Avalon Rare Metals Inc.

ISSUED FOR USE

THOR LAKE PROJECT PINE POINT AREA ENVIRONMENTAL CONSIDERATIONS

V15101007

December 2009

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1.0 INTRODUCTION

The Thor Lake Rare Metals Project is located approximately 100 km south of Yellowknife, NT, and about 5 km north of the Hearne Channel of Great Slave Lake. It is understood that the proposed Project will consist of an underground mining approach with an expected daily mill throughput of approximately 1000 tonnes/day, and a mine life in excess of 20 years. Previous evaluation work for the prospect considered open-pit operations with larger mill throughput and potentially shorter mine lives.

The main project site is located in an area where discontinuous permafrost conditions exist. Therefore, the presence of frozen soil/rock and its characteristics must be considered in the design of many of the required infrastructure components and the underground mine.

A significant and environmentally preferable component of the overall Thor Lake Project will involve the transportation of rare metals concentrate produced at the mine site via barges across the east end of Great Slave Lake to the existing brownfields area of the former Pine Point Mine, which will be used as the site for the Thor Lake Project Hydrometallurgical Processing Plant (Figure 1). Transportation from the south shore of Great Slave Lake to the former Pine Point Mine site will be via a 10.9 km long haul road, which will be aligned along an existing drainage ditch connecting to an existing haul road to a former mine pit located to the north of the main Pine Point Mine area.

The purpose of this report is to summarize the existing environmental baseline conditions of the terrestrial area between the south shore of Great Slave Lake and the proposed location of the Hydrometallurgical Plant to be located at the site of the former Pine Point Mine. This report also serves to identify potential environmental concerns and mitigation options for addressing such concerns.

2.0 ENVIRONMENTAL BASELINE CONDITIONS

2.1 ENVIRONMENTAL INFORMATION SOURCES

This section presents a description of the existing biophysical environmental conditions present in the terrestrial area of interest located between the south shore of Great Slave Lake and the proposed location of the Hydrometallurgical Plant to be located at the site of the former Pine Point Mine (Figure 1). Information included in this section has been drawn from various environmental baseline studies undertaken in the general area over the past 35 years; resource agency information sources; and studies conducted by EBA Engineering Consultants Ltd. (EBA) for the Tamerlane Pilot Project in 2005 and 2006.

2.2 GENERAL ECOLOGY

The area of interest is located in the Great Slave Lowlands Mid-Boreal Ecoregion of the Taiga Plains Ecozone (Figure 2) (Ecosystem Classification Group 2007). The area is characterized by short, cool summers and long, cold winters. The mean annual temperature is -17.5 ºC, and annual precipitation ranges from 300 to 400 mm. This ecoregion is classified as having a subhumid mid-boreal eco-climate.

Nearly level lacustrine and alluvial deposits with a mosaic of sedge wetlands and grass meadows, diverse forests and wetlands typify the Slave Lowland MB Ecoregion. The vegetation of this Ecoregion is characterized by medium to tall, closed stands of jack pine and trembling aspen. White spruce and black spruce dominate later successional stands. Poorly drained fens and bogs in this region are covered with low, open stands of larch), black spruce and ericaceous shrubs.

Moose, woodland caribou and occasionally wood bison are the main ungulates found in the area of interest, although none are considered common. As confirmed by Traditional Knowledge interviews conducted for the nearby Tamerlane Pilot Project (Tamerlane 2006a, b), hunting and trapping activities occur throughout this area. The bird life present is typical of the boreal forest, and the south shore of Great Slave Lake is considered to be an important concentration site for birds during their annual migrations.

2.3 SOILS

The general area is described in the Soils of the Slave River Lowland as low-lying flat land with numerous lakes and abandoned stream channels. The soil climate is subarctic (humid) with some discontinuous permafrost. In much of the area, soil development has been influenced by the presence of water for much of the year. The dominant soils are Humic Gleysols and Regosols (Day 1972, as cited in EBA 2005a). There is little relief, and changes in vegetation communities are not followed with a characteristic change in surface elevation, but rather, a change in the depth to mineral soil (EBA 2005a).

The soils in the study area are primarily Eluviated Eutric Brunisols in upland areas and Terric Organics and Gleysols in lowland areas. Cumulo Organics were encountered; most likely a result of the formation and flooding regimes of Glacial Lake McConnell. The cumulo layers are remnants of past glaciation. These soils will become Terric and Typic organics with the passage of time. Mineral soils vary in texture from gravel to clay. Sand is most common (EBA 2005a).

Discontinuous permafrost has been reported in some localized areas within the overburden, but is not common and is unlikely to occur in the area of interest due to its proximity to Great Slave Lake.

2.4 SURFACE HYDROLOGY

The area of interest is flat to gently sloping and a considerable portion of the area is covered by poorly drained muskeg ranging up to 3 m deep. The area also contains several generally east-west low ridges, which are considered to have been formed by old lake-level beaches. Extensive wetland areas and small lakes are located in the area (Figure 3). No streams are present in the proposed haul road alignment.

