

**ASSESSMENT REPORT**

**MEMEKAY AREA PROJECT**

Spectral Analysis Study and Prospecting  
Of the  
**MEMEKAY CLAIM GROUP**

Tenures: #551391

**EVENT #  
4194466**

Alberni Mining Division  
NTS 092K/05  
092K.021  
UTM Zone 10 N (NAD 83)  
Lat: 50.367127° Long: -125.904306°  
Northing: 678750  
Easting: 5511725

**(Associated Minfile # 092K 043 092K 055  
ARIS: 27922; 298186; 27438; 26874 and 12102)**

For  
Dan Price Berkshire  
FMC# 102181

By  
Auracle Geospatial Science Inc.  
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## **EXECUTIVE SUMMARY**

Auracle Geospatial Science Inc. was asked in 2007 by Dan Berkshire to carry out a Spectral Analysis program on the HISNIT mineral claims which had been staked for their base metal (Copper) potential. Geologically this area consists of Karmutsen Volcanic Rocks, Island Plutonic Suite granodioritics, and Vancouver Group Parsons Bay Formation sedimentary rocks: bounded by four mapped faults. A short program of work on the MIMEKAY was conducted by J. Houle in the preceding year to provide prospector direction which was carried out in 2007 consisting of sampling and geologic/topographic feature location over 2 days.

Remote Sensing work featuring Spectral Analysis was carried out on the tenures by the author and included the acquisition of satellite spectral data available from NASA, pre-processing the data into a workable format, orthorectifying and georeferencing to map data, atmospheric correction, noise reduction with rigorous and extensive classification of the data in search of indicators, or relationships that might lead to the discovery of metallic mineralization. This program was meant to apply recently developed technologies and methodologies together with the latest computer software available for spectral analysis as a tool for mineral exploration.

This spectral analysis program was highly labour and computer intensive. Tenure files were subject to classification and analysis resulting in numerous images for examination. These Classification images were examined for correlation to known or mapped contacts and surface geology. Spatial correlation was not considered to be conclusive however there are several resulting alteration signatures and mineral end members were identified.

A PIMA ground truthing program to verify the resulting data is advised to examine these relationships.

Auracle Geospatial Science Inc.  
December 2007

## **INTRODUCTION**

In December and February 2006 and 2007 these tenures were acquired by Dan Berkshire. This prospective area is a target for porphyry copper type occurrences and Skarn type occurrences. Rising demand and prices for metals on the world market was added incentive for these acquisitions. In 2007 Dan Berkshire asked Auracle Geospatial Science Inc. to conduct exploration to search for alteration mineralization by remote sensing. Remote Sensing spectral analysis is a recent and still developing exploration tool. David McLelland has gained valuable experience in the use of spectral data as part of his Post Graduate Diploma, Master of Science, and industry training and certification programs.

Alteration and surface mineralization mapping by remote sensing have become accepted methods in mineral exploration. This work program has provided further information and insight into the surface constitution of this mineral tenure.

## **LOCATION AND ACCESS** (See Figure 1 – General location Map)

The MEMEKAY tenure is located approximately 3.6 kilometres southeast of the Sayward -Island Highway intersection on the east coast of Vancouver Island British Columbia 12 kilometres south of the Town of Sayward. Access to the general area is by the White River forest Service Road. Logging Spur roads off this main to the east continue up into the tenure.

## **PHYSIOGRAPHY** (figure 2)

This prospect area is situated between the White and Salmon Rivers and above (north of) the Middle Memekay River. The central section of this tenure group consists of moderately steep ground. Elevation ranges from 500 to 800 metres. The tenure mountainsides are covered with both logging slash and second growth Fir, Balsam, Hemlock and Cedar timber. Ground cover is thick salal in the lower elevations. This area can still be snow covered until late winter.

## **MINERAL CLAIM STATUS**

This Claim is held in Good standing by Dan P. Berkshire. The MEMEKAY tenure recorded as the 'TOWER 1' Claim includes 475.15 hectares of mineral tenure. Mr. Berkshire enjoys a 100% unencumbered interest in this claim. Please refer to the cover confirmation sheet for further information.

