Mineralogy, Geochemistry, Magnetometer Traverse
Little Gem 'Polymetallic' Au-Ag, Co-Ni (Bi, U, As) Property
Bridge River Mining Camp

Tenure Nos. 501174, 502808, 1020030

Lillooet Mining Division, B.C.

NTS Map Sheet 92J15W
Mineral Titles Reference Map M092J086
Lat. 50°53'36" N, Long. 122°57'28" W

operator
B. Neil Church (Client No. 141798)
600 Parkridge St.
Victoria, B.C., V8Z 6N7

owners
(Client Nos. 141798 and 132841)

Prepared by
B.N. Church, P.Eng.

January 27th, 2015

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Ministry of Energy, Mines & Petroleum Resources
Mining & Minerals Division
BC Geological Survey

Assessment Report
Title Page and Summary

TYPE OF REPORT [type of survey(s)]: MINERALOGY, GEOCHEMISTRY, MAGNETOMETER TRAVERSE

TOTAL COST: $9905.00

AUTHOR(S): B.N. CHURCH Ph.D., P.Eng.

SIGNATURE(S): Neil Church

NOTICE OF WORK PERMIT NUMBER(S)/DATE(S):

YEAR OF WORK: 2014

STATEMENT OF WORK - CASH PAYMENTS EVENT NUMBER(S)/DATE(S): EVENT No. 5535893

PROPERTY NAME: LITTLE GEM

CLAIM NAME(S) (on which the work was done): TENURE NOS. 1020030, 501174, 502808

COMMODITIES SOUGHT: Au, Ag, Co, Ni, Bi, U, As

MINERAL INVENTORY MINFILE NUMBER(S), IF KNOWN: 092JNE068

MINING DIVISION: Lillooet Mining Division

NTS/BCGS: 92J15W (92J.086)

LATITUDE: 50 ° 53 ' 36 " LONGITUDE: 122 ° 57 ' 28 " (at centre of work)

OWNER(S):

1) B.N. CHURCH
Client No. 141786

2) R.H. McMillan
Client No. 132841

MAILING ADDRESS:

600 Parkridge St.
Victoria B.C., V8Z 6N7

OPERATOR(S) [who paid for the work]:

1) B.N. CHURCH
Client No. 141786

2)

MAILING ADDRESS:

600 Parkridge St
Victoria, B.C., V8Z 6N7

PROPERTY GEOLOGY KEYWORDS (lithology, age, stratigraphy, structure, alteration, mineralization, size and attitude):

polymetallic "five element vein model" Au-Ag, Co-Ni (Bi, U, As) in granodiorite of Coast Plutonic Complex, upper Cretaceous, on Cadwallader break continuation

REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS: Assess Rpts. 7704, 11877, 15451, 30031, 30192, 34024

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TYPE OF WORK IN THIS REPORT	EXTENT OF WORK (IN METRIC UNITS)	ON WHICH CLAIMS	PROJECT COSTS APPORTIONED (incl. support)
GEOLOGICAL (scale, area)			
Ground, mapping	1:4255 scale	1020030	1,100
Photo interpretation			
GEOPHYSICAL (line-kilometres)			
Ground			
✓ Magnetic	ground (700 m)	1020030, 501174	2,600
Electromagnetic			
Induced Polarization			
Radiometric			
Seismic			
Other			
Airborne			
GEOCHEMICAL (number of samples analysed for...)			
Soil			
Silt			
Rock	2 samples (37 elements)	1020030, 502808	1,500
Other			
DRILLING (total metres; number of holes, size)			
Core			
Non-core			
RELATED TECHNICAL			
Sampling/assaying	3 samples (37 elements)	1020030, 501174, 502808	2,600
Petrographic			
Mineralographic	(2) X-ray differaction	501174	2,100
Metallurgic			
PROSPECTING (scale, area)			
PREPARATORY / PHYSICAL			
Line/grid (kilometres)			
Topographic/Photogrammetric (scale, area)			
Legal surveys (scale, area)			
Road, local access (kilometres)/trail			
Trench (metres)			
Underground dev. (metres)			
Other			
		TOTAL COST:	$ 9,900

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Appendix B Analytical Results

Appendix C Statement of Qualifications

MineralTitles Online BC

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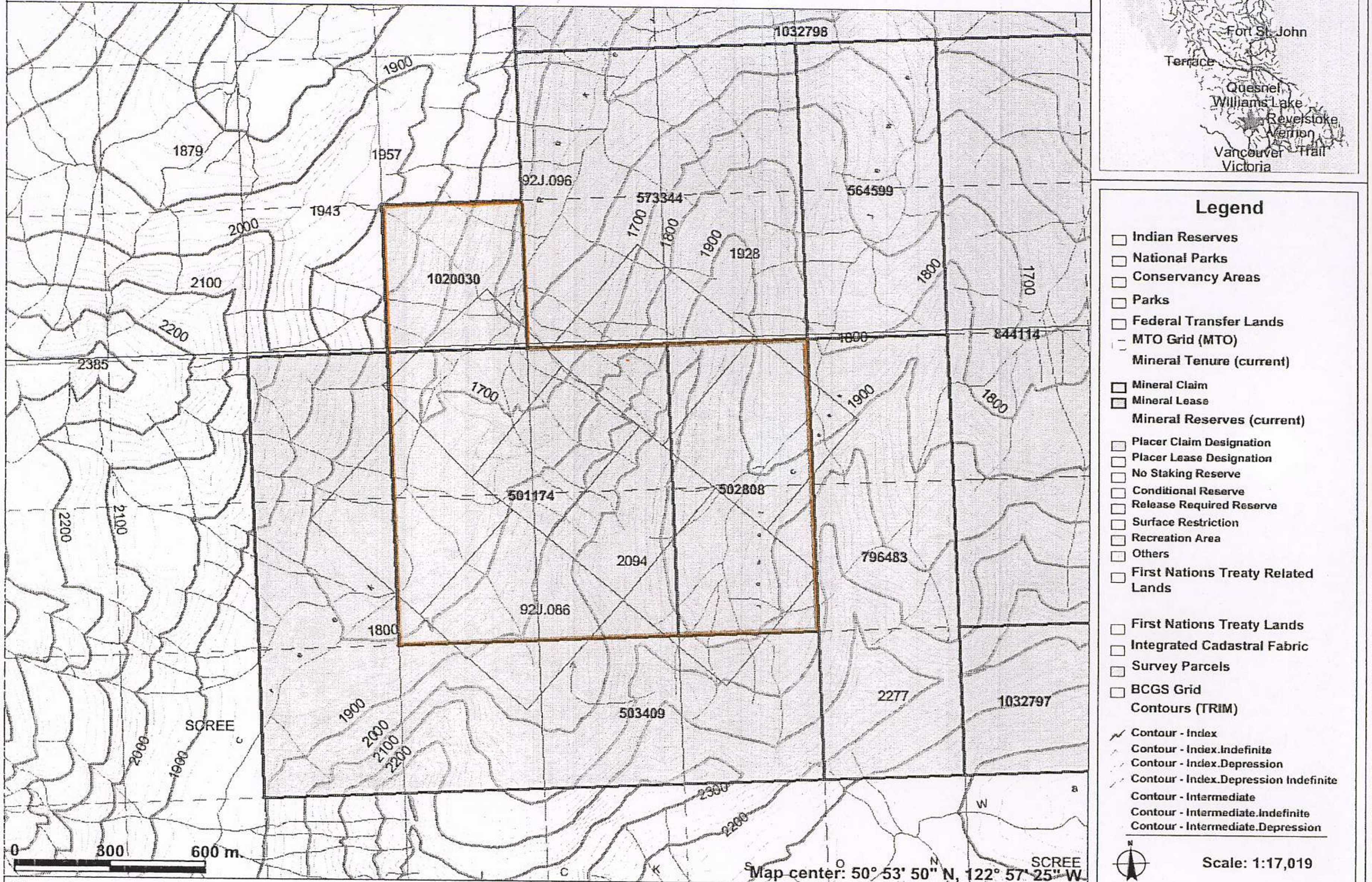

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Summary

The current field work and laboratory results centre on the Little Gem property located in the northwestern part of the NTS 92J/15 map sheet in the Bridge River mining camp. The project is a continuation of a previous study (Church, 2013) and includes a magnetometer traverse along the access road to the property and an investigation of mineralization supported by X-ray diffraction and chemical analysis (ICP-MS, 37 elements).

The deposit profile fits to the "five element vein model" not unlike the arsenide cobalt-rich precious metal (U) veins of the Cobalt-Gowganda area, Ontario, Great Bear Lake, NWT, the world famous Joachimsthal deposit on the Czech-Germany border and the historic Bou Azzer deposit in Morocco.

Several newly discovered minerals at Little Gem include whitlockite, arrojadeite, scorodite, argentojarosite and stephanite.

The data suggests that the ore is the result of **mixing** of diverse saline pre-ore fluids from the cooling granitic rocks of the Coast Plutonic Complex and subadjacent metamorphosed serpentinite that caused a decrease in the solubility of metal-bearing complexes and precipitation of the ore minerals, gold and silver.

Introduction

The Little Gem deposit (Minfile No. 92JNE068) is of interest because of the notable amounts of gold, cobalt and anomalous levels of several other elements including Ag, Ni, Bi, U (As) and some rare-earth elements. Analyses of ore samples average 0.7 to 5.1 per cent cobalt and 0.3 to 1.5 ounces per ton gold and to 3 ounces of silver.

Deposits in the 'five element vein' category were not known, hitherto-fore, to occur in British Columbia (Lefebure, 1996).

Cobalt production is often a by-product of processing copper, nickel, silver and iron ores. The Congo Republic is the foremost historical producer. In the USA, cobalt has been produced from the Gap nickel mine in Pennsylvania, the lead district of southeastern Missouri and the Blackbird mine of Lemhi County, Idaho.

Only at Jachimsthal in the Czech Republic and Morocco has cobalt been produced as a major product from veins.

Bufka and Velebil (2000) report "The historical mining district of Potucky is located in the Krusne hory Mts., 15 km NW of Joachimsthal (Jachymov). During the 16th to 20th centuries the so-called "Jachymov five-element type veins" were exploited; silver, cobalt, bismuth and uranium were successively mined at Potucky. The hydrothermal ore veins were developed within the metamorphosed mantle of the Karlov Vary plutonic massif. There are about 20 ore vein known of the thickness generally in the range of 5-30 cm with becciated and mylonite filling and lens-shaped bodies of quartz. The accumulation of Co-Ni-Bi ores (skutterudite, safflorite, rammellsbergite, niccolite, bismutite) occurs in these quartz bodies. During the development of the deposit, about five mineralizing stages of Variscan age successively occurred as follows: 1. quatz-sulphide, 2. uraninite-carbonate (with fluoride), 3. arsenide, 4. sulpharsenide, 5. sulphide (arsenopyrite, ehacopyrite, pyrite, galena, sphalerite). Relatlvely separated is a younger quartz-hematite mineralization. All types of the ore mineralization overlap with each other, constitution of veins is variable, the vertical zonality of the deposit is also evident: uranium ores appear in the middle and deep parts of veins, silver and sulpharsenide ores in the top and middle parts of deep development of the deposit. During the 18th and 19th centuries, hundreds of kg of silver, 141 tons of cobalt ores and 2243 kg of bismutite were mined out from this deposit. The amount of exploited uranium is not known; after the second World War (1946-1956), about 60 km of mine galleries, with a maximum depth of more than 300 meters was driven. Now the mining district is being liquidated, only the residues of dumps remain by old pits."

The Bou Azzer cobalt deposits of Morocco are associated with serpentinites of a late Proterozoic ophiolite. According to Leblanc and Pierre (1982), they consist of (Ni-Fe) arsenides and sulpharsenides with associated copper sulphides, molybdenite and gold in quartz carbonate gangue. Metamorphism has rendered these deposits in various sizes and shapes of complex shells and lenses. Silver is a minor constituent in these ores compared to the ores of Cobalt Ontario and Eldorado NWT mining districts. The serpentinites are the most likely origin of the cobalt at Bou Azzer, however, the source of arsenic and the quartz-carbonate gangue remains controversial.

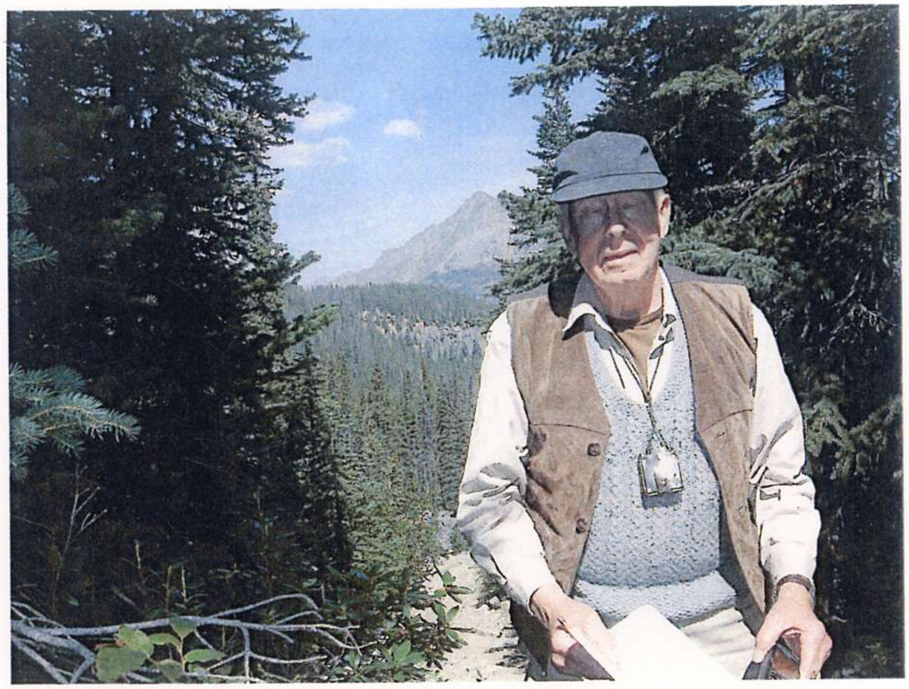


Photo 1 Fieldwork August 2014

Photo 2 Magnetometer Traverse

The Property

The property consists of two 'core' mineral claims, Tenures Nos. 501174 (4 cells) and No. 502808 (2 cells). These claims comprise a total of 122.3 Ha that covers the mine site and immediately surrounding area from the crest of the north spur of Mount Penrose at 2100 m elev. to Roxey Creek at 1700 m elevation (Figure 1, Photo 3). The property overlaps the original eight Crown-granted Little Gem mineral claims (Lots 7566, 7567, 7568, 7729, 7727, 7728, 7730 and 7731). The adjoining, but non-core claim to the west and northwest on the lower east slopes of Mount Dickson, Tenure No. 1020030 (1 cell), covers the upper section of the mine access road at Roxey Creek.

Registered Owners	Tenure No.	Area	Expiry Date
Church, 100%	1020030	20.38 Ha	June 03, 2024
Church, 100% "	502808	40.77 Ha	June 29, 2024
Church, 50%, McMillan, 50%	501174	81.54 Ha	June 29, 2024

The deposit consists mostly of sulpharsenide concentrations and disseminations. The sulpharsenide concentrations form an alignment of pods and lenses that range from a few metres to more than 5 m long and 1.5 m wide developed by three adit tunnels and surface trenching. The disseminated ore, known mostly from drilling, is broad but otherwise ill-defined beyond the vein lenses.

The No.3 adit tunnel, the lowest underground workings at elevation 1855 m, is approx. 500 m ESE by oal road from the cabin-campsite on the east bank of Roxey Creek (Photo 2). Adits No.1 and No.2, at elevations 1905 m and 1887 m, respectively, formerly serviced by a tram line, are now accessed by a steep mountain trail from the No.3 adit portal (Fig. 4a).

The No.1 adit is a well mineralized dog- leg tunnel in the first part that trends E then ENE to 146 m at the face. Surface stripping follows the vein structure to a point 180 m easterly and 140 m above the No.1 portal to just below the ridge-crest on Mt. Penrose. The No.2 adit, located 21 m NW of No.1 portal, comprises 169 m of drifts and crosscuts. The No.3 adit is a 140 m tunnel trending ESE. A well mineralized 16 m interval near the face of this tunnel is about 70 m south and 50 m below the No.1 adit ore zone.

Location and Access

The Little Gem property on Mount Penrose is centered 9.5 km northwest of the town of Gold Bridge. The mine workings are between 1800 and 2000 m elevation centred at Lat. 50°53'36", Long. 122°57'28". Access is by a 4.5 km steep mountain road (Photo 2) that goes south from the Slim Creek logging road at 0.5 km west of the bridge on Gun Creek and the small parking area at the head of the Spruce Lake Trail. The Slim Creek road extends easterly from the park for 8 km joining with the main Gun Lake road near the Gold Bridge airport and the east end of Gun Lake at about 16 km from the town of Gold Bridge via the Lajoie Lake - Downton Lake road

Physiography and Climate

The Bridge River mining camp, where the Little Gem property is located between the rugged Coast Mountains, west of the town of Gold Bridge, and the Shulaps and Chilcotin ranges to the northeast. Elevations vary from 650 m on Carpenter Lake to 2400 m at the summit of Mount Penrose. The area is markedly sculptured by Pleistocene and Recent glaciation which has resulted in the broad and deep valleys occupied by Downton Lake and Carpenter Lake and smaller 'U' shaped hanging tributary valleys such as the valley of Roxey Creek. The north facing slopes and low lands along Gun Creek are heavily forested with stands timber that support intermittent logging operations. Rock exposures occur on ridge tops and in the rugged areas above tree line and along gullies, road cuts, stream banks and shores at lower elevations. North of Carpenter Lake and Gun Creek the valley slopes are more modulated and sparsely timbered with some open exposures.

The varied topography is responsible for significant climatic differences in the region. Summer months are warm and dry - the winter months moderately cold in the valleys and severe with heavy snow conditions in the mountains. With short cool growing seasons and long cold winters only those trees capable of tolerating an extended period of frozen ground occur. The gentle landscape at the upper elevations is open parkland with trees clumped and interspersed with meadow, heath and grassland. Engelmann spruce, subalpine fir and lodgepole pine are the dominant trees. Rhododendron and false azalea are common understory shrubs. In areas of dry conditions forests of lodgepole pine and whitebark pine prevail. In wetter areas, where snowfall is more abundant, mountain hemlock occurs.

History

Evidence of mineralization on the slopes near tree line led to the discovery in 1934 of the 'Little Gem' showings 500 m southeast of Roxey Creek by W. Haymore and W.H. Ball. Their ownership interests were sold to J.M. Taylor and R.R. Taylor in 1937. In the same year the United States Vanadium Corporation optioned the property and in 1938 began work on the No.1 adit. Later that year contractors began work on No.2 adit. In 1939 the company suspended operations in Canada.

Bralorne Mines Ltd. optioned the Little Gem property briefly in 1940. Adit No.2 was extended and two raises were driven. The option was soon dropped due to uncertainties because of war conditions and the lack of a plan for ore treatment.

From 1952 through 1953 Estella Mines Ltd. held an option on the property during which time a switchback road from the bridge on Gun Creek to the camp was constructed and a program of 12 drill holes was completed. Drilling from No.2 adit encountered both disseminated and massive mineralization in several horizontal holes with intersections ranging from 0.5 m to 3.5 m, grading 0.20 to 0.36 oz/ton gold, and 0.9 to 2.34% cobalt. The company was unable to meet payments due in November 1953 and the option was dropped.

Northern Gem Mining Corporation was formed in December 1955 to acquire and develop the property. This company completed a cable tramway, road rebuilding, camp improvements and work on the showings between June and October 1956. Four inclined holes (totaling 212 m) drilled from No.2 adit encountered several mineralized lenses grading 0.04 to 3.26 oz/ton gold, and 0.01 to 2.42 % cobalt. In 1957 the company added 110 m of tunnel drifting and 15 m of crosscutting to No.1 adit. The company also collared No.3 adit completing 153 m of tunneling and 792 m of drilling. In February 1958 a sample of ore (230 kg) was shipped to the Mines Branch in Ottawa for metallurgical testing.

