December 18, 2012

Friends of the Nemaiah Valley
Email dawilliams2@shaw.ca
Attention: Mr. David Williams

Don MacKinnon – West Coast Consulting
P.O. Box 451 – 81 Thornton Road
Ucluelet, BC V0R 3A0

Dear Sir:

Re: Road Upgrade Review – Proposed Taseko New Prosperity Mine

1.0 Introduction

In response to your authorization, the following text provides a review of the existing road system that may ultimately be utilized for transport of mine concentrate, should the New Prosperity Gold-Copper Mine proceed into development.

The New Prosperity Mine has the potential to create 550 direct jobs and 1280 indirect jobs annually and to provide 22 years of economic development in the Province of BC (Prosperity Gold-Copper Project EIS/Application Volume 3 March 2009, Taseko Mines Limited). Its estimated investment in the Province includes $800 million in capital and $200 million annually. The BC Provincial Government may, therefore, favour investing in its public infrastructure in support of the project.

Currently at the Environmental Impact Statement (EIS) phase of the project, it is understood that comment has just been provided to Taseko Mine Limited by the Canadian Environmental Assessment Agency (December 10, 2012, CEAA). Based on the response to be prepared and submitted by Taseko Mine Limited to CEAA, there may be a 15-day public comment period needed based on the additional information requested by CEAA, or the project may proceed directly to a Public Hearing.

The purpose of this Road Upgrade Review is to provide information relevant to potential access road construction and maintenance costs, which are not included in the feasibility assessments and cost projections advanced by Taseko Mine Limited. It is herein assumed, therefore, that these costs would be borne by the Province of BC and as such, would be paid through some form of public taxation. It may be important that this information be provided to the general public, at the time of the imminent Public Hearing for the Proposed New Prosperity Mine.

2.0 Summary

This report considers the existing condition of the public access roads that will be required to accommodate the development and operation of the New Prosperity Mine over its anticipated 20 year design life. Together with estimating construction and maintenance costs for the 89 km of public access road, consideration is also provided for upgrades to the existing 88 km of paved BC Highway 20 between Williams Lake and Lees Corner.

The estimated cost of upgrading the existing public road network considers road upgrades to a standard that would allow year-round transport of mine concentrate using B-train trucks (7 or 8 axles) loaded with 40 tonnes of mine concentrate. This cost is estimated at $26.2 Million dollars with an annual operating and maintenance expenditure over the 20 year period at $0.8 Million/year. This figure should be considered together with normal road maintenance costs that the Province of BC would apply against similar projects that develop its resources.

3.0 Background

Based on a review of the Environmental Impact Assessment documents, the New Prosperity Gold-Copper Mine would transport concentrate from the proposed mine site by truck to Williams Lake. Concentrate will then be trucked to the CN Rail mainline at the existing Gibraltar Mine Concentrate Load-out Facility near Macalister.(EIS Volume 3, March 2009, Taseko Mine Limited). Section 6.12 of the noted report states the following:

> "The project site is currently accessible overland by traveling west along the paved Bella Coola Highway ("Highway 20") from Williams Lake to Lees Corner, then south-west along the all-weather logging roads as shown in Figure 6-30. The total road distance from Williams Lake to the property is approximately 194 km. The access route for construction and operations will be comprised of a portion of the following roads:
>
> - Provincial Highway No. 20–existing 90 km of 2-lane, paved road
> - Taseko Lake Road (Whitewater Road)–existing 68.4 km gravel road
> - 4500 Road (Riverside Haul Road)–existing 19.4 km single lane gravel road to be upgraded with pull outs added and spaced at 2 km intervals
> - Project Site Access Road–a new 2.8 km, 5-m wide, single lane gravel road with pull outs to be constructed"

As stated in Section 2.2.3 of the September 2012 Taseko Mine Limited EIS, there are no new or changed components, features or activities associated with the Transmission Line, Access Road and Transportation Corridor and the Gibralter Mines Concentrate Rail Load-Out Facility (EIS September 2012, Taseko Mine Limited).

This document questions this "all-weather logging roads" terminology and develops a cost estimate to construct these roads to a standard that would safely accommodate the year-round Concentrate truck traffic to and from the Prosperity mine site that will consist of an average of approximately 15, 40 tonne B-Train trailers per day. (Section 6.13 EIS Volume 3, March 2009, Taseko Mine Limited). "Climatic Conditions" as described in Section 6.3.2 of the EIS Volume 3 report describes the following:

> ***Climatic Conditions***
> The climatic conditions at the Prosperity Project are typical of the British Columbia Chilcotin District with an annual average of approximately 500 mm of rain equivalent precipitation. The seasons in this area are well defined with relatively predictable periods of "freeze up" in the fall and "break up" in the spring. The "break up" period is characterized by increased water flow from melting snow and cyclical thawing and freezing of the surface materials on pit slopes.

The statement made in Section 6.12 pertaining to transport of concentrate on "all weather roads" appears to be contradicted with respect to the "break-up" period, as follows:

> "The mine site will be accessed by a gravel road from Highway 20. The road will provide year round access for the delivery of supplies, products and personnel, and the transportation of concentrate from the mine site.
>
> On Highway 20, the allowable axel load of all delivery trucks is restricted to 70% from

> mid-March to mid-May due to the spring thaw and high volume of precipitation. During this period the service schedule of the delivery and concentrate trucks will be changed to ensure the uninterrupted operation of the plant.
>
> The existing road between Highway 20 and the plant site is approximately 91.4 km long and is designated as the Taseko Lake Road, the 4500 Forest Service Road (formerly Riverside Road) and Prosperity Plant Access Road. The Taseko Lake Road, approximately 68.4 km long crosses two rivers and both bridges are full axle load rated. Reconnaissance of this section was carried out in November of 2006 and no sections were identified that will require upgrading for the Prosperity Project. The following 19.4 km long the 4500 Road will be upgraded to a single lane with pull outs spaced at 2 km intervals. The road bed will be improved with suitable material. The last section, the approximately 2.8 km long Prosperity Plant Access Road will be new road construction, single lane with pull outs."

It is noted that "the access road is maintained on a seasonal basis by Taseko Mines Limited. During the wet spring months, four-wheel drive vehicles with high ground clearance are often required" (Taseko Mines Limited Geotechnical Diamond Drilling Assessment Report, January 2009, L.K. Brommeland et.al.)

On the basis that Highway 20 is a paved road, constructed with granular base (WGB) layers and granular subbase (SGSB) layers, the existing Taseko Lake Road and associated forest roads which may have a minor thickness of marginal-grade gravel surfacing, cannot be considered all-weather roads and must, therefore, be upgraded or the cost of road maintenance during the active stages of the Prosperity Mine development, will be cost-prohibitive to the Province of BC (and the taxpayers).

As the existing forest roads are located within an area subject to the Cariboo-Chilcotin Land Use Plan that allows for Enhanced, Integrated and Special Resource Development, it is understandable there would likely be an expectation from Taseko Mine Limited that the road system required for the development of resources within this land use context are the responsibility of the Provincial Government. This appears to be the case, since the comments pertaining to the EIS have not challenged the absence of road construction and maintenance costs on the public road system of forest roads.

4.0 Methodology

4. 1 Determination of a Pavement Structure for the Access Roads

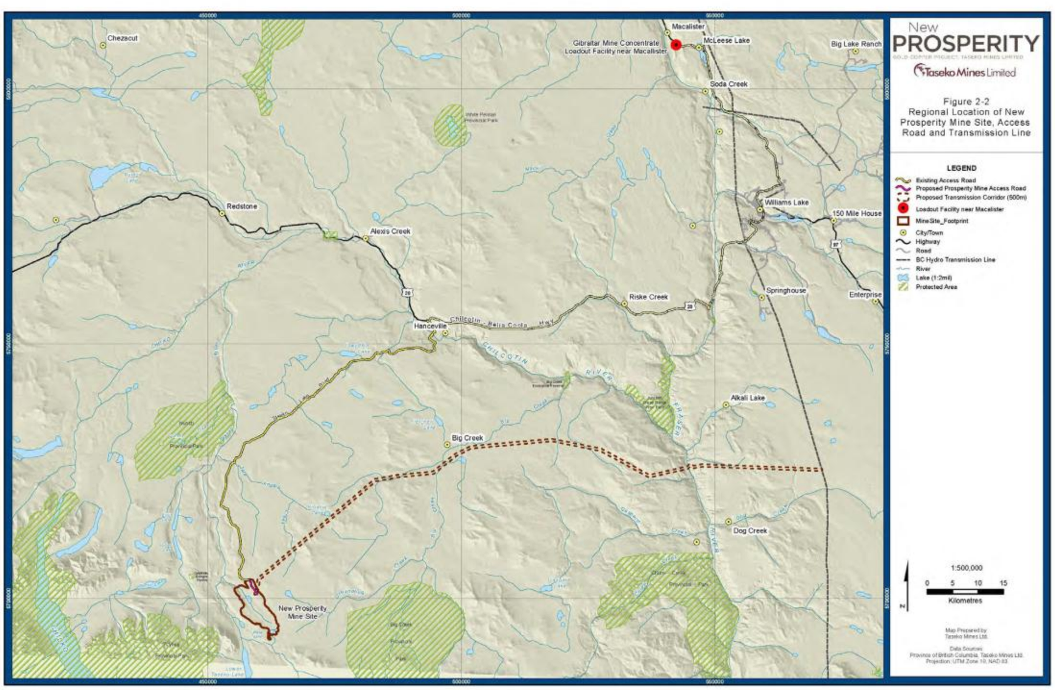
Ideally, the pavement structure developed by Taseko Mine Limited for the proposed new access road into the Prosperity Mine Site, would be applied to the public access roads. Although the author hasn't yet located a source for this information, this data may be contained in Appendices to the EIS report (ie. Appendix 3-6-I). As the public road system was observed in November of 2006, the weakest condition corresponding to "spring break-up" was not documented and permanent damage to the roads may not have been apparent, as these roads have largely been utilized in the winter or the summer (ie. they have not likely been utilized heavily, historically, in their weakened state during spring break-up).

