Geologic Hazard Rankings
Pelly Crossing, Yukon
(1:20 000 scale)

HAZARD RANKING

The potential environmental changes identified in the preceding sections of this report can be used to identify current and future landscape hazards in the Pelly Crossing region. The combined properties of surficial material type, landform shape and slope, hydrological regime, climate regime, and permafrost conditions have been used to arrive at a set of hazard 'rankings' that can be used to assess the potential stability of landscape units around the community of Pelly Crossing.

It is important to note that hazard rankings are based on general observations of surface materials, drainage, slope angle, vegetation and the presence of permafrost landforms; limited subsurface information was used in determining hazard rankings. This has resulted in a projected risk ranking that will require geotechnical and/or engineering analyses to quantify.

In classifying polygons, we have taken a precautionary approach and applied a category of higher risk where we are not confident in lower categories. However, every polygon will contain zones of lower and higher risk than the overall polygon classification. It is for this reason that this map should serve only as an initial guide for planning purposes. Any development will still require detailed site investigations.

Based on processes acting on distinct geological units, a hazard ranking of low, medium, or high has been assigned to each geological unit in the hazard map area. Rankings are qualitatively assigned to reflect the following conditions:

Low: Stable landform. Unlikely to be affected by mass movement, thermokarst, subsidence, bank erosion, flooding or instability. These landforms typically consist of gravel or sand, are well drained and have shallow to moderate slopes. Low hazard landforms may contain little to no permafrost and are above the floodplain of the Pelly River. Low hazard landforms are unlikely to become unstable under predicted changes in climate.

Medium: Moderately stable landform. Unlikely to be affected by mass movement, thermokarst, subsidence, bank erosion, flooding or instability. These landforms typically consist of gravel, sand, glacial diamict or colluvial materials. They are well to moderately drained and have shallow to steep slopes. Medium hazard landforms may have moderate amounts of permafrost and may occur within an area of shallow groundwater. Landforms containing permafrost may be susceptible to ground subsidence which could be accelerated by thermal erosion in areas of shallow groundwater. Permafrost thaw may also cause slope instability in some landforms. Medium hazard landforms are likely to become either more or less stable under predicted changes in climate.

High: Unstable landform. Likely to be affected by mass movement, thermokarst, subsidence, bank erosion, flooding or instability. These landforms typically consist of glacial diamicts, colluvium, glaciolacustrine, lacustrine and fluvial deposits. They are generally moderately to poorly drained and have shallow to steep slopes. High hazard landforms may to have a significant thickness of permafrost containing high ice contents, be prone to gravity-induced erosion, and occur within the floodplain of the Pelly River or its tributaries. High hazard landforms are likely to become either more or less stable under predicted changes in climate.

SYMBOLS

- textural sample locations (see Appendix A)
- 00 — polygon identification number (see Appendix C and Table 1 below)
- gravel pit
- water courses
- roads
- elevation contours
- gully
- escarpment

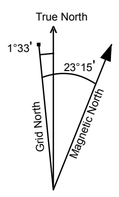
Geological boundaries

- defined boundary
- approximate boundary
- assumed boundary

NOTE: *Linework for map is based on aerial photography from 1989 and may not match basedata (contours, streams) derived from 1:50 000 scale*

Table 1. Hazard or combined hazards for individual polygons on adjacent map.

