EBA ENGINEERING
CONSULTANTS LTD.

CREATING AND DELIVERING BETTER SOLUTIONS

NICO MINE ACCESS ROUTE EVALUATION

EBA File No. 1700127.001
March 2005
(Revision 1)

EBA Engineering Consultants Ltd.
Creating and Delivering Better Solutions

NICO MINE ACCESS ROUTE EVALUATION (Revision 1)

Prepared by:

EBA ENGINEERING CONSULTANTS LTD.
YELLOWKNIFE, NORTHWEST TERRITORIES

Submitted To:

FORTUNE MINERALS LIMITED
LONDON, ONTARIO

Project No. 1700127.001

March 2005

P.O. Box 2244, #201, 4916 – 49 Street, Yellowknife, Northwest Territories X1A 2P7
Tel: (867) 920-2287 - Fax: (867) 873-3324 Internet: yellowknife@eba.ca - Web Site: http//www.eba.ca

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1.0 INTRODUCTION

1.1 General

This report describes a preliminary design for the proposed NICO mine access route. The objectives of this project were to identify different terrain units and potential borrow areas, check drainage conditions along the route, develop conceptual cross-sections for different terrains units, and provide preliminary cost estimates for road and cross drainage structures. It is understood that the proposed route will be a privately constructed gravel surfaced road, and is not intended to function as a public highway.

This project was completed in accordance with EBA Engineering Consultants Ltd.'s (EBA's) proposal, dated August 20, 2004. Authorization to proceed with this project was given by Mr. Robin Goad, President of Fortune Minerals Ltd., on August 26, 2004.

1.2 Project Details

EBA previously identified and evaluated two alternate routes (Route 1 and Route 2) to provide access to the proposed NICO mine site from the proposed Edzo to Gameti (Rae Lakes) all-weather road (EBA file: 1700127). The earlier evaluation was based on the interpretation of the aerial photography, satellite imagery, and topographic and geologic maps.

The NICO mine access routes identified in EBA's earlier route selection report started from the winter road to Wha Ti. It followed the north-south section of an existing trail (proposed Edzo to Gameti all-weather road) up to the points where either Route 1 or 2 branched off towards the east. The total length of the originally proposed NICO mine access route from the winter road to Wha Ti, and following either of the routes was approximately 53 km.

Route 1 followed an existing trail, from the proposed Edzo to Gameti all-weather road branch-off and headed northeast towards Hislop and Rabbit Lakes, beyond which it followed the ridge between Hislop and Rabbit Lake, crossed the Marian River, and finally ended at the NICO mine plant site. Route 1 was approximately 29 km long from the branch, and it crossed two minor streams and the Marian River. Three alternate locations for crossing the Marian River were also identified on Route 1. Route 2 branched off further south on the Rae Lakes Road, was approximately 36 km long and was routed on the south side of Rabbit Lake. Route 2 crossed a minor river, three minor streams and the Marian River.

A reconnaissance of the route and mine site was completed on July 10, 2004 by Mr. Ed Hoeve, P.Eng., and Mr. Eric Fier, P.Eng., of EBA in the company of Mr. Robin Goad of Fortune Minerals, and Mr. Gene Puritch, a mining consultant. A helicopter was used for this work and stops were made at various points along the route. Based on this reconnaissance, a road following the north-south section of the existing trail and Route 1 was identified as the preferred alternative to provide access to NICO mine, and was selected for further investigation. The branch-off point and alignment of Route 1 was adjusted at some places. The route was also straightened at many locations to reduce its overall length. The best location for the bridge on the Marian River was also chosen. The total length of the proposed NICO mine access road from the winter road to Wha Ti reduced to approximately 50 km as a result of this reconnaissance. The proposed route is shown on Figure 1.

1.3 Scope of Work

The scope of work for the phase of the work documented in this report included the following:

- Completing a site investigation, making observations on terrain types, natural drainage conditions, peat cover, and vegetation type;
- Investigating potential sources of construction materials;
- Developing conceptual embankment cross sections for different terrain types based on findings from the reconnaissance; and
- Developing preliminary cost estimates for road and bridge construction.

2.0 SITE INVESTIGATION

2.1 General

An investigation of the proposed route was made from July 17, 2004 to July 23, 2004 by Mr. Anwar Majid, E.I.T., of EBA. Edward Williah of Gameti, who was working with Fortune Minerals at that time, also participated as a helper in this investigation.

A visual inspection of the proposed route was conducted to classify terrain types. The subgrade along the route was evaluated by drilling hand probe holes at selected locations. Samples of the subgrade soils were collected for moisture content and soil classification testing. Five different terrain units (Figure 1) and seven potential borrow areas (Figure 2) were identified. In addition to a major crossing at the Marian River and a stream crossing,

six other locations were identified where cross drainage structures, such as culverts, would be required (Figure 2).

The subject area is in the zone of widespread discontinuous permafrost. Permafrost was identified at many places along the last six kilometres south of the NICO mine site, i.e. from the end of Borrow Area 7 to the plant site. The presence of permafrost could not be confirmed at other locations along the route, either because permafrost was not present or it was depressed and could not be confirmed with the shallow hand probe holes.

2.2 Terrain Types

The terrain has been classified into five different units along the route. This classification is based on the observations during investigation, a subsequent analysis of air photos, differences in the geology along the route, the relationship between permafrost and vegetation, as well as the local topography. The terrain units are presented in Table 1:

Table 1:
Terrain Units Along the Proposed Route

Terrain Units	Terrain Name	Permafrost Conditions	Interpreted Occurrence Along Centerline
1	Level or Undulating Terrain	Sporadic permafrost	50%
2	Level or Gently Undulating Terrain	Widespread permafrost	29%
3	Water Bodies	Permafrost or Nonpermafrost	6%
4	Undulating Sedimentary, Igneous, or Meta-Sedimentary Bedrocks	Sporadic Permafrost and Nonpermafrost	8%
5	Complex Terrain	Widespread Permafrost (overburden) and Nonpermafrost (bedrock)	8%

Figure 1 portrays the interpreted distribution of different terrain units. The majority of the route is classified as either Terrain Unit 1 or Terrain Unit 2.

Soil samples taken during the investigation indicate that the Terrain Unit 1 is underlain predominantly by coarse-grained soils consisting of different proportions of gravel, sand, and silt. Fine-grained soils (silt or clay) were also encountered at some locations. Cobbles and boulders were also observed on the surface at discrete locations. Permafrost was not observed in this terrain unit. Where present, the peat/moss is highly compressible, and its thickness is usually less than 200 mm. Terrain Unit 1 generally traverses well-drained areas and is characterized by moderate mixed deciduous (birch, aspen, poplar) and coniferous (spruce and pine) forests.

Terrain Unit 2 is underlain by soils similar to those in Unit 1. In general, the terrain is poorly drained with standing water and grasses at many places. This terrain unit is

characterized by highly compressible peat and is covered with predominantly stunted black spruce forest. The thickness of peat is usually greater than 200 mm. Permafrost could not be confirmed with hand probes; however, permafrost is expected to be present under most of this terrain unit.

It is interpreted that about 6 percent of the route crosses water bodies (Terrain Unit 3). Water bodies include rivers, streams, ponds, and stagnant water in hollows between peat hummocks in low-lying, marshy areas. Permafrost is usually absent under water bodies; however, it is likely present in the peat hummocks.

Approximately 8 percent of the route crosses terrain where outcropping bedrock is prevalent (Terrain Unit 4). This encompasses exposed/shallow undulating sedimentary, igneous, or meta-sedimentary bedrock. Sedimentary bedrock typically consists of dolomite and sandstone. Igneous and meta-sedimentary bedrocks, which form isolated ridges separated by valleys and depressions, are present near the NICO site. This terrain unit is vegetated with sparse pine, spruce, birch, and aspen forest. Valleys and depressions are characterized by thick peat cover (usually greater than 200 mm) and stunted black spruce forest as the proposed route approaches the NICO site. Permafrost is absent within most of the shallow or exposed bedrock; however, it was present in local depressions between the outcropping bedrock, and was confirmed at many places with the hand probe holes.

A complex terrain unit (Terrain Unit 5) is introduced to reflect the reality that terrain at some locations is highly variable. Complex terrain represents a combination of bedrock and overburden, hence also permafrost and nonpermafrost, over short distances. Approximately 8 percent of the route is expected to be in complex terrain as shown on Figure 1. Permafrost was observed in local depressions with peat cover usually greater than 200 mm. Standing water was also frequently observed in depressions. Permafrost is absent along shallow or exposed bedrock outcrops. In general, this terrain unit is vegetated with stunted black spruce in depressions, and sparse pine, birch, and aspen trees along the exposed or shallow bedrock.

2.3 Potential Borrow Areas

Seven potential sources of granular materials were identified along the route during the investigation. The lateral boundaries of the borrow areas were interpreted based on features on aerial photographs and Landsat images. The material in the borrow areas is generally granular with varying proportions of gravel, sand, and silt, and is expected to be suitable for use as general embankment fill. Boulders and cobbles are scattered on surface at many places. With detailed investigation, it may become possible to delineate varying gradations and sort materials for different applications, i.e. concrete aggregate, and road surfacing

materials. The location and interpreted boundaries of potential borrow areas are shown on Figure 2.

Bedrock outcrops were observed along the alignment within Borrow Area 3. Mixtures of boulders, cobbles, and frost-shattered rock were noted within Borrow Area 7. The rock from these borrow areas could be quarried and processed to produce good quality construction materials, if required.

It is expected that there will be ample material in these borrow areas. The surface area of all the borrow areas is approximately $17x10^6$ m^2. Assuming a minimum thickness of 1 m, it is estimated that there is at least $17x10^6$ m^3 material that can be borrowed from these areas. Estimated material requirements are less than 10 percent of this amount.

Soil samples were taken from all the potential borrow areas using hand tools, at the locations shown on Figure 2. The samples were collected from depths of up to 1 metre. The soils were tested in EBA's Yellowknife laboratory for the purpose of soil classification. Laboratory tests included the determination of natural moisture contents, and grain size analysis. Laboratory test results are presented in Appendix B. The test results indicate the presence of granular material in the potential borrow areas.

Approximate locations, surface area, and soil types in the potential borrow areas are summarized in Table 2.

Table 2:
Potential Borrow Ares – Location and Soil Types

Borrow Area	Station (km)		Approximate Surface Area (m^2)	Soil Type
	From	To		
1	3.44	5.14	$1.0x10^6$	Gravel – silty, sandy Gravel – some sand, some silt Sand – gravely, silty
2	13.35	15.91	$4.3 x10^6$	Gravel – silty, sandy
3	18.94	21.09	$5.2 x10^6$	Gravel – silty, sandy Gravel – silty, some sand Silt – gravely, sandy Silt – clayey, trace sand
4	24.86	26.80	$1.4 x10^6$	Sand – silty Gravel – some sand, some silt
5	27.90	29.28	$0.5 x10^6$	Sand – some silt, trace gravel Sand and Silt – trace gravel
6	33.91	38.25	$2.0 x10^6$	Sand – silty, some gravel Sand – some silt, some gravel
7	38.94	43.71	$2.9 x10^6$	Sand and Silt – trace gravel, trace clay Gravel and Sand – trace silt

2.4 Cross-Drainage Structures

A river crossing, a stream crossing, and six other locations along the route were identified where some sort of cross drainage structure i.e. bridge/culvert are expected to be necessary, as shown on Figure 2. The suggested structure type for each of these crossings is presented in Table 3 and the two main crossings are further discussed below:

3 m Stream (km 4.6): The width of stream where it crosses the winter road route is approximately 3 m. The native soil in the vicinity of this stream is primarily granular with varying proportions of gravel, sand, and silt. A box culvert or a multiplate culvert could be considered at this location.

Marian River Crossing (km 47.4): The Marian River is the major water crossing along the route, where a bridge will be required. The river valley at the proposed location is narrow and is approximately 15 m wide. Competent bedrock is exposed on both sides of the proposed river crossing, which will provide solid foundation for bridge abutments/piers. A single span steel girder bridge with concrete abutments is envisioned at this location. Alternatively low profile arch with headwalls could also be considered.

At all other locations, where either small streams or seepage was encountered, 800 mm diameter CSP culverts are envisioned to carry the discharge across the alignment.

Table 3:
Proposed Crossed Drainage Structures

Station (km)	Structure Type	Remarks
1.6	CSP Culvert	Stream
4.6	Box Culvert, or Multiplate Culvert	3 m Stream
6.9	CSP Culvert	Seepage
12.0	CSP Culvert	Seepage
22.6	CSP Culvert	Seepage
31.3	CSP Culvert	Seepage
47.4	Single Span Bridge or Low Profile Arch	Marian River Crossing
47.9	CSP Culvert	Seepage

In general, there will be a requirement to provide drainage culverts at regular intervals along the road, to drain the surface runoff. No standards were found for privately constructed gravel roads. Therefore, it is assumed that one culvert per km will be provided in addition to the culverts required at specific locations. Zones of selected, coarse, free-draining embankment fill could be considered as an alternative to culverts at locations where a defined drainage path does not exist.

3.0 ROAD CONSTRUCTION CONCEPTS

Several factors affect the surface performance of gravel roads. Some of these factors are axle loads, cover aggregate characteristics, surface/subsurface drainage, freeze/thaw, and subgrade properties. Detailed design of the proposed route is not the purpose of this project; therefore, experience, judgement, and some assumptions have been used to develop the embankment cross-sections that are expected to be suitable for different terrain units.

It is understood that the proposed route will be a gravel road, and is intended to provide access to NICO mine site only. The proposed route will not function as a highway. Therefore, low traffic volumes are anticipated. Moreover, due to constantly changing conditions of gravel roads, it is assumed that the traffic speeds will be low.

The proposed route traverses terrain that is variable in terms of highly compressible peat, subgrade and drainage conditions, and permafrost characteristics. Thaw-related settlement of the subgrade are expected, hence maintenance will be required. Some seasonal frost action can also be expected, although our evaluation suggests that it will not be a significant issue on this road.

Three embankment cross-sections are envisioned for the various terrain units. Figure 3 illustrates the recommended configurations for the embankments on relatively undisturbed overburden and bedrock. These sections are based on the concept of all fill and no cut. Thickness of fill over subgrade and side-slopes are related to the thickness of peat cover, presence or absence of permafrost, and drainage conditions.

A typical road-top width of 6 m is assumed. This is comparable to the all-weather road at the Wha Ti end of the proposed route, the existing winter trail, and other low traffic volume gravel roads in the vicinity of Yellowknife. The only exception is for the road section north of the Marian River crossing, where a top-width of 8 m is assumed. A wider road is suggested because the road alignment in this section is winding, thereby reducing site distances. Side-slopes should not be steeper than 2 Horizontal: 1 Vertical (2H:1V).

Figure 3(a) illustrates the recommended configuration for areas of no permafrost, good drainage conditions, and thin peat cover. A minimum thickness of 300 mm of granular fill or other suitable material is recommended if peat thickness is less than 200 mm, and 500 mm over areas of greater peat thickness. The steepest side-slope for this section is 2H:1V, although flatter side-slopes are generally preferred. This is comparable to the cross-section that was observed on the existing all-weather road at the Wha Ti end of the proposed route.

A thicker embankment section is recommended in areas where standing water or small ponds and thick peat cover or grasses are encountered. Figure 3(b) illustrates, the embankment configuration for both permafrost or nonpermafrost conditions in such areas. A minimum embankment thickness of 1 m is recommended if there is no permafrost. A minimum embankment thickness of 1.5 m is recommended where permafrost is believed to be present. This will allow for some settlement as permafrost degrades following road construction. Note that this embankment thickness is not intended to maintain permafrost. A maximum side-slope of 4H:1V is recommended.

The recommended cross-section for the road over rock is shown on Figure 3(c). A minimum gravel thickness of 300 mm, and side-slope of 2H:1V is recommended.

Selective use of geotextile is recommended to enhance the roadway performance over soft, natural foundation soil. By separating the fill from the foundation soil, the risk of localized failure of fill, initiated either by a pocket of thicker organic soil or thaw of ice-rich permafrost, will be reduced. The embankment will be better able to maintain its capability to support the road surface and differential settlements will be reduced. The use of a geotextile separator should also reduce the quantity of fill required. The relative merits of geotextile versus additional embankment fill will need to be evaluated on a site specific basis at the time of design. For the purpose of this evaluation, EBA has assumed that all of Terrain Units 2 and 3 will be underlain by geotextile.

4.0 COST ESTIMATES

A summary of cost estimates for the components of the project are presented in the following sections. This is considered to be a "Class C" cost estimate, which we consider to be within a range of ±15%. Therefore, a contingency of 15% is shown with the cost estimates. A summary of cost estimates for NICO mine access is presented in the following Table 4:

Table 4:
Summary of Cost Estimate for Road Construction

Road Segment	Construction Costs		Engineering	Contingency (15%)	Totals
	Road	Structures			
km 0.00 – km 18.94	$3,173,980	$289,700	$360,898	$573,706	$4,398,284
km 18.94 – km 50.52	$5,414,812	$661,200	$640,681	$1,007,543	$7,724,236
Totals	$8,588,792	$950,900	$1,001,579	$1,581,249	$12,122,520

The basis for this estimate is described in the following sections.

4.1 Road

A summary of quantities related to road construction is presented in Tables C-1 to C-11, Appendix C. It is assumed that the all-weather road to the NICO mine site will have a top width of 6 m south of the Marian River and 8 m north of it. Sideslopes of 2H:1V for Terrain Units 1 and 4, and 4H:1V for all other terrain units is also assumed.

The costs for a number of relevant projects in the area were compiled. These previous data have been considered for costing of this project. In addition, approximate unit costs were obtained from RTL Robinson Enterprises Ltd., (RTL). Their assistance with this project is gratefully acknowledged. Suppliers of road construction related products such as Nilex Armtec and Atlantic Industries Ltd. (AIL) were also contacted. Unit costs obtained from different sources (contractor, suppliers, previous projects) were then adjusted using judgement and experience, to suit this project. The estimated construction costs for the north-south and east-west segment of the access road are presented in Tables 5 and 6, respectively.

