



## 4.2.2 Regional Land Cover Classes

### 4.2.2.1 Heath Boulder

The heath boulder land cover class occurs on rapidly to well-drained sites that contain a high proportion of boulder deposits in association with bedrock outcrops. This land cover class is more common in the northeastern portion of the RSA, although, it does occur in scattered clusters in northern and southern parts of the RSA. The heath boulder land cover class is dominated by heath tundra vegetation interspersed with the occasional graminoid tussock-hummock community in low-lying wet areas. Typically, vegetation is characterized by heath shrubs, such as marsh Labrador tea, black crowberry, and arctic bell heather (*Cassiope tetragona*), as well as moss campion (*Silene acaulis*) and an abundance of crinkled snow lichen (*Flavocetraria nivalis*). Other species that may be encountered include arctic blueberry (*Vaccinium uliginosum*), purple mountain saxifrage (*Saxifraga oppositifolia*), swamp birch (*Betula glandulosa*), and sweet grass (*Hierochloe* sp). Boulders encrusted with various rock lichens (e.g., *Umbilicaria* sp., *Arctoparmelia* sp., and *Rhizocarpon geographicum*) may cover more than a third of the area in these communities and are often widely distributed across the landscape. This land cover class is generally associated with the lichen rock plant association and covers 141 484 ha (17%) of the RSA (Table 4-6, Figure 4-2).

### 4.2.2.2 Heath Lichen – Hair Lichen

The heath lichen – hair lichen land cover class is found on eskers and the crests and upper slopes of small ridges with poorly developed, rapidly drained soils. These areas may be associated with bedrock outcrops and tend to be found in isolated pockets that are more prevalent in the eastern portion of the RSA. Much of the vegetation in this area is composed of lichens, particularly *Bryocaulon* sp., *Alectoria* sp., and various rock lichens including *Umbilicaria* sp. and *Rhizocarpon geographicum*. Shrubs, such as swamp birch, mountain cranberry (*Vaccinium vitas-idea*), and black crowberry, are also commonly associated with this land cover class, whereas forbs, grasses, or mosses are uncommon to absent. The abundance of black hair lichen (*Alectoria nigricans*) in these areas has the effect of turning the landscape a dark, almost black colour that is very distinctive from both the air and the ground. The heath lichen – hair lichen land cover class covers 18 339 ha (2%) of the RSA and is associated with the lichen heath – hair lichen plant community at the LSA (Table 4-6, Figure 4-2).

### 4.2.2.3 Heath Lichen - Cetraria

The heath lichen – *Cetraria* land cover class is an uncommon landscape unit that typically occurs on the lower slopes of ridges and eskers or as veneers over flat rocky plains characterized by frost boils. This land cover class is sparsely distributed across the RSA and is primarily concentrated in eastern portions of the RSA, with isolated occurrences along the Hudson's Bay coast. Vegetation is typically composed of abundant lichens, primarily snow lichen and *Alectoria* sp., as well as reindeer lichens (*Cladina* sp.) and *Cladonia* sp., all of which may make up more than 50% of the vegetation cover. Heath shrubs, such as arctic blueberry, mountain cranberry, and arctic bell heather, as well as moss campion, are also common, as well as limited occurrences of forbs, willow, and sedge species. The heath lichen – *Cetraria* land cover class is similar to the lichen heath *Cetraria* plant community in the LSA and covers 12 414 ha (1%) of the RSA (Table 4-6, Figure 4-2).

### 4.2.2.4 Heath Tundra

The heath tundra land cover class is found on a range of upland sites, from small ridges to flat plains characterized by well-drained soils. This is the most common land cover class in the RSA and extends throughout the region, though it is less common in the northeastern sections of the RSA. Vegetation in this class



is composed of abundant heath shrubs, including marsh Labrador tea, black crowberry, bearberry, entireleaf mountain-avens (*Dryas integrifolia*), and arctic blueberry. Other plant species that may be found include Arctic crazy-weed or oxytrope (*Oxytropis* sp.), louseworts (*Pedicularis* sp.), and saxifrages, as well as various lichen species such as crinkled snow lichen and *Alectoria* sp. At the local scale, the heath tundra land cover class is equivalent to the heath tundra plant community association. The heath tundra land cover class covers 273 690 ha (32%) of the RSA (Table 4-6, Figure 4-2).