Alternatively, if the existing pavement structure of Highway 20 was determined (from BC Ministry of Transportation and Highways), the equivalent gravel pavement structure that will be required to support the 40 tonne B-Train trucks could be estimated. Recognizing that the existing pavement structure of Highway 20 is deficient during the "spring break-up" period of time, some improvements could be required once the mine becomes active, to allow the schedule of mine concentrate transportation to continue un-impeded. It is equally possible that more trucks carrying 70 percent of their loads would be employed during “spring break-up” to comply with the road bans, but this would increase operational cost for the trucking of concentrate as well as increasing the carbon footprint of the mine. It is herein considered more prudent to consider the costs of incrementally improving the pavement structure along Highway 20, through pavement rehabilitation and pavement overlays, as required, over the anticipated 20 year life span of the mine.

In the absence of better information, and without detailed analysis of the existing access roads, the following methodology is proposed to develop an estimate of cost to improve the existing road standard to that which will sustain year-round traffic without road damage corresponding to the “spring break-up” period. Utilizing existing aerial photographs showing the historical alignment of existing roads, together with published surficial geological information, the general terrain conditions would be estimated along the anticipated public access roads. Assuming that some additional aggregate would be required to raise the standard of the existing roads to enable “year-round” transport of concentrate, an estimate of cost would be developed together with sufficient data and cost assumption data, to enable the potential road improvement costs to be upgraded should better information become available. In this manner, the absolute value of projected road improvement costs would be of secondary importance to identifying that there could be significant road improvement costs that have not been factored into the presentation of potential impacts from the New Prosperity Gold-Copper Mine.

It is with this intent that the following analysis is provided; that there will be some costs associated with up-grading the public access roads required to transport concentrate from the proposed mine to Williams Lake and that these costs should be made public during the Public Hearing phase of the New Prosperity Gold-Copper Mine.

To undertake this review, it is recognized that additional information has been provided by Taseko Mine Limited since the 2009 EIS report was submitted. Specifically, the access road is as shown below (Project Description, August 2011, Taseko Mine Limited).



Typically, the intent of a highway pavement structure including pavement, is to avoid the requirement for seasonal road bans. Prior to 1995, the standard pavement structure for a "medium volume" highway would have consisted of 75mm of high density asphaltic concrete overlying 150mm of 25mm crushed base course gravel (WGB) overlying 150mm of 75mm crushed base course gravel overlying 300mm of Select Granular Subbase (SGSB) gravel (MoTH, 1995). This would be roughly equivalent in strength (and ability to sustain heavy truck wheel loads without rutting) to a gravel road structure consisting of 300mm of 25mm WGB overlying 600mm of SGSB gravel. This gravel road pavement standard has been selected, therefore, to generate a cost estimate for upgrading the existing forestry standard road system to one that would accommodate year-round 40 tonne B-train truck traffic.

It is possible that detailed design taking into account local soil conditions during the spring-break period of time would result in a thinner overall pavement structure. It is also possible that a thinner pavement structure could be selected on the basis that more road maintenance would be undertaken during spring break-up to keep the road trafficable to the B-train trucks. It is also possible that road bans would be imposed and complied to during spring break-up and that this would reduce the overall road improvement costs. The intent of this exercise, is to bring attention to the potential magnitude of road improvement costs.

As the public road system between the New Prosperity Mine and Highway 20 includes two bridges, it is assumed these will safely accommodate the one-way traffic resulting from the hauling of mine concentrate. It is also noted the above road location includes a re-alignment around the Yunesit'in Indian Reserve.

4.2 Other Issues affecting Road Improvement Costs

Generally, pavement design practice in BC accommodates a twenty (20) year design horizon accounting for the magnitude and number of vehicle axle loads that will be imposed on the road during its lifetime. Periodic maintenance may be required to optimize the road performance and protect the capital cost investment in the infrastructure. Drainage of the pavement structure is critical to satisfactory performance so grading/cleaning of ditches and culverts to maintain the granular portion of the pavement structure in a fully-drained condition, is an important aspect of road maintenance.

Once paved road surfaces become cracked and/or rutted, surface water can gain access to the granular portion of the structure causing weakness and premature deterioration of the pavement structure. For this reason, crack-sealing is routinely carried out on BC Highways and excessively cracked portions are rehabilitated with overlay placement, at timely intervals to sustain the pavements' design life.

To avoid penetration and loss of strength in a gravel road pavement structure, the surface of the gravel road is typically shaped (crowned) to promote the shedding of water to the roadside ditches. In combination with maintaining this crowned surface and controlling dust along the roads (resulting from traffic during dry summer months), a regular routine of road maintenance will protect the capital investment of a gravel road system. This road maintenance may include application of Calcium, which tends to stabilize the gravel road surface (promotes the shedding of water, controls dust and retains gravel on the road).

Sections of road that are constructed along terrain that is unstable or subject to erosion, will require on-going maintenance or re-construction unless precautions are taken to mitigate the potential damages. Lee's Corner is noted to have been built on an ancient landslide, and the road has had to be re-aligned within its current design life. Within the valley of the Chilcotin River, the potential for slope movement necessitates a form of road construction that avoids placement of deep fills, as this can promote the on-set of slope instability. Sometimes, however, the cost of construction to avoid potential impacts is prohibitive and is more often avoided in favour of assuming a higher degree of road maintenance and associated costs. It should, therefore, be expected that road maintenance costs for the public road system through approaches to the Chilcotin River will be required during the anticipated 20 year operation of the New Prosperity Gold-Copper mine.

5.0 Existing Condition of the Public Road Access – Williams Lake to New Prosperity Mine Site

In order to obtain a preliminary idea of existing conditions along the public road system that will accommodate B-train truck traffic, the author drove the subject roads on August 27, 2012. Observations were recorded along the route and referenced to oedometer readings from both Williams Lake, then from the turn-off into the Yunesit'in Indian Reserve. Observations are tabulated in Appendix A. Sections of Highway 20 were noted to be requiring maintenance upgrades to the existing paved surface and the 4500 Road was noted to be heavily rutted in some locations.

Based on a more detailed review, the existing public access road (highway) has been re-aligned and upgraded over various sections (ie. from 23 km to approximately 40 km south of Lee's corner), which together with visually apparent application of Calcium Chloride (Calcium) has likely improved the driving condition of the roads during favourable weather conditions.

6.0 Results of Preliminary Terrain Assessment and Drainage Conditions

Locations of drainage courses potentially affecting the road improvement costs were developed from a review of historical aerial photographs, from available surficial geology maps and from available topographic maps. This information is presented on maps included in Appendix B.

The proposed access road alignment, the aerial photographs used in analysis, and relatively recent condition of the access road alignment are presented on figures included in Appendix C.

7.0 Cost Estimate Assumptions

Based upon the results of preliminary terrain assessment, the observation of existing road conditions, and review of available surficial geology interpretations and maps, there does not appear to be an abundance of good-quality road construction gravels near the public road system required by the New Prosperity Gold-Copper mine. This observation tends to support the authors opinion of the current road system strength deficiency.

There is an existing geologic feature called an Esker, which will undoubtedly contain a well-sorted gravel deposit considered most suitable for the recovery of suitable SGSB gravel as well as for crushing/screening to make a WGB gravel for road construction. It is herein assumed this deposit is both extensive enough to meet the road construction requirements to surface the north portion of the public access road from the New Prosperity Gold-Copper mine to Highway 20, and that permitting to enable development of a gravel pit will not be an obstacle. The proposed pit would be located south of the Yunesit'in Indian Reserve (I.R. No. 1) but north of I.R. No. 4. This potential pit appears reasonable for cost estimating purposes at this time, but would require study to confirm both the quality and quantity of gravel products could be obtained from this location without adverse environmental affects to the nearby Minton Creek.

For access road improvements for the south portion of the public access road, it has been assumed that it would be feasible to obtain crushed gravel product from the preliminary development of the New Prosperity Gold-Copper mine. Recognizing that crushed rock products will be required to develop the mine development roads, infrastructure and tailings impoundment starter dam, it might be feasible to upgrade the public access road in advance of the mine site development. To this end, it is herein assumed that a rock crushing/screening operation would be set up in advance of the mine site development at the anticipated Phase 1 Starter Pit, which would be the first of four phases of developing the open pit mine. (EIS Volume 3, page 6-10, March 2009, Taseko Mine Limited). This material is projected as consisting of primarily rock described as basalt, which would respond well to rock blasting and could be screened and crushed into a suitable road building aggregate (both 25mm WGB and SGSB). It is assumed that this material would be suitable (non-PAG or non-potentially acid generating) and would be crushed and screened by a road building contractor as part of a contract that is separate from the mine development.

It has been assumed that road construction approvals, requirements for environmental studies, environmental controls and mitigation practises would all comply with all relevant provincial standards and to the BC Forest Practices Code. Costs of compliance have not been specifically itemized but are inherently contained within the preliminary cost estimates provided herein.