There was little activity on the property from 1958 to 1978. The Canadian Mines Handbook 1974-75 reports an ore reserve for the Little Gem property of 18,140 tonnes averaging 22.64 g/t gold, 3.0 % cobalt and 0.2 % uranium.

Major Resources Ltd. optioned the property and completed a geological review in March 1979. A combined airborne magnetometer - radiometric survey was then carried out followed by various ground-based surveys that included a VLF-EM survey and a soil geochemistry program (Mark, 1979).

Anvil Resources Ltd. renewed exploration of the property in 1984 under an option agreement to purchase the property. A program of data compilation, geology and drilling was completed in 1986. Drilling to test offset faulting of the ore zone on Little Gem No. 4 amounted to a total of 373.8m in two easterly inclined holes. Both holes intersected disseminated sulphides but no important ore grades (Lammle, 1986).

Ownership of the eight Little Gem claims reverted to the Crown in 2004. On November 14th, 2006 the mineral rights of the Crown grants were vested to the mineral cell claims registered over this land and the present owners.

Goldbridge Mining Ltd. optioned the property in October 2007 and subsequently completed road repairs, a hydrological review and a detailed underground rock-chip sampling program of No.1 and No.3 adits. The company was unable to meet obligations and this resulted in termination of the option in November 2010.

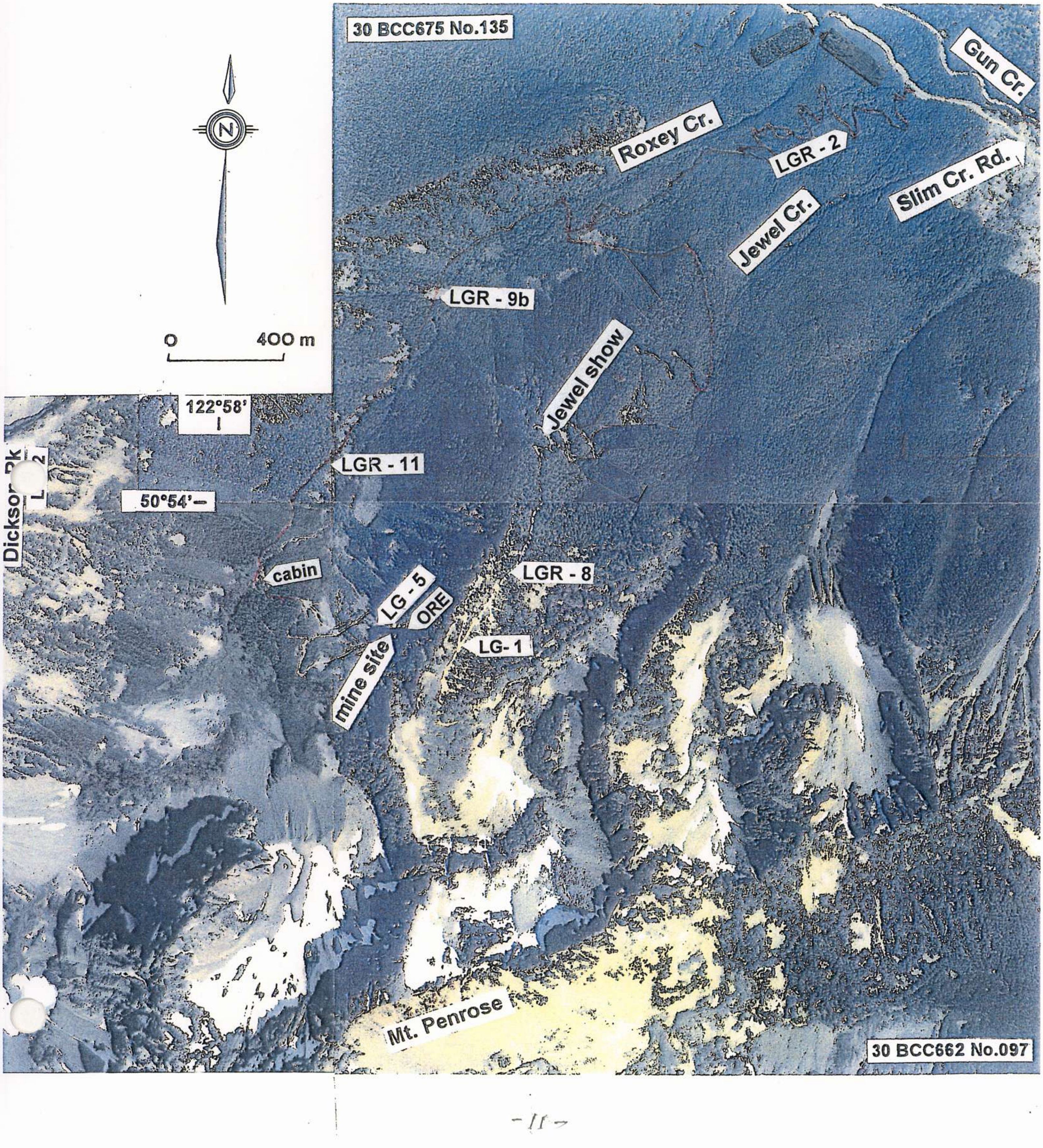
Program

A field investigation of the Little Gem property was completed in the period August 22nd to 24th , 2014. This included a ground-base reconnaissance magnetometer traverse and the collection and analysis of mineralized samples.

The magnetometer traverse was completed along the section of the mine access road from the cabin on Roxey Creek to the northeast boundary of the Tenure No. 1020030 (Figure 4a). The purpose was to delineate primary structures such as dikes, vein fissures and irregularities in the granodiorite beneath medium to thin glacial and post glacial cover.

The sampling program was planned to expand the mineralogical data base to clarify ore genesis and metal dispersion. In particular knowledge of the ore-gossan mineralogy is important for understanding the solution and release of metals into the drainage system.

Photo 3 Project Area
Aerial View



The primary references are the geological maps and reports by Cairnes (1943), Stevenson (1948), Lammle (1986), Church (1996, 2008, 2013), and Beaton (2008).

Regional Geology

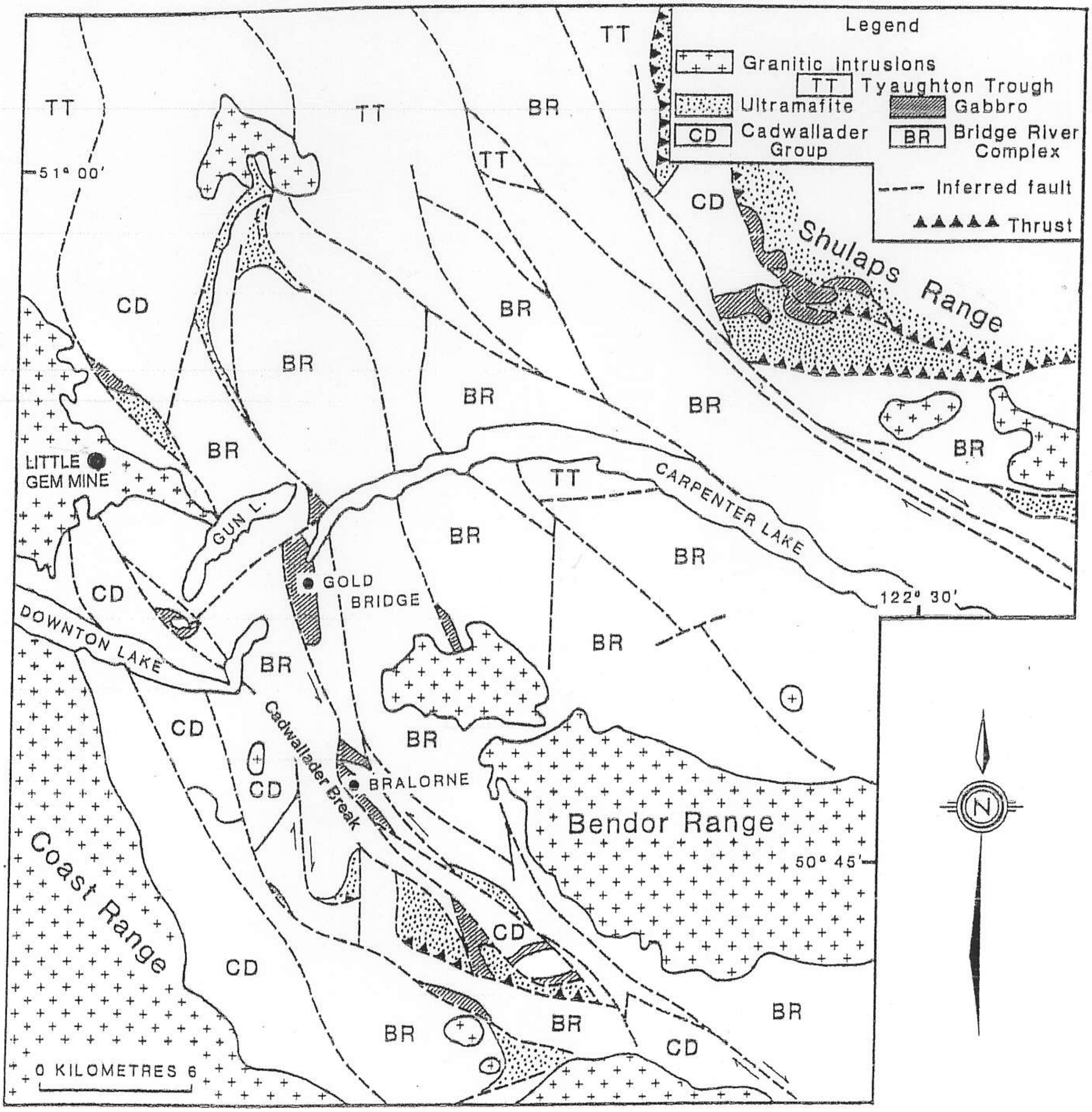
The rocks of the Bridge River mining camp comprise a variety of Paleozoic, Mesozoic and Tertiary sedimentary and volcanic rocks and igneous intrusions (Figure 2). The oldest rocks are deformed and fragmented; greenschist grade metamorphism is common throughout the area. The young cover beds are locally folded and tilted by block faulting and exhibit significant metamorphism, particularly at the contacts of major intrusions (Church, 1996).

The bedded rocks range in age from mid-upper Paleozoic to mid-Tertiary. The oldest rocks are assigned to the Fergusson Group that is a Paleozoic ocean floor assemblage that forms part of a metamorphic terrain referred to here as the Bridge River Complex. The Jurassic and Cretaceous Relay Mountain and Taylor Creek Groups were deposited in a seaway known as the Tyaughton trough that was developed on the Bridge River - Cadwallader basement.

Outlying Tertiary beds (Eocene) are preserved as downfaulted blocks, mainly along the Marshall Lake fault. The youngest Tertiary rocks occur as small remnants of Miocene basalt (Chilcotin Group) uplifted in the Coast Range.

The igneous intrusions span about the same age range as the bedded rocks. The oldest intrusions are the Permo-Carboniferous Bralorne gabbro-diorite. These rocks occur along many of the major faults, accompanied by ultramafites and small granitic stocks. The principal ultramafic bodies are the Shulaps Complex and the 'President Intrusions'. These may be part of a disrupted ophiolite complex of about the same age as the Bralorne intrusions, although there is no sheeted dyke system such as usually seen in association with ophiolites. The Coast Plutonic Complex comprises an assortment of Cretaceous and Early Tertiary granite to diorite plutons and similar satellitic stocks occurring along the axis of the Coast Range Mountains. The Middle Eocene Rexmont porphyry is the youngest of the major intrusions. A variety of basic to felsic dikes related to this pluton and to volcanic rocks of several ages are found throughout the area..

Figure 2 Geology, Bridge River Area



(after B.N. Church 1995)

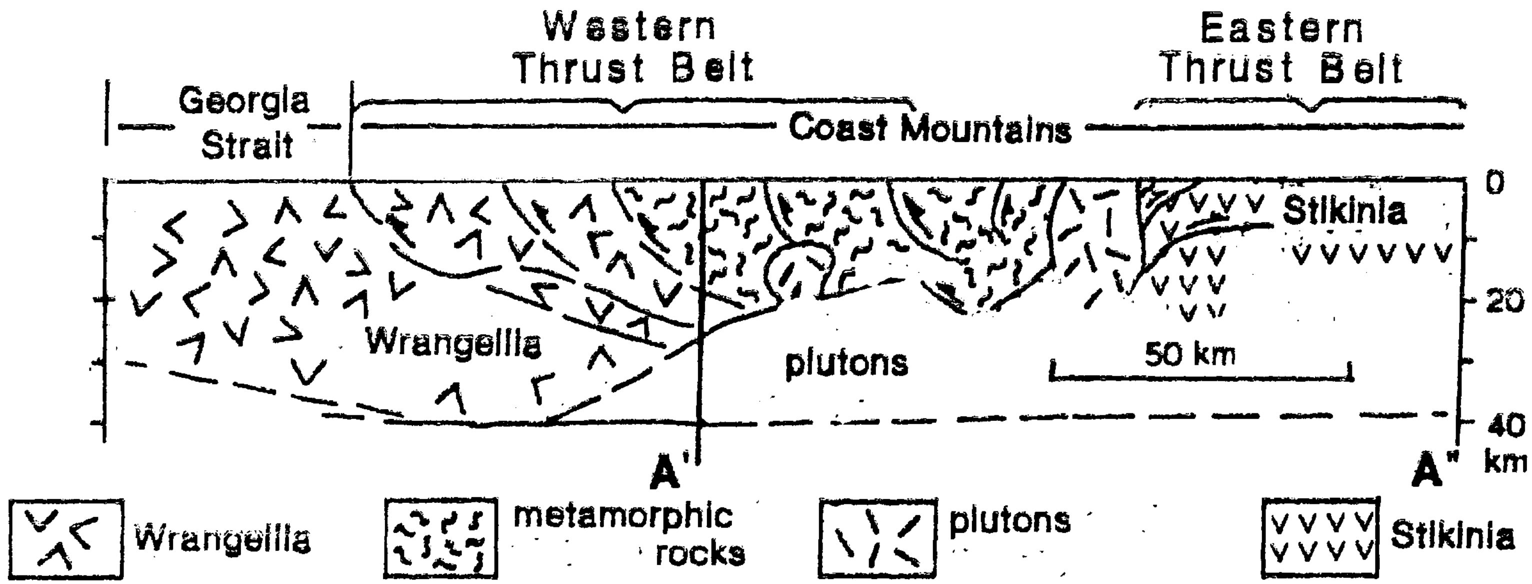


Figure 3. Schematic cross section

Table 1 Description of Samples

Sample	Notes	Location Lat.	Long.	Weight (g)	Volume (ml)	Density (g / ml)
LGR 2	pyrite+chert	50^54.8'	122^57.86'	28.8	8.3	3.47
LGR 8	granodiorite	50^54.0'	122^57.00'	198.2	73.1	2.71
LGR 9a	gossan	50^54.1'	122^57.58'	36.3	14.2	2.56
LGR 9b	qtz+gossan	50^54.5'	122^57.22'	97.6	37.4	2.61
LGR 10	gossan/clay	50^54.2'	122^57.52'	37.7	14.2	2.65
LGR 11	qtz+gossan	50^54.2'	122^57.46'	36.7	13.5	2.72
LG 5	black ore	50^53.9'	122^57.48'	303.1	68.1	4.46
LG 5/2	black ore					na
LG ore	main zone	50^53.6'	122^57.45'			na
LG ore 2	ore					na
control	Kspar	na	na	80.9	32.1	2.528
control	pyrite	na	na	41.5	8.4	4.941
control	quartz	na	na	161.1	6.2	2.601

Photo 4 Quartz-Carbonate Vein Fragment

Photo 5 Biotite Hornblende Granodiorite

There is consensus that the major vein systems of the area, in particular the Bralorne and Pioneer mines, are Late Cretaceous between the age of the Bendor pluton (~ 63.4 Ma) and the Dickson Peak - Mount Penrose lobes of the Coast Plutonic Complex (~92 Ma) – Hart et al (2009). This is about the same time required for the intrusion and cooling of the Sierra Nevada Batholith (USGS Bulletin 1799).

Figure 3 is a schematic cross-section of the Coast Range Mountains adapted from Rusmore and Woodsworth (1991). This shows the development of flanking east and west verging thrust faults accommodating emplacement of the Coast Plutonic Complex. It is suspected that metamorphism of the subjacent country rocks included thermal overprinting of serpentinites on intruded sections of the Cadwallader fault zone.

Local Geology

The Little Gem property extends from the north slope of Mount Penrose east of Dickson Peak to the confluence of the Gun Creek and Roxey Creek (Figures 1,2). This area is underlain by granitic rocks of the Coast Plutonic Complex and ultramafites on the northern extension of the Cadwallader fault These are the major geological units and structures important to the mineral deposits as host rocks and possible sources of the mineralizing fluids.

The Coast Plutonic Complex ranges in composition from granite to granodiorite (Photo 3, stations LG-1, LGR-8). These rocks are usually massive and unfoliated (Photo 5). A combination of sheeting fractures and widely spaced vertical joints gives a blocky aspect to large outcrops in the alpine areas. The rock is equigranular or, more commonly, porphyritic. A typical sample has a normative mineralogy of Qz 20.6 %, Or 14.9 %, Ab 31.1 %, An 20.7 %, Wo 0.4 %, En 6.8 %, Fs 3.3 %, Il 0.8 % and Mg 1.4 %. Rectangular plates of plagioclase ranging to 6 mm in length, that are set in an interlocking groundmass of smaller crystals consisting of plagioclase, quartz, amphibole, biotite, alkali feldspar and accessory magnetite, sphene and apatite. Quartz also occurs interstitially and forms inclusions in other minerals. Potassium feldspar is younger than plagioclase and commonly accompanies quartz interstitially or as part of the hypidiomorphic granular texture. Amphibole and biotite form ragged or irregular-shaped solitary plates between feldspar and quartz crystals or in crystal concentrations together with accessory magnetite, apatite and sphene.

The ultramafic rocks are well exposed north of the Mount Penrose granodiorite by the Jewel workings north of the Little Gem mine. These are massive brown and tan weathered rocks that break with difficulty into rough faced irregular lumps. Fresh surfaces display mottling consisting of irregular gray patches, to 1.5 cm across, set in a dense, dark green to black matrix. The rock consist of orthopyroxene, antigorite, talc, magnetite and chromite. The orthopyroxene occurs as individual grains, or clusters of grains, in a matted matrix of antigorite traversed by seams of talc. This assemblage, together with a small amount of magnesite and calcite is the result of alteration of the original peridotite rock where part of the original pyroxene and all of the olivine of has been serpentinized. Where alteration of the pyroxene is advanced, the antigorite replacement is commonly charged with opaque magnetite granules. The texture of the rock is predominantly pseudoporphyritic owing to the large size of some of the original olivine and pyroxene phenocrysts.

Geochemical Results

For this study ten samples of vein mineralization, the rock and gossans from the access roads and Little Gem mine area were submitted for analyses (Appendix B-1, Figure 4a, b, Photo 3, Tables 1, 2).

The samples were collected and processed by the author and assistant then shipped to Acme Analytical Laboratories Ltd. in Vancouver, B.C. At Acme the samples were analysed for 10 major elements (Ti, Al, Fe, Mn, Mg, Ca, K, Na, P, S) and 28 minor elements (Ag, As, Au, B, Ba, Bi, Cd, Co, Cr, Cu, Ga, Hg, La, Mo, Ni, Pb, Sb, Sc, Se, Sr, Te, Th, Tl, U, V, W, Zn). In accordance with Acme's 'AQ 250 package', the analytical procedure followed a routine whereby the samples were subjected to aqua regia digestion and final determination by ICP-mass spectrometry.

The Acme Laboratories brochure entitled 'Service and Fees' (Appendix B-1) provides details of the ultratrace exploration geochemical method and detection limits for the elements.

