

**Ministry of Energy and Mines**  
BC Geological Survey

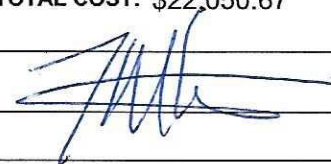
**Assessment Report**  
**Title Page and Summary**

TYPE OF REPORT [type of survey(s)]: Geological, Geochemical, Prospecting

TOTAL COST: \$22,050.67

AUTHOR(S): Francis MacDonald

SIGNATURE(S):



NOTICE OF WORK PERMIT NUMBER(S)/DATE(S): Not Applicable

YEAR OF WORK: 2015

STATEMENT OF WORK - CASH PAYMENTS EVENT NUMBER(S)/DATE(S):

PROPERTY NAME: Swannell

CLAIM NAME(S) (on which the work was done): SWAN, SWANWARD

COMMODITIES SOUGHT: Zn, Pb, Ag

MINERAL INVENTORY MINFILE NUMBER(S), IF KNOWN: 094C 005; 094C 003

MINING DIVISION: Omineca

NTS/BCGS: 094C/11E

LATITUDE: 56 ° 40 ' " LONGITUDE: 125 ° 10 ' " (at centre of work)

OWNER(S):

1) Douglas Cavey (in Trust for Spearhead Mining Corporation) 2)

MAILING ADDRESS:

6891 Wiltshire Street, Vancouver, BC V6P 5H2

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

1) Spearhead Mining Corporation 2)

MAILING ADDRESS:

6891 Wiltshire Street, Vancouver, BC, V6P 5H2

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

Limestone; Hadrynian; Ingenika Group; Carbonate-Replacement Deposit; Carbonate-hosted Zn-Pb-Ag;

REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS: 00153A; 01136; 13452; 14032; 26608A;  
26702A; 26794A; 27253; 27614; 28461

TYPE OF WORK IN THIS REPORT	EXTENT OF WORK (IN METRIC UNITS)	ON WHICH CLAIMS	PROJECT COSTS APPORTIONED (incl. support)
<b>GEOLOGICAL (scale, area)</b>			
Ground, mapping	600 ha	1030918; 1035234; 1035396; 1035363	\$19,725.34
Photo interpretation			
<b>GEOPHYSICAL (line-kilometres)</b>			
<b>Ground</b>			
Magnetic			
Electromagnetic			
Induced Polarization			
Radiometric			
Seismic			
Other			
<b>Airborne</b>			
<b>GEOCHEMICAL (number of samples analysed for...)</b>			
Soil			
Silt			
Rock	29 samples	1030918; 1035234; 1035396; 1035363	\$2,325.33
Other			
<b>DRILLING (total metres; number of holes, size)</b>			
Core			
Non-core			
<b>RELATED TECHNICAL</b>			
Sampling/assaying			
Petrographic			
Mineralographic			
Metallurgic			
<b>PROSPECTING (scale, area) 600 ha</b>			
<b>PREPARATORY / PHYSICAL</b>			
Line/grid (kilometres)			
Topographic/Photogrammetric (scale, area)			
Legal surveys (scale, area)			
Road, local access (kilometres)/trail			
Trench (metres)			
Underground dev. (metres)			
Other			
<b>TOTAL COST:</b>			<b>\$22,050.67</b>

**PROSPECTING and GEOLOGICAL  
ASSESSMENT REPORT**  
**on the**  
**SWANNELL PROPERTY**

**Tenure No's: 1030918, 1035234, 1035396, 1035363**

**Omineca Mining Division**

**NTS: 094C/11E**

**Latitude: 56° 40' N; Longitude: 125° 10' W**

**UTM (NAD83 – Zone 10): 367000E, 6282000N**

**Owner/Operator: Spearhead Mining Corporation – 100%**

**Author: Francis MacDonald, B.AppSci.**

**December 9, 2015**

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1 (p. 5)	General Location	1 : 8,000,000
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5 (in pocket)	Sample Locations	1 : 10,000
6 (in pocket)	Geochemistry: Zinc	1 : 10,000
7 (in pocket)	Geochemistry: Lead	1 : 10,000
8 (in pocket)	Geochemistry: Silver	1 : 10,000

## **1.0 SUMMARY**

The Swannell property consists of 4 contiguous mineral claims covering 1333.99 Ha in north-central British Columbia. The property has excellent access from Mackenzie along the main forest service road and secondary service roads that transect the area. Spearhead Mining Corporation owns 100% of the Swannell property, which was acquired by online staking in 2014, with further tenure additions made in 2015 after field work was completed on the original claim package.

The Swannell property was acquired by Spearhead Mining Corporation on the basis of interesting drill intersects and rock samples obtained by previous operators that had not been adequately followed up. The property lies within the Proterozoic to Paleozoic miogeoclinal rocks of the Cassiar Platform, an allochthonous continental fragment of ancestral North America that spans from the central Yukon Territory border to central-eastern British Columbia that hosts multiple styles of zinc-lead-silver mineralization, most notable being SEDEX, Mississippi-Valley type, and high-temperature carbonate-replacement deposits.

This report summarizes the prospecting and geological mapping programs carried out during September of 2015. Spearhead Mining Corporation contracted Francis MacDonald and Andrew Orr to carry out reconnaissance geologic mapping and rock sampling, as well as compilation of all useful data found in previous assessment reports. Work was conducted on Tenure Numbers: 1030918, 1035234, 1035396, and 1035363, and subsequent to field work being completed, Tenure Numbers: 1039490 & 1039491 were staked. A total of 29 rock samples were taken. Expenditures totalled \$22,050.67 and can be found in Appendix B.

## **2.0 INTRODUCTION**

### **2.1 Property**

The Swannell property consists of 4 contiguous mineral claims (Appendix C) covering 1333.99 Ha in north-central British Columbia (Figures 1 and 2). The property is located within NTS map sheet 094C/11E approximately 195 km north from Mackenzie and is centered at 56° 40' N latitude, 125° 10' W longitude, within the Omineca Mining Division.



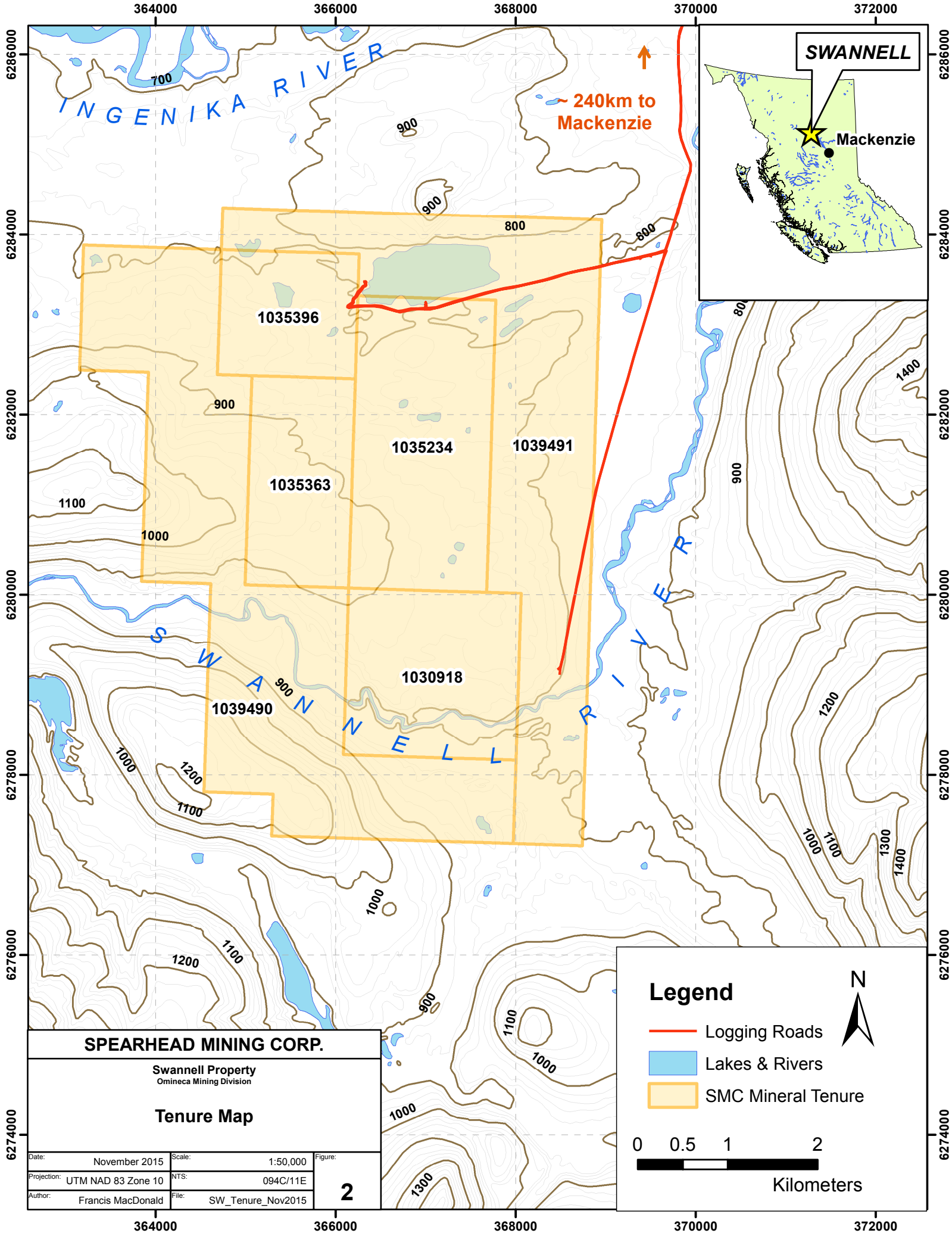
**SPEARHEAD MINING CORP.**

Swannell Property  
Omineca Mining Division

**Location Map**

Date:	November 2015	Scale:	1:8,000,000	Figure: <b>1</b>
Projection:	UTM NAD 83 Zone 10	NTS:	094C/11E	
Author:	Francis MacDonald	File:	SW_Location_Nov2015	





364000 366000 368000 370000 372000

6286000 6284000 6282000 6280000 6278000 6276000 6274000

INGENIKA RIVER

~ 240km to Mackenzie

SWANNELL

Mackenzie

1035396

1035234

1039491

1035363

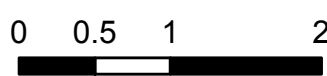
1030918

1039490

SWANNELL

**Legend**

- Logging Roads
- Lakes & Rivers
- SMC Mineral Tenure



Kilometers

**SPEARHEAD MINING CORP.**

Swannell Property  
Omineca Mining Division

**Tenure Map**

Date:	November 2015	Scale:	1:50,000	Figure:	<b>2</b>
Projection:	UTM NAD 83 Zone 10	NTS:	094C/11E		
Author:	Francis MacDonald	File:	SW_Tenure_Nov2015		

364000 366000 368000 370000 372000

The property is owned by Spearhead Mining Corporation (100%). The claims were acquired in 2014 by online staking by Douglas Ross Cavey in trust for Spearhead Mining Corporation.

## **2.2 Accessibility**

The Swannell property is located in the Ingenika Range, a subset of the Swannell Ranges of the Omineca Mountains in the Omineca Mining Division, approximately 195 kilometers northwest of MacKenzie, B.C. on NTS map sheet 094C/11E. The property covers the area to the south of the old Ingenika Mine and is situated primarily on west side of the Swannell River just upstream from its confluence with the Ingenika River. Geographic coordinates at the center of the property are latitude 56° 40' N; longitude: 125° 10' W and the UTM coordinates are 367000 E, 6282000 N in UTM Zone 10.

There is excellent access to the property as a result of extensive logging activity in the area. Access to the property is gained by driving 216 kilometers north from Mackenzie along the west side of Williston Lake on a main logging haulage road, then west 18 kilometers, south for 10 kilometers, and west for 3 kilometers to Delkluz Lake. Secondary logging roads are used to access the claims.

## **2.3 Physiography and Climate**

The Swannell area has cold winters with moderate snowfall and warm dry summers. The topography of the claims is relatively flat with low rolling hills that are heavily timbered by pine and spruce. In the clear cuts, deciduous willows and poplars predominate.

## **3.0 HISTORY**

The following list summarizes the work history of the Swannell and Ingenika prospects:

1917 – The original claims in the Ingenika area staked by S. Ferguson to cover the oxidized limestone hill, named Ferguson Hill. Mineralization consists of stratabound sphalerite, galena, and pyrite that ranges from 1 – 3m in thickness, strikes at 280° degrees and dips 20° – 40° to the north.

1926 – These claims were acquired by the Selkirk Mining Syndicate of Victoria. In 1927, Ingenika Mines Ltd. was formed and from 1927 – 1932 completed existing historic underground development of drifts, crosscuts, and raises. There was also extensive trenching completed and some diamond drilling. The ARIS database has very limited information because the Ingenika Mine was covered by crown granted mineral claims and therefore assessment reporting was not required. The work completed from 1927 – 1932 was summarized in the Geological Survey of Canada, Memoir 274, by E.F. Roots. The underground development explored four base metal zones from four levels, the 1, 2, 4 and 5 levels. Ore was encountered in all levels except for the lowest level, 5-level, which is postulated as being driven too low in stratigraphy.

1936 – The Swannell property was staked as the Dominion claims by H. Ravenal. Hand trenching was completed and the property was examined by E. Brunland for the Consolidated Mining and Smelting Co. Ltd. (former name of Cominco Ltd.)