Table 5:
Cost Estimate for Road Construction - North-South Segment (km 0.00 to km 18.94)

Item		Description	Unit	Qty	Unit Cost ($)			Total Cost ($)
					Min	Max	Assumed	
1.	(a)	Clear right-of-way along the existing winter road	m^2	235,172	0.5	0.5	0.50	117,600
2.	(a)	Excavate common borrow material for embankment construction	m^3	147,736	6.8	7.6	3	443,200
	(b)	Produce and stockpile 50 mm minus crush for subbase	m^3	27,123	13	13	13	352,600
	(c)	Produce and Stockpile 20 mm minus crush for pavement surface	m^3	11,913	9	28	15	178,700
3.	(a)	Load and haul – fill materials	m^3-km	915,580	0.1*	1*	1	915,580
4.	(a)	Place, and compact common borrow material for embankment construction	m^3	147,736	4	4	4	590,900
	(b)	Place, and compact crush materials	m^3	39,036	3.5**	10**	3.5	136,600
5.	(a)	Supply and place geotextile separator	m^2	144,252	3	3	3	432,800
	(b)	Supply and install traffic signs	units	20	215	300	300	6,000
					Subtotal			3,173,980
					Engineering (10%)			317,398
					Contingency (15%)			523,706
					Total			4,015,084

*includes only haulage not loading ** also includes loading

Table 6:
Cost Estimate for Road Construction – East-West Segment (km 18.94 to km 50.52)

Item		Description	Unit	Qty	Unit Cost ($)			Total Cost ($)
					Min	Max	Assumed	
1.	(a)	Clear right-of-way along the existing winter road	m^2	122,016	0.50	0.50	0.50	61,000
	(b)	Clear right-of-way along the new alignment	m^2	279,964	0.75	0.75	0.75	210,000
2.	(a)	Excavate common borrow material for embankment construction	m^3	265,196	6.8	7.6	3	795,600
	(b)	Produce and stockpile 50 mm minus crush for subbase	m^3	46,271	13	13	13	601,500
	(c)	Produce and Stockpile 20 mm minus crush for pavement surface	m^3	20,464	9	28	15	307,000
3.	(a)	Load and haul – fill materials	m^3-km	1,665,420	0.1*	1*	1	1,665,420
4.	(a)	Place, and compact common borrow material for embankment construction	m^3	265,196	4	4	4	1,060,800
	(b)	Place, and compact crush material	m^3	66,735	3.5**	10**	3.5	233,600
5.	(a)	Supply and place geotextile separator	m^2	156,964	3	3	3	470,892
	(b)	Supply and install traffic signs	units	30	215	300	300	9,000
					Subtotal			5,414,812
					Engineering (10%)			541,481
					Contingency (15%)			893,443
					Total			6,849,736

*includes only haulage not loading ** also includes loading

The indicated costs assume winter construction. RTL have recommended this approach.

The cost estimate is based on the different embankment sections shown in Figure 3. The cost of road construction can be reduced by exercising different embankment options, for example, either eliminating or reducing the thickness of the pavement/surface structure. However, this could expectedly increase the maintenance requirements. The construction cost for four different options was calculated and is presented in Table 7.

Table 7:
Cost Comparison for Different Pavement Options

Option	Description	Cost (Million $)
1	Embankment as shown in Figure 3	10.86
2	Pavement Structure = 100 mm of 20mm crush + 100 mm of 50 mm crush	9.66
3	Pavement Structure = 100 mm of 20 mm crush only, no 50 mm crush	8.45
4	Only embankment fill, no pavement surface	7.26

The construction costs of the road for different road-top width and embankment sections shown in Figure 3 are presented in Table 8.

Table 8:
Cost Comparison for Different Road Top-Widths

Option	Description	Cost (Million $)
1	Road top-width, as shown in Figure 3	10.86
2	Road top width = 6 m	10.77
3	Road top width = 7 m	12.56
4	Road top-width = 8 m	14.36

4.2 Bridges and Culverts

The costs for bridges are based on a number of relevant sources such as Department of Transportation (DOT) estimates for similar bridges on winter roads from Wrigley to Fort Good Hope in the Mackenzie Valley, Atlantic Industries Ltd. (AIL), and Armetec. DOT bridges in the Mackenzie Valley have a clear width of 4268 mm; these costs were adjusted for a 6000 mm clear width. The costs from all the sources were also considered and adjusted using judgment and experience. The estimated construction costs for bridges and culverts in north-south and east-west segments are presented in Table 9 and 10.

Table 9:
Cost Estimates for Structures – North-South Segment (km 0.00 to km 18.94)

Description	Unit	Qty	Unit Cost			Total Cost ($)
			Min	Max	Assumed	
Box or Multiplate Culvert - 3-m Stream	m	5	4,000	21,000	14,000	70,000
Supply and install 800 mm diameter CSP culverts (estimate – 54 culverts required)	m	338	--	--	650	219,700
				Subtotal		289,700
				Engineering (15%)		43,500
				Contingency (15%)		50,000
				Total		383,200

Table 10:
Cost Estimates for Structures – East-West Segment (km 18.94 to km 50.52)

Description	Unit	Qty	Unit Cost			Total Cost ($)
			Min	Max	Assumed	
Marian River Bridge or Low Profile Arch	m	15	13,300	27,600	22,500	337,500
Supply and install 800 mm diameter CSP culverts (estimate – 54 culverts required)	m	498	--	--	650	323,700
				Subtotal		661,200
				Engineering (15%)		99,200
				Contingency (15%)		114,100
				Total		874,500

5.0 CLOSURE

This report has been prepared for the exclusive use of the Fortune Minerals Ltd., and their agents, for specific application to the project described in Section 1 of this report. It has been prepared in accordance with generally accepted soil and foundation engineering practices. No warranty is made, either express or implied.

Reference should be made to the General Conditions attached in Appendix D of this report for further limitations.

We trust that this report satisfies your present requirements. Please contact the undersigned if you have questions or comments.

Respectfully submitted,

EBA ENGINEERING CONSULTANTS LTD.

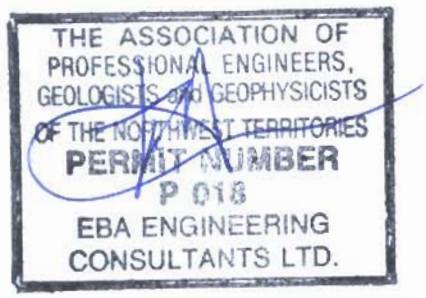
Prepared by:

A. Majid, P.Eng.
Geotechnical Engineer
(Direct Line: (867) 766-3728 ext. 107)
(email:amajid@eba.ca)

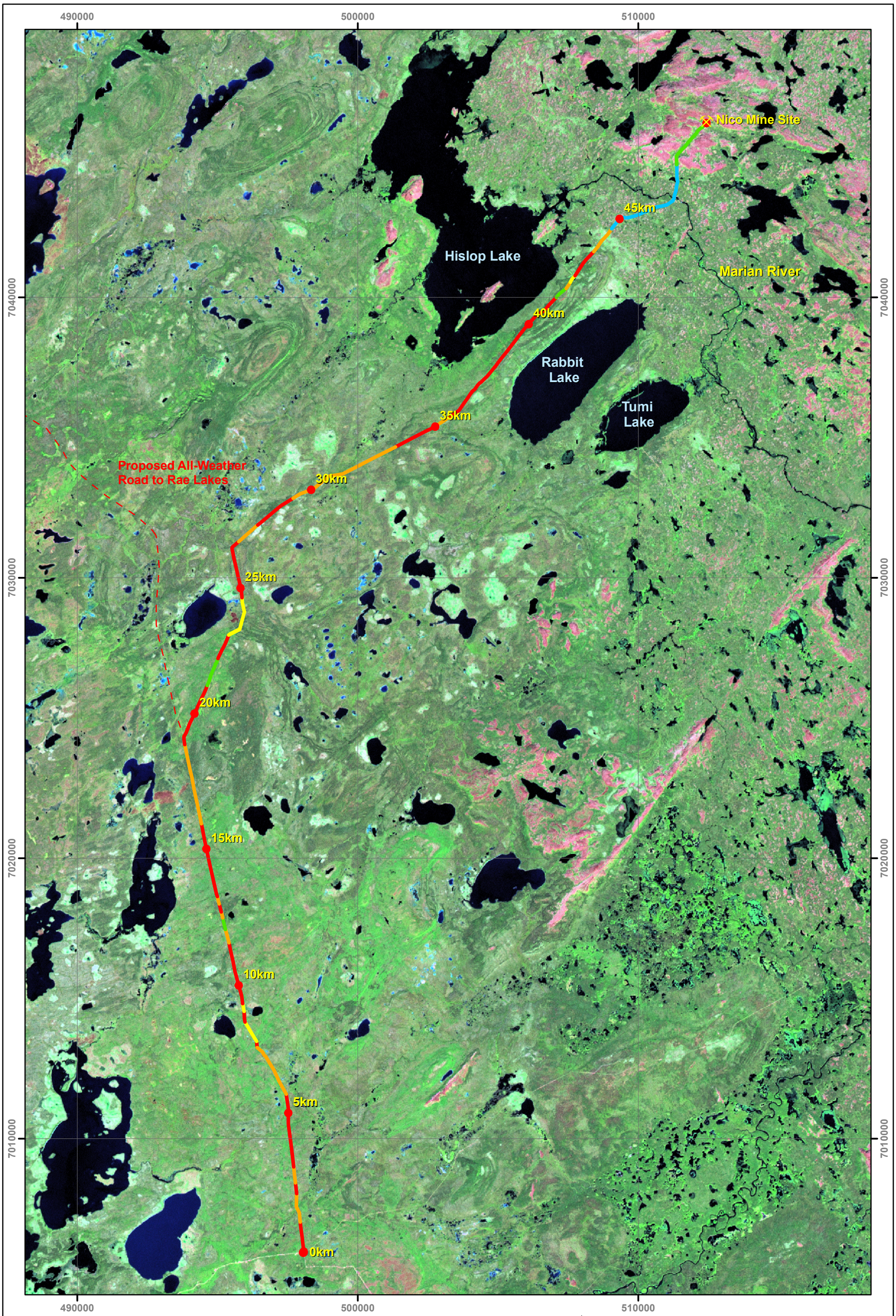
Reviewed by:

T.E. Hoeve, P.Eng.
Principal Consultant, NT/NU
(Direct Line: (867) 766-3728 ext. 114)
(email: ehoeve@eba.ca)

K.W. Jones, P.Eng.
Project Director, Circumpolar Regions
(Direct Line: (780) 451-2130 ext. 271)
(email: kjones@eba.ca)



FIGURES



Legend

Terrain Units

- Terrain Unit 1 - Level or Undulating Terrain: coarse grained deposits; well drained; usually no permafrost
- Terrain Unit 2 - Level or Gently Undulating Terrain: fine grained deposits; poorly drained;peat cover; usually permafrost
- Terrain Unit 3 - Water Bodies: rivers, streams, ponds, marshy areas, stagnant water; usually no permafrost
- Terrain Unit 4 - Undulating Shallow or Exposed Bedrock: sedimentary/igneous; usually no permafrost
- Terrain Unit 5 - Complex Terrain: combination of overburden and bedrock; usually permafrost in overburden

Nico Mine
Terrain Types Along Proposed Access Route

1:125,000

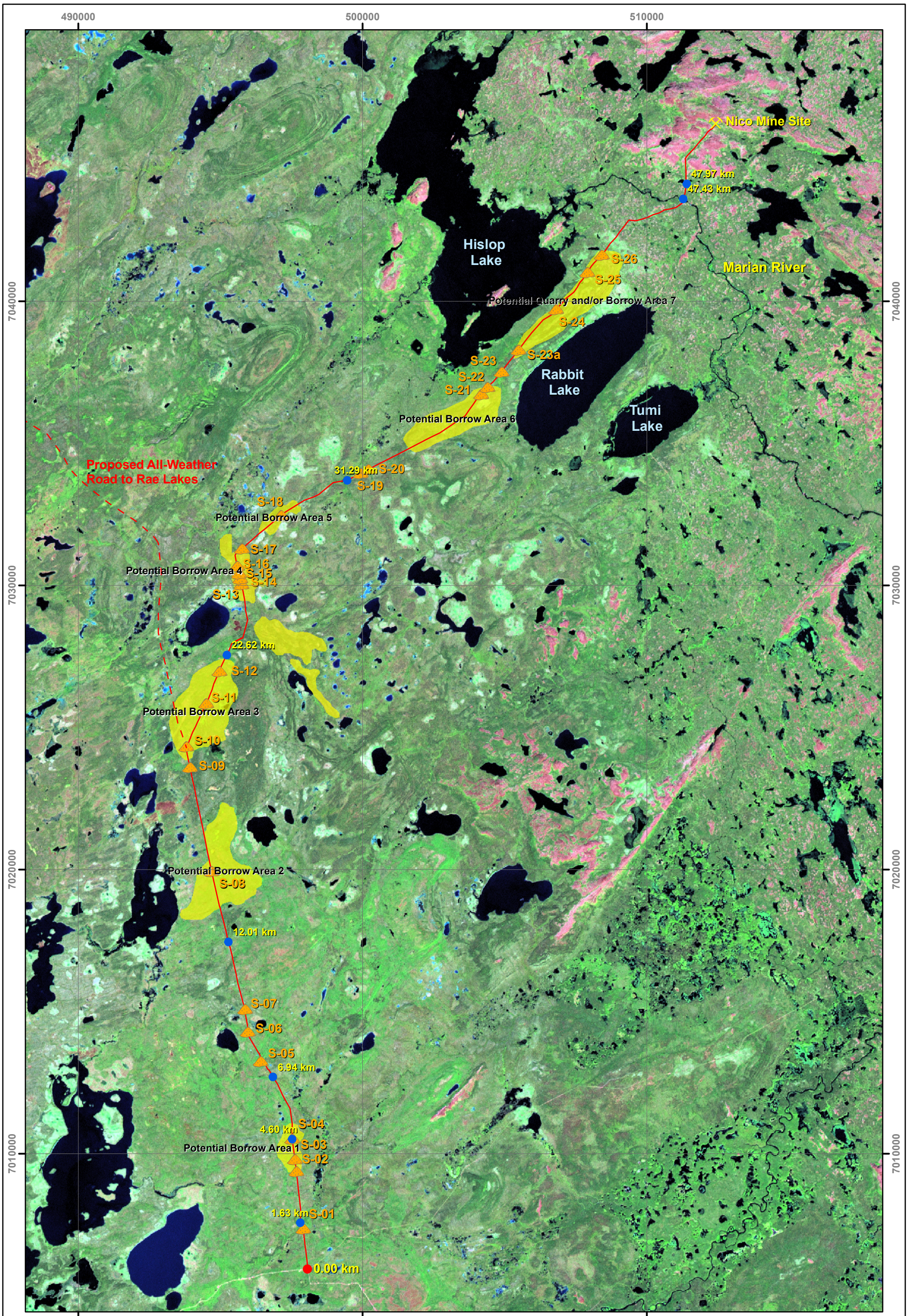
0 0.5 1 2 3 4 5 6 7 Kilometers

N W E S

November, 2004

EBA ENGINEERING CONSULTANTS LTD.

Figure 1



Legend

- Proposed Road Route
- Soil Sample Locations
- Drainage Structure
- Potential Borrow Area

Nico Mine
Location of Potential Borrow Areas and Proposed Drainage Structures

1:125,000

0 0.5 1 2 3 4 5 6 Kilometers

N W E S

January, 2005

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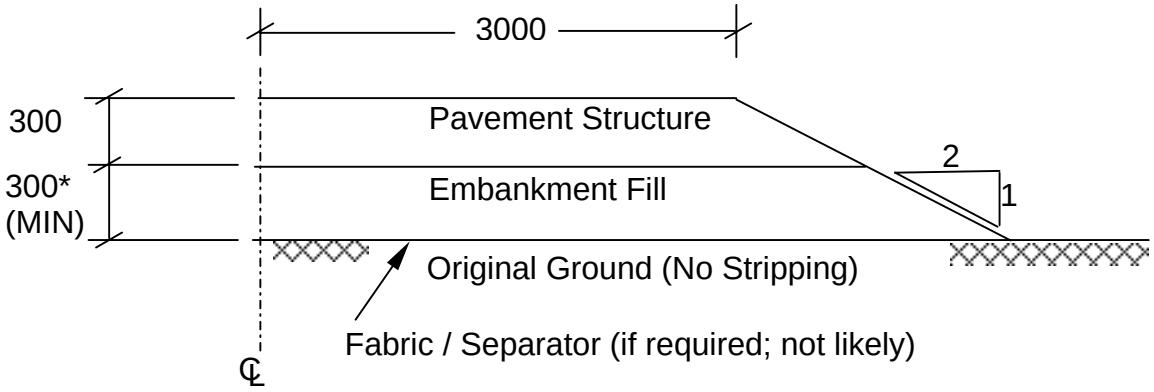
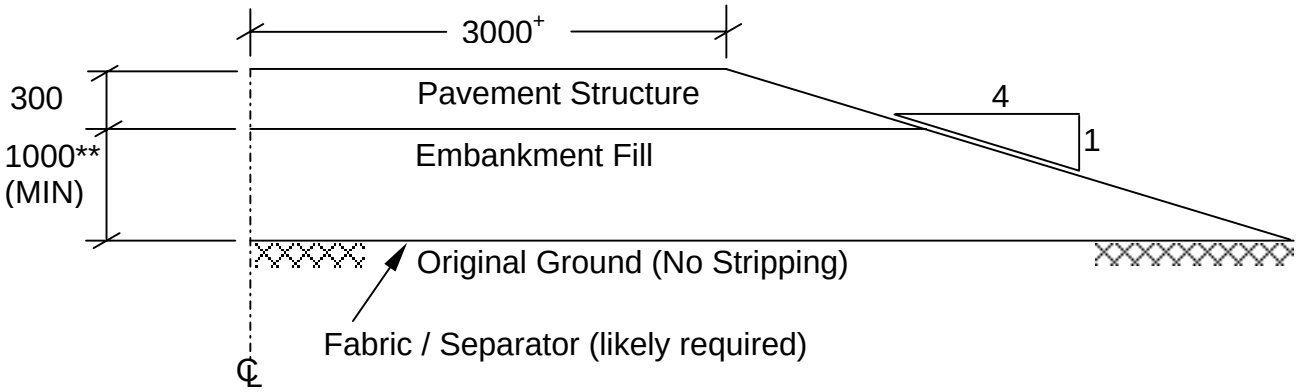
Figure 2

TERRAIN UNIT 1



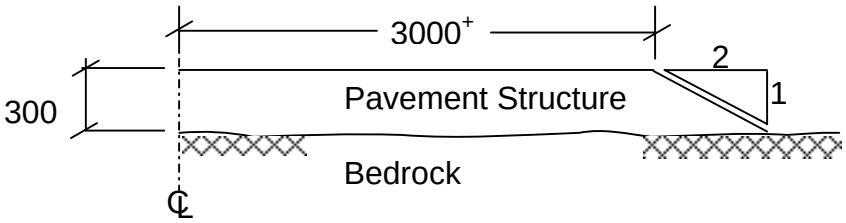
* 300, if peat thickness is from 0 - 200; and 500, if peat thickness is > 200

TERRAIN UNIT 2, 3, & 5



** 1000, if no permafrost; otherwise 1500

TERRAIN UNIT 4



+ 3000, if south of Marian River; otherwise 4000

All dimensions in millimetres
Figure not to scale

Figure 3
Conceptual Cross Section for Different Terrain Units

APPENDIX A

SELECTED PHOTOGRAPHS

Start of the north-south section of route, Distance = 0 km.
Looking north towards existing trail

Start of the north-south section of route, Distance = 0 km.
Looking approximately west along existing all-weather road segment to Wha Ti

Poorly drained area – Looking towards north, existing trail
Distance = 1.06 km.