The most detailed previous study of the Little Gem ore is a Mines Branch investigation of a 500 pound composite samples from three levels of the underground workings submitted by Northern Gem Mining Corp. Ltd.

According to Hughson (1958), a light fraction (S.G. < 2.98), representing 20 per cent of the sample, is composed mostly of feldspar, quartz, calcite, dolomite and minor siderite. The combined carbonate content of the sample is 9 per cent. Approximately one half of the sample (S.G. > 3.40) consists of metallic ore minerals, minor allanite, biotite, chlorite and traces of uraninite, native gold and anatase; biotite and biotite altered to chlorite comprises about 15 % of the sample. The metallic ore minerals consist largely of arsenopyrite (FeAsS) and safflorite((Co, Fe)As_2). Partial chemical analyses show the arsenopyrite contains Co, 5.50 %; Ni, 0.28 %; Fe, 25.8 %; S, 15.2 % and safflorite Co, 6.39 %; Ni, 0.38 %; Fe, 19.9 %; S, 1.31 %. Native gold is present as very fine grains preferentially associated with the supharsenides.

The results of analyses of vein samples are given in Appendix B-1. These are LG-5, LG-ore and LGR-2. Samples LG-5 and LG-ore are generally in accord with previous assay results for the Little Gem sulpharsenide ore, i.e. cobalt (Co) > 4,000 ppm; arsenic (As) > 10,000 ppm; iron (Fe) 9.42 to 34.79 %; and sulphur (S) ranging from 5 to 10 %. In comparison, sample LGR-2 , a sulphide - chert breccia (S.G. 3.47) from the Roxey Creek area, reports low metal values except for iron.

Samples LG-5/2, LG-ore and LG-ore-2 are replicates cut to 50%, 50% and 25% , respectively to determine the upper range limits for cobalt , arsenic and silver etc.

Sample LG-5 from below the mine site was thought to be a dike rock however, the density S.G. 4.46 greatly exceeds readings for any common igneous rock type. Also, assay results show high values of gold (Au) 48.69 ppm, silver (Ag) 108 ppm, cobalt (Co) 2,466 ppm and arsenic (As) > 1.0 % in addition to anomalous lead (Pb) 3,038 ppm, antimony (Sb) 1,598 ppm, bismuth (Bi) 1,655 ppm, tellurium (Te) 312.8 ppm) and mercury (Hg) 26.5 ppm. It is noted that some of these elements, especially arsenic, antimony and bismuth, are characterisically enriched in late magmatic crystalates.

The gossan samples (Table 1, samples, LGR-9 to LGR-11) are from talus on the lower east slopes of Mount Dixon accessed from the upper section of the Roxey Creek road. This material is massive or laminated rust-brown limonite with quartz or quartz-carbonate layers / pockets (Photo 4).

The gossans represent weathered caps to the veins formed by the oxidation of sulphides and the leaching out of sulphur and most metals, leaving mainly hydrated iron oxide and quartz. (Prospectors commonly target gossans as a guide to buried ore or the gossan itself as a ready source of free gold.) Assay results for these samples give the following range of values for the major elements; calcium (Ca) 2.26 – 18.83 %, iron (Fe) 1.58 – 5.48 %, magnesium (Mg) 0.05 – 4.63 %, aluminium (Al) 0.12 – 0.17 %, sulphur (S) < 0.02-0.06 %, and for the minor constituents, manganese (Mn) 617 – 1429 ppm, strontium (Sr) 275 – 617 ppm, barium (Ba) 25.4 – 117.2 ppm, arsenic (As) 13.8 – 76.2 ppm, and gold (Au) 0.5 – 117.2 ppb.

Mineralogy

X-ray diffraction analyses of mineralized samples are provided in Appendix B-2 as received from the University of Alberta. These data include diffractogram charts and line intensity d(A) tabulations for LGR-2, a chert – sulphide sample from the Roxey Creek access road, and LG 5 representing 'black ore' from the Little Gem mine area.

Sample LGR-2 consists of sub-angular gray chert clasts 0.5 to 1.5 em surrounded by about an equal amount of fine grained pyrite. According to X-ray results the accessory minerals include albite, clinochlore, muscovite and ammonioalunite. Ammonioalunite forms a solid solution series with ammoniojarosite. These minerals occur as yellowish-brown, fine grained crusts and botryoidal masses in the outer part of medium to lower temperature alteration zones.

Sample LG-5 is a fine grained black ore whereon close examination shows it to be a sulphide-charged microbreccia.. X-ray analyses indicates the prinicipal primary minerals are quartz, arsenopyrite and stephanite. Stephanite is a silver antimony sulfosalt (Ag_5SbS_4) composed of 68.8 % silver. In the USA it is an important ore mineral in the Comstock Lode, Virginia City, Nevada. It is also an ore mineral known at Joachimsthal in the Czech Republic. The presence of stephanite at Little Gem is confirmed by X-ray diffraction analysis – where the strongest line at d(A) 3.08 is accompanied secondary lines, by intensity, at d(A) 2.58, 2.89, 2.13, 2.19 and 1.834. It is often massive and metallic iron-black colour that soon becomes dull on exposure to light. It is usually primary in origin and found in the upper parts of veins where it has been deposited from warm ascending solutions late in the history of the deposit.

Alteration accompanying the black ore occurs as a yellowish rust-brown encrustation containing scorodite, argentojarosite and the rare phosphates, whitlockite and arrojadite. Scorodite ($FeAsO_4.2H_2O$) is by far the most common arsenate. It is the alteration product of arsenic minerals found in the upper portions of an ore vein. The presence of scorodite usually involves the oxidation of arsenopyrite in acid conditions to give locally high arsenic and iron activities, that ends in the precipitation of scorodite. The persistence of scorodite in nature suggests that its buffered low solubility may control the concentration of arsenic in natural waters. Argentojarosite $Ag,Fe_3(SO_4)2.(OH)_6$, containing 16.7 to 18.9 % silver, is the most important mineral in the ammoniojarosite-ammonioalunite series.. It is an uncommon secondary mineral occurring as scaly masses of minute crystal with hexagonal outline or in pulverulent crusts in the oxidized portions of silver- sulfide bearing mineral deposits. The definitive X-ray pattern gives the strongest diffraction line at d(A) 3.062 followed by secondary lines at d(A) 5.98, 3.681, 2.524, 2.218 and 1.979. Whitlockite $Ca_3(PO_4)_2$ is a late hydrothermal mineral often found lining open cavities. Arrojadite is a complex hydrous aluminum phosphate.

Ground Magnetometer Traverse

A ground-base reconnaissance magnetometer traverse was carried on the Little Gem property during August 2014. The survey was completed along a 700 m section of Little Gem mine access road west of Roxey Creek beginning near the cabin on mineral claim Tenure No. 501174 running thence northeasterly in a diagonal fashion across Tenure No. 1020030 to near the northeast boundary corner of this claim (Figure 4a, Photo 2).

A McPhar M700 vertical field magnetometer employing the fluxgate principle was used. A base station was setup by the base camp near Roxey Creek and the instrument calibrated such that an optimum operating range of values would be used during the survey. As the survey proceeded readings were checked back against a base station (R-0) and corrected relative to 57,840 gammas absolute - the value for this site as read from the contoured Federal/Provincial Tyaughton Lake BC Geophysical Series Map 8552G, Sheet 92J/15, (1:63,360 scale). For convenience, and to better fit with a local airborne magnetic survey, the base reading at R-0 was arbitrarily reset to -1650 gammas (Table 2).

Table 2 Magnetometer Results

Station	Easting	Northing	adjust	Gammas	Time
R-0	502712	5638544	0	-1650	16.11
R-1	502697	5638614	-38	-1600	16.25
R-2	502747	5638712	-31	-1900	16.35
R-3	502726	5638799	-43	-1900	16.38
R-4	502831	5638892	-42	-1825	16.42
R-5	502894	5638986	-54	-2050	16.46
R-6	502972	5639052	-93	-2150	16.51
R-7	503016	5639102	-50	-1650	17.05

Mark (1979) reported on an airborne magnetic survey conducted by Major Resources Ltd. over the property and surrounding area. The survey was flown at 30-meter terrain clearance on east-west lines with a separation of about 200 meters. According to this report granodiorite occurs southwest of the large serpentine body (on what is projected to be the continuation of the Cadwallader break). About half of this area consists of magnetic highs of moderate intensity which is a reflection of unaltered granodiorite. The magnetic contour map of the survey contains numerous lineaments indicating the area is well-dissected with geological structures.
On the Little Gem property the survey reveals a significant EW-trending magnetic low that is broadly coincident with the zone of adits and surface workings that extends aeross the north spur of Mount Penrose towards Jewel Creek.. According to the company report "This is, no doubt, caused by the shearing, faulting and alteration associated with sulphide mineralization which occurs in this area." Indeed, Lammle (1986) shows faulting, dykes and ankerite alteration associated with the mineralization. This zone of magnetic lows joins a broad NS 'valley' of negative readings in the central part of the property that is bounded on the west by Roxey Creek .

The magnetometer traverse along the Roxey Creek road, this study, adds little to understanding the underlying structure beyond the work of Major Resources, other than to say the readings generally decrease northerly by 500 gammas from station R-1 near the upper ford on Roxey Creek to R-6 at northeast boundary of Tenure No. 1020030 (Table 2). Then there is a sudden increase at R-7 to match the readings at R-1 and R-0 (given a 50 gamma reading diurnal correction.) The sudden change at R-7 may indicate a fault in a granite / granodiorite transition on Mount Dixon.

Diseussion

The Little Gem deposit probably fits the intragranitic vein model. Accordingly, mineral concentrations occur in short, steeply dipping veins associated with diorite-microdiorite dykes and sills. Carbonates are often the main gangue component although quartz is ubiquitous together with accessories such as K-spar, apatite, chlorite and epidote. The mineral succession in the veins indicates that the mineralizing fluids change with time from lower to higher pH values and in chemical composition from silicic to carbonate-rich. The ore minerals, when present, are usually found between the carbonates an silicates. Variations occur where repeated opening has produced ribbons with screens of wall rock.

The solutions that deposited the arsenide ores are interpreted to have been initially at high temperature. Indeed, it has been noted at Little Gem that the ore minerals are partly intercrystallized with the granodiorite wall rocks suggesting a common magmatie origin (Cairnes, 1943). Elsewhere, such as in altered dyke rock, disseminated ore minerals are found in direct contact with chlorite (clinochlore) suggesting that the growth of chlorite and the mineralizing event were broadly coeval. Metals originally derived from magmatic sources or from country rocks were probably transported as chloride-rich brines or possibly sulphates from which the ore minerals were precipitated in response to a decrease in temperature, a decrease in pressure associated with boiling and reaction with the wall rocks or solution mixing..

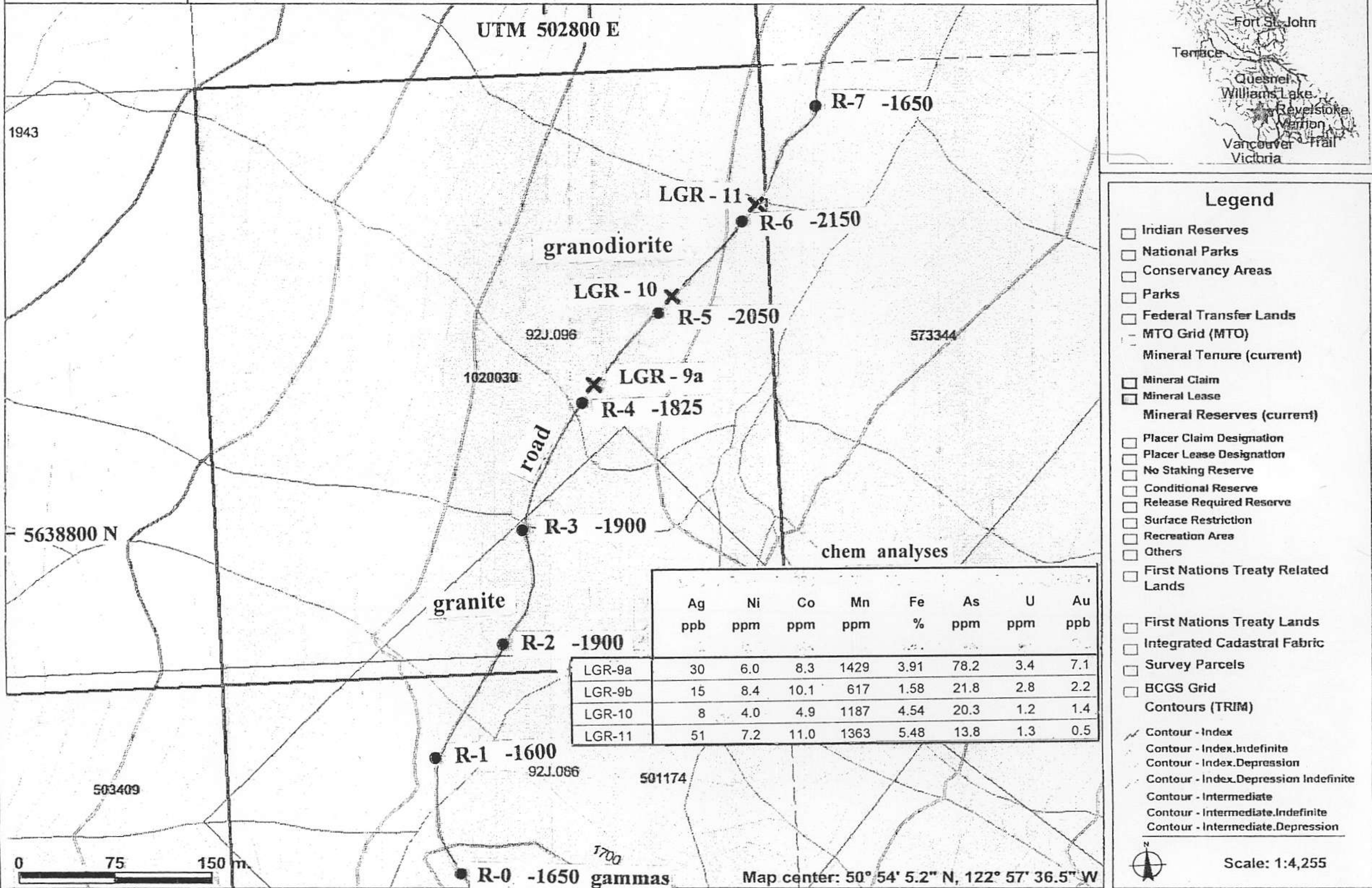
The origin of cobalt, arsenic and uranium is generally understood. Cobalt is siderophile, to less degree chalcophile, and correlates with magnesium and nickel in ultramafic and mafic rocks. The discovery of the accessory minerals 'cronstedtite' and 'godlievskite' points to ultramafic source rock (Church, 2013). Arsenic is strongly chalcophile and commonly associated with epigenetic gold ore. Grantitic or felsic rocks may be the most likely source of U-bearing arsenide vein systems It is possible that uranium was released at the interface where ascending reducing fluids encountered metal-saturated brines of low pH at an early stage of hydrothermal activity.

The discovery of stephanite, a sulphosalt mineral, completes the picture. Sulphosalts are a group of sulphide minerals, usually black and dense, in which antimony, arsenic and bismuth join at the low temperature, low pressure end stage with a truly metallic element to form a double salt that may have supergene or primary origin. In this case the association of stephanite with fine grained crushed quartz suggests a replacement lode in a fault zone i.e. Comstock, Nevada.

Conclusions and Recommendations

The Little Gem deposit fits the polymetallic cobalt-nickel sulpharsenide – precious metal vein sub-type model, not unlike deposits typical of the Cobalt – Gowganda region of Northern Ontario (Ruzicka and Thorpe, 1995). The data suggest that ore precipitation began when highly saline pre-ore fluid mixed with a second, genetically unrelated, weakly saline fluid. Variable dilution upon mixing formed the synore fluid, decreasing the solubility of the metal bearing chloride complexes causing precipitation of the ore minerals, gold and silver (Marshall et al., 1993).

Figure 4a Mag Geo Stations

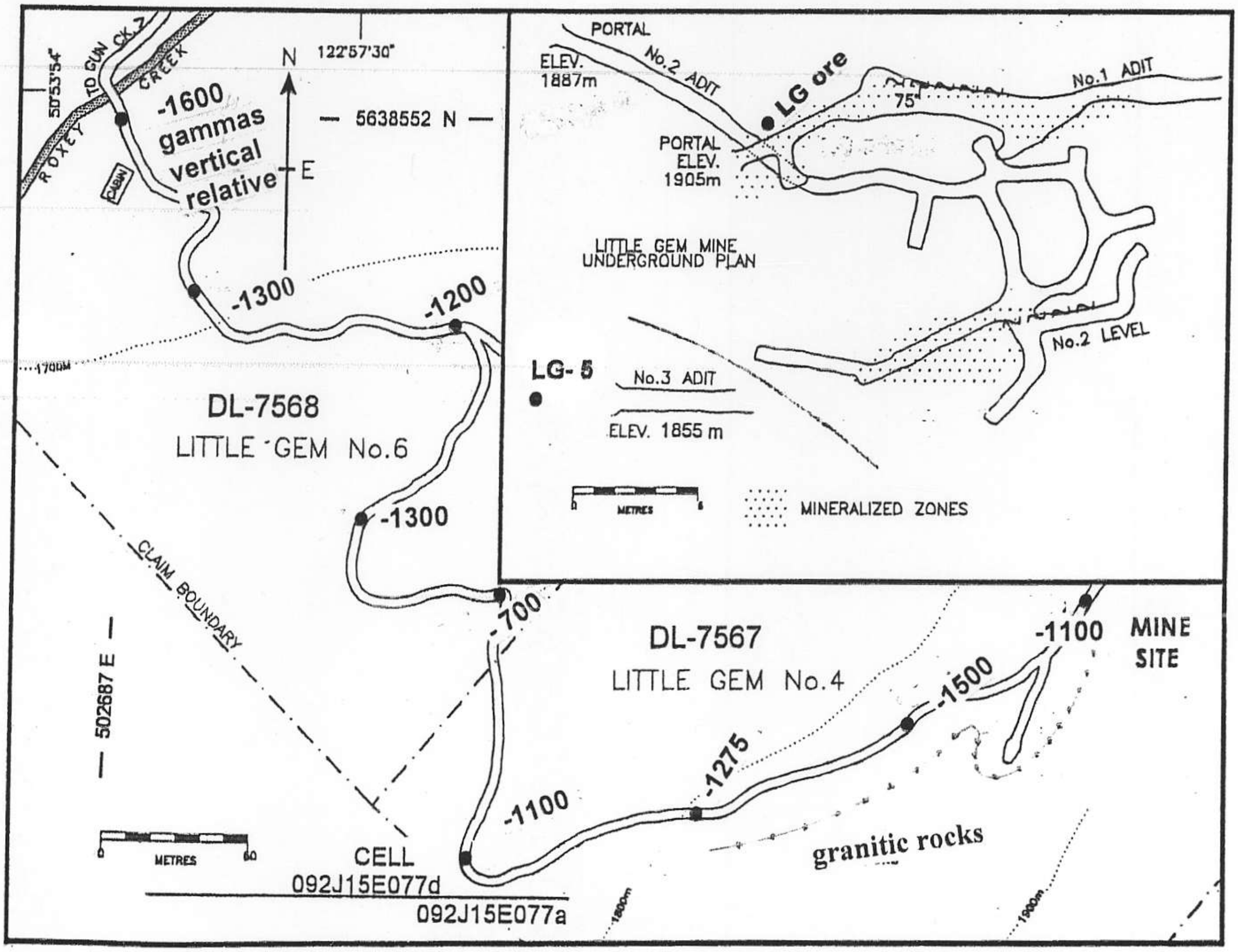


chem analyses

	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb
LGR-9a	30	6.0	8.3	1429	3.91	78.2	3.4	7.1
LGR-9b	15	8.4	10.1	617	1.58	21.8	2.8	2.2
LGR-10	8	4.0	4.9	1187	4.54	20.3	1.2	1.4
LGR-11	51	7.2	11.0	1363	5.48	13.8	1.3	0.5

(vertical , relative)

Figure 4b Mag Geo Stations



chem analyses

	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb
LG-5	>100000	142.6	>2000	21	34.79	>10000	<0.1	48697.5
LG-5/2	54186	78.2	1233.3	23	17.54	>10000	<0.1	25231.7
LG-ore	223	2964.2	>2000	162	10.96	>10000	12.4	10791.6
LG-ore2	231	1461.0	>2000	85	5.35	>10000	5.7	5470.6

A possible source of the mineralizing solutions is the SE trending regional fault, known as the 'Cadwallader Break' – the projection of a major splay in this fault system aligns with the Little Gem deposit in the Mount Penrose lobe of the Coast Plutonic Complex (Figure.2). The main origin of hydrothermal fluids is probably related to the cooling and magmatic differentiation of the granitic intrusions on Mount Penrose. A second stream of mineralizing fluids likely came from the ultramafic rocks, in particular, serpentinite associated with the 'Cadwallader Break'. Contact metamorphism resulting from pluton intrusion of ultramafite would reverse the serpentinization process releasing much water (~12%) and probably iron, nickel and cobalt.