- 1956 – The Swannell property was staked as the Swannell, Dell, and Mike Pedro Fox claims by Gust Ola of Prince George. Cominco optioned the claims and completed geological mapping and sampling.
- 1957 – Cominco conducted regional and local mapping, geophysics (McPhar VLEM) and drilled 3602 meters of AQ-size diamond drilling in and around the Ingenika Mine, Onward, Onward South, and Swannell showings. Three holes were abandoned in overburden. Cominco terminated the option subsequent to this work.
- 1967 – Northlode Exploration Ltd. completed a gravity geophysical survey over a grid located to the southwest of Delkluz Lake as part of an exploration program targeting the Swannell showing to the south. Three diamond drill holes were completed testing gravity anomalies, but results were not reported.
- 1969 – Dorita Silver Mines acquired the property and completed surface and underground mapping and 21 diamond drill holes totaling 550m. Reserves for the Ingenika Mine were estimated to be 22,677 tonnes grading 119.9g/t silver, 9.8% lead, and 6.1% zinc.
- 1981 - Cominco Ltd. restaked the Swannell claims as the Kluz 1 to 4 claims.
- 1982 - A.B. Mawer examined and re-evaluated the property on behalf of Cominco Ltd.
- 1984 - Cominco Ltd., through a joint venture with Elite Resources, completed horizontal-loop electromagnetic and induced polarization geophysical surveys.
- 1985 - The Kluz 5 claim was staked and the joint venture completed three NQ-size diamond-drill holes totalling 465.7 metres on the southeastern corner of the Kluz 1 claim. Further drilling on the base metal horizon was recommended but not completed.
- 1991 - International Impala Resources acquired the Ingenika property in 1991 and completed 24 km of VLF and magnetometer surveying, 7 km of I.P. surveying, collected 490 soil geochemical samples and 14 rock samples. The company concluded that drilling east of the No.5 level workings would intersect the ore if it rakes northeast.
- 2001 - Cross Lake Minerals Limited optioned the Swannell property from Teck Cominco (formerly known as Cominco) and staked the Del 4 and 5 claims. That year, Cross Lake undertook an exploration program consisting of geochemical sampling and drilling on the Swannell and Ingenika properties. A mobile metal ion geochemical sampling technique was first tested on the Onwards South showing. After receiving favourable results from the trial run, a mobile metal ion soil sampling grid was used to trace the strike extension of the known Swannell showing and explore for new mineralization. Three BQTK-size diamond-drill holes totalling 400.8 metres were completed on the Swannell property.
- 2002 - Cross Lake Minerals Ltd. completed four diamond-drill holes totalling 491.2m: one on the Ingenika property and three on the Swannell property. The drillholes were designed to test the mobile metal ion anomalies identified in 2001. Four trenches totalling 175m were completed, none of which reached bedrock due to extensive glacial till cover.
- 2004 – Cross Lake Minerals Ltd. completed a test 3D inversion IP survey in and around the Ingenika Mine in order to test this survey method over a known mineral occurrence, 17.0 km of IP survey

being conducted on Gnd "A". Based on the positive results, a more extensive 3D-IP survey was carried out further south over Grid "B", 49.5 line km of survey being conducted.

2005 – Cross Lake Minerals Ltd. completed seven diamond drill holes totalling 992.67m testing 3D-IP anomalies from the 2004 survey. Ownership of the Swannell and Ingenika properties was transferred to Selkirk Metals Holdings Corporation in 2005.

2007 – Selkirk Metals Holdings Corporation forfeited the claims encompassing the Swannell and Ingenika properties.

## **4.0 GEOLOGY**

### **4.1 Regional Geology**

The Swannell property lies within the core of the Cassiar trough, a para-autochthonous continental fragment of the miogeoclinal rocks of ancestral North America (referred to as the Windermere Supergroup) that range in age from Proterozoic to Cambrian, which are unconformably overlain by Lower Cambrian to Ordovician Atan and Kechika Group rock. The Windermere Supergroup is interpreted to represent the volcanic and sedimentary record following the break-up of the supercontinent Rodinia and the formation of the proto-Pacific Ocean at ~700 Ma, and consists of predominantly deep marine sedimentary and lesser volcanic rocks of Late Proterozoic to Cambrian age.

Strata exposed in the Ingenika Range belong to the Hadrynian Ingenika Group, which is unconformably overlain by Lower Cambrian to Lower Ordovician Kechika and Atan Groups. Ingenika Group rocks are comprised of the Swannell, Tsaydiz, Espee, and Stelkluz Formations.

The Swannell Formation is composed of three members: the Lower Member (mica schist, impure quartzite, and minor thin carbonate beds), the Middle Member (feldspar quartz pebble conglomerates, grits, green phyllite, and minor crystalline limestone), and the Upper Member (grey quartzite, phyllite, and minor limestone). The base of the Swannell Formation is not exposed, but currently stratigraphic thickness is estimated to be at least 2000m. The Tsaydiz Formation sits conformably on top of the Swannell Formation, and is composed of thinly bedded green phyllites with minor limestone and fine grit. Stratigraphic thickness is estimated to be on the order of 200m. The Espee Formation sits conformably on top of the Tsaydiz formation, and is composed of thickly bedded, varicoloured, coarse crystalline limestone and has a stratigraphic thickness of 90 – 400m. The Stelkluz Formation sits conformably on top of the Espee Formation, and is composed of varicoloured limestone, pelite, and sandstone, and has an estimated stratigraphic thickness of 300 – 500m (Bellefontaine, 1990). Rocks of the Atan Group are interpreted to sit unconformably on top of the Ingenika Group, and are composed of quartzites, phyllites, siltstones, limestones, and calcareous shales (BCGS mapping).

Ingenika Group rocks have experienced three distinct overprinting roughly colinear deformation events and four sets of crosscutting structures. The regional D<sub>1</sub> event is expressed as a bedding-parallel well-developed penetrative foliation that contains a pronounced mineral lineation that plunges moderately to the northwest. F<sub>1</sub> folds are typically northeast vergent, northwest plunging, tight, recumbent to overturned folds with well-developed schistosity. D<sub>2</sub> structures are similar to D<sub>1</sub> structures, but with a switch in vergence towards the southwest and are best viewed in thin section. The D<sub>3</sub> event is characterized by open and upright F<sub>3</sub> folds which are commonly devoid of cleavage, and plunge shallowly to moderately to the northwest. The Swannell Anticlinorium that outcrops to the west of the current tenements is attributed to this D<sub>3</sub> event (Bellefontaine, 1990). This fold has been interpreted as a regional-scale doubly-plunging anticlinorium as the result of southwest vergent folding and thrusting





during the Jurassic based on metamorphic isograd zonation (Bellefontaine, 1990). The synform that occupies the Swannell area would be a parasitic fold to the larger scale  $D_3$  fold system.

Northeast trending normal faults down drop wedges of Paleozoic Kechika and Atan Group rocks into surrounding Proterozoic rocks to the north of the Ingenika River. These normal faults are bounded to the southwest by the Pelly Fault, and to the northeast by the Rocky Mountain Trench.

Cretaceous to Neogene post orogenic plutonic rocks intrude Ingenika rocks to the south and north of the Swannell property.

To the east of the property, the Cassiar terrane is bounded by the Rocky Mountain Trench, which is the continuation of the Tintina Fault that transects the northern Cordillera from Alaska to southern British Columbia. Hundreds of kilometers of right-lateral movement has been recorded on the Rocky Mountain Trench/Tintina Fault during a transpressional stress regime from 60 – 10 Ma (Nelson & Colpron, 2007)

## 4.2 Property Geology

The Swannell property is currently thought to encompass two different formations of the Ingenika Group. Limestones encountered at the Swannell property are fine grained, micritic, unfossiliferous, and interlayered with fine grained deep water siliciclastics. This suggests that they belong to the Proterozoic Ingenika group, as opposed to Paleozoic Kechika Group as indicated by BCGS mapping (Okulitch et al., 2002). This interpretation is tentative as there has not been enough mapping completed to determine a robust stratigraphic correlation.

Rock types encountered during property-scale mapping in 2015 were thinly to thickly bedded laminated micritic limestones and dolostones, calcareous siltstones, phyllitic siltstones and argillites, graphitic argillites, and strongly sericite-dolomite altered intermediate igneous rocks, which may represent intrusive phases. Previous drilling campaigns have encountered glacial till cover up to 45m thick; for the most part, outcrop is limited to road cuts and along river banks.

Bedding-parallel  $S_1$  fabrics are ubiquitous throughout the mapping area and are expressed as a pervasive penetrative foliation. Fabrics and structures related to  $D_2$  deformation of Bellefontaine (1990) were not encountered, which are almost always only visible in thin section.  $S_3$  fabrics were encountered as discrete zones of penetrative foliation and spaced cleavage, which are axial planar to  $F_3$  open and upright folding.  $S_0$ - $S_1$  intersection lineations are common, which plunge moderately to the northwest and are co-linear with  $F_1$  and  $F_3$  fold hinges.

The Pelly Fault transects the Swannell Property, which is a northwest-trending topolinear that cuts approximately 250km of the Cassiar terrane. At the Swannell showing on the north and south banks of the Swannell river, the Pelly Fault is exposed and hosts Zn-Pb-Ag mineralization. Where the fault outcrops in the river,  $S_1$  pervasive foliation is dragged into the fault zone, indicating at the earliest late  $D_1$  displacement. The fault juxtaposes a package of graphitic argillites with interbedded limestone units (to the west) against a package of phyllitic non-graphitic siltstones with interbedded limestones (to the east), which are currently interpreted as different formations of the Ingenika Group. Later cataclastic breccias and brittle fault gouge are also within the Pelly Fault and proximal second order structures indicating later brittle reactivation. Also, milled quartz vein fragments that have similar textures to mineralized veining, and late euhedral gypsum within the fault zone indicate very late movement, possibly related to the dextral transpressional deformation along the Tintina Fault between 60-10 Ma (Nelson & Colpron, 2007).

Multiple cm- to dm-scale graphitic faults that crosscut  $S_1$  foliations and  $S_3$  foliations/ $F_3$  folds were mapped. The general trend of these faults is consistently northwest, but dips alternate between northeast and southwest. In one area, slickensides were noted in the footwall of a fault that plunge shallowly to the southeast where limestone beds slipped along bedding planes. Importantly, a pod/manto of high-grade mineralization plunges parallel to these slickensides. These late graphitic faults are interpreted as part of a flower structure that may have allowed the emplacement of intrusions and mineralizing fluids.

At the Onwards showing on the southern side of Delkluz Lake, bedding is approximately east-west striking with a shallow to moderate dip to the north. Pb-Zn-Ag mineralization is hosted in quartz-ankerite-galena veining, which is discordant to stratigraphy with a north-south trend and moderate to steep west dip. In a restored adit at the showing, there is excellent exposure of an east-southeast trending moderately south dipping fault which crosscuts stratigraphy and mineralization. Rotation of bedding and foliation suggests that this fault is a south-side down normal fault. At the Ingenika Mine showing, a pervasive spaced cleavage was observed at the scarp of a steep hill with the same orientation, indicating that stratigraphy and mineralization at Ingenika may have a similar structural history of south-side down normal faulting.

An airborne electromagnetic survey that encompasses all of the current tenements from 1966 (ARIS #01136) was digitized and imported into GIS. The interpreted Pelly Fault is coincident with a sharp boundary between conductive graphitic argillites to the west, and non-conductive siltstones and phyllites to the east. Multiple northeast-trending lineaments crosscut and seemingly displace the Pelly Fault with no coherent sense of lateral movement. These north-easterly lineaments are confirmed in gradient-array IP data from 2005 (ARIS #27614), where lineaments in resistivity and chargeability crosscut other lithologic and structural features. Tentatively, these northeast trending lineaments are interpreted to be the youngest structural feature in the area, although their relationship to late east-southeast trending, south-side down normal faults is unclear.

### **4.3 Mineralization**

#### **4.3.1 Swannell**

Mineralization at the Swannell showing has three different styles:

The first consists of quartz veins carrying up to 5 per cent pyrite and galena, sphalerite, minor malachite and covellite. One 0.5 metre wide vein exposed over a length of 50 metres had been repeated by isoclinal folding to a width of 2.5 metres. Graphitic septa are present in much of the veining.

The second style of mineralization consists of layers of quartz, crystalline calcite, sphalerite, galena and minor pyrite in blue-grey, thinly bedded limestone. The host strata are drag folded, and the mineralized layers are stratiform. A composite assay (Geological Survey of Canada Memoir 274, page 210) of two selected samples yielded 0.69 gram per tonne gold, 279.1 grams per tonne silver, 0.05 per cent copper, 24.6 per cent lead and 27.4 per cent zinc.

The third type of mineralization consists of bedding-parallel layers of coarse granular pyrite, fine galena and sphalerite in brecciated, silicified blue-grey limestone. One layer containing approximately 10 per cent sulphides reaches 3 metres in thickness. Some layers consist of semi-massive sulphides. Grab samples in 2015 of pods/mantos of massive sulfide mineralization returned values of 31% Zn, 19% Pb, 223 g/t Ag. In a 1985 diamond drill program (ARIS# 14032), Cominco Limited reported "fracture-controlled" galena-sphalerite mineralization and a grade of 1.23 per cent lead and 5.2 per cent zinc across 9.5 metres in the best hole.

### **4.3.2 Onwards**

Mineralization at Onwards is hosted in a 6-7m wide zone of veining and brecciation that is discordant to the finely laminated grey-white limestone host. Rock samples from outcrop in 2015 returned values up to 21.6% Pb and 302 g/t Ag, and previous operators have reported values up to 64.2% Pb and 1870 g/t Ag (West Cirque press release, 2012). Mineralization consists of quartz-galena-ankerite veining and massive pods of galena-pyrite +/- sphalerite.

