December 12, 2008 W23101021.016

North American Tungsten Corporation Ltd.
Suite 1400, 188 West Georgia Street
Vancouver, BC V6E 4A2

Attention: Mr. J. Britt Reid
Chief Operating Officer

**Subject: Report on 2008 Fieldwork for Terrain, Soils and Geology Proposed Mactung Mine Access Road Corridor in Yukon**

## 1.0 INTRODUCTION

North American Tungsten Corporation Ltd. (NATC) is considering the development of a world-class tungsten deposit located in the Yukon near Macmillan Pass, on the border between the Northwest Territories and Yukon. The mine site is located 650 km (400 air km) northeast of Whitehorse and is accessible by the North Canol Road, a gravel surfaced road to the southern Yukon that is open only during summer months. An all-Yukon mine access road is proposed that will initially follow an existing exploration trail off the North Canol Road near the MacMillan Pass Airstrip. A new road is proposed to connect the existing exploration trail with roads in the Mactung Mine Production area. The access road route is located in the Selwyn Mountains, ranging in elevation from about 1160 m at the MacMillan Pass Airstrip to nearly 2000 m a.s.l. at the mine.

NATC retained EBA to conduct a terrain study along the proposed Mactung Project access road corridor. This information is required for project planning and regulatory submissions leading to Mactung project approvals and implementation. The terrain and soils mapping comprised part of the comprehensive environmental baseline study being conducted within the Mactung study area which includes components such as meteorology, hydrology, fisheries and aquatic studies, vegetation, archaeology, wildlife and water sampling.

The overall length of the planned access road is about 42 km. It starts at about km 447 on the North Canol Road, three kilometres south of the MacMillan Pass Airfield. Starting in the valley of the South Macmillan River, the proposed route follows an abandoned exploration road that crosses a drainage divide at about km 4 into a northwest-flowing tributary of the Hess River. About 18 km west of the Canol Road, the proposed route heads northeast for 10 km where it crosses a drainage divide into a north flowing tributary of the Hess River. The route turns east into the project area valley about 6 km west of the minesite.



EBA Engineering Consultants Ltd.
p. 867.668.3068 • f. 867.668.4349
Calcite Business Centre • Unit 6, 151 Industrial Road • Whitehorse, Yukon Y1A 2V3 • CANADA

## 2.0 TERRAIN MAPPING METHODOLOGY

The terrain mapping component of the biophysical assessment for the proposed Mactung access road study area was initiated with a review of high level air photographs and research of existing geology mapped in the region. Considerable background and experience was applied from the terrain mapping completed for the Mactung mine production area completed in 2006.

Terrain field reconnaissance and ground-truthing of the proposed access road route corridor was completed from July 14 to 17, 2008. Terrain mapping was to be completed with low level air photographs that were to be acquired in 2008; however, the absence of a window of suitable weather conditions prevented flying to obtain the photographs. Completion of detailed terrain mapping has been postponed to 2009 when low level air photographs are available.

Ground-truthing was completed with relatively closely-spaced field stations and provides a basis for describing the surficial geology at a reconnaissance level along the proposed road alignment. Observations and reporting of surficial geology, terrain hazards and soils is preliminary and must be substantiated following detailed mapping with suitable-scale photography. At one 4 km-long section located about 15 km west of the North Canol Road, forest cover and terrain conditions precluded a helicopter landing and ground-truthing was limited to aerial observations.

The basis for terrain mapping is based on the Guidelines and Standards for Terrain Mapping in B.C. and Terrain Classification System for British Columbia, Version 2 (RIC, 1996 and 1997 respectively). When 2009 air photography is complete, terrain mapping will be completed at Terrain Survey Intensity Level D (TSIL D). TSIL D includes field checking of 0 to 25% of polygons by vehicle and flying. The typical objectives of TSIL D are preliminary mapping to produce a terrain map at a scale between 1:20,000 and 1:250,000. Terrain mapping includes creating polygons with similar terrain attributes such as surficial material type/genesis, surface expression, geomorphological processes (where applicable), drainage, and soil texture (where known). Ground-truthing completed in 2008 will provide greater than 25% field checking.

