

ANNEX VI

VEGETATION BASELINE REPORT FOR THE JAY PROJECT



VEGETATION BASELINE REPORT FOR THE JAY PROJECT

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September 2014

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Abbreviations

| Abbreviation | Definition |
|------------------|---|
| ANPC | Alberta Native Plant Council |
| BSA | baseline study area |
| Diavik Mine | Diavik Diamond Mine |
| DDMI | Diavik Diamond Mines Inc. |
| Dominion Diamond | Dominion Diamond Ekati Corporation |
| e.g., | for example |
| EIS | Environmental Impact Statement |
| Ekati Mine | Ekati Diamond Mine |
| ELC | Ecological Landscape Classification |
| et al. | and more than one additional author |
| GNWT | Government of the Northwest Territories |
| i.e., | that is |
| n/a | not applicable |
| NAD | North American Datum |
| NWT | Northwest Territories |
| Project | Jay Project |
| sp. | species |
| spp. | multiple species |
| WKSS | West Kitikmeot Slave Study |

Units of Measure

| Unit | Definition |
|-----------------|------------------|
| % | percent |
| < | less than |
| > | greater than |
| ha | hectare |
| km | kilometre |
| km ² | square kilometre |
| m | metre |

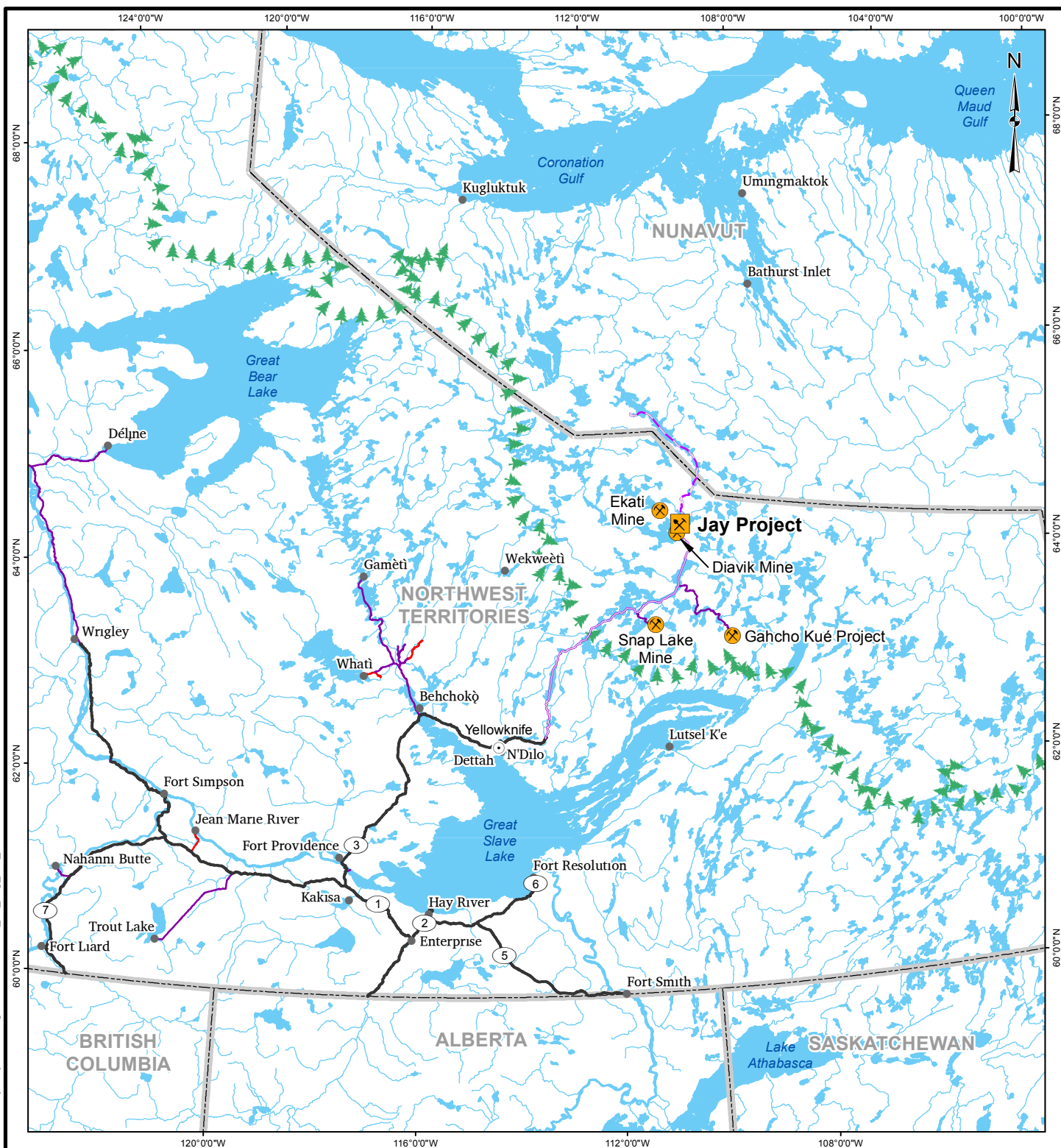
1 INTRODUCTION

1.1 Background and Scope

Dominion Diamond Ekati Corporation (Dominion Diamond) is a Canadian-owned and Northwest Territories (NWT) based mining company that mines, processes, and markets Canadian diamonds from its Ekati Diamond Mine (Ekati Mine). The existing Ekati Mine is located approximately 200 kilometres (km) south of the Arctic Circle and 300 km northeast of Yellowknife, NWT (Map 1.1-1).

Dominion Diamond is proposing to develop the Jay kimberlite pipe (Jay pipe) located beneath Lac du Sauvage. The proposed Jay Project (Project) will be an extension of the Ekati Mine, which is a large, stable, and successful mining operation that has been operating for 16 years. Most of the facilities required to support the development of the Jay pipe and to process the kimberlite currently exist at the Ekati Mine. The Project is located in the southeastern portion of the Ekati claim block approximately 25 km from the main facilities and approximately 7 km to the northeast of the Misery Pit, in the Lac de Gras watershed (Map 1.1-2).

This Vegetation Baseline Report is one component of a comprehensive baseline program to collect information concerning the natural and socio-economic environments near the Project. The present report describes characteristics and existing conditions of vegetation and Ecological Landscape Classification (ELC) units in the vegetation baseline study area (BSA), and presents mapping and vegetation analyses results completed for the Project and other mining projects in the Slave Geological Province. This baseline also provides supporting information for other baseline components, such as wildlife and traditional and non-traditional land use.



LEGEND

- | | |
|--------------------------|--|
| JAY PROJECT | TIBBITT TO CONTWOYTO WINTER ROAD |
| EXISTING MINE OR PROJECT | NORTHERN PORTION OF TIBBITT TO CONTWOYTO WINTER ROAD |
| TERRITORIAL CAPITAL | TERRITORIAL/PROVINCIAL BOUNDARY |
| POPULATED PLACE | TREELINE |
| HIGHWAY | WATERCOURSE |
| ALL-SEASON ROAD | WATERBODY |
| WINTER ROAD | |

REFERENCE

WATER OBTAINED FROM ATLAS OF CANADA
NATURAL RESOURCES CANADA, CENTRE FOR TOPOGRAPHIC INFORMATION, 2012
PROJECTION: CANADA LAMBERT CONFORMAL CONIC

DOCUMENT

VEGETATION BASELINE REPORT

150 0 150
SCALE 1:6,000,000 KILOMETRES



DOMINION
DIAMOND

JAY PROJECT
NORTHWEST TERRITORIES, CANADA

TITLE

LOCATION OF THE JAY PROJECT



Golder
Associates

| | | |
|----------------|--------------|---------------------------|
| PROJECT | 13-1328-0041 | FILE No. B_JC_Veg_008_GIS |
| DESIGN | ANK | 29/01/14 |
| GIS | NS | 10/09/14 |
| CHECK | CG | 10/09/14 |
| REVIEW | SM | 10/09/14 |
| SCALE AS SHOWN | | REV. 0 |
| MAP 1.1-1 | | |



LEGEND

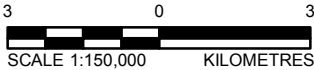
- EKATI MINE FOOTPRINT
- DIAMIK MINE FOOTPRINT
- PROPOSED JAY FOOTPRINT
- KIMBERLITE PIPE
- WINTER ROAD
- TIBBITT TO CONTWOYTO WINTER ROAD
- NORTHERN PORTION OF TIBBITT TO CONTWOYTO WINTER ROAD
- ELEVATION CONTOUR (10 m INTERVAL)
- ESKER
- WATERCOURSE
- WATERBODY



REFERENCE

CANVEC © NATURAL RESOURCES CANADA, 2012
NATURAL RESOURCES CANADA, CENTRE FOR TOPOGRAPHIC INFORMATION, 2012
DATUM: NAD83 PROJECTION: UTM ZONE 12N

DOCUMENT

VEGETATION BASELINE REPORT



| | | | | | |
|--|--|---|-----|---------------------------|------------------|
| PROJECT | | 13-1328-0041 | | FILE No. B_JC_Veg_009_GIS | |
|  DOMINION DIAMOND | | JAY PROJECT NORTHWEST TERRITORIES, CANADA | | | |
| TITLE | | | | | |
| EKATI PROPERTY MAP | | | | | |
|  | | DESIGN | SM | 12/08/14 | SCALE AS SHOWN |
| | | GIS | ANK | 10/09/14 | REV 0 |
| | | CHECK | CG | 10/09/14 | MAP 1.1-2 |
| | | REVIEW | SM | 10/09/14 | |

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1.2 Objectives

The objectives of the vegetation baseline were to:

- describe baseline vegetation and plant community data within the BSA;
- describe ecosystems within the BSA using an existing ELC map;
- map and describe occurrences of listed (rare) plants within the BSA and evaluate the suitability of habitats to support listed plant species; and,
- document traditional use plant species.

To meet these objectives, the Vegetation Baseline Report is organized into the following sections:

- **Section 1.3** provides a summary of previous studies completed for the existing Dominion Diamond mine and other operations in the region.
- **Section 1.4** provides a description and rationale for selecting the spatial boundary for vegetation.
- **Section 2** provides detailed descriptions of the sampling methods for collecting vegetation data, including approaches for characterizing the vegetation community types that are mapped in the BSA, the methods and rationale for producing an inventory of listed plant species, listed plant habitat potential, and traditional use plant species.
- **Section 3** provides quantitative information on the composition and location of vegetation communities and any listed and traditional use plants that have potential to occur within the BSA.
- **Section 4** provides a summary of the methods and results presented in this Vegetation Baseline Report.

1.3 Summary of Previous Studies

Numerous vegetation and plant community studies, including mapping, have been completed in the Slave Geological Province northeast of Yellowknife (Table 1.3-1). These include vegetation baseline studies completed as part of the Ekati Mine and Diavik Diamond Mine (Diavik Mine) environmental assessments, as well as ecological mapping completed as part of the West Kitikmeot/Slave Study (WKSS). The Project and descriptive terms presented in Table 1.3-1 are those used in the original references.