#### 4.2.2.5 Low Shrub

The low shrub land cover class is associated with imperfectly to poorly drained soils characteristic of riparian areas and depressions. This land cover class is characterized by 2 different plant community types: willow dominated shrub communities along the banks of major streams and waterbodies, and swamp birch shrub communities found in low-lying areas. Typically, various willow species and swamp birch form the dominant vegetation cover in these communities, often forming dense low growing mats over the ground that shade out other plant species. Marsh Labrador tea, black crowberry, arctic blueberry, and mountain cranberry may also occur, but are less common. This land cover class is most strongly associated with the birch seep and willow riparian plant community associations at the local scale. The low shrub land cover class is very uncommon on the landscape and only covers 12 662 ha (1%) of the RSA (Table 4-6, Figure 4-2).

#### 4.2.2.6 Tussock - Hummock

The tussock-hummock land cover class is typically found in flat to low-lying areas, where soils are poorly to very poorly drained. This land cover class includes wet sedge meadows, which are too small to be mapped as a separate unit in the RSA. Vegetation associated with the tussock-hummock class tends to be dominated by sedges, including water sedge, as well as various species of cottongrass (*Eriophorum* sp.) that form low-lying hummocks. Sphagnum mosses and *Aulacomnium* moss species commonly occur between the hummocks. Willow species, swamp birch, and other heath shrubs may occur on hummock tops, but with low abundance. The tussock-hummock land cover class is widely distributed across the RSA covering 109 913 ha (13%) of the RSA (Table 4-6, Figure 4-2).

#### 4.2.2.7 Bare Ground (Rock Outcrop)

The bare ground land cover class represents areas with limited to no vegetation cover. This class is typically associated with eskers, steep sandy slopes, and the tidal and inter-tidal beaches along Hudson's Bay. It can be associated with the sand plant community association at the local scale. The bare ground land cover class makes up a small proportion of the landbase covering 19 273 ha (2%) of the RSA (Table 4-6, Figure 4-2).

#### 4.2.2.8 Water

The water land cover class includes all rivers and lakes within the RSA, as well as portions of Hudson's Bay. This class covers 261 710 ha (31%) of the RSA (Table 4-6, Figure 4-2).

### 4.3 Local Study Area Results

#### 4.3.1 Plant Community Classification and Mapping

Ten plant community types were classified and mapped in the LSA (Table 4-7, Figure 4-3). These include 4 upland terrestrial vegetation classes, 3 wetlands classes, and 3 un-vegetated classes, which together cover an area of 8251 ha. Upland vegetation encompasses 4468 ha (54%) of the LSA, with the heath tundra community



type dominating the landscape. Wetlands are distributed over 2273 ha (27%) of the LSA (Table 4-7) and the remaining 1509 ha (18%) of the LSA is classified as un-vegetated units that are predominantly composed of waterbodies and rivers. Disturbance features and un-vegetated sand areas represent <1% of the total LSA (Table 4-7).

