APPENDIX 9-F
KSM PROJECT TERRAIN STABILITY FIELD ASSESSMENT OF THE PROPOSED COULTER CREEK, TEIGEN CREEK AND TUNNEL SPUR ACCESS ROADS

BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

SEABRIDGE GOLD INC.

KSM PROJECT

TERRAIN STABILITY FIELD ASSESSMENT OF THE PROPOSED COULTER CREEK, TEIGEN CREEK, AND TUNNEL SPUR ACCESS ROADS

FINAL

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November 30, 2010

Project No. 0638-005

Brent Murphy, M.Sc., P.Geo.
Seabridge Gold Inc.
106 Front Street East
Toronto, Ontario, M5A 1E1

Dear Mr. Murphy,

Re: Terrain Stability Field Assessment of the Proposed Coulter Creek, Teigen Creek and Tunnel Spur Access Roads

Please find attached two copies of our above referenced final report dated November 30, 2010. It contains the geotechnical design prescriptions resulting from helicopter and ground inspections of select sections of the proposed access roads.

Yours sincerely,

BGC ENGINEERING INC.
per:

Sam Fougère, M.Sc., P.Geo.
Engineering Geologist

EXECUTIVE SUMMARY

Seabridge Gold Inc. (Seabridge) is developing the Kerr-Sulphurets-Mitchell (KSM) copper-gold deposit located about 70 km north of Stewart, in the Coast Mountains of northwest British Columbia. As a follow-up to terrain stability mapping Seabridge retained BGC Engineering Inc. (BGC) to complete a terrain stability field assessment (TSFA) for the proposed mine access roads. McElhanney Consulting Services Inc. (McElhanney) designed the proposed access roads and the TSFA was completed for select sections of the proposed roads to help refine the road design and minimize construction triggered slope instability and watercourse sedimentation.

The MOF provides the construction and operation authority for the proposed access road and this assessment and recommendations in this report are intended to support Seabridge's permit application. The TSFA methodology adopted in this report is in general conformance with the B.C. Government's Forest Practices Code Mapping and Terrain Stability Guidebook (MoF 1999), the Forest Road Engineering Guidebook (MoF 2002), the Association of Professional Engineers and Geoscientists of British Columbia's Guidelines for Terrain Stability Assessments in the Forest Sector (APEGBC 2003), Worksafe B.C. regulations for road cut slope stability and generally accepted geotechnical practices in the B.C. forest industry.

This report provides a TSFA for the proposed Coulter Creek, Teigen Creek and Tunnel Spur (Treaty Shoulder) access roads of the proposed KSM project and includes a description of the methodology, results and geotechnical prescriptions for each road section. These geotechnical prescriptions are summarized relative to road chainage for the proposed June 18, 2010 route alignment (McElhanney 2010a). BGC completed a draft TSFA report for the KSM project access roads on August 15, 2010 (BGC 2010) and understands McElhanney used the prescriptions presented in the draft report to adapt and update their road design provided on November 2, 2010 (McElhanney 2010b).

In some cases the road sections of the June 18, 2010 alignment required detailed design prescriptions, mitigation and construction planning well in advance of construction. These sections included (June 18, 2010 alignment KP's):

- Coulter Creek – KP 9+000 to KP 10+300 – active landslide area.
- Coulter Creek – KP 30+320 to KP 30+600 – inactive or dormant landslide area.
- Teigen Creek – KP 8+300 – active landslide area.

BGC understands McElhanney modified the road alignment in these sections in the updated November 2, 2010 road alignments (McElhanney 2010b).

In addition to the specific sites listed above, BGC recommends that all rock cut slope design and support provisions be refined by a qualified professional during construction well in advance of the road heading to minimize the potential for cut slope failures that could disrupt the road construction schedule or expose construction personnel to unsafe working conditions. For rock cuts greater than 10 m in height, or where adverse geologic structure is suspected, we recommend that regular geotechnical review of rock cuts be conducted during construction to confirm cut slope design and stabilization recommendations are appropriate.

In addition, BGC suggests the following criteria for road sections will require detailed geotechnical design and construction planning well before any road construction commences:

- Rock cuts greater than 20 m height.
- Rock cuts traversing slopes greater than 50°.
- Soil cuts traversing slopes greater than 34°.
- Fill slopes greater than 20 m height.

The design and planning of these rock slopes is required to ensure slope stability is maintained during and after construction in the most economical manner with the least environmental impact.

Also, all rock cut faces should be scaled concurrently with construction, and a qualified registered professional engineer or geoscientist should inspect the scaling and make a determination during construction as to whether additional slope stabilization measures are required.

Finally, despite the development of a sound road design and the addition of geotechnical prescriptions for minimizing slope instability and soil erosion, the best designs will not be effective unless the design concepts and prescriptions are effectively communicated to, and understood by, machinery operators and blasting contractors. BGC recommends that sustained supervision of machine operators and blasting contractors by personnel who understand road design principals in order to maximize the benefits of this road design and set of prescriptions.

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LIMITATIONS

BGC Engineering Inc. (BGC) prepared this document for the account of Seabridge Gold Inc. The material in it reflects the judgment of BGC staff in light of the information available to BGC at the time of document preparation. Any use which a third party makes of this document or any reliance on decisions to be based on it is the responsibility of such third parties. BGC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this document.

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1.0 INTRODUCTION

Seabridge Gold Inc. (Seabridge) retained BGC Engineering Inc. (BGC) to complete a terrain stability field assessment (TSFA) for the proposed Coulter Creek, Teigen Creek and Tunnel Spur (Treaty Shoulder) access roads in northwest B.C. McElhanney Consulting Services Inc. (McElhanney) designed the proposed access roads and the TSFA was completed for select sections of the proposed roads to help refine the road design and minimize construction triggered slope instability and watercourse sedimentation. The MOF provides the construction and operation authority for the proposed access roads and this assessment and recommendations in this report are intended to support Seabridge's permit application.

BGC's initial terms of reference are based on a work task summary submitted to Seabridge April 9, 2010, and approved June 3, 2010.

BGC completed the TSFA for the proposed road alignments provided on June 18, 2010 and provided a draft report to Seabridge on August 15, 2010. Since this time McElhanney has updated the proposed access road alignments (provided November 2, 2010 – McElhanney 2010b). Both alignments are provided on maps in Appendix C and unless stated otherwise the road chainages referred to in the remainder of this report refer to the updated November 2, 2010 alignment (McElhanney 2010b).

This report presents the recommendations from the field assessments. This Section is an introduction to the project and background work. Section 2.0 highlights the scope of work and describes the methodology and Section 3.0 summarizes the results. Geotechnical prescriptions are tabulated in Appendix A, Appendix B contains photos of select road sections, and Appendix C includes maps of the review road sections.

1.1. Study Area

The proposed 34 km long Coulter Creek access road (orange line) begins from the closed Eskay Creek Mine Road approximately 20 km northwest of the proposed KSM mine site area (Figure 1). For 20 km the proposed Coulter Creek access road heads south along the Unuk River valley before ascending eastward up Sulphurets Creek to the proposed KSM mine site area. To the northeast of the mine site, the proposed 14 km long Teigen Creek access road (red line) ascends Teigen Creek southward from Highway 37 (Cassiar Highway) towards Seabridge's Seabee Camp at KP 8. To access the proposed Tailings Management Facility (TMF) the proposed Teigen Creek access road enters the southern tributary of Teigen Creek before ascending and traversing a glacial and rock plateau surface to the proposed TMF. The proposed Tunnel Spur access road (yellow line) begins at KP 10 along the proposed Teigen Creek access road and ascends a western tributary of Teigen Creek. From this tributary the proposed 16.7 km long Tunnel Spur access road ascends towards Treaty Shoulder and the proposed mine access and TMF tunnel portals.

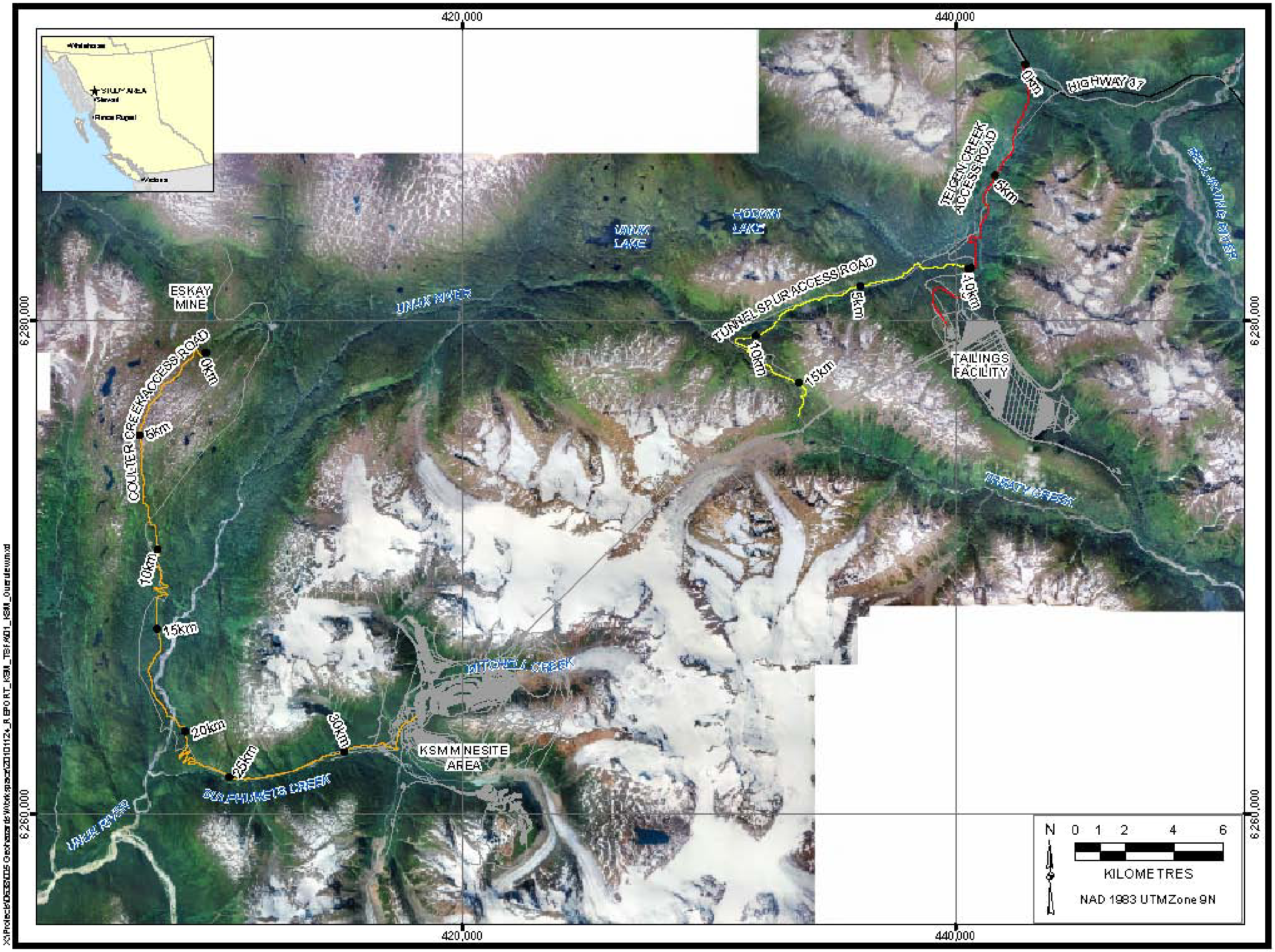

Figure 1. Location Map

1.1.1. Climate and Weather

Climate within the study area is a temperate or northern coastal rainforest, with subarctic conditions at high elevations. The major climatic processes during the fall and winter months include storm fronts arriving from the Pacific Ocean, resulting in precipitation as moist air masses are forced upwards over the Coast Mountains. Most of the precipitation from October through May falls as snow. A more detailed summary of climate at KSM is provided by Rescan (2009).

1.1.2. Bedrock Geology and Physiography

The study area lies within the Stikinia Terrane, one of many fault-bounded blocks of Triassic and Jurassic volcanic arcs that were accreted onto the Paleozoic basement of the North American continental margin in the Middle Jurassic and now form part of the Canadian Cordillera (Monger and Price, 2002). Within the study area the country rock of the Stikinia Terrane is composed mainly of folded and faulted sediments (e.g. sandstones, siltstones), volcaniclastics (e.g. tuffs, pyroclastic breccias), and volcanics (e.g. basalts, andesite flows). Major geological structures and fabrics of the study area include north-south striking steeply dipping faults, gently dipping thrust faults, and east-west striking, moderate to steeply dipping foliation/schistosity. Alteration and mineralization of these country rocks has occurred following intrusions of Jurassic monzonite, granite, and diorite porphyritic rocks.

1.1.2.1. Coulter Creek Access Road

As shown in Figure 1, the proposed Coulter Creek access road is intended for mine material supply and access. Starting at the Eskay Creek Mine Road, the proposed access road ascends a sparsely vegetated glacial surface underlain by glacial till, colluvium and linear bedrock exposures. Small to moderate sized glacial lakes form in depressions adjacent to this road section and are interspersed by north-south trending linear bedrock ridges and exposures. South of KP 5 the proposed access road descends through more incised sections of Coulter Creek towards the lower valley slopes of the Unuk River by KP 16. The proposed alignment crosses the Unuk River at about KP 19 before ascending eastward towards Sulphurets Valley through a series of switchbacks (KP 21 to KP 23). BGC understands that the Unuk River crossing location (McElhanney 2010a – June 18, 2010 alignment) moved upstream approximately 1 km to accommodate ecologically sensitive areas adjacent to the Unuk River banks along the proposed alignment (McElhanney 2010b). While ascending the lower slopes of the Sulphurets Valley the proposed access road corridor traverses areas prone to rock fall, debris flow, and snow avalanche hazards. At about KP 32 the proposed road heads northeast ascending towards the Mitchell and McTagg valleys of the proposed mine area.

1.1.2.2. Teigen Creek Access Road

The proposed Teigen Creek access road is intended for material supply and access to the TMF in the southern tributary of Teigen Creek. From Highway 37 the proposed access road heads south and ascends Teigen Creek traversing the lower western valley slopes to KP 3. South of KP 3, the proposed access road traverses Teigen Creek's lower valley eastern slopes to KP 8 where it crosses a southern tributary of Teigen Creek, before ascending and traversing a glacial and rock plateau surface to the proposed north dam of the TMF at KP 14.

1.1.2.3. Tunnel Spur Access Road

The proposed Tunnel Spur access road is intended to be a temporary summer only road accessing mine tunnel portals near Treaty Shoulder, the drainage divide between Unuk River and Treaty Creek. Leaving the proposed Teigen Creek access road at KP 10 the 16.7 km long Tunnel Spur access road heads westward across a glacial surface before ascending into a steep western Tiegen Creek tributary valley (KP 3 to KP 11). At KP 11 the access road ascends to sub-alpine meadows and sparsely forested areas underlain by glacial till, colluvium and rock interspersed by small glacial lakes to KP 16.7.

1.2. Previous Studies – Terrain Stability Mapping

Terrain, terrain stability and erosion potential mapping along the road corridor was carried out at a detailed level (TSIL C) by BGC along the proposed road corridor using B.C. Provincial Terrain Stability Mapping standards (RIC 1996, Howes and Kenk 1997, and MoF 1999) and 1:15,000 scale aerial photographs. A report and accompanying 1:20,000 scale terrain and interpretive maps (BGC 2010a) were produced that included the following information for each polygon:

- Surficial materials and their textures;
- Surface expression (slope shape);
- Geomorphological processes;
- Slope gradient;
- Slope drainage;
- Rating of the likelihood of landslides following road construction (terrain stability classification I to V); and,
- Rating of the potential for surface erosion to transport sediment to valley bottom streams (potential sediment delivery).

Debris flows, debris floods, debris slides, rock falls, and rock slides impacting the proposed road corridors were identified and mapped to assist with route selection and follow-up studies.

The correlation between slope class (1 to 5), surficial material type, and terrain stability class (I-V) used in this work is presented in Table 1. A description of the terrain stability classes and their susceptibility to slope instability is presented in Table 2. The correlation between surface erosion potential, slope class (1 to 5), and proximity to an active watercourse is presented in Table 3.

Table 1. Slope Class and Terrain Stability Class Correlation (BGC 2010a)

<table>
<tr><th rowspan="3">Terrain Stability Class</th><th colspan="6">Slope Class</th></tr>
<tr><th>1</th><th>2</th><th>3</th><th colspan="2">4</th><th>5</th></tr>
<tr><th>0.5%
(0-3°)</th><th>6-27%
(3-15°)</th><th>28-49%
(15-26°)</th><th>50-60%
(26-30°)</th><th>61-70%
(31-35°)</th><th>>70%
(>35°)</th></tr>
<tr><td>I</td><td>Mv, Mb; F^{G}p, F^{G}u; Fp; L^{G}p, L^{G}u; Rp, Ru</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">II</td><td></td><td>Rj, Ru</td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>Mv, Mb; F^{G}f, F^{G}u, F^{G}j; Ff, Fj; Cf; Dv; L^{G}j, L^{G}u</td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="5">III</td><td></td><td colspan="3">Ruh, Rum, Rur with Mw, Cv, Ra</td><td></td><td></td></tr>
<tr><td></td><td colspan="3">L^{G}a</td><td></td><td></td></tr>
<tr><td></td><td colspan="4">Mv, Mb; F^{G}ak, F^{G}a; Cv, Cb</td><td></td></tr>
<tr><td></td><td></td><td></td><td colspan="2">aCk;Rk</td><td></td></tr>
<tr><td></td><td colspan="4">L^{G}a</td><td></td></tr>
<tr><td rowspan="3">IV</td><td></td><td></td><td></td><td colspan="3">L^{G}k, L^{G}s</td></tr>
<tr><td></td><td></td><td></td><td colspan="3">Mb-V; Cb-V; (-V refers to dissected slopes)</td></tr>
<tr><td></td><td></td><td></td><td></td><td colspan="2">Mv, Mb; F^{G}k, F^{G}s; Cv;
Cb, L^{G}k, Uks, Us</td></tr>
<tr><td rowspan="2">V</td><td></td><td></td><td></td><td></td><td colspan="2">Mks-V; FGks-V; Cvb-V;
L^{G}ks-V, L^{G}s-V, Uks-V</td></tr>
<tr><td colspan="6">all materials and landforms that are unstable (i.e. include the initiation zone of mass movements:
-F”, -R”s, and/or –R”b*)</td></tr>
</table>

Table 2. Terrain Stability Classification (BGC 2010a)

Terrain Stability Class	Interpretation	Likelihood of Landslide Initiation
I	• No significant stability problems exist.	Negligible
II	• There is a very low likelihood of landslides following timber harvesting or road construction. • Minor slumping is expected along road cuts, especially for one or two years following construction.	Very Low
III	• Minor stability problems can develop • Timber harvesting should not significantly reduce terrain stability. There is a low likelihood of landslide initiation following timber harvesting. • Minor slumping is expected along road cuts, especially for one to two years following construction. There is a low likelihood of landslide initiation following road building. • A field inspection by a terrain specialist is usually not required.	Low
IV	• Expected to contain areas with a moderate likelihood of landslide initiation following timber harvesting or road construction. Wet season construction will significantly increase the potential for road-related landslides. • A field inspection of these areas is to be made by a qualified terrain specialist prior to any development, to assess the stability of the affected area.	Moderate
V	• Expected to contain areas with a high likelihood of landslide initiation following timber harvesting or road construction. Wet season construction will significantly increase the potential for road-related landslides. • A field inspection of these areas is to be made by a qualified terrain specialist prior to any development, to assess the stability of the affected area.	High

As part of TSIL C approximately 25% to 50% of the mapped polygons were field checked by air and on the ground in July 2010 by BGC (BGC 2010b). BGC's work focused on polygons intersecting the road alignment that were identified as unstable and/or subject to the geohazards listed above. A list of these sites was supplied in the BGC (2010a) report and follow-up recommended mitigation options are provided in this report. Snow avalanche consultants Alpine Solutions Avalanche Services identified areas along the road alignments subject to snow avalanches (BGC 2010a).

Map users should be aware that the minimum size of terrain polygons in the TSIL study area is about 2 ha. Thus local variations in terrain conditions over areas of 2-3 ha, or over distances of less than about 150 m, were not identified or mapped separately. As a result, there may be variation in slope steepness, material characteristics and soil moisture within individual polygons. This implies that more detailed planning of road alignments will require careful ground checking in order to identify sites that may be more sensitive to disturbance than the average conditions mapped for an individual polygon. This local variability is one of the main reasons that site-specific TSFA work is conducted.

1.2.1. Potential Sediment Delivery

Estimates of potential sediment delivery to streams were made for polygons that were assigned high or very high surface erosion potential. Interpretations for potential sediment delivery to streams range from “very low” (vl) to “very high” (vh). It is the likelihood that sediment will be transported to a permanent stream, should soil erosion occur in a terrain polygon. This term is synonymous with the terms “sediment transfer” or “risk of sediment delivery” in some Ministry of Forests guidebooks (e.g. MoF 1999). The criteria used for assessment of potential sediment delivery (BGC 2010a) are shown in Table 3 and involve three factors:

1. Polygon steepness. The potential sediment delivery interpretation is higher for steeper slopes, because steeper slopes have a relatively higher ability to transport sediment.
2. Period of flow of the nearest stream. The likelihood that sediment will be transported to a main creek depends on whether the stream flows for the entire year, or only during periods of snowmelt and storms. Potential sediment delivery ratings are higher for polygons near permanent streams. For interpretation purposes, streams are classified as “major” or “minor”. Minor streams are ephemeral streams that may not contain water in the drier summer months, and flow in direct response to local precipitation and snowmelt. Major streams are defined as follows:
    - All streams with permanent flow that are clearly visible on an air photograph and have a substantial catchment basin that likely have continuous flow.
    - Lakes, ponds, and standing water.
3. Proximity and “connection” of the polygon to the nearest stream. Polygons near streams are generally given higher sediment delivery ratings, unless terrain exists between the polygon and the stream where sediment may deposit. The latter is referred to as the “connection” of the polygon to the nearest stream.

Table 3. Guidelines for Assessing Potential Sediment Delivery (BGC 2010a)

Class	No stream channel in or adjacent to polygon	Minor stream channel in or adjacent to polygon	Major stream channel in or adjacent to polygon
Very Low (**vl**)	gentle to steep slope		
Low (**l**)		gentle slope	
Moderate (**m**)		moderate slope	gentle slope
High (**h**)		steep slope	moderate slope
Very High (**vh**)			steep slope

1.3. Previous Studies – Route Selection and Road Design

In 2009 McElhanney used aerial photography and LiDAR survey data to select preliminary road centrelines (P-lines) for each access road (dated June 18, 2010) (McElhanney 2010a). In July 2010, McElhanney field reviewed the proposed P-lines and considered re-alignments to minimize exposure to sensitive areas identified in environmental assessments (Rescan 2009), existing geohazards (BGC 2010a), and to take advantage of terrain identified by BGC (BGC 2010a). McElhanney's proposed June 18, 2010 alignment, design, cut-and-fill sections (McElhanney 2010a) were used in this follow-up TSFA work described in this report.

1.4. Terrain Stability Field Assessments

A TSFA is an on-site assessment of the potential impact of timber harvesting, road construction, or the construction of excavated or bladed trails on terrain stability (MoF 1999). TSFAs are carried out by terrain stability specialists who are qualified registered professionals (QRPs). TSFAs are triggered by Terrain Stability Mapping (TSM), and are required where the construction activities are planned for slopes mapped as moderate to high likelihood of landslide initiation following road construction (Class IV or V). TSFAs focus on areas where slopes will be modified by road construction and require relatively more intense examination of the ground conditions. The proposed road design drawings should be reviewed in the field during the TSFAs. A proposed road design in Class IV or V terrain, must address, among other requirements, measures to maintain slope stability within the road prism.

For example, given the logging plan, an area mapped at TSIL C as Class IV (Moderate likelihood) may be judged after a TSFA to have a low likelihood of instability. This is because although terrain characteristics meet the criteria for Class IV, carefully located roads on small areas of gentler terrain were recommended to create a low likelihood of post-construction instability. This does not mean the detailed TSM was incorrect but rather more detailed information helped refine the initial assessment. Similarly, a change in the road design during construction could increase or decrease the likelihood of instability as initially judged in a TSFA. For example, a proposed road alignment across an area mapped as Class IV (Moderate likelihood) could be judged to have a "moderate likelihood of instability" with regard to a conventional cut and fill road construction technique, or a low likelihood of instability following incorporation of site-specific engineering prescriptions (adapted from Ryder 2002).

Examples of prescriptions include (adapted from MoF 1999):

- road relocation, or a decision not to build;
- cut and fill slope angles for short and long term stability (i.e. for both worker's and road users safety);
- location and design of spoil or waste areas and end haul areas;
- drainage control or installation of subsurface drainage;
- methods to cross gullies and fish streams;
- road modification, maintenance, and deactivation strategies;
- road sections that will require field review and/or supervision by a QRP during construction; and,
- road construction techniques such as:
    - for single season use of the road, 1/2 bench construction with no end haul;
    - followed by full pullback of road fill after harvesting of over steepened fills for single-season use of the road;
    - use of wood for fill support for short-term roads;
    - over steepened cuts with modified drainage control to manage minor sloughing;
    - 3/4 bench construction with end haul and replacement of finer material with coarse rock fill;
    - full bench construction with 100% end haul and water management;
    - designed retaining wall structures to support cut or fill slopes; and,
    - designed fills that incorporate special requirements for compaction of the fill or reinforcement of the fill with geosynthetics.

2.0 PROJECT SCOPE AND METHODOLOGY

2.1. Project Scope

This report is limited to the proposed Coulter Creek access road between KP 0 and KP 34, the proposed Teigen Creek access road between KP 0 and KP 14, and the proposed Tunnel Spur access road between KP 0 and KP 16.7. It addresses mine access roads only, described above, and does not address mine haul roads. Road sections crossing debris flow/flood susceptible creeks and rivers, rock fall and snow avalanche paths were assessed by BGC (2010a and 2010b) and others and were not assessed in this TSFA.

2.2. Methodology

The proposed methodology is outlined below and is in general conformance with:

- Requirements detailed in the B.C. Government's Forest Practices Code Mapping and Terrain Stability Guidebook (MoF 1999) and Forest Road Engineering Guidebook (MoF 2002);
- APEGBC Guidelines for Terrain Stability Assessments in the Forest Sector (APEGBC 2003);
- Worksafe BC regulations for road cutslope stability; and,
- Generally accepted geotechnical practices in the B.C. forest industry.

The methodology for determining which road sections require ground-based TSFA is shown in Figure 2. This methodology involved an office and helicopter assessment to help identify which road sections required a ground assessment. The methodology for these two tasks is described below.

2.2.1. Office Assessments

Office study consisted of a three-step process to refine a list of road sections and cross sections requiring TSFA:

1. Re-inspection of the aerial photos and terrain stability maps (BGC 2010a).
2. Assess risk to downslope fisheries resources.
3. Identify road cross sections with anomalous cut and fill heights.

The first step consisted of careful review of the terrain stability maps and, under a stereoscope, of the annotated air photos showing BGC's original TSM. The purpose of this review was to gain insight into the accuracy and limitations of the mapping such as understanding the terrain variability and texture of the soils within the Class IV and V polygons.

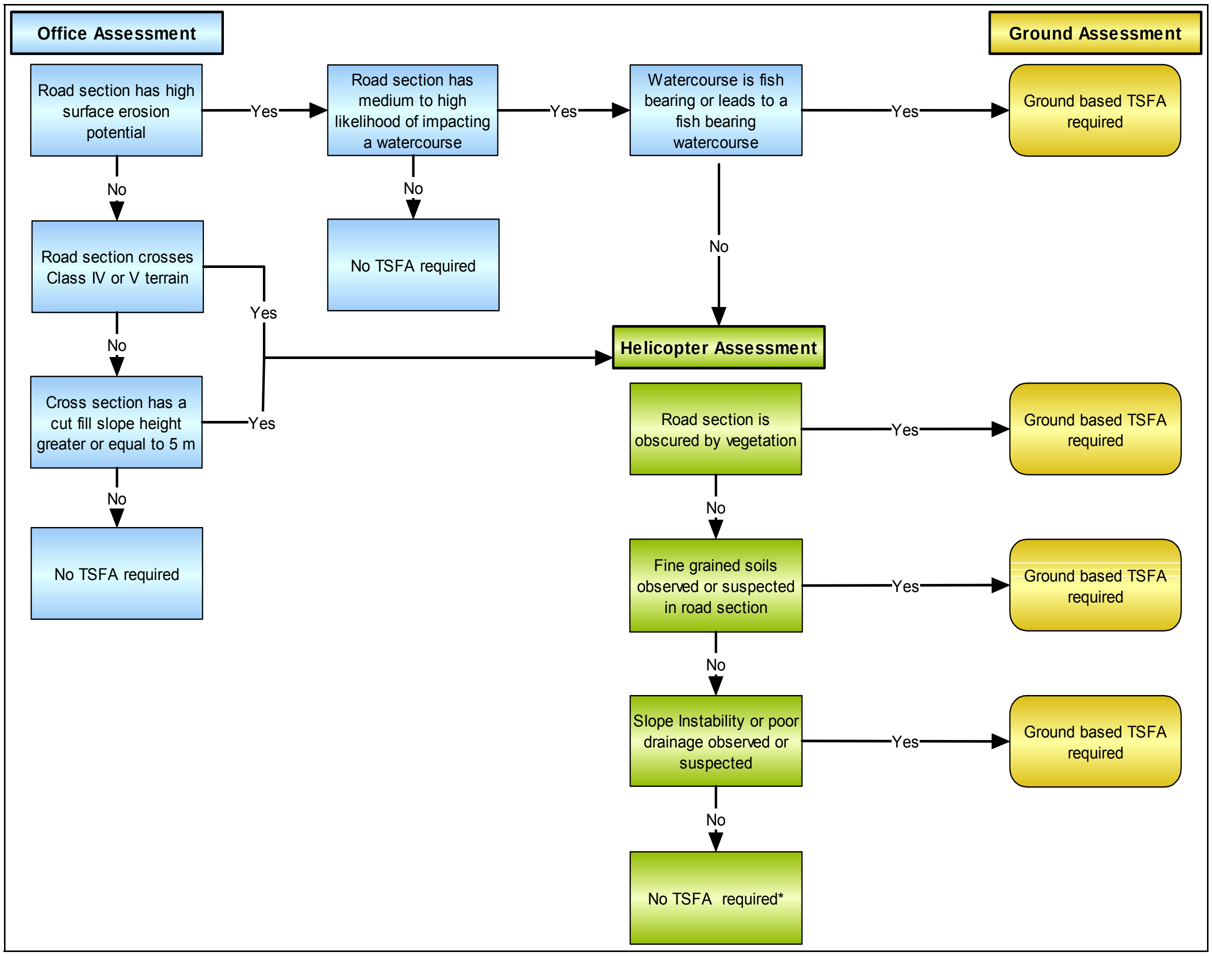

Figure 2. Flow Chart Describing Logic for Selecting Road Sections for Ground Based TSFA.

Secondly, surface erosion potential of polygons was reviewed in stereo airphotos and TRIM topographic data was used to subjectively estimate the potential landslide runout and the risk to downslope streams, rivers, small lakes and swampy areas.

Finally, every proposed road section provided by McElhanney (2010a), regardless of Terrain Stability Class, was reviewed in the office. Cross sections were flagged for TSFA if the cross section called for a cut or fill slope height in soil ≥ 5 m.

Figure 3 and Figure 4 are examples of typical road sections flagged, and not flagged, for TSFA, respectively. The road section in Figure 3 (Coulter Creek KP 7+920; June 18, 2010 alignment) is at least an 18 m high soil fill on a moderate slope. Figure 4 (Coulter Creek KP 21+300; June 18, 2010 alignment) is a 4-5 m high fill slope that is buttressed at the toe by a concave break in slope.

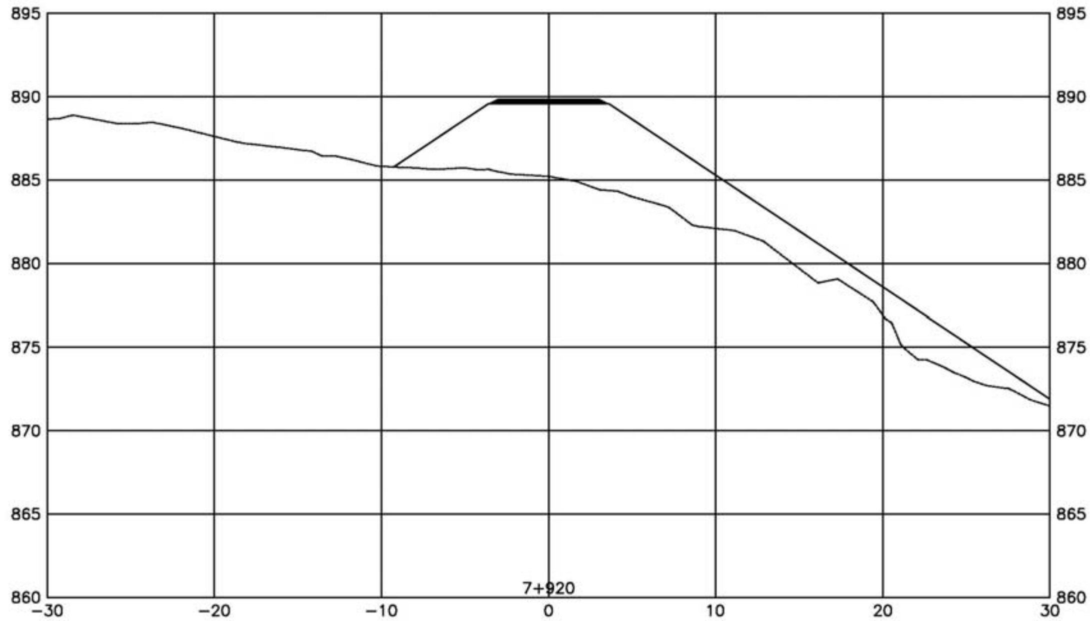

Figure 3. Example of a Proposed Road Section that was Flagged for Field Review

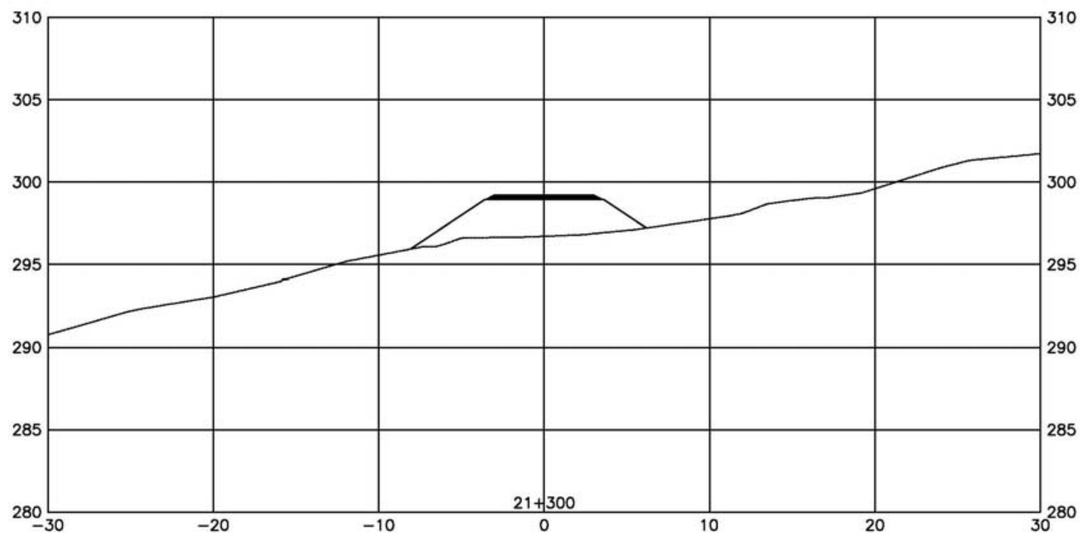

Figure 4. Example of a Proposed Road Section that was not Flagged for Field Review

2.2.2. Helicopter Assessments

Helicopter and ground-based field assessments were carried out by Ms. Jennifer Day and Mr. Sam Fougère, P.Geo., of BGC between July 23 and July 27, 2010. No snow was on the ground during the field assessments.

To start, all road sections and cross sections identified in the office assessment were reviewed during a "low and slow" helicopter reconnaissance to help confirm soil type, drainage, and potential to impact downstream watercourses. Road sections and cross sections;

- crossing soil,
- crossing poorly drained areas,
- containing evidence of slope instability,
- with potential to impact a downslope watercourse, and/or
- obscured by vegetation,

were selected for ground-based TSFA. The road sections observed crossing blocky talus or bedrock were assigned a lower priority for ground-based TSFA because blocky talus was not, in relative terms, expected to be a significant terrain stability issue. Additionally, rock cuts are common throughout this road alignment and remedial methods such as scaling and rock bolting will be implemented during construction as directed by an onsite QRP.