Recommendations for future exploration and development are:

(1) determine the age of the deposit (vein K-spar) and the granodiorite host rocks (hornblende, biotite);

(2) test the continuity of the ore zone, EM and/or SP geophysical program

(3) a drill program across the prominent easterly trending magnetic low 'alteration zone' in the central-northeast side of the property;

(4) repair, restore or relocate washed-out roads and trails.

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Appendix A

Statement of Costs (Estimate)

Labour: geological engineer, Neil Church, P.Eng.		
August 21-24th, 2014; 3 days @ $850/day =	$2,550	
geological assistant, David Church, P.Eng.		
August 21-24th, 2014; 3 days @ $700/day =	$2,100	
		$ 4,650.00
Accomodation: (2 nights x 2 persons)		$ 180.69
Meals: (2 persons x 3 days) $ 80.32 + $ 100.00 + $ 60.26		$ 240.58
Equipment Rental: Magnetometer + GPS unit		$ 240.00
Vehicle costs: 4x4 truck – 3 days @ $85/day + $0.40/km		$ 490.00
Repairs		$ 178.00
Fuel ($ 65.55 + $ 84.47 + $ 45.16)		$ 195.18
Ferry costs: vehicle + passengers ($ 88.80 + $ 88.50)		$ 177.30
TRIM topographic maps		$ 24.00
Geological map		$ 20.00
Shipping costs ($ 17.60 + $ 22.74)		$ 40.34
Assay costs (Acme Analytical Laboratories Ltd.)		$ 263.55
X-ray diffraction analyses (est)		$ 200.00
Report & other preparation costs: M. Church, D. Church & N. Church		
5 days @ $ 500/day		$ 2,500.00
Drafting etc.		$ 286.11
Typing		$ 40.00
Photography		$ 80.00
Copying costs		$ 100.00
Total		**$ 9, 905.72**

Shipment Receipt

Purolator

FROM/DE

B neil church
600 PARKRIDGE ST

VICTORIA, BC V8Z 6N7
(250) 727-3279

TO/A

Acme analytical laboratories
Vancourver ltd

9050 SHAUGHNESSY ST

Vancouver, BC V6P 6E5
(604) 253-3158
Canada

Total Cost
$17.60

DATE	PIECES	WEIGHT/POIDS
29 Dec 2014	1 of/de 1	1.00 lb.

PIN	330334286235
Package Type	Express Envelope
Premium Service	Purolator Express Envelope

Declared Value	
Adjusted Weight	1.00 lb.
Transit Time	1 Day
Cost	$16.76
Tax	$0.84
Total	$17.60

Payment Method

Credit Card
- [x] Visa
- [ ] MasterCard
- [ ] Amex
- [ ] Debit
- [ ] Cash
- [ ] Business Cheque

Customer's Signature

For Shipment tracking information, please go to www.purolator.com or contact 1-888-SHIP-123

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600 PARKRIDGE ST

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(250) 727-3279

TO/A

UNCIVERSITY OF ALBERTA
X-RAY DIFFRACTION

32 UNIVERSITY CAMP NW
SUITE 1-26 DEPT EARTH & ATMOSOHERIC

Edmonton, AB T6G 2E3

Canada

Total Cost
$22.74

DATE	PIECES	WEIGHT/POIDS
01 Dec 2014	1 of/de 1	1.00 lb.

PIN	330311888128
Package Type	Express Envelope
Premium Service	Purolator Express Envelope

Declared Value	
Adjusted Weight	1.00 lb.
Transit Time	1 Day
Cost	$21.66
Tax	$1.08
Total	$22.74

Payment Method

Credit Card
- ☐ Visa
- ☐ MasterCard
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☐ Cash
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AcmeLabs

Bureau Veritas Commodities Canada Ltd.
9050 Shaughnessy St.
Vancouver, BC Canada V6P 6E5
Phone 604 253 3158 Fax 604 253 1716
GST # 843013821 RT

Bill To: B.N. Church Geological Services
600 Parkridge St.
Victoria, BC V8Z 6N7
Canada

Invoice Date: January 14, 2015
Invoice Number: **VANI218760**
Submitted by: B. Neil Church
Email: bnchurch@shaw.ca
Job Number: VAN14004121
Order Number:
Project Code: Little Gem
Shipment ID:
Quote Number:

Item	Package	Description	Sample No.	Unit Price	Amount
1	BAT01	Batch surcharge for <20 samples	1	$50.00	$50.00
2	SLBHP	Sort, label and box pulp samples	10	$0.60	$6.00
3	AQ250	0.5g Basic Suite (37 elements)	10	$19.40	$194.00
4	DRPLP	Dispose or return handling of pulps	10	$0.10	$1.00
			Net Total		$251.00
			Canadian GST		$12.55
			Grand Total	CAD	**$263.55**

Invoice Stated In Canadian Dollars

Payment Terms:

Due upon receipt of invoice. Please pay the last amount shown on the invoice.

For **cheque payments**, please remit payable to: Bureau Veritas Commodities Canada Ltd., 9050 Shaughnessy St. Vancouver BC, V6P 6E5
Please specify invoice number on cheque remittance.

For **electronic payments**, please wire funds to one of the following accounts:

For payment in Canadian Funds:
Bureau Veritas Commodities Canada Ltd.
HSBC
885 West Georgia St
Vancouver, BC Canada V6C 3G1
Account # 428755-001
Bank Transit # 10270-016
Swift Code: HKBCCATT

For payment in US Funds:
Bureau Veritas Commodities Canada Ltd.
HSBC
885 West Georgia St
Vancouver, BC Canada V6C 3G1
Account # 428755-070
Bank Transit # 10270-016
Swift Code: HKBCCATT

Please specify invoice number for reference on transfer forms when making payment.
For any enquiries please contact us: AccountReceivable.VAN@acmelab.com

ACME LABS

9050 Shaughnessy St. Vancouver BC V6P 6E5
T: 604-253-3158 F: 778-329-9729 ***WWW.Acmelab.Com***

TRANSACTION APPROVED - THANK YOU

Payment Details

Transaction Type: PURCHASE

Transaction Amount: $263.55 (CAD)

Order ID: VAN14004121
Card Num: [redacted]
Card Type:: VISA
Resp Code - ISO Code: 027 - 01
Auth Code: 093685
Reference Num: 661383650018750060 M
Date/Time: Jan 22 2015 04:33PM

SIGNATURE
Cardholder will pay card issuer above amount pursuant to Cardholder Agreement

Item Details

Description	Product Code	Quantity	Price
		Total CAD:	$263.55

Customer Details

Customer ID: BN Church Geological Service

Address Details

Billing

UNIVERSITY OF ALBERTA

Financial Services
Attention: Accounts Receivable
3rd Flr, Administration Building
Edmonton, Alberta, T6G 2M7

Please send payment to above address

Neil Church
600 Parkridge Street

Victoria, BC V8Z 6N7

Statement Number: 342
Statement Date: 12/31/2014
Account Number: GAR28341

Item	Date	Invoicing Dept.	PO Number	Item Type	Item Amt	Due Date	Balance
UA166652	12/24/2014			Invoice	200.00	01/23/2015	200.00

Statement Total (CAD) 200.00

	Future	0 - 30	31 - 60	61 - 90	Over 90	Total
No. of Items		1				1
Amount		200.00				200.00 CAD

YOUR ACCOUNT IS NOW DUE AND PAYABLE

If you have any questions about your account, please call 780-492-0698 or 780-492-6299. If you have made payment before receipt of this statement, please disregard this statement.

N. Church

From: "Carmen Teierle" <cteierle@ualberta.ca>
To: <bnchurch@shaw.ca>
Sent: Friday, January 16, 2015 3:08 PM
Subject: UA166652 Proof of Payment

Hi Neil,

Funds were applied to UA166652.
Authorization # 084568

Item Activity From Payment

Deposit Unit:	UOFAB	Deposit ID:	8223		
Acctg Date:	01/09/2015	Posted Date:	01/09/2015		
Payment ID:	NDMV 6015	Payment Amount:	-200.00	Currency:	CAD

*Display Amount Switch: Payment Amount

Item Activity — Personalize | Find | View All

Activity 1 | Activity 2

Unit	Customer	Name	Group ID	Item ID	Line	Type	Reason	Payment ID	Paymer Amour
UOFAB	GAR28341	Neil Church	277219	UA166652		PY		NDMV 6015	-200.C

Totals

Total:	1	Total Amount:	-200.00	Currency:	CAD

Thank-you,

c.

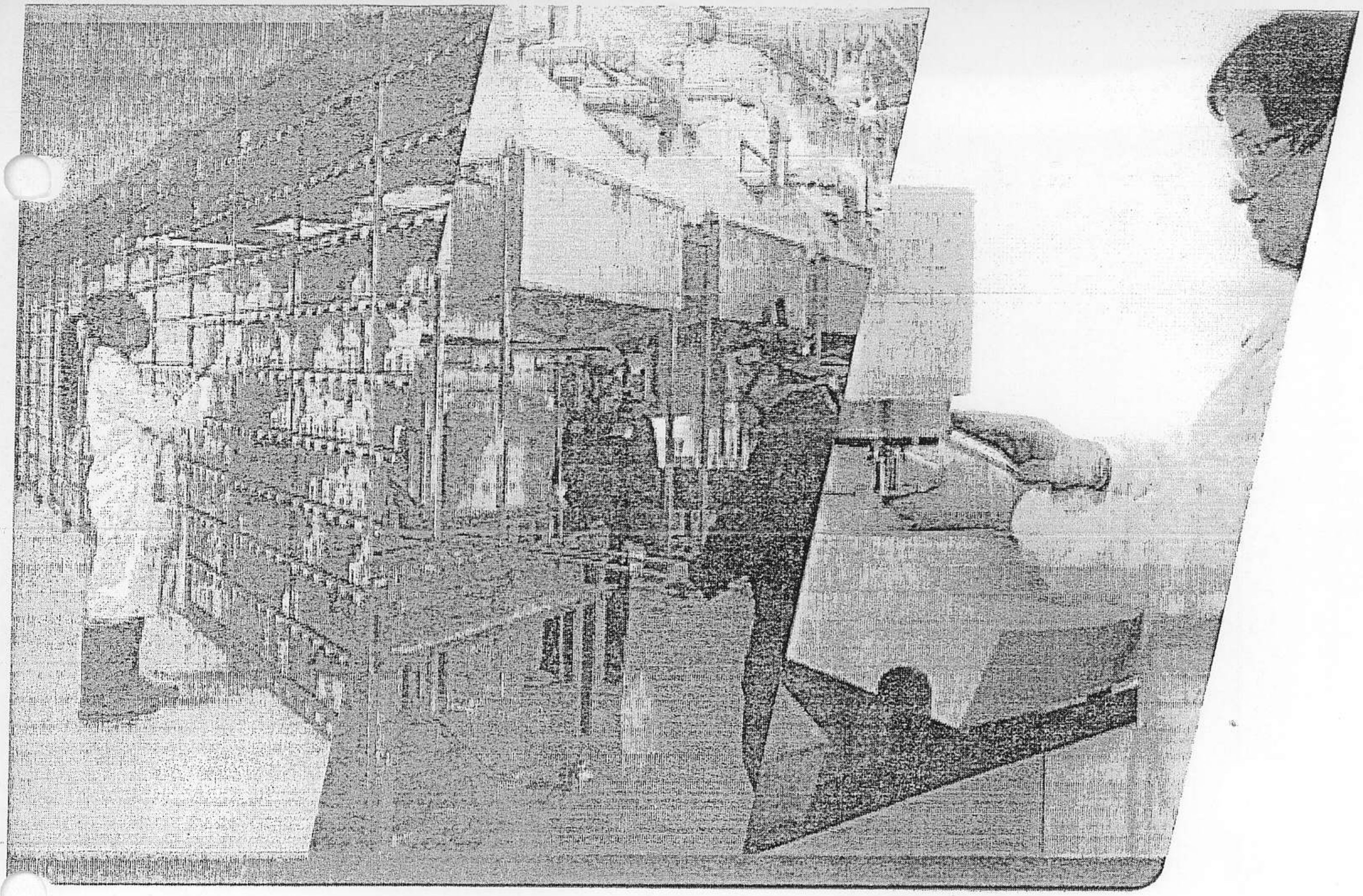
Â Â
Â Â

Carmen Teierle | Accounts Receivable Analyst â€" Restricted Funds | Financial Services | University of Alberta
3rd Floor Admin Bldg | Phone: 780.492.6299 | Fax: Â 780.492.2846 | fsar@ualberta.ca
Â

Appendix B

Analytical Results

Appendix B-1 Chemical Analyses



Move Forward With Confidence

2014 Schedule of Services and Fees (CDN)

-38-

AcmeLabs
A Bureau Veritas Group Company

Maxxam

Revision 2014.1

AQ250 – Ultratrace by ICP Mass Spec.

	Element	AQ250 Detection	Upper Limit
Standard Package	Ag	2 ppb	100000 ppb
	Al	0.01 %	10 %
	As	0.1 ppm	10000 ppm
	Au	0.2 ppb	100 ppm
	B*	20 ppm	2000 ppm
	Ba	0.5 ppm	10000 ppm
	Bi	0.02 ppm	2000 ppm
	Ca	0.01 %	40 %
	Cd	0.01 ppm	2000 ppm
	Co	0.1 ppm	2000 ppm
	Cr	0.5 ppm	10000 ppm
	Cu	0.01 ppm	10000 ppm
	Fe	0.01 %	40 %
	Ga	0.1 ppm	1000 ppm
	Hg	5 ppb	50000 ppb
	K	0.01 %	10 %
	La	0.5 ppm	10000 ppm
	Mg	0.01 %	30 %
	Mn	1 ppm	10000 ppm
	Mo	0.01 ppm	2000 ppm
	Na	0.001 %	5 %
	Ni	0.1 ppm	10000 ppm
	P	0.001 %	5 %
	Pb	0.01 ppm	10000 ppm
	S	0.02 %	10 %
	Sb	0.02 ppm	2000 ppm
	Sc	0.1 ppm	100 ppm
	Se	0.1 ppm	100 ppm
	Sr	0.5 ppm	10000 ppm
	Te	0.02 ppm	1000 ppm
	Th	0.1 ppm	2000 ppm
	Ti	0.001 %	5 %
	Tl	0.02 ppm	1000 ppm
	U	0.1 ppm	2000 ppm
	V	2 ppm	10000 ppm
	W	0.1 ppm	100 ppm
	Zn	0.1 ppm	10000 ppm

* Detection limit = 1 ppm for 15/30 g analysis

Aqua regia digestion is considered a partial digestion. Solubility of some elements will be limited by mineral species present

Aqua Regia

ICP-MS analysis of a 0.5, 15 or 30 g sample after modified Aqua Regia digestion for low to ultra-low determination on soils, sediments and lean rocks. Larger splits (15 or 30 g) give a more representative analysis of elements subject to nugget effect (e.g. Au). Au solubility can be limited in refractory and graphitic samples. Lead Isotope Add on adds Pb isotopes (Pb204, Pb206, Pb207, Pb208,) suitable for geochemical exploration of U and other commodities where gross differences in natural to radiogenic Pb ratios, is a benefit.

Code		CDN
AQ250	37 element 0.5 g - Standard Pkg	**$19.40**
AQ251	37 element 15 g - Standard Pkg	**$23.60**
AQ252	37 element 30 g - Standard Pkg	**$27.30**
+PGM	Pt Pd add on for Standard Pkg	**+ $2.10**
AQ250-EXT	53 element 0.5 g - Extended Pkg	**$22.85**
AQ251-EXT	53 element 15 g - Extended Pkg	**$27.05**
AQ252-EXT	53 element 30 g - Extended Pkg	**$30.70**
+REE	Rare Earth Element add on	**+ $6.30**
+ISO	Lead Isotope add on	**+ $12.60**

	Element	AQ250 Detection	Upper Limit
Extended Package	Be	0.1 ppm	1000 ppm
	Ce	0.1 ppm	2000 ppm
	Cs	0.02 ppm	2000 ppm
	Ge	0.1 ppm	100 ppm
	Hf	0.02 ppm	1000 ppm
	In	0.02 ppm	1000 ppm
	Li	0.1 ppm	2000 ppm
	Nb	0.02 ppm	2000 ppm
	Pd	10 ppb	100000 ppb
	Pt	2 ppb	100000 ppb
	Rb	0.1 ppm	2000 ppm
	Re	1 ppb	10000 ppb
	Sn	0.1 ppm	100 ppm
	Ta	0.05 ppm	2000 ppm
	Y	0.01 ppm	2000 ppm
	Zr	0.1 ppm	2000 ppm
REE Add on	Dy	0.02 ppm	2000 ppm
	Er	0.02 ppm	2000 ppm
	Eu	0.02 ppm	2000 ppm
	Gd	0.02 ppm	2000 ppm
	Ho	0.02 ppm	2000 ppm
	Lu	0.02 ppm	2000 ppm
	Nd	0.02 ppm	2000 ppm
	Pr	0.02 ppm	2000 ppm
	Sm	0.02 ppm	2000 ppm
	Tb	0.02 ppm	2000 ppm
	Tm	0.02 ppm	2000 ppm
	Yb	0.02 ppm	2000 ppm

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Bureau Veritas Commodities Canada Ltd.
9050 Shaughnessy St Vancouver BC V6P 6E5 CANADA
PHONE (604) 253-3158

Client: **B.N. Church Geological Services**
600 Parkridge St.
Victoria BC V8Z 6N7 Canada

Submitted By:	B. Neil Church
Receiving Lab:	Canada-Vancouver
Received:	December 30, 2014
Report Date:	January 22, 2015
Page:	1 of 2

CERTIFICATE OF ANALYSIS VAN14004121.1

CLIENT JOB INFORMATION

Project:	Little Gem
Shipment ID:	
P.O. Number	
Number of Samples:	10

SAMPLE DISPOSAL

RTRN-PLP Return

Bureau Veritas does not accept responsibility for samples left at the laboratory after 90 days without prior written instructions for sample storage or return.

SAMPLE PREPARATION AND ANALYTICAL PROCEDURES

Procedure Code	Number of Samples	Code Description	Test Wgt (g)	Report Status	Lab
BAT01	1	Batch charge of <20 samples			VAN
SLBHP	10	Sort, label and box pulps			VAN
AQ250	10	1:1:1 Aqua Regia digestion Ultratrace ICP-MS analysis	0.5	Completed	VAN
DRPLP	10	Warehouse handling / disposition of pulps			VAN

ADDITIONAL COMMENTS

Invoice To: B.N. Church Geological Services
600 Parkridge St.
Victoria BC V8Z 6N7
Canada

CC:

BRITISH COLUMBIA CERTIFIED ASSAYER
Marcus Lau
MARCUS LAU
Geochemical Laboratory Manager

BUREAU VERITAS MINERAL LABORATORIES
Canada

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Bureau Veritas Commodities Canada Ltd.

