A BRIEF SUMMARY OF KNIFE LAKE , NU WINTER 2004 WATER QUALITY SAMPLING PROGRAM

Project No. 1740090

January 2005

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Submitted To:

DE BEERS CANADA INC. - EXPLORATION
YELLOWKNIFE, NORTHWEST TERRITORIES

Prepared by:

EBA ENGINEERING CONSULTANTS LTD.
YELLOWKNIFE, NORTHWEST TERRITORIES

Project No. 0701-1740090

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EXECUTIVE SUMMARY

De Beers Canada Exploration Inc. (De Beers) retained EBA Engineering Consultants Ltd. (EBA) in 2004 to analyse and present the results from Knife Lake's 2004 winter water-quality sampling program at Knife Lake, West Kitikmeot Region, Nunavut (NU).

The objectives of the winter water-quality program were to monitor water quality of Knife Lake under winter conditions and to document measurable effects of the winter 2004 diamond-drillhole (DDH) drilling program. Between April 5 and May 10, 2004, De Beers conducted a DDH program at Knife Lake to delineate the Knife Lake kimberlite deposit.

Water samples were collected on April 2-3, April 26 and May 8, 2004. The April 2–3 trip occurred prior to the commencement of drilling on Knife Lake. The April 26th trip occurred during the latter half of lake drilling, while the May 8th sampling event occurred 12 days after the end of the lake-based portion of the drilling program.

Based on detailed review of analytical results, EBA is of the opinion that there is a potential that water samples may have been impacted further from their natural state by outside sources. Review of travel and field blank data leads to this opinion.

Upon analysing the data, De Beers recognizes the anomalous analyte levels and believes that contamination did occur during the sampling. Consequently, De Beers is generating a brief summary report of the 2004 winter water sampling program results, and will be resampling Knife Lake during the next work program.

Despite the issue of impact from outside sources, many of the analytes were below detection levels during the majority of the sampling events. Only six analytes exceeded the Canadian Council of Ministers of the Environment's Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life and included aluminum, arsenic, chromium, copper, iron and zinc. In general, the physical and chemical water quality parameters of Knife Lake are low and are consistent for pristine lakes occurring in that region.

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1.0 INTRODUCTION

1.1 General

De Beers Canada Exploration Inc. (De Beers) retained EBA Engineering Consultants Ltd. (EBA) in 2004 to analyse and present the results from Knife Lake's 2004 winter water-quality sampling program at Knife Lake, West Kitikmeot Region, Nunavut (NU). The data presented in this report has been compiled, analysed and prepared by Steve Moore of EBA.

The objectives of the winter water-quality program were to monitor water quality of Knife Lake under winter conditions and to document measurable effects of the winter 2004 diamond-drillhole (DDH) drilling program. Between April 5 and May 10, 2004, De Beers conducted a DDH program at Knife Lake to delineate the Knife Lake kimberlite deposit. This is the first year (2004) that a winter water-quality sampling program was conducted on Knife Lake.

Knife Lake is located at 67^{o} 00' north latitude and 113^{o} 09' west longitude, approximately 510 kilometres (km) north of Yellowknife, NWT (Figure 1). Four sampling locations (Stations A, B, C and D) were sampled in 2004. Figure 2 shows the locations of the sampling stations as well as 2004 drill hole locations on Knife Lake and the location of the Tree River control station. Station A is located in the northeast corner of Knife Lake, within the footprint of drilling activity. Stations B and C are located 250 m and 500 m, respectively, southwest of Station A. Station D, a control site, is located on the Tree River to the west.

Water samples were collected on April 2-3, April 26 and May 8, 2004. The April 2–3 trip occurred prior to the commencement of drilling on Knife Lake. The April 26th trip occurred during the latter half of lake drilling, while the May 8th sampling event occurred 12 days after the end of the lake-based drilling program. Land-based drilling continued until May 10. Contractor Sue Wollner and Unnikrishnan Purushothaman of De Beers (India) conducted the first water-sampling session; Unnikrishnan Purushothaman and contractor Gus Fomradas conducted the second water-sampling session; and contractors Gus Fomradas and Jason Cameron conducted the third water-sampling session.