Great Slave Lake is the final receptor of all surface water draining from the area of interest. Historic data available on lake levels at the Water Survey of Canada recording station at Hay River (Station 0708002) indicate that the mean lake level has been 156.7 metres above sea level (masl) with normal seasonal variations between 156.59 and 156.93 masl and extreme variations recorded of 157.28 and 156.22. Highest water levels typically occur in mid-summer (Beak 1980).

2.5 VEGETATION

Vegetation mapping of the general Pine Point area was first undertaken in 1977 by BC Research using black and white aerial photographs and fieldwork. Mapping of the area was carried out again using aerial photographs taken in June 1979 by Beak Consultants Ltd. The plant communities identified from these studies were: jack pine, aspen, mixed jack pine/black spruce, white spruce, black spruce, shrub, fen, muskeg and burn, for a total of nine distinct types.

In September 2005, EBA collected new baseline vegetation and ecosystem data for the proposed Tamerlane Pilot Project Regional Study area located immediately to the west of the current area of interest.

Eight naturally vegetated ecosystem units were classified within the Pine Point Regional Study Area. The most common ecosystem was the upland, Labrador Tea – Mesic ecosite (28.3 %). The Shrubby and Treed fens, characteristic of lowland landforms, were second and third in area (24.6 % and 24.3 %) (EBA 2005a).

Based on the information reported in EBA 2005a and our understanding that the area of interest to the north of the former Pine Point mine consists primarily of lowland landforms draining towards Great Slave Lake as illustrated in Figure 3, wetland ecosystems dominate the land in this area.

The main wetland ecosystems present in the area of interest include Graminoid, Shrubby and Treed Fen ecosites. The fens are generally restricted to areas of poorly drained organic soils. Soils tend to be rich in nutrients. Stand composition in the region varies due to the fire regime. Early successional stands are dominated by an open canopy of bog birch, while mature stands have a closed canopy of black spruce and larch.

The limited upland landforms in the area of interest include Bearberry Pj, Canada Buffalo – Green Alder, Labrador Tea – Mesic, and Labrador Tea – Subhygric ecosites. They are dominated by jack pine, aspen and paper birch in seral communities, and black and white spruce in climax communities. Immediately after fire, the communities are dominated by fast growing deciduous seral species such as paper birch and alder (Alnus species). The slower growing jack pine becomes the dominant species a few years after fire.

To confirm that the vegetation cover present in the area of interest is as described herein, it is recommended that an appropriate field study be undertaken during the early summer of 2010. This study could be undertaken in conjunction with an equally necessary wildlife and wildlife habitat study.

2.6 WILDLIFE

Early science-based wildlife studies of the Pine Point area were first conducted during the period 1976 to 1980 by BC Research to evaluate the environmental consequences of Cominco's mining operation at Pine Point (BC Research 1983). Large mammal surveys (i.e. caribou, moose, bison) were first conducted using fixed-wing aircraft in March 1976. The survey covered the area between Buffalo River and Little Buffalo River north to the shores of Great Slave Lake. The southern boundary of the survey area was Wood Buffalo National Park. All large mammal tracks and sightings were recorded (BC Research 1983). A second survey was carried out by BC Research by helicopter, followed by a ground survey in the summer of 1977. All observations of wildlife were recorded.

These early studies indicated that:

> *"large mammals may be less common than in the past due to habitat removal and people pressure, such as vehicular traffic and hunting, whereas there appeared to be little impact on upland furbearers".*

BC Research (1983) also reported that:

> *"the most productive furbearer habitat near Pine Point appeared to be located outside the areas of direct mining activity. Aquatic furbearers may have benefited from the creation of additional habitat, due to discharge of water from the open pits. However, the relatively low temperature of pit water may have reduced the productivity of their habitat, and thus may have degraded habitat that existed before the discharge of pit water began".*

During the bird-nesting season in 1978, BC research conducted a bird census study. The primary objective of that study was to provide a baseline inventory of aquatic birds which breed north of the Pine Point tailings area, along the shore of Great Slave Lake from Sulfur Point to Paulette Creek, and at several small islands and reefs near Paulette Island (BC Research 1983).

The most abundant aquatic birds observed during the 1978 survey were: Mallard, herring gulls, other unidentified gulls, shorebird species, scaup species, pintail, red-breasted and common merganser, Arctic terns and American wigeon. Effects of the tailings water discharge on the avifauna of the Pine Point region appeared to be minimal and confined to a relatively small area immediately adjacent to the north edge of the Pine Point Mine tailings area (BC Research 1983).