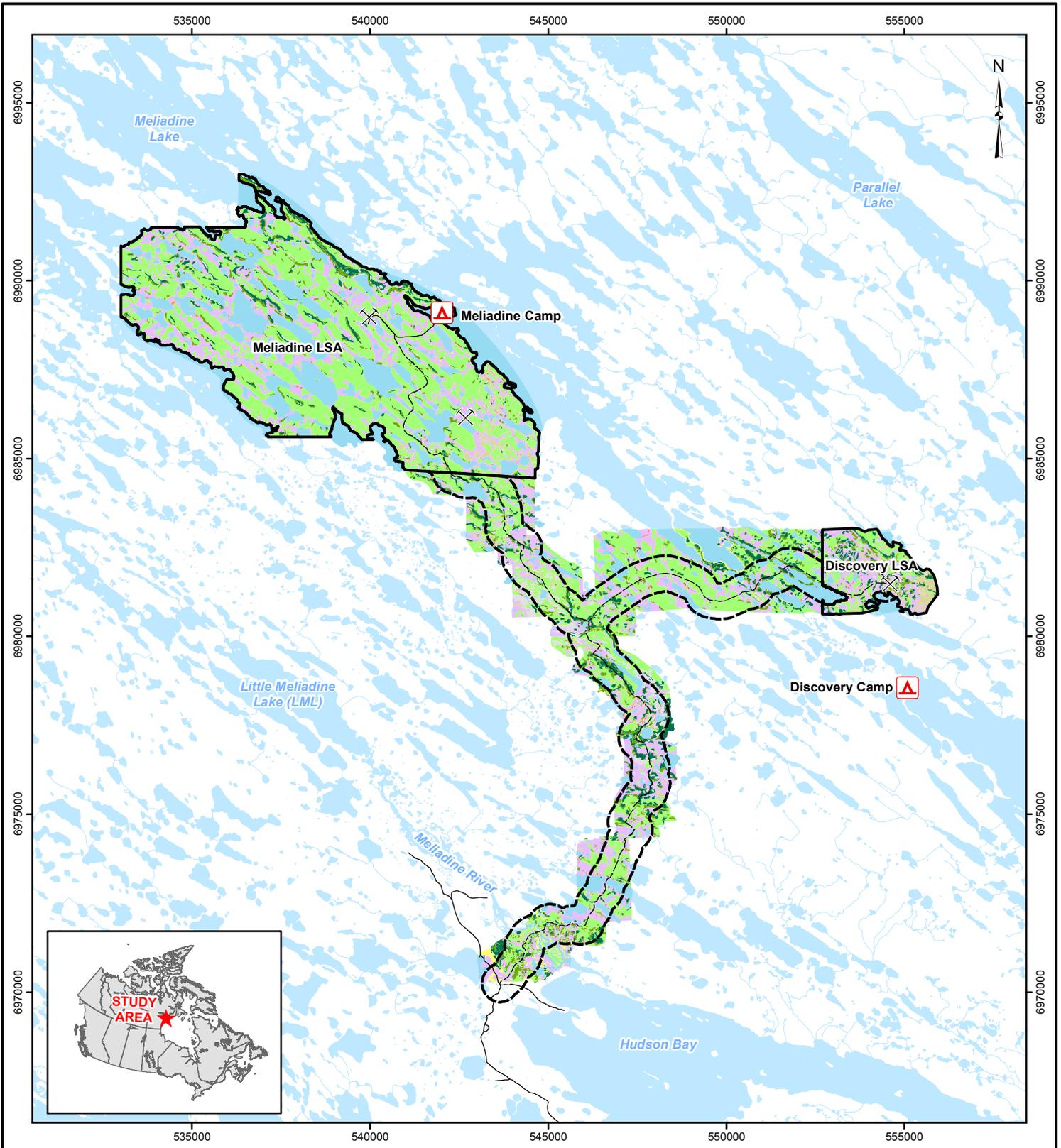
Descriptions of the mapped plant community types are presented below, while descriptions of non-mappable plant associations are presented in Appendix A7. Representative photographs of different plant communities and associations from 1998 and 2008 are presented in Sub-appendix A7a, 1998 and Sub-appendix A7b, 2008. Appendix A8 provides a summary of plant species by plant community type.

Common names are generally provided in the vegetation descriptions below. In cases where there is no common name, or the common name can be confused with 2 or more species, a scientific name is given. For a reference to common and scientific names, refer to Appendices A2, A4, and A5. Due to taxonomic changes in plant species names over the last number of years, all plant species lists have been updated to the most current taxonomic standards consistent with the NatureServe on-line database (NatureServe 2009).

**Table 4-7: Total Area and Percent Cover of Plant Community Types within the Local Study Area**

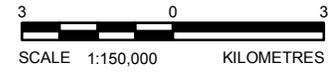
Map Code	Description	Meliadine and F Zone Mine Areas		Discovery Zone Mine Area		Road Area		Total Area of LSA (ha)	Total Percent of LSA
		Area of LSA (ha)	Percent of LSA	Area of LSA (ha)	Percent of LSA	Area of LSA (ha)	Percent of LSA		
<b>Vegetated Units</b>									
SC	Sedge Community	1136	23%	202	36%	642	24%	1980	24%
BS	Birch Seep	105	2%	79	14%	94	4%	278	3%
RW	Riparian Willow or Birch	7	<1%	2	<1%	5	<1%	14	<1%
HT	Heath Tundra Community	2262	45%	144	26%	935	35%	3341	40%
LHc	Lichen-Heath ( <i>Cetraria</i> Lichen)	216	4%	48	8%	199	8%	463	6%
LHh	Lichen-Heath (Hair Lichen)	210	4%	65	11%	255	10%	530	6%
LR	Lichen-Rock Community	21	<1%	10	2%	104	4%	134	2%
<i>Vegetated subtotal</i>		<i>3957</i>	<i>78%</i>	<i>550</i>	<i>97%</i>	<i>2234</i>	<i>84%</i>	<i>6741</i>	<i>82%</i>
<b>Un-vegetated Units</b>									
U	Un-vegetated (Sand)	1	<1%	1	<1%	25	1%	27	<1%
DS	Disturbed	<1	<1%	0	0%	0	0%	<1	<1%
W	Water	1083	21%	13	2%	385	15%	1482	18%
<i>Un-vegetated subtotal</i>		<i>1084</i>	<i>22%</i>	<i>14</i>	<i>3%</i>	<i>411</i>	<i>16%</i>	<i>1509</i>	<i>18%</i>
<b>Total</b>		<b>5041</b>	<b>100%</b>	<b>565</b>	<b>100%</b>	<b>2645</b>	<b>100%</b>	<b>8251</b>	<b>100%</b>