## 3.0 TERRAIN OVERVIEW

Terrain in the study area is characterized by valleys shaped by the retreat of mountain glaciers. Rapidly drained bedrock slopes of the upper valley walls and cirques are typically steep (greater than 70%) and moderately steep (50 to 70%). Snow accumulations in the area are heavy and the moderately steep to steep slopes are likely subject to avalanching. Rockfall is the primary erosional process on these slopes. A possible relic debris slide about 20 ha in area was mapped on a north valley hillslope about 6 km west of the Yukon / NWT border.

Colluvium most commonly occurs on moderately steep (50-70%) to moderate (27-49%) gradient, well drained blocky talus slopes below bedrock headwalls. Colluvium on lower gradient (moderate to gentle) lower valley slopes is more weathered and is typically covered by a thin organic horizon with ground vegetation. Lower valley slopes are typically moderately well to moderately drained. Colluvial fans are common on the lower reaches of tributary streams, consisting of coarse to fine-textured colluvium deposited from debris flows and fine-textured alluvium. Fans may be imperfectly drained near the toe.

Valley floors host till and glaciofluvial soils, the result of basal deposits, lateral and terminal moraines and other intra-glacial deposits formed during periodic glacial advance and retreat throughout deglaciation. Loose material, forming ridges and hummocks on the valley floor, are probably from intra-glacial deposition. Recent fluvial deposits on broad, flat areas of the valley floor -–below the existing exploration trail starting from the North Canol Road-– have formed silt-rich plains overlain with organic soils of various thickness.

## 3.1 SURFICIAL MATERIALS

Parent soils in the project area originate from glacial, colluvial and minor fluvial processes. Organic soil deposits have developed on the plains of drainage receiving areas of major valley floors, particularly in the MacMillan River valley and the broad valley downslope of the existing mining road west of the Canol Road. The results of field observations are summarized in Table 1 and field station locations are shown on Figure 4.1.3-2.

Upper slopes of the main valleys are mostly bedrock with negligible or thin deposits of rubbly colluvium soil. Middle valley hill slopes are typically covered by rubbly colluvium originating from rockfall and erosion of upper bedrock slopes. Lower slopes and valley bottoms are typically covered with deposits of residual soils from mountain glaciation processes (till).

Till (moraine) is the most common surficial material mapped in the study area. Morainal soil is typically coarse-textured, mostly gravel and sand with negligible to some silt. The density of near surface till is consistently loose throughout most of the study area. The potential for erosion in soils developed from till is generally recognized to be low except on moderately steep (50% to 70% gradient) and steep (>70% gradient) slopes.

Colluvium on valley hillslopes is most commonly coarse blocky talus on moderately steep (50-70%) to moderate (27-49%) gradient, well drained slopes derived from ongoing erosion of upslope bedrock headwalls. Colluvium on lower gradient (moderate to gentle) lower valley slopes is developed from till and/or talus and is typically well drained. Colluvial fans are common on the lower reaches of tributary streams, where material has been deposited from debris flows and alluvial processes. Fans may be imperfectly drained near the toe.

Recent fluvial deposits of silt and sand have accumulated in some low gradient stream channel areas and on the flat areas of the valley floor. These deposits are often overlain by a veneer (less than 1 m thick) organic soil cover, particularly in the broad valley west of the Canol Road.

## 3.2 SOILS AND SOIL EROSION POTENTIAL

Terrain field checking indicated the lack of well developed soil profiles, which is typical of arctic alpine and sub-alpine environments. Soils are absent on the upper, steep to moderately steep slopes where erosional processes are active. Low soil temperatures, short growing season and slow rates of plant reproduction, organic accumulation and decomposition contribute to poorly developed soil profiles. Most of the residual soils in the study area are Regosols or Brunisols. Regosols occur at high elevations in association with till deposits and Brunisols generally occur at lower elevations in well drained locations. Organisols have developed in flat, poorly drained areas on the valley floor. Crysosols exist in some areas where organic layers provide sufficient insulation to allow frozen soil horizons to develop.