Table 1.3-1 Summary of Previous Vegetation Studies Applicable to the Project Baseline Study Area

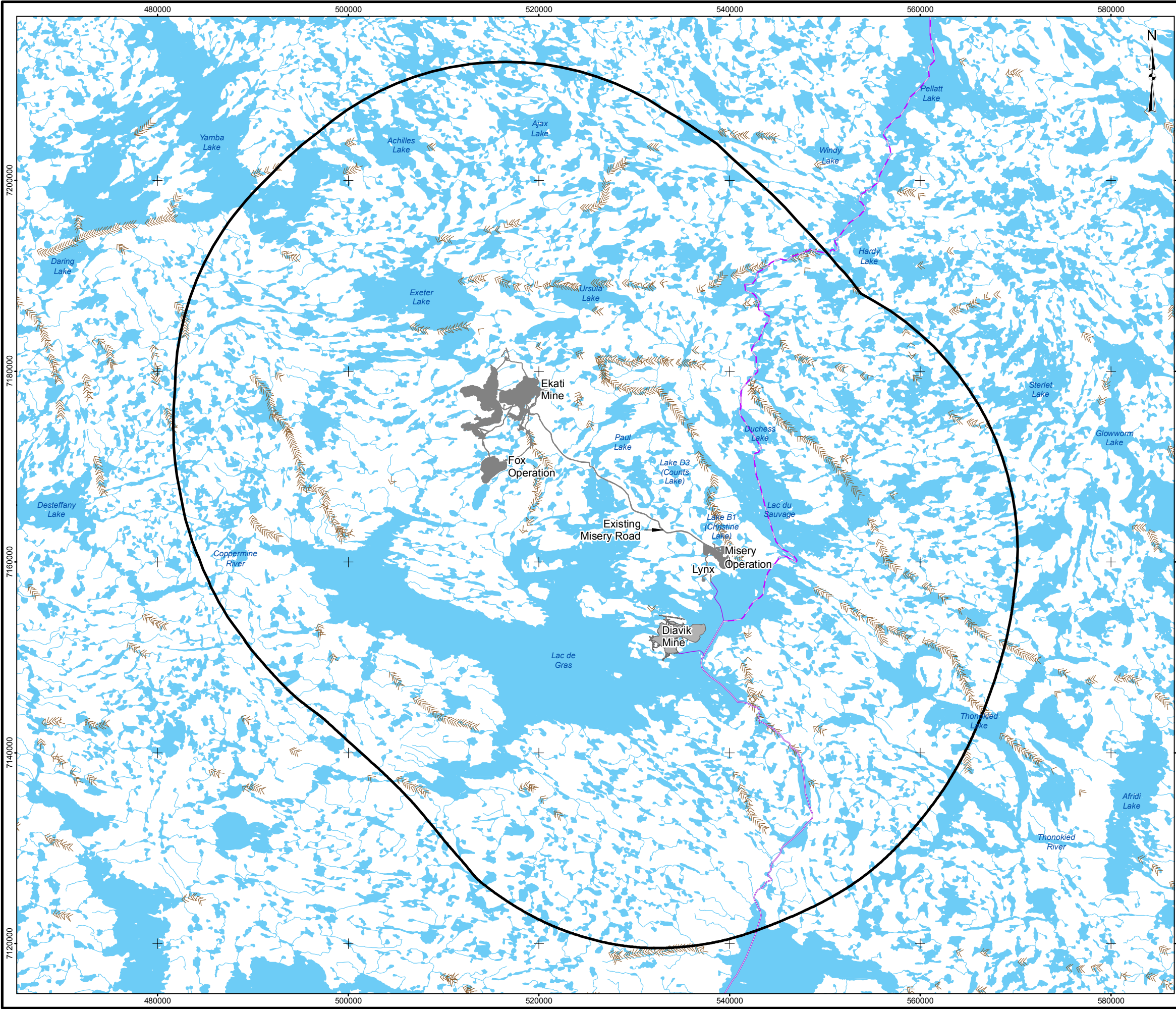
| Project | Description | Reference |
|--|---|---|
| Ekati Mine Ekati Mine – Sable, Pigeon and Beartooth | <ul style="list-style-type: none"> A preliminary map of ecosystem types developed from 1:20,000 colour photographs and from field work carried out in 1994. Ecosystem and bioterrain polygons from photographs were digitized using a stereoplotter and transferred to a 1:10,000 base map. Eleven ecosystem units divided into six physiognomic groups and subgroups were classified and mapped for the purposes of delineating ecosystems in the area. | Rescan (1995) BHP (1995, 1999, 2000) |
| West Kitikmeot/Slave Study (WKSS) Final Report | <ul style="list-style-type: none"> Digital Landsat Thematic Mapper data acquired from 1989 to 1997 were obtained to create the vegetation based land cover classification. The Landsat data were geometrically corrected to the Universal Transverse Mercator grid using 1:250,000 scale digital topographic maps and resampled from 30-m pixel resolution to 25-m pixel resolution. Twenty-two land and water cover types were classified and mapped and one unclassified unit (pixels that could not be successfully assigned to a class). Overall accuracy ranged from 51% to 82%. | Matthews et al. (2001) |
| Diavik Mine | <ul style="list-style-type: none"> Interpretation of broad vegetation/landform characteristics of the area to produce an Ecological Landscape Classification (ELC) map. The Diavik regional study area vegetation complexes were mapped at 1:500,000 scale using digital remote sensing data from Landsat satellite images. This work was completed in partnership with the Northwest Territories Remote Sensing Centre (NWTRSC) and the Government of the Northwest Territories (GNWT) to develop mapping categories based on data gathered as part of the WKSS. Land cover and vegetation categories were identified and ground-truthed during the field studies. Site-specific information was provided on various plant communities, listed species, and vegetation complexes. | Diavik Baseline report, Section D Ecosystem Components (DDMI 1997) Vegetation and Terrain (Golder 1998) and Vegetation and Land Cover Analysis (Golder 1997) |
| Tibbitt to Contwoyto Winter Road | <ul style="list-style-type: none"> 1:3,500 scale mapping of vegetation classes of the portages for the Tibbitt to Contwoyto Winter Road corridor. Eighteen vegetation classes based on field data and adapted from the WKSS Classification. | EBA (2002) |

% = percent; m = metre.

1.4 Study Area

To quantify baseline conditions, a BSA was defined for vegetation. The BSA is approximately 593 square kilometres (km²) centred on the existing Ekati Mine and the Project footprint (Map 1.4-1). The BSA was selected to encompass both the existing mine site and the area that contains the potential new development, as well as areas not expected to be affected by the Project. This information can be used in support of the assessment of potential Project effects on vegetation.

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LEGEND

- EKATI MINE FOOTPRINT
- DIABIK MINE FOOTPRINT
- WINTER ROAD
- TIBBITT TO CONTWOYT WINTER ROAD
- NORTHERN PORTION OF TIBBITT TO CONTWOYT WINTER ROAD
- ESKER
- WATERCOURSE
- WATERBODY
- BASLINE STUDY AREA

REFERENCE

NATIONAL TOPOGRAPHIC BASE DATA (NTDB) 1:250,000
CANVEC © NATURAL RESOURCES CANADA, 2012
NATURAL RESOURCES CANADA, CENTRE FOR TOPOGRAPHIC INFORMATION, 2012
DATUM: NAD83 PROJECTION: UTM ZONE 12N

DOCUMENT

VEGETATION BASELINE REPORT

100

0

10

SCALE 1:400,000 KILOMETRES

PROJECT

DOMINION DIAMOND

JAY PROJECT

NORTHWEST TERRITORIES, CANADA

TITLE

**LOCATION OF VEGETATION
BASELINE STUDY AREA**

Golder Associates

| | | |
|---------|--------------|---------------------------|
| PROJECT | 13-1328-0041 | FILE No. B_JC_Veg_001_GIS |
| DESIGN | LV | 28/01/14 |
| GIS | NS | 10/09/14 |
| CHECK | CG | 10/09/14 |
| REVIEW | SM | 10/09/14 |

MAP 1.4-1

The BSA occurs entirely within the Tundra Shield Low Arctic (south) Level III Ecoregion (ECG 2012) and is characterized by long, cold winters and very short summers. Characteristic landscape features in the region include extensive till and outwash deposits as well as granitic and sedimentary rocklands bisected by numerous eskers. Dwarf-shrub tundra and low-shrub tundra represent the most dominant vegetation types on upland areas, while sedge fens are predominant in wet areas (ECG 2012). The BSA is located in a transitional area between the boundaries of the Level IV Point Upland Ecoregion and the Contwoyto Upland Ecoregion, with a small portion to the south occurring within the Level IV Mackay Upland Ecoregion (ECG 2012).

The western portion of the BSA occurs within the Point Upland Ecoregion and is characterized by a rugged landscape dominated by exposed bedrock with extensive boulder tills, and patches of dwarf-shrub and rock lichen communities. The predominant vegetation types are erect dwarf-shrub tundra and low-shrub tundra, which occur with nearly continuous cover on fine-textured veneers throughout much of the ecoregion. The vegetation type distribution becomes patchy in the northwestern third of the BSA where rocklands and bouldery tills dominate the landscape (ECG 2012). In low-lying areas or seepage zones, wetlands dominated by sedges, mosses, and low and dwarf shrubs occur, while tall willow stands are common along stream drainages and lakeshores (ECG 2012).

The Contwoyto Upland Ecoregion encompasses the eastern portion of the BSA. This ecoregion includes deposits of fine-textured, level to hummocky bouldery till plains, with nearly continuous tundra cover (ECG 2012). Small eskers and kame deposits are scattered throughout the region and permafrost is continuous. The most common vegetation type is the erect dwarf-shrub tundra, but low-shrub tundra is locally extensive, particularly in the eastern portion of this ecoregion. In low-lying areas, or seepage zones, wetlands dominated by sedges, mosses, low and dwarf shrubs occur, while tall willow stands are common along stream drainages and lakeshores (ECG 2012).

The Mackay Upland Ecoregion encompasses the southern portion of the BSA and is characterized by level to hummocky terrain with deep till blankets, bouldery till, and minor areas of exposed bedrock (ECG 2012). Dry upland tundra is the dominant vegetation type and is composed of erect dwarf-shrub tundra and low-shrub tundra, which often occur as complexes in networks of non-sorted circles (ECG 2012). Localized wetlands dominated by sedges, mosses, low and dwarf shrubs occur in low-lying areas or seepage zones, while tall willow stands are common along stream drainages and lakeshores (ECG 2012).

2 METHODS

The Vegetation Baseline Report presents a review and interpretation of information from available literature and data collected during the 2013 field program. The main sources of existing information were:

- 1995 vegetation and plant species information from the Ekati Mine Environmental Impact Statement (EIS) (Rescan 1995);
- 1996 vegetation and plant species information from the Diavik Mine EIS (Diavik Diamond Mines Inc. [DDMI] 1997); and,
- Ecological Landscape Classification (ELC) units from the 1997 vegetation mapping in support of the Diavik EIS (Golder 1998).

2.1 Ecological Landscape Classification

An ELC system was used to define and map land cover classes that are identifiable remotely (e.g., from satellite imagery) and on the ground. Ecological landscape classification is a standardized approach to mapping areas of similar vegetation, soils, landforms, and water (Marshall et al. 1999).

Baseline ELC map units for the BSA were obtained from an existing classification developed for the Diavik Mine EIS (DDMI 1997; Golder 1997). The Diavik Mine classification used satellite imagery, air photo interpretation, remote sensing software, and a geographic information system (GIS) to provide information on the relative abundance and distribution of vegetation types. Remote interpretation of a 25-metre-resolution Landsat Thematic Mapper satellite image captured on August 1995 was used for the initial Diavik Mine classification (Golder 1997).

Ground truth data from plots collected as part of the 1996 vegetation field program were used to select training sites for imagery classification to prepare a second mapping iteration (Golder 1997). Based on the spectral signatures and the field-validated observation points at the training sites, the remote sensing software assigned a best-fit classification to all pixels in the image. The process of selecting training sites and image classification was iterative and balanced the objectives of having as many meaningful land cover classes as possible with a reasonable level of accuracy. The Diavik Mine classification was further refined through manual cross-referencing and error checking with vegetation mapping completed using air photo interpretation to produce the final mapping product (Golder 1997).

The Diavik Mine classification identified 14 vegetation classes, with an overall accuracy of 87 percent (%) (Golder 1997). Vegetation survey plots completed in 2013 confirmed that the existing mapping in the BSA was representative of the vegetation present at the plot locations. The accuracy evaluation results and correlations with field survey locations provided a high degree of confidence in the use of the Diavik Mine classification for this Project. However, the original Diavik Mine classification was slightly offset from the georeferenced orthophoto imagery used for the Project. This offset was corrected by shifting the entire ELC east 70 metres (m) and north 30 m to align the ELC with the georeferenced orthophoto imagery. The location of landscape features in the orthophotos (e.g., lakes), along with vegetation ground truth plots completed during the 2013 field survey served as the basis for the spatial correction of the ELC layer.