1.2 Quality Assurance/Quality Control Program

As part of a Quality Assurance/Quality Control (QA/QC) program, travel blanks, field blanks and duplicates were employed. Travel blanks and field blanks were utilized in order

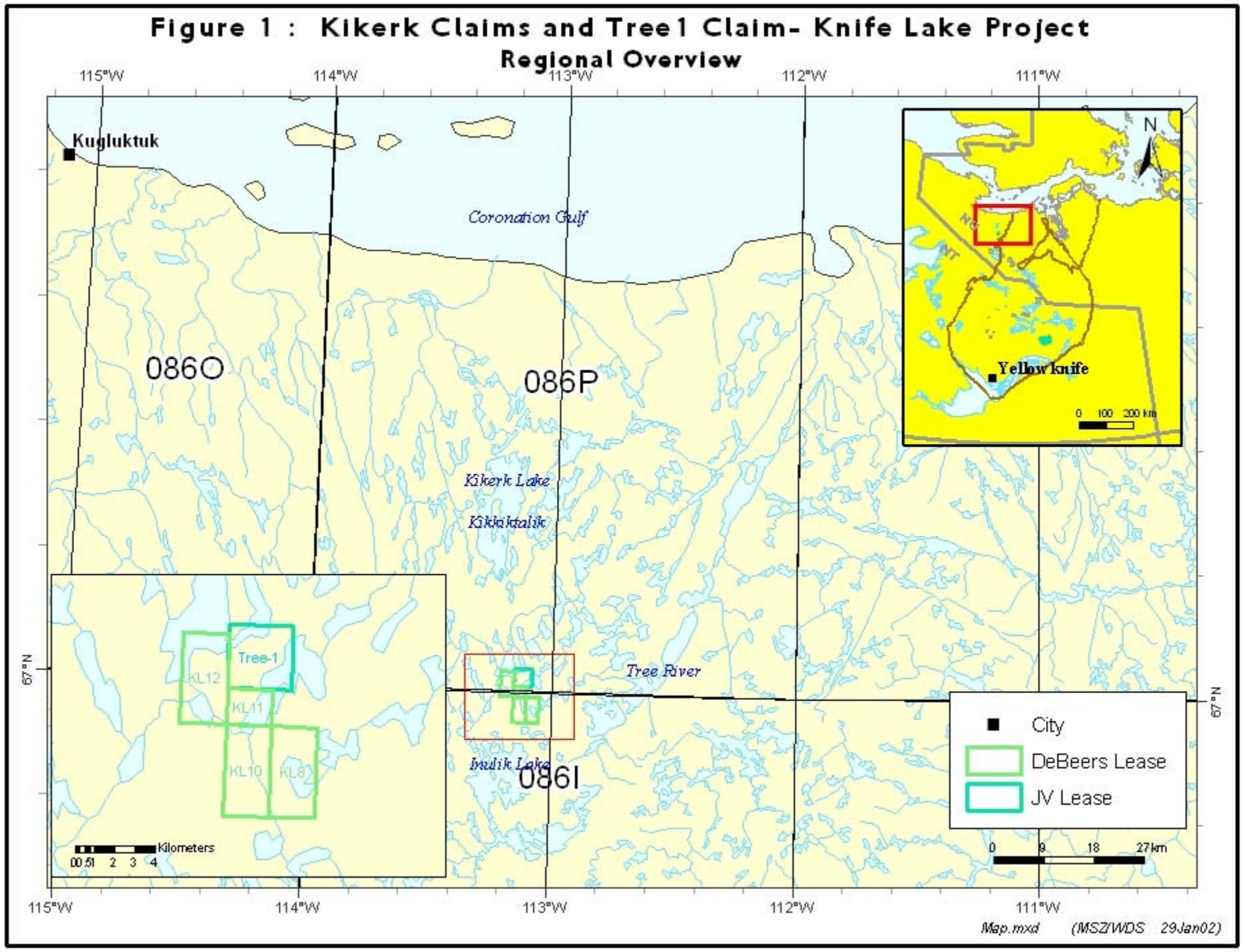
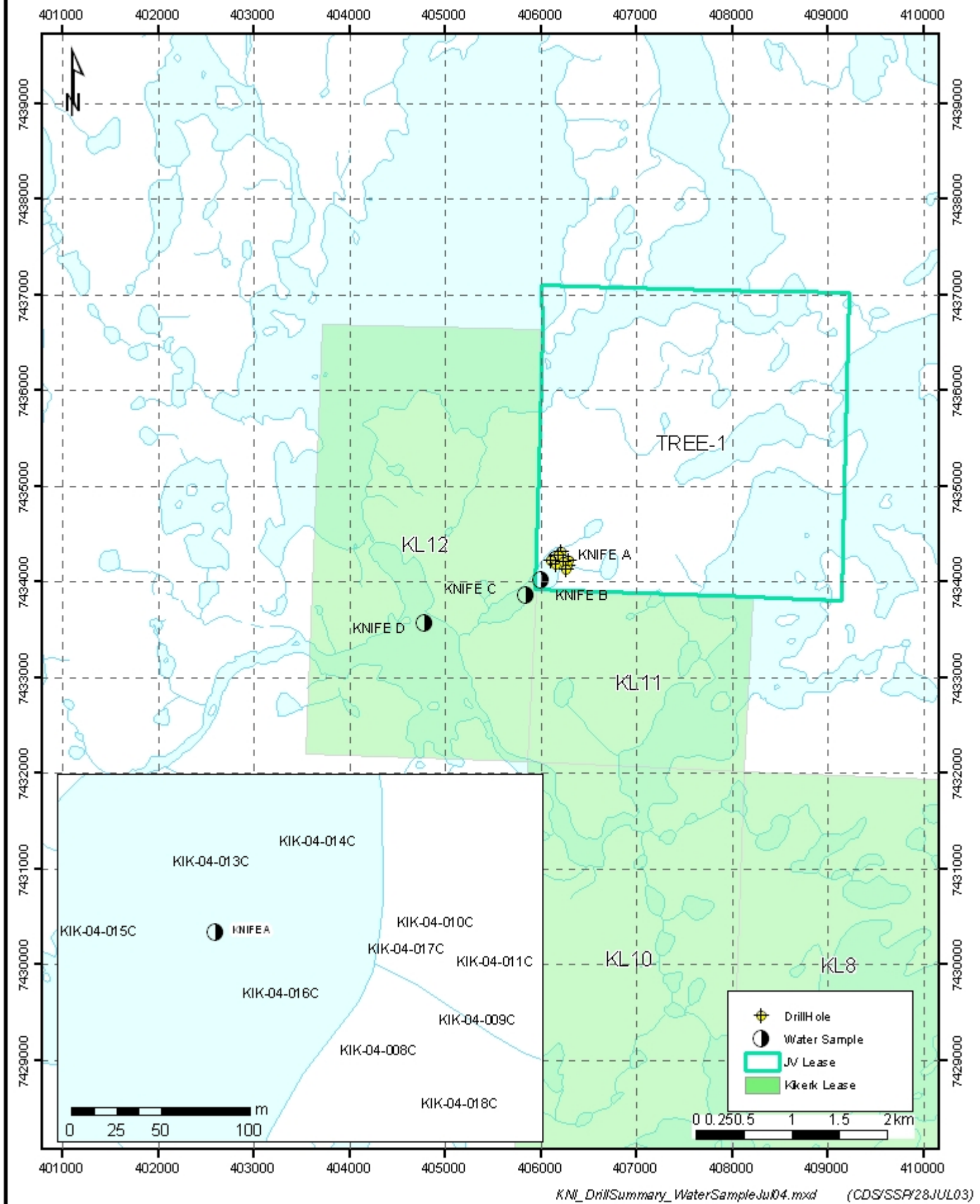


