab ID		S2006-11591	S2006-11592	S2006-11593	S2006-11595	S2006-11606	SOIL QUALITY GUIDELINES
FIELD ID		ML-TP18-SS1	ML-TP19-SS2	ML-TP20-SS3	ML-TP23-SS1	DUP 6	INDUSTRIAL (Revised 2005)
DATE (D/M/Y)		23-Sep-06	23-Sep-06	23-Sep-06	23-Sep-06	23-Sep-06	
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Naphthalene	0.002	<0.02	<0.002	<0.002	<0.002	<0.002	**22**
Acenaphthylene	0.001	<0.01	<0.001	<0.001	<0.001	<0.001	**-**
Acenaphthene	0.002	<0.02	<0.002	<0.002	<0.002	<0.002	**-**
Fluorene	0.001	<0.01	<0.001	<0.001	<0.001	0.058	**-**
Phenanthrene	0.001	<0.01	<0.001	<0.001	<0.001	0.153	**50**
Anthracene	0.001	<0.01	<0.001	<0.001	<0.001	<0.001	**-**
Fluoranthene	0.001	<0.01	<0.001	<0.001	<0.001	<0.001	**-**
Pyrene	0.003	<0.03	<0.003	0.040	<0.003	0.035	**100**
Benzo(a)anthracene	0.001	1.08	<0.001	<0.001	<0.001	<0.001	**10**
Chrysene	0.001	0.292	<0.001	<0.001	<0.001	<0.001	**-**
Benzo(b)fluoranthene	0.004	<0.04	<0.004	<0.004	<0.004	<0.004	**10**
Benzo(k)fluoranthene	0.004	<0.04	<0.004	<0.004	<0.004	<0.004	**10**
Benzo(a)pyrene	0.003	<0.03	<0.003	<0.003	<0.003	<0.003	**0.7**
Indeno(123 cd.)pyrene	0.003	<0.03	<0.003	<0.003	<0.003	<0.003	**10**
Dibenzo(ah)anthracene	0.004	<0.04	<0.004	<0.004	<0.004	<0.004	**10**
Benzo(ghi)perylene	0.002	<0.02	<0.002	<0.002	<0.002	<0.002	**-**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.
DUP 6 is a blind field duplicate of soil sample ML-TP23-SS1

Table 3-16: PCBs in Soil - Mill Area

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m) LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	2.0 - 3.1 S2006-11365 ML-TP2-SS3 21-Sep-06	0.0 - 1.0 S2006-11367 ML-TP4-SS1 21-Sep-06	1.0 - 2.0 S2006-11370 ML-TP7-SS2 21-Sep-06	2.0 - 3.0 S2006-11582 ML-TP9-SS3 22-Sep-06	1999 CCME RECOMMENDED SOIL QUALITY GUIDELINES INDUSTRIAL (Revised 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Polychlorinated Biphenyls	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**33**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 3-17: PCBs in Soil - Mill Area

		DATA				GUIDELINES
AVERAGE SAMPLING DEPTH (m)		0.0 - 1.0	1.0 - 2.0	0.3 - 1.3	0.0 - 0.3	
LAB ID		S2006-11583	S2006-11584	S2006-11588	S2006-11589	1999 CCME RECOMMENDED
FIELD ID		ML-TP10-SS1	ML-TP11-SS2	ML-TP15-SS1	ML-TP16-SS1	SOIL QUALITY GUIDELINES
DATE (D/M/Y)		22-Sep-06	22-Sep-06	22-Sep-06	22-Sep-06	INDUSTRIAL (Revised 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Polychlorinated Biphenyls	0.005	<0.005	<0.005	0.036	<0.005	**33**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 3-18: PCBs in Soil - Mill Area

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m)		0.0 - 0.3	0.0 - 0.3	1.5 - 2.5	0.0 - 1.0	0.4 - 1.3	
LAB ID		S2006-11646	S2006-11605	S2006-11594	S2006-11608	S2006-11595	1999 CCME RECOMMENDED
FIELD ID		ML-TP17-SS1	DUP 5	ML-TP21-SS1	ML-TP22-SS1	ML-TP23-SS1	SOIL QUALITY GUIDELINES
DATE (D/M/Y)		22-Sep-06	22-Sep-06	22-Sep-06	23-Sep-06	22-Sep-06	INDUSTRIAL (Revised 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Polychlorinated Biphenyls	0.005	0.126 (0.172)	1.16	<0.005	0.035	0.028	**33**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Value in (brackets) represents Lab Replicate
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.
DUP 5 is a blind field duplicate of soil sample ML-TP17-SS1

SECTION 4.0

WAREHOUSE AND DOCK AREA

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4.0 AREA C – WAREHOUSE AND DOCK AREA

4.1 SITE DESCRIPTION

The Warehouse and Dock Area is located along the shoreline of Duck Island Cove, approximately 2.3 km east of the Mill Area (refer to Figure 4.1, Appendix A-4).

The dock itself is currently in a state of disrepair and no longer in use (refer to Figure 4.1, Appendix A-4 and Photo 1, Appendix B-4). Historically, the dock provided two berths for marine vessels, one 70 m in length and the other at 150 m in length. The dock itself is constructed of sheet metal piling (20 m deep) and is rock filled. The top of the apron is located approximately 4 m above the low-water level and is topped with concrete, which served as the loading platform.

The warehouse is located approximately 10 m from the edge of the dock (refer to Figure 4.1, Appendix A-4 and Photo 2, Appendix B-4). The structure measures 96 m x 98 m and has a height clearance of approximately 7 m. It had a storage capacity of 26,000 tonnes of asbestos product. The warehouse was used to store finished asbestos product before delivery to market. The building is currently vacant with some asbestos product still remaining inside.

Another small building and two large propane ASTs were observed at the northwest corner of the dock (refer to Figure 4.1, Appendix A-4 and Photos 3 and 4, Appendix B-4). Reportedly, this building was formerly used as a lunchroom facility and the propane tanks were used to heat Bunker C fuel, previously stored in a large AST at the Site (refer Figure 4.1, Appendix A-4 and Photo 5, Appendix B-4). The AST has been removed from the Site.

A review of photographs and documentation at the NLDOEC revealed an area located approximately 100 m west of the dock and warehouse at which Site equipment (i.e. haul trucks, loaders, tractors, etc.) were parked, herein referred to as the former equipment parking area (refer to Figure 4.1, Appendix A-4 and Photo 6, Appendix B-4).

4.2 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

4.2.1 Phase I ESA, March 2005

A review of the Phase I ESA completed at the Site revealed the following potential environmental concerns at this area of the Site:

- Potential presence of asbestos containing materials (ACMs) within the Site buildings in the form of building materials (i.e. asbestos sheeting, insulation, floor tiles, etc.);
- Several bags of finished asbestos product were observed being stored inside the warehouse;
- A large stockpile of grey sandy type material, approximately 200 m^3 in size, was observed on the southeast side of the warehouse. Reportedly, this material may consist of tailings previously dredged from the mouth of Lower Duck Island Brook;
- A small stockpile of what appeared to be a mixture of copper concentrate, asbestos, mud and salt was observed inside the warehouse facility;

- Potential for airborne asbestos fibres due to the presence of friable ACMs at the Site;
- Based on the reported date of construction of the Site buildings (i.e. 1960s) lead, mercury and PCB containing paints may be present at the Site;
- A review of aerial photographs taken of the Site from 1950 to 1999 revealed the former presence of a large AST at Site, approximately 40 m west of the warehouse. Reportedly, Bunker C was delivered to the Site by marine vessels and pumped to the AST through an aboveground pipeline where it was stored until transported to a smaller AST located adjacent to the power centre of the secondary crusher building;
- Discussions with former employees of the mine revealed that occurrences of diesel fuel spills were frequent at the Site. Diesel fuel was spilled from fuel tanks of damaged equipment and during the refuelling the haul trucks, loaders, tractors, drills, etc.; and
- Potential for PCB impacted soil in the vicinity of an existing pole-mounted transformer located approximately 50 m south of the warehouse.

Based on the findings of the Phase I ESA, a Phase II ESA Intrusive Investigation consisting of a series of test pits and the subsequent collection of paint, asbestos, air and soil samples was recommended to assess the presence/absence of environmental impacts at the Site.

4.3 INITIAL SITE INSPECTION – AMEC JUNE 2006

The DNRMD requested that AMEC conduct an initial site inspection to verify surface conditions at the Site that could not be examined during the previous Phase I ESA completed for the Site in March 2005 due to snow cover and to confirm the findings presented in the Phase I ESA report prior to proceeding with the Phase II ESA at the Site. Information gathered during the initial site inspection was used to develop a Phase II ESA sampling program for the Site.

The initial site inspection was carried out at the Site by Gary Warren, M.A.Sc., Rod Winsor, P.Eng., Kelly Curtis, CET of AMEC on June 23, 2006. Additional environmental concerns and observations recorded by AMEC at the time of the initial site inspection include the following:

- The actual location of the former Bunker C AST was observed at the Site (refer to Figure 4.1, Appendix A-4). This area was identified as a circular area containing a reddish-brown fill material that was distinctively different than the surrounding grey fill materials present throughout the remainder of the Site (refer to Photo 7, Appendix B-4) ;
- The location of the former pipeline that extended from the dock to the former Bunker C AST was identified at the Site (refer to Figure 4.1, Appendix A-4). Remnants of the pipeline support racks and sections of the actual pipeline were observed at the Site (refer to Photos 8 to 10, Appendix B-4);
- A significant amount of tailings were observed along the banks of Lower Duck Island Cove Brook and the shoreline of Duck Island Cove (refer to Photo 11, Appendix B-4);
- An abandoned water well was observed approximately 40 m west of the warehouse (refer to Figure 4.1, Appendix A-4 and Photo 12, Appendix B-4); and
- Remnants of metal piping (red in colour), possible former fuel distribution lines, were observed within the former lunchroom building present at the Site (refer to Figure 4.1, Appendix A-4 and Photo 3, Appendix B-4).

As previously mentioned in Section 4.1, a review of photographs and documentation at the NLDOEC identified the location of a former equipment parking area approximately 100 m west of the dock and warehouse (refer to Figure 4-1, Appendix A-4 and Photo 6, Appendix B-4). In the photographs reviewed, mining equipment, such as haul trucks, loaders, and tractors, were parked in a circular fashion, indicating a potential equipment refuelling area. Potential environmental concerns and observations recorded by AMEC at this location of the Site at the time of the initial site inspection include the following:

- A discarded fuel tank, possibly a 10,000 gallon UST, and other metal debris was observed scattered throughout the area (refer to Photo 13, Appendix B-4);
- An area of stained soil, possible Bunker C, was identified at the Site (refer to Photo 14, Appendix B-4); and
- A petroleum hydrocarbon sheen was visible on the surface of a small pool of standing water present adjacent to the stain area identified at the Site (refer to Photo 15, Appendix B-4).

A review of documentation at the NLDOEC also revealed an historical Bunker C spill along the access road to the dock (refer to Appendix C-4). Reportedly, on December 21, 1974, a tanker truck delivering approximately 5,000 gallons of Bunker C fuel from the large Bunker C AST at the dock site to the small Bunker C AST (i.e. day tank) at the power centre went off the road near the entrance to the former equipment parking area, spilling approximately 500 gallons of Bunker C (refer to Figure 4.1, Appendix A-4). A cleanup was undertaken, but due to considerable accumulations of snow at the Site, further cleanup operations were reported to have been next to impossible.

4.4 PHASE II ENVIRONMENTAL SITE ASSESSMENT

The Phase II ESA was carried out in accordance with the DNRMD RFP dated May 2006, AMEC's proposal dated May 26, 2006 and AMEC's Proposed Phase II ESA Sampling Program dated August 21, 2006. Field work was carried out at the Site by Kelly Curtis, CET and Sheldon Adey, CET of AMEC during the period of September 19 to 28, 2006. Sample locations for the investigation were selected in consultation with the DNRMD Project Manager and based on the findings of the previous Phase I ESA and the initial site inspection carried out at the Site. The methodologies used to conduct the field investigations carried out at the Site during the current investigation are described in Section 1.5.

4.4.1 Scope of Work

Based on the findings outlined in the Phase I ESA report and information and observations recorded during the initial site inspection, the scope of work for this area of the Site included the following Phase II ESA activities:

- Collecting a total of three building material (insulation, siding and floor tile) samples (WH-ASB1 to WH-ASB3) from the Site buildings for asbestos analyses;
- Collecting a one air sample (WH#1) at the south corner of the warehouse for asbestos analyses;
- Collecting seven paint chip samples (WH-PS1 to WH-PS7) from painted surfaces present at the Site for a combination of lead, lead leachate, mercury, PCB and PCB leachate analyses;

- Excavating two test pits (WH-TP1 and WH-TP2) in the vicinity of the former lunchroom building and collecting soil samples for BTEX/TPH, metals plus hydrides and PAH analyses;
- Excavating two test pits (WH-TP3 and WH-TP4) along the former location of the Bunker C pipeline that extended from the dock to the former Bunker C AST and collecting soil samples for BTEX/TPH, metals plus hydrides and PAH analyses;
- Excavating three test pits (WH-TP5 to WH-TP7) at the location of the former Bunker C AST and collecting soil samples for BTEX/TPH, metals plus hydrides and PAH analyses;
- Excavating one test pit (WH-TP8) underneath the existing pole-mounted transformer and collecting on surface soil sample for PCB analysis;
- Excavating three test pits (WH-TP9 to WH-TP11) at the former equipment storage area and collecting soil samples for BTEX/TPH, metals plus hydrides and PAH analyses;
- Excavating three test pits (WH-TP12 to WH-TP14) at the reported location of a former Bunker C spill along the access road to the dock and collecting soil samples for BTEX/TPH, metals plus hydrides and PAH analyses;
- Recording GPS coordinates for all sample locations; and
- Preparing a comprehensive report outlining the methodologies, findings, conclusions and recommendations of the investigation.

All sample locations are presented on Figures 4-2 and 4-3, Appendix A-4.

4.4.2 Field Observations

Detailed field observations pertaining to soil stratigraphy, soil vapour headspace, groundwater conditions and contaminant observations are discussed in this section.

4.4.2.1 Stratigraphy

The soil stratigraphy generally consisted primarily of variable thickness grey, brown and reddish brown sand and gravel with some boulders, cobbles and trace organics and fines. Thickness of the soil identified at the Site ranged from approximately 2.5 m (WH-TP7) to at least 4.0 m below the ground surface (bgs) (WH-TP1 and WH-TP2). Detailed soil descriptions and sampling depths are provided in the test pit logs presented in Appendix D-4.

4.4.2.2 Soil Vapour Concentrations

All soil samples collected at the Site were tested using a hand-held PID for SVH. SVH readings report the concentrations of ionizable vapours being released from the soils. SVH readings ranged from 0.0 parts per million (ppm) to 33.4 ppm (refer to Appendix E-4). The SVH readings were used to assist with the selection of soil samples for laboratory analyses.

4.4.2.3 Groundwater Conditions

Groundwater was encountered in 11 (WH-TP2, WH-TP3, WH-TP5 to WH-TP7 and WH-TP9 to WH-TP14) of the 14 test pits excavated at the Site at depths of ranging from 0.7 m (WH-TP9 to WH-TP11) to 3.7 m (WH-TP2) bgs (refer to test pit logs presented in Appendix D-4). Based on the topography of the Site, groundwater flow direction has been inferred to be in a south-easterly direction, towards Lower Duck Island Brook.

4.4.2.4 Contaminant Observations

Friable Asbestos
Exposed friable asbestos products were observed at various locations throughout the Site, including, but not limited to, partially opened bags of finished product inside the warehouse and stockpiles of tailings present along the banks of Lower Duck Island Cove Brook (refer to Photos 11 and 16, Appendix B-4).

Petroleum Hydrocarbon Odours
Petroleum hydrocarbon odours were observed during the excavation of test pits WH-TP6, WH-TP11 and WH-TP12 (refer to Figure 4.3, Appendix A-3). Please note that since full face respirators were worn by field staff during excavation, olfactory evidence of petroleum hydrocarbons may have been present in other test pits excavated at the Site, however these may not have been detected by field staff.

Free Phase Petroleum Hydrocarbon Product
A layer of what appeared to be solidified Bunker C product, with an approximate thickness of 0.10 m, was observed during the excavation of test pit WH-TP6 at a depth of approximately 0.3 to 0.4 m bgs (refer to Photo 17, Appendix B-4). Test pit WH-TP6 was excavated in the vicinity of a former Bunker C AST (refer to Figure 4.3, Appendix A-4).

A petroleum hydrocarbon sheen was observed on the water table within test pits WH-TP11 and WH-TP12 (refer to Photos 18 and 19, Appendix B-4). Test pit WH-TP11 was excavated within the area of stained soil observed at the former equipment parking area and test pit WH-TP12 was excavated at the reported location of a former Bunker C spill along the gravel access road, near the entrance to the former equipment parking area (refer to Figure 4.3, Appendix A-4).

4.4.3 GPS Coordinates

AMEC recorded coordinates for all sampling locations using a handheld global positioning system (GPS) unit with an accuracy of +/- 5 m. All GPS coordinates were recorded in UTM NAD27 and are presented in Appendix F-4.

4.4.4 Laboratory Analytical Program

The detailed laboratory analytical program for the Phase II ESA completed at the Warehouse and Dock area of the Site is outlined in Table 4-1 below.

Table 4-1: Detailed Laboratory Analytical Program

Media	Sample ID	Analyses
Paint	WH-PS1, WH-PS2, WH-PS3, WH-PS4, WH-PS5, WHL-PS6, WH-PS7	Lead and Mercury
	WH-PS1, WH-PS2, WH-PS3, WH-PS4, WHL-PS6, WH-PS7	Lead Leachate (TCLP)
	WH-PS1, WH-PS7	PCB and PCB Leachate (TCLP)
Asbestos	WH-ASB1, WH-ASB2, WH-ASB3	Asbestos
Air	WH#1	
Soil	WH-TP1-SS2, WH-TP2-SS1, WH-TP3-SS1, WH-TP4-SS1, WH-TP5-SS3, WH-TP6-SS1, WH-TP7-SS3, WH-TP9-SS1, WH-TP10-SS1, WH-TP11-SS1, WH-TP12-SS2, WH-TP13-SS1, WH-TP14-SS2, DUP 2	BTEX/TPH, Metals Plus Hydrides and PAHs
	DUP 1	BTEX/TPH
	WH-TP8-SS1	PCBs

Notes:
DUP 1 is a blind field duplicate of soil sample WH-TP6-SS1 for BTEX/TPH analysis
DUP 2 is a blind field duplicate of soil sample WH-TP9-SS1 for BTEX/TPH, metals plus hydrides and PAH analyses

4.5 LABORATORY ANALYTICAL RESULTS

This section provides a summary of laboratory analytical results for paint, asbestos, air and soil samples collected at the Site during the current investigation. Tables summarizing the analytical results and applicable guidelines are presented in Appendix G-4. Sample locations are presented on Figures 4.2 and 4.3, Appendix A-4 and the Laboratory Certificates of Analyses are presented in Section 11.0.

4.5.1 Asbestos Sample Results

There are over 3,000 asbestos containing materials (ACMs), which can be divided into two broad categories: friable and non-friable.

- **Friable ACMs** are defined as materials that can be crumbled, pulverized and reduced to powder when dry using hand pressure. Typical friable materials include acoustical or decorative spray applications, fireproofing and thermal insulation; and
- **Non-friable ACMs** are hard or manufactured products such as floor tiles, fire blankets, pre-formed manufactured cementitious insulation and wallboards, pipes, and siding, wherein the asbestos fibres are bound to the substrate.

A total of three building material samples (WH-ASB1 to WH-ASB3) collected from the warehouse and former lunchroom present at the Site were analyzed for asbestos (refer to Figure 4.2, Appendix A-4). The laboratory results for asbestos are presented in Table 4-1, Appendix G-4. The results were compared to the “The Asbestos Abatement Regulations”, 1998 (Nfld. Reg. 111/98) criterion of 1% asbestos fibres.

Analytical results revealed that concentration of asbestos (20% chrysotile) detected in sample WH-ASB1 exceeded the applicable assessment criterion of 1%. Sample WH-ASB1 consisted of consisted of exterior siding collected from the warehouse. Asbestos fibres in exterior siding are considered to be “non-friable”, unless disturbed.

4.5.2 Air Sample Results

4.5.2.1 Asbestos in Air

One air sample (WH#1) collected at the Site and analyzed for asbestos (refer to Figure 4.2, Appendix A-4). Weather conditions at the time of sampling were overcast with light winds. The analytical result is presented in Table 4-2, Appendix G-4. The result was compared to the 2006 Occupational Exposure Threshold Limit Value (TLV) of 0.1 fibres/cm^3 as indicated by the American Conference of Governmental Industrial Hygienists (ACGIH)[1].

The concentration of asbestos fibres detected in air sample WH#1 (0.004 fibres/cm^3) did not exceed the applicable assessment criterion of 0.1 fibres/cm^3.

4.5.3 Paint Sample Results

4.5.3.1 Lead in Paint

A total of seven paint samples (WH-PS1 to WH-PS7) collected from the painted surfaces present at the Site were submitted to the laboratory for lead analyses. The laboratory results for lead in paint are presented in Table 4-3, Appendix G-4. The results were compared to the Federal HPA criterion of 600 mg/kg and former Federal HPA criterion of 5,000 mg/kg.

Results of the paint sampling program revealed that the concentrations of lead detected in all paint samples exceeded the Federal HPA criterion of 600 mg/kg and are therefore considered to be a health hazard during any renovation/demolition activities at the Site. Concentrations of lead detected in paint ranged from 815 mg/kg (WH-PS5) to 81,300 mg/kg (WH-PS3).

Concentrations of lead detected in the paint samples WH-PS1 (14,700 mg/kg), WH-PS2 (13,900 mg/kg), WH-PS3 (81,300 mg/kg), WH-PS4 (10,200 mg/kg), WH-PS6 (7,640 mg/kg) and WH-PS7 (5,920 mg/kg) also exceeded the former Federal HPA criterion of 5,000 mg/kg.

4.5.3.2 Mercury in Paint

A total of seven paint samples (WH-PS1 to WH-PS7) collected from the painted surfaces present at the Site were submitted to the laboratory for mercury analyses. The laboratory results for mercury in paint are presented in Table 4-4, Appendix G-4. The results are compared to the Federal HPA criterion of 10.0 mg/kg and the CCME-CEQG of 24 mg/kg for mercury in soil at a commercial site.

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[1] Documentation of the Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices, ACGIH Worldwide Signature Publications, Cincinnati, OH, 2006.

Results of the paint sampling program revealed that the concentrations of mercury detected in paint samples WH-PS1 (20.7 mg/kg) and WH-PS4 (13.0 mg/kg) exceeded the Federal HPA criterion of 10.0 mg/kg and are therefore considered to be a health hazard during any renovation/demolition activities at the Site.

Since levels of mercury detected in the paint samples did not exceed the CCME-CEQG for mercury in soil at a commercial site (24.0 mg/kg), leachability testing for mercury was not carried out on the paint samples.

4.5.3.3 PCBs in Paint

A total of two paint sample (WH-PS1 and WH-PS7) collected from the painted surfaces present at the Site were submitted to the laboratory for PCB analyses. The laboratory results for PCB in paint are presented in Table 4-5, Appendix G-4. The results were compared to the CCME-CEQG of 33 mg/kg for PCB in soil at a commercial site.

Results of the paint sampling program revealed that concentrations of PCBs detected in paint samples WH-PS1 (420 mg/kg) and WH-PS7 (4,260 mg/kg) exceeded the applicable CCME-CEQG of 33 mg/kg.

4.5.3.4 Lead Leachate in Paint

Since concentrations of lead in paint samples WH-PS1 to EWH-PS4 and WH-PS6 to WH-PS7 exceeded the applicable former Federal HPA criterion of 5,000 mg/kg, these paint samples were also analyzed using the Toxicity Characteristic Leaching Procedure (TCLP) for lead leachate to determine whether or not these paints would be considered hazardous waste upon removal from the Site. The laboratory results for lead leachate in paint are presented in Table 4-6, Appendix G-4. The results were compared to the provincial guideline for leachable toxic waste[2] and the federal regulation for the TDG criterion of 5.0 mg/L.

Results revealed that the concentrations of lead leachate all paint samples analyzed did not exceed the applicable assessment criterion of 5.0 mg/L. Therefore, this paint, if removed from the Site, may be disposed of at an approved landfill facility.

4.5.3.5 PCB Leachate in Paint

Since concentrations of PCB detected in paint sample WH-PS1 and WH-PS7 exceeded the applicable CCME-CEQG of 33 mg/kg for PCB in soil at a commercial site, these paint sample were also analyzed using the TCLP for PCB leachate to determine if these paints would be considered hazardous waste upon removal from the Site. The laboratory results for PCB leachate in paint are presented in Table 4-7, Appendix G-4. The result was compared to the federal regulation for the TDG criterion of 0.3 mg/L.

Results revealed that the concentration of PCB leachate in paint sample EM-PS7 (0.318 mg/L) exceeded the applicable assessment criterion of 0.3 mg/L. Since the concentration of PCB leachate in

[2] Newfoundland and Labrador Department of Environment and Conservation, November 2003. Guidance Document: Leachable Toxic Waste, Testing and Disposal (GD-PPD-26.1).

this paint is at a level considered hazardous, in the absence of further rationalization (i.e. dilute with metal substrate), this paint, if removed form the Site, must be disposed of as hazardous waste.

4.5.4 Soil Sample Results

4.5.4.1 Petroleum Hydrocarbons in Soil

A total of 13 soil samples (WH-TP1-SS2, WH-TP2-SS1, WH-TP3-SS1, WH-TP4-SS1, WH-TP5-SS3, WH-TP6-SS1, WH-TP7-SS3, WH-TP9-SS1, WH-TP10-SS1, WH-TP11-SS1, WH-TP12-SS2, WH-TP13-SS1 and WH-TP14-SS2), plus two blind field duplicate sample (DUP 1 and DUP 2), collected at the Site were analyzed for BTEX/TPH. The analytical results are presented in Tables 4-8 to 4-10, Appendix G-4. The results were compared to the CCME-CEQG for industrial sites and the 2003 Atlantic PIRI Tier I RBSLs for commercial sites with coarse-grained soil and non-potable groundwater.

Concentrations of BTEX and TPH were either non-detect or detected at levels below the applicable assessment criteria in all soil samples analyzed.

4.5.4.2 Metals in Soil

A total of 13 soil samples (WH-TP1-SS2, WH-TP2-SS1, WH-TP3-SS1, WH-TP4-SS1, WH-TP5-SS3, WH-TP6-SS1, WH-TP7-SS3, WH-TP9-SS1, WH-TP10-SS1, WH-TP11-SS1, WH-TP12-SS2, WH-TP13-SS1 and WH-TP14-SS2), plus one blind field duplicate sample (DUP 2), collected at the Site were analyzed for metals plus hydrides. The analytical results are presented in Tables 4-11 to 4-13, Appendix G-4. The results were compared to the CCME-CEQG for industrial sites.

The concentration of arsenic detected in soil sample WH-TP4-SS1 (17.5 mg/kg) exceeded the applicable CCME-CEQG of 12 mg/kg.

Concentrations of chromium detected in all soil samples analyzed exceeded the applicable CCME-CEQG of 87 mg/kg. Concentrations of chromium detected in soil ranged from 135 mg/kg (WH-TP3-SS1) to 594 mg/kg (WH-TP11-SS1).

The concentration of copper detected in soil sample WH-TP2-SS1 (484 mg/kg) exceeded the applicable CCME-CEQG of 91 mg/kg.

Concentrations of nickel detected in all soil samples analyzed exceeded the applicable CCME-CEQG of 50 mg/kg. Concentrations of nickel detected in soil ranged from 106 mg/kg (WH-TP1-SS2) to 832 mg/kg (WH-TP11-SS1).

4.5.4.3 PAHs in Soil

A total of 13 soil samples (WH-TP1-SS2, WH-TP2-SS1, WH-TP3-SS1, WH-TP4-SS1, WH-TP5-SS3, WH-TP6-SS1, WH-TP7-SS3, WH-TP9-SS1, WH-TP10-SS1, WH-TP11-SS1, WH-TP12-SS2, WH-TP13-SS1 and WH-TP14-SS2), plus one blind field duplicate sample (DUP 2), collected at the Site were analyzed for PAHs. The analytical results are presented in Tables 4-14 to 4-16, Appendix G-4. The results were compared to the CCME-CEQGs for industrial sites.

Concentrations of PAHs in all soil samples analyzed were either non-detect or detected at levels below the applicable assessment criteria.

4.5.4.4 PCBs in Soil

One surface soil sample (WH-TP8-SS1) collected from underneath the pole-mounted transformer present at the Site was analyzed for PCBs. The analytical result is presented in Table 4-17, Appendix G-4. The result was compared to the CCME-CEQG of 33.0 mg/kg for PCBs in soil at industrial sites.

PCBs were not detected in soil sample WH-TP8-SS1 and therefore are below the applicable assessment criterion of 33.0 mg/kg.

4.6 DISCUSSION OF CONTAMINANTS OF CONCERN

Based on the findings of this Phase II ESA the following discussions of contaminants of concern (COC) investigated are provided.

4.6.1 Asbestos

Asbestos was detected in the in the exterior siding of the warehouse. Asbestos fibres in siding are considered to be “non-friable”, unless disturbed.

Exposed friable asbestos products were observed at various locations throughout the Site, including, but not limited to, damaged bags of finished product inside the warehouse, a potential stockpile of dredged sediment/tailings at the rear (southeast side) of the warehouse and tailings present along the banks of Lower Duck Island Cove Brook.

The concentration of asbestos fibres (0.004 fibres/cm^3) detected in the air sample collected at the Site during the current investigation did not exceed the applicable assessment criterion of 0.1 fibres/cm^3. However, please note that these findings are based on one sampling event and that the concentrations of asbestos fibres in air may vary (i.e. increase or decrease) over time, especially during dry times and periods of activity at the Site.

4.6.2 Paint

Lead

Results of the paint sampling program revealed that concentrations of lead detected in all seven paint samples analyzed exceeded the Federal HPA criterion of 600 mg/kg and are therefore considered to be a health hazard during any renovation/demolition activities at the Site. Concentrations of lead detected seven of the six of the seven paints samples analyzed also exceeded the former Federal HPA criterion of 5,000 mg/kg.

Concentrations of lead leachate detected in all six paint sample analyzed did not exceed the applicable assessment criterion of 5.0 mg/L.

Mercury

Results of the paint sampling program revealed that concentrations of mercury detected in two of the seven paint samples analyzed exceeded the Federal HPA criterion of 10.0 mg/kg and are therefore considered to be a health hazard during any renovation/demolition activities at the Site. Concentrations of mercury detected all seven paints samples analyzed did not exceed CCME-CEQG of 24.0 mg/kg for mercury in soil at a commercial site.

PCBs

Results of the paint sampling program revealed that concentrations of PCBs detected in both paint samples analyzed exceeded the CCME-CEQG of 33.0 mg/kg for PCBs in soil at a commercial site. The concentration of PCB leachate (0.318 mg/L) detected in grey paint collected from the interior walls of the former lunchroom present at the Site also exceeded the applicable assessment criterion of 0.3 mg/L.

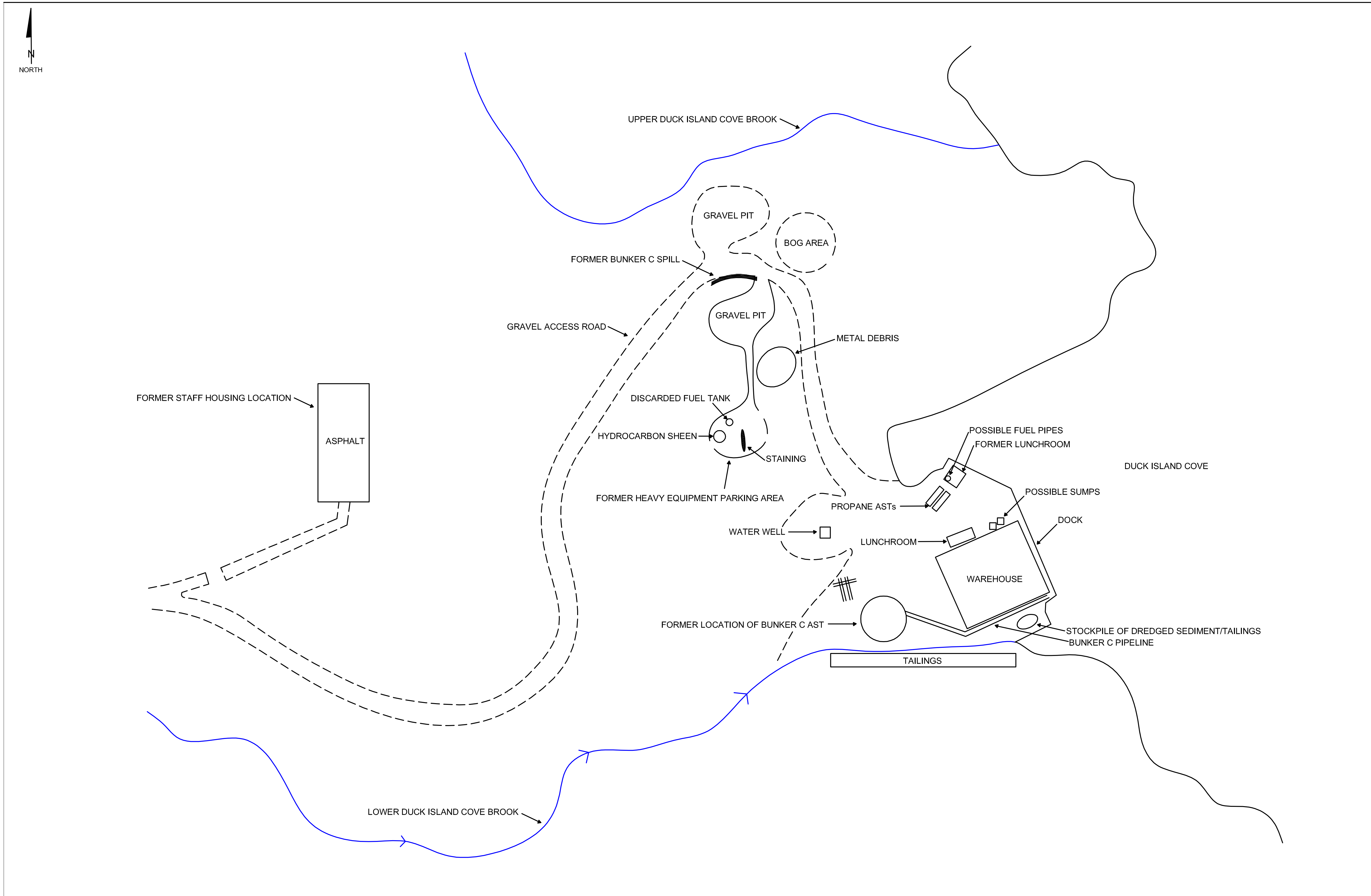
Based on the testing completed, all painted surfaces present at the Site, with the exception of the grey paint present on the interior walls of the former lunchroom, may be disposed of at an approved landfill facility. In the absence of further rationalization (i.e. dilute with metal substrate), the grey paint present on the interior walls of the lunchroom, if removed from the Site, must be treated as hazardous waste.

4.6.3 Metals

Concentrations of a combination of metals (arsenic, copper, chromium and nickel) detected in all 13 soil samples collected at the Site exceeded the applicable assessment criteria for metals in soil at industrial sites. Based on the testing completed, metal impacts in soil are considered to be widespread throughout the Site.

APPENDIX A-4

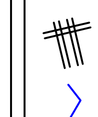
FIGURES



NOTES

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM FIGURE.
3. THIS FIGURE IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
5. THIS FIGURE SHOULD NOT BE USED FOR PURPOSES OTHER THAN THOSE OUTLINED ABOVE.
6. THIS FIGURE CONTAINS INTELLECTUAL PROPERTY OF THE DEPARTMENT OF NATURAL RESOURCES AND MAY NOT BE REPRODUCED OR COPIED WITHOUT THEIR WRITTEN CONSENT.
7. THIS FIGURE WAS PRODUCED FROM DOCUMENTS SUPPLIED BY THE CLIENT AND VISUAL OBSERVATIONS.

LEGEND

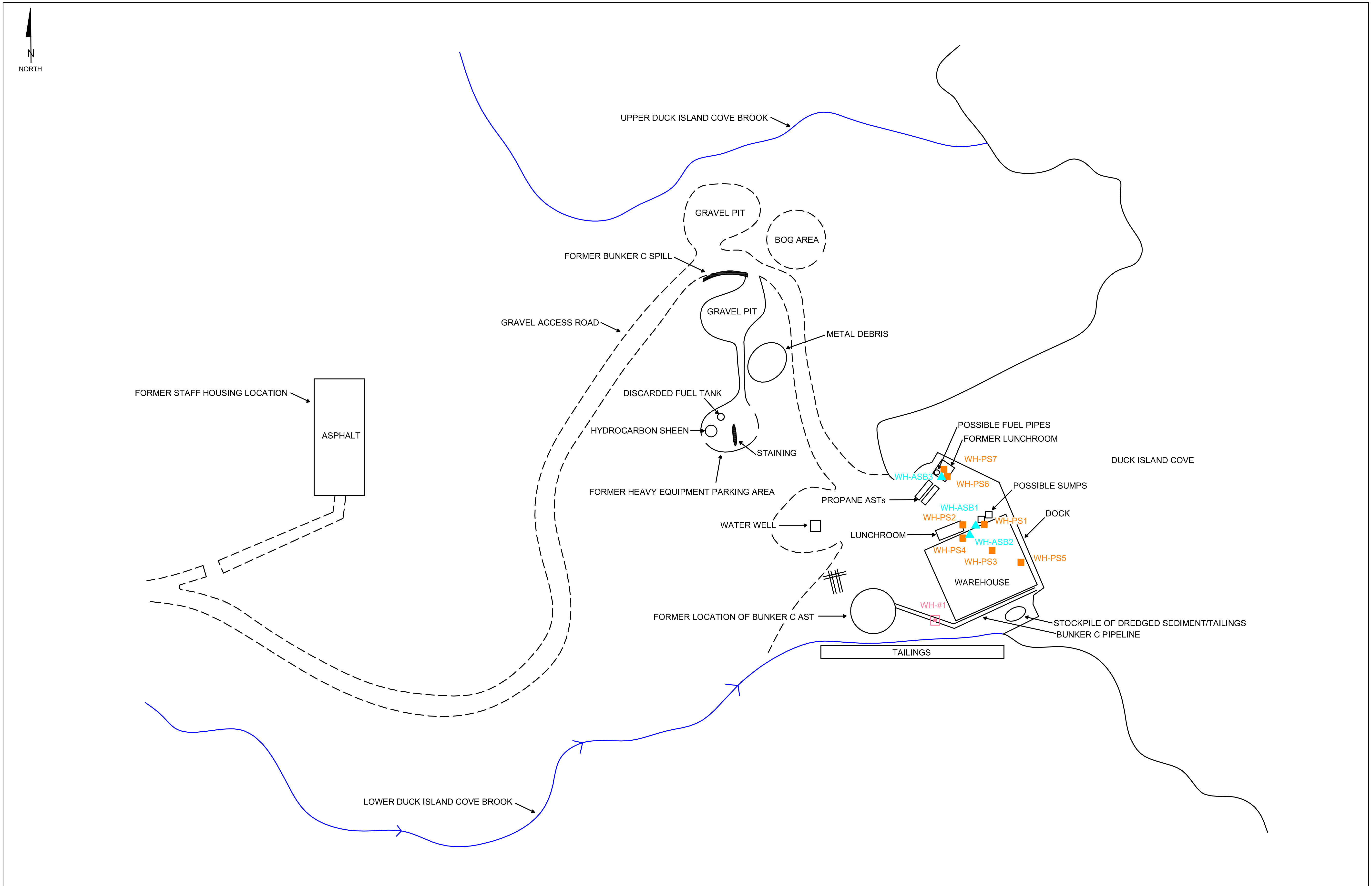


CLIENT
DEPARTMENT OF NATURAL RESOURCES

PROJECT
PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER BAIE VERTE ASBESTOS MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE
DOCK / WAREHOUSE AREA

SCALE	PROJECT NUMBER	
NTS	TF6126509	
DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	
DRAWING NO.	DATE	REV
4.1	January 2007	



NOTES

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LEGEND

- GRAVEL ACCESS ROADS
- TRANSFORMER LOCATION
- FLOW DIRECTION
- ASBESTOS SAMPLE
- PAINT SAMPLE
- AIR SAMPLES

CLIENT

DEPARTMENT OF NATURAL RESOURCES

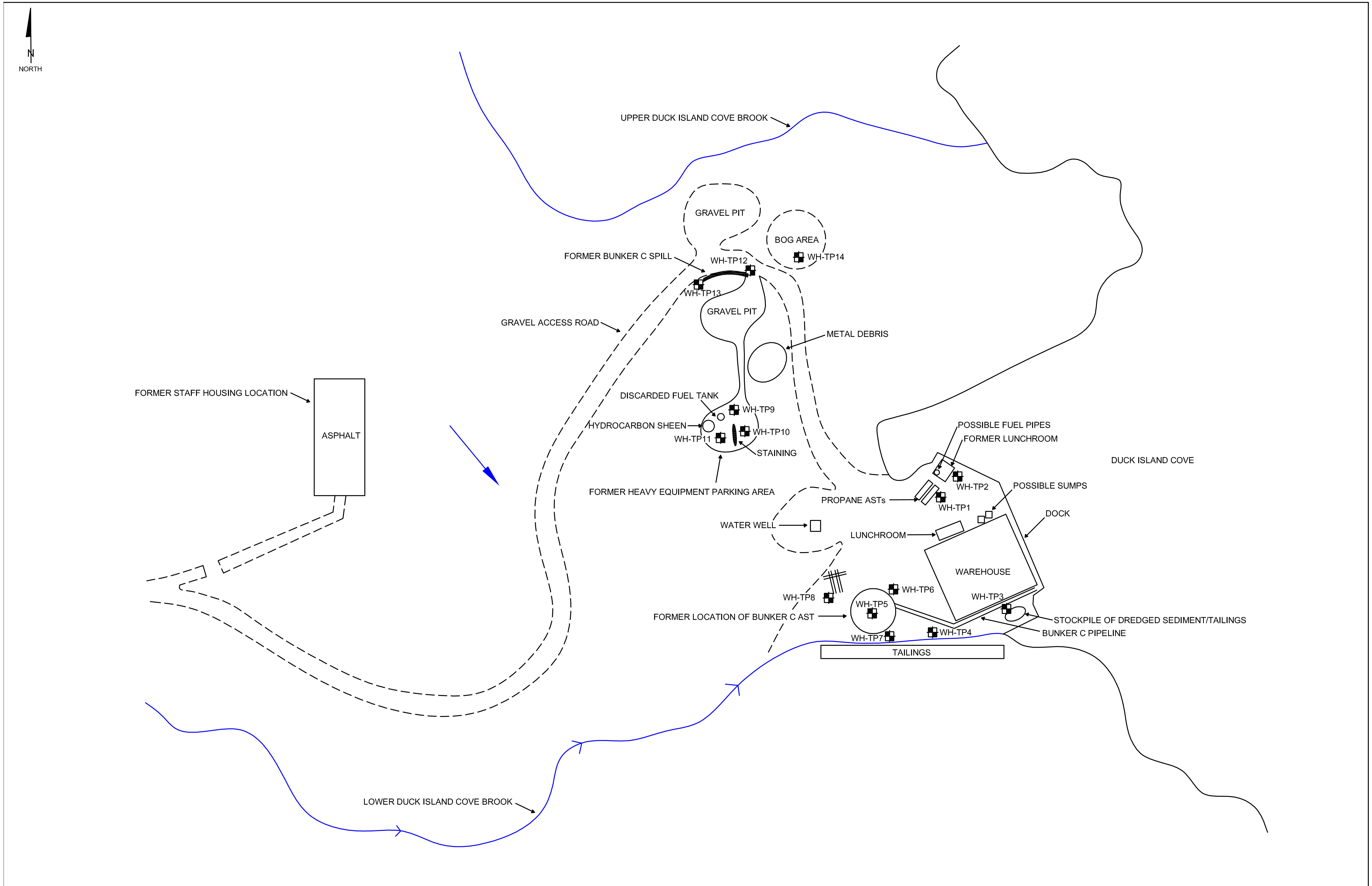
PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER BAIE VERTE ASBESTOS MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

DOCK / WAREHOUSE AREA
AIR, ASBESTOS AND PAINT SAMPLE LOCATIONS

SCALE	PROJECT NUMBER	
NTS	TF6126509	
DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	
DRAWING NO.	DATE	REV
4.2	January 2007	



NOTES

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LEGEND

- GRAVEL ACCESS ROADS
- TRANSFORMER LOCATION
- TEST PIT LOCATION
- FLOW DIRECTION
- ASSUMED GROUNDWATER FLOW DIRECTION

CLIENT

DEPARTMENT OF NATURAL RESOURCES

PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER BAIE VERTE ASBESTOS MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

DOCK / WAREHOUSE AREA
TEST PIT LOCATIONS

SCALE	PROJECT NUMBER	
NTS	TF6126509	
DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	
DRAWING NO.	DATE	REV
4.3	January 2007	

APPENDIX B-4

PHOTOGRAPHIC RECORD

Photo 1: Dock – Poor Condition.

Photo 2: Warehouse.

Photo 3: Former Lunchroom.
(Note the Potential Fuel Distribution Lines)

Photo 4. Two Propane ASTs located West of Warehouse.
(Note the Former Lunchroom in Background)

Photo 5: Former Bunker C AST.
(1983 Aerial Photograph)

Photo 6: Former Equipment Parking Area.
(Photo Obtained from NLDOEC)


Photo 7: Location of Former Bunker C AST.
(Note the Reddish-Brown Fill)


Photo 8: Former Bunker C Pipeline Support Racks.

Photo 9: Former Bunker C Pipeline.
(Southeast Side of Warehouse)

Photo 10: Metals Hangers Along Southeast Side of Warehouse.
(Previous Location of Bunker C Pipeline)

Photo 11: Tailings present along the Banks of Lower Duck Island Cove Brook.

Photo 12: Water Well.

Photo 13: Discarded Fuel Tank – Possible UST.
(Former Equipment Parking Area)

Photo 14: Stain Area – Possible Bunker C.
(Former Equipment Parking Area)

Photo 15: Petroleum Hydrocarbon Sheen.
(Former Equipment Parking Area)

Photo 16: Finished Asbestos Product.
(Note that some Bags are Partially Opened)

Photo 17: Test Pit WH-TP6 - Layer of Bunker C.
(0.3 m to 0.4 m bgs)

Photo 18: Test Pit WH-TP11 - Petroleum Hydrocarbon Sheen.