Additionally, the northern extent of the Diavik Mine classification did not fully encompass the northern border of the BSA. Thus, the West Kitikmeot Slave Study Ecological Land Classification (West Kitikmeot ELC) was used to fill in approximately 21,700 hectares (ha) of the northern portion of the BSA. The West Kitikmeot ELC also displayed an offset error where the ELC mapping was not aligned with the georeferenced orthophoto imagery used for the Project. The West Kitikmeot ELC coordinate system was re-projected to Universal Transverse Mercator North American Datum (NAD) 27 and shifted west 25 m and north 120 m to correct this offset. Two of the West Kitikmeot ELC classes were reclassified to fit with the ELC map units defined for this Project. The vegetation descriptions for each respective ELC were reviewed and the West Kitikmeot ELC classes were then correlated and assigned to the most appropriate map units as follows:

- the lichen veneer map unit from the West Kitikmeot ELC was reclassified as the Heath Tundra 30% to 80% Bedrock; and,
- the spruce forest map unit from the West Kitikmeot ELC was reclassified as the Riparian Tall Shrub.

2.2 Field Data Collection

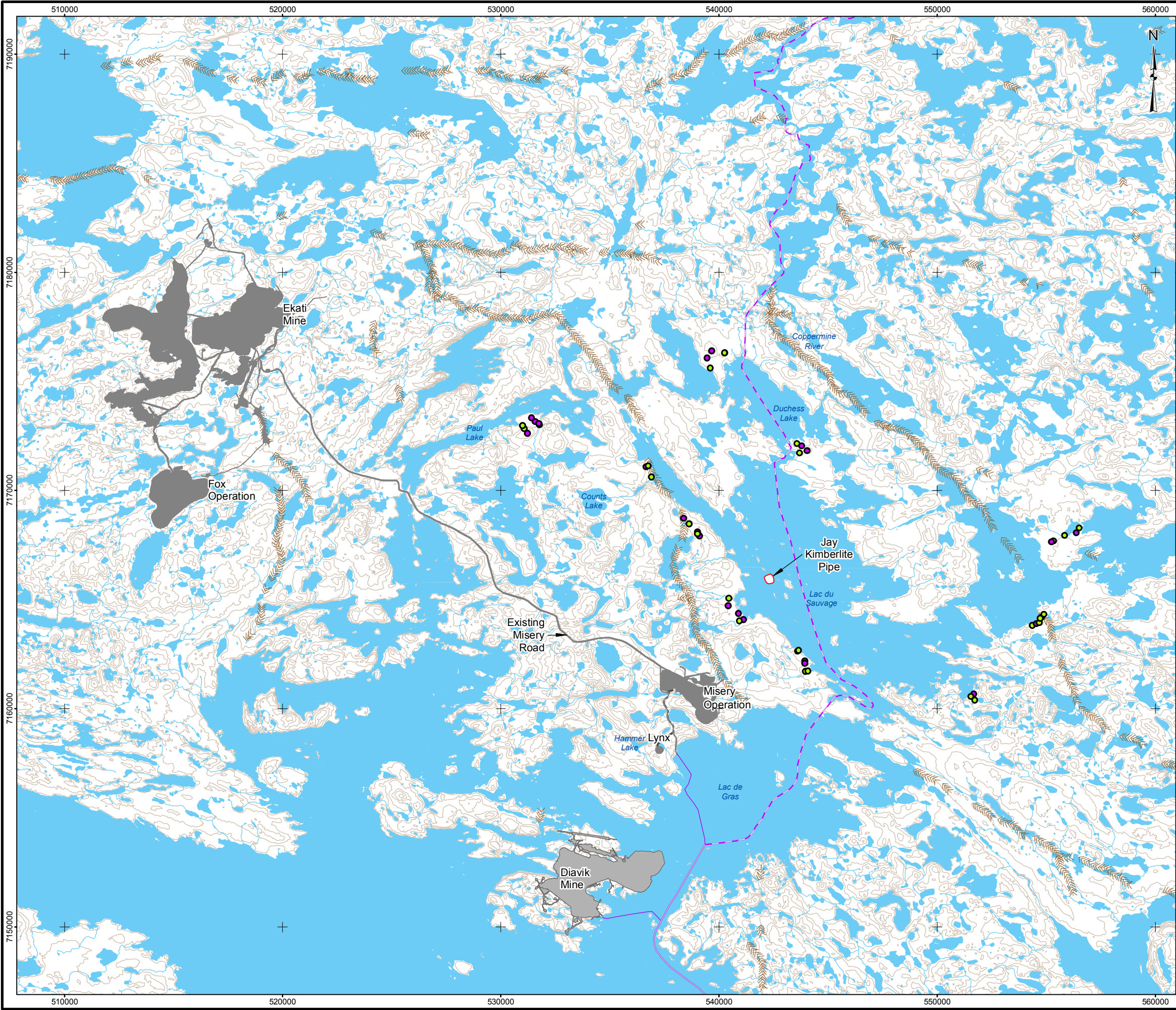
Baseline vegetation surveys were carried out between July 24 and 31, 2013. The objectives of the field survey were to:

- collect baseline vegetation data at representative locations within each ELC unit to provide site-specific, descriptive information on the nature and characteristics of plant communities within the BSA; and,
- search for listed plant species.

In total, 49 plots were established, including 8 detailed plots, 16 reconnaissance plots, and 25 listed plant survey sites (Map 2.2-1). Detailed and reconnaissance plots were established in representative locations of selected ELC units; at least one detailed plot was established in each mapped ELC unit. A list of plant species observed during the 2013 vegetation surveys is provided in Plant Species Observed during the 2013 Vegetation Survey (Appendix A).

Detailed plots were completed to collect site-specific and descriptive information on the characteristics of the plant communities within each ELC map unit. Data on species present, percent cover, and vegetation layer were recorded. In addition, site information such as terrain, moisture regime, nutrient regime, substrate, and slope were recorded to provide additional background information. For listed plant survey sites, data collected were moisture regime, landform class, dominant species present, and percent cover of vegetation layers. More information on listed plant survey sites is provided in Section 2.3. Data collected at reconnaissance plots included only basic data to ground-truth the ELC.

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LEGEND

- EKATI MINE FOOTPRINT
- DIABIK MINE FOOTPRINT
- KIMBERLITE PIPE
- WINTER ROAD
- TIBBITT TO CONTWOYTO WINTER ROAD
- NORTHERN PORTION OF TIBBITT TO CONTWOYTO WINTER ROAD
- ELEVATION CONTOUR (10 m INTERVAL)
- ESKER
- WATERCOURSE
- WATERBODY
- VEGETATION SURVEY LOCATION - DETAILED AND RECONNAISSANCE
- VEGETATION SURVEY LOCATION - LISTED PLANT



REFERENCE

CANVEC © NATURAL RESOURCES CANADA, 2012
NATURAL RESOURCES CANADA, CENTRE FOR TOPOGRAPHIC INFORMATION, 2012
DATUM: NAD83 PROJECTION: UTM ZONE 12N

DOCUMENT

VEGETATION BASELINE REPORT



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|---|--------|--|----------|---------------------------|--|
| PROJECT | | 13-1328-0041 | | FILE No. B_JC_Veg_003_GIS | |
|  DOMINION DIAMOND | | JAY PROJECT NORTHWEST TERRITORIES, CANADA | | | |
| TITLE | | | | | |
| VEGETATION AND LISTED PLANT SURVEY LOCATIONS | | | | | |
|  | DESIGN | LV | 28/01/14 | SCALE AS SHOWN | |
| | GIS | NS | 10/09/14 | REV 0 | |
| | CHECK | CG | 10/09/14 | MAP 2.2-1 | |
| | REVIEW | SM | 10/09/14 | | |

2.3 Listed Plants

Territorial and federal agencies maintain lists of plant species of conservation concern, which include rare species as well as other species that may not necessarily be rare but are of conservation concern due to declining populations or other sensitivities. The definition of a rare plant species is any native plant that, because of biological characteristics or for some other reason, exists in low numbers or in very restricted areas (Drury 1974; Rabinowitz 1981). In the strict sense of the definition, rare plants have restricted spatial, ecological, and/or temporal distributions in variable or diverse environments (Harper 1981). In this regard, the term “listed plant” is used rather than rare plant, as it better reflects the broader nature of species of conservation concern.

For the purposes of the vegetation baseline, listed plant species of the NWT include the following:

- any plant species listed as “At Risk,” “May be at Risk,” or “Sensitive” in the NWT, according to the NWT Species Monitoring Infobase (GNWT 2012);
- any plant species listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2013); and,
- any plant species listed in the Federal *Species at Risk Act* (SARA 2012).

Plant species rankings included on these lists are dynamic, and change as new information becomes available or as the status of a given plant species population changes. For example, a species may be delisted due to increased survey intensity and detection that indicate that the species occurs more frequently than initially thought.

2.3.1 Listed Plant Species Occurrences

A reference list of all potential vascular and non-vascular listed plant species occurring in the region was compiled before completing listed plant surveys. The list is provided in Potential Vascular and Non Vascular Listed Plant Species Occurring in the Southern Arctic Ecoregion (Appendix B). Listed plant surveys were conducted between July 24 and 31, 2013 as part of the reconnaissance surveys. Survey methods followed Alberta Native Plant Council (ANPC) guidelines for listed (rare) plant surveys (ANPC 2012). A wide range of plant communities was surveyed, with the greatest effort focused towards those habitats with the highest potential to support listed plant species (e.g., riparian areas, seepage areas, habitat edges [ecotones]). Surveyors searched for listed plant species using a random meandering technique, focusing the search effort on microhabitats (e.g., small areas with unique habitat features). The length of each meander varied according to the complexity and number of microhabitats present at each location.

Effective surveys for all listed plant species could not be completed, as the field visit was outside the appropriate timing for confidently identifying listed plants because of the early growing season in 2013. Most of the forb species had already flowered and were starting to senesce, and many of the heath plants (i.e., blueberry, bearberry, Labrador tea) had ripe berries and were already starting to change colour. A supplemental field survey for listed plant species within the Project footprint will be completed in summer 2014 within the appropriate timing window for species identification (e.g., late June or early July when vascular plants are in peak flower).

2.3.2 Listed Plant Habitat Potential

The potential for ELC map units to support listed vascular plant species was evaluated for the BSA through the development of a simple model. This approach integrates data and habitat information on listed vascular plant species with potential to occur in the BSA with the ELC mapping results. Ecological Landscape Classification map units were assigned scores to reflect their listed plant habitat potential. Scores were assigned based on the relationships between vascular plants listed as “May be at Risk,” “At Risk,” or “Sensitive” by the GNWT (GNWT 2012) and the habitat in which they are typically found (Porsild and Cody 1980; Aiken et al. 2007).

The first step in developing the listed plant habitat potential model was to identify which listed plant species should be included in the model based on their potential to be found in the BSA. A coarse filter by ecozone was used to screen the entire GNWT species list (GNWT 2012) to only those listed vascular plant species found within the Southern Arctic Ecozone. Listed non-vascular species were excluded from this process due to limited information on their distribution and habitat preferences. Listed plant species with occurrences in the Southern Arctic Ecozone were then evaluated to determine whether they had potential to occur in the BSA based on range distribution maps and habitat information.

Once the final list of plant species used to define the listed plant habitat potential was compiled, plant species were assigned to an ELC map unit based on an evaluation of available habitat information from the literature (Porsild and Cody 1980; Aiken et al. 2007). A frequency histogram of the number of listed plant species occurrences associated with each ELC map unit was then used to score and rank ELC map units according to their potential to support listed vascular plant species (Table 2.3-1).

This method is based solely on an interpretation of listed plant species probable distributions and habitat associations relative to the ELC classification. It does not include site-specific information on known locations of listed plant species within the BSA due to limited available information. Thus, there is uncertainty associated with interpreting the listed plant habitat potential rankings. However, the scoring system does provide a reasonable basis for evaluating and rating ELC map units for their potential to support listed plant species.

