TECHNICAL REPORT ON THE 2017 MINERAL RESOURCE UPDATES AND PRELIMINARY ECONOMIC ASSESSMENT

SPECTRUM-GJ COPPER-GOLD PROJECT

LIARD MINING DIVISION BRITISH COLUMBIA, CANADA

Latitude 57º 39' 21" N
Longitude 130º 15' 41" W

for Skeena Resources Limited

Qualified Persons:

Stephen J. Godden, C. Eng.
David T. Mehner, P. Geo.
David G. Thomas, P. Geo.
Scott A. Britton, C. Eng.
Christopher J. Martin, C. Eng.
M. John Brodie, P. Eng.

Report Date: May 24, 2017
Effective Date: April 20, 2017

DATE AND SIGNATURE PAGE

The Effective Date of this Technical Report, entitled 'Technical Report on the 2017 Mineral Resource Update and Preliminary Economic Assessment, Spectrum-GJ Copper-Gold Project, Liard Mining Division, British Columbia, Canada' is April 20, 2017.

CERTIFICATE – Mr. STEPHEN J. GODDEN, C. Eng.

I, Stephen J. Godden, C. Eng., of P.O. Box 54113, North Vancouver, British Columbia, Canada, as the Principal Author of this report entitled 'Technical Report on the 2017 Mineral Resource Updates and Preliminary Economic Assessment, Spectrum-GJ Copper-Gold Project, Liard Mining Division, British Columbia, Canada', with an Effective Date of April 20, 2017 and which was prepared for Skeena Resources Limited (the "Issuer"), do hereby certify that:

1. I am currently employed as an independent mining consultant with offices at North Vancouver, British Columbia.
2. I am a graduate of the University of Leicester, United Kingdom, with a Bachelor of Science Honours Degree in Mining Geology (1977), as well as a Master of Science Degree in Mining Engineering (1982) from the University of Newcastle upon Tyne, United Kingdom.
3. This certificate applies to the technical report entitled 'Technical Report on the 2017 Mineral Resource Updates and Preliminary Economic Assessment, Spectrum-GJ Copper-Gold Project, Liard Mining Division, British Columbia, Canada' with an Effective Date of April 20, 2017 and a Report Date of May 24, 2017 (the "Technical Report") that was prepared for the Issuer.
4. I have practiced my profession for more than 38 years and have been involved with many projects, in 27 countries on six continents, covering many different deposit types and mining methods, including both porphyry copper-gold deposits and openpit mining. I have considerable experience in the preparation of engineering and financial studies for base- and precious-metal projects, including Preliminary Economic Assessments, Preliminary Feasibility Studies and Feasibility Studies.
5. I am a Chartered Professional Engineer and Fellow in good standing of the Institute of Minerals, Materials and Mining (Reg. Number: 45994).
6. I have read the definition of 'Qualified Person' set out in National Instrument 43-101 – *Standards of Disclosure for Mineral Projects* ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a Qualified Person for the purposes of NI 43-101.
7. I visited the subject property from October 04 to October 06, 2015 and from October 08 to October 09, 2016.
8. I am responsible for Sections 1, 19, 25 and 26, with the exception of those portions related to: Geological Setting and Mineralization; Deposit Type; Exploration; Sample Preparation Analysis and Security; Data Verification; the Mineral Resource estimates that are the subject of the Technical Report; Mineral Processing and Metallurgical Testing; Recovery Methods; Environmental Studies and Permitting; and Social or Community Impact. I am also responsible for Sections 2 through 6 (except for Sections 4.7 and 4.8) and Sections 10, 15, Sections 23, 24 and 27. I am further responsible, as co-author, for Sections 16, 18, 21 and 22, except for: Sub-Section 21.2.3; and those portions of Sections 21 and 22 relating to the processing plant, the tailings storage facility and associated infrastructure, the Spectrum waste rock dam, and reclamation and closure.
9. I am independent of the Issuer applying all the tests in Section 1.5 of NI 43-101.
10. I have had no prior involvement with the property that is the subject of the Technical Report.
11. I have read NI 43-101 and NI 43-101F1 and the Technical Report that has been prepared in compliance with that instrument and form.
12. As of the Effective Date of the Technical Report (April 20, 2017), to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

// Signed and Sealed //

Stephen J. Godden, C. Eng. FIMMM
DATED at North Vancouver, British Columbia, Canada, this 24th day of May, 2017.

CERTIFICATE – Mr. DAVID T. MEHNER, P. Geo.

I, David T. Mehner, P. Geo., of 333 Scenic Drive, Coldstream, British Columbia, Canada, as a co-author of this report entitled 'Technical Report on the 2017 Mineral Resource Updates and Preliminary Economic Assessment, Spectrum-GJ Copper-Gold Project, Liard Mining Division, British Columbia, Canada', with an Effective Date of April 20, 2017 and which was prepared for Skeena Resources Limited (the "Issuer"), do hereby certify that:

1. I am an independent geological consultant with offices at 333 Scenic Drive, Coldstream, British Columbia, Canada.
2. I am a graduate of the University of Manitoba, with a Bachelor of Science Honours Degree in 1976 and a Master of Science Degree (Geology) in 1982.
3. This certificate applies to the technical report entitled 'Technical Report on the 2017 Mineral Resource Updates and Preliminary Economic Assessment, Spectrum-GJ Copper-Gold Project, Liard Mining Division, British Columbia, Canada' with an Effective Date of April 20, 2017 and a Report Date of May 24, 2017 (the "Technical Report") that was prepared for the Issuer.
4. I have practiced my profession for 40 years. In that time I have been involved in all aspects of mineral exploration programs for a variety of mineral deposits, including porphyry Cu-Au and epithermal gold deposits in Canada, Mexico, Alaska and Russia.
5. I am a member in good standing of the Association of Professional Geoscientists of British Columbia (APEGBC NRL # 121324).
6. I have read the definition of 'Qualified Person' set out in National Instrument 43-101 – *Standards of Disclosure for Mineral Projects* ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a Qualified Person for the purposes of NI 43-101.
7. I visited the subject property between August 25 and August 29, 2016.
8. I am responsible for those portions of Sections 7, 8, 9 and 11 of the Technical Report.
9. I am not independent of the Issuer as per Section 1.5 of NI 43-101. At the time of writing this report I have a minor holding of free trading shares in the Company.
10. I have had prior involvement with the property that is the subject of this Technical Report. It dates from 1989: between 1989 and 1991 I worked for Keewatin Engineering Inc. and was responsible for diamond drilling on the GJ property for Ascot Resources Ltd; in 2003, I was senior consulting geologist with Keewatin Consultants (2002) Inc., responsible for geological mapping on the Donnelly and North Zones for International Curator Resources Ltd.; and from 2004 to 2007, I was Project Manager for Canadian Gold Hunter Corp., responsible for co-ordinating all field activities on the project, developing a geological model for Mineral Resource estimating and initiating metallurgical testing.
11. I have read NI 43-101 and NI 43-101F1 and the Technical Report that has been prepared in compliance with that instrument and form.
12. As of the Effective Date of the Technical Report (April 20, 2017), to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

// Signed and Sealed //

David T. Mehner, P. Geo.

DATED at Vancouver, British Columbia, Canada, this 24th day of May, 2017.

CERTIFICATE – Mr. SCOTT A. BRITTON, C. Eng.

I, Scott A. Britton, C. Eng. MIMMM of 37 Bothwell Road, Hamilton, South Lanarkshire, United Kingdom, as a co-author of this report entitled 'Technical Report on the 2017 Mineral Resource Updates and Preliminary Economic Assessment, Spectrum-GJ Copper-Gold Project, Liard Mining Division, British Columbia, Canada', with an Effective Date of April 20, 2017 and which was prepared for Skeena Resources Limited (the "Issuer"), do hereby certify that:

1. I am a Principal Mining Engineer and Director of SAB Mining Consultants Ltd ("SAB") of Hamilton, South Lanarkshire, United Kingdom.
2. I am a graduate of the Glasgow Caledonian University, with a Master of Science degree in Energy & Environmental Management.
3. This certificate applies to the technical report entitled 'Technical Report on the 2017 Mineral Resource Updates and Preliminary Economic Assessment, Spectrum-GJ Copper-Gold Project, Liard Mining Division, British Columbia, Canada' with an Effective Date of April 20, 2017 and a Report Date of May 24, 2017 (the "Technical Report") that was prepared for the Issuer.
4. I have practiced my profession for over 20 years. In that time I have been directly involved in a variety of engineering studies, valuations and technical reports and have taken responsibility for the mining and Mineral Reserve elements of the studies, which cover a wide range of deposit types.
5. I am a Chartered Professional Engineer and Member in good standing of the Institute of Minerals, Materials and Mining (Reg. Number: 608878).
6. I have read the definition of 'Qualified Person' set out in National Instrument 43-101 – *Standards of Disclosure for Mineral Projects* ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a Qualified Person for the purposes of NI 43-101.
7. I visited the subject property from October 8th to October 9th, 2016.
8. As co-author, I am responsible for Sections 16, 18, 21 and 22, except for: Sub-Section 21.2.3; those portions of Sections 21 and 22 relating to the processing plant, the tailings storage facility and associated infrastructure, the Spectrum waste rock dam, and reclamation and closure.
9. I am independent of the Issuer applying all the tests in Section 1.5 of NI 43-101.
10. I have had no prior involvement with the property that is the subject of the Technical Report.
11. I have read NI 43-101 and NI 43-101F1 and the Technical Report has been prepared in compliance with that instrument and form.
12. As of the Effective Date of the Technical Report (April 20, 2017), to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

// Signed and Sealed //

Scott A. Britton C. Eng. MIMMM

DATED at Hamilton, South Lanarkshire, United Kingdom, this 24th day of May, 2017.

CERTIFICATE – Mr. DAVID G. THOMAS, P. Geo.

I, David G. Thomas, P. Geo., of #601-1088 Georgia Street, Vancouver, British Columbia, Canada, as a co-author of this report entitled 'Technical Report on the 2017 Mineral Resource Updates and Preliminary Economic Assessment, Spectrum-GJ Copper-Gold Project, Liard Mining Division, British Columbia, Canada', with an Effective Date of April 20, 2017 and which was prepared for Skeena Resources Limited (the "Issuer"), do hereby certify that:

1. I am an independent mineral resource geologist with the geological consulting firm DKT Geosolutions Inc. of Vancouver, British Columbia, Canada.
2. I am a graduate of Durham University, in the United Kingdom, with a Bachelor of Science degree in Geology, and I am a graduate of Imperial College, University of London, in the United Kingdom, with a Master of Science degree in Mineral Exploration.
3. This certificate applies to the technical report entitled 'Technical Report on the 2017 Mineral Resource Updates and Preliminary Economic Assessment, Spectrum-GJ Copper-Gold Project, Liard Mining Division, British Columbia, Canada' with an Effective Date of April 20, 2017 and a Report Date of May 24, 2017 (this "Technical Report") that was prepared for the Issuer.
4. I have practiced my profession for over 20 years. In that time I have been directly involved in the review of exploration programs, geological models, exploration data, sampling, sample preparation, quality assurance-quality control, databases, and Mineral Resource estimates for a variety of mineral deposits, including porphyry Cu-Au and epithermal gold deposits (Canada, Greece, Romania, Mexico, Argentina, Bulgaria and Serbia).
5. I am a member in good standing of the Association of Professional Geoscientists of British Columbia (APEGBC NRL # 149114). I am also a member of the Australasian Institute of Mining and Metallurgy (MAusIMM # 225250).
6. I have read the definition of 'Qualified Person' set out in National Instrument 43-101 – *Standards of Disclosure for Mineral Projects* ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a Qualified Person for the purposes of NI 43-101.
7. I visited the subject property from September 15 to September 18, 2016.
8. I am responsible for Sections 1.5, 6.2, 12 and 14 of the Technical Report.
9. I am independent of the Issuer applying all the tests in Section 1.5 of NI 43-101.
10. I have had no prior involvement with the property that is the subject of the Technical Report.
11. I have read NI 43-101 and NI 43-101F1 and the Technical Report that has been prepared in compliance with that instrument and form.
12. As of the Effective Date of the Technical Report (April 20, 2017), to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

// Signed and Sealed //

David G. Thomas, P. Geo.

DATED at Vancouver, British Columbia, Canada, this 24th day of May, 2017.

CERTIFICATE – Mr. Christopher J. Martin, MIMMM, C. Eng.

I, Christopher J. Martin, MIMMM, C. Eng., of 3573 Shelby Lane, Nanoose Bay, British Columbia, Canada, as a co-author of this report entitled 'Technical Report on the 2017 Mineral Resource Updates and Preliminary Economic Assessment, Spectrum-GJ Copper-Gold Project, Liard Mining Division, British Columbia, Canada', with an Effective Date of April 20, 2017 and which was prepared for Skeena Resources Limited (the "Issuer"), do hereby certify that:

1. I am Principal Metallurgist with the metallurgical consulting firm of Blue Coast Metallurgy Ltd, Parksville, British Columbia, Canada.
2. I hold degrees from Camborne School of Mines (B.Sc [Hons] in Mineral Processing Technology, 1984) and McGill University (M.Eng in Metallurgical Engineering, 1988).
3. This certificate applies to the technical report entitled 'Technical Report on the 2017 Mineral Resource Updates and Preliminary Economic Assessment, Spectrum-GJ Copper-Gold Project, Liard Mining Division, British Columbia, Canada' with an Effective Date of April 20, 2017 and a Report Date of May 24, 2017 (this "Technical Report") that was prepared for the Issuer.
4. I have practiced my profession for over 30 years. In that time I have worked in operational roles in base and precious metal grinding and flotation plants in Canada, the United States and South Africa, including the commissioning of five new circuits. I have also consulted to the flowsheet development and/or engineering of hundreds of projects, as well as the optimization of numerous existing operations.
5. I have been a member in good standing of the Institution of Materials, Minerals and Mining since 1990. I am also a Registered Chartered Engineer (#423115) with the Engineering Council.
6. I have read the definition of 'Qualified Person' set out in National Instrument 43-101 – *Standards of Disclosure for Mineral Projects* ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a Qualified Person for the purposes of NI 43-101.
7. I have not visited the subject property.
8. I am responsible for those portions of Sections 1 and 21 related to Mineral Processing and Metallurgical Testing, and Recovery Methods. I am also responsible for Sections 13 and 17, Sub-Section 21.2.3, and Sections 25.7 and 26.3 of the Technical Report.
9. I am independent of the Issuer applying all the tests in Section 1.5 of NI 43-101.
10. I have had no prior involvement with the property that is the subject of the Technical Report.
11. I have read NI 43-101 and NI 43-101F1 and the Technical Report has been prepared in compliance with that instrument and form.
12. As of the Effective Date of the Technical Report (April 20, 2017), to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

<u>// Signed and Sealed //</u>

Christopher J. Martin. C. Eng.

DATED at Parksville, British Columbia, Canada, this 24th day of May, 2017.

CERTIFICATE – Mr. M. JOHN BRODIE, P. Eng.

I, M. John Brodie, P. Eng., of 8627 Seascape Drive, West Vancouver, British Columbia, Canada, as a co-author of this report entitled 'Technical Report on the 2017 Mineral Resource Updates and Preliminary Economic Assessment, Spectrum-GJ Copper-Gold Project, Liard Mining Division, British Columbia, Canada', with an Effective Date of April 20, 2017 and which was prepared for Skeena Resources Limited (the "Issuer"), do hereby certify that:

1. I am an independent professional engineer with the consulting firm of Brodie Consulting Ltd., West Vancouver, British Columbia, Canada.
2. I am a graduate of the University of British Columbia, with a Bachelor of Applied Science degree in Geotechnical Engineering.
3. This certificate applies to the technical report entitled 'Technical Report on the 2017 Mineral Resource Updates and Preliminary Economic Assessment, Spectrum-GJ Copper-Gold Project, Liard Mining Division, British Columbia, Canada' with an Effective Date of April 20, 2017 and a Report Date of May 24, 2017 (this "Technical Report") that was prepared for the Issuer.
4. I have practiced my profession for over 30 years. In that time I have been directly involved in the design operation and closure of mining projects, on behalf of proponents and regulatory/stakeholder reviews. This work has involved projects from northern Canada to Chile, SA and has included a variety of mineral deposits, including porphyry Cu-Au and epithermal gold deposits.
5. I am a member in good standing of the Association of Professional Geoscientists of British Columbia (APEGBC Licence # 15567), and Association of Professional Engineers of Yukon, and Northwest Territories Association of Professional Engineers and Geologists. I am also a member of the Canadian Institute of Mining and Metallurgy.
6. I have read the definition of 'Qualified Person' set out in National Instrument 43-101 – *Standards of Disclosure for Mineral Projects* ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a Qualified Person for the purposes of NI 43-101.
7. I have not visited the subject property.
8. I am responsible for Sections 4.7, 4.8 and 20 of the Technical Report.
9. I am independent of the Issuer applying all the tests in Section 1.5 of NI 43-101.
10. I have had no prior involvement with the property that is the subject of the Technical Report.
11. I have read NI 43-101 and NI 43-101F1 and the Technical Report has been prepared in compliance with that instrument and form.
12. As of the Effective Date of the Technical Report (April 20, 2017), to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

// Signed and Sealed //

M. John Brodie, P. Eng.

DATED at West Vancouver, British Columbia, Canada, this 24th day of May, 2017.

TABLE OF CONTENTS

Contents **Page**

Contents continued…. **Page**

Contents continued…. **Page**

Contents continued…. **Page**

Contents continued…. **Page**

Contents continued…. **Page**

Contents continued…. **Page**

Contents continued…. **Page**

Contents continued…. **Page**

Contents continued…. **Page**

Contents continued…. **Page**

Contents continued…. **Page**

LIST OF FIGURES

Figure **Page**

Figures continued…. **Page**

Figures continued…. **Page**

Figures continued…. **Page**

Figures continued…. **Page**

Figures continued…. **Page**

Figures continued…. **Page**

Figures continued…. **Page**

LIST OF TABLES

Table **Page**

Tables continued…. **Page**

Tables continued…. **Page**

Tables continued…. **Page**

Tables continued…. **Page**

Tables continued…. **Page**

Tables continued…. **Page**

Tables continued…. **Page**

NOMENCLATURE AND ABBREVIATIONS

The following table of nomenclatures, abbreviations and acronyms is in three parts, due to its overall length.

Abbreviation	Unit or Description
1985 Act	The Fisheries Act of 1985
1996 Act	B.C. Ministry of Energy and Mines' Mineral Tenure Act of 1996
AACE	Association for the Advancement of Cost Engineering
AAS	atomic adsorption spectrophotometry
Ag	silver
AIA	Archaeological Impact Assessment
ALS	ALS Chemex (laboratories)
a.m.s.l.	above mean sea level
AOA	Archaeological Overview Assessment
AQ, BTW, BQ, NQ, NQ2, HQ	drillhole / drillcore sizes (diameters), as follows AQ - 44.5 mm diameter holes yielding 34.9 mm diameter core BTW - 59.69 mm diameter holes yielding 42.0 mm diameter core BQ - 60 mm diameter holes yielding 36.5 mm diameter core NQ - 75.7 mm diameter holes yielding 47.6 mm diameter core NQ2 (or NQTK) - 75.88 mm diameter holes yielding 50.5 mm core HQ - 95.76 mm diameter holes yielding 63.63 mm diameter core
ARD	acid rock drainage
As	arsenic
Au	gold
AuEq	equivalent gold (ounces or grade)
B.C.	British Columbia, Canada
B.C. EAA	British Columbia Environmental Assessment Act
ºC	degrees Celsius
C$	Canadian dollars
CAPA	Conditional Asset Purchase Agreement
CAPEX	capital costs (or expenditures)
CEAA	Canadian Environmental Assessment Act
CEA Agency	Canadian Environmental Assessment Agency
CGH	Canadian Gold Hunter Corp.
CIS LRMP	Cassiar-Iskut-Stikine Land and Resource Management Plan
cm	centimetre
CSRM	certified standard reference materials
Cu	copper
CuEq	copper equivalent (ounces or grade)
CV	coefficient of variation (statistical function)
DCF	discounted cashflow
DGPS	Differential Global Positioning System
DKT	DKT Geosolutions Inc. of Vancouver, B.C.
dmt	dry metric tom
EA	environmental assessment
EAO	British Columbia Environmental Assessment Office
EMP	Environmental Management Plan
EMS	Environmental Management System
Fe	iron
g	gram
g/L	grams per litre
g/t	grams per tonne
G&A	general and administrative (operating expense)
GMD	General Management Direction
GPS	Global Positioning System