## **PREVIOUS WORK** (Extracts from Minfile and ARIS data)

No recorded work is attributed to the ground encompassed by this tenure. 5.5 kilometres North-west from the Memekay is located a past producer Minfile # 092K 043: The 1959 to 1969 IRON MIKE open pit magnetite (Skarn type Deposit) mine. 2.04 kilometres to the South west: The WHITE Minfile # 092K055 records a skarn type zinc (Sphalerite) occurrence.

Recorded work in this area consists of: ARIS file # 27922; a seismic study of the aggregate potential of the adjacent tenure to the east and ARIS Files 12102: 26874; 29186 and 27438 representing exploration work that has been conducted at or near the IRON MIKE mine site. There is no record of previous work within the tenure boundaries

**GEOLOGY** (figure3) According to provincial geological survey mapping, this area generally consists of Middle to Upper Triassic Karmutsen Volcanic Basalts, and Middle to Upper Triassic Vancouver Group Sedimentary rocks of the Parsons Bay Formation, intruded by Early to middle Jurassic Island Plutonic Suite granodioritics. The immediate area of the tenure is mapped as Karmutsen volcanics.

#### **MINERALIZATION**

Alteration mineralization detected by remote sensing: Ferroaxinite, magnesiochromite buddingtonite chlorite

#### **EXPLORATION WORK 2007**

Spectral Analysis was conducted using ASTER L1B data granule: AST\_L1B\_00308042000195115\_20080208170751\_26731.hdf which was selected for suitability to multispectral image analysis for mineral classification based on the date of collection, time of day, presence of cloud over the target area, and availability of coherent Multi-band data. This granule is cloud free (0%) low aerosol image covering the MEMEKAY GROUP. L1B images are unprocessed data requiring georegistration, and other pre processing for this application. TRIM vector data was acquired for mapping and combined with the BC geological survey's 10N UTM dataset.

#### **FIELD WORK**

Field work in 2007 was comprised of two days of prospecting by two prospectors with samples collected for further analysis. Suitability to spectral analysis and other methodologies was reported based on this work.

#### **EQUIPMENT and SOFTWARE**

These data were processed using Clark University's IDRISI ANDES and CARTOLINX raster GIS, ESRI and ENVI raster analysis applications.

## PROCESSING and ANALYSIS

Data was imported as raw reflectance data and visually checked for completeness and consistency before a series of pre-processing steps were taken. Pre-processing included georeferencing of the image data to create positional reference. Georeferencing consisted of resampling and rubber sheeting the data using a cubic convolution method, and reprojecting the resulting data. A region of interest (dark oceanic water) depicting a flat spectral field was used as a basis for a Flat Field Atmospheric Correction. The atmospherically corrected images were processed using a minimum noise fraction (MNF) transform to identify and reduce noise. Six MNF bands were generated and from these a level of spectral coherence was achieved, that is that data was extracted that represented the significant spectral information contained within and the insignificant data was eliminated. The MNF data was classified using a variety of statistical methods including mixture tuned matching, spectral angle comparison, and pixel unmixing to generate classification images of pixels which most likely represent the spectral end members of specific minerals. The Spectral end members were compared with those collected in 15 spectral libraries including those of the US Geological Survey, Johns Hopkins University, Jet Propulsion Laboratory, and several other industry standard libraries.

## RESULTS

The Initial Minimum Noise Fraction multiband Data produced adequate spectral coherence for subsequent analysis. A fused data image was used to identify the region of interest. DBMemClass (figure\_\_\_\_\_ ) image displaces the low infeasibility of Sphalerite together with overlain tenure corners (red crosses) to identify the target area to the viewer This image shows the correlation between the spectral mapping and existing geological mapping. The White lines depict implied contacts as extracted from the 2005 B. C. Geological Survey map and the dark areas within the image. Painted areas represent regions within the image of high probably correlation to library mineral specimen spectral endmembers. Colour coded (painted areas) in the DPBMemcolAltMin30M.pdf image have been selected as representational of multiple methodology correlation or good matches to the following alteration minerals:

Blue: #3 USGS Dumortieite .832 Buddingtonite .762

Green: #4 USGS Pigeonite/ Ilmenite/ Smithsonianite .582

Pale Green #8 JPL Ferroaxinite .749

Brown #10 USGS A Chlorite .692

The data clearly demonstrates that there are spectral signals which may be identified to produce regional exploration targets. These areas would benefit by higher resolution spectral examination.