In 1980, Mr. Jim Beaulieu of the former NWT Wildlife Service indicated that moose and woodland caribou were the principal ungulates found in the Pine Point area although neither species was believed to be very abundant (Beak 1980). BC Research (1977) concluded that densities were low in the Pine Point area on the basis of winter surveys between Buffalo and Little Buffalo rivers, and browse and pellet group surveys in summer.

BC Research (1977) determined that carnivores in the study area included black bear, coyote, wolf and red fox. Black bears were reported to be particularly common in the Pine

Point area by BC Research. Lynx, marten, fisher, ermine, least weasel, mink, wolverine and river otter were also reported to occur in the area.

Aquatic furbearers such as muskrat and beaver were also reported to be common in the area (BC Research 1977).

During a site tour conducted as part of the MVEIRB scoping sessions for the proposed Tamerlane Pilot Project in mid August 2006, and Traditional Knowledge interviews conducted in October 2006, a number of the community participants discussed wildlife species found in the general Pine Point region. Wildlife identified as living in and being harvested included moose, woodland caribou, lynx, wolf, otter, black bear, rabbit, porcupine, prairie chicken, spruce chicken, ruffed grouse, waterfowl and upland game birds. Migrating wildlife observed from time-to-time include ducks, geese, swans, songbirds, whooping crane, prairie chickens and ptarmigan (Tamerlane 2007; 2006a, b).

More recent wildlife studies of the Tamerlane Regional Study Area (RSA) were carried out by EBA in September 2005 and during the spring, summer and fall of 2006 (EBA 2006a, 2006b).

A total of 187 wildlife observations were recorded during the September 2005 field survey. Approximately 43 % of the observations consisted of birds (identified through song, nests, or other sign), and 56 % of the observations consisted of mammals (primarily through tracks, scat/pellets, and evidence of browsing).

Within the different habitat types, a total of 80 bird observations were recorded, comprising 32 different species, including the Whooping Crane and Peregrine Falcon (both of which have special status designations). A single Whooping Crane was recorded in a Treed Fen habitat, and the Peregrine Falcon was noted in a Shrubby Fen.

In addition, a total of 104 mammal observations, comprising 13 different mammal species were documented as occurring in the RSA, including woodland caribou and wood bison (both which have special status designations). Woodland caribou sign was documented in Labrador-tea subhygric and Treed Fens, and wood bison sign was recorded in Shrubby Fen and Treed Fen. Other species of special designation that could occur in the study area but were not recorded were northern leopard frog, Yellow Rail, Short-eared Owl, and wolverine.

Habitat types that exhibited the highest species diversity included Treed Fen and Labrador-tea Subhygric habitat units which are also present in the area of interest to the north of the former Pine Point Mine area.

2.6.1 Mammals

A preliminary list of all mammal species known or suspected to occur in the Pine Point area (i.e. within 200 km of the Tamerlane Pilot Project Regional Study Area) was generated by EBA using Banfield (1977) Mammals of Canada and Beak (1980). A total of 40 mammal species were determined to occur or potentially occur in the Pine Point Mine area (EBA 2005b).

As previously indicated during EBA's 2005 field study, a total of 104 mammal observations, including actual sightings or sign, were recorded. Based on the experience of the EBA wildlife study team, Traditional Knowledge and these observations, evidence of 13 different mammal species were documented as occurring in the RSA (Table 2.6-2).

The most notable mammal observations during the September survey included evidence of woodland caribou and wood bison sign (hair, pellets, tracks, and feeding areas).

To confirm that the wildlife present in or utilizing the area of interest is as described herein, it is recommended that an appropriate field study be undertaken during the early summer of 2010. This study could be undertaken in conjunction with an equally necessary vegetation cover study.

TABLE 2.6-1: MAMMAL SPECIES OCCURRING OR POTENTIALLY OCCURRING IN THE PINE POINT AREA, NWT

Scientific Name	Common Name	Scientific Name	Common Name
Sorex cinereus	Masked Shrew	*Microtus xanthognathus*	Chestnut-cheeked (Taiga) Vole
Sorex monticolus	Dusky Shrew	*Zapus hudsonius*	Meadow Jumping Mouse
Sorex palustris	Water Shrew	*Erethizon dorsatum*	Common Porcupine
Sorex arcticus	Arctic Shrew	*Canis latrans*	Coyote
Sorex hoyi	Pigmy Shrew	*Canis lupus*	Gray Wolf
Myotis lucifugus	Little Brown Bat (Myotis)	*Vulpes vulpes*	Red Fox
Myotis septentrionalis	Northern myotis	*Ursus americanus*	Black Bear
Lepus americanus	Snowshoe Hare	*Martes americana*	American marten
Eutamias minimus	Least Chipmunk	*Martes pennanti*	Fisher
Marmota monax	Woodchuck	*Mustela erminea*	Ermine (Stoat)
Tamiasciurus hudsonicus	Red Squirrel	*Mustela nivalis*	Least Weasel
Glaucomys sabrinus	Northern Flying Squirrel	*Mustela vison*	Mink
Castor canadensis	American beaver	*Gulo gulo*	Wolverine
Peromyscus maniculatus	Deer Mouse	*Mephitis mephitis*	Striped skunk
Clethrionomys rutilis	Northern Red-backed Vole	*Lutra canadensis*	River Otter
Clethrionomys gapperi	Southern Red-backed Vole	*Lynx canadensis*	Lynx
Synaptomys borealis	Northern Bog Lemming	*Rangifer tarandus caribou*	Woodland Caribou
Phenacomys intermedius	Heather Vole	*Odocoileus hemionus*	Mule Deer
Ondatra zibethicus	Muskrat	*Alces alces*	Moose
Microtus pennsylvanicus	Meadow Vole	*Bison bison athabascae*	Wood Bison