Figure 1 : Kikerk Claims and Tree1 Claim- Knife Lake Project
Regional Overview
115°W
114°W
113°W
112°W
111°W
Kugluktuk
Coronation Gulf
086O
086P
086I
Kikerk Lake
Kikkiktalik
Tree River
Inulik Lake
Tree-1
KL12
KL11
KL10
KL8
Kilometers
0 0.5 1 2 3 4
67°N
N
Yellowknife
0 100 200 km
City
DeBeers Lease
JV Lease
0 9 18 27 km
Map.mxd (MSZ/WDS 29Jan02)

Figure 2: Water Sampling Locations in Relation to 2004 Drill Locations



to assess contamination from sample containers or other equipment used in the collection and handling of samples, and to detect other systematic or random errors from sampling through to analysis. Duplicates were collected in order to test the validity of sampling procedures and laboratory methodology.

Travel blanks were prepared by ETL and shipped along with the sample bottles to Knife Lake. One set of travel blanks was used for each sampling event. Field blanks were collected. Once in the field, field blank sample bottles were filled with deionized water, however, no preservatives were added to these bottles. Duplicates were prepared in the field in the same environment in which the original water samples were collected. Duplicates were collected for each sampling event, one at each station.

1.3 Analytical Program

Water samples were submitted to Enviro-Test Laboratories (ETL) in Edmonton. ETL is a laboratory accredited by the Canadian Association for Environmental Analytical Laboratories (CAEAL).

Water samples were analysed for total and dissolved metals, total organic carbon, nutrients and routine water chemistry (major ions and physical parameters). A list of specific parameters analysed and their respective detection limits is presented in Table 1.

Table 1: Parameters Analysed and Their Respective Detection Limits

Analysis	*	**	**Units**
Chloride (Cl)	1	1	mg/L
Fluoride (F)	0.05	0.05	mg/L
Calcium (Ca)	0.5	0.5	mg/L
Potassium (K)	0.1	0.1	mg/L
Magnesium (Mg)	0.1	0.1	mg/L
Sodium (Na)	1	1	mg/L
Ion Balance	-	-	mg/L
Hardness (as CaCO3)	-	-	%
Nitrate+Nitrite-N	0.006	0.006	mg/L
Nitrate-N	0.006	0.006	mg/L
Nitrite-N	0.002	0.002	mg/L
Sulphate (SO4)	0.05	0.05	mg/L
pH	0.1	0.1	pH
Conductivity (EC)	0.2	0.2	uS/cm
Bicarbonate (HCO3)	5	5	mg/L
Carbonate (CO3)	5	5	mg/L
Hydroxide (OH)	5	5	mg/L

… (cont'd)

Table 1: Parameters Analysed and Their Respective Detection Limits (Continued)

