

TITLE OF REPORT [type of survey(s)]  
Aster Analysis of the Bedex 1-8 & 15-24 Claims

TOTAL COST  
\$3,740.00

AUTHOR(S): B.K. Bowen, P. Eng. &  
Ward E. Kilby, P. Geo

SIGNATURE(S):



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

YEAR OF WORK: 2009

STATEMENT OF WORK - CASH PAYMENT EVENT NUMBER(S)/DATE(S): 4435708 (2009/DEC/23)

PROPERTY NAME: Bedex

CLAIM NAME(S) (on which work was done): Bedex 1-8 & 15-24 claims (for tenure #'s, see Table 1)

COMMODITIES SOUGHT: Zn, Ag, Au, Pb, Cu

MINERAL INVENTORY MINFILE NUMBER(S), IF KNOWN: no Minfile on claims

MINING DIVISION: Skeena

NTS: 104A/5

LATITUDE 56 ° 21 ' 00 " LONGITUDE 129 ° 43 ' 00 " (at centre of work)

OWNER & OPERATOR:

1) B.K. Bowen, P. Eng. 2)

MAILING ADDRESS:

1) 12470 99A Avenue 2)  
Surrey, B.C.  
V3V 2R5

PROPERTY GEOLOGY KEYWORDS (lithology, age, stratigraphy, structure, alteration, mineralization, size and attitude): Property underlain by Hazelton Group calc-alkaline volcanic rocks in its southwestern part, Hazelton Group (Salmon River Formation) sedimentary rocks in its central part, and Bowser Lake Group sedimentary rocks in its northeastern part. The rocks are Lower to Upper Jurassic in age. The sedimentary rocks strike northwesterly and dip between 20 and 50° northeast. Salmon River Formation sedimentary rocks host the gold and silver-rich volcanogenic massive sulphide deposits at Eskay Creek 55 km to the northwest.

The Bedex claims were staked to cover a cluster of Zn-Ag-Cd-Se-Pb-Sb-As-Hg silt anomalies generated from RGS 58 stream sediment data released on August 3, 2005. 2006 field work identified: a highly sulphidized rhyolite horizon at the southern claims boundary; very strongly anomalous zinc and cadmium values in silt and seep samples in the south-central part of the property; and significant Zn (to 2.11%) and precious metals values (to 64.8 ppm Ag and 5,890 ppb Au) present in mineralized, likely quartz vein float in the northeastern part of the property.

The 2009 Aster analysis of the Bedex claims area identified a 2,500 m long by 300-400 m wide alteration zone of possible buddingtonite located about 3 km up-ice from the 2006 mineralized float sample described above. This strongly suggests that the alteration zone may be the source area for the mineralized float. The area underlain by the alteration zone has not, to date, been examined nor sampled.

REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS:

- Assessment Report #28681 (B. K. Bowen, November 2006)

.... P2

TYPE OF WORK IN THIS REPORT	EXTENT OF WORK (IN METRIC UNITS)	ON WHICH CLAIMS	PROJECT COSTS APPORTIONED (incl. support)
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GEOLOGICAL (scale, area):

Ground, mapping: Air photo interpretation: Aster image analysis:	320 km <sup>2</sup>	- Bedex 1-8 & 15-24 (and adjacent areas)	2,790.00
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GEOPHYSICAL (line-km):

Ground:  
Magnetic:  
Electromagnetic:  
Induced Polarization:  
Radiometric:  
Seismic:  
Other:  
Airborne:

GEOCHEMICAL:

(number of samples analysed for ...)

Silt:  
Rock:  
Other:

DRILLING:

(total metres; number of holes, size)

Core:  
Non-core:

RELATED TECHNICAL:

Sampling/assaying: Petrographic: Mineralographic: Report cost:			950.00
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PROSPECTING (scale, area):

- see Geochemical

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: \$3,740.00**

**ASSESSMENT REPORT**

**BC Geological Survey  
Assessment Report  
31426**

**ASTER ANALYSIS  
OF THE  
BEDEX 1-8 & 15-24 CLAIMS**

**BOWSER LAKE AREA  
NORTHWESTERN BRITISH COLUMBIA**

**SKEENA MINING DIVISION  
LATITUDE 56° 21' N LONGITUDE 129° 43' W  
NTS MAP SHEET 104A/5  
MINERAL CLAIM SHEETS 104A/022 & 032**

**MTO CLAIMS:** BEDEX 1-8 & 15-24: (518684, 518685, 518725, 518728, 518735, 518743, 518755, 518758, 543045, 543046, 543047, 543048, 543049, 543050, 552367, 552368, 552371, 552373)

**OWNER:** B. K. (Barney) Bowen, Surrey, B.C.

**OPERATOR:** B. K. (Barney) Bowen, Surrey, B.C.

**REPORT  
AUTHORS:** Ward E. Kilby, P. Geo.  
421 Curlew Drive, Kelowna, B.C., Canada, V1W 4L2  
and  
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**REPORT  
DATE:** March 23, 2010

## TABLE OF CONTENTS

	<u>PAGE</u>
<b>1.0 SUMMARY</b>	5
<b>2.0 CONCLUSIONS</b>	5
<b>3.0 RECOMMENDATIONS</b>	5
<b>4.0 INTRODUCTION</b>	7
4.1 Location and Access	7
4.2 Claims	7
4.3 Topography, Vegetation and Climate	7
4.4 History and Development	7
4.5 Summary of Work Done	8
<b>5.0 GEOLOGY AND MINERALIZATION</b>	8
5.1 Geology	8
5.2 Mineralization	8
<b>6.0 ASTER ANALYSIS</b>	9
6.1 Introduction	9
6.2 Buddingtonite Spectral Signature	10
6.3 Goethite Spectral Signature	11
<b>7.0 PROPOSED WORK</b>	12
<b>8.0 COST STATEMENT</b>	13
<b>9.0 REFERENCES</b>	14
<b>10.0 STATEMENT OF QUALIFICATIONS</b>	15

## FIGURES

		<u>IN FOLDER NAME</u>
FIGURE 1	BEDEX CLAIMS LOCATION MAP Scale 1:500,000 <u>File Name: Figure 1.jpg</u>	Figures
FIGURE 2	BEDEX CLAIMS CLAIM MAP Scale 1:80,000 <u>File Name: Figure 2.jpg</u>	Figures
FIGURE 3	BEDEX CLAIMS REGIONAL GEOLOGY Scale as shown <u>File Name: Figure 3.jpg</u>	Figures
FIGURE 4	BEDEX CLAIMS DISTRIBUTION OF BUDDINGTONITE SPECTRAL SIGNATURE Scale as shown <u>File Name: Figure 4.jpg</u>	Figures

## TABLES

		<u>IN FOLDER NAME</u>
TABLE 1	BEDEX CLAIMS DATA <u>File Name: Table 1.xls</u>	Tables

## APPENDICES

		<u>ON CD OR DVD</u>
APPENDIX 1	ASTER ANALYSIS OF THE BEDEX 1-8 & 15-24 CLAIMS <u>File Name: Bedex Aster Analysis Report Dec 09.pdf</u>	on CD

Appendices (continued):

ON CD OR DVD

APPENDIX 2 ASTER ANALYSIS RESULTS & DATA FILES on DVD

Appendix 2 includes the following files:

- (1) **A26\_ASTER (ZIP):** Original ASTER data as downloaded from MapPlace.
- (2) **REF\_STACK (ENVI IMG):** A 14 band image containing the nadir spectral bands from the ASTER image. All bands are presented in 15 metre pixels and orthorectified. The VNIR and SWIR bands have been atmospherically corrected and the TIR bands have been thermally corrected.
- (3) **DTM (GeoTIFF):** Digital elevation model constructed from the ASTER image and used for the orthorectification. It is a relative rather than absolute DEM.
- (4) **NaturalColourBRIGHT (GeoTIF):** Pseudo natural colour image constructed from the ASTER image. Colours have been stretched to enhance shaded areas and rock differences.
- (5) **NaturalColourBRIGHTmap (GeoTIF):** Map of the natural colour image for the BEDEX claim area.
- (6) **Buddingtonite (PDF):** A property scale image map of the Buddingtonite distribution.
- (7) **Geothite (PDF):** A property scale image map of the Geothite distribution.
- (8) **Natural (PDF):** A property scale image map showing the natural colour image and location of mineralized float sample.
- (9) **A26 (KML):** A kml file as downloaded from MapPlace containing BC Geological Survey data for the ASTER image area used in this study. Simply double click on the file to launch in Google Earth (GE must be present on machine).
- (10) **BEDEX Analysis (KMZ):** A kmz (zipped kml) file containing results from this analysis. Simply double click on the file to launch in Google Earth (GE must be present on machine). It can be loaded in combination with A26.kml to view all information together.

## 1.0

### SUMMARY

The Bedex property is located in northwestern British Columbia about 48 km north-northeast of the town of Stewart. The property lies about 20 km north of the paved highway connecting Stewart to Meziadin Junction. Access to the claims is by helicopter based out of either Stewart, or the Bell 2 Lodge on the Stewart-Cassiar Highway. The Bedex claims total 6,903 hectares and all are 100%-owned by the writer.

There is no record of past work having been performed in the Bedex claims area prior to 2006, nor were there, prior to 2006 field work carried out by the writer, any known mineral occurrences in the area. In August 2006, the writer carried out helicopter-supported prospecting and geochemical sampling on parts of the Bedex property. This work identified several areas where there is excellent potential for the discovery of precious metals-rich, epigenetic vein mineralization and zinc-dominant, silver-rich massive sulphide mineralization in an Eskay Creek-type setting.

In June 2007, the property was optioned to Williams Creek Explorations Limited who planned to carry out follow-up prospecting, geological mapping and geochemical sampling on the property. Williams Creek was unable to raise funds to carry out field work in either 2007 or 2008 and the property was subsequently returned to the owner.

At the request of the writer, Ward Kilby of Cal Data Ltd. carried out a spectral analysis of the Aster image covering the Bedex claims area in December 2009. Cost of the work totaled \$3,740. The most important finding of Kilby's study was the recognition of a large, 2500 m long by 300-400 m wide alteration zone of possible buddingtonite located about 3 km up-ice from a 2006 float sample which returned values of 2.11% Zn, 64.8 ppm Ag and 5890 ppb Au.

## 2.0

### CONCLUSIONS

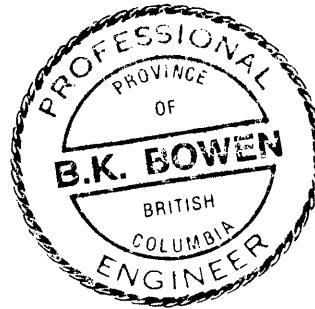
The possible presence of buddingtonite in the Bedex claims area is very significant. Buddingtonite is an ammoniated feldspar that is associated with significant precious metals deposits elsewhere in the world and is commonly used as a pathfinder alteration mineral for the exploration of epithermal vein deposits. Kilby's identification of a large alteration zone of possible buddingtonite at the head of a glacier up-ice from known mineralized float strongly suggests that the alteration zone may be the source area for the mineralized float. The area underlain by the alteration zone has not, to date, been examined nor sampled.

## 3.0

### RECOMMENDATIONS

In addition to earlier recommendations for further work on the property which were made in a November 2006 assessment report (# 28681) on the Bedex property, it is strongly recommended that detailed prospecting and rock geochemical sampling be carried out in the following areas in the central part of the property:

- (a) in the terminal moraine deposits immediately to the southwest of the mineralized float sample found in 2006. It would be encouraging if more mineralized float was found in the moraine material.
- (b) in the area of higher buddingtonite potential on the southerly-facing slope within the same cirque containing the mineralized float; and
- (c) in the area of higher buddingtonite potential on the southwesterly-facing slope at the southwest end of the main zone of possible buddingtonite alteration.



*B. K. Bowen*  
*MAR. 24, 2010*



## **4.0**

## **INTRODUCTION**

### **4.1 Location and Access**

The Bedex claims are located in northwestern British Columbia about 48 km north-northeast of the town of Stewart (Figure 1). Specifically, the claims are located on map sheet 104A/5 at coordinates 56°21' N and 129°43' W and are in the Skeena Mining Division.

Access to the claims is by helicopter based out of either Stewart, or the Bell 2 Lodge on the Stewart-Cassiar Highway. Stewart, the area's commercial center, has a long history of mining exploration and development and is a good base from which to operate. The property lies about 20 km north of the paved highway connecting Stewart to Meziadin Junction.

### **4.2 Claims**

As of March 23, 2010, the date of this report, the property consisted of the Bedex 1-8 and 15-24 claims totaling 6,903 hectares (Figure 2 and Table 1). All claims are 100%-owned by the writer.

### **4.3 Topography, Vegetation and Climate**

The property is situated in steep terrain typical of the Coast Range Mountains of British Columbia. Icefields and glaciers cover about 30-40% of the property, mainly in its higher parts. Below tree-line, the area is forested with hemlock, spruce and balsam. Elevations range from about 600 m to 2,100 m.

Average temperatures in Stewart are 22.5° C in summer and 2.5° C in winter, with annual rainfall and snowfall averaging 133 cm and 76 cm respectively (B.C. Ministry of Forests Public Website).

### **4.4 History and Development**

There is no record of past work having been performed in the Bedex claims area prior to 2006, nor were there, prior to 2006 field work carried out by the writer, any known mineral occurrences in the area.

In August 2006, the writer carried out helicopter-supported prospecting and geochemical sampling on parts of the Bedex property. This work identified several areas where there is excellent potential for the discovery of precious metals-rich, epigenetic vein mineralization and zinc-dominant, silver-rich massive sulphide mineralization in an Eskay Creek-type setting.

In June 2007, the property was optioned to Williams Creek Explorations Limited who planned to carry out follow-up prospecting, geological mapping and geochemical

sampling on the property. Unfortunately, Williams Creek was unable to raise funds to carry out field work in either 2007 or 2008 and the property was subsequently returned to the owner.

#### **4.5 Summary of Work Done**

At the request of the writer, Ward Kilby of Cal Data Ltd. carried out a spectral analysis of the Aster image covering the Bedex claims area during the period December 16-22, 2009. Cost of the work totaled \$3,740, all of which was applied as assessment credits on the Bedex 1-8 and 15-24 claims.

### **5.0 GEOLOGY AND MINERALIZATION**

#### **5.1 Geology**

The Bedex property is shown, on the B.C. Ministry website “The Map Place”, to be underlain by: Hazelton Group calc-alkaline volcanic rocks in its southwestern part; Hazelton Group (Salmon River Formation) sedimentary rocks in its central part; and Bowser Lake Group sedimentary rocks in its northeastern part (Figure 3). The sedimentary rocks strike northwesterly and dip between 20 and 55° northeast.

No intrusive rocks are mapped in the immediate vicinity of the Bedex claims. Small porphyritic bodies of Jurassic to Tertiary age are shown to be present some distance to the south and northwest of the property.

Salmon River Formation sedimentary rocks pass through the Bedex property. They also host the gold and silver-rich volcanogenic massive sulphide deposits at Eskay Creek 55 km to the northwest.

#### **5.2 Mineralization**

##### **5.2.1 Local Minfile Occurrences**

Figure 3 shows the location of three mineral occurrences to the south of the Bedex claims. Todd Creek (South Zone) and Surprise Creek are discussed in some detail below.