TABLE 2.6-2: MAMMAL SPECIES RECORDED IN THE TAMERLANE RSA BY EBA IN SEPTEMBER 2005	
Common Name	Scientific Name
Snowshoe Hare	*Lepus americanus*
Red Squirrel	*Tamiasciurus hudsonicus*
American beaver	*Castor canadensis*
Common Porcupine	*Erethizon dorsatum*
Coyote	*Canis latrans*
Gray Wolf	*Canis lupus*
Black Bear	*Ursus americanus*
Ermine (Stoat)	*Mustela erminea*
Mink	*Mustela vison*
Lynx	*Lynx canadensis*
Woodland Caribou	*Rangifer tarandus caribou*
Moose	*Alces alces*
Wood Bison	*Bison bison athabascae*

2.6.2 Birds

In preparation for the 2005 wildlife survey conducted by EBA for the Tamerlane RSA, a list of bird species known to occur or those that potentially occur in the study area was developed using Sibley (2003) and government reports. All bird species occurring within a 200 km radius of the study area were included. A total of 210 bird species were identified as confirmed or potentially occurring in the study area, either as breeders or during migration.

As previously indicated during EBA's 2005 field study, a total of 80 different bird observations were recorded during this study, comprising 32 different species (Table 2.6-3). These observations included actual sightings, bird calls, or sign. Ten of the most frequently seen bird species observed include the following: American Robin, Tundra Swans, White-winged Scoter, Gray Jay, Common Raven, Spruce Grouse, and Bohemian Waxwings.

Bird species observed were classified as migrant, breeding, transient, resident, or accidental. A migrant occurs regularly as it passes through during spring or fall migration. A breeder is a species that breeds in the area and is usually present during the spring, summer and fall. A transient is a species that can occur irregularly at any time of the year. A resident is a species that occurs in the area throughout the year.

The most notable bird observations during the September survey included a visual recording of a single non-breeding Whooping Crane in a recently flooded beaver pond within the study area and two sightings of Peregrine Falcons. One of the Peregrine Falcon observations occurred along Provincial Highway 5 near the eastern boundary of Hay River Reserve, while the second observation occurred along a dirt road where the falcon was feeding on a recently killed snow goose (approximately 13 km southwest of the former Pine Point town site.

TABLE 2.6-3: BIRD SPECIES RECORDED IN THE TAMERLANE RSA – SEPTEMBER 2005		
Common Name	Scientific Name	Classification
Greater White-fronted Goose	*Anser albifrons*	Migrant
Snow Goose	*Chen caerulescens*	Migrant
Canada Goose	*Branta canadensis*	Breeder
Tundra Swan	*Cygnus columbianus*	Migrant
Lesser Scaup	*Aythya affinis*	Breeder
White-winged Scoter	*Melanitta fusca*	Breeder
Ruffed Grouse	*Bonasa umbellus*	Resident
Spruce Grouse	*Falcipennis canadensis*	Resident
Ptarmigan species	*Lagopus lagopus*	Winter Resident
Common Loon	*Gavia immer*	Breeder
Bald Eagle	*Haliaeetus leucocephalus*	Breeder
Northern Harrier	*Circus cyaneus*	Breeder
Rough-legged Hawk	*Buteo lagopus*	Migrant
American Kestrel	*Falco sparverius*	Breeder
Peregrine Falcon	*Falco peregrinus (anatum)*	Migrant or Transient
Whooping Crane	*Grus americana*	Transient
Yellow-bellied Sapsucker	*Sphyrapicus varius*	Breeder
Black-backed Woodpecker	*Picoides arcticus*	Resident
Northern Flicker	*Colaptes auratus*	Breeder
Pileated Woodpecker	*Dryocopus pileatus*	Resident
Gray Jay	*Perisoreus canadensis*	Resident
Common Raven	*Corvus corax*	Resident
Horned Lark	*Eremophila alpestris*	Breeder
Bank Swallow	*Riparia riparia*	Breeder
Boreal Chickadee	*Parus hudsonicus*	Resident
American Robin	*Turdus migratorius*	Breeder
Bohemian Waxwing	*Bombycilla garrulus*	Breeder
Orange-crowned Warbler	*Vermivora celata*	Breeder
Yellow-rumped Warbler	*Dendroica coronata*	Breeder
Dark-eyed Junco	*Junco hyemalis*	Breeder
Rusty Blackbird	*Euphagus carolinus*	Breeder
Pine Siskin	*Carduelis pinus*	Breeder

[1] Species organized in phylogenetic order. Source: EBA 2005 b

The majority of bird species occurring in the Pine Point area are migratory and are present only during their reproductive phase; however, some are year-round residents. Bird species are widely distributed throughout all terrestrial habitat types present in the area.