Analysis	*	**	Units
Alkalinity, Total (as CaCO3)	5	5	mg/L
Ammonia-N	0.005	0.005	mg/L
Phosphorus, Total	0.001	0.001	mg/L
Total Organic Carbon	0.2	0.2	mg/L
Total Suspended Solids	3	3	mg/L
Turbidity	0.1	0.1	NTU
Silver (Ag)	0.4	0.1	ug/L
Aluminum (Al)	20	0.3	ug/L
Arsenic (As)	1	0.03	ug/L
Boron (B)	20	1	ug/L
Barium (Ba)	0.2	0.05	ug/L
Beryllium (Be)	1	0.2	ug/L
Bismuth (Bi)	0.1	0.03	ug/L
Calcium (Ca)	0.5	N/A	mg/L
Cadmium (Cd)	0.2	0.05	ug/L
Cesium (Cs)	50	N/A	ug/L
Cobalt (Co)	0.2	0.1	ug/L
Chromium (Cr)	0.8	0.06	ug/L
Copper (Cu)	1	0.6	ug/L
Iron (Fe)	5	5	ug/L
Lithium (Li)	6	0.1	ug/L
Mercury (Hg)	0.2	0.02	ug/L
Potassium (K)	0.1	N/A	mg/L
Magnesium (Mg)	0.1	N/A	ug/L
Manganese (Mn)	1	0.1	ug/L
Molybdenum (Mo)	0.1	0.06	ug/L
Sodium (Na)	1	N/A	mg/L
Nickel (Ni)	0.2	0.06	ug/L
Lead (Pb)	0.1	0.05	ug/L
Rubidium (Rb)	50	N/A	ug/L
Antimony (Sb)	5	0.03	ug/L
Strontium (Sr)	0.2	0.1	ug/L
Silicon (Si)	0.1	0.1	mg/L
Tin (Sn)	0.4	0.1	ug/L
Titanium (Ti)	5	N/A	ug/L
Thallium (Tl)	0.1	N/A	ug/L
Uranium (U)	0.1	0.5	ug/L
Vanadium (V)	0.2	0.05	ug/L
Zinc (Zn)	4	0.8	ug/L

***** Detection Limits for April 2-3 Field Blank1, Field Blank3, Travel Blank1, A-1, A-1Dup, D-1 and D-1Dup.

****** Detection Limits for April 2-3 Field Blank2, Travel Blank2, B-1, B-1Dup, C-1 and C-1Dup, April 26 and May 8 sampling events.

2.0 FIELD RESULTS AND DISCUSSIONS

2.1 Quality Assurance/Quality Control Program

2.1.1 Travel Blanks

Travel blanks were utilized during each sampling event to assess whether contamination occurred from sample containers or other equipment used in the collection and handling of samples, and to detect other systematic or random errors from sampling through to analysis. During the first sampling event, travel blanks were analysed for all parameters: total and dissolved low and ultra-low level metals, total organic carbon, nutrients and routine water chemistry.

Results of the travel blanks indicated that there were detectable levels of rubidium, nitrate (N), sulphate, ammonia and total phosphorus in the routine water chemistry and nutrients analyses. Levels of silver, aluminum, arsenic, boron, barium, calcium, cobalt, chromium, copper, iron, potassium, magnesium, manganese, molybdenum, nickel, lead, antimony, strontium, silicon, uranium, vanadium and zinc were detected in the total ultra-low level metals analysis. In the dissolved ultra-low level metals analysis, concentrations of aluminum, arsenic, boron, barium, cadmium, cobalt, chromium, copper, iron, lithium, potassium, magnesium, manganese, molybdenum, nickel, lead, antimony, strontium, vanadium and zinc were detected. The contaminants found in the travel blanks can be attributed to one or a combination of five sources: laboratory errors, preservatives, deionized water, bottles/containers, filters, or sampling errors.

Since ETL is an accredited laboratory with high standards of QA/QC, the likelihood of laboratory errors is small. ETL has indicated that occasionally, trace amounts of cations such as calcium, iron, potassium, magnesium, manganese and sodium and trace metals such as aluminum, barium and strontium in the travel blanks can be present. In order to distinguish between the three remaining potential sources of the contamination, all deionized water used during this program was first analysed for ultra-low level metals in the laboratory prior to its shipment and usage in the field. Past laboratory analyses have indicated that deionized water often has trace amounts of sodium and antimony. However, due to the significant number of parameters detected and the level of contamination found in all the travel blanks, contamination cannot be attributed to the above reasons. EBA is left with no other option but to conclude that contamination must have occurred during transportation or during the sampling procedure. Although the source of contamination is unknown, many of the detected parameters are also found, in varying amounts, in cigarette

smoke and gasoline used to power snowmobiles and gas augers. These sources may be the basis for the contamination.