The Todd Creek (South Zone) contains a reported mineral reserve of 207,000 tonnes grading 5.48 g/t Au with some copper credits. Mineralization is hosted in a 5-15 m wide north-northeast trending, steeply west-dipping fracture zone that cuts the eastern portion of a small feldspar porphyry body. This occurrence is situated at the south end of a well-defined mineralized corridor that trends north-northeastly along Todd Creek over a distance of about 8 km. Occurrences in the southern portion of the mineralized corridor are gold and/or copper-rich, with only minor amounts of lead, zinc and silver locally; those towards the northern end of the trend are mainly silver-lead-zinc occurrences with minor amounts of copper or gold. At the Bow 32 prospect, near the southern boundary of

the Bedex claims, grab samples of altered felsic tuff have returned silver values to 2,262.9 g/t (66.0 opt.).

In 2005, Pinnacle Mines Ltd. reported the discovery of stratiform zinc-lead-silver mineralization on their Surprise Creek property located about 10 km south-southeast of the Bedex property. Mineralization is described as “extremely fine grained syngenetic pyrite, sphalerite and galena, with high silver and mercury, hosted in black chert, limestone and mudstone”<sup>1</sup>. Contents of zinc, lead, silver and mercury reportedly vary in a broad range from elevated values to highs of 7.61% Zn, 1.1% Pb, 106 g/t Ag and 33,800 ppb Hg. The syngenetic mineralization is spatially associated with felsic volcanic rocks which form a relatively thin horizon, 70 to 200 meters wide, within Hazelton volcanic rocks which are predominantly intermediate to mafic in composition.

Pinnacle Mines’ geologists conclude that “the gold-bearing pyrite-chalcopyrite dominated veins and stringers in the Todd Creek area and the syngenetic zinc, lead and silver mineralization of the Surprise Creek area probably represent two different parts of the same Kuroko-type, volcanogenic massive sulphide system. The former represents the footwall-stringer zone and the latter, the distal zone of the system. The substantial amounts of gold in the presumed footwall-stringer zone and the abundance of silver in the distal zone indicate the potential for the occurrence of precious metals-rich, volcanogenic massive sulphide deposits in the area”<sup>2</sup>.

### **5.2.2 Bedex Property Mineralization**

Prospecting and geochemical sampling carried out in August 2006 were successful in identifying a number of target areas on the Bedex property, including: a highly sulphidized rhyolite horizon at the southern claims boundary; very strongly anomalous zinc and cadmium results in silt and seep samples in the south-central part of the property; and significant zinc (to 2.11%) and precious metals values (to 64.8 ppm Ag and 5,890 ppb Au) present in mineralized quartz vein float in the northeastern part of the property.

## **6.0 ASTER ANALYSIS**

### **6.1 Introduction**

Ward Kilby of Cal Data Ltd. was contracted by B.K. Bowen to acquire and analyze Aster Multispectral imagery covering the Bedex claim group. Bowen provided the claim descriptions and assessment report information. The required digital files were obtained through the BC government’s MapPlace website. The required Aster image was identified and downloaded from the MapPlace. In addition a search was conducted to confirm that the acquired Aster image was the best available.

<sup>1 & 2</sup> Surprise Creek project description, from the website [www.pinnaclemines.com](http://www.pinnaclemines.com)

Image analysis included converting the image from radiance to relative reflectance values through a process of atmospheric corrections. The image was orthorectified to the UTM Zone 9, WGS 84 projection.

A variety of multispectral analysis procedures were applied to the image in an attempt to identify alteration minerals. Aster, due to its limited number of bands, can not always provide definite mineral identifications. But in this case there were some very good examples of potentially important alteration minerals such as buddingtonite (tentatively identified). The analysis concentrated on the Bedex claims but some analyses were conducted over the whole Aster image to provide a regional context. The results of the analysis are presented as image maps as well as in KML format which can be viewed with the Google Earth viewer.

During the orthorectification process a DEM is calculated from the ASTER image and is provided as a grid file. This DEM was used to generate perspective views of some analysis results.

Kilby's report on the Aster Analysis of the Bedex 1-8 and 15-24 Claims is presented in Appendix 1 (on the CD). A number of accompanying files, of Aster analysis results and data files, are presented in Appendix 2 (on the DVD).

In Sections 6.2 and 6.3 below, brief descriptive comments are made on the buddingtonite and goethite spectral signatures respectively. For more details, the reader is asked to refer to Kilby's report in Appendix 1.

## **6.2 Buddingtonite Spectral Signature**

The 'buddingtonite' (tentatively identified) spectrum obtained from the Aster image (Endmember 6) was compared to all the spectra contained in the USGS spectral library and buddingtonite was the best fit. Figure 10 in Kilby's report shows the comparisons of the Endmember 6 spectrum from the image and the two USGS library spectrum.

In addition to visual comparison of the spectra a tool contained within ENVI performs a rigorous mathematical evaluation of the similarities between the library spectra and the image spectra. Figure 11 in Kilby's report shows the results of the comparisons. The two library buddingtonite spectra are in the top twelve spectra with the best combined matching scores. A visual comparison of the ranked spectra is essential to determine if the mathematically derived rankings are the best. Figure 12 in Kilby's report shows the visual comparisons of the image spectrum with the library matches for the top ranking choices and the two buddingtonite spectra. It is obvious that the two buddingtonite spectra are better matches than any of the other choices provided by the Spectral Analyst tool.

The possible presence of buddingtonite in the Bedex claims area is very significant. Buddingtonite is an ammoniated feldspar that is associated with significant precious metals deposits elsewhere in the world and is commonly used as a pathfinder alteration

mineral for the exploration of epithermal vein deposits. The tentative identification of such an important alteration mineral immediately shifted the focus of Kilby's analysis from trying to map some clay species to the mapping and verification of this mineral. The current Aster analysis project was limited in scope so the effort was focused on the most important finding of the study. In addition iron staining had been recognized in the area and its mapping is addressed in Section 6.3 below.

Figure 4 in this report and Figure 13 in Kilby's report show the distribution of the buddingtonite spectral signature in the Bedex claims area. The main buddingtonite alteration zone(s) straddles the drainage divide between two northeast and southwest flowing streams in the central part of the property. It is elongate in a northeasterly direction, measures about 2,500 m by 300-400 m wide and its central portion appears to be covered by glacial ice.

Approximately 3 km to the northeast of the alteration zone, in a terminal moraine deposit, is a 2006 float sample (06B-14R) which returned significant zinc and precious metals values of 2.11% Zn, 64.8 ppm Ag and 5890 ppb Au. The sample was taken from a rounded boulder, approximately 0.5 m in diameter, of likely white quartz vein material containing 40-50% coarse crystalline sulphide aggregates. Sulphides present include pyrite, pyrrhotite, sphalerite, arsenopyrite and traces of chalcopyrite. It was concluded at the time that the mineralized float likely had a local source. Kilby's identification of a large alteration zone of possible buddingtonite at the head of the glacier strongly suggests that the alteration zone may be the source area for the mineralized float. The area underlain by the alteration zone has not, to date, been examined nor sampled.

### **6.3 Goethite Spectral Signature**

The three ASTER bands from the VNIR portion of the electromagnetic spectrum were processed with the SMACC procedure in the area of the Bedex claims. The primary target of this portion of the analysis was to identify any iron-bearing mineralization that could point to areas of interest. Several endmembers approximating goethite (limonite) were found through this analysis. These endmembers were not excellent matches for the goethite spectra contained in the spectral library, but on the assumption that they did represent a diluted version of the goethite spectrum one of the USGS spectra was used for the spectral mapping exercise. The spectrum labeled 'geothit1 Goethite WS222' was used. Figure 14 in Kilby's report illustrates the shape of this spectrum along with the closest matches obtained from the SMACC analysis. The Goethite WS222 spectrum was used to examine the complete Aster image and it provided a very positive area in the vicinity of the Iron Cap deposits in the Sulphurets area. This excellent match confirmed that the mapping process was providing accurate results. Within the Bedex claims area several good occurrences were identified and careful examination of the natural colour image confirmed the strong likelihood that limonitic material was present in these areas.

Figure 15 in Kilby's report illustrates the distribution of this spectrum in and around the Bedex claims area. The identification of goethite based on the VNIR bands is subject to including a number of other minerals so caution should be used with this distribution

map. Areas with any red or green coding along with reasonably large areas of blue coding warrant investigation. Of note is the general lack of red or green goethite coding directly coincident with the main buddingtonite alteration zone.

## **7.0**

### **PROPOSED WORK**

In addition to earlier recommendations for further work on the property which were made in the November 2006 assessment report (# 28681) on the Bedex property, it is strongly recommended that detailed prospecting and rock geochemical sampling be carried out in the following areas in the central part of the property:

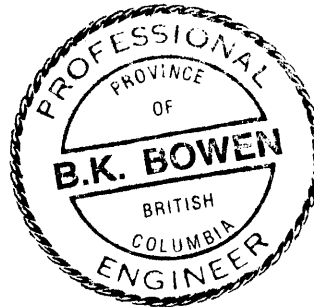
- (d) in the terminal moraine deposits immediately to the southwest of float sample 06B-14R. The toe of the glacier has retreated about 400 m from its location as shown in Figure 4 of this report. It would be encouraging if more mineralized float was found in the moraine material.
- (e) in the area of higher buddingtonite potential (green coding) on the southerly-facing slope within the same cirque containing the known mineralized float; and
- (f) in the area of higher buddingtonite potential (green coding) on the southwesterly-facing slope at the southwest end of the main alteration zone of possible buddingtonite.

8.0

**COST STATEMENT**

The cost for the work summarized in Section 4.5 is as follows:

	<u>\$CDN</u>	<u>\$CDN</u>
1) <u>Aster Image Analysis:</u>		
- Ward Kilby, P. Geo (analysis & report):		
- 18 hrs. @ \$105/hr. (incl. GST) - (Dec. 16-22)	1,890.00	
- B. Bowen, P. Eng (data editing & compilation):		
- 1.5 days @ \$600/d (Dec. 21-22)	<u>900.00</u>	
- Sub-total image analysis:	2,790.00	2,790.00
2) <u>Report Cost:</u>		
- B. Bowen: 1.5 days @ \$600/d	900.00	
- Office supplies, copying & printing:	<u>50.00</u>	
- Sub-total report cost:	950.00	<u>950.00</u>
 <b>GRAND TOTAL:</b>		 <b>\$3,740.00</b>



*B. K. Bowen*

*MAR. 23, 2010*

## 9.0

## REFERENCES

- (1) Compilation of RGS 58 Silt Geochemistry, Air Photo Lineament Study, Prospecting & Geochemical Sampling on the Bedex Claims, Skeena Mining Division, November 2006, Assessment Report 28681.
- (2) British Columbia Ministry of Forests, Public Website. November, 2006.  
<http://www.for.gov.bc.ca/dja/page1.htm>
- (3) British Columbia Ministry of Energy, Mines and Petroleum Resources, Public Website. November, 2006.  
[http://www.webmap.em.gov.bc.ca/mapplace/minpot/ex\\_assist.cfm](http://www.webmap.em.gov.bc.ca/mapplace/minpot/ex_assist.cfm)
- (4) British Columbia Ministry of Energy, Mines and Petroleum Resources, MINFILE Public Website. November, 2006.  
<http://www.em.gov.bc.ca/Mining/Geolsurv/minfile/>
- (5) Surprise Creek project description, from Pinnacle Mines website. May, 2006  
[www.pinnaclemines.com](http://www.pinnaclemines.com)
- (6) RGS 58 Regional Geochemical Survey, Map Sheets 104A & 104H. August 3, 2005.
- (7) Evenchick, C.A., 1991: Structural Relationships of the Skeena Fold Belt West of the Bowser Basin, Northwestern B.C. Canadian Journal of Earth Sciences, v. 28, p. 973-983.



10.0

STATEMENT OF QUALIFICATIONS

I, Brian K. Bowen, of Surrey, in the Province of British Columbia, DO HEREBY CERTIFY THAT:

1. I am a Consulting Geological Engineer with an office at 12470 99A Avenue, Surrey, British Columbia, V3V 2R5, Telephone (604) 930-0177.
2. I am a graduate of the University of British Columbia with a degree of Bachelor of Applied Science in Geological Engineering, obtained in 1970. I have been practicing my profession continuously in Canada and elsewhere since graduation.
3. I am a member in good standing of the Association of Professional Engineers and Geoscientists of the Province of British Columbia.
4. This report is based in part upon: (1) Ward E. Kilby's December 2009 spectral analysis of the Aster image covering the Bedex claims area; and (2) the writer's compilation, field work and other studies carried out on the Bedex claims during the period August 2005 to November 2006.
5. I am the 100% owner of the Bedex 1-8 and 15-24 mineral claims, Skeena Mining Division.

Dated at Surrey, British Columbia, this twenty-third day of March, 2010.

March 23, 2010  
Surrey, B.C.  
BKB/bb

B. K. Bowen, P. Eng.  
Consulting Geologist




*B. K. Bowen*  
*MAR. 23, 2010.*


## Certificate of Author

I, Ward E. Kilby, P. Geo., am a Professional Geoscientist residing at 421 Curlew Drive in the City of Kelowna, in the Province of British Columbia.

- I am member of the Association of Professional Engineers and Geologists of British Columbia (#19138).
- I graduated from the University of Alberta with a Bachelor of Science degree (Specialization in Geology) in 1976 and obtained a Master of Science degree in geology in 1978 from the University of Alberta. I have practiced my profession continuously since 1978.
- Since 1978 I have been involved in mineral and coal exploration in Canada and the United States. From 1982 until 2000 I was employed by the British Columbia Geological Survey. Since 2000 I have been a partner in Cal Data Ltd., providing geological consulting services to the exploration industry and governments.
- Since 2000 I have been continually involved in providing remote sensing services to industry and governments.
- I prepared this report and performed all the remote sensing work described in this report.

Dated at Kelowna, British Columbia, this 18 day of December 2009

  
Ward E. Kilby, P. Geo.