9050 Shaughnessy St Vancouver BC V6P 6E5 CANADA
PHONE (604) 253-3158

Client: **B.N. Church Geological Services**
600 Parkridge St.
Victoria BC V8Z 6N7 Canada

Project: Little Gem
Report Date: January 22, 2015

CERTIFICATE OF ANALYSIS VAN14004121.1

	Method	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250
	Analyte	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	U	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
	Unit	ppm	ppm	ppm	ppm	ppb	ppm	ppm	ppm	%	ppm	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
	MDL	0.01	0.01	0.01	0.1	2	0.1	0.1	1	0.01	0.1	0.1	0.2	0.1	0.5	0.01	0.02	0.02	2	0.01	0.001
LGR-2	Rock Pulp	20.87	31.77	23.72	72.2	545	22.1	35.4	122	14.36	98.0	0.2	194.6	<0.1	7.8	0.20	3.42	2.78	86	0.18	0.026
LGR-8	Rock Pulp	0.58	41.55	1.89	30.9	27	13.8	15.9	285	2.35	53.1	0.7	13.5	4.0	13.7	0.12	0.16	0.27	73	0.30	0.051
LGR-9a	Rock Pulp	3.17	6.55	2.49	24.0	30	6.0	8.3	1429	3.91	78.2	3.4	7.1	1.8	72.8	0.23	2.33	0.29	17	11.45	0.018
LGR-9b	Rock Pulp	4.57	10.47	2.26	27.8	15	8.4	10.1	617	1.58	21.8	2.8	2.2	0.9	7.9	0.36	1.63	0.05	10	2.26	0.013
LGR-10	Rock Pulp	1.22	4.54	1.39	20.1	8	4.0	4.9	1187	4.54	20.3	1.2	1.4	1.8	275.3	0.20	0.98	0.03	29	14.85	0.018
LGR-11	Rock Pulp	5.12	7.81	33.53	40.9	51	7.2	11.0	1363	5.48	13.8	1.3	0.5	1.1	617.2	0.53	7.37	0.05	42	18.83	0.009
LG-5	Rock Pulp	8.96	68.67	3038.82	105.1	>100000	142.6	>2000	21	34.79	>10000	<0.1	48697.5	0.2	10.3	2.11	1598.43	1654.56	3	0.02	0.001
LG-5/2	Rock Pulp	5.02	42.65	1362.71	49.4	54186	78.2	1233.3	23	17.54	>10000	<0.1	25231.7	0.2	5.2	1.17	768.08	816.86	<2	0.03	<0.001
LG-ore	Rock Pulp	592.22	12.07	5.53	22.1	223	2964.2	>2000	162	10.96	>10000	12.4	10791.6	<0.1	12.9	0.88	104.16	45.39	76	0.24	<0.001
LG-ore2	Rock Pulp	325.52	17.08	5.33	15.9	231	1461.0	>2000	85	5.35	>10000	5.7	5470.6	<0.1	6.7	0.46	51.12	22.81	35	0.14	<0.001

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Canada

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Bureau Veritas Commodities Canada Ltd.

9050 Shaughnessy St Vancouver BC V6P 6E5 CANADA
PHONE (604) 253-3158

Client: **B.N. Church Geological Services**
600 Parkridge St.
Victoria BC V8Z 6N7 Canada

Project: Little Gem
Report Date: January 22, 2015

CERTIFICATE OF ANALYSIS VAN14004121.1

	Method	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250
	Analyte	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Sc	Tl	S	Hg	Se	Te	Ga
	Unit	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	%	ppb	ppm	ppm	ppm
	MDL	0.5	0.5	0.01	0.5	0.001	20	0.01	0.001	0.01	0.1	0.1	0.02	0.02	5	0.1	0.02	0.1
LGR-2	Rock Pulp	<0.5	25.4	0.43	20.7	0.093	<20	0.66	0.047	0.05	0.5	7.5	1.79	>10	853	9.2	1.76	1.8
LGR-8	Rock Pulp	3.8	32.4	0.76	276.1	0.213	<20	1.16	0.053	0.55	0.9	1.6	0.20	<0.02	14	<0.1	0.06	5.0
LGR-9a	Rock Pulp	6.4	6.0	1.08	117.2	<0.001	<20	0.17	0.002	0.05	1.0	2.9	0.07	0.08	118	<0.1	0.02	0.6
LGR-9b	Rock Pulp	1.9	12.7	0.05	82.5	<0.001	<20	0.14	0.001	0.07	1.0	3.2	0.03	<0.02	114	<0.1	<0.02	0.3
LGR-10	Rock Pulp	5.5	6.5	3.88	25.4	<0.001	<20	0.19	0.004	0.03	2.2	4.8	<0.02	<0.02	189	0.1	<0.02	0.6
LGR-11	Rock Pulp	5.4	2.5	4.63	38.6	0.001	<20	0.12	0.005	0.03	1.6	2.4	<0.02	<0.02	331	0.1	<0.02	0.6
LG-5	Rock Pulp	<0.5	3.0	<0.01	2.9	<0.001	<20	0.02	0.005	0.05	8.8	0.1	1.48	9.29	26523	46.0	312.84	<0.1
LG-5/2	Rock Pulp	<0.5	17.9	<0.01	1.6	<0.001	<20	0.01	0.003	0.02	6.5	0.2	0.52	5.70	12089	24.2	151.43	0.3
LG-ore	Rock Pulp	7.8	15.1	0.18	5.1	<0.001	<20	0.07	0.008	0.01	1.6	4.8	0.04	6.36	251	71.9	65.42	1.1
LG-ore2	Rock Pulp	4.8	21.1	0.09	2.8	<0.001	<20	0.04	0.005	<0.01	2.2	2.3	0.02	3.47	149	35.2	30.44	0.9

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PHONE (604) 253-3158

Client: B.N. Church Geological Services
600 Parkridge St.
Victoria BC V8Z 6N7 Canada

Project: Little Gem
Report Date: January 22, 2015

QUALITY CONTROL REPORT VAN14004121.1

	Method	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250
	Analyte	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	U	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
	Unit	ppm	ppm	ppm	ppm	ppb	ppm	ppm	ppm	%	ppm	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
	MDL	0.01	0.01	0.01	0.1	2	0.1	0.1	1	0.01	0.1	0.1	0.2	0.1	0.5	0.01	0.02	0.02	2	0.01	0.001
Reference Materials																					
STD DS10	Standard	13.65	161.64	151.31	393.6	1837	77.2	13.3	864	2.72	42.6	2.7	47.0	7.3	61.2	2.43	6.72	12.01	43	1.03	0.074
STD DS10	Standard	12.70	143.83	146.98	344.1	2350	71.0	12.2	831	2.63	43.6	2.4	60.5	6.5	62.1	2.52	7.62	12.04	40	1.02	0.077
STD OREAS45EA	Standard	1.50	668.48	14.44	33.2	247	368.1	52.3	407	23.50	8.1	1.7	50.8	9.8	3.6	0.05	0.28	0.25	298	0.04	0.028
STD OREAS45EA	Standard	1.58	671.93	13.60	28.0	249	375.1	49.0	390	21.58	10.7	1.7	49.1	9.5	3.6	0.02	0.34	0.27	290	0.03	0.029
STD DS10 Expected		14.69	154.61	150.55	370	2020	74.6	12.9	875	2.7188	43.7	2.59	91.9	7.5	67.1	2.49	8.23	11.65	43	1.0625	0.073
STD OREAS45EA Expected		1.39	709	14.3	28.9	260	381	52	400	23.51	9.1	1.73	53	10.7	3.5	0.02	0.2	0.26	303	0.036	0.029
BLK	Blank	<0.01	0.09	<0.01	<0.1	6	<0.1	<0.1	<1	<0.01	<0.1	<0.1	<0.2	<0.1	<0.5	<0.01	<0.02	<0.02	<2	<0.01	<0.001

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9050 Shaughnessy St Vancouver BC V6P 6E5 CANADA

PHONE (604) 253-3158

Client: B.N. Church Geological Services
600 Parkridge St.
Victoria BC V8Z 6N7 Canada

Project: Little Gem

Report Date: January 22, 2015

QUALITY CONTROL REPORT VAN14004121.1

	Method	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250	AQ250
	Analyte	La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Sc	Tl	S	Hg	Se	Te	Ga
	Unit	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	%	ppb	ppm	ppm	ppm
	MDL	0.5	0.5	0.01	0.5	0.001	20	0.01	0.001	0.01	0.1	0.1	0.02	0.02	5	0.1	0.02	0.1
Reference Materials																		
STD DS10	Standard	16.5	55.8	0.76	400.0	0.075	<20	0.99	0.064	0.33	2.9	2.6	5.15	0.29	261	2.5	4.79	4.2
STD DS10	Standard	14.8	50.0	0.74	431.0	0.065	<20	0.95	0.062	0.32	3.1	2.7	5.05	0.27	289	2.3	4.86	4.1
STD OREAS45EA	Standard	6.9	894.4	0.09	142.4	0.097	<20	3.00	0.020	0.05	<0.1	70.7	0.06	0.04	7	0.6	0.13	12.0
STD OREAS45EA	Standard	6.3	870.9	0.09	144.9	0.086	<20	2.99	0.017	0.05	<0.1	80.4	0.07	0.03	<5	1.0	0.09	12.2
STD DS10 Expected		17.5	54.6	0.775	359	0.0817		1.0259	0.067	0.338	3.32	2.8	5.1	0.29	300	2.3	5.01	4.3
STD OREAS45EA Expected		6.57	849	0.095	148	0.0875		3.13	0.02	0.053		78	0.072	0.036	10	0.63	0.07	11.7
BLK	Blank	<0.5	<0.5	<0.01	<0.5	<0.001	<20	<0.01	<0.001	<0.01	<0.1	<0.1	0.02	<0.02	<5	<0.1	<0.02	<0.1

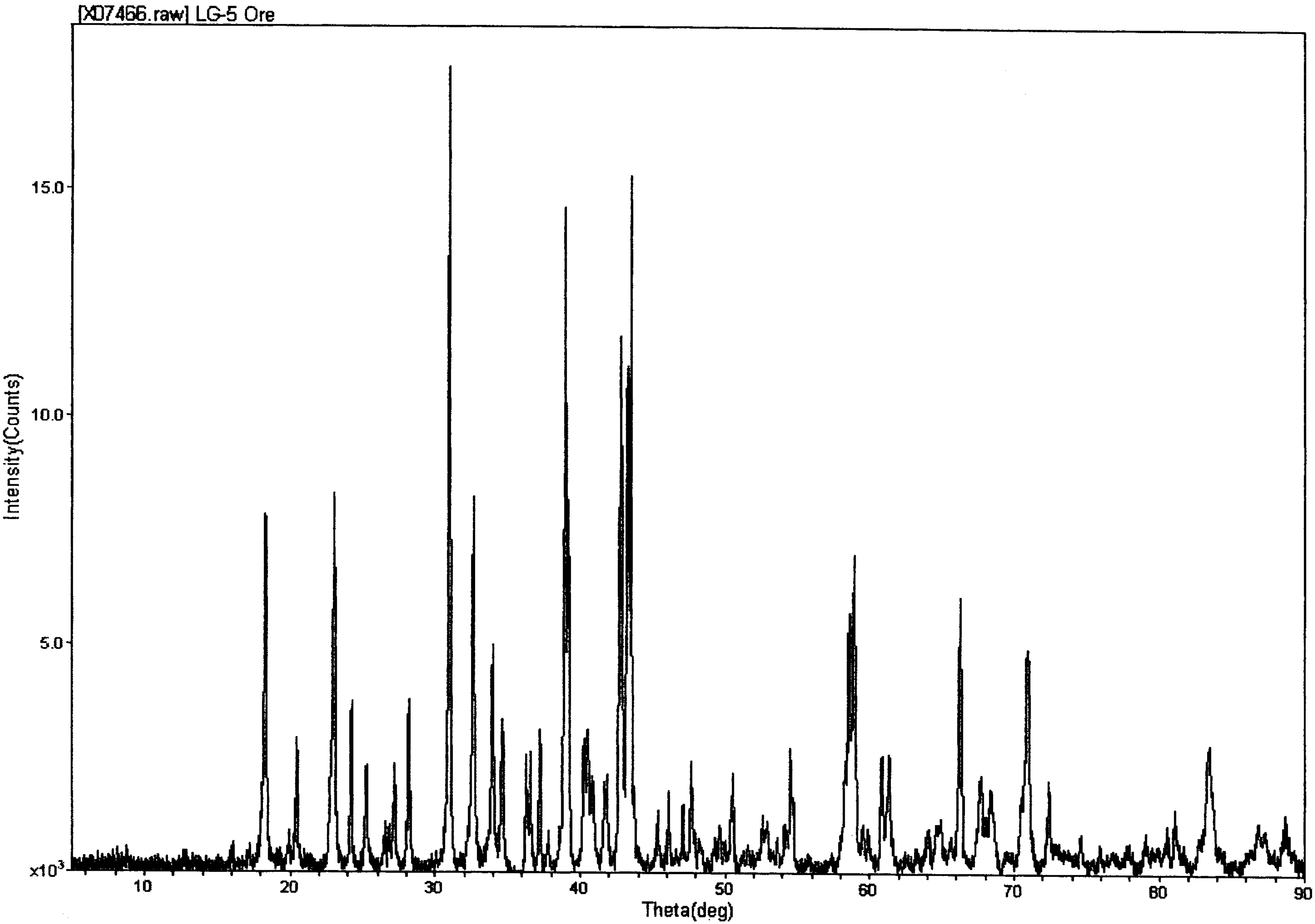
Appendix B-2 X-Ray Diffraction Analyses

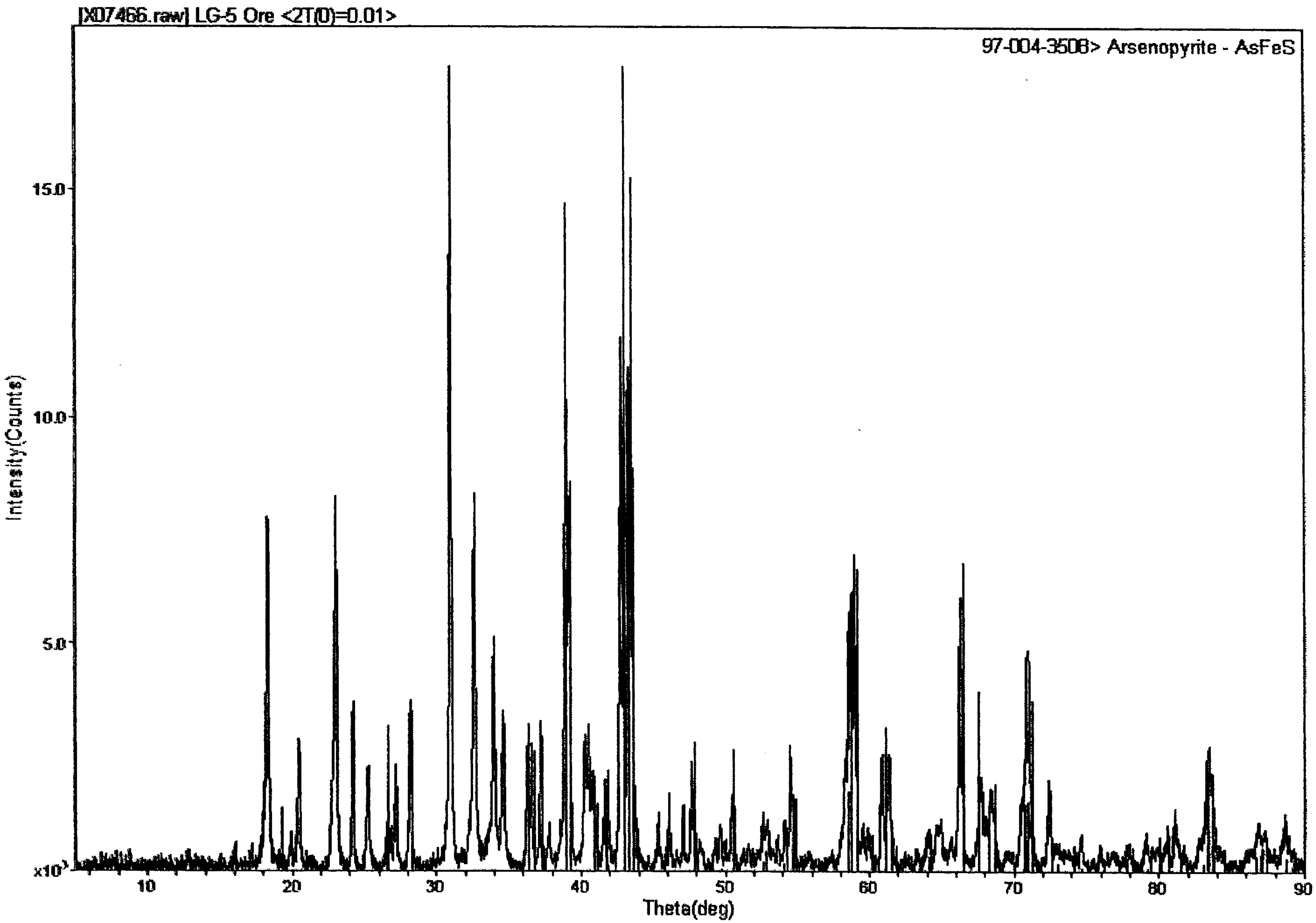
X07466

USER: xrd lab
JADE: Peak Search Report (76 Peaks, Max P/N = 65.8)
DATE: Tuesday, December 16, 2014 04:47p
FILE: [X07466.raw] LG-5 Ore
SCAN: 5.0/90.0/0.02/0.8(sec), Co(38kV,38mA), I(p)=17715, 12/03/14 09:50a
PEAK: 31(pts)/Parabolic Filter, Threshold=2.0, Cutoff=0.1%, BG=3/1.0, Peak-Top=Centroid Fit
NOTE: Intensity = Counts, 2T(0)=0.01(deg), Wavelength to Compute d-Spacing = 1.78899Å (Co/K-alpha1)