Stream of water – Existing trail, north-south section. Water flowing from west to east. Distance 1.63 km

Well-drained area – Looking towards south, existing trail near 3 m stream. Distance = 4.60 km.

3 m Stream – Existing trail, north-south section. Distance 4.60 km

Poorly drained area – Looking towards west, existing trail; Seepage from west to east; culvert may be required; Distance = 6.94 km.

Poorly drained area – Looking east, existing trail; Distance = 6.94 km.

Poorly drained area – Existing trail, north-south section; Distance 8.00 km

Poorly drained area – Existing trail, north south section
Small ponds in the vicinity - Distance 8.00 km

Intersection of the north-south section of trail and east-west section of the proposed new route. Looking approximately south along the existing trail. Distance = 19.08 km

Intersection of the north-south section of trail and east-west section of the proposed new route. Looking approximately towards north-east along the east-west section of the proposed new route. Distance = 19.08 km

Exposed bedrock along proposed new route – Distance = 22.13 km

Proposed new route, east-west section – Distance = 22.93 km

Small ponds, proposed new route, north-south section – Distance = 24.42 km

Small ponds, proposed new route north-south section – Distance = 24.50 km

Intersection – East-west section of existing trail and proposed new route
Poor drainage; Distance = 35.33 km

Intersection – East-west section of existing trail and proposed new route
Poor drainage, looking west; Distance = 35.33 km

Well-drained area, birch trees – Proposed new route; Distance = 38.05 km

Intersection – Rabbit Lake to Hislop Lake winter road portage and proposed new route, looking east; Distance = 38.94 km

Exposed frost shattered rock – Proposed new route, looking south
Distance = 41.72 km

Poor Drainage, Standing Water – Proposed new route, looking northeast
Distance = 42.61 km

Marian River Crossing – Looking south from north Side of river
Distance = 47.38 km

Marian River Crossing – Looking north-east towards NICO plant site
Distance = 48.57 km

NICO mine site; Distance = 50.52 km.

NICO mine site; Distance = 50.52 km.

NICO mine site – Checking subsurface soils and permafrost

NICO mine site – Soil sampling

APPENDIX B

LABORATORY TEST RESULTS

Table B-1
NICO Mine Access Route
Laboratory Test Result Summary

Sample	Location			Visual Classification	Unified Soil Classification				AASHTO Soil Classification				
	Station	Coordinates			Gravel	Sand	Silt/Clay	Group	Percent Passing			Group	Subgrade Rating
	(km)	(mE)	(mN)		(%)	(%)	(%)		No. 10	No. 40	No. 200		
S-01	1.39	497907	7007355	Gravel - sandy, some silt, poorly graded, brown, moist, nonplastic, low organic content	65	25	10	GP-GM	28	15	10	A-1-a	excellent
S-02	3.44	497665	7009372	Gravel - sandy, silty, poorly graded, grey, moist, grass roots	42	28	30	GM	51	39	30	A-2-4	good
S-03	3.86	497612	7009794	Gravel - some silt, some sand, poorly graded, light brown to grey, damp grass roots	74	11	15	GM	21	19	15	A-1-a	excellent
S-04	4.60	497524	7010523	Sand - gravelly, silty, brown, damp to moist	28	52	20	SM	53	25	20	A-1-b	excellent
S-05	7.64	496413	7013253	Sand and Gravel - trace silt, poorly graded, brown, damp to moist, nonplastic, high organic content	39	52	9	SP-SM	59	43	9	A-1-b	excellent
S-06	8.79	495956	7014285	Gravel - sandy, trace silt, poorly graded, dark brown, damp, nonplastic, high organic content	66	28	6	GP-GM	22	8	6	A-1-a	excellent
S-07	9.60	495857	7015085	Gravel - sandy, silty, poorly graded, dark brown, moist, nonplastic, low organic content	48	32	20	GM	39	26	20	A-1-a	excellent
S-08	14.60	494687	7019943	Gravel - silty, sandy, light brown to grey, wet, nonplastic	40	26	34	GM	54	45	34	A-2-4	good
S-09	18.33	493925	7023602	Silt and Sand, trace gravel, brown, wet, nonplastic, low organics	6	39	55	ML	89	74	55	A-4/A-5	fair
S-10	19.08	493790	7024335	Gravel - sandy, sitly, brown, damp, nonplastic	47	33	20	GM	39	29	20	A-1-b	excellent
S-11	20.74	494490	7025843	Gravel - silty, some sand, dark brown, moist, nonplastic	66	13	21	GM	33	30	20	A-1-b	excellent
S-12	21.97	494956	7026977	Silt - gravelly, sandy, brown, wet, nonplastic, high organics	29	27	44	GM	67	59	44	A-4/A-5	fair
S-13	25.40	495733	7030034	Sand - silty, some gravel, light brown, damp, nonplastic	16	64	20	SM	81	64	20	A-2-4	good
S-14	25.61	495685	7030240	Silt - clayey, trace sand, brownish grey, moist to wet, medium plastic	0	7	66/27	CL	99	98	93	A-6	poor
S-15	25.79	495645	7030412	Sand - silty, brown, very wet, nonplastic	0	70	30	SM	99	80	30	A-2-4	good
S-16	26.06	495584	7030675	Gravel - some sand, some silt, brown, wet, nonplastic, grass roots	73	14	13	GM	23	20	13	A-1-a	excellent
S-17	26.80	495748	7031299	Sand - gravelly, some silt, yellow, damp	32	56	12	SW-SM	62	28	12	A-1-b	excellent
S-18	28.60	497124	7032468	Sand - some silt, trace gravel, yellowish grey, damp	6	82	12	SW-SM	84	38	12	A-1-b	excellent
S-19	31.83	499934	7033953	Silt - some sand, some clay, poorly graded, dark brown, very wet, non-low plastic	0	11	89	ML	100	97	87	A-5	fair
S-20	32.12	500198	7034087	Gravel - sandy, some silt, poorly graded, brown, moist to wet, low organics	55	32	13	GM	39	29	13	A-1-a	excellent
S-21	37.17	504162	7036728	Sand and Silt - trace gravel, brown to grey, wet, low plastic	6	56	38	SM	83	54	38	A-4/A-5	fair
S-22	37.51	504386	7036976	Sand - silty, some gravel, trace clay, poorly graded, grey, wet	12	56	32	SM	71	41	32	A-2-4	good
S-23	38.25	504888	7037515	Gravel - silty, sandy, poorly graded, light grey, damp	38	28	34	GM	54	43	34	A-2-4	good
S-23a	39.23	505481	7038291	Sand - some silt, some gravel, poorly graded, brown, wet, nonplastic	10	75	15	SM	86	50	15	A-1-b	excellent
S-24	41.19	506802	7039716	Sand and Silt - trace gravel, trace clay, light brown, wet, low plastic, low organics	3	50	47	SM	93	66	47	A-5	fair
S-25	42.90	507898	7041016	Gravel and Sand - trace silt, poorly graded, grey, damp, mostly flat gravel	50	43	7	GP-GM	28	12	7.4	A-1-a	excellent
S-26	43.71	508411	7041636	Gravel and Sand - trace silt, poorly graded, light brown to grey, damp, mostly flat gravel	60	38	2	GP	15	4	2	A-1-a	excellent

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

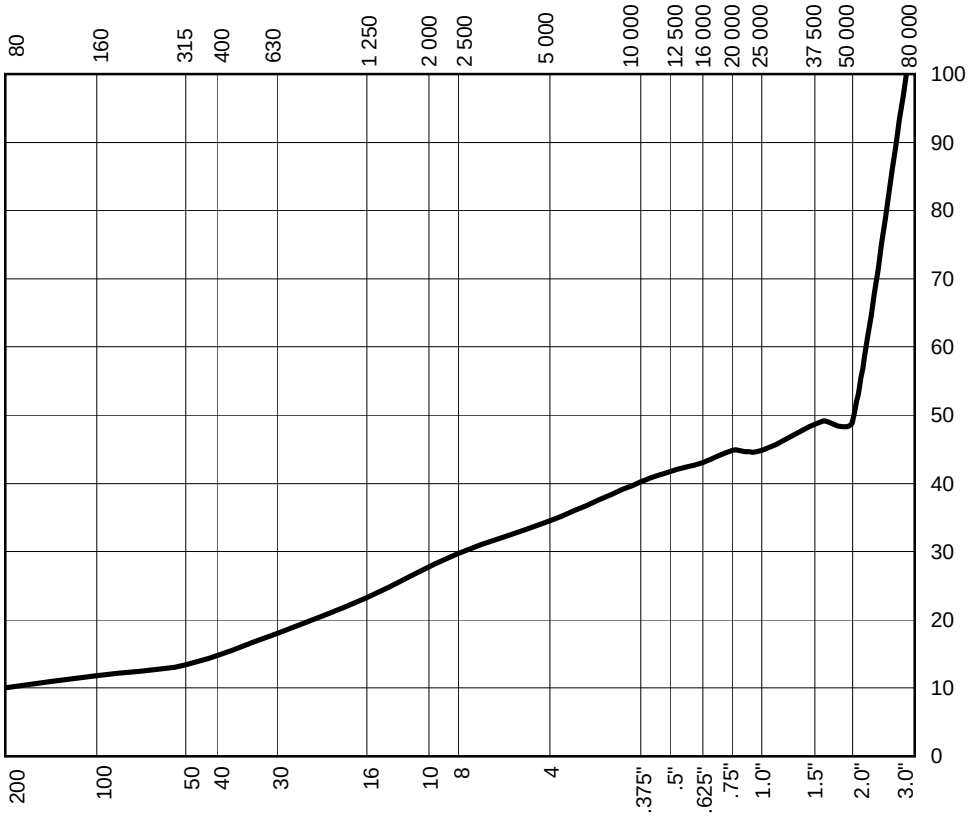
Project Number: 1700127- 001
Date Tested: January 13-14, 2005
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771-16
Sample Description: Sandy GRAVEL, some silt
Station: 1.39 km
Sample Number: S-1
Natural Moisture Content: 4.7%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Apparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	100
2"	50 000	49
1.5"	37 500	49
1"	25 000	45
.75"	20 000	45
.625"	16 000	43
.5"	12 500	42
.375"	10 000	40
No. 4	5 000	35
No. 8	2 500	30
16	1250	23
30	630	18
50	315	13
100	160	12
200	80	10.1

Metric Sieve Size (C.G.S.B. Spec. 8-GP-2M)



U.S. Standard Sieve Size - approximate (A.S.T.M. Des. E 11)

Remarks: Classification according to ASTM D3282: A-1-b

Reviewed By: _____ P.Eng.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

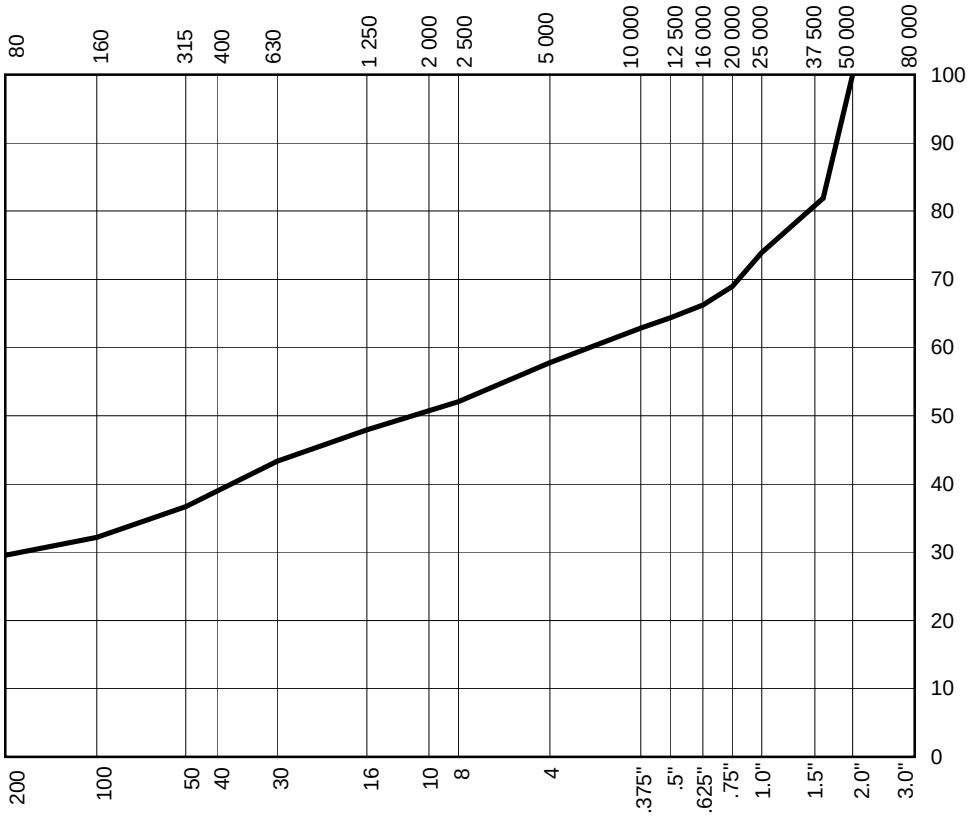
Project Number: 1700127- 001
Date Tested: September 21, 2004
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771 - 1
Sample Description: Silty, sandy GRAVEL
Station: 3.4 km
Sample Number: S-02
Natural Moisture Content: 7.3%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Aparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	
2"	50 000	100
1.5"	37 500	82
1"	25 000	74
.75"	20 000	69
.625"	16 000	66
.5"	12 500	64
.375"	10 000	63
No. 4	5 000	58
No. 8	2 500	52
16	1250	48
30	630	43
50	315	37
100	160	32
200	80	29.6

Metric Sieve Size (C.G.S.B. Spec. 8-GP-2M)



U.S. Standard Sieve Size - approximate (A.S.T.M. Des. E 11)

Remarks:

Reviewed By: P.Eng.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

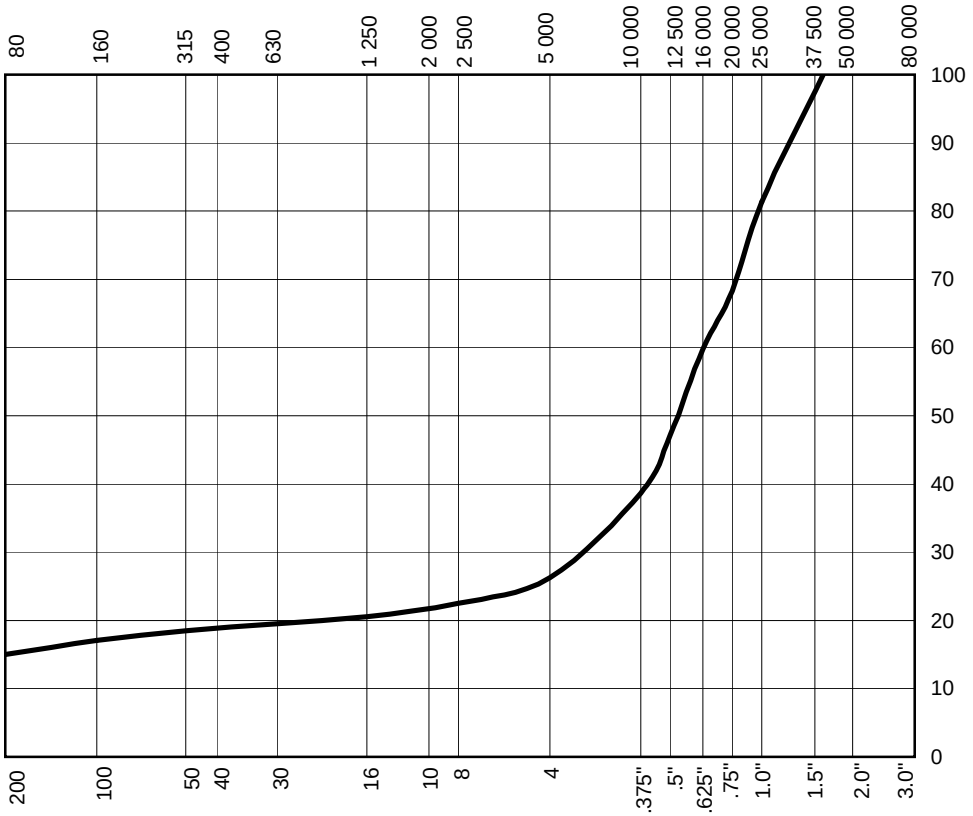
Project Number: 1700127- 001
Date Tested: September 21, 2004
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771 - 2
Sample Description: GRAVEL, some silt, some sand
Station: 3.9 km
Sample Number: S-03
Natural Moisture Content: 7.0%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Aparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	
2"	50 000	
1.5"	37 500	100
1"	25 000	81
.75"	20 000	68
.625"	16 000	60
.5"	12 500	47
.375"	10 000	39
No. 4	5 000	26
No. 8	2 500	22
16	1250	21
30	630	19
50	315	18
100	160	17
200	80	15.0