Photo 19: Test Pit WH-TP12 - Petroleum Hydrocarbon Sheen.

APPENDIX C-4

DOCUMENTATION – 1974 BUNKER C SPILL

Advocate Mines Limited

TELEX 016-316 BAIE VERTE, NEWFOUNDLAND PHONE 532-4251-2-3
A0K 1B0

RECEIVED
FEB - 7 1975

DG
CJ
BP

File:
Baie Verte
Advocate Mines

February 5, 1975.

Mr. D. G. Jeans,
Director of Environment,
Dept. Provincial Affairs & Environment,
Elizabeth Towers,
ST. JOHN'S, Newfoundland.

Dear Sir:

Please find attached a report on a Bunker "C" spill which you requested in a telephone conversation with Advocate representative, Ronald Moore.

It is hoped that this report supplies all the information that you require. Should you require any additional information, we will attempt to comply as quickly as possible.

Yours very truly,

J. G. Cole,
Mine Manager.

cc: W. Lyall
R. Moore
File

Enclosure

BUNKER "C" SPILL

At approximately 9:30 a.m. on December 21, 197~~5~~4, a tank truck having a capacity of 5,000 gallons was proceeding from the Bunker "C" storage tank to the Bunker "C" day tank.

The driver reported that as he was approaching the uphill curve, he lost consciousness and came to a short time later in the cab in the south ditch. The vehicle was on its side and a rock in the ditch had opened a twelve inch gash in the tanker just below the filling spout. The driver then returned to the warehouse and called for assistance. Subsequently, a truck crane and two bulldozers were dispatched to the accident site. A dam was bulldozed between the accident site and the culvert in order to localize the spill.

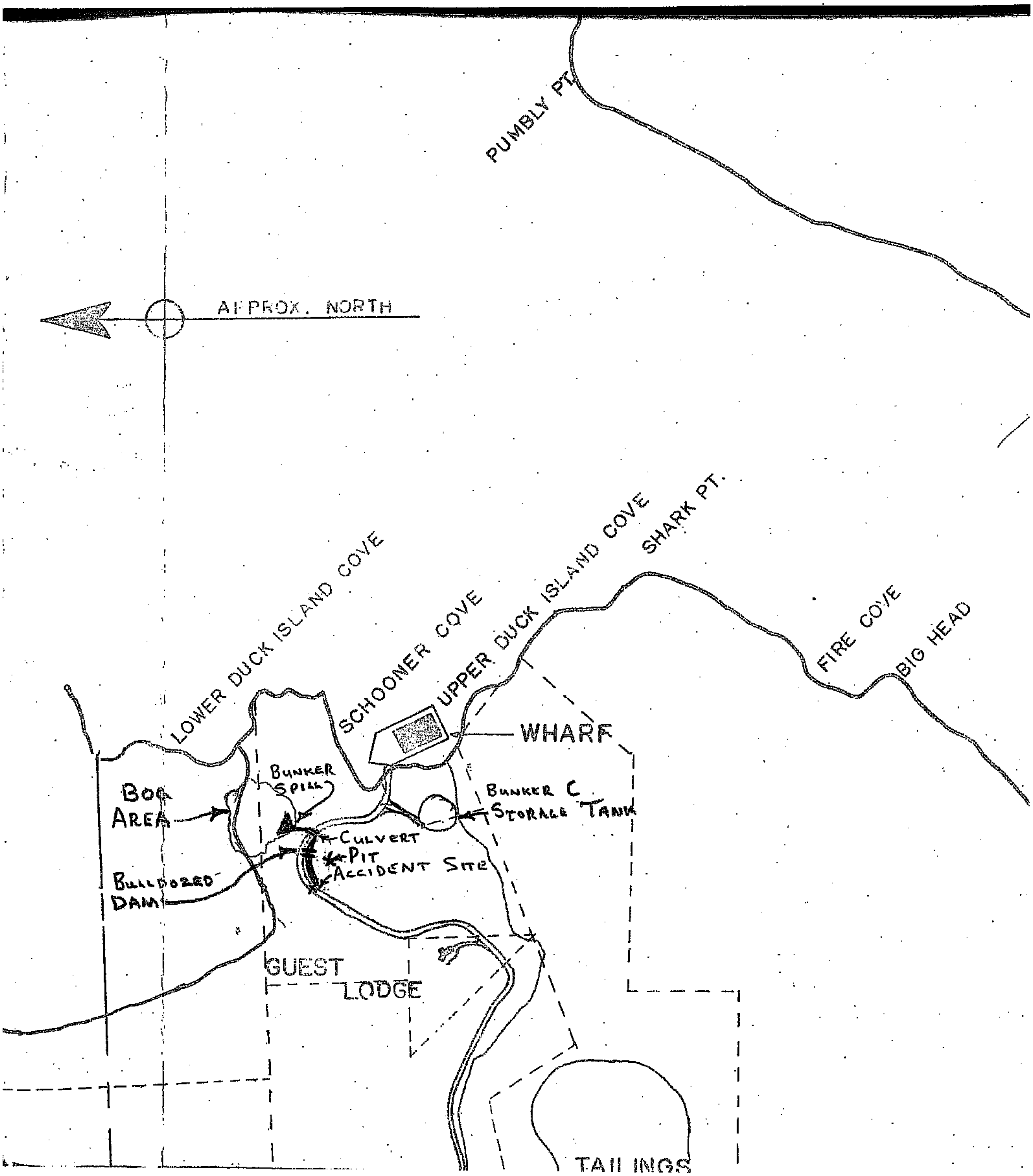
It is estimated that the total volume of Bunker "C" spilled was two thousand gallons. Of this, only about 500 gallons got through the culvert.

Since the accident, the driver has not been permitted to operate any vehicle or machinery. He was sent to St. John's to see a specialist. No report has been received from the specialist to this date.

The following clean up actions have been completed. A pit has been dug in a nearby gravel pit. The Bunker "C" in the south ditch and a ten foot section of the north ditch have been removed to the pit by means of a backhoe and a five ton truck. The major accumulations on the north side of the road have been burnt.

Excessively cold weather and considerable accumulations of snow since the accident have made further clean up operations next to impossible. Therefore, it has been decided to wait until spring for the final clean up. A final report will be issued thereafter.

J. G. Cole,
Mine Manager.


PUMBLY PT.
APPROX. NORTH
LOWER DUCK ISLAND COVE
SCHOONER COVE
UPPER DUCK ISLAND COVE
SHARK PT.
FIRE COVE
BIG HEAD
WHARF
BUNKER SPILL
BOG AREA
BUNKER C STORAGE TANK
CULVERT
PIT
ACCIDENT SITE
BULLDOZED DAM
GUEST LODGE
TAILINGS

APPENDIX D-4

TEST PIT LOGS

Department of Natural Resources
Phase II Environmental Site Assessment
Baie Verte Asbestos Mine – Warehouse and Dock Area

Test Pit Identification Number	Depth From – To (m)	Soil Description
WH-TP1	0.0 - 0.8	FILL - Grey, SAND and GRAVEL with some fines, cobbles, moist, loose.
	0.8 - 1.1	FILL - Reddish brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact.
	1.1 - 4.0	FILL - Grey, GRAVEL and SAND with some fines, cobbles and boulders, moist, compact.
	4.0	Test pit terminated on Bedrock.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
WH-TP2	0.0 - 4.0	FILL - Grey / brown, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, loose to compact.
	4.0	Test pit terminated on Bedrock.
		Note: 1) Groundwater encountered at 3.7 m depth. 2) No hydrocarbon odour present during excavation.
WH-TP3	0.0 - 0.3	ROOTMAT / TOPSOIL
	0.3 - 1.5	FILL - BOULDERS and COBBLES with some sand and gravel, moist, loose.
	1.5 - 3.5	FILL - Brown, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, compact.
	3.5	Test pit terminated on Bedrock.
		Note: 1) Groundwater encountered at 3.0 m depth. 2) No hydrocarbon odour present during excavation.
WH-TP4	0.0 - 0.5	FILL - Reddish brown, SAND and GRAVEL with some fines, cobbles, moist, loose.
	0.5 - 3.0	FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact.
	3.0	Test pit terminated in Fill.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.

Test Pit Identification Number	Depth From – To (m)	Soil Description
WH-TP5	0.0 - 1.4	FILL - Brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact.
	1.4 - 1.7	FILL - Black, ORGANICS with some sand and gravel, moist, loose.
	1.7 - 2.6	FILL - Brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	2.6 - 3.5	FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, compact.
	3.5	Test pit terminated on Bedrock.
		Note: 1) Groundwater encountered at 2.7 m depth. 2) No hydrocarbon odour present during excavation.
WH-TP6	0.0 - 2.5	FILL - Brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact.
	2.5 - 3.0	FILL - Grey, coarse grained SAND and GRAVEL, cobbles and boulders, moist to saturated, compact.
	3.0	Test pit terminated on Bedrock.
		Note: 1) Groundwater encountered at 2.4 m depth. 2) Slight hydrocarbon odour present during excavation. 3) Layer of Bunker C, approximately 10 cm thick, was observed in test pit at 0.3 m depth.
WH-TP7	0.0 - 0.2	ROOTMAT / TOPSOIL
	0.2 - 1.8	FILL - Light brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose.
	1.8 - 2.5	FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, loose to compact.
	2.5	Test pit terminated on Bedrock.
		Note: 1) Groundwater encountered at 2.0 m depth. 2) No hydrocarbon odour present during excavation.

Test Pit Identification Number	Depth From – To (m)	Soil Description
WH-TP8	0.0 - 0.3 0.3	FILL - Grey, SAND an GRAVEL with some fines, cobbles, moist, loose. Test pit terminated in Fill. Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation. 3) Test pit hand dug underneath pole-mounted transformer.
WH-TP9	0.0 - 0.5 0.5 - 1.0 1.0	FILL - Brown, SAND and GRAVEL with some fines, cobbles, moist, loose. FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, loose. Test pit terminated in Fill. Note: 1) Groundwater encountered at 0.7 m depth. 2) No hydrocarbon odour present during excavation.
WH-TP10	0.0 - 0.5 0.5 - 1.0 1.0	FILL - Brown, SAND and GRAVEL with some fines, cobbles, moist, loose. FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, loose. Test pit terminated in Fill. Note: 1) Groundwater encountered at 0.7 m depth. 2) No hydrocarbon odour present during excavation.
WH-TP11	0.0 - 0.5 0.5 - 1.0 1.0	FILL - Brown, SAND and GRAVEL with some fines, cobbles, moist, loose. FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, loose. Test pit terminated in Fill. Note: 1) Groundwater encountered at 0.7 m depth. 2) Slight hydrocarbon odour present during excavation. 3) Sheen observed on water surface.

Test Pit Identification Number	Depth From – To (m)	Soil Description
WH-TP12	0.0 - 1.2	FILL - Brown, SAND and GRAVEL with some fines, cobbles, moist, loose.
	1.2 - 2.5	FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, loose.
	2.5	Test pit terminated in Fill.
		Note: 1) Groundwater encountered at 1.2 m depth. 2) Slight hydrocarbon odour present during excavation. 3) Sheen observed on water surface.
WH-TP13	0.0 - 1.3	FILL - Brown, SAND and GRAVEL with some fines, cobbles, organics, moist, loose.
	1.3 - 2.0	FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist to saturated, loose.
	2.0	Test pit terminated in Fill.
		Note: 1) Groundwater encountered at 1.0 m depth. 2) No hydrocarbon odour present during excavation.
WH-TP14	0.0 - 1.0	FILL - Brown, SAND and GRAVEL with some fines, cobbles, moist, loose.
	1.0 - 1.6	FILL - Beige, SAND and GRAVEL with some fines, cobbles and boulders, saturated, loose.
	1.6 - 1.8	PEAT - Black, ORGANICS with some sand and gravel, saturated, loose.
	1.8	Test pit terminated in Peat.
		Note: 1) Groundwater encountered at 1.0 m depth. 2) No hydrocarbon odour present during excavation.

APPENDIX E-4

SOIL VAPOUR HEADSPACE READINGS

SVH READINGS OF SOIL SAMPLES – WAREHOUSE AND DOCK AREA

SAMPLING LOCATION	SOIL SAMPLE ID	SAMPLING DEPTH (m)	PID SVH (PPM)
WH-TP1	WH-TP1-SS1	0.0 – 1.0	13.0
	WH-TP1-SS2	1.0 – 2.0	17.8
	WH-TP1-SS3	2.0 – 3.0	13.9
	WH-TP1-SS4	3.0 – 4.0	4.3
WH-TP2	WH-TP2-SS1	0.0 – 1.0	6.4
	WH-TP2-SS2	1.0 – 2.0	2.2
	WH-TP2-SS3	2.0 – 3.0	1.6
	WH-TP2-SS4	3.0 – 4.0	3.0
WH-TP3	WH-TP3-SS1	0.0 – 1.0	11.4
	WH-TP3-SS2	1.0 – 2.0	2.8
	WH-TP3-SS3	2.0 – 3.0	9.0
	WH-TP3-SS4	3.0 – 4.0	4.6
WH-TP4	WH-TP4-SS1	0.0 – 1.0	9.5
	WH-TP4-SS2	1.0 – 2.0	1.1
WH-TP5	WH-TP5-SS1	0.0 – 1.0	0.4
	WH-TP5-SS2	1.0 – 2.0	0.8
	WH-TP5-SS3	2.0 – 3.0	2.5
	WH-TP5-SS4	3.0 – 4.0	0.2
WH-TP6	WH-TP6-SS1	0.0 – 1.0	1.1
	WH-TP6-SS2	1.0 – 2.0	1.0
	WH-TP6-SS3	2.0 – 3.0	0.2
WH-TP7	WH-TP7-SS1	0.0 – 1.0	0.5
	WH-TP7-SS2	1.0 – 2.0	1.0
	WH-TP7-SS3	2.0 – 2.5	1.9
WH-TP8	WH-TP8-SS1	0.0 – 0.3	2.1
WH-TP9	WH-TP9-SS1	0.0 – 1.0	8.4
WH-TP10	WH-TP10-SS1	0.0 – 0.9	4.9
WH-TP11	WH-TP11-SS1	0.0 – 0.9	6.2
WH-TP12	WH-TP12-SS1	0.0 – 1.0	10.7
	WH-TP12-SS2	1.0 – 2.0	33.4
	WH-TP12-SS3	2.0 – 2.5	3.5
WH-TP13	WH-TP13-SS1	0.0 – 1.0	0.0
	WH-TP13-SS2	1.0 – 2.0	0.0
WH-TP14	WH-TP14-SS1	0.0 – 1.0	3.7
	WH-TP14-SS2	1.0 – 1.8	1.6

Notes:
Shaded cells mean sample submitted for analyses.

APPENDIX F-4

GPS COORDINATES

GPS COORDINATES - NAD27 - WAREHOUSE AND DOCK AREA

Location	Northing	Easting
WH-TP1	560618	5537514
WH-TP2	560630	5537525
WH-TP3	560676	5537356
WH-TP4	560645	5537351
WH-TP5	560547	5537356
WH-TP6	560557	5537371
WH-TP7	560566	5537353
WH-TP8	560532	5537385
WH-TP9	560367	5537469
WH-TP10	560377	5537460
WH-TP11	560378	5537454
WH-TP12	560385	5537692
WH-TP13	560343	5537675
WH-TP14	560370	5537743

APPENDIX G-4

LABORATORY ANALYSES TABLES

Table 4-1: Summary of Building Materials Samples and Asbestos Analyses - Warehouse and Dock Area

Sample ID	Sample Location	Sample Type	Asbestos Fibre % Chrysotile	Asbestos Fibre % Amosite	Asbestos Fibre % other asbestos fibres
WH-ASB1	Warehouse Building - Exterior Wall	Exterior Siding	20	nd	nd
WH-ASB2	Warehouse Building - Interior Wall	Insulation	nd	nd	nd
WH-ASB3	Former Lunchroom - Floor	Floor Tile	nd	nd	nd

Note: Shaded results are above maximum as outlined under "The Asbestos Abatement Regulations, 1998 (Nfld. Reg. 111/98) of 1 % asbestos fibers.
trace: <1%
nd: not detected

Table 4-2: Asbestos in Air - Warehouse and Dock Area

Sample ID	Sample Location	Sample Type	Airborne Concentration (fibres/cm^3)
WH#1	Warehouse Building - Outside	Air	0.004

Note: Shaded results are above maximum as outlined under “2006 Occupational Exposure Threshold Limit Value (TLV) of 0.1 fibres/cm^3 (ACGIH)

nd: not detected

Table 4-3. Lead in Paint - Warehouse and Dock Area

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/kg)	Total Lead (mg/kg)
S2006-12085	WH-PS1	Warehouse - Exterior Wall	Wood	Grey on Blue on Green Paint	5	**14700**
S2006-12086	WH-PS2	Lunchroom - Exterior Wall	Wood	Yellow Paint	5	**13900**
S2006-12087	WH-PS3	Warehouse - Steel Columns	Metal	Yellow-Orange Paint	5	**81300**
S2006-12088	WH-PS4	Warehouse - Interior Wall	Wood	Green on Blue Paint	5	**10200**
S2006-12089	WH-PS5	Warehouse - Steel Columns	Metal	Grey Paint	5	**815 (889)**
S2006-12090	WH-PS6	Former Lunchroom - Interior Wall	Wood	Blue on Dark Grey Paint	5	**7640**
S2006-12091	WH-PS7	Former Lunchroom - Interior Wall	Wood	Grey on Green on Yellow Paint	5	**5920**

Notes:
MDL: Method detection limit
<X: Below MDL
Data in brackets: Laboratory replicate results
Bold and underlined results indicate that lead concentration is above the relevant Federal Hazardous Products Act criterion of 600 mg/kg
Shaded results indicate that lead concentration is above the former Federal Hazardous Products Act criterion of 5000 mg/kg

Table 4-4. Mercury in Paint - Warehouse and Dock Area

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/kg)	Total Mercury (mg/kg)
S2006-12085	WH-PS1	Warehouse - Exterior Wall	Wood	Grey on Blue on Green Paint	0.01	**<u>20.7 (20.9)</u>**
S2006-12086	WH-PS2	Lunchroom - Exterior Wall	Wood	Yellow Paint	0.01	0.14
S2006-12087	WH-PS3	Warehouse - Steel Columns	Metal	Yellow-Orange Paint	0.01	2.18
S2006-12088	WH-PS4	Warehouse - Interior Wall	Wood	Green on Blue Paint	0.01	**<u>13.0</u>**
S2006-12089	WH-PS5	Warehouse - Steel Columns	Metal	Grey Paint	0.01	0.62
S2006-12090	WH-PS6	Former Lunchroom - Interior Wall	Wood	Blue on Dark Grey Paint	0.01	5.27
S2006-12091	WH-PS7	Former Lunchroom - Interior Wall	Wood	Grey on Green on Yellow Paint	0.01	7.91

<u>Notes:</u>
MDL: Method detection limit
<X: Below MDL
Data in brackets: Laboratory replicate results
<u>Bold and and underlined results indicate that mercury concentration is above the Federal Hazardous Products Act criterion of 10 mg/kg</u>
Shaded results indicate that mercury concentration is above the CCME-CEQG for a commercial property (24 mg/kg)

Table 4-5. PCB in Paint - Warehouse and Dock Area

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/kg)	PCB (mg/kg)
S2006-12085	WH-PS1	Warehouse - Exterior Wall	Wood	Grey on Blue on Green Paint	0.005	420
S2006-12091	WH-PS7	Former Lunchroom - Interior Wall	Wood	Grey on Green on Yellow Paint	0.005	4260(4390)

Notes:
MDL: Method detection limit
<X: Below MDL
Shaded results indicate that PCB concentration is above the CCME-CEQG for a commercial property (33 mg/kg)

Table 4-6. Lead Leachate in Paint - Warehouse and Dock Area

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/L)	TCLP Lead (mg/L)
S2006-12085	WH-PS1	Warehouse - Exterior Wall	Wood	Grey on Blue on Green Paint	0.002	0.253
S2006-12086	WH-PS2	Lunchroom - Exterior Wall	Wood	Yellow Paint	0.002	0.117
S2006-12087	WH-PS3	Warehouse - Steel Columns	Metal	Yellow-Orange Paint	0.002	1.420
S2006-12088	WH-PS4	Warehouse - Interior Wall	Wood	Green on Blue Paint	0.002	0.204
S2006-12090	WH-PS6	Former Lunchroom - Interior Wall	Wood	Blue on Dark Grey Paint	0.002	0.807
S2006-12091	WH-PS7	Former Lunchroom - Interior Wall	Wood	Grey on Green on Yellow Paint	0.002	1.780

Notes:
MDL: Method detection limit
<X: Below MDL
Shaded results indicate that lead concentration is above the relevant Transportation of Dangerous Good Act (Updated 2002) criterion of 5.0 mg/L

Table 4-7. PCB Leachate in Paint - Warehouse and Dock Area

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/L)	TCLP PCB (mg/L)
S2006-12085	WH-PS1	Warehouse - Exterior Wall	Wood	Grey on Blue on Green Paint	0.005	0.003
S2006-12091	WH-PS7	Former Lunchroom - Interior Wall	Wood	Grey on Green on Yellow Paint	0.005	0.318

Notes:
MDL: Method detection limit
<X: Below MDL
Shaded results indicate that lead concentration is above the relevant Transportation of Dangerous Good Act (Updated 2002) criterion of 0.3 mg/L

Table 4-8: BTEX/TPH in Soil - Warehouse and Dock Area

		DATA						GUIDELINES			
AVERAGE SAMPLING DEPTH (m)			1.0 - 2.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	2.0 - 3.0	1999 CCME-CEQG	2003 ATLANTIC PIRI		
LAB ID		Lab	S2006-11346	S2006-11347	S2006-11348	S2006-11349	S2006-11350	(Updated 2005)	TIER I RBSL[1]		
FIELD ID		Blank	WH-TP1-SS2	WH-TP2-SS1	WH-TP3-SS1	WH-TP4-SS1	WH-TP5-SS3	INDUSTRIAL SITES			
DATE (D/M/Y)			20-Sep-06	20-Sep-06	20-Sep-06	20-Sep-06	20-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	<0.01	0.21	<0.01	<0.01	<0.01	<0.01	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	<0.06	0.30	<0.06	<0.06	<0.06	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	<10	<10	<10	<10	<10	<10	-	-	-	-
TPH (>C10-C21)	10	<10	<10	31	<10	<10	<10	-	-	-	-
TPH (>C21-C32)	50	<50	<50	243	<50	<50	<50	-	-	-	-
Modified TPH (C6-C32)	70	<70	<70	<284	<70	<70	<70	-	**450**	**7400**	**10000**
Hydrocarbon Identification		-	-	Chromatogram resembles heavy oil	-	-	-				

Notes:
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
Data in brackets: Laboratory replicate results
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable

Table 4-9: BTEX/TPH in Soil - Warehouse and Dock Area

		DATA					GUIDELINES			
AVERAGE SAMPLING DEPTH (m)		0.0 - 1.0	0.0 - 1.0	2.0 - 2.5	0.0 - 1.0	0.0 - 1.0	1999 CCME-CEQG (Updated 2005) INDUSTRIAL SITES	2003 ATLANTIC PIRI TIER I RBSL[1]		
LAB ID		S2006-11351	S2006-11353	S2006-11352	S2006-11355	S2006-11361				
FIELD ID		WH-TP6-SS1	DUP 1	WH-TP7-SS3	WH-TP9-SS1	DUP 2				
DATE (D/M/Y)		20-Sep-06	20-Sep-06	20-Sep-06	21-Sep-06	21-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	<0.06	<0.06	<0.06	<0.06	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	<10	<10	<10	<10	<10	**-**	**-**	**-**	**-**
TPH (>C10-C21)	10	<10	<10	<10	<10	<10	**-**	**-**	**-**	**-**
TPH (>C21-C32)	50	<50	<50	<50	<50	<50	**-**	**-**	**-**	**-**
Modified TPH (C6-C32)	70	<70	<70	<70	<70	<70	**-**	**450**	**7400**	**10000**
Hydrocarbon Identification		-	-	-	-	-				

Notes:

MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
Data in brackets: Laboratory replicate results
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable
DUP 1 is a blind field duplicate of soil sample WH-TP6-SS1
DUP 2 is a blind field duplicate of soil sample WH-TP9-SS1

Table 4-10: BTEX/TPH in Soil - Warehouse and Dock Area

		DATA					GUIDELINES			
AVERAGE SAMPLING DEPTH (m)		0.0 - 0.9	0.0 - 0.9	1.0 - 2.0	0.0 - 1.0	1.0 - 1.8	1999 CCME-CEQG (Updated 2005) INDUSTRIAL SITES	2003 ATLANTIC PIRI TIER I RBSL[1]		
LAB ID		S2006-11356	S2006-11357	S2006-11358	S2006-11359	S2006-11360				
FIELD ID		WH-TP10-SS1	WH-TP11-SS1	WH-P12-SS2	WH-TP13-SS1	WH-TP14-SS2				
DATE (D/M/Y)			21-Sep-06	21-Sep-06	21-Sep-06	21-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	<0.06	<0.06	<0.06	<0.04	<0.04	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	<10	<10	<10	<10	<10	**-**	**-**	**-**	**-**
TPH (>C10-C21)	10	<10	69	32	77	<10	**-**	**-**	**-**	**-**
TPH (>C21-C32)	50	<50	<50	89	490	<50	**-**	**-**	**-**	**-**
Modified TPH (C6-C32)	70	<70	<129	<131	<577	<70	**-**	**450**	**7400**	**10000**
Hydrocarbon Identification		-	-	Chromatogram resembles heavy oil	Chromatogram resembles heavy oil	-				

Notes:
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
Data in brackets: Laboratory replicate results
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable

Table 4-11: Metals in Soil - Warehouse and Dock Area

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m) LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	1.0 - 2.0 S2006-11346 WH-TP1-SS2 20-Sep-06	0.0 - 1.0 S2006-11347 WH-TP2-SS1 20-Sep-06	0.0 - 1.0 S2006-11348 WH-TP3-SS1 20-Sep-06	0.0 - 1.0 S2006-11349 WH-TP4-SS1 20-Sep-06	1999 CCME RECOMMENDED SOIL QUALITY GUIDELINES INDUSTRIAL (Revised 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	5	<5	16400	10200	11000	16500	**-**
Antimony	0.5	<0.5	1.4	2.2	1.4	1.5	**40**
Arsenic	0.5	<0.1	7.3	5.7	7.9	**17.5**	**12**
Barium	0.5	<0.5	3.1	6.4	7.1	5.3	**2000**
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	**8**
Bismuth	0.2	<0.2	0.2	0.4	0.2	0.3	**-**
Cadmium	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**22**
Calcium	25	<25	27400	20800	10300	11900	**-**
Chromium	1	<1	**143**	**384**	**135**	**179**	**87**
Cobalt	1	<1	21	31	20	25	**300**
Copper	1	<1	47	**484**	43	46	**91**
Iron	5	<5	32900	26100	27400	39400	**-**
Lead	5	<5	<5	20	<5	5	**600**
Magnesium	10	<10	35800	95800	24100	33500	**-**
Manganese	1	<1	620	544	526	697	**-**
Mercury	0.01	<0.01	0.01	0.06	0.02	0.03	**50**
Molybdenum	2	<2	<2	<2	<2	<2	**40**
Nickel	5	<5	**106**	**710**	**129**	**135**	**50**
Phosphorus	5	<5	599	190	348	663	**-**
Potassium	10	<10	356	476	304	339	**-**
Selenium	0.1	<0.1	0.1	0.3	0.1	0.2	**3.9**
Silver	0.25	<0.25	0.85	0.53	0.42	0.37	**40**
Sodium	25	<25	141	162	149	145	**-**
Vanadium	5	<5	51	31	41	61	**130**
Zinc	2	<2	39	70	33	55	**360**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 4-12: Metals in Soil - Warehouse and Dock Area

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m) LAB ID FIELD ID DATE (D/M/Y)		2.0 - 3.0 S2006-11350 WH-TP5-SS3 20-Sep-06	0.0 - 1.0 S2006-11351 WH-TP6-SS1 20-Sep-06	2.0 - 2.5 S2006-11352 WH-TP7-SS3 20-Sep-06	0.0 - 1.0 S2006-11355 WH-TP9-SS1 21-Sep-06	0.0 - 1.0 S2006-11361 DUP 2 21-Sep-06	1999 CCME RECOMMENDED SOIL QUALITY GUIDELINES INDUSTRIAL (Revised 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	5	16500	10100	15100	10000	11600	-
Antimony	0.5	2.3	1.9	2.3	2.1	2.4	**40**
Arsenic	0.5	2.2	2.4	1.4	2.1	0.8	**12**
Barium	0.5	7.8	4.6	4.8	6.3	5.6	**2000**
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	**8**
Bismuth	0.2	0.2	0.3	0.3	0.2	0.3	-
Cadmium	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**22**
Calcium	25	4390	2390	2780	1700	1840	-
Chromium	1	**394**	**318**	**432**	**382**	**417**	**87**
Cobalt	1	17	20	26	22	23	**300**
Copper	1	12	16	29	30	39	**91**
Iron	5	36600	23500	28800	25300	24900	-
Lead	5	<5	<5	<5	<5	<5	**600**
Magnesium	10	56000	42100	66300	58700	55300	-
Manganese	1	551	410	449	340	409	-
Mercury	0.01	0.03	0.02	0.04	0.03	0.04	**50**
Molybdenum	2	<2	<2	<2	<2	<2	**40**
Nickel	5	**137**	**147**	**315**	**417**	**357**	**50**
Phosphorus	5	528	295	386	349	407	-
Potassium	10	314	280	321	313	385	-
Selenium	0.1	0.1	<0.1	0.1	0.1	0.1	**3.9**
Silver	0.25	0.25	<0.25	<0.25	<0.25	<0.25	**40**
Sodium	25	182	147	158	121	117	-
Vanadium	5	67	35	48	32	35	**130**
Zinc	2	43	21	34	45	33	**360**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.
DUP 2 is a blind field duplicate of soil sample WH-TP9-SS1

Table 4-13: Metals in Soil - Warehouse and Dock Area

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m)		0.0 - 0.9	0.0 - 0.9	1.0 - 2.0	0.0 - 1.0	1.0 - 1.8	1999 CCME RECOMMENDED SOIL QUALITY GUIDELINES INDUSTRIAL (Revised 2005)
LAB ID		S2006-11356	S2006-11357	S2006-11358	S2006-11359	S2006-11360	
FIELD ID		WH-TP10-SS1	WH-TP11-SS1	WH-TP12-SS2	WH-TP13-SS1	WH-TP14-SS2	
DATE (D/M/Y)		21-Sep-06	21-Sep-06	21-Sep-06	21-Sep-06	21-Sep-06	
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	5	7980	11700	9500	11500	12600	**-**
Antimony	0.5	1.9	3.1	2.2	2.2	2.0	**40**
Arsenic	0.5	4.0	7.5	3.4	2.5	2.6	**12**
Barium	0.5	4.5	6.7	11.1	10.2	15.4	**2000**
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	**8**
Bismuth	0.2	0.3	0.5	0.3	0.3	0.2	**-**
Cadmium	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**22**
Calcium	25	1430	1740	1710	4370	2320	**-**
Chromium	1	**328**	**594**	**379**	**360**	**298**	**87**
Cobalt	1	22	39	23	26	23	**300**
Copper	1	24	28	30	34	34	**91**
Iron	5	21800	30000	26300	32600	29000	**-**
Lead	5	<5	<5	<5	8	<5	**600**
Magnesium	10	61300	70700	64300	67800	36500	**-**
Manganese	1	297	469	445	516	391	**-**
Mercury	0.01	0.03	0.04	0.03	0.03	0.04	**50**
Molybdenum	2	<2	<2	<2	<2	<2	**40**
Nickel	5	**391**	**832**	**463**	**456**	**192**	**50**
Phosphorus	5	206	345	440	419	490	**-**
Potassium	10	233	377	543	585	926	**-**
Selenium	0.1	<0.1	0.1	<0.1	0.1	<0.1	**3.9**
Silver	0.25	<0.25	<0.25	<0.25	<0.25	<0.25	**40**
Sodium	25	143	149	151	199	154	**-**
Vanadium	5	24	38	30	43	36	**130**
Zinc	2	24	34	31	35	36	**360**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.
DUP 10 is a blind field duplicate of soil sample EM-TP13-SS1

Table 4-14: PAHs in Soil - Warehouse and Dock Area

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m) Lab ID FIELD ID DATE (D/M/Y)		Lab Blank	1.0 - 2.0 S2006-11346 WH-TP1-SS2 20-Sep-06	0.0 - 1.0 S2006-11347 WH-TP2-SS1 20-Sep-06	0.0 - 1.0 S2006-11348 WH-TP3-SS1 20-Sep-06	0.0 - 1.0 S2006-11349 WH-TP4-SS1 20-Sep-06	SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Naphthalene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	**22**
Acenaphthylene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Acenaphthene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	**-**
Fluorene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Phenanthrene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**50**
Anthracene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Fluoranthene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Pyrene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	**100**
Benzo(a)anthracene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**10**
Chrysene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Benzo(b)fluoranthene	0.004	<0.004	0.004	<0.004	<0.004	<0.004	**10**
Benzo(k)fluoranthene	0.004	<0.004	0.006	<0.004	<0.004	<0.004	**10**
Benzo(a)pyrene	0.003	<0.003	0.007	0.005	<0.003	<0.003	**0.7**
Indeno(123 cd.)pyrene	0.003	<0.003	0.008	0.007	0.003	<0.003	**10**
Dibenzo(ah)anthracene	0.004	<0.004	0.012	<0.004	<0.004	<0.004	**10**
Benzo(ghi)perylene	0.002	<0.002	0.009	0.007	<0.002	<0.002	**-**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 4-15: PAHs in Soil - Warehouse and Dock Area

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m) Lab ID FIELD ID DATE (D/M/Y)		2.0 - 3.0 S2006-11350 WH-TP5-SS3 20-Sep-06	0.0 - 1.0 S2006-11351 WH-TP6-SS1 20-Sep-06	2.0 - 2.5 S2006-11352 WH-TP7-SS3 20-Sep-06	0.0 - 1.0 S2006-11355 WH-TP9-SS1 21-Sep-06	0.0 - 1.0 S2006-11361 DUP 2 21-Sep-06	SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Naphthalene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	**22**
Acenaphthylene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Acenaphthene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	**-**
Fluorene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Phenanthrene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**50**
Anthracene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Fluoranthene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Pyrene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	**100**
Benzo(a)anthracene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**10**
Chrysene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Benzo(b)fluoranthene	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	**10**
Benzo(k)fluoranthene	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	**10**
Benzo(a)pyrene	0.003	<0.003	0.004	<0.003	0.003	<0.003	**0.7**
Indeno(123 cd.)pyrene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	**10**
Dibenzo(ah)anthracene	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	**10**
Benzo(ghi)perylene	0.002	<0.002	0.007	<0.002	0.002	<0.002	**-**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.
DUP 2 is a blind field duplicate of soil sample WH-TP9-SS1

Table 4-16: PAHs in Soil - Warehouse and Dock Area

		DATA					GUIDELINES
AVERAGE SAMPLING DEPTH (m) Lab ID FIELD ID DATE (D/M/Y)		0.0 - 0.9 S2006-11356 WH-TP10-SS1 21-Sep-06	0.0 - 0.9 S2006-11357 WH-TP11-SS1 21-Sep-06	1.0 - 2.0 S2006-11358 WH-TP12-SS2 21-Sep-06	0.0 - 1.0 S2006-11359 WH-TP13-SS1 21-Sep-06	1.0 - 1.8 S2006-11360 WH-TP14-SS2 21-Sep-06	SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Naphthalene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	**22**
Acenaphthylene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Acenaphthene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	**-**
Fluorene	0.001	<0.001	0.004	<0.001	<0.001	<0.001	**-**
Phenanthrene	0.001	<0.001	0.050	<0.001	<0.001	<0.001	**50**
Anthracene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Fluoranthene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**-**
Pyrene	0.003	0.008	0.016	<0.003	<0.003	<0.003	**100**
Benzo(a)anthracene	0.001	<0.001	0.008	<0.001	<0.001	<0.001	**10**
Chrysene	0.001	0.013	0.029	<0.001	<0.001	<0.001	**-**
Benzo(b)fluoranthene	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	**10**
Benzo(k)fluoranthene	0.004	<0.004	0.007	<0.004	<0.004	<0.004	**10**
Benzo(a)pyrene	0.003	0.014	<0.003	<0.003	<0.003	<0.003	**0.7**
Indeno(123 cd.)pyrene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	**10**
Dibenzo(ah)anthracene	0.004	0.018	0.022	<0.004	<0.004	<0.004	**10**
Benzo(ghi)perylene	0.002	0.009	0.011	<0.002	<0.002	<0.002	**-**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 4-17: PCBs in Soil - Warehouse and Dock Area

		DATA		GUIDELINES
AVERAGE SAMPLING DEPTH (m) LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	0.0 - 0.3 S2006-11354 WH-TP8-SS1 20-Sep-06	1999 CCME RECOMMENDED SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Polychlorinated Biphenyls	0.005	<0.005	<0.005	**33**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

SECTION 5.0

TAILINGS AREA

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APPENDICES

5.0 AREA D – TAILINGS AREA

5.1 SITE DESCRIPTION

The tailings stockpile, located southeast of the Mill Area, is estimated to contain over 40 million tonnes of tailings (refer to Figure 5.1, Appendix A-5 and Photo 1, Appendix B-5). This material was deposited at the Site between the early 1960s and the late 1980s. At the time of the Site inspection, a large slump was observed on the eastern slope of the tailings stockpile (refer to Figure 5.1, Appendix A-5 and Photo 2, Appendix B-5). It appears that this slump was a result of surface run-off and/or the presence of a stream flowing underneath or around the tailings stockpile.

Two buildings (i.e. conveyor house and grease shack) were identified at the tailings area during the current investigation (refer Figure 5.1, Appendix A-5 and Photos 3 and 4, Appendix B-5). A network of conveyors and transfer stations were also observed throughout the Site (refer to Figure 5.1, Appendix A-5 and Photos 5 and 6, Appendix B-5).

5.2 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

5.2.1 Phase I ESA –March 2005

A review of the Phase I ESA completed for the Site revealed the following potential environmental concerns at this area of the Site:

- The tailings stockpile is reported to contain approximately 2.2% asbestos fibre;
- Tailings from the stockpile are eroding into the waters of Lower Duck Island Cove Brook and have created a “beach” of tailings at the mouth of the brook where it discharges its waters into Duck Island Cove. It is likely that the brook is contaminated with asbestos containing tailings throughout its length, as well as the marine sediments of the harbour;
- Potential presence of asbestos containing materials (ACMs) within the Site buildings;
- Based on the reported date of construction of the Site buildings (i.e. 1960s), lead and mercury containing paints may be present at the Site;
- Potential for PCB impacted soil in the vicinity of a pole-mounted transformer present at the Site; and
- Discussions with former employees of the mine revealed that occurrences of diesel fuel spills were frequent at the Site. Diesel fuel was spilled from fuel tanks of damaged equipment and during the refuelling of haul trucks, loaders, tractors, drills, etc. at the Site.

Please note that due to snow conditions at the time of the Phase I ESA, access to the Site buildings was not possible. Based on the findings of the Phase I ESA, a Phase II ESA Intrusive Investigation consisting of a series of test pits and the subsequent collection of paint, air and asbestos and soil samples was recommended to assess the presence/absence of environmental impacts at the Site.

5.3 INITIAL SITE INSPECTION – AMEC JUNE 2006

The DNRMD requested that AMEC conduct an initial site inspection to verify surface conditions and assess the Site buildings that could not be examined during the previous Phase I ESA completed for the Site in March 2005 due to snow cover and to confirm the findings presented in the Phase I ESA report prior to proceeding with the Phase II ESA at the Site. Information gathered during the initial site inspection was used to develop a Phase II ESA sampling program for the Site.

The initial site inspection was carried out at the Site by Gary Warren, M.A.Sc., Rod Winsor, P.Eng., Kelly Curtis, CET of AMEC on June 23, 2006. Additional environmental concerns and observations recorded by AMEC at the time of the initial site inspection include the following:

- An area of stained soil was observed along the southwest corner of the grease shack (refer to Figure 5.1, Appendix A-5 and Photo 7, Appendix B-5);
- Partially buried metal and wood debris/waste was observed a several locations throughout the tailings pile (refer to Figure 5.1, Appendix A-5 and Photo 8, Appendix B-5); and
- Insulation materials were observed inside the conveyor house that may contain asbestos (refer to Photo 9, Appendix B-5).

5.4 PHASE II ENVIRONMENTAL SITE ASSESSMENT

The Phase II ESA was carried out in accordance with the DNRMD RFP dated May 2006, AMEC's proposal dated May 26, 2006 and AMEC's Proposed Phase II ESA Sampling Program dated August 21, 2006. Field work was carried out at the Site by Kelly Curtis, CET and Sheldon Adey, CET of AMEC during the period of September 19 to 28, 2006. Sample locations for the investigation were selected in consultation with the DNRMD Project Manager and based on the findings of the previous Phase I ESA and the initial site inspection carried out at the Site. The methodologies used to conduct the field investigations carried out at the Site during the current investigation are described in Section 1.5.

5.4.1 Scope of Work

Based on the findings outlined in the Phase I ESA report and information and observations recorded during the initial site inspection, the scope of work for this area of the Site included the following Phase II ESA activities:

- Collecting one insulation sample (SP-ASB1) from the interior of the conveyor house present at the Site for asbestos analysis;
- Collecting a one air sample (SP#1) adjacent to the south side of the grease shack present at the Site for asbestos analysis;
- Collecting two paint chip samples (SP-PS1 and SP-PS2) from painted surfaces of the conveyor house present at the Site for lead and mercury analyses;
- Excavating one test pit (SP-TP1) in the vicinity of a former pole-mounted transformer located along the tailings conveyor system and collecting one surface soil sample for PCB analysis;

- Excavating one test pit (SP-TP2) within an area of stained soil identified along the south side of the grease shack and collecting soil samples for BTEX/TPH, metals plus hydrides, PAHs and PCB analyses;
- Recording GPS coordinates for all sample locations; and
- Preparing a comprehensive report outlining the methodologies, findings, conclusions and recommendations of the investigation.

All sample locations are presented on Figures 5.2 and 5.3, Appendix A-5.

5.4.2 Field Observations

Detailed field observations pertaining to soil stratigraphy, soil vapour headspace, groundwater conditions and contaminant observations are discussed in this section.

5.4.2.1 Stratigraphy

The test pits were excavated within mine tailings present at the Site. Detailed soil descriptions and sampling depths are provided in the test pit logs presented in Appendix C-5. Bedrock was not encountered in any of the test pits excavated at the Site.

5.4.2.2 Soil Vapour Concentrations

All soil samples collected at the Site were tested using a hand-held PID for SVH. SVH readings report the concentrations of volatile organic vapours being released from the soils. SVH readings for all soil samples collected at the Site equalled 0.0 ppm (refer to Appendix D-5).

5.4.2.3 Groundwater Conditions

Groundwater was not encountered in any of the test pits excavated at the Site. Based on the topography of the Site, groundwater flow direction at the Site has been inferred to be in a northerly direction, towards Lower Duck Island Cove Brook.

5.4.2.4 Contaminant Observations

<u>Petroleum Hydrocarbons</u>
No petroleum hydrocarbon odours or free phase petroleum hydrocarbon product was detected in any of the test pits excavated at the Site during the current investigation.

5.4.3 GPS Coordinates

AMEC recorded coordinates for all sampling locations using a handheld global positioning system (GPS) unit with an accuracy of +/- 5 m. All GPS coordinates were recorded in UTM NAD27 and are presented in Appendix E-5.

5.4.4 Laboratory Analytical Program

The detailed laboratory analytical program for the Phase II ESA completed at the Tailings Area of the Site is outlined in Table 5-1 below.

Table 5-1: Detailed Laboratory Analytical Program

Media	Sample ID	Analyses
Paint	SP-PS1, SP-PS2	Lead and Mercury
Asbestos	SP-ASB1	Asbestos
Air	SP#1	
Soil	SP-TP2-SS1	BTEX/TPH, Metals Plus Hydrides, PAH and PCB
	SP-TP1-SS1	PCB

5.5 LABORATORY ANALYTICAL RESULTS

This section provides a summary of laboratory analytical results for paint, asbestos, air and soil samples collected at the Site during the current investigation. Tables summarizing the analytical results and applicable guidelines are presented in Appendix F-5. Sample locations are presented on Figures 5.2 and 5.3, Appendix A-5 and the Laboratory Certificates of Analyses are presented in Section 11.0.

5.5.1 Asbestos Sample Results

There are over 3,000 asbestos containing materials (ACMs), which can be divided into two broad categories: friable and non-friable.

- **Friable ACMs** are defined as materials that can be crumbled, pulverized and reduced to powder when dry using hand pressure. Typical friable materials include acoustical or decorative spray applications, fireproofing and thermal insulation; and
- **Non-friable ACMs** are hard or manufactured products such as floor tiles, fire blankets, pre-formed manufactured cementitious insulation and wallboards, pipes, and siding, wherein the asbestos fibres are bound to the substrate.

One insulation sample (SP-ASB1), collected from the interior of the conveyor house present at the Site, was analyzed for asbestos (refer to Figure 5.2, Appendix A-5). The laboratory result for asbestos is presented in Table 5-1, Appendix F-5. The result was compared to the "The Asbestos Abatement Regulations", 1998 (Nfld. Reg. 111/98) criterion of 1% asbestos fibres.

Asbestos was not detected in sample SP-ASB1. Based on the testing completed, the insulation present inside the conveyor house is not considered to be asbestos containing.

5.5.2 Air Sample Results

5.5.2.1 Asbestos in Air

One air sample (SP#1) collected at the Site was analyzed for asbestos (refer to Figure 5.2, Appendix A-5). Weather conditions at the time of sampling were overcast with light winds. The analytical result is presented in Table 5-2, Appendix F-5. The result was compared to the 2006 Occupational Exposure Threshold Limit Value (TLV) of 0.1 fibres/cm^3 as indicated by the American Conference of Governmental Industrial Hygienists (ACGIH)[1].

The concentration of asbestos fibres detected in air sample SP#1 (0.003 fibres/cm^3) did not exceed the applicable assessment criterion of 0.1 fibres/cm^3.

5.5.3 Paint Sample Results

5.5.3.1 Lead in Paint

A total of two paint samples (SP-PS1 and SP-PS2) collected from the painted surfaces of the conveyor house present at the Site were submitted to the laboratory for lead analyses. The laboratory results for lead in paint are presented in Table 5-3, Appendix F-5. The results were compared to the Federal HPA criterion of 600 mg/kg and former Federal HPA criterion of 5,000 mg/kg.