Steep terrain and climate factors such as rain and snowmelt contribute to potentially high surface soil erosion hazard on the lower and middle slopes from May to September, particularly during spring freshet. Natural erosion will be particularly acute in steep-sided stream valleys incised deeply into thick deposits of lateral moraine.

Predominantly coarse-textured soils and the associated low soil detachability, abundant surface coarse fragments and good drainage indicate potentially low susceptibility to erosion along most of the proposed access road route, which is underlain by till and colluvium. Susceptibility to soil erosion will increase in areas with restricted layers such as shallow bedrock, increased slope gradients and during sensitive climatic events such as high precipitation. Limited soil development and generally coarse soil texture indicates a low probability of detrimental soil compaction.

Run-off is rapid on upper valley slopes (mostly bedrock) and middle valley slopes (mostly blocky colluvium with some coarse textured till) where slope gradients are steep to moderate and ground vegetation cover is nil to thin. The infiltration rate is expected to be high in most areas along the proposed route where surficial material is dominantly thick deposits of coarse-textured till or colluvium. Vertical percolation may be inhibited by shallow bedrock, permafrost or seasonally frozen soils; however, these conditions were not observed to be dominant along the proposed alignment.

## 3.3 BEDROCK GEOLOGY

The access road route is located on the eastern margin of the Selwyn basin characterized by Late Proterozoic-Paleozoic age miogeosynclinal sedimentary rocks that have been regionally folded along northwest trending axes and cut by north westerly and easterly trending faults. The area is mapped as mostly rocks of the Earn Group, a complex assemblage of submarine fan and channel deposits including siliceous shale, chert and small occurrences of felsic volcanics. Zones of the Road River-Selwyn formation, which includes black shale, chert, orange siltstone and buff platy limestone, are also mapped in the area.

## 3.4 PERMAFROST

The region lies in the zone of discontinuous permafrost (Oswald and Senyk, 1977). However, the study area is within a high elevation alpine zone with a low mean annual temperature (-7.7ºC to -8.5ºC) and the area climate is likely similar to conditions found in the continuous permafrost zone. Continuous permafrost terrain is generally expected wherever the mean annual air temperature is less than about -5ºC. There is limited data collected to date to characterize permafrost in the study area, but based on near surface information gathered over the years, surface features of the area are not typical of permafrost terrain . No permafrost was intersected in any of the shallow hand-excavated pits evaluated during the 2008 terrain field program. Soil drainage all along the proposed route was generally well-drained and there is judged to be a low probability of intersecting ice-rich soils. Surficial material along of the proposed route was observed to be dominantly coarse-textured and is expected to be generally thaw stable.

## 3.5 GEOMORPHOLOGICAL PROCESSES

Active geomorphological processes observed in the study area include rockfalls, gully erosion and avalanches. Debris slides and debris flows have also likely shaped the study area terrain; however, active debris deposits were not observed.

Rapidly drained bedrock slopes of the upper valley walls and cirques are typically steep (greater than 70%) and moderately steep (50 to 70%). Rockfall is the primary erosional process on these slopes and the moderately steep to steep slopes are likely subject to avalanching. Rockfall involves the release of relatively small masses of rock (e.g., a single block or a few cubic metres) and movement downslope by freefall, rolling and bouncing. This is the most common process in the area and results in the formation of extensive talus slopes.

Gully erosion on some valley sideslopes is seasonally active, particularly in thick moraine deposits. Gullies are small ravines with v-shaped profiles that form in glacial drift and bedrock. Gully erosion is probably most active during spring run-off. The presence of gullies indicates erodable material, such as till, colluvium and weathered bedrock.

Avalanches are rapid slides or flows of snow. Snow accumulations in the project area are heavy and the moderately steep to steep slopes have avalanche potential. Avalanches are likely an annual occurrence in this region and probably play a part in some downslope transport of colluvial material in the study area. Observations to support an avalanche risk study have been acquired in 2008 will continue in conjunction with other environmental studies.