Metric Sieve Size (C.G.S.B. Spec. 8-GP-2M)



U.S. Standard Sieve Size - approximate (A.S.T.M. Des. E 11)

Remarks:

Reviewed By: P.Eng.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

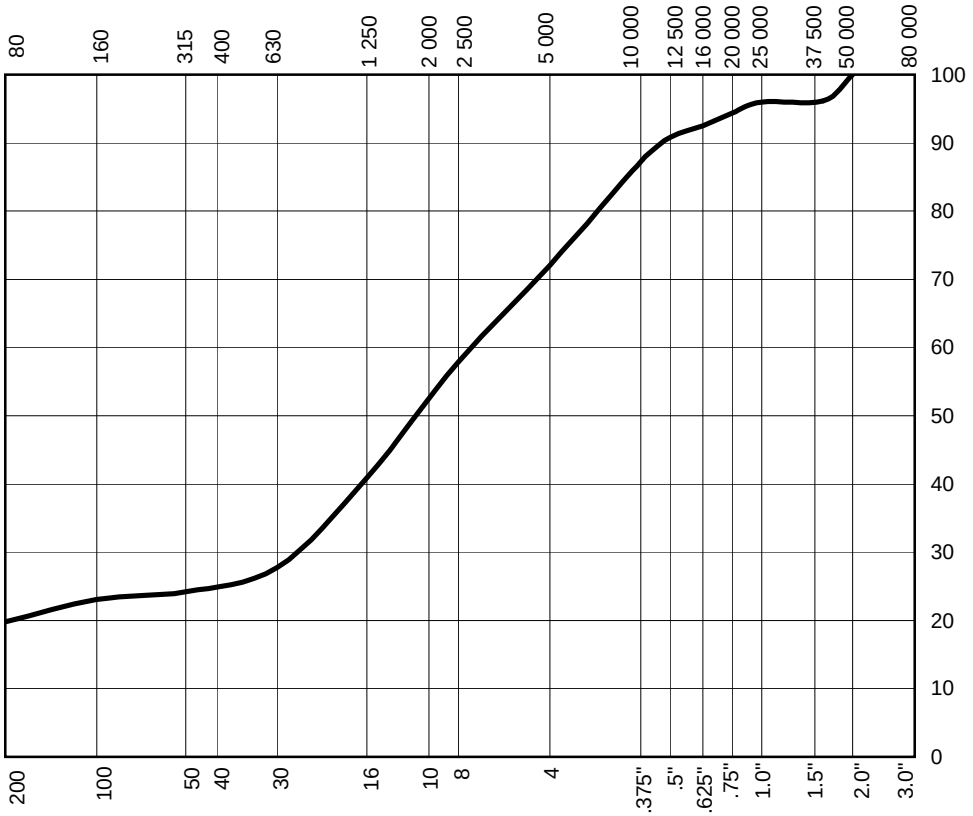
Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

Project Number: 1700127- 001
Date Tested: September 21, 2004
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771 - 3
Sample Description: Gravelly, silty SAND
Station: 4.6 km
Sample Number: S-04
Natural Moisture Content: 6.3%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Aparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	
2"	50 000	100
1.5"	37 500	96
1"	25 000	96
.75"	20 000	94
.625"	16 000	92
.5"	12 500	91
.375"	10 000	87
No. 4	5 000	72
No. 8	2 500	58
16	1250	41
30	630	28
50	315	24
100	160	23
200	80	19.8



Remarks:

Reviewed By: P.Eng.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

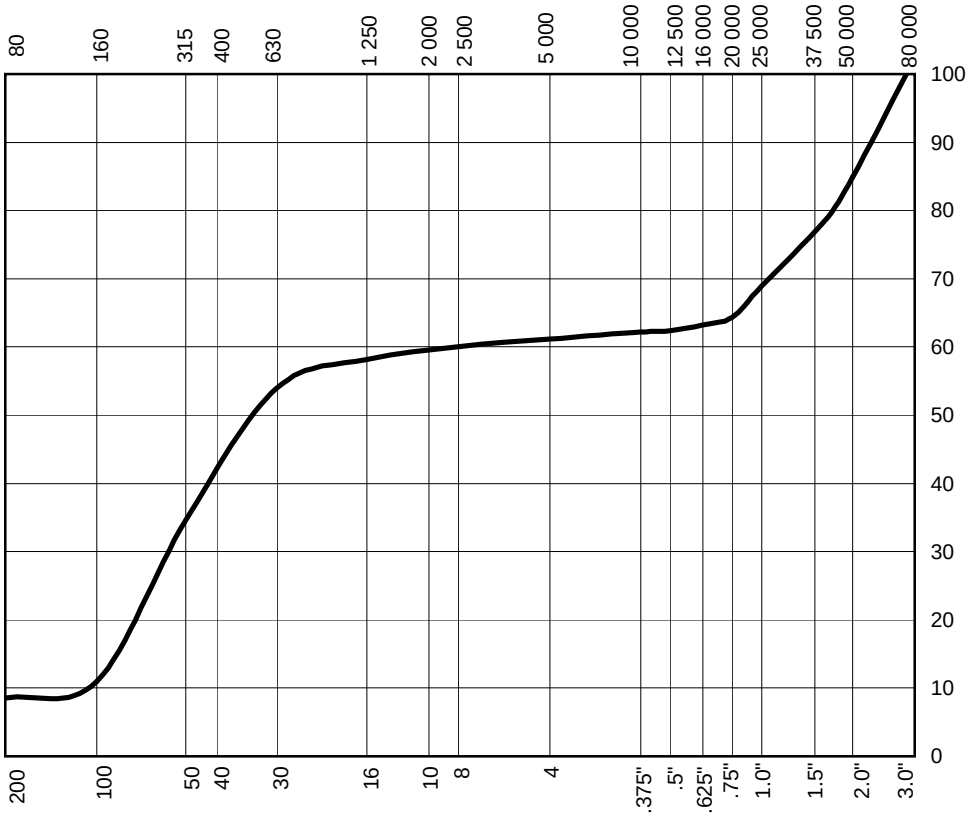
Project Number: 1700127- 001
Date Tested: January 13-14, 2005
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771-17
Sample Description: SAND and GRAVEL, trace silt.
Station: 7.65 km
Sample Number: S-05
Natural Moisture Content: 4.5%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Apparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	100
2"	50 000	85
1.5"	37 500	78
1"	25 000	69
.75"	20 000	64
.625"	16 000	63
.5"	12 500	62
.375"	10 000	62
No. 4	5 000	61
No. 8	2 500	60
16	1250	58
30	630	54
50	315	35
100	160	11
200	80	8.5

Metric Sieve Size (C.G.S.B. Spec. 8-GP-2M)



U.S. Standard Sieve Size - approximate (A.S.T.M. Des. E 11)

Remarks: High content of the organic material.
Classification according to ASTM D3282: A-1-b

Reviewed By: _____ P.Eng.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

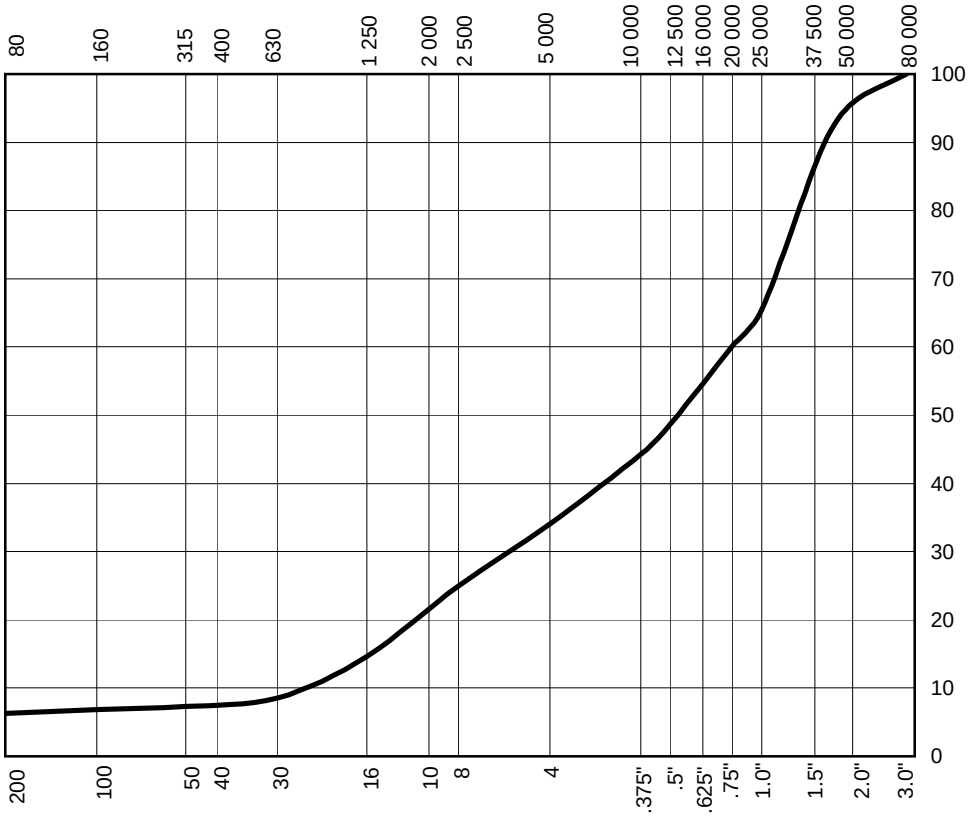
Project Number: 1700127- 001
Date Tested: January 13-14, 2005
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771-18
Sample Description: Sandy GRAVEL, trace silt.
Station: 8.79 km
Sample Number: S-06
Natural Moisture Content: 3.6%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Apparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	100
2"	50 000	96
1.5"	37 500	89
1"	25 000	65
.75"	20 000	60
.625"	16 000	55
.5"	12 500	49
.375"	10 000	44
No. 4	5 000	34
No. 8	2 500	25
16	1250	15
30	630	9
50	315	7
100	160	7
200	80	6.3

Metric Sieve Size (C.G.S.B. Spec. 8-GP-2M)



U.S. Standard Sieve Size - approximate (A.S.T.M. Des. E 11)

Remarks: High content of the organic material.
Classification according to ASTM D3282: A-1-b

Reviewed By: _____ P.Eng.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

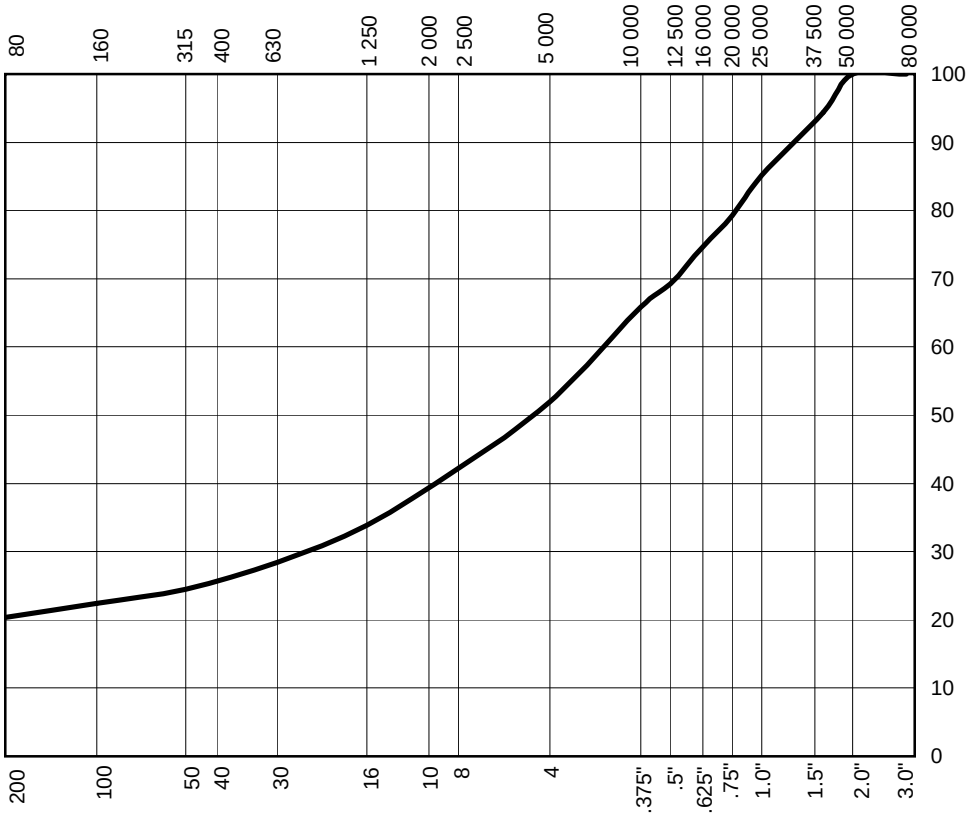
Project Number: 1700127- 001
Date Tested: January 13-14, 2005
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771-19
Sample Description: Sandy, silty GRAVEL.
Station: 9.60 km
Sample Number: S-07
Natural Moisture Content: 7.6%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Apparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	
2"	50 000	100
1.5"	37 500	94
1"	25 000	85
.75"	20 000	79
.625"	16 000	75
.5"	12 500	69
.375"	10 000	66
No. 4	5 000	52
No. 8	2 500	42
16	1250	34
30	630	28
50	315	24
100	160	22
200	80	20.3

Metric Sieve Size (C.G.S.B. Spec. 8-GP-2M)



U.S. Standard Sieve Size - approximate (A.S.T.M. Des. E 11)

Remarks: Classification according to ASTM D3282: A-2-4

Reviewed By: _____ P.Eng.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

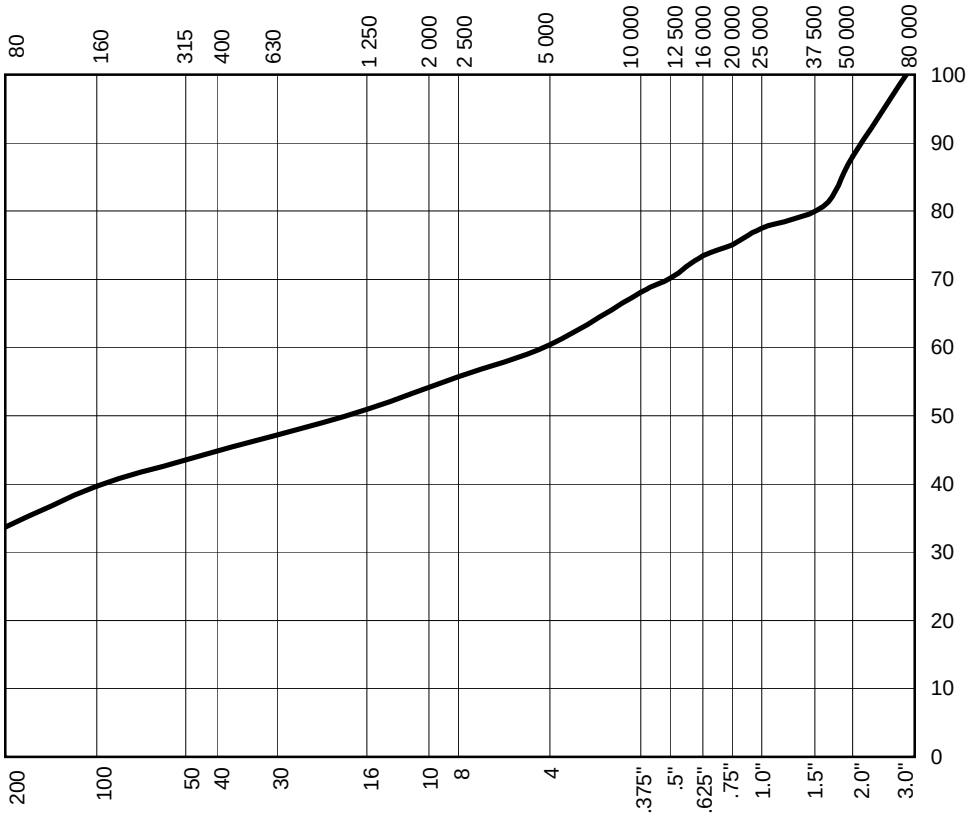
Project Number: 1700127- 001
Date Tested: September 21, 2004
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771 - 4
Sample Description: Silty, sandy GRAVEL
Station: 14.6 km
Sample Number: S-08
Natural Moisture Content: 6.6%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Aparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	100
2"	50 000	88
1.5"	37 500	81
1"	25 000	77
.75"	20 000	75
.625"	16 000	73
.5"	12 500	70
.375"	10 000	68
No. 4	5 000	60
No. 8	2 500	56
16	1250	51
30	630	47
50	315	44
100	160	40
200	80	33.7

Metric Sieve Size (C.G.S.B. Spec. 8-GP-2M)



U.S. Standard Sieve Size - approximate (A.S.T.M. Des. E 11)

Remarks:

Reviewed By: P.Eng.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

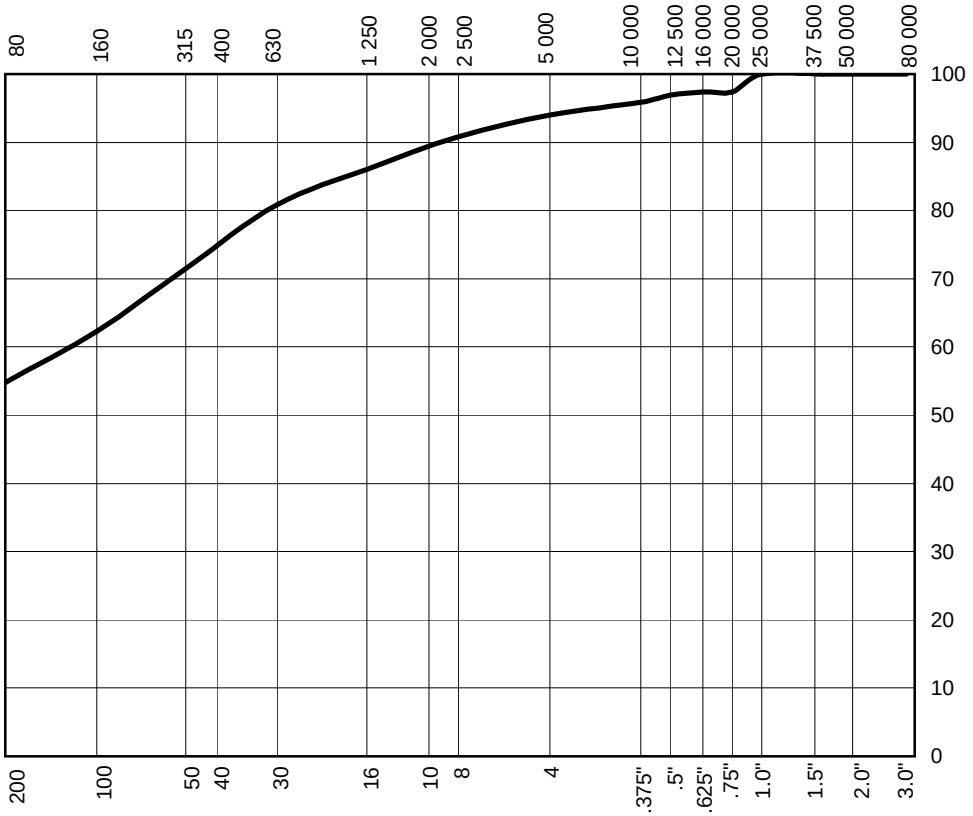
Project Number: 1700127- 001
Date Tested: January 13-14, 2005
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771-20
Sample Description: SILT and SAND, trace gravel.
Station: 18.33 km
Sample Number: S-09
Natural Moisture Content: 15.5%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Apparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	
2"	50 000	
1.5"	37 500	
1"	25 000	100
.75"	20 000	97
.625"	16 000	97
.5"	12 500	97
.375"	10 000	96
No. 4	5 000	94
No. 8	2 500	91
16	1250	86
30	630	81
50	315	71
100	160	62
200	80	54.8

Metric Sieve Size (C.G.S.B. Spec. 8-GP-2M)



U.S. Standard Sieve Size - approximate (A.S.T.M. Des. E 11)

Remarks: Classification according to ASTM D3282: A-4

Reviewed By: _____ P.Eng.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

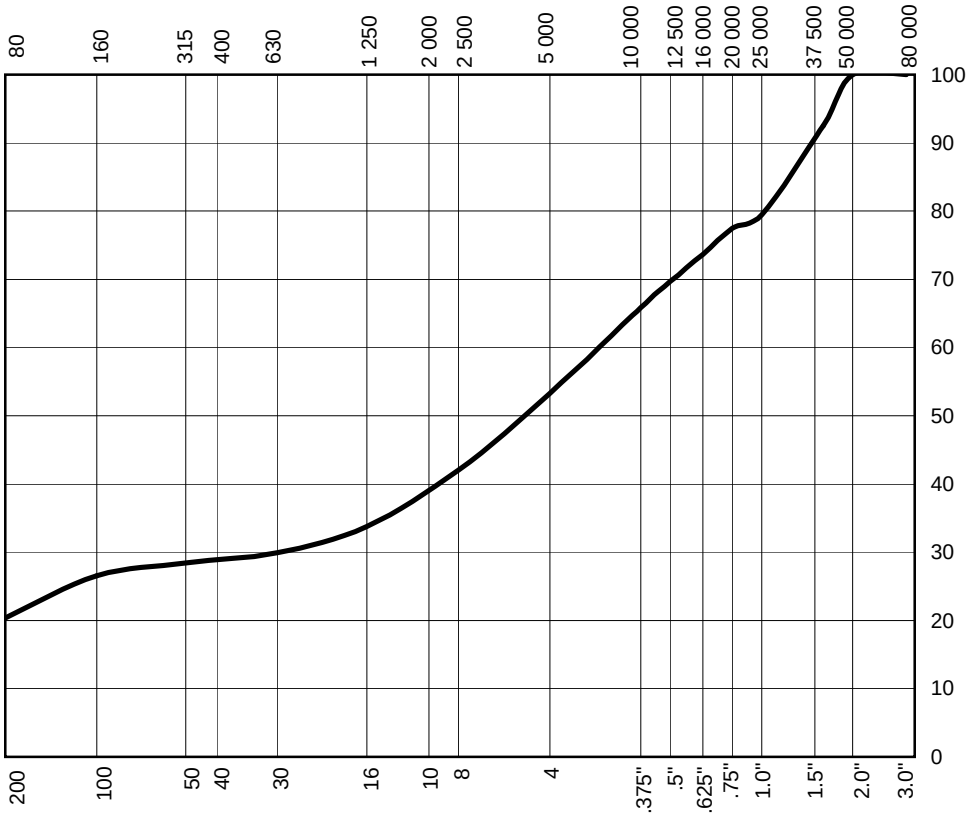
Project Number: 1700127- 001
Date Tested: September 21, 2004
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771 - 5
Sample Description: Sandy, silty GRAVEL
Station: 19.1 km
Sample Number: S-10
Natural Moisture Content: 3.5%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Aparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	
2"	50 000	100
1.5"	37 500	93
1"	25 000	79
.75"	20 000	78
.625"	16 000	74
.5"	12 500	70
.375"	10 000	66
No. 4	5 000	53
No. 8	2 500	42
16	1250	34
30	630	30
50	315	28
100	160	27
200	80	20.3

Metric Sieve Size (C.G.S.B. Spec. 8-GP-2M)



U.S. Standard Sieve Size - approximate (A.S.T.M. Des. E 11)

Remarks:

Reviewed By: P.Eng.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

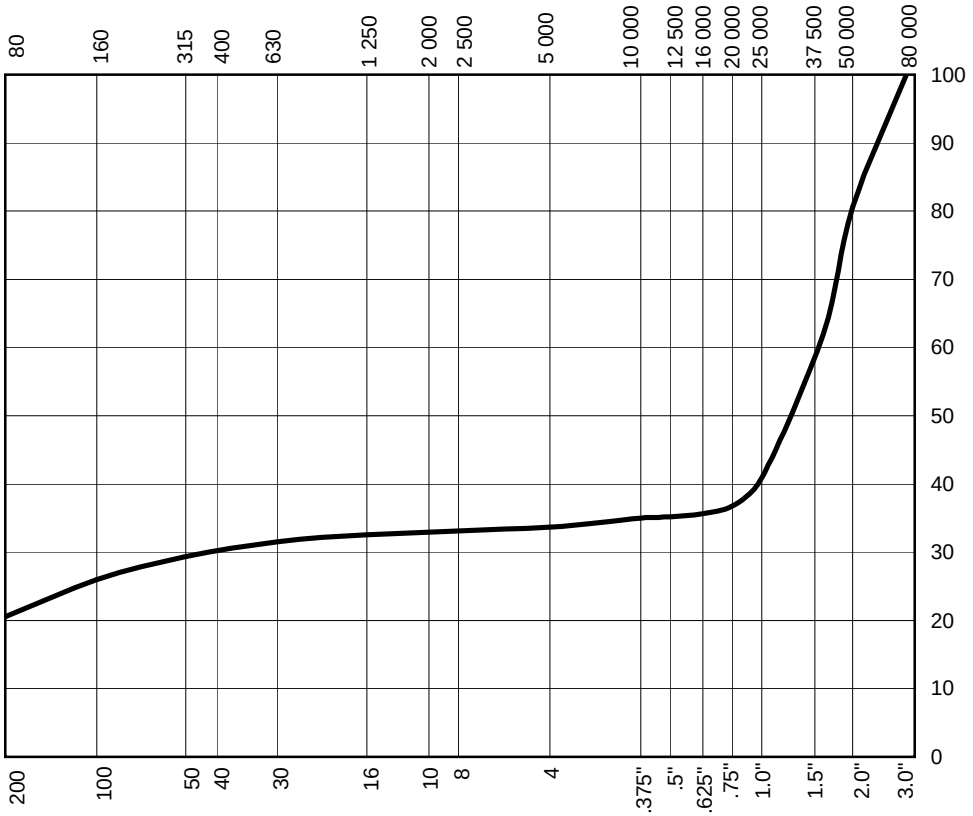
Project Number: 1700127- 001
Date Tested: September 21, 2004
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771 - 6
Sample Description: Silty GRAVEL, some sand
Station: 20.7 km
Sample Number: S-11
Natural Moisture Content: 7.3%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Aparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	100
2"	50 000	81
1.5"	37 500	62
1"	25 000	41
.75"	20 000	37
.625"	16 000	36
.5"	12 500	35
.375"	10 000	35
No. 4	5 000	34
No. 8	2 500	33
16	1250	33
30	630	32
50	315	29
100	160	26
200	80	20.5

Metric Sieve Size (C.G.S.B. Spec. 8-GP-2M)



U.S. Standard Sieve Size - approximate (A.S.T.M. Des. E 11)

Remarks:

Reviewed By: P.Eng.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

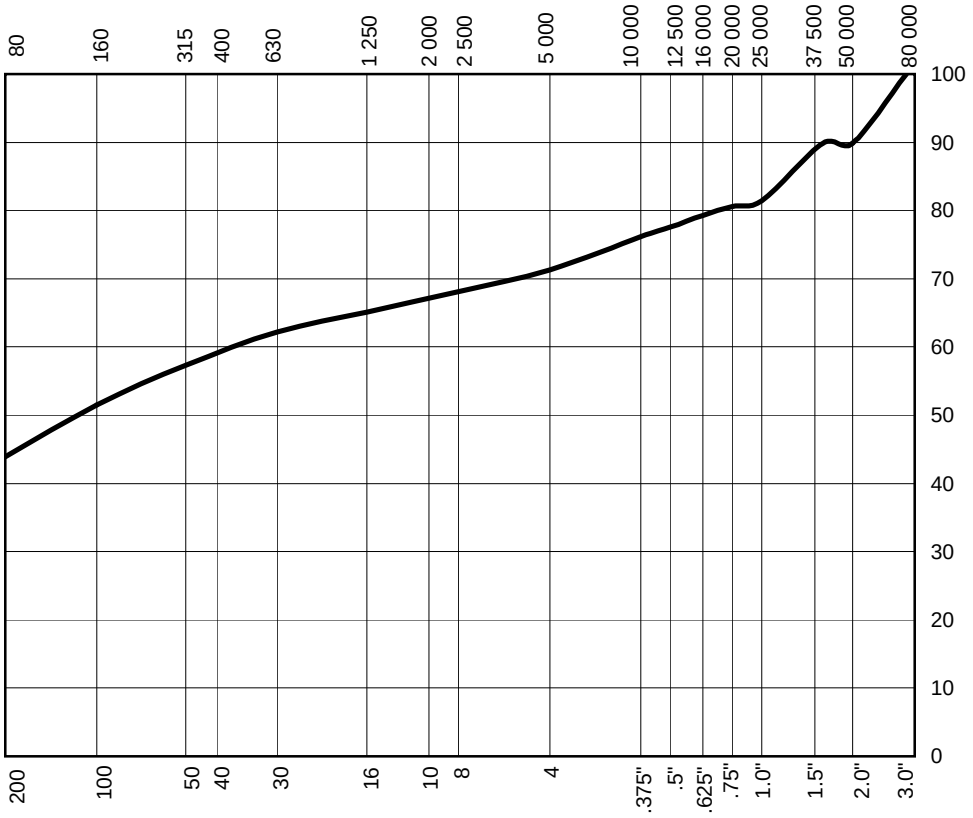
Project Number: 1700127- 001
Date Tested: January 13-14, 2005
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771-21
Sample Description: Gravelly, sandy SILT.
Station: 21.97 km
Sample Number: S-12
Natural Moisture Content: 16.1%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Apparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	100
2"	50 000	90
1.5"	37 500	90
1"	25 000	81
.75"	20 000	81
.625"	16 000	79
.5"	12 500	78
.375"	10 000	76
No. 4	5 000	71
No. 8	2 500	68
16	1250	65
30	630	62
50	315	57
100	160	52
200	80	43.9

Metric Sieve Size (C.G.S.B. Spec. 8-GP-2M)



U.S. Standard Sieve Size - approximate (A.S.T.M. Des. E 11)

Remarks: High content of the organic material.
Classification according to ASTM D3282: A-4

Reviewed By: _____ P.Eng.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

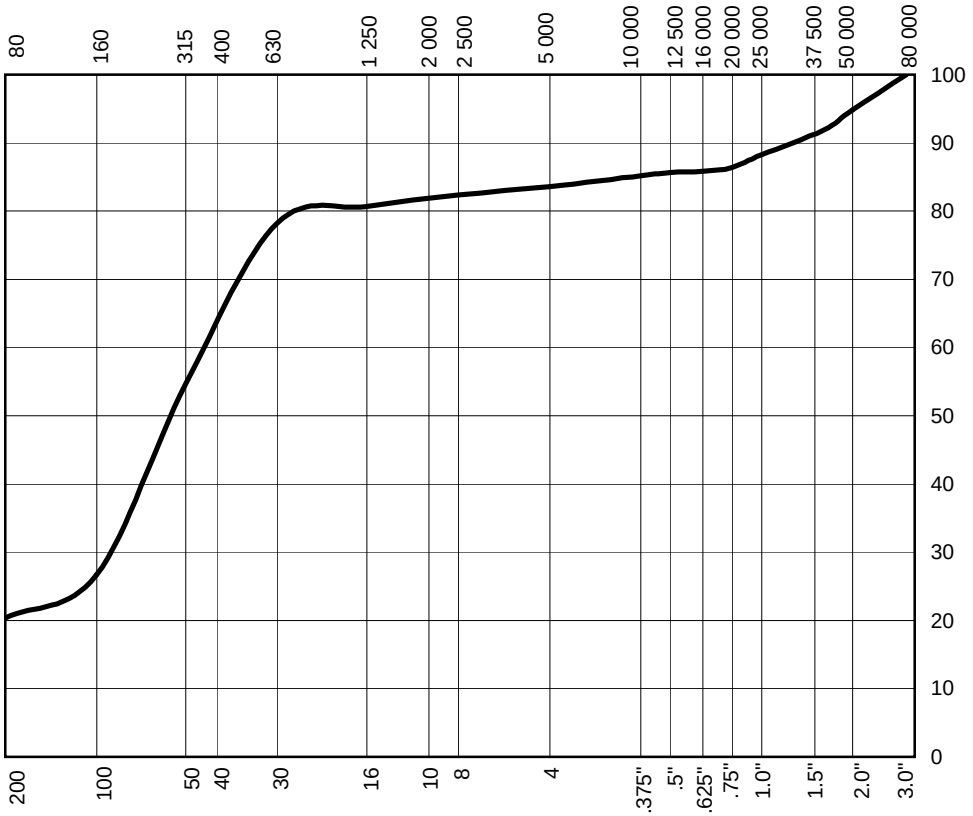
Project Number: 1700127- 001
Date Tested: September 21, 2004
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771 - 7
Sample Description: Silty SAND, some gravel
Station: 25.4 km
Sample Number: S-13
Natural Moisture Content: 5.1%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Aparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	100
2"	50 000	95
1.5"	37 500	92
1"	25 000	88
.75"	20 000	86
.625"	16 000	86
.5"	12 500	86
.375"	10 000	85
No. 4	5 000	84
No. 8	2 500	82
16	1250	81
30	630	78
50	315	55
100	160	27
200	80	20.4

Metric Sieve Size (C.G.S.B. Spec. 8-GP-2M)



U.S. Standard Sieve Size - approximate (A.S.T.M. Des. E 11)

Remarks:

Reviewed By: P.Eng.