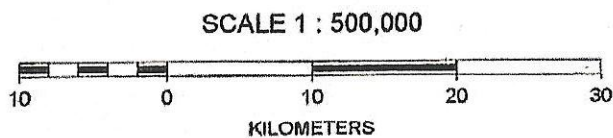
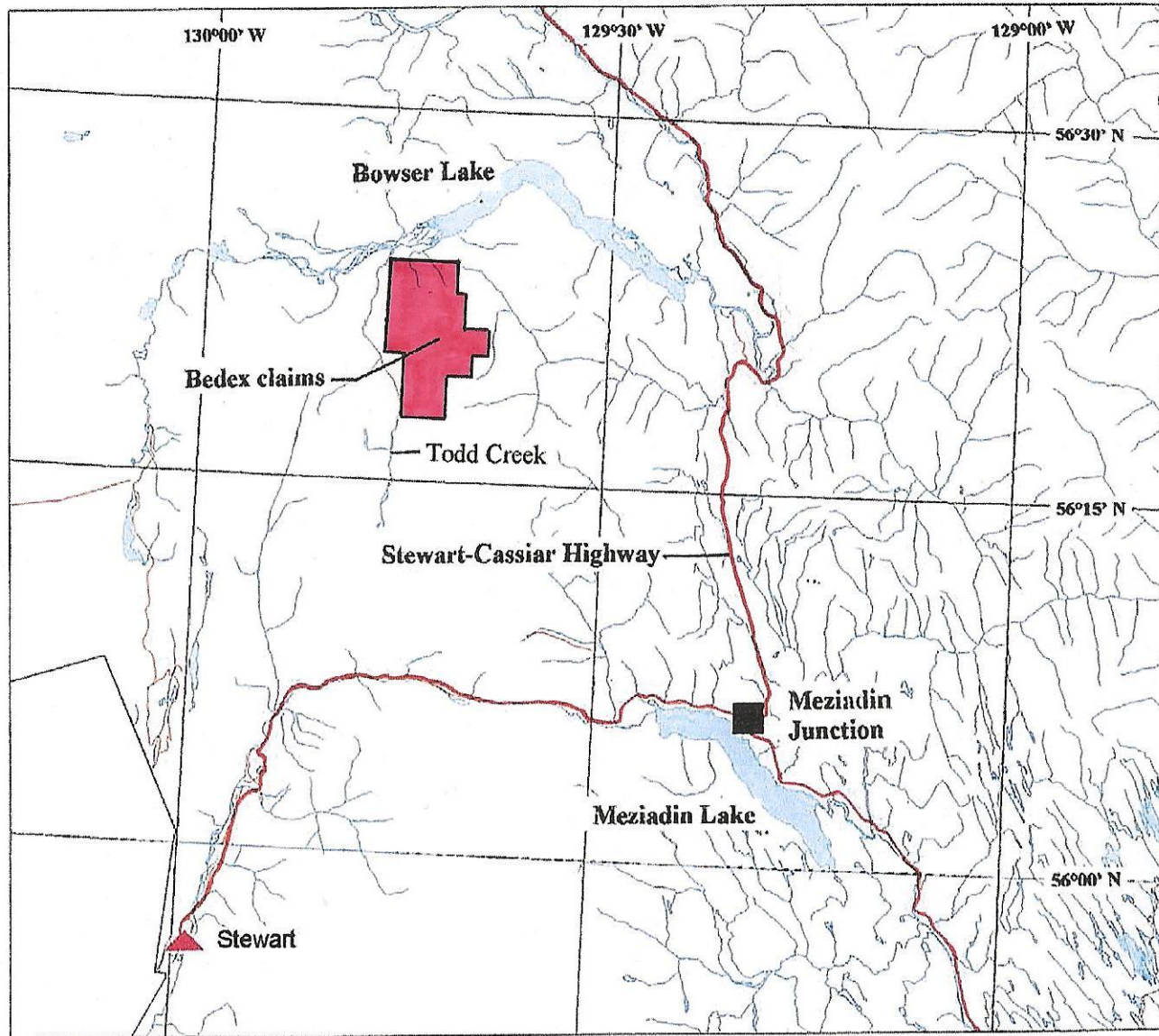
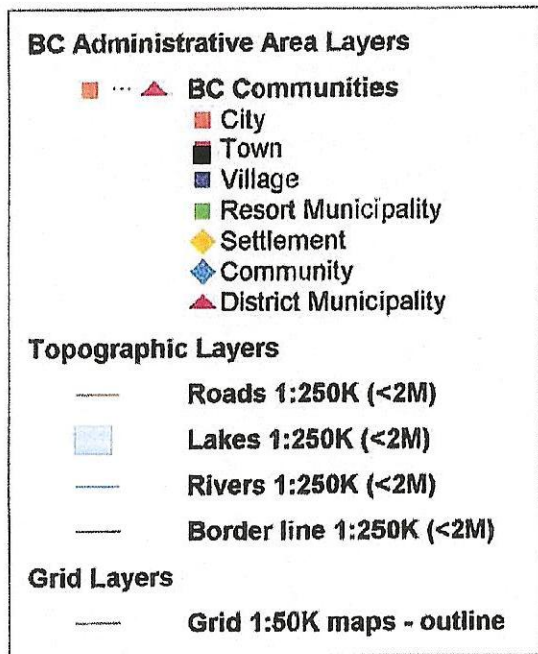
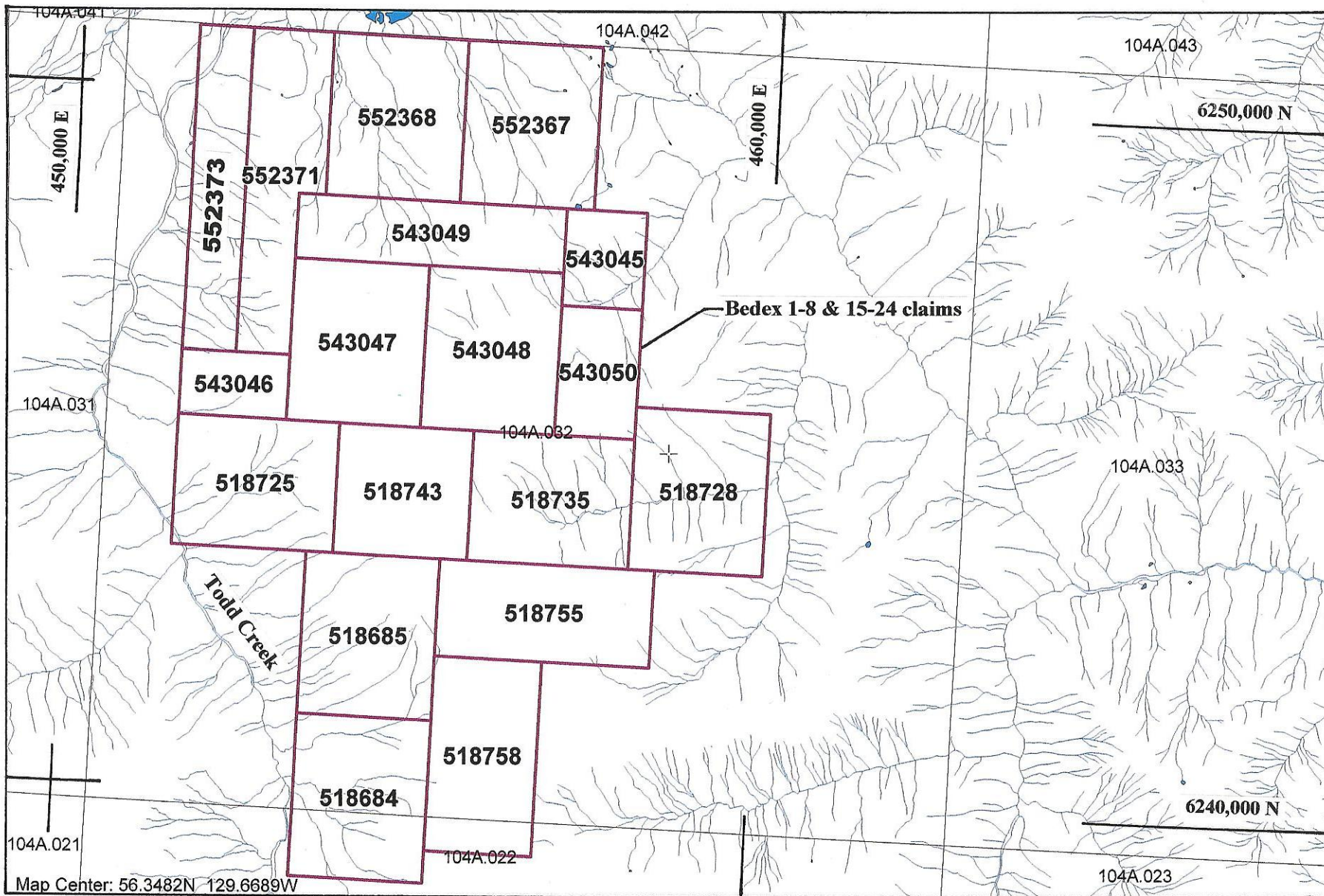
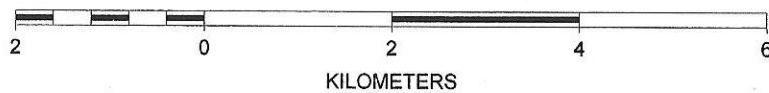


Figure 1  
Bedex Claims  
Location Map





SCALE 1 : 80,000

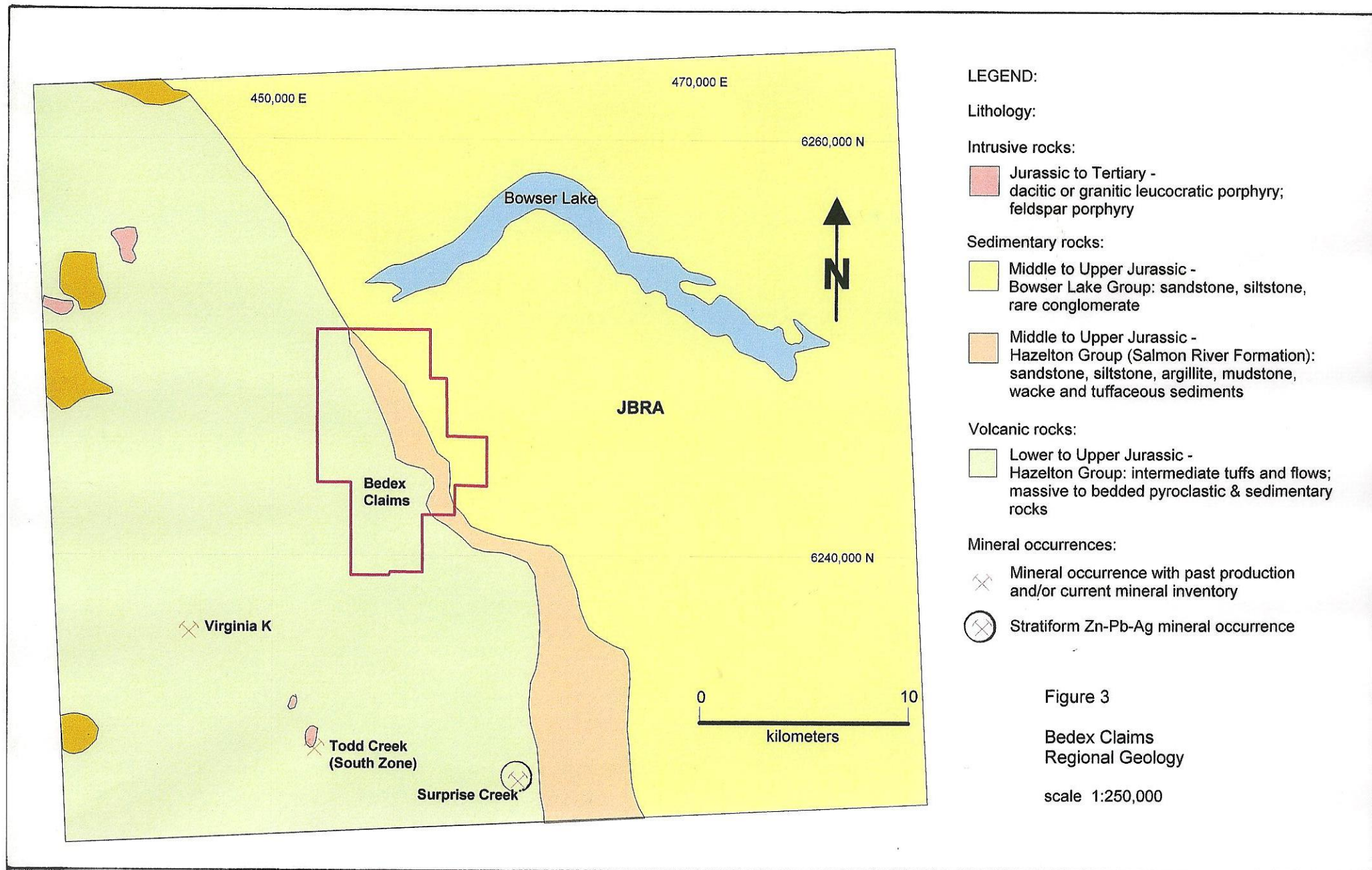


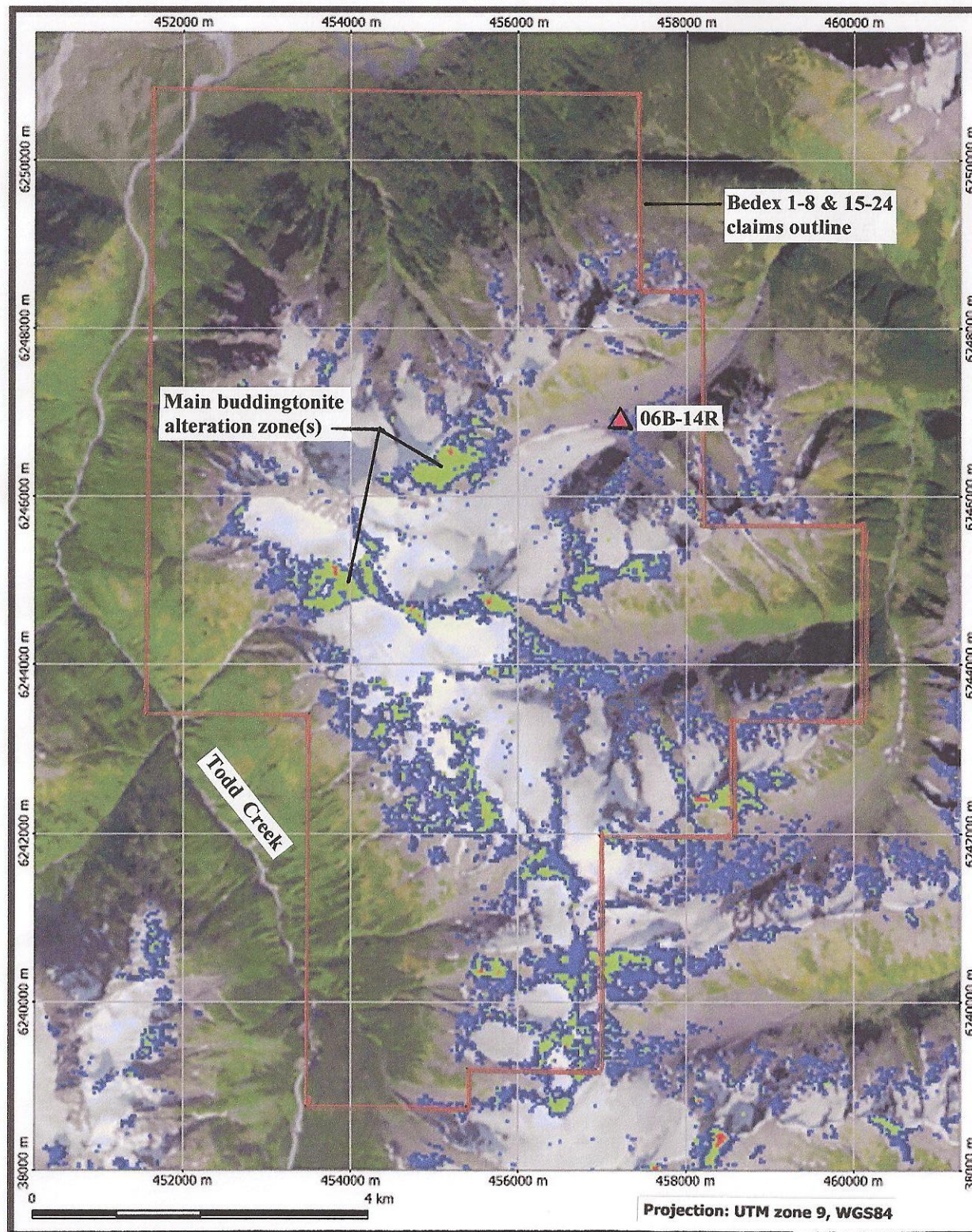
**Figure 2**

**Bedex Claims  
Claim Map**

**NTS: 104 A/5**







**BEDEX CLAIM GROUP**

	<b>BEDEX CLAIM GROUP</b> Grab Sample
<b>06B-14R</b>	2.11% Zn, 64.8 ppm Ag, 5890 ppb Au
	<b>Buddingtonite Potential</b> SAM angle 0.0000 to 0.0333
	SAM angle 0.0333 to 0.0667
	SAM angle 0.0667 to 0.1000
<b>ASTER Natural Colour base image</b>	