Debris slides occur when a mass of glacial drift or colluvium becomes detached from a hillside and moves rapidly downslope by sliding along a shear plane. Debris slides are initiated on steep hillsides by the sliding of weathered till and/or colluvium along a shear plane that coincides with the contact between weathered till and unweathered till, or between colluvium and till, or between any of these materials and bedrock. A possible relic debris slide about 10 ha in area was mapped on a north valley hillslope about 6 km west of the Yukon / NWT border. No active debris slides were observed.

A debris flow is the rapid flow of a mass of viscous material consisting of mud, sand, stones and/or organic debris. A debris flow is often initiated when a debris slide enters a stream channel and may move downslope for several hundred metres or more. Debris flows likely were a significant source of stream sediment and deposition on colluvial fans in lower reach run-out zones. No recent debris flows were observed during the 2008 field work and this process is likely infrequent and not a dominant erosional process in the study area. However, small, periodic debris flows are probably an ongoing process within valley sideslope stream channels and contribute to the colluvial fan deposits mapped in the study area.

The project area is located in an area of moderate seismic hazard, rated 3 on a scale of 5 (GSC 2005[1]). The maximum ground accelerations associated with 1:475 and 1:1000 year return earthquakes are 0.137 g and 0.179 g, respectively.

Most of the area is well to rapidly drained with a well developed network of upper watershed streams with low flood hazard.

## 3.6 POTENTIAL CONSTRUCTION MATERIALS

In the absence of suitable-scale air photography, specific deposits of construction borrow material were not delineated. However, most of the till and glaciofluvial material observed throughout the study area is typically coarse-textured and should be favourable for use as construction material. Extensive deposits of sand and gravel glaciofluvial material were observed at the following locations: near the MacMillan Pass airstrip; where the existing mining road leaves the Canol Road; at the confluence of two valleys about 16 km west of the Canol Road; and, at the Hess River at the terminus of the pump house access road about 10 km west of the MacTung mine. Thick till deposits with favourable granular textures cover the valley floor and lower hill slopes of the valleys of the proposed route from the end of the existing mining road (about 16 km west of the Canol Road) to the terminus of the pump house access road about 10 km west of the MacTung mine.

The proposed route is located almost exclusively through Quaternary deposits of till, glaciofluvial material and colluvium. Bedrock is expected to be a minor component underlying the road. Extensive deposits of favourable granular material are located

[1] Natural Resources Canada. National Building Code of Canada Seismic Hazard Values. 2005.

throughout the proposed access road route and will likely form most if not all of the borrow material used for road construction.

Also, some drilling and blasting may be required on specific sections of the road, creating quarry materials for road base construction.

## 4.0 DISCUSSION AND CONCLUSIONS

The results of the terrain mapping characterize a landscape typical of northern alpine and sub-alpine glaciated terrain. Surficial materials range from coarse textured colluvial talus on middle to upper slopes to sandy gravelly silt colluvium and till on lower slopes and fine-textured alluvium on the plains of valley floors.

Much of the colluvium and till should be suitable as general fill. Field reconnaissance to map terrain and soils textures identified good quality granular material over a considerable area, particularly throughout the centre valley (i.e., approximately km 18 to km 35 of the proposed access road route).

Geomorphological processes identified in the study area include active rockfall, avalanche and gully erosion, and inactive or infrequent debris slides and debris flows. Colluvium and bedrock dominate the upper valley hillslopes and moraine is the common parent material of the lower valley hillslopes and main valley floor.

Most of the soils in the study area are Regosols or Brunisols. Organisols have developed in flat, poorly drained areas on the valley floor. Crysosols have developed in some areas where organic layers provide sufficient insulation for frozen soil horizons to develop. Although the area is within the zone of discontinuous permafrost, this should not affect road construction.

## 5.0 CLOSURE

The information and analyses contained in this report and maps are based on the results of previous reports, air photograph interpretation, current understanding of regional terrain and geology, and on limited observations of land-surface conditions. In most of the study area, subsurface conditions (e.g., characteristics of subsurface materials and subsurface hydrologic conditions) are interpreted from surface observations or air photo interpretation with only reconnaissance scale field checking.