2.2.3. Ground Assessments

Ground assessments required helicopter set-outs and walking the P-line (preliminary line) along the identified road sections. Several road sections were not accessible on the ground due to unsafe helicopter landing areas, difficult access to the road section, thick brush, or required long (>2 km) foot traverses to reach the road section. However, the following was noted during the ground assessments to help assess the current stability of the slope and assess how the slope will perform during and after road construction:

- P-line chainage on the field flagging and GPS location.
- Slope gradients and shape.
- Soil drainage, texture, and thickness.
- Presence/absence of rock.
- Vegetation type and condition (deformation, tilting, etc.).
- Presence/absence of favourable terrain for road re-alignment, road fill support, or water discharge.
- Geomorphology down slope of the road cut to help assess the likelihood of eroded soil reaching a watercourse.
- Road sections that will require more detailed investigations and/or supervision by a QRP during construction.

Information on the subsurface soil, groundwater and bedrock conditions were gathered from hand-dug test holes, gully side walls, bedrock outcrops and root balls of fallen trees. No subsurface information from deep test pits or drill holes was obtained.

Stability of cut and fill soil slopes in steep terrain is closely linked to the depth of soils over bedrock and gradation of the soil. TSFA work is based on the surface assessment of materials and natural exposures, so this assessment is subject to change as bedrock and soil is exposed and re-assessed during construction supervision by a QRP.

3.0 RESULTS

Prescriptions are summarized relative to the June 18, 2010 P-line (McElhanney 2010a) chainage in Appendix A. Table 4 summarizes the types of prescriptions proposed for this road alignment. We understand that McElhanney has used these prescriptions to adapt their June 18, 2010 road design – road sections that required detailed design prescriptions, mitigation and construction planning well in advance of construction are listed in Section 3.1. Photographs of select road sections are provided in Appendix B. For further reference, maps showing the terrain stability polygons, soil type, surface erosion potential, and GPS points of ground traverse and both the June 18, 2010 and updated November 2, 2010 proposed road alignments are provided in Appendix C.

These prescriptions assume that McElhanney has used the following angles in their preliminary cut and fill slope designs:

Soil Cuts:	1.5H:1V (34°)
Combination Soil and Bedrock Cuts, Talus:	1H:1V (45°)
Bedrock Cuts:	0.25H:1V (76°)
Angle of repose for rock and soil fill slopes:	1.4H:1V (36°)

3.1. Road Sections Requiring Detailed Design In Advance of Construction

In some cases road sections of the June 18, 2010 alignment required detailed design prescriptions, mitigation and construction planning well in advance of construction. These sections included (June 18, 2010 alignment KP's):

- Coulter Creek – KP 9+000 to KP 10+300 – active landslide area.
- Coulter Creek – KP 30+320 to KP 30+600 – inactive or dormant landslide area.
- Teigen Creek – KP 8+300 – active landslide area.

BGC understands McElhanney modified the road alignment in these sections in the updated November 2, 2010 proposed road alignments (McElhanney 2010b).

Photographs of these road sections are provided in Appendix B.

Table 4. Summary of Geotechnical Prescriptions Proposed in this Report

Avoid the Potential Slope Instability	
A	Consider re-routing around slope instability.
Landslide Area - Coulter Creek Access Road KP 9+500 - KP 10+000 (June 18, 2010 KP's)	
B	Consider re-routing around active landslide area by re-aligning road between KP 9+000 and KP 10+300 (consider moving road centreline approximately 250 m east). November 2, 2010 alignment centreline moved approximately 250 m eastward to avoid this hazard.
Avoid Large Fill Slopes	
C	Consider re-routing alignment to avoid large fill sections.
Inactive Landslide Area - Coulter Creek Access Road KP 30+320 - KP 30+600) (June 18, 2010 KP's)	
D	Confirm construction plan with QRP before crossing this dormant or inactive landslide area. Ensure the road prism is constructed of fill across the dormant or inactive landslide area. Do not cut into the slope. Ensure adequate and efficient slope drainage. Monitor slope for movement as specified by a QRP.
Potential Flooding	
E	Consider placing rip rap at the base of the fill slopes for the length of the flood plain to design flood level elevation.
> 10 m High Soil Cut	
F	Consider site specific geotechnical review of soil cuts by a QRP in advance of construction to confirm cut slope angle and refine surface water management design.
> 10 m High Bedrock Cut	
G	Consider site specific geotechnical review of rock cuts by a QRP in advance of construction to confirm cut slope angle and refine support or rock fall protection.
> 10 m High Fills	
H	Consider site specific geotechnical review of fill footprint foundation conditions by a QRP in advance of construction to confirm fill slope angles and comment on potential fill slope settlement or bearing capacity failure.
No Prescription Required	
I	No prescription required at this time.

Also, BGC recommends the following screening criteria be applied to road sections requiring detailed design and construction planning well before (several months) any construction commences:

- Rock cuts greater than 20 m height.
- Rock cuts traversing slopes greater than 50°.
- Soil cuts traversing slopes greater than 34°.
- Fill slopes greater than 20 m height.

The design and planning is required to ensure slope stability is maintained during and after construction in the most economical manner with the least environmental impact.

3.2. Rock Slope Stabilization

Stability of rock slopes is largely dependent on the number, frequency, orientation and conditions of discontinuities (joints, faults) in the rock mass. For cuts greater than 10 m in height, or where adverse geologic structure is suspected, we recommend that rock cut slope design and support provisions be refined by a QRP in advance of the road heading. The primary purpose of this work is to minimize the potential for cut slope failures that could disrupt the road construction schedule. In addition, BGC recommends that geotechnical review and detailed engineering design of rock cuts greater than 20 m high and soil or rock cuts traversing slopes greater than 50° be conducted well before (several months) any road construction commences.

The proposed road alignment crosses a significant length of rock cut slopes greater than 5 m high. Not all of these slopes could be reviewed in the field during the TSFA mainly due to the challenging access. BGC's review of the road design cross-sections indicates that, in most cases, rock slopes with potential rock fall sources will be excavated during road construction and the potential problems may be removed. The face of the cuts should be scaled concurrently with construction, and a QRP should inspect the scaling and make a determination during construction as to whether additional slope stabilization measures are required. These stabilization measures primarily consist of spot bolting of potential planar or wedge failure blocks with 25 mm diameter, tensioned, resin grouted, galvanized rock bolts in various lengths, up to a maximum of 6 m. Additional slope stabilization measures may include localized trim drilling and blasting.

Measures to protect the road or vehicles may include wider/deeper ditches, engineered walls, and mesh/nets draped over the rock face. Controlled blasting techniques may be required during rock excavation of the final cut slope face to avoid excessive disturbance in areas where potential planar and wedge failures have been identified.

3.3. Road Construction Supervision

Despite the development of a sound road design and the implementation of geotechnical prescriptions for minimizing slope instability and soil erosion, the best designs will not be effective unless the design concepts and prescriptions are effectively communicated to, and understood by, machinery operators and blasting contractors. BGC recommends that sustained supervision of machine operators and blasting contractors by personnel who understand road design principals in order to maximize the benefits of this road design and set of prescriptions.

Again, BGC recommends that regular geotechnical review of rock cuts greater than 10 m high be conducted in advance of road construction to confirm cut slope design and stabilization recommendations. BGC also recommends geotechnical review and design of rock cuts greater than 20 m high and soil or rock cuts traversing slopes greater than 50° be conducted well before (several months) any road construction commences.

This report is limited to fill and cut slope stability and soil erosion susceptibility considerations for the proposed access roads. It is a premise of this report that best practices for road construction, road surface water runoff control, and natural surface water cross drainage provisions will be adopted, and that these requirements are being designed by others. In particular, it is assumed that natural surface water cross drainage will be designed, constructed, and maintained as appropriate to limit erosion, and that road cross slope and ditch gradients will be designed, constructed, and maintained to limit and control road runoff and potential road and ditch erosion, preventing road runoff into fill slopes. It is a premise of this assessment that a QRP will oversee and be responsible for the as-constructed road designs.

4.0 CLOSURE

We trust the above satisfies your requirements at this time. Should you have any questions or comments, please do not hesitate to contact us.

Yours sincerely,

BGC ENGINEERING INC.
per:

Sam Fougère, M.Sc., P.Geo.
Engineering Geologist

Reviewed by:

Mark Leir, P.Eng., P.Geo., (BC/AB)
Senior Geological Engineer

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APPENDIX A

TABULATED RESULTS OF THE TERRAIN STABILITY FIELD ASSESSMENTS

KSM Project - Coulter Creek Access Road (June 18, 2010 alignment - McElhanney 2010b)

<table>
<tr><th rowspan="2">P-Line From (km)</th><th rowspan="2">P-Line To (km)</th><th rowspan="2">Length (km)</th><th rowspan="2">GPS ID</th><th rowspan="2">TSFA Photo Number</th><th rowspan="2">Inspection Type</th><th rowspan="2">Polygon Number</th><th rowspan="2">Terrain Symbol</th><th rowspan="2">Surfical Material</th><th rowspan="2">Stability Class</th><th rowspan="2">Potential Sediment Delivery (Geohazards)</th><th colspan="2">Sediment Source Potential</th><th rowspan="2">Potential Sediment Delivery (TSFA)</th><th rowspan="2">Drainage Class</th><th rowspan="2">Geohazards</th><th rowspan="2">Upslope/ Downslope Angle (°)</th><th rowspan="2">Terrain/Soils/Stability Observations</th><th rowspan="2">Geotechnical Prescription</th><th rowspan="2">Comment</th></tr>
<tr><th>Proximity (*)</th><th>Sediment Source Potential (**)</th></tr>
<tr><td>9.23</td><td>9.68</td><td>0.45</td><td>47-48</td><td>-</td><td>Ground</td><td>476</td><td>Cv</td><td>Colluvium</td><td>IV</td><td>M</td><td>LP</td><td>LS</td><td>Low</td><td>w</td><td>R"s-Rb</td><td>15-20/27</td><td>Colluvium/Rock/Landslide Area</td><td>A and B</td><td>Many pistol-butt conifers but no evidence of recent slope deformation.</td></tr>
<tr><td>9.77</td><td>9.94</td><td>0.17</td><td>51-53</td><td>-</td><td>Ground</td><td>476</td><td>Cv</td><td>Colluvium</td><td>IV</td><td>M</td><td>LP</td><td>LS</td><td>Low</td><td>w</td><td>R"s-Rb</td><td>32/25</td><td>Colluvium/Rock/Active Landslide Area</td><td>A and B</td><td>Many pistol-butt conifers and evidence of recent slope deformation. A 5-10 m wide tension crack, vertically offset 3-5 m, at least 50 m long, is interpreted as a backscarp to a larger rock slope failure.</td></tr>
<tr><td>19.15</td><td>20.03</td><td>0.88</td><td>-</td><td>-</td><td>Helicopter</td><td>604</td><td>Cv//Rks</td><td>Colluvium and Rock</td><td>IV</td><td>M</td><td>LP</td><td>LS</td><td>Low</td><td>w</td><td>-</td><td>-</td><td>-</td><td>F,G and H</td><td>-</td></tr>
<tr><td>25.64</td><td>25.87</td><td>0.24</td><td>-</td><td>-</td><td>Helicopter</td><td>975</td><td>Cv-V</td><td>Colluvium</td><td>IV</td><td>H</td><td>LP</td><td>LS</td><td>Low</td><td>w</td><td>-</td><td>-</td><td>-</td><td>F,G and H</td><td>-</td></tr>
<tr><td>26.06</td><td>26.61</td><td>0.55</td><td>-</td><td>-</td><td>Helicopter</td><td>975</td><td>Cv-V</td><td>Colluvium</td><td>IV</td><td>H</td><td>LP</td><td>LS</td><td>Low</td><td>w</td><td>-</td><td>-</td><td>-</td><td>F,G and H</td><td>-</td></tr>
<tr><td>27.23</td><td>27.28</td><td>0.06</td><td>-</td><td>-</td><td>Helicopter</td><td>735</td><td>Cv/Rs-R"b</td><td>Colluvium and Rock</td><td>IV</td><td>M</td><td>LP</td><td>LS</td><td>Low</td><td>w-r</td><td>R"b</td><td>-</td><td>-</td><td>F,G and H</td><td>-</td></tr>
<tr><td>27.41</td><td>27.48</td><td>0.06</td><td>-</td><td>-</td><td>Helicopter</td><td>777</td><td>Cv-VRd</td><td>Colluvium</td><td>IV</td><td></td><td>MP</td><td>LS</td><td>Low</td><td>m</td><td>Rd</td><td>-</td><td>-</td><td>F,G and H</td><td>-</td></tr>
<tr><td>27.48</td><td>27.88</td><td>0.40</td><td>-</td><td>-</td><td>Helicopter</td><td>778</td><td>Cv-Rb</td><td>Colluvium</td><td>IV</td><td>M</td><td>LP</td><td>LS</td><td>Low</td><td>w</td><td>Rb</td><td>-</td><td>-</td><td>F,G and H</td><td>-</td></tr>
<tr><td>28.05</td><td>28.11</td><td>0.06</td><td>-</td><td>-</td><td>Helicopter</td><td>781</td><td>Cv-Rd</td><td>Colluvium</td><td>IV</td><td></td><td>MP</td><td>LS</td><td>Low</td><td>m</td><td>Rd</td><td>-</td><td>-</td><td>F,G and H</td><td>-</td></tr>
<tr><td>28.11</td><td>28.34</td><td>0.23</td><td>-</td><td>-</td><td>Helicopter</td><td>782</td><td>Cv-Rb</td><td>Colluvium</td><td>IV</td><td>M</td><td>LP</td><td>LS</td><td>Low</td><td>w</td><td>Rb</td><td>-</td><td>-</td><td>F,G and H</td><td>-</td></tr>
<tr><td>31.91</td><td>32.01</td><td>0.10</td><td>-</td><td>-</td><td>Helicopter</td><td>810</td><td>Cv</td><td>Colluvium</td><td>IV</td><td>M</td><td>LP</td><td>LS</td><td>Low</td><td>w</td><td>-</td><td>-</td><td>-</td><td>F,G and H</td><td>-</td></tr>
<tr><td colspan="20">Sites Below Not Assessed As Per TSFA Methodology - Some Sites Assessed To Confirm Ground Conditions</td></tr>
<tr><td>0.00</td><td>1.45</td><td>1.45</td><td></td><td></td><td></td><td>432</td><td>Rhu/Mw|Ruh</td><td>Rock and Till</td><td>II</td><td>M</td><td></td><td></td><td></td><td>w</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>1.45</td><td>1.60</td><td>0.15</td><td></td><td></td><td></td><td>432</td><td>Rhu/Mw|Ruh</td><td>Rock and Till</td><td>II</td><td>M</td><td></td><td></td><td></td><td>w</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>1.60</td><td>1.72</td><td>0.12</td><td></td><td></td><td></td><td>431</td><td>Mw|Rm/Rm</td><td>Rock and Till</td><td>I</td><td>L</td><td></td><td></td><td></td><td>w-i</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>1.72</td><td>3.35</td><td>1.63</td><td></td><td></td><td></td><td>450</td><td>Mw.Mw|Rr</td><td>Rock and Till</td><td>II</td><td>M</td><td></td><td></td><td></td><td>w</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>3.35</td><td>5.13</td><td>1.78</td><td></td><td></td><td></td><td>438</td><td>Mw|Rm.Rm</td><td>Rock and Till</td><td>I</td><td>L</td><td></td><td></td><td></td><td>w-m</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>5.13</td><td>5.94</td><td>0.81</td><td></td><td></td><td></td><td>450</td><td>Mw.Mw|Rr</td><td>Rock and Till</td><td>II</td><td>M</td><td></td><td></td><td></td><td>w</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>5.94</td><td>5.99</td><td>0.05</td><td></td><td></td><td></td><td>448</td><td>Cv/Rk</td><td>Colluvium and Rock</td><td>III</td><td>M</td><td></td><td></td><td></td><td>w</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>5.99</td><td>6.18</td><td>0.18</td><td></td><td></td><td></td><td>818</td><td>FGt</td><td>Glaciofluvial</td><td>III</td><td>L</td><td></td><td></td><td></td><td>m</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>6.18</td><td>6.40</td><td>0.22</td><td></td><td></td><td></td><td>457</td><td>Cv/Rk</td><td>Colluvium and Rock</td><td>III</td><td>M</td><td></td><td></td><td></td><td>w</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>6.40</td><td>6.95</td><td>0.55</td><td></td><td></td><td></td><td>448</td><td>Cv/Rk</td><td>Colluvium and Rock</td><td>III</td><td>M</td><td></td><td></td><td></td><td>w</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>6.95</td><td>7.10</td><td>0.15</td><td></td><td></td><td></td><td>457</td><td>Cv/Rk</td><td>Colluvium and Rock</td><td>III</td><td>M</td><td></td><td></td><td></td><td>w</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>7.10</td><td>7.29</td><td>0.19</td><td>38</td><td>-</td><td>Ground</td><td>448</td><td>Cv/Rk</td><td>Colluvium and Rock</td><td>III</td><td>M</td><td>LP</td><td>LS</td><td>Low</td><td>w</td><td>-</td><td>15-25/15-25</td><td>Colluvium/Swampy over Rock</td><td>I</td><td>Linear colluvium-covered bedrock ridges and swampy areas.</td></tr>
<tr><td>7.29</td><td>7.44</td><td>0.15</td><td>38</td><td>-</td><td>Ground</td><td>457</td><td>Cv/Rk</td><td>Colluvium and Rock</td><td>III</td><td>M</td><td>LP</td><td>LS</td><td>Low</td><td>w</td><td>-</td><td>15-25/15-25</td><td>Colluvium/Swampy over Rock</td><td>I</td><td>Linear colluvium-covered bedrock ridges and swampy areas.</td></tr>
<tr><td>7.44</td><td>7.67</td><td>0.23</td><td>39</td><td>-</td><td>Ground</td><td>448</td><td>Cv/Rk</td><td>Colluvium and Rock</td><td>III</td><td>M</td><td>MP</td><td>LS</td><td>Moderate</td><td>w</td><td>-</td><td>15-25/15-25</td><td>Colluvium/Swampy over Rock</td><td>I</td><td>Rock observed in incised creek 25 m west of road alignment.</td></tr>
<tr><td>7.67</td><td>8.20</td><td>0.53</td><td>40-42</td><td>-</td><td>Ground</td><td>473</td><td>/Mw|Rm</td><td>Rock and Till</td><td>II</td><td>L</td><td>HP</td><td>LS</td><td>Moderate</td><td>w-m</td><td></td><td>0-25/0-25</td><td>Colluvium/Swampy over Rock</td><td>I</td><td>-</td></tr>
<tr><td>8.20</td><td>8.70</td><td>0.50</td><td>43-44</td><td>-</td><td>Ground</td><td>473</td><td>/Mw|Rm</td><td>Rock and Till</td><td>II</td><td>L</td><td>MP</td><td>LS</td><td>Moderate</td><td>w-m</td><td></td><td>15/15-37</td><td>Colluvium/Swampy over Rock</td><td>A</td><td>At KP 8+325 (GPS Point 43), move road 25 m to the west to avoid potential slope instability (2-3 year old, 5-10 m wide debris avalanche landslide scarp at KP 8+325).</td></tr>
<tr><td>8.70</td><td>9.00</td><td>0.30</td><td>45</td><td>-</td><td>Ground</td><td>473</td><td>/Mw|Rm</td><td>Rock and Till</td><td>II</td><td>L</td><td>MP</td><td>LS</td><td>Moderate</td><td>w-m</td><td></td><td><15/<15</td><td>Colluvium/Swampy</td><td>I</td><td>Road alignment 25-50 m away from a moderate sized glacial lake.</td></tr>
<tr><td>9.00</td><td>9.23</td><td>0.23</td><td>46</td><td>-</td><td>Ground</td><td>473</td><td>/Mw|Rm</td><td>Rock and Till</td><td>II</td><td>L</td><td>LP</td><td>LS</td><td>Low</td><td>w-m</td><td></td><td><15/<15</td><td>Colluvium/Swampy</td><td>B</td><td>Road alignment 50 m away from a moderate sized glacial lake.</td></tr>
<tr><td>9.68</td><td>9.77</td><td>0.09</td><td>49-50</td><td>-</td><td>Ground</td><td>479</td><td>Cv/Rs-VR"s</td><td>Colluvium and Rock</td><td></td><td></td><td>LP</td><td>LS</td><td>Low</td><td>w</td><td>R"s-Rb</td><td>32/25</td><td>Colluvium/Rock/Active Landslide Area</td><td>A and B</td><td>Many pistol-butt conifers and evidence of recent slope deformation. A 5-10 m wide tension crack, vertically offset 3-5 m, at least 50 m long, is interpreted as a backscarp to a larger rock slope failure.</td></tr>
<tr><td>9.94</td><td>10.30</td><td>0.36</td><td>54-56</td><td>-</td><td>Ground</td><td>478</td><td>Mwb|Ram</td><td>Rock and Till</td><td>II</td><td>M</td><td>LP</td><td>LS</td><td>Low</td><td>m</td><td>-</td><td><20/<20</td><td>Colluvium/Rock</td><td>A and B</td><td>-</td></tr>
<tr><td>10.30</td><td>10.70</td><td>0.40</td><td>57</td><td>-</td><td>Ground</td><td>478</td><td>Mwb|Ram</td><td>Rock and Till</td><td>II</td><td>M</td><td>LP</td><td>LS</td><td>Low</td><td>m</td><td>-</td><td><20/<20</td><td>Colluvium/Rock</td><td>I</td><td>-</td></tr>
<tr><td>10.70</td><td>11.01</td><td>0.31</td><td></td><td></td><td></td><td>478</td><td>Mwb|Ram</td><td>Rock and Till</td><td>II</td><td>M</td><td></td><td></td><td></td><td>m</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>11.01</td><td>11.08</td><td>0.07</td><td></td><td></td><td></td><td>499</td><td>Mvb</td><td>Till</td><td>III</td><td>M</td><td></td><td></td><td></td><td>w-m</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>11.08</td><td>12.26</td><td>1.18</td><td></td><td></td><td></td><td>424</td><td>Rm.Mw|Rm</td><td>Rock and Till</td><td>II</td><td>M</td><td></td><td></td><td></td><td>w</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>12.26</td><td>12.75</td><td>0.49</td><td></td><td></td><td></td><td>499</td><td>Mvb</td><td>Till</td><td>III</td><td>M</td><td></td><td></td><td></td><td>w-m</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>12.75</td><td>12.84</td><td>0.09</td><td></td><td></td><td></td><td>479</td><td>Cv/Rs-VR"s</td><td>Colluvium and Rock</td><td></td><td></td><td></td><td></td><td></td><td>w</td><td>R"s</td><td></td><td></td><td></td><td></td></tr>
<tr><td>12.84</td><td>13.37</td><td>0.53</td><td></td><td></td><td></td><td>499</td><td>Mvb</td><td>Till</td><td>III</td><td>M</td><td></td><td></td><td></td><td>w-m</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>13.37</td><td>13.41</td><td>0.04</td><td></td><td></td><td></td><td>501</td><td>Cv//Rk</td><td>Colluvium and Rock</td><td></td><td></td><td></td><td></td><td></td><td>w</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>13.41</td><td>13.47</td><td>0.05</td><td></td><td></td><td></td><td>499</td><td>Mvb</td><td>Till</td><td>III</td><td>M</td><td></td><td></td><td></td><td>w-m</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>13.47</td><td>13.49</td><td>0.02</td><td></td><td></td><td></td><td>501</td><td>Cv//Rk</td><td>Colluvium and Rock</td><td></td><td></td><td></td><td></td><td></td><td>w</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>13.49</td><td>14.33</td><td>0.84</td><td></td><td></td><td></td><td>503</td><td>Mbu</td><td>Till</td><td>I</td><td>L</td><td></td><td></td><td></td><td>m</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>14.33</td><td>15.32</td><td>0.99</td><td></td><td></td><td></td><td>502</td><td>Cv/Rks</td><td>Colluvium and Rock</td><td>III</td><td>M</td><td></td><td></td><td></td><td>w</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>15.32</td><td>16.03</td><td>0.72</td><td></td><td></td><td></td><td>511</td><td>Ft</td><td>Fluvial</td><td>I</td><td>L</td><td></td><td></td><td></td><td>m</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>16.03</td><td>16.52</td><td>0.49</td><td></td><td></td><td></td><td>510</td><td>Fp</td><td>Fluvial</td><td>I</td><td>L</td><td></td><td></td><td></td><td>i-m</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>16.52</td><td>16.68</td><td>0.16</td><td></td><td></td><td></td><td>509</td><td>Mb</td><td>Till</td><td>II</td><td>L</td><td></td><td></td><td></td><td>m</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>16.68</td><td>16.77</td><td>0.09</td><td></td><td></td><td></td><td>518</td><td>Cf</td><td>Colluvium</td><td>I</td><td>M</td><td></td><td></td><td></td><td>m</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>16.77</td><td>16.87</td><td>0.10</td><td></td><td></td><td></td><td>509</td><td>Mb</td><td>Till</td><td>II</td><td>L</td><td></td><td></td><td></td><td>m</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

P-Line From (km)	P-Line To (km)	Length (km)	GPS ID	TSFA Photo Number	Inspection Type	Polygon Number	Terrain Symbol	Surfical Material	Stability Class	Potential Sediment Delivery (Geohazards)	Sediment Source Potential		Potential Sediment Delivery (TSFA)	Drainage Class	Geohazards	Upslope/ Downslope Angle (°)	Terrain/Soils/Stability Observations	Geotechnical Prescription	Comment
											Proximity (*)	Sediment Source Potential (**)							
16.87	16.92	0.05				518	Cf	Colluvium	I	M				m					
16.92	17.30	0.38				509	Mb	Till	II	L				m					
17.30	17.38	0.08	35	-	Ground	509	Mb	Till	II	L	LP	MS	Moderate	m	-	-	Till and Rock	A and C	At KP 17+400 (GPS Point 35), move road 25 m to the west to avoid potential slope instability (25-40 m high subvertical rock bluff below KP 17+400). Evidence of recent small planar and wedge rock failures originating from the true right bank of the Unuk River (east of the current road alignment). Proposed road design calls for >33 m fills at both KP 17+400 and KP 17+420.
17.38	17.50	0.12	35	-	Ground	596	Mb	Till	III	M	LP	MS	Moderate	m	-	-	Till and Rock	A and C	At KP 17+400 (GPS Point 35), move road 25 m to the west to avoid potential slope instability (25-40 m high subvertical rock bluff below KP 17+400). Evidence of recent small planar and wedge rock failures originating from the true right bank of the Unuk River (east of the current road alignment). Proposed road design calls for >33 m fills at both KP 17+400 and KP 17+420.
17.50	19.15	1.65				596	Mb	Till	III	M				m					
20.03	20.32	0.29				603	Fp	Fluvial	II	L				i-m					
20.32	20.40	0.08				513	FAp	Fluvial	I					i					
20.40	20.52	0.12				722	Mb	Till	II	M				m					
20.52	20.75	0.24				721	Cv.Mw	Colluvium and Till	III	M				w					
20.75	21.91	1.16				478	Mwb|Ram	Rock and Till	II	M				m					
21.91	22.16	0.25				725	Cv/Mw	Colluvium and Till	III	M				w-m					
22.16	22.46	0.30				602	FGh	Glaciofluvial	II	M				m-i					
22.46	23.43	0.97				725	Cv/Mw	Colluvium and Till	III	M				w-m					
23.43	24.02	0.59				741	Mw|Ru	Rock and Till	I	L				m					
24.02	24.26	0.24				740	Cv	Colluvium						w					
24.26	24.38	0.12				741	Mw|Ru	Rock and Till	I	L				m					
24.38	24.69	0.31				740	Cv	Colluvium						w					
24.69	24.92	0.23	-	-	Helicopter	738	Rs/Cv-R"b	Colluvium and Rock	V	M	-	-	-	w	R"b	-	**Rockfall Potential**	F,G and H	BGC (2010) identified KP 24+920 to KP 25+550 as a Road Hazard Segment (Rockfall).
24.92	24.97	0.05	-	-	Helicopter	739	Cvb-Rb	Colluvium	III	M	-	-	-	w	Rb	-	**Rockfall Potential**	F,G and H	BGC (2010) identified KP 24+920 to KP 25+550 as a Road Hazard Segment (Rockfall).
24.97	25.02	0.06	-	-	Helicopter	738	Rs/Cv-R"b	Colluvium and Rock	V	M	-	-	-	w	R"b	-	**Rockfall and Debris Flow Potential**	F,G and H	BGC (2010) identified KP 24+920 to KP 25+550 as a Road Hazard Segment (Rockfall or Debris Flow).
25.02	25.61	0.58	-	-	Helicopter	739	Cvb-Rb	Colluvium	III	M	-	-	-	w	Rb	-	**Rockfall and Debris Flow Potential**	F,G and H	BGC (2010) identified KP 24+920 to KP 25+550 as a Road Hazard Segment (Rockfall or Debris Flow).
25.61	25.64	0.03				737	Cvb	Colluvium	III	M				w					
25.87	26.06	0.19				737	Cvb	Colluvium	III	M				w					
26.61	26.64	0.03	-	-	Helicopter	734	Cv//Rk	Colluvium and Rock	III	M	-	-	-	w	-	-	-	-	-
26.64	27.23	0.58	-	-	Helicopter	732	Cv-Rb	Colluvium	IV	H	-	-	-	w	Rb	-	**Rockfall and Debris Flow Potential**	F,G and H	BGC (2010) identified KP 26+645 to KP 27+228 as a Road Hazard Segment (Rockfall or Debris Flow).
27.28	27.41	0.13				731	Cv	Colluvium						w					
27.88	28.05	0.17				780	Cv	Colluvium						m					
28.34	29.69	1.35	-	-	Helicopter	784	Cv	Colluvium	III	M	-	-	-	w-m	-	-	**Rockfall and Debris Flow Potential**	F,G and H	BGC (2010) identified KP 28+750 to KP 28+850 and KP 29+150 to KP 29+250 as a Road Hazard Segment (Rockfall or Debris Flow).
29.69	30.06	0.37				774	Cv//Rsk	Colluvium and Rock						w					
30.06	30.29	0.23				804	Cc	Colluvium						w-m					
30.29	31.13	0.83	-	-	Helicopter	843	Mw|Ru	Rock and Till	II	M	-	-	-	m-w	-	-	**Remnant Landslide**	D	BGC (2010) identified KP 30+320 to KP 30+600 as a Road Hazard Segment (Remnant Rotational Slope Failure or Earth Flow). BGC (2010) identified KP 30+600 to KP 31+900 as a Potential Road Hazard Segment (Flooding).
31.13	31.20	0.07	-	-	Helicopter	809	/Cv|FGt	Colluvium and Glaciofluvial	II	L	-	-	-	m	-	-	**Flooding Potential**	E	BGC (2010) identified KP 30+600 to KP 31+900 as a Potential Road Hazard Segment (Flooding).
31.20	31.91	0.71	-	-	Helicopter	843	FAp	Fluvial	II	M	-	-	-	m-i	-	-	**Flooding Potential**	E	BGC (2010) identified KP 30+600 to KP 31+900 as a Potential Road Hazard Segment (Flooding).
32.01	32.09	0.09	-	-	Helicopter	639	Cf-Rd	Colluvium			-	-	-	m	Rb	-	**Debris Flow Potential**	F,G and H	BGC (2010) identified KP 32+000 to KP 32+100 as a Road Hazard Segment (Debris Flow).
32.09	32.47	0.37				638	FGt	Glaciofluvial						w					
32.47	32.50	0.03				843	FAp	Fluvial	II	M				m-i					
32.50	32.80	0.30				843	FAp	Fluvial	II	M				m-i					
32.80	33.40	0.60				821	Mwb/Cv	Colluvium and Till	III	M				w-m					
33.40	35.07	1.67				819	Mbw	Till	III	M				m					
35.07	36.06	0.99				680	Ck	Colluvium	III	M				w					
36.65	36.92	0.27				675	Ck	Colluvium and Till	III	M				m					

* Field assessment of sediment proximity potential
Low Proximity (LP): 0 - 25 m from a stream or water body
Moderate Proximity (MP): 25 - 50 m from a stream or water body
High Proximity (HP): >50 m from a stream or water body

* * Field assessment of sediment source potential
Low Sediment Source Potential (LS): Rock, coarse colluvium or gravels
Moderate Sediment Source Potential (MS): Till or fine colluvium or gravels
High Sediment Source Potential (HS): Fine soils

KSM Project - Teigen Creek Access Road (June 18, 2010 alignment - McElhanney 2010a)

P-Line From (km)	P-Line To (km)	Length (km)	GPS ID	TSFA Photo Number	Inspection Type	Polygon Number	Terrain Symbol	Surfical Material	Stability Class	Potential Sediment Delivery (Geohazards)	Sediment Source Potential		Potential Sediment Delivery (TSFA)	Drainage Class	Geohazards	Upslope/ Downslope Angle (˚)	Terrain/Soils/Stability Observations	Geotechnical Prescription	Comment
											Proximity (*)	Sediment Source Potential (**)							
3.21	3.58	0.37	2-7	-	Ground	969	Cv.Mw-V	Colluvium and Till	IV	H	LP	LS	Low	m	-	25/25	Colluvium/Till/Rock	F and G	Some small rock bluffs exposing a moderately strong foliated metasedimentary rock.
3.70	4.51	0.81	8-10	-	Ground	39	Cv//Rsk	Colluvium and Rock	IV	M	LP	LS	Low	w	-	35-40/<10	Colluvium/Rock	F and G	Some small rock bluffs exposing a moderately strong foliated metasedimentary rock.
4.60	4.75	0.15	-	-	Helicopter	39	Cv//Rsk	Colluvium and Rock	IV	M	LP	LS	Low	w	-	-	Colluvium/Rock	-	
7.94	8.20	0.25	23-25	-	Ground	81	Cv//Rks-V	Colluvium and Rock	IV	H	LP	LS	Low	w	-	30-40/30-40	Colluvium/Till	F	Well established slope vegetation with >50 year old conifers, devils club and some slide alders. Concave slope shape adjacent to GPS Point 25 interpreted as a remnant landslide scarp. No evidence of recent slope instability. Sediment source potential proximity is moderate to high from 7+940 to 8+000.
8.74	8.79	0.06	-	-	Helicopter	81	Cv//Rks-V	Colluvium and Rock	IV	H				w					
10.79	11.13	0.35	-	-	Helicopter	81	Cv//Rks-V	Colluvium and Rock	IV	H				w					
Sites Below Not Assessed As Per TSFA Methodology - Some Sites Assessed To Confirm Ground Conditions																			
0.02	0.73	0.70				2	Ff.Cf-Rd	Colluvium and Fluvial	II	M				m	Rd		-		
0.73	0.75	0.02				3	Cv	Colluvium						w			-		
0.75	2.51	1.77				4	Cvb	Colluvium and Rock						w-m			-		
2.51	2.77	0.25				8	Cv//Rks	Colluvium and Rock						w			-		
2.77	3.21	0.44	1	-	Ground	7	Fp-U	Fluvial	I	M	MP	MS	Moderate	i-p	U	-	Fluvial Sediments	E	Flooding potential across the Tiegen Creek flood plain - consider rip rap blankets on the fill bridge approaches. In some cases, sediment source potential proximity is high, depending on the location of the river channel.
3.58	3.70	0.12				37	Cf-Rd	Colluvium						m	Rd		-		
4.51	4.60	0.09				38	Cf-Rd	Colluvium						m	Rd		-		
4.75	5.36	0.61				56	Cf-Rd	Colluvium	II	M				m	Rd		-		
5.36	5.42	0.06				57	FGt	Glaciofluvial						w			-		
5.42	5.49	0.07				56	Cf-Rd	Colluvium	II	M				m	Rd		-		
5.49	5.68	0.19				7	Fp	Fluvial	I	M				i-p			-		
5.68	5.73	0.05				57	FGt	Glaciofluvial						w			-		
5.73	6.24	0.51				7	Fp	Fluvial	I	M				i-p			-		
6.24	6.66	0.43				85	Ckv	Colluvium	III	M				w-m			-		
6.66	6.93	0.27				75	FGp	Glaciofluvial	I	L				w			-		
6.93	7.20	0.27				85	Ckv	Colluvium	III	M				w-m			-		
7.20	7.24	0.04				86	Cv/Rk	Colluvium and Rock						w					
7.24	7.32	0.08				98	Cv/Mw	Colluvium and Till						w-m					
7.32	7.81	0.50				74	Cvk	Colluvium	III	M				w			-		
7.81	7.94	0.13	-	-	Ground	7	Fp	Fluvial	I	M	MP	MS	Moderate	i-p	-	-	Fluvial	E	Flooding potential across the Tiegen Creek flood plain - consider rip rap blankets on the fill bridge approaches. In some cases, sediment source potential proximity is high, depending on the location of the river channel.
8.20	8.27	0.08	-	-	Ground	79	Mw|Ru	Rock and Till	I	L	LP	LS	Low	m	-	<5/35-90	Colluvium/Till	A	Debris slide/avalanche 8-10 m from flagged centreline. Consider moving road 25-50 m southeast to avoid potential slope instability.
8.27	8.33	0.05	26	-	Ground	78	Cv/Mk/Rk-V	Colluvium and Rock and Till	IV	H	LP	LS	Low	m-w	-	<5/35-90	Colluvium/Till	A	Debris slide/avalanche 8-10 m from flagged centreline. Consider moving road 25-50 m southeast to avoid potential slope instability.
8.33	8.74	0.41	-	-	Ground	79	Mw|Ru	Rock and Till	I	L	LP	LS	Low	m	-	<5/35-90	Colluvium/Till	A	Debris slide/avalanche 8-10 m from flagged centreline. Consider moving road 25-50 m southeast to avoid potential slope instability.
8.79	10.39	1.60				79	Mw|Ru	Rock and Till	I	L				m			-		
10.39	10.79	0.39				197	Mb	Till	II	L				m			-		
11.13	11.55	0.41				199	Mw|Ru	Rock and Till	I	L				w			-		
11.55	12.38	0.83				200	Mv.Cv	Colluvium and Till	III	M				w-m			-		
12.38	12.41	0.03				196	Mw	Till	I	L				m-i			-		
12.41	12.70	0.29				195	Mw|Rm/Rm	Rock and Till	I	L				w-m			-		
12.70	12.71	0.01				196	Mw	Till	I	L				m-i			-		
12.71	14.13	1.42				195	Mw|Rm/Rm	Rock and Till	I	L				w-m			-		