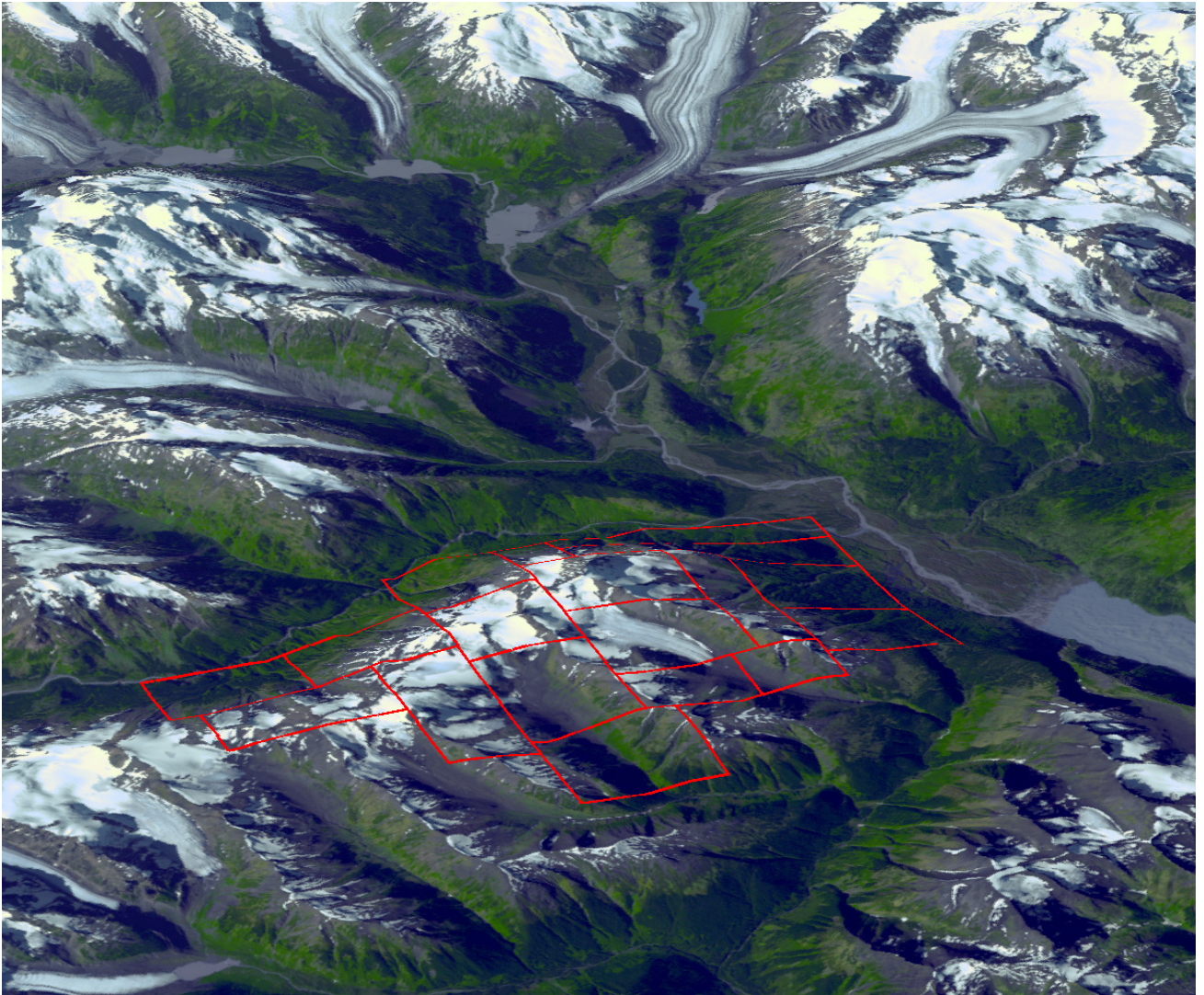
Figure 4

Bedex Claims  
Distribution of Buddingtonite Spectral Signature

(after Cal Data Ltd. - December 2009)



**ASTER ANALYSIS**  
of the  
**BEDEX 1-8 & 15-24 Claims, British Columbia**  
**B. K. Bowen**



**Prepared for:**

**B.K. Bowen**  
Surrey, Canada

**Prepared by:**

Ward E. Kilby, Pgeo.  
Cal Data Ltd.  
18 December, 2009



# Table of Contents

INTRODUCTION.....	1
Summary .....	1
Area and Image .....	2
IMAGE ANALYSIS .....	4
Pre-analysis Processing (preprocessing).....	4
Analysis .....	6
Natural Colour Image- .....	6
Masking- .....	6
Mineral Indices- .....	7
Crosta Analysis- .....	8
Hyperspectral Analysis – .....	8
SWIR SMACC-.....	9
Buddingtonite Evaluation .....	11
VNIR SMACC-.....	16
KML Display.....	18
CONCLUSIONS and RECOMENDATIONS.....	19
APPENDIX: Analysis results and data files.....	20

# INTRODUCTION

## *Summary*

Cal Data Ltd. was contracted by B.K. Bowen to acquire and analyze ASTER Multispectral imagery covering the BEDEX claim group in northern British Columbia. B.K. Bowen provided the claim descriptions and assessment report information. The required digital files were obtained through the BC government's MapPlace website. The required ASTER image was identified and downloaded from the MapPlace. In addition a search was conducted to confirm that the acquired ASTER image was the best available.

Image analysis included converting the image from radiance to relative reflectance values through a process of atmospheric corrections. The image was orthorectified to the UTM Zone 9, WGS 84 projection.

A variety of multispectral analysis procedures were applied to the image in an attempt to identify alteration minerals. ASTER, due to its limited number of bands, can not always provide definite mineral identifications. But in this case there were some very good examples of potentially important alteration minerals such as buddingtonite (assumed). The analysis concentrated on the BEDEX claims but some analyses were conducted over the whole ASTER image to provide a regional context. The results of the analysis are presented as image maps as well as in KML format which can be viewed with the Google Earth viewer. Some of the resultant images are provided in the appendix.

During the orthorectification process a DEM is calculated from the ASTER image and is provided as a grid file. This DEM was used to generate perspective views of some analysis results.

## Area and Image

The BEDEX claims are located in northwestern British Columbia centred on geographic coordinate 56° 20' 34" N 129° 45' 00" W. The claim area is located in the south east quadrant of an ASTER image and the whole claim group is contained within the image. The whole image (approx. 60 x 60 km) was available at processed Level 1B through the MapPlace. The image information is contained in Figure 1. The claim boundaries and the outline of the ASTER image are shown in Figure 2.

Dataset Attribute	Attribute Value
<a href="#">Level 1A Scene ID</a>	SC:AST_L1A.003:2018933367
<a href="#">Acquisition Date</a>	2000/09/24
<a href="#">WRS-2 Path</a>	054
<a href="#">WRS-2 Row</a>	021
<a href="#">Upper Left Corner</a>	56°52'05"N, 130°14'25"W
<a href="#">Upper Right Corner</a>	56°42'18"N, 129°14'18"W
<a href="#">Lower Left Corner</a>	56°19'47"N, 130°33'31"W
<a href="#">Lower Right Corner</a>	56°10'08"N, 129°34'11"W
<a href="#">Scene Center</a>	56°31'04"N, 129°54'06"W
<a href="#">Scene Cloud Cover</a>	4%
<a href="#">SWIR Mode</a>	ON
<a href="#">TIR Mode</a>	ON
<a href="#">VNIR1 Mode</a>	ON
<a href="#">VNIR2 Mode</a>	ON
<a href="#">Day or Night</a>	Day
<a href="#">Orbital Direction</a>	Descending
<a href="#">Sun Elevation</a>	32.831937
<a href="#">Sun Azimuth</a>	176.878604
<a href="#">Acquisition Time</a>	20:20:36.3310000
<a href="#">VNIR Pointing Angle</a>	8.5879999
<a href="#">TIR Pointing Angle</a>	8.5670000
<a href="#">SWIR Pointing Angle</a>	8.5310000

### [FGDC Metadata](#)

**Figure 1. ASTER image metadata.**

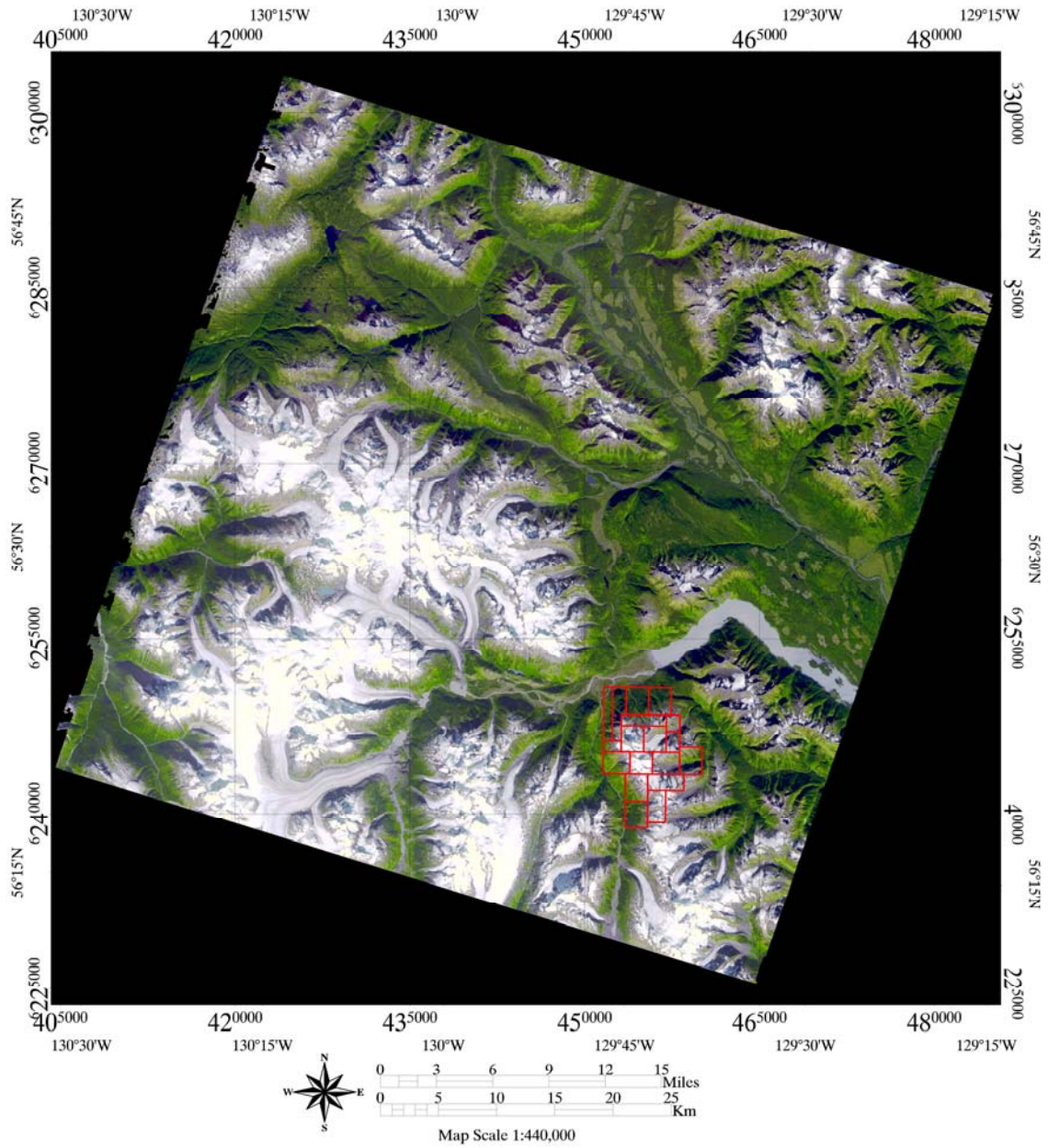


Figure 2. The near natural colour ASTER Image with property outline shown in red.

# IMAGE ANALYSIS

## *Pre-analysis Processing (preprocessing)*

Upon obtaining the raw ASTER image a number of preprocessing steps are required to transform the raw data values into relatively standard values. In the case of this study these standard values are relative reflectance. The relative reflectance spectrum of a mineral has the same shape as a true reflectance spectrum but the values may not be true. In most cases it is the shape of the spectra and the relative band values that are used in any analysis. The image pixels are also spatially adjusted to conform to the UTM map projection. Orthorectification is employed to compensate for the effects of topography in this spatial adjustment.

Step 1- Cross Talk correction: due to a design flaw in the ASTER SWIR instrument there is some leakage of light between bands. This problem can be largely corrected by running a corrective routine on the raw data (CTIO.exe).

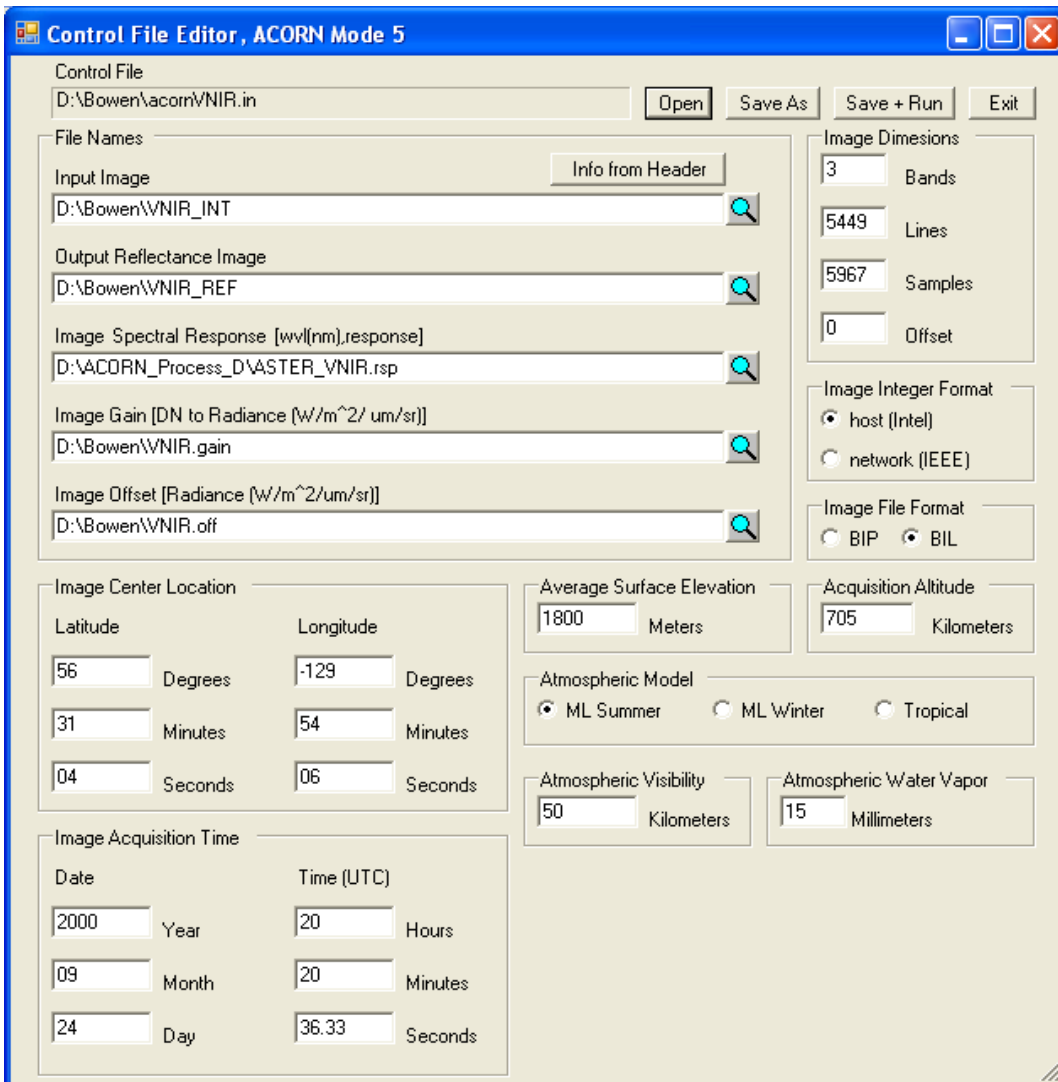
Step 2- Orthorectification, gain and offset: The raw ASTER data is shipped in a format where the pixel values are simple DN (digital numbers). To convert these values to 'at sensor radiance' specific gains and offsets must be applied. The ASTERdtm program makes these corrections at the same time that it orthorectifies the VNIR, SWIR and TIR image bands. As part of the orthorectification process a relative DEM is generated from the ASTER data to provide the basis of the orthorectification. The result of this step is orthorectified 'at sensor radiance' data. The spatial accuracy of the orthorectification has not been evaluated but will be internally consistent and within 100 metres of true position.