Table 2.3-1 Listed Plant Habitat Potential of Ecological Landscape Classification Map Units in the Baseline Study Area

| Ecological Landscape Classification Map Unit | Potential Number of Listed Vascular Plant Species | Listed Plant Habitat Potential |
|--|---|--------------------------------|
| Riparian Tall Shrub | 10 | High |
| Shallow Water | 8 | High |
| Esker Complex | 5 | Moderate |
| Sedge Wetland | 5 | Moderate |
| Heath Tundra | 4 | Low |
| Tussock/Hummock | 3 | Low |
| Heath Tundra 30% to 80% Boulders | 2 | Low |
| Birch Seep and Riparian Shoreline Shrub | 2 | Low |
| Bedrock Complex (>80% rock) | 0 | Low |
| Boulder Complex (>80% rock) | 0 | Low |
| Heath Tundra 30% to 80% Bedrock | 0 | Low |
| Deep Water | n/a | n/a |
| Existing Disturbance | n/a | n/a |
| Unclassified | n/a | n/a |

n/a = not applicable; > = greater than; % = percent.

The ELC map units for Deep Water, Existing Disturbance, and Unclassified were not assigned a ranking. Deep Water and Existing Disturbance map units are assumed to not currently support habitat for plant species. Unclassified areas have an unknown listed plant habitat potential because these areas could not be classified during the mapping process due to the imagery being obscured by cloud or shadows.

2.4 Traditional Use Plants

An evaluation of which traditional use plants may occur within what ELC map units was conducted through analysis of the Traditional Land Use and Traditional Knowledge Baseline Report (Annex XVII).

3 RESULTS

3.1 Ecological Landscape Classification

3.1.1 Baseline Study Area

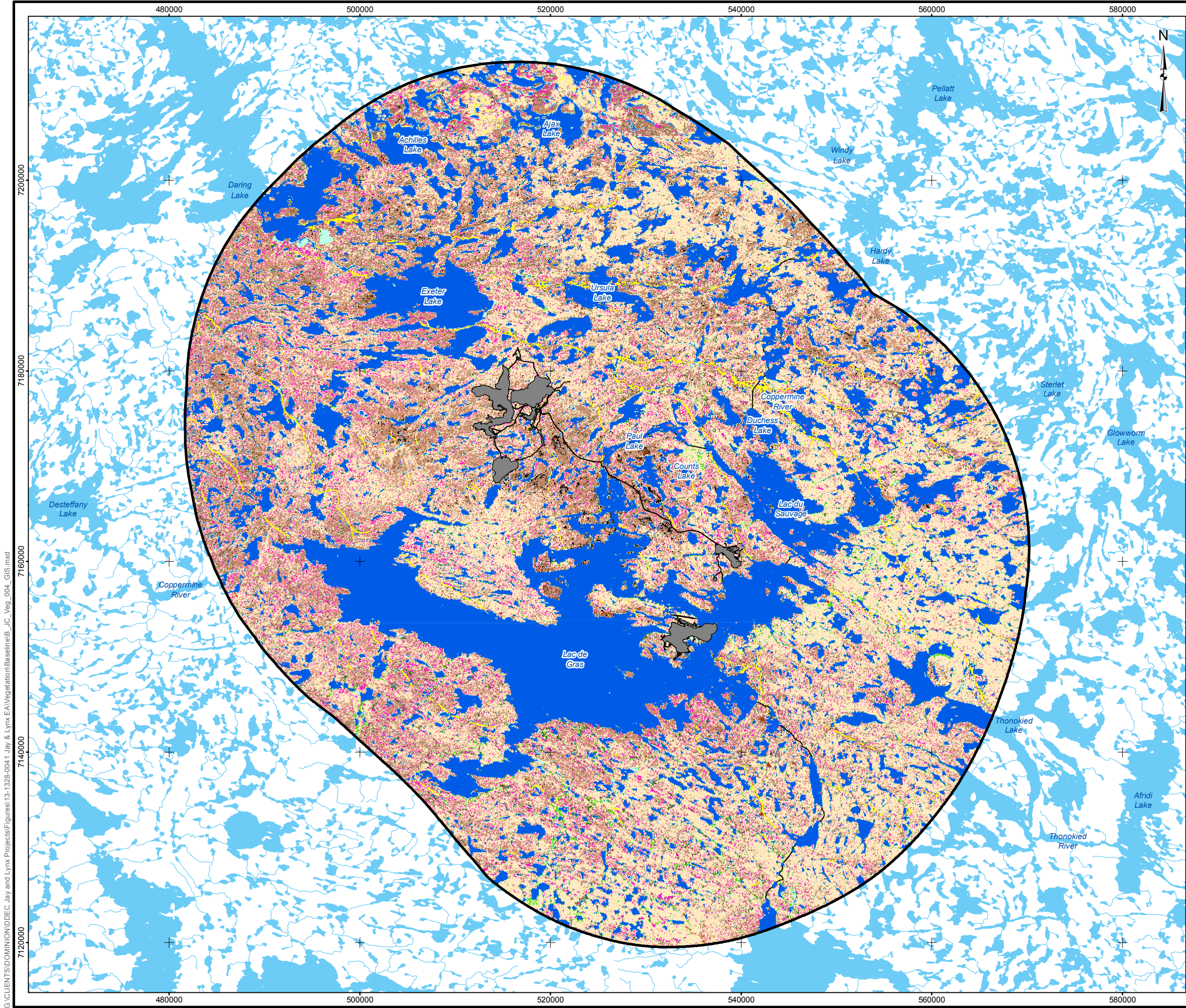
A total of 14 ELC map units were mapped within the BSA, including six upland, four wetland, two non-vegetated, one existing disturbance, and one unclassified ELC map unit (Table 3.1-1, Map 3.1-1). Upland ELC map units compose the majority of the BSA, accounting for 54% of the BSA. Of the upland ELC map units, Heath Tundra is the most dominant unit, occupying 37% of the BSA. Wetland ELC map units account for 12% of the BSA, of which the majority is classified as Tussock/Hummock (9% of the BSA). Non-vegetated ELC map units account for 33% of the BSA and are predominantly comprised of Deep Water, namely lakes and ponds. The Existing Disturbance ELC map unit accounts for 1% of the BSA and is associated with existing man-made disturbances which include the current Ekati and Diavik mine footprints, the Lynx Project footprint, and portages associated with winter roads and all-season roads. Less than 1% of the BSA is unclassified, due to cloud or shadows in the satellite image.

Table 3.1-1 Total Area and Percent Cover of Ecological Landscape Classification Map Units in the Baseline Study Area

| Ecological Landscape Classification (ELC) Map Units | Area (ha) | Proportion of BSA (%) |
|---|----------------|-----------------------|
| Upland ELC Map Units | | |
| Esker Complex | 5,350 | 1 |
| Bedrock Complex (>80% rock) | 1,303 | <1 |
| Boulder Complex (>80% rock) | 2,105 | <1 |
| Heath Tundra 30% to 80% Bedrock | 14,830 | 2 |
| Heath Tundra 30% to 80% Boulder | 75,285 | 13 |
| Heath Tundra | 221,873 | 37 |
| <i>Upland ELC map units subtotal</i> | <i>320,745</i> | <i>54</i> |
| Wetland ELC Map Units | | |
| Riparian Tall Shrub | 449 | <1 |
| Birch Seep and Riparian Shoreline Shrub | 6,405 | 1 |
| Tussock/Hummock | 50,644 | 9 |
| Sedge Wetland | 16,347 | 3 |
| <i>Wetland ELC map units subtotal</i> | <i>73,846</i> | <i>12</i> |
| Non-Vegetated ELC Map Units | | |
| Shallow Water | 23,997 | 4 |
| Deep Water | 170,177 | 29 |
| <i>Non-vegetated ELC map units subtotal</i> | <i>194,175</i> | <i>33</i> |
| Existing Disturbance ELC Map Unit | | |
| Existing Disturbance | 4,354 | 1 |
| <i>Existing Disturbance ELC map units subtotal</i> | <i>4,354</i> | <i>1</i> |
| Unclassified ELC Map Unit | | |
| Unclassified | 155 | <1 |
| <i>Unclassified subtotal</i> | <i>155</i> | <i><1</i> |
| Total | 593,274 | 100 |

Note: Numbers are rounded for presentation purposes. Therefore, it may appear that the totals do not equal the sum of the individual values.

ha = hectare; % = percent; BSA = baseline study area; < = less than; > = greater than.



LEGEND

WATERCOURSE

WATERBODY

BASELINE STUDY AREA

ECOLOGICAL LANDSCAPE CLASSIFICATION MAP UNITS

ESKER COMPLEX

BEDROCK COMPLEX (>80% ROCK)

BOULDER COMPLEX (>80% ROCK)

HEATH TUNDRA 30% TO 80% BEDROCK

HEATH TUNDRA 30% TO 80% BOULDERS

HEATH TUNDRA

RIPARIAN TALL SHRUB

BIRCH SEEP AND RIPARIAN SHORELINE SHRUB

TUSSOCK/HUMMOCK

SEDGE WETLAND

SHALLOW WATER

DEEP WATER

EXISTING DISTURBANCE

UNCLASSIFIED

REFERENCE


VEGETATION CLASSIFICATION DATA: DIAVIK LANDSAT CLASSIFICATION 1997; WEST KITIKMEOT CLASSIFICATION 2001; MODIFIED BY GOLDER ASSOCIATES 2014
NATIONAL TOPOGRAPHIC BASE DATA (NTDB) 1:250,000
NATURAL RESOURCES CANADA, CENTRE FOR TOPOGRAPHIC INFORMATION, 2012
DATUM: NAD83 PROJECTION: UTM ZONE 12N

DOCUMENT

VEGETATION BASELINE REPORT




PROJECT

DOMINION DIAMOND

JAY PROJECT
NORTHWEST TERRITORIES, CANADA

TITLE

ECOLOGICAL LANDSCAPE CLASSIFICATION
IN THE BASELINE STUDY AREA

Golder Associates

| | | |
|---------|--------------|---------------------------|
| PROJECT | 13-1328-0041 | FILE No. B_JC_Veg_004_GIS |
| DESIGN | LV | 28/01/14 |
| GIS | NS | 10/09/14 |
| CHECK | CG | 10/09/14 |
| REVIEW | SM | 10/09/14 |

MAP 3.1-1

Descriptions of each ELC map unit within the BSA are provided in the following subsections. Common names follow the convention used by the GNWT in their general status species reports. In cases where there are no common names or the common name can be confused with two or more species, a scientific name is given. Representative photographs of each of the ELC map units are provided in Representative Plot Photographs (Appendix C).

3.1.1.1 Esker Complex Map Unit

The Esker Complex is characterized by rapid to well-drained soils that occur on sandy to gravelly ridges formed by remnant deposits of rivers that flowed within the continental ice sheets (DDMI 1997; Golder 1997). Within the BSA, eskers tend to form long, sinuous, linear features on the landscape and are relatively uncommon, accounting for only 5,350 ha (1% of the BSA) (Table 3.1-1, Map 3.1-1).

Due to the complicated nature of the microclimates created by their structures, eskers are complexes of plant communities, rather than a single community (DDMI 1997; Golder 1997). Plant communities exposed to winds along the crests and upper slopes of eskers where the snow does not accumulate are sparsely vegetated and contain discrete low-growing mats of heath vegetation on sand or gravel substrate. Common mat-forming species along the crests and upper slopes of eskers include red bearberry (*Arctostaphylos rubra*), black crowberry (*Empetrum nigrum*), narrow-leaved Labrador tea (*Ledum palustre*), alpine bilberry (*Vaccinium uliginosum*), and lingonberry (*Vaccinium vitis-idaea*). Scattered plants of moss campion (*Silene acaulis*) and prickly saxifrage (*Saxifrage tricuspidata*) may also be present, along with a dense cover of lichen species such as reindeer lichens (*Cladonia mitis* and *C. rangiferina*), witch's hair (*Alectoria* sp.), and snow lichen (*Flavocetraria* sp.).

However, plant communities on the mid to lower slopes of eskers can be different, particularly on the lee side of eskers, which tend to be less exposed to wind. These areas typically are more moist and more densely vegetated, with a greater diversity of plant species. Sheltered esker side slopes can include dense patches of dwarf birch (*Betula glandulosa*) and occasionally willows, such as gray willow (*Salix glauca*) and diamond-leaved willow (*S. planifolia*). These slopes can also have a more well-developed ground cover of grass forb and moss species.