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High Proximity (HP): >50 m from a stream or water body

* * Field assessment of sediment source potential
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Moderate Sediment Source Potential (MS): Till or fine colluvium or gravels
High Sediment Source Potential (HS): Fine soils

KSM Project - Tunnel Spur Access Road (June 18, 2010 alignment - McElhanney 2010a)

P-Line From (km)	P-Line To (km)	Length (km)	GPS ID	TSFA Photo Number	Inspection Type	Polygon Number	Terrain Symbol	Surfical Material	Stability Class	Potential Sediment Delivery (Geohazards)	Sediment Source Potential		Potential Sediment Delivery (TSFA)	Drainage Class	Geohazards	Upslope/ Downslope Angle (˚)	Terrain/Soils/Stability Observations	Geotechnical Prescription	Comment
											Proximity (*)	Sediment Source Potential (**)							
Sites Below Not Assessed As Per TSFA Methodology - Some Sites Assessed To Confirm Ground Conditions																			
0.00	1.48	1.48				79	Mw|Ru	Rock and Till	I	L									
1.48	2.04	0.56				197	Mb	Till	II	L									
2.04	2.62	0.58				77	Ff	Colluvium and Fluvial	II	M									
2.62	2.64	0.02				7	Fp	Fluvial	I	M									
2.64	2.76	0.12				186	Fp	Fluvial											
2.76	2.96	0.20				184	Cv	Colluvium											
2.96	3.02	0.06				186	Fp	Fluvial											
3.02	3.17	0.15				185	Cv/Rsk	Colluvium and Rock											
3.17	3.22	0.05				186	Fp	Fluvial											
3.22	3.43	0.21				185	Cv/Rsk	Colluvium and Rock											
3.43	3.74	0.31				186	Fp	Fluvial											
3.74	3.76	0.02				179	Cvb	Colluvium											
3.76	3.87	0.10				186	Fp	Fluvial											
3.87	3.93	0.06				179	Cvb	Colluvium											
3.93	3.98	0.06				186	Fp	Fluvial											
3.98	4.32	0.34				179	Cvb	Colluvium											
4.32	4.37	0.05				186	Fp	Fluvial											
4.37	4.45	0.07				179	Cvb	Colluvium											
4.45	4.55	0.10				180	Cf-Rd	Colluvium	II	M					Rd				
4.55	5.05	0.50				179	Cvb	Colluvium											
5.05	5.08	0.03				164	Cf-Rd	Colluvium	II	M					Rd				
5.08	5.19	0.11				179	Cvb	Colluvium											
5.19	5.41	0.22				160	Cvb-V	Colluvium											
5.41	5.43	0.02				161	Ch|Fp	Colluvium and Fluvial											
5.43	5.50	0.07				160	Cvb-V	Colluvium											
5.50	5.57	0.07				161	Ch|Fp	Colluvium and Fluvial											
5.57	5.69	0.12				163	Cf-Rd	Colluvium	II	M									
5.69	5.70	0.01				162	Cb	Colluvium	III	M									
5.70	5.94	0.23				161	Ch|Fp	Colluvium and Fluvial											
5.94	5.95	0.01				162	Cb	Colluvium	III	M									
5.95	6.01	0.06				161	Ch|Fp	Colluvium and Fluvial											
6.01	6.83	0.82	27-30	-	Ground	152	Cf-Rd	Colluvium	II	M	MP	MS	Moderate	m	Rd	15/15	Colluvium	I	Debris flow fan and avalanche deposits.
6.83	6.94	0.10				145	Ck-Rb	Colluvium	III	L					Rb				
6.94	7.01	0.07				143	Cj	Colluvium											
7.01	7.94	0.93				122	Cck-Rbd	Colluvium	III	M					Rbd				
7.94	8.13	0.18				143	Cj	Colluvium											
8.13	8.70	0.57				122	Cck-Rbd	Colluvium	III	M					Rbd				
8.70	9.20	0.50				142	Cf-Rd	Colluvium	II	M					Rd				
9.20	10.01	0.81				140	Ffj	Fluvial	II	L									
10.01	10.94	0.94				139	FGh	Glaciofluvial	II	m									
10.94	11.14	0.19				226	Cv/Msk.Rs-VR"s	Colluvium and Rock and Till							R"s				
11.14	11.41	0.27				139	FGh	Glaciofluvial	II	m									
11.41	13.10	1.69				236	FGh.Mh-E	Glaciofluvial and Till	I	L									

P-Line From (km)	P-Line To (km)	Length (km)	GPS ID	TSFA Photo Number	Inspection Type	Polygon Number	Terrain Symbol	Surfical Material	Stability Class	Potential Sediment Delivery (Geohazards)	Sediment Source Potential		Potential Sediment Delivery (TSFA)	Drainage Class	Geohazards	Upslope/ Downslope Angle (°)	Terrain/Soils/Stability Observations	Geotechnical Prescription	Comment
											Proximity (*)	Sediment Source Potential (**)							
13.10	13.54	0.44	19-21	-	Ground	236	FGh.Mh-E	Glaciofluvial and Till	I	L	MP	LS	Low	w-m	-	35/35	Colluvium/Rock	H	Consider review of the fill foundation conditions. Consider moving flagged road section adjacent to GPS Point 19 to the south by 10-20 m.
13.54	13.82	0.28	18	-	Ground	242	/Mw|Rm	Rock and Till	II	L	LP	LS	Low	w	-	<10/<10	Colluvium/Till/Rock	I	Swampy sub-alpine meadows.
13.82	14.86	1.04	13-17	-	Ground	971	Cvb	Colluvium	III	M	LP	LS	Low	w	-	0-10/0-35	Colluvium/Till/Rock	A and C	Large fill slopes proposed between KP 14+080 and KP 14+120. Potential for debris avalanches towards incised creek below (observed on opposite slope). Consider moving road centreline 50 - 100 m northeast. Bedrock, till or colluvium surface with linear depressions filled with swampy material or ponded within this polygon.
14.86	15.58	0.72	11-12	-	Ground	246	Ca	Colluvium	III	M	LP	LS	Low	m	-	<10/<10	Colluvium	I	Sub-alpine meadow.
15.58	16.24	0.65				269	Mw	Till											
16.24	16.45	0.21				270	/Mw|Rm	Rock											
16.45	16.56	0.11				271	Cv.Mw	Colluvium and Till											
16.56	17.00	0.43				270	/Mw|Rm	Rock											
17.00	17.11	0.12				278	Cv/Mw	Colluvium and Till											

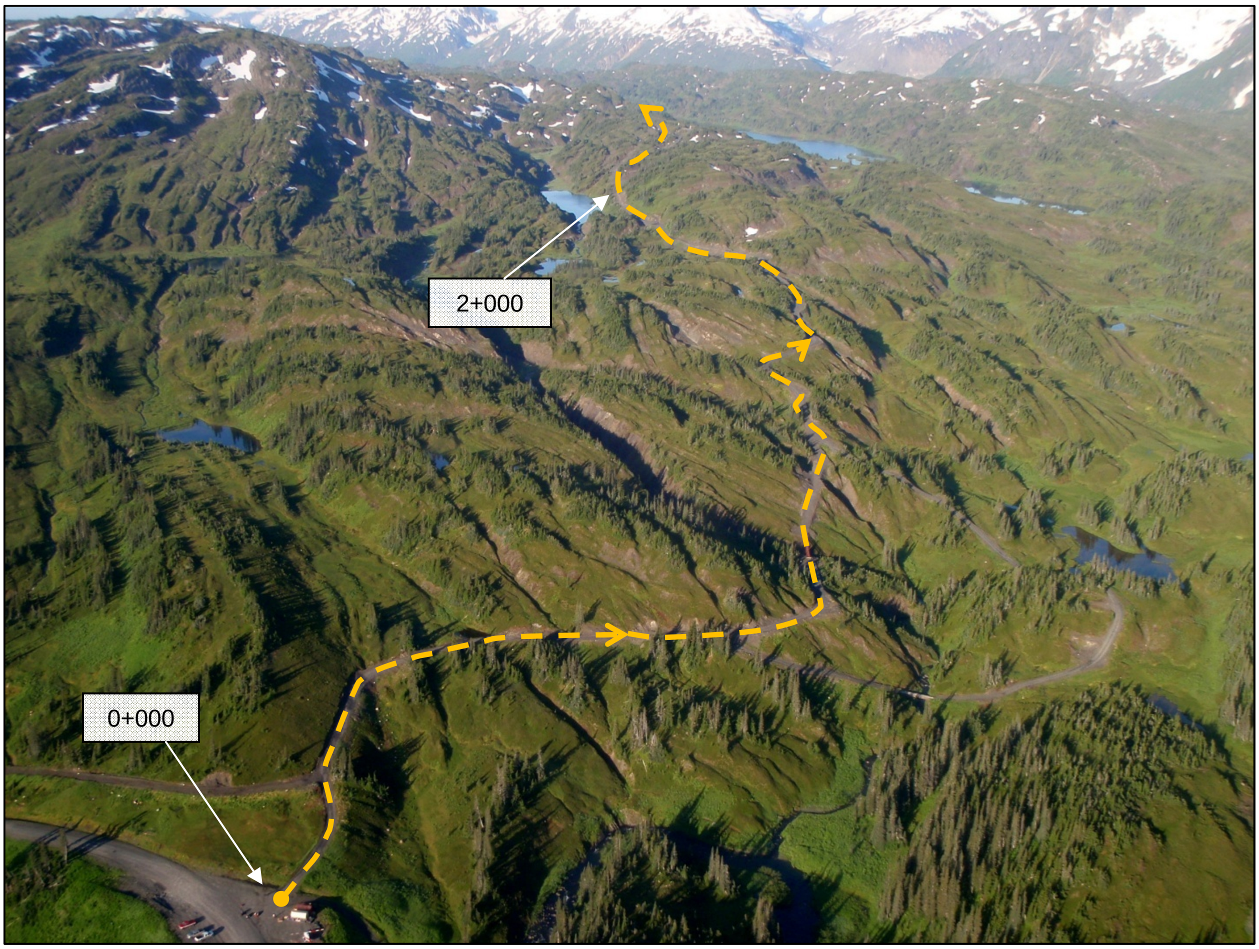
* Field assessment of sediment proximity potential
Low Proximity (LP): 0 - 25 m from a stream or water body
Moderate Proximity (MP): 25 - 50 m from a stream or water body
High Proximity (HP): >50 m from a stream or water body

* * Field assessment of sediment source potential
Low Sediment Source Potential (LS): Rock, coarse colluvium or gravels
Moderate Sediment Source Potential (MS): Till or fine colluvium or gravels
High Sediment Source Potential (HS): Fine soils

APPENDIX B

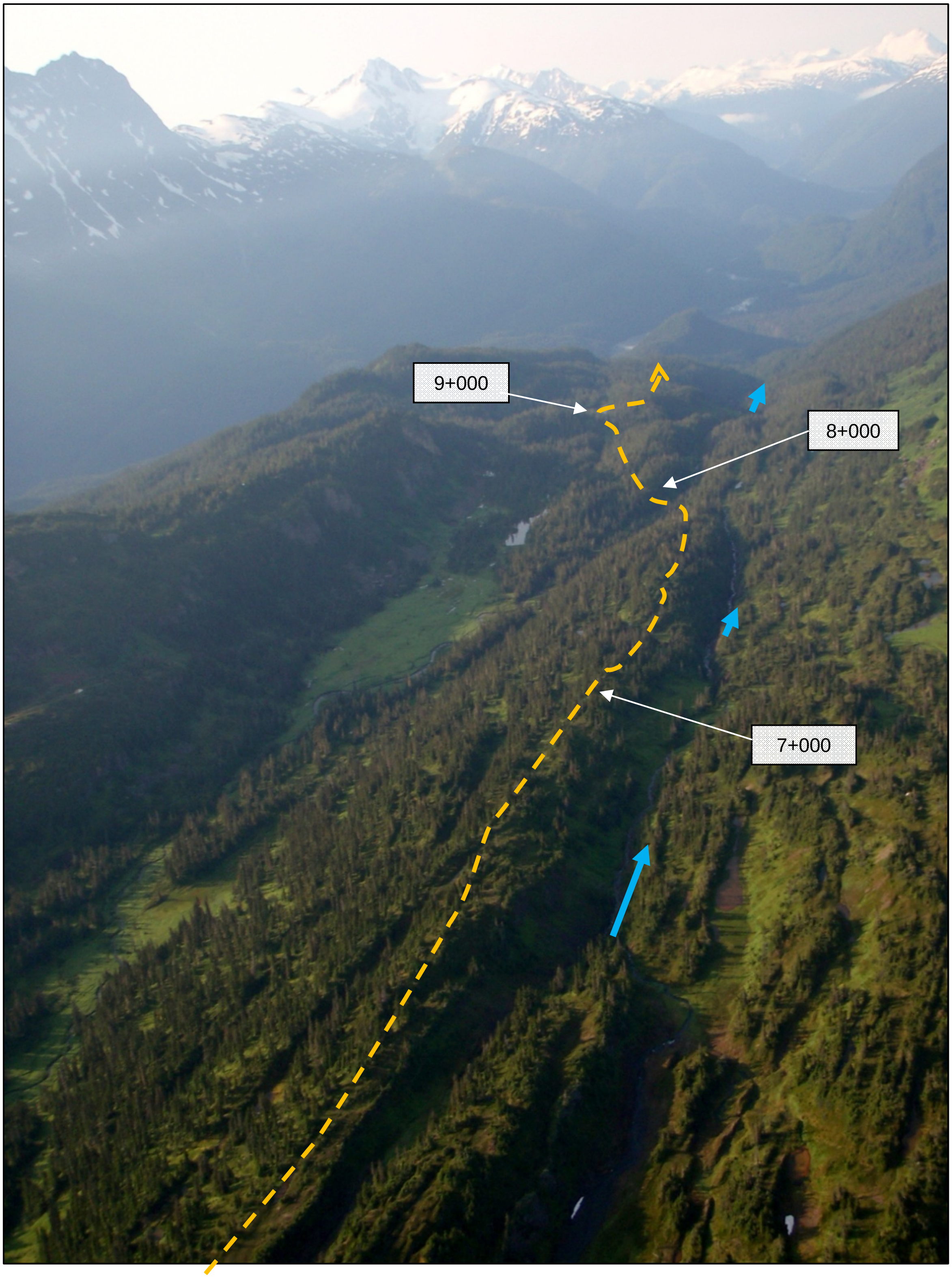
PHOTOGRAPHS OF SELECT ROAD SECTIONS

In the following site photographs "upchain" is looking in direction of increasing chainage towards the end of the access road (from KP 0 towards the road end) while "downchain" is looking in the direction of decreasing chainage towards the start of the access (from the road end direction towards KP 0). The direction of ascending road kilometer posts is labeled with a dashed orange arrow for the proposed Coulter Creek access road, a dashed red arrow for the proposed Teigen Creek access road, and a dashed yellow arrow for the proposed Tunnel Spur access road. The term left and right creek or river bank refers to the left and right creek/river banks, respectively, when one looks in direction of the creek/river flow.

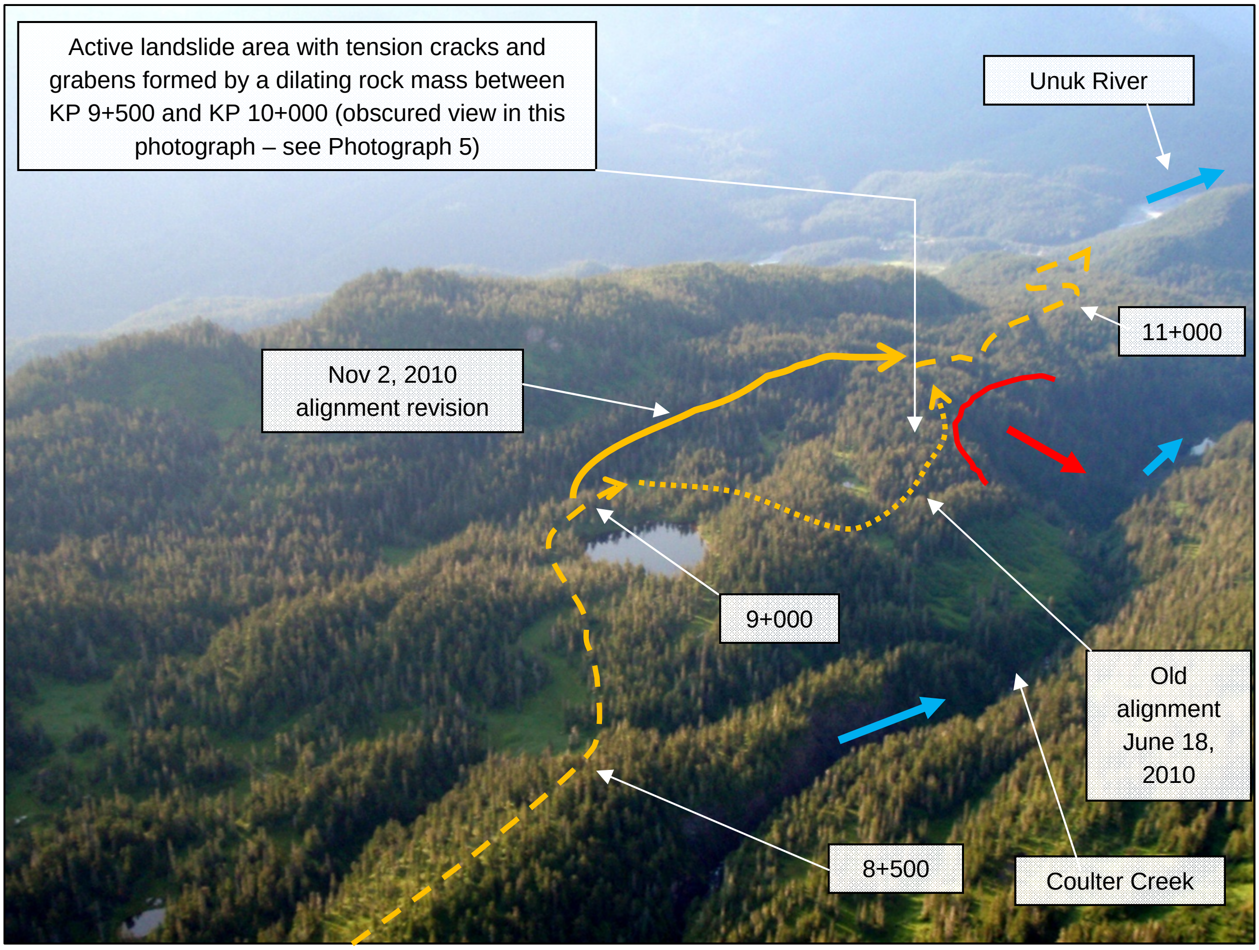


Photograph 1 **Coulter Creek Access Road – Looking upchain (southwest) from the Eskay Creek Mine Access road towards KP 2+000.**

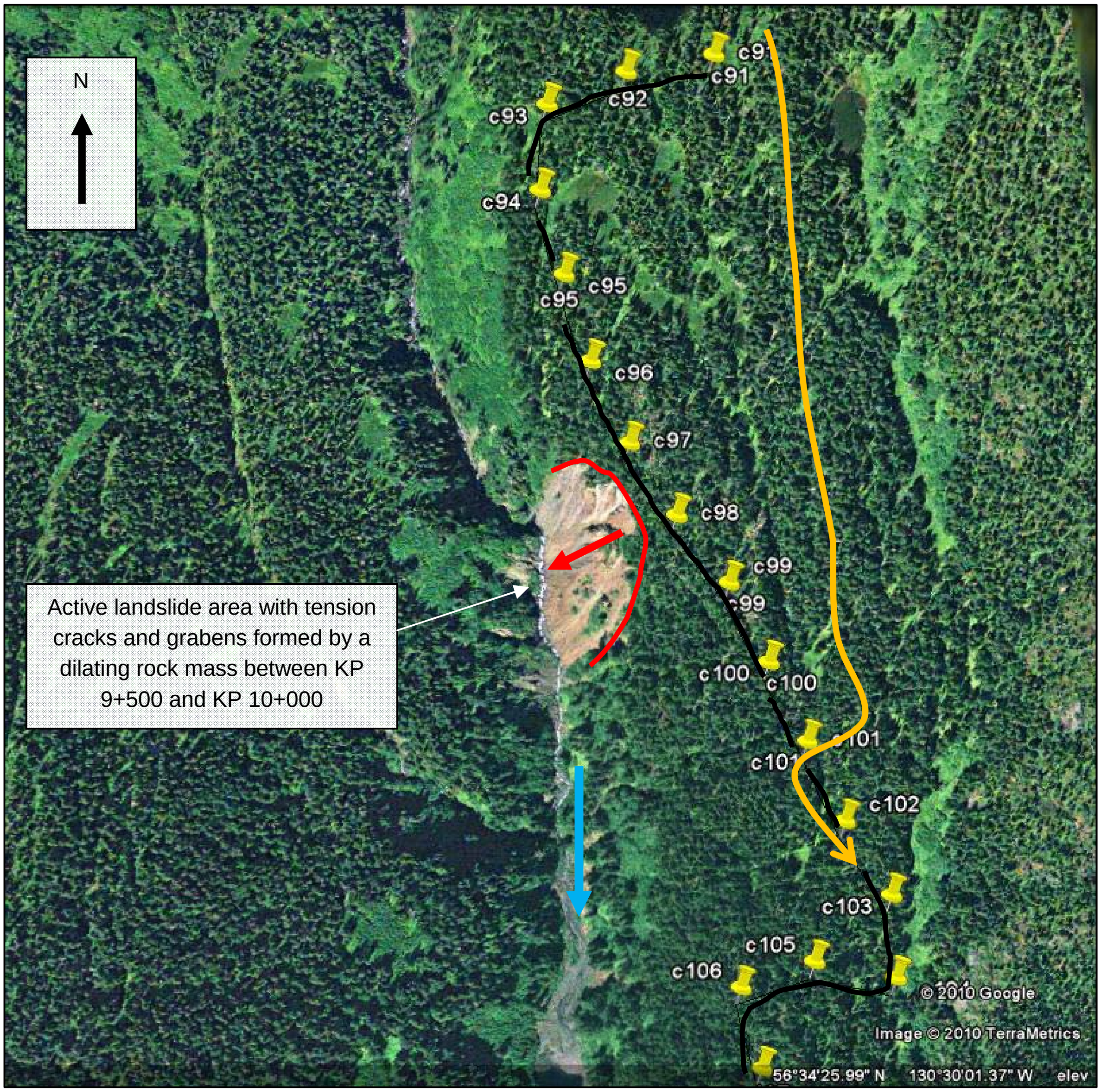
Photograph 2 **Coulter Creek Access Road – Looking upchain (south) along Coulter Creek towards the Unuk River Valley from KP 5+000.**



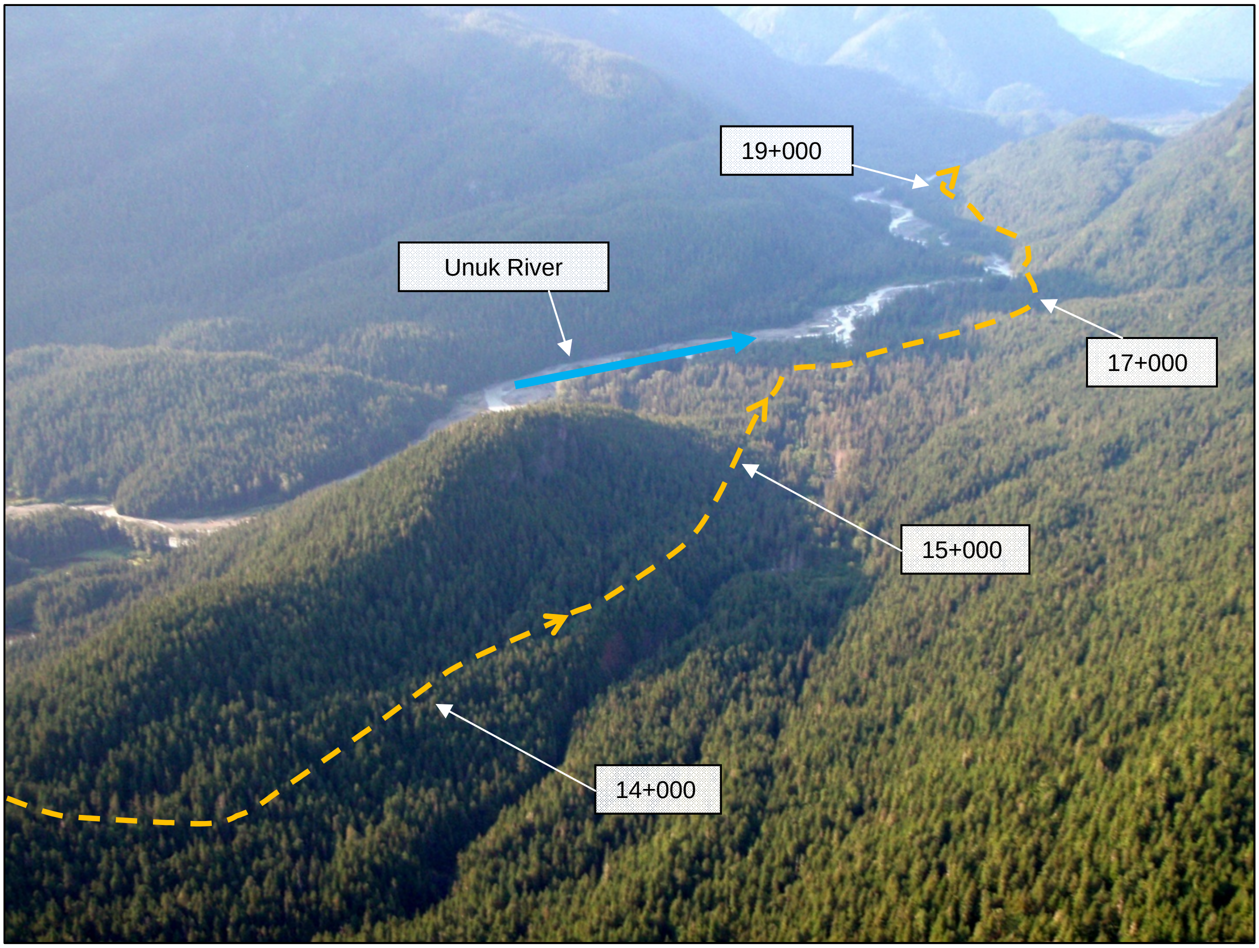
Photograph 3 **Coulter Creek Access Road – Looking upchain (south) along Coulter Creek towards the Unuk River Valley from about KP 6+000.**



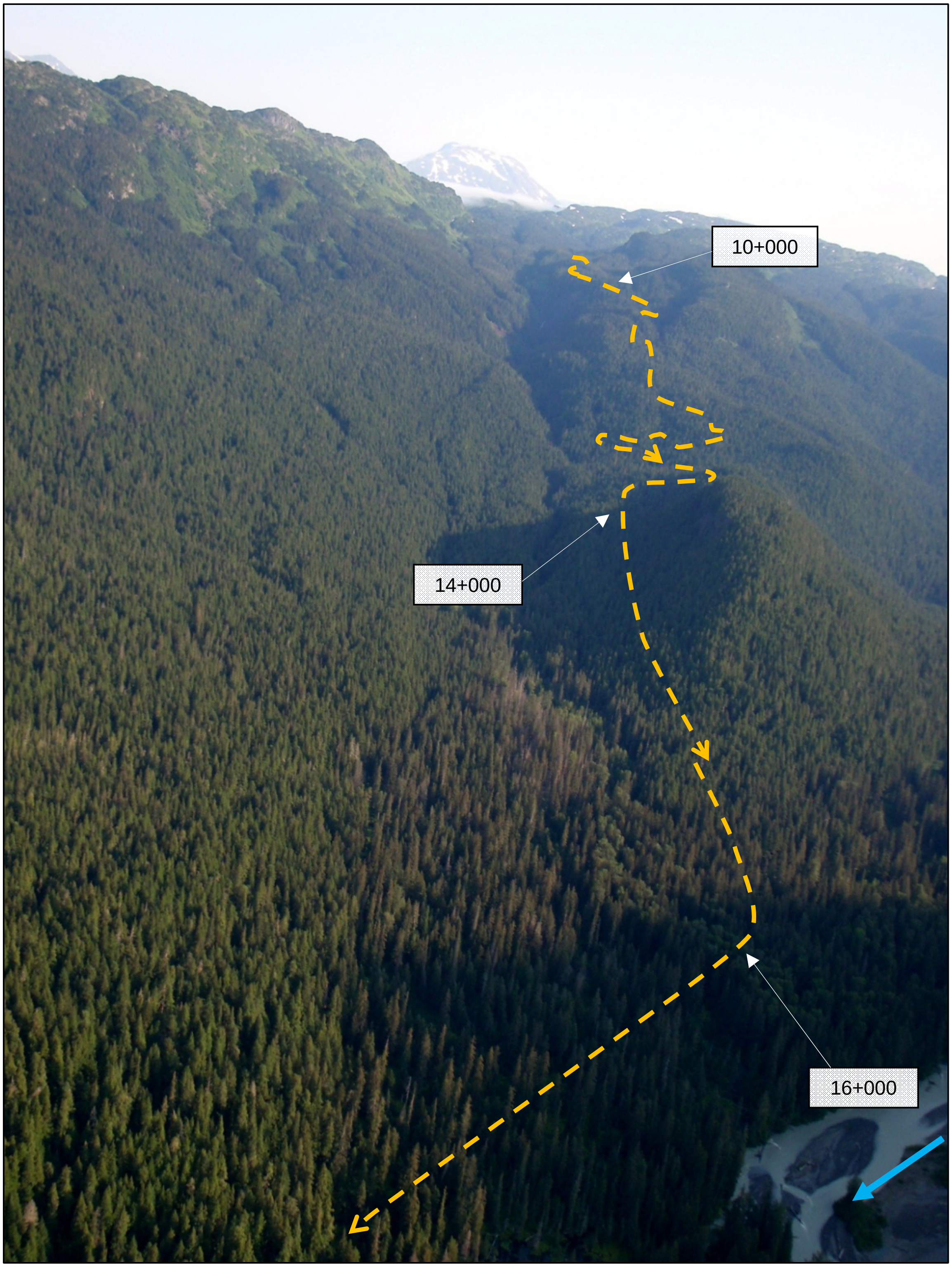
Photograph 4 **Coulter Creek Access Road – Looking upchain (south) along Coulter Creek towards the Unuk River Valley from about KP 8+000. The dotted orange line marks the approximate location of the June 18, 2010 alignment and the solid orange line marks the approximate location of the updated November 2, 2010 alignment. The revised alignment avoids the active landslide area (see Photograph 5).**



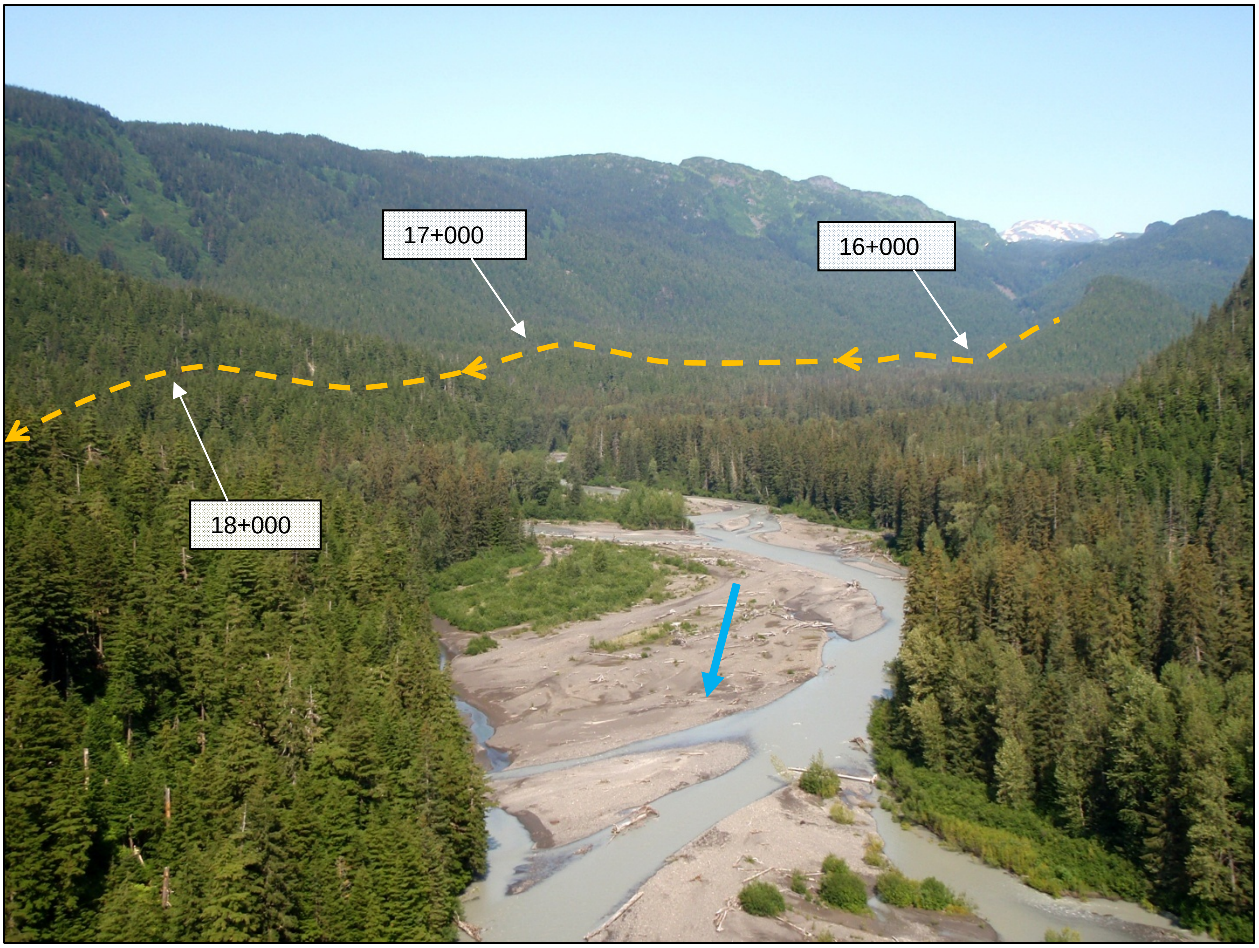
Photograph 5 **Coulter Creek Access Road – Orthophoto of active landslides identified in BGC (2010a) on the left bank of Coulter Creek. Tension cracks, grabens and evidence of fresh deformation was observed in the field. Yellow pins mark the June 18, 2010 alignment centreline – c93 refers to Coulter Creek KP 9+300. BGC recommended re-routing around the active landslide area by re-aligning road between about KP 9+000 and KP 10+300. The solid orange line marks the approximate location of the November 2, 2010 updated road alignment (McElhanney 2010b).**



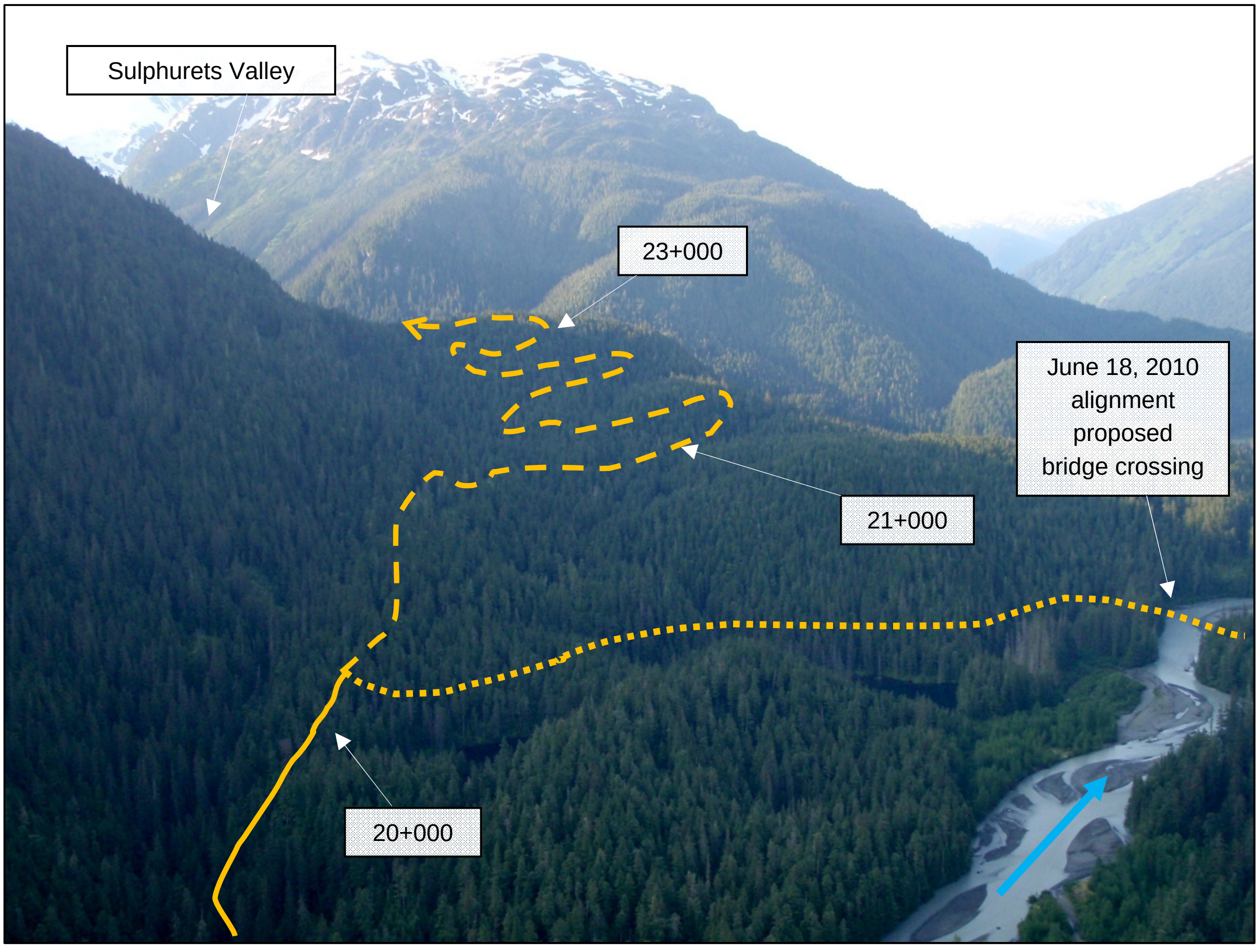
Photograph 6 Coulter Creek Access Road – Looking upchain (south) along Coulter Creek towards Unuk River from about KP 14+000.