During the 2006 breeding bird survey conducted by EBA for the Tamerlane Pilot Project RSA, a total of 195 birds were recorded at point count stations, including 31 different passerine species, one upland nesting bird, and four shorebird species (EBA 2006b). White-winged Crossbill, Ruby-crowned Kinglet, Hermit Thrush, White-throated Sparrow, Yellow-rumped Warbler, Palm Warbler, and Chipping Sparrow were the most common species. The number of individual birds that were recorded in each habitat type and species richness were calculated. Results from these analyses must be interpreted with caution since sample sizes were low, particularly for bearberry – Jack pine, graminoid fen, and human disturbed/upland complex habitats.

Bearberry – Jack pine habitat had the highest average number of birds, followed by shrubby fens, upland/lowland complex, graminoid fen and disturbed/upland complex, treed fen, and Labrador-tea – mesic (Table 2.6-4). The Labrador-tea – subhygric habitat had the lowest average number of bird observations.

The highest average number of species (species richness) was found in graminoid fens, followed by upland/lowland complex, shrubby fen, bearberry – Jack pine and disturbed/upland complex, Labrador-tea – mesic and Labrador-tea – subhygric. Treed fen habitats had the lowest average species richness (Table 2.12-4).

TABLE 2.12-4: ANALYSIS OF 2006 BREEDING BIRD OBSERVATIONS BY EACH HABITAT TYPE

Habitat (Number of Survey Stations in Each Habitat Type)	Total Number of Observations per Station	Average Number of Observations per Station	Total Species Richness per Station	Average Species Richness per Station
Labrador-tea – Mesic	37	7.4	15	3
Labrador-tea – Subhygric	9	4.5	6	3
Bear-berry – Jack Pine	39	39	6	6
Treed Fen	42	8.4	14	2.8
Shrubby Fen	26	13	13	6.5
Graminoid Fen	9	9	9	9
Upland and Lowland Complex	24	12	15	7.5
Human Disturbed and Two Different Uplands Complex	9	9	6	6

2.6.3 Amphibians

The NWT and the Pine Point area are in the extreme northern limit of amphibian species ranges. Four amphibian species potentially occur within the Regional Study Area: Boreal Chorus, Wood, and Northern Leopard frog, and Canadian Toad. Little information currently exists on amphibian populations within the NWT; however, there is particular interest in Northern Leopard Frog and Canadian Toad populations due to their uncommon occurrence and restricted distributions within the NWT and southern Canada.

Boreal Chorus and Wood frogs are the most commonly observed frogs within the NWT. These species occur in shallow areas of lakes, rivers, ponds, wetlands, woodlands, and even temporary waterbodies, including roadside ditches and open meadows. In Alberta, Boreal Chorus Frogs may breed from mid April to mid June in small ponds or temporary pools, and Wood Frogs may breed in a short week to two week period from mid April to June in shallow, clear, permanent or temporary ponds (SRD 2005).

Northern Leopard Frogs are classified as a species of Special Concern by SARA and Sensitive in the NWT. The Canadian Toad is listed under the NWT as May Be At Risk. Northern Leopard Frogs are predominantly found in or near permanent waterbodies including lakes, rivers, streams, and wetlands, although they can be found a long distance from water, particularly after a rain. After hibernating at the bottom of ponds, Northern Leopard Frogs emerge and begin mating in early spring; some years prior to complete ice-melt. In Alberta, breeding may occur from early April to early June (SRD 2005). Northern Leopard frogs have been documented near Fort Resolution (Ecology North ND).

To enhance the limited available information on amphibian distribution and breeding behaviour within the Tamerlane PPPP area, during 2006 EBA completed a pilot survey to better understand breeding and/or calling behaviour of the four amphibian species hypothetically occurring within the 16,551 ha 2006 survey area EBA 2006b). The work program included a single auditory survey at selected habitats in May, 2006 and documentation of incidental amphibian observations and calling indexes in conjunction with owl surveys in April and May, and the breeding bird survey in June.