This Terrain Study report has been produced for North American Tungsten Corporation Ltd. to aid project planning and future regulatory submissions leading to MacTung project approvals and implementation. We are confident that the data and associated information presented in the report will assist in supporting this objective. Further information on the use of this report is presented in the attached General Conditions, which form a part of the report.

Respectfully submitted,

EBA Engineering Consultants Ltd.

Jack T. Dennett, P.Geol.(NWT)
Senior Project Geoscientist
Direct Line: 867.668.2071 x230
jdennett@eba.ca

J. Richard Trimble, M.Sc. (Eng.), P.Eng.
Project Director, Yukon Region
Direct Line: 867.668.2071 x222
rtrimble@eba.ca

## GEOTECHNICAL REPORT – GENERAL CONDITIONS

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

### 1.0 USE OF REPORT AND OWNERSHIP

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

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

This report is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of EBA. Additional copies of the report, if required, may be obtained upon request.

### 2.0 ALTERNATE REPORT FORMAT

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

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

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

### 3.0 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, EBA has not been retained to investigate, address or consider and has not investigated, addressed or considered any environmental or regulatory issues

### 4.0 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems and methods employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. EBA does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

### 5.0 LOGS OF TESTHOLES

The testhole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

### 6.0 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historic environment. EBA does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional investigation and review may be necessary.

associated with development on the subject site.

## 7.0 SURFACE WATER AND GROUNDWATER CONDITIONS

Surface and groundwater conditions mentioned in this report are those observed at the times recorded in the report. These conditions vary with geological detail between observation sites; annual, seasonal and special meteorologic conditions; and with development activity. Interpretation of water conditions from observations and records is judgemental and constitutes an evaluation of circumstances as influenced by geology, meteorology and development activity. Deviations from these observations may occur during the course of development activities.

## 8.0 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

## 9.0 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

## 10.0 INFLUENCE OF CONSTRUCTION ACTIVITY

There is a direct correlation between construction activity and structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques are known.

## 11.0 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, as well as the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

## 12.0 DRAINAGE SYSTEMS

Where temporary or permanent drainage systems are installed within or around a structure, the systems which will be installed must protect the structure from loss of ground due to internal erosion and must be designed so as to assure continued performance of the drains. Specific design detail of such systems should be developed or reviewed by the geotechnical engineer. Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function.

## 13.0 BEARING CAPACITY

Design bearing capacities, loads and allowable stresses quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition assumed. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions assumed in this report in fact exist at the site.

## 14.0 SAMPLES

EBA will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the Client's expense upon written request, otherwise samples will be discarded.

References:

2004: Yukon Ecoregions Working Group. Selwyn Mountains. *In:* Ecoregions of the Yukon Territory: Biophysical Properties of Yukon Landscapes, C.A.S. Smith, J.C. Meikle and C.F. Roots (eds.), Agriculture and Agri-food Canada, PARC Technical Bulletin No. 04-01, Summerland, Britsh Columbia, p. 150-154.

2001: Bedrock Geology, Yukon Territory; Geological Survey of Canada, Open File 3754 and Exploration and Geological Services Division, Yukon. Indian and Northern Affairs Canada, Open File 2001-1, scale 1:1,000,000.

1997: Resources Inventory Committee (RIC). Terain Classification System for British Columbia. A System for the Classification of Surficial Materials, Landforms and Geological Processes of British Columbia. Version 2.

1996: Resources Inventory Committee (RIC). Guidelines and Standards to Terrain Mapping in B.C.