Theta	d(Å)	BG	Height	H%	Area	A%	FWHM
8.839	11.6085	111	319	1.8	299	0.2	0.020
12.861	7.9866	33	401	2.3	1726	1.0	0.069
16.093	6.3904	136	443	2.5	1408	0.8	0.051
17.136	6.0040	155	245	1.4	840	0.5	0.055
18.328	5.6166	191	7586	43.3	84584	47.9	0.190
19.306	5.3345	84	268	1.5	851	0.5	0.051
19.958	5.1619	156	669	3.8	3411	1.9	0.087
20.503	5.0261	180	2673	15.3	21234	12.0	0.135
21.026	4.9024	123	277	1.6	188	0.1	0.020
23.077	4.4720	121	8095	46.2	112767	63.9	0.237
24.274	4.2545	118	3554	20.3	29773	16.9	0.142
25.302	4.0843	82	2182	12.5	22873	13.0	0.178
26.574	3.8920	80	929	5.3	7459	4.2	0.136
27.212	3.8024	95	2212	12.6	20591	11.7	0.158
28.210	3.6705	79	3634	20.7	34326	19.4	0.161
31.017	3.3454	198	17517	100.0	138828	78.6	0.135
32.676	3.1798	326	7975	45.5	87607	49.6	0.187
34.013	3.0583	353	4748	27.1	56373	31.9	0.202
34.690	3.0004	108	3362	19.2	42673	24.2	0.216
36.444	2.8606	108	1782	10.2	13884	7.9	0.132
37.293	2.7977	167	3077	17.6	30759	17.4	0.170
37.865	2.7569	167	847	4.8	9049	5.1	0.182
39.044	2.6768	194	14485	82.7	176534	100.0	0.207
40.349	2.5936	194	2611	14.9	51291	29.1	0.334
40.930	2.5584	194	1958	11.2	64847	36.7	0.563
41.817	2.5065	194	1833	10.5	30448	17.2	0.282
42.863	2.4481	256	11470	65.5	130223	73.8	0.193
43.368	2.4209	149	10823	61.8	164473	93.2	0.258
45.412	2.3173	149	1116	6.4	8901	5.0	0.136
46.174	2.2811	187	1502	8.6	7686	4.4	0.087
47.143	2.2368	165	1236	7.1	7424	4.2	0.102
47.738	2.2106	64	2302	13.1	26658	15.1	0.197
48.353	2.1841	64	521	3.0	7682	4.4	0.251
49.394	2.1409	80	624	3.6	6617	3.7	0.180
49.702	2.1284	64	805	4.6	8326	4.7	0.176
50.574	2.0941	123	1983	11.3	22314	12.6	0.191
51.285	2.0670	123	215	1.2	1412	0.8	0.112
51.657	2.0531	211	344	2.0	2262	1.3	0.112
52.873	2.0092	236	634	3.6	9989	5.7	0.268
53.715	1.9800	286	463	2.6	2258	1.3	0.083
54.223	1.9628	91	978	5.6	8992	5.1	0.156
54.638	1.9490	91	2639	15.1	30547	17.3	0.197
55.896	1.9086	94	300	1.7	2091	1.2	0.119
58.661	1.8261	190	4645	26.5	96885	54.9	0.355
58.982	1.8170	190	6760	38.6	107709	61.0	0.271
59.582	1.8004	116	894	5.1	10906	6.2	0.207
60.004	1.7889	116	814	4.6	9443	5.3	0.197
60.931	1.7642	116	2406	13.7	27775	15.7	0.196
61.401	1.7520	118	2408	13.7	39904	22.6	0.282
64.080	1.6861	91	747	4.3	8131	4.6	0.185
64.925	1.6665	209	823	4.7	16983	9.6	0.351
65.707	1.6489	243	486	2.8	4389	2.5	0.153

					X07466		
66.342	1.6349	144	5853	33.4	68556	38.8	0.199
67.774	1.6043	144	1907	10.9	45107	25.6	0.402
68.482	1.5897	135	1632	9.3	36393	20.6	0.379
69.570	1.5679	114	331	1.9	2959	1.7	0.152
70.630	1.5474	115	1479	8.4	59020	33.4	0.678
71.017	1.5400	96	4733	27.0	99495	56.4	0.357
72.483	1.5130	122	1857	10.6	23096	13.1	0.211
72.955	1.5046	122	458	2.6	4252	2.4	0.158
74.748	1.4736	87	691	3.9	5532	3.1	0.136
76.025	1.4525	178	380	2.2	2728	1.5	0.122
76.897	1.4385	156	285	1.6	1682	1.0	0.100
77.909	1.4228	144	416	2.4	3222	1.8	0.132
79.189	1.4035	250	556	3.2	2975	1.7	0.091
80.006	1.3915	245	292	1.7	1784	1.0	0.104
80.637	1.3825	214	762	4.4	6972	3.9	0.156
81.201	1.3745	201	1142	6.5	12251	6.9	0.182
82.907	1.3512	128	610	3.5	4779	2.7	0.133
83.520	1.3431	210	2527	14.4	68546	38.8	0.461
84.293	1.3330	83	441	2.5	2596	1.5	0.100
85.243	1.3210	72	168	1.0	871	0.5	0.088
86.107	1.3103	157	299	1.7	2488	1.4	0.142
86.886	1.3008	182	885	5.0	28359	16.1	0.545
87.311	1.2958	186	695	4.0	17330	9.8	0.424
88.732	1.2792	183	812	4.6	7661	4.3	0.160


[X07466.raw] LG-5 Ore
Intensity(Counts)
15.0
10.0
5.0
x10³
10
20
30
40
50
60
70
80
90
Theta(deg)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97-004-3508> Arsenopyrite - AsFeS
Intensity(Counts)
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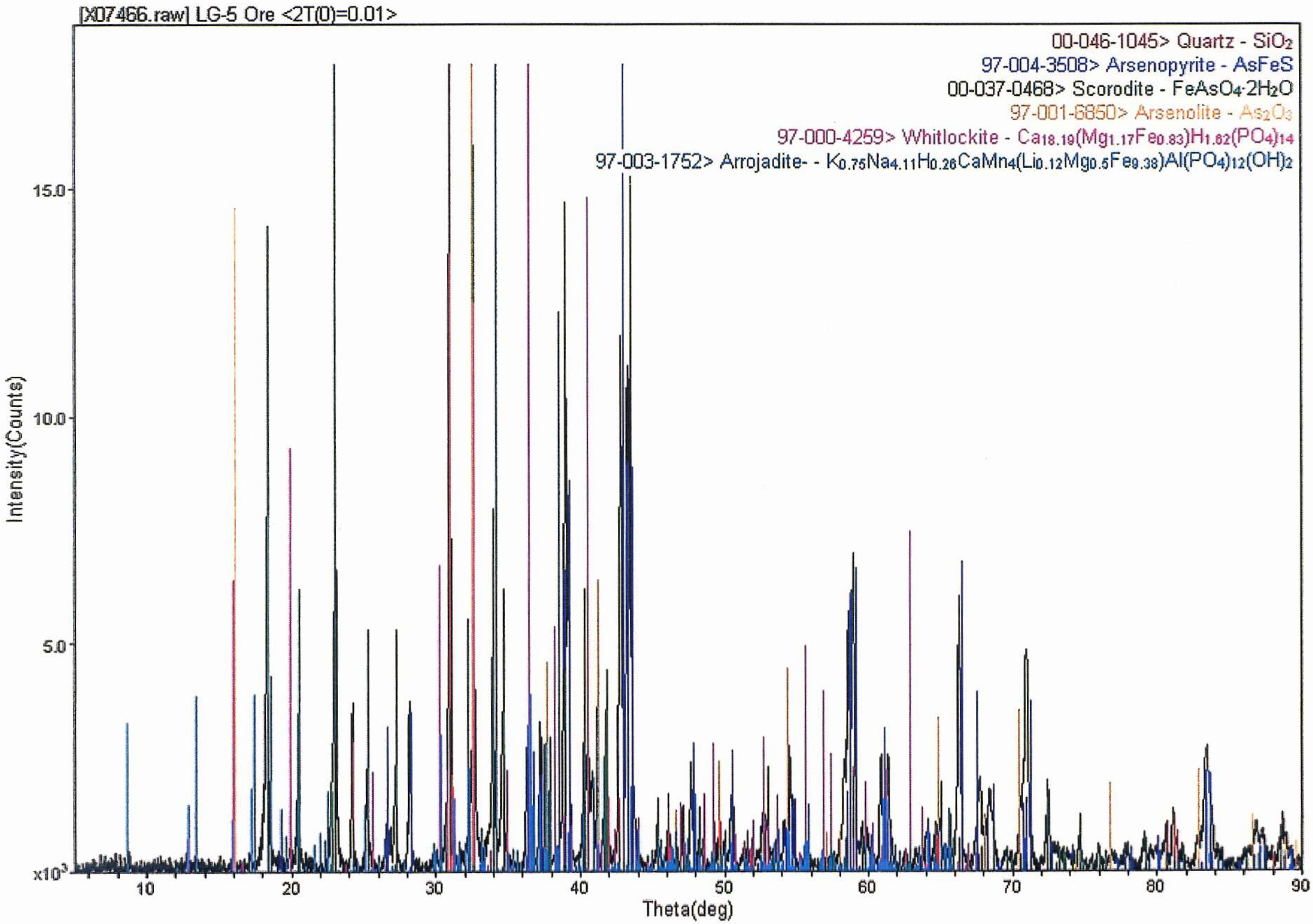
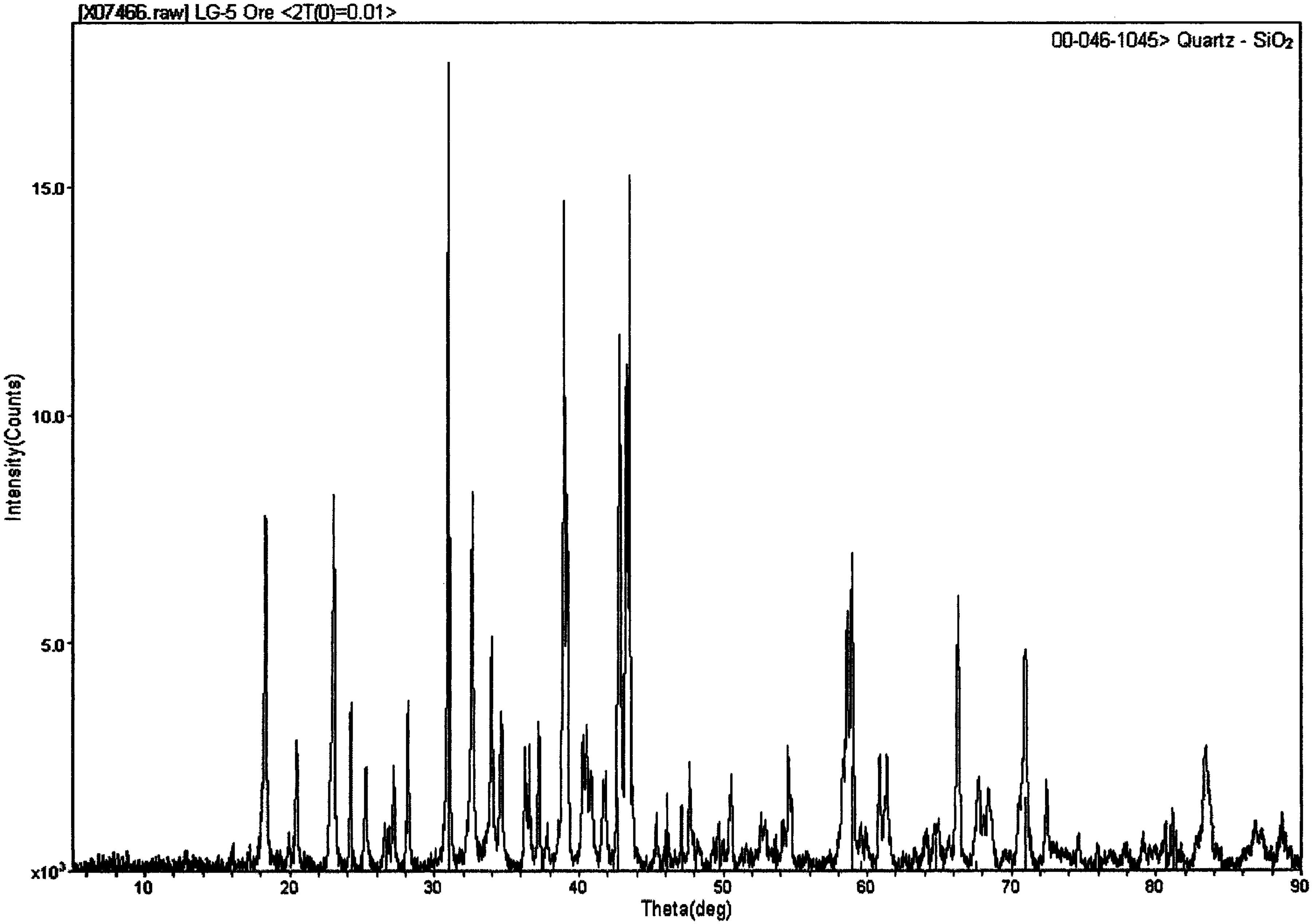
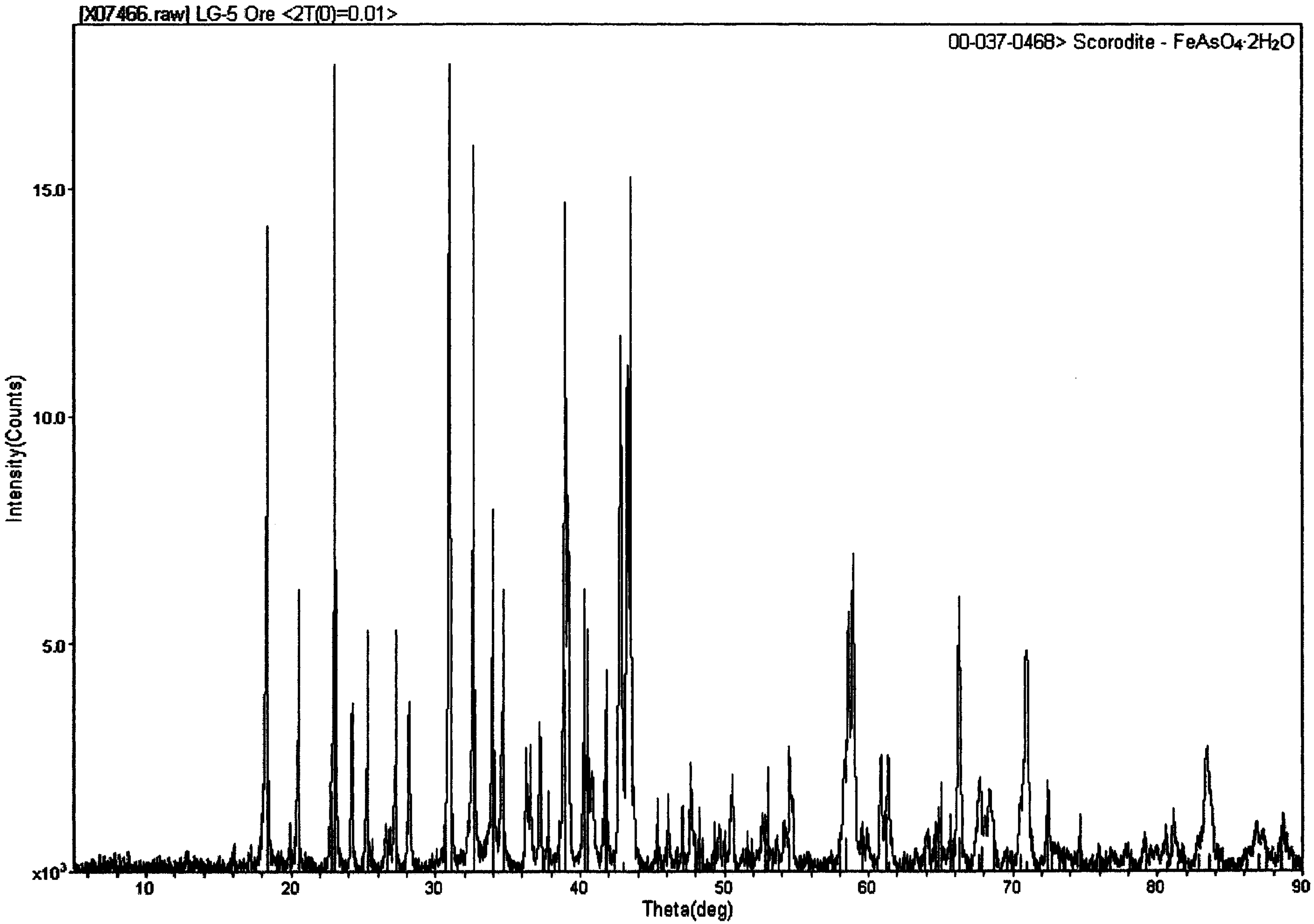
15.0
10.0
5.0
10
20
30
40
50
60
70
80
90
Theta(deg)



[X07466.raw] LG-5 Ore <2T(0)=0.01>
00-046-1045> Quartz - SiO_2
97-004-3508> Arsenopyrite - AsFeS
00-037-0468> Scorodite - $FeAsO_4 \cdot 2H_2O$
97-001-6850> Arsenolite - As_2O_3
97-000-4259> Whitlockite - $Ca_{18.19}(Mg_{1.17}Fe_{0.83})H_{1.62}(PO_4)_{14}$
97-003-1752> Arrojadite- - $K_{0.75}Na_{4.11}H_{0.26}CaMn_4(Li_{0.12}Mg_{0.5}Fe_{9.38})Al(PO_4)_{12}(OH)_2$
Intensity(Counts)
x10³
15.0
10.0
5.0
10
20
30
40
50
60
70
80
90
Theta(deg)



[X07466.raw] LG-5 Ore <2T(0)=0.01>
00-046-1045> Quartz - SiO2
Intensity(Counts)
x10³
15.0
10.0
5.0
10
20
30
40
50
60
70
80
90
Theta(deg)