Abbreviation	**Unit or Description**
GRG	gravity recovered gold
GSC	Geological Survey of Canada
GVW	gross vehicle weight
ha	hectare
ICP-AES	inductively coupled plasma atomic emission spectrometer
ICP-MS	inductively coupled plasma mass spectrometry
ICP-OES	inductively coupled argon plasma – optical emission spectrophotometer
IP	induced polarization (geophysical survey method)
IRR	internal rate of return
K	potassium
K-Ar	potassium-argon radiometric dating method
kg	kilogram
kg/t	kilogram per tonne
km	kilometre
km^2	square kilometre
kph	kilometres per hour
ktpd	kilo-tonnes per day
kV	kilovolt
kWh/t	kilowatt hour per tonne
L	litre
LRMP	Land and Resource Management Plan
µm	microns
m	metre
m^2	metre squared (or square metres)
m^3	metre cubed (or cubic metres)
M+I	Measured plus Indicated (categories of Mineral Resource)
Ma	million years ago
Mg	magnesium
MIA	Main Infrastructure Area
ML	metal leaching
mm	millimetre
MMER	Metal Mining Effluent Regulation
Mo	molybdenum
MoS2	molybdenum disulphide
Moz	million troy ounces
MRE	Mineral Resource estimate
MRM	Mineral Resource Model
m/s	metres per second
Mt	million tonnes
MTO	B.C. Mineral Titles Online facility
Mtpa	million tonnes per annum
MV/V	megavolt/volt
MYAB	Multi-Year, Area-Based exploration permit
NAG	non-acid generating (material)
NI 43-101	(Canadian) National Instrument 43-101
NIV	net insurance value
NN	nearest neighbour (geostatistical method)
NP	neutralization potential
NPV	net present value
NWR	Notice of Work and Reclamation
NSR	net smelter return
OK	ordinary kriging (geostatistical method)
OLTC	Occupant License to Cut (permit)
OPEX	operating cost (or expenditure)

Abbreviation	**Unit or Description**
oz	troy ounce
oz/t	troy ounce per tonne
%	percent
P_{80} (or any other subscript)	% of material (indicated by the number) passing a specified mesh size
PAG	potentially acid generating (material)
Pb	lead
PEA	the preliminary economic assessment (as defined in NI 43-101) that is the subject of this Technical Report
ppb	parts per billion
ppm	parts per million
Q1, Q2, Q3, Q4	first, second, third and fourth quarters (of a calendar year)
QA/QC	quality assurance/quality control
QP	Qualified Person (as defined in NI 43-101)
Rb-Sr	rubidium-strontium radiometric dating method
Re-Os	rhenium-osmium radiometric dating method
Rescan	Rescan Environmental Services Ltd.
ROM	run-of-mine (production of material for processing)
RQD	rock quality designation
RSE	relative standard error of a kriged estimate
RTEC	Rescan Tahltan Environmental Consultants
RUP	Road Use Permit
S	sulphur
$S0_2$	sulphur dioxide
SAG	semi-autogenous grinding (mill type)
SAP	site alteration permit
Sb	antimony
SD	standard deviation (statistical function)
SG	specific gravity
SIA	Spectrum Infrastructure Area
Sn	tin
t	metric ton (or tonne)
TCG	Tahltan Central Government
THREAT	Tahltan Heritage Resources Environmental Assessment Team
TNDC	Tahltan Nation Development Corporation
tpa	tonnes per annum
tpd (or t/day)	tonnes per day
TPM	Transpacific Mining Ltd.
TSF	tailings storage facility
TSS	total suspended solids
TSX	Toronto Stock Exchange
TSX-V	Venture Exchange of the Toronto Stock Exchange
U-Pb	uranium-lead radiometric dating method
UMS	United Mineral Services Ltd.
US$	United States dollars
UTM	Universal Transverse Mercator (co-ordinate system)
VLF-mag	very low frequency magnetic (geophysical survey method)
wmt	wet metric ton
xx° xx’ xx”	degrees, minutes and seconds or arch (xx denotes the attributed value)
Zn	zinc

Unless otherwise stated, all dollar figures are in Canadian dollars (C$). The metric system is employed and a base case exchange rate of C$1.00 = US$0.75 is employed.

1 SUMMARY

1.1 Issuer

This technical report has been prepared at the request of the issuer, Skeena Resources Ltd. (the "Company") that is incorporated in British Columbia, Canada ("B.C."). The Company has its offices at Vancouver, B.C., and it is listed on Tier 1 of the TSX-V (trading symbol: SKE). The Company is focused on developing three projects located in the Golden Triangle of northwest B.C., including the Spectrum-GJ Cu-Au project that is the subject of this technical report.

1.2 Spectrum-GJ Cu-Au Project

The Spectrum-GJ Cu-Au project area (the "Project Area") comprises a combination of the properties that the Company previously reported as the Spectrum property or project and the GJ property or project. The amalgamation of the two properties reflects the Company's plan to jointly exploit mineralization contained in the Central Zone located on the Spectrum claims block (the "Central Zone") and the Donnelly deposit located on the GJ claims block (the "Donnelly Deposit"). The two deposits of interest are approximately 14 km apart.

The Project Area is located in the Liard Mining Division within the Stikine River region of northwest B.C., approximately 200 km north of Stewart, B.C. It comprises 99 mineral claims that cover a total of 42,825.736 ha, centred on Latitude 57º 39' 21" North and Longitude 130º 15' 41" West. The Company holds a 100% interest in 96 of the claims, which cover the entirety of the project areas of interest, and a 50% interest in the three claims of the Nuttlude Group that cover an area of 1,298.811 ha, or approximately 3% of the Project Area. The balance of interest (50%) in the Nuttlude Group is held by Colorado Resources Ltd.

Project development to date includes: exploration drilling, data verification and Mineral Resource estimation for both deposits of interest; and completion of a preliminary economic assessment ("PEA"). The PEA encompasses openpit mining on the Central Zone and Donnelly Deposit, with metallurgical processing at a single, central plant. The principal product will be a bulk Cu-Au-(Ag) concentrate; a gravity gold concentrate will be produced in the first five years followed by doré gold-silver for the remaining project life.