# TABLES

| TABLE 1 Proposed MacTung Mine Access Road- Terrain and Soils Field Stations (2008) | | | |
|---|---|---|---|
| STATION | TEXTURE | DRAINAGE | TERRAIN SYMBOL |
| JD-08-1 | PEAT | p | pOp |
| JD-08-2 | sandy GRAVEL, trace silt | m | sgCa |
| JD-08-3 | GRAVEL, some sand | w | sgMb |
| JD-08-4 | SILT, some sand, trace gravel | m | szCk |
| JD-08-5 | sandy GRAVEL, trace silt | w | zxgCx/Rka |
| JD-08-6 | sandy GRAVEL | w | Mvd/R |
| JD-08-7 | SAND and GRAVEL | m | sgMb |
| JD-08-8 | blocky, shaly ROCK | w | Cxd/Rs |
| JD-08-9 | GRAVEL, some sand | r | sgCx/Rs |
| JD-08-10 | SAND and GRAVEL | w | Mxd and Cv/R |
| JD-08-11 | gravelly SAND | w | gsMb |
| JD-08-12 | SAND and GRAVEL | w | gsMb/R |
| JD-08-13 | GRAVEL, some sand | w | sgCv/shRkr |
| JD-08-14 | GRAVEL and SAND | w | sgMb |
| JD-08-15 | GRAVEL and SAND, trace silt | m | sgCv/Rak |
| JD-08-16 | gravelly to GRAVEL and SAND | m | gsMb |
| JD-08-17 | sandy GRAVEL | w | sgCv |
| JD-08-18 | silty, gravelly SAND | w | gsMb |
| JD-08-19 | sandy GRAVEL | w | sgCv/R |
| JD-08-20 | sandy GRAVEL | m | sgCv(b) |
| JD-08-21 | SAND, some gravel, some silt | m | gsMb |
| JD-08-22 | gravelly SAND, some silt | m | gzsDj/tR |
| JD-08-23 | fine SAND and boulders | m | Dr/tR(f)j |
| JD-08-24 | GRAVEL and SAND, trace silt | m | sgCv |
| JD-08-25 | silty SAND, some gravel | m | gzsMb |
| JD-08-26 | gravelly SAND, trace silt | m | gsMb |
| JD-08-27 | gravelly SAND, trace silt | w | gsMb |
| JD-08-28 | gravelly SAND | w | gsMb |
| JD-08-29 | gravelly SAND, trace silt | w | sgMb/R |
| JD-08-30 | gravelly SAND, trace silt | w | gsMb |
| JD-08-31 | gravelly SAND, trace silt | w | gsMb |
| JD-08-32 | fine GRAVEL and SAND | m | sgMb |
| JD-08-33 | sandy GRAVEL | w | sgMh |
| JD-08-34 | GRAVEL and SAND | w | sgM(FG?)rh |
| JD-08-35 | SAND and GRAVEL, trace silt | w | gsMb |
| JD-08-36 | bouldery, cobbly SAND | w | rCf - A |
| JD-08-37 | GRAVEL, some sand | w | rCvb |
| JD-08-38 | GRAVEL and SAND | w | gsMhm |
| JD-08-39 | GRAVEL and SAND | w | sgMb(v)/shRm |
| JD-08-40 | SAND and GRAVEL | w | gsMr-H |
| JD-08-41 | gravelly SAND | w | gsMb/shR |
| JD-08-42 | -- | - | Mb |
| JD-08-43 | GRAVEL and SAND | w | sgMr |
| JD-08-44 | -- | w | aCv/Mb(?)/R |
| JD-08-45 | GRAVEL and SAND | w | gsMb/shR |
| JD-08-46 | GRAVEL and SAND | w | gsMrh |
| JD-08-47 | sandy GRAVEL | - | sgMb/R |
| JD-08-48 | SAND, some silt, some gravel | w | zgsMht |
| JD-08-49 | GRAVEL and SAND | w | sgMb-H |