3.1.1.2 Bedrock Complex Map Unit

The Bedrock Complex (greater than 80% rock) map unit is associated with exposed bedrock outcrops that support very little vegetative cover (Matthews et al. 2001). Crustose lichens (e.g., rock tripe [*Umbilicaria* sp.]) and green map lichen (*Rhizocarpon geographicum*) are the most common species associated with this ELC map unit. However, isolated occurrences of heath and herbaceous plants may occur in protected areas, crevices, and depressions where sufficient soil development has occurred to initiate vegetative growth (Matthews et al. 2001). The Bedrock Complex is restricted in distribution, accounting for 1,303 ha (less than 1%) of the BSA (Table 3.1-1, Map 3.1-1).

3.1.1.3 Boulder Complex Map Unit

The Boulder Complex (>80% rock) map unit is associated with boulder fields that include boulder outcrops, interlaced boulder streams, or drainages, and glacial erratics (DDMI 1997; Golder 1997). Vegetation cover is limited to protected areas, crevices, and depressions where sufficient soil development has occurred to initiate plant growth. However, up to 80% of exposed boulders may be colonized with various crustose rock lichens (DDMI 1997; Golder 1997). Commonly occurring crustose lichens include rock tripe, elegant sunburst lichen (*Xanthoria elegans*), green map lichen, and green starburst lichen (*Parmeliopsis ambigua*) (DDMI 1997; Golder 1997; Matthews et al. 2001). The Boulder Complex is restricted in distribution, accounting for 2,105 ha (less than 1%) of the BSA (Table 3.1-1, Map 3.1-1).

3.1.1.4 Heath Tundra 30% to 80% Bedrock Map Unit

Exposed bedrock outcrops and a discontinuous vegetation cover characterize Heath Tundra 30% to 80% Bedrock (Matthews et al. 2001). This map unit is often described as open-mat heath tundra (Matthews et al. 2001). Plant species include common heath species, such as bearberry species, dwarf birch, black crowberry, narrow-leaved Labrador tea, and alpine bilberry. Lichen species such as reindeer lichen and snow lichen are commonly found in the heath tundra areas, while green map lichen, rock tripe, and other crustose lichen species often occur on exposed bedrock faces. Heath Tundra 30% to 80% Bedrock accounts for 14,830 ha (2%) of the BSA (Table 3.1-1, Map 3.1-1).

3.1.1.5 Heath Tundra 30% to 80% Boulder Map Unit

Heath Tundra 30% to 80% Boulder is another open-mat plant community that is associated with discontinuous vegetation cover, where exposed boulder fields are interspersed within the heath tundra landscape (Matthews et al. 2001). Heath shrubs, such as bearberry, dwarf birch, black crowberry, narrow-leaved Labrador tea, and alpine bilberry are common. Various lichen species, including reindeer lichen and snow lichen commonly occur in heath tundra areas, while boulder field areas are dominated by boulders encrusted with various crustose lichens (e.g., rock tripe *Arctoparmelia* sp., and green map lichen) (Golder 1997). Heath Tundra 30% to 80% Boulder accounts for 75,285 ha (13%) and is widely distributed throughout the BSA (Table 3.1-1, Map 3.1-1).

3.1.1.6 Heath Tundra Map Unit

Heath Tundra occurs over a wide range of dry upland areas, from small ridges to flat plains, and typically occurs on moderately to well-drained soils. Heath Tundra is the most widespread and abundant ELC map unit in the BSA, covering 221,873 ha (37%) (Table 3.1-1, Map 3.1-1).

Heath Tundra is characterized by an abundance of low-growing heath plants, most belonging to the Ericaceae (heath family). Characteristic species include narrow-leaved Labrador tea, lingonberry, alpine bilberry, bearberry species, black crowberry, and dwarf birch. Alpine azalea (*Loiseleuria procumbens*) commonly occurs, along with a variety of lichen species (e.g., reindeer and snow lichens). The herb and moss layers normally are not well developed. A range of other plant species may also be associated with this unit, depending on variations in topography, moisture, and soil.

3.1.1.7 Riparian Tall Shrub Map Unit

Riparian Tall Shrub occurs as linear bands along the banks of watercourses, typically associated with the inflow or outflow of a lake or along the drainages that connect one lake to another. These units are associated with landscapes with substantial water flow through a boulder substrate and often have imperfectly drained, nutrient-enriched soils (DDMI 1997; Golder 1997). Riparian Tall Shrub has a very restricted distribution and accounts for only 449 ha (less than 1%) of the total BSA (Table 3.1-1, Map 3.1-1).

This map unit is characterized by a dense cover of various willow species, including diamond-leaved willow. These willow communities can grow up to 1.5 m and typically contain an understory of dwarf birch, narrow-leaved Labrador tea, black crowberry, cloudberry (*Rubus chamaemorus*), violets (*Viola* sp.), horsetail (*Equisetum* sp.), reed grass (*Calamagrostis* sp.), and various sedge species (e.g., *Carex aquatilis*). Mosses, such as tufted moss (*Aulacomnium palustre* and *A. turgidum*) and peat moss (*Sphagnum* sp.), are also common.

3.1.1.8 Birch Seep and Riparian Shoreline Shrub Map Unit

Birch Seep and Riparian Shoreline Shrub consists of two vegetation types: riparian shoreline shrub and riparian birch seep. These vegetation types could not be separated in the ELC due to similarities in spectral signatures (DDMI 1997; Golder 1997). The riparian shoreline shrub vegetation type occurs as sporadic, narrow bands of vegetation (less than 5 m in width) along the margins of lakes where shorelines have slumped (DDMI 1997; Golder 1997). Characteristic vegetation of these areas includes dwarf birch and willow species, various heath species (e.g., narrow-leaved Labrador tea, black crowberry), sedges, and horsetails (DDMI 1997; Golder 1997).

In contrast, the birch seep vegetation type is most often located at the edges of boulder fields, within boulder streams, and occasionally at the edges of eskers, on moist bouldery (rather than organic or mineral) soils. This vegetation type can cover large areas of relatively flat land (DDMI 1997; Golder 1997). The birch seep vegetation type is characterized by a dense mat of dwarf birch, with an understory of black crowberry, alpine bilberry, sedges (e.g., *Carex aquatilis*, *C. saxatilis*), peat mosses, and tufted mosses. In some cases, an understory of heath vegetation, such as bog rosemary (*Andromeda polifolia*), narrow-leaved Labrador tea, and lingonberry may be found where conditions are slightly drier. There may be little to no understory vegetation where birch cover is extremely dense. Birch Seep and Riparian Shoreline Shrub accounts for 6,405 ha (1%) of the BSA (Table 3.1-1, Map 3.1-1).

3.1.1.9 Tussock/Hummock Map Unit

Tussock/Hummock occurs in wet areas on silty or organic soils where the land is slightly higher and is infrequently flooded (DDMI 1997; Golder 1997). The unit has a scattered though wide distribution and accounts for 50,644 ha (9%) of the BSA (Table 3.1-1, Map 3.1-1).

The vegetation is typically composed of tussock-forming cotton-grasses such as tussock cotton-grass (*Eriophorum vaginatum*), interspersed with sedges, such as water sedge (*Carex aquatilis*) and russet sedge (*C. saxatilis*). Over time, tussocks invaded by heath tundra species and peat moss form larger hummocks that can range in size from 0.4 m to 1 m (DDMI 1997; Golder 1997). These hummocks typically contain species such as dwarf birch, narrow-leaved Labrador tea, and lingonberry, while a variety of peat mosses, such as rusty peat moss (*Sphagnum fuscum*), midway peat moss (*S. magellanicum*), and *S. angustifolium* occupy the troughs between the hummocks.

3.1.1.10 Sedge Wetland Map Unit

Sedge Wetland occurs on silty or organic soils, and is typically found adjacent to lakes or streams on very poorly drained soils. This unit was also mapped in low-lying areas between upland ridges or plateaus, where substantial amounts of water drain from the uplands and accumulate on poorly to very poorly drained soils. Sedge wetlands are typically located in the centre of a drainage basin in the deeper channels where water tends to flow or remain for longer periods of time (DDMI 1997; Golder 1997). Although Sedge Wetland is relatively uncommon in the BSA, accounting for 16,347 ha (3%), it is distributed throughout the BSA and often forms interconnecting networks between ponds, lakes, and streams (Table 3.1-1, Map 3.1-1).

Sedges such as *Carex aquatilis*, found in areas where water tends to flow or remain for longer periods, and non-tussock forming cotton-grasses such as *Eriophorum angustifolium*, found in shallower areas, make up the dominant vegetation of this ELC map unit. Other species that commonly occupy Sedge Wetland include bog rosemary, buttercup (*Ranunculus*) species, tufted bulrush (*Trichophorum caespitosum*), creeping sedge (*C. chordorrhiza*), and pumpkin-fruited sedge (*C. rotundata*). A variety of peat mosses, including rusty peat moss, midway peat moss, and *S. angustifolium* also commonly occur.

3.1.1.11 Shallow Water Map Unit

Shallow Water is associated with small, shallow waterbodies and the margins of larger lakes where water levels are approximately 2 m deep or less (Matthews et al. 2001). These waterbodies may contain a range of submergent or emergent vegetation, including such species as pondweed (*Potamogeton* sp.), buttercup species, and sedges. Shallow Water accounts for 23,997 ha (4%) of the BSA (Table 3.1-1, Map 3.1-1).

3.1.1.12 Deep Water Map Unit

Deep Water is associated with deep lakes and major river systems where water depths are typically greater than 2 m (Matthews et al. 2001). Within the BSA, this map unit is associated with large, deep-water lake systems, such as Lac du Savage, Paul Lake, and Duchess Lake, as well as numerous smaller lakes with depths greater than 2 m. Deep Water is very common and widespread, accounting for 170,177 ha (29%) of the BSA (Table 3.1-1, Map 3.1-1).

3.1.1.13 Existing Disturbance

This map unit is the result of existing man-made disturbances that include the current Ekati and Diavik mine footprints and the Lynx Project footprint, portages associated with winter roads, and all-season roads. This map unit does not include disturbances from fire and no fire history data (1965 to 2012; ENR 2013) have been documented in the BSA. Existing Disturbance covers 4,354 ha (1%) of the BSA (Table 3.1-1, Map 3.1-1).

3.1.1.14 Unclassified

Unclassified areas are those areas that could not be classified into one of the ELC map units. In most cases, this occurred where imagery of the earth's surface was blocked by cloud or haze during the image capture period, or where satellite imagery could not capture surficial data due to shadows cast by clouds. Unclassified areas cover 155 ha (less than 1%) of the BSA (Table 3.1-1, Map 3.1-1).

3.2 Ecological Landscape Classification Map Units of Restricted Distribution in the Baseline Study Area

Ecological Landscape Classification map units of restricted distribution are defined as units that represent 1% or less of the land base within the BSA (Table 3.2-1). Three upland and two wetland ELC map units meet this description. The Bedrock Complex (greater than 80% rock) and Boulder Complex (greater than 80% rock) units tend to occur as small isolated patches along the north and western shoreline of Lac du Savage, as well as along the all-season road between the Ekati Mine and the Misery site. In contrast, Riparian Tall Shrub, and Birch Seep and Riparian Shoreline Shrub, are associated with riparian areas along inlets and outlets to lakes, and along lake shorelines.

Table 3.2-1 Ecological Landscape Classification Map Units of Restricted Distribution in the Baseline Study Area

| Ecological Landscape Classification (ELC) Map Units | Area (ha) | Proportion of BSA (%) |
|---|-----------|-----------------------|
| Upland ELC Map Units | | |
| Esker Complex | 5,350 | 1 |
| Bedrock Complex (>80% rock) | 1,303 | <1 |
| Boulder Complex (>80% rock) | 2,105 | <1 |
| Wetland ELC Map Units | | |
| Riparian Tall Shrub | 449 | <1 |
| Birch Seep and Riparian Shoreline Shrub | 6,405 | 1 |

ha = hectare; % = percent; BSA = baseline study area; < = less than; > = greater than.