Infrequent calls of both Wood and Boreal Chorus frogs were heard during the April owl survey conducted by EBA. In April, Wood Frogs were reported at five sites (calling frequency ranged from 1 – 3 at these five sites; average 1.6) and Boreal Chorus Frogs were recorded at four sites (calling indexes reported as 1 and 3; average 1.2). During the May owl survey, Boreal Chorus Frogs were the most commonly heard amphibian species. During the May owl survey, Wood Frogs were not heard; however, a single Wood Frog was observed within a treed fen. Boreal Chorus Frogs were heard at eight sites during the May Owl survey. Calling indexes of the Boreal Chorus Frogs appeared higher during the May Owl survey, than compared to the April Owl survey (calling indexes ranged between 1 and 3; average 2.5).

During the auditory survey, a total of 12 stations were surveyed between May 16 – 18 in the 16,551 ha 2006 survey area Auditory stations included a variety of breeding habitats, including: roadside ditches, temporary pools, wetlands, ponds, streams, and lakes that were accessible from the highway, cutlines, and trails. During the auditory surveys, Boreal Chorus Frogs were documented at all of the twelve auditory stations, and a Wood Frog was recorded at two auditory stations (total of two Wood frogs). Boreal Chorus Frog calling indexes at eleven of the stations was at a level where individual frogs could not be counted (calling index 3), and at one station calling indexes were at a level where individuals are distinguishable, but overlap slightly (calling index 2). The Northern Leopard Frog and Canadian Toad were not documented in the study area during the 2006 surveys.

Based on these results it is very likely that Boreal Chorus frogs and Wood frogs, in particular, would be expected to be present in the lowland and wetland areas that characterize the area of interest between Great Slave Lake and the former Pine Point Mine site.

To confirm that these amphibian species are present in or are utilizing the area of interest is as described herein, it is recommended that an amphibian field study be undertaken in conjunction with the wildlife study proposed to be undertaken during the early summer of 2010.

3.0 ENVIRONMENTAL CONCERNS AND MITIGATION MEASURES

This section serves to identify potential environmental concerns and mitigation options for effectively addressing potential concerns related to the establishment of a Hydrometallurgical Processing Plant at the former Pine Point Mine site and the construction and operation of a 10.9 km haul road to be aligned along an existing drainage ditch connecting to an existing haul road extending south from a former mine pit located to the north of the main Pine Point Mine area.

3.1 HYDROMETALLURGICAL PROCESSING PLANT

Avalon is proposing to locate the Hydrometallurgical Processing Plant needed to refine the rare metals ore to be mined at the Thor Lake property at the existing brownfields site of the former Pine Point Mine. Pursuing this strategy presents a number of significant environmental and operational benefits for the overall project. In particular, the former Pine Point Mine site is considered to be an ideal location for the siting of a Hydrometallurgical Processing Plant. The area is a very large brownfields site, having been reclaimed by industry and government since closure of the mine in 1987. Reclamation of the minesite included the complete removal of the mill and the re-establishment of drainage.

The proposed Hydrometallurgical Processing Plant would be located on the site of the former smelter, which has known and ideal foundation conditions for a facility of this nature. In addition, the site continues to be serviced by a Northwest Territories Power Corporation (NTPC) substation and line power from the Talston Dam.

In addition, the site is directly accessible via Territorial Highway 5, which is classified as an all-weather highway by the GNWT Department of Transportation (DOT). The highway is rated for year-round use by commercial vehicles with no load restrictions for haul truck traffic. Throughout the operational life of the historic Pine Point Mine (1964 to 1987), this highway was used for all of the commercial trucking and hauling activities associated with this large-scale mine development. This highway also connects directly to the Canadian National Railways (CN) railhead located at Hay River.

It is not the purpose of this document to present a complete assessment of the potential environmental effects and proposed mitigation measures for the construction and operation of the proposed Hydrometallurgical Processing Plant at this existing brownfields location, but clearly it offers significant environmental benefits and mitigation opportunities.

Locating this component of the overall project at the site of the former Pine Point Mine will effectively reduc the overall physical footprint of the overall Thor Lake Project located on the essentially pristine north side of Great Slave Lake about 5 km north of the Hearne Channel of the lake.

Locating this component of the overall project at this existing brownfields site will minimize potential effects, including potentially cumulative effects on the natural terrain, vegetation, wildlife habitats, surface and groundwater quality and air quality of the Thor Lake Project site, while posing minimal potential impacts on the natural resources of the Pine Point area beyond the limits of the existing brownfields site.

Locating this component of the overall project at this existing brownfields site will allow the Hydrometallurgical Processing Plant to utilize the existing power grid and reduce the need for diesel power generation (and the generation of emissions including greenhouse gases) at the Thor Lake Project site, and the Project can directly use Highway 5 and the CN railhead to ship product to market.

The proximity of this site to existing communities such as Hay River and Fort Resolution will also facilitate local employment and the opportunity for businesses to benefit from the relatively nearby location of the Hydrometallurgical Processing Plant and will also reduce the camp and associated logistics and consumables requirements at the more remote Thor Lake Project site.