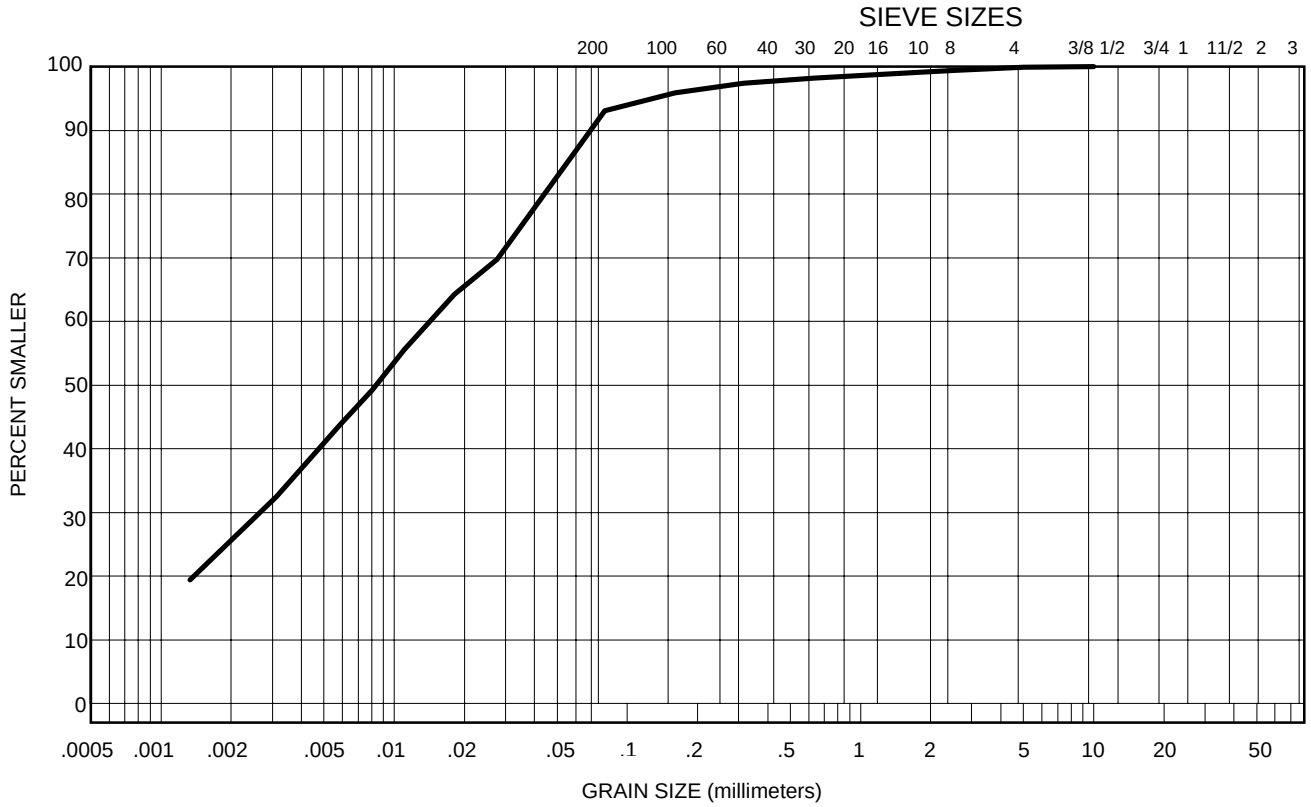
EBA Engineering Consultants Ltd.

GRAIN SIZE DISTRIBUTION

Project: NICO Mine Access, Route Evaluation
Project Number: 1700127-001
Client: Fortune Minerals Limited, London, ON
Attention: Mr. Robin Goad, President
Date Tested: January 19-20, 2005
Station: 25.61 km
Sample # S-14
Sample Number: n/a
Lab Number: 3771-22
Soil Description: Clayey Silt, trace sand.
Natural Moisture Content: 13.7%
Remarks: Classification according to ASTM D3282: A-6

SIEVE	PERCENTAGE PASSING
40	
25	
20	
16	
12.5	
10	
5	100
2.5	99
1.25	99
0.63	98
0.315	97
0.16	96
0.08	93

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE



Reviewed By:_____ P.Eng.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

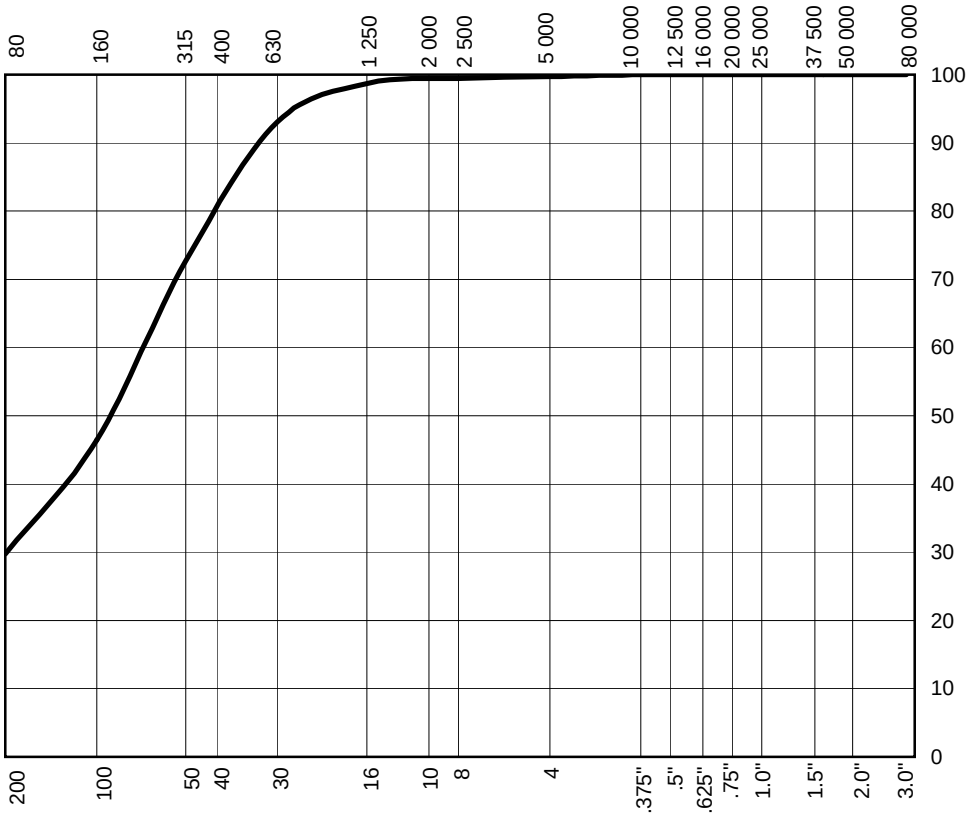
Project Number: 1700127- 001
Date Tested: September 21, 2004
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771 - 8
Sample Description: Silty SAND
Station: 25.8 km
Sample Number: S-15
Natural Moisture Content: 18.4%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Aparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	
2"	50 000	
1.5"	37 500	
1"	25 000	
.75"	20 000	
.625"	16 000	
.5"	12 500	
.375"	10 000	
No. 4	5 000	100
No. 8	2 500	99
16	1250	99
30	630	93
50	315	73
100	160	46
200	80	29.7

Metric Sieve Size (C.G.S.B. Spec. 8-GP-2M)



U.S. Standard Sieve Size - approximate (A.S.T.M. Des. E 11)

Remarks:

Reviewed By: P.Eng.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

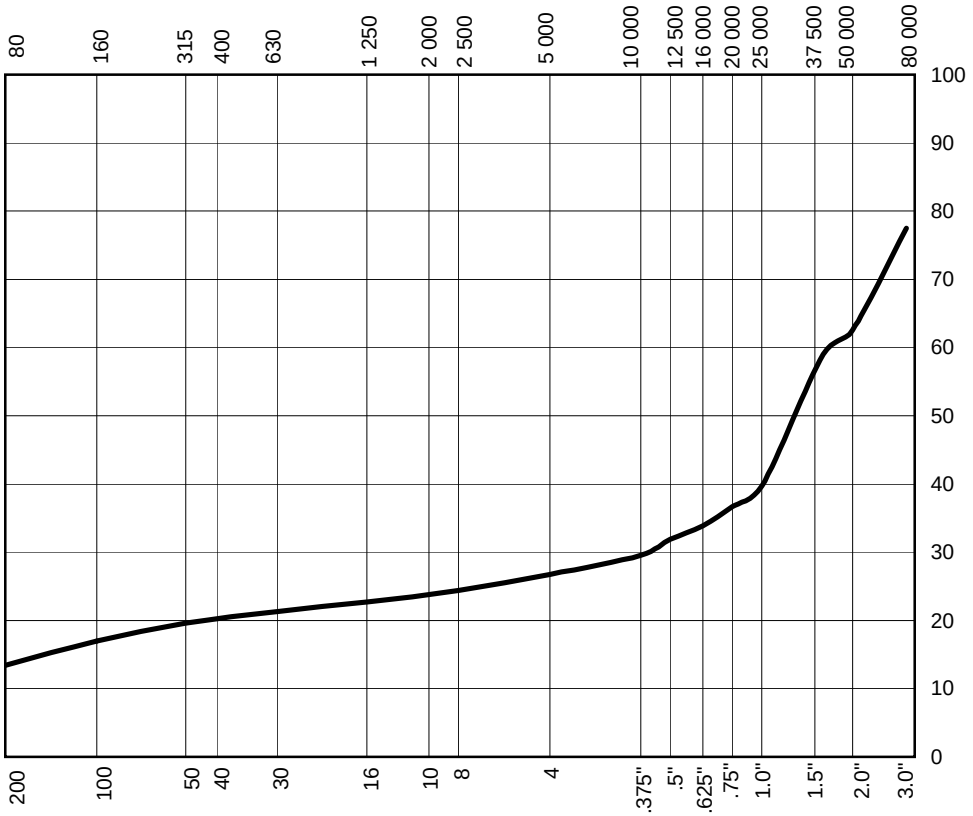
Project Number: 1700127- 001
Date Tested: September 21, 2004
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771 - 9
Sample Description: GRAVEL, some sand, some silt
Station: 26.1 km
Sample Number: S-16
Natural Moisture Content: 7.3%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Aparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	78
2"	50 000	63
1.5"	37 500	59
1"	25 000	40
.75"	20 000	37
.625"	16 000	34
.5"	12 500	32
.375"	10 000	30
No. 4	5 000	27
No. 8	2 500	24
16	1250	23
30	630	21
50	315	20
100	160	17
200	80	13.4

Metric Sieve Size (C.G.S.B. Spec. 8-GP-2M)



U.S. Standard Sieve Size - approximate (A.S.T.M. Des. E 11)

Remarks:

Reviewed By: P.Eng.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

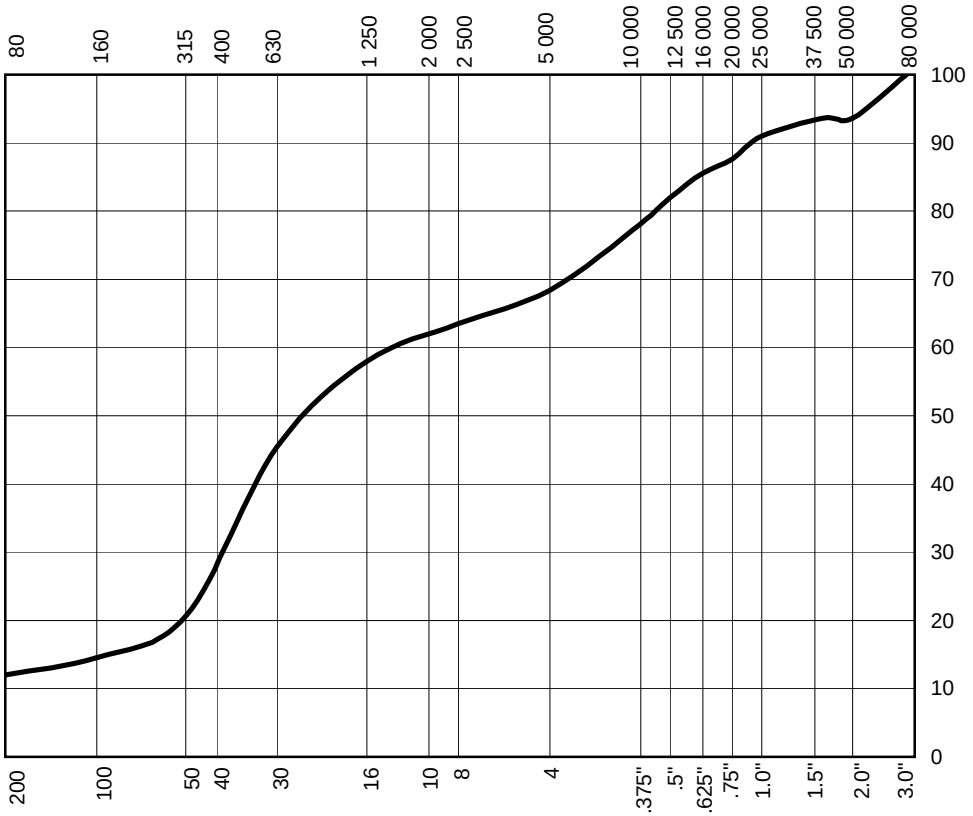
Project Number: 1700127- 001
Date Tested: September 21, 2004
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771 - 10
Sample Description: Gravelly SAND, some silt
Station: 26.8 km
Sample Number: S-17
Natural Moisture Content: 4.8%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Aparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	100
2"	50 000	94
1.5"	37 500	94
1"	25 000	91
.75"	20 000	88
.625"	16 000	86
.5"	12 500	82
.375"	10 000	78
No. 4	5 000	68
No. 8	2 500	63
16	1250	58
30	630	45
50	315	21
100	160	15
200	80	12.0

Metric Sieve Size (C.G.S.B. Spec. 8-GP-2M)



U.S. Standard Sieve Size - approximate (A.S.T.M. Des. E 11)

Remarks:

Reviewed By: P.Eng.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

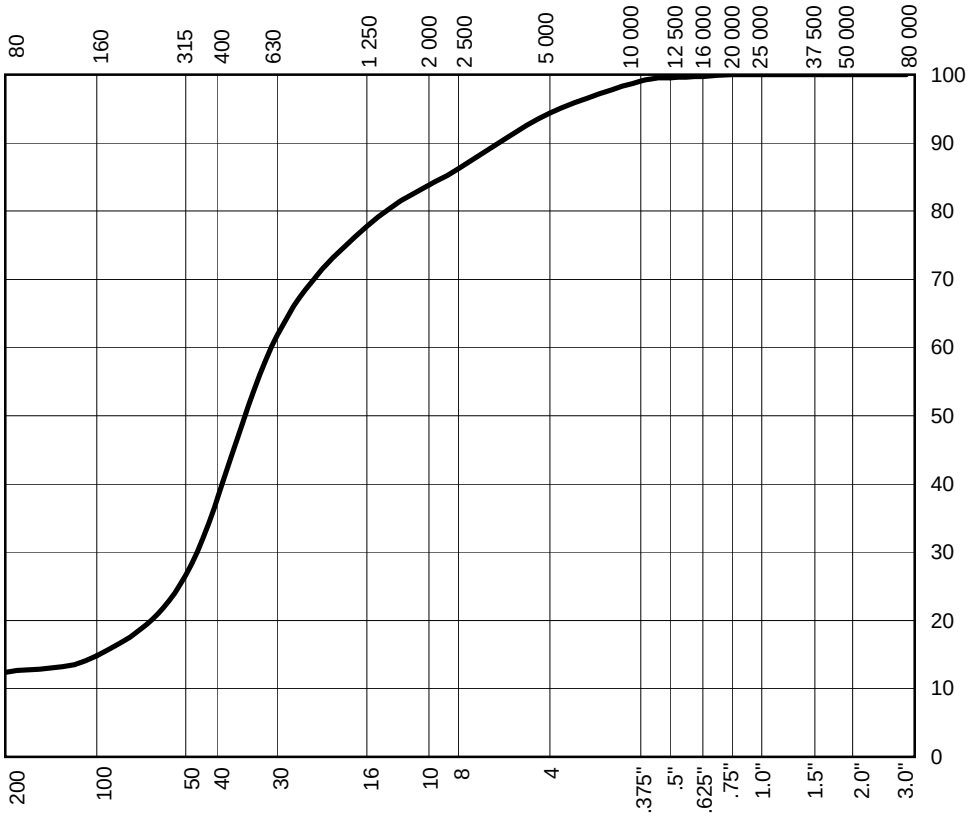
Project Number: 1700127- 001
Date Tested: September 21, 2004
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771 - 11
Sample Description: SAND, some silt, trace gravel
Station: 28.6 km
Sample Number: S-18
Natural Moisture Content: 3.9%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Aparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	
2"	50 000	
1.5"	37 500	
1"	25 000	
.75"	20 000	
.625"	16 000	
.5"	12 500	100
.375"	10 000	99
No. 4	5 000	94
No. 8	2 500	86
16	1250	78
30	630	62
50	315	27
100	160	15
200	80	12.4

Metric Sieve Size (C.G.S.B. Spec. 8-GP-2M)



U.S. Standard Sieve Size - approximate (A.S.T.M. Des. E 11)

Remarks:

Reviewed By: P.Eng.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

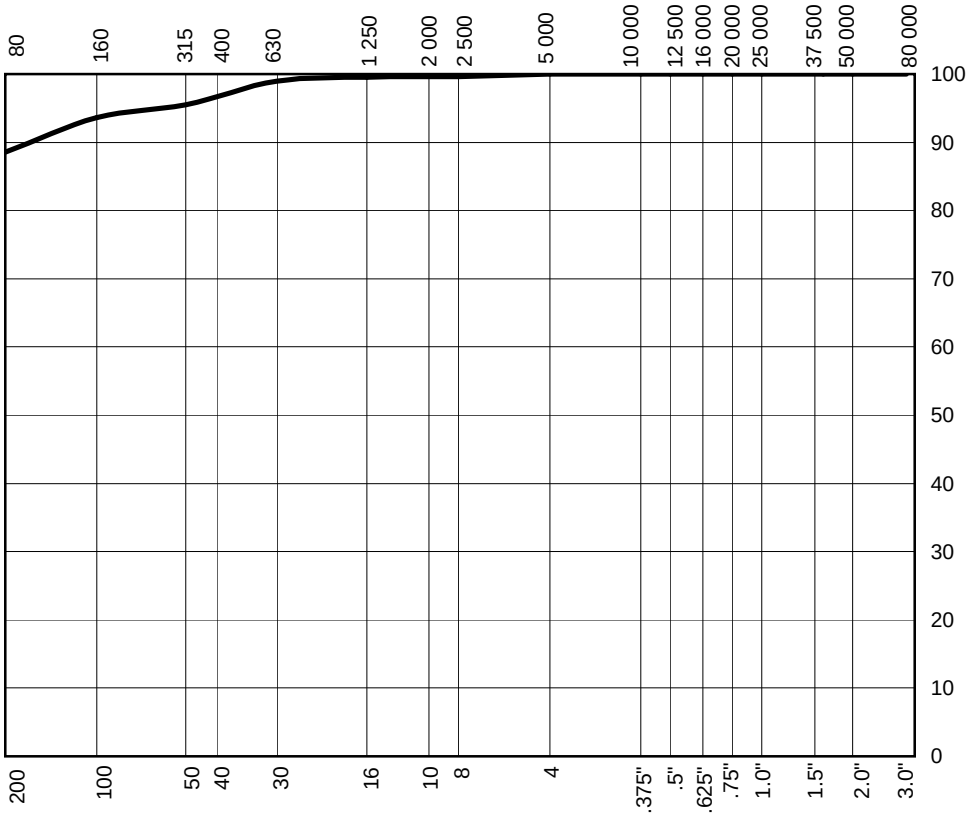
Project Number: 1700127- 001
Date Tested: January 13-14, 2005
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771-23
Sample Description: Silt, trace sand.
Station: 31.83 km
Sample Number: S-19
Natural Moisture Content: 13.3%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Apparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	
2"	50 000	
1.5"	37 500	
1"	25 000	
.75"	20 000	
.625"	16 000	
.5"	12 500	
.375"	10 000	
No. 4	5 000	
No. 8	2 500	
16	1250	100
30	630	99
50	315	96
100	160	94
200	80	88.6