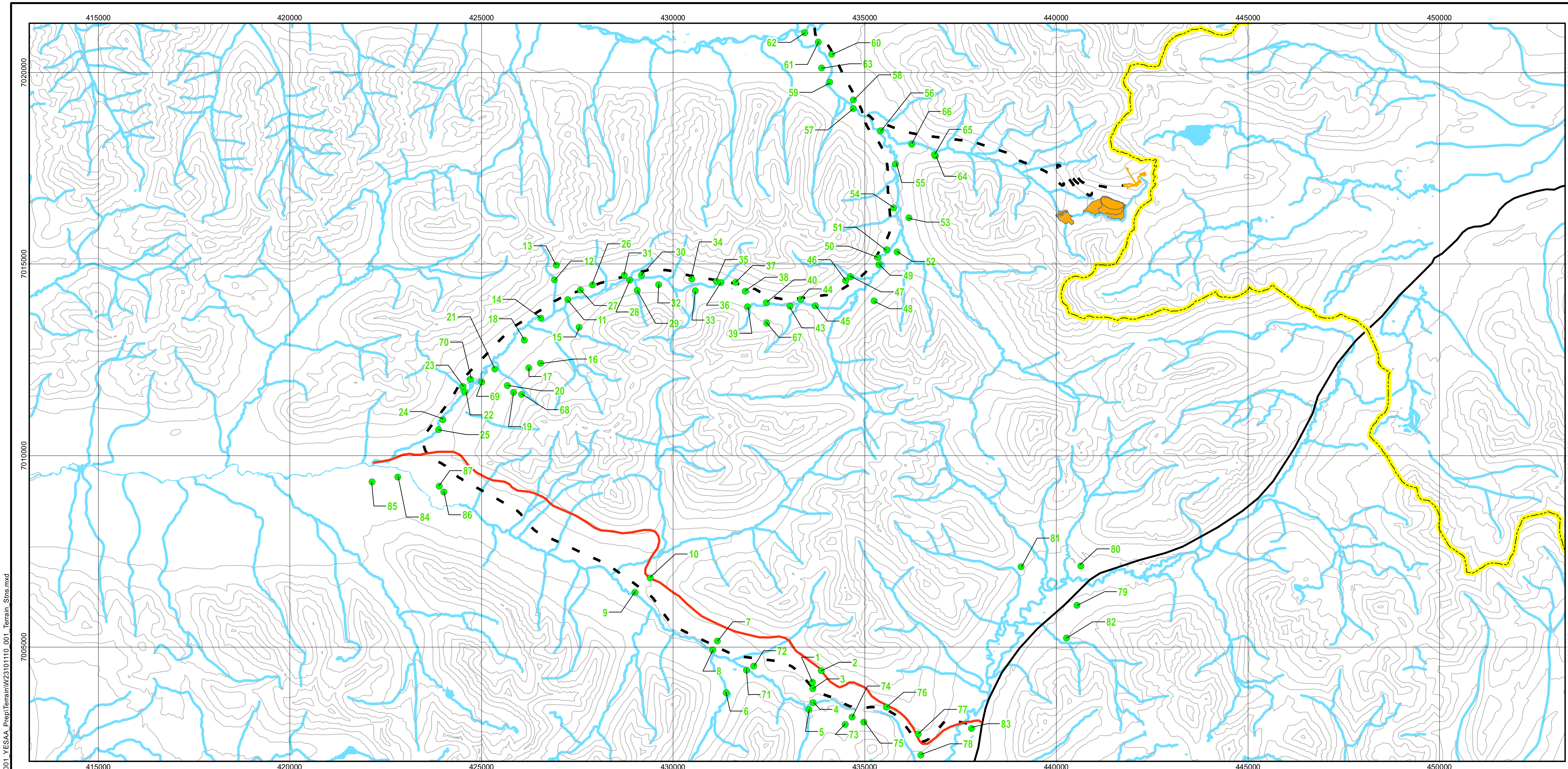
| TABLE 1 Proposed MacTung Mine Access Road- Terrain and Soils Field Stations (2008) | | | |
|---|---|---|---|
| STATION | TEXTURE | DRAINAGE | TERRAIN SYMBOL |
| JD-08-50 | -- | - | Mx/R |
| JD-08-51 | gravelly SAND | w | gsMhr-H |
| JD-08-52 | gravelly SAND | w | gsMhr-H |
| JD-08-53 | GRAVEL and SAND | w | gsMhr |
| JD-08-54 | gravelly SAND | w | gsMb |
| JD-08-55 | gravelly SAND | w | Mb(t) |
| JD-08-56 | gravelly SAND | w | gsMt |
| JD-08-57 | sandy GRAVEL | - | sgFp |
| JD-08-58 | gravelly SAND | w | gsMb-H/LGd |
| JD-08-59 | SAND and GRAVEL | w | gsMb(t)-H(?) |
| JD-08-60 | gravelly SAND, trace silt | w | gsMt |
| JD-08-61 | gravelly SAND | w | gsFGt |
| JD-08-62 | GRAVEL and SAND | w | gsFGt/R |
| JD-08-63 | GRAVEL and SAND | w | gsFGt |
| JD-08-64 | bouldery, cobbly GRAVEL, trace sand | w | rCk |
| JD-08-65 | GRAVEL and SAND | w | sgMh |
| JD-08-66 | SAND, some gravel, trace silt | w | gsMvb/shR |
| JD-08-67 | gravelly SAND | w | gsM |
| JD-08-68 | GRAVEL and SAND | w | sgCv/Rh |
| JD-08-69 | gravelly SAND, trace silt | - | gsMb |
| JD-08-70 | gravelly SAND, trace silt | w | gsMb |
| JD-08-71 | sandy GRAVEL, trace silt | w | sgCk/shRh |
| JD-08-72 | gravelly SAND | w | gsMb |
| JD-08-73 | SAND and GRAVEL, trace silt | - | sgCv/shRh |
| JD-08-74 | SAND, some gravel, trace silt | w | gsMb |
| JD-08-75 | gravelly SAND, trace silt | mw to w | M + C |
| JD-08-76 | SAND, some gravel | - | gsFG |
| JD-08-77 | -- | - | Cv/shR; /Mx |
| JD-08-78 | -- | w | Mb |
| JD-08-79 | GRAVEL and SAND, trace silt | w | sgCv/Rr; /Mx |
| JD-08-80 | GRAVEL and SAND, trace silt | w | gsCv/shR |
| JD-08-81 | GRAVEL and SAND | w | sgFGh (M?) |
| JD-08-82 | GRAVEL and SAND | w | sgCv/shRr |
| JD-08-83 | SAND and GRAVEL | w | FG (M?) |
| JD-08-84 | SAND and GRAVEL, trace silt | - | gsFG (M?) |
| JD-08-85 | gravelly SAND, trace silt | w | gsMb |
| JD-08-86 | SAND, some gravel, trace silt | mw | gsMb |
| JD-08-87 | SAND, some gravel | w | gsFGh |