Results of the paint sampling program revealed that the concentrations of lead detected in paint samples SP-PS1 (2,560 mg/kg) and SP-PS2 (3,490 mg/kg) exceeded the Federal HPA criterion of 600 mg/kg and are therefore considered to be a health hazard during any renovation/demolition activities at the Site.

Since levels of lead detected in both paint samples did not exceed the former Federal HPA criterion of 5,000 mg/kg, leachability testing for lead was not carried out on the paint samples.

5.5.3.2 Mercury in Paint

A total of two paint samples (SP-PS1 and SP-PS2) collected from the painted surfaces of the conveyor house present at the Site were submitted to the laboratory for mercury analyses. The laboratory results for mercury in paint are presented in Table 5-4, Appendix F-5. The results are compared to the Federal HPA criterion of 10 mg/kg and the CCME-CEQG of 24 mg/kg for mercury in soil at a commercial site.

Results of the paint sampling program revealed that the concentrations of mercury detected in paint samples SP-PS1 (0.47 mg/kg) and SP-PS2 (1.54 mg/kg) did not exceed the Federal HPA criterion of 10 mg/kg.

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[1] Documentation of the Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices, ACGIH Worldwide Signature Publications, Cincinnati, OH, 2006.

Since levels of mercury detected in the paint samples did not exceed the CCME-CEQG for mercury in soil at a commercial site (24 mg/kg), leachability testing for mercury was not carried out on the paint samples.

5.5.4 Soil Sample Results

5.5.4.1 Petroleum Hydrocarbons in Soil

One soil sample (SP-TP2-SS1) collected at the Site was analyzed for BTEX/TPH. The analytical result is presented in Table 5-5, Appendix F-5. The result was compared to the CCME-CEQGs for industrial sites and the 2003 Atlantic PIRI Tier I RBSLs for commercial sites with coarse-grained soil and non-potable groundwater.

BTEX was not detected in soil sample SP-TP2-SS1 and is therefore below the applicable assessment criteria.

The concentration of modified TPH detected in soil sample SP-TP2-SS1 (<121 m/kg) did not exceed the applicable 2003 Atlantic PIRI Tier I RBSL of 10,000 mg/kg for heavy oil in soil at a commercial site with coarse-grained soil and non-potable groundwater. The petroleum hydrocarbon detected in soil sample SP-TP2-SS1 resembled heavy oil.

5.5.4.2 Metals in Soil

One soil sample (SP-TP2-SS1) collected at the Site was analyzed for metals plus hydrides. The analytical results are presented in Table 5-6, Appendix F-5. The results were compared to the CCME-CEQGs for industrial sites.

Concentrations of chromium (897 mg/kg) and nickel (1,290 mg/kg) detected in soil sample SP-TP2-SS1 exceeded the applicable CCME-CEQGs of 87 mg/kg and 50 mg/kg, respectively.

5.5.4.3 PAHs in Soil

One soil sample (SP-TP2-SS1) collected at the Site was analyzed for PAHs. The analytical results are presented in Table 5-7, Appendix F-5. The results were compared to the CCME-CEQGs for industrial sites.

PAHs were not detected in soil sample SP-TP2-SS1 and therefore are below the applicable assessment criteria.

5.5.4.4 PCBs in Soil

A total of two soil samples (SP-TP1-SS1 and SP-TP2-SS1) collected at the Site were analyzed for PCBs. The analytical results are presented in Table 5-8, Appendix F-5. The results were compared to the CCME-CEQGs for industrial sites.

Concentrations of PCBs in both soil samples analyzed were either non-detect or detected at levels below the applicable assessment criterion of 33 mg/kg. Results ranged from <0.005 mg/kg in soil sample SP-TP2-SS1 to 1.82 mg/kg in soil sample SP-TP1-SS2.

5.6 DISCUSSION OF CONTAMINANTS OF CONCERN

Based on the findings of this Phase II ESA the following discussions of contaminants of concern (COC) investigated are provided.

5.6.1 Asbestos Containing Materials

The tailings stockpile is reported to contain approximately 2.2% asbestos fibre.

The concentration of asbestos fibres (0.003 fibres/cm^3) detected in the air sample collected at the Site during the current investigation did not exceed the applicable assessment criterion of 0.1 fibres/cm^3. However, please note that these findings are based on one sampling event and that the concentrations of asbestos fibres in air may vary (i.e. increase or decrease) over time, especially during dry times and periods of activity at the Site.

5.6.2 Paint

Results of the paint sampling program revealed that the concentrations of lead detected in paint samples SP-PS1 (2,560 mg/kg) and SP-PS2 (3,490 mg/kg) exceeded the Federal HPA criterion of 600 mg/kg and are therefore considered to be a health hazard during any renovation/demolition activities at the Site.

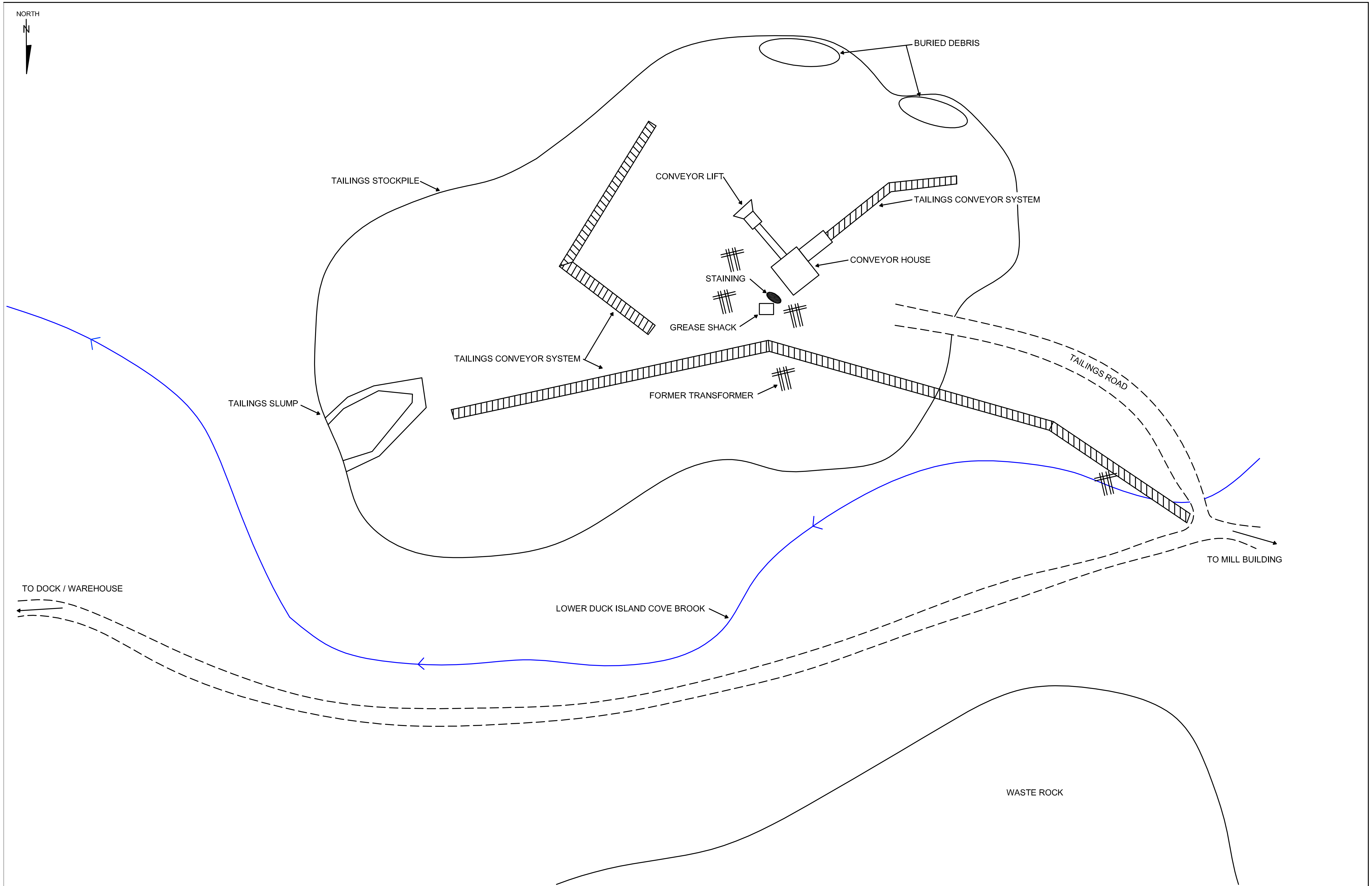
Since levels of lead and mercury detected in the paint samples SP-PS1 and SP-PS2 did not exceed the former Federal HPA criterion of 5,000 mg/kg for lead in paint and the CCME-CEQG for mercury in soil at a commercial site (24 mg/kg), these paints (blue and red), if removed form the Site, may be disposed of at an approved landfill facility.

5.6.3 Metals

Concentrations of a chromium and nickel detected in soil sample SP-TP2-SS1 collected at the Site exceeded the applicable assessment criteria for metals in soil at industrial sites.

APPENDIX A-5

FIGURES



NOTES

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM FIGURE.
3. THIS FIGURE IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
5. THIS FIGURE SHOULD NOT BE USED FOR PURPOSES OTHER THAN THOSE OUTLINED ABOVE.
6. THIS FIGURE CONTAINS INTELLECTUAL PROPERTY OF THE DEPARTMENT OF NATURAL RESOURCES AND MAY NOT BE REPRODUCED OR COPIED WITHOUT THEIR WRITTEN CONSENT.
7. THIS FIGURE WAS PRODUCED FROM DOCUMENTS SUPPLIED BY THE CLIENT AND VISUAL OBSERVATIONS.

LEGEND

GRAVEL ACCESS ROADS

UTILITY POLE LOCATIONS

FLOW DIRECTION

CLIENT

DEPARTMENT OF NATURAL RESOURCES

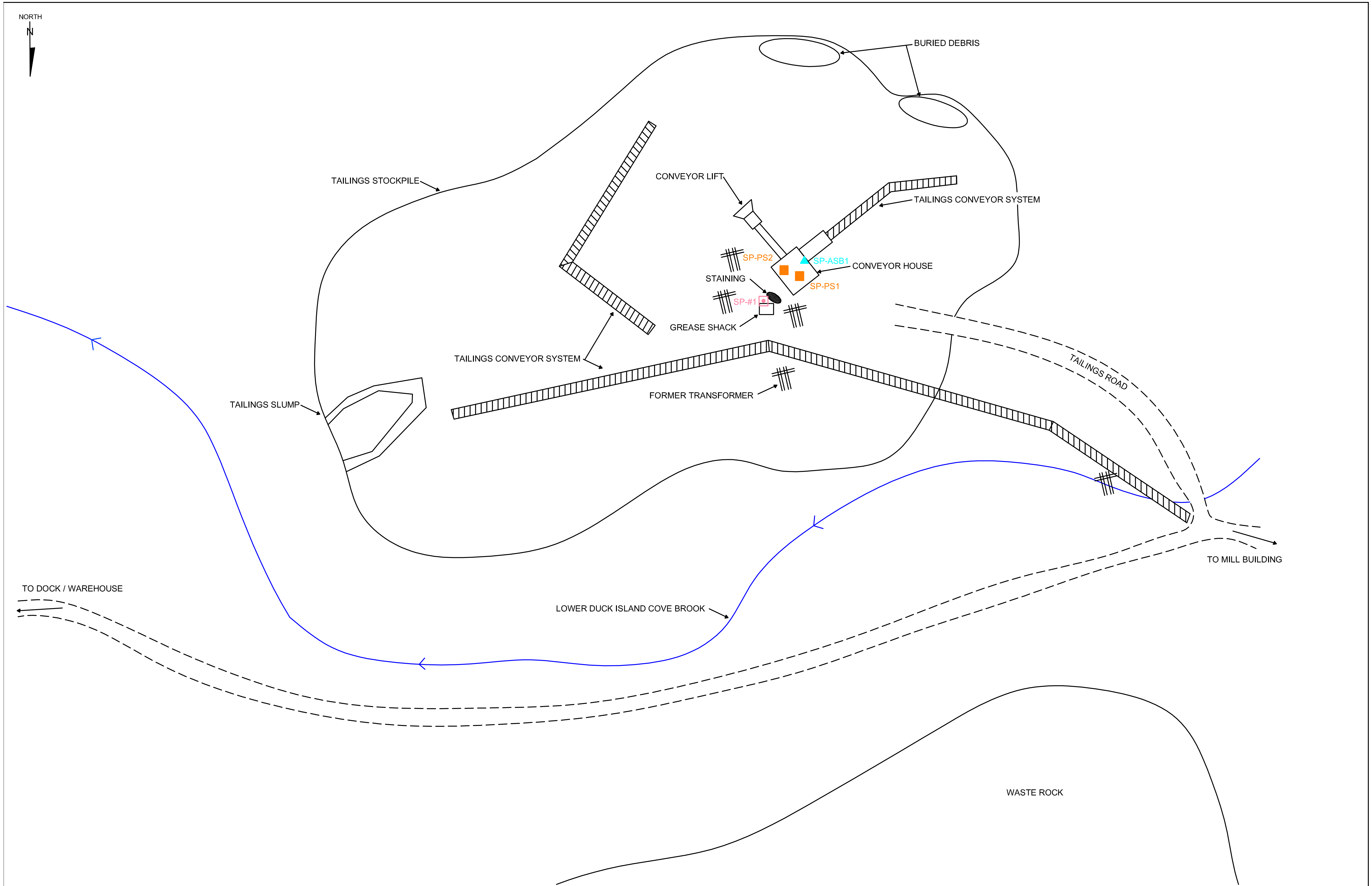
PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER BAIE VERTE ASBESTOS MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

TAILINGS STOCKPILE AREA

SCALE	PROJECT NUMBER	
NTS	TF6126509	
DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	
DRAWING NO.	DATE	REV
5.1	January 2007	



NOTES

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7. THIS FIGURE WAS PRODUCED FROM DOCUMENTS SUPPLIED BY THE CLIENT AND VISUAL OBSERVATIONS.

LEGEND

- GRAVEL ACCESS ROADS
- UTILITY POLE LOCATIONS
- FLOW DIRECTION
- ASBESTOS SAMPLE
- PAINT SAMPLES
- AIR SAMPLE

CLIENT

DEPARTMENT OF NATURAL RESOURCES

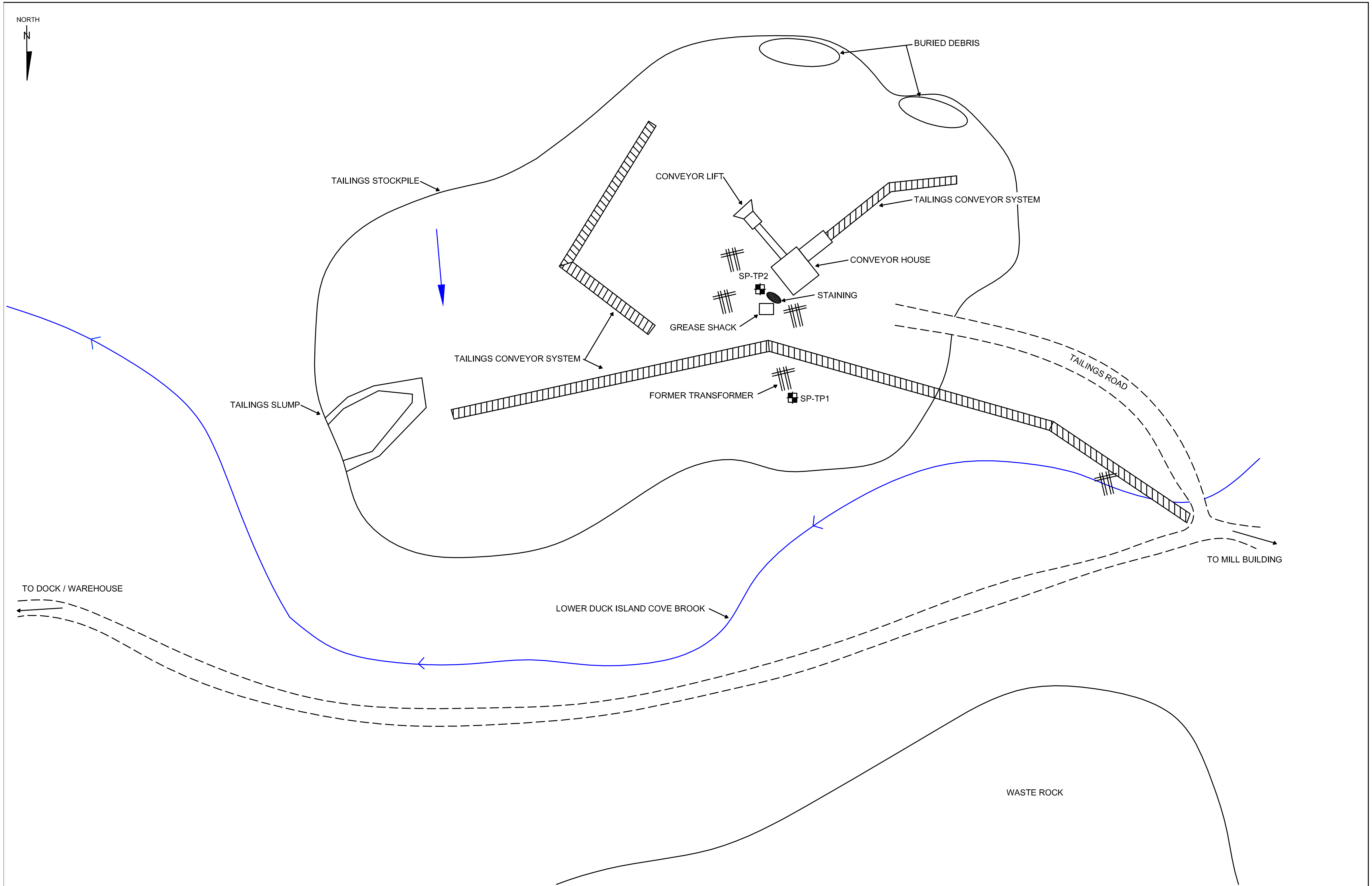
PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER BAIE VERTE ASBESTOS MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

TAILINGS STOCKPILE AREA
AIR, ASBESTOS AND PAINT SAMPLE LOCATIONS

SCALE	PROJECT NUMBER	
NTS	TF6126509	
DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	
DRAWING NO.	DATE	REV
5.2	January 2007	



NOTES

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LEGEND

GRAVEL ACCESS ROADS
UTILITY POLE LOCATIONS
TEST PIT LOCATION
FLOW DIRECTION
ASSUMED GROUNDWATER FLOW DIRECTION

CLIENT
DEPARTMENT OF NATURAL RESOURCES

PROJECT
PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER BAIE VERTE ASBESTOS MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE
TAILINGS STOCKPILE AREA
TEST PIT LOCATIONS

SCALE	PROJECT NUMBER	
NTS	TF6126509	
DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	
DRAWING NO.	DATE	REV
5.3	January 2007	

APPENDIX B-5

PHOTOGRAPHIC RECORD

Photo 1: Tailings Pile.
(Taken From a Waste Rock Pile – Looking South)

Photo 2: Slump at Eastside of the Tailings Pile.

Photo 3: Conveyor House.

Photo 4: Grease Shack.

Photo 5: Conveyor System.
(Looking Southwest)

Photo 6: Conveyor System.
(Looking East)

Photo 7: Stain Area Located at Southwest Corner of the Grease Shack.

Photo 8: Partially Buried Debris/Waste.


Photo 9: Insulation inside the Conveyor House.

APPENDIX C-5

TEST PIT LOGS

Test Pit Identification Number	Depth From – To (m)	Soil Description
SP-TP1	0.0 - 0.3 0.3	FILL - Grey tailings, moist. Test pit terminated in tailings. Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation. 3) Test pit hand dug at former location of a pole-mounted transformer.
SP-TP2	0.0 - 3.7 3.7	FILL - Grey tailings, some cobbles, moist. Test pit terminated in tailings. Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation. 3) Test pit excavated in tailings.

APPENDIX D-5

SOIL VAPOUR HEADSPACE READINGS

SVH READINGS OF SOIL SAMPLES – TAILINGS AREA

SAMPLING LOCATION	SOIL SAMPLE ID	SAMPLING DEPTH (m)	PID SVH (PPM)
SP-TP1	SP-TP1-SS1	0.0 – 0.3	0.0
SP-TP2	SP-TP2-SS1	0.0 – 1.0	0.0
	SP-TP2-SS2	1.0 – 2.0	0.0
	SP-TP2-SS3	2.0 – 3.0	0.0

Notes:
Shaded cells mean sample submitted for analyses.

APPENDIX E-5

GPS COORDINATES

GPS COORDINATES - NAD27 - TAILINGS AREA

Location	Northing	Easting
SP-TP1	559234	5536858
SP-TP2	559233	5536943

APPENDIX F-5

LABORATORY ANALYSES TABLES

Table 5-1: Summary of Building Materials Samples and Asbestos Analysis - Tailings Area

Sample ID	Sample Location	Sample Type	Asbestos Fibre %		
			Chrysotile	Amosite	other asbestos fibres
SP-ASB1	Conveyor House - Interior Wall	Insulation	nd	nd	nd

Note: Shaded results are above maximum as outlined under “The Asbestos Abatement Regulations, 1998 (Nfld. Reg. 111/98) of 1 % asbestos fibers.

nd: not detected

Table 5-2: Asbestos in Air - Tailings Area

Sample ID	Sample Location	Sample Type	Airborne Concentration (fibres/cm^3)
SP#1	Southside of Grease Shack - Exterior	Air	0.003

Note: Shaded results are above maximum as outlined under “2006 Occupational Exposure Threshold Limit Value (TLV) of 0.1 fibres/cm3 (ACGIH)

Table 5-3. Lead in Paint - Tailings Area

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/kg)	Total Lead (mg/kg)
S2006-12081	SP-PS1	Conveyor House - Mechanical Equipment	Metal	Red Paint	5	**<u>2560</u>**
S2006-12082	SP-PS2	Conveyor House - Siding	Metal	Blue Paint	5	**<u>3490</u>**

<u>Notes:</u>
MDL: Method detection limit
<X: Below MDL
<u>Bold and underlined results indicate that lead concentration is above the relevant Federal Hazardous Products Act criterion of 600 mg/kg</u>
Shaded results indicate that lead concentration is above the former Federal Hazardous Products Act criterion of 5000 mg/kg

Table 5-4. Mercury in Paint - Tailings Area

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/kg)	Total Mercury (mg/kg)
S2006-12081	SP-PS1	Conveyor House - Mechanical Equipment	Metal	Red Paint	0.01	0.47
S2006-12082	SP-PS2	Conveyor House - Siding	Metal	Blue Paint	0.01	1.54

Notes:

MDL: Method detection limit

<X: Below MDL

Bold and and underlined results indicate that mercury concentration is above the Federal Hazardous Products Act criterion of 10 mg/kg

Shaded results indicate that mercury concentration is above the CCME-CEQG for a commercial property (24 mg/kg)

Table 5-5: BTEX/TPH in Soil - Tailings Area

		DATA		GUIDELINES			
AVERAGE SAMPLING DEPTH (m)			0.0 - 1.0	1999 CCME-CEQG (Updated 2005) INDUSTRIAL SITES	2003 ATLANTIC PIRI TIER I RBSL[1]		
LAB ID		Lab Blank	S2006-11363				
FIELD ID			SP-TP2-SS1				
DATE (D/M/Y)			21-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	**0.03**	1.8	1.8	**1.8**
Toluene	0.01	<0.01	<0.01	**0.37**	160	160	**160**
Ethylbenzene	0.02	<0.02	<0.02	**0.082**	430	430	**430**
Total Xylenes	0.06	<0.06	<0.06	**11**	200	200	**200**
TPH (C6-C10)	10	<10	<10	**-**	-	-	**-**
TPH (>C10-C21)	10	<10	<10	**-**	-	-	**-**
TPH (>C21-C32)	50	<50	101	**-**	-	-	**-**
Modified TPH (C6-C32)	70	<70	<121	**-**	450	7400	**10000**
Hydrocarbon Identification		-	Chromatogram resembles heavy oil				

Notes:
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable

Table 5-6: Metals in Soil - Tailings Area

		DATA		GUIDELINES
AVERAGE SAMPLING DEPTH (m) LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	0.0 - 1.0 S2006-11363 SP-TP2-SS1 21-Sep-06	1999 CCME RECOMMENDED SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	5	<5	3860	-
Antimony	0.5	<0.5	4.0	**40**
Arsenic	0.5	<0.1	<0.1	**12**
Barium	0.5	<0.5	0.5	**2000**
Beryllium	0.2	<0.2	<0.2	**8**
Bismuth	0.2	<0.2	1.2	-
Cadmium	0.5	<0.5	<0.5	**22**
Calcium	25	<25	1830	-
Chromium	1	<1	**897**	**87**
Cobalt	1	<1	44	**300**
Copper	1	<1	20	**91**
Iron	5	<5	29000	-
Lead	5	<5	<5	**600**
Magnesium	10	<10	207000	-
Manganese	1	<1	570	-
Mercury	0.01	<0.01	0.04	**50**
Molybdenum	2	<2	<2	**40**
Nickel	5	<5	**1290**	**50**
Phosphorus	5	<5	35	-
Potassium	10	<10	31	-
Selenium	0.1	<0.1	0.1	**3.9**
Silver	0.25	<0.25	<0.25	**40**
Sodium	25	<25	98	-
Vanadium	5	<5	14	**130**
Zinc	2	<2	22	**360**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 5-7: PAHs in Soil - Tailings Area

		DATA		GUIDELINES
AVERAGE SAMPLING DEPTH (m) Lab ID FIELD ID DATE (D/M/Y)		Lab Blank	0.0 - 1.0 S2006-11363 SP-TP2-SS1 21-Sep-06	SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Naphthalene	0.002	<0.002	<0.002	**22**
Acenaphthylene	0.001	<0.001	<0.001	**-**
Acenaphthene	0.002	<0.002	<0.002	**-**
Fluorene	0.001	<0.001	<0.001	**-**
Phenanthrene	0.001	<0.001	<0.001	**50**
Anthracene	0.001	<0.001	<0.001	**-**
Fluoranthene	0.001	<0.001	<0.001	**-**
Pyrene	0.003	<0.003	<0.003	**100**
Benzo(a)anthracene	0.001	<0.001	<0.001	**10**
Chrysene	0.001	<0.001	<0.001	**-**
Benzo(b)fluoranthene	0.004	<0.004	<0.004	**10**
Benzo(k)fluoranthene	0.004	<0.004	<0.004	**10**
Benzo(a)pyrene	0.003	<0.003	<0.003	**0.7**
Indeno(123 cd.)pyrene	0.003	<0.003	<0.003	**10**
Dibenzo(ah)anthracene	0.004	<0.004	<0.004	**10**
Benzo(ghi)perylene	0.002	<0.002	<0.002	**-**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

Table 5-8: PCBs in Soil - Tailings Area

		DATA			GUIDELINES
AVERAGE SAMPLING DEPTH (m)			0.0 - 0.3	0.0 - 1.0	
LAB ID			S2006-11362	S2006-11363	1999 CCME RECOMMENDED
FIELD ID		Lab Blank	WH-TP1-SS1	WH-TP2-SS1	SOIL QUALITY GUIDELINES
DATE (D/M/Y)			21-Sep-06	21-Sep-06	INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Polychlorinated Biphenyls	0.005	<0.005	1.820	<0.005	**33**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for industrial sites.

SECTION 6.0

WASTE ROCK AND PIT AREA

TABLE OF CONTENTS

APPENDICES

6.0 AREA E – WASTE ROCK AND PIT AREA

6.1 SITE DESCRIPTION

There are three large stockpiles of waste rock present at the Site containing approximately 190 million tonnes of material (refer Figure 6.1, Appendix A-6). The largest of the three waste rock stockpiles is located northeast of the north pit. The smallest is located between the west pit and Steam Bath Pond. A third stockpile is located northwest of the north pit and is bounded to the west by the Fleur de Lys Highway. These stockpiles consist of waste rock (i.e. overburden) that was removed from the pits while mining the ore for use in the production of asbestos (refer Photo 1, Appendix B-6).

There are two open mining pits present at the Site: north pit and west pit (refer to Figure 6.1, Appendix A-6 and Photo 2, Appendix B-6). The two pits are located side-by-side and are separated by a body of waste rock designated as the “saddle area”. The saddle has a thickness of approximately 45 m and consists of compacted mine rejects over the underlying bedrock. Both pits were partially filled with water at the time of the current investigation (refer to Photo 3, Appendix B-6).

6.2 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

6.2.1 Phase I ESA, March 2005

A review of the Phase I ESA completed at the Site revealed the following potential environmental concerns at this area of the Site:

- Due to historic asbestos mining operations at the Site, it was anticipated that asbestos containing materials (ACMs) are present at the Site;
- Based on discussions with former employees of the mine, all solid waste generated at the mine was disposed of on-Site. Reportedly, waste generated at the mine was mostly limited to metal debris, plastics, wood and typical domestic waste. In most cases, the waste was collected in trucks, dumped into a pit and covered with waste rock. The number and locations of former waste disposal sites at the Site is not known at this time, however, the majority of the waste generated at the Site is suspected to have been buried within the waste rock piles;
- Two former pit offices were reported to have been present at this area of the Site (refer to Figure 6.1, Appendix A-6). Reportedly, haul trucks were refuelled everyday at noon by tanker trucks at the pit offices. Throughout the life of the mine, pit offices were located at two different locations; one on the left-hand-side of the pit access road, near the access road leading to the primary crusher and another at the saddle area (when mining shifted from the north pit to the west pit). The potential for historic fuel spill events at these locations is considered to the high; and
- Discussions with former employees of the mine revealed that occurrences of diesel fuel spills were frequent at the Site. Diesel fuel was spilled from fuel tanks of damaged equipment and during refuelling of haul trucks, loaders, tractors, drills, etc. at the Site.

Based on the findings of the Phase I ESA, a Phase II ESA Intrusive Investigation consisting of a series of test pits and the subsequent collection of soil samples was recommended to assess the presence/absence of environmental impacts at the Site.

6.3 INITIAL SITE INSPECTION – AMEC JUNE 2006

The DNRMD requested that AMEC conduct an initial site inspection to verify surface conditions at the Site that could not be examined during the previous Phase I ESA completed for the Site by AMEC in March 2005 due to snow cover and to confirm the findings presented in the Phase I ESA report prior to proceeding with the Phase II ESA at the Site. Information gathered during the initial site inspection was used to develop a Phase II ESA sampling program for the Site.

The initial site inspection was carried out at the Site by Gary Warren, M.A.Sc., Rod Winsor, P.Eng., Kelly Curtis, CET of AMEC on June 23, 2006. The following information and observations were recorded by AMEC at the time of the initial site inspection:

- A wooden shed and a pipe storage rack were observed northwest of the north pit (refer to Figure 6.1, Appendix A-6 and Photos 4 and 5, Appendix B-6). The wooden shed was empty at the time of the site inspection and its former use is not known at this time (refer to Photos 4 and 6, Appendix B-6);
- An area of stained soil, approximately 0.5 m x 0.5 m, was observed approximately 50 m south of the wooden shed present at the Site (refer to Figure 6.1, Appendix A-6 and Photos 7 and 8, Appendix B-6). An open-top 45-gallon drum, containing an unknown substance (possibility grease or lube oil), was observed, lying on its side, in vicinity of the stain area;
- An area of stained soil, approximately 3.0 m x 8.0 m, was observed along the pit roadway approximately 200 m northwest of the primary crusher of the Mill Area (refer to Figure 6.1, Appendix A-6 and Photo 9, Appendix B-6);
- Two partially buried underground storage tanks (USTs) were observed along the south wall of the west pit (refer to Figure 6.1, Appendix A-6 and Photo 10, Appendix B-6). Due to safety concerns, access was not gained to this area at the time of the site inspection;
- A potentially discarded transformer was observed at the waste rock pile located northeast of the Mill Area (refer to Figure 6.1, Appendix A-6). Due to safety concerns, access was not gained to this area at the time of the site inspection;
- An area of partially buried debris/waste was observed along the north side of the north pit (refer to Figure 6.1, Appendix A-6 and Photo 11, Appendix B-6); and
- An area containing discarded tires, equipment and drums was observed along the toe of the waste rock piles located north of the Mill Area (refer to Figure 6.1, Appendix A-6 and Photo 12, Appendix B-6). Due to safety concerns, access was not gained to this area at the time of the site inspection.

6.4 PHASE II ENVIRONMENTAL SITE ASSESSMENT

The Phase II ESA was carried out in accordance with the DNRMD RFP dated May 2006, AMEC's proposal dated May 26, 2006 and AMEC's Proposed Phase II ESA Sampling Program dated August 21, 2006. Field work was carried out at the Site by Kelly Curtis, CET and Sheldon Adey, CET of AMEC during the period of September 19 to 28, 2006. Sample locations for the investigation were selected in consultation with the DNRMD Project Manager and based on the findings of the previous Phase I ESA and the initial site inspection carried out at the Site. The methodologies used to conduct the field investigations carried out at the Site during the current investigation are described in Section 1.5.

6.4.1 Scope of Work

Based on the findings outlined in the Phase I ESA report and information and observations recorded during the initial site inspection, the scope of work for this area of the Site included the following Phase II ESA activities:

- Collecting one air sample (WR#1) in the vicinity of the former pit office located east of the north pit for asbestos analyses;
- Collecting one paint chip sample (WR-PS1) from the yellow painted surfaces of the wooden shed located northwest of the north pit for lead and mercury analyses;
- Excavating one test pit (WR-TP1) within an area of stained soil identified approximately 50 m south of the wooden shed and collecting soil samples for BTEX/TPH and PCB analyses;
- Excavating one test pit (WR-TP2) within an area of stained soil identified along the pit road, approximately 200 m northwest of the primary crusher building of the Mill Area, and collecting soil samples for BTEX/TPH and PCB analyses; and
- Excavating three test pits (WR-TP3 and WR-TP5) at the reported location of the former pit office located west of the assess road to the primary crusher building and east of the north pit and collecting soil samples for BTEX/TPH, metals plus hydrides and PAH analyses.

Please note that due to safety concerns (i.e. rough terrain, steep slopes, etc.) access was not gained to following areas of the Site during the current investigation:

- Former pit office located on the saddle;
- Partially buried USTs along the south wall of the west pit;
- Area along the toe of the waste rock pile containing discarded tires, equipment and drums; and
- Area of the waste rock pile at which a potential discarded transformer was observed.

No sampling was conducted at the above listed locations of the Site at the time of the current investigation. All sample locations are presented on Figures 6.2 and 6.3, Appendix A-6.

6.4.2 Field Observations

Detailed field observations pertaining to soil stratigraphy, soil vapour headspace, groundwater conditions and contaminant observations are discussed in this section.

6.4.2.1 Stratigraphy

The soil stratigraphy generally consisted primarily of variable thickness grey sand and gravel with some cobbles, boulders and fines overlying glacial till consisting of grey sand and gravel with some boulders, cobbles and fines. Asbestos fibres were observed throughout the soil column in test pits WR-TP3 to WR-TP5 excavated within the former pit office area. Bedrock was not encountered within any of the test pits excavated at the Site during the current investigation. Detailed soil descriptions and sampling depths are provided in the test pit logs presented in Appendix C-6.

6.4.2.2 Soil Vapour Concentrations

All soil samples collected at the Site were tested using a hand-held PID for SVH. SVH readings report the concentrations of ionizable vapours being released from the soils. SVH readings ranged from 0.0 parts per million (ppm) to 32.0 ppm (refer to Appendix D-6). The SVH readings were used to assist with the selection of soil samples for laboratory analyses.

6.4.2.3 Groundwater Conditions

Groundwater was encountered in test pits WR-TP3 and WR-TP4 at depths of 3.3 m and 0.9 m bgs, respectively. Based on the topography of the Site, groundwater flow direction at the Site has been inferred to be in a south-easterly direction, towards the pits and Lower Duck Island Cove Brook.

6.4.2.4 Contaminant Observations

<u>Petroleum Hydrocarbon Odours</u>
A petroleum hydrocarbon odour was observed during the excavation of test pit WR-TP2 (refer to Figure 6.2, Appendix A-6). Please note that since full face respirators were worn by field staff during excavation, olfactory evidence of petroleum hydrocarbons may have been present in other test pits excavated at the Site, however these may not have been detected by field staff.

<u>Free Phase Petroleum Hydrocarbon Product</u>
No free phase petroleum hydrocarbon product was identified in any of the test pits excavated at the Site during the current investigation.

<u>Asbestos Fibres</u>
An abundance of asbestos fibres were observed throughout the soil column in test pits WR-TP3 to WR-TP5, excavated within the former pit office area of the Site (refer to Photos 13 to 15, Appendix B-6).

6.4.3 GPS Coordinates

AMEC recorded coordinates for all sampling locations using a handheld global positioning system (GPS) unit with an accuracy of +/- 5 m. All GPS coordinates were recorded in UTM NAD27 and are presented in Appendix E-6.

6.4.4 Laboratory Analytical Program

The detailed laboratory analytical program for the Phase II ESA completed at the Waste Rock and Pit Area of the Site is outlined in Table 6-1 below.

Table 6-1: Detailed Laboratory Analytical Program

Media	Sample ID	Analyses
Paint	WR-PS1	Lead and Mercury
Air	WR#1	Asbestos
Soil	WR-TP1-SS2, WR-TP2-SS1, WR-TP3-SS1, WR-TP4-SS1, WR-TP5-SS1	BTEX/TPH
	WR-TP5-SS1	Metals Plus Hydrides and PAH
	WR-TP1-SS2, WR-TP2-SS1	PCBs

6.5 LABORATORY ANALYTICAL RESULTS

This section provides a summary of laboratory analytical results for air, paint and soil samples collected at the Site during the current investigation. Tables summarizing the analytical results and applicable guidelines are presented in Appendix F-6. Sample locations are presented on Figures 6.2 and 6.3, Appendix A-6 and the Laboratory Certificates of Analyses are presented in Section 11.0.

6.5.1 Air Sample Results

6.5.1.1 Asbestos in Air

One air sample (WR#1) collected at the Site was analyzed for asbestos (refer to Figure 6.2, Appendix A-6). Weather conditions at the time of sampling were overcast with moderate winds. The analytical result is presented in Table 6-1, Appendix F-6. The result was compared to the 2006 Occupational Exposure Threshold Limit Value (TLV) of 0.1 fibres/cm^3 as indicated by the American Conference of Governmental Industrial Hygienists (ACGIH)[1].

Asbestos fibres were not detected (<0.003 fibres/cm^3) in air sample WR#1 and therefore did not exceed the applicable assessment criterion of 0.1 fibres/cm^3.

6.5.2 Paint Sample Results

6.5.2.1 Lead in Paint

One paint sample (WR-PS1) collected from the yellow painted surfaces of the wooden shed present at the Site was submitted to the laboratory for lead analysis. The laboratory result for lead in paint is presented in Table 6-2, Appendix F-6. The result was compared to the Federal HPA criterion of 600 mg/kg and former Federal HPA criterion of 5,000 mg/kg.

Results of the paint sampling program revealed that the concentration of lead detected in paint sample WR-PS1 (1,200 mg/kg) exceeded the Federal HPA criterion of 600 mg/kg and therefore considered to be a health hazard during any renovation/demolition activities at the Site.

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[1] Documentation of the Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices, ACGIH Worldwide Signature Publications, Cincinnati, OH, 2006.

Since the level of lead detected in the paint sample WR-PS1 did not exceed the former Federal HPA criterion of 5,000 mg/kg, leachability testing for lead was not carried out on the paint sample.

6.5.2.2 Mercury in Paint

One paint sample (WR-PS1) collected from the yellow painted surfaces of the wooden shed present at the Site was submitted to the laboratory for mercury analysis. The laboratory result for mercury in paint is presented in Table 6-3, Appendix F-6. The result was compared to the Federal HPA criterion of 10.0 mg/kg and the CCME-CEQG of 24.0 mg/kg for mercury in soil at a commercial site.

Results of the paint sampling program revealed that concentrations of mercury detected in paint sample WR-PS1 (0.41 mg/kg) did not exceed the Federal HPA criterion of 10.0 mg/kg and the CCME-CEQG of 24.0 mg/kg.

Since the level of mercury detected in the paint sample WR-PS1 did not exceed the CCME-CEQG of 24.0 mg/kg, leachability testing for mercury was not carried out on the paint sample.

6.5.3 Soil Sample Results

6.5.3.1 Petroleum Hydrocarbons in Soil

A total of five soil samples (WR-TP1-SS2, WR-TP2-SS1, WR-TP3-SS1, WR-TP4-SS1 and WR-TP5-SS1) collected at the Site were analyzed for BTEX/TPH. The analytical results are presented in Table 6-4, Appendix F-6. The results were compared to the CCME-CEQG for industrial sites and the 2003 Atlantic PIRI Tier I RBSLs for commercial sites with coarse-grained soil and non-potable groundwater.

BTEX was not detected in any of the soil samples analyzed and therefore is below the applicable assessment criteria.

The concentration of modified TPH detected in soil sample WR-TP2-SS1 (<14,900 mg/kg) exceeded the 2003 Atlantic PIRI Tier I RBSL criterion of 7,400 mg/kg for diesel fuel in soil at a commercial site with coarse-grained soil and non-potable groundwater. Hydrocarbons detected in soil resembled weathered diesel fuel and heavy oil. TPH was not detected in any of the remaining four soil samples analyzed.

6.5.3.2 Metals in Soil

One soil sample (WR-TP5-SS1) collected at the Site was analyzed for metals plus hydrides. The analytical results are presented in Tables 6-5, Appendix F-6. The results were compared to the CCME-CEQG for industrial sites.

Concentrations of chromium (779 mg/kg) and nickel (1340 mg/kg) detected in soil sample WR-TP5-SS1 exceeded the applicable CCME-CEQGs of 87 mg/kg and 50 mg/kg, respectively.

6.5.3.3 PAHs in Soil

One soil sample (WR-TP5-SS1) collected at the Site was analyzed for PAHs. The analytical results are presented in Tables 6-6, Appendix F-6. The results were compared to the CCME-CEQG for industrial sites.

PAHs were not detected in soil sample WR-TP5-SS1 and therefore are below the applicable assessment criteria.

6.5.3.4 PCBs in Soil

Two surface soil samples (WR-TP1-SS1 and WR-TP2-SS1) collected at the Site were analyzed for PCBs. The analytical result is presented in Table 6-7, Appendix F-6. The results were compared to the CCME-CEQG for commercial/industrial sites.

Concentrations of PCBs in both soil samples analyzed were either non-detect (<0.005 mg/kg) or detected at levels below the applicable assessment criteria of 33 mg/kg. PCBs were detected in soil sample WR-TP2-SS1 at a concentration of 0.202 mg/kg.

6.6 DISCUSSION OF CONTAMINANTS OF CONCERN

Based on the findings of this Phase II ESA the following discussions of contaminants of concern (COC) investigated are provided.

6.6.1 Asbestos

An abundance of asbestos fibres were observed throughout the soil column in test pits WR-TP3 to WR-TP5, excavated within the former pit office area of the Site.

Asbestos fibres were not detected (<0.003 fibres/cm^3) in the air sample collected at the Site during the current investigation and therefore did not exceed the applicable assessment criterion of 0.1 fibres/cm^3. However, please note that these findings are based on one sampling event and that the concentrations of asbestos fibres in air may vary (i.e. increase or decrease) overtime, especially during times of activity at the Site.

6.6.2 Paint

Results of the paint sampling program revealed that the concentration of lead detected in paint sample WR-PS1 (1,200 mg/kg), yellow paint collected from the exterior wall of the wooden shed present at the Site, exceeded the Federal HPA criterion of 600 mg/kg and therefore considered to be a health hazard during any renovation/demolition activities at the Site.

Since levels of lead and mercury detected in the paint sample WR-PS1 did not exceed the former Federal HPA criterion of 5,000 mg/kg for lead in paint and/or the CCME-CEQG for mercury in soil at a commercial site (24 mg/kg), this yellow paint, if removed from the Site, may be disposed of at an approved landfill facility.

6.6.3 Petroleum Hydrocarbons

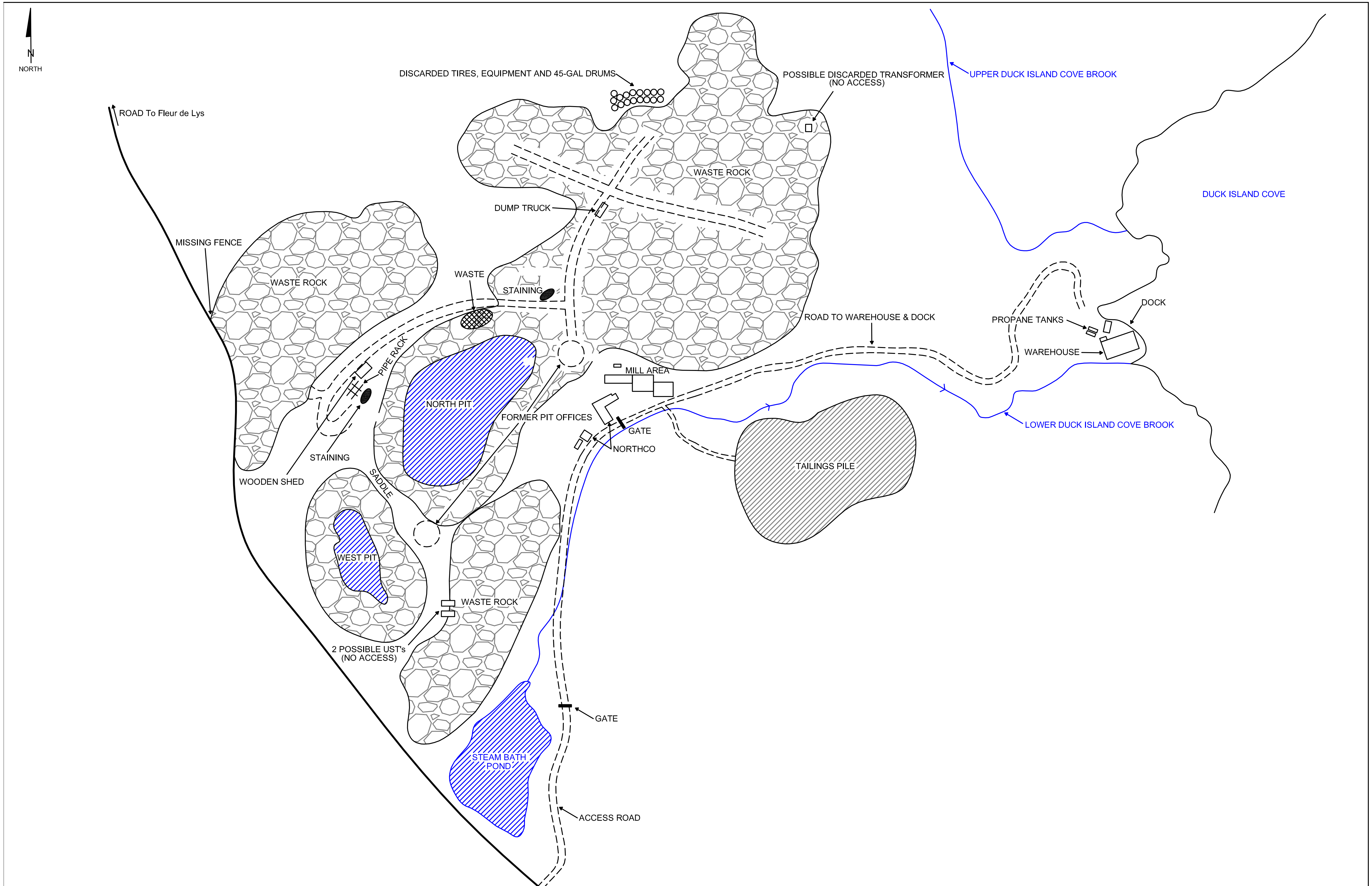
The concentration of modified TPH detected in soil sample WR-TP2-SS1 (<14,900 mg/kg) exceeded the 2003 Atlantic PIRI Tier I RBSL criterion of 7,400 mg/kg for diesel fuel in soil at a commercial site with coarse-grained soil and non-potable groundwater. Soil sample WR-TP2-SS1 was collected within an area of stained soil identified along the pit road, approximately 200 m northwest of the primary crusher building of the Mill Area.