The northern extent of mineralization is well defined where it terminates against an east-southeast trending, south-side down normal fault. At the southern extent of the vein, surface trenching and underground exploration have failed to extend the mineralization, possibly due to structural complications.

## **5.0 2015 GEOLOGICAL AND PROSPECTING PROGRAM**

### **5.1 General**

Four days were spent prospecting and geologic mapping at the Swannell property in September of 2015. Work was focused on the previously known showings and mapping outcropping exposures within the Swannell River to give geologic context to known mineralization. Much of the property was not visited and is reported to have a thick veneer of glacial till up to 45m thick with little to no outcrop.

### **5.2 Sampling Procedures and Analytical Methodology**

Rock samples were taken from outcrops and are representative of the underlying geology.

## **6.0 CONCLUSIONS**

The 2015 mapping and prospecting program was successful in giving geologic context to known mineral occurrences and placing them within a larger geologic and metallogenic framework. Mineralization is considered to be post deformation and metamorphism, which would be Cretaceous in age. Rock samples taken in 2015 confirm the high grade nature of massive sulphide areas that have been sampled in earlier exploration campaigns when analytical methods probably were not as robust as today.

## **7.0 RECOMMENDATIONS**

Encouraging results from the exploration program of 2015 warrant further work. A property-wide soil sampling program should be undertaken with emphasis on Ah-horizon sampling in order to obtain a response through the thick veneer of glacial till which is representative of the underlying bedrock. A simultaneous gravity survey should be performed in order to detect massive sulphide bodies, and also to find possible intrusive bodies that may be the source of mineralization.

## 8.0 REFERENCES

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**Nelson, J. L. & Colpron, M. (2007):** Tectonics and Metallogeny of the Canadian and Alaskan Cordillera, 1.8 Ga to present. In: Goodfellow, W. D. (eds) Mineral Deposits of Canada: A Synthesis of Major Deposit Types, District Metallogeny, the Evolution of Geological Provinces, and Exploration Methods. Mineral Deposit Division, Geological Association of Canada, Special Publications, 5, 755–791.

**Okulitch, A.V., MacIntyre, D.G., Taylor, G.C., Gabrielse, H., Cullen, B., Massey, N., Bellefontaine, K.A., (2002):** Geology, Fort Nelson, British Columbia; Central Foreland Map NO-10-G, scale 1:500,000. Geological Survey of Canada, Open File 3604.

**Roots, E.F., (1954):** Geology and Mineral Deposits of the Aitken Lake Map Area, British Columbia. Geological Survey of Canada Memoir 274

**Ross, G.M., (1991):** Tectonic setting of the Windermere Supergroup revisited. *Geology*, v. 19, p. 1125-1128

**West Cirque Resources Ltd. (2013):** <http://www.infomine.com/index/pr/PB168028.PDF>

Respectfully submitted,



**Francis MacDonald, Bach. App.Sci.**

**December 9<sup>th</sup>, 2015**

## **APPENDIX A: STATEMENT OF QUALIFICATIONS**

For: Francis MacDonald, 1800 Mamquam Road #7, Squamish, BC, V8B 0J1.

I graduated from the University of British Columbia with a Bachelor of Applied Sciences Degree in Geological Engineering (2011);

I have been practicing my profession as a geologist in mineral exploration and mining continuously since 2009 and seasonally since 2007

The observations, conclusions and recommendations contained in the report are based on supervision of the described program, field examinations, and the evaluation of results of the exploration program completed by the operator of the property.

A handwritten signature in blue ink, appearing to read 'F. MacDonald', with a horizontal line drawn underneath it.

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**Francis MacDonald, Bach. App.Sci.**

**December 9<sup>th</sup>, 2015**

**APPENDIX B: STATEMENT OF EXPENDITURES**

<b>Exploration Work Type</b>	<b>Comment</b>	<b>No.</b>	<b>Rate</b>		<b>Totals</b>
<b>Field Work</b>					
<b>Personnel (Name,Position)</b>		<b>Days</b>	<b>Rate</b>	<b>Subtotal</b>	
Francis MacDonald, Geologist		8	\$600.00	\$4,800.00	
Andy Orr, Geologist		8	\$600.00	\$4,800.00	
				\$9,600.00	\$9,600.00
<b>Office Work</b>					
		<b>Days</b>	<b>Rate</b>	<b>Subtotal</b>	
Report preparation	Francis MacDonald	5	\$600.00	\$3,000.00	
GIS compilation	Francis MacDonald	8	\$600.00	\$4,800.00	
				\$7,800.00	\$7,800.00
<b>Ground Exploration Surveys</b>					
	<b>Area in Hectares/Personnel</b>				
Geological Mapping	600 ha/F. MacDonald, A. Orr			\$0.00	
Prospecting	600 ha/F. MacDonald, A. Orr			\$0.00	
				\$0.00	\$0.00
<b>Geochemical Surveying</b>					
	<b>Analytical Methods</b>	<b>No.</b>	<b>Rate</b>	<b>Subtotal</b>	
Rock	ICP-MS	29	30.64	\$888.56	
				\$888.56	\$888.56
<b>Transportation</b>					
		<b>No.</b>	<b>Rate</b>	<b>Subtotal</b>	
Truck Rental	Nissan Xterra	2900	0.6	\$1,740.00	
Fuel				\$623.12	
				\$2,363.12	\$2,363.12
<b>Accommodations &amp; Food</b>					
		<b>No.</b>	<b>Rate</b>	<b>Subtotal</b>	
Hotel		1	\$109.25	\$109.25	
Meals				\$212.60	
Groceries				\$235.82	
				\$557.67	\$557.67
<b>Miscellaneous</b>					
		<b>No.</b>	<b>Rate</b>	<b>Subtotal</b>	
Field Supplies	Sample bags, bear spray, stationary, etc.			\$428.42	
				\$428.42	\$428.42
<b>Equipment Rentals</b>					
		<b>No.</b>	<b>Rate</b>	<b>Subtotal</b>	
Radio	1 rental unit for truck on FSR	1		\$50.40	
Satellite Phone	1 week rental + airtime	1		\$137.67	
InReach Communication unit	1 month rental + airtime	1		\$49.30	
Generator	1 week rental	1		\$175.53	
				\$412.90	\$412.90
<b>TOTAL EXPENDITURES</b>					<b>\$22,050.67</b>



**APPENDIX C: TENURE INFORMATION**

<b>Title Number</b>	<b>Owner</b>	<b>Issue Date</b>	<b>Good To Date</b>	<b>Status</b>	<b>Area (ha)</b>
1030918	Douglas Cavey (In Trust for SMC)	2014/sep/12	2017/jan/15	GOOD	355.9244
1035234	Douglas Cavey (In Trust for SMC)	2015/apr/03	2017/jan/15	GOOD	497.9515
1035363	Douglas Cavey (In Trust for SMC)	2015/apr/08	2017/jan/15	GOOD	266.8045
1035396	Douglas Cavey (In Trust for SMC)	2015/apr/09	2017/jan/15	GOOD	213.3058
1039490	Douglas Cavey (In Trust for SMC)	2015/oct/22	2016/oct/22	GOOD	1049.6934
1039491	Douglas Cavey (In Trust for SMC)	2015/oct/22	2016/oct/22	GOOD	906.9419
"Good To Date" assumes the work detailed in this report is accepted for assessment.					

## APPENDIX D: Sample Descriptions

SampleID	UTM_X	UTM_Y	SampleType	SampleDate	Comments
21026	366874	6278559	Grab	02/09/2015	Steep fault on E margin of outcrop. 20cm wide zone of 40% strong milky qtz + 5-10% fe-cb stockwork veining, foliation of argillite becomes sub // to fault and increased small scale Z crenulation approaching from W to E.
21027	366839	6278574	Grab	02/09/2015	Milky white qtz vein w/ 10% mm graphitic stylolitic septa, no visible sulphides, 3% anhedral orange fe-cb.
21028	366998	6283202	Grab	02/09/2015	3-5cm layered milky white qtz/siderite vein material, orthogonal to trend of limestone unit. ??164/88. 30% pods/discontinuous veinlets of med grained galena, lesser sphalerite. 5% patchy chalcopyrite.
21029	367004	6283193	Grab	02/09/2015	Milky qtz vein w/ 30% vein parallel layers of med grained fe-cb/lesser siderite. 3cm seams of diffuse vein parallel med grained galena (20% overall). 10% euhedral fine grained sphalerite blebs.
21030	366359	6278953	Grab	04/09/2015	30-40% buff orange fe-cb >> qtz veining in phyllitic scree at bottom of hill. No visible sx.
21031	366527	6278842	Grab	04/09/2015	Buff orange to minor dark brick red weathering, mod pervasively silicified ?limestone, very weakly effervesces ?dolomitized. Distinct in orange colour. Moderate patchy sericite and wispy emerald green mineral
21032	366652	6278661	Grab	04/09/2015	3% to 5cm deformed, necking milky qtz + minor fe-cb veins with 1% med grained py on margins. Greensih septa on margins. Hosted in strongly foliated thinly laminated grey wk graphitic argillite. Inconsistent fabric orientations.
21033	366750	6278566	Grab	04/09/2015	Mod limonitic weathering argillites. Adjacent to a 340 trending 10cm wide graphitic fault.
21034	366961	6278586	Grab	05/09/2015	Strongly silicified, 10% subhedral disseminated pyrite bearing western margin of alteration zone
21035	366964.2	6278586	Grab	05/09/2015	10cm wide 30% coarse subhedral pyrite seam in middle of strongly silicified alteration zone. Pyrite disseminated and concentrated as patches.
21036	366968.8	6278586	Grab	05/09/2015	Strongly silicified/limonite stained gossanous weathering E margin of altered zone, 20-30% subhedral vitreous sphalerite pods. 1-3% disseminated subhedral med grained pyrite,
21037	366967	6278586	Grab	05/09/2015	10-15% poddy sphalerite, 2% chalcopyrite in mm seams, minor disseminated pyrite. In silicified limonite altered zone.

21051	366847.3	6278558	Grab	02/09/2015	White milky qtz vein, and light grey str silicified limestone? Maybe different phase of qtz. ~15% septa composed of graphite, and brown-red sphalerite. Trace dissem cpy+py. Galena occurs w sph in mm-scale to poddy septa. Angular boulder on side of stream, subcrop. Pods up to 10cm long and 2 cm wide.
21052	366852	6278557	Grab	02/09/2015	Malachite stained qtz veinlets hosted in weakly graphitic argillite. Veins up to 3cm wide along foliation with graphitic septa.
21053	366843	6278553	Grab	02/09/2015	Grey strongly dolomite/ankerite altered limestone with white milky quartz veinlets to veins throughout, ~10% quartz vein. Euhedral dolomite in veining and wallrock. Pods with fine-grained disseminated galena, locally 1%. Dusty brown mineral within limestone, sphalerite? Float on riverbank, angular, maybe subcrop.
21054	366814	6278548	Grab	02/09/2015	Quartz vein float with 5-10% graphitic and dolomite septa, elongate and wispy. Quartz is milky white. Trace disseminated pyrite associated with septa.
21055	366842	6278555	Grab	02/09/2015	1.5m wide quartz-carbonate vein outcrop in riverbed. 30cm long angular clasts of dark grey carbonate altered mudstone with irregular carbonate pods and veins, and strongly foliated sandstone with 1mm sized quartz clasts. 5-10% wispy to weakly stylolitic graphitic septa. No visible sulphides. Vein trend is ~350. Spaced cleavage cuts through vein, 056/55
21056	366838	6278565	Grab	02/09/2015	White-grey quartz vein subcrop. ~10-15% wispy graphitic septa. 1-2% disseminated weakly oxidized Fe-carbonate crystals. 1-2% pods/septa of galena, composed of fine-grained euhedral galena aggregates. Pods up to 1cm long. Moderately malachite-azurite stained.
21057	366849	6278694	Grab	02/09/2015	White-orange strongly silicified/vein material, quartz carbonate, possibly strongly silica flooded limestone (no graphite). Wisps and lenses of galena (2%) and 2% red-brown medium grained sphalerite. 0.5% disseminated fine to medium grained pyrite. Angular float in road cut. 50cm boulder.
21058	366911	6278963	Grab	02/09/2015	Red/brown-white strongly silica-dolomite flooded/altered material. Dolomite is ~40% and disseminated throughout.
21059	366999	6283208	Grab	02/09/2015	Quartz-galena-FeCarbonate float or subcrop on top of adit. 40% galena, trace chalcopyrite.

21061	367000	6283206	Grab	02/09/2015	Galena-quartz-ankerite zone, outcrop, not sure how wide. ~60% galena. Vein/zone ~ 180/60 oriented.
21062	366933	6283161	Grab	03/09/2015	Ochre colored siderite/ankerite zone, 1.2m wide, with 0.5 - 1% disseminated euhedral oxidized pyrite, and trace sphalerite and chalcopyrite. Outcrop, ~340 trend
21063	367422	6278637	Grab	04/09/2015	Quartz - FeCarbonate vein subcrop? Float on riverbank, very angular, looks from nearby. No visible sulphides. Irregular wallrock septa, micaceous.
21064	366966	6278555	Grab	04/09/2015	~80cm wide mineralized zone with massive pods and veins of galena-sphalerite, with ~1% pyrite. Sample has mostly galena. Dull metallic mineral with brownish streak may be sphalerite (smells like eggs with HCl added - sphalerite). Mineralized zone hosted in micritic limestone ~ 1m into hanging wall of fault with orientation ~150/70, and slicks raking 20 -> SE. Galena in interstices of fragments of dolomite in places.
21065	366963	6278551	Grab	05/09/2015	Moderately silicified phyllitic argillite, some is graphitic. Looks like limestone in places, but no effervesence. Quartz-sphalerite +/- galena-pyrite veining/zones. Float on hillslope. 5-10% sphalerite overall, brown in color.
21066	366966	6278564	Grab	05/09/2015	High grade galena>sphalerite mineralization hosted in strongly silicified banded/laminated seds, siltstone or limestone. Subcrop. In some places looks like mineralization crosscuts laminated silicified material. ~35-40% sulphides.
21067	366863	6278543	Grab	05/09/2015	Light green strongly sericite-dolomite altered siltstone. Dogtooth dolomite crystals within light grey dolomite matrix, and sericite alteration is pervasive. 2% fine-grained disseminated pyrite throughout. Trace apple green mineral, fuchsite?
21068	366841	6278567	Grab	05/09/2015	Bands of galena parallel to foliation in strongly silica-dolomite altered zone with sericite along banding. 2% disseminated pyrite, and aggregates of pyrite. Sample from zone ~15cm wide in micritic limestone. Subcrop. ~5-10% galena.