A phased approach to project development was adopted for purposes of the PEA, following preliminary analyses of potential project development options. The results identified the benefits of a combined operation designed to limit operational, technical and capital risks that are typical of greenfield mine start-ups. Production starts at 10,000 tpd at Donnelly Pit, ramping up to 20,000 tpd in Year 6 when Spectrum Pit (exploiting the Central Zone) comes on-line, and reaching 30,000 tpd in Year 12. The overall planned project life is 25 years, inclusive of two years of processing stockpiled marginal grade material at the end of the planned mine life, at a rate of 30,000 tpd.

1.3 This Technical Report

This technical report has been prepared with the purpose of providing National Instrument ("NI") 43-101 disclosures of the Company's 2017 Mineral Resource updates for the Central Zone and the Donnelly Deposit, and the results of the PEA outlined above. Details of exploration drilling and data verification to January 06, 2017 are provided (i.e. to the effective date for the Mineral Resource updates presented herein), along with details of: the 2017 Mineral Resource updates; completed metallurgical testwork; mine design, planning and scheduling; preliminary process designs; project infrastructure planning; cost and price assumptions; marketing plans; risks and opportunities; pre- and post-tax cashflow modelling; and financial outcomes, including sensitivity analyses.

1.4 First Nations Involvement

The Spectrum-GJ project lies within the asserted traditional territory of the Tahltan Nation. The Company has committed to work closely with the Tahltan Central Government, with its agencies and with Tahltan Nation-owned businesses to identify and maximize employment and contracting opportunities arising from its mineral exploration and project development activities. To this end, the Company and the Tahltan Central Government (the "Parties") have signed a Communications Agreement that provides a framework for the sharing of information and for joint participation in communications with Tahltan membership and communities regarding the Company's activities in Tahltan Territory (see the Company news release dated January 24, 2017).

1.5 2017 Mineral Resource Updates

The Mineral Resources that are the subject of this Technical Report (Table 1.1) were prepared in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum standards on Mineral Resources and Mineral Reserves (2014), by application of cut-off grades that incorporate cost and process recovery parameters. The estimate for the Central Zone is based on 164 diamond drillholes (88 completed by the Company) totalling 34,597.54 m and 22,581 assay intervals. The estimate for the Donnelly Deposit is based on 176 diamond drillholes (eight completed by the Company) totalling 48,325.27 m and 16,410 assay intervals. The estimated Mineral Resources are constrained to pit shells based on commodity prices, metallurgical recoveries and operating costs. Long-term metal prices of US$2.75/lb Cu, US$1,250/oz Au and US$17.75/oz Ag were applied, along with metallurgical recovery rates of 90% for copper, 73% for gold and 50% for silver (i.e. the projected, long-term recovery rates established by means of metallurgical testing). The stated Mineral Resources have an effective date of January 06, 2017.

Table 1.1 A Summary of the 2017 Mineral Resource Updates by David Thomas, P. Geo., Spectrum-GJ Cu-Au Project

(undiluted, pit constrained, 100% in-pit recovery, effective date January 06, 2017)

Category	Million Tonnes	Average Grades			Metal Content		
		Au (g/t)	Ag (g/t)	Cu (%)	Au (Moz)	Ag (Moz)	Cu (Mlb)
Spectrum Central Zone (0.40 g/t AuEq cut-off)							
Indicated	31.2	0.94	2.6	0.10	0.94	2.64	67.7
Inferred	29.8	0.47	1.4	0.12	0.45	1.34	76.4
GJ Donnelly Deposit (0.15% CuEq cut-off)							
Indicated	215.2	0.31	1.9	0.26	2.14	13.03	1,235.4
Inferred	28.3	0.31	1.8	0.14	0.28	1.64	85.1

Basis of Estimate

QP Thomas reviewed the Company's QA/QC programs on the Mineral Resources data. After removing samples with data quality issues, the QP concludes that the collar, survey, assay, and lithology data are adequate to support Mineral Resources estimation.

Domains were modelled in 3D to separate mineralized rock types from surrounding waste rock. The domains were modelled based on a combination of lithology, copper grades and gold grades.

Raw drillhole assays were composited to 4 m lengths broken at domain boundaries. Capping of high grades was considered necessary and was completed for each domain on assays prior to compositing.

Block grades for gold and silver were estimated from the composites using an ordinary kriging interpolation method into 4 m x 4 m x 4 m blocks for Central Zone, and into 10 m x 10 m x 8 m blocks for the Donnelly Deposit.

Dry bulk density varies by domain. The dry bulk densities are based on 858 specific gravity measurements for Central Zone and 1,316 measurements for the Donnelly Deposit.

Blocks were classified as Indicated and Inferred in accordance with CIM Definition Standards, 2014.

For Central Zone, the results of a comparison with the previous Mineral Resource model, a drillhole spacing study and conditional simulation of gold grades were used to support the classification of Indicated Mineral Resources (Indicated Mineral Resources are classified on the basis of blocks falling within a drillhole spacing of 40 m x 40 m). Inferred Mineral Resources are classified on the basis of blocks falling within a drillhole spacing which varied by domain - for Domains 2 and 3 a spacing of 150 m was used and for Domains 4 and 5 a drillhole spacing of 75 m was used.

For the Donnelly Deposit, Indicated Mineral Resources are classified on the basis of blocks falling within a drillhole spacing of 75 m. Inferred Mineral Resources are classified using a drillhole spacing of approximately 150 m.

The Mineral Resource estimate is constrained within optimized pits with average slope angles of 45°. Metal prices of US$1,250/oz Au, US$2.75/lb Cu and US$17.75/oz Ag were used along with metallurgical recovery rates of 90% for copper, 73% for gold and 50% for silver and the estimated on-site operating costs.