6.6.4 Metals

Concentrations of a chromium and nickel detected in soil sample SP-TP5-SS1 exceeded the applicable assessment criteria for metals in soil at industrial sites. Soil sample WR-TP5-SS1 was collected within the former pit office area located west of the assess road to the primary crusher building of the Mill Area. Based on the testing completed, metal impacts in soil are considered to be widespread throughout the Site.

APPENDIX A-6

FIGURES



NOTES

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM FIGURE.
3. THIS FIGURE IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
5. THIS FIGURE SHOULD NOT BE USED FOR PURPOSES OTHER THAN THOSE OUTLINED ABOVE.
6. THIS FIGURE CONTAINS INTELLECTUAL PROPERTY OF THE DEPARTMENT OF NATURAL RESOURCES AND MAY NOT BE REPRODUCED OR COPIED WITHOUT THEIR WRITTEN CONSENT.
7. THIS FIGURE WAS PRODUCED FROM DOCUMENTS SUPPLIED BY THE CLIENT AND VISUAL OBSERVATIONS.

LEGEND

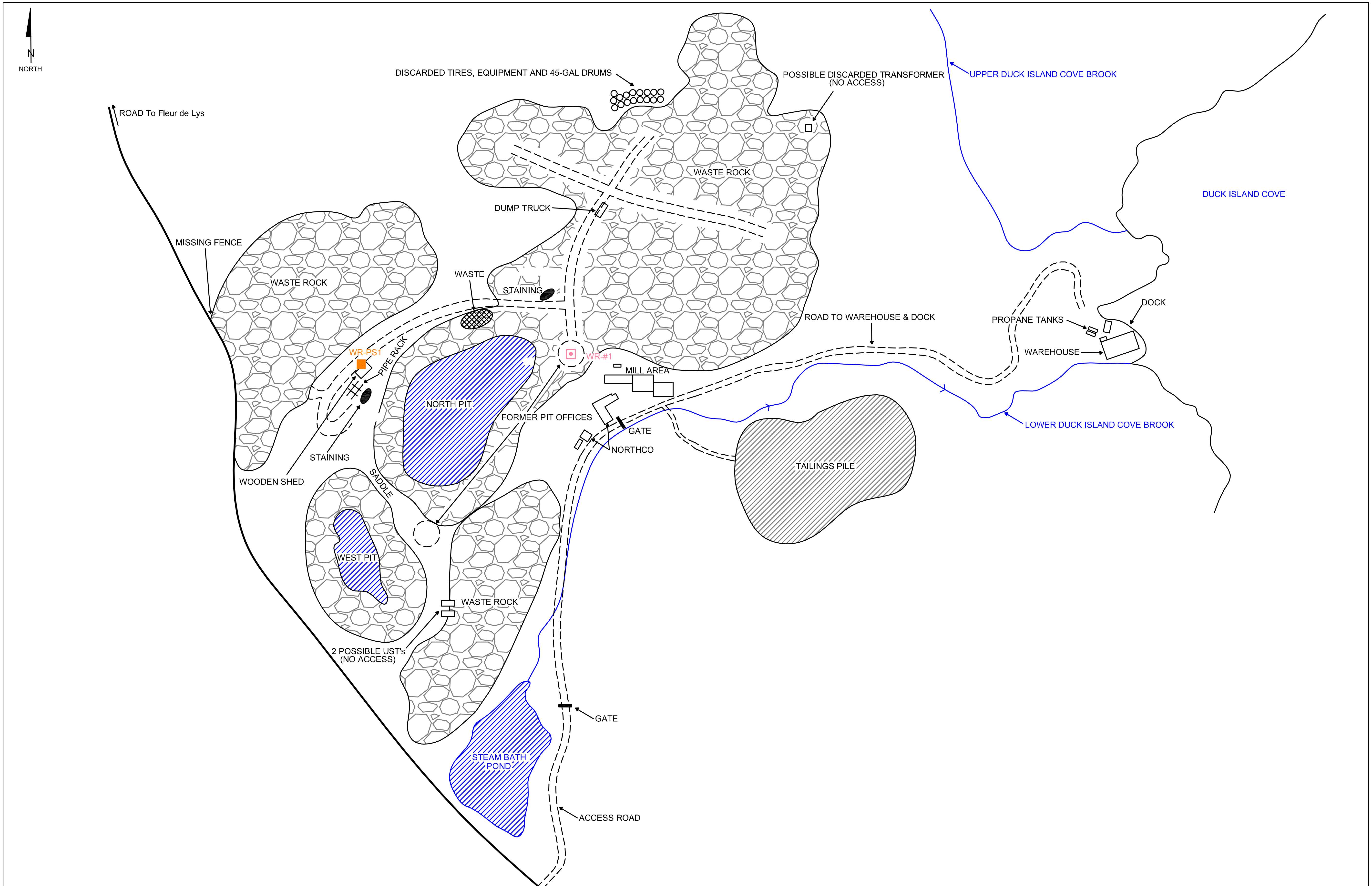
GRAVEL ACCESS ROADS
FLOW DIRECTION

CLIENT
DEPARTMENT OF NATURAL RESOURCES

PROJECT
PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER BAIE VERTE ASBESTOS MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE
WASTE ROCK AND PIT AREAS

SCALE	PROJECT NUMBER	
NTS	TF6126509	
DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	
DRAWING NO.	DATE	REV
6.1	January 2007	



NOTES

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM FIGURE.
3. THIS FIGURE IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
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LEGEND

- GRAVEL ACCESS ROADS
- FLOW DIRECTION
- PAINT SAMPLE
- AIR SAMPLES

CLIENT

DEPARTMENT OF NATURAL RESOURCES

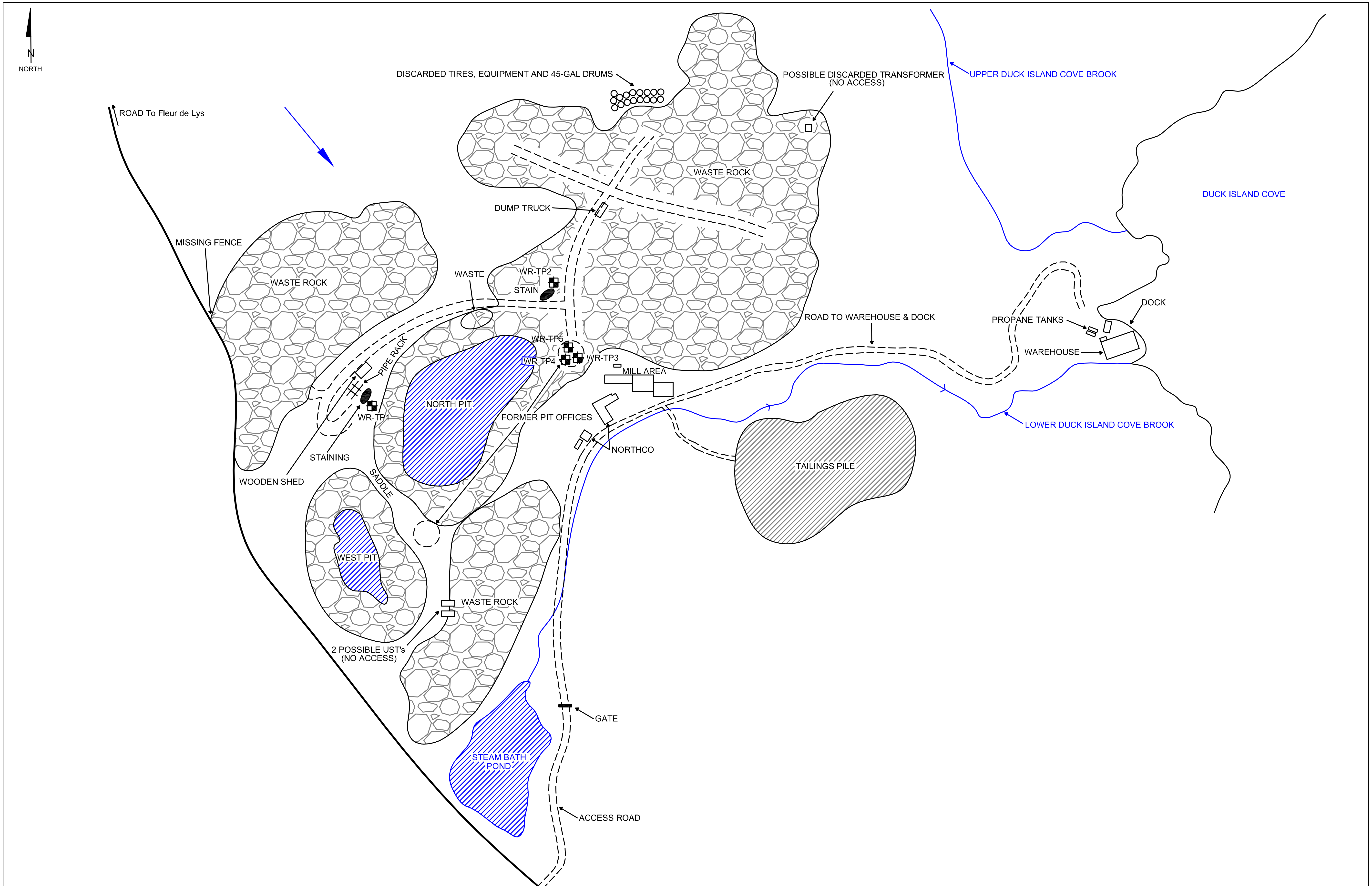
PROJECT

PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER BAIE VERTE ASBESTOS MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE

WASTE ROCK AND PIT AREAS
AIR, ASBESTOS AND PAINT SAMPLE LOCATIONS

SCALE	PROJECT NUMBER	
NTS	TF6126509	
DRAWN BY	REVIEWED BY	APPROVED BY
J. Young	G. Warren	
DRAWING NO.	DATE	REV
6.2	January 2007	



NOTES

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM FIGURE.
3. THIS FIGURE IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THIS REPORT.
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LEGEND

GRAVEL ACCESS ROADS
TEST PIT LOCATION
FLOW DIRECTION
ASSUMED GROUNDWATER FLOW DIRECTION

CLIENT
DEPARTMENT OF NATURAL RESOURCES

PROJECT
PHASE II ENVIRONMENTAL SITE ASSESSMENT
FORMER BAIE VERTE ASBESTOS MINE PROPERTY
BAIE VERTE
NEWFOUNDLAND AND LABRADOR

DRAWING TITLE
WASTE ROCK AND PIT AREAS
TEST PIT LOCATIONS

SCALE		PROJECT NUMBER	
NTS		TF6126509	
DRAWN BY	REVIEWED BY	APPROVED BY	
J. Young	G. Warren		
DRAWING NO.	DATE		REV
6.3	January 2007		

APPENDIX B-6

PHOTOGRAPHIC RECORD

Photo 1: Typical Waste Rock.

Photo 2: North Pit and West Pit.
(Photograph Obtained From NLDOEC)

Photo 3: North Pit – Filled with Water.

Photo 4: Wooden Shed located Northwest of North Pit.

Photo 5: Pipe Holding Rack.

Photo 6: Interior of Wooden Shed.
(Empty)

Photo 7: Area of Stained Soil located South of the Wooden Shed.

Photo 8: Area of Stained Soil located South of the Wooden Shed.

Photo 9: Area of Stained Soil Located Northwest of Mill Area.

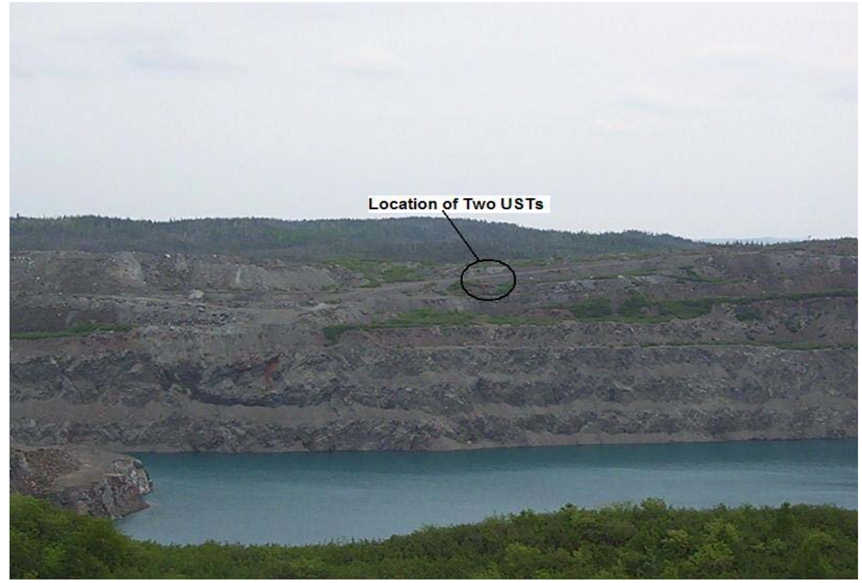

Photo 10: Two Partially Buried USTs observed South of West Pit.
(Unable to Access)

Photo 11: Area of Partially Buried Waste/Debris.
(Northside of North Pit)

Photo 12: Discarded Drums, Tires, Equipment, Etc.
(Northeast of Mill Area)

Photo 13: Asbestos Fibres within Test Pit WR-TP3.
(Former Pit Office Area)

Photo 14: Asbestos Fibres within Test Pit WR-TP4.
(Former Pit Office Area)

Photo 15: Asbestos Fibres within Test Pit WR-TP5.
(Former Pit Office Area)

APPENDIX C-6

TEST PIT LOGS

Department of Natural Resources
Phase II Environmental Site Assessment
Baie Verte Asbestos Mine – Waste Rock and Pit Area

Test Pit Identification Number	Depth From – To (m)	Soil Description
WR-TP1	0.0 - 0.3	ROOTMAT - Grey, SAND and GRAVEL with some fines, cobbles, moist, loose.
	0.3 - 1.8	FILL - Brown, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact.
	1.8 - 3.2	GLACIAL TILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, compact.
	3.2	Test pit terminated in Glacial till.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.
WR-TP2	0.0 - 0.5	FILL - Grey, SAND and GRAVEL with some fines, cobbles, moist, loose.
	0.5 - 1.0	FILL - Grey to dark grey, SAND and GRAVEL with some fines, cobbles and boulders, moist, loose to compact.
	2.7	Test pit terminated in Fill.
		Note: 1) Groundwater was not encountered. 2) Hydrocarbon odour present during excavation.
WR-TP3	0.0 - 3.0	FILL - Grey, SAND and GRAVEL with some fines, cobbles and boulders, asbestos fibers, moist, loose to compact.
	3.0 - 3.5	FILL - Grey crushed stone.
	3.5	Test pit terminated in Fill.
		Note: 1) Groundwater was encountered at 3.3 m depth. 2) No hydrocarbon odour present during excavation.
WR-TP4	0.0 - 1.0	FILL - Grey, asbestos fibers with some sand and gravel, moist to saturated, loose.
	1.0	Test pit terminated in Fill.
		Note: 1) Groundwater encountered at 0.9 m depth. 2) No hydrocarbon odour present during excavation.

Test Pit Identification Number	Depth From – To (m)	Soil Description
WR-TP5	0.0 - 3.0	FILL - Grey, asbestos fibers with some sand and gravel, moist, loose.
	3.0	Test pit terminated in Fill.
		Note: 1) Groundwater was not encountered. 2) No hydrocarbon odour present during excavation.

APPENDIX D-6

SOIL VAPOUR HEADSPACE READINGS

PID READINGS OF SOIL SAMPLES – WASTE ROCK AND PIT AREAS

SAMPLING LOCATION	SOIL SAMPLE ID	SAMPLING DEPTH (m)	PID SVH (PPM)
WR-TP1	WR-TP1-SS1	0.0 – 1.0	0.0
	WR-TP1-SS2	1.0 – 2.0	1.7
	WR-TP1-SS3	2.0 – 3.2	0.0
WR-TP2	WR-TP2-SS1	0.0 – 1.0	32.0
	WR-TP2-SS2	1.0 – 2.0	0.0
	WR-TP2-SS3	2.0 – 2.7	0.0
WR-TP3	WR-TP3-SS1	0.0 – 1.0	0.0
	WR-TP3-SS2	1.0 – 2.0	0.0
	WR-TP3-SS3	2.0 – 3.0	0.0
WR-TP4	WR-TP4-SS1	0.0 – 1.0	0.0
WR-TP5	WR-TP5-SS1	0.0 – 1.0	0.0

Notes:
Shaded cells mean sample submitted for analyses.

APPENDIX E-6

GPS COORDINATES

GPS COORDINATES - NAD27 - WASTE ROCK AND PIT AREAS

Location	Northing	Easting
WR-TP1	557716	5532292
WR-TP2	558559	5537615
WR-TP3	558460	5537368
WR-TP4	558489	5537320
WR-TP5	558366	5537314

APPENDIX F-6

LABORATORY ANALYSES TABLES

Table 6-1: Asbestos in Air - Waste Rock and Pit Areas

Sample ID	Sample Location	Sample Type	Airborne Concentration (fibres/cm^3)
WR#1	Former Pit Office Area	Air	<0.003

Note: Shaded results are above maximum as outlined under “2006 Occupational Exposure Threshold Limit Value (TLV) of 0.1 fibres/cm^3 (ACGIH)

Table 6-2. Lead in Paint - Waste Rock and Pit Areas

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/kg)	Total Lead (mg/kg)
S2006-12084	WR-PS1	Wooden Shed - Exterior Wall	Wood	Yellow Paint	5	**1200**

Notes:
MDL: Method detection limit
<X: Below MDL
Bold and underlined results indicate that lead concentration is above the relevant Federal Hazardous Products Act criterion of 600 mg/kg
Shaded results indicate that lead concentration is above the former Federal Hazardous Products Act criterion of 5000 mg/kg

Table 6-3. Mercury in Paint - Waste Rock and Pit Areas

Lab #	Sample ID	Sample Location	Substrate	Description	MDL (mg/kg)	Total Mercury (mg/kg)
S2006-12084	WR-PS1	Wooden Shed - Exterior Wall	Wood	Yellow Paint	0.01	0.41

Notes:
MDL: Method detection limit
<X: Below MDL
Bold and underlined results indicate that mercury concentration is above the Federal Hazardous Products Act criterion of 10 mg/kg
Shaded results indicate that mercury concentration is above the CCME-CEQG for a commercial property (24 mg/kg)

Table 6-4: BTEX/TPH in Soil - Waste Rock and Pit Areas

		DATA						GUIDELINES			
AVERAGE SAMPLING DEPTH (m)			1.0 - 2.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	1999 CCME-CEQG	2003 ATLANTIC PIRI		
LAB ID		Lab	S2006-11642	S2006-11613	S2006-11363	S2006-11363	S2006-11363	(Updated 2005)	TIER I RBSL[1]		
FIELD ID		Blank	WR-TP1-SS2	WR-TP2-SS1	WR-TP3-SS1	WR-TP4-SS1	WR-TP5-SS1	INDUSTRIAL SITES			
DATE (D/M/Y)			24-Sep-06	24-Sep-06	24-Sep-06	24-Sep-06	24-Sep-06		GASOLINE	DIESEL/#2	#6 OIL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**	**1.8**	**1.8**	**1.8**
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.37**	**160**	**160**	**160**
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.082**	**430**	**430**	**430**
Total Xylenes	0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	**11**	**200**	**200**	**200**
TPH (C6-C10)	10	<10	<10	<10	<10	<10	<10	**-**	**-**	**-**	**-**
TPH (>C10-C21)	10	<10	<10	1970	<10	<10	<10	**-**	**-**	**-**	**-**
TPH (>C21-C32)	50	<50	<50	12900	<50	<50	<50	**-**	**-**	**-**	**-**
Modified TPH (C6-C32)	70	<70	<70	**<14900**	<70	<70	<70	**-**	**450**	**7400**	**10000**
Hydrocarbon Identification		-	-	Chromatogram resembles weathered diesel and heavy oil	-	-	-				

Notes:
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold and underlined data exceeds the CCME-CEQGs
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
1: Tier I RBCA criteria for coarse-grained soils at commercial sites where groundwater is non-potable

Table 6-5: Metals in Soil - Waste Rock and Pit Areas

		DATA		GUIDELINES
AVERAGE SAMPLING DEPTH (m) LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	0.0 - 1.0 S2006-11616 WR-TP5-SS1 24-Sep-06	1999 CCME RECOMMENDED SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	<5	<5	3320	**-**
Antimony	<0.5	<0.5	3.3	**40**
Arsenic	<0.1	<0.1	0.1	**12**
Barium	<0.5	<0.5	<0.5	**2000**
Beryllium	<0.2	<0.2	<0.2	**8**
Bismuth	<0.2	<0.2	1.1	**-**
Cadmium	<0.5	<0.5	<0.5	**22**
Calcium	<25	<25	1440	**-**
Chromium	<1	<1	**779**	**87**
Cobalt	<1	<1	44	**300**
Copper	<1	<1	10	**91**
Iron	<5	<5	25700	**-**
Lead	<5	<5	<5	**600**
Magnesium	<10	<10	165000	**-**
Manganese	<1	<1	502	**-**
Mercury	<0.01	<0.01	0.01	**50**
Molybdenum	<2	<2	<2	**40**
Nickel	<5	<5	**1340**	**50**
Phosphorus	<5	<5	25	**-**
Potassium	<10	<10	18	**-**
Selenium	<0.1	<0.1	<0.1	**3.9**
Silver	<0.25	<0.25	<0.25	**40**
Sodium	<25	<25	207	**-**
Vanadium	<5	<5	12	**130**
Zinc	<2	<2	18	**360**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for commercial sites.

Table 6-6: PAHs in Soil - Waste Rock and Pit Areas

		DATA		GUIDELINES
AVERAGE SAMPLING DEPTH (m) Lab ID FIELD ID DATE (D/M/Y)		Lab Blank	0.0 - 1.0 S2006-11616 WR-TP5-SS1 24-Sep-06	SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Naphthalene	0.002	<0.002	<0.002	**22**
Acenaphthylene	0.001	<0.001	<0.001	**-**
Acenaphthene	0.002	<0.002	<0.002	**-**
Fluorene	0.001	<0.001	<0.001	**-**
Phenanthrene	0.001	<0.001	<0.001	**50**
Anthracene	0.001	<0.001	<0.001	**-**
Fluoranthene	0.001	<0.001	<0.001	**-**
Pyrene	0.003	<0.003	<0.003	**100**
Benzo(a)anthracene	0.001	<0.001	<0.001	**10**
Chrysene	0.001	<0.001	<0.001	**-**
Benzo(b)fluoranthene	0.004	<0.004	<0.004	**10**
Benzo(k)fluoranthene	0.004	<0.004	<0.004	**10**
Benzo(a)pyrene	0.003	<0.003	<0.003	**0.7**
Indeno(123 cd.)pyrene	0.003	<0.003	<0.003	**10**
Dibenzo(ah)anthracene	0.004	<0.004	<0.004	**10**
Benzo(ghi)perylene	0.002	<0.002	<0.002	**-**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for commercial sites.

Table 6-7: PCBs in Soil - Waste Rock Piles Pit Areas

		DATA			GUIDELINES
AVERAGE SAMPLING DEPTH (m) LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	1.0 - 2.0 S2006-11642 WR-TP1-SS2 24-Sep-06	0.0 - 1.0 S2006-11613 WR-TP2-SS1 24-Sep-06	1999 CCME RECOMMENDED SOIL QUALITY GUIDELINES INDUSTRIAL (REVISED 2005)
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Polychlorinated Biphenyls	0.005	<0.005	<0.005	0.202	**33**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
-: VALUE NOT ESTABLISHED
Bold and shaded results indicate that concentration exceeds the CCME CEQG for commercial sites.

SECTION 7.0

FRESHWATER AND MARINE RESOURCES

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APPENDICES

7.0 AREA F – FRESHWATER AND MARINE RESOURCES

7.1 SITE DESCRIPTION

Freshwater resources present at the Site include Steam Bath Pond, Lower Duck Island Cove Brook and Upper Duck Island Cove Brook (refer Figure 7.1, Appendix A-7). Steam Bath Pond is located near the entrance to the Site, at the southwest corner of the property. Lower Duck Island Cove Brook extends from Steam Bath Pond, through the Site and discharges into the waters of Duck Island Cove. Upper Duck Island Cove Brook travels just north of the waste rock piles and discharges into Duck Island Cove.

Marine resources present at the Site are limited to marine environment of Duck Island Cove, located along the eastern boundary of the Site (refer Figure 7.1, Appendix A-7). Reportedly, during operation of the mine, vessel activity was frequent within the harbour, both for the export asbestos product and delivery of Bunker C fuel and other materials to the Site.

7.2 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

7.2.1 Phase I ESA, March 2005

A review of the Phase I ESA completed at the Site revealed the following potential environmental concerns with respect to freshwater and marine resources present at Site:

- Tailings from the tailings pile have eroded into the waters of Lower Duck Island Cove Brook and have created a “beach” of tailings at the mouth of the brook where it discharges its waters into Duck Island Cove. It is likely that the brook is contaminated with asbestos containing tailings throughout its length, as well as the marine sediments of the harbour;
- Environment Canada reported two fuel spills at the Site that resulted in fuel being spilled into the waters of Duck Island Cove. On January 18, 1978 it was reported that an unknown amount of diesel fuel was spilled into the harbour due to a leak from the discharge line of a 45,500 L (10,000-gallon) storage tank. On May 30, 1978 it was reported that an unknown amount of fuel was spilled into the harbour due to a broken casing in a pump connected to a 45,500 L (10,000-gallon) storage tank; and
- It is typical to find certain amounts of debris and other contaminants, such as petroleum hydrocarbons (diesel, gasoline, etc.), heavy metals, polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs) in sediments around vessel berthage Sites. These impacts are a result of various activities associated with berthage Sites, but not limited to indiscriminate dumping, accidental spills during refuelling and general usage waste.

Based on the findings of the Phase I ESA, surface water and sediment sampling programs were recommended to assess the presence/absence of environmental impacts at the Site.

7.3 PHASE II ENVIRONMENTAL SITE ASSESSMENT

The Phase II ESA was carried out in accordance with the DNRMD RFP dated May 2006, AMEC's proposal dated May 26, 2006 and AMEC's Proposed Phase II ESA Sampling Program dated August 21, 2006. Field work was carried out at the Site by Kelly Curtis, CET and Sheldon Adey, CET of AMEC during the period of September 19 to 28, 2006. Sample locations for the investigation were selected in consultation with the DNRMD Project Manager and based on the findings of the previous Phase I ESA completed for the Site. The methodologies used to conduct the field investigations carried out at the Site during the current investigation are described in Section 1.5.

7.3.1 Scope of Work

Based on the findings outlined in the Phase I ESA report, the scope of work for this area of the Site included the following Phase II ESA activities:

- Collecting two surface water samples (SW4 and SW5) from the drainage ditch leading from the north pit to Lower Duck Island Cove Brook for BTEX/TPH, metals plus hydrides and PCB analyses;
- Collecting four surface water samples (SW1 to SW3 and SW6) from Lower Duck Island Cove Brook for BTEX/TPH, metals plus hydrides and PCB analyses;
- Collecting two freshwater sediment samples (SED4 and SED5) from the drainage ditch leading from the north pit to Lower Duck Island Cove Brook for asbestos, BTEX/TPH, metals plus hydrides and PCB analyses;
- Collecting four freshwater sediment samples (SED1 to SED3 and SED6) from Lower Duck Island Cove Brook for asbestos, BTEX/TPH, metals plus hydrides and PCB analyses; and
- Collecting three marine sediment samples (SED7 to SED9) from Duck Island Cove for asbestos, BTEX/TPH, metals plus hydrides, PAH and PCB analyses.

All sample locations are presented on Figure 7.1, Appendix A-7.

7.3.2 GPS Coordinates

AMEC recorded coordinates for all surface water and sediment sample locations using a handheld global positioning system (GPS) unit with an accuracy of +/- 5 m. All GPS coordinates were recorded in UTM NAD27 and are presented in Appendix B-7.

7.3.3 Laboratory Analytical Program

The detailed laboratory analytical program for the Phase II ESA completed at this area of the Site is outlined in Table 7-1 below.

Table 7-1: Detailed Laboratory Analytical Program

Media	Sample ID	Analyses
Surface Water	SW1, SW2, SW3, SW4, SW5, SW6, DUP 11	BTEX/TPH, Metals Plus Hydrides and PCB
Freshwater Sediment	SED1, SED2, SED3, SED4, SED5, SED6, DUP 9	BTEX/TPH, Metals Plus Hydrides, PCB and Asbestos
Marine Sediment	SED7, SED8, SED9	BTEX/TPH, Metals Plus Hydrides, PCB, PAH and Asbestos

Notes:
DUP 9 is a blind field duplicate of sediment sample SED6 for BTEX/TPH, metals plus hydrides, PCB and asbestos analyses
DUP 11 is a blind field duplicate of surface water sample SW6 for BTEX/TPH, metals plus hydrides and PCB analyses

7.4 LABORATORY ANALYTICAL RESULTS

This section provides a summary of laboratory analytical results for surface water and sediment samples collected at the Site during the current investigation. Tables summarizing the analytical results and applicable guidelines are presented in Appendix C-7. Sample locations are presented on Figure 7.1, Appendix A-7 and the Laboratory Certificates of Analyses are presented in Section 11.0.

7.4.1 Surface Water Sample Results

7.4.1.1 Petroleum Hydrocarbons in Surface Water

Six surface water samples (SW1 to SW6), plus one blind field duplicate sample (DUP 11), collected at the Site were analyzed for BTEX/TPH. The analytical results are presented in Table 7-1 and 7-2, Appendix C-7. The results were compared to the CCME-FAL guidelines (revised 2005) and the 2003 Atlantic PIRI Tier I RBSLs for groundwater at a commercial site with coarse-grained soil and non-potable groundwater.

BTEX and TPH were not detected in any of the surface water samples analyzed and therefore are below the applicable assessment criteria.

7.4.1.2 Metals in Surface Water

Six surface water samples (SW1 to SW6), plus one blind field duplicate sample (DUP 11), collected at the Site were analyzed for metals plus hydrides. The analytical results are presented in Tables 7-3 and 7-4, Appendix C-7. The results were compared to the CCME-FAL guidelines (revised 2005).

Concentrations of metals detected in surface water that exceeded the applicable CCME-FAL guidelines are listed below:

SW1

- Aluminum (0.016 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.000073 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L;
- Chromium (0.003 mg/L) exceeded the CCME-FAL of 0.001 mg/L; and
- Iron (0.84 mg/L) exceeded the CCME-FAL of 0.3 mg/L.

SW2

- Aluminum (0.012 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.000043 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L; and
- Chromium (0.002 mg/L) exceeded the CCME-FAL of 0.001 mg/L.

SW3

- Aluminum (0.016 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.000066 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L; and
- Chromium (0.002 mg/L) exceeded the CCME-FAL of 0.001 mg/L.

SW4

- Aluminum (0.006 mg/L) exceeded the CCME-FAL of 0.005 mg/L; and
- Cadmium (0.000053 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L.

SW5

- Aluminum (0.006 mg/L) exceeded the CCME-FAL of 0.005 mg/L; and
- Cadmium (0.000050 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L.

SW6

- Aluminum (0.017 mg/L) exceeded the CCME-FAL of 0.005 mg/L; and
- Chromium (0.002 mg/L) exceeded the CCME-FAL of 0.001 mg/L.

DUP 11 (Duplicate of SW6)

- Aluminum (0.012 mg/L) exceeded the CCME-FAL of 0.005 mg/L;
- Cadmium (0.000019 mg/L) exceeded the CCME-FAL of 0.0000017 mg/L; and
- Chromium (0.002 mg/L) exceeded the CCME-FAL of 0.001 mg/L.

7.4.1.3 PCBs in Surface Water

Six surface water samples (SW1 to SW6), plus one blind field duplicate sample (DUP 11), collected at the Site were analyzed for PCBs. The analytical results are presented in Tables 7-5 and 7-6, Appendix C-7. There is no criterion available for the assessment of the PCBs in surface water. PCBs in surface water were assessed based on presence or absence.

PCBs were not detected (<0.04 mg/L) in any of the surface water samples analyzed.

7.4.2 Freshwater Sediment Sample Results

7.4.2.1 Asbestos in Freshwater Sediment

Six freshwater sediment samples (SED1 to SED6), plus one blind field duplicate sample (DUP 9), collected at the Site were analyzed for asbestos. The analytical results are presented in Table 7-7, Appendix C-7. The results were compared to the "The Asbestos Abatement Regulations", 1998 (Nfld. Reg. 111/98) criterion of 1% asbestos fibres.

Concentrations of asbestos detected in all freshwater sediment samples analyzed exceeded the applicable assessment criterion of 1% asbestos. Concentrations of asbestos detected in freshwater sediment at the Site ranged from 3% (SED6) to 10% (SED4 and SED5).

7.4.2.2 Petroleum Hydrocarbons in Freshwater Sediment

Six freshwater sediment samples (SED1 to SED6), plus one blind field duplicate sample (DUP 9), collected at the Site were analyzed for BTEX/TPH. The analytical results are presented in Tables 7-8 and 7-9, Appendix C-7. There are no criteria available for the assessment of the BTEX/TPH in freshwater sediments. These parameters were assessed based on presence or absence.

BTEX compounds were not detected in any of the freshwater sediment samples analyzed.

Modified TPH was detected in two of the six freshwater sediment samples analyzed with concentrations in the range of <72 mg/kg (SED5) to <1,120 mg/kg (SED4). Petroleum hydrocarbons detected in sediment resembled diesel and heavy oil.

7.4.2.3 Metals in Freshwater Sediment

Six freshwater sediment samples (SED1 to SED6), plus one blind field duplicate sample (DUP 9), collected at the Site were analyzed for metals plus hydrides. The analytical results are presented in Tables 7-10 and 7-11, Appendix C-7. The results were compared to the CCME Interim Sediment Quality Guidelines (CCME-ISQGs) and Probable Effect Levels (CCME-PELs) for freshwater sediments.

Concentrations of metals detected in sediment that exceeded the applicable CCME guidelines for freshwater sediments are listed below:

<u>SED1</u>

- Chromium (792 mg/kg) exceeded the CCME-ISQG (37.3 mg/kg) and the CCME-PEL (90 mg/kg).

<u>SED2</u>

- Chromium (771 mg/kg) exceeded the CCME-ISQG (37.3 mg/kg) and the CCME-PEL (90 mg/kg).

<u>SED3</u>

- Chromium (425 mg/kg) exceeded the CCME-ISQG (37.3 mg/kg) and the CCME-PEL (90 mg/kg).

SED4

- Chromium (1,150 mg/kg) exceeded the CCME-ISQG (37.3 mg/kg) and the CCME-PEL (90 mg/kg);
- Copper (61 mg/kg) exceeded the CCME-ISQG (37.5 mg/kg); and
- Zinc (213 mg/kg) exceeded the CCME-ISQG (123 mg/kg).

SED5

- Chromium (898 mg/kg) exceeded the CCME-ISQG (37.3 mg/kg) and the CCME-PEL (90 mg/kg).

SED6

- Arsenic (11.0 mg/kg) exceeded the CCME-ISQG (5.9 mg/kg); and
- Chromium (323 mg/kg) exceeded the CCME-ISQG (37.3 mg/kg) and the CCME-PEL (90 mg/kg).

DUP 9 (Duplicate of SED6)

- Arsenic (11.4 mg/kg) exceeded the CCME-ISQG (5.9 mg/kg); and
- Chromium (327 mg/kg) exceeded the CCME-ISQG (37.3 mg/kg) and the CCME-PEL (90 mg/kg).

7.4.2.4 PCBs in Freshwater Sediment

Six freshwater sediment samples (SED1 to SED6), plus one blind field duplicate sample (DUP 9), collected at the Site were analyzed for PCBs. The analytical results are presented in Tables 7-12 and 7-13, Appendix C-7. The results were compared to the CCME-ISQGs and CCME-PELs for freshwater sediments.

PCBs were not detected in any of the sediment samples analyzed and therefore are below the applicable assessment criteria.

7.4.3 Marine Sediment Sample Results

7.4.3.1 Asbestos in Marine Sediment

Three marine sediment samples (SED7 to SED9) collected at the Site were analyzed for asbestos. The analytical results are presented in Table 7-14, Appendix C-7. The results were compared to the “The Asbestos Abatement Regulations”, 1998 (Nfld. Reg. 111/98) criterion of 1% asbestos fibres.

Concentrations of asbestos detected in all three marine sediment samples analyzed exceeded the applicable assessment criterion of 1% asbestos. Concentrations of asbestos detected in marine sediment at the Site ranged from 20% (SED7) to 75% (SED8).

7.4.3.2 Petroleum Hydrocarbons in Marine Sediment

Three marine sediment samples (SED7 to SED9) collected at the Site were analyzed for BTEX/TPH. The analytical results are presented in Table 7-15, Appendix C-7. There are no criteria available for the assessment of the BTEX/TPH in marine sediments. These parameters were assessed based on presence or absence.

Ethylbenzene was detected in marine sediment sample SED9 at a concentration of 0.025 mg/kg. BTEX was not detected in any of the remaining sediment samples analyzed.

Modified TPH was detected in two of the three marine sediment samples analyzed with concentrations in the range of <199 mg/kg (SED8) to <285 mg/kg (SED9). Petroleum hydrocarbon detected in sediment resembled weathered diesel and heavy oil.

7.4.3.3 Metals in Marine Sediment

Three marine sediment samples (SED7 to SED9) collected at the Site were analyzed for metals plus hydrides. The analytical results are presented in Table 7-16, Appendix C-7. The results were compared to the CCME-ISQGs and CCME-PELs for marine sediments.

Concentrations of metals detected in sediment that exceeded the applicable CCME guidelines for marine sediments are listed below:

<u>SED7</u>
- Chromium (488 mg/kg) exceeded the CCME-ISQG (52.3 mg/kg) and the CCME-PEL (160 mg/kg); and
- Copper (686 mg/kg) exceeded the CCME-ISQG (18.7 mg/kg) and the CCME-PEL (108 mg/kg).

<u>SED8</u>
- Chromium (499 mg/kg) exceeded the CCME-ISQG (52.3 mg/kg) and the CCME-PEL (160 mg/kg); and
- Copper (496 mg/kg) exceeded the CCME-ISQG (18.7 mg/kg) and the CCME-PEL (108 mg/kg).

<u>SED9</u>
- Chromium (681 mg/kg) exceeded the CCME-ISQG (52.3 mg/kg) and the CCME-PEL (160 mg/kg); and
- Copper (96 mg/kg) exceeded the CCME-ISQG (18.7 mg/kg).

7.4.3.4 PAHs in Marine Sediment

Three marine sediment samples (SED7 to SED9) collected at the Site were analyzed for PAHs. The analytical results are presented in Table 7-17, Appendix C-7. The results are compared to the CCME-ISQGs and CCME-PELs for marine sediments.

The concentration of fluoranthene (0.180 mg/kg) detected in marine sediment sample SED8 exceeded the CCME-ISQG of 0.133 mg/kg. Concentrations of PAHs in all other sediment samples analyzed were either non-detect or detected at levels below the applicable CCME-ISQGs and CCME-PELs.

7.4.3.5 PCBs in Marine Sediment

Three marine sediment samples (SED7 to SED9) collected at the Site were analyzed for PCBs. The analytical results are presented in Table 7-18, Appendix C-7. The results are compared to the CCME-ISQGs and CCME-PELs for marine sediments.

PCBs were not detected in any of the marine sediment samples analyzed and therefore are below the applicable assessment criteria.

7.5 DISCUSSION OF CONTAMINANTS OF CONCERN

Based on the findings of this Phase II ESA the following discussions of contaminants of concern (COC) investigated are provided.

7.5.1 Asbestos

Asbestos fibres were detected and above the applicable assessment criterion in all the freshwater and marine sediment samples collected at the Site. Based on the testing completed, the sediments within the drainage ditch, Lower Duck Island Cove Brook and Duck Island Cove are impacted with asbestos.

7.5.2 Metals

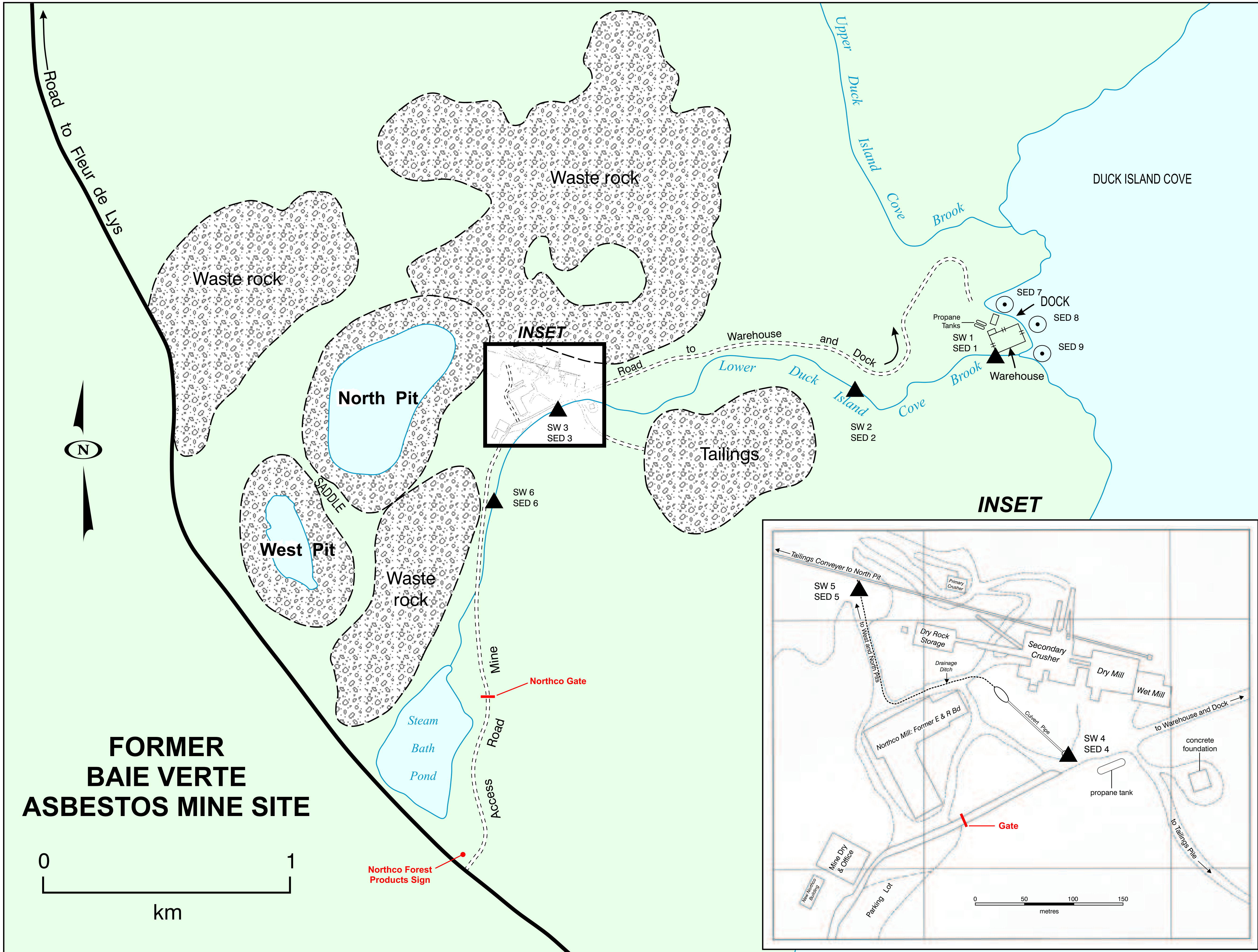
Concentrations of a combination of metals detected in all six surface water and nine sediment samples collected at the Site during the current investigation exceeded the applicable assessment guidelines. Based on the testing completed, metal impacts detected in surface water and sediment are considered to be widespread throughout the Site. Metal impacts in surface water and sediment may be related to background geology conditions in the area.

7.5.3 PAHs

The concentration of fluoranthene (0.180 mg/kg) detected in one marine sediment (SED8), collected from Duck Island Cove, exceeded the CCME-ISQG of 0.133 mg/kg. Concentrations of PAHs in all other sediment samples analyzed were either non-detect or detected at levels below the CCME-ISQGs and CCME-PELs for marine sediments. Based on the testing completed, PAH impacts detected in marine sediment are considered to be isolated.

APPENDIX A-7

FIGURES



NOTES

THIS DRAWING IS BASED ON DRAWINGS PROVIDED BY THE DEPARTMENT OF FOREST, RESOURCES, AND AGRIFOODS.

IT IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION IN SUPPORT OF THIS REPORT.

ALL LOCATIONS, DIMENSIONS AND ORIENTATIONS ARE APPROXIMATE.

THIS DRAWING SHOULD NOT BE USED FOR PURPOSES OTHER THAN THOSE OUTLINED ABOVE.

▲ FRESHWATER SURFACE WATER AND SEDIMENT SAMPLE LOCATIONS

⊙ MARINE SEDIMENT SAMPLE LOCATIONS

CONSULTANT

CLIENT

DEPARTMENT OF
NATURAL RESOURCES

PROJECT

PHASE II ESA
FORMER BAIE VERTE ASBESTOS MINE PROPERTY
BAIE VERTE, NL.