## APPENDIX E: Analytical Reports



**BUREAU VERITAS** MINERAL LABORATORIES  
Canada

[www.bureauveritas.com/um](http://www.bureauveritas.com/um)

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

**Client:** **Dustin Perry**  
3949 W. 12 Ave.  
Vancouver BC V6R 2P1 CANADA

Submitted By: Dustin Perry  
Receiving Lab: Canada-Vancouver  
Received: September 11, 2015  
Report Date: October 15, 2015  
Page: 1 of 2

# CERTIFICATE OF ANALYSIS

VAN15002381.1

## CLIENT JOB INFORMATION

Project: Swannell  
Shipment ID: Swannell 15  
P.O. Number  
Number of Samples: 29

## SAMPLE DISPOSAL

PICKUP-PLP Client to Pickup Pulps  
PICKUP-RJT Client to Pickup Rejects

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

Invoice To: Dustin Perry  
3949 W. 12 Ave.  
Vancouver BC V6R 2P1  
CANADA

CC: Doug Cavey  
Francis MacDonald

## SAMPLE PREPARATION AND ANALYTICAL PROCEDURES

Procedure Code	Number of Samples	Code Description	Test Wgt (g)	Report Status	Lab
PRP70-250	29	Crush, split and pulverize 250 g rock to 200 mesh			VAN
AQ200	29	1:1:1 Aqua Regia digestion ICP-MS analysis	0.5	Completed	VAN
DRPLP	29	Warehouse handling / disposition of pulps			VAN
DRRJT	29	Warehouse handling / Disposition of reject			VAN
AQ370	12	1:1:1 Aqua Regia digestion ICP-ES analysis	0.4	Completed	VAN
AQ371	4	1:1:1 Aqua Regia Digestion ICP-ES Finish	0.1	Completed	VAN
FA530	1	Lead collection fire assay 30G fusion - Grav finish	30	Completed	VAN

## ADDITIONAL COMMENTS



This report supersedes all previous preliminary and final reports with this file number dated prior to the date on this certificate. Signature indicates final approval; preliminary reports are unsigned and should be used for reference only. All results are considered the confidential property of the client. Bureau Veritas assumes the liabilities for actual cost of analysis only. Results apply to samples as submitted.  
\*\*\* asterisk indicates that an analytical result could not be provided due to unusually high levels of interference from other elements.





Bureau Veritas Commodities Canada Ltd.

9050 Shaughnessy St Vancouver BC V6P 6E5 CANADA

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**Client:** **Dustin Perry**  
3949 W. 12 Ave.  
Vancouver BC V6R 2P1 CANADA

**Project:** Swannell  
**Report Date:** October 15, 2015

**Page:** 2 of 2

**Part:** 1 of 3

# CERTIFICATE OF ANALYSIS

# VAN15002381.1

Method	WGHT	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200
Analyte	Wgt	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P	
Unit	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%	
MDL	0.01	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001	
21026	Rock	1.91	5.6	19.6	20.3	127	<0.1	35.0	7.1	385	1.76	15.9	1.2	2.5	217	1.1	0.5	<0.1	15	5.85	0.020
21027	Rock	2.22	2.2	3.1	15.4	199	0.1	6.6	2.1	76	0.68	8.1	1.0	1.2	13	0.8	0.4	<0.1	6	0.27	0.008
21028	Rock	2.02	0.7	868.1	>10000	57	>100	5.7	4.3	2654	4.21	9.0	41.2	0.2	69	4.5	173.6	0.7	<2	6.85	0.002
21029	Rock	2.04	0.1	109.9	>10000	25	>100	11.2	2.5	3418	11.38	2.4	53.3	<0.1	21	3.1	140.6	0.7	<2	2.10	<0.001
21030	Rock	1.36	0.2	10.5	270.0	50	0.6	13.5	7.1	779	3.68	14.6	<0.5	11.8	288	0.3	0.4	0.2	3	5.42	0.011
21031	Rock	1.91	<0.1	1.3	58.9	3	<0.1	2.8	0.9	148	0.56	2.9	<0.5	1.2	43	<0.1	0.2	<0.1	<2	2.87	0.003
21032	Rock	2.05	0.2	8.5	50.8	35	<0.1	14.6	7.2	788	3.20	16.7	3.1	1.8	15	<0.1	0.1	0.1	4	0.60	0.037
21033	Rock	1.81	1.4	14.6	57.3	80	0.1	34.6	13.2	431	4.47	78.9	0.9	8.7	36	0.1	0.3	0.6	10	0.90	0.132
21034	Rock	1.38	0.2	11.3	561.7	1911	1.2	4.4	2.8	1150	4.41	115.0	1.4	0.6	13	2.9	3.5	0.2	5	0.95	0.018
21035	Rock	0.85	0.2	110.2	691.2	4517	1.1	6.1	7.0	>10000	21.69	994.4	235.5	0.5	73	9.1	6.9	0.3	2	4.55	0.058
21036	Rock	1.31	0.5	9.3	519.4	1407	0.6	6.4	7.9	>10000	17.29	162.8	7.2	0.3	72	3.2	3.8	0.2	2	5.76	0.017
21037	Rock	1.00	0.3	579.3	5826.5	>10000	7.2	5.3	15.4	3190	4.24	42.1	13.4	0.6	22	103.4	8.6	0.2	<2	1.29	0.030
21051	Rock	1.45	1.4	654.0	5195.6	>10000	29.6	3.1	2.0	60	0.75	<0.5	11.8	0.2	6	339.7	35.1	1.1	<2	0.04	0.003
21052	Rock	1.25	14.6	1667.5	>10000	1891	>100	2.0	0.9	69	1.01	43.6	4.9	2.1	17	19.5	89.9	2.5	14	0.12	0.039
21053	Rock	2.21	<0.1	1.7	408.3	87	0.7	6.8	2.4	2772	2.66	1.4	<0.5	0.8	204	0.1	0.8	<0.1	<2	12.60	0.006
21054	Rock	1.61	0.1	3.9	9.9	41	<0.1	11.2	3.2	555	3.07	4.1	<0.5	1.4	30	<0.1	0.1	<0.1	2	1.16	0.006
21055	Rock	1.55	0.2	2.1	17.1	274	<0.1	3.7	1.3	206	0.81	2.5	1.6	0.9	28	0.7	0.3	<0.1	<2	0.96	0.010
21056	Rock	3.73	3.0	594.5	4474.1	1937	24.7	1.5	0.5	55	0.72	5.8	2.5	0.5	14	21.3	24.2	1.0	4	0.27	0.005
21057	Rock	1.11	<0.1	5.1	9226.0	>10000	9.1	6.4	7.6	2529	2.39	2.8	5.9	0.9	494	38.8	9.0	0.4	3	13.01	0.039
21058	Rock	1.13	<0.1	9.2	28.2	47	<0.1	8.5	5.2	631	1.73	8.6	0.8	10.6	108	0.1	0.2	<0.1	3	1.62	0.009
21059	Rock	1.15	0.2	2051.7	>10000	56	>100	9.5	2.8	1682	4.14	3.0	9.8	<0.1	36	2.0	116.5	0.4	<2	3.68	0.002
21061	Rock	1.41	0.2	55.0	>10000	14	>100	3.0	1.9	870	2.25	5.0	31.8	<0.1	24	12.9	370.9	1.5	<2	2.27	0.001
21062	Rock	1.45	0.3	190.9	201.8	209	1.3	15.9	17.9	6492	18.69	35.9	4.8	0.3	153	1.0	1.1	<0.1	<2	17.64	0.001
21063	Rock	1.29	0.1	3.2	149.9	34	0.2	9.1	2.0	786	2.65	1.0	<0.5	2.5	495	<0.1	0.6	<0.1	3	13.69	0.008
21064	Rock	1.54	<0.1	54.3	>10000	>10000	>100	2.7	51.9	191	2.67	20.3	28.8	0.2	31	511.1	364.5	2.4	<2	1.19	0.015
21065	Rock	1.16	0.5	122.3	2017.4	>10000	2.9	4.6	43.9	1521	3.59	36.0	17.4	0.4	30	281.2	6.0	0.3	2	1.25	0.041
21066	Rock	2.36	1.0	58.6	>10000	>10000	>100	4.9	34.8	288	2.40	23.2	16.6	0.3	11	347.5	368.6	2.4	<2	0.30	0.036
21067	Rock	1.54	3.6	27.3	48.1	152	0.2	112.2	32.6	1302	5.03	312.8	12.2	2.3	1261	0.5	1.4	<0.1	26	10.43	0.381
21068	Rock	1.64	<0.1	12.1	8726.0	>10000	10.9	13.2	5.6	3527	3.26	11.0	8.6	2.5	536	24.2	11.8	0.4	<2	16.54	0.017



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**Project:** Swannell  
**Report Date:** October 15, 2015

**Page:** 2 of 2

**Part:** 2 of 3

# CERTIFICATE OF ANALYSIS

**VAN15002381.1**

Method	Analyte	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ374	AQ374	AQ374
		La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Sc	Tl	S	Ga	Se	Te	Pb	Zn	Ag
Unit		ppm	ppm	%	ppm	%	ppm	%	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	%	%	%	
MDL		1	1	0.01	1	0.001	20	0.01	0.001	0.01	0.01	0.01	0.01	0.05	1	0.5	0.2	0.01	0.01	2	
21026	Rock	6	7	2.76	147	<0.001	<20	0.19	0.015	0.09	0.1	<0.01	3.1	<0.1	0.13	<1	0.5	<0.2			
21027	Rock	4	7	0.03	64	<0.001	<20	0.10	0.007	0.05	0.1	<0.01	0.4	<0.1	<0.05	<1	<0.5	<0.2			
21028	Rock	<1	4	2.03	3	<0.001	<20	0.01	<0.001	<0.01	<0.1	0.03	0.8	0.2	2.08	<1	1.9	<0.2	>10	<0.01	179
21029	Rock	<1	3	0.59	2	<0.001	<20	0.03	0.002	<0.01	<0.1	0.01	0.4	0.3	1.61	<1	0.5	<0.2	9.86	<0.01	128
21030	Rock	13	6	0.25	65	<0.001	<20	0.24	0.019	0.14	0.1	<0.01	3.1	<0.1	<0.05	<1	<0.5	<0.2			
21031	Rock	3	18	1.63	17	<0.001	<20	0.04	0.002	0.03	<0.1	<0.01	0.4	<0.1	<0.05	<1	<0.5	<0.2			
21032	Rock	3	8	0.57	47	<0.001	<20	0.44	0.015	0.04	<0.1	<0.01	1.3	<0.1	0.42	1	<0.5	<0.2			
21033	Rock	15	19	0.76	65	0.001	<20	1.40	0.052	0.17	0.1	<0.01	1.7	<0.1	0.76	4	0.6	<0.2			
21034	Rock	2	5	0.10	22	<0.001	<20	0.07	0.004	0.04	<0.1	2.30	0.3	0.1	4.11	<1	<0.5	<0.2			
21035	Rock	<1	3	0.67	15	<0.001	<20	0.04	0.003	0.02	<0.1	0.22	1.3	<0.1	>10	<1	0.5	<0.2			
21036	Rock	1	4	1.48	9	<0.001	<20	0.02	<0.001	0.01	<0.1	0.06	1.1	<0.1	>10	<1	<0.5	<0.2			
21037	Rock	<1	4	0.27	25	<0.001	<20	0.05	0.003	0.03	<0.1	6.22	0.4	<0.1	6.27	1	1.4	<0.2	0.59	6.46	7
21051	Rock	1	10	0.02	25	<0.001	<20	0.02	0.003	0.01	<0.1	0.92	<0.1	<0.1	2.31	1	13.0	<0.2	0.45	3.75	28
21052	Rock	11	8	0.03	174	<0.001	<20	0.14	0.007	0.06	0.3	0.34	0.4	0.2	0.48	<1	23.0	0.3	1.90	0.18	101
21053	Rock	4	3	5.64	37	<0.001	<20	0.04	0.004	0.02	<0.1	<0.01	1.7	<0.1	0.05	<1	<0.5	<0.2			
21054	Rock	3	7	1.02	12	<0.001	<20	0.11	0.017	0.05	<0.1	<0.01	2.0	<0.1	0.10	<1	<0.5	<0.2			
21055	Rock	2	7	0.39	26	<0.001	<20	0.04	0.005	0.02	<0.1	<0.01	0.3	<0.1	0.08	<1	<0.5	<0.2			
21056	Rock	2	10	0.07	57	<0.001	<20	0.05	0.003	0.02	0.1	0.10	0.4	<0.1	0.37	<1	5.2	<0.2			
21057	Rock	4	4	2.47	146	0.001	<20	0.06	0.003	0.02	<0.1	2.99	1.7	<0.1	1.71	1	1.2	<0.2	0.93	2.89	8
21058	Rock	21	6	0.39	62	<0.001	<20	0.21	0.046	0.11	<0.1	<0.01	1.9	<0.1	<0.05	<1	<0.5	<0.2			
21059	Rock	<1	5	0.75	5	<0.001	<20	0.04	0.001	<0.01	<0.1	<0.01	0.6	0.2	1.29	<1	<0.5	<0.2	7.86	<0.01	108
21061	Rock	<1	6	0.39	5	<0.001	<20	0.03	0.002	0.01	<0.1	<0.01	0.3	0.2	3.42	<1	1.3	<0.2	>10	<0.01	>300
21062	Rock	2	1	2.57	6	<0.001	<20	0.04	0.001	<0.01	<0.1	<0.01	1.2	<0.1	0.52	<1	<0.5	<0.2			
21063	Rock	8	3	0.81	46	<0.001	<20	0.06	0.005	0.02	<0.1	<0.01	4.6	<0.1	<0.05	<1	<0.5	<0.2			
21064	Rock	<1	1	0.04	23	<0.001	<20	0.02	<0.001	<0.01	<0.1	>50	<0.1	0.3	9.51	20	10.7	<0.2	>10	30.95	223
21065	Rock	<1	3	0.17	54	<0.001	<20	0.04	0.001	0.02	<0.1	39.54	0.2	<0.1	>10	4	4.0	<0.2	0.17	18.02	2
21066	Rock	<1	5	0.06	39	<0.001	<20	0.03	<0.001	0.01	<0.1	>50	<0.1	0.3	>10	14	6.9	<0.2	>10	20.95	221
21067	Rock	19	25	4.30	455	0.003	<20	0.40	0.044	0.15	0.4	0.14	7.9	<0.1	1.87	1	1.3	<0.2			
21068	Rock	5	2	2.97	324	<0.001	<20	0.08	0.002	0.04	<0.1	2.58	2.4	<0.1	2.11	1	0.7	<0.2	0.81	1.03	8