3.2 HAUL ROAD

As indicated earlier in this document, a haul road will be needed to transport the ore offloaded from barges on the south shore of Great Slave Lake to the Hydrometallurgical Processing Plant to be located at the former Pine Point Mine site. The new haul road will be approximately 10.9 km long and will be aligned directly north-south along an existing drainage ditch for approximately 4.9 km prior to connecting to an existing haul road from a former mine pit located to the north of the main Pine Point Mine area.

The haul road will be constructed using readily available local road construction material derived from the historic Pine Point Mine operations. Once operational, water or other approved dust suppressant products will be applied as needed to minimize dust generation during dry periods of the snow-free season.

Apart from the generation of dust, the construction of the new haul road will permanently impact vegetation and wildlife habitat directly beneath the linear footprint of the haul road. However, with the application of the following mitigation measures, no significant residual impacts on the vegetation, wildlife and wildlife habitat of the area of interest are anticipated to occur.

- Full compliance with Land Use Permit conditions to be issued by the MVLWB.
- Implementation of erosion control measures if and as warranted - not anticipated to be required due to the generally level and porous nature of the terrain at the development site.
- Avoidance of development on rare ecosystem types – none anticipated to be present with the haul road footprint.
- Application of dust suppressants - e.g. water or approved dust suppressant products.
- Re-contouring, scarification, and reseeding of the road surface during future closure and reclamation of the road if warranted.

3.3 DOCK AT GREAT SLAVE LAKE

A dock will be needed on the south shore of Great Slave Lake to permit the berthing of standard barges the and unloading of Thor Lake rare metals ore into haul trucks for transportation to the Hydrometallurgical Processing Plant.

The design of this dock facility is not yet available. However the dock will need to be designed and constructed to meet the requirements of Transport Canada (Coast Guard) and will require Navigable Waters approval from Transport Canada. In addition, if the dock impacts fish habitat, a Fisheries Authorization will be required from the Department of Fisheries and Oceans. EBA believes that there will be no significant environmental issues associated with the development and operation of the proposed dock facility.

4.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Avalon Rare Metals Inc. and their agents. EBA does not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Avalon Rare Metals Inc., or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in EBA's Services Agreement and in the General Conditions provided in Appendix A of this report.

5.0 CLOSURE

We trust this report meets your present requirements. Should you have any questions or comments, please contact the undersigned at your convenience.

Sincerely,
EBA Engineering Consultants Ltd.

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FIGURES

THOR LAKE PROJECT

Proposed Road Corridor Between Great Slave Lake and the Former Teck Cominco Pine Point Mine Site, NWT

PROJECTION	DATUM
UTM Zone 11	NAD83

Scale: 1:70,000

1 0.5 0 1

Kilometres

FILE NO.
V15101007_Figure01.mxd

PROJECT NO.	DWN	CKD	REV
V15101007	MEZ	RH	0

OFFICE	DATE
EBA-VANC	December 10, 2009

EBA Engineering Consultants Ltd.

eba

Figure 1

ISSUED FOR USE

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LEGEND

- ● Pine Point
- Road

Ecoregions

- Great Slave Lowland MB
- Slave Upland MB

NOTES

Base data source:
- Google Earth Pro
- Ecosystem Classification Group. 2007. Ecological Regions of the Northwest Territories – Taiga Plains. Department of Environment and Natural Resources, Government of the Northwest Territories, Yellowknife, NT, Canada. vii + 209 pp. + folded insert poster map.