TITLE

BAIE VERTE MINE SITE PLAN
SURFACE WATER AND SEDIMENT
SAMPLE LOCATIONS

DRAWN: J. Young	SCALE: NTS
CHECKED: G. Warren	FIG. NO. 7.1
DATE: January 2007	FILENO. Tf6126509

APPENDIX B-7

GPS COORDINATES

GPS COORDINATES - NAD27 - FRESHWATER AND MARINE

Location	Northing	Easting
SW1/SED1	560729	5537449
SW2/SED2	560147	5537085
SW3/SED3	558846	5537120
SW4/SED4	558784	5537120
SW5/SED5	558602	5537278
SW6/SED6	558541	5536566
SED7	560605	5537532
SED8	560715	5537501
SED9	560773	5537454

APPENDIX C-7

LABORATORY ANALYSES TABLES

Table 7-1: BTEX/TPH in Surface Water

		DATA				GUIDELINES	
LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	S2006-11623 SW 1 28-Sep-06	S2006-11624 SW 2 28-Sep-06	S2006-11625 SW 3 28-Sep-06	CCME CEQGs (REVISED 2005) FAL	2003 ATLANTIC PIRI TIER I RBSL*
PARAMETERS	MDL (µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Benzene	0.2	<0.4	<0.4	<0.4	<0.4	**370**	**6900**
Toluene	0.2	<0.4	<0.4	<0.4	<0.4	**2**	**20000**
Ethylbenzene	0.3	<0.6	<0.6	<0.6	<0.6	**90**	**20000**
Total Xylene	0.7	<0.8	<0.8	<0.8	<0.8	**-**	**20000**
TPH (C6-C10)	50	<50	<50	<50	<50	**-**	**-**
TPH (>C10-C21)	50	<50	<50	<50	<50	**-**	**-**
TPH (>C21-<C32)	50	<50	<50	<50	<50	-	**-**
Modified TPH (C6-C32)	150	<150	<150	<150	<150	**-**	**20000**
Hydrocarbon Identification		-	-	-	-		

Notes:
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
FAL: Freshwater Aquatic Life
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold faced guidelines reflect those most applicable to current land use designation
Bold and underlined data exceeds the CCME-FAL
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
-: VALUE NOT ESTABLISHED
*: Tier I RBCA criteria for gasoline, diesel/#2 and #6 oil in coarse grained soils at commercial sites where groundwater is non-potable

Table 7-2: BTEX/TPH in Surface Water

		DATA				GUIDELINES	
LAB ID FIELD ID DATE (D/M/Y)		S2006-11626 SW 4 28-Sep-06	S2006-11627 SW 5 28-Sep-06	S2006-11696 SW 6 28-Sep-06	S2006-11698 DUP 11 28-Sep-06	CCME CEQGs (REVISED 2005) FAL	2003 ATLANTIC PIRI TIER I RBSL*
PARAMETERS	MDL (µg/L)	(µg/L)	(ug/L)	(ug/L)	(µg/L)	(µg/L)	(µg/L)
Benzene	0.2	<0.4	<0.4	<0.4	<0.4	**370**	**6900**
Toluene	0.2	<0.4	<0.4	<0.4	<0.4	**2**	**20000**
Ethylbenzene	0.3	<0.6	<0.6	<0.6	<0.6	**90**	**20000**
Total Xylene	0.7	<0.8	<0.8	<0.8	<0.8	**-**	**20000**
TPH (C6-C10)	50	<50	<50	<50	<50	**-**	**-**
TPH (>C10-C21)	50	<50	<50	<50	I/S	**-**	**-**
TPH (>C21-<C32)	50	<50	<50	<50	I/S	-	**-**
Modified TPH (C6-C32)	150	<150	<150	<150	I/S	**-**	**20000**
Hydrocarbon Identification		-	-	-	-		

Notes:
MDL: Method detection limit
<X: not detected above MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
FAL: Freshwater Aquatic Life
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
Bold faced guidelines reflect those most applicable to current land use designation
Bold and underlined data exceeds the CCME-FAL
Shaded and bold faced data exceeds recommended 2003 Atlantic PIRI RBSL
-: VALUE NOT ESTABLISHED
*: Tier I RBCA criteria for gasoline, diesel/#2 and #6 oil in coarse grained soils at commercial sites where groundwater is non-potable
I/S - Insufficient sample to run the analysis
DUP 11 is a blind field duplicate of surface water sample SW 6

Table 7-3: Metals Plus Hydrides in Surface Water

		DATA				GUIDELINES
LAB ID REPORT ID DATE		Lab Blank	S2006-11623 SW 1 25-Sep-06	S2006-11624 SW 2 25-Sep-06	S2006-11625 SW 3 25-Sep-06	CCME-CEQGs (REVISED 2005) FAL
PARAMETERS	MDL (mg/L)	(mg/L)	(mg/L)		(mg/L)	(mg/L)
Aluminum	0.001	<0.001	**0.016**	**0.012**	**0.016**	**0.005-0.1**
Antimony	0.001	<0.001	<0.001	<0.001	<0.001	**-**
Arsenic	0.001	<0.001	<0.001	<0.001	<0.001	**0.005**
Barium	0.001	<0.001	0.008	0.009	0.009	**-**
Beryllium	0.001	<0.001	<0.001	<0.001	<0.001	**-**
Cadmium	0.000015	<0.000015	**0.000073**	**0.000043**	**0.000066**	**0.000017**
Calcium	0.5	<0.5	36.7	39.0	40.9	**-**
Chromium	0.001	<0.001	**0.003**	**0.002**	**0.002**	**0.001**
Cobalt	0.001	<0.001	<0.001	<0.001	<0.001	**-**
Copper	0.001	<0.001	0.002	0.003	0.002	**0.002-0.004**
Iron	0.01	<0.01	**0.84**	0.05	0.16	**0.3**
Lead	0.002	<0.002	<0.002	<0.002	<0.002	**0.001-0.007**
Magnesium	0.02	<0.02	72.7	78.7	57.2	**-**
Manganese	0.001	<0.001	0.006	0.005	0.007	**-**
Mercury	0.0001	<0.00005	<0.00005	<0.00005	<0.00005	**0.0001**
Molybdenum	0.002	<0.002	<0.002	<0.002	<0.002	**-**
Nickel	0.001	<0.001	0.006	0.005	0.004	**0.025-0.15**
Phosphorus	0.02	<0.02	<0.02	<0.02	<0.02	**-**
Potassium	0.02	<0.02	2.33	2.50	2.47	**-**
Selenium	0.001	<0.001	<0.001	<0.001	<0.001	**0.001**
Silver	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	**0.0001**
Sodium	0.5	<0.5	29.6	31.6	36.0	**-**
Vanadium	0.005	<0.005	<0.005	<0.005	<0.005	**-**
Zinc	0.005	<0.005	0.005	<0.005	<0.005	**0.03**

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
FAL: Freshwater Aquatic Life
(#): Data in brackets indicate laboratory replicate sample results
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED

Table 7-4: Metals Plus Hydrides in Surface Water

		DATA				GUIDELINES
LAB ID REPORT ID DATE		S2006-11626 SW 4 25-Sep-06	S2006-11627 SW 5 25-Sep-06	S2006-11696 SW 6 28-Sep-06	S2006-11698 DUP 11 28-Sep-06	CCME-CEQGs (REVISED 2005) FAL
PARAMETERS	MDL (mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Aluminum	0.001	**0.006**	**0.006**	**0.017**	**0.012**	**0.005-0.1**
Antimony	0.001	<0.001	<0.001	<0.001	<0.001	**-**
Arsenic	0.001	<0.001	<0.001	<0.001	<0.001	**0.005**
Barium	0.001	0.014	0.013	0.001	0.001	**-**
Beryllium	0.001	<0.001	<0.001	<0.001	<0.001	**-**
Cadmium	0.000015	**0.000053**	**0.000050**	<0.000015	**0.000019**	**0.000017**
Calcium	0.5	63.6	72.2	10.6	11.1	**-**
Chromium	0.001	<0.001	<0.001	**0.002**	**0.002**	**0.001**
Cobalt	0.001	<0.001	<0.001	<0.001	<0.001	**-**
Copper	0.001	0.001	<0.001	0.002	0.001	**0.002-0.004**
Iron	0.01	0.09	0.17	0.07	0.05	**0.3**
Lead	0.002	<0.002	<0.002	<0.002	<0.002	**0.001-0.007**
Magnesium	0.02	77.1	33.5	28.2	28.6	**-**
Manganese	0.001	0.005	0.001	0.012	0.01	**-**
Mercury	0.0001	<0.00005	<0.00005	<0.00005	<0.00005	**0.0001**
Molybdenum	0.002	<0.002	<0.002	<0.002	<0.002	**-**
Nickel	0.001	0.001	0.001	0.005	0.004	**0.025-0.15**
Phosphorus	0.02	<0.02	<0.02	<0.02	<0.02	**-**
Potassium	0.02	3.67	3.17	0.69	0.73	**-**
Selenium	0.001	<0.001	<0.001	<0.001	<0.001	**0.001**
Silver	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	**0.0001**
Sodium	0.5	56.4	58.4	7.5	8.2	**-**
Vanadium	0.005	<0.005	<0.005	<0.005	<0.005	**-**
Zinc	0.005	<0.005	<0.005	<0.005	<0.005	**0.03**

Notes:
MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
CEQG: Canadian Environment Quality Guidelines
FAL: Freshwater Aquatic Life
(#): Data in brackets indicate laboratory replicate sample results
Bold faced guidelines reflect those most applicable to current land use designation
-: VALUE NOT ESTABLISHED
Shaded data exceeds both the CCME FAL Criteria
DUP 11 is a blind field duplicate of surface water sample SW 6

Table 7-5: PCBs in Surface Water

		DATA				GUIDELINES	
						1999 CCME RECOMMENDED CANADIAN QUALITY GUIDELINES (REVISED 2005)	
LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	S2006-11623 SW 1 28-Sep-06	S2006-11624 SW 2 28-Sep-06	S2006-11625 SW 3 28-Sep-06	ISQG	PEL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Polychlorinated Biphenyls	0.04	<0.04	<0.04	<0.04	<0.04	-	-

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim marine sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
-: VALUE NOT ESTABLISHED
Underlined and bold data exceed the CCME ISQG criteria/guideline(s)
Shaded data exceed the CCME PEL criteria/guideline(s)

Table 7-6: PCBs in Surface Water

		DATA				GUIDELINES	
LAB ID FIELD ID		S2006-11626 SW 4	S2006-11627 SW 5	S2006-11696 SW 6	S2006-11698 DUP 11	1999 CCME RECOMMENDED CANADIAN QUALITY GUIDELINES (REVISED 2004)	
DATE (D/M/Y)		09/28/06	28-Sep-06	28-Sep-06	28-Sep-06	ISQG	PEL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Polychlorinated Biphenyls	0.04	<0.04	<0.04	<0.04	<0.04	-	-

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim marine sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
-: VALUE NOT ESTABLISHED
Underlined and bold data exceed the CCME ISQG criteria/guideline(s)
Shaded data exceed the CCME PEL criteria/guideline(s)
DUP 11 is a blind field duplicate of surface water sample SW 6

Table 7-7: Asbestos in Freshwater Sediment

Sample ID	Sample Location	Sample Type	Asbestos Fibre %		
			Chrysotile	Amosite	other asbestos fibres
SED 1	Warehouse	Sediment	5	nd	nd
SED 2	Tailings Area	Sediment	8	nd	nd
SED 3	Mill Buildings Area	Sediment	6	nd	nd
SED 4	Mill Buildings Area	Sediment	10	nd	nd
SED 5	Dry Rock Storage Area	Sediment	10	nd	nd
SED 6	Waste Rock Stockpile	Sediment	3	nd	nd
DUP 9	Waste Rock Stockpile	Sediment	3	nd	nd

Note: Shaded results are above maximum as outlined under "The Asbestos Abatement Regulations, 1998 (Nfld. Reg. 111/98) of 1 % asbestos fibers.
nd: not detected
DUP 9 is a blind field duplicate of sediment sample SED 6

Table 7-8: BTEX/TPH in Freshwater Sediment

		DATA				GUIDELINES	
AVERAGE SAMPLING DEPTH (m) LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	0.0 - 0.3 S2006-11617 SED 1 25-Sep-06	0.0 - 0.3 S2006-11618 SED 2 25-Sep-06	0.0 - 0.3 S2006-11619 SED 3 25-Sep-06	1999 CCME RECOMMENDED SEDIMENT QUALITY GUIDELINES (REVISED 2005) ISQG	 PEL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	-	-
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	-	-
Ethylbenzene	0.01	<0.02	<0.02	<0.02	<0.02	-	-
Total Xylene	0.06	<0.06	<0.06	<0.06	<0.06	-	-
TPH (C6-C10)	10	<10	<10	<10	<10	-	-
TPH (>C10-C21)	10	<10	<10	<10	<10	-	-
TPH (>C21-<C32)	50	<50	<50	<50	<50	-	-
Modified TPH	70	<70	<70	<70	<70	-	-
Hydrocarbon Identification		-	-	-	-		

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim freshwater sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
N/R - Analyses not required
-: VALUE NOT ESTABLISHED

Table 7-9: BTEX/TPH in Freshwater Sediment

		DATA				GUIDELINES	
AVERAGE SAMPLING DEPTH (m)		0.0 - 0.3	0.0 - 0.3	0.0 - 0.3	0.0 - 0.3	1999 CCME RECOMMENDED SEDIMENT QUALITY GUIDELINES (REVISED 2005)	
LAB ID		S2006-11620	S2006-11621	S2006-11622	S2006-11629		
FIELD ID		SED 4	SED 5	SED 6	DUP 9		
DATE (D/M/Y)		25-Sep-06	25-Sep-06	26-Sep-06	26-Sep-06	ISQG	PEL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	-	-
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	-	-
Ethylbenzene	0.01	<0.02	<0.02	<0.02	<0.02	-	-
Total Xylene	0.06	<0.06	<0.06	<0.06	<0.06	-	-
TPH (C6-C10)	10	<10	<10	<10	<10	-	-
TPH (>C10-C21)	10	46	12	<10	<10	-	-
TPH (>C21-<C32)	50	1060	<50	<50	<50	-	-
Modified TPH	70	<1120	<72	<70	<70	-	-
Hydrocarbon Identification		Chromatogram resembles diesel and heavy oil	Too low to identify	-	-		

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim freshwater sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
N/R - Analyses not required
-: VALUE NOT ESTABLISHED
DUP 9 is a blind field duplicate of sediment sample SED 6

Table 7-10: Metals Plus Hydrides in Freshwater Sediment

		DATA				GUIDELINES	
AVERAGE SAMPLING DEPTH (m) LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	0.0 - 0.3 S2006-11617 SED 1 25-Sep-06	0.0 - 0.3 S2006-11618 SED 2 25-Sep-06	0.0 - 0.3 S2006-11619 SED 3 25-Sep-06	1999 CCME RECOMMENDED SEDIMENT QUALITY GUIDELINES (REVISED 2005) ISQG	PEL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	5	<5	3540	5460	15100	-	-
Antimony	0.5	<0.5	3.0	2.9	2.5	-	-
Arsenic	0.5	<0.1	0.5	0.3	4.0	**5.9**	**17**
Barium	0.5	<0.5	1.6	2.7	14.4	-	-
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	-	-
Bismuth	0.2	<0.2	0.8	0.9	0.5	-	-
Cadmium	0.5	<0.5	<0.5	<0.5	<0.5	**0.6**	**3.5**
Calcium	25	<25	1150	2080	3120	-	-
Chromium	1	<1	**792**	**771**	**425**	**37.3**	**90**
Cobalt	1	<1	44	52	26	-	-
Copper	1	<1	10	15	21	**37.5**	**197**
Iron	5	<5	17400	24300	35500	-	-
Lead	5	<5	<5	<5	<5	**35**	**91.3**
Magnesium	10	<10	153000	183000	55600	-	-
Manganese	1	<1	493	651	578	-	
Mercury	0.01	<0.01	<0.01	0.01	<0.01	**0.17**	**0.486**
Molybdenum	2	<2	<2	<2	<2	-	-
Nickel	5	<5	1400	1740	239	-	-
Phosphorus	5	<5	35	75	487	-	-
Potassium	10	<10	66	108	507	-	-
Selenium	0.5	<0.1	<0.1	<0.1	<0.1	-	-
Silver	0.25	<0.25	<0.25	<0.25	<0.25	-	-
Sodium	25	<25	221	212	213	-	-
Vanadium	5	<5	10	16	48	-	-
Zinc	2	<2	19	29	39	**123**	**315**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim freshwater sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
-: VALUE NOT ESTABLISHED
Underlined and bold data exceed the CCME ISQG criteria/guideline(s)
Shaded data exceed the CCME PEL criteria/guideline(s)

Table 7-11: Metals Plus Hydrides in Freshwater Sediment

		DATA				GUIDELINES	
AVERAGE SAMPLING DEPTH (m) LAB ID FIELD ID DATE (D/M/Y)		0.0 - 0.3 S2006-11620 SED 4 25-Sep-06	0.0 - 0.3 S2006-11621 SED 5 25-Sep-06	0.0 - 03.3 S2006-11622 SED 6 25-Sep-06	0.0 -0.3 S2006-11629 DUP 9 25-Sep-06	1999 CCME RECOMMENDED SEDIMENT QUALITY GUIDELINES (REVISED 2005) ISQG	 PEL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	5	14600	7910	19100	19800	-	-
Antimony	0.5	5.4	4.0	2.1	2.3	-	-
Arsenic	0.5	3.2	5.7	**<u>11.0</u>**	**<u>11.4</u>**	**5.9**	**17**
Barium	0.5	9.3	1.1	13.7	13.6	-	-
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	-	-
Bismuth	0.2	1.9	1.2	0.4	0.6	-	-
Cadmium	0.5	<0.5	<0.5	<0.5	<0.5	**0.6**	**3.5**
Calcium	25	11800	2760	4170	3520	-	-
Chromium	1	**<u>1150</u>**	**<u>898</u>**	**<u>323</u>**	**<u>327</u>**	**37.3**	**90**
Cobalt	1	82	53	28	30	-	-
Copper	1	**<u>61</u>**	31	23	37	**37.5**	**197**
Iron	5	70000	15900	41600	42800	-	-
Lead	5	6	<5	<5	<5	**35**	**91.3**
Magnesium	10	275000	182000	4000	45600	-	-
Manganese	1	1490	674	1500	1500	-	
Mercury	0.01	<0.01	<0.01	<0.01	<0.01	**0.17**	**0.486**
Molybdenum	2	<2	<2	<2	<2	-	-
Nickel	5	2480	7600	165	226	-	-
Phosphorus	5	301	130	426	476	-	-
Potassium	10	534	185	251	290	-	-
Selenium	0.5	<0.1	<0.1	<0.1	<0.1	-	-
Silver	0.25	<0.25	<0.25	<0.25	<0.25	-	-
Sodium	25	332	206	150	169	-	-
Vanadium	5	56	29	70	65	-	-
Zinc	2	**<u>213</u>**	49	51	52	**123**	**315**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim freshwater sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
-: VALUE NOT ESTABLISHED
Underlined and bold data exceed the CCME ISQG criteria/guideline(s)
Shaded data exceed the CCME PEL criteria/guideline(s)
DUP 9 is a blind field duplicate of sediment sample SED 6

Table 7-12. PCBs in Freshwater Sediment

		DATA				GUIDELINES	
AVERAGE SAMPLING DEPTH (m)			0.0 - 0.3	0.0 - 0.3	0.0 - 0.3	1999 CCME RECOMMENDED CANADIAN SEDIMENT QUALITY GUIDELINES (REVISED 2005)	
LAB ID		Lab	S2006-11617	S2006-11618	S2006-11619		
FIELD ID		Blank	SED 1	SED2	SED3		
DATE (D/M/Y)			25-Sep-06	25-Sep-06	25-Sep-06	ISQG	PEL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Polychlorinated Biphenyls	0.005	<0.005	<0.005	<0.005	<0.005	**0.0341**	**0.2770**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim freshwater sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
-: VALUE NOT ESTABLISHED
Underlined and bold data exceed the CCME ISQG criteria/guideline(s)
Shaded data exceed the CCME PEL criteria/guideline(s)

Table 7-13: PCBs in Freshwater Sediment

		DATA				GUIDELINES	
AVERAGE SAMPLING DEPTH (m)		0.0 - 0.3	0.0 - 0.3	0.0 - 0.3	0.0 - 0.3	1999 CCME RECOMMENDED CANADIAN SEDIMENT QUALITY GUIDELINES (REVISED 2004)	
LAB ID		S2006-11620	S2006-11621	S2006-11622	S2006-11629		
FIELD ID		SED 4	SED 5	SED6	DUP 9		
DATE (D/M/Y)		09/25/06	25-Sep-06	25-Sep-06	25-Sep-06	ISQG	PEL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Polychlorinated Biphenyls	0.005	<0.005	<0.005	<0.005	<0.005	**0.0341**	**0.2770**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim marine sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
-: VALUE NOT ESTABLISHED
Underlined and bold data exceed the CCME ISQG criteria/guideline(s)
Shaded data exceed the CCME PEL criteria/guideline(s)
DUP 9 is a blind field duplicate of sediment sample SED 6

Table 7-14: Asbestos in Marine Sediment

Sample ID	Sample Location	Sample Type	Asbestos Fibre %		
			Chrysotile	Amosite	other asbestos fibres
SED 7	Warehouse	Sediment	20	nd	nd
SED 8	Warehouse	Sediment	75	nd	nd
SED 9	Warehouse	Sediment	60	nd	nd

Note: Shaded results are above maximum as outlined under "The Asbestos Abatement Regulations, 1998 (Nfld. Reg. 111/98) of 1 % asbestos fibers.
nd: not detected

Table 7-15: BTEX/TPH in Marine Sediment

						GUIDELINES	
AVERAGE SAMPLING DEPTH (m) LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	0.0 - 0.3 S2006-11699 SED 7 28-Sep-06	0.0 - 0.3 S2006-11700 SED 8 28-Sep-06	0.0 - 0.3 S2006-11701 SED 9 28-Sep-06	1999 CCME RECOMMENDED SEDIMENT QUALITY GUIDELINES (REVISED 2004) ISQG	PEL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	-	-
Toluene	0.01	<0.01	<0.01	<0.01	0.025	-	-
Ethylbenzene	0.01	<0.02	<0.02	<0.02	<0.02	-	-
Total Xylene	0.06	<0.06	<0.06	<0.06	<0.06	-	-
TPH (C6-C10)	10	<10	<10	<10	<10	-	-
TPH (>C10-C21)	10	<10	<10	22	34	-	-
TPH (>C21-<C32)	50	<50	<50	167	241	-	-
Modified TPH	70	<70	<70	<199	<285	-	-
Hydrocarbon Identification		-	-	Chromatogram resembles weathered diesel and heavy oil	Chromatogram resembles weathered diesel and heavy oil		

<u>Notes:</u>
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim marine sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
-: VALUE NOT ESTABLISHED

Table 7-16: Metals Plus Hydrides in Marine Sediment

		DATA				GUIDELINES	
AVERAGE SAMPLING DEPTH (m) LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	0.0 - 0.3 S2006-11699 SED 7 28-Sep-06	0.0 - 0.3 S2006-11700 SED 8 28-Sep-06	0.0 - 0.3 S2006-11701 SED 9 28-Sep-06	1999 CCME RECOMMENDED SEDIMENT QUALITY GUIDELINES (REVISED 2004) ISQG	 PEL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	5	<5	12400	5070	14800	**-**	**-**
Antimony	0.5	<0.5	2.6	3.7	5.1	**-**	**-**
Arsenic	0.5	<0.1	5.8	6.3	7.1	**7.24**	**41.6**
Barium	0.5	<0.5	10.8	4.6	14.8	**-**	**-**
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	**-**	**-**
Bismuth	0.2	<0.2	0.5	1.2	1.5	**-**	**-**
Cadmium	0.5	<0.5	<0.5	<0.5	<0.5	**0.7**	**4.2**
Calcium	25	<25	5280	7820	9450	**-**	**-**
Chromium	1	<1	<u>**488**</u>	<u>**499**</u>	<u>**681**</u>	**52.3**	**160**
Cobalt	1	<1	27	39	63	**-**	**-**
Copper	1	<1	<u>**686**</u>	<u>**496**</u>	<u>**96**</u>	**18.7**	**108**
Iron	5	<5	37900	43700	69600	**-**	**-**
Lead	5	<5	14	13	12	**30.2**	**112**
Magnesium	10	<10	100000	155000	224000	**-**	**-**
Manganese	1	<1	449	357	552	**-**	
Mercury	0.01	<0.01	0.05	0.03	<0.01	**0.13**	**0.7**
Molybdenum	2	<2	3	<2	5	**-**	**-**
Nickel	5	<5	471	981	882	**-**	**-**
Phosphorus	5	<5	598	256	652	**-**	**-**
Potassium	10	<10	1260	1130	4360	**-**	**-**
Selenium	0.5	<0.1	0.2	0.1	<0.1	**-**	**-**
Silver	0.25	<0.25	<0.25	<0.25	<0.25	**-**	**-**
Sodium	25	<25	9390	13800	61200	**-**	**-**
Vanadium	5	<5	52	30	66	**-**	**-**
Zinc	2	<2	84	77	101	**124**	**271**

<u>Notes:</u>
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim marine sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
-: VALUE NOT ESTABLISHED
<u>**Underlined and bold data exceed the CCME ISQG criteria/guideline(s)**</u>
Shaded data exceed the CCME PEL criteria/guideline(s)

Table 7-17: PAHs in Marine Sediment

		DATA				GUIDELINES	
AVERAGE SAMPLING DEPTH (m)			0.0 - 0.3	0.0 - 0.3	0.0 - 0.3	1999 CCME RECOMMENDED CANADIAN SEDIMENT QUALITY GUIDELINES (REVISED 2004)	
LAB ID		Lab Blank	S2006-11699	S2006-11700	S2006-11701		
FIELD ID			SED 7	SED 8	SED 9		
DATE (D/M/Y)			28-Sep-06	28-Sep-06	28-Sep-06	ISQG	PEL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Naphthalene	0.002	<0.002	<0.002	<0.002	<0.002	**0.0346**	**0.391**
Acenaphthylene	0.001	<0.001	<0.001	<0.001	<0.001	**0.00587**	**0.128**
Acenaphthene	0.002	<0.002	<0.002	<0.002	<0.002	**0.00671**	**0.0889**
Fluorene	0.001	<0.001	<0.001	<0.001	<0.001	**0.0212**	**0.144**
Phenanthrene	0.001	<0.001	<0.001	0.008	0.005	**0.0867**	**0.544**
Anthracene	0.001	<0.001	<0.001	0.005	<0.001	**0.0469**	**0.245**
Fluoranthene	0.001	<0.001	<0.001	<u>**0.180**</u>	<0.001	**0.113**	**1.494**
Pyrene	0.003	<0.003	<0.003	0.085	<0.003	**0.153**	**1.398**
Benzo(a)anthracene	0.001	<0.001	0.002	0.059	<0.001	**0.0748**	**0.693**
Chrysene	0.001	<0.001	0.001	0.048	<0.001	**0.108**	**0.846**
Benzo(b)fluoranthene	0.004	<0.004	<0.004	0.064	<0.004	**-**	**-**
Benzo(k)fluoranthene	0.004	<0.004	<0.004	0.006	<0.004	**-**	**-**
Benzo(a)pyrene	0.003	<0.003	<0.003	0.017	<0.003	**0.0888**	**0.763**
Indeno(123 cd.)pyrene	0.003	<0.003	<0.003	0.073	<0.003	**-**	**-**
Dibenzo(ah)anthracene	0.004	<0.004	<0.004	<0.004	<0.004	**0.00622**	**0.135**
Benzo(ghi)perylene	0.002	<0.002	<0.002	0.035	<0.002	**-**	**-**

<u>Notes:</u>
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim marine sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
-: VALUE NOT ESTABLISHED
<u>**Underlined and bold data exceed the CCME ISQG criteria/guideline(s)**</u>
Shaded data exceed the CCME PEL criteria/guideline(s)

Table 7-18: PCBs in Marine Sediment

		DATA				GUIDELINES	
AVERAGE SAMPLING DEPTH (m) LAB ID FIELD ID DATE (D/M/Y)		Lab Blank	0.0 - 0.3 S2006-11699 SED 7 28-Sep-06	0.0 - 0.3 S2006-11700 SED 8 28-Sep-06	0.0 - 0.3 S2006-11701 SED 9 28-Sep-06	1999 CCME RECOMMENDED CANADIAN SEDIMENT QUALITY GUIDELINES (REVISED 2004) ISQG	PEL
PARAMETERS	MDL (mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Polychlorinated Biphenyls	0.005	<0.005	<0.005	<0.005	<0.05 (<0.05)	**0.0215**	**0.1890**

Notes:
MDL: Method detection limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
ISQG: Interim marine sediment quality guidelines (dry weight)
PEL: Probable effect levels (dry levels)
-: VALUE NOT ESTABLISHED
Underlined and bold data exceed the CCME ISQG criteria/guideline(s)
Shaded data exceed the CCME PEL criteria/guideline(s)

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SECTION 8.0

QA/QC DISCUSSION

8.0 QA/QC DISCUSSION

Approximately 10 percent of all samples submitted to the laboratory were blind field duplicates for each parameter of each media tested. A total of six field duplicate paint samples (PS-DUP1 to PS-DUP6), nine field duplicate soil samples (DUP 1 to DUP 8 and DUP 10), one field duplicate surface water sample (DUP 11) and one field duplicate sediment sample (DUP 9) were submitted to the laboratory during the field program for select chemical analyses. Laboratory blanks and laboratory replicate samples were also analyzed to assess the reliability of the analyses. The laboratory QA/QC results are reported on the Laboratory Certificates of Analysis included in Section 11.0. To assess the quality of both the sampling and laboratory analytical program, a review of the QA/QC results was completed.

Assessment of the analyses of the blind field duplicates, laboratory blanks and laboratory replicates showed relatively good correlation. Overall, based on this QA/QC review, the analytical results are considered representative of the Site conditions in the immediate vicinity of the sample locations.

8.1 SURROGATE RECOVERIES

Surrogate recoveries have been reviewed to evaluate the effectiveness and accuracy of the laboratory testing methods on a sample-specific basis. It is noted that the acceptable range for surrogate recoveries for all organic parameters is 60 to 140% in all media. A summary of the reported surrogate recovery data for each media and parameter is provided in Table 8-1.

Table 8-1: Surrogate Recovery Summary

Media	**Parameter**	**Surrogate Recovery**			
Soil and Sediment	BTEX/TPH	DFB: 79-113%	4-B: 74-124%	TFT: 67-128%	OT: 70-131%
	PAHs	NP-8: 62-130%	AN-10: 78-129%	P-12: 63-132%	
	PCBs	DCB: 70-133%			
Paint	PCBs	DCB: 73-113%			
Surface Water	BTEX/TPH	DFB: 98-102%	4-B: 97-107%	OT: 66-92%	
	PCBs	DCB: 78- 89%			

Notes:
Surrogate recoveries identified as follows:

DFB Difluorobenzene
4-B 4-Bromofluorobenzene
TFT Trifluorotoulene
OT O-Terphenyl
NP-8 Naphthalene-d8
AN-10 Antracene-d10
P-12 Perylene-d12
DCB Decachlorobiphenyl

For all paint, soil, sediment and surface water samples analyzed, all surrogate recoveries were within the acceptable range (60-140%).

8.2 LABORATORY BLANKS

Laboratory blanks were analyzed for all paint, soil, sediment and surface water parameters tested during the laboratory analytical program. The purpose of the laboratory blanks was to assess the quality of the laboratory results with respect to the presence/absence of instrument cross contamination at the laboratory.

Results of the laboratory analyses revealed that non-detectable of all tested parameters (refer to the Laboratory Certificates of Analyses in Section 11.0).

8.3 BLIND FIELD DUPLICATES

The results of the analyses of blind field duplicate samples were compared as relative percent differences (RPD), which are given by the difference in two results times 100 divided by the mean of the two results. These evaluations are only applicable when both results are at least three times the reporting limit. For groundwaters, wastewaters, surface waters and composite soil samples, RPD values of 50% or less are acceptable. For discrete paint, soil or sediment samples, where there is no theoretical reason for the samples to be equivalent, RPDs of 100% or less are considered to be acceptable proof of equivalency.

For paint samples submitted in duplicate, all RPD results were acceptable (100% or less), with the following exception:

- Lead: 167% in ML-PS24 and PS-DUP4.

For soil and sediment samples submitted in duplicate, all RPD results were acceptable (100% or less), with the following exceptions:

- TPH: 167% in ML-TP3-SS1 and DUP 3; and
- PCBs: 161% in ML-TP6-SS1 and DUP 1.

For surface water samples submitted in duplicate, all RPD results were acceptable (50% or less).

The variability noted in the analyses of the blind field duplicate samples will not change the overall interpretation of the Site data. This variability can be attributed to the matrix (paint and soil) heterogeneity, because it is not possible to fully blend the sample without varying its chemical composition.

8.4 LABORATORY REPLICATES

The results of the analyses of laboratory replicate samples were also compared as RPD. For groundwaters, wastewaters, surface waters and composite soil samples, RPD values of 50% or less are acceptable. For paint, soil and sediment samples, where there is no theoretical reason for the samples to be equivalent, RPDs of 100% or less are considered to be acceptable proof of equivalency.

For paint, soil and sediment samples analyzed in replicate, all RPD results were acceptable (100% or less).

For surface water samples analyzed in replicate, all RPD results were acceptable (50% or less).

8.5 BACKGROUND AIR SAMPLE

One background air sample (BACK#1) was collected along Highway 410, approximately 3.2 km southeast and downwind of the entrance to the Site, and analyzed for asbestos. The purpose of collecting this air sample was to assess the concentration of asbestos fibres in air leaving the Site. Weather conditions at the time of sampling were overcast with sunny periods and strong winds.

The concentration of asbestos fibres detected in air sample BACK#1 (0.014 fibres/cm^3) did not exceed the applicable 2006 Occupational Exposure Threshold Limit Value (TLV) of 0.1 fibres/cm^3 as indicated by the American Conference of Governmental Industrial Hygienists (ACGIH)[1] nor the Ontario Ministry of Environment (MOE) Ambient Air Quality Criteria of 0.04 fibres/cm^3 (O. REG. 419/05). Therefore, based on the testing completed, concentrations of asbestos fibres in air leaving the Site at the time of the current investigation were detected at levels below both ambient air and industrial hygiene criteria. However, please note that these findings are based on one sampling event and that the concentrations of asbestos fibres in air may vary (i.e. increase or decrease) overtime, especially during times of activity at the former mine site.

[1] Documentation of the Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices, ACGIH Worldwide Signature Publications, Cincinnati, OH, 2006.

SECTION 9.0

LIST OF PETROLEUM STORAGE TANKS

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APPENDICES

9.0 LIST OF PETROLEUM STORAGE TANKS

As indicated in the RFP for the Phase II ESA, one objective of the current investigation was to prepare a final list of petroleum storage tanks present at the Site. Petroleum storage tanks identified at the Site at the time of the current investigation are presented in this section.

9.1 AREA A: NORTHCO

The following petroleum storage tanks were identified at this area of the Site at the time of the current investigation:

- A 1,000-gallon waste oil AST was observed at the northwest corner of the former E&R building (refer to Photo 1, Appendix A-9);
- A 1,000-gallon and associated refuelling pedestal was observed at the northwest corner of the former E&R building (refer to Photo 2, Appendix A-9);
- A 200-gallon AST was observed at the northwest corner of the former E&R building (refer to Photo 2, Appendix A-9);
- A discarded 200-gallon AST (empty) was observed north of the former E&R building (refer to Photo 3, Appendix A-9); and
- The location of a possible UST was observed inside the former E&R building (refer to Photo 4, Appendix A-9).

A potential location an UST was observed at the southeast corner of the mine dry building, adjacent to the boiler room. A fuel tank levelometer was observed inside the boiler room and a possible fill/vent pipe was observed on the southeast corner of the structure (refer to Photos 5 and 6, Appendix A-9). Test pits excavated at this area were purposely positioned downgradient of the possible fill/vent pipe to ensure that the UST, if present, was not punctured during excavation. Therefore, the presence/absence of an UST at this area of the Site was not confirmed during the current investigation.

9.2 AREA B: MILL AREA

The following petroleum storage tanks were identified at this area of the Site at the time of the current investigation:

- A UST was observed northwest of the dry dock storage facility (refer to Photo 7, Appendix A-9);
- A 200-gallon AST was observed inside the power centre (refer to Photo 8, Appendix A-9);
- A saddle tank, possibly belonging to a former mine haulage truck, was observed inside the power centre (refer to Photo 9, Appendix A-9);
- Two 200-gallon ASTs were observed adjacent to and west of the power centre (refer to Photo 10, Appendix A-9);
- The location a the Bunker C AST (i.e. day tank) associated with the power centre could not be confirmed due to the presence of a large stockpile of sawdust in the area, however, it is believed to exist at the Site (refer to Photos 11 and 12, Appendix A-9);

- A discarded 10,000-gallon UST (empty) was observed at the equipment storage area, located northwest of the dry rock storage facility (refer to Photo 13, Appendix A-9);
- A discarded 200-gallon AST (empty) was observed at the equipment storage area, located west of the dry rock storage facility (refer to Photo 14, Appendix A-9); and
- A large propane AST was observed south of the wet mill building, on the southside of Lower Duck Island Cove Brook (refer to Photo 15, Appendix A-9).

9.3 AREA C: WAREHOUSE AND DOCK AREA

The following petroleum storage tanks were identified at this area of the Site at the time of the current investigation:

- Two large propane ASTs were observed west of the warehouse and south of the former lunchroom building (refer to Photo 16, Appendix A-9); and
- A discarded 10,000-gallon AST (empty) was observed at the former equipment parking area, located west of the warehouse (refer to Photo 17, Appendix A-9);

9.4 AREA D: TAILINGS AREA

No petroleum storage tanks were identified at this area of the Site at the time of the current investigation.

9.5 AREA E: WASTE ROCK AND PIT AREA

The following petroleum storage tanks were identified at this area of the Site at the time of the current investigation:

- Two partially buried underground storage tanks (USTs) were observed along the south wall of the west pit (refer to Photo 18, Appendix A-9). Due to safety concerns, access was not gained to this area at the time of the site inspection.

APPENDIX A-9

PHOTOGRAPHIC RECORD

Photo 1: 1,000-Gallon Waste Oil AST - Former E&R Building.
(Former Northco Property)

Photo 2: 200-Gallon and 1,000-Gallon AST - Former E&R Building.
(Former Northco Property)

Photo 3. Discarded 200-Gallon AST - North of Former E&R Building.
(Former Northco Property)

Photo 4. Possible UST inside of the Former E&R Building.
(Former Northco Property)

Photo 5: Fuel Tank Levelometer – Boiler Room of Mine Dry.
(Former Northco Property)

Photo 6: Possible UST Fill Pipe - Southeast Corner of Mine Dry.
(Former Northco Property)

Photo 7. UST located Adjacent to Dry Rock Storage Facility.
(Mill Area)

Photo 8. 200-Gallon AST located inside the Power Centre.
(Mill Area)

Photo 9. Saddle Tank located inside the Power Centre.
(Mill Area)

Photo 10. Two 200-Gallon ASTs - Adjacent to the Power Centre.
(Mill Area)

Photo 11. Approximate Location of the Bunker C AST – Day Tank.
(Mill Area)

Photo 12. Location of Bunker C AST - Day Tank.
(Mill Area)

Photo 13. Discarded 10,000-Gallon UST - Equipment Storage Area.
(Mill Area)

Photo 14. Discarded 200-Gallon AST - Equipment Storage Area.
(Mill Area)

Photo 15. Propane AST located South of the Wet Mill.
(Mill Area)

Photo 16. Two Propane ASTs located West of the Warehouse.
(Warehouse and Dock Area)

Photo 17. Discarded 10,000-Gallon UST.
(Warehouse and Dock Area)

Photo 18. Location of Two USTs along the South Wall of West Pit.
(Waste Rock and Pit Area)

SECTION 10.0

CONCLUSIONS

10.0 CONCLUSIONS

Based on the findings of the Phase II ESA conducted at the Site by AMEC in September 2006, the following conclusions can be made with respect to the environmental status of the subject property:

- Lead and mercury containing paints were identified at the Northco Area, Mill Area and Dock and Warehouse Area;
- Lead containing paints were identified at the Tailings Area and the Waste Rock and Pit Area;
- Polychlorinated biphenyl (PCB) containing paint was identified at the Warehouse and Dock Area;
- Asbestos containing building materials (i.e. floor tiles, siding, ceiling tiles, pipe insulation, brick mortar, etc.) were identified at the Northco Area, Mill Area and Dock and Warehouse Area ;
- Concentrations of asbestos fibres detected in all air samples (indoor and outdoor) collected at the Site during the current investigation did not exceed the applicable assessment criterion of 0.1 fibres/cm^3;
- Findings of the florescent light ballast inspection were inconclusive, however, given the age of the Site buildings, it is likely that PCB containing light ballasts are present at the Site;
- Petroleum hydrocarbon impacts in soil were identified at the following locations:
  - Northco Area: Former Tank Farm;
  - Northco Area: Downgradient of the Bunker C Tank Farm;
  - Mill Area: South side of the Dry Mill;
  - Mill Area: Southwest corner of the Power Centre; and
  - Waste Rock and Pit Area: North Pit access road, approximately 200 m northwest of the Primary Crusher of the Mill Area.
- Approximately 2.0 cm free phase petroleum hydrocarbon product was observed on the water table at the Mill Area, along the south side of the Dry Mill;
- Metal impacts were detected in all soil samples analyzed during the current investigation. Most notably, concentrations of nickel and chromium detected in all soil samples analyzed exceeded the applicable assessment criteria. A few exceedances of copper, iron and arsenic were also reported under the same applicable assessment criteria. The nickel and chromium impacts in soil may be related to background geology conditions in the area;
- Concentrations of polycyclic aromatic hydrocarbons (PAHs) and PCBs in all soil samples analyzed were either non-detect or detected at levels below the applicable assessment criteria;
- Concentrations of a combination of metals detected in all six surface water samples collected from Lower Duck Island Cove Brook exceeded the applicable assessment criteria; and
- Concentrations of asbestos, and a combination of metals detected in all freshwater sediment samples collected from Lower Duck Island Cove Brook as well as marine sediment samples collected from Duck Island Cove exceeded the applicable assessment criteria. The concentration of fluoranthene detected in one of the three marine sediment samples collected at the Site also exceeded the applicable assessment criterion.

Based on the findings of the Phase II ESA, AMEC indicates the following Phase III ESA requirements for the Site at this time:

Northco Area

- Excavate six to 10 additional test pits to further delineate the vertical and horizontal extent of petroleum hydrocarbon contaminated soil identified within and downgradient of the former Tank Farm;
- Install a minimum of three boreholes/monitoring wells downgradient of the former Tank Farm to assess the presence/absence of groundwater impacts and potential free phase petroleum hydrocarbon product at this location of the Site;
- Excavate three to five additional test pits along the perimeter of the former E&R building and collect soil samples for volatile organic compound (VOC) analyses;
- In the event that the Site buildings are to be demolished and/or removed for the Site, a Hazardous Materials Assessment (HMA) should be implemented to identify any additional hazardous materials which may be present within the structures. This information can then be used to assess demolition and/or disposal options for the Site buildings (as required);
- All ASTs and USTs identified at the Site should be decommissioned in accordance with the most recent Storage and Handling of Gasoline and Associated Products Regulations; and
- In the event that the pad-mounted and pole-mounted transformers present at the Site are to be removed from the property, the dielectric fluids within the transformers must be tested for PCBs to assess transportation and disposal requirements.

Mill Area

- Excavate three to five additional test pits to further delineate the vertical and horizontal extent of petroleum hydrocarbon contaminated soil identified along the south side of the Dry Mill;
- Install a minimum of three boreholes/monitoring wells along the south side of the Dry Mill to assess the presence/absence of groundwater impacts and potential free phase petroleum hydrocarbon product at this location of the Site;
- Excavate three additional test pits to further delineate the vertical and horizontal extent of petroleum hydrocarbon contaminated soil identified at the southeast corner of the Power Centre;
- Install a minimum of three boreholes/monitoring wells along the southeast corner of the Power Centre and downgradient of the Bunker C AST (i.e. Day Tank) to assess the presence/absence of groundwater impacts and potential free phase petroleum hydrocarbon product at this location of the Site;
- In the event that the Site buildings are to be demolished and/or removed for the Site, a Hazardous Materials Assessment (HMA) should be implemented to identify any additional hazardous materials which may be present within the structures. This information can then be used to assess demolition and/or disposal options for the Site buildings (as required);
- All ASTs and USTs identified at the Site should be decommissioned in accordance with the most recent Storage and Handling of Gasoline and Associated Products Regulations; and

- In the event that the pole-mounted transformer present at the Site is to be removed from the property, the dielectric fluids within the transformer must be tested for PCBs to assess transportation and disposal requirements.

<u>Warehouse and Dock Area</u>

- In the event that the Site buildings are to be demolished and/or removed for the Site, a Hazardous Materials Assessment (HMA) should be implemented to identify any additional potential hazardous materials present within the structures. This information can then be used to assess demolition and/or disposal options for the Site buildings (if necessary); and
- In the event that the pole-mounted transformer present at the Site is to be removed from the property, the dielectric fluids within the transformer must be tested for PCBs to assess transportation and disposal options.

<u>Waste Rock and Pit Area</u>

- Excavate three to five additional test pits to further delineate the vertical and horizontal extent of petroleum hydrocarbon contaminated soil identified along the North Pit access road; and
- Install a minimum of one borehole/monitoring well downgradient the area of stained soil identified along the North Pit access road to assess the presence/absence of groundwater impacts and potential free phase petroleum hydrocarbon product at this location of the Site.

Based testing completed at the time of the Phase II ESA, no petroleum hydrocarbon or PCB impacts were identified in the tailings presents at the Tailings Area. Therefore, no Phase III ESA activities are recommended for the Tailings Area at this time.

Please note that due to safety concerns (i.e. rough terrain, steep slopes, etc.) access was not gained to following areas of the Site during the Phase II ESA:

- Lower levels of the Primarily Crusher Building;
- Former pit office located on the Saddle;
- Partially buried USTs along the south wall of the West Pit;
- Area along the toe of the waste rock pile containing discarded tires, equipment and drums; and
- Area of the waste rock pile at which a potential discarded transformer was observed.