Step 3- Atmospheric correction was performed using specialized software called ACORN5 that compensates for the effects of atmospheric gases on the amount of light energy that penetrates and is reflected by the atmosphere. The original ASTER data is in the form of 'at sensor radiance' which is a measure of the amount of light the satellite sensor receives from all sources. A significant amount of the light that the sensor sees is reflected from the atmosphere and never reached the ground surface. This light obviously provides no information about the ground features and should be removed. The atmosphere also absorbs or otherwise scatters some of the light reflected from the ground surface. This missing light at the sensor is calculated by knowing the incident light value and general atmospheric conditions. Water vapour has the largest effect on the ability of light to penetrate the atmosphere. The relative reflectance values obtained from this process provide a spectra shape similar to what would be obtained with a field spectrometer or in a laboratory setting. This processing is essential so that the various band measurements at a given pixel have standard relative values. Otherwise the standard ratios and band formula used to identify minerals or mineral groups would be of little value. Figure 3 contains a view of the input panel for this calculation and records the

values utilized. The elevation used was the average elevation of good rock exposure within the claim blocks.

Step 4- The VNIR, SWIR and TIR bands were used during this study. These bands are collected by three different sensors on the space platform. The VNIR bands are 15 metres wide, the SWIR are 30 metres wide and the TIR are 90 metres wide. A single file, stack, is constructed to bring these two data sets together. During this process the SWIR and TIR bands are subsampled and converted to 15 metre pixels. It is this ‘stack’ that is used in subsequent analysis where VNIR, SWIR and TIR bands are involved.

The atmospherically corrected and orthorectified image files are available in ENVI \*.BIL format in the appendix. Also included in the appendix is the digital elevation model.

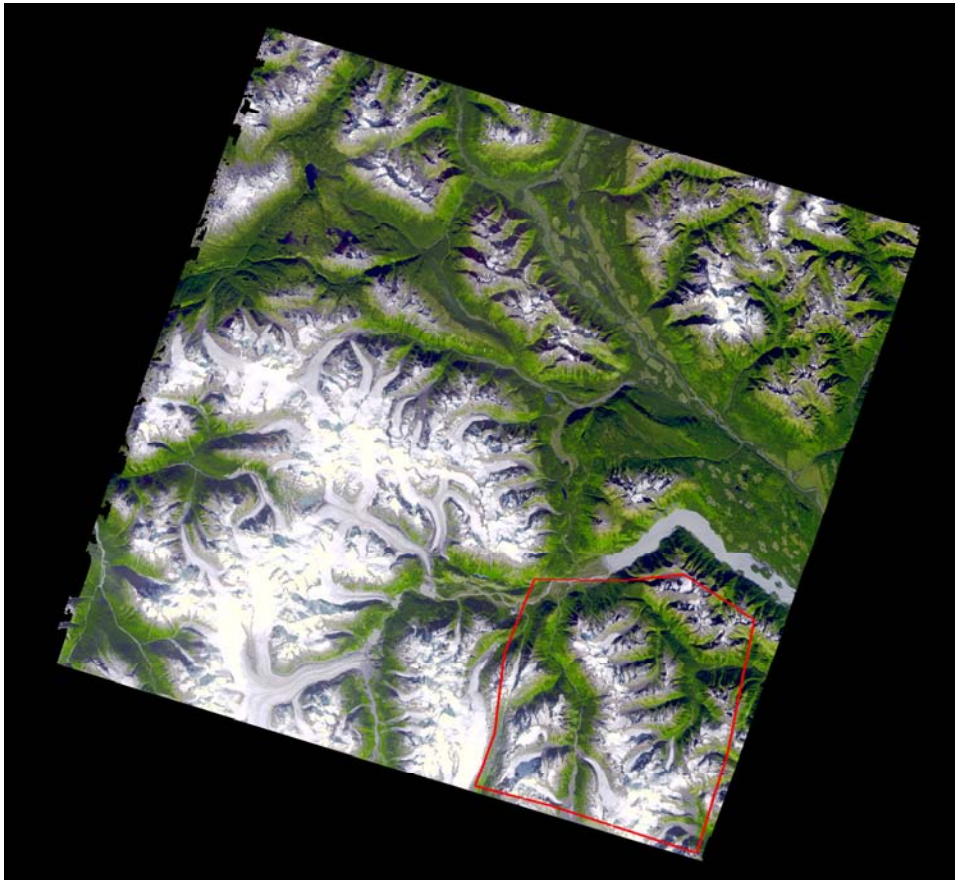


**Figure 3. Input panel for the ACORN5 atmospheric correction process for the VNIR bands of this image.**

## *Analysis*

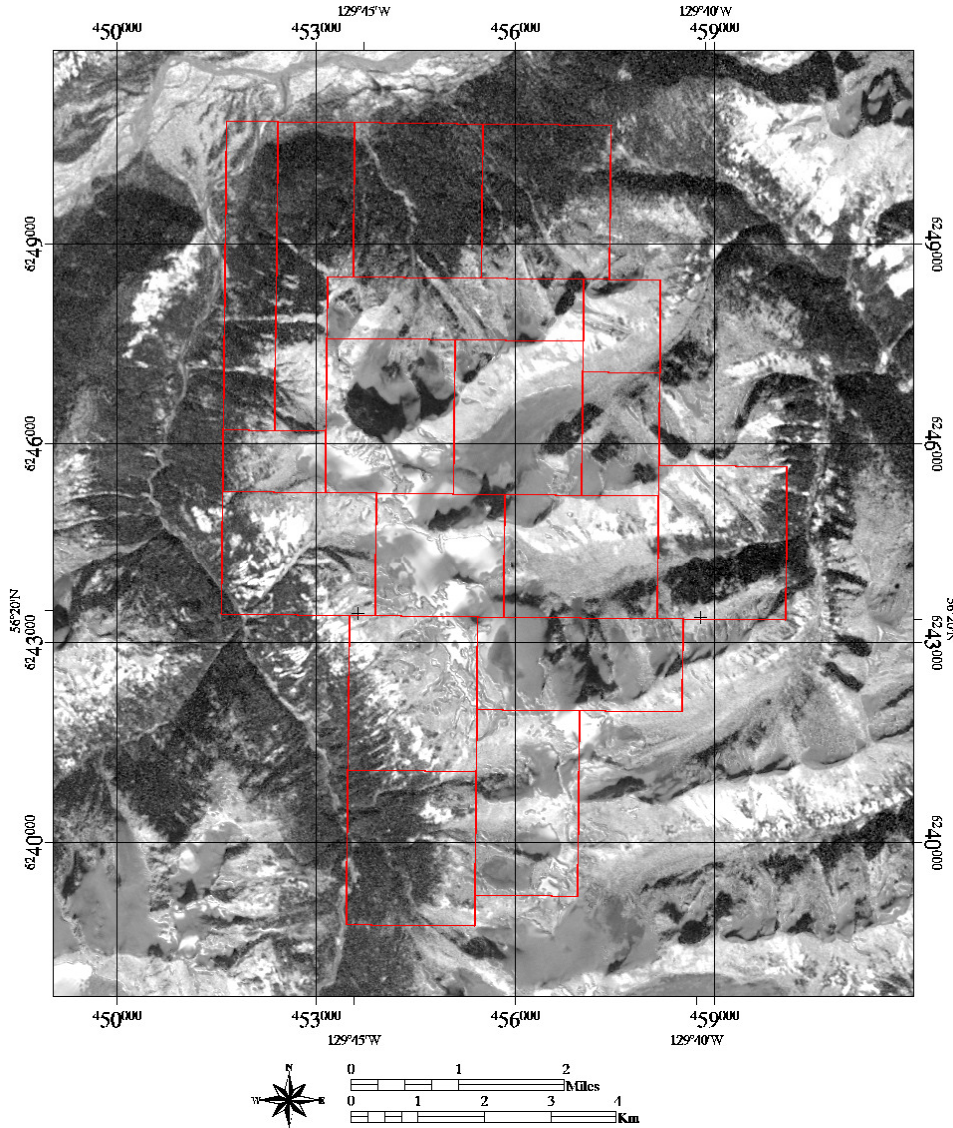
**Natural Colour Image-** The product generated from the corrected ASTER data is a near-natural colour image. ASTER does not sample the blue range of the electromagnetic spectrum so the resulting image is only an approximation to what one would see if viewing the natural scene. In this study the three VNIR bands were used to generate this view. These bands are combined in various combinations to produce the three primary colours of red, blue and green. The result is a close approximation to a natural colour scene. The image has 15 metre pixels and is available in the appendix as a GeoTiff (NaturalColourBRIGHT.TIF). Figure 2 displays the natural colour image.

**Masking-** A small area of the whole ASTER image, encompassing the whole property, was outlined and used to construct a mask. In addition to masking out most of the ASTER image area masks were also constructed to remove vegetation, snow/ice, shadow and water so that spectral endmember identification was restricted to only rock exposures. Inclusion of pixels (spectra) unrelated to the purpose of the analysis only confuses the process. Figure 4 shows the position of the area defined by the mask relative to the whole ASTER image



**Figure 4. Outline of masked area is shown in red relative to the whole image.**

**Mineral Indices-** A number of ASTER band ratios and band combinations have been used by past workers in a variety of metallogenic provinces to map the distribution of potential alteration minerals in the search for economic minerals. A suite of these band combinations (28) were run for this image. This traditional multispectral analysis technique did not identify any obvious trends in claim areas. There are broad scale patterns across the whole image that may be related to geology but in general this analysis was not beneficial and was not evaluated further as other techniques provided more promising results.



**Figure 5. Example of a mineral ratio image. In this case band 2 over band 1, referred to as 'Ferric iron'. The lighter areas are the highest ratio values or the closest match to the material being targeted.**

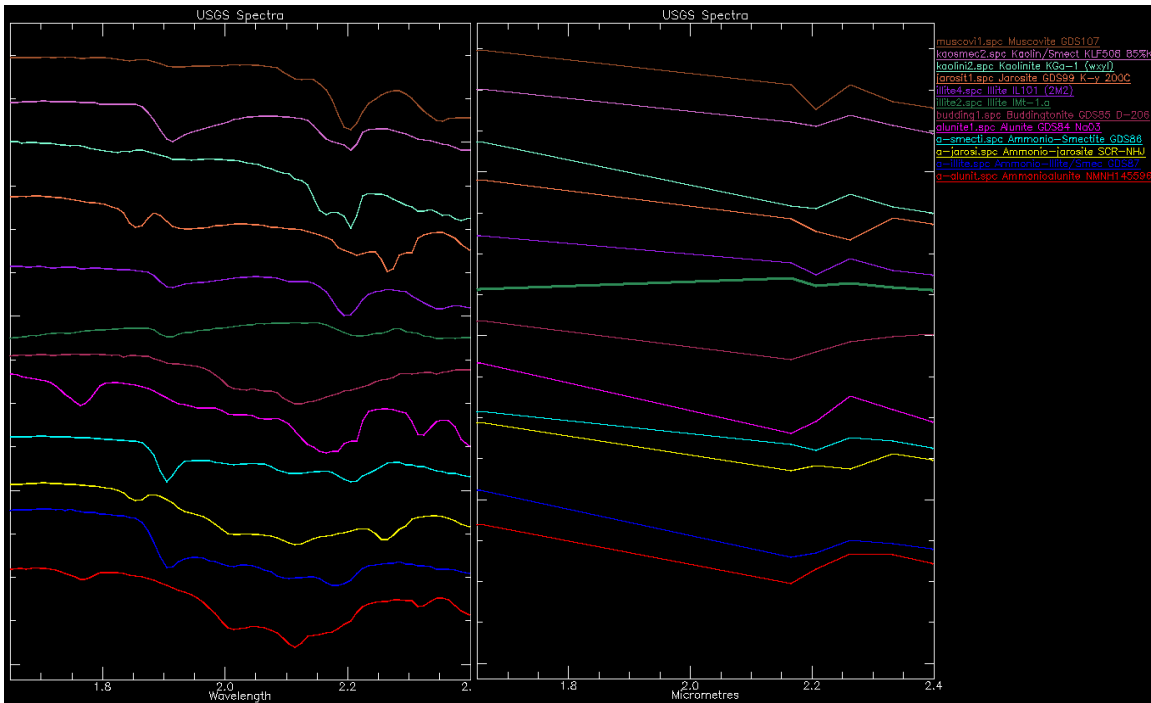


### **Crosta Analysis-**

Crosta analysis is another commonly employed technique used to examine multispectral imagery. It utilizes principal component analysis (PCA) of bands related to the mineral species being sought. This method was used in an attempt to map four mineral species; Alunite (1,3,5,7), Illite (1,3,5,6), Kaolinite+Smectite (1,4,6,9) and Kaolinite (1,4,6,7). Results of PCA are very dependent upon the area included in the analyses. A highly masked region covering the area of the claim group was used for this analysis. Examination of the results of this analysis provided some interesting trends and highlighted some interesting features but the more interesting results obtained from using hyperspectral techniques resulted in no detailed follow-up being performed on the Crosta results. If more promising results had not been obtained with other techniques this analysis method would have proven quite useful.

**Hyperspectral Analysis** – ASTER provides multispectral data but hyperspectral analysis tools can be used to examine the imagery to extract additional information to augment the multispectral analysis techniques. Spectral endmembers were extracted from the ASTER image using the SMACC (sequential maximum angle convex cone) endmember extraction procedure. The spectral endmember extraction process was performed only on the rock exposures in and around the claim group. The resulting endmembers were compared to spectra contained in the USGS spectral library as well as several of the John Hopkins University spectral libraries in an attempt to identify each spectrum. The ground location of each endmember was examined on the natural colour image to make sure the sample site was indeed on good rock exposure and not influenced by nearby snow/ice, vegetation or water. The SMACC process was conducted on the bands from the three sensors independently. The VNIR (bands 1-3) was used to identify iron minerals. The SWIR was used to look for alteration minerals such as clays (bands 4-9). The TIR (bands 10-14) is used to identify silicate minerals. The large ground sample distance (GSD) or pixel size of 90 metres will be of limited use but zones of silicification may be identified with these bands.

The library spectra were collected in laboratories and the spectrum for each sample was sampled in great detail with many very narrow slices of the spectrum. ASTER on the other hand samples the spectrum over a few very broad ranges. The library spectra were resampled using the response curves for ASTER to generate ‘ASTER’ spectral libraries to use in the comparison between image spectra and library spectra. Some common library spectra and their equivalent ASTER spectra are displayed in Figure 6.