3.3 Listed Plants

3.3.1 Listed Plant Occurrences

No listed vascular or non-vascular plant species (GNWT 2012; SARA 2012; COSEWIC 2013) were confirmed to occur within the BSA during the 2013 field program.

The absence of listed plant observations does not preclude the potential for listed plants to be present in the BSA. Therefore, a listed plant survey cannot confirm the absence of listed plants or listed plant communities; it can only confirm their presence.

3.3.2 Listed Plant Habitat Potential

Ecological Landscape Classification map units within the BSA were ranked according to their ability to potentially support listed plant species based on the habitat requirements for each listed plant species (Table 2.3-1, Section 2.6.2).

Only 8% of the BSA was determined to have high (4%) or moderate (4%) listed plant potential (Table 3.3-1, Map 3.3-1). Map units with a high potential to support listed plants are the Shallow Water and Riparian Tall Shrub units. Units with a moderate potential to support listed plant species are the Esker Complex and Sedge Wetland units. The majority of the BSA is composed of ELC map units with a low (63%) potential to support listed plants. Deep Water, Existing Disturbance, and Unclassified (29%) were not ranked.

Table 3.3-1 Total Area and Percent Cover of Listed Plant Habitat Potential in the Baseline Study Area

| Ecological Landscape Classification (ELC) Map Units | Area (ha) | Proportion of BSA (%) |
|---|----------------|-----------------------|
| High Potential ELC Map Units | | |
| Riparian Tall Shrub | 449 | <1 |
| Shallow Water | 23,997 | 4 |
| <i>High Potential ELC Map Units subtotal</i> | <i>24,447</i> | <i>4</i> |
| Moderate Potential ELC Map Units | | |
| Esker Complex | 5,350 | 1 |
| Sedge Wetland | 16,347 | 3 |
| <i>Moderate Potential ELC Map Units subtotal</i> | <i>21,697</i> | <i>4</i> |
| Low Potential ELC Map Units | | |
| Bedrock Complex (>80% rock) | 1,303 | <1 |
| Boulder Complex (>80% rock) | 2,105 | <1 |
| Heath Tundra 30% to 80% Bedrock | 14,830 | 2 |
| Heath Tundra 30% to 80% Boulders | 75,285 | 13 |
| Heath Tundra | 221,873 | 37 |
| Birch Seep and Riparian Shoreline Shrub | 6,405 | 1 |
| Tussock/Hummock | 50,644 | 9 |
| <i>Low Potential ELC Map Units subtotal</i> | <i>372,444</i> | <i>63</i> |

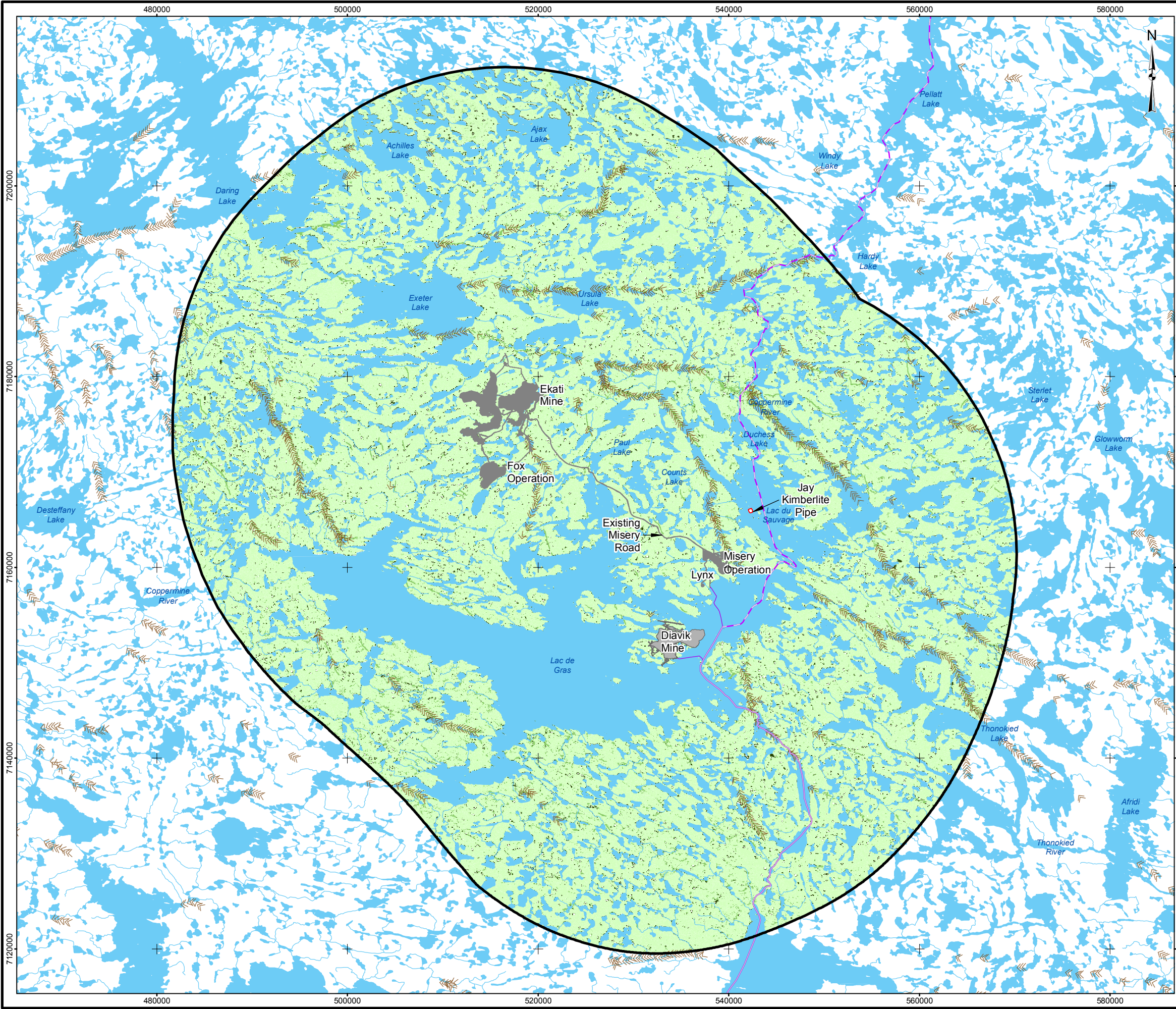
Table 3.3-1 Total Area and Percent Cover of Listed Plant Habitat Potential in the Baseline Study Area

| Ecological Landscape Classification (ELC) Map Units | Area (ha) | Proportion of BSA (%) |
|---|----------------|-----------------------|
| Non-ranked ELC Map Units | | |
| Deep Water | 170,177 | 29 |
| Unclassified | 155 | <1 |
| Existing Disturbance | 4,354 | 1 |
| <i>Non-ranked ELC map units subtotal</i> | <i>174,686</i> | <i>29</i> |
| Total | 593,274 | 100 |

Note: Numbers are rounded for presentation purposes. Therefore, it may appear that the totals do not equal the sum of the individual values.

ha = hectare; % = percent; BSA = baseline study area; < = less than; > = greater than.

G:\CLIENTS\DOMINION\DEC Jay and Lynx Projects\Figures\13-1328-0041 Jay & Lynx EA\Vegetation\Baseline\B_JC_Veg_007_GIS.mxd



LEGEND

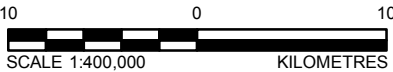
- EKATI MINE FOOTPRINT
- DIAMIK MINE FOOTPRINT
- KIMBERLITE PIPE
- WINTER ROAD
- TIBBITT TO CONTWOYTO WINTER ROAD
- NORTHERN PORTION OF TIBBITT TO CONTWOYTO WINTER ROAD
- ESKER
- WATERCOURSE
- WATERBODY
- BASELINE STUDY AREA
- LISTED PLANT HABITAT POTENTIAL
 - LOW
 - MODERATE
 - HIGH

REFERENCE

VEGETATION CLASSIFICATION DATA: DIAVIK LANDSAT CLASSIFICATION 1997; WEST KITIKMEOT CLASSIFICATION 2001; MODIFIED BY GOLDER ASSOCIATES 2014
CANVEC © NATURAL RESOURCES CANADA, 2012
NATURAL RESOURCES CANADA, CENTRE FOR TOPOGRAPHIC INFORMATION, 2012
DATUM: NAD83 PROJECTION: UTM ZONE 12N

DOCUMENT

VEGETATION BASELINE REPORT



| | | | | | |
|--|---------|------------------|--------------|--|-------|
| PROJECT | | DOMINION DIAMOND | | JAY PROJECT NORTHWEST TERRITORIES, CANADA | |
| TITLE | | | | | |
| LISTED PLANT HABITAT POTENTIAL IN THE BASELINE STUDY AREA | | | | | |
| | PROJECT | | 13-1328-0041 | FILE No. B_JC_Veg_007_GIS | |
| | DESIGN | LV | 28/01/14 | SCALE AS SHOWN | REV 0 |
| | GIS | NS | 10/09/14 | | |
| | CHECK | CG | 10/09/14 | | |
| | REVIEW | SM | 10/09/14 | | |
| MAP 3.3-1 | | | | | |

3.4 Traditional Use Plants

Traditional plants used in the NWT include edible plants, medicinal plants, and plants used for construction or other purposes. A list of traditional plants applicable to the Project (Table 3.4-1) provides a means for assessing ELC map units for their potential traditional plant value. It does not, however, take into account the distribution of the units on the landscape.

Table 3.4-1 Traditional Use Plants and Associated Ecological Landscape Classification Map Units

| Common Name | Latin Name | Tłıchq Name | Most Probable Dominant ELC Map Unit(s) ^(b) | Traditional Use |
|------------------|--|-------------------------------|--|---|
| willow (various) | <i>Salix</i> spp. | k'aa, k'òò | Birch Seep and Riparian Shoreline Shrub, Riparian Tall Shrub | fuel, food, tools, shelter, medicine, tobacco, insect repellent, moth ball, fire starter ^(d) |
| dwarf birch | <i>Betula glandulosa</i> | k'i | Birch Seep and Riparian Shoreline Shrub, Heath Tundra | fuel, food, tools, shelter, fire starter ^(d) |
| blueberry | <i>Vaccinium uliginosum</i> | dziewà, jiewà | Esker, Heath Tundra, Heath Tundra 30% to 80% Bedrock, Heath Tundra 30% to 80% Boulders | food, medicine ^(d) |
| lingonberry | <i>Vaccinium vitis-idaea</i> | -- | Birch Seep, Riparian Tall Shrub, Heath Tundra 30% to 80% Bedrock, Heath Tundra 30% to 80% Boulders | food, medicine, dye ^(d) |
| black crowberry | <i>Empetrum nigrum</i> | tsqht'è | Esker, Heath Tundra, Heath Tundra 30% to 80% Bedrock, Heath Tundra 30% to 80% Boulders | food, medicine ^(c) |
| red bearberry | <i>Arctostaphylos rubra</i> | k'àowocho, k'àowotso | Esker, Heath Tundra, Heath Tundra 30% to 80% Bedrock, Heath Tundra 30% to 80% Boulders | food ^(d) |
| Labrador tea | <i>Ledum palustre</i> | gots'agoò, ligaezqò, ligaezqà | Birch Seep; Heath Tundra; Heath Tundra 30% to 80% Bedrock, Heath Tundra 30% to 80% Boulders | food, medicine ^(d) |
| cloudberry | <i>Rubus chamaemorus</i> | nqdlàa | Birch Seep and Riparian Shoreline Shrub, Riparian Tall Shrub, Sedge Wetland, Tussock/Hummock | food ^(d) |
| acerbic bulrush | <i>Schoenoplectus acutus</i> ^(a) | -- | Sedge Wetland; Shallow Water | food, medicine, baskets ^(c) |
| peat moss | <i>Sphagnum</i> spp., wetlands species | kw'ah | Birch Seep and Riparian Shoreline Shrub Riparian Tall Shrub, Sedge Wetland, Tussock/Hummock | diapers, cleaner ^(d) |
| lichen | <i>Cladina</i> spp., <i>Flavocetraria</i> spp., <i>Parmelia</i> spp., <i>Actinogyra</i> spp. | adzjì, ajjì, ajjì | Esker, Heath Tundra, Heath Tundra 30% to 80% Bedrock, Heath Tundra 30% to 80% Boulders | food, medicine ^(c) |

a) Genus or species not found during Golder Associates Ltd. 2013 vegetation surveys.

b) Most probable dominant type based on survey data, habitat descriptions, and Golder Associates Ltd. vegetation ecologist experience.

c) Marles et al. 2000.

d) Andre and Fehr 2002.