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Project: Swannell  
Report Date: October 15, 2015

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Part: 3 of 3

# CERTIFICATE OF ANALYSIS

**VAN15002381.1**

Method	Analyte	AQ371	FA530
		Pb	Ag
Unit		%	gm/t
MDL		0.01	50
21026	Rock		
21027	Rock		
21028	Rock	14.98	
21029	Rock		
21030	Rock		
21031	Rock		
21032	Rock		
21033	Rock		
21034	Rock		
21035	Rock		
21036	Rock		
21037	Rock		
21051	Rock		
21052	Rock		
21053	Rock		
21054	Rock		
21055	Rock		
21056	Rock		
21057	Rock		
21058	Rock		
21059	Rock		
21061	Rock	21.64	302
21062	Rock		
21063	Rock		
21064	Rock	19.38	
21065	Rock		
21066	Rock	18.50	
21067	Rock		
21068	Rock		



# QUALITY CONTROL REPORT

VAN15002381.1

Method	WGHT	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200
Analyte	Wgt	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P	
Unit	kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%	
MDL	0.01	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001	
Pulp Duplicates																					
21061 Rock	1.41	0.2	55.0	>10000	14	>100	3.0	1.9	870	2.25	5.0	31.8	<0.1	24	12.9	370.9	1.5	<2	2.27	0.001	
REP 21061 QC		0.2	53.3	>10000	13	>100	3.1	1.6	844	2.23	4.3	31.3	<0.1	22	13.2	359.8	1.5	<2	2.21	0.001	
21066 Rock	2.36	1.0	58.6	>10000	>10000	>100	4.9	34.8	288	2.40	23.2	16.6	0.3	11	347.5	368.6	2.4	<2	0.30	0.036	
REP 21066 QC																					
21068 Rock	1.64	<0.1	12.1	8726.0	>10000	10.9	13.2	5.6	3527	3.26	11.0	8.6	2.5	536	24.2	11.8	0.4	<2	16.54	0.017	
REP 21068 QC																					
Reference Materials																					
STD AGPROOF Standard																					
STD CCU-1D Standard																					
STD CZN-4 Standard																					
STD DS10 Standard		15.0	151.8	157.1	359	1.9	73.4	12.7	871	2.70	50.2	56.3	8.2	79	2.7	9.4	13.8	43	1.06	0.078	
STD GBM997-6 Standard																					
STD GC-7 Standard																					
STD OREAS133B Standard																					
STD OREAS45EA Standard		1.8	700.6	18.3	31	0.3	391.2	52.8	402	22.22	12.7	48.6	11.8	4	<0.1	0.4	0.3	306	0.04	0.030	
STD PTC-1A Standard																					
STD SP49 Standard																					
STD SQ70 Standard																					
STD DS10 Expected		13.6	154.61	150.55	370	2.02	74.6	12.9	875	2.7188	46.2	91.9	7.5	67.1	2.62	9	11.65	43	1.0625	0.0765	
STD OREAS45EA Expected		1.6	709	14.3	31.4	0.26	381	52	400	23.51	10.3	53	10.7	3.5	0.03	0.32	0.26	303	0.036	0.029	
STD GC-7 Expected																					
STD OREAS133B Expected																					
STD AGPROOF Expected																					
STD SP49 Expected																					
STD SQ70 Expected																					
STD CZN-4 Expected																					
STD GBM997-6 Expected																					
STD CCU-1D Expected																					



# QUALITY CONTROL REPORT

VAN15002381.1

Method	Analyte	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ374	AQ374	AQ374
		La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Sc	Tl	S	Ga	Se	Te	Pb	Zn	Ag
Unit		ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	%	%	gm/t
MDL		1	1	0.01	1	0.001	20	0.01	0.001	0.01	0.1	0.01	0.1	0.05	1	0.5	0.2	0.01	0.01		
Pulp Duplicates																					
21061	Rock	<1	6	0.39	5	<0.001	<20	0.03	0.002	0.01	<0.1	<0.01	0.3	0.2	3.42	<1	1.3	<0.2	>10	<0.01	>300
REP 21061	QC	<1	5	0.38	5	<0.001	<20	0.03	0.002	<0.01	<0.1	<0.01	0.2	0.3	3.32	<1	1.2	<0.2			
21066	Rock	<1	5	0.06	39	<0.001	<20	0.03	<0.001	0.01	<0.1	>50	<0.1	0.3	>10	14	6.9	<0.2	>10	20.95	221
REP 21066	QC																				
21068	Rock	5	2	2.97	324	<0.001	<20	0.08	0.002	0.04	<0.1	2.58	2.4	<0.1	2.11	1	0.7	<0.2	0.81	1.03	8
REP 21068	QC																		0.80	1.03	9
Reference Materials																					
STD AGPROOF	Standard																				
STD CCU-1D	Standard																				
STD CZN-4	Standard																				
STD DS10	Standard	19	54	0.78	467	0.085	<20	1.04	0.072	0.34	2.7	0.30	2.7	5.0	0.30	4	2.2	5.6			
STD GBM997-6	Standard																				
STD GC-7	Standard																		>10	21.58	>300
STD OREAS133B	Standard																		5.17	10.80	101
STD OREAS45EA	Standard	8	777	0.10	163	0.107	<20	3.22	0.025	0.06	<0.1	<0.01	76.8	<0.1	<0.05	13	1.2	<0.2			
STD PTC-1A	Standard																				
STD SP49	Standard																				
STD SQ70	Standard																				
STD DS10 Expected		17.5	54.6	0.775	412	0.0817		1.0259	0.067	0.338	3.32	0.3	2.8	5.1	0.29	4.3	2.3	5.01			
STD OREAS45EA Expected		7.06	849	0.095	148	0.0984		3.13	0.02	0.053			78	0.072	0.036	12.4	0.78	0.07			
STD GC-7 Expected																			10.44	22.06	624
STD OREAS133B Expected																			5.07	11.12	104
STD AGPROOF Expected																					
STD SP49 Expected																					
STD SQ70 Expected																					
STD CZN-4 Expected																					
STD GBM997-6 Expected																					
STD CCU-1D Expected																					



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**Client:** **Dustin Perry**  
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Project: Swannell  
Report Date: October 15, 2015

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# QUALITY CONTROL REPORT

**VAN15002381.1**

Method	AQ371	FA530
Analyte	Pb	Ag
Unit	%	gm/t
MDL	0.01	50
Pulp Duplicates		
21061	Rock	21.64 302
REP 21061	QC	
21066	Rock	18.50
REP 21066	QC	18.76
21068	Rock	
REP 21068	QC	
Reference Materials		
STD AGPROOF	Standard	96
STD CCU-1D	Standard	0.27
STD CZN-4	Standard	0.22
STD DS10	Standard	
STD GBM997-6	Standard	22.90
STD GC-7	Standard	
STD OREAS133B	Standard	
STD OREAS45EA	Standard	
STD PTC-1A	Standard	0.05
STD SP49	Standard	62
STD SQ70	Standard	155
STD DS10 Expected		
STD OREAS45EA Expected		
STD GC-7 Expected		
STD OREAS133B Expected		
STD AGPROOF Expected		94
STD SP49 Expected		60.2
STD SQ70 Expected		159.5
STD CZN-4 Expected	0.1861	
STD GBM997-6 Expected	23.75	
STD CCU-1D Expected	0.262	



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# QUALITY CONTROL REPORT

**VAN15002381.1**

		WGHT	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200
		Wgt	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Th	Sr	Cd	Sb	Bi	V	Ca	P
		kg	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppb	ppm	ppm	ppm	ppm	ppm	ppm	%	%
		0.01	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	1	0.1	0.1	0.1	2	0.01	0.001
BLK	Blank		0.1	0.4	0.2	<1	<0.1	0.3	<0.1	<1	<0.01	<0.5	<0.5	<0.1	<1	<0.1	<0.1	<0.1	<2	<0.01	<0.001
BLK	Blank																				
BLK	Blank																				
BLK	Blank																				
Prep Wash																					
ROCK-VAN	Prep Blank		1.0	3.3	1.3	31	<0.1	0.7	3.8	458	1.86	1.0	2.8	2.5	22	<0.1	<0.1	<0.1	23	0.58	0.040
ROCK-VAN	Prep Blank		0.9	3.8	1.2	29	<0.1	0.7	3.6	447	1.76	1.0	1.2	2.4	22	<0.1	<0.1	<0.1	22	0.48	0.038



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Project: Swannell  
Report Date: October 15, 2015

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Part: 2 of 3

# QUALITY CONTROL REPORT

**VAN15002381.1**

		AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ200	AQ374	AQ374	AQ374
		La	Cr	Mg	Ba	Ti	B	Al	Na	K	W	Hg	Sc	Tl	S	Ga	Se	Te	Pb	Zn	Ag
		ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	%	%	gm/t
		1	1	0.01	1	0.001	20	0.01	0.001	0.01	0.1	0.01	0.1	0.1	0.05	1	0.5	0.2	0.01	0.01	2
BLK	Blank	<1	1	<0.01	<1	<0.001	<20	<0.01	<0.001	<0.01	<0.1	<0.01	<0.1	<0.1	<0.05	<1	<0.5	<0.2			
BLK	Blank																		<0.01	<0.01	<2
BLK	Blank																				
BLK	Blank																				
Prep Wash																					
ROCK-VAN	Prep Blank	6	3	0.42	55	0.089	<20	0.87	0.095	0.09	0.1	<0.01	2.5	<0.1	<0.05	4	<0.5	<0.2			
ROCK-VAN	Prep Blank	6	4	0.41	62	0.087	<20	0.80	0.085	0.08	0.1	<0.01	2.3	<0.1	<0.05	4	<0.5	<0.2			