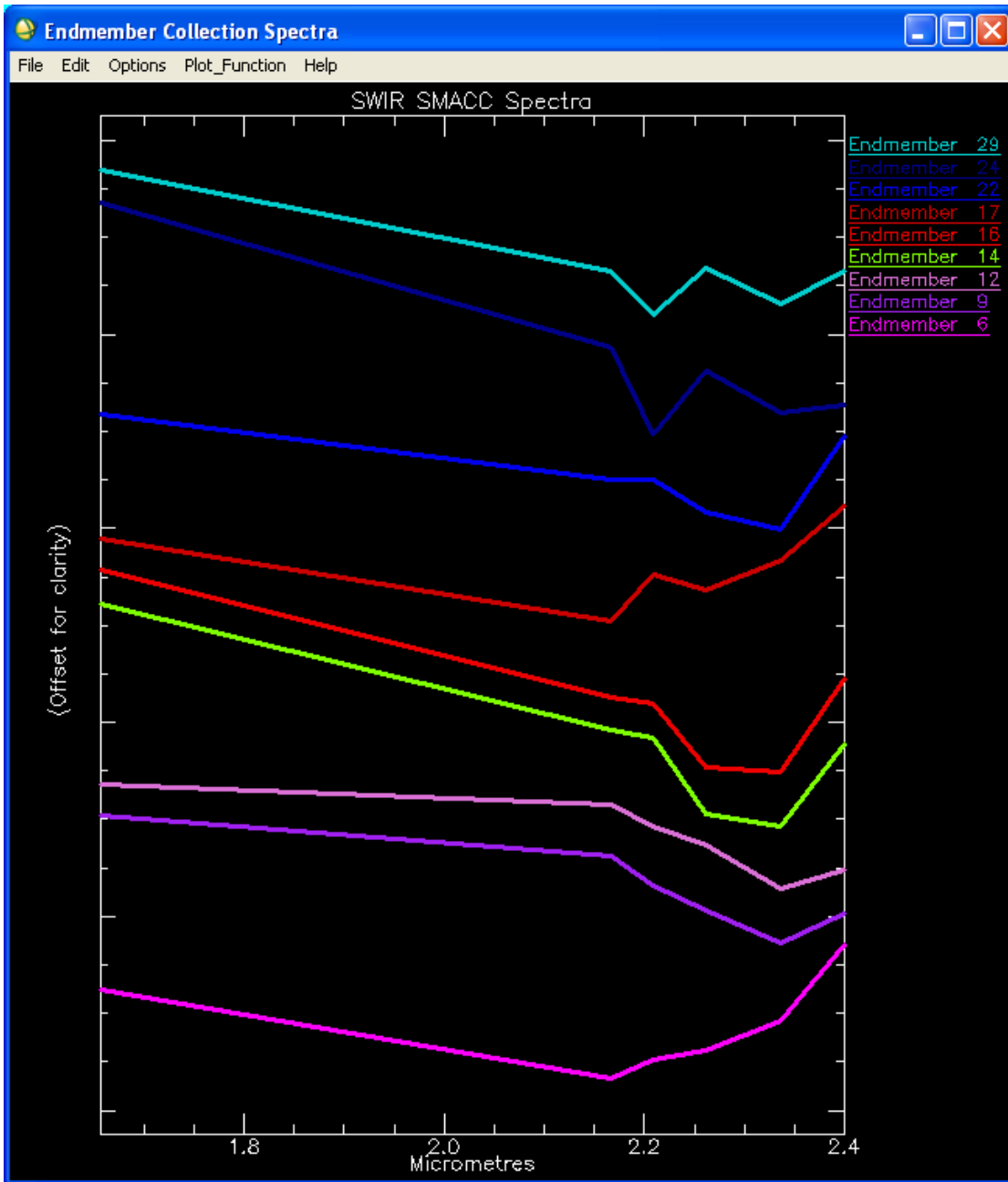


**Figure 6. The SWIR region spectra of selected potential alteration minerals that could be present within the claim group are shown above (from the USGS Spectral Library). Left panel contains detailed spectra and the right panel contains the spectra as seen with ASTER's 6 SWIR bands.**

The SMACC endmember extraction procedure identified 30 endmembers in the area immediately around the property. Examination of the endmember locations against the Natural Colour image eliminated all the spectra that were not derived from rock exposures. Many of the endmembers were from near the edge of water, ice or vegetation which would influence the spectrum and make it unreliable for consideration. Also any spectrum that was very different from any spectrum in the libraries was eliminated from further processing.

### **SWIR SMACC-**

Five of the spectral endmembers identified for the SWIR bands were invalid as they sampled a part of the image edge that contained invalid values. Figure 7 illustrates the 9 endmembers that were tentatively associated with a mineral spectrum from one of the spectral libraries. Several of the endmembers were very similar and likely represented the same mineral. Table 1 contains the tentative mineral identification associated with each of the spectra in Figure 7.



**Figure 9. The nine SWIR endmembers that were tentatively identified as minerals.**

<b>ENDMEMBER</b>	<b>MINERAL suspected</b>
Endmember 6	Buddingtonite
Endmember 9	Calcite-Limestone
Endmember 12	Calcite-Limestone
Endmember 14	Dolomite
Endmember 16	Dolomite
Endmember 17	Buddingtonite
Endmember 22	Dolomite
Endmember 24	Muscovite-Illite
Endmember 29	Kaolinite-Smectite

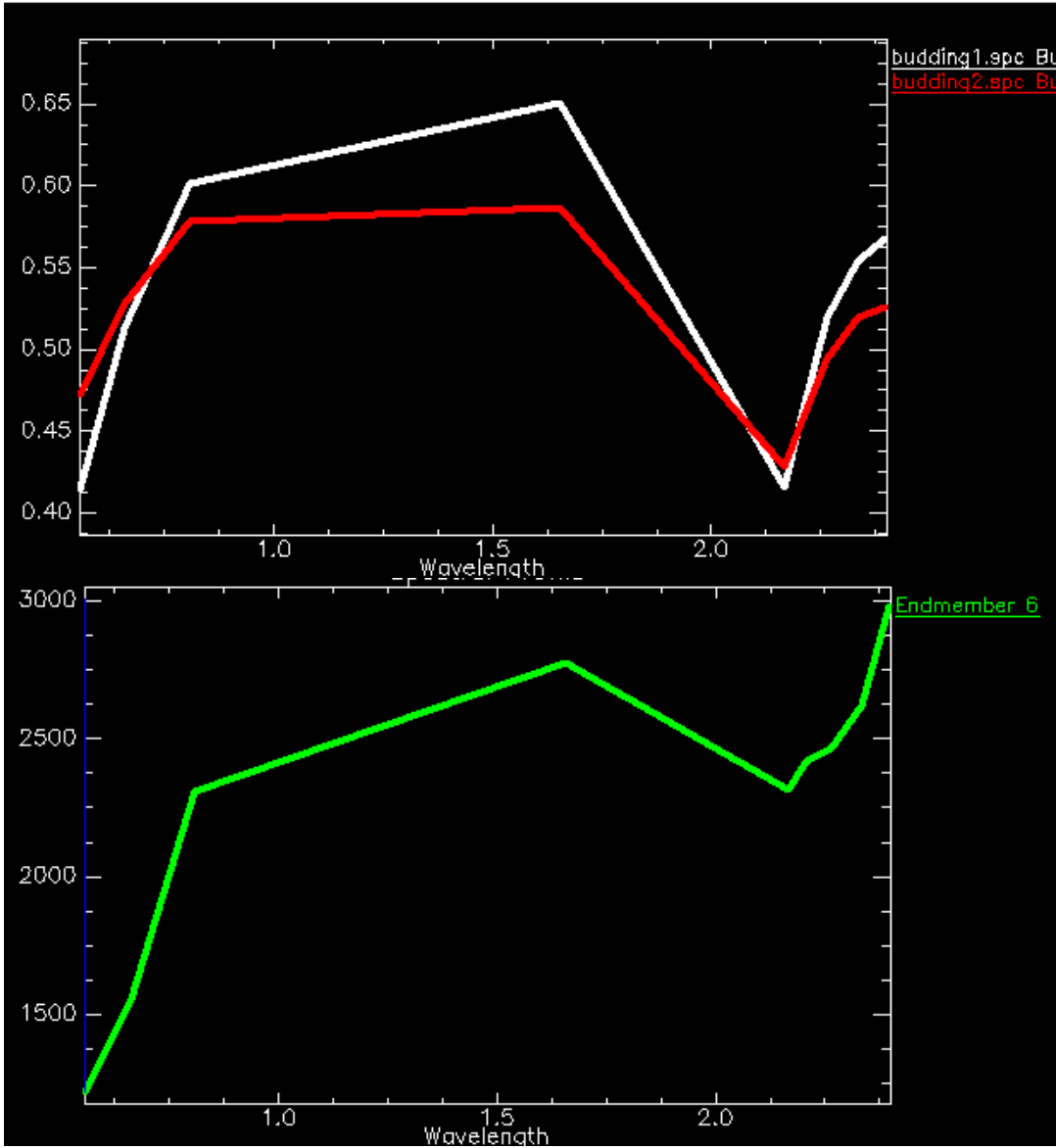
**Table 1. Valid SWIR endmembers and suspected mineral identification.**

The possible presence of Buddingtonite in the claim area is very significant. Buddingtonite is an ammoniated feldspar that has been associated with significant gold deposits and is commonly used as a pathfinder alteration for the exploration of epithermal vein deposits. The tentative identification of such an important alteration mineral immediately shifted the focus of the analysis from trying to map some clay species to the mapping and verification of this mineral. The ASTER analysis project was limited in scope so the effort was focused on the most important finding of the study. In addition the iron staining had been recognized in the area and its mapping is addressed in the following section.

### **Buddingtonite Evaluation**

The ‘Buddingtonite’ (tentative) spectrum obtained from the ASTER image (Endmember 6) was compared to all the spectra contained in the USGS spectral library and Buddingtonite was the best fit. Figure 10 shows the comparisons of the Endmember 6 spectrum from the image and the two USGS library spectrum.

In addition to visual comparison of the spectra a tool contained within ENVI performs a rigorous mathematical evaluation of the similarities between the library spectra and the image spectra. Figure 11 shows the results of the comparisons. The two library buddingtonite spectra are in the top twelve spectra with the best combined matching scores. A visual comparison of the ranked spectra is essential to determine if the mathematically derived rankings are the best. Figure 12 shows the visual comparisons of the image spectrum with the library matches for the top ranking choices and the two buddingtonite spectra. It is obvious that the two buddingtonite spectra are better matches than any of the other choices provided by the Spectral Analyst tool.



**Figure 10. Comparison on the ASTER obtained spectrum called Endmember 10 with the two Buddingtonite spectra contained in the USGS Spectral Library (resampled to ASTER band configuration).**

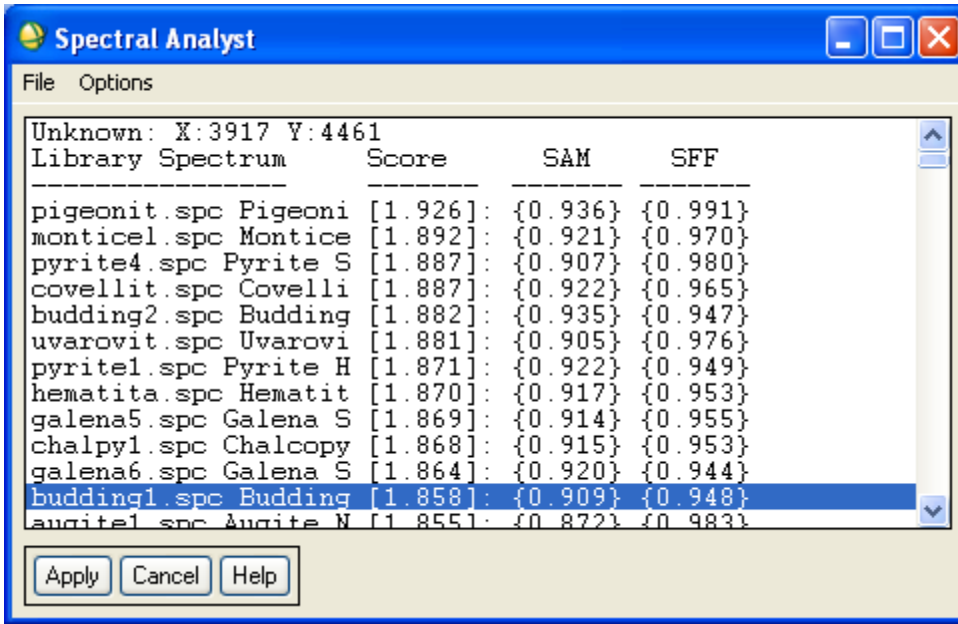


Figure 11. Results of Spectral Analysis of Endmember 6. The top twelve USGS Spectral Library spectra matches are shown.

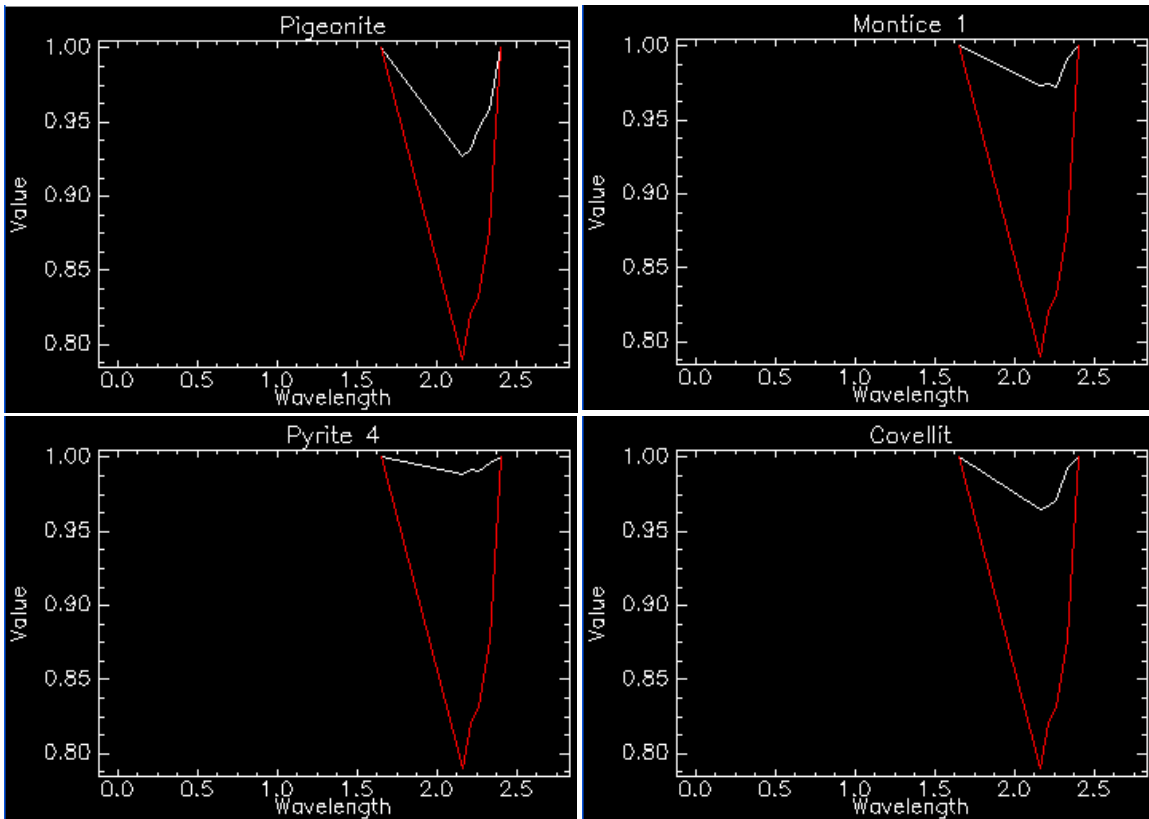
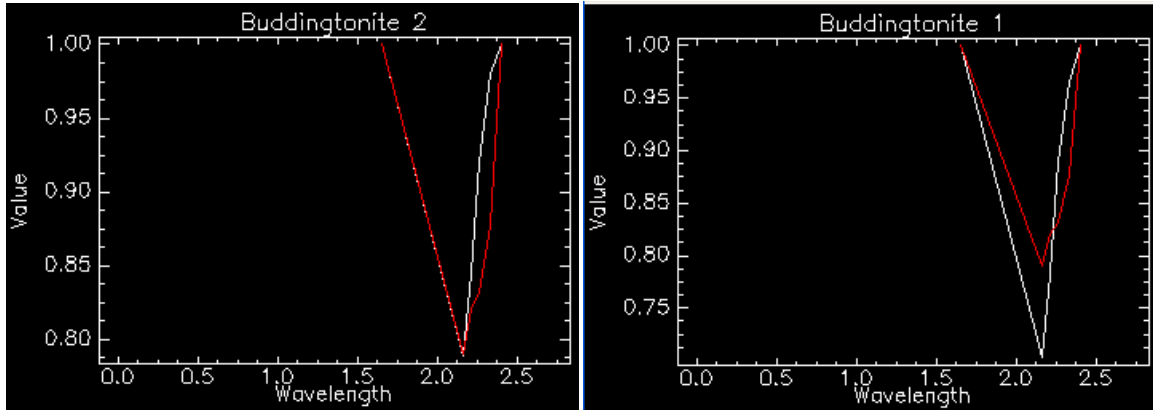


Figure 12a. The four spectral matches with combined SAM and SFF totals better than Buddingtonite. ASTER image spectrum in red.