Polygon number	Landscape Hazards
1	slope stability
2	permafrost
3	slope stability
4	slope stability
5	permafrost
6	permafrost, slope stability
7	shallow groundwater
8	shallow groundwater
9	permafrost
10	permafrost
11	permafrost
12	permafrost, slope stability
13	permafrost, slope stability
14	shallow groundwater
15	shallow groundwater
16	permafrost, slope stability
17	permafrost
18	slope stability
19	permafrost, shallow groundwater
20	shallow groundwater, slope stability
21	flooding risk
22	permafrost
23	negligible
24	negligible
25	negligible
26	permafrost
27	permafrost
28	permafrost, shallow groundwater, slope stability
29	permafrost
30	negligible
31	permafrost, slope stability
32	negligible
33	negligible
34	permafrost
35	negligible
36	slope stability
37	slope stability
38	negligible
39	flooding risk
40	permafrost
41	negligible
42	slope stability
43	flooding risk
44	permafrost, slope stability
45	negligible
46	permafrost
47	flooding risk
48	negligible
49	flooding risk
50	negligible
51	negligible
52	negligible
53	negligible
54	flooding risk
55	slope stability
56	negligible
57	flooding risk
58	shallow groundwater, slope stability
59	flooding risk
60	flooding risk
61	permafrost
62	flooding rist
63	negligible
64	negligible
65	permafrost
66	flooding risk
67	flooding risk
68	flooding risk
69	flooding risk; riverbank erosion
70	flooding risk; riverbank erosion
71	slope stability
72	permafrost
73	negligible
74	flooding risk
75	flooding risk
76	slope stability
77	slope stability
78	slope stability
79	negligible
80	negligible
81	slope stability
82	slope stability
83	flooding risk; riverbank erosion
84	slope stability
85	flooding risk; riverbank erosion
86	flooding risk; permafrost
87	slope stability
88	negligible
89	negligible
90	flooding risk
91	negligible
92	negligible
93	flooding risk
94	flooding risk
95	flooding risk
96	flooding risk
97	slope stability
98	slope stability
99	slope stability
100	flooding risk
101	flooding risk
102	negligible
103	flooding risk
104	negligible
105	slope stability
106	negligible
107	permafrost, shallow groundwater, slope stability
108	slope stability
109	permafrost, shallow groundwater, slope stability
110	flooding risk
111	permafrost, slope stability
112	permafrost, shallow groundwater
113	flooding risk, slope stability
114	slope stability
115	flooding risk
116	negligible
117	flooding risk
118	slope stability
119	slope stability
120	permafrost
121	permafrost, slope stability
122	slope stability
123	permafrost, slope stability
124	negligible
125	slope stability
126	permafrost
127	permafrost, slope stability
128	permafrost
129	slope stability
130	flooding risk
131	permafrost, slope stability



Use diagram only to obtain numerical values
APPROXIMATE MEAN DECLINATION
FEBRUARY 2011 FOR CENTRE OF MAP

GEOLOGIC HAZARD RANKINGS

PELLY CROSSING, YUKON

part of NTS 115I/15

SCALE 1:20 000

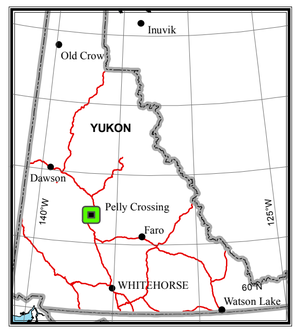
0 0.25 0.5 1 1.5 2
kilometres

1:50 000-scale topographic base data produced by CENTRE FOR TOPOGRAPHIC INFORMATION, NATURAL RESOURCES CANADA

ONE THOUSAND METRE GRID
Universal Transverse Mercator Projection

CONTOUR INTERVAL 100 FEET
Elevations in feet above Mean Sea Level

115P/03 COLDSPRING MOUNTAIN	115P/02 WILLOW LAKE	115P/01 CRYSTAL LAKE
115I/14 VOLCANO MOUNTAIN	115I/15 MAP LOCATION	115I/16 STODDART CREEK
115I/11 DARK CREEK	115I/10 MINTO	115I/09 PTARMIGAN MOUNTAIN



This map accompanies the report "Pelly Crossing Landscape Hazards: Geological Mapping for Climate Change Adaptation Planning" released in 2011 by the Northern Climate Exchange, Yukon Research Centre, Yukon College. For copies of the report, or additional information, please contact Lacia Kinnear at lkinnear@yukoncollege.yk.ca.