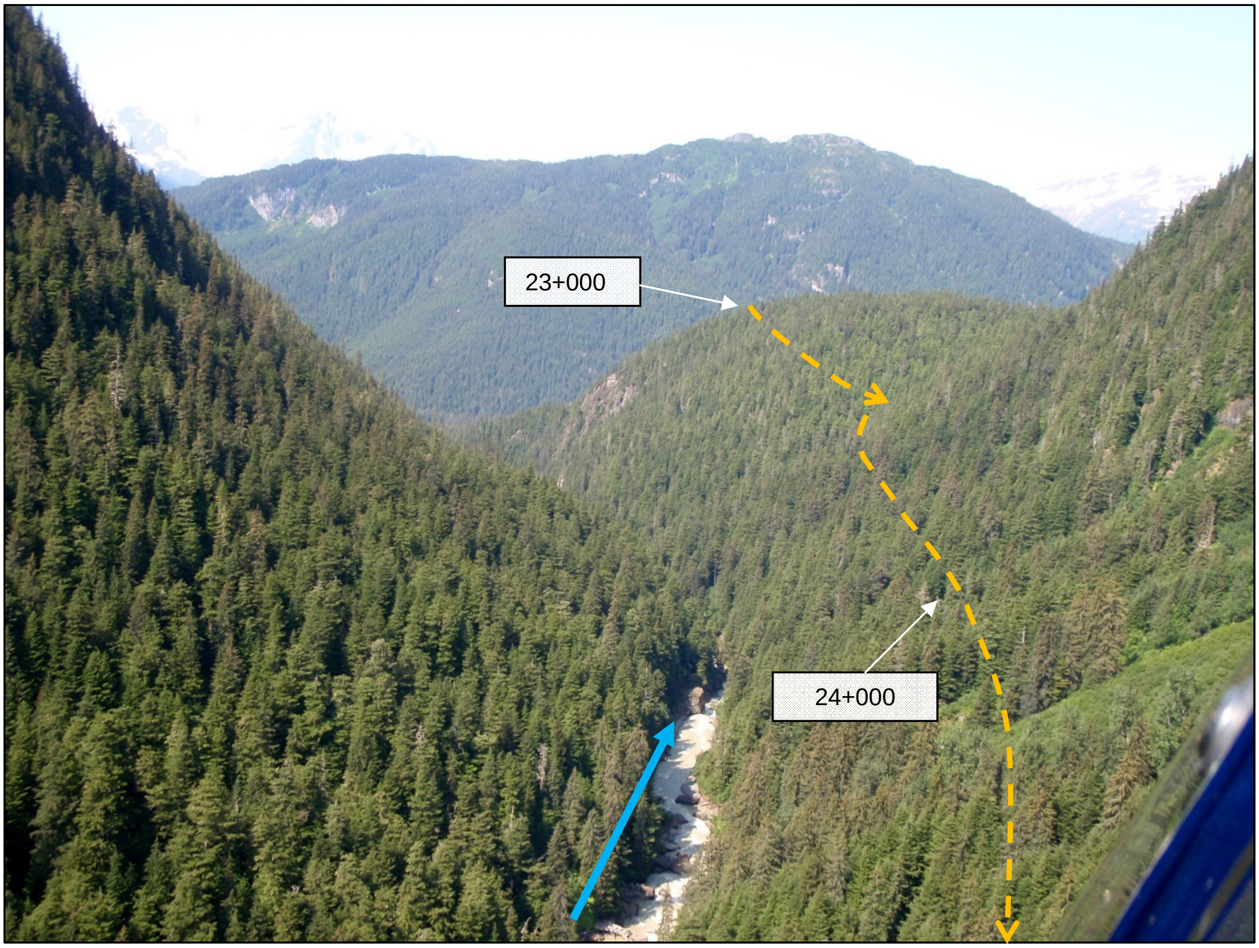
Photograph 7 Coulter Creek Access Road – Looking downchain (north) up Coulter Creek from the Unuk River from about KP 16+500.



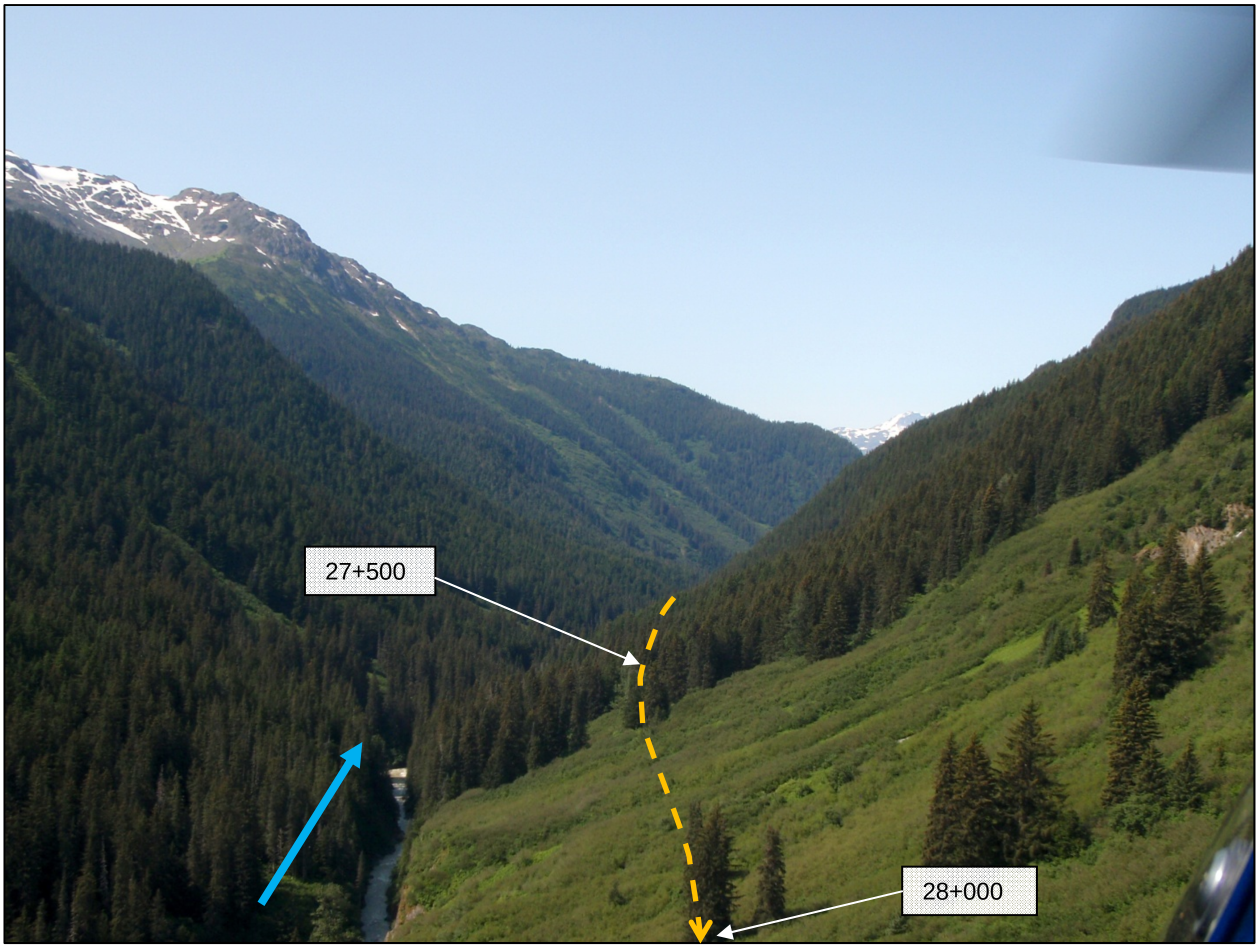
Photograph 8 **Coulter Creek Access Road – Looking downchain (north) up the Unuk River from about KP 18+000.**



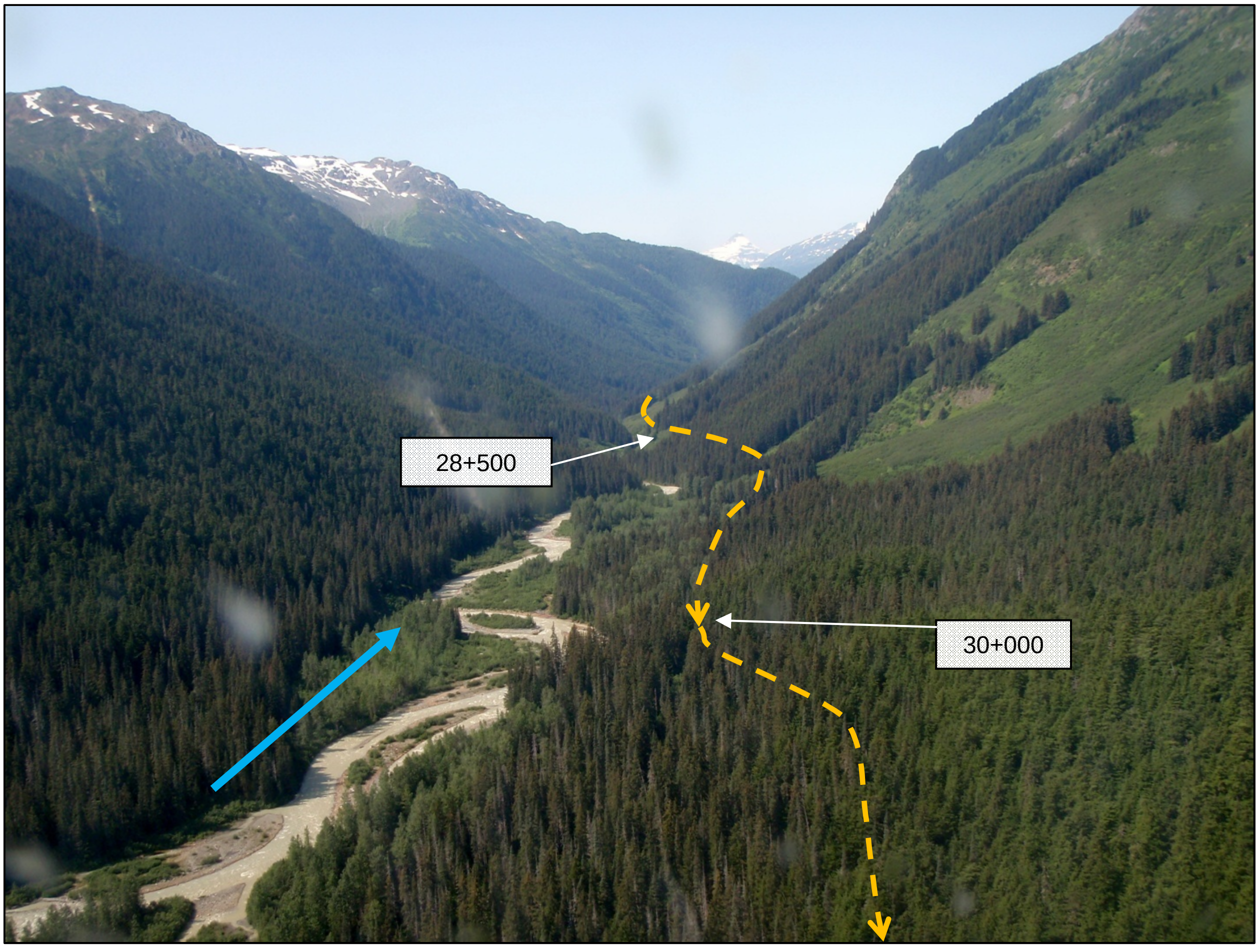
Photograph 9 **Coulter Creek Access Road – Looking upchain (southeast) from the Unuk River towards Sulphurets Creek Valley. The proposed access road ascends through a series of switchbacks into Sulphurets Valley. The solid orange line marks the approximate location of the November 2, 2010 updated road alignment (McElhanney 2010b). The November 2, 2010 road alignment bridge crossing is slightly upstream of the bottom right section of this photograph – and so not shown on this photograph.**



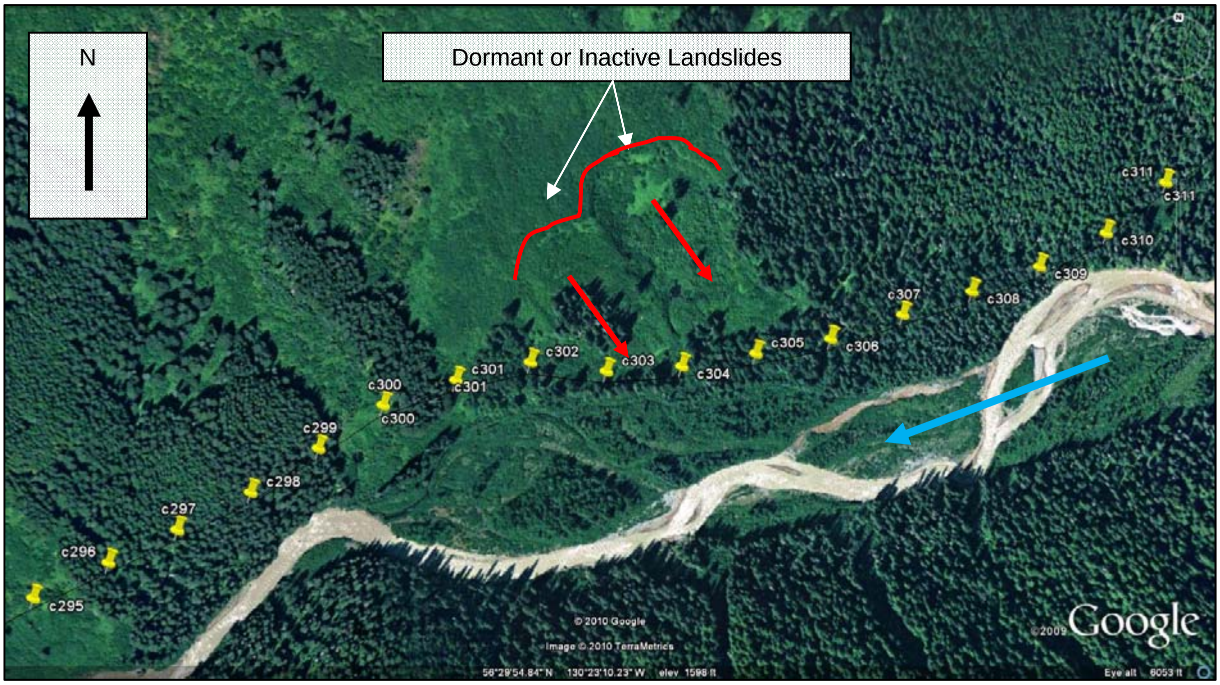
Photograph 10 **Coulter Creek Access Road – Looking downchain (west) down Sulphurets Creek towards the Unuk River Valley.**



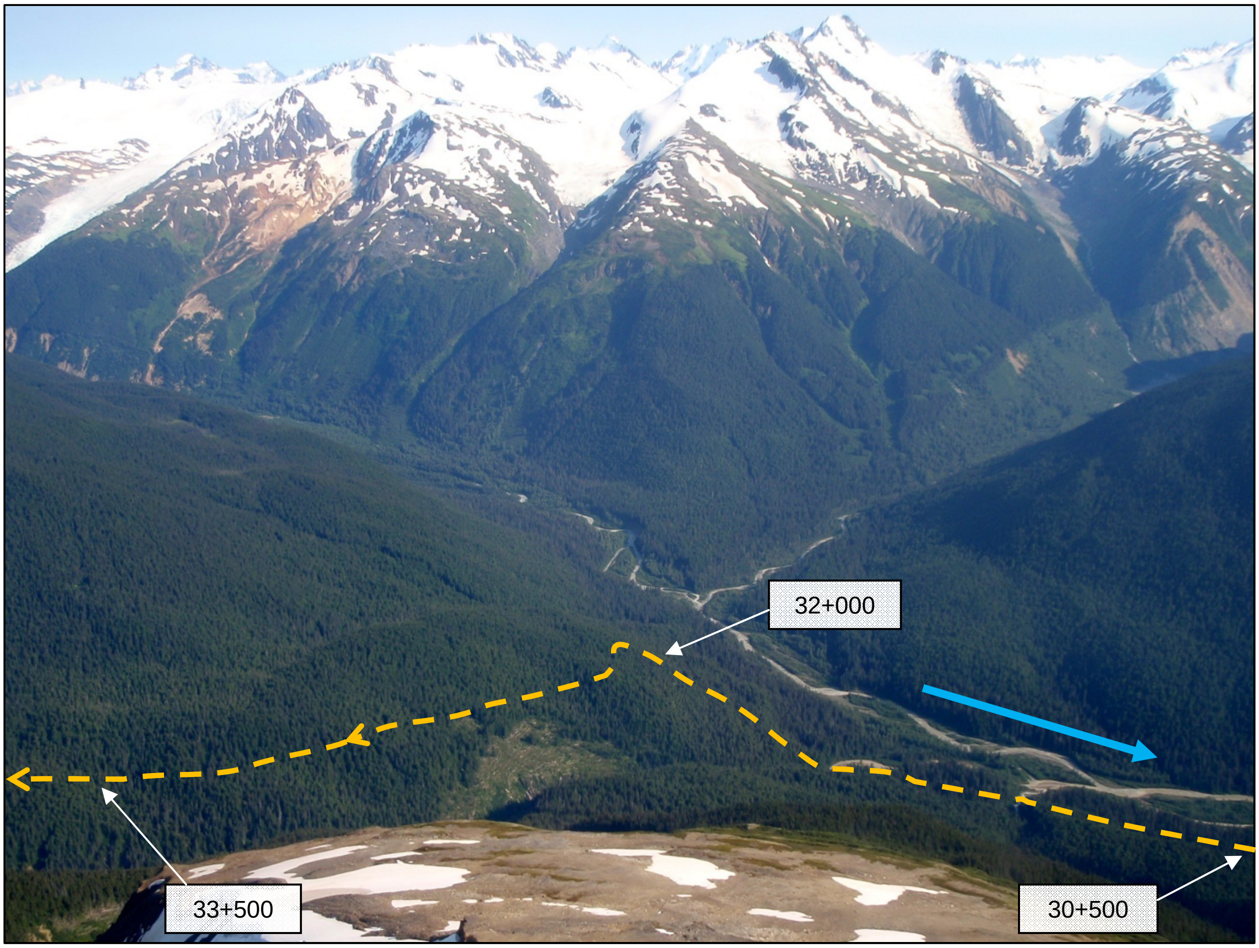
Photograph 11 Coulter Creek Access Road – Looking downchain (west) down Sulphurets Creek.



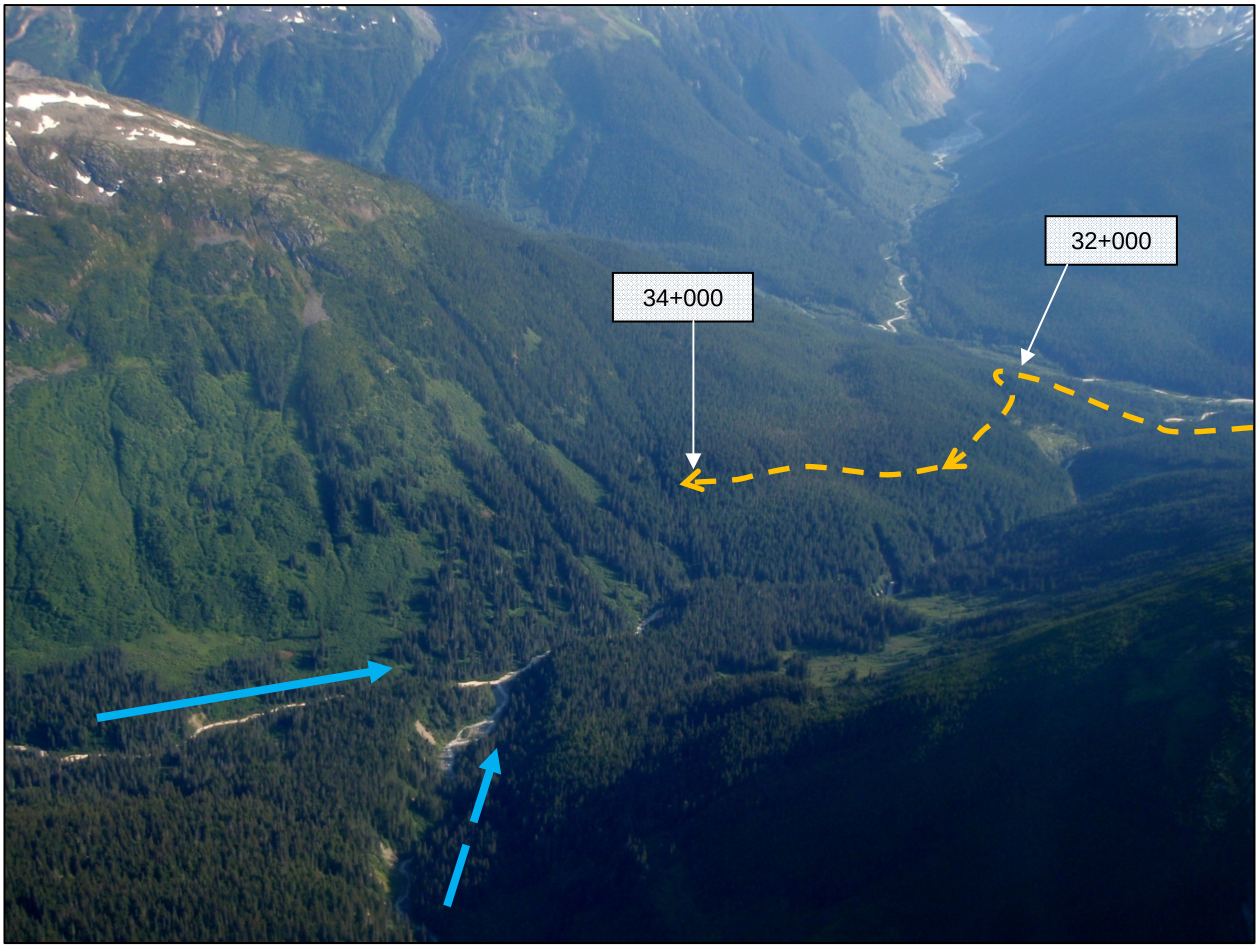
Photograph 12 **Coulter Creek Access Road – Looking downchain (west) down Sulphurets Creek.**



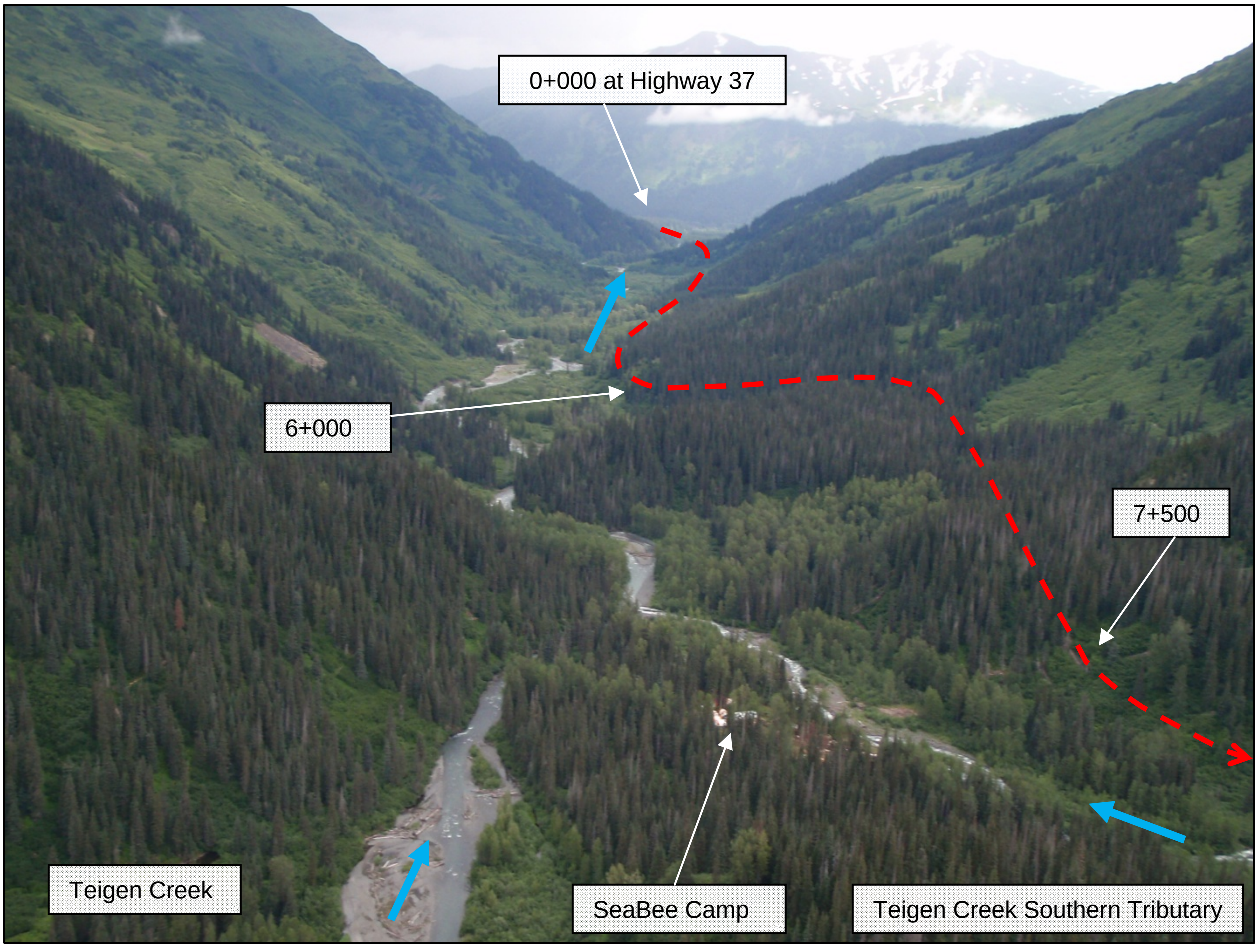
Photograph 13 **Coulter Creek Access Road – Orthophoto of dormant or inactive landslides identified in BGC (2010a). Yellow pins mark the June 18, 2010 alignment centreline – c304 refers to Coulter Creek KP 30+400. Fill only road construction (over landing) is recommended between KP 29+300 and KP 29+700 (June 18, 2010 alignment KP 30+200 to KP 30+600) and confirmation of the construction plan with a QRP is recommended before crossing this dormant or inactive landslide area. Do not cut into the slope between KP 29+300 and KP 29+700 (November 2, 2010; McElhanney 2010b) and ensure effective slope drainage. Monitor slope for movement during construction as directed by a QRP.**



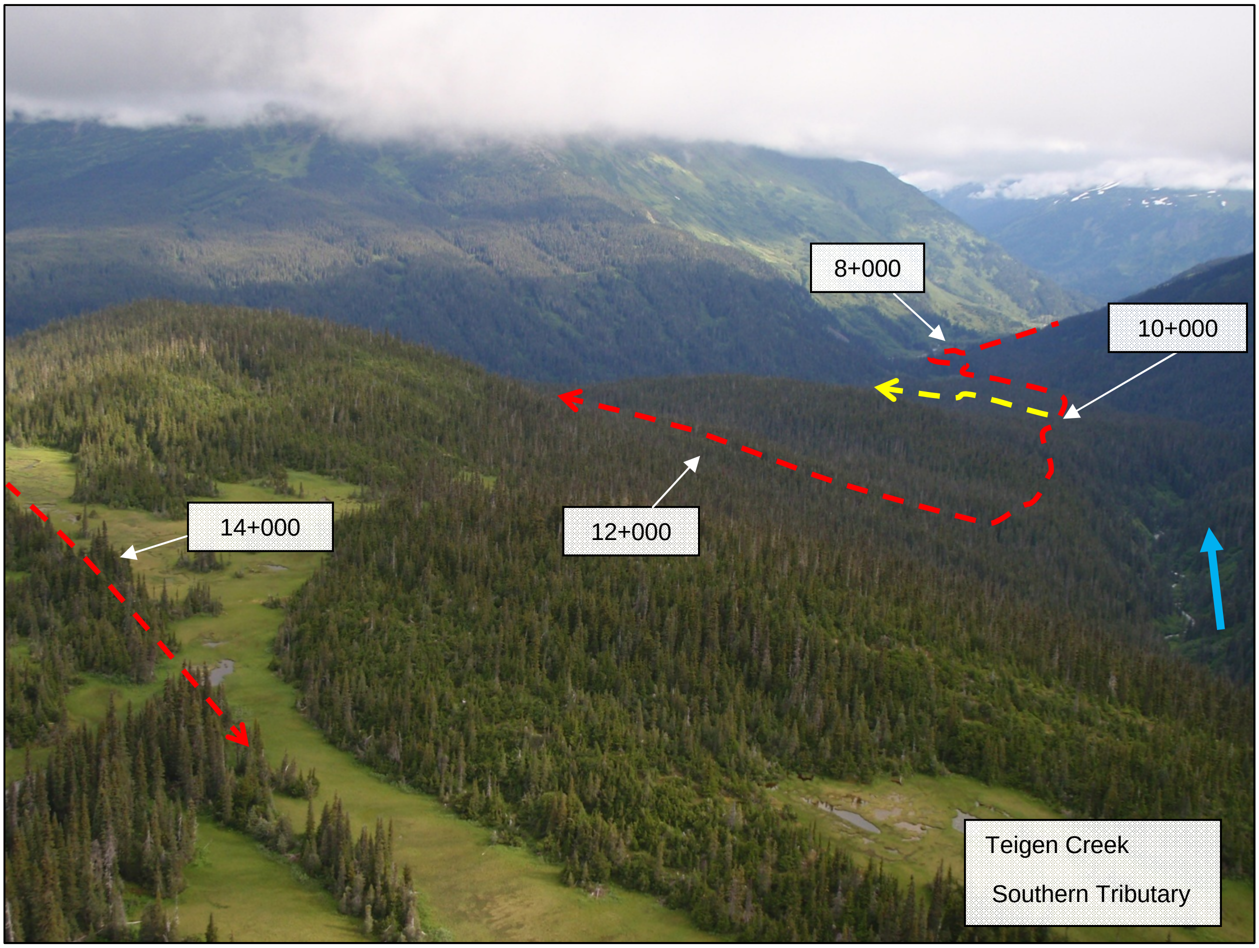
Photograph 14 **Coulter Creek Access Road – Looking southeast towards KP 32 (Sulphurets Creek flows to the right).**



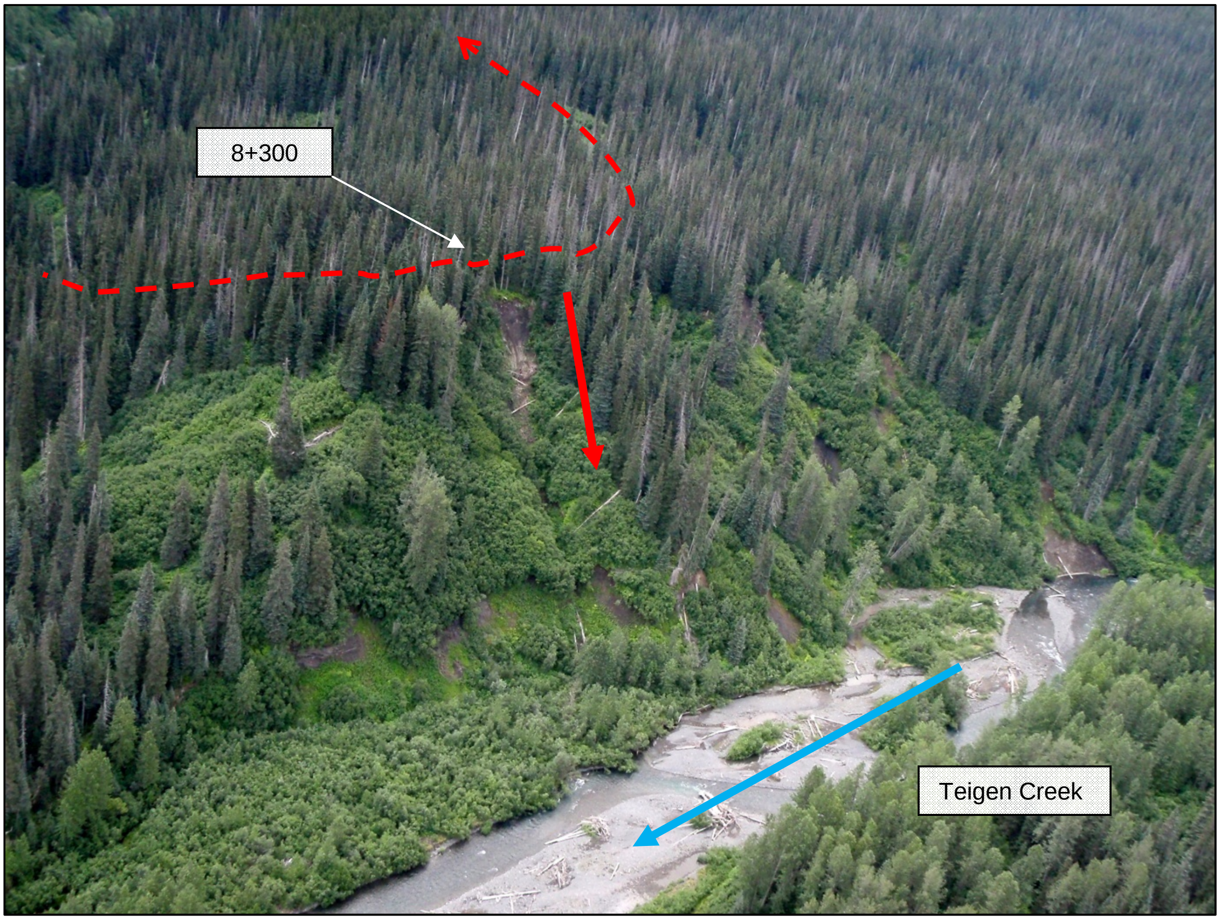
Photograph 15 **Coulter Creek Access Road – Looking south towards the confluence of Mitchell Creek (solid arrow) and McTagg Creek (dashed arrow) at the proposed mine site area.**



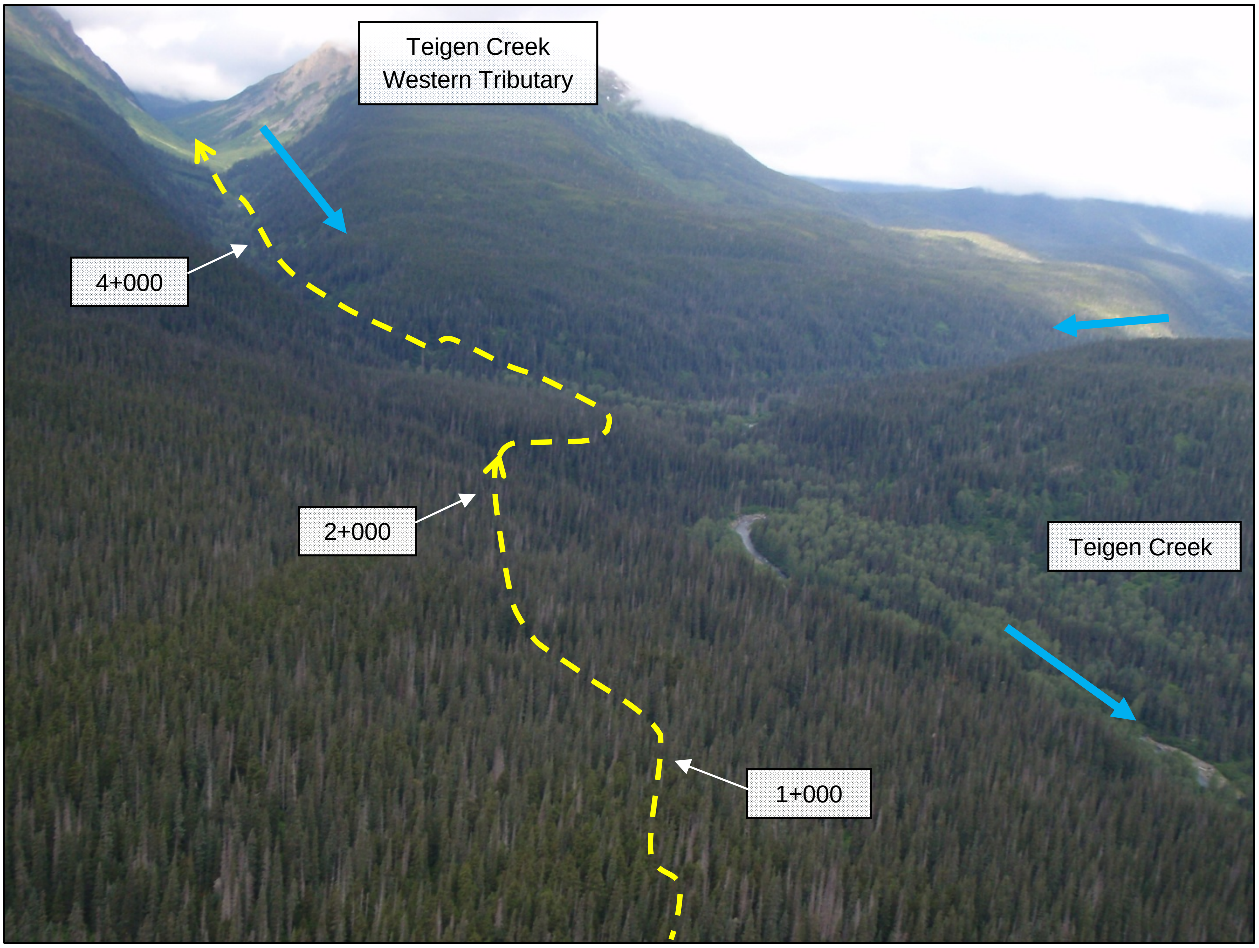
Photograph 16 Teigen Creek Access Road – Looking downchain (north) towards Highway 37, past Seabridge's temporary Seabee Camp from KP 8.