2.1.2 Field Blanks

Multiple sets of field blanks were collected during each sampling event. The field blanks were analysed for total and dissolved ultra-low level metals, total organic carbon, low-level nutrients and low-level routine water chemistry.

Results of the field blanks indicated that there were detectable levels of rubidium, nitrate-N, sulphate, ammonia, phosphorus and total organic carbon (TOC) in the routine water chemistry and nutrient analyses. Levels of silver, aluminum, arsenic, boron, barium, calcium, cobalt, chromium, copper, iron, potassium, magnesium, manganese, molybdenum, nickel, lead, antimony, strontium, silicon, uranium, vanadium and zinc were detected in the total ultra-low level metals analysis. In the dissolved ultra-low level metals analysis, concentrations of aluminum, arsenic, boron, barium, cadmium, calcium, cobalt, chromium, copper, iron, lithium, potassium, magnesium, manganese, molybdenum, nickel, lead, antimony, strontium, vanadium and zinc were detected.

Since the main purpose of a field blank is to test for field contamination, all field blank results were compared to travel blank results. In the previous section, it was indicated that the deionized water used often contains trace amounts of sodium and antimony. Although the dissolved metals were not filtered in the field, they were filtered by ETL prior to analysis. Past studies (EBA Engineering Consultants 2003; EBA Engineering Consultants 2002; Jacques Whitford 1998 and Jacques Whitford 1999) have indicated that filters exhibit concentrations of aluminum, barium, calcium, iron, potassium, magnesium, manganese, sodium, nickel, antimony, strontium and zinc that were above the detection limits. Since the field blanks contained analytes that were not already detected in the travel blanks, EBA is forced to conclude that contamination occurred during field sampling procedures.

2.1.3 Duplicates

Duplicates were collected during each sampling event (one at each station), and were analysed for total and dissolved ultra-low level metals, TOC, low-level nutrients and low-level routine water chemistry. ETL performed a statistical analysis on all duplicate samples to determine if the duplicates were statistically the “same” as or “different” from the

original samples. The results of the analysis indicated that in general the duplicates were the same as their original samples.

3.0 ANALYTICAL RESULTS AND DISCUSSIONS

In general, the water quality of Knife Lake is pristine and reflective of lakes in the region. The physical and chemical water quality parameters of the lake are low. The water quality of Knife Lake is slightly acidic with low electrical conductivity. Nutrient parameters such as ammonia, nitrate and phosphorous were either below the detection limits or very low, which was expected.

3.1 Parameter Highlights

Physical parameters include pH, turbidity, and electrical conductivity. In general, these parameters were normal for lakes in this region under winter conditions.

Nutrients include parameters such as ammonia, nitrate and phosphorous. These parameters were found to be within the expected range for lakes in this region in winter conditions.

Major ions include calcium, potassium, magnesium and sodium. In general, these parameters were found in trace amounts at Knife Lake with little variance. There are no guidelines for comparison with the Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (FAL).

3.1.1 Trace Metals

Laboratory results of total and dissolved metals at Knife Lake ranged from below the detection limit to above the CCME FAL guideline for aluminum, arsenic, chromium, copper, iron, silver and zinc. Table 2 presents a summary of the metals that were below the detection limit, those that were above the detection limit but within the CCME FAL guideline, and those that were above the detection limit and exceeded the CCME FAL guideline.