Based on the estimated volumes of aggregate materials, the cost estimate to upgrade the public forestry standard access road is based on the following estimates:

7.1 Estimated Cost of Aggregate Production/Transport/Placement

- Cost of developing approximately 1.2 to 1.3 million tonnes of SGSB or 75mm crushed rock suitable for use as SGSB, including stripping of the pit area, would amount to $3.00/tonne loaded into trucks
- Cost of developing approximately 0.52 million tonnes of 25mm crushed/screened gravel meeting WGB gradation/quality specifications, would amount to $3.00/tonne loaded into trucks with an estimated crushing cost of $4.00/tonne.
- Cost of hauling the rock products based on an average speed of 50 km/hour and an average distance of 25 km from respective pit areas, 1 trip/hour, using off-highway trucks and 30 tonne payload would amount to $4.50/tonne.
- Cost of placing and compacting the rock products would be estimated at $2.00/tonne
- Estimated cost, therefore, of making and placing SGSB gravel would total $9.50/tonne
- Estimated cost, therefore, of making and placing WGB gravel would total $13.50/tonne

7.2 Estimated Associated Road Construction Costs

- Estimated camp costs of $120.00 - $150.00/day/person.
- Estimated duration of project using 12 workers, moving 200 tonnes/hour, would total 9100 hours. Assuming average 10 hour days, this would require 1000 days accommodation in a construction camp or equivalent.
- Annual road maintenance would be undertaken by grader(s), requiring minimum 12 hours/day for snow removal and/or grading for an estimated 3 months annually plus a sanding truck for an estimated total of 2600 hours/year at an estimated rate of $145/hour

- Cost of installing a culvert up to 600mm diameter would be $500 delivered, would take 2 hours to install using an EX300 excavator at $185.00/hour for estimated "installed" cost of $850 /culvert
- Cost of installing a bridge would take between 1 week and 2 weeks at $5000/day and for 6 m long span, an estimated "installed" cost of $70,000 /bridge.
- Cost of installing an arch culvert of 1.2m opening would take about 3 days at $5000/day, an estimated "installed" cost of $20,000 /arch culvert.
- Cost of ditching or similar road improvement is estimated at $3700 /km

7.3 Estimated Highway Improvement/Maintenance Costs

- Hot Mix Paving overlay 50mm (minimal base repair), overlay width one lane, 15 year life expectancy, Cost/lane km $100,500 to $134,500 with average of $117,000 (2011/2012$) (Source: Ministry of Transportation and Infrastructure Construction and Cost Rehabilitation Cost Guide, July 2012)

8.0 Cost Estimate

8.1 Initial Construction Cost

The cost estimate developed to improve the existing forest road to accommodate un-interrupted 40 tonne B-train trucks is based upon constructing the road to a 7 m wide surface. The existing road system contains many vertical and horizontal curves and a narrower road would not enable use of low-bed trucks or the axle turning capabilities of B-train trucks. To estimate the volume of WGB gravel, an average width of 8 m was assumed accounting for the sideslopes of the 300mm thick layer at 3 horizontal to 1 vertical. To estimate the volume of the SGSB gravel, an average width of 10 m was assumed accounting for the sideslopes of the 600mm thick layer at 2 horizontal to 1 vertical.

The volume of WGB gravel required to upgrade the 89 km of existing road as a gravel surfacing layer is estimated at 213,600 m^3 or 0.52 Million tonnes at an estimated in-place cost of $7.02 Million dollars.

The volume of SGSB gravel required as granular subbase (underlying the gravel surfacing layer) is estimated at 534,000 m^3 or 1.30 Million tonnes at an estimated in-place cost of $12.35 Million dollars.

Accommodation cost for 12 workers over the estimated 3 year (1000 days) construction period is estimated at $1.80 Million dollars.

It is estimated that 41 km of ditching, 47 culverts of 600mm diameter size, 17 arch culverts of 1.2m opening size, and a 6m long bridge span would cost an estimated $0.6 Million dollars.

It is estimated that a total of 38 km of one-lane pavement overlay would be required along Highway 20 to accommodate the 40 tonne B-train truck traffic. This overlay would be undertaken within two sections (from 39km to 42km south of Williams Lake, then from 54km to 70km south of Williams Lake). These overlays would cost an estimated $4.45 Million dollars.
(2 lanes x 19km x $117,000/km = $4.45 Million)

8.2 Annual Maintenance Cost Estimate

In order to maintain the condition of the improved public access road, it is estimated that two graders would operate year round to shape the road surface, remove pot holes and rough (washboard) sections (snow, as required), at an estimated cost of $0.38 Million/year. Otherwise, it is assumed that Highway 20 would be maintained by annual contract paid by Ministry of Transportation and Infrastructure (MoT), (or as it is now).

In addition, it is anticipated that Calcium would be applied to the gravel-surfaced road on an annual basis at an application rate of 1.5 to 2.0 litres/m^2 either with a nominal application of road surfacing gravel or in conjunction with watering and grading the existing road surfacing gravel. This cost assumes the liquid Calcium would be brought in by rail then transported and spread at the site over the period of about a week at an estimated cost of $0.34 Million/year.

In addition, it is anticipated that asphalt pavement crack-sealing would periodically be undertaken along Highway 20. Although this normally might be undertaken by MoT, it is included herein for completeness, as the pavement surface could degrade rapidly under the heavy loads imposed by the B-train trucks. The estimated cost of this crack-sealing, applied over the 20 years to various sections of the 88 km of paved Hwy 20 (or including up to Macalister) would be estimated based on 500m of sealing product/km at a cost between $4.50 - $5.50/lineal metre. Considered to be applied to 20 km sections in a rotation over the 20 year period (with 25% increase in material and labour costs every 5 years) this is estimated to total $0.06 Million/year.

9.0 Closure

This Road Review has been undertaken using established geotechnical engineering and pavement design methodologies. It is **not** intended to represent a detailed engineering design, as this was not considered within the terms of reference of this assignment. It is stated herein that qualified professionals would be commissioned should these road improvements be considered, and that the existing condition of the public road system and its historical development would be completed in advance of any construction. No allowance has been provided herein for the costs of these assessments or environmental assessments required by the appropriate regulations and by regulatory authorities. The information is intended for use as described herein, to provide a reasonable basis to evaluate potential costs associated with the New Prosperity Mine development and operation. No other warranty is expressed or implied.

Respectfully submitted,

Don MacKinnon, M.Eng., P.Eng.
Geotechnical Engineer

<u>References</u>

Taseko Mines Limited – Prosperity Gold-Copper Project - Environmental Impact Statement/Application dated September 2012. Scope of Project 2.2.3

Taseko Mines Limited – Prosperity Gold-Copper Project - Environmental Impact Statement/Application dated March 2009. Volume 3 – Project Description and Scope of Project

Deficiency Statement – Request for Additional Information – Various Topics – New Prosperity Gold-Copper Mine Project Environmental Impact Statement. Prepared by New Prosperity Gold-Copper Mine Project Federal Review Panel, Canadian Environmental Assessment Agency dated December 10, 2012

The New Prosperity Mine Project – Project Description Appendix 2-6-A dated August 2011 prepared by Taseko Mines Limited Vancouver BC.

Taseko Mines Limited, Geotechnical Diamond Drilling Assessment Report – F1 to F9, Fish 1 and Fish 5 to Fish 11, Mineral Claims, Fish Lake Property – Clinton Mining Division BC, Canada NTS 920/5E by L.K. Brommeland, B.Sc., R. J. Haslinger, P.Eng., C.M. Rebagliati, P.Eng., dated January 11, 1995

Province of British Columbia Ministry of Transportation and Highways – Pavement Design Standards, Technical Circular T-9/95 prepared by Geotechnical and Materials Engineering Branch dated July 10, 1995

Ministry of Transportation and Infrastructure – Construction and Rehabilitation Cost Guide dated July 2012

Geological Survey of Canada – Department of Energy Mines and Resources Map 1292A Surficial Geology Taseko Lakes, British Columbia Published 1971 to accompany GSC Bulletin 196 by H.W. Tipper (Geology by H.W. Tipper, 1954 – 1969)

<u>Aerial Photographs Reviewed</u>

(obtained through Geographic Information Centre – Air Photo Library UBC Department of Geography)

1974	BC7672 photos 14 – 16	BC 7671 photos 222 – 225	BC7616 photo 52
	BC 7616 photo 018- 022	BC 7615 photos 182 – 187	BC 5631 photos 7, 8
	BC 7615 photos 167 -170	BC 5628 photos 280 – 281	
	BC 5629, photos 206-210	BC 5631 photos 048 - 049	

1989 BCC1023 photos 203 – 205, 132 – 135, 209,
BCC1033 photos182 – 183, 112 – 119, 187 – 188, 59 – 60

1967 BC 5259 photos 199 – 210

APPENDIX A

Road Observation Notes – Williams Lake to New Prosperity Mine Site
Via Highway 20, Nemaiah Valley Road, 4500 Road

Hwy 20

- 23K bridge over Fraser River
- 23k South approach sloughing cut slope
- 26k Switchback begins
- 28-30k Heavy temperature cracking and washboarding
- 39-42k Washboard
- 54k End of road improvements
- 54-70k Poor pavement conditions
- 88k Lee's Corner

Nemaiah Valley Road

- 88-89.2k Asphalt stabilized base
- 89.2k Gravel begins (road bands begin also)
- 92k Bridge over Chilcotin River
- 92k Gravel exposed south of bridge
- 92.3-93.1 Washboard on switchbacks

From Yunesit'in on Nemaiah Valley Road

- 5.5-6k kame kettle topography
- 4.3-4.5 possible wetland (aspen trees present on sides of road)
- 6k presence of active sandpit
- 8.5k start of plateau and best roads (corresponds with 24 km on maps in Appendix B)
- 16.3k Call sign = 23k (corresponds with 31.8 km on maps in Appendix B)
- 22.k Heavy washboard
- 39k Bog crossing
- 39.2k Gravel pit
- 43.7k Start of S-corners (descending)
- 44.5k Vedan Creek bridge (slope failure above road bank) (60 km om maps in Appendix B)
- 44.5k Calcium application on road apparent
- 52.6k 4500 Road begins