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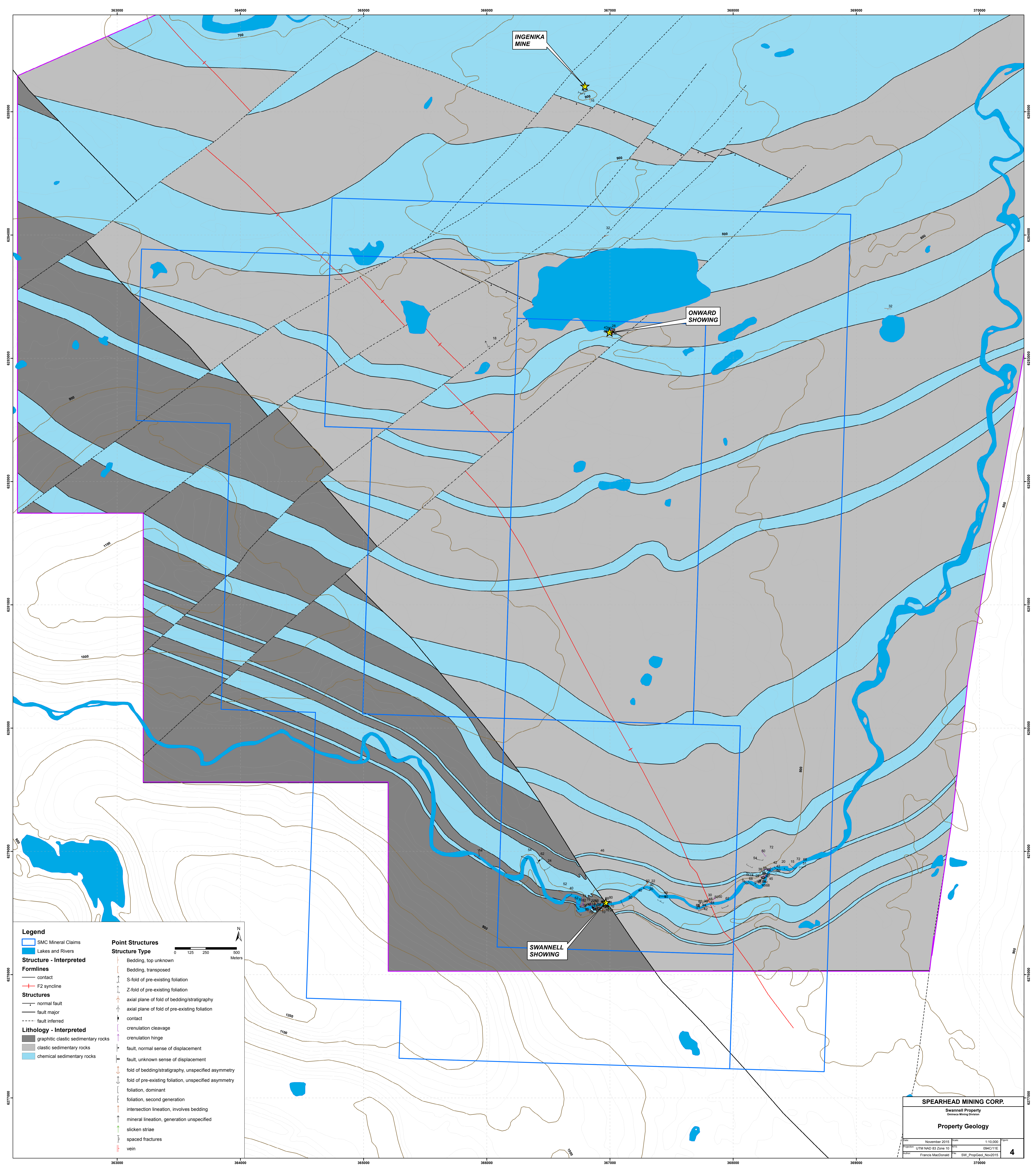
## QUALITY CONTROL REPORT

VAN15002381.1

		AQ371	FA530
		Pb	Ag
		%	gm/t
		0.01	50
BLK	Blank		
BLK	Blank		
BLK	Blank		<50
BLK	Blank	0.05	
Prep Wash			
ROCK-VAN	Prep Blank		
ROCK-VAN	Prep Blank		

## APPENDIX F: Maps





**Legend**

- SMC Mineral Claims
- Lakes and Rivers

**Structure - Interpreted**

**Formlines**

- contact
- F2 syncline

**Structures**

- normal fault
- fault major
- fault inferred

**Lithology - Interpreted**

- graphitic clastic sedimentary rocks
- clastic sedimentary rocks
- chemical sedimentary rocks

**Point Structures**

**Structure Type**

- Bedding, top unknown
- Bedding, transposed
- S-fold of pre-existing foliation
- Z-fold of pre-existing foliation
- axial plane of fold of bedding/stratigraphy
- axial plane of fold of pre-existing foliation
- contact
- crenulation cleavage
- crenulation hinge
- fault, normal sense of displacement
- fault, unknown sense of displacement
- fold of bedding/stratigraphy, unspecified asymmetry
- fold of pre-existing foliation, unspecified asymmetry
- foliation, dominant
- foliation, second generation
- intersection lineation, involves bedding
- mineral lineation, generation unspecified
- slicken striae
- spaced fractures
- vein

0 125 250 500 Meters

**SPEARHEAD MINING CORP.**

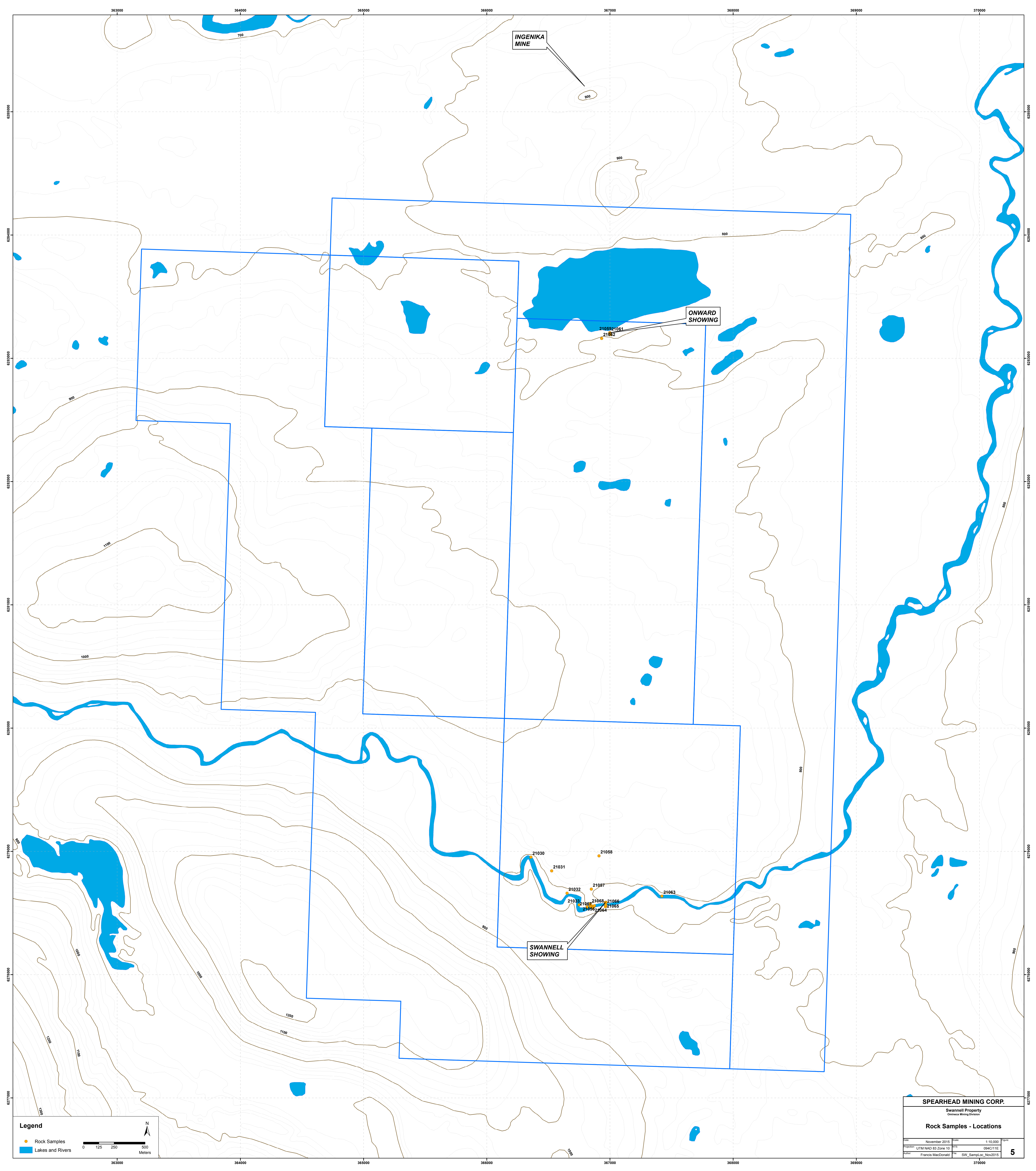
Swannell Property  
Orencia Mining Division

**Property Geology**

Date: November 2015 Scale: 1:10,000  
 Projection: UTM NAD 83 Zone 10 GIS: 094C11E  
 Author: Francis MacDonald SW\_PropGeol\_Nov2015

**4**





INGENIKA  
MINE

ONWARD  
SHOWING

SWANNELL  
SHOWING

**Legend**

- Rock Samples
- Lakes and Rivers

0 125 250 500  
Meters

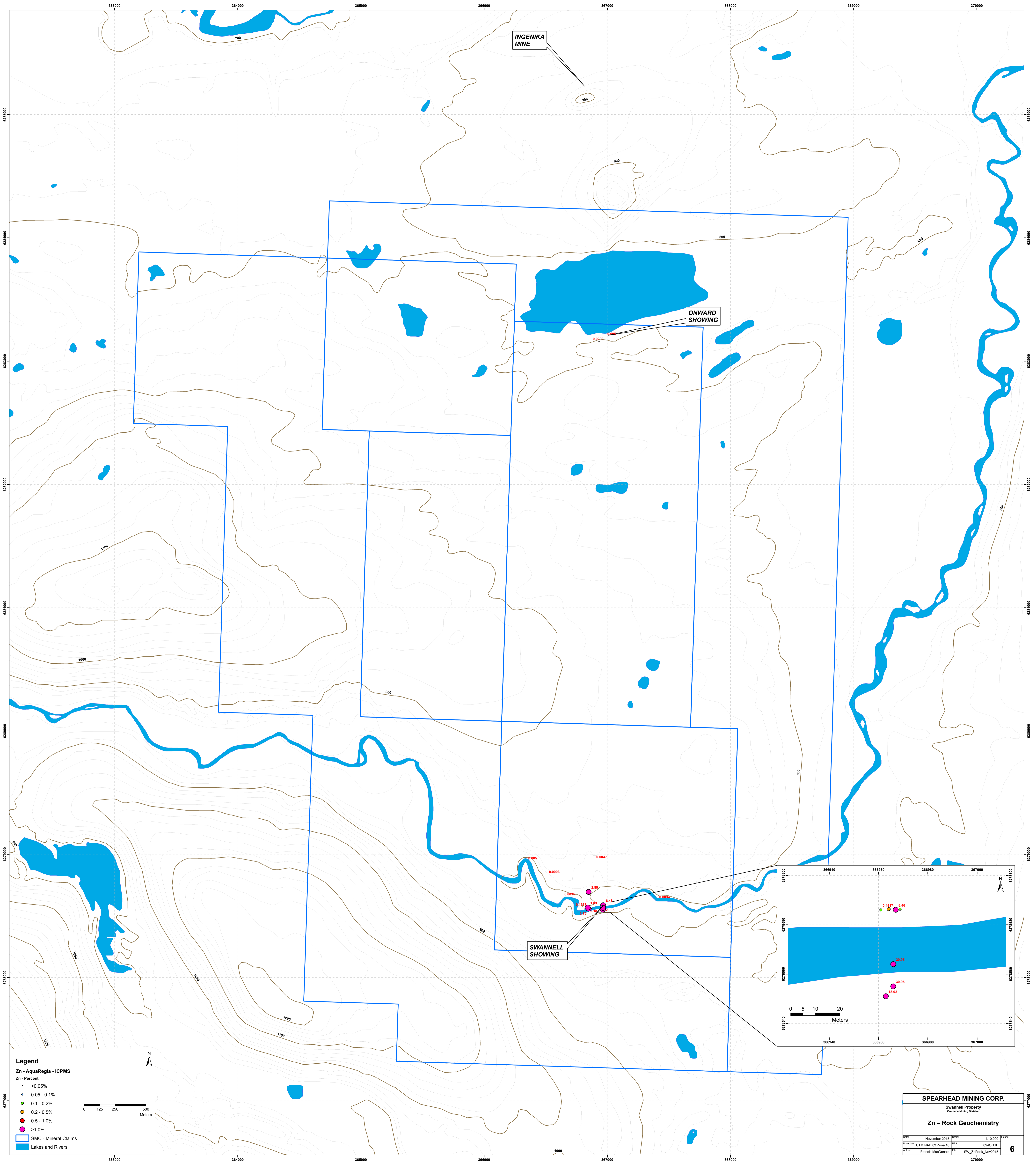
N

**SPEARHEAD MINING CORP.**  
Swannell Property  
Geomatics Mining Division

**Rock Samples - Locations**

DATE: November 2015	SCALE: 1:10,000	PROJECT: 094C11E	5
PROJ: UTM NAD 83 Zone 10	DWG: SW_SampLoc_Nov2015	AUTH: Francis MacDonald	