ELC = Ecological Landscape Classification; spp. = multiple species; -- = Tłıchq Name unavailable; % = percent.

In general, most edible berries are collected and used for food. Blackberries and blueberries are collected for food, juice, and tinder, while cranberries (lingonberries) and cloudberry are collected for food and made into jams (Golder 2014). Dwarf birch and various willow species are used as firewood or fire-starting materials. Dwarf birch also provides a strong root that can be used to repair canoes and as drying racks and cord or lacing (babiche) (Golder 2014).

4 SUMMARY

The Vegetation Baseline Report presents characteristics and existing conditions of vegetation in the BSA, summarizes previous studies completed for the Project and other projects in the BSA, and presents vegetation data collected during the 2013 field survey. The report describes existing vegetation and plant community data, ELC mapping, the suitability of ELC map units to support listed plant species, and traditional use species.

To quantify baseline conditions, a BSA was defined for vegetation. The BSA is approximately 593 km² centred on the existing Ekati Mine and the Project footprint. The baseline study was selected to encompass both the existing mine site and the area that contains the potential new development, as well as areas not expected to be affected by the Project. This information can be used in support of the assessment of potential Project effects on vegetation.

A field program was completed in 2013 to describe the characteristics of the plant communities within each ELC map unit, search for listed plant species, and ground-truth the ELC map.

A total of 14 ELC map units are mapped within the BSA, including six upland, four wetland, two non-vegetated, one existing disturbance, and one unclassified unit. Upland map units compose the majority of the BSA, accounting for 54% of the area. Wetland map units account for 12% of the BSA.

Esker Complex is characterized by sandy to gravelly ridges formed by remnant deposits of rivers that flowed within the continental ice sheets (DDMI 1997; Golder 1997). Eskers, which tend to form long, sinuous, linear features on the landscape, are restricted in distribution; this map unit accounts for only 1% (5,350 ha) of the BSA. Eskers are complexes of plant communities, rather than a single community (DDMI 1997; Golder 1997). Plant communities along the crests and upper slopes of eskers are sparsely vegetated and contain discrete low-growing mats of heath vegetation on sand or gravel substrate. Plant communities on the mid to lower slopes of eskers are different from those occurring on crests and upper slopes, particularly on the lee side of eskers, which tends to be less exposed to wind. These areas tend to be more densely vegetated with a greater diversity of plant species.

Bedrock Complex (greater than 80% rock) is associated with exposed bedrock outcrops that support very little vegetative cover (Matthews et al. 2001). Crustose lichens (e.g., rock tripe [*Umbilicaria* sp.]), and green map lichen (*Rhizocarpon geographicum*) are the most common species associated with this map unit. Isolated occurrences of heath and herbaceous plants may occur in protected areas, crevices, and depressions where sufficient soil development has occurred to initiate vegetative growth (Matthews et al. 2001). Bedrock Complex is restricted in distribution, accounting for less than 1% (1,303 ha) of the BSA.

Boulder Complex (greater than 80% rock) is associated with boulder fields that include boulder outcrops, interlaced boulder streams or drainages, and glacial erratics (DDMI 1997; Golder 1997). Vegetation cover in this map unit is limited to protected areas, crevices, and depressions where sufficient soil development has occurred to initiate vegetative growth. Exposed boulders may be colonized with various crustose rock lichens including rock tripe, elegant sunburst lichen (*Xanthoria elegans*), green map lichen, and green starburst lichen (*Parmeliopsis ambigua*) (DDMI 1997; Golder 1997; Matthews et al. 2001). Boulder Complex is restricted in distribution, accounting for less than 1% (2,105 ha) of the BSA.

Exposed bedrock outcrops and a discontinuous vegetation cover characterize Heath Tundra 30% to 80% Bedrock (Matthews et al. 2001). This map unit is often described as open-mat heath tundra (Matthews et al. 2001). Plant species include common heath species, such as bearberry species, dwarf birch, black crowberry, narrow-leaved Labrador tea, and alpine bilberry. Lichen species such as reindeer lichen and snow lichen are commonly found in the heath tundra areas, while green map lichen, rock tripe and other crustose lichen species often occur on exposed bedrock faces. Heath Tundra 30% to 80% Bedrock accounts for 2% (14,830 ha) of the BSA.

Heath Tundra 30% to 80% Boulder is another open-mat plant community that is associated with discontinuous vegetation cover where exposed boulder fields are interspersed within the heath tundra landscape (Matthews et al. 2001). Heath shrubs, such as bearberry, dwarf birch, black crowberry, narrow-leaved Labrador tea, and alpine bilberry are common. Various lichen species, including reindeer lichen and snow lichen commonly occur in heath tundra areas, while boulder field areas are dominated by boulders encrusted with various crustose lichens (e.g., *Umbilicaria* sp., *Arctoparmelia* sp., and green map lichen) (Golder 1997). Heath Tundra 30% to 80% Boulder map unit accounts for 13% (75,285 ha) of the BSA.

Heath Tundra occurs over a wide range of dry upland areas, from small ridges to flat plains, and typically occurs on moderately to well-drained soils. It is characterized by an abundance of low-growing heath plants, most belonging to the Ericaceae (heath family). Characteristic species include narrow-leaved Labrador tea, lingonberry, alpine bilberry, bearberry species, black crowberry, and dwarf birch. Alpine azalea (*Loiseleuria procumbens*) commonly occurs, along with a variety of lichen species (e.g., reindeer and snow lichens). The herb and moss layers normally are not well developed. Heath Tundra is the most widespread and abundant ELC map unit in the BSA, covering 37% (221,873 ha) of the area.

Riparian Tall Shrub occurs as linear groves along the banks of watercourses, typically associated with the inflow or outflow of a lake, or along the drainages that connect one lake to another. This map unit is associated with landscapes with substantial water flow through a boulder substrate that often have imperfectly drained, nutrient enriched soils (DDMI 1997; Golder 1997). Riparian Tall Shrub has a very restricted distribution and accounts for less than 1% (449 ha) of the BSA.

Birch Seep and Riparian Shoreline Shrub consists of two vegetation types: riparian birch seep and riparian shoreline shrub. These vegetation types could not be separated in the ELC due to similarities in spectral signatures (DDMI 1997; Golder 1997). The riparian shoreline shrub vegetation type occurs as sporadic, narrow bands of vegetation (less than 5 m in width) along the margins of lakes where shorelines have slumped (DDMI 1997; Golder 1997). The birch seep vegetation type is most often located at the edges of boulder fields, within boulder streams, and occasionally at the edges of eskers, on moist bouldery (rather than organic or mineral) soils. Birch Seep and Riparian Shoreline Shrub is uncommon and accounts for only 1% (6,405 ha) of the BSA.

Tussock/Hummock occurs in wet areas on silty or organic soils where the land is slightly higher and is infrequently flooded (DDMI 1997; Golder 1997). The vegetation in this map unit is typically composed of tussock-forming cotton-grasses such as tussock cotton-grass (*Eriophorum vaginatum*), interspersed with sedges, such as water sedge (*Carex aquatilis*) and russet sedge (*C. saxatilis*). Tussock/Hummock has a scattered and wide distribution and accounts for 9% (50,644 ha) of the BSA.

Sedge Wetland is typically found adjacent to lakes or streams on very poorly drained areas. This map unit is also found in low-lying areas between upland ridges or plateaus, where substantial amounts of water drain from the uplands. Sedges such as *Carex aquatilis*, found in areas where water tends to flow or remain for longer periods, and non-tussock forming cotton-grasses such as *Eriophorum angustifolium*, found in shallower areas, make up the dominant vegetation of this map unit. Sedge Wetland covers 3% (16,347 ha) of the BSA.

Shallow Water is associated with small, shallow waterbodies and the margins of larger lakes, where water levels are approximately 2 m deep or less, and accounts for 4% (23,997 ha) of the BSA. Deep Water is associated with deep lakes and major river systems where water depths are typically greater than 2 m, and covers 29% (170,177 ha) of the BSA.

Existing Disturbance covers 1% (4,354 ha) of the BSA. This map unit is the result of existing anthropogenic disturbances that include the current Ekati and Diavik mine footprints, the Lynx Project footprint, portages associated with winter roads, and all-season roads. This unit does not include disturbances from fire; however, no fires (1965 to 2012; ENR 2013) have been documented in the BSA.

Unclassified areas are those areas that could not be classified into one of the ELC map units. In many cases, this occurred where imagery of the earth's surface was blocked by cloud or haze during the image capture period, or where satellite imagery could not capture surficial data due to shadows casted by clouds. Unclassified areas cover less than 1% (155 ha) of the BSA.

No listed vascular or non-vascular plant species (GNWT 2012; SARA 2012; COSEWIC 2013) were confirmed to occur within the BSA during the late July 2013 field program. However, survey timing was not ideal as the field visit was outside the appropriate timing for confidently identifying listed plants because of the early growing season in 2013. The absence of listed plant observations does not preclude the potential for listed plants to be present in the area. Therefore, a listed plant survey cannot confirm the absence of listed plants or listed plant communities; it can only confirm their presence. A supplemental survey for listed plant species will be completed in summer of July 2014 when vascular plants are in peak flower.

Using data collected from other studies and the 2013 field program, ELC map units within the BSA were ranked according to their potential to support listed plant species. The majority (63%) of the BSA comprises ELC map units with a low potential to support listed plants, while Deep Water, Existing Disturbance and Unclassified (29%) were not ranked. Three percent of the BSA was ranked as being of moderate potential to support listed species (Esmer Complex and Sedge Wetland), while another 3% was ranked with a high potential (Shallow Water and Riparian Tall Shrub).

Traditional plants used in the NWT include edible plants, medicinal plants, and plants used for construction or other purposes. In general, most edible berries are collected and used for food. Blackberries and blueberries are collected for food, juice, and tinder, while cranberries (lingonberries) and cloudberries are collected for food and made into jams (Golder 2014). Dwarf birch and various willow species are used as firewood or fire-starting materials. Dwarf birch also provides a strong root that can be used to repair canoes and as drying racks and cord (babiche) (Golder 2014).