Metric Sieve Size (C.G.S.B. Spec. 8-GP-2M)



U.S. Standard Sieve Size - approximate (A.S.T.M. Des. E 11)

Remarks: Classification according to ASTM D3282: A-6

Reviewed By: _____ P.Eng.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

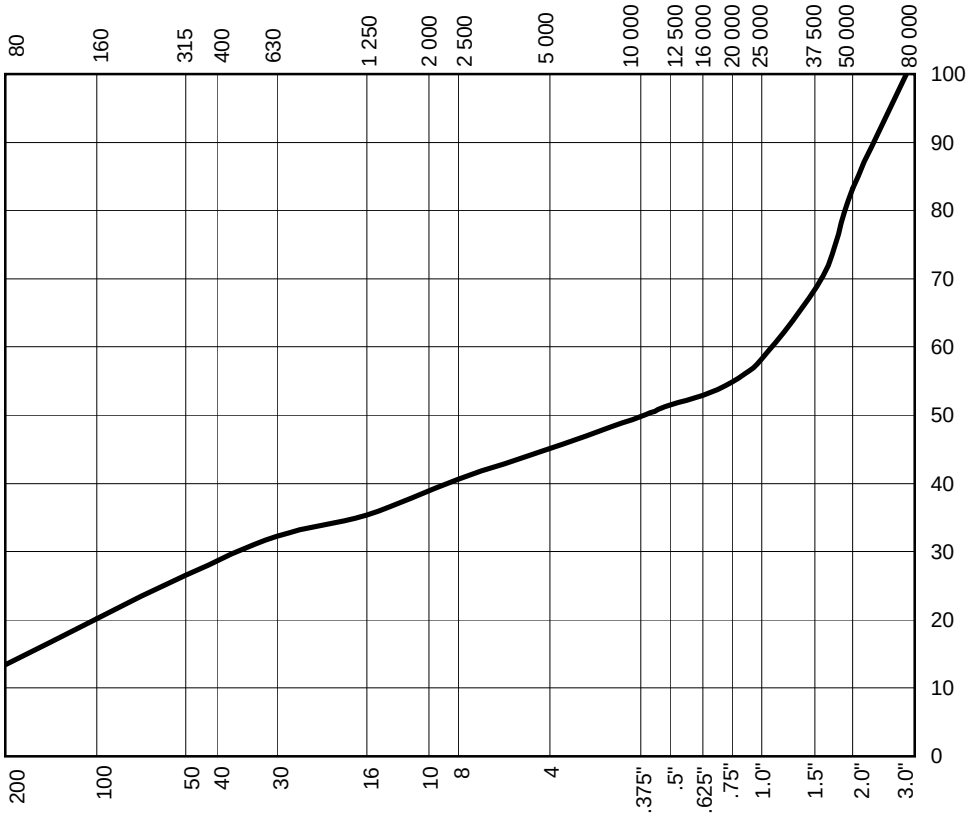
Project Number: 1700127- 001
Date Tested: January 17-18, 2005
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771-24
Sample Description: Sandy GRAVEL, some silt.
Station: 32.12 km
Sample Number: S-20
Natural Moisture Content: 7.8%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Apparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	100
2"	50 000	83
1.5"	37 500	70
1"	25 000	58
.75"	20 000	55
.625"	16 000	53
.5"	12 500	51
.375"	10 000	50
No. 4	5 000	45
No. 8	2 500	41
16	1250	35
30	630	32
50	315	27
100	160	20
200	80	13.4

Metric Sieve Size (C.G.S.B. Spec. 8-GP-2M)



U.S. Standard Sieve Size - approximate (A.S.T.M. Des. E 11)

Remarks: Classification according to ASTM D3282: A-1-a

Reviewed By: _____ P.Eng.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

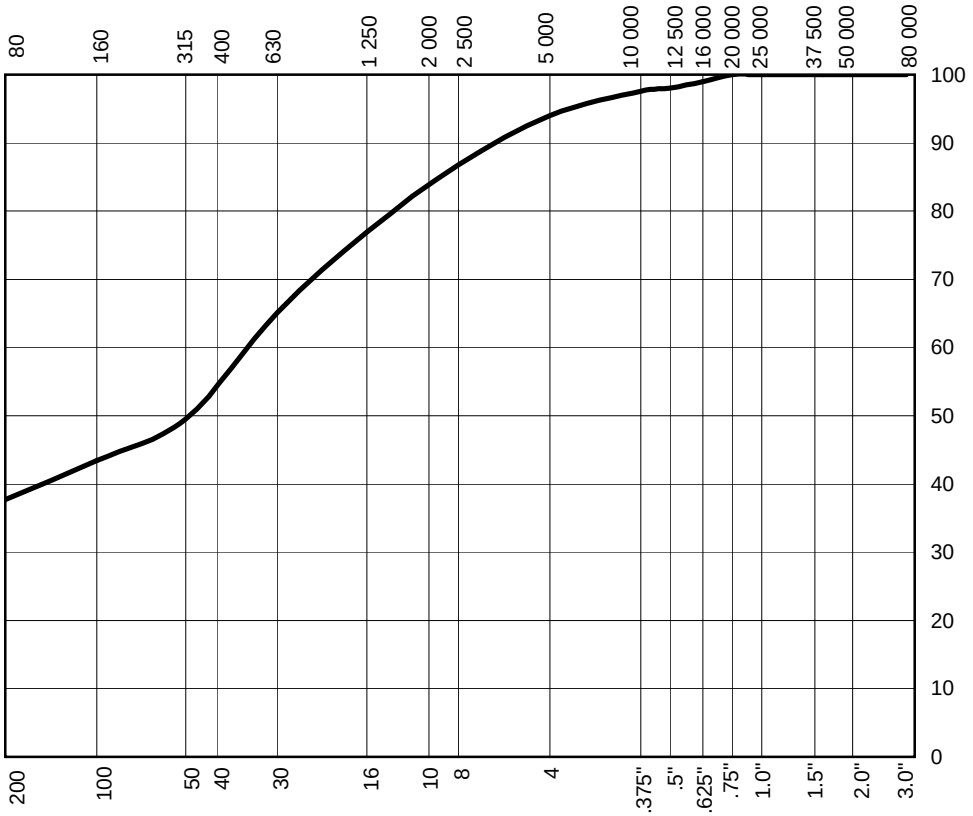
Project Number: 1700127- 001
Date Tested: September 21, 2004
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771 - 12
Sample Description: SAND and SILT, trace gravel
Station: 37.2 km
Sample Number: S-21
Natural Moisture Content: 16.1%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Aparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	
2"	50 000	
1.5"	37 500	
1"	25 000	
.75"	20 000	100
.625"	16 000	99
.5"	12 500	98
.375"	10 000	98
No. 4	5 000	94
No. 8	2 500	87
16	1250	77
30	630	65
50	315	49
100	160	43
200	80	37.8

Metric Sieve Size (C.G.S.B. Spec. 8-GP-2M)



U.S. Standard Sieve Size - approximate (A.S.T.M. Des. E 11)

Remarks:

Reviewed By: P.Eng.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

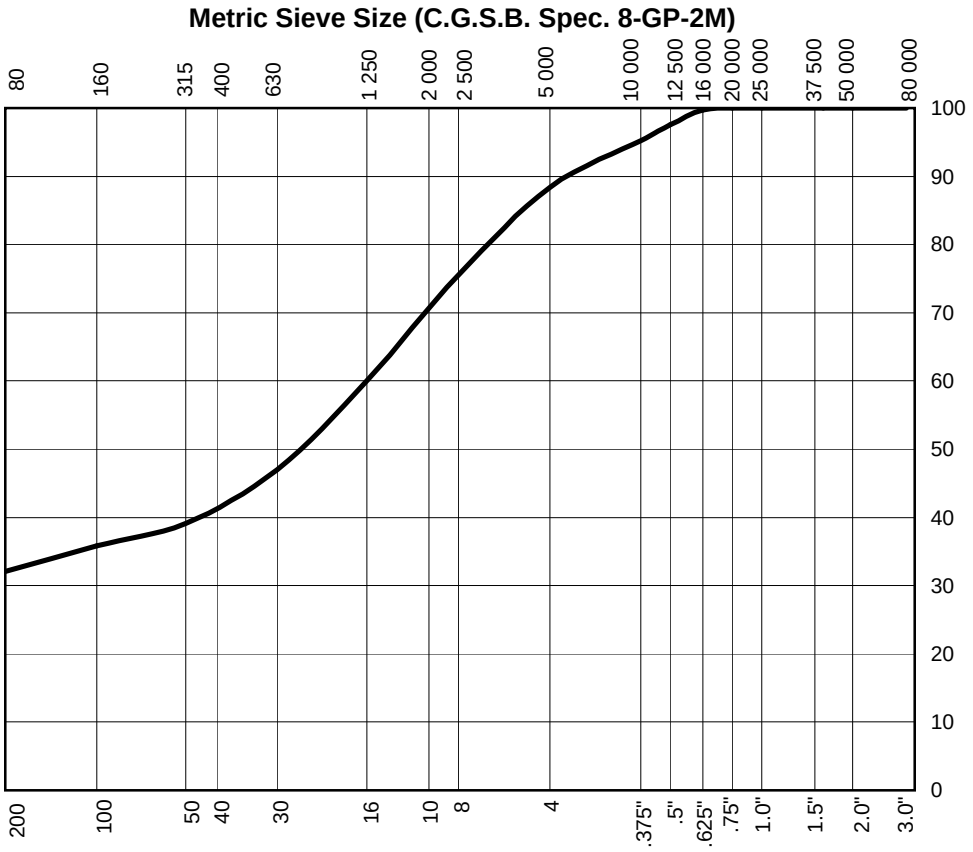
Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

Project Number: 1700127- 001
Date Tested: January 17-18, 2005
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771-25
Sample Description: Silty SAND, some gravel.
Station: 37.51 km
Sample Number: S-22
Natural Moisture Content: 23.6%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Apparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	
2"	50 000	
1.5"	37 500	
1"	25 000	
.75"	20 000	
.625"	16 000	100
.5"	12 500	98
.375"	10 000	95
No. 4	5 000	88
No. 8	2 500	75
16	1250	60
30	630	47
50	315	39
100	160	36
200	80	32.1



Remarks: Classification according to ASTM D3282: A-2-4

Reviewed By: _____ P.Eng.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

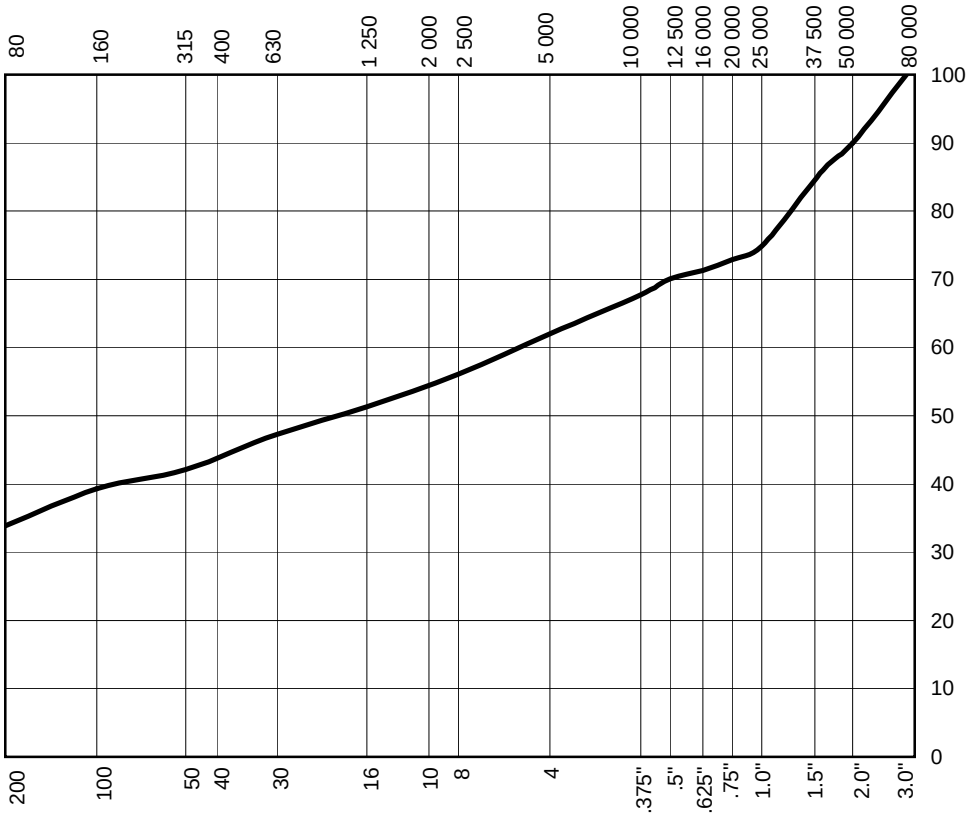
Project Number: 1700127- 001
Date Tested: September 21, 2004
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771 - 13
Sample Description: Silty, sandy GRAVEL
Station: 38.3 km
Sample Number: S-23
Natural Moisture Content: 5.2%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Aparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	100
2"	50 000	90
1.5"	37 500	86
1"	25 000	75
.75"	20 000	73
.625"	16 000	71
.5"	12 500	70
.375"	10 000	68
No. 4	5 000	62
No. 8	2 500	56
16	1250	51
30	630	47
50	315	42
100	160	39
200	80	33.9

Metric Sieve Size (C.G.S.B. Spec. 8-GP-2M)



U.S. Standard Sieve Size - approximate (A.S.T.M. Des. E 11)

Remarks:

Reviewed By: P.Eng.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

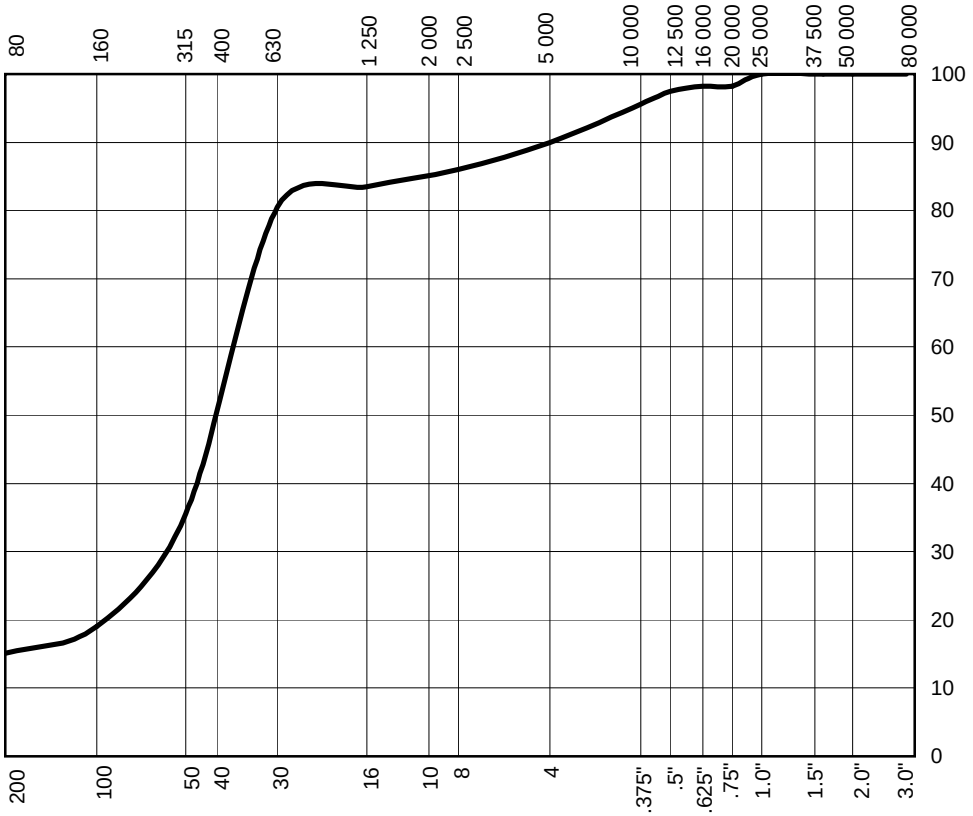
Project Number: 1700127- 001
Date Tested: January 17-18, 2005
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771-26
Sample Description: SAND, some silt, some gravel.
Station: 39.23 km
Sample Number: S-23a
Natural Moisture Content: 8.7%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Apparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	
2"	50 000	
1.5"	37 500	
1"	25 000	100
.75"	20 000	98
.625"	16 000	98
.5"	12 500	97
.375"	10 000	96
No. 4	5 000	90
No. 8	2 500	86
16	1250	83
30	630	81
50	315	36
100	160	19
200	80	15.1

Metric Sieve Size (C.G.S.B. Spec. 8-GP-2M)



U.S. Standard Sieve Size - approximate (A.S.T.M. Des. E 11)