## CONCLUSIONS

Classification Rules:

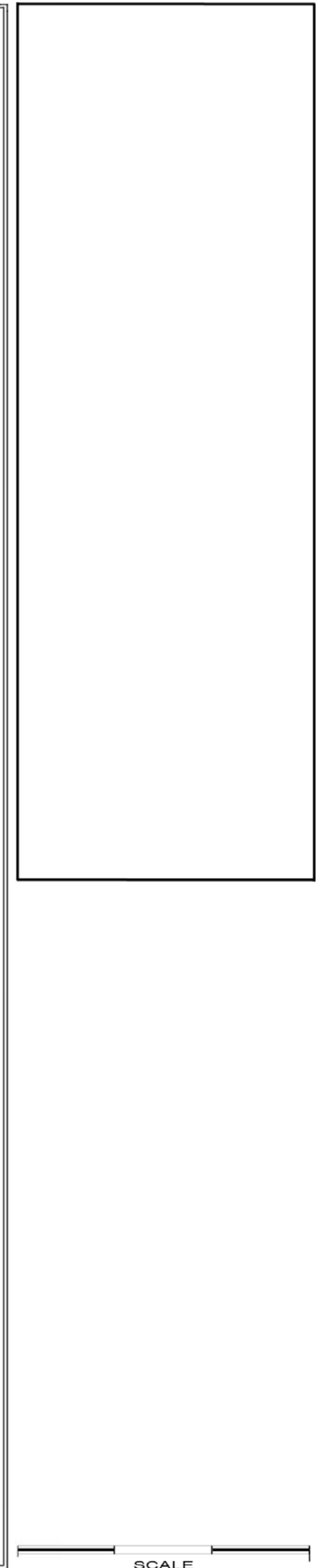
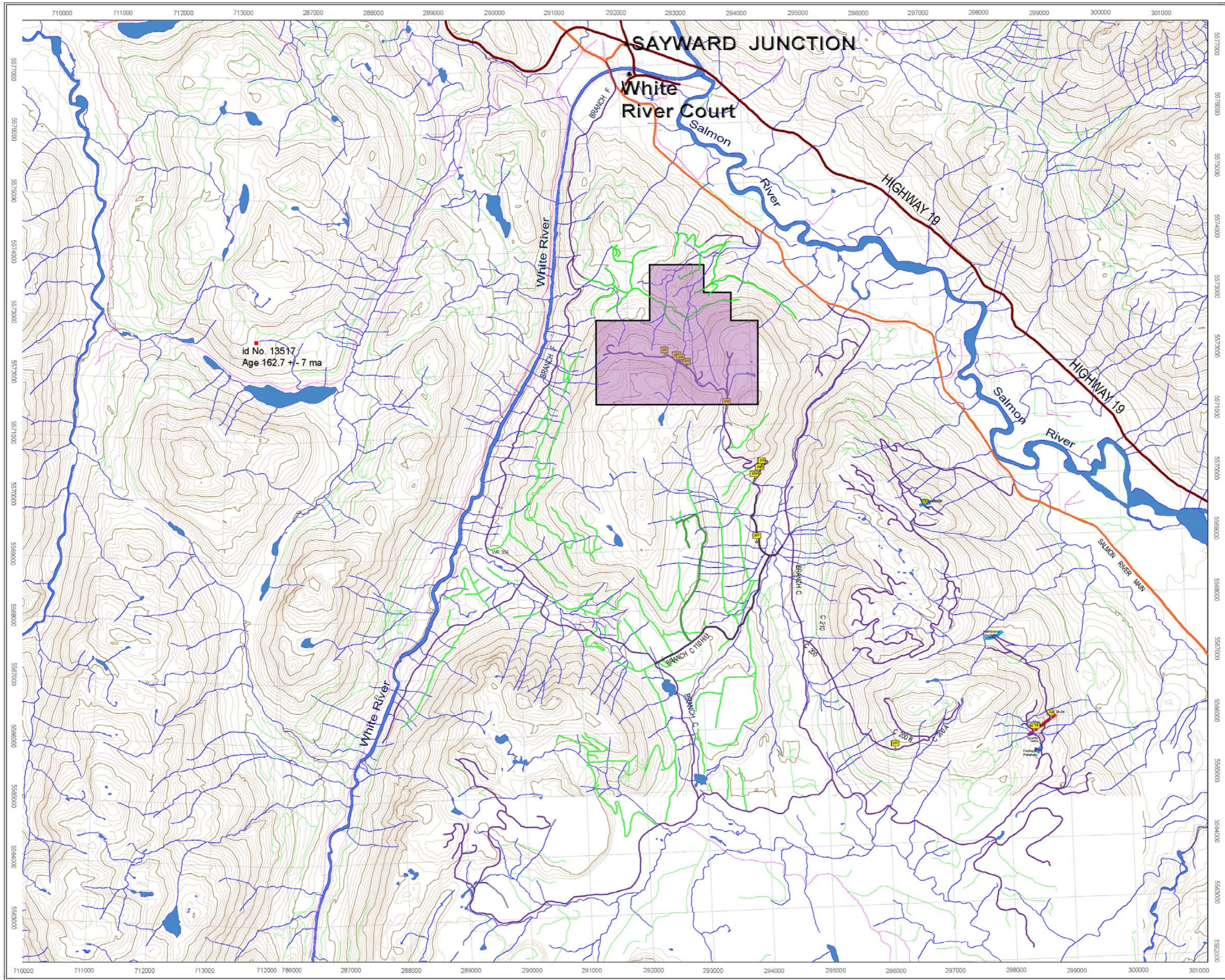
- Rule #1 JPL Ferroaxinite .593 magnesiochromite .557
- Rule #2 USGS Galena/Chalcopyrite .668
- Rule #3 USGS Dumortieite .832 Buddingtonite .762
- Rule #4 USGS Pigeonite/ Ilmenite/ Smithsonite .582
- Rule #5 USGS Mascagnite .618
- Rule #6 JPL Pigeonite .626 Sphalerite
- Rule #7 USGS Axinite .922 Arsenopyrite/ Galena
- Rule #8 JPL Ferroaxinite .749 Magnesiochromite/ Galena
- Rule #9 JPL Ilmenite .619
- Rule #10 USGS A Chlorite .692