**Figure 12b. The two Buddingtonite library spectra compared with the ASTER image spectrum. ASTER image spectrum is shown in red the library spectra in white.**

Figure 13 presents the distribution of this spectral feature in the claim area. The pixel dimensions in this figure are 15 metres on a side. The map presented in Figure 13 is contained in the appendix as a stand alone PDF.

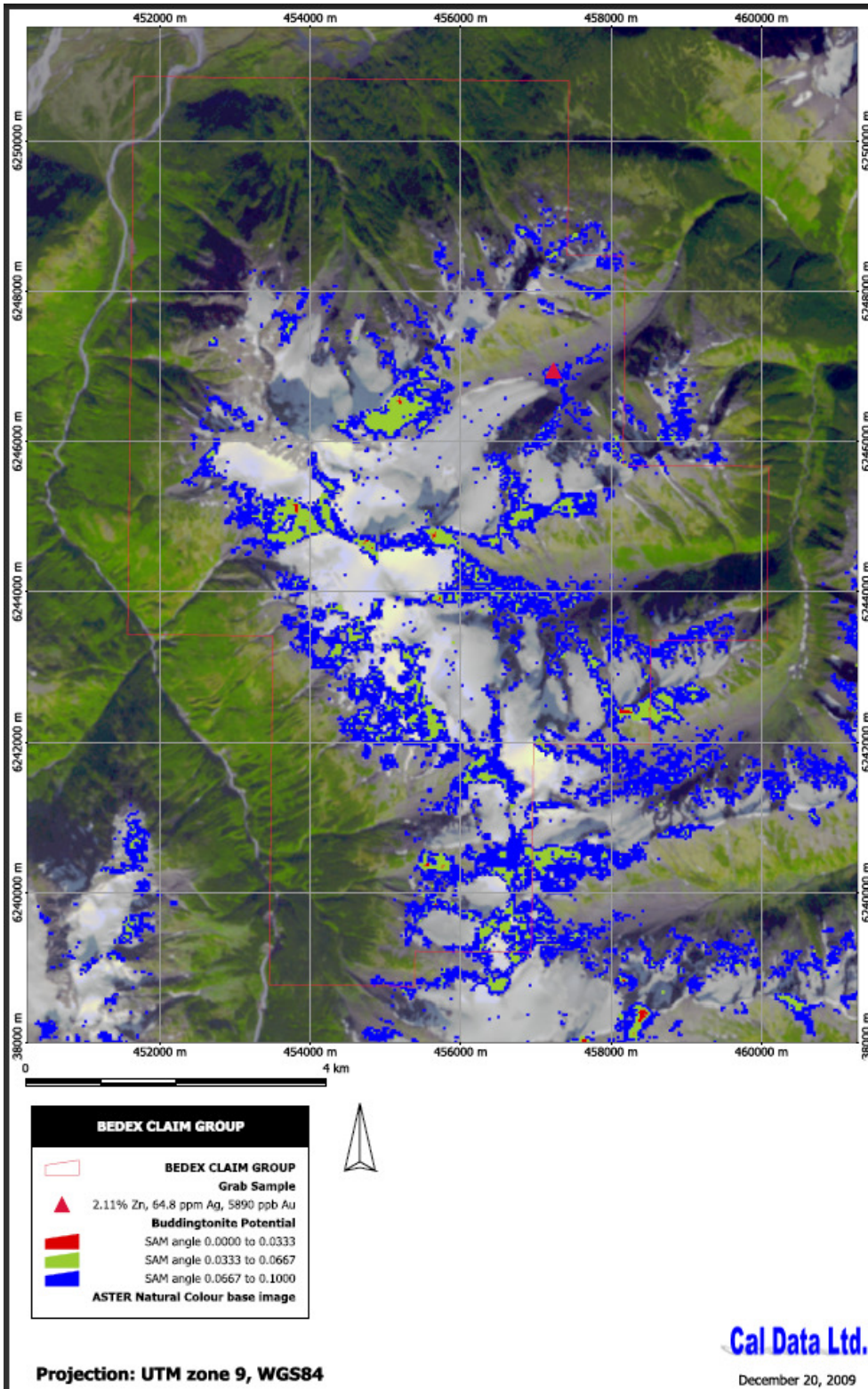
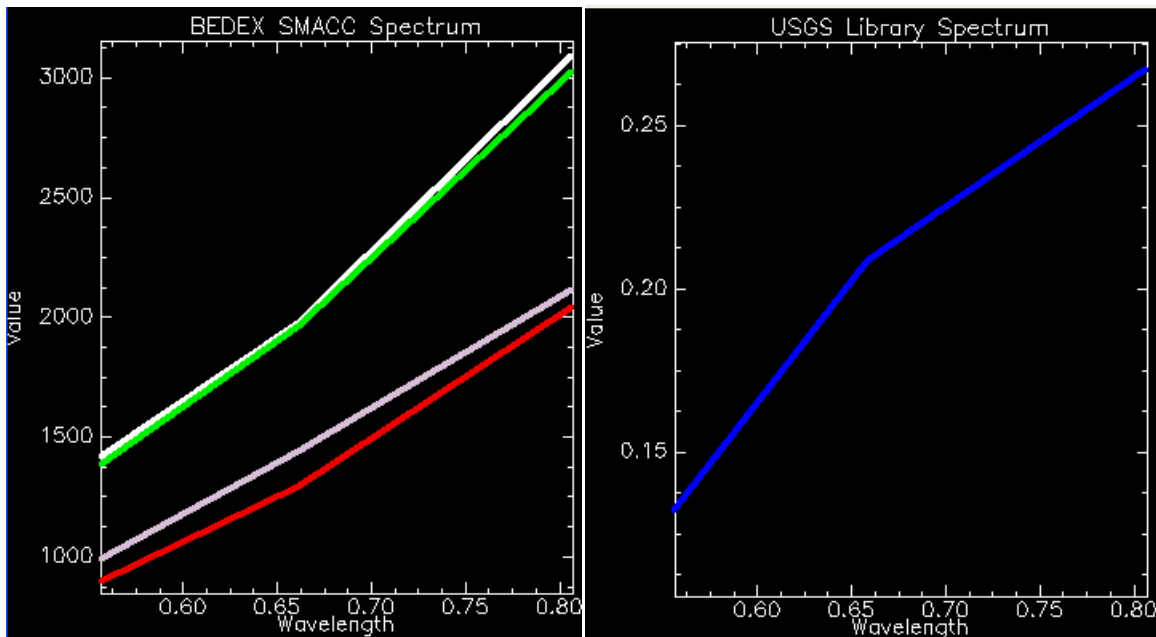


Figure 13. Distribution of Buddingtonite spectral signature on the BEDEX Claim Group.



## VNIR SMACC-

The three ASTER bands from the VNIR portion of the electromagnetic spectrum were processed with the SMACC procedure in the area of the BEDEX Claims. The primary target of this portion of the analysis was to identify any iron bearing mineralization that could point to areas of interest. Several endmembers approximating goethite (limonite) were found through this analysis. These endmembers were not excellent matches for the goethite spectra contained in the spectral library, but on the assumption that they did represent a diluted version of the goethite spectrum one of the USGS spectra was used for the spectral mapping exercise. The spectrum labeled 'geothit1 Geothite WS222' was used. Figure 14 illustrates the shape of this spectrum along with the closest matches obtained from the SMACC analysis. The Geothite WS222 spectrum was used to examine the complete ASTER image and it provided a very positive area in the vicinity of the Iron Cap deposits in the Sulphurets area. This excellent match confirmed that the mapping process was providing accurate results. Within the claim area several good occurrences were identified and careful examination of the natural colour image confirmed the strong likelihood that limonitic material was present in these areas. Figure 15 illustrates the distribution of this spectrum in and around the claim area. The map is also provided in the appendix as a standalone PDF.



**Figure 14. Comparison of the USGS Spectral Library spectrum for Goethite on the right and several SMACC derived endmembers from the BEDEX Claim area of the ASTER image.**

The identification of Goethite based on the VNIR bands is subject to including a number of other minerals so caution should be used with this distribution map. Areas with any red or green coding along with reasonably large areas of blue coding warrant investigation.

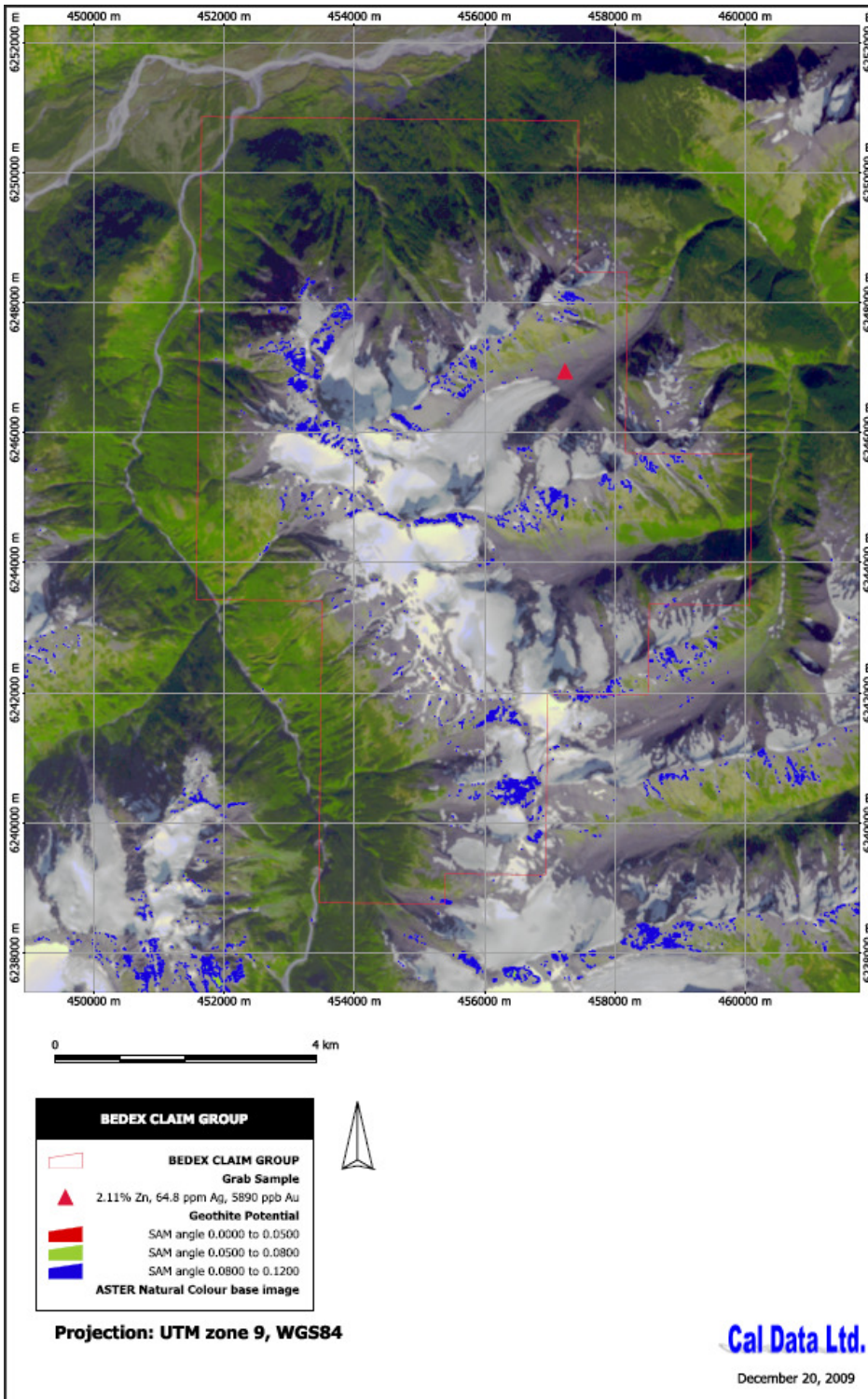


Figure 15. Distribution of the Goethite spectrum in the BEDEX Claim Group.

## **KML Display**

KML and KMZ files were created to provide the ability of the client to better visualize the results of the analysis. Two files are provided in the appendix. The 'A26.kml' file was downloaded from the MapPlace and contains information served directly from the Ministry of Energy, Mines and Petroleum Resources website. This file was originally created by the author for a different project. The 'BEDEX Analysis.kmz' file contains information generated during this analysis. Both files can be launched simply by double clicking on the file assuming a copy of Google Earth is available on the user's computer. No views of these files are presented in this report as the author does not currently have a commercial version of Google Earth. Any version of Google Earth can be used to view these files. There is a slight misalignment between Google Earth and the files provided in the BEDEX Analysis.kmz file. This misalignment is minor and can be adjusted by the user if desired. No attempt to make the two sets of data align was made as no accurate ground control points were available to determine which set should be adjusted.

## CONCLUSIONS and RECOMENDATIONS

An ASTER image that was collected on September 24, 2000 was obtained from the MapPlace ([www.MapPlace.ca](http://www.MapPlace.ca)) and analyzed during this investigation. The image was corrected for cross-talk, an on-board instrument design issue, and atmospheric interference. Spatially, the image was orthorectified utilizing a DEM generated from bands 3 and 3B which provide a stereo pair.

A number of multi and hyper spectral image analysis techniques were used to examine the image. The results of this processing are partially displayed in this report and the complete set of analysis results are contained in digital form in the appendix. Multispectral analysis techniques were used to investigate the image as well as hyperspectral techniques. The hyperspectral techniques provided the most detailed results and were used for the mapping of the identified mineral species.