4500 Road

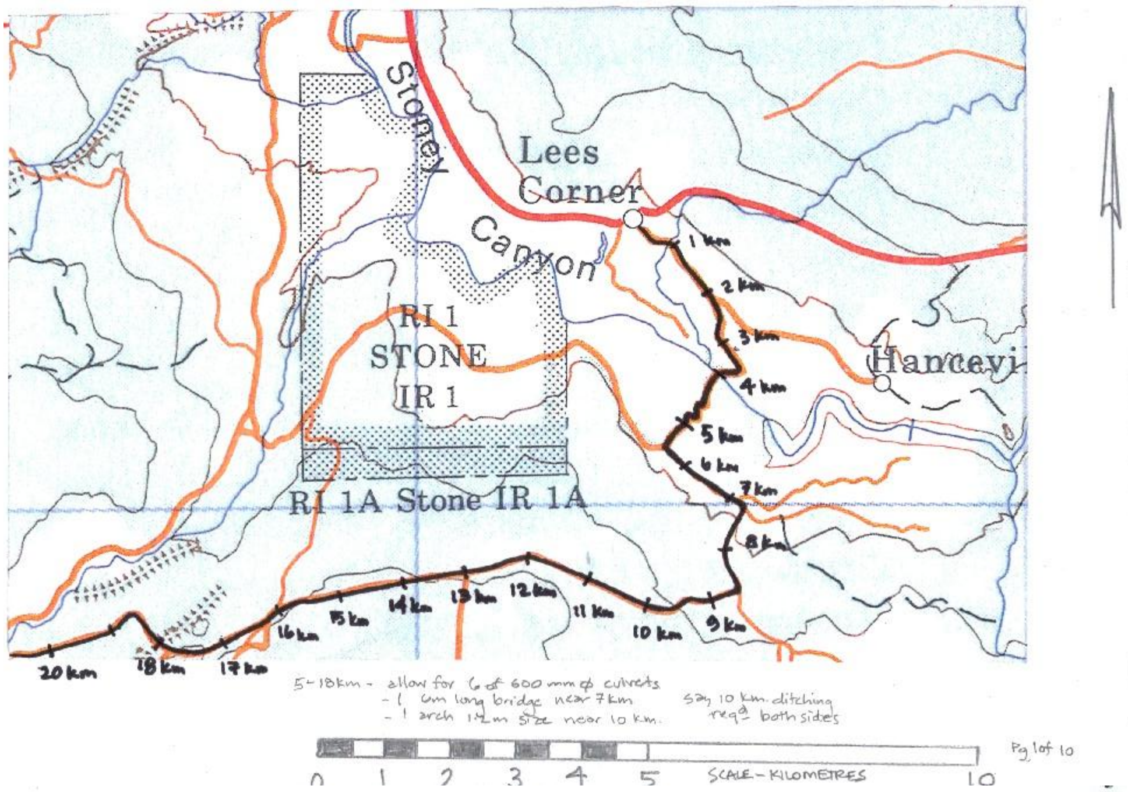
- 4.5 to 5 m wide road, marginal ditching
- 54.1k Skirts bog
- 55k Heavy rutting
- 59-60k Possible escarpment slope failure
- 64.2k Culvert with long drainage contribution
- 64.5 Possible road access to Fish Lake (fenced access)

- 65k road up for possible quarry/gravel pit
- 65k Vertical culvert – possible well
- 66.3k = Call sign 13

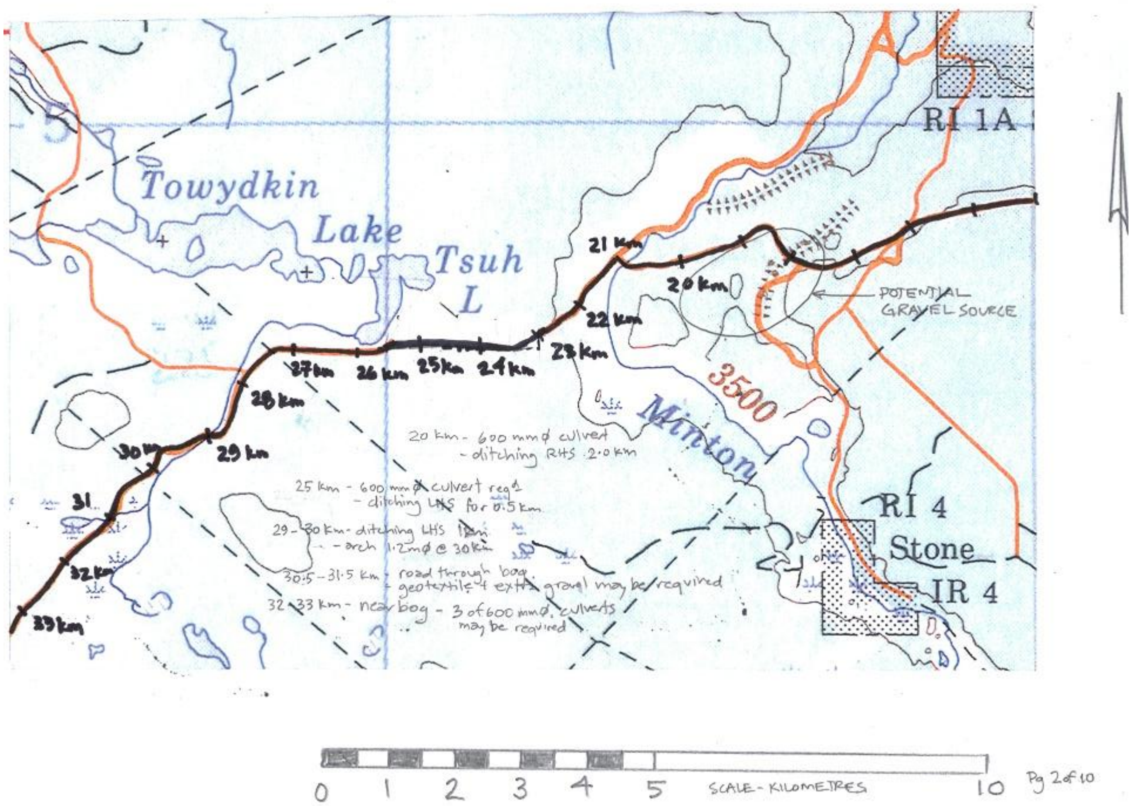
APPENDIX B

MAPS WITH DESIGN COMMENT INFORMATION

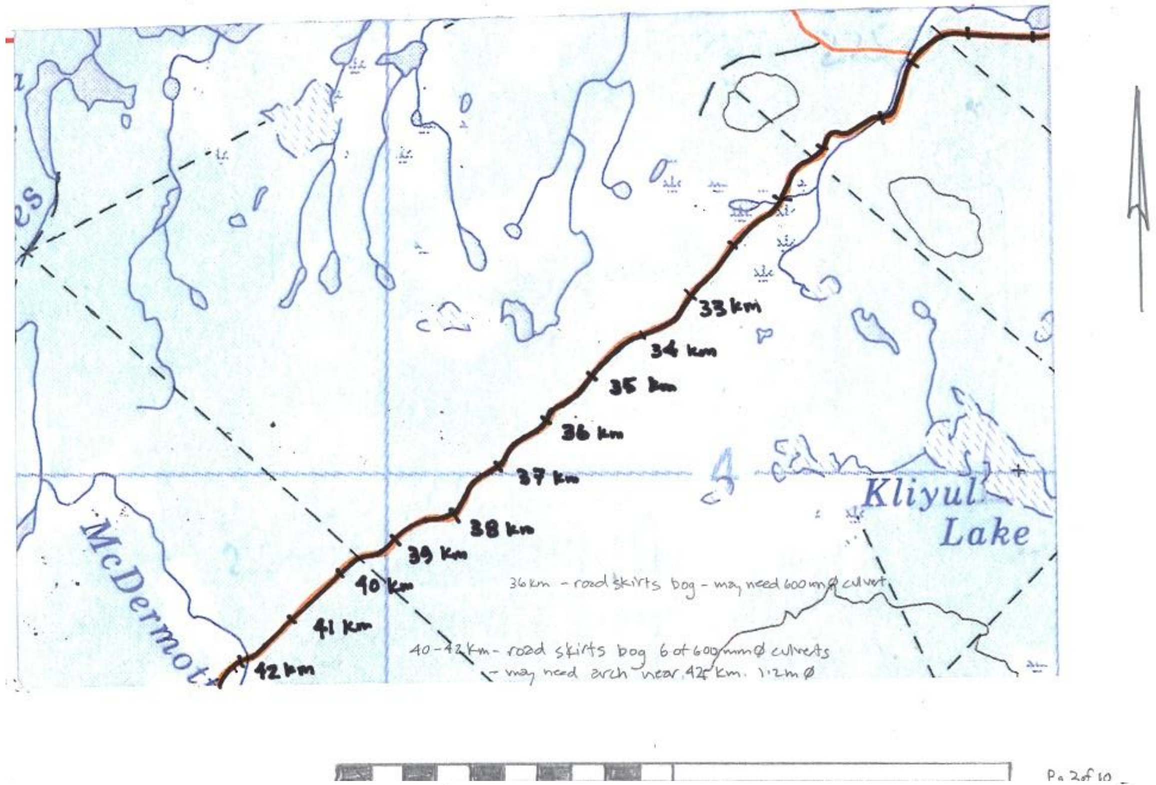
Source: 1990 Scale 1:250,000 TASEKO LAKES 92-O
Energy Mines and Resources Canada, National Topographic Service mapping Edition 3