Enhanced safety protocols, including but not limited to confined space entry, fall arrest and evaluation of alternative access routes and sampling techniques, should be implemented at the Site to safely assess the presence/absence of environmental contamination at these areas of the Site (if possible).

SECTION 11.0

LABORATORY CERTIFICATES OF ANALYSES

amec

AMEC Earth & Environmental
133 Crosbie Rd.,PO.Box #13216
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A1B 4A5
Attn.: Garry Warren

Date: October 18,2006
File#: JB06-184
W.O.#: TF6126509
Project: Baie Verte
Fax #: 709-722-7353

Re: Polarized Light Microscopy Results

Lab Sample Number/Type		Client Sample Number/Description	Sample Location	ASBESTOS FIBRES %			NON-ASBESTOS FIBRES %				%
				Chrysotile	Amosite	Other Asbestos Fibres	Cellulose	Mineral Wool	Fibrous Glass	Other Non-Asbestos Fibres	Nonfibrous Material
2006B- Homogeneous	0942	WH-ASB3 Floor Tile		---	---	---	25	---	---	10	65
2006B- 3 Layer	0943	SP-ASB1 Insulation		---	---	---	3	80	---	5	12
2006B- Homogeneous	0944	WH-ASB1 Drywall		20	---	---	1	---	---	2	77
2006B- Homogeneous	0945	WH-ASB2 Insulation		---	---	---	---	---	---	---	100

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Attn.: Garry Warren

Date: October 18,2006
File#: JB06-184
W.O.#: TF6126509
Project: Baie Verte
Fax #: 709-722-7353

Re: Polarized Light Microscopy Results:

Bulk samples were analyzed using Polarized Light Microscopy and dispersion staining techniques. The analytical procedures are in accordance with NIOSH Method 9002.

The % composition of the asbestos forms and other materials identified are the subjective visual judgement of the analyst based on specialized training, experience and comparison to standard area projections. The limit of detection is <1% asbestos and the sample range is from 1 to 100% asbestos. Due to the subjectivity of the Method, the quoted % of asbestos detected is an estimate and no reponsibility is assumed to the manner in which the results are used or interpreted.

Separate components (eg. layers) are described separately and are combined in proportion to their abundance with a single analysis provided for the sample.

Analyst ____________________

Authorized Signature ____________________

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Attn.: Gary Warren

Date: October 16,2006
File#: JB06-182
W.O.#: TF6126509
Project: Baie Verte
Fax #: 709-722-7353

Re: Polarized Light Microscopy Results

Lab Sample Number/Type		Client Sample Number/Description	Sample Location	ASBESTOS FIBRES % Chrysotile	Amosite	Other Asbestos Fibres	NON-ASBESTOS FIBRES % Cellulose	Mineral Wool	Fibrous Glass	Other Non-Asbestos Fibres	% Nonfibrous Material
2006B- Homogeneous	0928	NC-ASB1		20	—	—	2	—	—	3	75
2006B- Homogeneous	0929	NC-ASB2		3	—	—	3	1	—	5	88
2006B- Homogeneous	0930	NC-ASB3		—	—	—	3	2	—	15	80
2006B- Homogeneous	0931	NC-ASB4		3	—	—	1	—	—	2	94
2006B- Homogeneous	0932	NC-ASB5		25	—	—	2	—	—	2	71

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2006B- Homogeneous	0933	NC-ASB6		---	5	---	25	50	---	5	15
2006B- Homogeneous	0934	NC-ASB7		---	---	---	2	3	---	15	80
2006B- Homogeneous	0935	ML-ASB1		---	50	---	3	---	---	5	42
2006B- Homogeneous	0936	ML-ASB2		---	55	---	3	---	---	2	40
2006B- Homogeneous	0937	ML-ASB3		5	---	---	1	---	---	2	92
2006B- Homogeneous	0938	ML-ASB4		2	---	---	1	---	---	2	95

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Page:	3 of 3

Re: Polarized Light Microscopy Results:

Bulk samples were analyzed using Polarized Light Microscopy and dispersion staining techniques. The analytical procedures are in accordance with NIOSH Method 9002.

The % composition of the asbestos forms and other materials identified are the subjective visual judgement of the analyst based on specialized training, experience and comparison to standard area projections. The limit of detection is <1% asbestos and the sample range is from 1 to 100% asbestos.
Due to the subjectivity of the Method, the quoted % of asbestos detected is an estimate and no reponsibility is assumed to the manner in which the results are used or interpreted.

Separate components (eg. layers) are described separately and are combined in proportion to their abundance with a single analysis provided for the sample.

Analyst ____________________

Authorized Signature ____________________

amec

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Project: Baie Verte
Fax #: 709-722-7353

Re: Polarized Light Microscopy Results

Lab Sample Number/Type		Client Sample Number/Description	Sample Location	ASBESTOS FIBRES %			NON-ASBESTOS FIBRES %				%
				Chrysotile	Amosite	Other Asbestos Fibres	Cellulose	Mineral Wool	Fibrous Glass	Other Non-Asbestos Fibres	Nonfibrous Material
2006B- Homogeneous	0908	SED 1		5	—	—	3	—	—	8	84
2006B- Homogeneous	0909	SED 2		8	—	—	5	—	—	10	77
2006B- Homogeneous	0910	SED 3		6	—	—	3	—	—	5	86
2006B- Homogeneous	0911	SED 4		10	—	—	5	—	—	2	83
2006B- Homogeneous	0912	SED 5		10	—	—	3	10	—	2	75

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A1B 4A5
Attn.: Gary Warren

Date: October 16,2006
File#: JB06-178
W.O.#: TF6126509
Project: Baie Verte
Fax #: 709-722-7353

Re: Polarized Light Microscopy Results

			ASBESTOS FIBRES %			NON-ASBESTOS FIBRES %				%
Lab Sample Number/Type	Client Sample Number/Description	Sample Location	Chrysotile	Amosite	Other Asbestos Fibres	Cellulose	Mineral Wool	Fibrous Glass	Other Non-Asbestos Fibres	Nonfibrous Material
2006B-0913 Homogeneous	SED 6		3	—	—	3	10	---	2	82
2006B-0914 Homogeneous	DUP 9		3	—	—	3	5	---	2	87

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Attn.: Gary Warren

Date:	October 16,2006
File#:	JB06-178
W.O.#:	TF6126509
Project:	Baie Verte
Fax #:	709-722-7353
Page:	3 of 3

Re: Polarized Light Microscopy Results:

Bulk samples were analyzed using Polarized Light Microscopy and dispersion staining techniques. The analytical procedures are in accordance with NIOSH Method 9002.

The % composition of the asbestos forms and other materials identified are the subjective visual judgement of the analyst based on specialized training, experience and comparison to standard area projections. The limit of detection is <1% asbestos and the sample range is from 1 to 100% asbestos. Due to the subjectivity of the Method, the quoted % of asbestos detected is an estimate and no reponsibility is assumed to the manner in which the results are used or interpreted.

Separate components (eg. layers) are described separately and are combined in proportion to their abundance with a single analysis provided for the sample.

Analyst ____________________

Authorized Signature ____________________

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Attn.: Gary Warren

Date: October 13,2006
File#: JB06-177
W.O.#: TF6126509
Project: Baie Verte Mines
Fax #: 709-722-7353

Re: Polarized Light Microscopy Results

	Lab Sample Number/Type	Client Sample Number/Description	Sample Location	ASBESTOS FIBRES % Chrysotile	Amosite	Other Asbestos Fibres	NON-ASBESTOS FIBRES % Cellulose	Mineral Wool	Fibrous Glass	Other Non-Asbestos Fibres	% Nonfibrous Material
2006B- Homogeneous	0905	SED 7 Soil		20	---	—	10	—	—	20	50
2006B- Homogeneous	0906	SED 8 Soil		75	—	—	10	—	—	5	10
2006B- Homogeneous	0907	SED 9 Soil		60	—	—	15	—	—	15	10

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Attn.: Gary Warren

Date:	October 13,2006
File#:	JB06-177
W.O.#:	TF6126509
Project:	Baie Verte Mines
Fax #:	709-722-7353
Page:	2 of 2

Re: Polarized Light Microscopy Results:

Bulk samples were analyzed using Polarized Light Microscopy and dispersion staining techniques. The analytical procedures are in accordance with NIOSH Method 9002.

The % composition of the asbestos forms and other materials identified are the subjective visual judgement of the analyst based on specialized training, experience and comparison to standard area projections. The limit of detection is <1% asbestos and the sample range is from 1 to 100% asbestos. Due to the subjectivity of the Method, the quoted % of asbestos detected is an estimate and no reponsibility is assumed to the manner in which the results are used or interpreted.

Separate components (eg. layers) are described separately and are combined in proportion to their abundance with a single analysis provided for the sample.

Analyst ____________________

Authorized Signature ____________________

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A1B 4A5
Attn.: Gary Warren

Date: October 12,2006
File#: JA06-062
W.O.#: TF6126509
Project: Baie Verte
Fax #: 709-722-7353

Attention:

Airborne fiber samples were analyzed using Phase Contrast Microscopy in accordance with the NIOSH 7400A method. The Limit of Detection (L.O.D.) is based on NIOSH 7400 A method (7.0 fibres/mm2). The airborne concentration will vary with sample volume.

Date Receved 2006	Lab Number	Client Number	Date	Sampling Volume (*) (liters)	Analyzed Area (mm2)	Fibre Concentrarion (fibres/mm2)	Airborne Concentrarion (fibres/cm3)
Oct.06	06A-167	WH-#1	Sept.20.06	791.3	0.8171	8.6	**0.004**
Oct.06	06A-168	SP-#1	Sept.20.06	1348.8	0.8171	9.8	**0.003**
Oct.06	06A-169	ML-#1	Sept.21.06	894.0	0.8171	9.8	**0.004**
Oct.06	06A-170	ML-#2	Sept.21.06	900.0	0.8171	<7.0	**<0.002**
Oct.06	06A-171	ML-#3	Sept.22.06	855.0	0.8171	<7.0	**<0.002**
Oct.06	06A-172	ML-#4	Sept.22.06	792.0	0.8171	<7.0	**<0.003**
Oct.06	06A-173	ML-#5	Sept.23.06	1089.0	0.8171	7.3	**0.003**
Oct.06	06A-174	ML-#6	Sept.23.06	909.0	0.8171	<7.0	**<0.003**
Oct.06	06A-175	NC-#1	Sept.24.06	838.8	0.8171	<7.0	**<0.002**
Oct.06	06A-176	NC-#2	Sept.24.06	915.0	0.8171	<7.0	**<0.002**
Oct.06	06A-177	Back -#1	Sept.25.06	1419.0	0.8171	51.4	**0.014**
Oct.06	06A-178	WR-#1	Sept.26.06	918.0	0.8171	<7.0	**<0.003**

Analyst ____________

Volume supply by client

Approved by ____________

Suman Punani
Manager, AMEC Earth & Environmental Laboratory

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Client:	AMEC Earth & Environmental, A Division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date: Revised Date: Page:	November 08, 2006 November 10, 2006 1 of 1
Project Name:	Baie Verte	Sample Type:	Paint
Project Number:	TF 6126509	Lab. Ref.:	F2006-1655/01
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Parameters Method Detection Limit Unit			Total Lead 5 (µg/g)	Mercury 0.01 (µg/g)
Lab Number	Sample ID	Date Collected		
S2006-12081	SP-PS1	20-Sep-06	2560	0.47
S2006-12082	SP-PS2	20-Sep-06	3490	1.54
S2006-12084	WR-PS1	29-Sep-06	1200	0.41
S2006-12085	WH-PS1	19-Sep-06	14700	20.7 (20.9)
S2006-12086	WH-PS2	19-Sep-06	13900	0.14
S2006-12087	WH-PS3	19-Sep-06	81300	2.18
S2006-12088	WH-PS4	19-Sep-06	10200	13.0
S2006-12089	WH-PS5	19-Sep-06	815 (889)	0.62
S2006-12090	WH-PS6	19-Sep-06	7640	5.27
S2006-12091	WH-PS7	19-Sep-06	5920	7.91
S2006-12095	NC-PS1	20-Sep-06	2870	3.59
S2006-12096	NC-PS2	20-Sep-06	6200	3.99
S2006-12097	NC-PS3	20-Sep-06	385	19.7
S2006-12098	NC-PS4	20-Sep-06	131	2.61
S2006-12099	NC-PS5	20-Sep-06	1880	32.2
S2006-12100	NC-PS6	20-Sep-06	27400	3.14
S2006-12101	NC-PS7	20-Sep-06	26400	0.99
S2006-12102	NC-PS8	23-Sep-06	996	0.97
S2006-12103	NC-PS9	23-Sep-06	237	54.7
S2006-12104	NC-PS10	23-Sep-06	796	3.44
S2006-12105	NC-PS11	23-Sep-06	406	5.44
S2006-12106	NC-PS12	23-Sep-06	930	0.81
Lab Blank			<5	<0.01
Q.C. Standard Actual (mg/L)			1.03	0.002
Q.C. Standard Expected (mg/L)			1.00	0.002
Date of Analysis			17/18-Oct-06	27-Oct-06 / 01-Nov-06

Comment: Value in (brackets) signifies Lab Replicate

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

ASSOCIATION OF THE CHEMICAL PROFESSION OF ONTARIO
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Client:	AMEC Earth & Environmental, A Division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date:	November 08, 2006
		Page:	1 of 1
Project Name:	Baie Verte	Sample Type:	Paint
Project Number:	TF 6126509	Lab. Ref.:	F2006-1657
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Parameters Method Detection Limit Unit			Total Lead 5 (µg/g)	Mercury 0.01 (µg/g)
Lab Number	Sample ID	Date Collected		
S2006-12122	ML-PS13	21-Sep-06	7240	0.57
S2006-12123	ML-PS14	21-Sep-06	10300	0.11
S2006-12124	ML-PS15	21-Sep-06	537	0.02
S2006-12125	ML-PS16	21-Sep-06	3750	0.39
S2006-12126	ML-PS17	21-Sep-06	975	25.2
S2006-12127	ML-PS18	22-Sep-06	48.4	0.21
S2006-12128	ML-PS19	22-Sep-06	4150	0.54
S2006-12129	ML-PS20	23-Sep-06	2500	1.75
S2006-12130	ML-PS21	23-Sep-06	2070	0.87
S2006-12131	ML-PS22	23-Sep-06	2140	0.68
S2006-12132	ML-PS23	23-Sep-06	160	0.46
S2006-12133	ML-PS24	23-Sep-06	83	0.69
S2006-12134	ML-PS25	23-Sep-06	1670	0.19
S2006-12135	PS-DUP1	20-Sep-06	268	13.4
S2006-12137	PS-DUP3	23-Sep-06	<5	0.04
S2006-12138	PS-DUP4	23-Sep-06	909	0.22
S2006-12139	PS-DUP5	21-Sep-08	54500	14.9
S2006-12140	PS-DUP6	22-Sep-09	3630	0.24
Lab Blank			<5	<0.01
Q.C. Standard Actual (mg/L)			0.98	0.002
Q.C. Standard Expected (mg/L)			1.00	0.002
Date of Analysis			20/21-Oct-06	27-Oct-06 / 01-Nov-06

Comment: Value in ppm (ug/g)

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

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Suman Punani, C. Chem.
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Client:	AMEC Earth & Environmental, A Division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date:	November 08, 2006
		Page:	1 of 1
Project Name:	Baie Verte	Sample Type:	Paint
Project Number:	TF 6126509	Lab. Ref.:	F2006-1655
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polychlorinated Biphenyls

Parameter Method Detection Limit Unit			Total PCB 0.005 (µg/g)	Surrogate Recovery (Decachloro-biphenyl) (%)
Lab Number	Sample ID	Date Collected		
S2006-12085	WH-PS1	19-Sep-06	420	93
S2006-12091	WH-PS7	19-Sep-06	4260 (4390)	99 (99)
S2006-12095	NC-PS1	20-Sep-06	3.39	102
S2006-12096	NC-PS2	20-Sep-06	1.88	114
S2006-12099	NC-PS5	20-Sep-06	2.01	99
S2006-12102	NC-PS8	23-Sep-06	2.55	90
S2006-12105	NC-PS11	23-Sep-06	0.53	80
Lab Blank			<0.005	83
Blank Spike			0.078	85
Blank Spike Recovery (%)			97	85
Date of Analysis			16/18-Oct-06	16/18-Oct-06

Comments: Method: EPA 8080B - Solvent Ext,/GC/ECD
Total PCB quantified as Aroclor 1254/60
Results reported on dry weight basis
Value in ppm (ug/g)
Value in (brackets) signifies Lab Replicate

Analyst: S. Lam, C. Chem.

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

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Client:	AMEC Earth & Environmental, A Division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date:	November 10, 2006
		Page:	1 of 1
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab. Ref.:	F2006-1592
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polychlorinated Biphenyls

Parameter Method Detection Limit Unit			Total PCB 0.005 (µg/g)	Surrogate Recovery (%)
Lab Number	**Sample ID**	**Date Collected**		
S2006-11582	ML-TP9-SS3	22-Sep-06	<0.005	80
S2006-11583	ML-TP10-SS1	22-Sep-06	<0.005	80
S2006-11584	ML-TP11-SS2	22-Sep-06	<0.005	80
S2006-11588	ML-TP15-SS1	22-Sep-06	<0.005	73
S2006-11589	ML-TP16-SS1	22-Sep-06	<0.005	101
S2006-11590	ML-TP17-SS1	22-Sep-06	0.126 (0.172)	86 (94)
S2006-11594	ML-TP21-SS1	23-Sep-06	<0.005	80
S2006-11595	ML-TP23-SS1	23-Sep-06	0.028	94
S2006-11599	NC-TP4-SS3	23-Sep-06	<0.005	75
S2006-11601	NC-TP6-SS1	23-Sep-06	0.033	73
S2006-11605	Dup 5	22-Sep-06	1.16	76
S2006-11607	Dup 7	23-Sep-06	0.036	70
S2006-11608	ML-TP22-SS1	23-Sep-06	0.035	84
Lab Blank			<0.005	87
Blank Spike			0.094	97
Blank Spike Recovery (%)			118	97
Date of Analysis			11-Oct-06	11-Oct-06

Comments: Method: EPA 8080B - Solvent Ext./GC/ECD
Total PCB quantified as Aroclor 1254/60
Results reported on dry weight basis
Value in ppm (ug/g)
Value in (brackets) represents Lab Replicate

Analyst: S. Lam, C. Chem.

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

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Client:	AMEC Earth & Environmental, A Division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date:	November 08, 2006
		Page:	1 of 1
Project Name:	Baie Verte	Sample Type:	Paint
Project Number:	TF 6126509	Lab. Ref.:	F2006-1657
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polychlorinated Biphenyls

Parameter Method Detection Limit Unit			Total PCB 0.005 (µg/g)	Surrogate Recovery (Decachloro-biphenyl) (%)
Lab Number	Sample ID	Date Collected		
S2006-12122	ML-PS13	21-Sep-06	17.6	82
S2006-12130	ML-PS21	23-Sep-06	29.5	82
S2006-12131	ML-PS22	23-Sep-06	2.64	87
S2006-12136	PS-DUP2	20-Sep-06	3.77	73
Lab Blank			<0.005	83
Blank Spike			0.078	85
Blank Spike Recovery (%)			97	85
Date of Analysis			16/18-Oct-06	16/18-Oct-06

Comments: Method: EPA 8080B - Solvent Ext./GC/ECD
Total PCB quantified as Aroclor 1254/60
Results reported on dry weight basis
Value in ppm (ug/g)

Analyst: S. Lam, C. Chem.

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date:	November 17, 2006
		Page:	1 of 1
Project Name:	Baie Verte	Sample Type:	Solid/Reg.558 Leachate
Project Number:	TF 6126509	Lab. Ref.:	F2006-1655
Contact:	Gary Warren		Final

.CERTIFICATE OF ANALYSIS

Ontario Regulation 558 - TCLP Leachate (Lead)

Lab Number Sample ID Date Collected Unit			S2006-12085 WH-PS1 19-Sep-06 (mg/L)	S2006-12086 WH-PS2 19-Sep-06 (mg/L)	S2006-12087 WH-PS3 19-Sep-06 (mg/L)	S2006-12088 WH-PS4 19-Sep-06 (mg/L)	S2006-12090 WH-PS6 19-Sep-06 (mg/L)
Parameters	**Schedule 4 Leachate Criteria (mg/L)**	**MDL * (mg/L)**					
Lead	5	0.002	0.253	0.117	1.42	0.204	0.807

Lab Number Sample ID Date Collected Unit			S2006-12091 WH-PS7 19-Sep-06 (mg/L)	S2006-12096 NC-PS2 20-Sep-06 (mg/L)	S2006-12100 NC-PS6 20-Sep-06 (mg/L)	S2006-12101 NC-PS7 20-Sep-06 (mg/L)
Parameters	**Schedule 4 Leachate Criteria (mg/L)**	**MDL * (mg/L)**				
Lead	5	0.002	1.78	0.188	1.54	2.96

			Lab Blank (mg/L)	Q.C. Standard Found (mg/L)	Q.C. Standard Expected (mg/L)	Date of Analysis
Parameters	**Sch. 4 Leachate Criteria (mg/L)**	**MDL * (mg/L)**				
Lead	5	0.002	<0.002	1.03	1.00	10/14-Nov-06

Comments: * Method Detection Limit

The inorganic parameters analyzed on the leachate using the following methods from "Standard Method for the Examination of Water and Wastewater."

Lead - SM 3120 (ICP)

Analysis requested on November 09, 2006

Cynthia Ridge, C. Chem.
Q.A/Q.C Officer

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Client:	AMEC Earth and Environmental, A Division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date:	November 17, 2006
		Page:	1 of 1
Project Name:	Baie Verte	Sample Type:	Solid/Reg.558 Leachate
Project Number:	TF 6126509	Lab. Ref.:	F2006-1655
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Ontario Regulation 558- TCLP Leachate (PCB)

Lab Number			**S2006-12085**	**S2006-12091**
Sample ID			**WH-PS1**	**WH-PS7**
Date Collected			**19-Sep-06**	**19-Sep-06**
Date of Analysis			**09-Nov-06**	**09-Nov-06**
Unit			**(mg/L)**	**(mg/L)**
Parameter	**Schedule 4 Leachate Criteria (mg/L)**	**MDL* (mg/L)**		
Polychlorinated Biphenyl	0.3	0.002	0.003	0.318
Surrogate Recovery				
Decachlorobiphenyl (%)			94	130

			Lab Blank (mg/L)	**Blank Spike (mg/L)**	**Blank Spike Recovery (%)**
Parameter	**Schedule 4 Leachate Criteria (mg/L)**	**MDL* (mg/L)**			
Polychlorinated Biphenyl	0.3	0.002	<0.002	0.00075	80
Surrogate Recovery					
Decachlorobiphenyl (%)			66	80	94

Comments: * Method Detection Limit

Method: EPA 608 - Solvent Ext./GC/ECD

Total PCB quantified as Aroclor 1254/60

Analysis requested on November 09, 2006

Analyst: S. Lam, C. Chem.

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date:	November 17, 2006
		Page:	1 of 1
Project Name:	Baie Verte	Sample Type:	Solid/Reg.558 Leachate
Project Number:	TF 6126509	Lab. Ref.:	F2006-1655
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Ontario Regulation 558 - TCLP Leachate (Mercury)

Lab Number Sample ID Date Collected Unit			S2006-12099 NC-PS5 20-Sep-06 (mg/L)	S2006-12103 NC-PS9 23-Sep-06 (mg/L)
Parameters	**Schedule 4 Leachate Criteria (mg/L)**	**MDL * (mg/L)**		
Mercury	0.1	0.0001	0.0005	0.0009

			Lab Blank (mg/L)	Q.C. Standard Found (mg/L)	Q.C. Standard Expected (mg/L)	Date of Analysis
Parameters	**Sch. 4 Leachate Criteria (mg/L)**	**MDL * (mg/L)**				
Mercury	0.1	0.0001	<0.0001	0.002	0.002	14-Nov-06

Comments: * Method Detection Limit

The inorganic parameters analyzed on the leachate using the following methods from "Standard Method for the Examination of Water and Wastewater."

Mercury - SM 3112 B

Analysis requested on November 09, 2006

Cynthia Ridge, C. Chem.
Q.A/Q.C Officer

Suman Punani, C. Chem.
Laboratory Manager

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date:	November 17, 2006
		Page:	1 of 1
Project Name:	Baie Verte	Sample Type:	Solid/Reg.558 Leachate
Project Number:	TF 6126509	Lab. Ref.:	F2006-1656
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Ontario Regulation 558 - TCLP Leachate (Lead)

Lab Number Sample ID Date Collected Unit			S2006-12113 ML-PS4 21-Sep-06 (mg/L)	S2006-12114 ML-PS5 21-Sep-06 (mg/L)	S2006-12116 ML-PS7 21-Sep-06 (mg/L)	S2006-12117 ML-PS8 21-Sep-06 (mg/L)	S2006-12121 ML-PS12 21-Sep-06 (mg/L)
Parameters	**Schedule 4 Leachate Criteria (mg/L)**	**MDL * (mg/L)**					
Lead	5	0.002	4.78	8.51	0.204	0.996	0.258

			Lab Blank (mg/L)	Q.C. Standard Found (mg/L)	Q.C. Standard Expected (mg/L)	Date of Analysis
Parameters	**Sch. 4 Leachate Criteria (mg/L)**	**MDL * (mg/L)**				
Lead	5	0.002	<0.002	1.03	1.00	14-Nov-06

Comments: * Method Detection Limit
The inorganic parameters analyzed on the leachate using the following methods from "Standard Method for the Examination of Water and Wastewater."
Lead - SM 3120 (ICP)
Analysis requested on November 09, 2006

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date: Page:	November 17, 2006 1 of 1
Project Name:	Baie Verte	Sample Type:	Solid/Reg.558 Leachate
Project Number:	TF 6126509	Lab. Ref.:	F2006-1657
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Ontario Regulation 558 - TCLP Leachate (Lead)

Lab Number Sample ID Date Collected Unit			S2006-12122 ML-PS13 21-Sep-06 (mg/L)	S2006-12123 ML-PS14 21-Sep-06 (mg/L)
Parameters	**Schedule 4 Leachate Criteria (mg/L)**	**MDL * (mg/L)**		
Lead	5	0.002	2.80	116

			Lab Blank (mg/L)	Q.C. Standard Found (mg/L)	Q.C. Standard Expected (mg/L)	Date of Analysis
Parameters	**Sch. 4 Leachate Criteria (mg/L)**	**MDL * (mg/L)**				
Lead	5	0.002	<0.002	1.03	1.00	14-Nov-06

Comments: * Method Detection Limit

The inorganic parameters analyzed on the leachate using the following methods from "Standard Method for the Examination of Water and Wastewater."

Lead - SM 3120 (ICP)

Analysis requested on November 09, 2006

Cynthia Ridge, C. Chem.
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Suman Punani, C. Chem.
Laboratory Manager

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		Page:	1 of 1
Project Name:	Baie Verte	Sample Type:	Solid/Reg.558 Leachate
Project Number:	TF 6126509	Lab. Ref.:	F2006-1657
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Ontario Regulation 558 - TCLP Leachate (Mercury)

Lab Number Sample ID Date Collected Unit			S2006-12126 ML-PS17 21-Sep-06 (mg/L)	Lab Blank (mg/L)	Q.C. Standard Found (mg/L)	Q.C. Standard Expected (mg/L)	Date of Analysis
Parameters	**Schedule 4 Leachate Criteria (mg/L)**	**MDL * (mg/L)**					
Mercury	0.1	0.0001	0.0008	<0.0001	0.002	0.002	14-Nov-06

Comments: * Method Detection Limit

The inorganic parameters analyzed on the leachate using the following methods from "Standard Method for the Examination of Water and Wastewater."

Mercury - SM 3112 B

Analysis requested on November 09, 2006

Cynthia Ridge, C. Chem.
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Suman Punani, C. Chem.
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Date: November 10, 2006

Project Name: Baie Verte Mines

Sample Type: Soil

Project Number: TF 6126509

Lab Ref.: F2006-1563

Contact: Gary Warren

Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-11346 WH-TP1-SS2 20-Sep-06 (µg/g)	S2006-11347 WH-TP2-SS1 20-Sep-06 (µg/g)	S2006-11348 WH-TP3-SS1 20-Sep-06 (µg/g)	S2006-11349 WH-TP4-SS1 20-Sep-06 (µg/g)	S2006-11350 WH-TP5-SS3 20-Sep-06 (µg/g)	S2006-11351 WH-TP6-SS1 20-Sep-06 (µg/g)
Parameters	**MDL* (µg/g)**						
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.01	0.21	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02
m+p-Xylene	0.04	0.21	<0.04	<0.04	<0.04	<0.04	<0.04
o-Xylene	0.02	0.09	<0.02	<0.02	<0.02	<0.02	<0.02
TPH (C6-C10)	10	<10	<10	<10	<10	<10	<10
TPH (C6-C10) less BTEX	10	<10	<10	<10	<10	<10	<10
TPH (>C10-C21)	10	<10	31	<10	<10	<10	<10
TPH (>C21-<C32)	50	<50	243	<50	<50	<50	<50
Modified TPH (Tier 1)**		<70	<284	<70	<70	<70	<70
Hydrocarbon Identification		-	Chromatogram resembles heavy oil	-	-	-	-
BTEX, TPH Purgeable							
Surrogate Recovery							
Difluorobenzene (%)		98	100	95	100	102	98
Trifluorotoluene (%)		103	105	87	105	99	106
4-Bromofluorobenzene (%)		99	99	101	97	101	102
TPH Extractable							
Surrogate Recovery							
O-Terphenyl (%)		96	96	98	103	112	97

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		Page:	2 of 5
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1563
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-11351 WH-TP6-SS1 20-Sep-06 (µg/g)	S2006-11352 WH-TP7-SS3 20-Sep-06 (µg/g)	S2006-11353 Dup 1 20-Sep-06 (µg/g)	S2006-11355 WH-TP9-SS1 21-Sep-06 (ug/g)	S2006-11356 WH-TP10-SS1 21-Sep-06 (µg/g)	S2006-11357 WH-TP11-SS1 21-Sep-06 (µg/g)
Parameters	**MDL* (µg/g)**	**(Rplicate)**					
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
m+p-Xylene	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
o-Xylene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
TPH (C6-C10)	10	<10	<10	<10	<10	<10	<10
TPH (C6-C10) less BTEX	10	<10	<10	<10	<10	<10	<10
TPH (>C10-C21)	10	<10	<10	<10	<10	<10	<10
TPH (>C21-<C32)	50	<50	<50	<50	<50	<50	<50
Modified TPH (Tier 1)**		<70	<70	<70	<70	<70	<70
Hydrocarbon Identification		-	-	-	-	-	-
BTEX, TPH Purgeable							
Surrogate Recovery							
Difluorobenzene (%)		100	100	96	99	100	100
Trifluorotoluene (%)		106	98	105	105	106	99
4-Bromofluorobenzene (%)		103	101	102	99	101	98
TPH Extractable							
Surrogate Recovery							
O-Terphenyl (%)		85	93	86	86	77	90

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		Page:	3 of 5
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1563
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-11358 WH-P12-SS2 21-Sep-06 (µg/g)	S2006-11359 WH-TP13-SS1 21-Sep-06 (µg/g)	S2006-11360 WH-TP14-SS2 21-Sep-06 (µg/g)	S2006-11361 Dup 2 21-Sep-06 (µg/g)	S2006-11363 SP-TP2-SS1 21-Sep-06 (ug/g)	S2006-11364 ML-TP1-SS1 21-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**						
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
m+p-Xylene	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
o-Xylene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
TPH (C6-C10)	10	<10	<10	<10	<10	<10	<10
TPH (C6-C10) less BTEX	10	<10	<10	<10	<10	<10	<10
TPH (>C10-C21)	10	32	77	<10	<10	<10	<10
TPH (>C21-<C32)	50	89	490	<50	<50	101	<50
Modified TPH (Tier 1)**		<131	<577	<70	<70	<121	<70
Hydrocarbon Identification		Chromatogram resembles heavy oil	Chromatogram resembles heavy oil	-	-	Chromatogram resembles heavy oil	-
BTEX, TPH Purgeable							
Surrogate Recovery							
Difluorobenzene (%)		99	100	102	98	99	99
Trifluorotoluene (%)		102	108	104	103	106	112
4-Bromofluorobenzene (%)		103	100	105	98	101	101
TPH Extractable							
Surrogate Recovery							
O-Terphenyl (%)		92	93	91	82	91	105

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		Page:	4 of 5
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1563
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-11365 ML-TP2-SS3 21-Sep-06 (µg/g)	S2006-11366 ML-TP3-SS1 21-Sep-06 (µg/g)	S2006-11366 ML-TP3-SS1 21-Sep-06 (µg/g)	S2006-11367 ML-TP4-SS1 21-Sep-06 (µg/g)	S2006-11368 ML-TP5-SS1 21-Sep-06 (µg/g)	S2006-11369 ML-TP6-SS2 21-Sep-06 (µg/g)
Parameters	**MDL* (µg/g)**			**(Replicate)**			
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	0.02	1.10	0.17	0.17	<0.02	<0.02	<0.02
m+p-Xylene	0.04	2.04	0.82	0.88	<0.04	0.07	<0.04
o-Xylene	0.02	0.28	0.29	0.30	<0.02	<0.02	<0.02
TPH (C6-C10)	10	135	81	81	<10	<10	<10
TPH (C6-C10) less BTEX	10	131	80	80	<10	<10	<10
TPH (>C10-C21)	10	1610	30300	N/R	56	<10	<10
TPH (>C21-<C32)	50	1740	36100	N/R	177	<50	<50
Modified TPH (Tier 1)**		<3480	<66500	-	<243	<70	<70
Hydrocarbon Identification		Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	-	Chromatogram resembles diesel and heavy oil	-	-
BTEX, TPH Purgeable							
Surrogate Recovery							
Difluorobenzene (%)		96	98	96	100	98	99
Trifluorotoluene (%)		104	72	71	109	113	107
4-Bromofluorobenzene (%)		104	113	103	110	103	100
TPH Extractable							
Surrogate Recovery							
O-Terphenyl (%)		126	96	N/R	100	99	113

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		Page:	5 of 5
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1563
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-11370 ML-TP7-SS2 21-Sep-06 (ug/g)	S2006-11371 Dup 3 21-Sep-06 (µg/g)	Lab Blank (µg/g)	Blank Spike (ug/g)	Blank Spike Recovery (%)	Date of Analysis
Parameters	**MDL* (µg/g)**						
Benzene	0.01	<0.01	<0.01	<0.01	2.45	98	02-Oct-06
Toluene	0.01	<0.01	<0.01	<0.01	2.55	102	02-Oct-06
Ethylbenzene	0.02	<0.02	<0.02	<0.02	2.55	102	02-Oct-06
m+p-Xylene	0.04	<0.04	1.33	<0.04	2.53	101	02-Oct-06
o-Xylene	0.02	<0.02	<0.02	<0.02	2.52	101	02-Oct-06
TPH (C6-C10)	10	<10	70	<10	126	126	02-Oct-06
TPH (C6-C10) less BTEX	10	<10	69	<10	113	113	02-Oct-06
TPH (>C10-C21)	10	846	2640	<10	854	85	14/16-Oct-06
TPH (>C21-<C32)	50	116	3320	<50			14/16-Oct-06
Modified TPH (Tier 1)**		<972	<6030	<70	-	-	-
Hydrocarbon Identification		Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	-	-	-	-
BTEX, TPH Purgeable							
Surrogate Recovery							
Difluorobenzene (%)		97	99	102	103	103	02-Oct-06
Trifluorotoluene (%)		115	108	109	105	105	02-Oct-06
4-Bromofluorobenzene (%)		103	111	99	100	100	02-Oct-06
TPH Extractable							
Surrogate Recovery							
O-Terphenyl (%)		122	97	78	95	95	14/16-Oct-06

Comments: Total hydrocarbons quantified as Toluene/Diesel

Methods: Modified EPA SW-846, EPA Method 5030/8015/8020/Purge and Trap GC/FID
Modified EPA SW-846, EPA Method 3550/3580/8000 Solvent Ext./GC/FID

Values in ppm (ug/g)

Results reported on dry weight basis

* Method Detection Limit

** Modified TPH is the total of TPH Purgeable and Extractable

N/R No Lab Replicate

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

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		Page:	1 of 5
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1592
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-11581 ML-TP8-SS4 22-Sep-06 (µg/g)	S2006-11581 ML-TP8-SS4 22-Sep-06 (µg/g)	S2006-11582 ML-TP9-SS3 22-Sep-06 (µg/g)	S2006-11583 ML-TP10-SS1 22-Sep-06 (µg/g)	S2006-11584 ML-TP11-SS2 22-Sep-06 (µg/g)	S2006-11585 ML-TP12-SS1 22-Sep-06 (µg/g)
Parameters	**MDL* (µg/g)**		**(Replicate)**				
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.01	0.03	0.02	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03
m+p-Xylene	0.04	<0.04	<0.04	<0.04	<0.04	0.48	<0.04
o-Xylene	0.02	<0.02	<0.02	<0.02	<0.02	0.57	<0.02
TPH (C6-C10)	10	<10	<10	<10	<10	111	<10
TPH (C6-C10) less BTEX	10	<10	<10	<10	<10	110	<10
TPH (>C10-C21)	10	260	303	<10	442	3830	<10
TPH (>C21-<C32)	50	<50	<50	4400	5910	530	<50
Modified TPH (Tier 1)**		<320	<363	<4420	<6360	<4470	<70
Hydrocarbon Identification		Chromatogram resembles weathered diesel	Chromatogram resembles weathered diesel	Chromatogram resembles heavy oil	Chromatogram resembles heavy oil	Chromatogram resembles diesel and heavy oil	-
BTEX, TPH Purgeable							
Surrogate Recovery							
Difluorobenzene (%)		100	107	105	105	101	79
Trifluorotoluene (%)		123	102	103	109	116	74
4-Bromofluorobenzene (%)		101	96	99	93	112	74
TPH Extractable							
Surrogate Recovery							
O-Terphenyl (%)		119	131	126	102	124	96

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Client:	AMEC Earth & Environmental, A Division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date: Page:	November 10, 2006 2 of 5
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1592
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-11586 ML-TP13-SS3 22-Sep-06 (µg/g)	S2006-11587 ML-TP14-SS1 22-Sep-06 (µg/g)	S2006-11588 ML-TP15-SS1 22-Sep-06 (µg/g)	S2006-11591 ML-TP18-SS1 23-Sep-06 (ug/g)	S2006-11592 ML-TP19-SS2 23-Sep-06 (µg/g)	S2006-11593 ML-TP20-SS3 23-Sep-06 (µg/g)
Parameters	**MDL* (µg/g)**						
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.01	<0.01	<0.01	0.02	0.02	<0.01	<0.01
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
m+p-Xylene	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
o-Xylene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
TPH (C6-C10)	10	<10	<10	<10	<10	<10	<10
TPH (C6-C10) less BTEX	10	<10	<10	<10	<10	<10	<10
TPH (>C10-C21)	10	<10	29	304	5610	14	1040
TPH (>C21-<C32)	50	<50	302	429	13200	91	2870
Modified TPH (Tier 1)**		<70	<341	<743	<18800	<115	<3920
Hydrocarbon Identification		-	Chromatogram resembles heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles heavy oil	Chromatogram resembles diesel and heavy oil
BTEX, TPH Purgeable							
Surrogate Recovery							
Difluorobenzene (%)		93	103	102	107	100	103
Trifluorotoluene (%)		82	128	102	111	110	93
4-Bromofluorobenzene (%)		101	99	101	98	99	99
TPH Extractable							
Surrogate Recovery							
O-Terphenyl (%)		98	78	116	127	105	125

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Client:	AMEC Earth & Environmental, A Division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date:	November 10, 2006
		Page:	3 of 5
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1592
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-11596 NC-TP1-SS4 23-Sep-06 (µg/g)	S2006-11596 NC-TP1-SS4 23-Sep-06 (µg/g)	S2006-11597 NC-TP2-SS2 23-Sep-06 (µg/g)	S2006-11598 NC-TP3-SS3 23-Sep-06 (µg/g)	S2006-11599 NC-TP4-SS3 23-Sep-06 (ug/g)	S2006-11600 NC-TP5-SS1 23-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**		**(Replicate)**				
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01
Ethylbenzene	0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02
m+p-Xylene	0.04	<0.04	<0.04	0.20	<0.04	<0.04	<0.04
o-Xylene	0.02	<0.02	<0.02	0.33	<0.02	<0.02	<0.02
TPH (C6-C10)	10	<10	<10	97	<10	<10	<10
TPH (C6-C10) less BTEX	10	<10	<10	96	<10	<10	<10
TPH (>C10-C21)	10	<10	<10	1240	61	102	<10
TPH (>C21-<C32)	50	<50	<50	4170	172	373	<50
Modified TPH (Tier 1)**		<70	<70	<5510	<243	<485	<70
Hydrocarbon Identification		-	-	Chromatogram resembles diesel and heavy oil	Chromatogram resembles heavy oil	Chromatogram resembles heavy oil	-
BTEX, TPH Purgeable							
Surrogate Recovery							
Difluorobenzene (%)		101	103	96	104	101	101
Trifluorotoluene (%)		97	97	113	116	107	116
4-Bromofluorobenzene (%)		100	97	106	97	99	98
TPH Extractable							
Surrogate Recovery							
O-Terphenyl (%)		102	104	125	94	99	83

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Client:	AMEC Earth & Environmental, A Division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date:	November 10, 2006
		Page:	4 of 5
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1592
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-11601 NC-TP6-SS1 23-Sep-06 (ug/g)	S2006-11602 NC-TP7-SS3 23-Sep-06 (µg/g)	S2006-11603 NC-TP8-SS3 23-Sep-06 (µg/g)	S2006-11604 Dup 4 22-Sep-06 (ug/g)	S2006-11607 Dup 7 23-Sep-06 (ug/g)	S2006-11608 ML-TP22-SS1 23-Sep-06 (ug/g)
Parameters	**MDL*** **(µg/g)**						
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.01	0.02	<0.01	0.01	<0.01	<0.01	<0.01
Ethylbenzene	0.02	<0.02	0.16	<0.02	<0.02	<0.02	<0.02
m+p-Xylene	0.04	<0.04	0.20	<0.04	<0.04	<0.04	<0.04
o-Xylene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
TPH (C6-C10)	10	38	171	22	<10	29	<10
TPH (C6-C10) less BTEX	10	38	170	22	<10	29	<10
TPH (>C10-C21)	10	966	2720	1260	176	710	101
TPH (>C21-<C32)	50	631	2080	846	<50	524	141
Modified TPH (Tier 1)**		<1640	<4970	<2130	<236	<1260	<252
Hydrocarbon Identification		Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles weathered diesel	Chromatogram resembles diesel and heavy oil	Chromatogram resembles weathered diesel and heavy oil
BTEX, TPH Purgeable							
Surrogate Recovery							
Difluorobenzene (%)		98	91	99	89	102	101
Trifluorotoluene (%)		108	104	78	95	128	118
4-Bromofluorobenzene (%)		98	114	101	90	106	93
TPH Extractable							
Surrogate Recovery							
O-Terphenyl (%)		99	99	108	91	99	99

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		Page:	5 of 5
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1592
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-11608 ML-TP22-SS1 23-Sep-06 (ug/g)	Lab Blank (ug/g)	Blank Spike (ug/g)	Blank Spike Recovery (%)	Date of Analysis
Parameters	**MDL* (µg/g)**	**(Replicate)**				
Benzene	0.01	<0.01	<0.01	2.69	107	06-Oct-06
Toluene	0.01	<0.01	<0.01	2.72	109	06-Oct-06
Ethylbenzene	0.02	<0.02	<0.02	2.58	103	06-Oct-06
m+p-Xylene	0.04	<0.04	<0.04	2.60	104	06-Oct-06
o-Xylene	0.02	<0.02	<0.02	2.50	100	06-Oct-06
TPH (C6-C10)	10	<10	<10	77	77	06-Oct-06
TPH (C6-C10) less BTEX	10	<10	<10	64	91	06-Oct-06
TPH (>C10-C21)	10	87	<10	869	87	16/17-Oct-06
TPH (>C21-<C32)	50	127	<50			16/17-Oct-06
Modified TPH (Tier 1)**		<224	<70	-	-	-
Hydrocarbon Identification		Chromatogram resembles weathered diesel and heavy oil	-	-	-	-
BTEX, TPH Purgeable						
Surrogate Recovery						
Difluorobenzene (%)		103	112	100	100	06-Oct-06
Trifluorotoluene (%)		113	110	95	95	06-Oct-06
4-Bromofluorobenzene (%)		98	97	98	98	06-Oct-06
TPH Extractable						
Surrogate Recovery						
O-Terphenyl (%)		95	84	114	114	16/17-Oct-06

Comments: Total hydrocarbons quantified as Toluene/Diesel

Methods: Modified EPA SW-846, EPA Method 5030/8015/8020/Purge and Trap GC/FID
Modified EPA SW-846, EPA Method 3550/3580/8000 Solvent Ext./GC/FID

Values in ppm (ug/g)

Results reported on dry weight basis

* Method Detection Limit

** Modified TPH is the total of TPH Purgeable and Extractable

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Q.A./Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

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Client:	AMEC Earth & Environmental, A Division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date:	November 10, 2006
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Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1595
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-11630 NC-TP9-SS1 24-Sep-06 (µg/g)	S2006-11630 NC-TP9-SS1 24-Sep-06 (µg/g)	S2006-11631 NC-TP10-SS1 24-Sep-06 (µg/g)	S2006-11632 NC-TP11-SS2 24-Sep-06 (µg/g)	S2006-11633 NC-TP12-SS2 24-Sep-06 (µg/g)	S2006-11634 NC-TP20-SS1 24-Sep-06 (µg/g)
Parameters	**MDL* (µg/g)**		**(Replicate)**				
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.01	0.01	0.02	0.02	0.01	<0.01	<0.01
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
m+p-Xylene	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
o-Xylene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
TPH (C6-C10)	10	<10	<10	<10	103	11	<10
TPH (C6-C10) less BTEX	10	<10	<10	<10	103	11	<10
TPH (>C10-C21)	10	28	24	<10	3480	572	209
TPH (>C21-<C32)	50	62	62	<50	<50	379	789
Modified TPH (Tier 1)**		<100	<96	<70	<3630	<962	<1010
Hydrocarbon Identification		Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	-	Chromatogram resembles diesel	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil
BTEX, TPH Purgeable							
Surrogate Recovery							
Difluorobenzene (%)		100	95	101	100	103	92
Trifluorotoluene (%)		87	88	92	105	81	86
4-Bromofluorobenzene (%)		101	99	124	106	118	87
TPH Extractable							
Surrogate Recovery							
O-Terphenyl (%)		94	74	70	111	89	98