Two minerals (spectrum) were mapped across the property using SAM (Spectral Angle Mapper) procedure. What is believed to be Buddingtonite and Goethite were mapped using the SWIR and VNIR portions of the electromagnetic spectrum respectively. Buddingtonite is an ammoniated feldspar that is associated with hydrothermal systems and has been found in deposits such as Carlin. This mineral has a very distinct spectral signature and is often a target of such analysis as it indicates alteration due to fluids passing through organic rich material that are believed to have enhanced mineral mobilization capabilities.

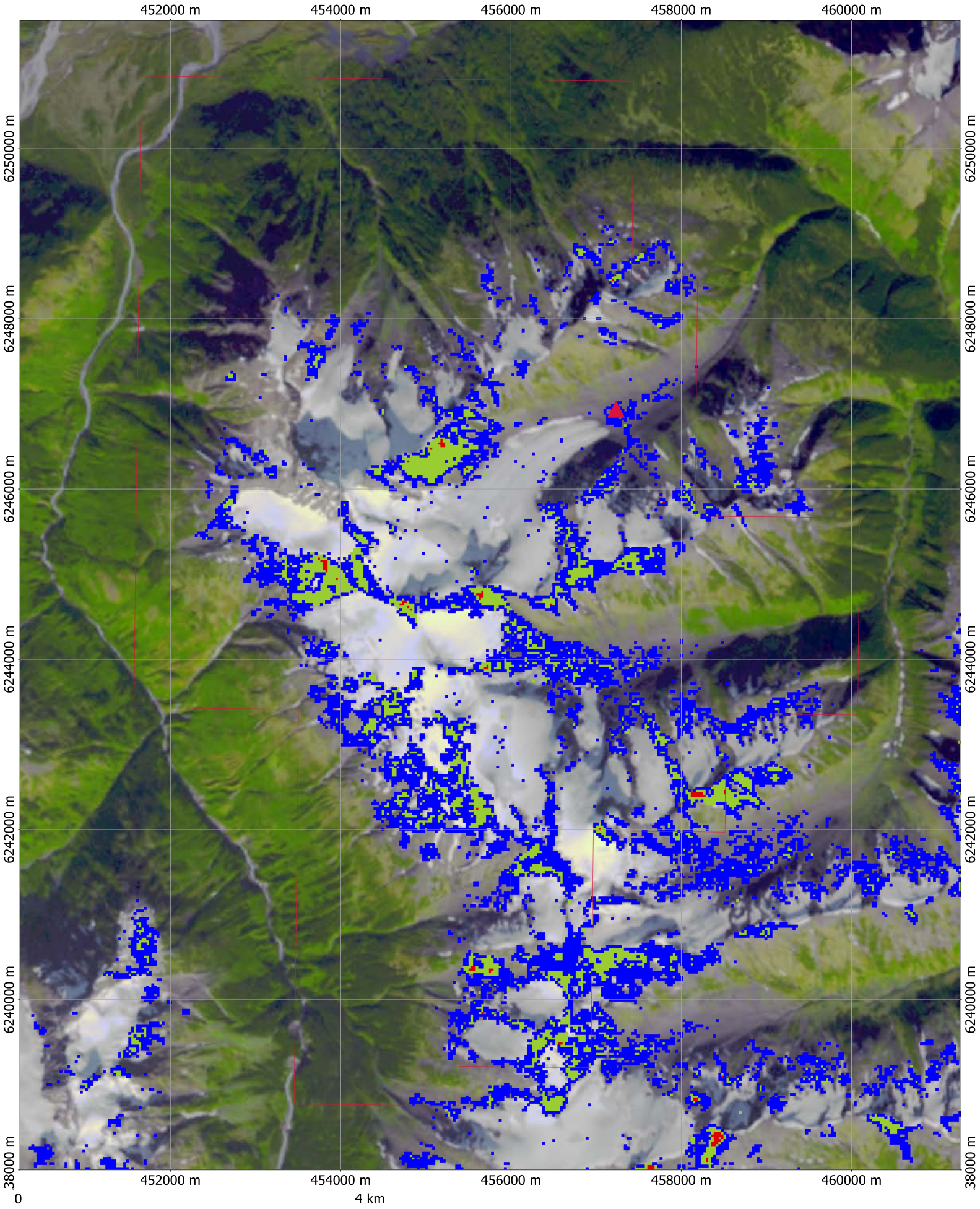
It must be remembered that these mineral identifications are based on remote sensing and have not been field verified. *No absolute pronouncement of the actual minerals being mapped can be made without field verification.*





The occurrence of what is believed to be a large buddingtonite zone with peripheral iron bearing material up slope from a well mineralized float sample is a very positive indication that additional examination is required. Personnel communications with B.K. Bowen indicate that he has not visited any of the buddingtonite bearing areas. There are indications that similar alteration exists around the head of the cirque above the location where the mineralize float sample was collected. This whole area should be investigated. There are other locations within the claim group that contain buddingtonite and limonitic spectral signatures and these should also be investigated.

This analysis was preliminary in nature and limited in scope. Only the most obvious significant spectra were mapped and described. There is potentially more information to be obtained from the ASTER image should resources and need warrant. The spatial accuracy of the ASTER derived information is suspect. It could be refined by comparison to the BC TRIM base map information. The TIR (Thermal Infrared) bands were not utilized in this analysis. These bands are useful in mapping silicate minerals.

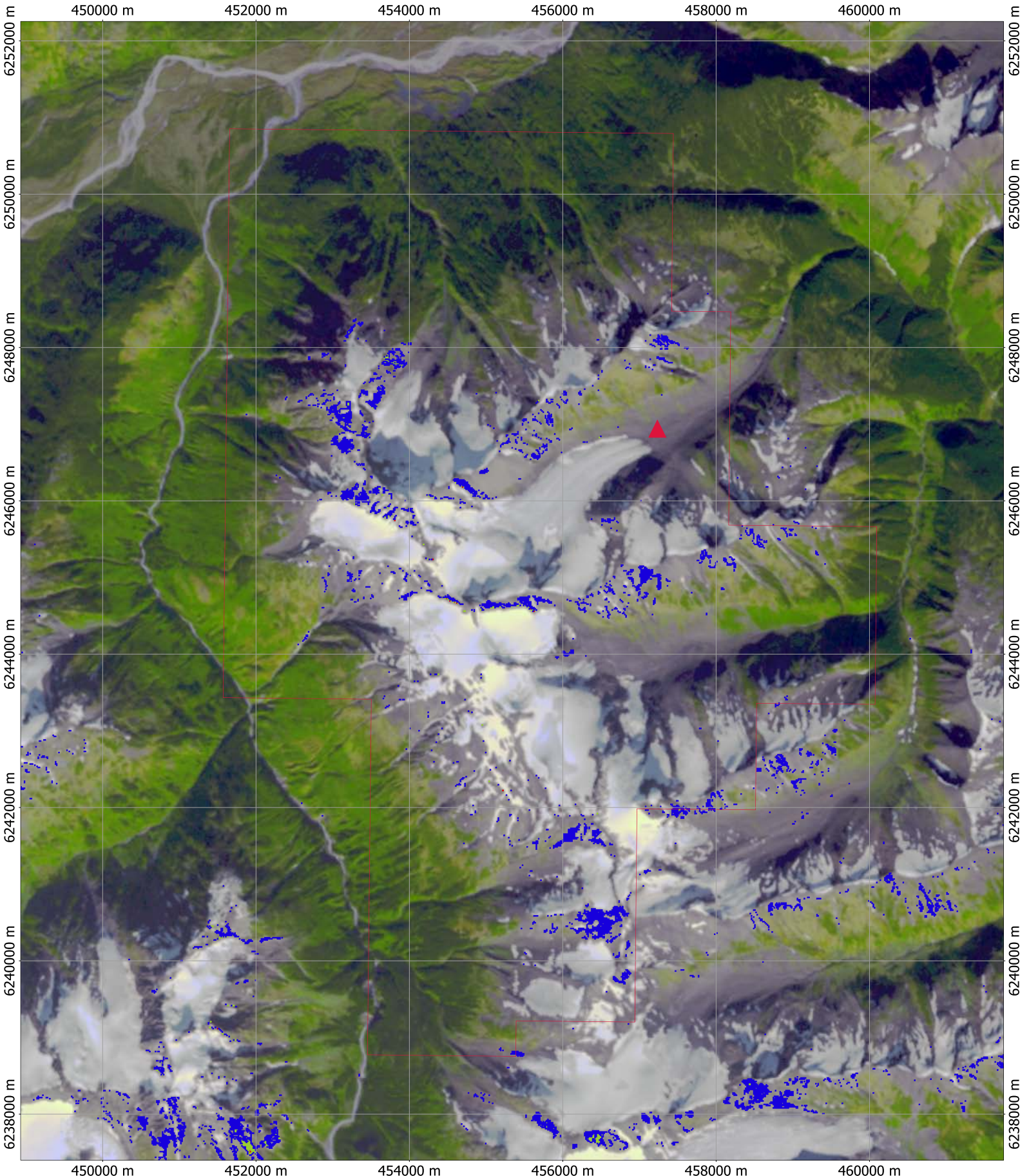
## **APPENDIX: Analysis results and data files** (on DVD)

- 1) **A26\_ASTER (ZIP):** Original ASTER data as downloaded from MapPlace.
- 2) **REF\_STACK (ENVI IMG):** A 14 band image containing the nadir spectral bands from the ASTER image. All bands are presented in 15 metre pixels and orthorectified. The VNIR and SWIR bands have been atmospherically corrected and the TIR bands have been thermally corrected.
- 3) **DTM (GeoTIFF):** Digital elevation model constructed from the ASTER image and used for the orthorectification. It is a relative rather than absolute DEM.
- 4) **NaturalColourBRIGHT (GeoTIF):** Pseudo natural colour image constructed from the ASTER image. Colours have been stretched to enhance shaded areas and rock differences.
- 5) **NaturalColourBRIGHTmap (GeoTIF):** Map of the natural colour image for the BEDEX claim area.
- 6) **Buddingtonite (PDF):** A property scale image map of the Buddingtonite distribution.
- 7) **Geothite (PDF):** A property scale image map of the Geothite distribution.
- 8) **Natural (PDF):** A property scale image map showing the natural colour image and location of mineralized float sample.
- 9) **A26 (KML):** A kml file as downloaded from the MapPlace containing BC Geological Survey data for the ASTER image area used in this study. Simply double click on the file to launch in Google Earth (GE must be present on machine).
- 10) **BEDEX Analysis (KMZ):** A kmz (zipped kml) file containing results from this analysis. Simply double click on the file to launch in Google Earth (GE must be present on machine). It can be loaded in combination with A26.kml to view all information together.



<b>BEDEX CLAIM GROUP</b>	
	<b>BEDEX CLAIM GROUP</b> <b>Grab Sample</b> 2.11% Zn, 64.8 ppm Ag, 5890 ppb Au
	<b>Buddingtonite Potential</b> SAM angle 0.0000 to 0.0333
	SAM angle 0.0333 to 0.0667
	SAM angle 0.0667 to 0.1000
<b>ASTER Natural Colour base image</b>	





**BEDEX CLAIM GROUP**

**BEDEX CLAIM GROUP**  
**Grab Sample**  
 ▲ 2.11% Zn, 64.8 ppm Ag, 5890 ppb Au

**Geothite Potential**  
 ■ SAM angle 0.0000 to 0.0500  
 ■ SAM angle 0.0500 to 0.0800  
 ■ SAM angle 0.0800 to 0.1200

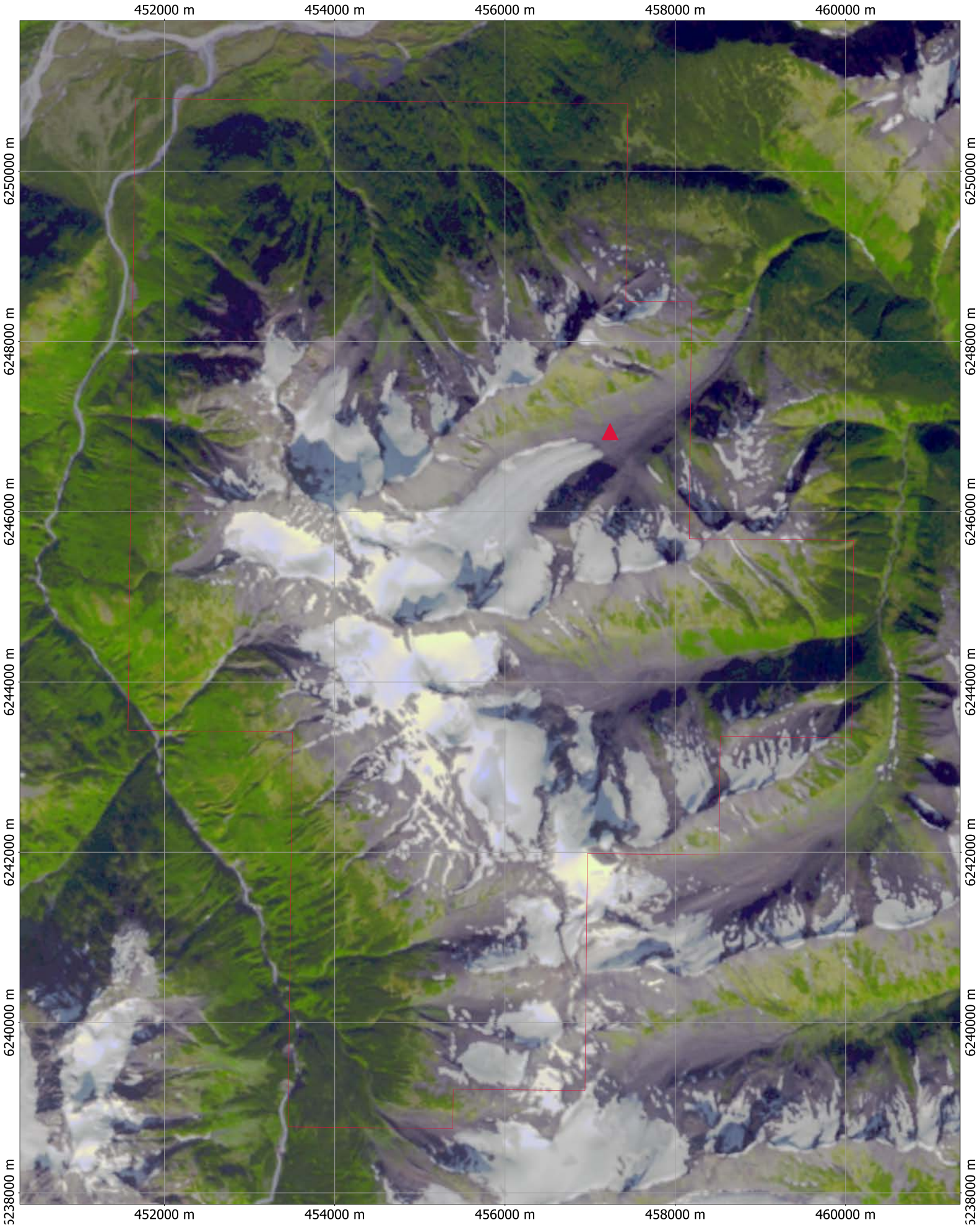
**ASTER Natural Colour base image**



**Projection: UTM zone 9, WGS84**

**Cal Data Ltd.**

December 20, 2009



<b>BEDEX CLAIM GROUP</b>	
<b>BEDEX CLAIM GROUP</b>	<b>Grab Sample</b>
<b>2.11% Zn, 64.8 ppm Ag, 5890 ppb Au</b>	<b>ASTER Natural Colour base image</b>