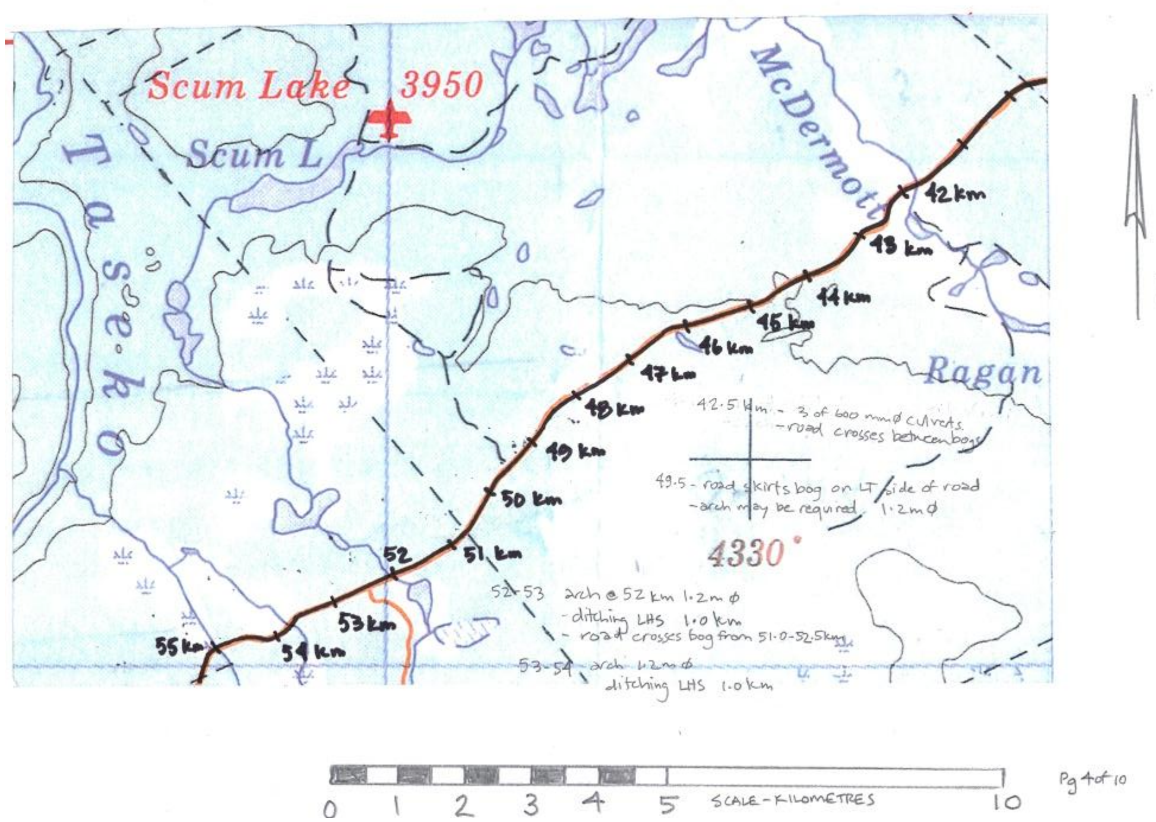


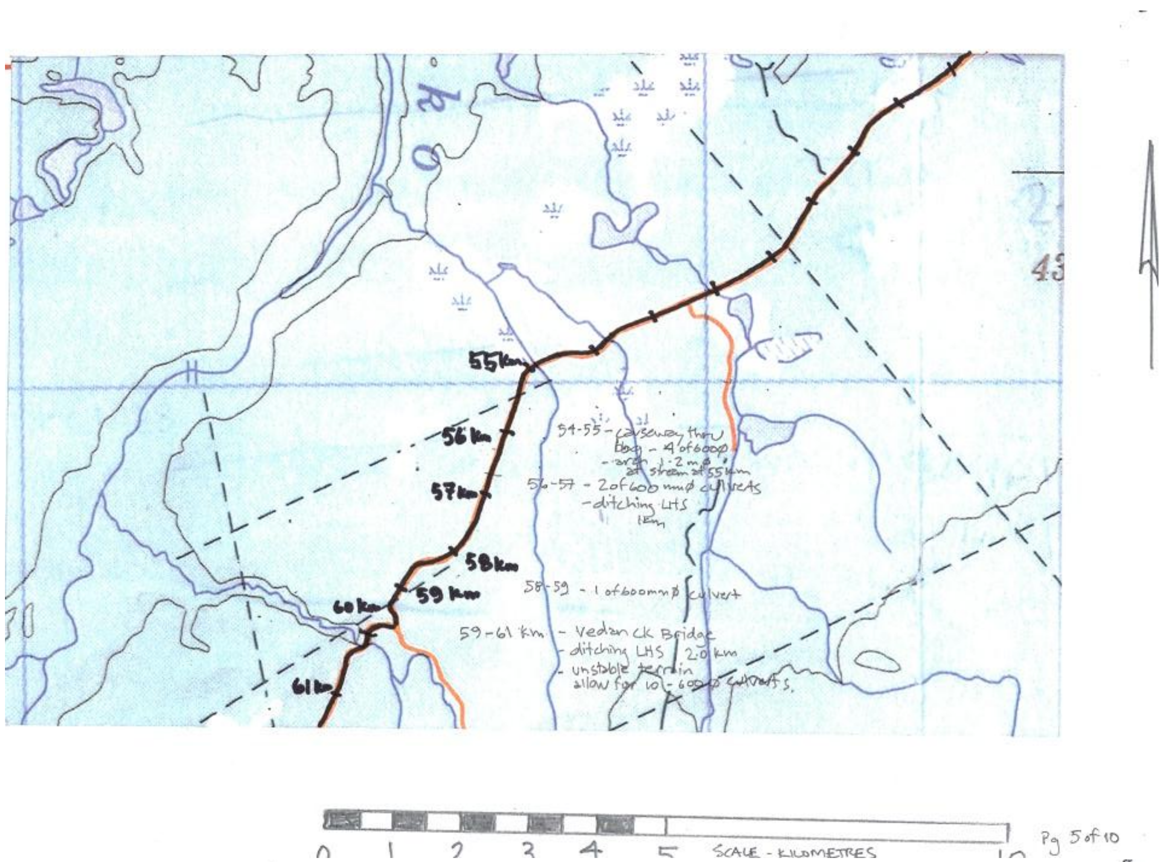
Stoney
Lees Corner
Canyon
Hanceville
RI 1
STONE
IR 1
RI 1A Stone IR 1A
1 km
2 km
3 km
4 km
5 km
6 km
7 km
8 km
9 km
10 km
11 km
12 km
13 km
14 km
15 km
16 km
17 km
18 km
20 km
5–18km – allow for 6 of 600 mm ϕ culverts
– 1 cm long bridge near 7 km
– 1 arch 1.2m size near 10 km.
say 10 km. ditching req'd both sides
0 1 2 3 4 5 SCALE – KILOMETRES 10
Pg 1 of 10