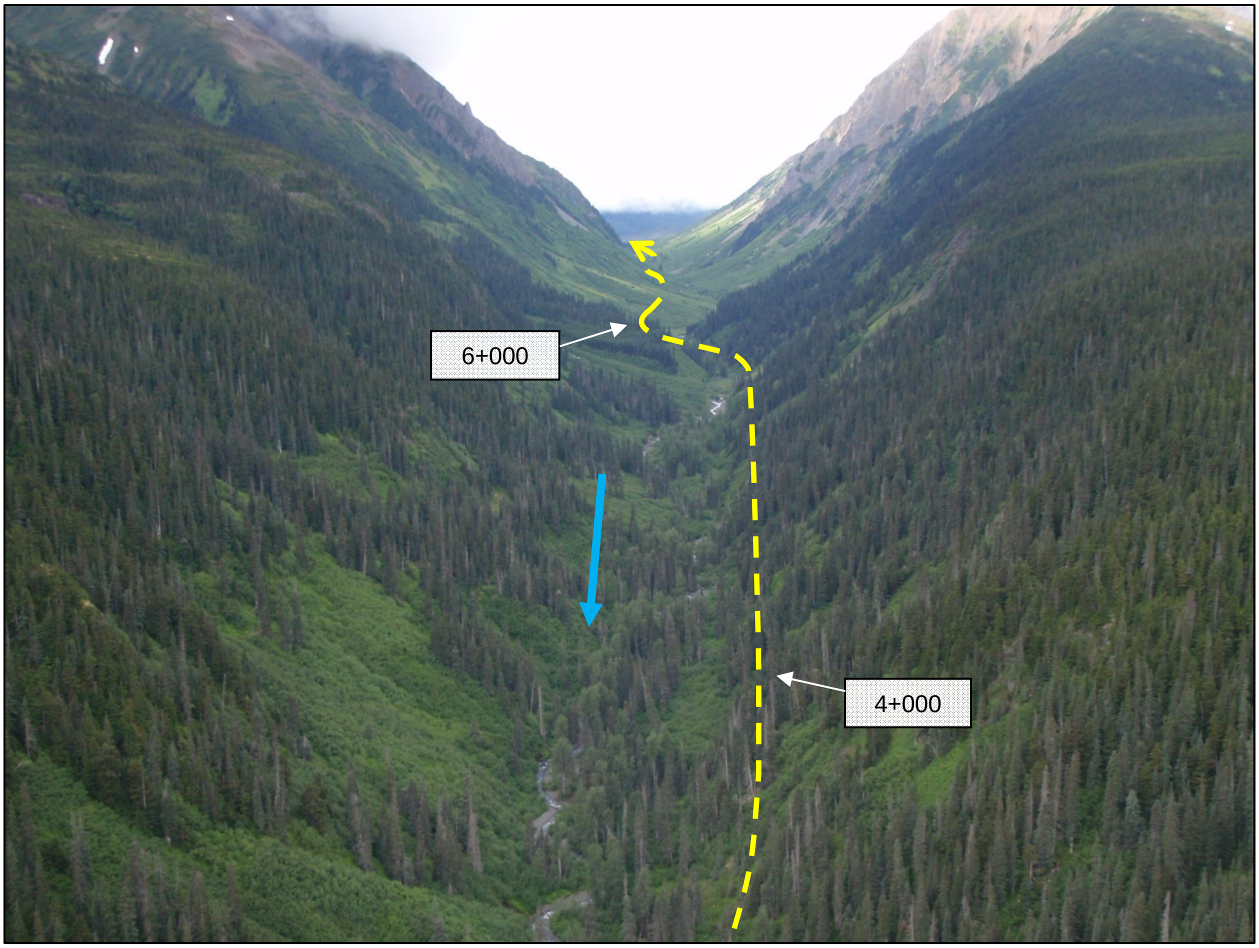
Photograph 17 **Teigen Creek Access Road – Looking downchain (northeast) towards the start of Tunnel Spur Access Road (yellow dash – starting at KP 10 Teigen Creek), Seabee Camp (KP 8) and Highway 37 from the proposed Tailings Management Facility at KP 14.**



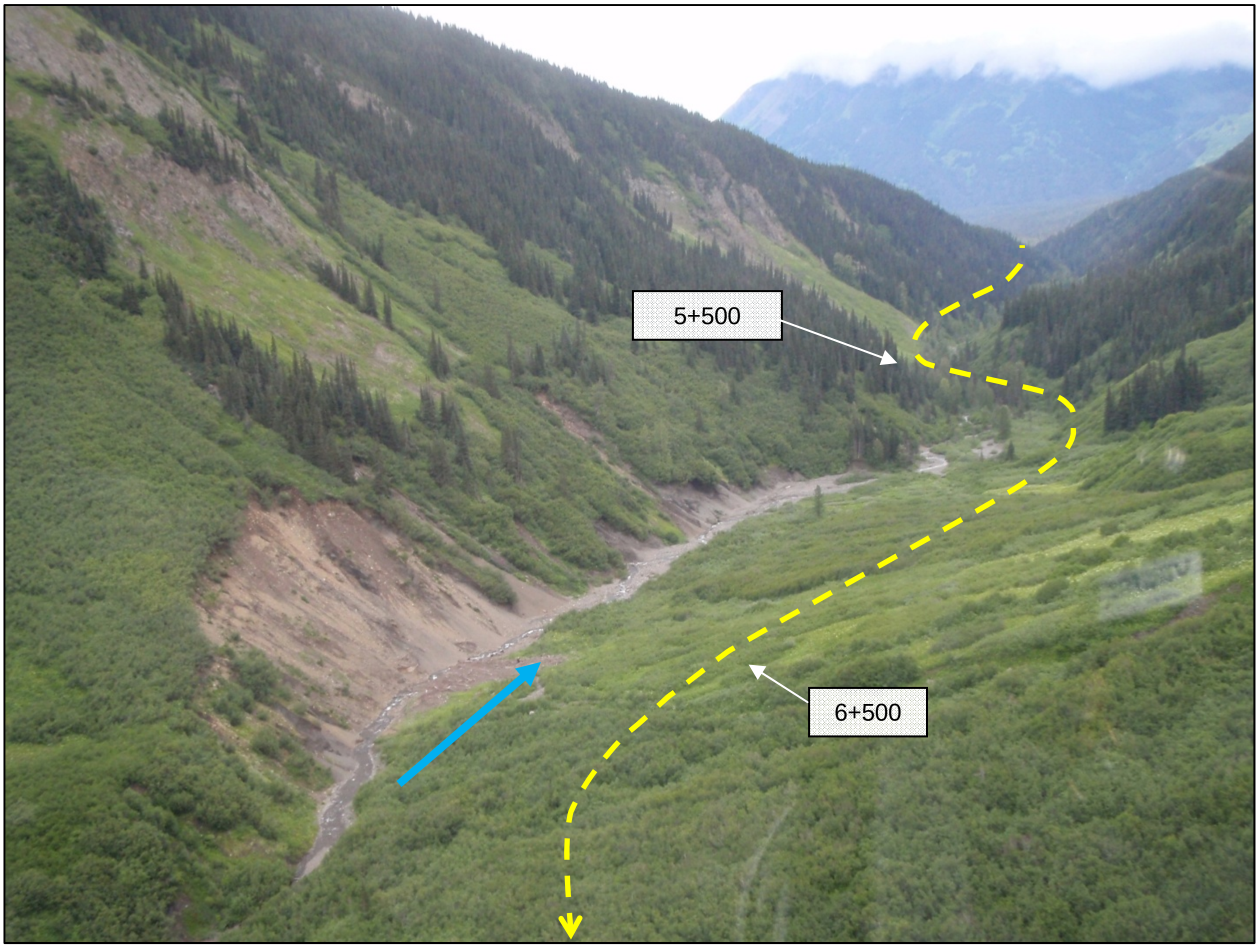
Photograph 18 **Teigen Creek Access Road – Looking towards KP 8+300 and an active landslide area (left of solid red line in photograph) below road grade approximately 10 m from the flagged road alignment. Moving road centreline approximately 25 – 50 m to the southeast is recommended.**



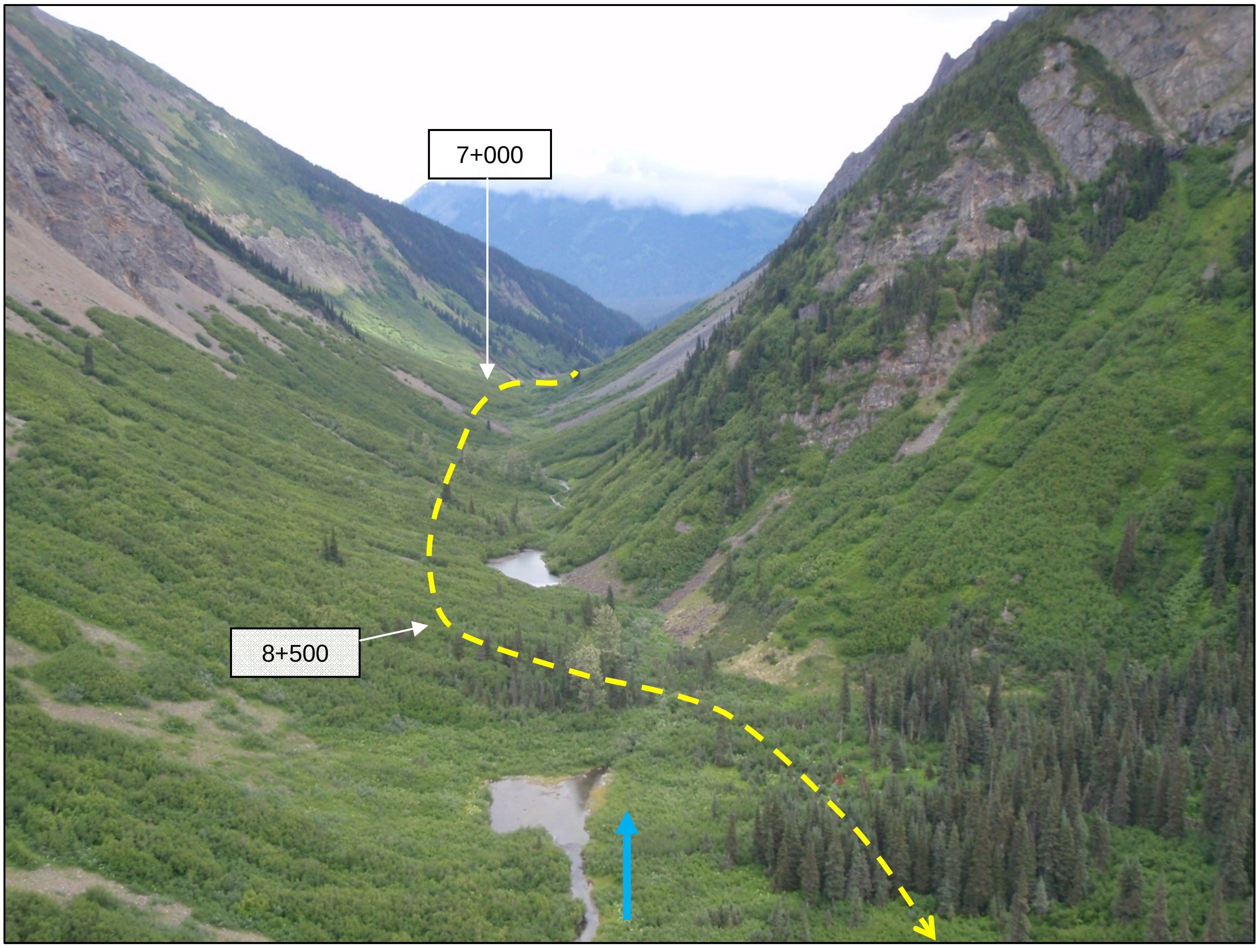
Photograph 19 Tunnel Spur Access Road – Looking upchain (west) up the western tributary of Teigen Creek.



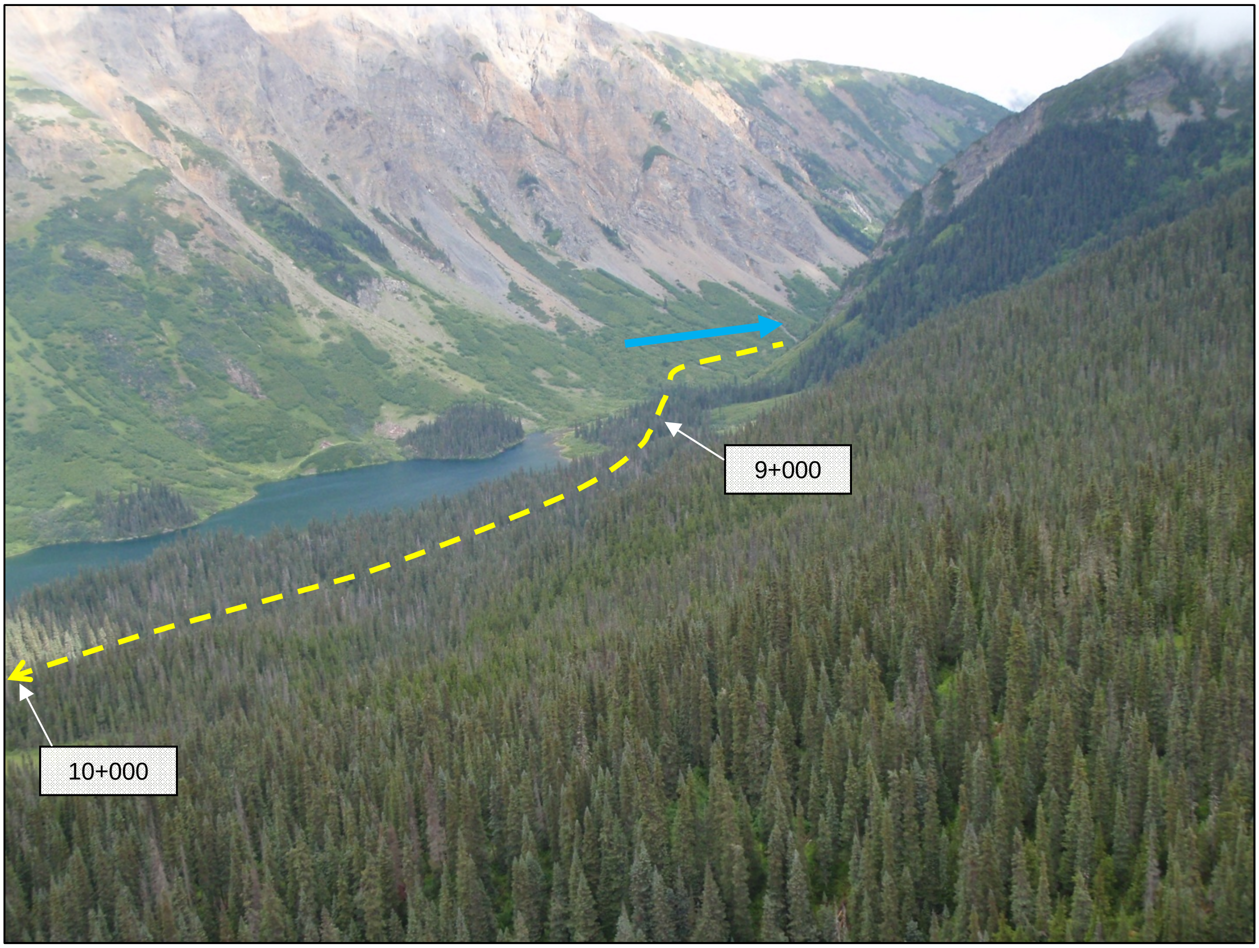
Photograph 20 **Tunnel Spur Access Road – Looking upchain (west) up the western tributary of Teigen Creek.**



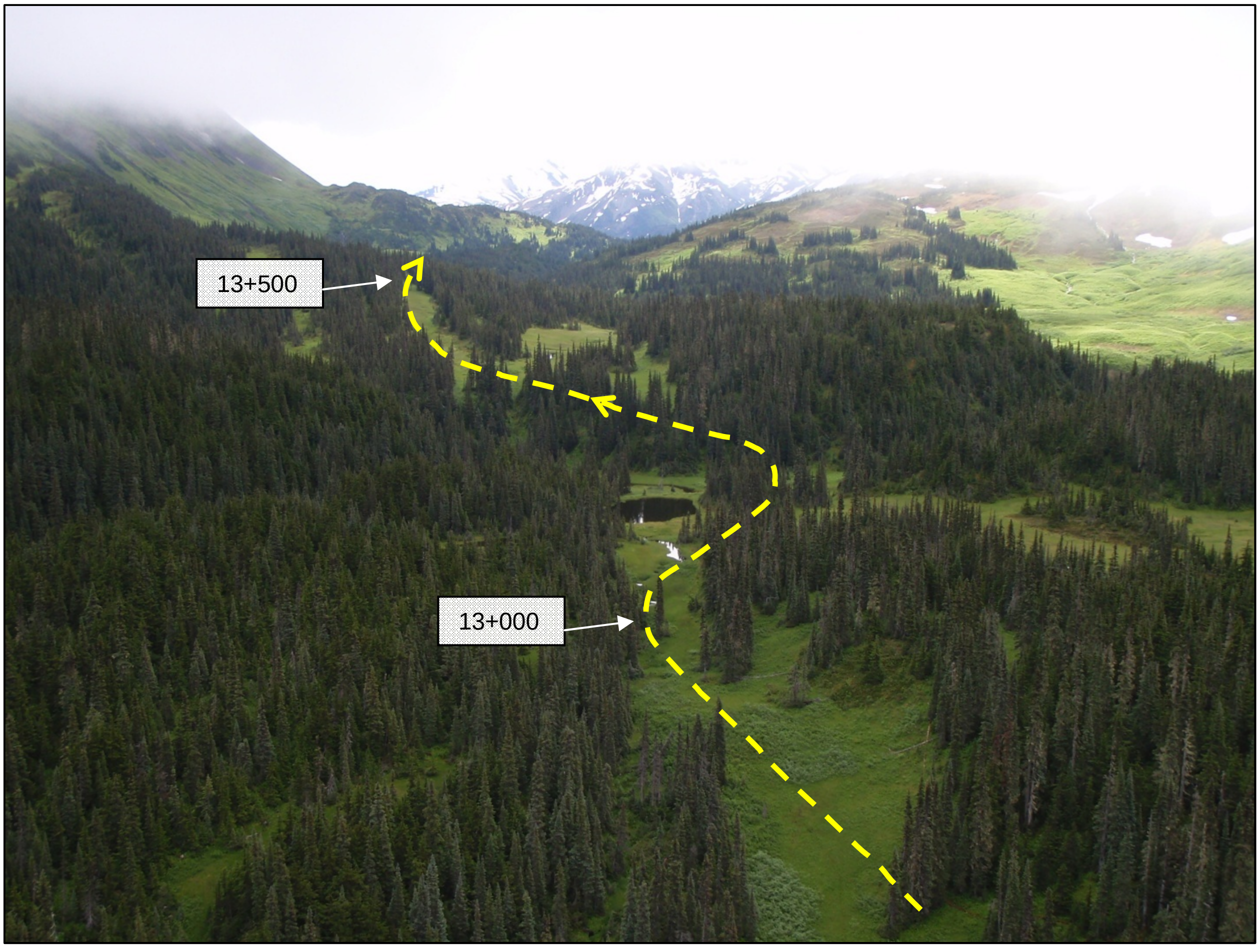
Photograph 21 **Tunnel Spur Access Road – Looking downchain (east) down the western tributary of Teigen Creek.**



Photograph 22 Tunnel Spur Access Road – Looking downchain (east) down the western tributary of Teigen Creek.

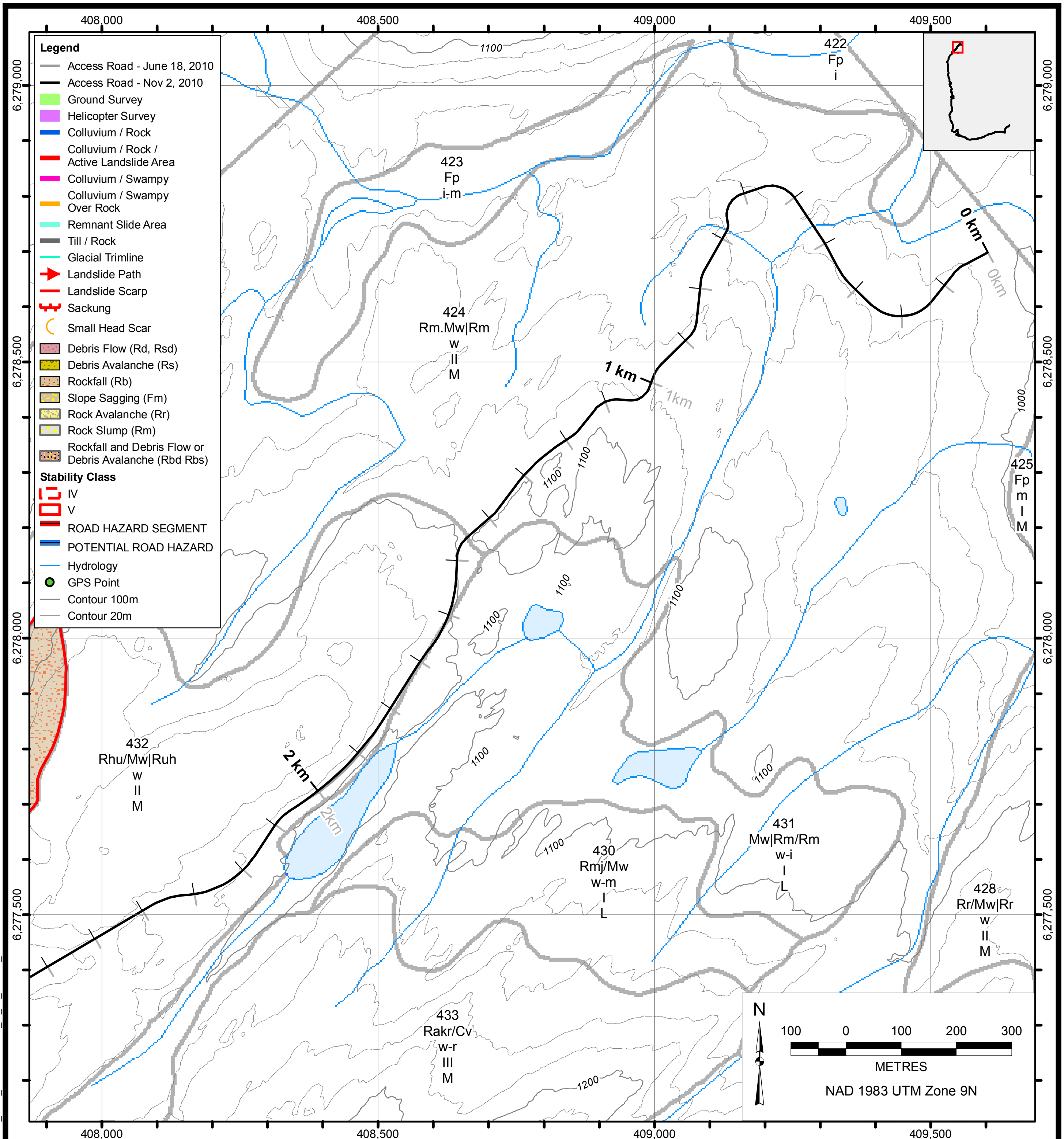


Photograph 23 **Tunnel Spur Access Road – Looking downchain towards an unnamed lake of the western tributary of Teigen Creek.**



Photograph 24 Tunnel Spur Access Road – Looking upchain (east) towards Treaty Shoulder.

APPENDIX C
ROAD MAPS



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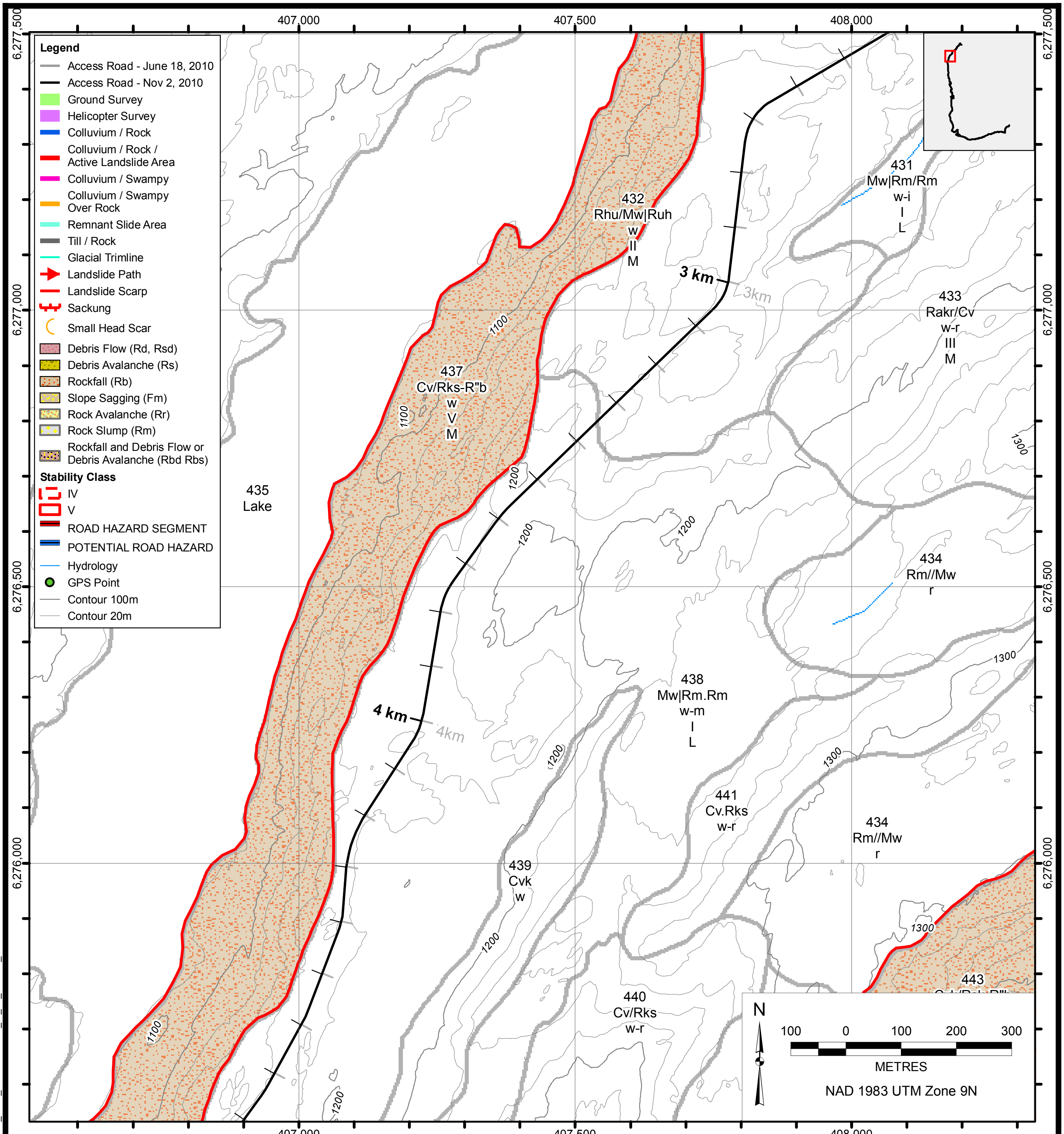

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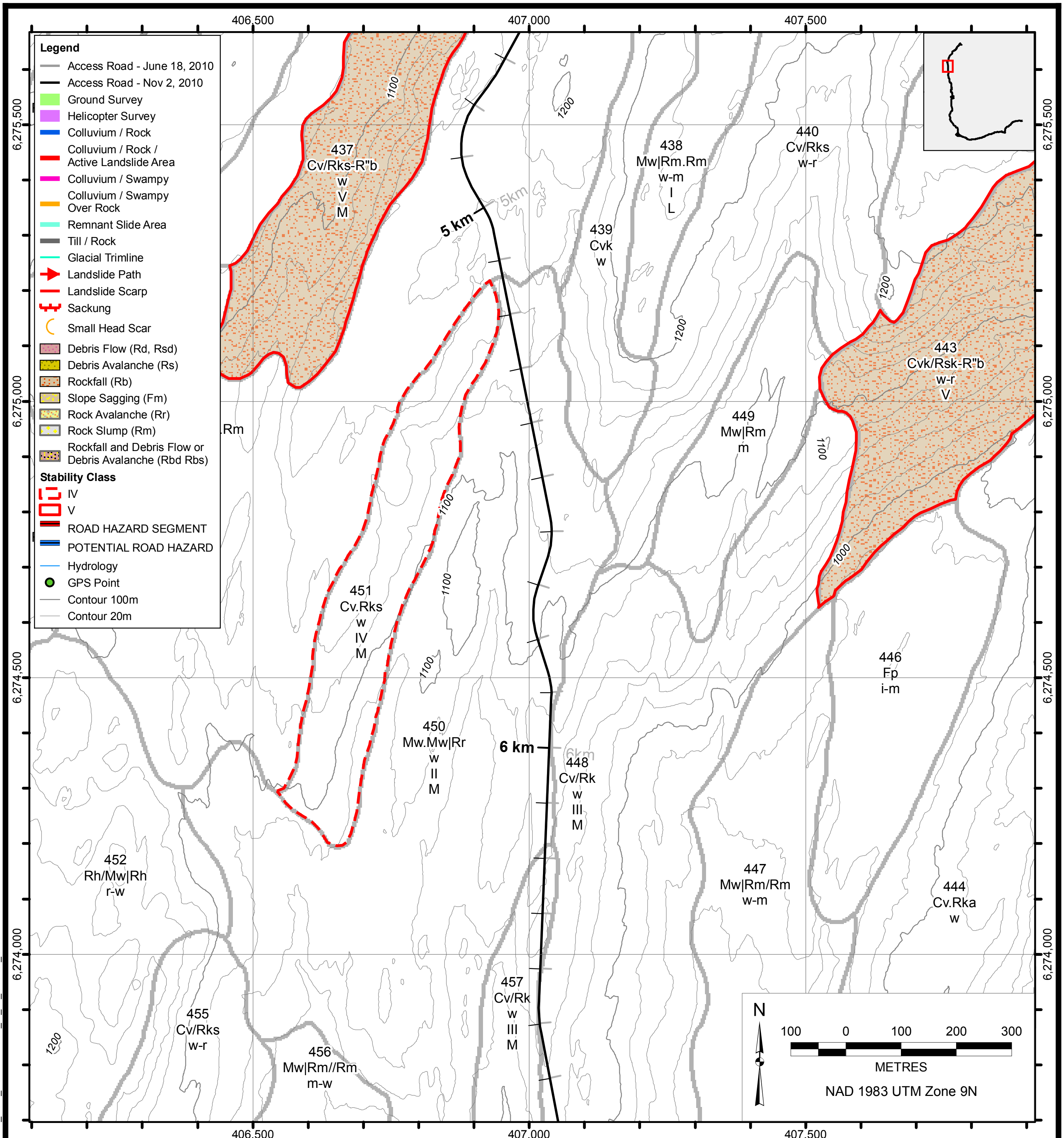

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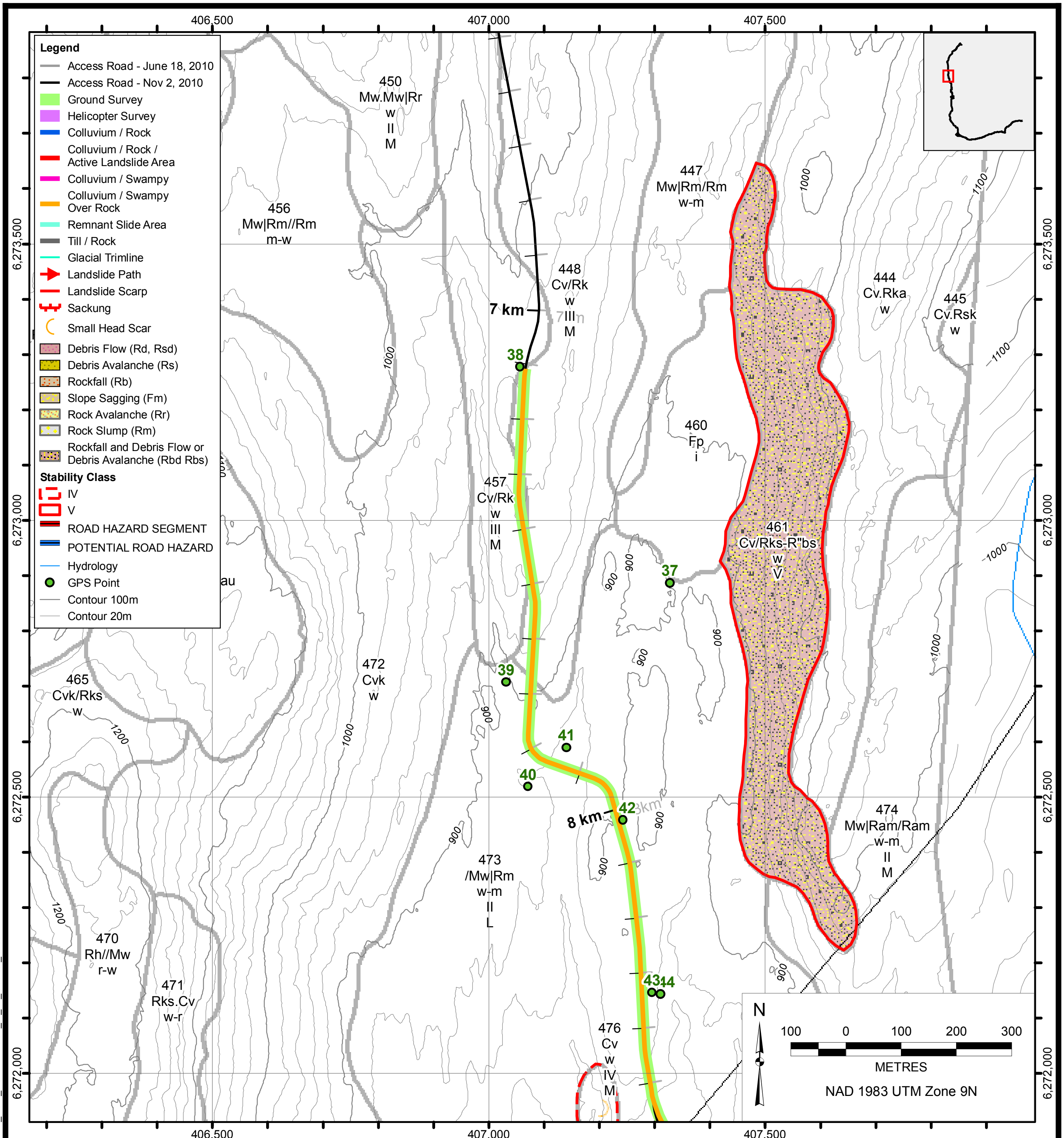