Cautionary Notes
The contained copper, gold and silver values shown on Table 1.1 are in situ. No assurance can be given that the estimated quantities will be produced. All values have been rounded to reflect accuracy and to comply with securities regulatory requirements. Summations within the tables may not agree due to rounding.

Mineral Resources which are not Mineral Reserves do not have demonstrated economic viability. The estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, sociopolitical, marketing, or other relevant issues.

The quantity and grade of reported Inferred Mineral Resources in this estimation are conceptual in nature. There has been insufficient exploration to define these resources as an Indicated or Measured Mineral Resource and it is uncertain if further exploration will result in upgrading them to an indicated or measured mineral resource category.

Minimum Grade Cut-off
Minimum grade cut-offs for the Mineral Resource estimates were determined using the metal prices, metallurgical recovery rates and operating costs as outlined above, as well as smelter terms and applicable royalties applied to the following formula, the result of which is multiplied by 31.1035 to yield a precious metal cut-off but divided by 2,204.62 (assuming the metric system) and then multiplied by 100 to yield a base metal cut-off:

$$Xc = [(M_m - M_w) + (P_o - P_w) + (O_o - O_w)] / \{[r \cdot (V - R)] \cdot (1 - Gr)\}$$

where:

M_m = *the all-in unit cost of mining and delivering one ton of material to the primary crusher*

M_w = *the unit cost of mining, transporting and dumping one ton of waste on the waste dump*

P_o = *the unit cost of processing one ton of material (from primary crushing to production of a final, saleable product, inclusive of supervision and labour costs, consumables)*

P_w = *the unit cost of processing one ton of waste (inclusive of labour costs and consumables associated with avoiding potential water contamination and/or acid generation, as well as to satisfy any other applicable regulatory and environmental requirements)*

O_o = *on-site general and administrative costs ("G&A")*

O_w = *the unit cost of the additional on-site G&A associated with processing one ton of waste*

r = *recovery, or % of valuable product recovered on processing the mined material to a final saleable product*

V = *the value of one unit of the final saleable product*

R = *smelting, refining, transportation and other costs incurred per unit of final saleable product*

Gr = *payable net smelter return royalty (percent)*

Grade Equivalence
Grade equivalence for the Mineral Resource estimates were determined using the metal prices and metallurgical recovery rates summarized above, as well as smelter terms applied to the following formula:

AuEq = Au grade + [(Ag grade · (Ag revenue / Au revenue)] + [Cu grade · (Cu revenue / Au revenue)]

CuEq = (Cu grade + [(Au grade · (Au revenue / Cu revenue)] + [Ag grade · (Ag revenue / Cu revenue)]

where:

Au revenue = (1 / 31.1035) · Au plant recovery · Au smelter recovery · Au refinery recovery · unit Au price
Ag revenue = (1 / 31.1035) · Ag plant recovery · Ag smelter recovery · Ag refinery recovery · unit Ag price
Cu revenue = 2,204.62 · 0.01 · Cu plant recovery · Cu smelter recovery · Cu refinery recovery · unit Cu price

1.6 Preliminary Economic Assessment

Figure 1.1 shows the general layout of the planned infrastructure for the Spectrum-GJ Au-Cu Project, as well as the locations of the planned openpits. The main infrastructure area is where all the major infrastructure elements will be located, including the camp, central processing plant and main maintenance facilities. Standard truck and shovel openpit mining is planned. Production from Spectrum Pit has been limited to 5,000 tpd, for the reasons described in Section 16. Upside potential exists, both in terms of project longevity and the assumed production rates, the former by exploiting mineralization contiguous to both planned pits and the latter by means of trade-off and optimization studies that are planned for completion during the pre-feasibility study stage. Selective underground mining beneath the completed pits might also be possible, to extract known higher-/high-grade areas.

Table 1.2 provides a summary of the key inputs and outputs of and for the planned, 25 year life-of-mine project. Table 1.3 summarizes the cash costs and all-in costs per payable pound of copper and per payable Troy ounce of gold, net of by-product credits. Figures 1.2 through 1.4 summarize the quantities of payable metal by production year.

Table 1.2 A Summary of Key Elements of the Planned Spectrum-GJ Project

Production	ROM Production Marginal Grade Material Total Plant Throughput	191.75 Mt 21.99 Mt 213.74 Mt
Proportion in Indicated Mineral Resource Category	Spectrum Pit Donnelly Pit	79% 96%
Average Overall Pit Slope Angles	Spectrum Pit Donnelly Pit	45°
Average Strip Ratios	Spectrum Pit Donnelly Pit	0.52 0.86
Average Cut-Off Grades (ROM production)	Spectrum Pit Donnelly Pit	0.435 g/t AuEq 0.204% CuEq
Average Grades (Spectrum Pit ROM material)	Cu Au Ag	0.13% Cu 0.96 g/t Au 3.24 g/t Ag
Average Grades (Donnelly Pit ROM material)	Cu Au Ag	0.28% Cu 0.32 g/t Au 1.97 g/t Ag
Overall Average Grades (ROM material)	Cu Au Ag	0.27% Cu 0.35 g/t Au 2.04 g/t Ag
Life of Project, Average Metallurgical Recoveries	Cu Au Ag	89.2% 72.3% 57.1%
Payable Metal	Cu Au Ag	998.99 Mlb 1.61 Moz 7.54 Moz

Figure 1.1 A Project Area Plan Showing the General Layout of the Planned Infrastructure, Spectrum-GJ Project Area
(compiled by the Principal Author, in conjunction with Company personnel)