INGENIKA  
MINE

ONWARD  
SHOWING

SWANNELL  
SHOWING

**Legend**

Zn - AquaRegia - ICPMS

Zn - Percent

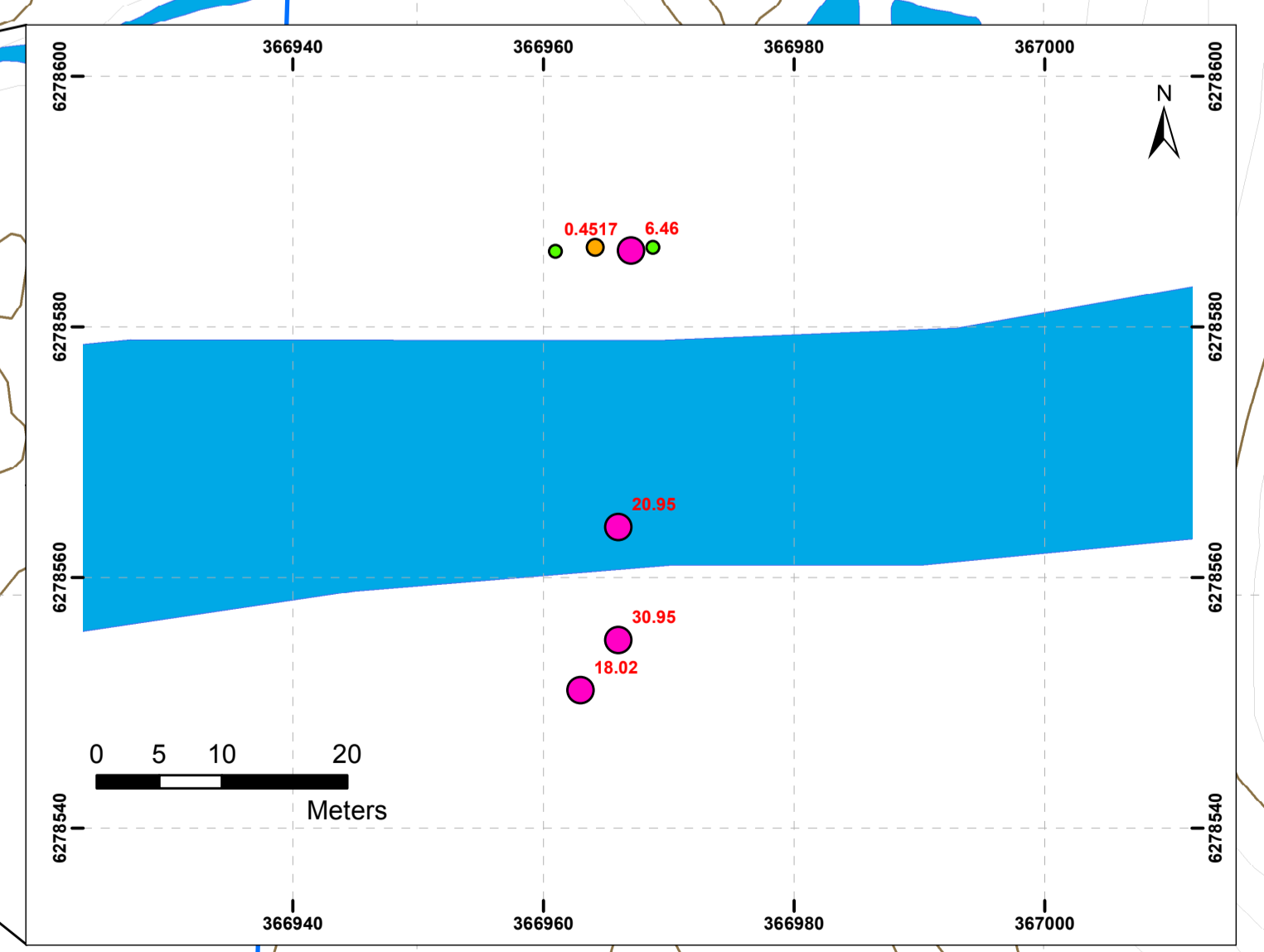
- <0.05%
- 0.05 - 0.1%
- 0.1 - 0.2%
- 0.2 - 0.5%
- 0.5 - 1.0%
- >1.0%

□ SMC - Mineral Claims

■ Lakes and Rivers

0 125 250 500  
Meters

N



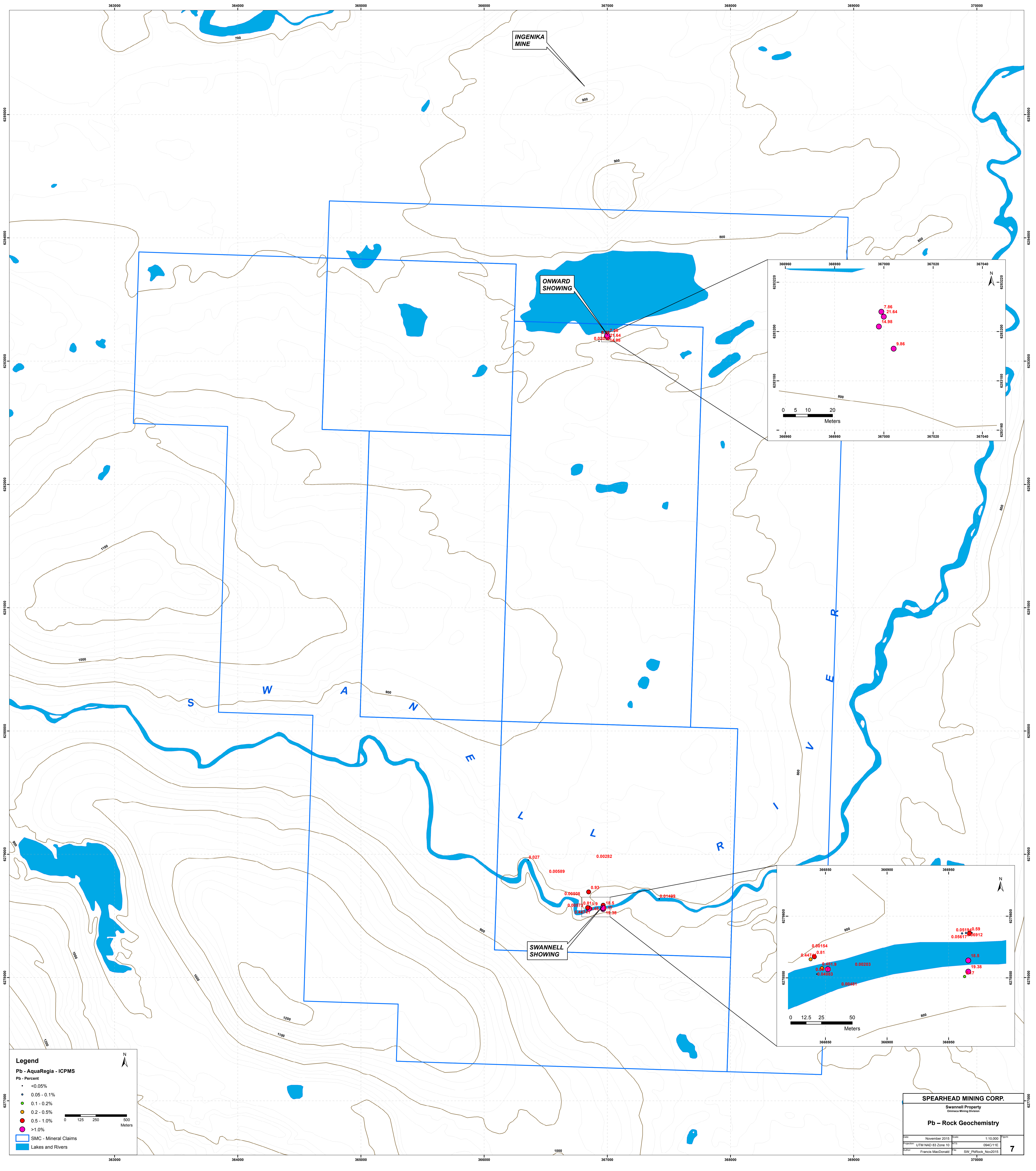
**SPEARHEAD MINING CORP.**

Swannell Property  
Omineca Mining Division

**Zn - Rock Geochemistry**

Date:	November 2015	Scale:	1:10,000	Figure:
Projection:	UTM NAD 83 Zone 10	Map:	094C11E	
Author:	Francis MacDonald	File:	SW_ZnRock_Nov2015	<b>6</b>





INGENIKA MINE

ONWARD SHOWING

SWANNELL SHOWING

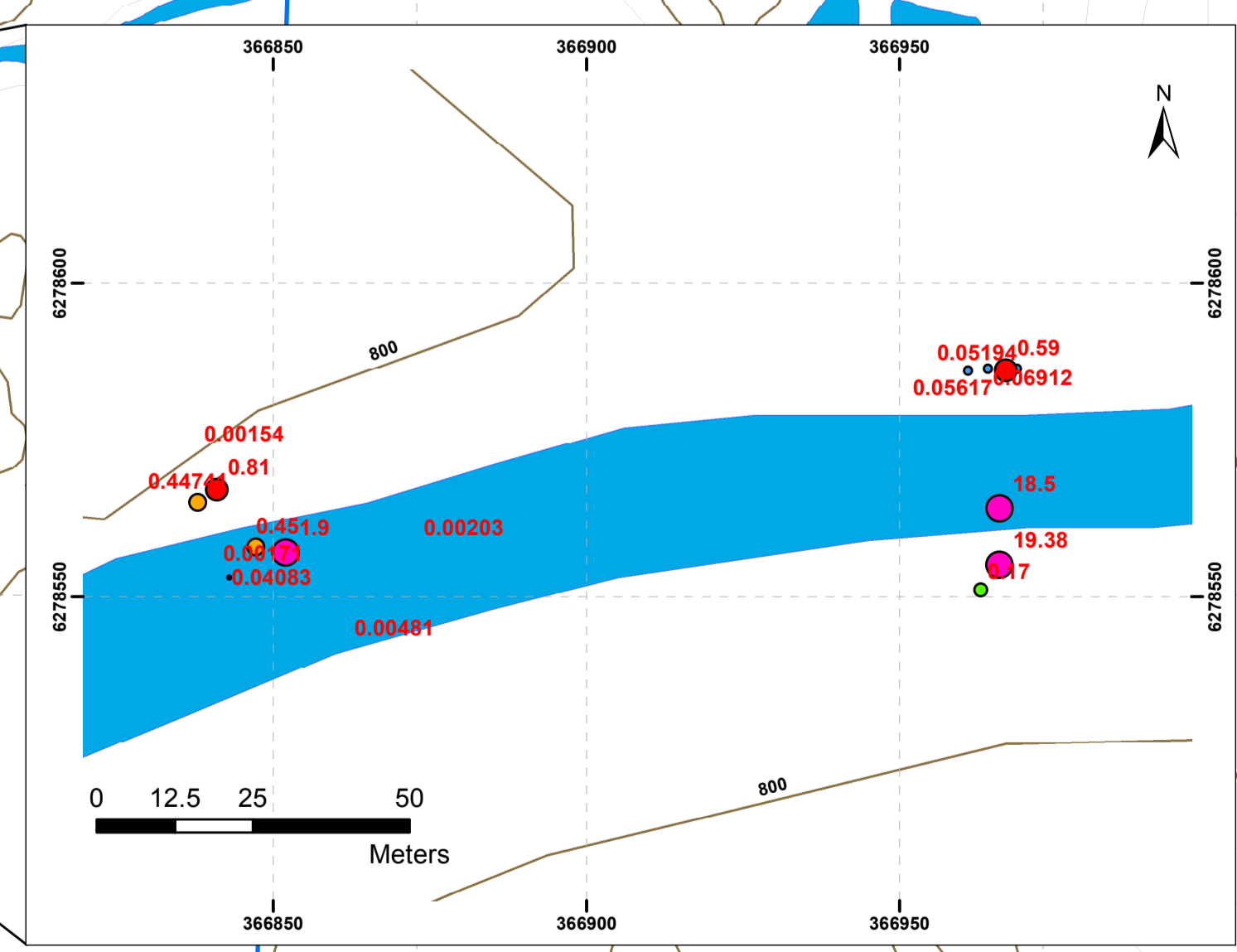
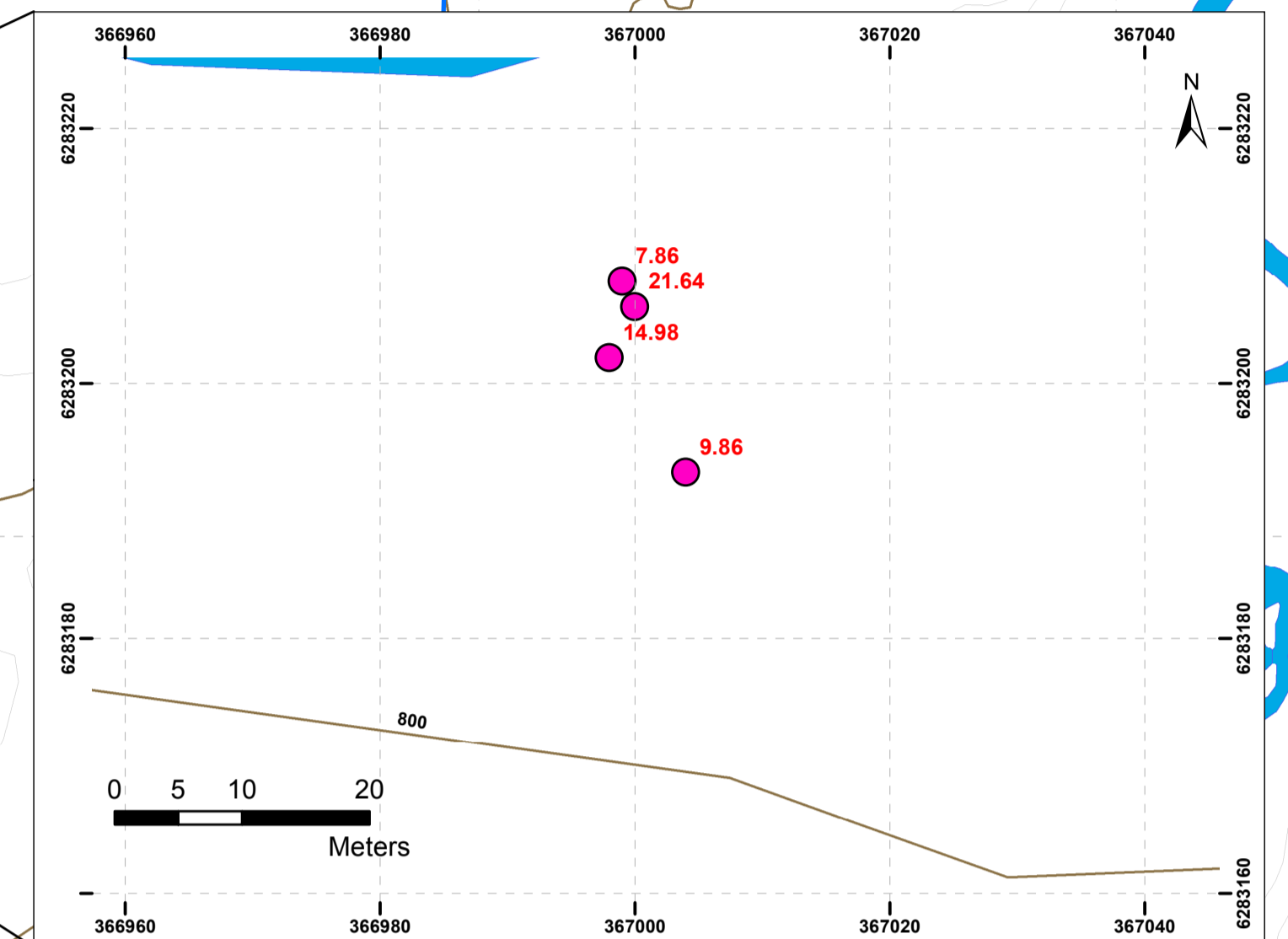
**Legend**