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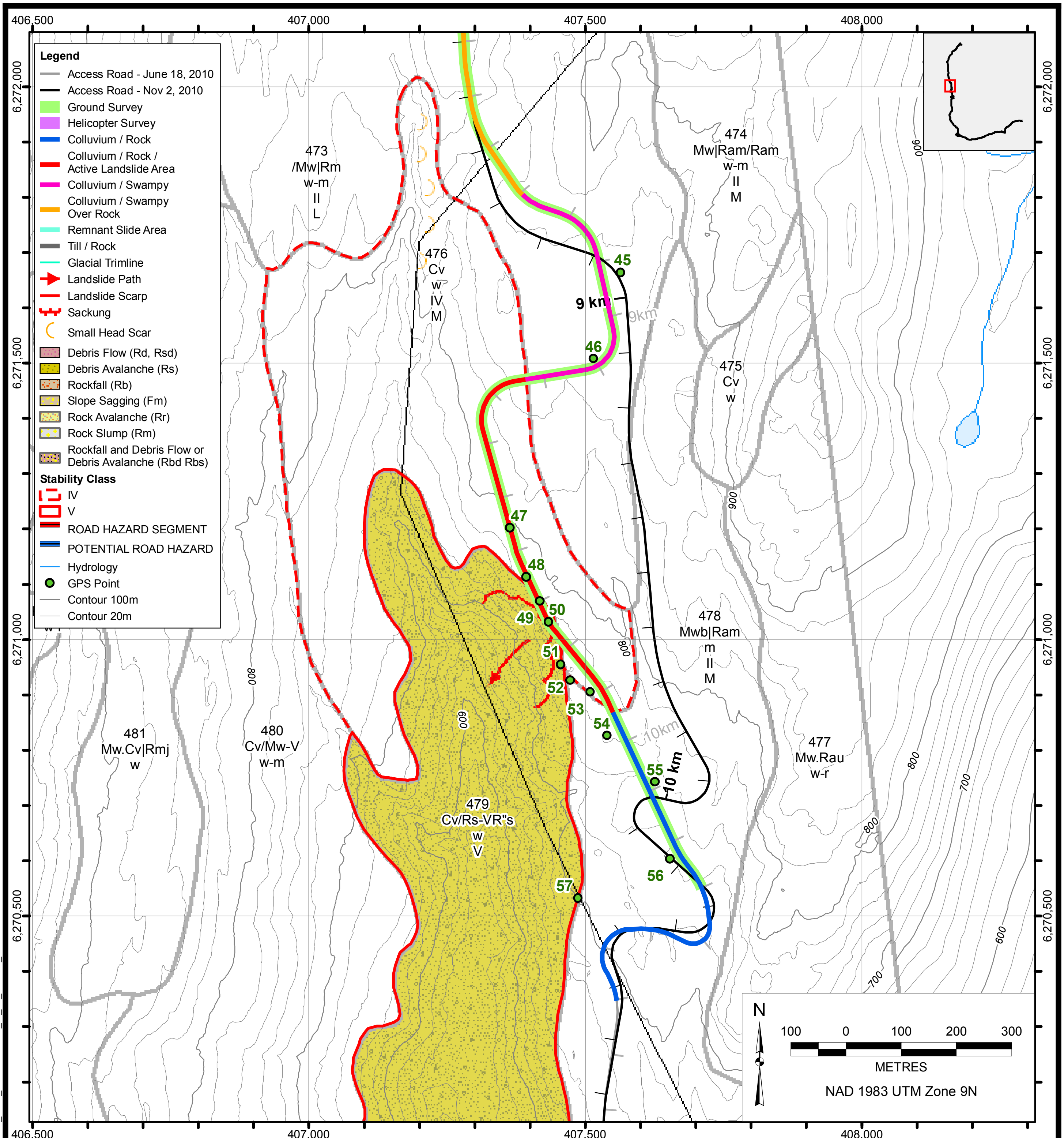

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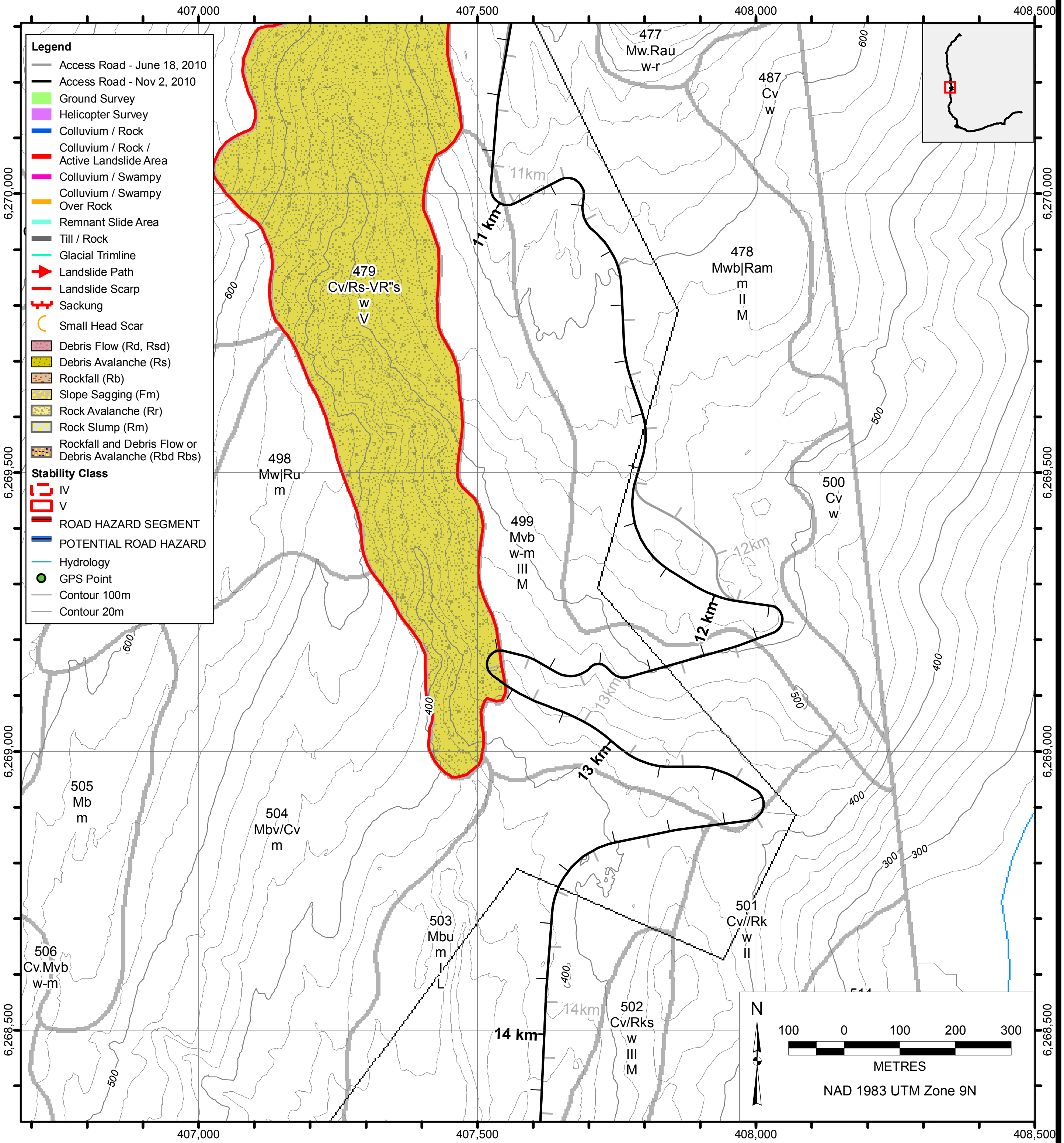

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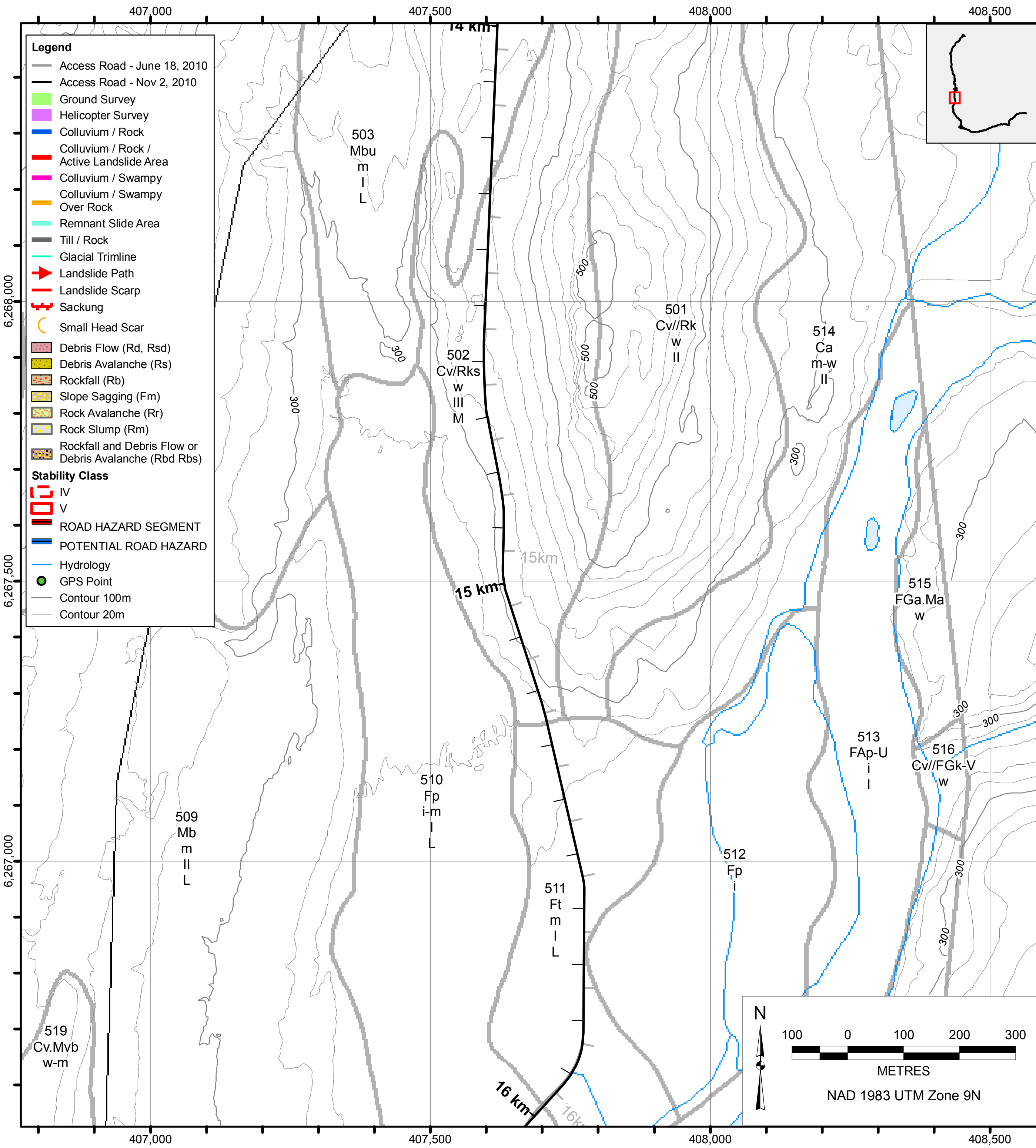

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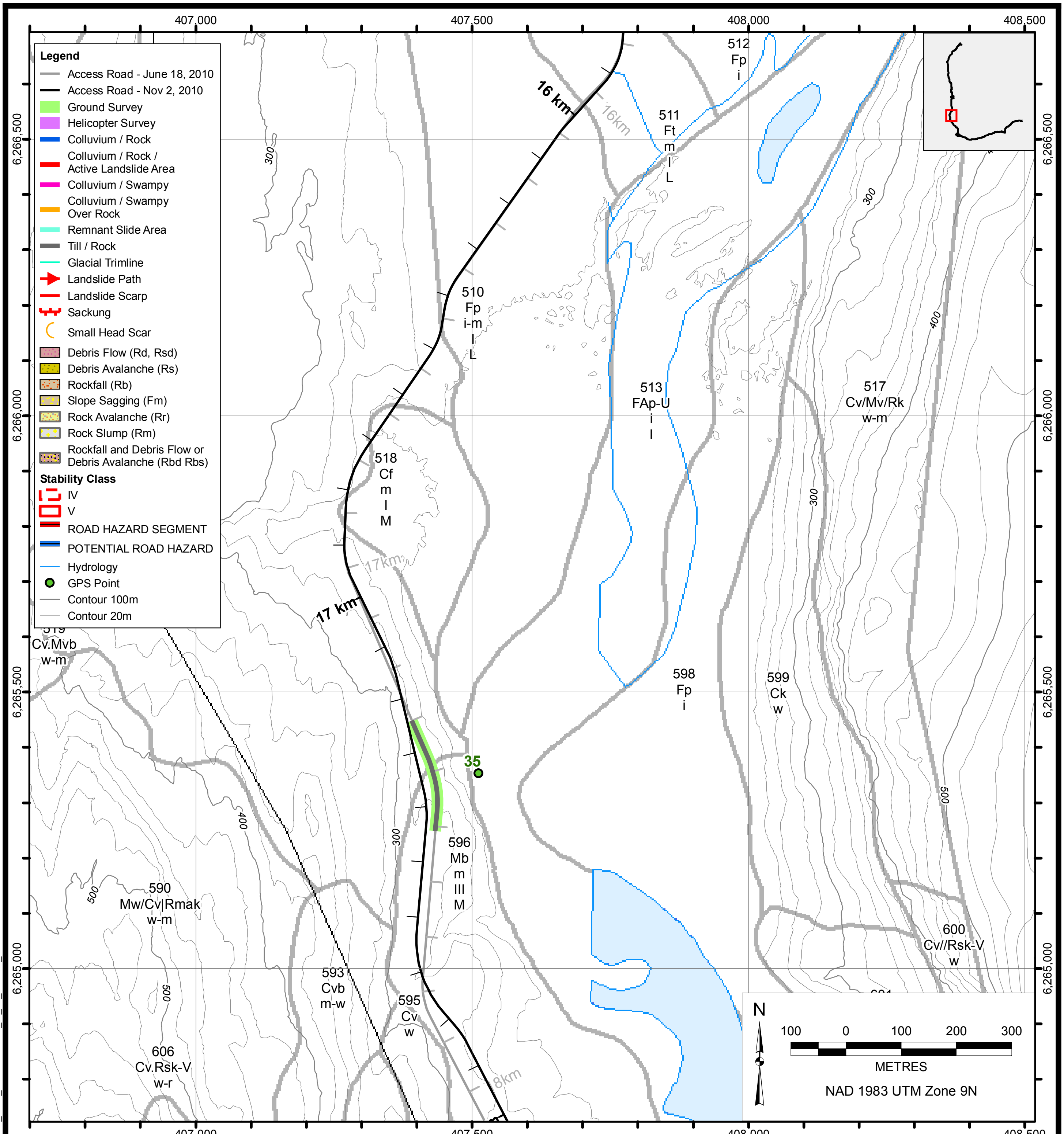

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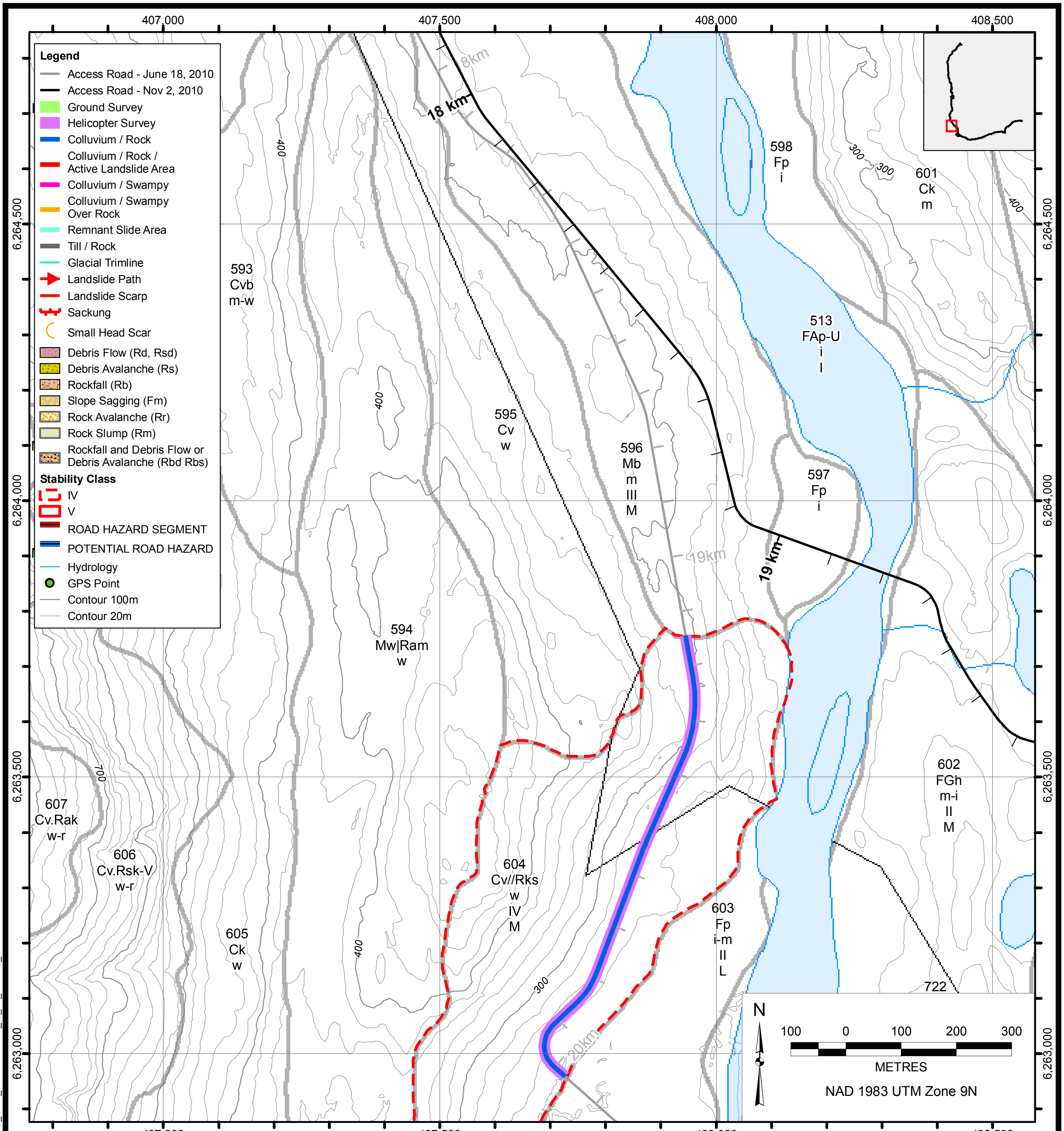

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PROJECT: KSM GEOHAZARDS PROJECT - TSFA

TITLE: COULTER CREEK ACCESS ROAD

CLIENT: SEABRIDGE GOLD INC.

PROJECT No.:	DWG No.:	REV.:
0638-005	09	

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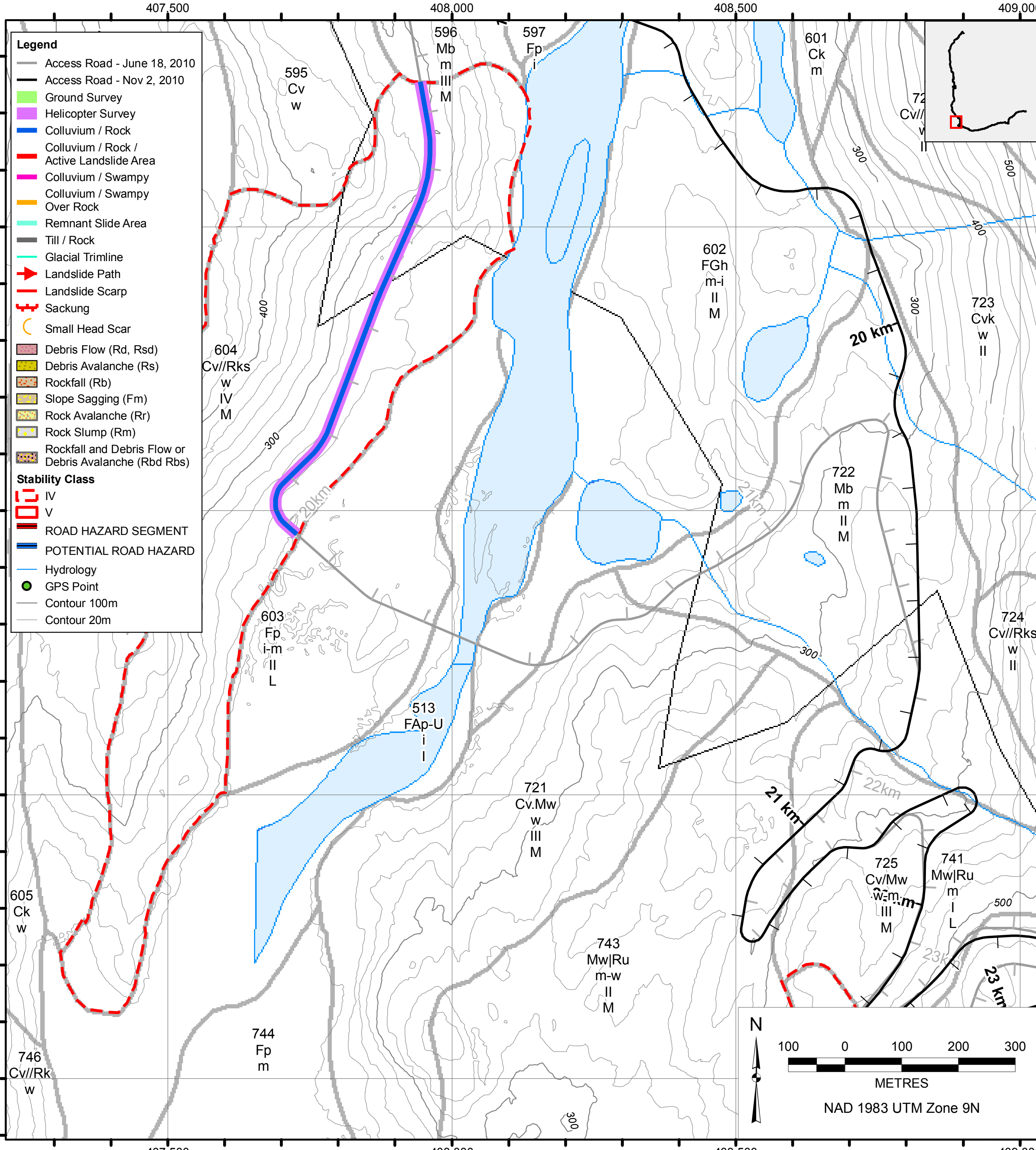

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BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PROJECT: KSM GEOHAZARDS PROJECT - TSFA

TITLE: COULTER CREEK ACCESS ROAD

CLIENT: SEABRIDGE GOLD INC.

PROJECT No.:	DWG No.:	REV.:
0638-005	10	

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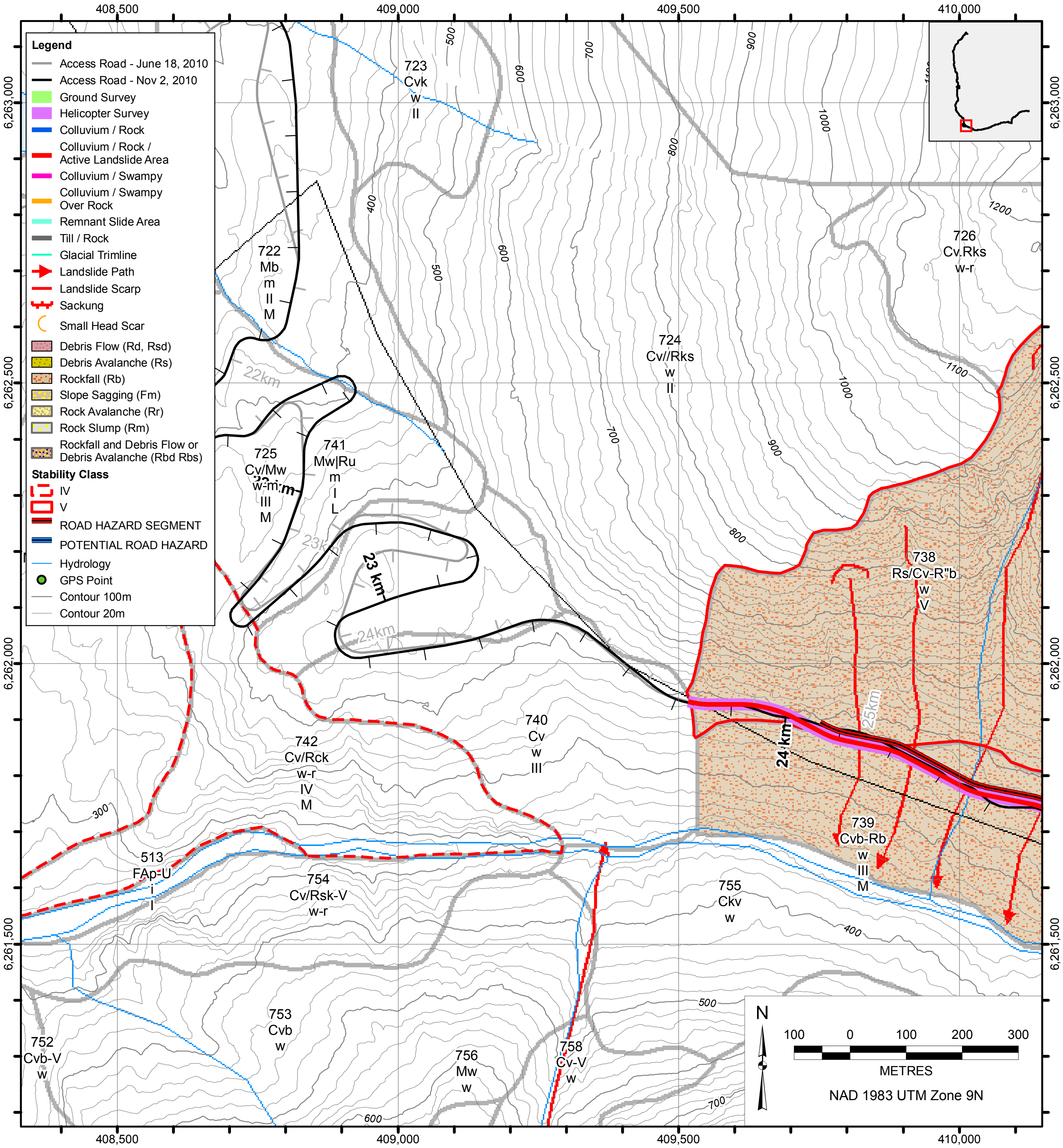

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DATE: NOV 2010		CHECKED: SF	
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BGC ENGINEERING INC.
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PROJECT: KSM GEOHAZARDS PROJECT - TSFA

TITLE: COULTER CREEK ACCESS ROAD

CLIENT: SEABRIDGE GOLD INC.

PROJECT No.:	DWG No.:	REV.:
0638-005	11	

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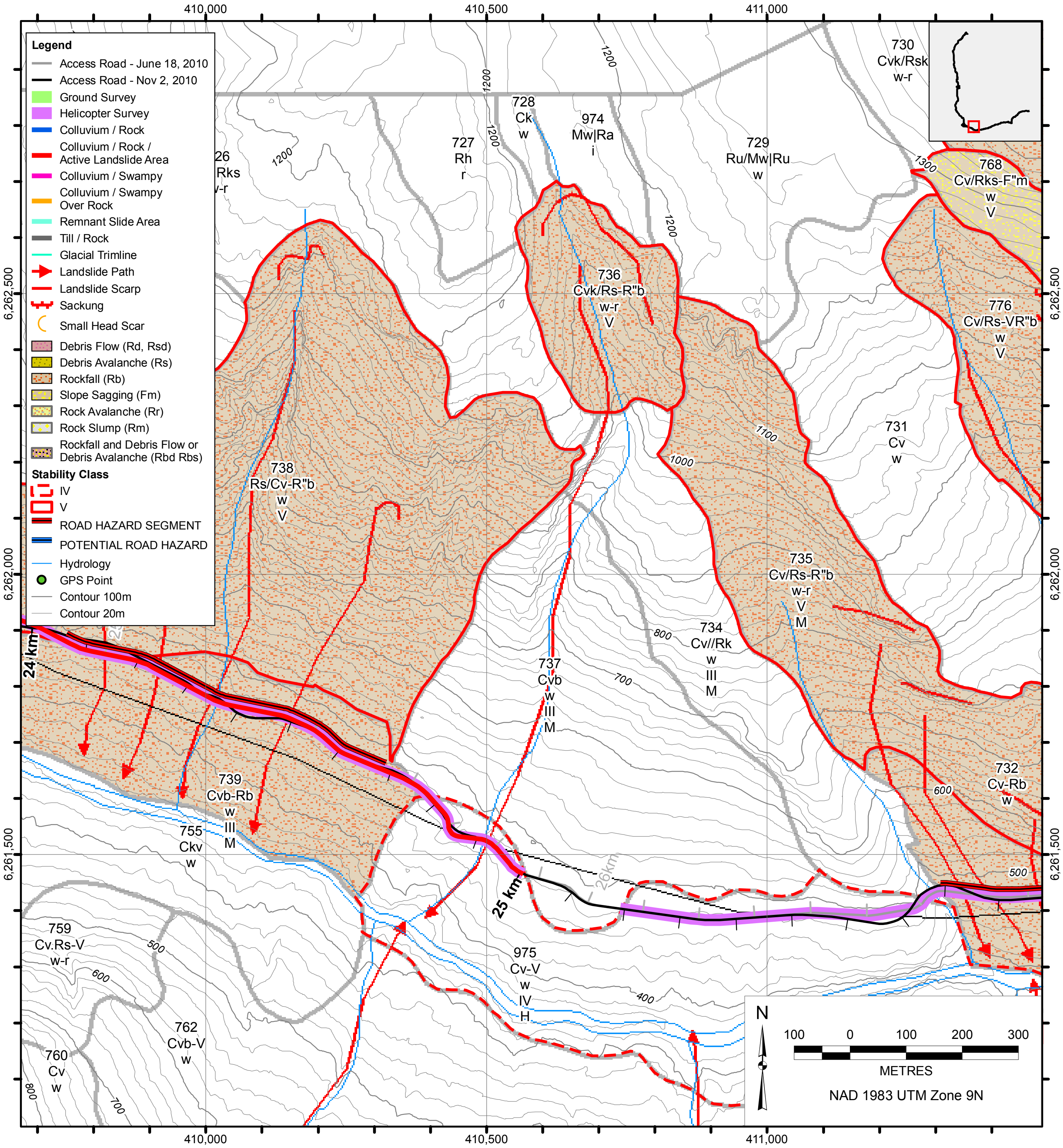

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AN APPLIED EARTH SCIENCES COMPANY

PROJECT: KSM GEOHAZARDS PROJECT - TSFA

TITLE: COULTER CREEK ACCESS ROAD

CLIENT: SEABRIDGE GOLD INC.

PROJECT No.:	DWG No.:	REV.:
0638-005	12	

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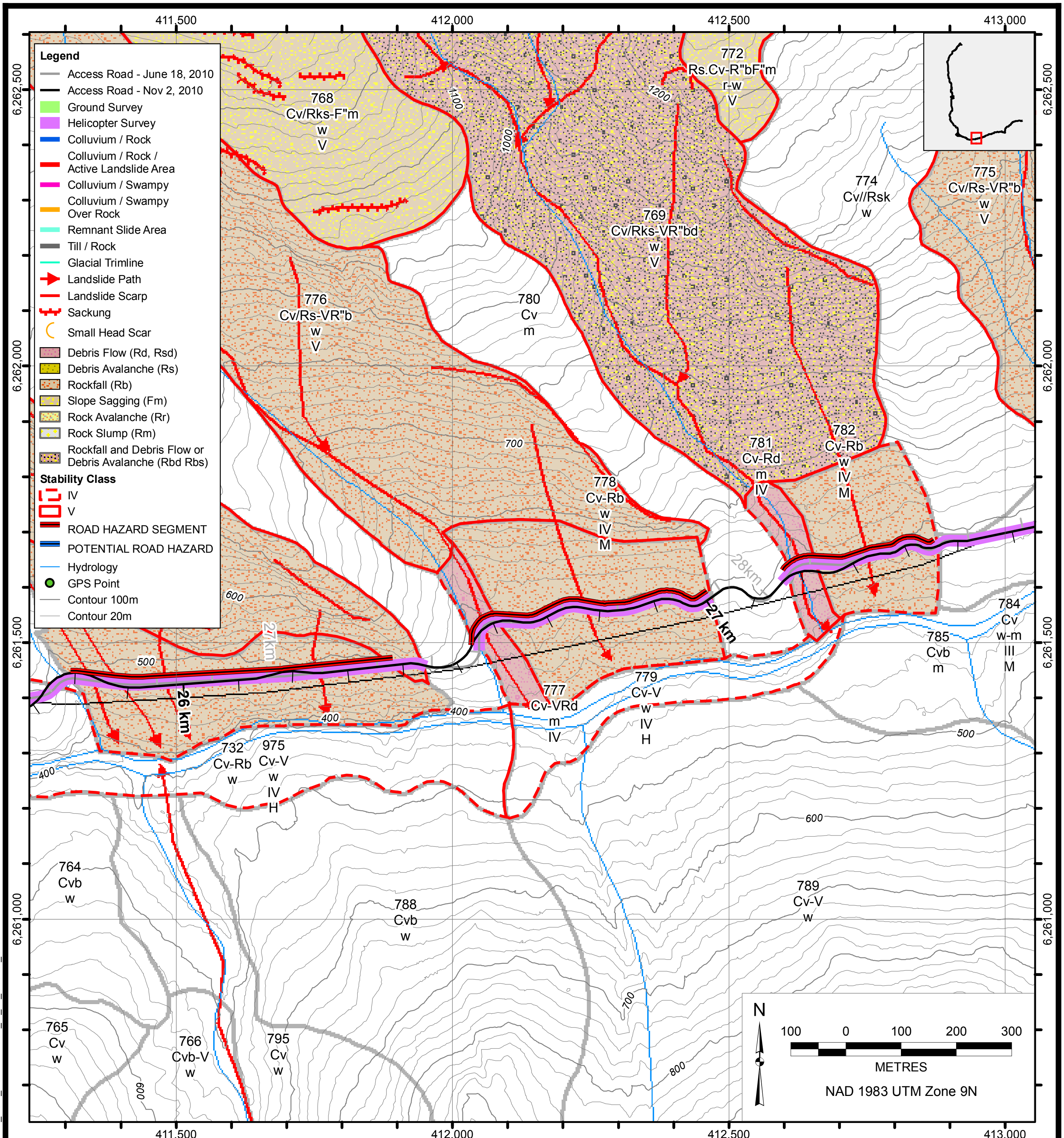

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PROJECT: KSM GEOHAZARDS PROJECT - TSFA

TITLE: COULTER CREEK ACCESS ROAD

CLIENT: SEABRIDGE GOLD INC.