This is an area of considerable potential which is supported by this work and analyses. The area is readily accessible is amenable to further work and seems to be in a region of possible future development. This area seems to be underexplored at present. Spectral analysis has identified areas of interest that should receive more intensive ground based follow up

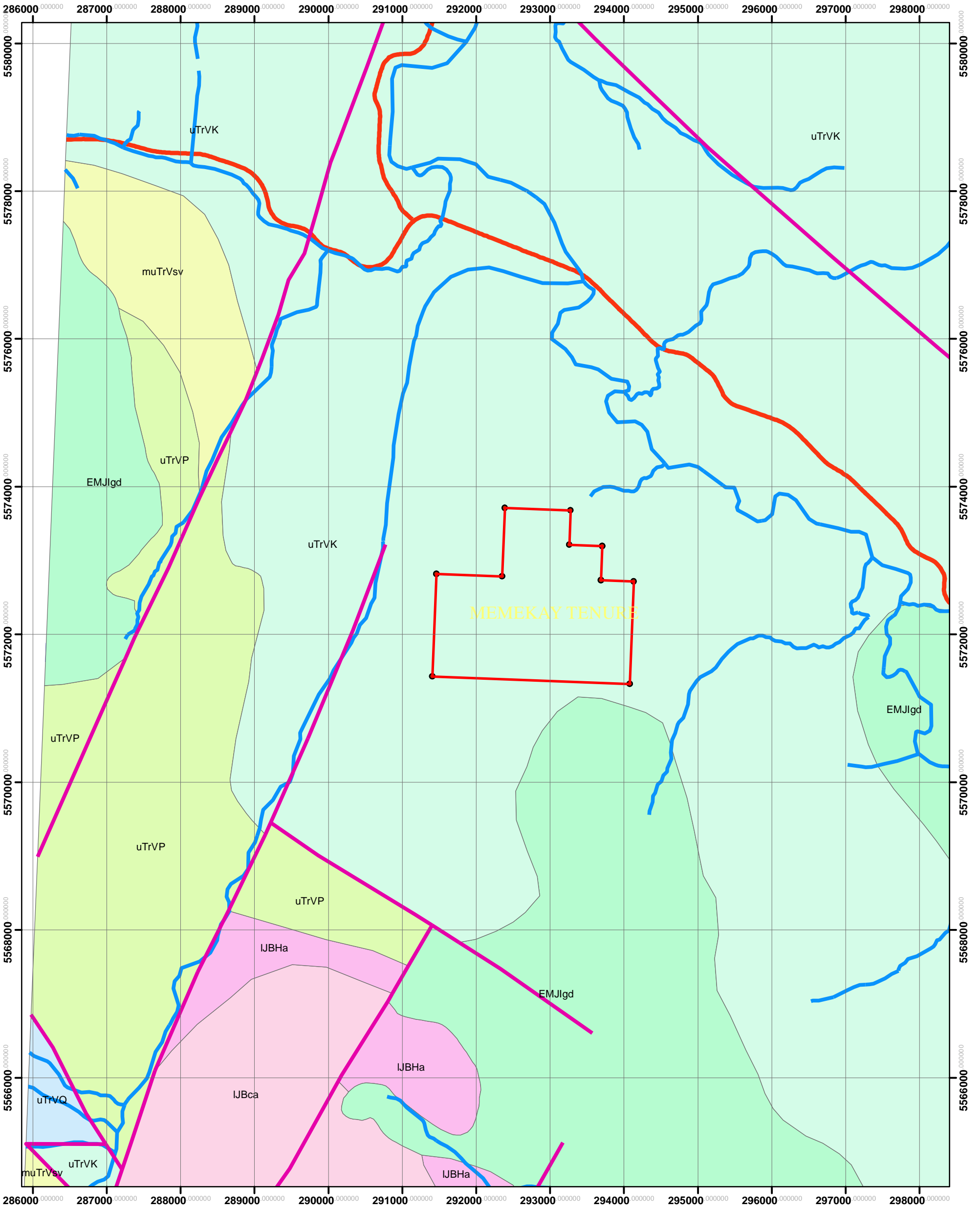
**STATEMENT OF WORK and COSTS**

This work was carried out by Auracle Geospatial Science Inc. between April 2007 and February 2008 for Dan P. Berkshire and fulfils the requirements of assessment work on the Tenures shown. Work is as disclosed on the following tables of costs.