Remarks: Classification according to ASTM D3282: A-1-b

Reviewed By: _____ P.Eng.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

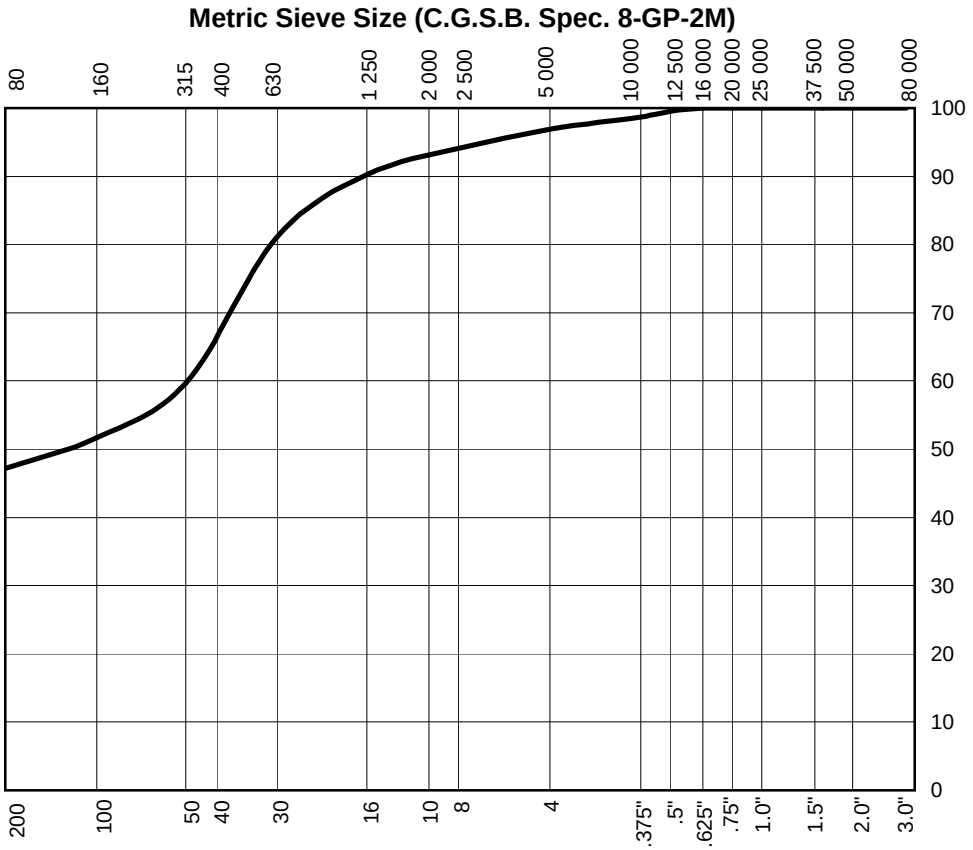
Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

Project Number: 1700127- 001
Date Tested: January 17-18, 2005
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771-27
Sample Description: SAND and SILT, trace gravel.
Station: 41.19
Sample Number: S-24
Natural Moisture Content: 28.7%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Apparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	
2"	50 000	
1.5"	37 500	
1"	25 000	
.75"	20 000	
.625"	16 000	100
.5"	12 500	100
.375"	10 000	99
No. 4	5 000	97
No. 8	2 500	94
16	1250	90
30	630	81
50	315	60
100	160	52
200	80	47.2



Remarks: Classification according to ASTM D3282: A-4

Reviewed By: _____ P.Eng.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

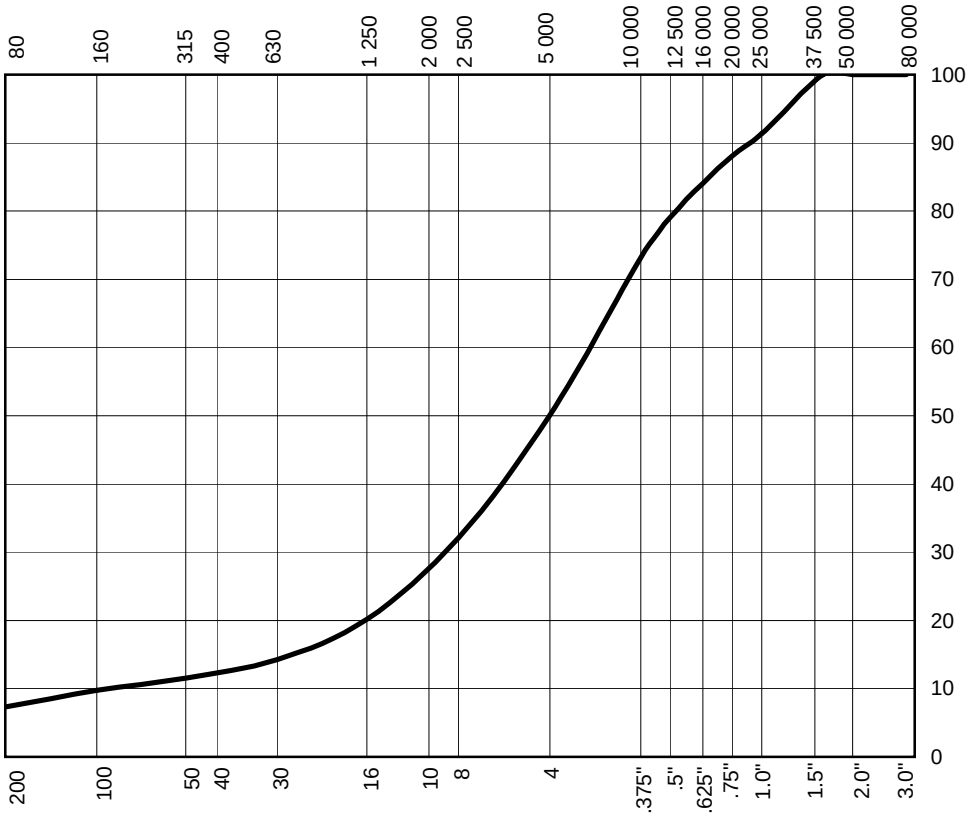
Project Number: 1700127- 001
Date Tested: September 21, 2004
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771 - 14
Sample Description: GRAVEL and SAND, trace silt
Station: 42.9 km
Sample Number: S-25
Natural Moisture Content: 5.4%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Aparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	
2"	50 000	
1.5"	37 500	100
1"	25 000	91
.75"	20 000	88
.625"	16 000	84
.5"	12 500	79
.375"	10 000	73
No. 4	5 000	50
No. 8	2 500	32
16	1250	20
30	630	14
50	315	11
100	160	10
200	80	7.4

Metric Sieve Size (C.G.S.B. Spec. 8-GP-2M)



U.S. Standard Sieve Size - approximate (A.S.T.M. Des. E 11)

Remarks:

Reviewed By: P.Eng.

EBA Engineering Consultants Ltd.

AGGREGATE ANALYSIS REPORT

Project: NICO Mine Access , Route Evaluation
Address: Lou Lake, NT

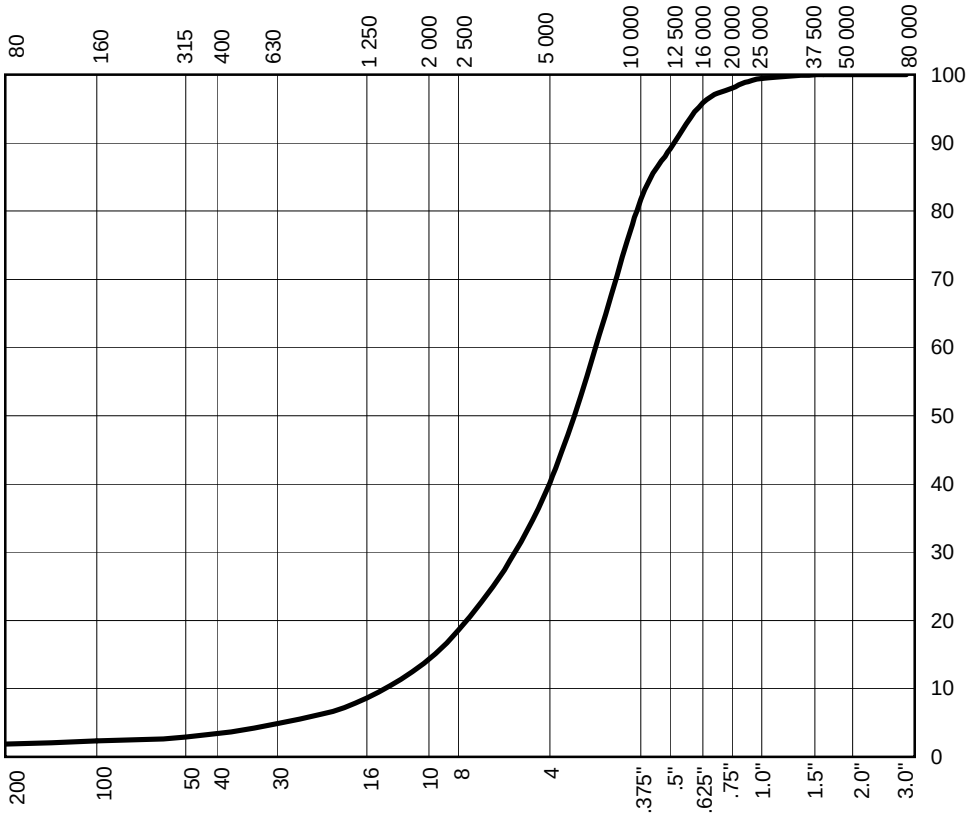
Project Number: 1700127- 001
Date Tested: September 21, 2004
Client: Fortune Minerals Limited
London, ON

Attention: Mr. Robin Goad, President

Lab Number: 3771 - 15
Sample Description: GRAVEL and SAND, trace silt
Station: 43.7 km
Sample Number: S-26
Natural Moisture Content: 5.1%
Colour Plate No.: n/d
Bulk Relative Density: n/d
Apparent Relative Density (SSD): n/d
Aparent Relative Density: n/d
Absorption: n/d

Sieve Sizes		%
U.S.	Metric	Passing
3"	80 000	
2"	50 000	
1.5"	37 500	100
1"	25 000	99
.75"	20 000	98
.625"	16 000	96
.5"	12 500	89
.375"	10 000	82
No. 4	5 000	40
No. 8	2 500	19
16	1250	9
30	630	5
50	315	3
100	160	2
200	80	1.9

Metric Sieve Size (C.G.S.B. Spec. 8-GP-2M)



U.S. Standard Sieve Size - approximate (A.S.T.M. Des. E 11)

Remarks:

Reviewed By: P.Eng.

APPENDIX C

COST ESTIMATE DETAILS AND CALCULATION BACK-UP

TABLE C-1

Common Borrow Material

Terrain Unit	Length	Width	Height	Side Slope	Base Course Area	Quantity
	m	m	m		m^2	m^3
1	9980	7.2	0.40	2	3.20	31,936
2	7440	8.4	1.00	4	12.40	92,256
3	1090	8.4	1.50	4	21.60	23,544
4	N/A	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A	N/A
					Total	147,736

TABLE C-2

Pavement Structure, 200 mm of 50 mm minus crush

Terrain Unit	Length	Width	Height	Side Slope	Base Course Area	Quantity
	m	m	m		m^2	m^3
1	9980	6.4	0.20	2	1.36	13,573
2	7440	6.8	0.20	4	1.52	11,309
3	1090	6.8	0.20	4	1.52	1,657
4	430	6.4	0.20	2	1.36	585
4	N/A	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A	N/A
					Total	27,123

TABLE C-3

Pavement Surface, 100 mm of 20 mm minus crush

Terrain Unit	Length	Width	Height	Side Slope	Base Course Area	Quantity
	m	m	m		m^2	m^3
1	9980	6	0.10	2	0.62	6,188
2	7440	6	0.10	4	0.64	4,762
3	1090	6	0.10	4	0.64	698
4	430	6	0.10	2	0.62	267
4	N/A	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A	N/A
					Total	11,913

TABLE C-4

Clear Right of Way - Existing Winter Road

Terrain Unit	Length	Topwidth	Height	Side Slope	Bottom Width	Quantity
	m	m	m		m	m^2
1	9980	6	0.70	2	8.80	87,824
2	7440	6	1.30	4	16.40	122,016
3	1090	6	1.80	4	20.40	22,236
4	430	6	0.30	2	7.20	3,096
5	N/A	N/A	N/A	N/A	N/A	N/A
					Total	235,172

TABLE C-5

Supply and Place Geotextile Membrane

Terrain Unit	Length	Width	Height	Side Slope	Bottom Width	Quantity
	m	m	m		m	m^2
1	N/A	N/A	N/A	N/A	N/A	N/A
2	7440	6	1.30	4	16.40	122,016
3	1090	6	1.8	4	20.40	22,236
4	N/A	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A	N/A
					Total	144,252

TABLE C-6

Common Borrow Material

Terrain Unit	Length	Width	Height	Side Slope	Base Course Area	Quantity
	m	m	m		m^2	m^3
1	15180	7.2	0.40	2	3.20	48,576
2	7220	8.4	1.00	4	12.40	89,528
3	1890	8.4	1.50	4	21.60	40,824
4	N/A	N/A	N/A	N/A	N/A	N/A
5	2650	8.4	1.50	4	21.60	57,240
5	1180	10.4	1.50	4	24.60	29,028
					Total	265,196

TABLE C-7

Pavement Structure, 200 mm of 50 mm minus crush

Terrain Unit	Length	Width	Height	Side Slope	Base Course Area	Quantity
	m	m	m		m^2	m^3
1	15180	6.4	0.20	2	1.36	20,645
2	7220	6.8	0.20	4	1.52	10,974
3	1890	6.8	0.20	4	1.52	2,873
4	1510	6.4	0.20	2	1.36	2,054
4	1950	8.4	0.20	2	1.76	3,432
5	2650	6.8	0.20	4	1.52	4,028
5	1180	8.8	0.20	4	1.92	2,266
					Total	46,271

TABLE C-8

Pavement Surface, 100 mm of 20 mm minus crush

Terrain Unit	Length	Width	Height	Side Slope	Base Course Area	Quantity
	m	m	m		m^2	m^3
1	15180	6	0.10	2	0.62	9,412
2	7220	6	0.10	4	0.64	4,621
3	1890	6	0.10	4	0.64	1,210
4	1510	6	0.10	2	0.62	936
4	1950	8	0.10	2	0.82	1,599
5	2650	6	0.10	4	0.64	1,696
5	1180	8	0.10	4	0.84	991
					Total	20,464

TABLE C-9

Clear Right of Way - Existing Winter Road

Terrain Unit	Length	Topwidth	Height	Side Slope	Bottom Width	Quantity
	m	m	m		m	m^2
1	3280	6	0.70	2	8.80	28,864
2	5680	6	1.30	4	16.40	93,152
3	N/A	N/A	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A	N/A
					Total	122,016

TABLE C-10

Clear Right of Way - New Alignment

Terrain Unit	Length	Topwidth	Height	Side Slope	Bottom Width	Quantity
	m	m	m		m	m^2
1	11620	6	0.70	2	8.8	102,256
2	1820	6	1.30	4	16.4	29,848
3	1890	6	1.80	4	20.4	38,556
4	1510	6	0.30	2	7.2	10,872
4	1950	8	0.30	2	9.2	17,940
5	2650	6	1.8	4	20.4	54,060
5	1180	8	1.8	4	22.4	26,432
					Total	279,964

TABLE C-11

Supply and Place Geotextile Membrane

Terrain Unit	Length	Width	Height	Side Slope	Bottom Width	Quantity
	m	m	m		m	m^2
1	N/A	N/A	N/A	N/A	N/A	N/A
2	7220	6	1.30	4	16.40	118,408
3	1890	6	1.8	4	20.40	38,556
4	N/A	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A	N/A
					Total	156,964

APPENDIX D

GENERAL CONDITIONS

EBA Engineering Consultants Ltd. (EBA)
GEOTECHNICAL REPORT
GENERAL CONDITIONS

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

A.1 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. Any such unauthorized use of the report is at the sole risk of the user.

A.2 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.

A.3 LOGS OF TEST HOLES

The test hole (test pits, boreholes) logs are a compilation of conditions and classification of soils and rocks interpreted 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.

A.4 STRATIGRAPHIC AND GEOLOGICAL SECTIONS

The stratigraphic and geological sections indicated on drawings contained in this report are evolved 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 exact locations of geological units is necessary, additional investigation and review may be necessary.

A.5 GROUNDWATER CONDITIONS

Groundwater conditions represented in this report refer only to those observed at the times recorded on logs of test holes and/or wells, and/or within the text of this report. These conditions may vary with geological detail between test holes and/or wells; annual, seasonal and special meteorologic conditions; and with construction activity. Where instruments have been established to record groundwater variations on an ongoing basis, the records will be specifically referred to. Interpretation of groundwater conditions from observations and records is judgemental and constitutes an evaluation of circumstances as influenced by geology, meteorology and construction activity. Deviations from these observations may occur.

A.6 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.

A.7 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Preservation of adjacent ground and structures from the adverse impact of construction activity is required. Therefore support of excavation walls, of ground adjacent to anticipated construction and of structures adjacent to the construction must be provided.

A.8 INFLUENCE OF CONSTRUCTION ACTIVITY

Construction activity may affect 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.

A.9 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgemental 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 to the benefit of the project.

A.10 DRAINAGE SYSTEMS

Where temporary and 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.

A.11 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.

A.12 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, or samples will be discarded.

A.13 STANDARD OF CARE

Services performed by EBA for this report are conducted in a manner consistent with that level and skill ordinarily exercised by members of the profession currently practising under similar conditions in the jurisdiction in which the services are provided. Engineering judgement has been applied in developing the conclusions and/or recommendations provided in this report. No warranty or guarantee, express or implied, is made, concerning the test results, comments, recommendations, or any other portion of this report.

A.14 ENVIRONMENTAL AND REGULATORY ISSUES

EBA has not been retained to investigate, address or consider and has not investigated, addressed or considered any environmental or regulatory issues associated with development on the subject site, unless otherwise specifically indicated in the report.