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		Page:	2 of 4
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1595
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-11635 NC-TP21-SS1 24-Sep-06 (µg/g)	S2006-11636 NC-TP22-SS1 24-Sep-06 (µg/g)	S2006-11637 NC-TP23-SS1 24-Sep-06 (µg/g)	S2006-11638 NC-TP24-SS1 24-Sep-06 (µg/g)	S2006-11639 NC-TP25-SS3 24-Sep-06 (µg/g)	S2006-11640 NC-TP26-SS2 24-Sep-06 (µg/g)
Parameters	**MDL* (µg/g)**						
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.01	<0.01	<0.01	0.04	0.02	<0.01	<0.01
Ethylbenzene	0.02	<0.02	<0.02	0.51	0.03	<0.02	<0.02
m+p-Xylene	0.04	<0.04	<0.04	1.27	0.17	<0.04	<0.04
o-Xylene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
TPH (C6-C10)	10	<10	12	65	63	<10	<10
TPH (C6-C10) less BTEX	10	<10	12	63	62	<10	<10
TPH (>C10-C21)	10	179	591	1790	1730	<10	<10
TPH (>C21-<C32)	50	2100	77	974	1570	<50	<50
Modified TPH (Tier 1)**		<2290	<680	<2830	<3360	<70	<70
Hydrocarbon Identification		Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	-	-
BTEX, TPH Purgeable							
Surrogate Recovery							
Difluorobenzene (%)		101	104	103	100	99	99
Trifluorotoluene (%)		98	88	118	83	90	98
4-Bromofluorobenzene (%)		95	103	109	110	93	99
TPH Extractable							
Surrogate Recovery							
O-Terphenyl (%)		96	76	116	115	96	82

Client:	AMEC Earth & Environmental, A Division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date:	November 10, 2006
		Page:	3 of 4
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1595
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-11640 NC-TP26-SS2 24-Sep-06 (µg/g)	S2006-11641 NC-TP27-SS3 24-Sep-06 (µg/g)	S2006-11642 WR-TP1-SS2 24-Sep-06 (µg/g)
Parameters	**MDL*** **(µg/g)**	**(Replicate)**		
Benzene	0.01	<0.01	<0.01	<0.01
Toluene	0.01	<0.01	<0.01	<0.01
Ethylbenzene	0.02	<0.02	<0.02	<0.02
m+p-Xylene	0.04	<0.04	<0.04	<0.04
o-Xylene	0.02	<0.02	<0.02	<0.02
TPH (C6-C10)	10	<10	15	<10
TPH (C6-C10) less BTEX	10	<10	15	<10
TPH (>C10-C21)	10	<10	167	<10
TPH (>C21-<C32)	50	<50	<50	<50
Modified TPH (Tier 1)**		<70	<232	<70
Hydrocarbon Identification		-	Chromatogram resembles diesel	-
BTEX, TPH Purgeable				
Surrogate Recovery				
Difluorobenzene (%)		105	105	104
Trifluorotoluene (%)		88	93	100
4-Bromofluorobenzene (%)		96	101	96
TPH Extractable				
Surrogate Recovery				
O-Terphenyl (%)		89	113	80

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Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1595
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Parameters	MDL* (µg/g)	Lab Blank (µg/g)	Blank Spike (µg/g)	Blank Spike Recovery (%)	Date of Analysis
Benzene	0.01	<0.01	2.58	103	11/16-Oct-06
Toluene	0.01	<0.01	2.56	102	11/16-Oct-06
Ethylbenzene	0.02	<0.02	2.56	103	11/16-Oct-06
m+p-Xylene	0.04	<0.04	2.56	103	11/16-Oct-06
o-Xylene	0.02	<0.02	2.58	103	11/16-Oct-06
TPH (C6-C10)	10	<10	99	99	11/16-Oct-06
TPH (C6-C10) less BTEX	10	<10	86	101	11/16-Oct-06
TPH (>C10-C21)	10	<10	854	85	14/16-Oct-06
TPH (>C21-<C32)	50	<50			14/16-Oct-06
Modified TPH (Tier 1)**		<70	-	-	-
Hydrocarbon Identification			-	-	-
BTEX, TPH Purgeable					
Surrogate Recovery					
Difluorobenzene (%)		98	97	97	11/16-Oct-06
Trifluorotoluene (%)		114	94	94	11/16-Oct-06
4-Bromofluorobenzene (%)		100	107	107	11/16-Oct-06
TPH Extractable					
Surrogate Recovery					
O-Terphenyl (%)		94	95	95	14/16-Oct-06

Comments: Total hydrocarbons quantified as Toluene/Diesel
Methods: Modified EPA SW-846, EPA Method 5030/8015/8020/Purge and Trap GC/FID
Modified EPA SW-846, EPA Method 3550/3580/8000 Solvent Ext./GC/FID
Values in ppm (ug/g)
Results reported on dry weight basis
* Method Detection Limit
** Modified TPH is the total of TPH Purgeable and Extractable

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Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1607
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-11692 NC-TP15-SS1 28-Sep-06 (µg/g)	S2006-11693 NC-TP16-SS1 28-Sep-06 (µg/g)	S2006-11697 DUP 10 28-Sep-06 (µg/g)	S2006-11699 SED 7 28-Sep-06 (µg/g)	S2006-11700 SED 8 28-Sep-06 (µg/g)
Parameters	**MDL* (µg/g)**					
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
m+p-Xylene	0.04	<0.04	<0.04	0.054	<0.04	<0.04
o-Xylene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
TPH (C6-C10)	10	<10	<10	<10	<10	<10
TPH (C6-C10) less BTEX	10	<10	<10	<10	<10	<10
TPH (>C10-C21)	10	1670	1340	1540	<10	22
TPH (>C21-<C32)	50	20700	11700	13800	<50	167
Modified TPH (Tier 1)**		<22400	<13000	<15400	<70	<199
Hydrocarbon Identification		Chromatogram resembles weathered diesel and heavy oil	Chromatogram resembles diesel and heavy oil	Chromatogram resembles diesel and heavy oil	-	Chromatogram resembles weathered diesel and heavy oil
BTEX, TPH Purgeable						
Surrogate Recovery						
Difluorobenzene (%)		102	97	94	100	104
Trifluorotoluene (%)		87	91	100	67	98
4-Bromofluorobenzene (%)		91	97	99	92	102
TPH Extractable						
Surrogate Recovery						
O-Terphenyl (%)		113	111	117	103	84

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Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1607
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-11700 SED 8 28-Sep-06 (µg/g)	S2006-11701 SED 9 28-Sep-06 (µg/g)
Parameters	**MDL* (µg/g)**	**(Replicate)**	
Benzene	0.01	<0.01	<0.01
Toluene	0.01	<0.01	0.025
Ethylbenzene	0.02	<0.02	<0.02
m+p-Xylene	0.04	<0.04	<0.04
o-Xylene	0.02	<0.02	<0.02
TPH (C6-C10)	10	<10	<10
TPH (C6-C10) less BTEX	10	<10	<10
TPH (>C10-C21)	10	20	34
TPH (>C21-<C32)	50	120	241
Modified TPH (Tier 1)**		<150	<285
Hydrocarbon Identification		Chromatogram resembles weathered diesel and heavy oil	Chromatogram resembles weathered diesel and heavy oil
BTEX, TPH Purgeable			
Surrogate Recovery			
Difluorobenzene (%)		105	99
Trifluorotoluene (%)		95	89
4-Bromofluorobenzene (%)		102	101
TPH Extractable			
Surrogate Recovery			
O-Terphenyl (%)		95	79

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Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1607
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Parameters	MDL* (µg/g)	Lab Blank (µg/g)	Blank Spike (ug/g)	Blank Spike Recovery (%)	Date of Analysis
Benzene	0.01	<0.01	2.14	86	12/16-Oct-06
Toluene	0.01	<0.01	2.25	90	12/16-Oct-06
Ethylbenzene	0.02	<0.02	2.15	86	12/16-Oct-06
m+p-Xylene	0.04	<0.04	2.16	87	12/16-Oct-06
o-Xylene	0.02	<0.02	2.22	89	12/16-Oct-06
TPH (C6-C10)	10	<10	105	105	12/16-Oct-06
TPH (C6-C10) less BTEX	10	<10	95	96	12/16-Oct-06
TPH (>C10-C21)	10	<10	854	85	14/16-Oct-06
TPH (>C21-<C32)	50	<50			14/16-Oct-06
Modified TPH (Tier 1)**		<70	-	-	-
Hydrocarbon Identification			-	-	-
BTEX, TPH Purgeable					
Surrogate Recovery					
Difluorobenzene (%)		105	102	102	12/16-Oct-06
Trifluorotoluene (%)		93	82	82	12/16-Oct-06
4-Bromofluorobenzene (%)		96	106	106	12/16-Oct-06
TPH Extractable					
Surrogate Recovery					
O-Terphenyl (%)		94	95	95	14/16-Oct-06

Comments: Total hydrocarbons quantified as Toluene/Diesel

Methods: Modified EPA SW-846, EPA Method 5030/8015/8020/Purge and Trap GC/FID

Modified EPA SW-846, EPA Method 3550/3580/8000 Solvent Ext./GC/FID

Values in ppm (ug/g)

Results reported on dry weight basis

* Method Detection Limit

** Modified TPH is the total of TPH Purgeable and Extractable

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Client:	AMEC Earth & Environmental, A Division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date:	November 10, 2006
		Page:	1 of 3
Project Name:	Baie Verte Mines	Sample Type:	Soil/Sediment
Project Number:	TF 6126509	Lab Ref.:	F2006-1594
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-11613 WR-TP2-SS1 24-Sep-06 (µg/g)	S2006-11614 WR-TP3-SS1 24-Sep-06 (µg/g)	S2006-11614 WR-TP3-SS1 24-Sep-06 (µg/g)	S2006-11615 WR-TP4-SS1 24-Sep-06 (µg/g)	S2006-11616 WR-TP5-SS1 24-Sep-06 (µg/g)	S2006-11617 SED 1 25-Sep-06 (µg/g)
Parameters	**MDL* (µg/g)**			**(Replicate)**			
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
m+p-Xylene	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
o-Xylene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
TPH (C6-C10)	10	<10	<10	<10	<10	<10	<10
TPH (C6-C10) less BTEX	10	<10	<10	<10	<10	<10	<10
TPH (>C10-C21)	10	1970	<10	<10	<10	<10	<10
TPH (>C21-<C32)	50	12900	<50	<50	<50	<50	<50
Modified TPH (Tier 1)**		<14900	<70	<70	<70	<70	<70
Hydrocarbon Identification		Chromatogram resembles weathered diesel and heavy oil	-	-	-	-	-
BTEX, TPH Purgeable							
Surrogate Recovery							
Difluorobenzene (%)		102	113	106	100	101	106
Trifluorotoluene (%)		103	113	115	100	110	120
4-Bromofluorobenzene (%)		100	95	101	99	99	103
TPH Extractable							
Surrogate Recovery							
O-Terphenyl (%)		125	79	89	83	92	78

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		Page:	2 of 3
Project Name:	Baie Verte Mines	Sample Type:	Soil/Sediment
Project Number:	TF 6126509	Lab Ref.:	F2006-1594
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-11618 SED 2 25-Sep-06 (µg/g)	S2006-11619 SED 3 25-Sep-06 (µg/g)	S2006-11620 SED 4 25-Sep-06 (µg/g)	S2006-11621 SED 5 25-Sep-06 (µg/g)	S2006-11622 SED 6 26-Sep-06 (µg/g)	S2006-11628 Dup 8 24-Sep-06 (µg/g)
Parameters	**MDL* (µg/g)**						
Benzene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
m+p-Xylene	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
o-Xylene	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
TPH (C6-C10)	10	<10	<10	<10	<10	<10	17
TPH (C6-C10) less BTEX	10	<10	<10	<10	<10	<10	17
TPH (>C10-C21)	10	<10	<10	46	12	<10	444
TPH (>C21-<C32)	50	<50	<50	1060	<50	<50	442
Modified TPH (Tier 1)**		<70	<70	<1120	<72	<70	<903
Hydrocarbon Identification		-	-	Chromatogram resembles diesel and heavy oil	Too low to identify	-	Chromatogram resembles diesel and heavy oil
BTEX, TPH Purgeable							
Surrogate Recovery							
Difluorobenzene (%)		102	103	102	106	102	104
Trifluorotoluene (%)		97	119	83	108	118	128
4-Bromofluorobenzene (%)		97	100	101	103	100	103
TPH Extractable							
Surrogate Recovery							
O-Terphenyl (%)		81	88	93	75	91	74

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		Page:	3 of 3
Project Name:	Báie Verte Mines	Sample Type:	Soil/Sediment
Project Number:	TF 6126509	Lab Ref.:	F2006-1594
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit		S2006-11628 Dup 8 24-Sep-06 (µg/g)	S2006-11629 Dup 9 25-Sep-06 (µg/g)	Lab Blank (µg/g)	Blank Spike (ug/g)	Blank Spike Recovery (%)	Date of Analysis
Parameters	**MDL* (µg/g)**	**(Replicate)**					
Benzene	0.01	<0.01	<0.01	<0.01	2.45	98	03-Oct-06
Toluene	0.01	<0.01	<0.01	<0.01	2.55	102	03-Oct-06
Ethylbenzene	0.02	<0.02	<0.02	<0.02	2.55	102	03-Oct-06
m+p-Xylene	0.04	<0.04	<0.04	<0.04	2.53	101	03-Oct-06
o-Xylene	0.02	<0.02	<0.02	<0.02	2.52	101	03-Oct-06
TPH (C6-C10)	10	18	<10	<10	126	126	03-Oct-06
TPH (C6-C10) less BTEX	10	18	<10	<10	113	113	03-Oct-06
TPH (>C10-C21)	10	N/R	<10	<10	854	85	14/16-Oct-06
TPH (>C21-<C32)	50	N/R	<50	<50			14/16-Oct-06
Modified TPH (Tier 1)**		-	<70	<70	-	-	-
Hydrocarbon Identification		-	-	-	-	-	-
BTEX, TPH Purgeable							
Surrogate Recovery							
Difluorobenzene (%)		100	106	102	103	103	03-Oct-06
Trifluorotoluene (%)		101	113	109	105	105	03-Oct-06
4-Bromofluorobenzene (%)		92	104	99	100	100	03-Oct-06
TPH Extractable							
Surrogate Recovery							
O-Terphenyl (%)		N/R	77	94	95	95	14/16-Oct-06

Comments: Total hydrocarbons quantified as Toluene/Diesel
Methods: Modified EPA SW-846, EPA Method 5030/8015/8020/Purge and Trap GC/FID
Modified EPA SW-846, EPA Method 3550/3580/8000 Solvent Ext./GC/FID
Values in ppm (ug/g)
Results reported on dry weight basis
* Method Detection Limit
** Modified TPH is the total of TPH Purgeable and Extractable
N/R No Lab Replicate

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		Page:	1 of 2
Project Name:	Baie Verte Mines	Sample Type:	Water
Project Number:	TF 6126509	Lab Ref.:	F2006-1594
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit			S2006-11623 SW 1 25-Sep-06 (µg/L)	S2006-11624 SW 2 25-Sep-06 (µg/L)	S2006-11625 SW 3 25-Sep-06 (µg/L)	S2006-11626 SW 4 25-Sep-06 (µg/L)	S2006-11627 SW 5 25-Sep-06 (µg/L)
Parameters	**MDL* (µg/L)**	**RDL ** (µg/L)**					
Benzene	0.2	0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Toluene	0.2	0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Ethylbenzene	0.3	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
m+p-Xylene	0.4	0.8	<0.8	<0.8	<0.8	<0.8	<0.8
o-Xylene	0.3	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
TPH (C6-C10)	50	50	<50	<50	<50	<50	<50
TPH (C6-C10) less BTEX	50	50	<50	<50	<50	<50	<50
TPH (>C10-C21)	50	50	<50	<50	<50	<50	<50
TPH (>C21-<C32)	50	50	<50	<50	<50	<50	<50
Modified TPH (Tier 1)***			<150	<150	<150	<150	<150
Hydrocarbon Identification			-	-	-	-	-
BTEX, TPH (C6-C10) Surrogate Recovery							
Dibromofluoromethane (%)			101	101	102	100	100
4-Bromofluorobenzene (%)			100	100	97	99	100
TPH (>C10-<C32) Surrogate Recovery							
O-Terphenyl (%)			80	85	88	92	78

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		Page:	2 of 2
Project Name:	Baie Verte Mines	Sample Type:	Water
Project Number:	TF 6126509	Lab Ref.:	F2006-1594
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit			S2006-11627 SW 5 25-Sep-06 (µg/L)	Lab Blank (µg/L)	Blank Spike (µg/L)	Blank Spike Recovery (%)	Date of Analysis
Parameters	**MDL* (µg/L)**	**RDL ** (µg/L)**	**(Replicate)**				
Benzene	0.2	0.4	<0.4	<0.4	53.1	106	03-Oct-06
Toluene	0.2	0.4	<0.4	<0.4	53.4	107	03-Oct-06
Ethylbenzene	0.3	0.6	<0.6	<0.6	52.4	105	03-Oct-06
m+p-Xylene	0.4	0.8	<0.8	<0.8	52.5	105	03-Oct-06
o-Xylene	0.3	0.6	<0.6	<0.6	53.5	107	03-Oct-06
TPH (C6-C10)	50	50	<50	<50	945	94	03-Oct-06
TPH (C6-C10) less BTEX	50	50	<50	<50	680	100	03-Oct-06
TPH (>C10-C21)	50	50	N/R	<50	10000	80	18/21-Oct-06
TPH (>C21-<C32)	50	50	N/R	<50			18/21-Oct-06
Modified TPH (Tier 1)***			-	<150	-	-	-
Hydrocarbon Identification			-	-	-	-	-
BTEX, TPH (C6-C10) Surrogate Recovery							
Dibromofluoromethane (%)			98	104	104	104	03-Oct-06
4-Bromofluorobenzene (%)			100	104	102	102	03-Oct-06
TPH (>C10-<C32) Surrogate Recovery							
O-Terphenyl (%)			N/R	99	80	80	18/21-Oct-06

Comments:

* Method Detection Limit
** Reporting Detection Limit
*** Modified TPH is the total of TPH Purgeable and Extractable
Total hydrocarbons quantified as Toluene/Diesel
Methods: Modified EPA SW-846, EPA Method 5030/8015/8020/Purge and Trap GC/FID
Modified EPA SW-846, EPA Method 3550/3580/8000 Solvent Ext./GC/FID
Values in ppb (ug/L)
N/R No Lab Replicate

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		Page:	1 of 2
Project Name:	Baie Verte Mines	Sample Type:	Water
Project Number:	TF 6126509	Lab Ref.:	F2006-1607
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Lab Number Sample ID Date Collected Unit			S2006-11696 SW 6 28-Sep-06 (µg/L)	S2006-11698 DUP 11 28-Sep-06 (µg/L)	S2006-11698 DUP 11 28-Sep-06 (µg/L)
Parameters	**MDL*** **(µg/L)**	**RDL **** **(µg/L)**			**(Replicate)**
Benzene	0.2	0.4	<0.4	<0.4	<0.4
Toluene	0.2	0.4	<0.4	<0.4	<0.4
Ethylbenzene	0.3	0.6	<0.6	<0.6	<0.6
m+p-Xylene	0.4	0.8	<0.8	<0.8	<0.8
o-Xylene	0.3	0.6	<0.6	<0.6	<0.6
TPH (C6-C10)	50	50	<50	<50	<50
TPH (C6-C10) less BTEX	50	50	<50	<50	<50
TPH (>C10-C21)	50	50	<50	I/S	-
TPH (>C21-<C32)	50	50	<50	I/S	-
Modified TPH (Tier 1)***			<150	-	-
Hydrocarbon Identification			-	-	-
BTEX, TPH (C6-C10) Surrogate Recovery					
Dibromofluoromethane (%)			100	92	94
4-Bromofluorobenzene (%)			107	102	99
TPH (>C10-<C32) Surrogate Recovery					
O-Terphenyl (%)			66	I/S	-

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		Page:	2 of 2
Project Name:	Baie Verte Mines	Sample Type:	Water
Project Number:	TF 6126509	Lab Ref.:	F2006-1607
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

BTEX, TPH (RBCA Method)

Parameters	MDL* (µg/L)	RDL ** (µg/L)	Lab Blank (µg/L)	Blank Spike (µg/L)	Blank Spike Recovery (%)	Date of Analysis
Benzene	0.2	0.4	<0.4	43.7	87	17-Oct-06
Toluene	0.2	0.4	<0.4	42.8	86	17-Oct-06
Ethylbenzene	0.3	0.6	<0.6	45.1	90	17-Oct-06
m+p-Xylene	0.4	0.8	<0.8	43.6	87	17-Oct-06
o-Xylene	0.3	0.6	<0.6	43.1	86	17-Oct-06
TPH (C6-C10)	50	50	<50	1070	107	17-Oct-06
TPH (C6-C10) less BTEX	50	50	<50	850	97	17-Oct-06
TPH (>C10-C21)	50	50	<50	10000	80	19/21-Oct-06
TPH (>C21-<C32)	50	50	<50			19/21-Oct-06
Modified TPH (Tier 1)***			<150	-	-	-
Hydrocarbon Identification			-	-	-	-
BTEX, TPH (C6-C10) Surrogate Recovery						
Dibromofluoromethane (%)			103	101	101	17-Oct-06
4-Bromofluorobenzene (%)			94	99	99	17-Oct-06
TPH (>C10-<C32) Surrogate Recovery						
O-Terphenyl (%)			94	80	80	19/21-Oct-06

Comments:

*	Method Detection Limit	
**	Reporting Detection Limit	
***	Modified TPH is the total of TPH Purgeable and Extractable	
	Total hydrocarbons quantified as Toluene/Diesel	
	Methods:	Modified EPA SW-846, EPA Method 5030/8015/8020/Purge and Trap GC/FID
		Modified EPA SW-846, EPA Method 3550/3580/8000 Solvent Ext./GC/FID
	Values in ppb (ug/L)	
I/S	Insufficient sample to run the analysis	

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		Page:	1 of 4
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1563
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab Number Sample ID Date Collected Unit		S2006-11346 WH-TP1-SS2 20-Sep-06 (ug/g)	S2006-11346 WH-TP1-SS2 20-Sep-06 (ug/g)	S2006-11347 WH-TP2-SS1 20-Sep-06 (ug/g)	S2006-11348 WH-TP3-SS1 20-Sep-06 (ug/g)	S2006-11349 WH-TP4-SS1 20-Sep-06 (ug/g)	S2006-11350 WH-TP5-SS3 20-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**		**(Replicate)**				
Aluminum	5	16400	20500	10200	11000	16500	16500
Antimony	0.5	1.4	1.9	2.2	1.4	1.5	2.3
Arsenic	0.1	7.3	10.0	5.7	7.9	17.5	2.2
Barium	0.5	3.1	4.0	6.4	7.1	5.3	7.8
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bismuth	0.2	0.2	0.3	0.4	0.2	0.3	0.2
Cadmium	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Calcium	25	27400	15200	20800	10300	11900	4390
Chromium	1	143	161	384	135	179	394
Cobalt	1	21	24	31	20	25	17
Copper	1	47	56	484	43	46	12
Iron	5	32900	39700	26100	27400	39400	36600
Lead	5	<5	<5	20	<5	5	<5
Magnesium	10	35800	33300	95800	24100	33500	56000
Manganese	1	620	722	544	526	697	551
Mercury	0.01	0.01	0.02	0.06	0.02	0.03	0.03
Molybdenum	2	<2	<2	<2	<2	<2	<2
Nickel	5	106	117	710	129	135	137
Phosphorus	5	599	478	190	348	663	528
Potassium	10	356	404	476	304	339	314
Selenium	0.1	0.1	0.1	0.3	0.1	0.2	0.1
Silver	0.25	0.85	0.73	0.53	0.42	0.37	0.25
Sodium	25	141	130	162	149	145	182
Vanadium	5	51	67	31	41	61	67
Zinc	2	39	51	70	33	55	43

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		Page:	2 of 4
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1563
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab Number Sample ID Date Collected Unit		S2006-11351 WH-TP6-SS1 20-Sep-06 (µg/g)	S2006-11352 WH-TP7-SS3 20-Sep-06 (µg/g)	S2006-11355 WH-TP9-SS1 21-Sep-06 (µg/g)	S2006-11356 WH-TP10-SS1 21-Sep-06 (µg/g)	S2006-11357 WH-TP11-SS1 21-Sep-06 (µg/g)	S2006-11358 WH-TP12-SS2 21-Sep-06 (µg/g)
Parameters	**MDL* (µg/g)**						
Aluminum	5	10100	15100	10000	7980	11700	9500
Antimony	0.5	1.9	2.3	2.1	1.9	3.1	2.2
Arsenic	0.1	2.4	1.4	2.1	4.0	7.5	3.4
Barium	0.5	4.6	4.8	6.3	4.5	6.7	11.1
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bismuth	0.2	0.3	0.3	0.2	0.3	0.5	0.3
Cadmium	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Calcium	25	2390	2780	1700	1430	1740	1710
Chromium	1	318	432	382	328	594	379
Cobalt	1	20	26	22	22	39	23
Copper	1	16	29	30	24	28	30
Iron	5	23500	28800	25300	21800	30000	26300
Lead	5	<5	<5	<5	<5	<5	<5
Magnesium	10	42100	66300	58700	61300	70700	64300
Manganese	1	410	449	340	297	469	445
Mercury	0.01	0.02	0.04	0.03	0.03	0.04	0.03
Molybdenum	2	<2	<2	<2	<2	<2	<2
Nickel	5	147	315	417	391	832	463
Phosphorus	5	295	386	349	206	345	440
Potassium	10	280	321	313	233	377	543
Selenium	0.1	<0.1	0.1	0.1	<0.1	0.1	<0.1
Silver	0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Sodium	25	147	158	121	143	149	151
Vanadium	5	35	48	32	24	38	30
Zinc	2	21	34	45	24	34	31

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Client:	AMEC Earth & Environmental, A Division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date:	November 10, 2006
		Page:	3 of 4
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1563
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab Number Sample ID Date Collected Unit		S2006-11359 WH-TP13-SS1 21-Sep-06 (µg/g)	S2006-11360 WH-TP14-SS2 21-Sep-06 (µg/g)	S2006-11361 Dup 2 21-Sep-06 (µg/g)	S2006-11361 Dup 2 21-Sep-06 (µg/g)	S2006-11363 SP-TP2-SS1 21-Sep-06 (µg/g)	S2006-11370 ML-TP7-SS2 21-Sep-06 (µg/g)
Parameters	**MDL* (µg/g)**				**(Replicate)**		
Aluminum	5	11500	12600	11600	8930	3860	13900
Antimony	0.5	2.2	2.0	2.4	2.2	4.0	2.0
Arsenic	0.1	2.5	2.6	0.8	0.6	<0.1	374
Barium	0.5	10.2	15.4	5.6	5.2	0.5	36.0
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bismuth	0.2	0.3	0.2	0.3	0.2	1.2	0.6
Cadmium	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.6
Calcium	25	4370	2320	1840	1930	1830	6370
Chromium	1	360	298	417	464	897	365
Cobalt	1	26	23	23	17	44	31
Copper	1	34	34	39	21	20	36
Iron	5	32600	29000	24900	21300	29000	37800
Lead	5	8	<5	<5	<5	<5	5
Magnesium	10	67800	36500	55300	65400	207000	107000
Manganese	1	516	391	409	312	570	746
Mercury	0.01	0.03	0.04	0.04	0.04	0.04	0.04
Molybdenum	2	<2	<2	<2	<2	<2	<2
Nickel	5	456	192	357	338	1290	550
Phosphorus	5	419	490	407	173	35	404
Potassium	10	585	926	385	284	31	981
Selenium	0.1	0.1	<0.1	0.1	<0.1	0.1	0.1
Silver	0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Sodium	25	199	154	117	112	98	139
Vanadium	5	43	36	35	27	14	45
Zinc	2	35	36	33	24	22	48

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		Page:	4 of 4
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1563
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Unit		Lab Blank (ug/g)	Q.C. Standards Actual (mg/L)	Q.C. Standards Expected (mg/L)	Date of Analysis
Parameters	**MDL* (μg/g)**				
Aluminum	5	<5	1.01	1.00	06-Oct-06
Antimony	0.5	<0.5	1.01	1.00	06-Oct-06
Arsenic	0.1	<0.1	1.12	1.00	06-Oct-06
Barium	0.5	<0.5	0.53	0.50	06-Oct-06
Beryllium	0.2	<0.2	0.53	0.50	06-Oct-06
Bismuth	0.2	<0.2	1.04	1.00	06-Oct-06
Cadmium	0.5	<0.5	0.54	0.50	06-Oct-06
Calcium	25	<25	10.2	10.0	06-Oct-06
Chromium	1	<1	0.52	0.50	06-Oct-06
Cobalt	1	<1	0.56	0.50	06-Oct-06
Copper	1	<1	1.04	1.00	06-Oct-06
Iron	5	<5	1.07	1.00	06-Oct-06
Lead	5	<5	1.06	1.00	06-Oct-06
Magnesium	10	<10	3.96	4.00	06-Oct-06
Manganese	1	<1	0.55	0.50	06-Oct-06
Mercury	0.01	<0.01	0.002	0.002	10-Oct-06
Molybdenum	2	<2	1.06	1.00	06-Oct-06
Nickel	5	<5	1.01	1.00	06-Oct-06
Phosphorus	5	<5	2.06	2.00	06-Oct-06
Potassium	10	<10	19.0	20.0	06-Oct-06
Selenium	0.1	<0.1	0.003	0.003	06-Oct-06
Silver	0.25	<0.25	1.06	1.00	06-Oct-06
Sodium	25	<25	21.0	20.0	06-Oct-06
Vanadium	5	<5	0.53	0.50	06-Oct-06
Zinc	2	<2	0.55	0.50	06-Oct-06

Comments: * Method Detection Limit
Antimony and Arsenic analyzed under ICP Method.

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Analysts: M. Rahman, B. Sc.
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Client:	AMEC Earth & Environmental, A Division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date:	November 10, 2006
		Page:	1 of 3
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1592
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab Number Sample ID Date Collected Unit		S2006-11581 ML-TP8-SS4 22-Sep-06 (ug/g)	S2006-11581 ML-TP8-SS4 22-Sep-06 (ug/g)	S2006-11586 ML-TP13-SS3 22-Sep-06 (ug/g)	S2006-11587 ML-TP14-SS1 22-Sep-06 (ug/g)	S2006-11588 ML-TP15-SS1 22-Sep-06 (ug/g)	S2006-11591 ML-TP18-SS1 23-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**		**(Replicate)**				
Aluminum	5	22900	20500	16200	4110	3100	10100
Antimony	0.5	2.8	2.4	3.0	2.7	2.6	4.0
Arsenic	0.1	7.8	7.8	4.4	<0.1	0.1	1.0
Barium	0.5	4.2	3.6	19.6	5.1	4.3	31.8
Beryllium	0.2	0.3	0.3	0.2	<0.2	<0.2	<0.2
Bismuth	0.2	0.3	0.3	0.7	1.2	1.2	0.9
Cadmium	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Calcium	25	29300	30500	4000	3170	4510	4910
Chromium	1	514	391	516	585	454	775
Cobalt	1	31	30	43	45	48	42
Copper	1	60	49	57	11	9	28
Iron	5	51800	46400	38000	32700	33300	41800
Lead	5	30	23	5	<5	<5	8
Magnesium	10	69700	68800	59600	179000	184000	158000
Manganese	1	1310	1310	959	728	659	702
Mercury	0.01	0.02	0.02	0.02	0.02	0.02	0.03
Molybdenum	2	<2	<2	<2	<2	<2	<2
Nickel	5	494	418	671	1400	1450	1090
Phosphorus	5	769	483	697	82	53	187
Potassium	10	555	505	756	150	76	410
Selenium	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Silver	0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Sodium	25	135	142	185	115	134	183
Vanadium	5	79	74	38	13	11	51
Zinc	2	87	79	43	26	23	47

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		Page:	2 of 3
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1592
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab Number Sample ID Date Collected Unit		S2006-11592 ML-TP19-SS2 23-Sep-06 (ug/g)	S2006-11593 ML-TP20-SS3 23-Sep-06 (ug/g)	S2006-11597 NC-TP2-SS2 23-Sep-06 (ug/g)	S2006-11599 NC-TP4-SS3 23-Sep-06 (ug/g)	S2006-11604 Dup 4 22-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**					
Aluminum	5	16600	10600	1860	18000	18900
Antimony	0.5	2.5	3.4	2.5	2.8	3.4
Arsenic	0.1	6.8	1.0	0.1	2.9	6.9
Barium	0.5	12.4	23.3	5.4	16.5	3.3
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	0.2
Bismuth	0.2	0.5	0.8	1.1	0.4	0.5
Cadmium	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Calcium	25	5400	6560	7190	7010	18500
Chromium	1	421	647	501	520	620
Cobalt	1	35	41	48	34	37
Copper	1	40	31	6	42	46
Iron	5	43400	34200	27000	43700	48500
Lead	5	<5	8	6	7	16
Magnesium	10	68600	138000	198000	75400	108000
Manganese	1	779	687	537	904	1250
Mercury	0.01	0.03	0.04	0.02	0.03	0.03
Molybdenum	2	<2	<2	<2	<2	<2
Nickel	5	545	1150	1470	569	679
Phosphorus	5	519	146	50	492	452
Potassium	10	717	375	112	679	442
Selenium	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Silver	0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Sodium	25	177	141	127	190	133
Vanadium	5	69	40	8	73	73
Zinc	2	42	44	19	46	62

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		Page:	3 of 3
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1592
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Unit		Lab Blank (ug/g)	Q.C. Standards Actual (mg/L)	Q.C. Standards Expected (mg/L)	Date of Analysis
Parameters	MDL* (µg/g)				
Aluminum	5	<5	0.97	1.00	12-Oct-06
Antimony	0.5	<0.5	0.99	1.00	12-Oct-06
Arsenic	0.1	<0.1	1.06	1.00	12-Oct-06
Barium	0.5	<0.5	0.53	0.50	12-Oct-06
Beryllium	0.2	<0.2	0.51	0.50	12-Oct-06
Bismuth	0.2	<0.2	1.00	1.00	12-Oct-06
Cadmium	0.5	<0.5	0.52	0.50	12-Oct-06
Calcium	25	<25	10.1	10.0	12-Oct-06
Chromium	1	<1	0.50	0.50	12-Oct-06
Cobalt	1	<1	0.53	0.50	12-Oct-06
Copper	1	<1	1.01	1.00	12-Oct-06
Iron	5	<5	1.03	1.00	12-Oct-06
Lead	5	<5	1.01	1.00	12-Oct-06
Magnesium	10	<10	3.96	4.00	12-Oct-06
Manganese	1	<1	0.53	0.50	12-Oct-06
Mercury	0.01	<0.01	0.002	0.002	13-Oct-06
Molybdenum	2	<2	1.01	1.00	12-Oct-06
Nickel	5	<5	1.01	1.00	12-Oct-06
Phosphorus	5	<5	1.96	2.00	12-Oct-06
Potassium	10	<10	18.7	20.0	12-Oct-06
Selenium	0.1	<0.1	0.003	0.003	16-Oct-06
Silver	0.25	<0.25	1.05	1.00	12-Oct-06
Sodium	25	<25	19.7	20.0	12-Oct-06
Vanadium	5	<5	0.52	0.50	12-Oct-06
Zinc	2	<2	0.51	0.50	12-Oct-06

Comments: * Method Detection Limit
Antimony and Arsenic analyzed under ICP Method.

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Analysts: M. Rahman, B. Sc.
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		Page:	1 of 2
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1595
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab Number Sample ID Date Collected Unit		S2006-11633 NC-TP12-SS2 24-Sep-06 (ug/g)	S2006-11636 NC-TP22-SS1 24-Sep-06 (ug/g)	S2006-11636 NC-TP22-SS1 24-Sep-06 (ug/g)	S2006-11637 NC-TP23-SS1 24-Sep-06 (ug/g)	S2006-11638 NC-TP24-SS1 24-Sep-06 (ug/g)
Parameters	**MDL*** **(µg/g)**			**(Replicate)**		
Aluminum	5	16800	8830	10100	13200	12100
Antimony	0.5	2.5	3.5	4.1	2.5	1.7
Arsenic	0.1	5.5	6.2	6.6	3.6	5.3
Barium	0.5	13.5	9.4	8.4	48.6	7.0
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bismuth	0.2	0.5	1.1	1.3	0.6	0.5
Cadmium	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Calcium	25	5460	6920	6720	3790	21900
Chromium	1	426	810	978	473	344
Cobalt	1	34	50	52	40	33
Copper	1	73	29	17	48	51
Iron	5	41500	33000	36100	37800	25000
Lead	5	6	<5	<5	12	<5
Magnesium	10	76700	187000	180000	116000	97500
Manganese	1	623	614	660	683	501
Mercury	0.01	<0.01	<0.01	<0.01	0.02	<0.01
Molybdenum	2	<2	<2	<2	<2	<2
Nickel	5	416	1350	1380	964	744
Phosphorus	5	493	162	171	542	134
Potassium	10	954	511	436	1700	418
Selenium	0.1	0.1	<0.1	<0.1	<0.1	<0.1
Silver	0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Sodium	25	621	167	179	180	147
Vanadium	5	63	23	28	38	27
Zinc	2	48	33	35	58	29

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		Page:	2 of 2
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1595
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Parameters	MDL* (µg/g)	Lab Blank (ug/g)	Q.C. Standards Actual (mg/L)	Q.C. Standards Expected (mg/L)	Date of Analysis
Aluminum	5	<5	1.01	1.00	16-Oct-06
Antimony	0.5	<0.5	1.01	1.00	16-Oct-06
Arsenic	0.1	<0.1	1.16	1.00	16-Oct-06
Barium	0.5	<0.5	0.53	0.50	16-Oct-06
Beryllium	0.2	<0.2	0.54	0.50	16-Oct-06
Bismuth	0.2	<0.2	1.01	1.00	16-Oct-06
Cadmium	0.5	<0.5	0.53	0.50	16-Oct-06
Calcium	25	<25	10.3	10.0	16-Oct-06
Chromium	1	<1	0.52	0.50	16-Oct-06
Cobalt	1	<1	0.54	0.50	16-Oct-06
Copper	1	<1	1.03	1.00	16-Oct-06
Iron	5	<5	1.08	1.00	16-Oct-06
Lead	5	<5	1.04	1.00	16-Oct-06
Magnesium	10	<10	4.06	4.00	16-Oct-06
Manganese	1	<1	0.54	0.50	16-Oct-06
Mercury	0.01	<0.01	0.002	0.002	17-Oct-06
Molybdenum	2	<2	1.03	1.00	16-Oct-06
Nickel	5	<5	1.04	1.00	16-Oct-06
Phosphorus	5	<5	2.07	2.00	16-Oct-06
Potassium	10	<10	18.7	20.0	16-Oct-06
Selenium	0.1	<0.1	0.003	0.003	16-Oct-06
Silver	0.25	<0.25	1.06	1.00	16-Oct-06
Sodium	25	<25	20.6	20.0	16-Oct-06
Vanadium	5	<5	0.53	0.50	16-Oct-06
Zinc	2	<2	0.53	0.50	16-Oct-06

Comments: * Method Detection Limit
Antimony and Arsenic analyzed under ICP Method.

Analysts: M. Rahman, B. Sc.
D. Du, B. Sc.

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		Page:	1 of 2
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1607
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab Number Sample ID Date Collected Unit		S2006-11692 NC-TP15-SS1 28-Sep-06 (ug/g)	S2006-11693 NC-TP16-SS1 28-Sep-06 (ug/g)	S2006-11697 DUP 10 28-Sep-06 (ug/g)	S2006-11699 SED 7 28-Sep-06 (ug/g)	S2006-11700 SED 8 28-Sep-06 (ug/g)	S2006-11700 SED 8 28-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**						**(Replicate)**
Aluminum	5	11000	13400	10100	12400	5070	7300
Antimony	0.5	2.3	3.0	1.9	2.6	3.7	3.9
Arsenic	0.1	2.3	3.1	3.3	5.8	6.3	9.1
Barium	0.5	14.7	13.1	9.8	10.8	4.6	6.6
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bismuth	0.2	0.6	0.6	0.4	0.5	1.2	1.6
Cadmium	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Calcium	25	2730	2100	1710	5280	7820	8500
Chromium	1	413	639	227	488	499	801
Cobalt	1	30	27	21	27	39	45
Copper	1	30	25	15	686	496	687
Iron	5	29600	34200	25100	37900	43700	54400
Lead	5	<5	<5	<5	14	13	16
Magnesium	10	88600	67500	43700	100000	155000	187000
Manganese	1	469	456	373	449	357	404
Mercury	0.01	0.02	<0.01	<0.01	0.05	0.03	0.05
Molybdenum	2	<2	<2	<2	3	<2	<2
Nickel	5	580	387	176	471	981	913
Phosphorus	5	383	383	236	598	256	336
Potassium	10	723	635	349	1260	1130	1410
Selenium	0.1	<0.1	<0.1	<0.1	0.2	0.1	0.2
Silver	0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Sodium	25	167	172	183	9390	13800	18700
Vanadium	5	36	43	30	52	30	37
Zinc	2	156	144	89	84	77	92

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Client:	AMEC Earth & Environmental, A Division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date:	November 10, 2006
		Page:	2 of 2
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1607
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Parameters	MDL* (µg/g)	S2006-11701 SED 9 28-Sep-06 (ug/g)	Lab Blank (ug/g)	Q.C. Standards Actual (mg/L)	Q.C. Standards Expected (mg/L)	Date of Analysis
Aluminum	5	14800	<5	1.01	1.00	17-Oct-06
Antimony	0.5	5.1	<0.5	1.01	1.00	17-Oct-06
Arsenic	0.1	7.1	<0.1	1.16	1.00	17-Oct-06
Barium	0.5	14.8	<0.5	0.53	0.50	17-Oct-06
Beryllium	0.2	<0.2	<0.2	0.54	0.50	17-Oct-06
Bismuth	0.2	1.5	<0.2	1.02	1.00	17-Oct-06
Cadmium	0.5	<0.5	<0.5	0.53	0.50	17-Oct-06
Calcium	25	9450	<25	10.3	10.0	17-Oct-06
Chromium	1	681	<1	0.52	0.50	17-Oct-06
Cobalt	1	63	<1	0.54	0.50	17-Oct-06
Copper	1	96	<1	1.03	1.00	17-Oct-06
Iron	5	69600	<5	1.08	1.00	17-Oct-06
Lead	5	12	<5	1.04	1.00	17-Oct-06
Magnesium	10	224000	<10	4.06	4.00	17-Oct-06
Manganese	1	552	<1	0.54	0.50	17-Oct-06
Mercury	0.01	<0.01	<0.01	0.002	0.002	17-Oct-06
Molybdenum	2	5	<2	1.03	1.00	17-Oct-06
Nickel	5	882	<5	1.04	1.00	17-Oct-06
Phosphorus	5	652	<5	2.07	2.00	17-Oct-06
Potassium	10	4360	<10	18.7	20.0	17-Oct-06
Selenium	0.1	<0.1	<0.1	0.003	0.003	16/17-Oct-06
Silver	0.25	<0.25	<0.25	1.06	1.00	17-Oct-06
Sodium	25	61200	<25	20.6	20.0	17-Oct-06
Vanadium	5	66	<5	0.53	0.50	17-Oct-06
Zinc	2	101	<2	0.53	0.50	17-Oct-06

Comments: * Method Detection Limit
Antimony and Arsenic analyzed under ICP Method.

Analysts: M. Rahman, B. Sc.
D. Du, B. Sc.

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

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Client:	AMEC Earth & Environmental, A Division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date:	November 10, 2006
		Page:	1 of 3
Project Name:	Baie Verte Mines	Sample Type;	Soil/Sediment
Project Number:	TF 6126509	Lab Ref.:	F2006-1594
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab Number Sample ID Date Collected Unit		S2006-11616 WR-TP5-SS1 24-Sep-06 (ug/g)	S2006-11617 SED 1 25-Sep-06 (ug/g)	S2006-11618 SED 2 25-Sep-06 (ug/g)	S2006-11619 SED 3 25-Sep-06 (ug/g)	S2006-11620 SED 4 25-Sep-06 (ug/g)	S2006-11621 SED 5 25-Sep-06 (ug/g)
Parameters	**MDL* (µg/g)**						
Aluminum	5	3320	3540	5460	15100	14600	7910
Antimony	0.5	3.3	3.0	2.9	2.5	5.4	4.0
Arsenic	0.1	0.1	0.5	0.3	4.0	3.2	5.7
Barium	0.5	<0.5	1.6	2.7	14.4	9.3	1.1
Beryllium	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bismuth	0.2	1.1	0.8	0.9	0.5	1.9	1.2
Cadmium	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Calcium	25	1440	1150	2080	3120	11800	2760
Chromium	1	779	792	771	425	1150	898
Cobalt	1	44	44	52	26	82	53
Copper	1	10	10	15	21	61	31
Iron	5	25700	17400	24300	35500	70000	15900
Lead	5	<5	<5	<5	<5	6	<5
Magnesium	10	165000	153000	183000	55600	275000	182000
Manganese	1	502	493	651	578	1490	674
Mercury	0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01
Molybdenum	2	<2	<2	<2	<2	<2	<2
Nickel	5	1340	1400	1740	239	2480	7600
Phosphorus	5	25	35	75	487	301	130
Potassium	10	18	66	108	507	534	185
Selenium	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Silver	0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Sodium	25	207	221	212	213	332	206
Vanadium	5	12	10	16	48	56	29
Zinc	2	18	19	29	39	213	49

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Client:	AMEC Earth & Environmental, A Division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date:	November 10, 2006
		Page:	2 of 3
Project Name:	Baie Verte Mines	Sample Type:	Soil/Sediment
Project Number:	TF 6126509	Lab Ref.:	F2006-1594
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab Number Sample ID Date Collected Unit		S2006-11622 SED 6 26-Sep-06 (µg/g)	S2006-11628 Dup 8 24-Sep-06 (µg/g)	S2006-11629 Dup 9 25-Sep-06 (µg/g)
Parameters	**MDL* (µg/g)**			
Aluminum	5	19100	16200	19800
Antimony	0.5	2.1	2.6	2.3
Arsenic	0.1	11.0	5.4	11.4
Barium	0.5	13.7	16.4	13.6
Beryllium	0.2	<0.2	<0.2	<0.2
Bismuth	0.2	0.4	0.7	0.6
Cadmium	0.5	<0.5	<0.5	<0.5
Calcium	25	4170	5200	3520
Chromium	1	323	412	327
Cobalt	1	28	56	30
Copper	1	23	95	37
Iron	5	41600	46400	42800
Lead	5	<5	13	<5
Magnesium	10	4000	71900	45600
Manganese	1	1500	664	1500
Mercury	0.01	<0.01	<0.01	<0.01
Molybdenum	2	<2	<2	<2
Nickel	5	165	593	226
Phosphorus	5	426	686	476
Potassium	10	251	1110	290
Selenium	0.1	<0.1	0.3	<0.1
Silver	0.25	<0.25	<0.25	<0.25
Sodium	25	150	698	169
Vanadium	5	70	55	65
Zinc	2	51	53	52

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Client:	AMEC Earth & Environmental, A Division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date: Page:	November 10, 2006 3 of 3
Project Name:	Baie Verte Mines	Sample Type:	Soil/Sediment
Project Number:	TF 6126509	Lab Ref.:	F2006-1594
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Parameters	MDL* (µg/g)	Lab Blank (ug/g)	Q.C. Standards Actual (mg/L)	Q.C. Standards Expected (mg/L)	Date of Analysis
Aluminum	5	<5	1.00	1.00	16/19-Oct-06
Antimony	0.5	<0.5	1.02	1.00	16/19-Oct-06
Arsenic	0.1	<0.1	1.09	1.00	16/19-Oct-06
Barium	0.5	<0.5	0.51	0.50	16/19-Oct-06
Beryllium	0.2	<0.2	0.52	0.50	16/19-Oct-06
Bismuth	0.2	<0.2	1.01	1.00	16/19-Oct-06
Cadmium	0.5	<0.5	0.53	0.50	16/19-Oct-06
Calcium	25	<25	9.6	10.0	16/19-Oct-06
Chromium	1	<1	0.51	0.50	16/19-Oct-06
Cobalt	1	<1	0.54	0.50	16/19-Oct-06
Copper	1	<1	1.00	1.00	16/19-Oct-06
Iron	5	<5	1.03	1.00	16/19-Oct-06
Lead	5	<5	1.03	1.00	16/19-Oct-06
Magnesium	10	<10	4.02	4.00	16/19-Oct-06
Manganese	1	<1	0.53	0.50	16/19-Oct-06
Mercury	0.01	<0.01	0.002	0.002	17-Oct-06
Molybdenum	2	<2	1.00	1.00	16/19-Oct-06
Nickel	5	<5	1.04	1.00	16/19-Oct-06
Phosphorus	5	<5	1.98	2.00	16/19-Oct-06
Potassium	10	<10	18.4	20.0	16/19-Oct-06
Selenium	0.1	<0.1	0.003	0.003	06-Oct-06
Silver	0.25	<0.25	1.07	1.00	16/19-Oct-06
Sodium	25	<25	20.1	20.0	16/19-Oct-06
Vanadium	5	<5	0.50	0.50	16/19-Oct-06
Zinc	2	<2	0.53	0.50	16/19-Oct-06

Comments: * Method Detection Limit
Antimony and Arsenic analyzed under ICP Method.