Pb - AquaRegia - ICAMS

- <0.05%
- 0.05 - 0.1%
- 0.1 - 0.2%
- 0.2 - 0.5%
- 0.5 - 1.0%
- >1.0%

□ SMC - Mineral Claims

■ Lakes and Rivers



**SPEARHEAD MINING CORP.**

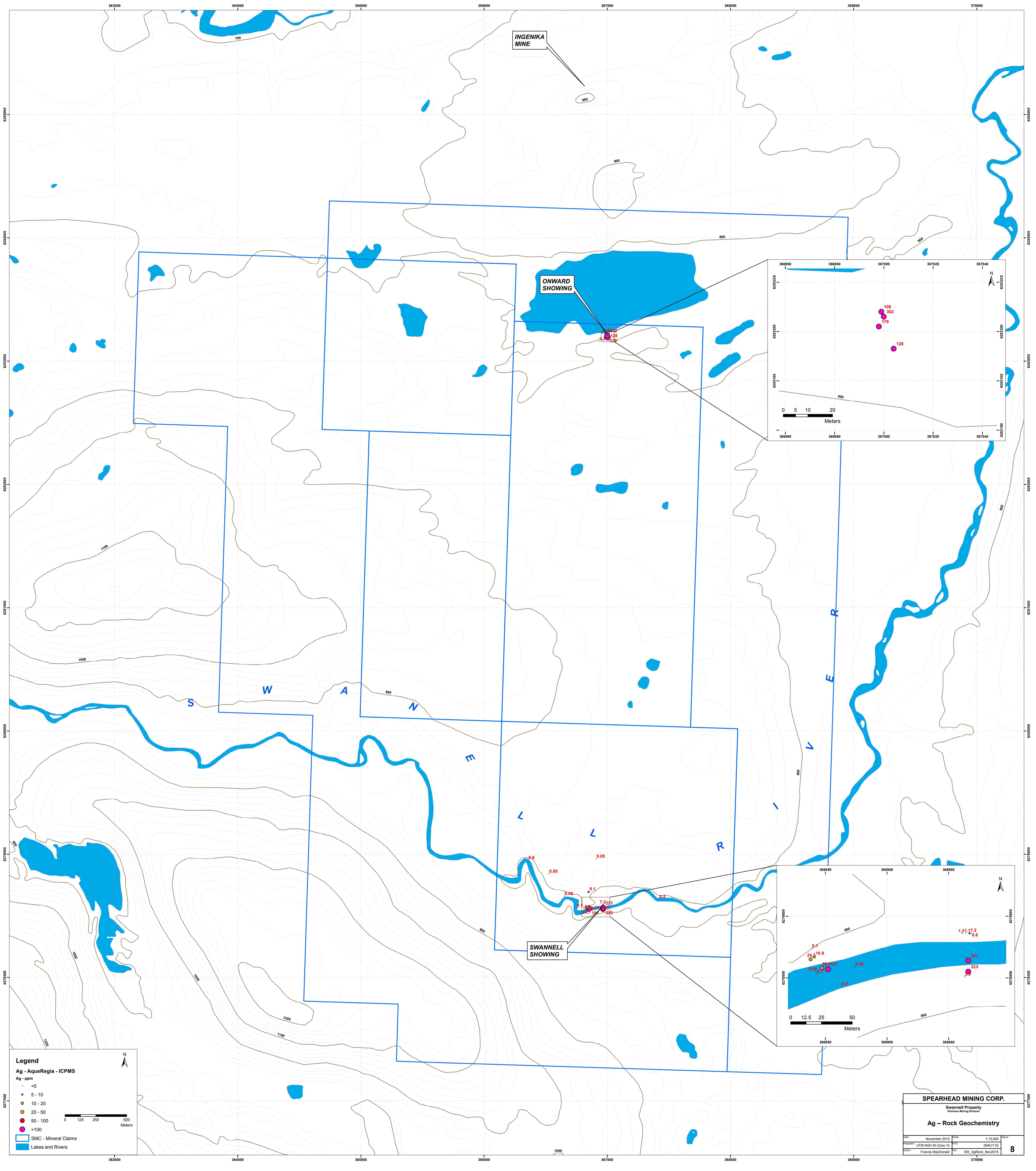
Swannell Property  
Omica Mining Division

**Pb - Rock Geochemistry**

Date:	November 2015	Scale:	1:10,000
Project:	UTM NAD 83 Zone 10	Map:	094C11E
Author:	Francis MacDonald	File:	SW_PbRock_Nov2015

7





INGENIKA  
MINE

ONWARD  
SHOWING

SWANNELL  
SHOWING

**Legend**

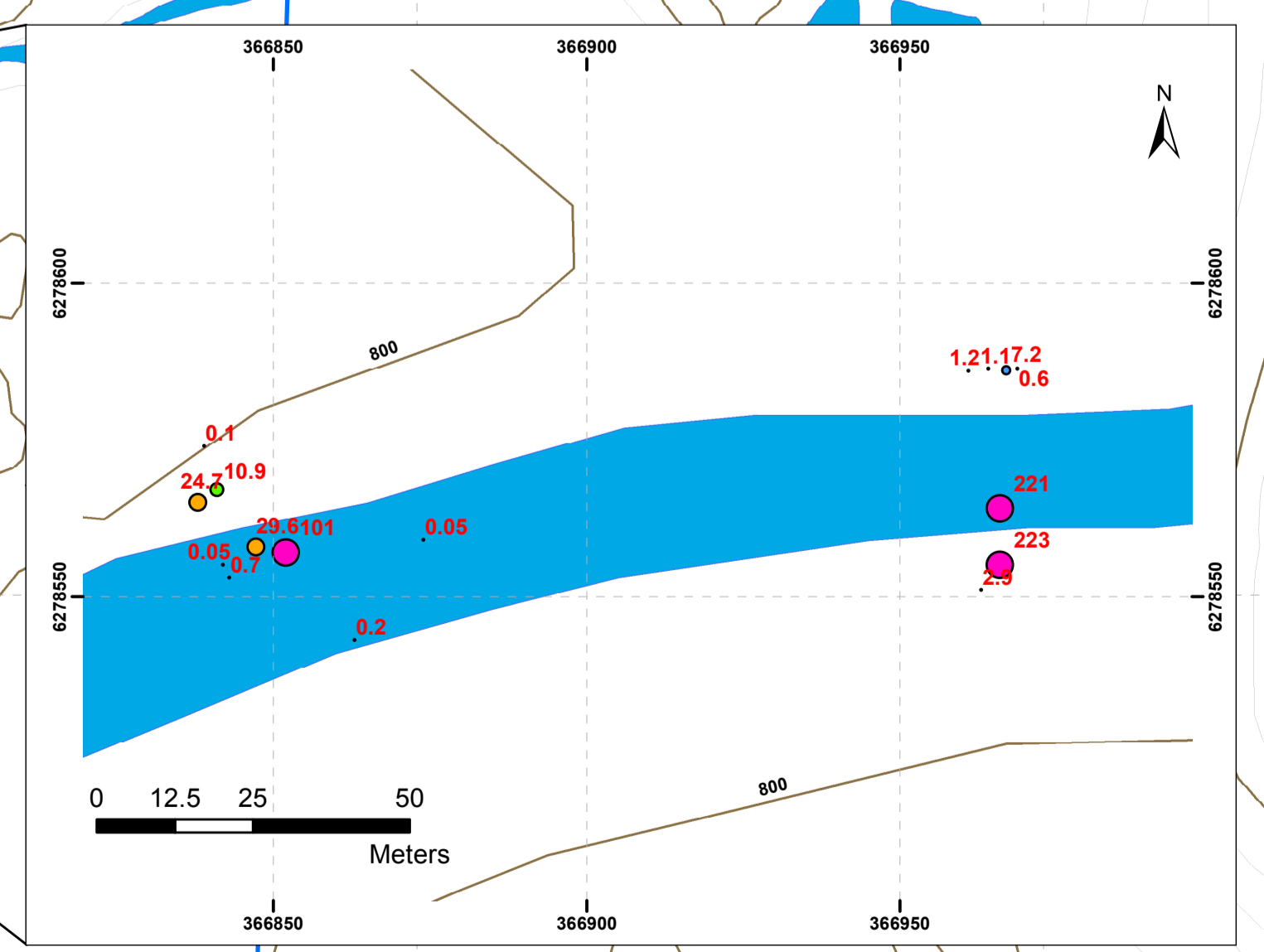
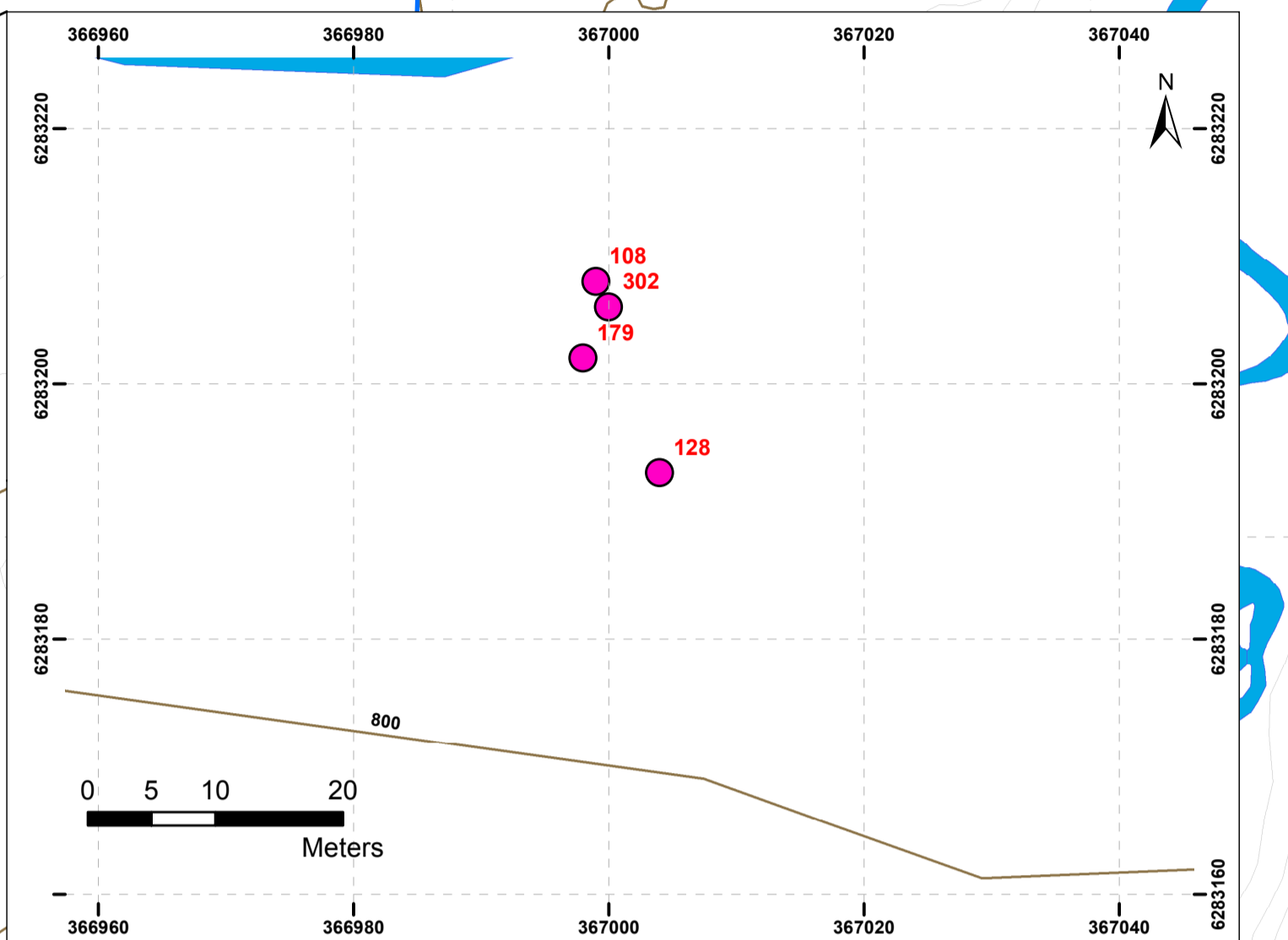
Ag - AqueRegia - ICMS

Ag - ppm

- <5
- 5 - 10
- 10 - 20
- 20 - 50
- 50 - 100
- >100

□ SMC - Mineral Claims

■ Lakes and Rivers



**SPEARHEAD MINING CORP.**

Swannell Property  
Omega Mining Division

**Ag - Rock Geochemistry**

Date:	November 2015	Scale:	1:10,000
Projection:	UTM NAD 83 Zone 10	Map:	094C11E
Author:	Francis MacDonald	File:	SW_AgRock_Nov2015

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