PROJECT No.:	DWG No.:	REV.:
0638-005	13	

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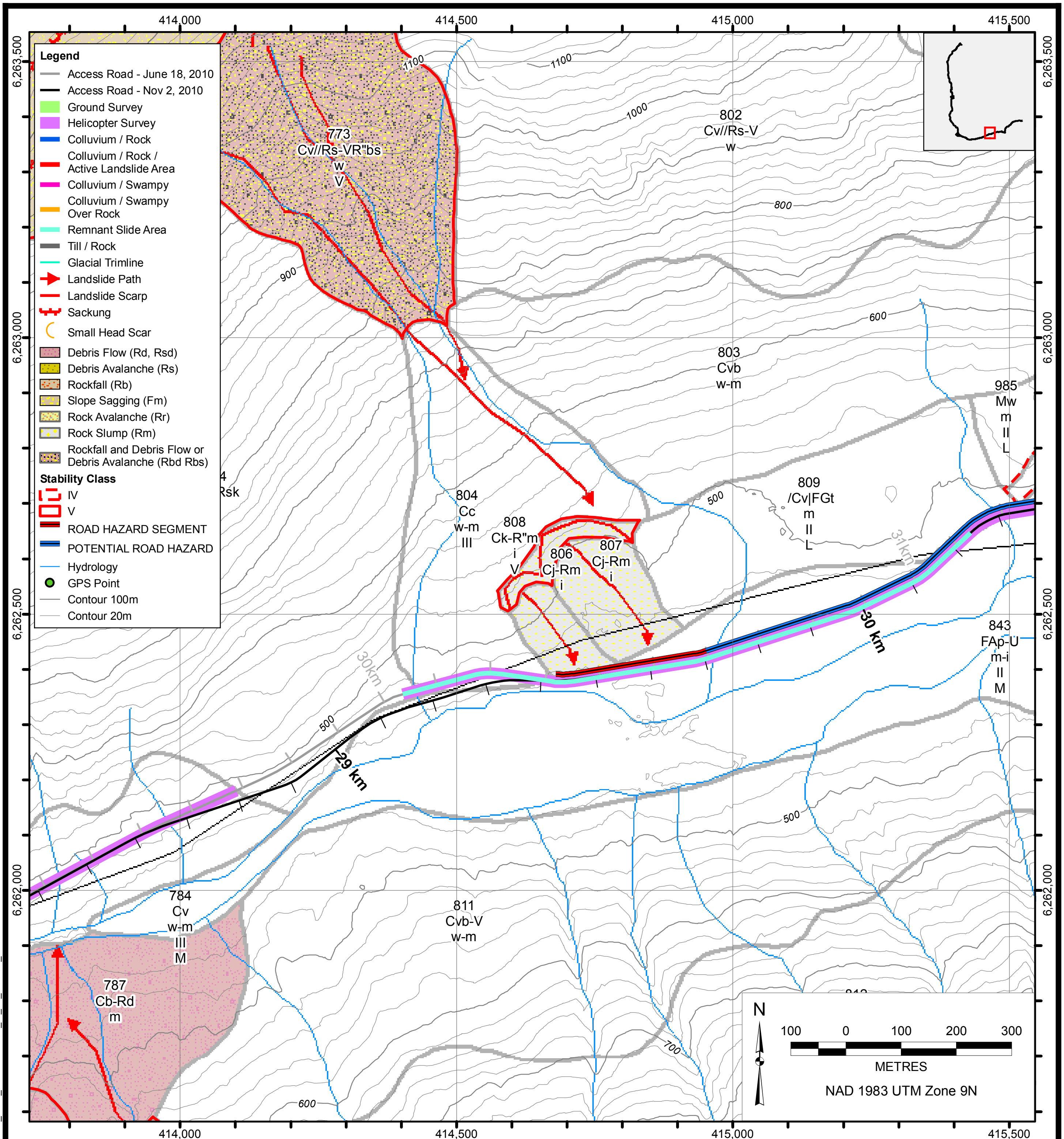

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AN APPLIED EARTH SCIENCES COMPANY

PROJECT:
KSM GEOHAZARDS PROJECT - TSFA

TITLE:
COULTER CREEK ACCESS ROAD

CLIENT:
SEABRIDGE GOLD INC.

PROJECT No.:	DWG No.:	REV.:
0638-005	14	

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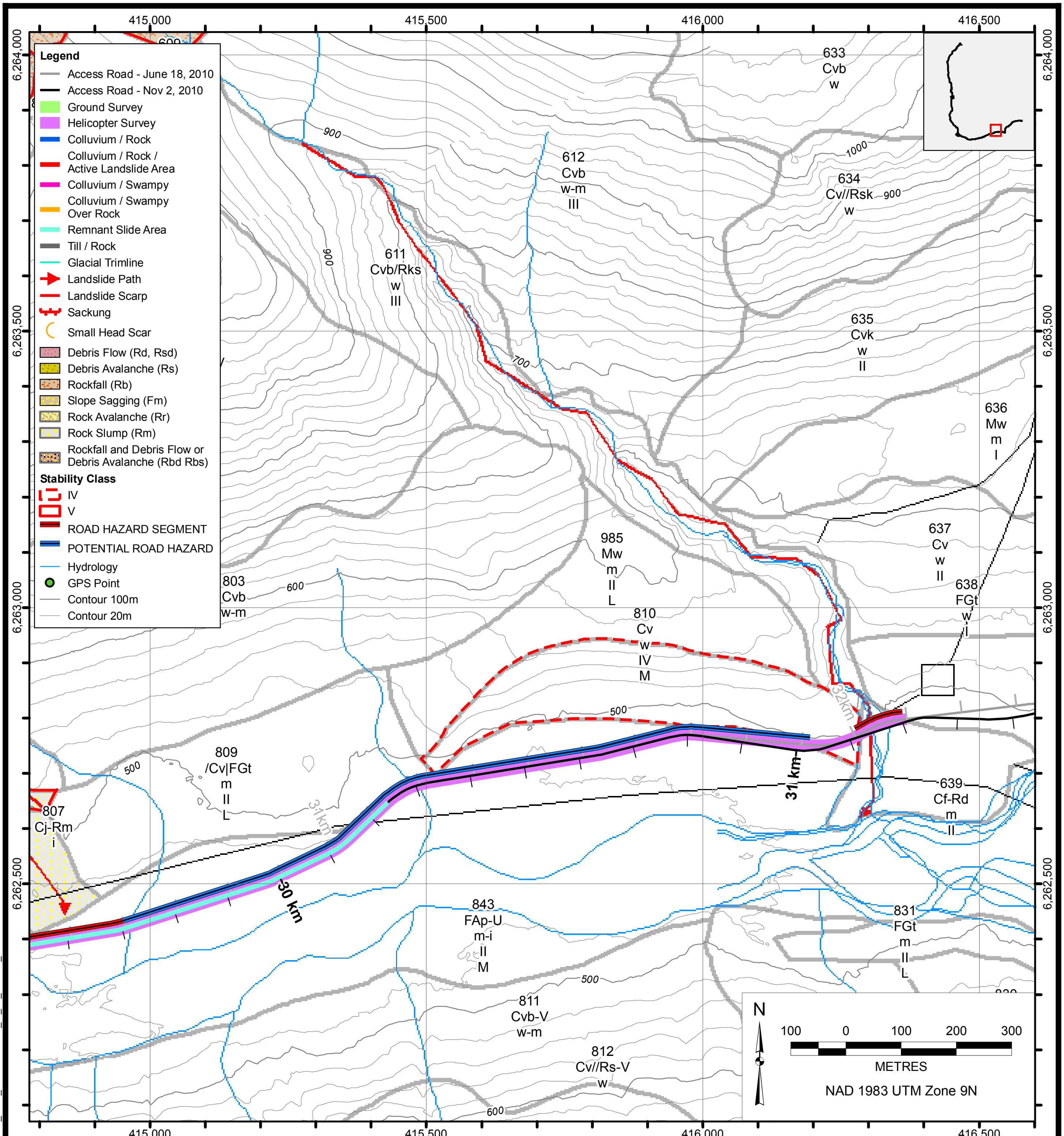

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PROJECT: KSM GEOHAZARDS PROJECT - TSFA

TITLE: COULTER CREEK ACCESS ROAD

CLIENT: SEABRIDGE GOLD INC.

PROJECT No.:	DWG No.:	REV.:
0638-005	15	

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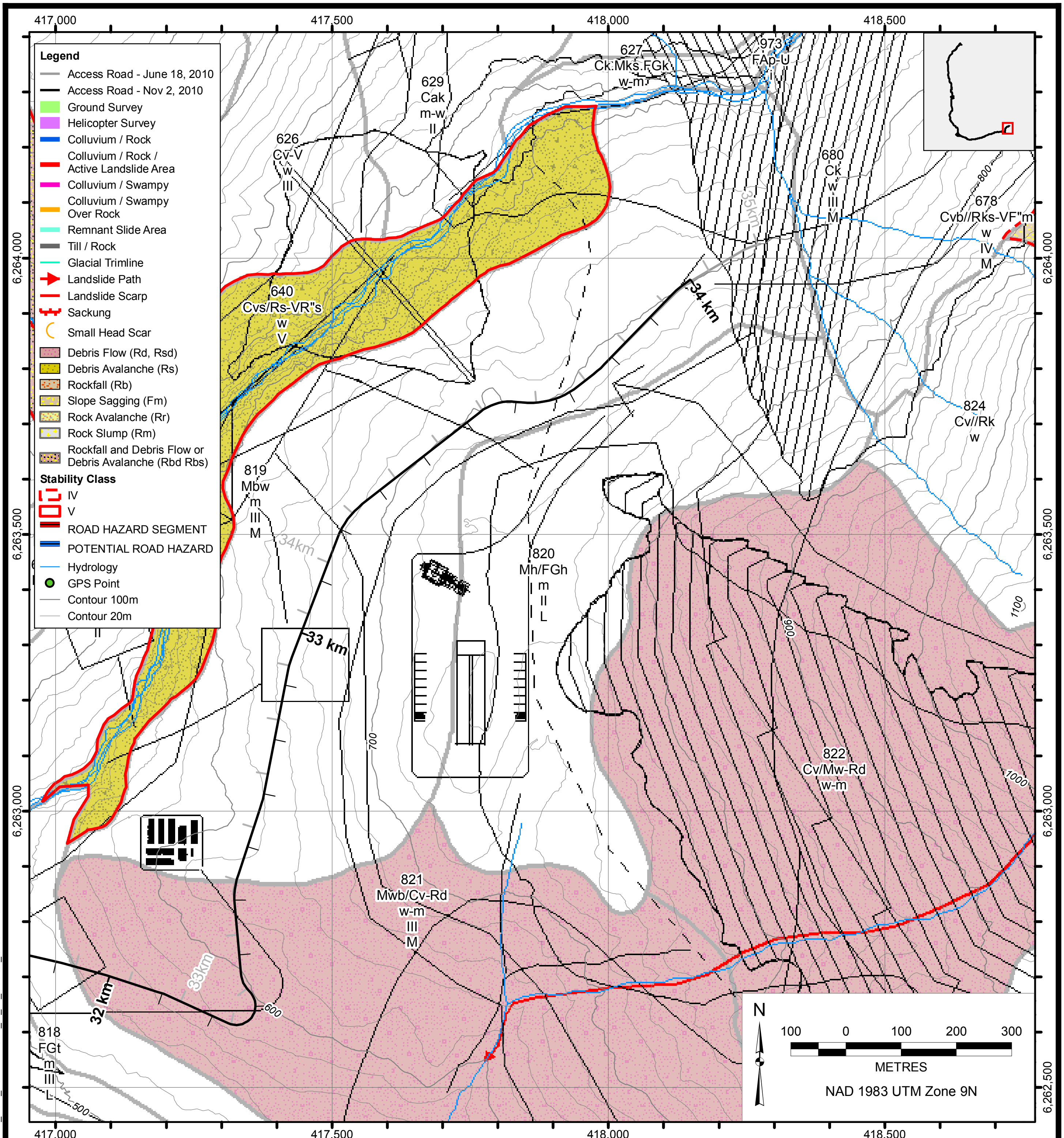

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PROJECT: KSM GEOHAZARDS PROJECT - TSFA

TITLE: COULTER CREEK ACCESS ROAD

CLIENT: SEABRIDGE GOLD INC.

PROJECT No.:	DWG No.:	REV.:
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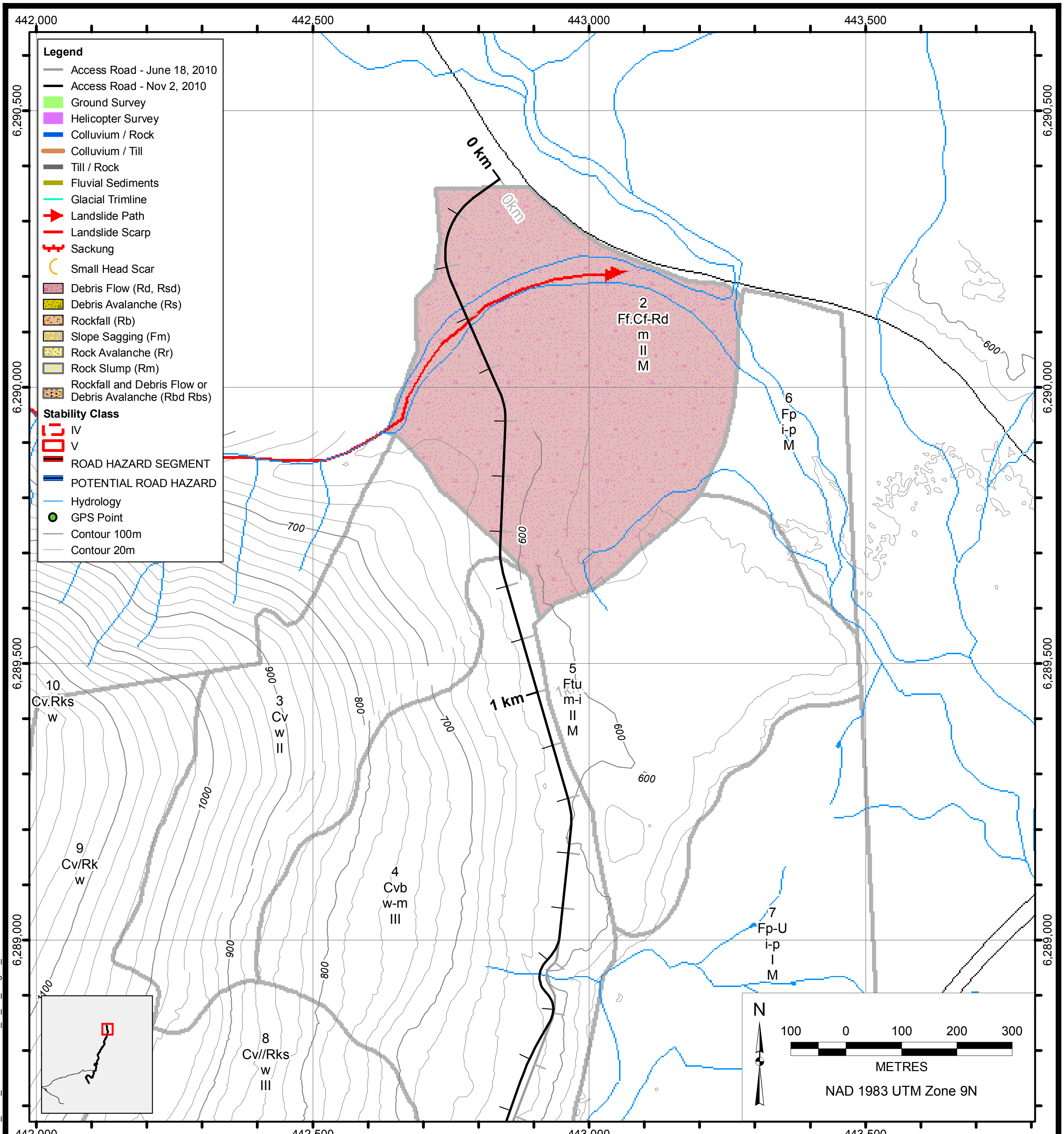

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BGC ENGINEERING INC.
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PROJECT: KSM GEOHAZARDS PROJECT - TSFA

TITLE: TEIGEN CREEK ACCESS ROAD

CLIENT: SEABRIDGE GOLD INC.

PROJECT No.:	DWG No.:	REV.:
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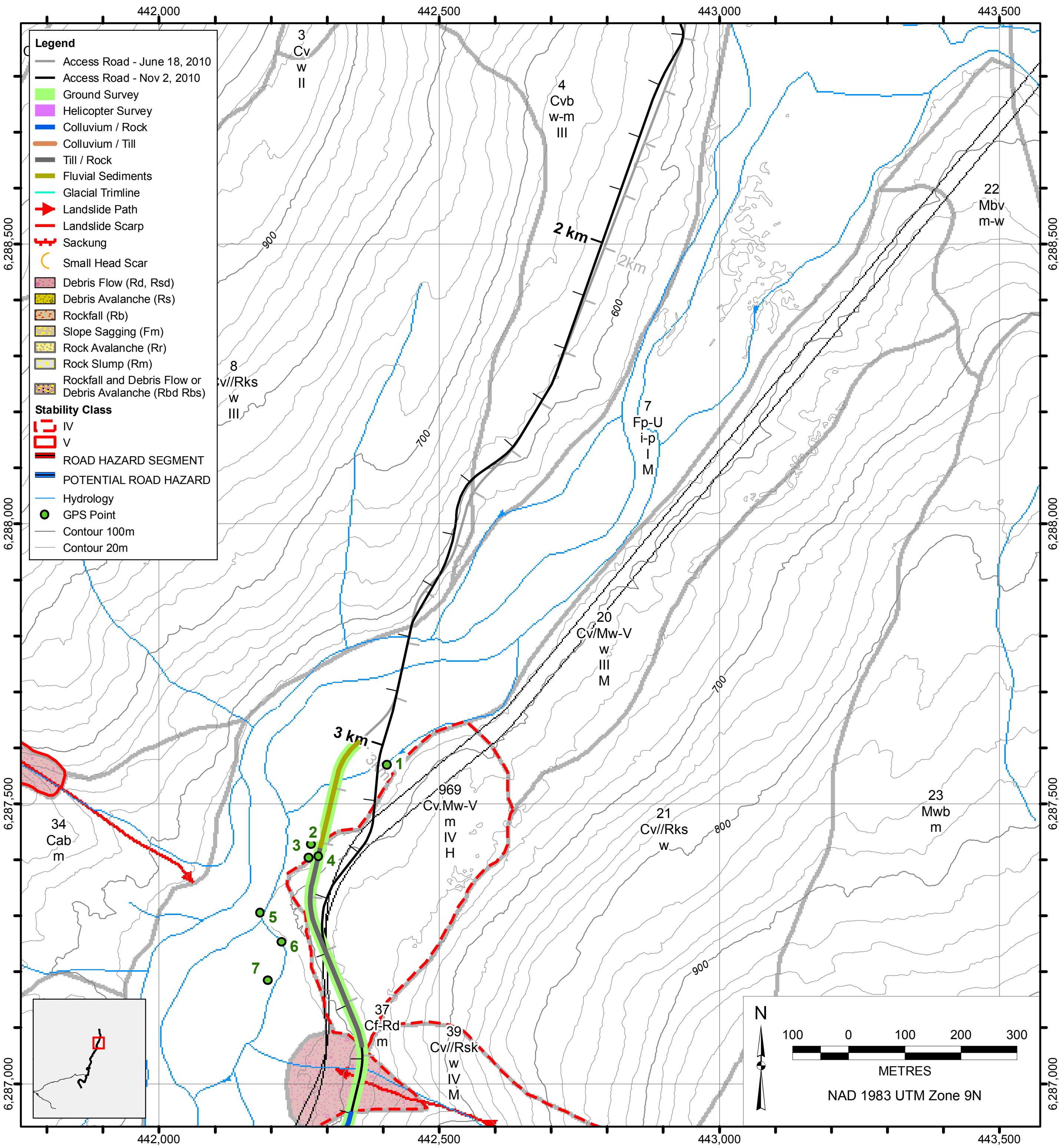

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PROJECT: KSM GEOHAZARDS PROJECT - TSFA

TITLE: TEIGEN CREEK ACCESS ROAD

CLIENT: SEABRIDGE GOLD INC.

PROJECT No.:	DWG No.:	REV.:
0638-005	18	

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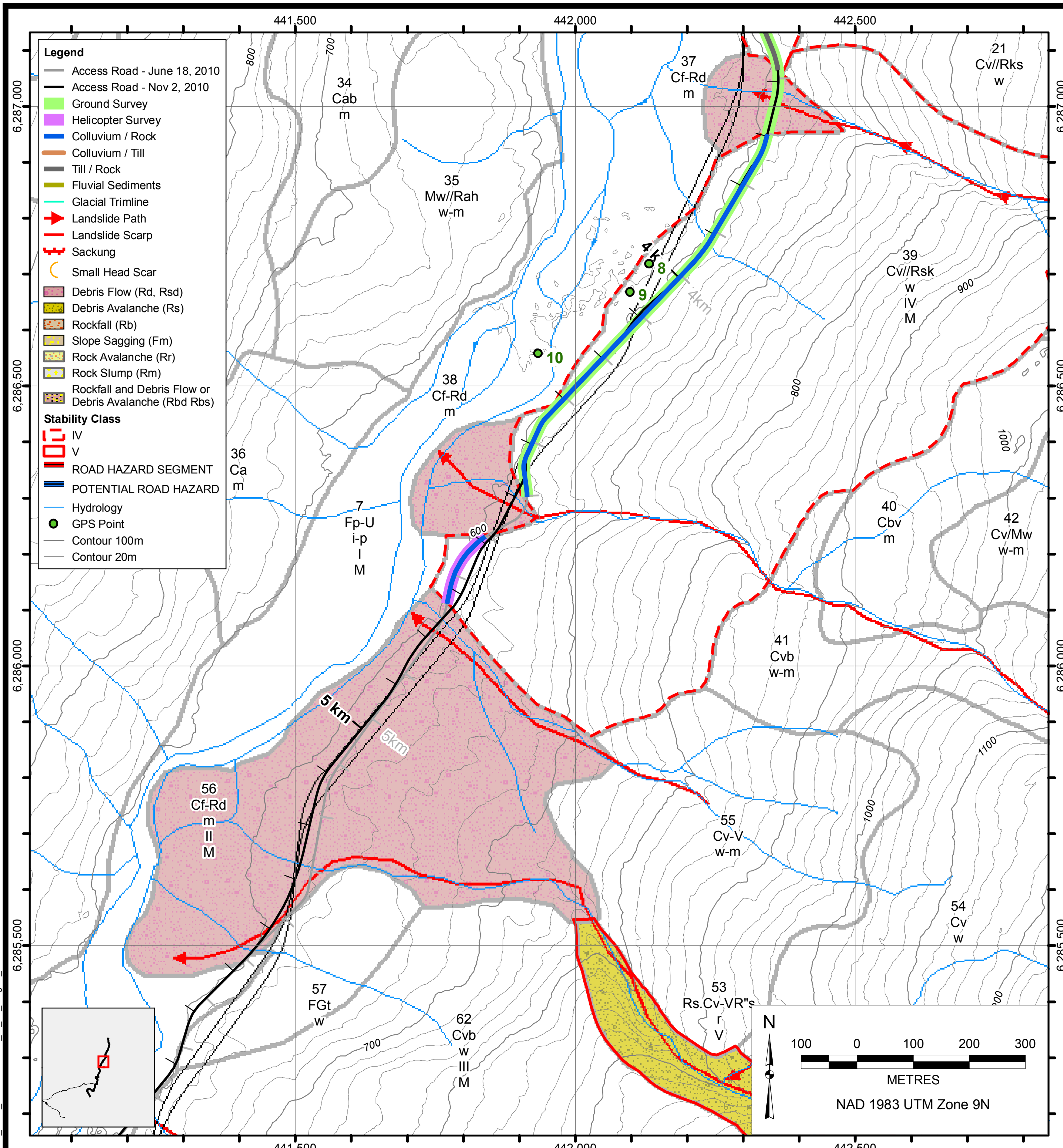

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AN APPLIED EARTH SCIENCES COMPANY

PROJECT: KSM GEOHAZARDS PROJECT - TSFA

TITLE: TEIGEN CREEK ACCESS ROAD

CLIENT: SEABRIDGE GOLD INC.

PROJECT No.:	DWG No.:	REV.:
0638-005	19	

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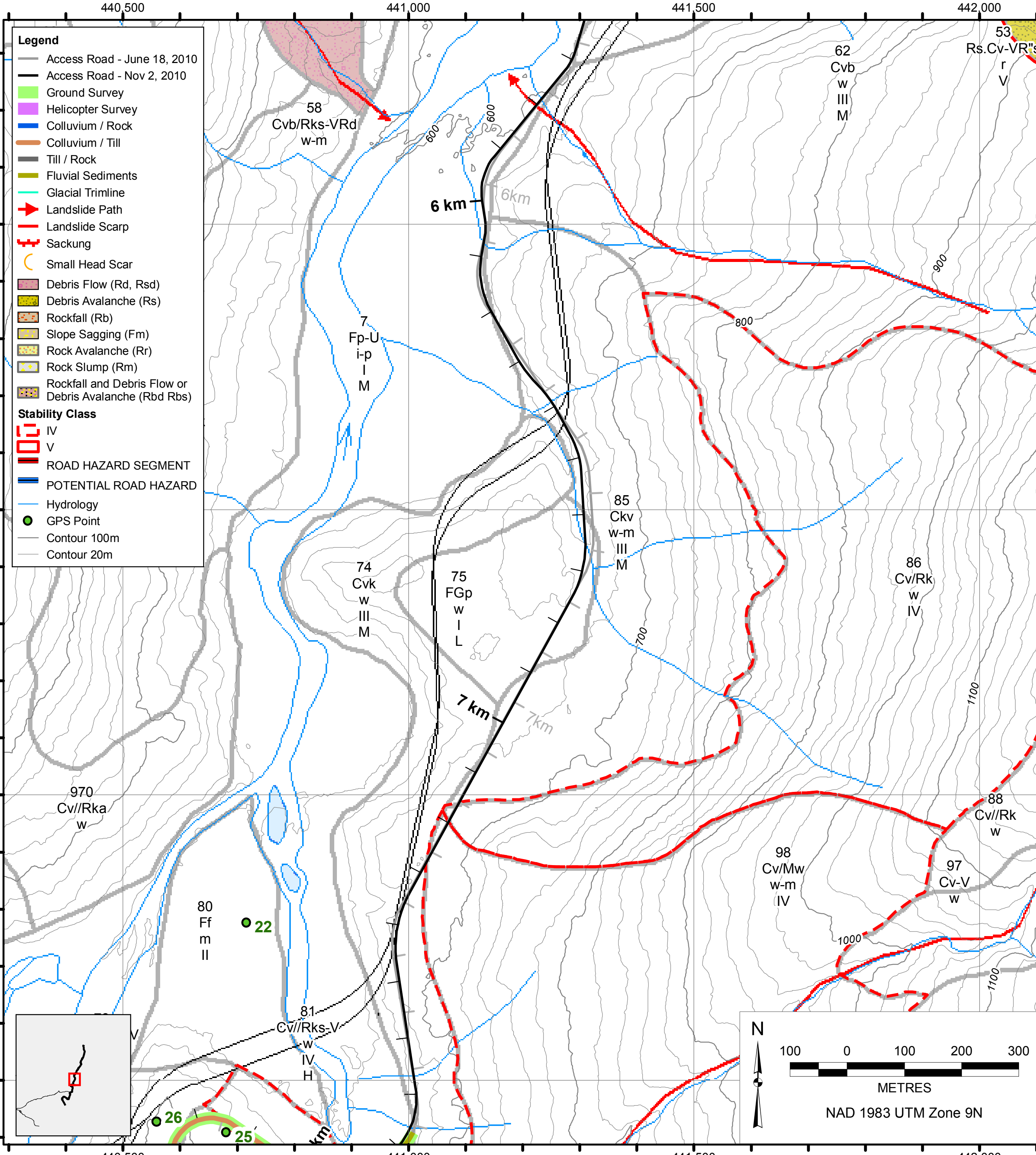

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BGC ENGINEERING INC.
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PROJECT: KSM GEOHAZARDS PROJECT - TSFA

TITLE: TEIGEN CREEK ACCESS ROAD

CLIENT: SEABRIDGE GOLD INC.

PROJECT No.:	DWG No.:	REV.:
0638-005	20	

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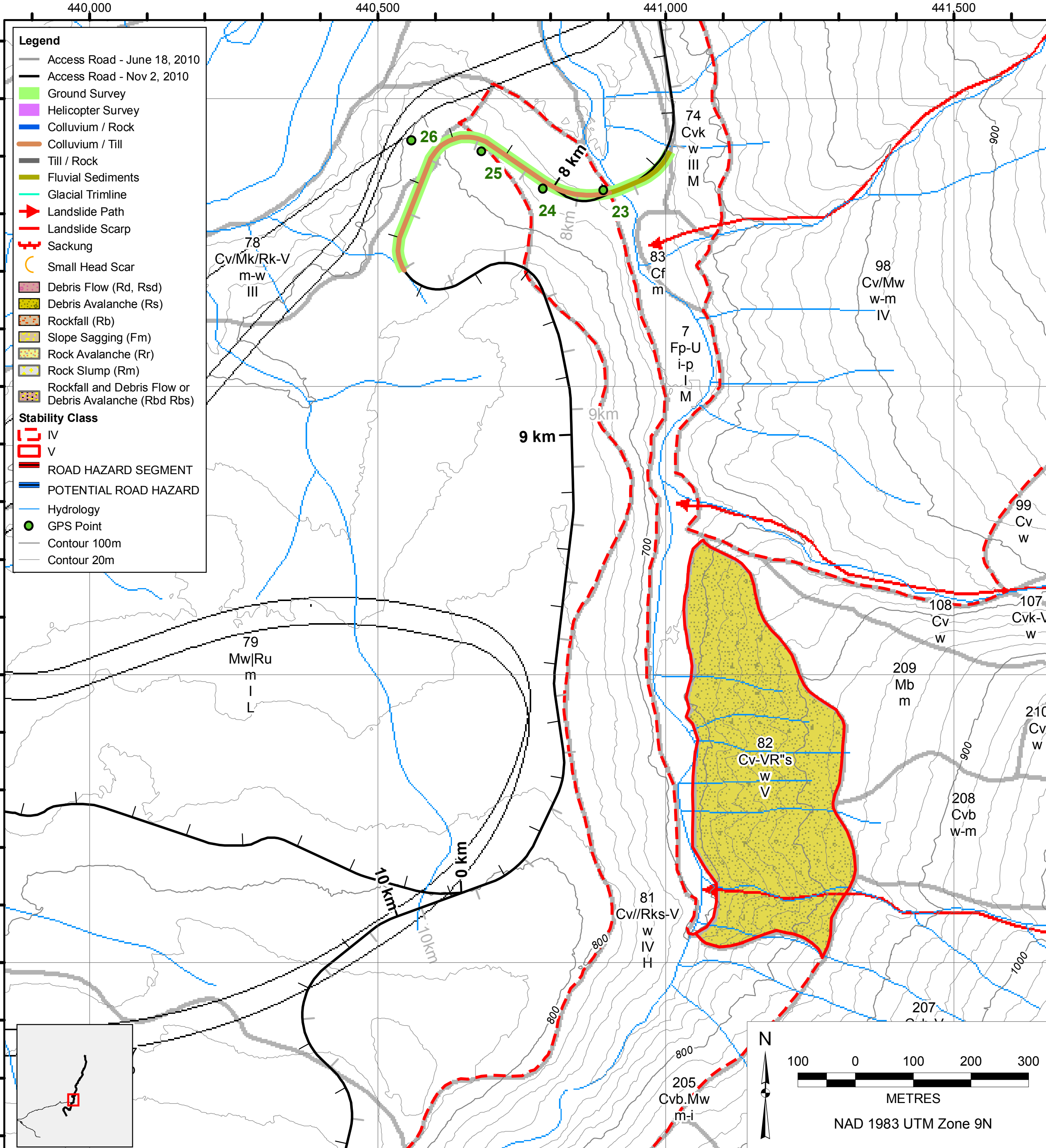

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BGC ENGINEERING INC.
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PROJECT: KSM GEOHAZARDS PROJECT - TSFA

TITLE: TEIGEN CREEK ACCESS ROAD

CLIENT: SEABRIDGE GOLD INC.

PROJECT No.:	DWG No.:	REV.:
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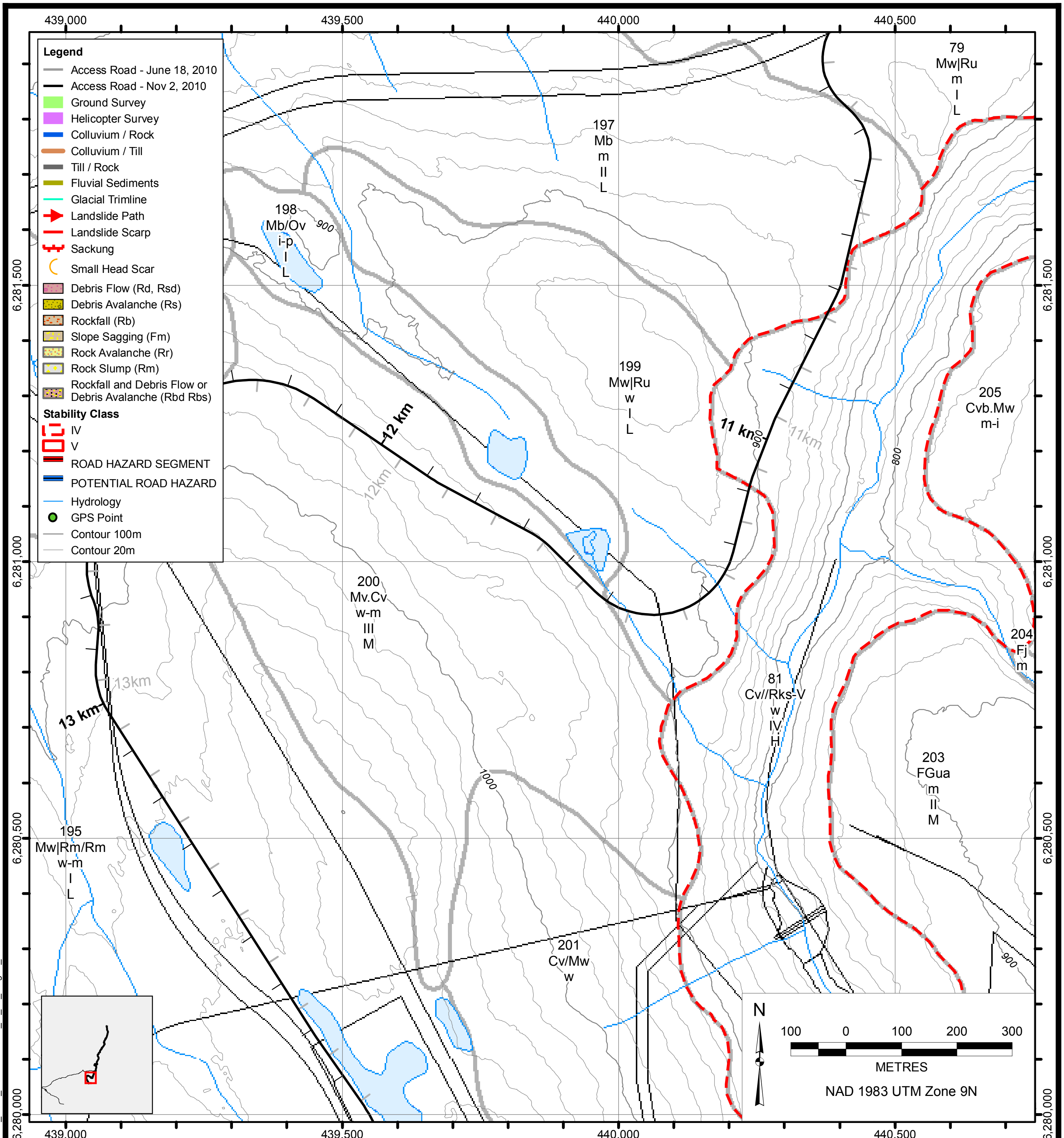

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PROJECT: KSM GEOHAZARDS PROJECT - TSFA

TITLE: TEIGEN CREEK ACCESS ROAD

CLIENT: SEABRIDGE GOLD INC.

PROJECT No.:	DWG No.:	REV.:
0638-005	22	

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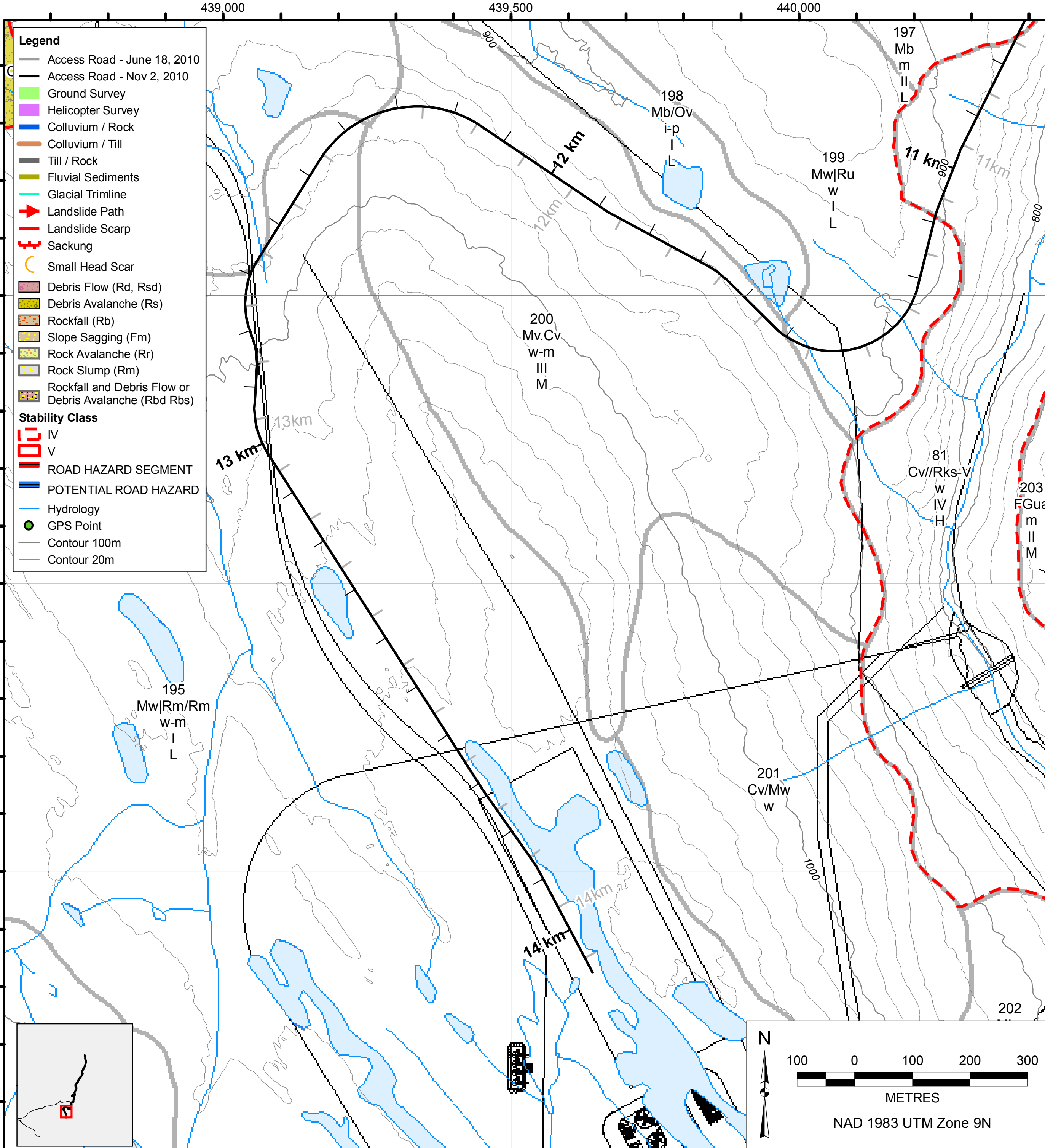

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BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PROJECT: KSM GEOHAZARDS PROJECT - TSFA

TITLE: TEIGEN CREEK ACCESS ROAD

CLIENT: SEABRIDGE GOLD INC.