[X07466.raw] LG-5 Ore <2T(0)=0.01>
00-037-0468> Scorodite - FeAsO4·2H2O
Intensity(Counts)
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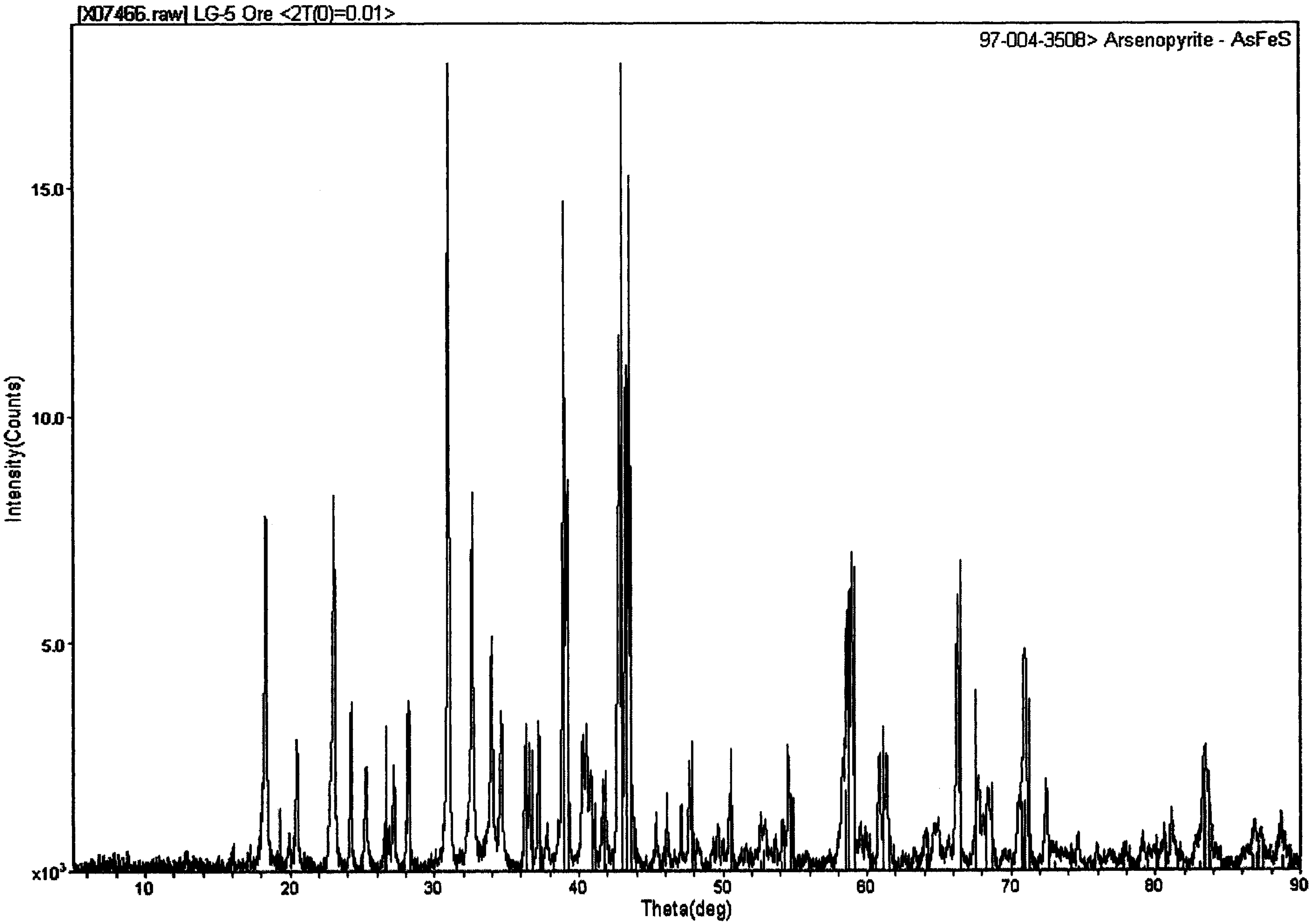
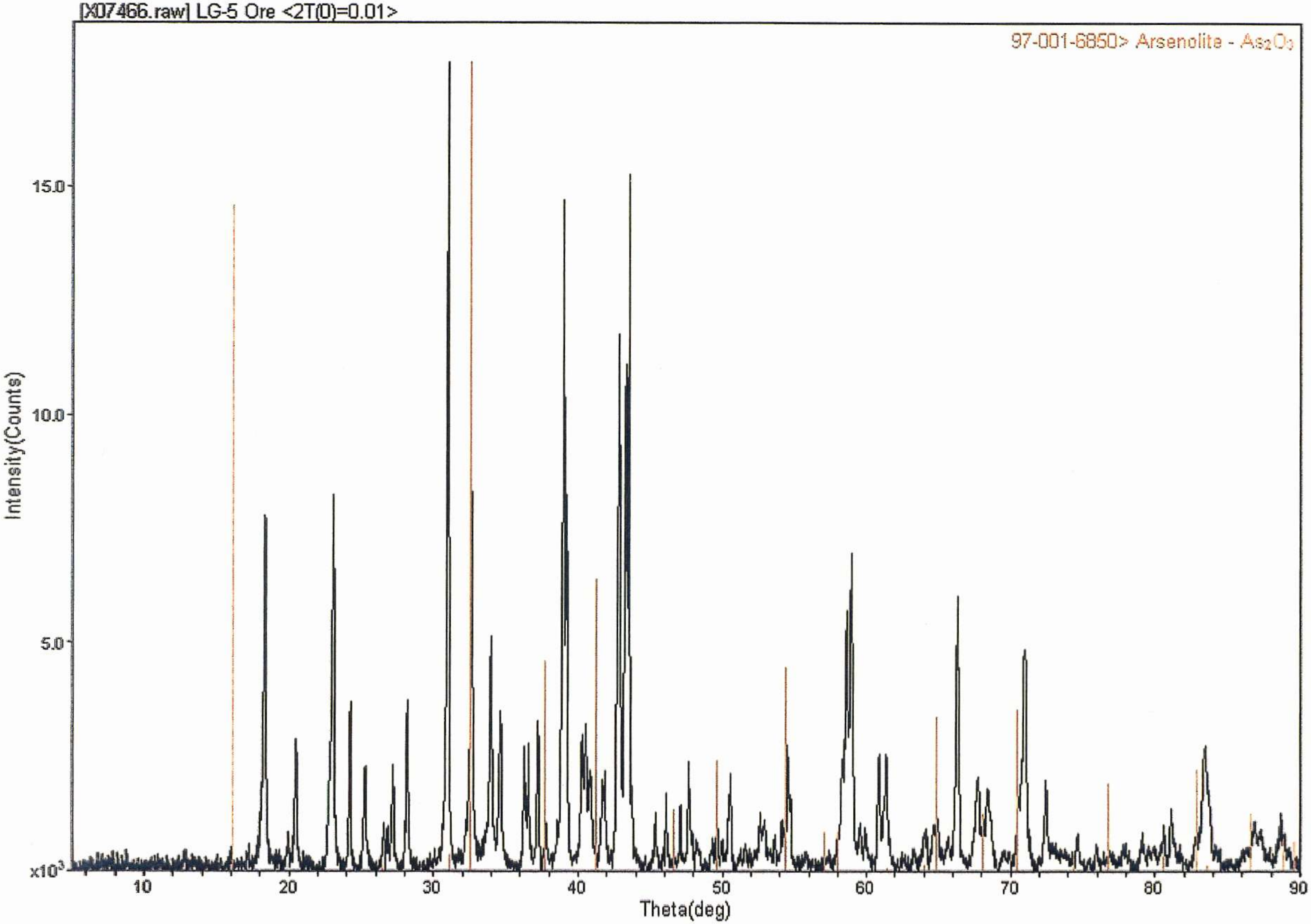
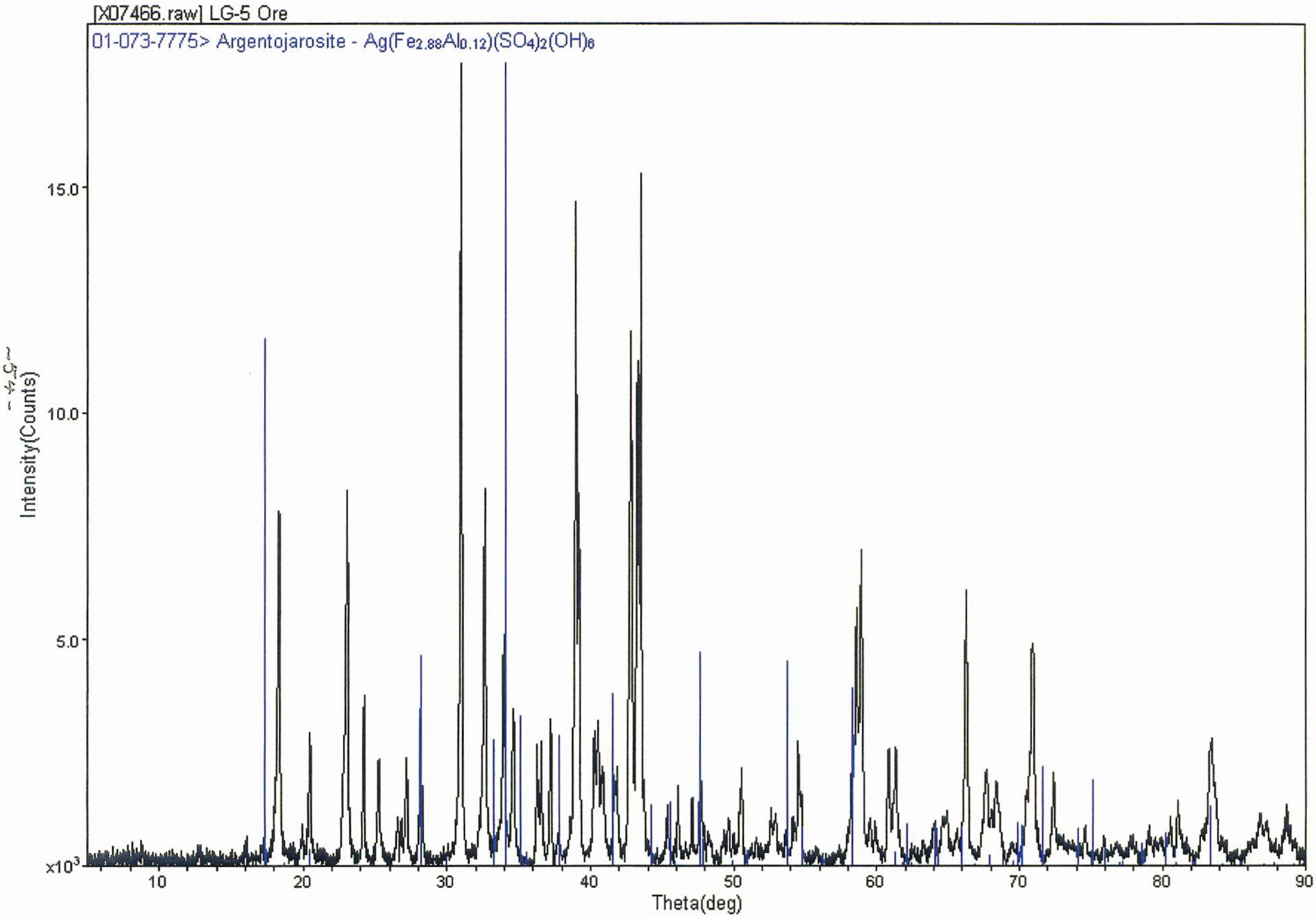
5.0
10.0
15.0
10
20
30
40
50
60
70
80
90
Theta(deg)

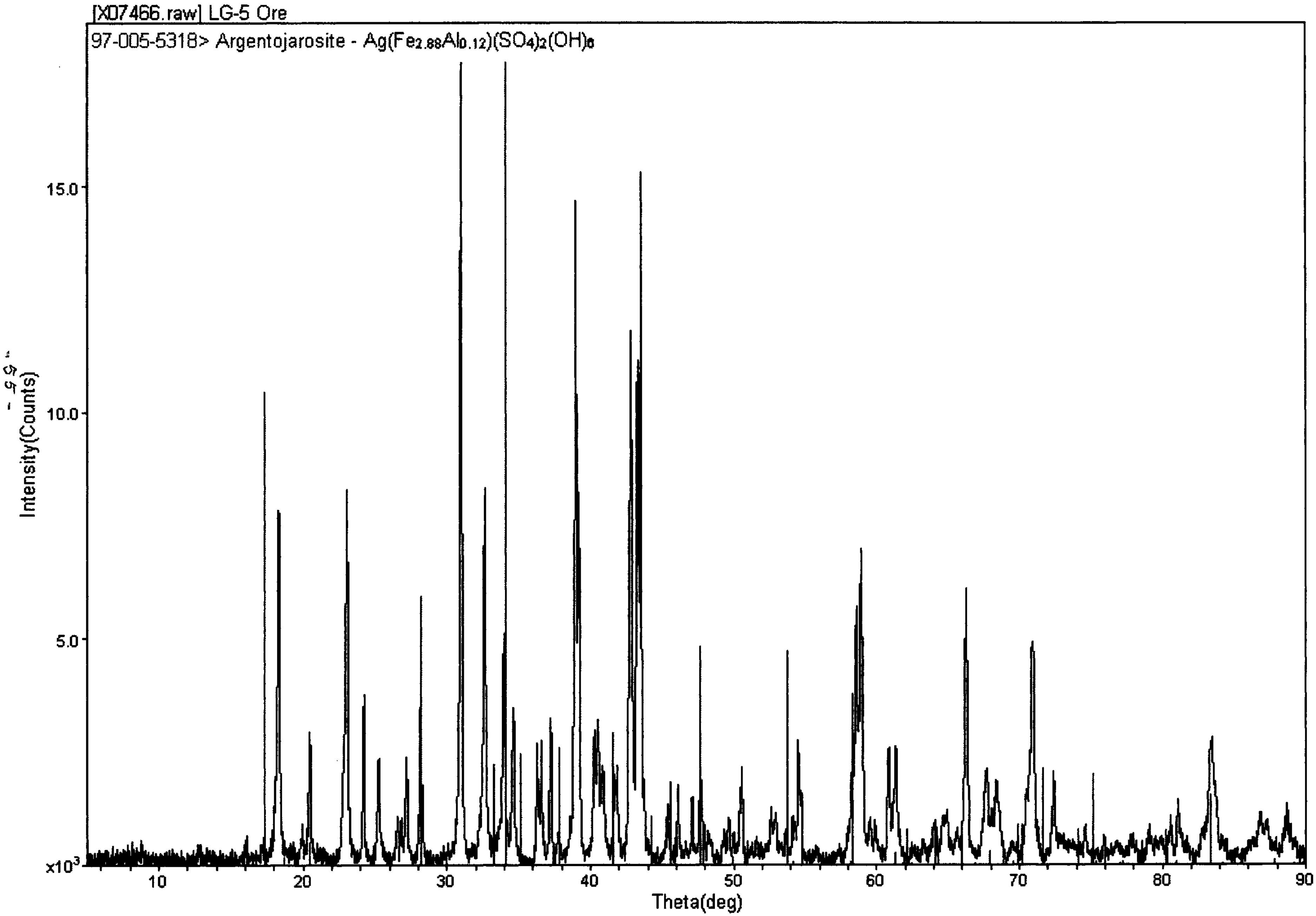

[X07466.raw] LG-5 Ore <2T(0)=0.01>
97-004-3508> Arsenopyrite - AsFeS
Intensity(Counts)
15.0
10.0
5.0
x10³
10
20
30
40
50
60
70
80
90
Theta(deg)

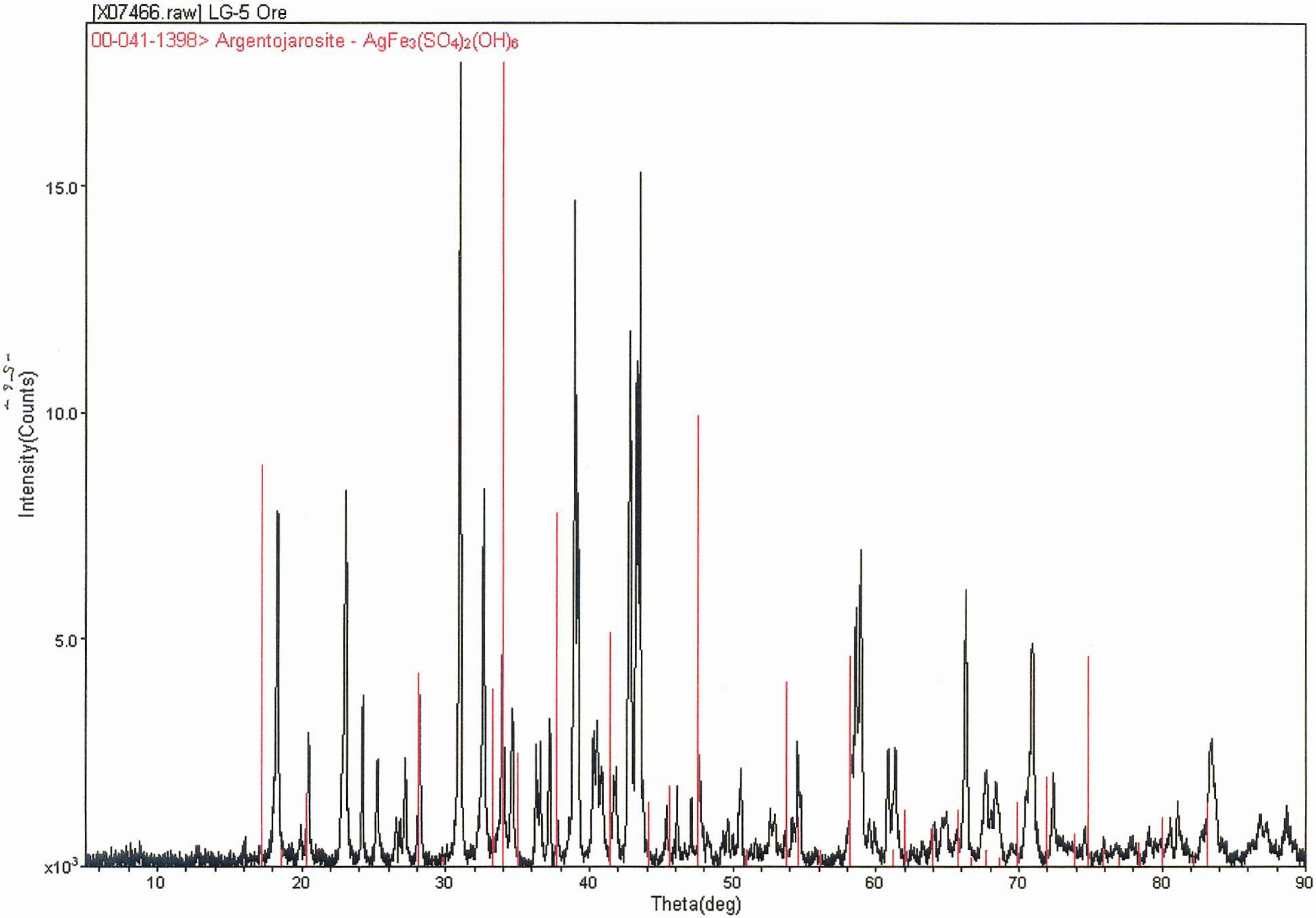

[X07466.raw] LG-5 Ore <2T(0)=0.01>
97-001-6850> Arsenolite - As_2O_3
Intensity(Counts)
15.0
10.0
5.0
x10^3
10
20
30
40
50
60
70
80
90
Theta(deg)

~ 53 ~



[X07466.raw] LG-5 Ore
01-073-7775> Argentojarosite - Ag(Fe2.88Al0.12)(SO4)2(OH)6
Intensity(Counts)
x10³
15.0
10.0
5.0
10
20
30
40
50
60
70
80
90
Theta(deg)


[X07466.raw] LG-5 Ore
97-005-5318> Argentojarosite - Ag(Fe2.88Al0.12)(SO4)2(OH)6
Intensity(Counts)
15.0
10.0
5.0
x10³
10
20
30
40
50
60
70
80
90
Theta(deg)


[X07466.raw] LG-5 Ore
00-041-1398> Argentojarosite - AgFe3(SO4)2(OH)6
Intensity(Counts)
x10³
15.0
10.0
5.0
10
20
30
40
50
60
70
80
90
Theta(deg)

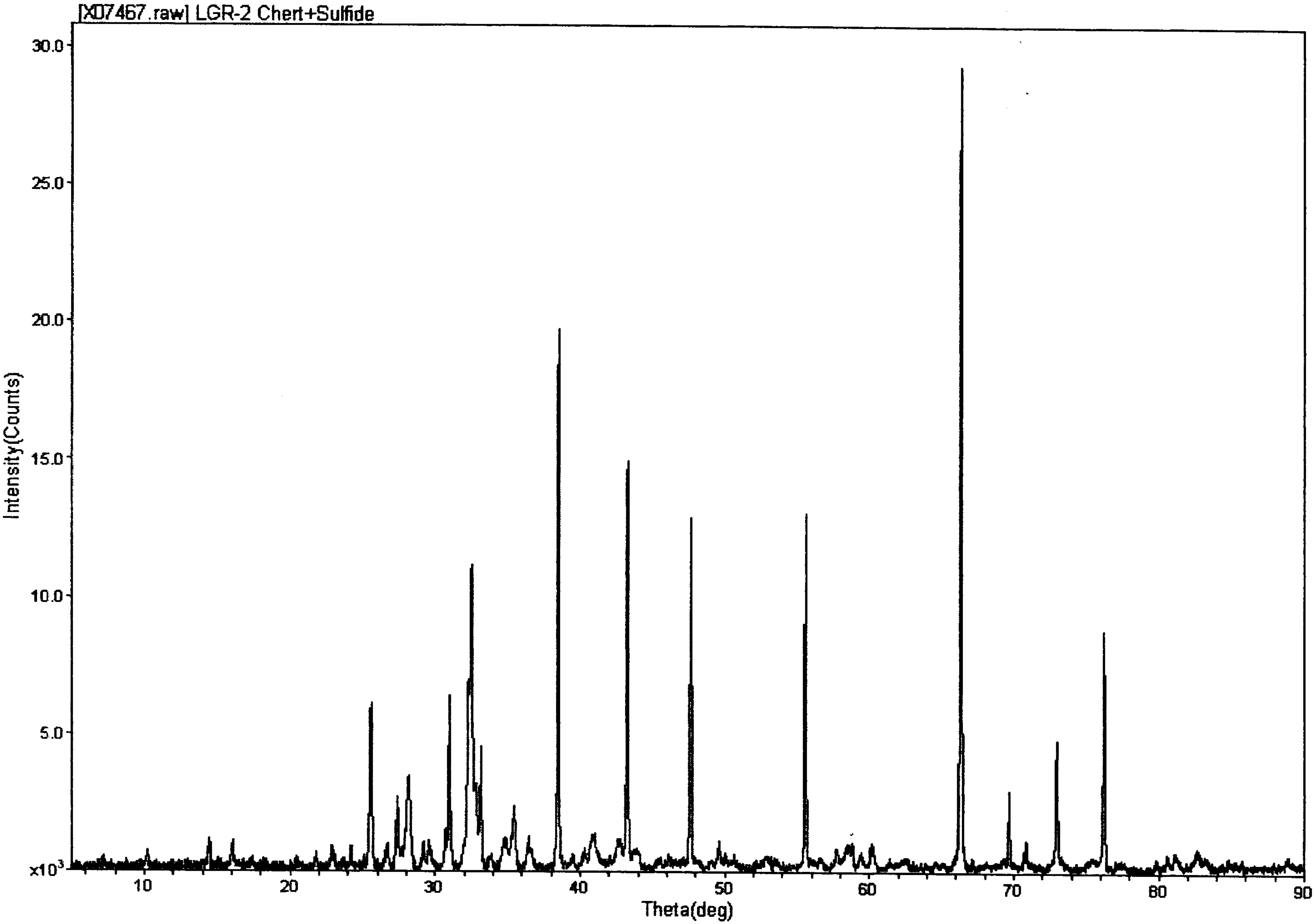
X07467

USER: xrd lab
JADE: Peak Search Report (71 Peaks, Max P/N = 85.2)
DATE: Tuesday, December 16, 2014 04:57p
FILE: [X07467.raw] LGR-2 Chert+Sulfide
SCAN: 5.0/90.0/0.02/0.8(sec), Co(38kV,38mA), I(p)=29268, 12/03/14 11:17a
PEAK: 31(pts)/Parabolic Filter, Threshold=2.0, Cutoff=0.1%, BG=3/1.0, Peak-Top=Centroid Fit
NOTE: Intensity = Counts, 2T(0)=0.02(deg), Wavelength to Compute d-Spacing = 1.78899Å (Co/K-alpha1)