During the 2004 winter sampling program, concentrations of aluminum were measured to be above the CCME FAL guideline of 0.005 mg/L, in several samples during the sampling program. The elevated aluminum concentrations found in Knife Lake samples during 2004

Table 2: Metals Analyses Comparison

Metals[1] Below Detection Limits	Metals[1] Above Detection Limit but Below CCME FAL[2]	Metals[1] Above Detection Limit and Above CCME FAL[2]
Beryllium	Antimony	Aluminum
Bismuth	Boron	Arsenic
Cadmium	Barium	Chromium
Cesium	Calcium	Copper
Mercury	Cobalt	Iron
Rubidium	Lithium	Zinc
Silver	Potassium	
Titanium	Magnesium	
Thallium	Manganese	
	Molybdenum	
	Sodium	
	Nickel	
	Lead	
	Silicon	
	Strontium	
	Tin	
	Uranium	
	Vanadium	

[1] The following metals were only analysed during the first sampling event: Calcium, Cesium, Potassium, Magnesium, Sodium, Rubidium, Titanium, and Thallium.

[2] CCME FAL - Canadian Council of Ministers of the Environment – Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (Updated 2003)(CCME 2003)

cannot be explained at this time. These levels are higher than what would be expected to occur naturally in background levels. EBA believes that these elevated levels may be from outside sources.

Arsenic concentrations exceeded the CCME FAL guideline of 0.005 mg/L in two samples during the 2004 sampling program. The elevated arsenic concentrations found in Knife Lake samples during 2004 cannot be explained at this time. However, these levels are higher than what would be expected to occur naturally in background levels. EBA believes that these reported values may be due to impact from outside sources.

Copper concentrations exceeded the CCME FAL guideline of 0.002 mg/L in several samples during the 2004 sampling program. The elevated copper concentrations found in

Knife Lake samples during 2004 cannot be explained at this time. Copper is found naturally in the environment and is used commercially for many purposes. These levels are higher than what would be expected to occur naturally in background levels. EBA believes that two of the reported values may be a result of impact from outside sources.

During the 2004 winter sampling program, concentrations of chromium were determined to be above the CCME FAL guideline of 0.001 mg/L, in several samples during the sampling program. The elevated chromium concentrations found in Knife Lake samples during 2004 cannot be explained at this time. However, these levels are higher than what would be expected to occur naturally in background levels. EBA believes that these reported values may be a result of sample contamination.

During the 2004 winter sampling program, concentrations of iron were measured to be above the CCME FAL guideline of 0.3 mg/L, in total metals at Station A during the third sampling event. The elevated iron concentrations found in Knife Lake samples during 2004 cannot be explained at this time. However, these levels may be a manifestation of iron leeching from the organic materials in Knife Lake.

Zinc concentrations exceeded the CCME FAL guideline of 0.005 mg/L in two samples during the 2004 sampling program. The elevated zinc concentrations found in Knife Lake samples during 2004 cannot be explained at this time. However, these levels are higher than what would be expected to occur naturally in background levels. EBA believes that these reported values may be a result of sample contamination.

4.0 CONCLUSION

EBA was retained by De Beers to analyse and report the results from Knife Lake's winter water-quality sampling program, 2004. This document represents a summary report of that program. The results are based on a field program conducted for De Beers' Canada and on the summarized data and analytical results as presented to EBA.

Based on detailed review of analytical results, EBA is of the opinion that there is a potential that water samples may have been impacted further from their natural state by outside sources. Review of travel and field blank data leads to this opinion.

Upon analysing the data, De Beers recognizes the anomalous analyte levels and believes that contamination did occur during the sampling. De Beers will resample Knife Lake during the next work program and use that data to compare against the 2004 results.

Despite the issue of contamination, many of the analytes were below detection levels during the majority of the sampling events. Only six analytes exceeded the CCME guidelines and include aluminum, arsenic, chromium, copper, iron and zinc. In general, the physical and chemical water quality parameters of Knife Lake are low and are consistent for pristine lakes occurring in that region.

5.0 CLOSURE

We trust that this report meets your present requirements. Please contact either of the undersigned should there be any questions.

Respectfully submitted,
EBA ENGINEERING CONSULTANTS LTD.

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Reviewed by:

David Das, Ph.D
Project Director, NWT/Nunavut

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