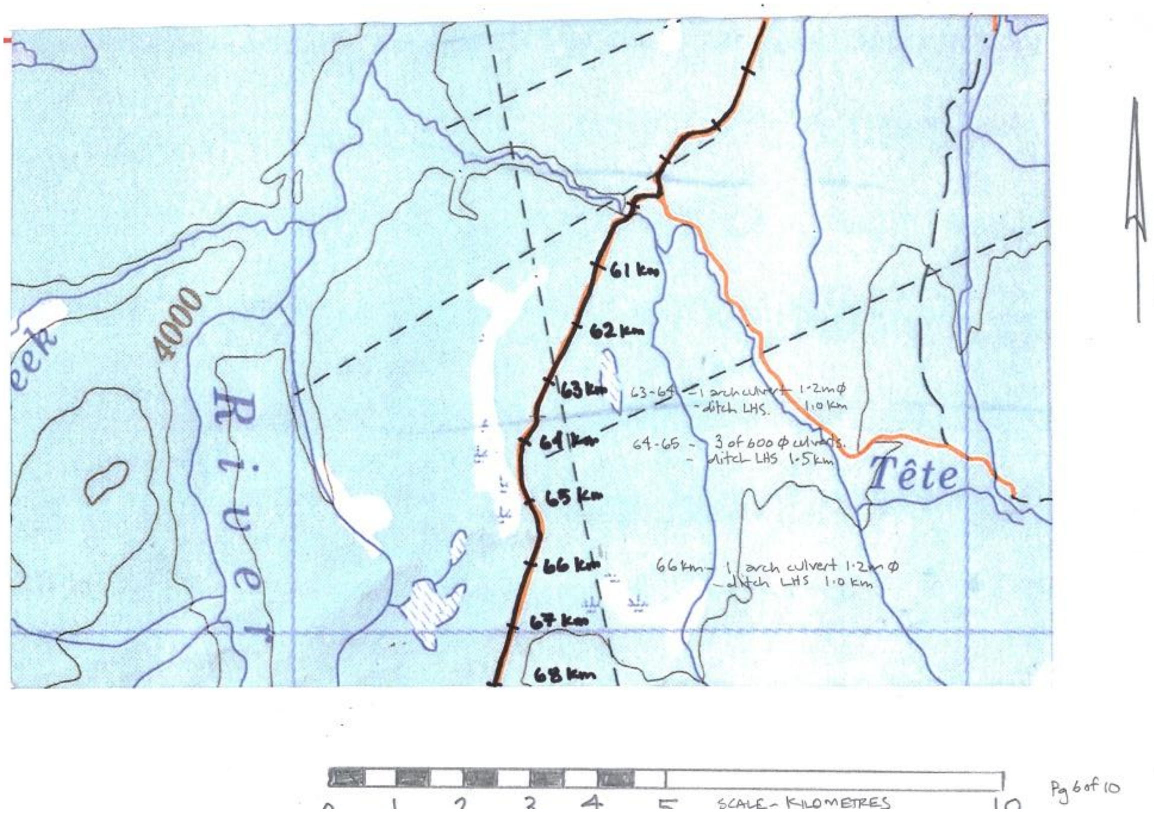


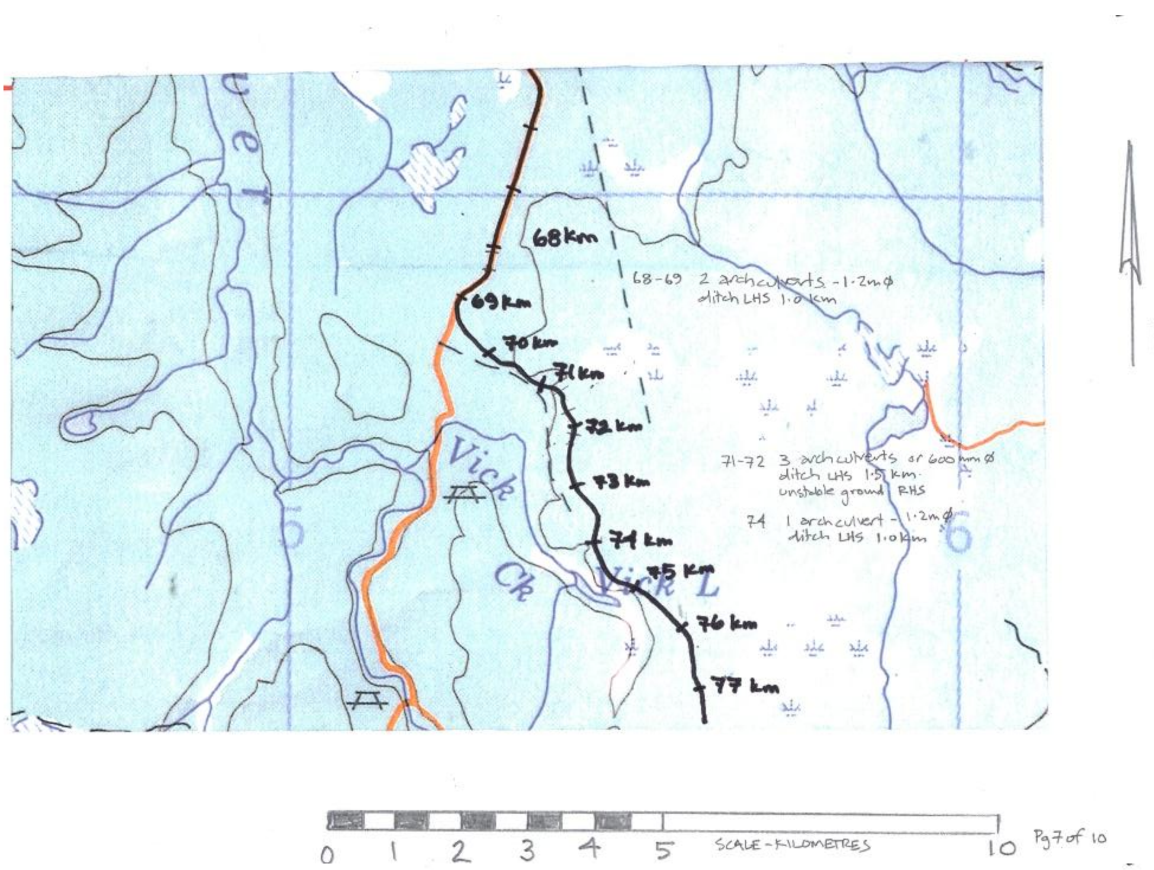
RI 1A
Towydkin Lake
Tsuh L
Minton
3500
POTENTIAL GRAVEL SOURCE
RI 4 Stone IR 4
20 km
21 km
22 km
23 km
24 km
25 km
26 km
27 km
28 km
29 km
30 km
31
32 km
33 km
20 km – 600 mm ϕ culvert
– ditching RHS 2.0 km
25 km – 600 mm ϕ culvert req'd
– ditching LHS for 0.5 km
29–30 km – ditching LHS 1 km
– arch 1.2m ϕ @ 30 km
30.5–31.5 km – road through bog
– geotextile + extra gravel may be required
32–33 km – near bog – 3 of 600 mm ϕ culverts may be required
0 1 2 3 4 5 SCALE – KILOMETRES 10
Pg 2 of 10

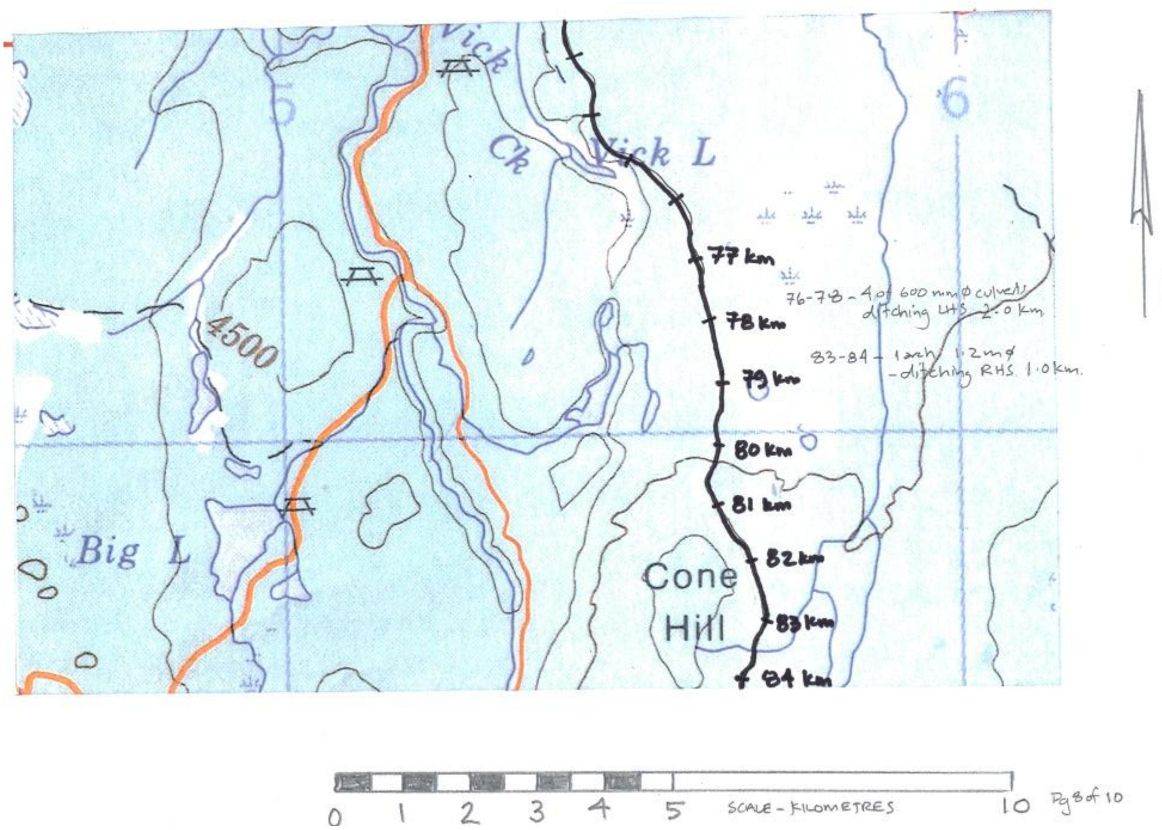

33 km
34 km
35 km
36 km
37 km
38 km
39 km
40 km
41 km
42 km
Kliyul Lake
McDermott
36 km - road skirts bog - may need 600 mm Ø culvert
40-42 km - road skirts bog 6 of 600 mm Ø culverts
- may need arch near 42 km. 1.2 m Ø
Pg 2 of 10

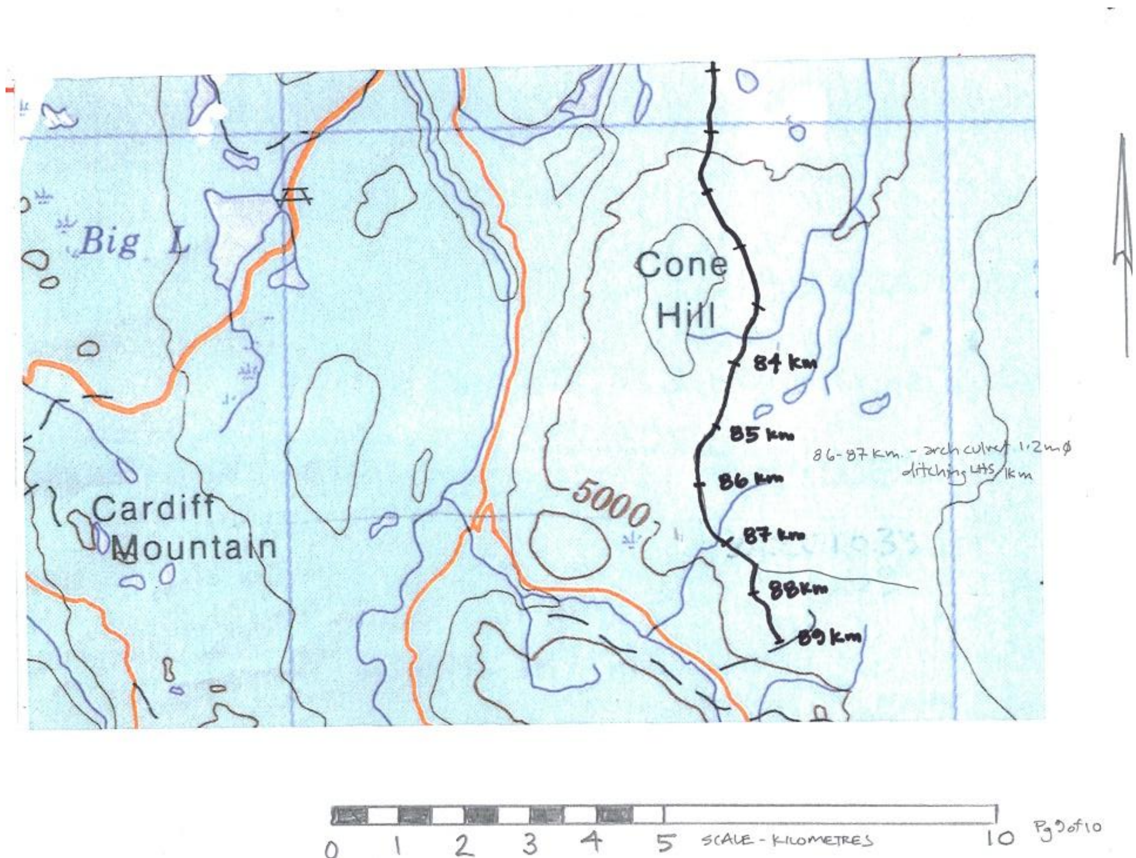

Scum Lake 3950
Scum L.
Taseko
McDermott
Ragan
4330
42 km
43 km
44 km
45 km
46 km
47 km
48 km
49 km
50 km
51 km
52
53 km
54 km
55 km
42.5 km - 3 of 600 mm Ø culverts
- road crosses between bogs
49.5 - road skirts bog on LT side of road
- arch may be required. 1.2 m Ø
52-53 arch @ 52 km 1.2 m Ø
- ditching LHS 1.0 km
- road crosses bog from 51.0-52.5 km
53-54 arch 1.2 m Ø
ditching LHS 1.0 km
0 1 2 3 4 5 SCALE - KILOMETRES 10
Pg 4 of 10