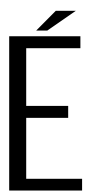




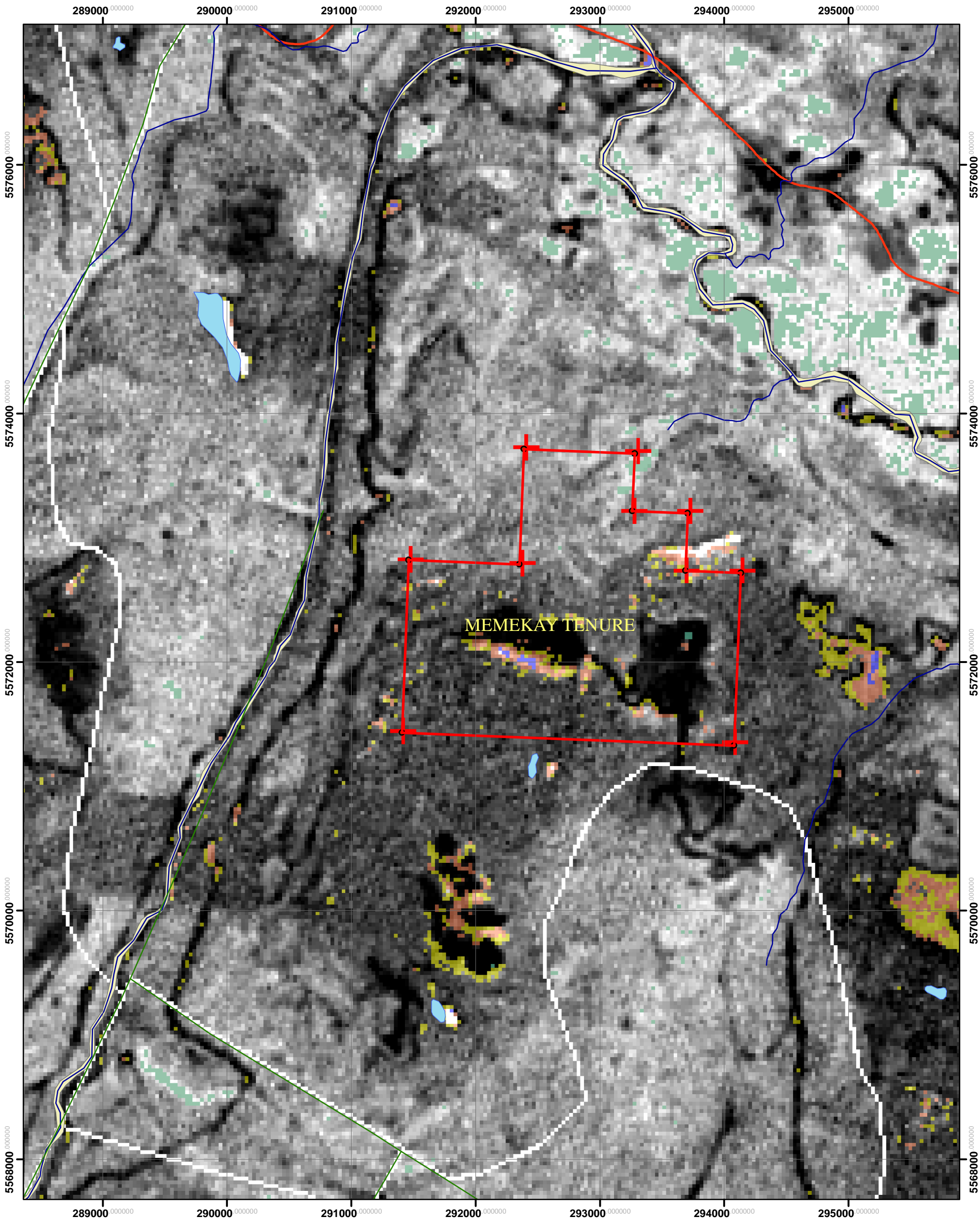


**Legend**

- NM10\_ftltns\_utm
- NM10\_river\_utm
- NM10\_road\_utm
- Tower 1 mineral claim outline
- NM10\_lake\_utm



1:50,000  
**Dan Berkshire's**  
**MEMEKAY TENURE**  
 Regional Geology



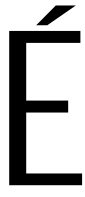
**Legend**

- NM10\_ftlns\_utm
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- Tower 1 mineral claim outline
- NM10\_lake\_utm

Colour codes  
 Blue: Class#3 Dumorteite/Buddingtonite  
 Green/Yellow: Class#4 Ilmentite/Smithsonite  
 Pale Green: Class#8 Ferroaxinite  
 Brown: Class#10 Chlorite



1:30,000



Dan Berkshire's  
**MEMEKAY TENURE**  
 Colour mapping of Alteration Minerals



## Statement of Qualification

**I, David J. McLelland**, do hereby certify that:

1. I am a Principal in:  
Auracle Geospatial Science Inc,  
325 Dorset Road Qualicum Beach,  
British Columbia, Canada V9K 1H5
2. I am a post graduate student of Earth and Environmental Science and have completed the postgraduate certificate in applied and theoretical GI Science at Simon Fraser University, and completed the academic component of the MSc. program requirement.
3. *I* have completed the B.C.I.T. B.C.Y.C.M. Mineral Exploration program, and Completed the B.C.I.T.1 B.C.Y.C.M. Advanced field School.
4. I am the Project Manager and I am responsible for the collection and management of data and execution of analysis.
5. This report was prepared on behalf of Auracle Geospatial Science who has been engaged by Dan P. berkshire to complete a work program on these properties.
6. I have no material or financial interest in the subject properties or the companies that own them.
7. This report has been prepared in accordance with generally accepted Scientific Principles and is based upon the best information available at the time of preparation. I am not aware of any material fact or material change with respect to the subject matter of the report that is not reflected in the report.