Analysts: M. Rahman, B. Sc.
D. Du, B. Sc.

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

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		Page:	1 of 2
Project Name:	Baie Verte Mines	Sample Type:	Water
Project Number:	TF 6126509	Lab Ref.:	F2006-1594
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab # Sample ID Date Collected Unit			S2006-11623 SW 1 25-Sep-06 (mg/L)	S2006-11624 SW 2 25-Sep-06 (mg/L)	S2006-11625 SW 3 25-Sep-06 (mg/L)	S2006-11626 SW 4 25-Sep-06 (mg/L)	S2006-11627 SW 5 25-Sep-06 (mg/L)
Parameters	**Unit**	**MDL***					
Aluminum	(mg/L)	0.001	0.016	0.012	0.016	0.006	0.006
Antimony	(mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	(mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	(mg/L)	0.001	0.008	0.009	0.009	0.014	0.013
Berylium	(mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	(mg/L)	0.000015	0.000073	0.000043	0.000066	0.000053	0.000050
Calcium	(mg/L)	0.5	36.7	39.0	40.9	63.6	72.2
Chromium	(mg/L)	0.001	0.003	0.002	0.002	<0.001	<0.001
Cobalt	(mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	(mg/L)	0.001	0.002	0.003	0.002	0.001	<0.001
Iron	(mg/L)	0.01	0.84	0.05	0.16	0.09	0.17
Lead	(mg/L)	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Magnesium	(mg/L)	0.02	72.7	78.7	57.2	77.1	33.5
Manganese	(mg/L)	0.001	0.006	0.005	0.007	0.005	0.001
Mercury	(mg/L)	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Molybdenum	(mg/L)	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Nickel	(mg/L)	0.001	0.006	0.005	0.004	0.001	0.001
Phosphorous	(mg/L)	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Potassium	(mg/L)	0.02	2.33	2.50	2.47	3.67	3.17
Selenium	(mg/L)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	(mg/L)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Sodium	(mg/L)	0.5	29.6	31.6	36.0	56.4	58.4
Vanadium	(mg/L)	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	(mg/L)	0.005	0.005	<0.005	<0.005	<0.005	<0.005

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		Page:	2 of 2
Project Name:	Baie Verte Mines	Sample Type:	Water
Project Number:	TF 6126509	Lab Ref.:	F2006-1594
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Parameters	Unit	MDL*	Lab Blank	Q.C. Standard Actual	Q.C. Standard Expected	Date of Analysis
Aluminum	(mg/L)	0.001	<0.001	0.96	1.00	04-Oct-06
Antimony	(mg/L)	0.001	<0.001	0.003	0.003	11-Oct-06
Arsenic	(mg/L)	0.001	<0.001	0.003	0.003	11-Oct-06
Barium	(mg/L)	0.001	<0.001	0.52	0.50	04-Oct-06
Berylium	(mg/L)	0.001	<0.001	0.52	0.50	04-Oct-06
Cadmium	(mg/L)	0.000015	<0.000015	0.52	0.50	04-Oct-06
Calcium	(mg/L)	0.5	<0.5	9.7	10.0	04-Oct-06
Chromium	(mg/L)	0.001	<0.001	0.52	0.50	04-Oct-06
Cobalt	(mg/L)	0.001	<0.001	0.54	0.50	04-Oct-06
Copper	(mg/L)	0.001	<0.001	0.99	1.00	04-Oct-06
Iron	(mg/L)	0.01	<0.01	1.02	1.00	04-Oct-06
Lead	(mg/L)	0.002	<0.002	1.05	1.00	04-Oct-06
Magnesium	(mg/L)	0.02	<0.02	3.96	4.00	04-Oct-06
Manganese	(mg/L)	0.001	<0.001	0.54	0.50	04-Oct-06
Mercury	(mg/L)	0.00005	<0.00005	0.002	0.002	03-Oct-06
Molybdenum	(mg/L)	0.002	<0.002	1.02	1.00	04-Oct-06
Nickel	(mg/L)	0.001	<0.001	1.04	1.00	04-Oct-06
Phosphorous	(mg/L)	0.02	<0.02	1.98	2.00	04-Oct-06
Potassium	(mg/L)	0.02	<0.02	18.6	20.0	04-Oct-06
Selenium	(mg/L)	0.001	<0.001	0.003	0.003	12-Oct-06
Silver	(mg/L)	0.0001	<0.0001	1.09	1.00	04-Oct-06
Sodium	(mg/L)	0.5	<0.5	20.9	20.0	04-Oct-06
Vanadium	(mg/L)	0.005	<0.005	0.53	0.50	04-Oct-06
Zinc	(mg/L)	0.005	<0.005	0.53	0.50	04-Oct-06

Comment: * Method Detection Limit

Analysts: M. Rahman, B. Sc.
D. Du, B. Sc.

Cynthia Ridge, C. Chem.
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		Page:	1 of 1
Project Name:	Baie Verte Mines	Sample Type:	Water
Project Number:	TF 6126509	Lab Ref.:	F2006-1607
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

ICP Metals + Hydrides

Lab # Sample ID Date Collected Unit			S2006-11696 SW 6 28-Sep-06 (mg/L)	S2006-11698 DUP 11 28-Sep-06 (mg/L)	Lab Blank (mg/L)	Q.C. Standard Actual (mg/L)	Q.C. Standard Expected (mg/L)	Date of Analysis
Parameters	**Unit**	**MDL***						
Aluminum	(mg/L)	0.001	0.017	0.012	<0.001	0.96	1.00	10-Oct-06
Antimony	(mg/L)	0.001	<0.001	<0.001	<0.001	0.003	0.003	11-Oct-06
Arsenic	(mg/L)	0.001	<0.001	<0.001	<0.001	0.003	0.003	11-Oct-06
Barium	(mg/L)	0.001	0.001	0.001	<0.001	0.52	0.50	10-Oct-06
Berylium	(mg/L)	0.001	<0.001	<0.001	<0.001	0.50	0.50	10-Oct-06
Cadmium	(mg/L)	0.000015	<0.000015	0.000019	<0.000015	0.52	0.50	10-Oct-06
Calcium	(mg/L)	0.5	10.6	11.1	<0.5	9.8	10.0	10-Oct-06
Chromium	(mg/L)	0.001	0.002	0.002	<0.001	0.50	0.50	10-Oct-06
Cobalt	(mg/L)	0.001	<0.001	<0.001	<0.001	0.53	0.50	10-Oct-06
Copper	(mg/L)	0.001	0.002	0.001	<0.001	0.98	1.00	10-Oct-06
Iron	(mg/L)	0.01	0.07	0.05	<0.01	1.00	1.00	10-Oct-06
Lead	(mg/L)	0.002	<0.002	<0.002	<0.002	1.00	1.00	10-Oct-06
Magnesium	(mg/L)	0.02	28.2	28.6	<0.02	3.88	4.00	10-Oct-06
Manganese	(mg/L)	0.001	0.012	0.01	<0.001	0.53	0.50	10-Oct-06
Mercury	(mg/L)	0.00005	<0.00005	<0.00005	<0.00005	0.002	0.002	10-Oct-06
Molybdenum	(mg/L)	0.002	<0.002	<0.002	<0.002	0.99	1.00	10-Oct-06
Nickel	(mg/L)	0.001	0.005	0.004	<0.001	1.00	1.00	10-Oct-06
Phosphorous	(mg/L)	0.02	<0.02	<0.02	<0.02	1.96	2.00	10-Oct-06
Potassium	(mg/L)	0.02	0.69	0.73	<0.02	18.9	20.0	10-Oct-06
Selenium	(mg/L)	0.001	<0.001	<0.001	<0.001	0.003	0.003	12-Oct-06
Silver	(mg/L)	0.0001	<0.0001	<0.0001	<0.0001	1.03	1.00	10-Oct-06
Sodium	(mg/L)	0.5	7.5	8.2	<0.5	19.9	20.0	10-Oct-06
Vanadium	(mg/L)	0.005	<0.005	<0.005	<0.005	0.51	0.50	10-Oct-06
Zinc	(mg/L)	0.005	<0.005	<0.005	<0.005	0.51	0.50	10-Oct-06

Comment: * Method Detection Limit

Analysts: M. Rahman, B. Sc.
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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date:	November 10, 2006
		Page:	1 of 4
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1563
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polynuclear Aromatic Hydrocarbons

Lab Number Sample ID Date Collected Unit		S2006-11346 WH-TP1-SS2 20-Sep-06 (µg/g)	S2006-11347 WH-TP2-SS1 20-Sep-06 (µg/g)	S2006-11348 WH-TP3-SS1 20-Sep-06 (µg/g)	S2006-11349 WH-TP4-SS1 20-Sep-06 (µg/g)	S2006-11350 WH-TP5-SS3 20-Sep-06 (µg/g)	S2006-11351 WH-TP6-SS1 20-Sep-06 (µg/g)
Parameters	**MDL* (µg/g)**						
Naphthalene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Acenaphthylene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Fluorene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phenanthrene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Anthracene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fluoranthene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Pyrene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Benzo(a)anthracene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chrysene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(b)fluoranthene	0.004	0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Benzo(k)fluoranthene	0.004	0.006	<0.004	<0.004	<0.004	<0.004	<0.004
Benzo(a)pyrene	0.003	0.007	0.005	<0.003	<0.003	<0.003	0.004
Indeno(123 cd.)pyrene	0.003	0.008	0.007	0.003	<0.003	<0.003	<0.003
Dibenzo(ah)anthracene	0.004	0.012	<0.004	<0.004	<0.004	<0.004	<0.004
Benzo(ghi)perylene	0.002	0.009	0.007	<0.002	<0.002	<0.002	0.007
Dilution Factor		1	1	1	1	1	1
Surrogate Recovery							
Naphthalene-d8 (%)		96	86	79	101	86	86
Antracene-d10 (%)		97	98	100	107	99	100
Perylene-d12 (%)		108	99	111	110	112	119
Date of Analysis		04-Oct-06	04-Oct-06	04-Oct-06	04-Oct-06	04-Oct-06	04-Oct-06

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		Page:	2 of 4
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1563
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polynuclear Aromatic Hydrocarbons

Lab Number Sample ID Date Collected Unit		S2006-11352 WH-TP7-SS3 20-Sep-06 (µg/g)	S2006-11355 WH-TP9-SS1 21-Sep-06 (µg/g)	S2006-11356 WH-TP10-SS1 21-Sep-06 (µg/g)	S2006-11357 WH-TP11-SS1 21-Sep-06 (µg/g)	S2006-11357 WH-TP11-SS1 21-Sep-06 (µg/g)	S2006-11358 WH-TP12-SS2 21-Sep-06 (µg/g)
Parameters	**MDL* (µg/g)**					**(Replicate)**	
Naphthalene	0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002
Acenaphthylene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Fluorene	0.001	<0.001	<0.001	<0.001	0.004	0.024	<0.001
Phenanthrene	0.001	<0.001	<0.001	<0.001	0.050	0.110	<0.001
Anthracene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fluoranthene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Pyrene	0.003	<0.003	<0.003	0.008	0.016	0.036	<0.003
Benzo(a)anthracene	0.001	<0.001	<0.001	<0.001	0.008	0.021	<0.001
Chrysene	0.001	<0.001	<0.001	0.013	0.029	0.045	<0.001
Benzo(b)fluoranthene	0.004	<0.004	<0.004	<0.004	<0.004	0.005	<0.004
Benzo(k)fluoranthene	0.004	<0.004	<0.004	<0.004	0.007	<0.004	<0.004
Benzo(a)pyrene	0.003	<0.003	0.003	0.014	<0.003	0.020	<0.003
Indeno(123 cd.)pyrene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Dibenzo(ah)anthracene	0.004	<0.004	<0.004	0.018	0.022	0.015	<0.004
Benzo(ghi)perylene	0.002	<0.002	0.002	0.009	0.011	0.010	<0.002
Dilution Factor		1	1	1	1	1	1
Surrogate Recovery							
Naphthalene-d8 (%)		85	81	77	82	79	85
Antracene-d10 (%)		97	96	103	97	97	106
Perylene-d12 (%)		94	112	122	120	115	126
Date of Analysis		05-Oct-06	05-Oct-06	05-Oct-06	05-Oct-06	05-Oct-06	05-Oct-06

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		Page:	3 of 4
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1563
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polynuclear Aromatic Hydrocarbons

Lab Number Sample ID Date Collected Unit		S2006-11359 WH-TP13-SS1 21-Sep-06 (µg/g)	S2006-11360 WH-TP14-SS2 21-Sep-06 (µg/g)	S2006-11361 Dup 2 21-Sep-06 (µg/g)	S2006-11363 SP-TP2-SS1 21-Sep-06 (µg/g)	S2006-11365 ML-TP2-SS3 21-Sep-06 (µg/g)	S2006-11370 ML-TP7-SS2 21-Sep-06 (µg/g)
Parameters	**MDL* (µg/g)**						
Naphthalene	0.002	<0.002	<0.002	<0.002	<0.002	0.355	<0.002
Acenaphthylene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Fluorene	0.001	<0.001	<0.001	<0.001	<0.001	0.144	<0.001
Phenanthrene	0.001	<0.001	<0.001	<0.001	<0.001	0.203	0.264
Anthracene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fluoranthene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Pyrene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Benzo(a)anthracene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chrysene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(b)fluoranthene	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Benzo(k)fluoranthene	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Benzo(a)pyrene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Indeno(123 cd.)pyrene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Dibenzo(ah)anthracene	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Benzo(ghi)perylene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Dilution Factor		1	1	1	1	1	1
Surrogate Recovery							
Naphthalene-d8 (%)		74	77	77	76	70	70
Antracene-d10 (%)		97	97	92	95	97	88
Perylene-d12 (%)		129	105	103	99	99	93
Date of Analysis		06-Oct-06	06-Oct-06	06-Oct-06	06-Oct-06	06-Oct-06	06-Oct-06

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		Page:	4 of 4
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1563
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polynuclear Aromatic Hydrocarbons

Lab Number Sample ID Date Collected Unit		S2006-11370 ML-TP7-SS2 21-Sep-06 (µg/g)	Lab Blank (µg/g)	Blank Spike (µg/g)	Blank Spike Recovery (%)
Parameters	**MDL* (µg/g)**	**(Replicate)**			
Naphthalene	0.002	<0.002	<0.002	0.146	73
Acenaphthylene	0.001	<0.001	<0.001	0.173	86
Acenaphthene	0.002	<0.002	<0.002	0.169	84
Fluorene	0.001	<0.001	<0.001	0.191	95
Phenanthrene	0.001	0.376	<0.001	0.185	93
Anthracene	0.001	<0.001	<0.001	0.186	93
Fluoranthene	0.001	<0.001	<0.001	0.205	102
Pyrene	0.003	<0.003	<0.003	0.218	109
Benzo(a)anthracene	0.001	<0.001	<0.001	0.146	73
Chrysene	0.001	<0.001	<0.001	0.202	101
Benzo(b)fluoranthene	0.004	<0.004	<0.004	0.164	82
Benzo(k)fluoranthene	0.004	<0.004	<0.004	0.188	94
Benzo(a)pyrene	0.003	<0.003	<0.003	0.158	79
Indeno(123 cd.)pyrene	0.003	<0.003	<0.003	0.158	79
Dibenzo(ah)anthracene	0.004	<0.004	<0.004	0.158	79
Benzo(ghi)perylene	0.002	<0.002	<0.002	0.228	114
Dilution Factor		1	1	1	1
Surrogate Recovery					
Naphthalene-d8 (%)		62	92	83	83
Antracene-d10 (%)		93	112	108	108
Perylene-d12 (%)		91	113	101	101
Date of Analysis		06-Oct-06	04-Oct-06	04-Oct-06	04-Oct-06

Comments: * Method Detection Limit
Method: EPA 625/8270 - Solvent Ext./GC/MS

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CHARTERED
Suman Punani
CHEMIST

Analyst: S. Lam, C.Chem

Cynthia Ridge, C. Chem.
Q.A/.Q.C. Officer

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		Page:	1 of 3
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1592
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polynuclear Aromatic Hydrocarbons

Lab Number Sample ID Date Collected Unit		S2006-11586 ML-TP13-SS3 22-Sep-06 (µg/g)	S2006-11587 ML-TP14-SS1 22-Sep-06 (µg/g)	S2006-11591 ML-TP18-SS1 23-Sep-06 (µg/g)	S2006-11592 ML-TP19-SS2 23-Sep-06 (µg/g)	S2006-11593 ML-TP20-SS3 23-Sep-06 (µg/g)
Parameters	**MDL* (µg/g)**			**		
Naphthalene	0.002	<0.002	<0.002	<0.02	<0.002	<0.002
Acenaphthylene	0.001	<0.001	<0.001	<0.01	<0.001	<0.001
Acenaphthene	0.002	<0.002	<0.002	<0.02	<0.002	<0.002
Fluorene	0.001	<0.001	<0.001	<0.01	<0.001	<0.001
Phenanthrene	0.001	<0.001	<0.001	<0.01	<0.001	<0.001
Anthracene	0.001	<0.001	<0.001	<0.01	<0.001	<0.001
Fluoranthene	0.001	<0.001	<0.001	<0.01	<0.001	<0.001
Pyrene	0.003	<0.003	<0.003	<0.03	<0.003	0.040
Benzo(a)anthracene	0.001	<0.001	<0.001	1.08	<0.001	<0.001
Chrysene	0.001	<0.001	<0.001	0.292	<0.001	<0.001
Benzo(b)fluoranthene	0.004	<0.004	<0.004	<0.04	<0.004	<0.004
Benzo(k)fluoranthene	0.004	<0.004	<0.004	<0.04	<0.004	<0.004
Benzo(a)pyrene	0.003	<0.003	<0.003	<0.03	<0.003	<0.003
Indeno(123 cd.)pyrene	0.003	<0.003	<0.003	<0.03	<0.003	<0.003
Dibenzo(ah)anthracene	0.004	<0.004	<0.004	<0.04	<0.004	<0.004
Benzo(ghi)perylene	0.002	<0.002	<0.002	<0.02	<0.002	<0.002
Dilution Factor		1	1	10	1	1
Surrogate Recovery						
Naphthalene-d8 (%)		90	83	130	82	64
Antracene-d10 (%)		109	106	129	104	88
Perylene-d12 (%)		63	82	118	79	117
Date of Analysis		16-Oct-06	16-Oct-06	16-Oct-06	16-Oct-06	16-Oct-06

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		Page:	2 of 3
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1592
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polynuclear Aromatic Hydrocarbons

Lab Number Sample ID Date Collected Unit		S2006-11593 ML-TP20-SS3 23-Sep-06 (µg/g)	S2006-11595 ML-TP23-SS1 23-Sep-06 (µg/g)	S2006-11597 NC-TP2-SS2 23-Sep-06 (µg/g)	S2006-11599 NC-TP4-SS3 23-Sep-06 (µg/g)	S2006-11606 Dup 6 23-Sep-06 (µg/g)
Parameters	**MDL* (µg/g)**	**(Replicate)**				
Naphthalene	0.002	<0.002	<0.002	0.166	<0.002	<0.002
Acenaphthylene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Fluorene	0.001	<0.001	<0.001	0.034	<0.001	0.058
Phenanthrene	0.001	<0.001	<0.001	0.149	<0.001	0.153
Anthracene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fluoranthene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Pyrene	0.003	0.053	<0.003	<0.003	<0.003	0.035
Benzo(a)anthracene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chrysene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(b)fluoranthene	0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Benzo(k)fluoranthene	0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Benzo(a)pyrene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Indeno(123 cd.)pyrene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Dibenzo(ah)anthracene	0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Benzo(ghi)perylene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Dilution Factor		1	1	1	1	1
Surrogate Recovery						
Naphthalene-d8 (%)		76	88	83	80	77
Antracene-d10 (%)		108	107	110	99	113
Perylene-d12 (%)		118	79	117	93	118
Date of Analysis		16-Oct-06	16-Oct-06	16-Oct-06	16-Oct-06	16-Oct-06

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		Page:	3 of 3
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1592
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polynuclear Aromatic Hydrocarbons

Parameters	MDL* (µg/g)	Lab Blank (µg/g)	Blank Spike (µg/g)	Blank Spike Recovery (%)
Naphthalene	0.002	<0.002	0.162	81
Acenaphthylene	0.001	<0.001	0.164	82
Acenaphthene	0.002	<0.002	0.165	82
Fluorene	0.001	<0.001	0.166	83
Phenanthrene	0.001	<0.001	0.173	87
Anthracene	0.001	<0.001	0.180	90
Fluoranthene	0.001	<0.001	0.181	90
Pyrene	0.003	<0.003	0.191	96
Benzo(a)anthracene	0.001	<0.001	0.174	87
Chrysene	0.001	<0.001	0.180	90
Benzo(b)fluoranthene	0.004	<0.004	0.174	87
Benzo(k)fluoranthene	0.004	<0.004	0.198	99
Benzo(a)pyrene	0.003	<0.003	0.169	85
Indeno(123 cd.)pyrene	0.003	<0.003	0.167	83
Dibenzo(ah)anthracene	0.004	<0.004	0.210	105
Benzo(ghi)perylene	0.002	<0.002	0.154	77
Dilution Factor				
Surrogate Recovery				
Naphthalene-d8 (%)		91	74	74
Antracene-d10 (%)		99	102	102
Perylene-d12 (%)		86	96	96
Date of Analysis		16-Oct-06	16-Oct-06	16-Oct-06

Comments:
* Method Detection Limit
Method: EPA 625/8270 - Solvent Ext./GC/MS
** Higher MDL used for sample 11591 due to dilution factor

Analyst: S. Lam, C. Chem.

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Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1594
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polynuclear Aromatic Hydrocarbons

Lab Number Sample ID Date Collected Unit		S2006-11616 WR-TP5-SS1 24-Sep-06 (µg/g)	S2006-11628 Dup 8 24-Sep-06 (µg/g)	Lab Blank (µg/g)	Blank Spike (µg/g)	Blank Spike Recovery (%)
Parameters	**MDL* (µg/g)**					
Naphthalene	0.002	<0.002	<0.002	<0.002	0.162	81
Acenaphthylene	0.001	<0.001	<0.001	<0.001	0.164	82
Acenaphthene	0.002	<0.002	<0.002	<0.002	0.165	82
Fluorene	0.001	<0.001	<0.001	<0.001	0.166	83
Phenanthrene	0.001	<0.001	0.300	<0.001	0.173	87
Anthracene	0.001	<0.001	<0.001	<0.001	0.180	90
Fluoranthene	0.001	<0.001	<0.001	<0.001	0.181	90
Pyrene	0.003	<0.003	<0.003	<0.003	0.191	96
Benzo(a)anthracene	0.001	<0.001	<0.001	<0.001	0.174	87
Chrysene	0.001	<0.001	<0.001	<0.001	0.180	90
Benzo(b)fluoranthene	0.004	<0.004	<0.004	<0.004	0.174	87
Benzo(k)fluoranthene	0.004	<0.004	<0.004	<0.004	0.198	99
Benzo(a)pyrene	0.003	<0.003	<0.003	<0.003	0.169	85
Indeno(123 cd.)pyrene	0.003	<0.003	<0.003	<0.003	0.167	83
Dibenzo(ah)anthracene	0.004	<0.004	<0.004	<0.004	0.210	105
Benzo(ghi)perylene	0.002	<0.002	<0.002	<0.002	0.154	77
Dilution Factor		1	1	1	1	
Surrogate Recovery						
Naphthalene-d8 (%)		83	72	91	74	74
Antracene-d10 (%)		105	117	99	102	102
Perylene-d12 (%)		78	88	86	96	96
Date of Analysis		16-Oct-06	16-Oct-06	16-Oct-06	16-Oct-06	16-Oct-06

Comments: * Method Detection Limit
Method: EPA 625/8270 - Solvent Ext./GC/MS

Analyst: S. Lam, C. Chem.

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

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Client:	AMEC Earth and Environmental, a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 1H3	Date: Page:	November 10, 2006 1 of 2
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1595
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polynuclear Aromatic Hydrocarbons

Lab Number Sample ID Date Collected Unit		S2006-11633 NC-TP12-SS2 24-Sep-06 (µg/g)	S2006-11636 NC-TP22-SS1 24-Sep-06 (µg/g)	S2006-11637 NC-TP23-SS1 24-Sep-06 (µg/g)	S2006-11638 NC-TP24-SS1 24-Sep-06 (µg/g)	S2006-11638 NC-TP24-SS1 24-Sep-06 (µg/g)
Parameters	**MDL* (µg/g)**					**(Replicate)**
Naphthalene	0.002	<0.002	0.098	3.98	0.710	0.870
Acenaphthylene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Fluorene	0.001	0.067	0.164	1.25	0.373	0.528
Phenanthrene	0.001	0.256	0.327	1.80	0.803	0.955
Anthracene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fluoranthene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Pyrene	0.003	<0.003	0.003	0.075	<0.003	<0.003
Benzo(a)anthracene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chrysene	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(b)fluoranthene	0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Benzo(k)fluoranthene	0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Benzo(a)pyrene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Indeno(123 cd.)pyrene	0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Dibenzo(ah)anthracene	0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Benzo(ghi)perylene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Dilution Factor		1	1	1/10	1/10	1/10
Surrogate Recovery						
Naphthalene-d8 (%)		82	70	93	76	73
Antracene-d10 (%)		115	124	101	104	110
Perylene-d12 (%)		97	93	116	125	114
Date of Analysis		16-Oct-06	16-Oct-06	16-Oct-06	16-Oct-06	16-Oct-06

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		Page:	2 of 2
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1595
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polynuclear Aromatic Hydrocarbons

Unit		Lab Blank (µg/g)	Blank Spike (µg/g)	Blank Spike Recovery (%)
Parameters	**MDL* (µg/g)**			
Naphthalene	0.002	<0.002	0.162	81
Acenaphthylene	0.001	<0.001	0.164	82
Acenaphthene	0.002	<0.002	0.165	82
Fluorene	0.001	<0.001	0.166	83
Phenanthrene	0.001	<0.001	0.173	87
Anthracene	0.001	<0.001	0.180	90
Fluoranthene	0.001	<0.001	0.181	90
Pyrene	0.003	<0.003	0.191	96
Benzo(a)anthracene	0.001	<0.001	0.174	87
Chrysene	0.001	<0.001	0.180	90
Benzo(b)fluoranthene	0.004	<0.004	0.174	87
Benzo(k)fluoranthene	0.004	<0.004	0.198	99
Benzo(a)pyrene	0.003	<0.003	0.170	85
Indeno(123 cd.)pyrene	0.003	<0.003	0.167	83
Dibenzo(ah)anthracene	0.004	<0.004	0.210	105
Benzo(ghi)perylene	0.002	<0.002	0.154	77
Dilution Factor		1	1	
Surrogate Recovery				
Naphthalene-d8 (%)		91	74	74
Antracene-d10 (%)		99	102	102
Perylene-d12 (%)		86	96	96
Date of Analysis		16-Oct-06	16-Oct-06	16-Oct-06

Comments: * Method Detection Limit
Method: EPA 625/8270 - Solvent Ext./GC/MS

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Analyst: S. Lam, C. Chem.

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		Page:	1 of 3
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1607
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polynuclear Aromatic Hydrocarbons

Lab Number Sample ID Date Collected Unit		S2006-11692 NC-TP15-SS1 28-Sep-06 (µg/g)	S2006-11693 NC-TP16-SS1 28-Sep-06 (µg/g)	S2006-11697 Dup 10 28-Sep-06 (µg/g)	S2006-11697 Dup 10 28-Sep-06 (µg/g)	S2006-11699 SED 7 28-Sep-06 (µg/g)
Parameters	**MDL* (µg/g)**	**	**	**	**(Replicate) ****	
Naphthalene	0.002	<0.02	<0.02	<0.02	<0.02	<0.002
Acenaphthylene	0.001	<0.01	<0.01	<0.01	<0.01	<0.001
Acenaphthene	0.002	<0.02	<0.02	<0.02	<0.02	<0.002
Fluorene	0.001	<0.01	<0.01	<0.01	<0.01	<0.001
Phenanthrene	0.001	<0.01	<0.01	<0.01	<0.01	<0.001
Anthracene	0.001	<0.01	<0.01	<0.01	<0.01	<0.001
Fluoranthene	0.001	<0.01	<0.01	<0.01	<0.01	<0.001
Pyrene	0.003	<0.03	<0.03	<0.03	<0.03	<0.003
Benzo(a)anthracene	0.001	<0.01	<0.01	<0.01	<0.01	0.002
Chrysene	0.001	<0.01	<0.01	<0.01	<0.01	0.001
Benzo(b)fluoranthene	0.004	<0.04	<0.04	<0.04	<0.04	<0.004
Benzo(k)fluoranthene	0.004	<0.04	<0.04	<0.04	<0.04	<0.004
Benzo(a)pyrene	0.003	<0.03	<0.03	<0.03	<0.03	<0.003
Indeno(123 cd.)pyrene	0.003	<0.03	<0.03	<0.03	<0.03	<0.003
Dibenzo(ah)anthracene	0.004	<0.04	<0.04	<0.04	<0.04	<0.004
Benzo(ghi)perylene	0.002	<0.02	<0.02	<0.02	<0.02	<0.002
Dilution Factor		**10**	**10**	**10**	**10**	**1**
Surrogate Recovery						
Naphthalene-d8 (%)		109	126	109	111	85
Antracene-d10 (%)		121	95	86	78	96
Perylene-d12 (%)		132	95	103	118	78
Date of Analysis		16-Oct-06	16-Oct-06	16-Oct-06	16-Oct-06	16-Oct-06

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Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1607
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polynuclear Aromatic Hydrocarbons

Lab Number **Sample ID** **Date Collected** **Unit**		**S2006-11700** **SED 8** **28-Sep-06** **(µg/g)**	**S2006-11701** **SED 9** **28-Sep-06** **(µg/g)**	**S2006-11701** **SED 9** **28-Sep-06** **(µg/g)**
Parameters	**MDL*** **(µg/g)**			**(Replicate)**
Naphthalene	0.002	<0.002	<0.002	<0.002
Acenaphthylene	0.001	<0.001	<0.001	<0.001
Acenaphthene	0.002	<0.002	<0.002	<0.002
Fluorene	0.001	<0.001	<0.001	<0.001
Phenanthrene	0.001	0.008	0.005	<0.001
Anthracene	0.001	0.005	<0.001	<0.001
Fluoranthene	0.001	0.180	<0.001	<0.001
Pyrene	0.003	0.085	<0.003	<0.003
Benzo(a)anthracene	0.001	0.059	<0.001	<0.001
Chrysene	0.001	0.048	<0.001	<0.001
Benzo(b)fluoranthene	0.004	0.064	<0.004	<0.004
Benzo(k)fluoranthene	0.004	0.006	<0.004	<0.004
Benzo(a)pyrene	0.003	0.017	<0.003	<0.003
Indeno(123 cd.)pyrene	0.003	0.073	<0.003	<0.003
Dibenzo(ah)anthracene	0.004	<0.004	<0.004	<0.004
Benzo(ghi)perylene	0.002	0.035	<0.002	<0.002
Dilution Factor		1	1	1
Surrogate Recovery				
Naphthalene-d8 (%)		85	85	85
Antracene-d10 (%)		91	95	90
Perylene-d12 (%)		83	94	80
Date of Analysis		16-Oct-06	16-Oct-06	16-Oct-06

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Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab Ref.:	F2006-1607
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polynuclear Aromatic Hydrocarbons

Parameters	MDL* (µg/g)	Lab Blank (µg/g)	Blank Spike (µg/g)	Blank Spike Recovery (%)
Naphthalene	0.002	<0.002	0.161	81
Acenaphthylene	0.001	<0.001	0.163	82
Acenaphthene	0.002	<0.002	0.165	82
Fluorene	0.001	<0.001	0.166	83
Phenanthrene	0.001	<0.001	0.173	87
Anthracene	0.001	<0.001	0.180	90
Fluoranthene	0.001	<0.001	0.181	90
Pyrene	0.003	<0.003	0.191	96
Benzo(a)anthracene	0.001	<0.001	0.174	87
Chrysene	0.001	<0.001	0.179	90
Benzo(b)fluoranthene	0.004	<0.004	0.173	87
Benzo(k)fluoranthene	0.004	<0.004	0.197	99
Benzo(a)pyrene	0.003	<0.003	0.169	85
Indeno(123 cd.)pyrene	0.003	<0.003	0.167	83
Dibenzo(ah)anthracene	0.004	<0.004	0.210	105
Benzo(ghi)perylene	0.002	<0.002	0.154	77
Dilution Factor		1	1	
Surrogate Recovery				
Naphthalene-d8 (%)		85	74	74
Antracene-d10 (%)		99	102	102
Perylene-d12 (%)		101	96	96
Date of Analysis		16-Oct-06	16-Oct-06	16-Oct-06

Comments:
* Method Detection Limit
Method: EPA 625/8270 - Solvent Ext./GC/MS
** Higher MDL used for samples 11692, 11693 and 11697 due to dilution factor

Analyst: S. Lam, C.Chem

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		Page:	1 of 1
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab. Ref.:	F2006-1563
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polychlorinated Biphenyls

Parameter Method Detection Limit Unit			Total PCB 0.005 (µg/g)	Surrogate Recovery (%)
Lab Number	Sample ID	Date Collected		
S2006-11354	WH-TP8-SS1	20-Sep-06	<0.005	81
S2006-11362	SP-TP1-SS1	21-Sep-06	1.82	91
S2006-11363	SP-TP2-SS1	21-Sep-06	<0.005	81
S2006-11365	ML-TP2-SS3	21-Sep-06	<0.005	78
S2006-11367	ML-TP4-SS1	21-Sep-06	<0.005	84
S2006-11370	ML-TP7-SS2	21-Sep-06	<0.005	78
Lab Blank			<0.005	83
Blank Spike			0.063	92
Blank Spike Recovery (%)			79	92
Date of Analysis			06-Oct-06	06-Oct-06

Comments: Method: EPA 8080B - Solvent Ext,/GC/ECD
Total PCB quantified as Aroclor 1254/60
Results reported on dry weight basis
Value in ppm (ug/g)

Analyst: S. Lam, C. Chem.

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		Page:	1 of 1
Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab. Ref.:	F2006-1607
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polychlorinated Biphenyls

Parameter **Method Detection Limit** **Unit**			**Total PCB** **0.005** **(µg/g)**	**Surrogate Recovery** **(%)**
Lab Number	**Sample ID**	**Date Collected**		
S2006-11690	NC-TP13-SS1	28-Sep-06	<0.005	95
S2006-11691	NC-TP14-SS1	28-Sep-06	<0.005	100
S2006-11692	NC-TP15-SS1	28-Sep-06	<0.005	93
S2006-11693	NC-TP16-SS1	28-Sep-06	0.036	91
S2006-11694	NC-TP17-SS1	28-Sep-06	<0.005	75
S2006-11695	NC-TP19-SS1	28-Sep-06	<0.005	98
S2006-11697	Dup 10	28-Sep-06	<0.005 (<0.005)	88 (90)
S2006-11699	SED 7	28-Sep-06	<0.05 *	92
S2006-11700	SED 8	28-Sep-06	<0.05 *	78
S2006-11701	SED 9	28-Sep-06	<0.05 (<0.05)*	99 (101)
Lab Blank			<0.005	83
Blank Spike			0.066	84
Blank Spike Recovery (%)			83	84
Date of Analysis			13-Oct-06	13-Oct-06

Comments: Method: EPA 8080B - Solvent Ext,/GC/ECD
Total PCB quantified as Aroclor 1254/60
Results reported on dry weight basis
Value in ppm (ug/g)
Value in (brackets) represents Lab Replicate
* Higher MDL used due to dilution factor

Analyst: S. Lam, C. Chem.

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Project Name:	Baie Verte Mines	Sample Type:	Soil
Project Number:	TF 6126509	Lab. Ref.:	F2006-1595
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polychlorinated Biphenyls

Parameter Method Detection Limit Unit			Total PCB 0.005 (µg/g)	Surrogate Recovery (%)
Lab Number	Sample ID	Date Collected		
S2006-11642	WR-TP1-SS2	24-Sep-06	<0.005	95
S2006-11646	NC-TP18	24-Sep-06	0.051	117
Lab Blank			<0.005	87
Blank Spike			0.094	97
Blank Spike Recovery (%)			118	97
Date of Analysis			11-Oct-06	11-Oct-06

Comments: Method: EPA 8080B - Solvent Ext,/GC/ECD
Total PCB quantified as Aroclor 1254/60
Results reported on dry weight basis
Value in ppm (ug/g)

Analyst: S. Lam, C. Chem.

Cynthia Ridge, C. Chem.
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		Page:	1 of 1
Project Name:	Baie Verte Mines	Sample Type:	Sediment/Soil
Project Number:	TF 6126509	Lab. Ref.:	F2006-1594
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polychlorinated Biphenyls

Parameter Method Detection Limit Unit			Total PCB 0.005 (µg/g)	Surrogate Recovery (%)
Lab Number	Sample ID	Date Collected		
S2006-11613	WR-TP2-SS1	24-Sep-06	0.202	133
S2006-11617	SED 1	25-Sep-06	<0.005	88
S2006-11618	SED 2	25-Sep-06	<0.005	95
S2006-11619	SED 3	25-Sep-06	<0.005	88
S2006-11620	SED 4	25-Sep-06	<0.005	70
S2006-11621	SED 5	25-Sep-06	<0.005	90
S2006-11622	SED 6	26-Sep-06	<0.005	84
S2006-11629	Dup 9	25-Sep-06	<0.005 (<0.005)	101 (84)
Lab Blank			<0.005	87
Blank Spike			0.094	97
Blank Spike Recovery (%)			118	97
Date of Analysis			11-Oct-06	11-Oct-06

Comments: Method: EPA 8080B - Solvent Ext,/GC/ECD
Total PCB quantified as Aroclor 1254/60
Results reported on dry weight basis
Value in ppm (ug/g)
Value in (brackets) represents Lab Replicate

Analyst: S. Lam, C. Chem.

Cynthia Ridge, C. Chem.
Q.A./Q.C. Officer

Suman Punani, C. Chem.
Laboratory Manager

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Client:	AMEC Earth and Environmental a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date: Page:	November 10, 2006 1 of 1
Project Name:	Baie Verte Mines	Sample Type:	Water
Project Number:	TF 6126509	Lab Ref.:	F2006-1594
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polychlorinated Biphenyls

Parameter Method Detection Limit Unit			Total PCB 0.04 (µg/L)	Surrogate Recovery (%)
Lab Number	Sample ID	Date Collected		
S2006-11623	SW 1	25-Sep-06	<0.04	78
S2006-11624	SW 2	25-Sep-06	<0.04	78
S2006-11625	SW 3	25-Sep-06	<0.04	82
S2006-11626	SW 4	25-Sep-06	<0.04	89
S2006-11627	SW 5	25-Sep-06	<0.04	86
Lab Blank			<0.04	89
Blank Spike			0.99	85
Blank Spike Recovery (%)			124	85
Date of Analysis			11-Oct-06	11-Oct-06

Comments: Method: EPA 608 - Solvent Ext./GC/ECD
Total PCB quantified as Aroclor 1254/60

Analyst: S. Lam, C. Chem.

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Client:	AMEC Earth and Environmental a division of AMEC Americas Limited 133 Crosbie Road, Suite 202, P.O. Box 13216 St. John's, Newfoundland A1B 4A5	Date:	November 10, 2006
		Page:	1 of 1
Project Name:	Baie Verte Mines	Sample Type:	Water
Project Number:	TF 6126509	Lab Ref.:	F2006-1607
Contact:	Gary Warren		Final

CERTIFICATE OF ANALYSIS

Polychlorinated Biphenyls

Parameter Method Detection Limit Unit			Total PCB 0.04 (µg/L)	Surrogate Recovery (%)
Lab Number	**Sample ID**	**Date Collected**		
S2006-11696	SW 6	28-Sep-06	<0.04	80
S2006-11698	Dup 11	28-Sep-06	<0.04	89
Lab Blank			<0.04	89
Blank Spike			0.99	85
Blank Spike Recovery (%)			124	85
Date of Analysis			11-Oct-06	11-Oct-06

Comments: Method: EPA 608 - Solvent Ext,/GC/ECD
Total PCB quantified as Aroclor 1254/60

Analyst: S. Lam, C. Chem.

Cynthia Ridge, C. Chem.
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SECTION 12.0

ASSESSOR'S QUALIFICATIONS

12.0 ASSESSOR'S QUALIFICATIONS

Key members of the project team and their qualifications are listed below.

Rod Winsor, M.Sc., P.Eng., Project Manager

Mr. Winsor has managed or conducted a wide range of environmental, geotechnical engineering, and geological/hydrogeological projects in Newfoundland and Labrador, Nova Scotia, New Brunswick, Labrador and the US working for private organizations and government agencies. Notably he has had significant field, reporting and management roles in recent ESAs conducted for Public Works and Government Services Canada, Department of Environment and Conservation, Department of Transportation & Works, Department of National Defense, Pennecon, M-I, L.L.C. and NLHC at four similar sites located in Stephenville, Goose Bay, Come by Chance, Hopedale, Buchans, West and Upper Salmon, and Northwest Point. Most environmental projects generally entailed the assessment and management of environmental liabilities and risks associated with compliance, hazardous materials and industrial chemicals, contamination of soil, sediment, groundwater, surface water, and indoor air by various chemical, physical, and biological agents. Major categories of work include various phases of Environmental Site Assessments, Environmental Remediation, Environmental Impact Studies, Indoor Air Quality and Sound Level Assessments, and Environmental Design. He has over 12 years experience practising as a consultant and project manager and has current US EPA HAZWOPER training. Mr. Winsor is a member of the Association of Professional Engineers and Geoscientists in NL.

Gary Warren, M.A.Sc., Intermediate Project Professional/Site Assessor

Mr. Warren has a Masters of Applied Science in Environmental Engineering from Memorial University of Newfoundland. He has over 6 years of experience conducting environmental investigations comprising Phase I, II and III site assessments, environmental audits and baseline studies for numerous sites. Most notably, Mr. Warren has also worked on several assessments and remediation projects for Public Works Government Services Centre (PWGSC), Defence Construction Canada (DCC), Transport Canada (TC) and the Department of Transportation and Works (DWT). Mr. Warren's experience also includes scheduling and coordination of field programs, site inspections for environmental assessment and legislative regulatory compliance, hazmat surveys, environmental sampling of the various media, sewage treatment feasibility studies, supervision of underground storage tank removal programs, waste audits, inventories of hazardous chemicals and other materials, and site supervision for the installation of monitoring wells, test pits, and for the excavation and disposal of contaminated soils. Mr. Warren has the current US EPA HAZWOPER training.

Kelly Curtis, CET, Site Assessor

Ms Curtis has a Diploma in Civil Engineering Technology from the College of the North Atlantic and is a member of the Association of Engineering Technicians and Technologists of Newfoundland and Labrador. She has 7 years of experience conducting environmental investigations comprising of Phase I, II and III environmental site assessments, remediation, hazmat surveys and site decommissioning projects and is familiar with all aspects of soil and groundwater sampling, as well as QA/QC protocols. Projects have included a wide spectrum of sites including, residential, commercial and industrial establishments. She is experienced in monitoring well installation, well development using hand and mechanized methods, test pit excavation, soil sampling, water sampling, sediment sampling, etc. Ms. Curtis has the current US EPA HAZWOPER training.

Sheldon Adey, CET, Site Assessor

Mr. Adey has a Bachelors Degree of in Environmental Technology from the University of Cape Breton. He has 7 years of experience conducting environmental investigations comprising of Phase I, II and III environmental site assessments, remediation and hazmat surveys and is familiar with all aspects of soil and groundwater sampling, as well as QA/QC protocols. Projects have included a wide spectrum of sites including, residential, commercial and industrial establishments. He is experienced in monitoring well installation, well development using hand and mechanized methods, test pit excavation, soil sampling, water sampling, sediment sampling, etc.. Mr. Adey has the current US EPA HAZWOPER training.

SECTION 13.0

REFERENCES

13.0 REFERENCES

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