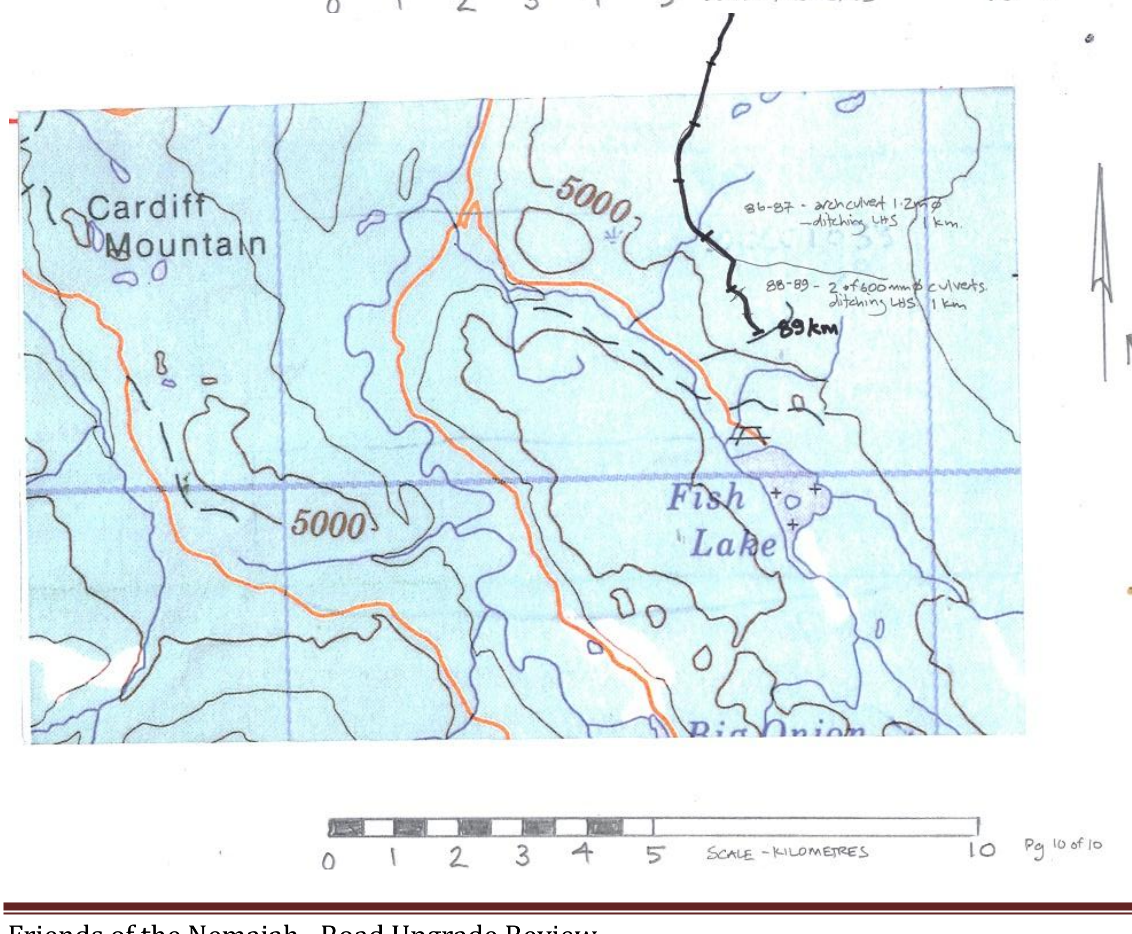

55km
56km
57km
58km
59km
60km
61km
54-55 - causeway thru bog - 4 of 600ø - arch 1.2mø at stream at 55km
56-57 - 2 of 600mmø culverts - ditching LHS 1km
58-59 - 1 of 600mmø culvert
59-61 km - Vedan Ck Bridge - ditching LHS 2.0 km - unstable terrain allow for 10 - 600ø culverts.
0 1 2 3 4 5 SCALE - KILOMETRES 10
Pg 5 of 10


61 km
62 km
63 km
64 km
65 km
66 km
67 km
68 km
4000
River
Tête
63-64 - 1 arch culvert 1.2mø - ditch LHS. 1.0 km
64-65 - 3 of 600ø culverts. - ditch LHS 1.5km
66 km - 1 arch culvert 1.2mø - ditch LHS 1.0 km
0 1 2 3 4 5 SCALE - KILOMETRES 10
Pg 6 of 10


68km
69 km
70 km
71 km
72 km
73 km
74 km
75 km
76 km
77 km
68-69 2 archculverts - 1.2m ø
ditch LHS 1.0 km
71-72 3 archculverts or 600 mm ø
ditch LHS 1.5 km.
unstable ground RHS
74 1 archculvert - 1.2m ø
ditch LHS 1.0 km
Vick
Ck
Vick L
0 1 2 3 4 5 SCALE - KILOMETRES 10
Pg 7 of 10


Vick
Ck
Vick L
4500
Big L
Cone
Hill
77 km
78 km
79 km
80 km
81 km
82 km
83 km
84 km
76-78 - 4 of 600 mm ø culverts
ditching LHS 2.0 km
83-84 - 1 arch 1.2m ø
- ditching RHS 1.0 km.
0 1 2 3 4 5 SCALE - KILOMETRES 10
Pg 8 of 10


Big L
Cone Hill
84 km
85 km
86-87 km. - arch culvert 1.2m ø
ditching LHS 1km
86 km
5000
87 km
Cardiff Mountain
88km
89 km
0 1 2 3 4 5 SCALE - KILOMETRES 10
Pg 9 of 10


Cardiff Mountain
5000
86-87 - arch culvert 1.2m ø
- ditching LHS 1 km.
88-89 - 2 of 600mm ø culvets.
ditching LHS 1 km
89 km
5000
Fish Lake
0 1 2 3 4 5 SCALE - KILOMETRES 10
Pg 10 of 10

APPENDIX C

GOOGLE-EARTH “RECENT” PHOTOS SHOWING PROPOSED ACCESS ROAD ALIGNMENT

ALSO SHOWN ARE APPROXIMATE AERIAL PHOTOGRAPHIC COVERAGE

51.931,-123.145 (Stone) - Google Maps https://maps.google.com/maps?q=51.931,-123.145+(Stone)&t=h&z=14&hl=en&om=1&ie...

Google

To see all the details that are visible on the screen, use the "Print" link next to the map.

1 of 1 06/09/2012 12:38 PM

51.931,-123.145 (Stone) - Google Maps https://maps.google.com/maps?q=51.931,-123.145+(Stone)&t=h&z=14&hl=en&om=1&ie...

Google

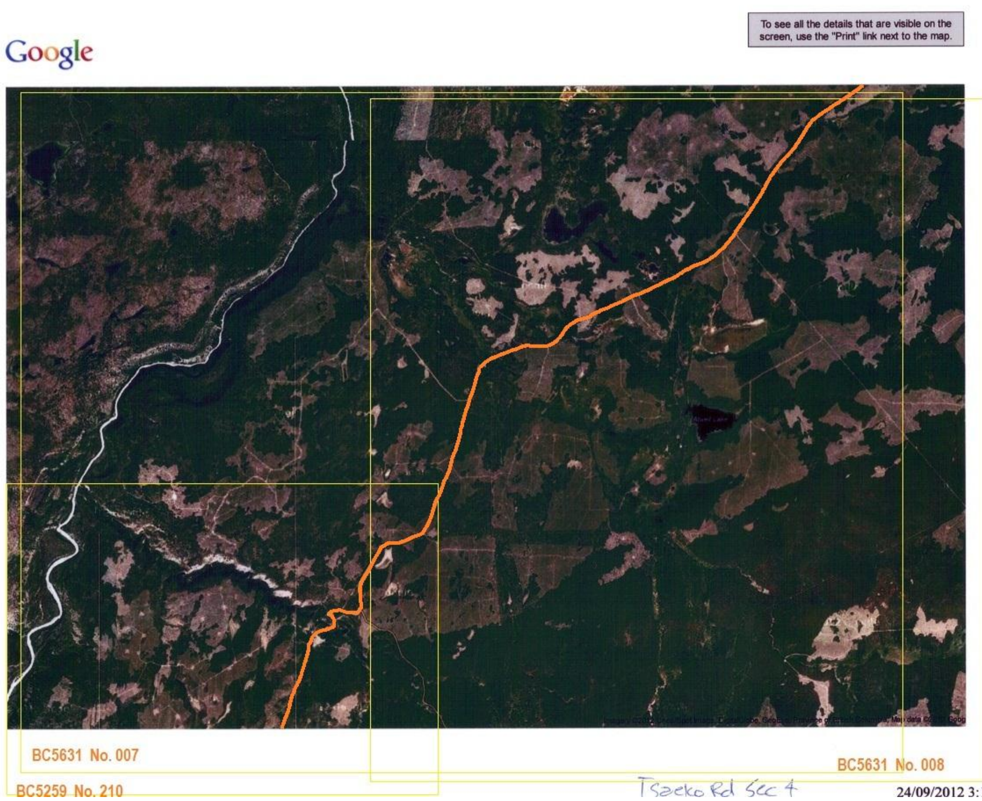
To see all the details that are visible on the screen, use the "Print" link next to the map.