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**LEGEND**

- |                         |                                |                                |
|-------------------------|--------------------------------|--------------------------------|
| Camp                    | Plant Community Classification | Lichen-Heath (Cetraria Lichen) |
| Proposed Mine Site      | Sedge Community                | Lichen-Heath (Hair Lichen)     |
| Road - Existing         | Birch Seep                     | Lichen-Rock Community          |
| Proposed Road           | Riparian Willow or Birch       | Unvegetated (Sand)             |
| Watercourse             | Heath Tundra Community         | Disturbed                      |
| Local Study Area - Mine | Water                          | Water                          |
| Local Study Area - Road |                                |                                |
| Waterbody               |                                |                                |



**REFERENCE**

Base data obtained from Comaplex Minerals Corporation. Vegetation data obtained from field survey.  
 Projection: UTM Zone 15 Datum: NAD 83

**DRAFT**

PROJECT  
**COMAPLEX** MINERALS CORP  
 COMAPLEX MINERALS CORPORATION  
 MELIADINE GOLD PROJECT  
 NUNAVUT

TITLE  
**LOCAL STUDY AREA PLANT  
 COMMUNITY CLASSIFICATION**

 Golder Associates Edmonton, Alberta	PROJECT NO. 09-1373-0010		PHASE No. 1000		
	DESIGN	LV	29 Oct. 2009	SCALE AS SHOWN	REV. 0
	GIS	CDB	29 Oct. 2009		
	CHECK	LV	22 Nov. 2009		
		REVIEW	CO	22 Nov. 2009	

**FIGURE 4-3**



#### 4.3.1.1 Sedge Community

The sedge community is found adjacent to lakes and streams on very poorly drained soils and 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. The presence of surface water is essential to the maintenance of sedge communities (Bliss et. al. 1973) and in most cases, sedge wetlands develop where the percentage of boulders in the soil is less than 40%. However, in some cases, sedge communities may blend into the surrounding heath tundra as heath species from the adjacent heath tundra invade the edges of the sedge basins as these basins infill and become drier. Sedge communities are widely distributed across the study area, covering 1980 ha (24%) of the Project and road LSAs, and often form extensive interconnecting networks between ponds, lakes, and streams (Table 4-7, Figure 4-3).

Associated vegetations is typically composed of a mix of tussock-forming species, such as various cotton grasses and sedges (e.g., *Eriophorum vaginatum*, *Carex atrofusca*, and *C. membranacea*) and carpet forming species, such as *C. bigelowii*, *C. rariflora*, *E. angustifolium* that grow individually. Forbs, such as Sudetan lousewort (*Pedicularis sudetica*) and viviparous knotweed (*Polygonum viviparum*), are common in all sedge areas, as are several willows, including *Salix lanata* sp. *calvicola*.

Within the sedge community, 4 non-mappable plant association units were identified as follows:

- Sedge association – emergent (Se);
- Non-tussock sedge association (Snt);
- Tussock sedge association (St); and
- Sedge association – frost scars (Sfs).

These plant associations have developed as a result of variations in landscape topography that influences the amount of water available for plant growth.

#### 4.3.1.2 Birch Seep Community

The birch seep community type occurs in a variety of landscapes on imperfectly to poorly drained soils, such as the edges of solifluction lobes, on the slopes of some eskers where water flows out of the esker materials, and in stream valleys. Birch seeps may also occur at the transition to some sedge associations and as shrublands in slightly drier habitats, such as on esker slopes. The birch seep community is uncommon in the study area and only accounts for 278 ha (3%) and is primarily found through the Project and road LSAs (Table 4-7, Figure 4-3).

The birch seep community is characterized by dense mats of swamp birch (*Betula nana*), which can form extensive miniature forests over the surface of the tundra landscape. Where birch cover is extremely dense, there may be little to no understory vegetation, just ground covered with old birch leaf litter. In exposed areas, swamp birch may occasionally form prostrate shrubs over fairly large areas as a result of the pruning actions of wind and blowing snow.

Birch seep communities are typically associated with an understory of black crowberry, arctic blueberry, and occasionally arctic wintergreen (*Pyrola grandiflora*), one-side wintergreen (*Orthilia secunda*), as well as various lichen species including *Cladonia squamosa* and *Lecidea* sp. Willows such as Lanate Willow (*Salix lanata* ssp.