PROJECT No.:	DWG No.:	REV.:
0638-005	23	

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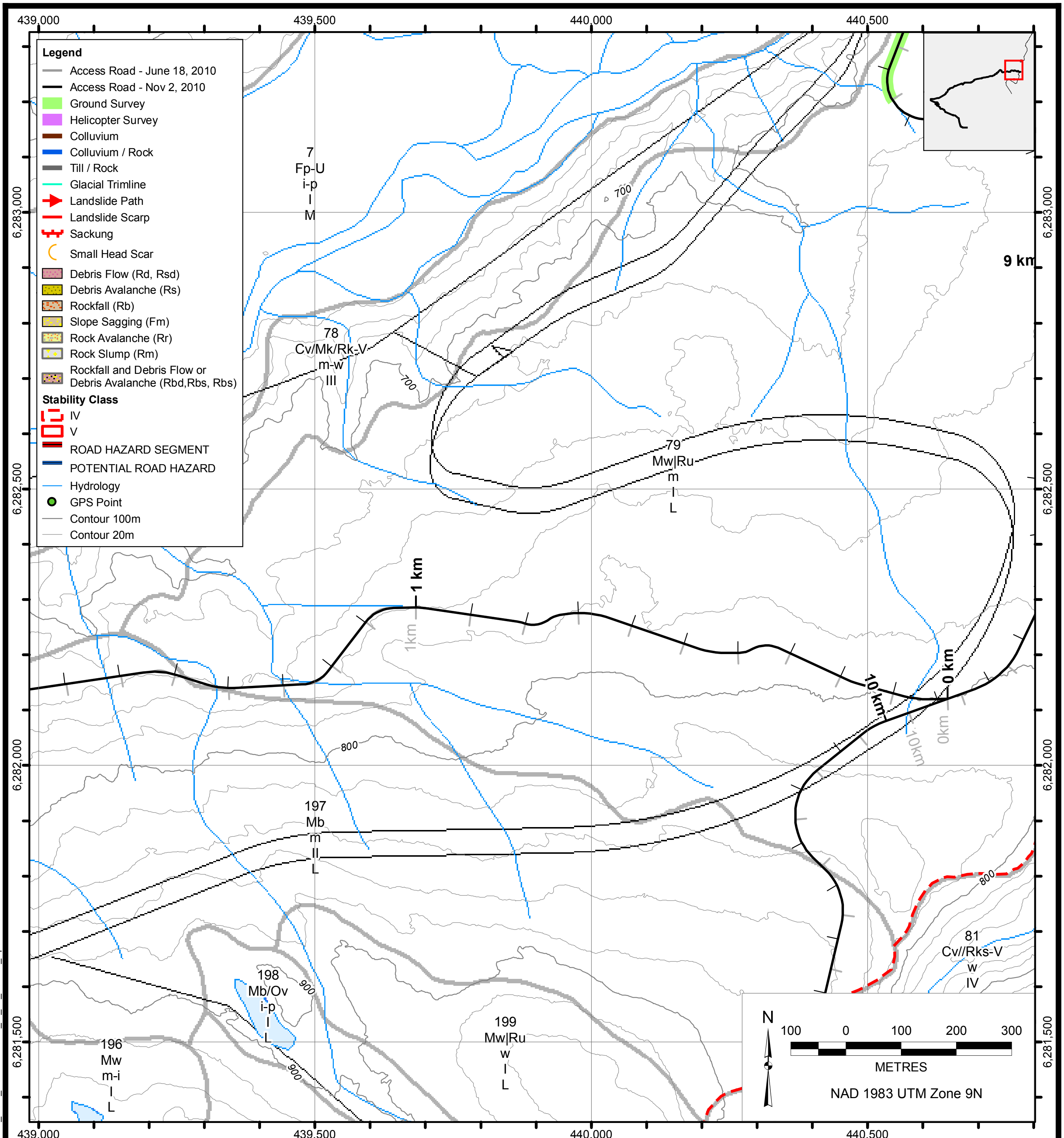

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BGC ENGINEERING INC.
AN APPLIED EARTH SCIENCES COMPANY

PROJECT: KSM GEOHAZARDS PROJECT - TSFA

TITLE: TUNNEL SPUR ACCESS ROAD

CLIENT: SEABRIDGE GOLD INC.

PROJECT No.:	DWG No.:	REV.:
0638-005	24	

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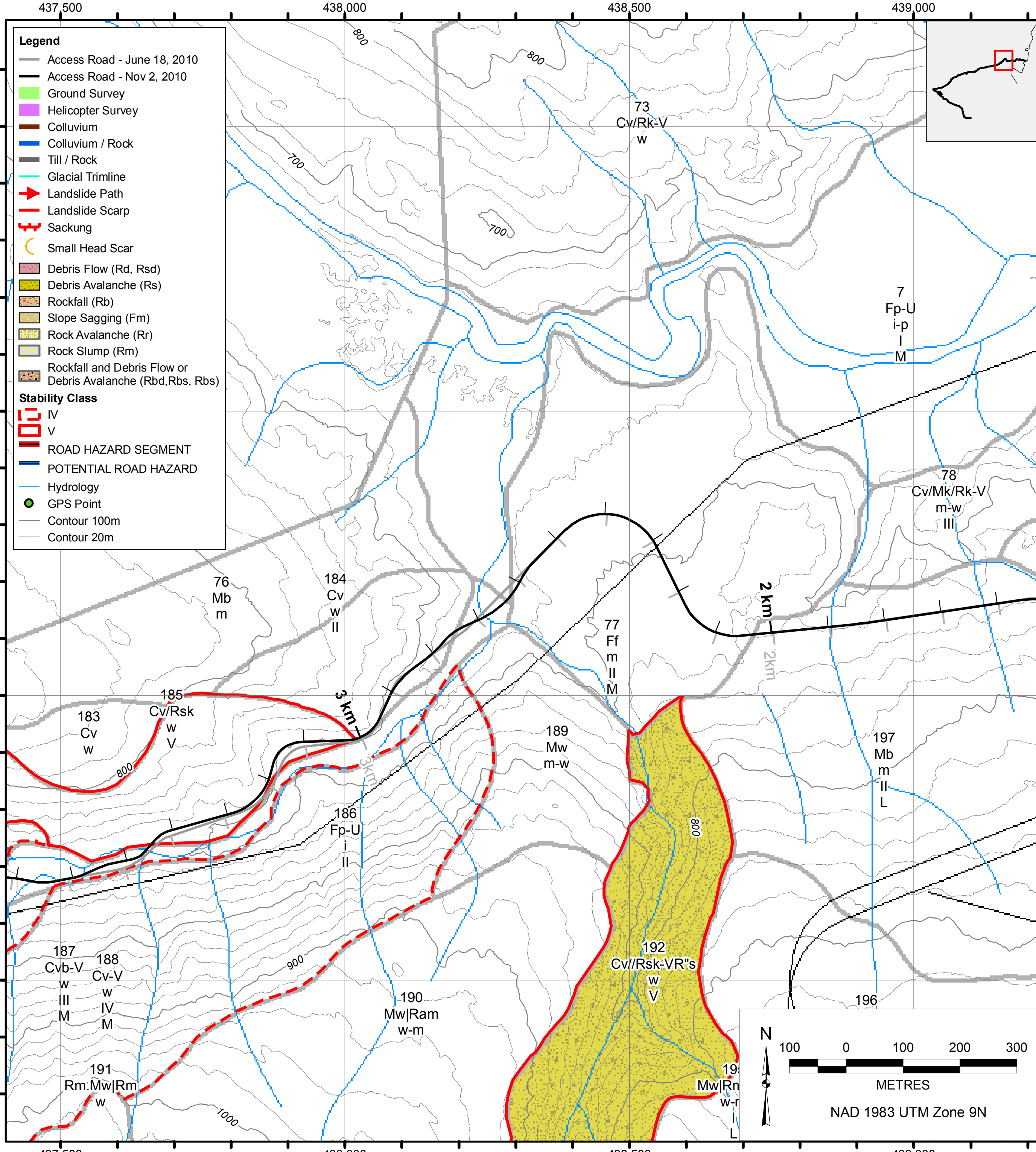

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PROJECT:
KSM GEOHAZARDS PROJECT - TSFA

TITLE:
TUNNEL SPUR ACCESS ROAD

CLIENT:
SEABRIDGE GOLD INC.

PROJECT No.:	DWG No.:	REV.:
0638-005	25	

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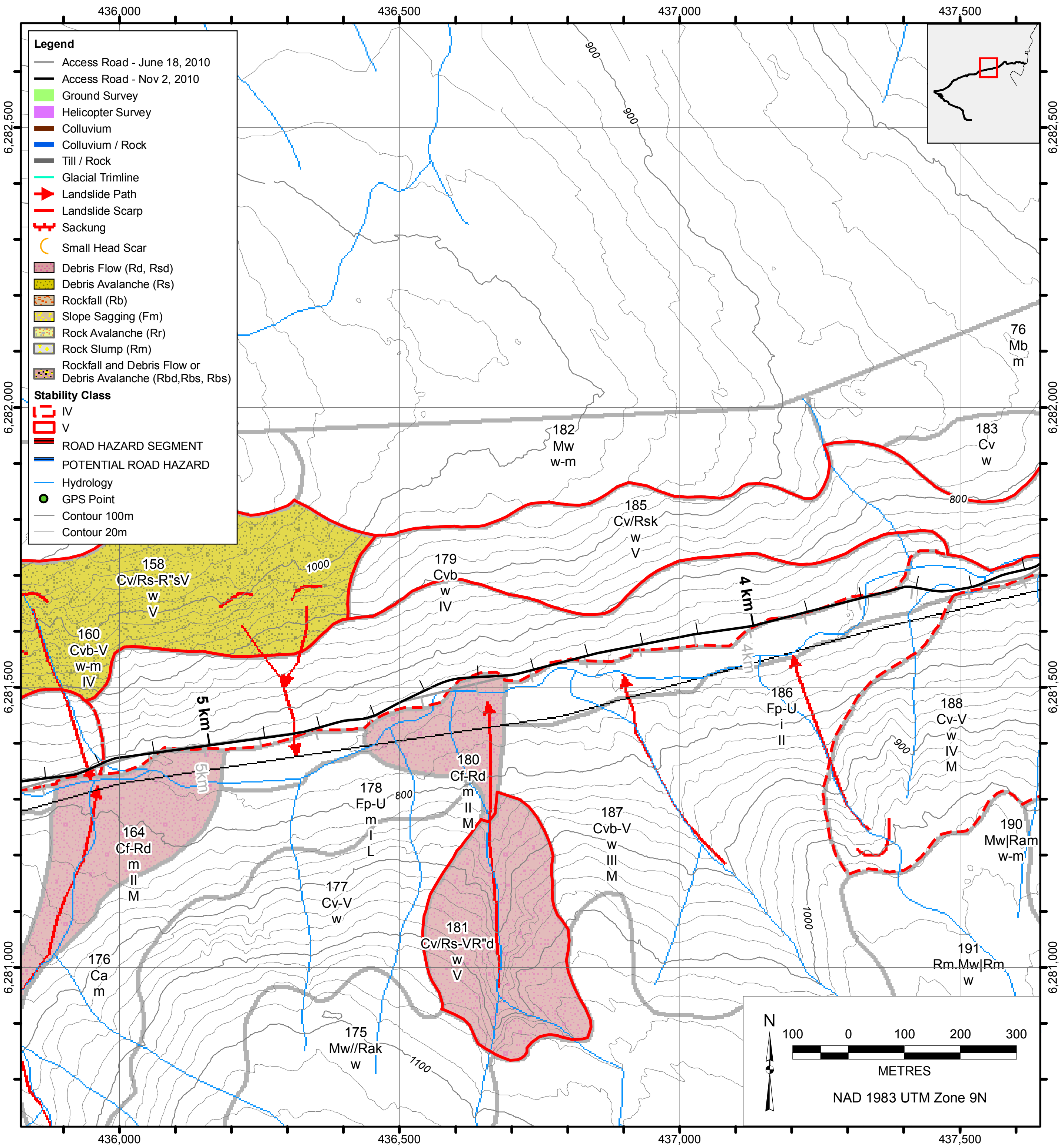

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PROJECT: KSM GEOHAZARDS PROJECT - TSFA

TITLE: TUNNEL SPUR ACCESS ROAD

CLIENT: SEABRIDGE GOLD INC.

PROJECT No.:	DWG No.:	REV.:
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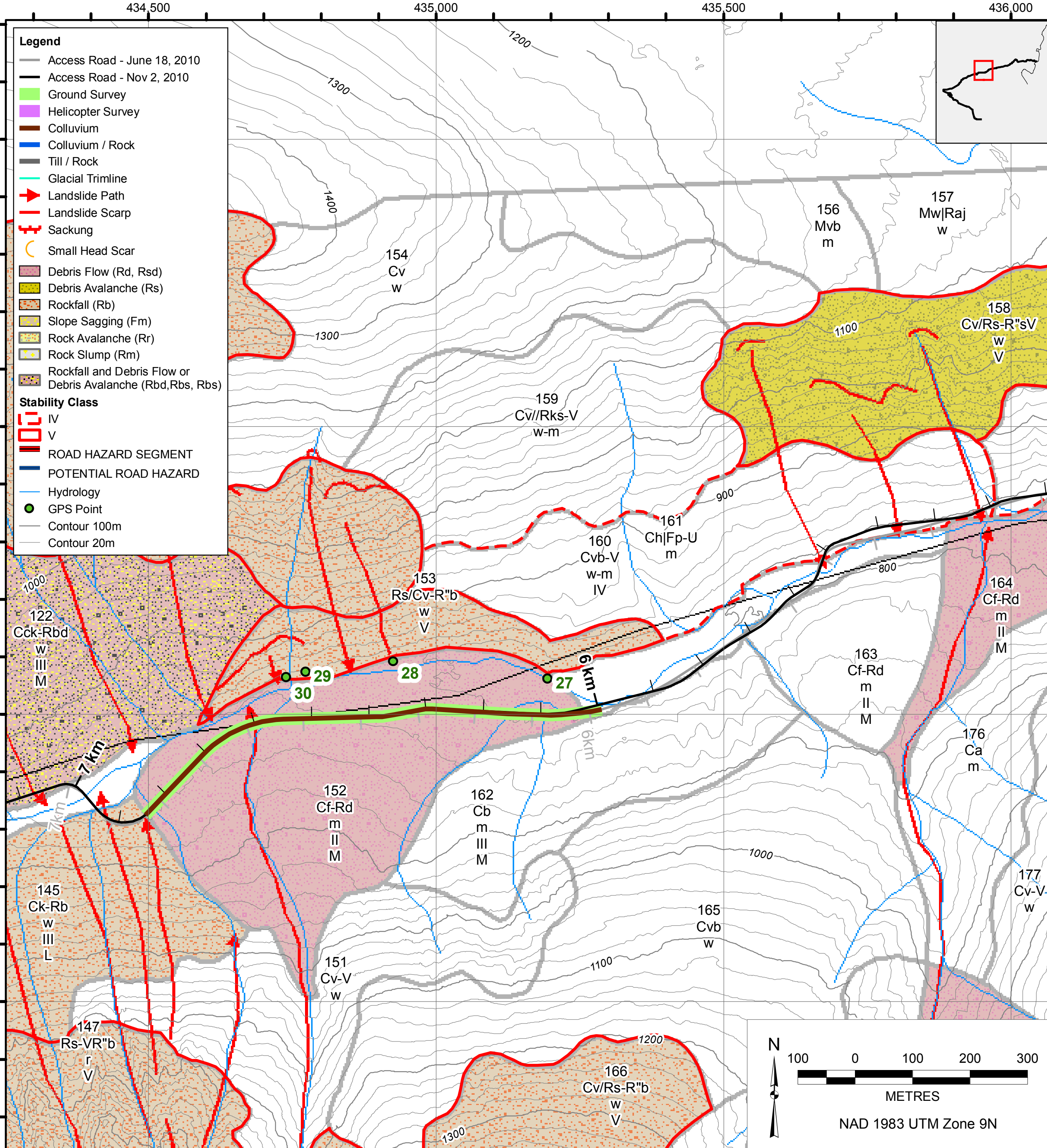

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AN APPLIED EARTH SCIENCES COMPANY

PROJECT: KSM GEOHAZARDS PROJECT - TSFA

TITLE: TUNNEL SPUR ACCESS ROAD

CLIENT: SEABRIDGE GOLD INC.

PROJECT No.:	DWG No.:	REV.:
0638-005	27	

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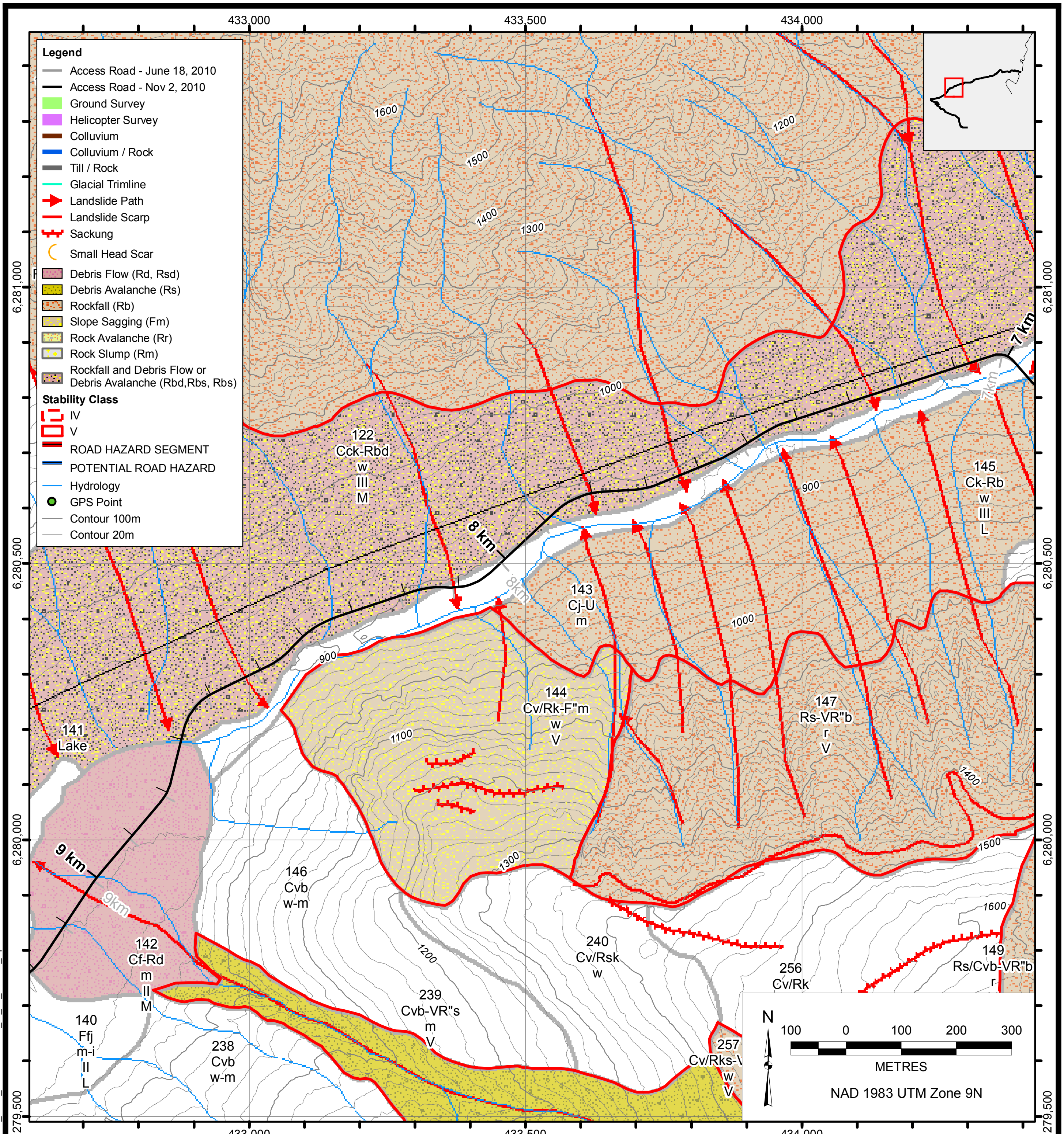

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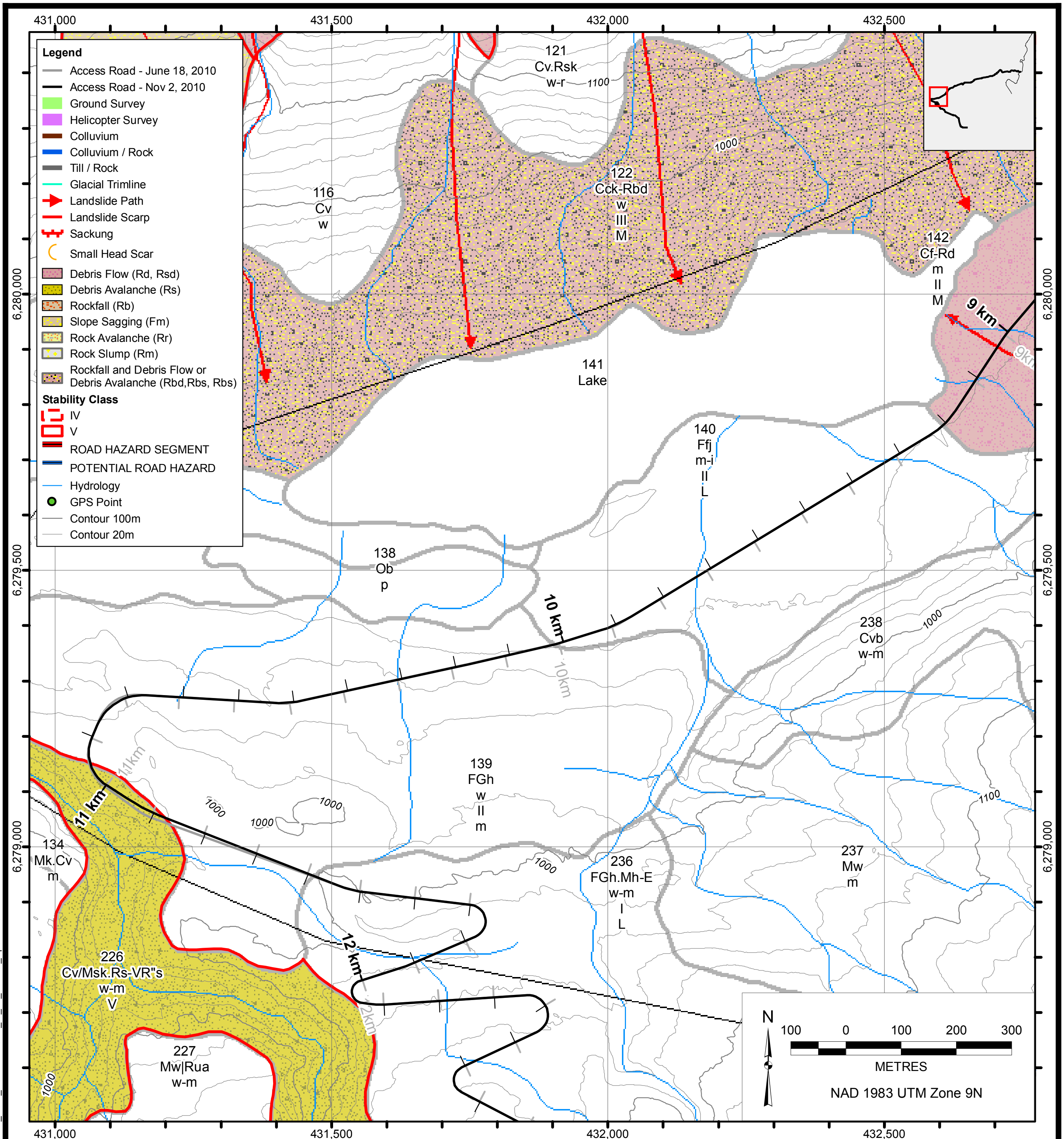

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0638-005	29	

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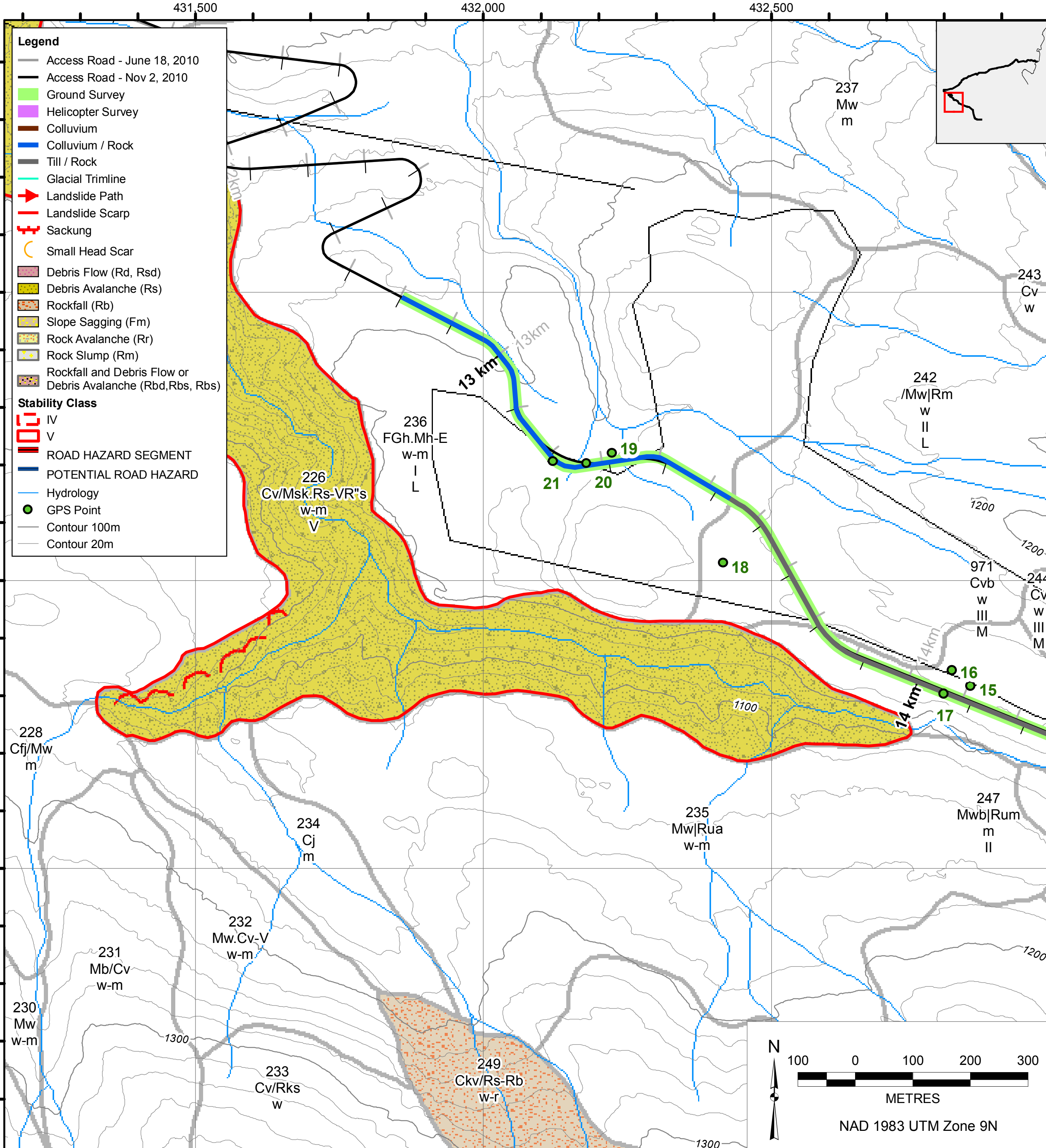

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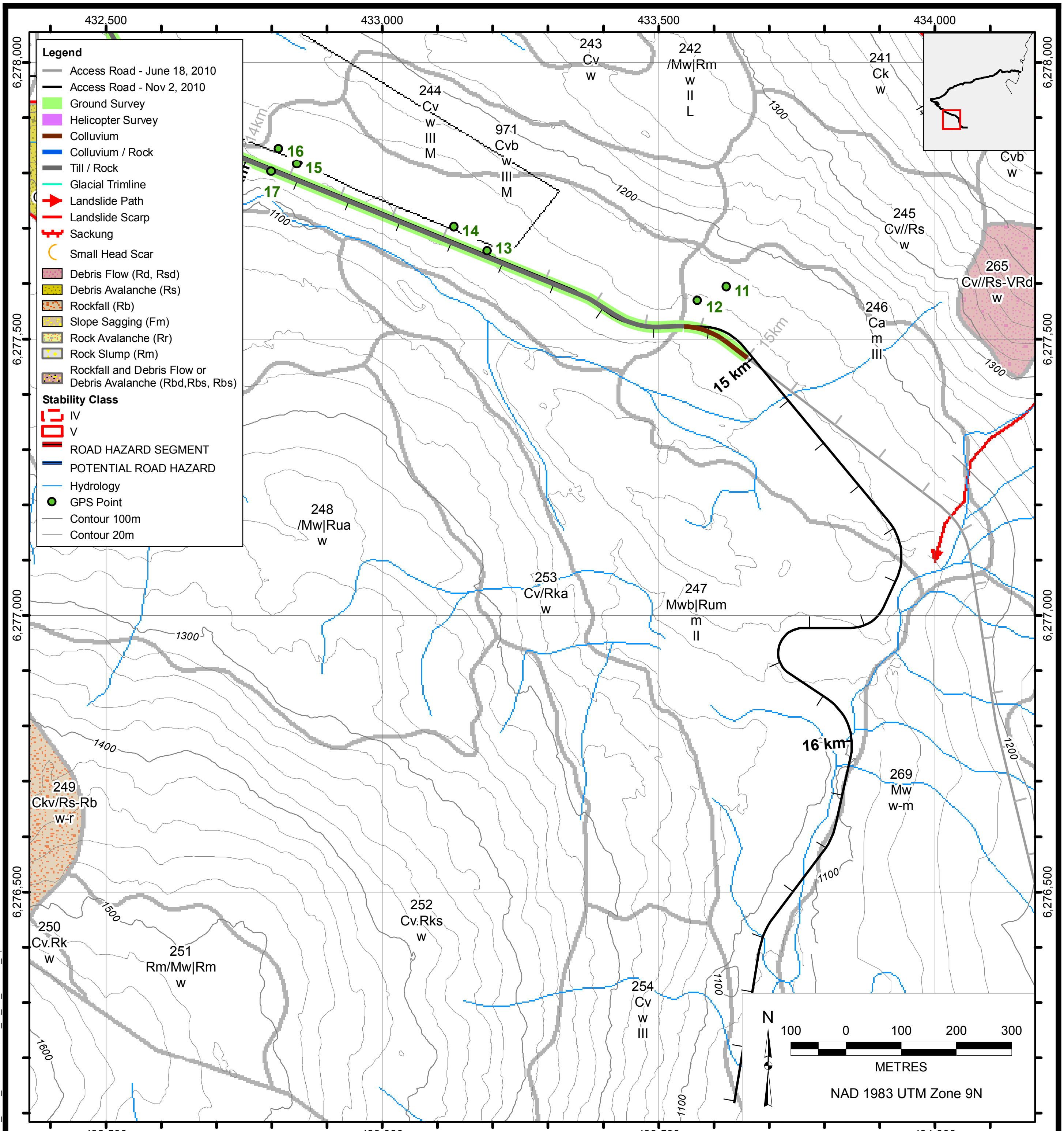

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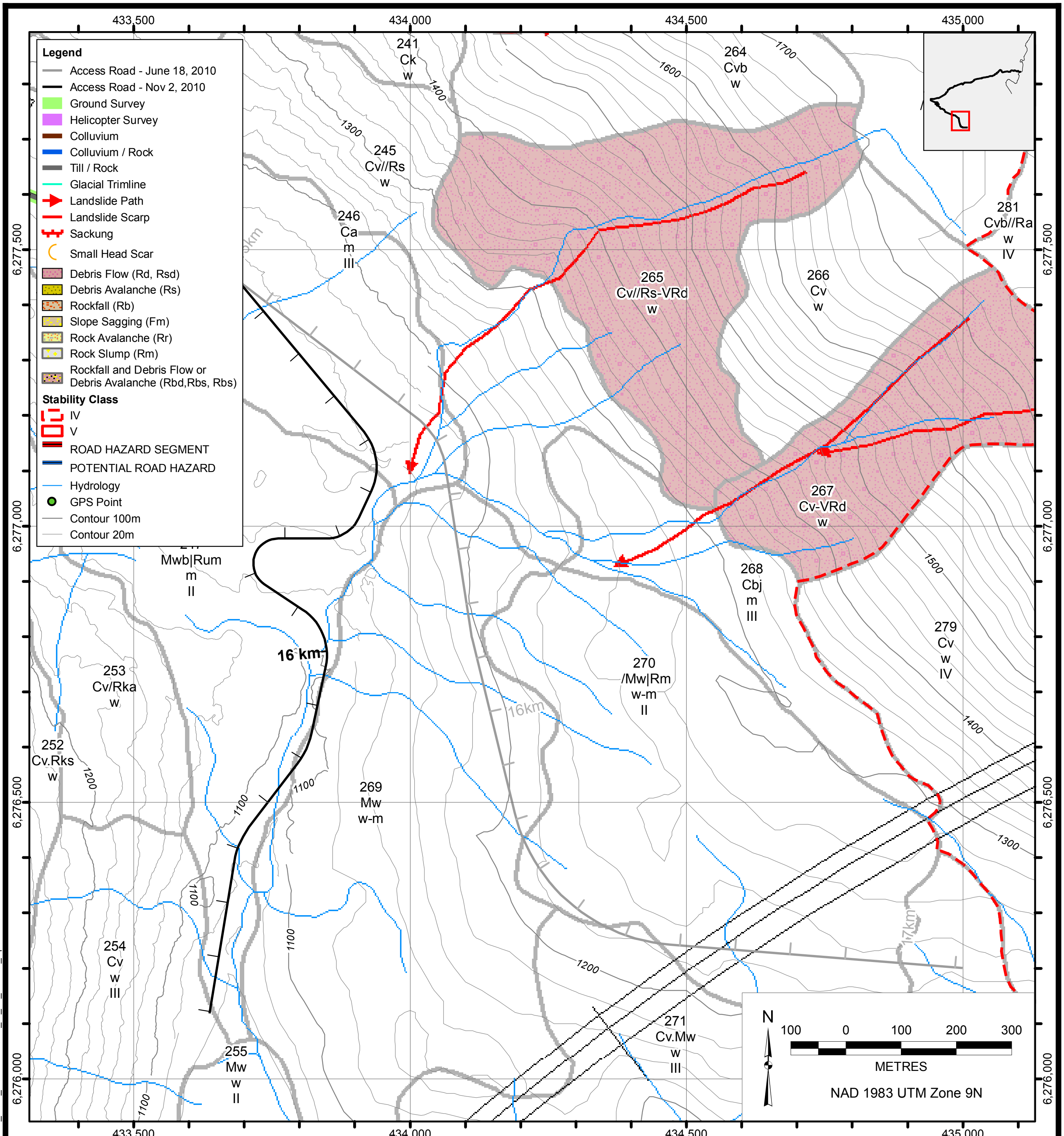

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