1 of 1 06/09/2012 12:45 PM

51.931,-123.145 (Stone) - Google Maps https://maps.google.com/maps?q=51.931,-123.145+(Stone)&t=h&z=14&hl=en&om=1&ie..

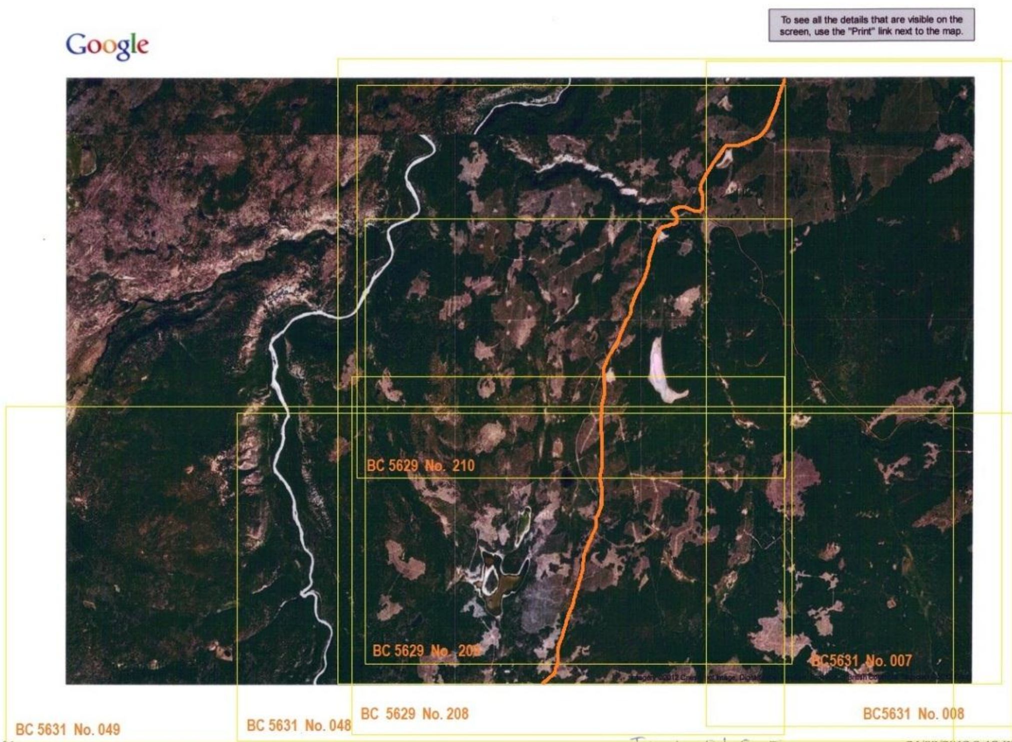
1 of 1 06/09/2012 12:51 PM

51.931,-123.145 (Stone) - Google Maps https://maps.google.com/maps?q=51.931,-123.145+(Stone)&t=h&z=14&hl=en&om=1&ie...



1 of 1 24/09/2012 3:10 PM

51.931,-123.145 (Stone) - Google Maps https://maps.google.com/maps?q=51.931,-123.145+(Stone)&t=h&z=14&hl=en&om=1&ie...



1 of 1 24/09/2012 3:17 PM

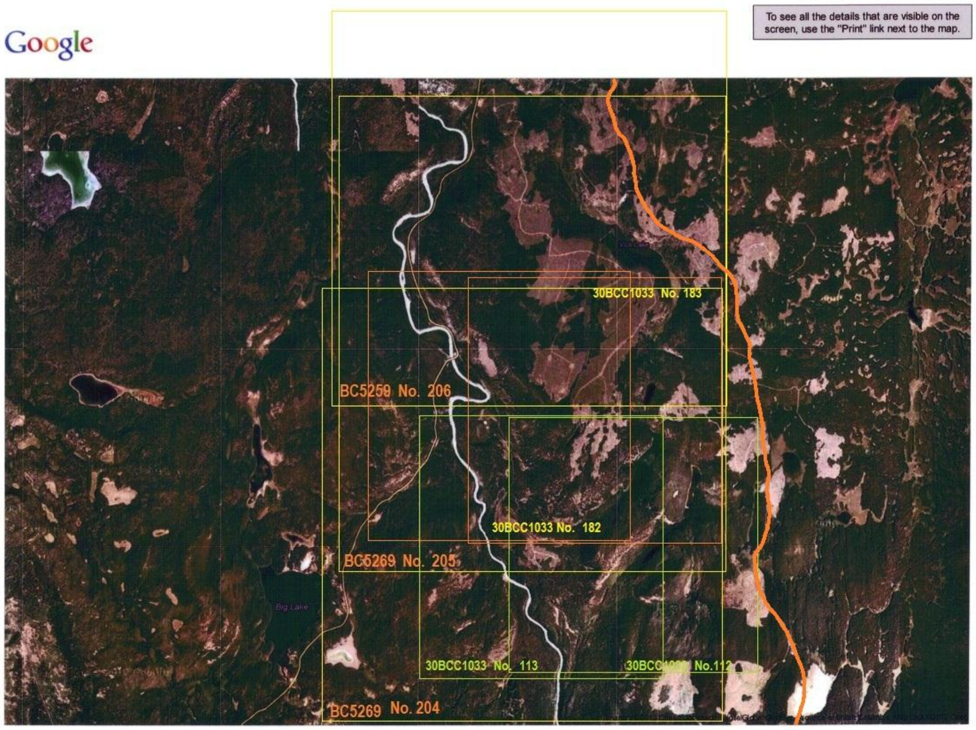
51.931,-123.145 (Stone) - Google Maps https://maps.google.com/maps?q=51.931,-123.145+(Stone)&t=h&z=14&hl=en&om=1&ie...

1 of 1 24/09/2012 3:26 PM

51.931,-123.145 (Stone) - Google Maps https://maps.google.com/maps?q=51.931,-123.145+(Stone)&t=h&z=14&hl=en&om=1&ie...

Google

To see all the details that are visible on the screen, use the "Print" link next to the map.



1 of 1 24/09/2012 3:33 PM

51.931,-123.145 (Stone) - Google Maps https://maps.google.com/maps?q=51.931,-123.145+(Stone)&t=h&z=14&hl=en&om=1&ie...

Google

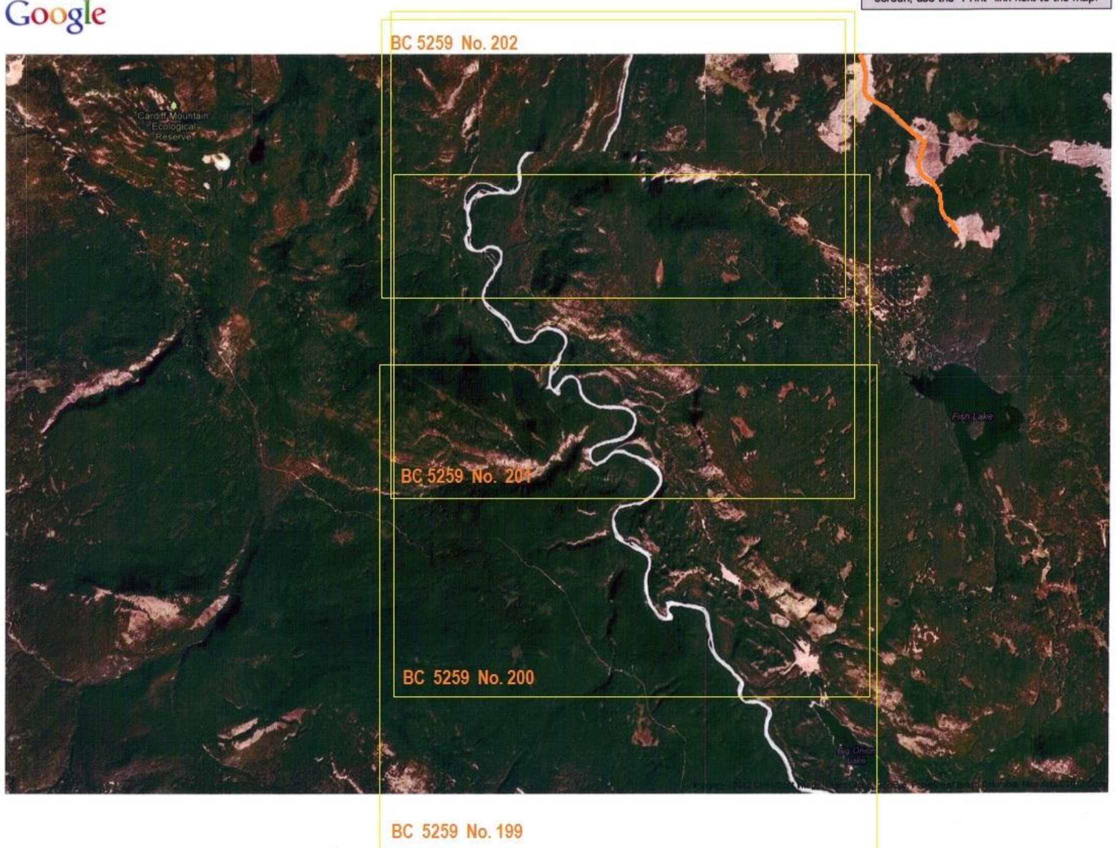
To see all the details that are visible on the screen, use the "Print" link next to the map.

1 of 1 24/09/2012 3:39 PM

51.931,-123.145 (Stone) - Google Maps https://maps.google.com/maps?q=51.931,-123.145+(Stone)&t=h&z=14&hl=en&om=1&ie..

Google

To see all the details that are visible on the screen, use the "Print" link next to the map.



1 of 1 24/09/2012 3:46 PM