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6 GLOSSARY

| Term | Definition |
|---|---|
| Diavik Diamond Mines Inc. | A diamond mine located on East Island in Lac de Gras, approximately 30 km southeast of the Ekati main camp and 10 km southwest of the Misery Pit. |
| Ekati Mine | Ekati Diamond Mine, Canada's first diamond mine. |
| Abundance | The number of individuals. |
| Adverse effect | An undesirable or harmful effect to an organism (human or animal) indicated by some result such as mortality, altered food consumption, altered body and organ weights, altered enzyme concentrations, or visible pathological changes. |
| Anthropogenic | Human-related, often referring to an activity, development or disturbance on the landscape. |
| Babiche | A type of cord or lacing made from rawhide . |
| Background | An area (or state of the atmosphere) not influenced by chemicals released from the site under evaluation. |
| Baseline study area (BSA) | A broad area defined for the description of vegetation conditions generally centered on the Project and surroundings. |
| Basin | A large area that is lower in elevation than surrounding areas and contains water. Basins are separated by land or shallow channels. |
| Bedrock | The solid rock (harder than 3 on Moh's scale of hardness) underlying soils and the regolith in depths ranging from zero (where exposed to erosion) to several hundred metres. |
| Boulder | A large rounded mass of rock lying on the surface of the ground or embedded in the soil. |
| Classification, vegetation | The systematic arrangement of plant communities into categories according to their inherent characteristics. Groupings are made on the basis of dominant vegetation species, in association with commonly associated species and a commonly associated set of site and soil conditions. |
| Community (biology) | Group of co-existing organisms in an ecosystem. |
| Discontinuous | Marked by breaks or interruptions; intermittent. |
| Distribution | The pattern of dispersion of an entity within its range. |
| Diversity | A numerical index that incorporates evenness and richness; diversity measures the proportional distribution of organisms in the community. |
| Dominant | In natural resources mapping, the feature (soil type, terrain, or other feature) that constitutes the majority of a mapping unit (generally 40% or more, and usually 50% or more). |
| Drainage | The removal of excess surface water or groundwater from land by natural runoff and percolation, or by means of surface or subsurface drains. |
| Drainage basin | The area drained by a river or stream; see also watershed. |
| Ecological Landscape Classification (ELC) | A means of classifying landscapes by integrating landforms, soils and vegetation components in a hierarchical manner. |
| Ecoregion | Subdivisions of ecozones that are relatively homogeneous with respect to soil, terrain, and dominant vegetation. |
| Ecosystem | An integrated and stable association of living and non-living resources functioning within a defined physical location. A community of organisms and its environment functioning as an ecological unit. For the purposes of assessment, the ecosystem must be defined according to a particular unit and scale. |
| Ecosystem Type | An ecosystem type is a standardized name that is given to an identifiable group of living organisms (defined by and named using the most common plant species) that interact among themselves and which, together with their environment (soil, climate, water, and light), function as a unit. |

| Term | Definition |
|-------------------------------------|--|
| Ecotone | The transition of physical and biological characteristics, from one community to the next. |
| Ecozone | Areas of the earth's surface representative of large and very generalized units characterized by interactive and adjusting abiotic and biotic factors. The ecozone lies at the top of the ecological hierarchy and defines, on a subcontinental scale, the broad mosaics formed by the interaction of macroscale climate, human activity, vegetation, soils, geological, and physiographic features of the country. |
| Effect | In the EIS, the term "effect," used in the effects analyses, is regarded as an "impact" in the residual impact classification. An effect represents a change in a valued component (VC); Any response by an environmental or social component to an action's impact. Under the <i>Canadian Environmental Assessment Act</i> , "environmental effect" means, in respect of a Project, "(a) any change that the Project may cause in the environment, including any effect of any such change on health and socio-economic conditions, on physical and cultural heritage, on the current use of lands and resources for traditional purposes by Aboriginal persons, or on any structure, site or thing that is of historical, archaeological, paleontological or architectural significance and (b) any change to the Project that may be caused by the environment, whether any such change occurs within or outside of Canada. |
| Ericaceous | Plants that belong to the Heath [Ericaceae] family. |
| Erratic | A rock fragment, different from the local bedrock, carried by glacier ice or floating ice and deposited when the ice melted at some distance from the outcrop from which the fragment was derived. |
| Esker | A long, winding ridge of stratified sand and gravel believed to form in ice-walled tunnels by streams, which flowed within and under glaciers. After the retaining ice walls melt away, stream deposits remain as long winding ridges. |
| Fen | Minerotrophic peat-forming wetlands that receive surface moisture from precipitation and groundwater. Fens are less acidic than bogs, deriving most of their water from groundwater rich in calcium and magnesium. Peat materials derived primarily from sedges with inclusions of partially decayed stems of shrubs formed in a eutrophic environment due to the close association of the material with mineral rich waters. |
| Footprint | The proposed development area that directly affects the soil and vegetation components of the landscape. |
| Forb | An herbaceous plant that is not a grass, sedge, or rush. |
| Frequency | Refers to how often an effect will occur. |
| Geographic Information System (GIS) | Computer software designed to develop, manage, analyze and display spatially referenced data. |
| Glacial | (i) Of or relating to the presence and activities of ice or glaciers, such as glacial erosion. (ii) Pertaining to distinctive features and materials produced by or derived from glaciers and ice sheets, such as glacial lakes. (iii) Pertaining to an ice age or region of glaciation. |
| Gravel | (i) As a deposit term: glaciofluvial or fluvial materials with 60% or more coarse fragments, usually subrounded to rounded and of variable size. (ii) As a particle size term: a size fraction between 2 and 75 mm diameter with rounded, subrounded, angular, or irregular shapes. |
| Gravelly | Containing appreciable amounts of rounded or subrounded rock or mineral fragments 2 mm to 8 cm in diameter. 'Angular gravelly' is used when the fragments are less rounded. |
| Ground-truthing | Visiting locations in the field to confirm or correct information produced from remote sources such as interpreted aerial photographs or classified satellite imagery. |
| Habitat | The physical location or type of environment in which an organism or biological population lives or occurs. |
| Heath | Vegetation typical of the Arctic, often characterized by lichens, mosses, sedges, and dwarf trees and shrubs. |

| Term | Definition |
|--------------------|---|
| Heath tundra | A closed mat plant community that grows on moderate to well-drained soils, covering most of the upland areas. Plants generally belong to the heath family, the Ericaceae. The vegetation layer forms a mat of low shrubs dominated by dwarf birch and Labrador tea. |
| Herb | Any flowering plant except those developing persistent woody bases and stems. |
| Hummock | A very complex sequence of slopes extending from somewhat rounded depressions or kettles of various sizes to irregular to conical knolls or knobs. There is a lack of concordance between knolls and depressions. Slopes are generally 9% to 70%. |
| Inflow | Water flowing into a lake. |
| Kimberlite | Igneous rocks that originate deep in the earth's mantle and intrude the Earth's crust. These rocks typically form narrow pipe-like deposits that sometimes contain diamonds. |
| Landscape | A heterogeneous land area with interacting ecosystems that are repeated in similar form throughout. From a wildlife perspective, a landscape is an area of land containing a mosaic of habitat patches within which a particular "focal" or "target" habitat patch is embedded. |
| Lichen veneer | A continuous mat of lichen that appears as a "veneer." These sites are windswept and dry, allowing very little other plant growth. Lichen veneer consists mainly of Iceland moss, several other species of Cetraria, green and black hair lichens, grey mealy lichen, worm lichens and other species. |
| Map unit | A combination of kinds of soil, terrain, or other feature that can be shown at a specified scale of mapping for the defined purpose and objectives of a particular survey. |
| Meandering | Following a winding or intricate course. |
| Mitigation | The elimination, reduction or control of the adverse environmental effects of a project, including restitution for any damage to the environment caused by such effects through replacement, restoration, compensation, or any other means. |
| Moisture regime | Represents the available moisture supply for plant growth on a relative scale. It is assessed through an integration of species composition and soil and site characteristics. Moisture regime ranges from very dry to wet. |
| Non-sorted circle | A patterned ground form that is equidimensional in several directions, with a dominantly circular outline which lacks a border of stones. Nonsorted circles characteristically have margins of vegetation, they occur singly or in groups, and their diameter is commonly between 0.5 and 3.0 m. Their central areas tend to be slightly dome-shaped and may be cracked into small nonsorted polygons. The term covers both mud circles, developed in fine-grained materials, and stony earth circles, developed in gravelly materials. |
| Non-vascular plant | Plants that do not possess conductive tissues (e.g., veins) for the transport of water and food. |
| Nutrient regime | Amount of essential nutrients that are available for plant growth. The determination of nutrient regime requires the integration of many environmental and biotic parameters. Soil nutrient regime is rated on a relative scale ranging from very poor to very rich. Nutrient regime classes are: very poor, poor, medium, rich, and very rich. |
| Outcrop | That part of a geologic formation or structure that appears at the surface of the earth. |
| Outflow | Water flowing out of a lake. |
| Peat | A deposit consisting of decayed or partially decayed humified plant remains. Peat is commonly formed by the slow decay of successive layers of aquatic and semi-aquatic plants in swampy or water-logged areas, where oxygen is absent. |

| Term | Definition |
|-----------------------|---|
| Permafrost | Ground (soil or rock and included ice and organic material) that remains at or below 0°C for at least two consecutive years. Permafrost is defined on the basis of temperature. It is not necessarily frozen, because the freezing point of the included water may be depressed several degrees below 0°C; moisture in the form of water or ice may or may not be present. |
| Plant community | A collection of plants that live together on a relatively uniform area of land with a floristic composition and structure that is distinct from surrounding vegetation. |
| Population | A group of individuals of the same species that is primarily affected by natural and human-related factors that change survival and reproduction of individuals. |
| Range | The geographic limits within which an organism occurs. |
| Rare plant | A native plant species found in restricted areas, at the edge of its range or in low numbers within a province, state, territory or country. |
| Riparian | Refers to terrain, vegetation or simply a position next to or associated with a stream, floodplain or standing waterbody. |
| Scale | The resolution at which patterns are measured, perceived, or represented. Scale can be broken into several components, including geographic extent, resolution, and other aspects. |
| Sedge | A grass-like plant with a triangular stem often growing in wet areas. Sedge wetland habitats are typically wet sedge meadows and other sedge associations of non-tussock plant species. Sedge species such as <i>Carex aquatilis</i> and <i>C. bigelowii</i> , and cotton-grass (<i>Eriophorum angustifolium</i>) are the dominant vegetation types. Plant species occupy wet, low lying sites where standing water is present throughout much of the growing season. |
| Seepage | Slow water movement in subsurface. Flow of water from man-made retaining structures. A spot or zone, where water oozes from the ground, often forming the source of a small spring. |
| Sensitive | 1. Sites or organisms that are particularly vulnerable to harm 2. A general status rank for a species with one or more of the effects.3. in statistics, parameter sensitivity refers to a series of tests in which different parameter values are set to see how a change in the parameter causes a change in the dynamic behaviour of the system in question (e.g., how much does a change in adult female survival affect population growth of a caribou herd). |
| Shrub | A woody perennial plant differing from a tree by its low stature and by generally producing several basal shoots instead of a single trunk. |
| Species | A group of organisms that actually or potentially interbreed and are reproductively isolated from all other such groups; a taxonomic grouping of genetically and morphologically similar individuals; the category below genus. |
| Temporal | Related to time. |
| Traditional Knowledge | The knowledge, innovations, and practices of indigenous people; refers to the matured long-standing traditions and practices of certain regional, indigenous, or local communities. |
| Traditional Land Use | The practices and traditions of land use and resource harvesting by regional, indigenous, and local communities. |
| Tundra | A vast, mostly flat, treeless Arctic region of Europe, Asia, and North America in which the subsoil is permanently frozen. The dominant vegetation is low-growing stunted shrubs, mosses, lichens. |
| Tundra heath | The treeless area to the north of the boreal forest. Vegetation includes low, matted and erect shrubs and herbs such as cotton-grass. |
| Tussock/Hummock | A tussock is a tuft of grass or grasslike plants like sedges. Tussock/Hummock refers to a type of tundra consisting of acre upon acre of sedge tussocks, usually located on flat, poorly drained land or gentle slopes. |
| Uncertainty | Imperfect knowledge concerning the present or future state of the system under consideration; a component of risk resulting from imperfect knowledge of the degree of hazard or of its spatial and temporal distribution. |

| Term | Definition |
|-------------------|---|
| Understory | Trees or other vegetation in a forest that exist below the main canopy level. |
| Upland Area | Ground elevated above the lowlands along rivers or between hills; highland or elevated land; high and hilly country. |
| UTM | Universal Transverse Mercator coordinate system: a grid based method of specifying locations, employing a series of sixty zones each based on a specifically defined secant Transverse Mercator projection. |
| Vascular plant(s) | Plants possessing conductive tissues (e.g., veins) for the transport of water and food. |
| Vegetation Type | Base unit of identification during field surveys. Can be analogous to ecosystem type but is generally used to describe vegetation at the site-level. |
| Veneer | Unconsolidated materials too thin to mask the minor irregularities of the underlying unit surface. A veneer ranges from 10 cm to 1 m in thickness and possesses no form typical of the materials' genesis. |
| Watershed | The area drained by a river or stream; see also drainage basin. |
| Wetland | Land having the water table at, near, or above the land surface or which is saturated for a long enough period to promote wetland or aquatic processes as indicated by hydric soils, hydrophytic vegetation and various kinds of biological activity which are adapted to the wet environment. |
| Wildlife | Under the <i>Species at Risk Act</i> , wildlife is defined as a species, subspecies, variety or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus that is wild by nature and is native to Canada or has extended its range into Canada without human intervention and has been present in Canada for at least 50 years. |