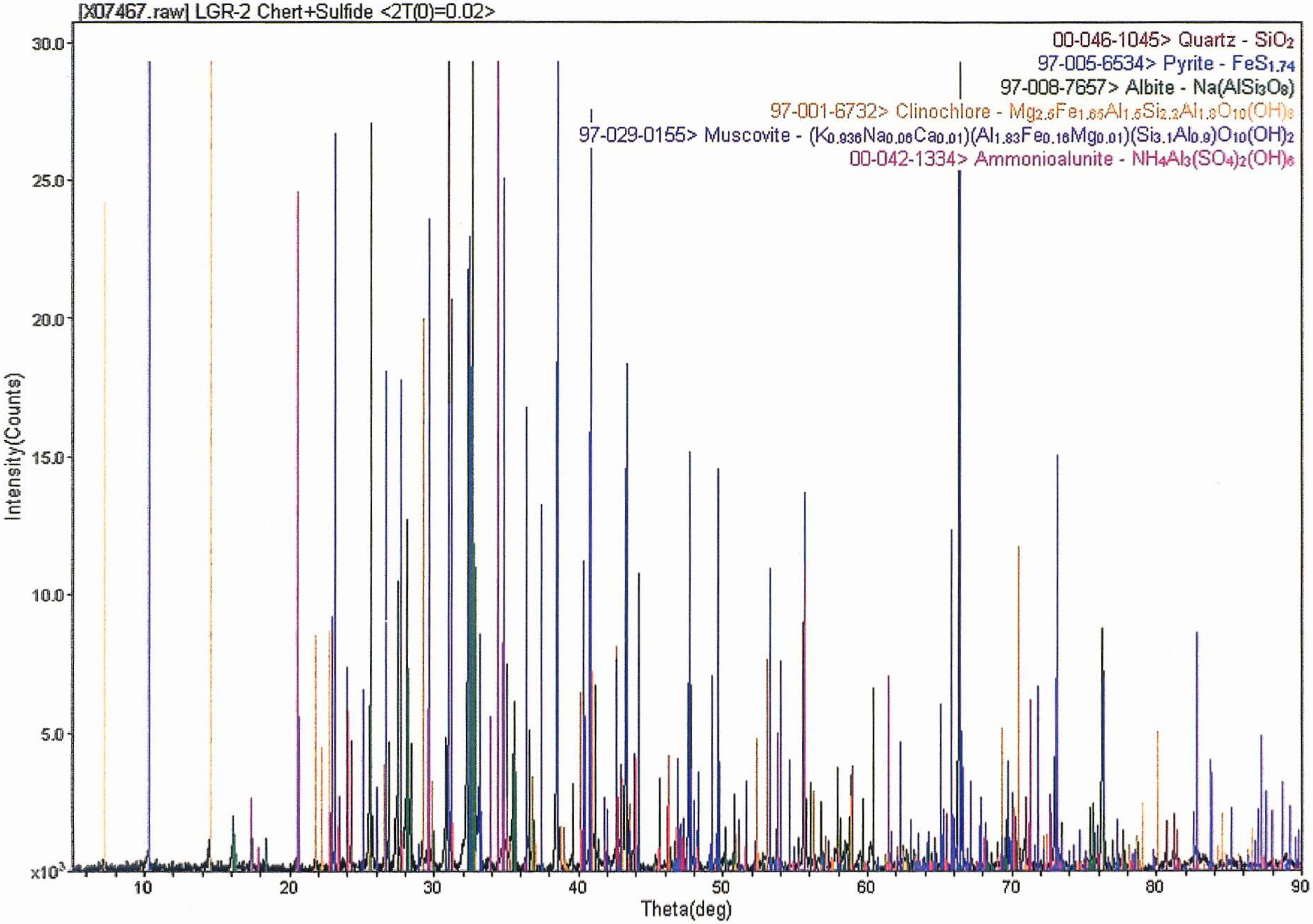
Theta	d(Å)	BG	Height	H%	Area	A%	FWHM
7.210	14.2268	67	393	1.3	770	0.3	0.031
10.260	10.0034	87	621	2.1	5507	1.9	0.151
14.518	7.0793	144	938	3.2	5193	1.8	0.094
16.103	6.3865	111	891	3.1	5371	1.9	0.102
17.494	5.8820	93	350	1.2	1468	0.5	0.067
17.880	5.7561	134	51	0.2	-492	-0.2	0.020
18.356	5.6081	66	271	0.9	1011	0.4	0.060
20.536	5.0181	109	323	1.1	442	0.2	0.022
20.634	4.9945	55	298	1.0	913	0.3	0.049
21.842	4.7214	101	481	1.6	2255	0.8	0.080
22.203	4.6456	53	156	0.5	-59	0.0	0.020
23.001	4.4865	86	743	2.5	11598	4.1	0.265
23.349	4.4206	85	158	0.5	390	0.1	0.039
23.529	4.3871	121	111	0.4	-47	0.0	0.020
24.257	4.2574	139	732	2.5	4193	1.5	0.097
25.159	4.1071	154	393	1.3	608	0.2	0.025
25.617	4.0348	126	5945	20.4	56372	19.9	0.161
26.020	3.9734	224	32	0.1	-847	-0.3	0.020
26.785	3.8620	198	819	2.8	10591	3.7	0.220
27.460	3.7687	205	2478	8.5	25955	9.2	0.178
28.208	3.6707	149	3304	11.3	55567	19.6	0.286
29.267	3.5406	149	931	3.2	7499	2.7	0.137
29.644	3.4967	149	963	3.3	10696	3.8	0.189
31.037	3.3433	172	6208	21.3	41607	14.7	0.114
32.546	3.1922	158	10928	37.5	282861	100.0	0.440
33.210	3.1301	58	4405	15.1	32168	11.4	0.124
33.942	3.0646	58	505	1.7	3312	1.2	0.112
34.838	2.9880	130	982	3.4	26439	9.3	0.458
35.483	2.9354	132	2133	7.3	32510	11.5	0.259
36.553	2.8523	60	1139	3.9	13925	4.9	0.208
38.565	2.7087	89	19561	67.1	108134	38.2	0.094
39.540	2.6445	81	478	1.6	4969	1.8	0.177
40.383	2.5916	59	719	2.5	8665	3.1	0.205
40.944	2.5575	81	1172	4.0	48523	17.2	0.704
42.684	2.4579	198	892	3.1	22116	7.8	0.421
43.323	2.4233	101	14760	50.6	104019	36.8	0.120
43.999	2.3879	68	691	2.4	12840	4.5	0.316
45.479	2.3141	49	341	1.2	1953	0.7	0.097
46.208	2.2796	106	368	1.3	2934	1.0	0.136
47.132	2.2373	198	172	0.6	1000	0.4	0.099
47.712	2.2117	65	12765	43.8	82199	29.1	0.109
49.165	2.1502	91	244	0.8	2244	0.8	0.156
49.696	2.1287	150	894	3.1	9672	3.4	0.184
53.011	2.0043	64	412	1.4	7910	2.8	0.326
53.715	1.9800	64	326	1.1	2897	1.0	0.151
55.676	1.9155	134	12824	44.0	65399	23.1	0.087
56.707	1.8835	69	393	1.3	5929	2.1	0.256
57.835	1.8499	126	659	2.3	6778	2.4	0.175
58.909	1.8191	168	833	2.9	4705	1.7	0.096
59.534	1.8017	153	495	1.7	5400	1.9	0.185
60.278	1.7815	35	939	3.2	13433	4.7	0.243
61.458	1.7506	35	395	1.4	1981	0.7	0.085

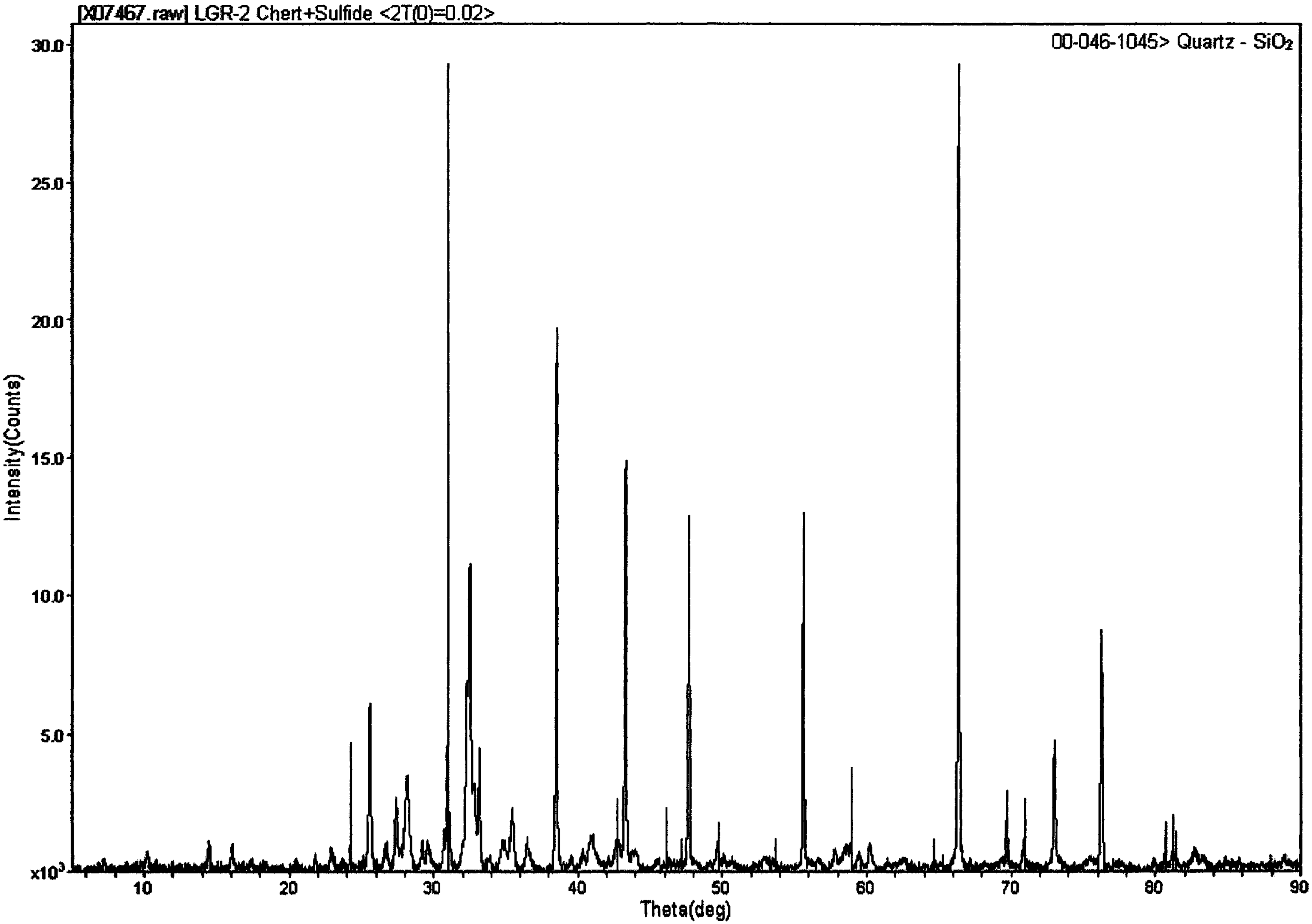
X07467

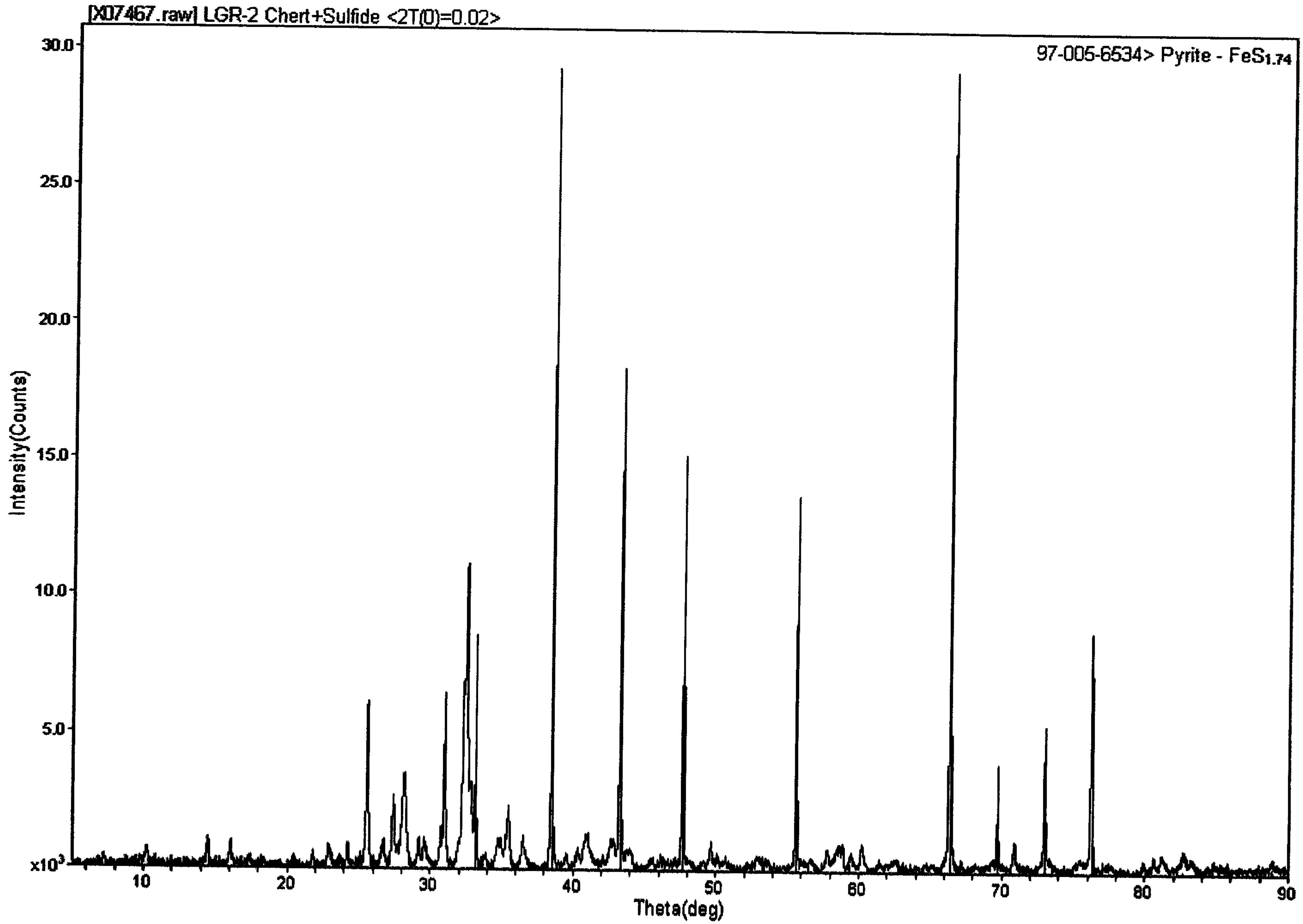
62.592	1.7220	73	354	1.2	7123	2.5	0.342
64.732	1.6709	89	211	0.7	2176	0.8	0.175
66.418	1.6332	111	29158	100.0	175705	62.1	0.102
68.257	1.5943	121	209	0.7	1146	0.4	0.093
69.385	1.5716	128	333	1.1	3007	1.1	0.154
69.769	1.5640	147	2745	9.4	16265	5.8	0.101
70.927	1.5417	165	901	3.1	7916	2.8	0.149
73.076	1.5025	80	4641	15.9	37794	13.4	0.138
75.157	1.4668	68	264	0.9	2236	0.8	0.144
75.567	1.4600	68	447	1.5	5740	2.0	0.218
76.318	1.4478	81	8661	29.7	61833	21.9	0.121
77.586	1.4277	69	322	1.1	2050	0.7	0.108
79.961	1.3922	46	380	1.3	3248	1.1	0.145
80.692	1.3817	74	541	1.9	4886	1.7	0.154
81.237	1.3740	117	549	1.9	9681	3.4	0.300
82.757	1.3532	121	676	2.3	12803	4.5	0.322
83.320	1.3457	69	416	1.4	3311	1.2	0.135
84.872	1.3256	99	373	1.3	2579	0.9	0.118
88.975	1.2765	218	345	1.2	2571	0.9	0.127


[X07467.raw] LGR-2 Chert+Sulfide
Intensity(Counts)
x10³
30.0
25.0
20.0
15.0
10.0
5.0
10
20
30
40
50
60
70
80
90
Theta(deg)

- 65 -


[X07467.raw] LGR-2 Chert+Sulfide <2T(0)=0.02>
00-046-1045> Quartz - SiO2
97-005-6534> Pyrite - FeS1.74
97-008-7657> Albite - Na(AlSi3O8)
97-001-6732> Clinochlore - Mg2.6Fe1.65Al1.5Si2.2Al1.8O10(OH)8
97-029-0155> Muscovite - (K0.936Na0.06Ca0.01)(Al1.83Fe0.16Mg0.01)(Si3.1Al0.9)O10(OH)2
00-042-1334> Ammonioalunite - NH4Al3(SO4)2(OH)6
Intensity(Counts)
x10³
30.0
25.0
20.0
15.0
10.0
5.0
10
20
30
40
50
60
70
80
90
Theta(deg)


[X07467.raw] LGR-2 Chert+Sulfide <2T(0)=0.02>
00-046-1045> Quartz - SiO2
Intensity(Counts)
x10³
30.0
25.0
20.0
15.0
10.0
5.0
10
20
30
40
50
60
70
80
90
Theta(deg)



[X07467.raw] LGR-2 Chert+Sulfide <2T(0)=0.02>
97-005-6534> Pyrite - FeS1.74
Intensity(Counts)
x10³
30.0
25.0
20.0
15.0
10.0
5.0
10
20
30
40
50
60
70
80
90
Theta(deg)

Appendix C

Statement of Qualifications

I, Barry Neil Church, do hereby certify that:

1. I am a member of the Association of Professional Engineers and Geoscientists of British Columbia (membership number #8172) with offices at 600 Parkridge St., Victoria, B.C.
2. I am a graduate of the University of British Columbia (1967) with a Ph.D. in geology. I have practiced my profession continuously since graduation.
3. I am familiar with the district. This report is based on my personal examination of the property during 2014. I am the author of this report and verify the costs as reported to be true.
4. B.N. Church (Client No. 141786) and R.H. McMillan (Client No. 132841) of Victoria are owners of the property (see page 7).

Dated at Victoria, B.C., the 27th day of January, 2015

Submitted by:

Neil Church

B. Neil Church, Ph.D., P.Eng.
January 27st, 2015