ISSUED FOR USE

Scale: 1:250,000

4 2 0 4

Kilometres

PROJECTION	DATUM
UTM Zone 11	NAD83

FILE NO.
V15101007_Figure02.mxd

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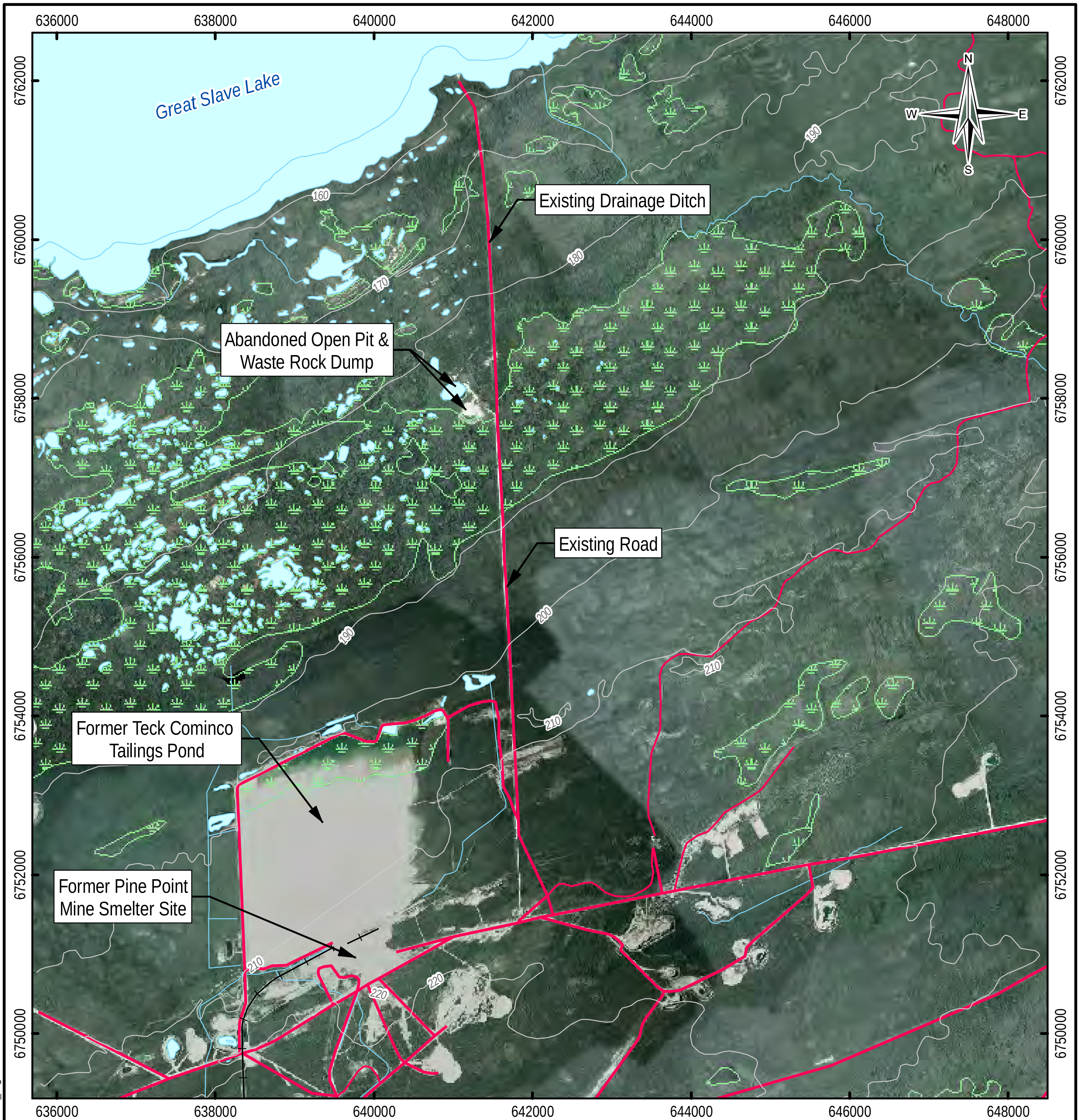
THOR LAKE PROJECT

Ecoregions in the Vicinity of the Former Pine Point Mine, NWT

PROJECT NO.	DWN	CKD	REV
V15101007	MEZ	RH	0

OFFICE	DATE
EBA-VANC	December 10, 2009

Figure 2



LEGEND

- Contour (10m)
- Road
- Limited Use Road
- Railway
- Watercourse
- Waterbody
- Wetland

THOR LAKE PROJECT

Wetlands and Lakes
North of the Former Pine Point Mine, NWT

PROJECTION	DATUM
UTM Zone 11	NAD83

Scale: 1:70,000

1 0.5 0 1

Kilometres

EBA Engineering Consultants Ltd.

FILE NO.
V15101007_Figure03.mxd

PROJECT NO.	DWN	CKD	REV
V15101007	MEZ	RH	0

OFFICE	DATE
EBA-VANC	December 10, 2009

Figure 3

ISSUED FOR USE

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APPENDIX A

APPENDIX A EBA'S GENERAL CONDITIONS

GEO-ENVIRONMENTAL REPORT – GENERAL CONDITIONS

This report incorporates and is subject to these "General Conditions".

1.0 USE OF REPORT AND OWNERSHIP

This report pertains to a specific site, a specific development, and a specific scope of work. It is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site or proposed development would necessitate a supplementary investigation and assessment.

This report and the assessments and recommendations contained in it are intended for the sole use of EBA's client. EBA does not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than EBA's Client unless otherwise authorized in writing by EBA. Any unauthorized use of the report is at the sole risk of the user.

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2.0 ALTERNATE REPORT FORMAT

Where EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed EBA's instruments of professional service), only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by EBA shall be deemed to be the original for the Project.

Both electronic file and hard copy versions of EBA's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except EBA. The Client warrants that EBA's instruments of professional service will be used only and exactly as submitted by EBA.

Electronic files submitted by EBA have been prepared and submitted using specific software and hardware systems. EBA makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

3.0 NOTIFICATION OF AUTHORITIES

In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by EBA in its reasonably exercised discretion.