Terrain symbols include the surficial material in upper case prefixed by soil texture and followed by landform description; “/” symbol indicates the first material overlying the second.

TERRAIN SYMBOLS MATERIAL: C –colluvium; F –fluvial; FG –glaciofluvial; LG –glaciolacustrine; M –till;
LANDFORM: b –blanket; d –discontinuous; f –fan; h –hummocky; j –gentle; k –moderately steep; m –rolling; p –plain; r –ridged; s –steep; t –terraced; v –veneer; x –thin veneer; -H –kettled (and hummocky) glacial ice-melt deposits; A –avalanched;

DRAINAGE: p –poorly drained; m –moderately well drained; w –well drained; r –rapidly drained;

# FIGURES



**LEGEND**

- Terrain Stations
- Proposed Access Road
- Existing Trail/Road Track
- Existing Roads
- Proposed Mine Site Infrastructure
- NWT - Yukon Territory Border
- Contours (100m)
- Watercourse
- Waterbody

**NOTES**

Base data source: NTDB 1:50,000
Site Plan Design adapted from original provided by Wardrop

ISSUED FOR USE

## MACTUNG

## Terrain Field-Checking Stations

| PROJECTION | DATUM |
|---|---|
| UTM Zone 9 | NAD83 |

Scale: 1:100,000

Kilometers

FILE NO.
W23101110_001_Terrain_Stns.mxd

| PROJECT NO. | DWN | CKD | REV |
|---|---|---|---|
| W23101110.001 | MEZ | JD | 1 |

| OFFICE | DATE |
|---|---|
| EBA-VANC | December 4, 2008 |

NORTH AMERICAN TUNGSTEN CORPORATION LTD

EBA Engineering Consultants Ltd.

**Figure 4.1.3-2**

Q:\Vancouver\GIS\ENVIRONMENTAL\W231\W23101110_MacTung_AP\Maps\001_YESAA_Prep\Terrain\W23101110_001_Terrain_Stns.mxd