Date: Dec 1 2007

Qualicum Beach, British Columbia

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David McLelland

**SW BC**

HISNIT Group Project

2007Work Budget

Project Area: **TOWER 1 MINERAL TITLE GROUP**

Cost Categories	Type	Description	Units	Rate	number	Qty	extended	
Personnel								
	Project Manager	Field Verify		\$/Day(8hr.)	\$550.00	1	0	\$0.00
	QP	Field Verify		\$/Day(8hr.)	\$650.00	1	0	\$0.00
	Field Assistants			\$/Day(8hr.)	\$350.00	1	2	\$700.00
	Other			\$/Day(8hr.)				
Travel								
	Lodging	R and Board		\$/Day/Person	\$100.00	1	0	\$0.00
	Lodging Short Stay	R and Board	QP	\$/Day/Person	\$120.00	1	0	\$0.00
	Meals		travel	\$/Day/Person	\$30.00	0	0	\$0.00
	Utility Trailer				\$30.00	0	1	\$30.00
	Vehicle QP			\$/Diem	\$240.00	1	0	\$0.00
	Vehicle			\$/Kilometre	\$0.51	160	1	\$81.60
	Fuel	Unimog					0	\$0.00
	Fares	Ferry			\$88.00	2	0	\$0.00
		Ferry Passenger			\$8.80	2	0	\$0.00
Misc Costs								
	Materials							
	Supplies							
	Misc.							
Communications								
	Satellite			\$/Week	\$30.00	1	0	\$0.00
	Sat Phone			\$/month	\$275.00	1	0	\$0.00
	Radio			\$/Week				
Field Equipment Rental								
	Unimog			\$/Day	\$200.00	1	0	\$0.00
	Generator			\$/Week	\$250.00	1	0	\$0.00
	Dryer heater			\$/Month	\$98.00	1	0	\$0.00
	ATV			\$/Day	\$100.00	1	1	\$100.00
	Aircraft	J Ranger		\$/Hour				
		Mob & Demofuel inc		\$/Minute	\$18.89	150	0	\$0.00
		Daily fuel inc		\$/Minute	\$378.00	4	0	\$0.00
		L Ranger						
Tech Equipment Rental								
	Field Equipment	DB		\$/Day	\$60.00	1	0	\$10.00
	Computer			\$/Day	\$25.00	1	0	\$0.00
	CDGPS			\$/Day	\$30.00	1	0	\$0.00
	Gamma Ray Spectrometer			\$/Week	\$500.00	1	0	\$0.00
	SWIR Spectrometer			\$/Week	\$850.00	1	0	\$0.00
Sampling equipment Rental								
	Soil Probe		portable	\$/Week	\$1,550.00	1	0	\$0.00
	Tips		wet cutting	\$each	\$144.19	1	0	\$0.00
	Core Tubes	36"	clr vinyl	\$ per set of 1	\$26.75	2	0	\$0.00
SampleAnalysis								
	GCP Integrative analyses			\$/Hr.	\$68.50	1	8	\$0.00
	C/Processing			\$/Hr.	\$50.00	4	0	\$0.00
	micro prep							



	microscopy			\$/diem	\$600.00	1	0	\$0.00
	Sample prep							
	Drying		onsite	\$/week				
	Sample Bags			\$each	\$0.30	15	0	\$0.00
	Assays	JH		total				\$0.00
	Chemical analysis		Uassay	\$perSample	\$12.15	15	0	\$0.00
Fuel								
	ATV			\$/Day	\$10.00	2	0	\$0.00
	Probe			\$/Day	\$20.00	1	0	\$0.00
	Heater		dryer	\$Day	\$10.00	1	0	\$0.00
Data Acquisition								
	Data selection			\$hr	\$68.50	2	1	\$137.00
	L1B	rectified	156	Units	\$156.00	1	1	\$156.00
	TRIM base data	92K.021			\$200.00			\$200.00
	data integration							
Mapping and Reporting								
	Spectral analysis			\$hr	\$68.50	16	1.5	\$1,644.00
	co-processing			\$hr	\$50.00	8	1.5	\$600.00
	Geological interpretation			\$hr	\$81.25	30	0	\$0.00
	Mapping						0	\$150.00
	Geo report			cost			0	\$0.00
	Priniting and copying							
Licences and Permits								
	Exploration Permit							\$0.00
	Bond							\$0.00
	WCB	inc						\$0.00
	Insurances	Equipment						\$0.00
		Liability					0	\$0.00
	ATV	in rental						
Office and Admin								\$3,808.60
Total								\$3,808.60