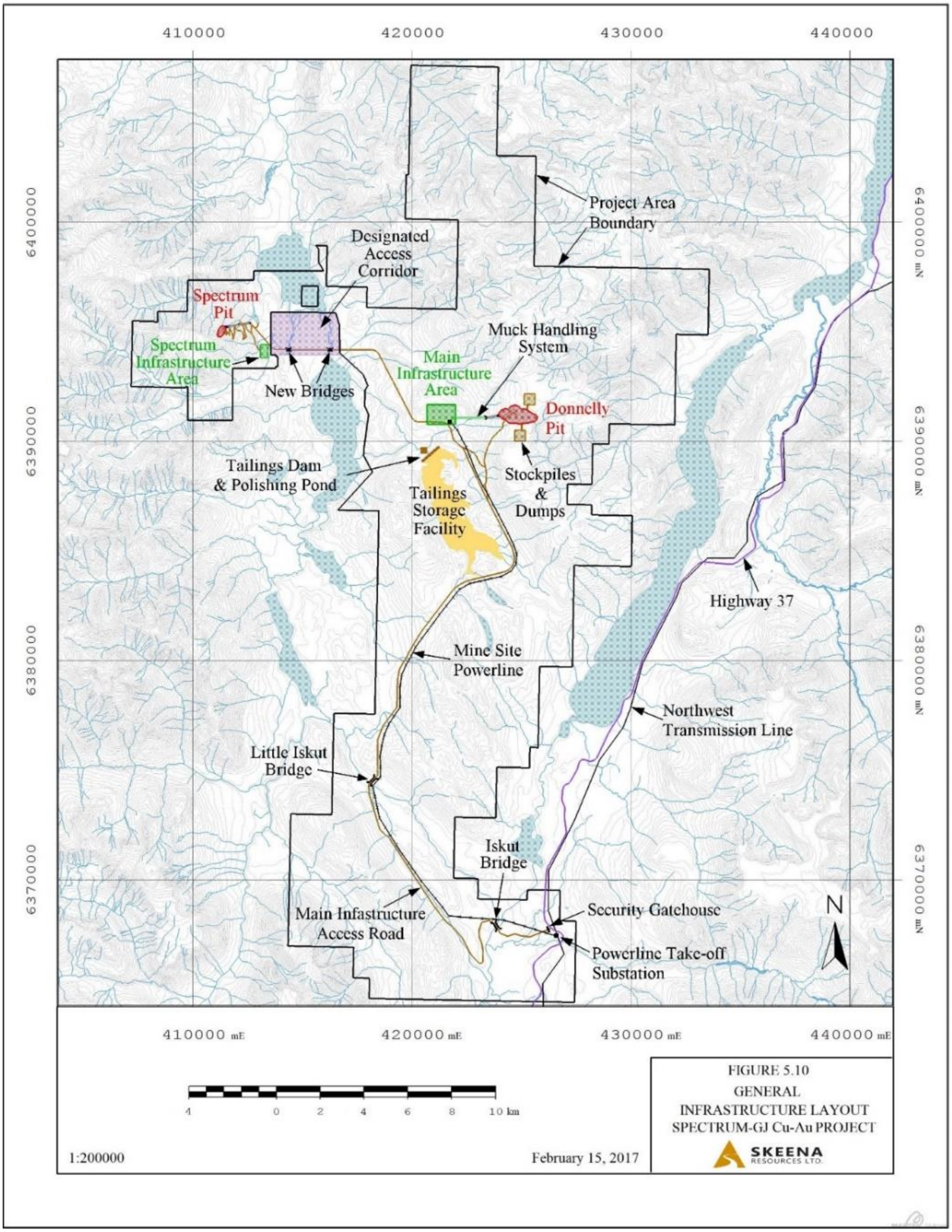


Table 1.3 A Summary of Overall Average Cash Costs and All-In Costs by Payable Pound of Copper and Per Payable Troy Ounce of Gold, Spectrum-GJ Cu-Au Project

Case	Metal Prices	Cash Cost		All-In Cost	
		Per lb Cu (C$)	Per lb Cu (US$)	Per lb Cu (C$)	Per lb Cu (US$)
Base Case	Cu – US$2.75/lb Au – US$1,250/oz Ag – US$17.75/oz	1.83	1.37	2.41	1.81
Upside Case 1	Cu – US$3.00/lb Au – US$1,300/oz Ag – US$20.00/oz	1.75	1.31	2.33	1.75
Upside Case 2	Cu – US$3.25/lb Au – US$1,350/oz Ag – US$22.50/oz	1.67	1.25	2.25	1.69
Case	**Metal Prices**	**Cash Cost**		**All-In Cost**	
		Per oz Au (C$)	**Per oz Au (US$)**	**Per oz Au (C$)**	**Per oz Au (US$)**
Base Case	Cu – US$2.75/lb Au – US$1,250/oz Ag – US$17.75/oz	615.42	461.56	974.63	730.97
Upside Case 1	Cu – US$3.00/lb Au – US$1,300/oz Ag – US$20.00/oz	453.18	339.89	812.39	609.30
Upside Case 2	Cu – US$3.25/lb Au – US$1,350/oz Ag – US$22.50/oz	289.78	217.34	649.00	486.75

Note: US$0.75 = C$1.00. The per payable pound of copper cash costs and all-in costs include gold and silver credits. The per Troy ounce of gold cash costs and all-in costs include copper and silver credits.

Figure 1.2 Payable Copper by Production Year, Spectrum-GJ Cu-Au Project

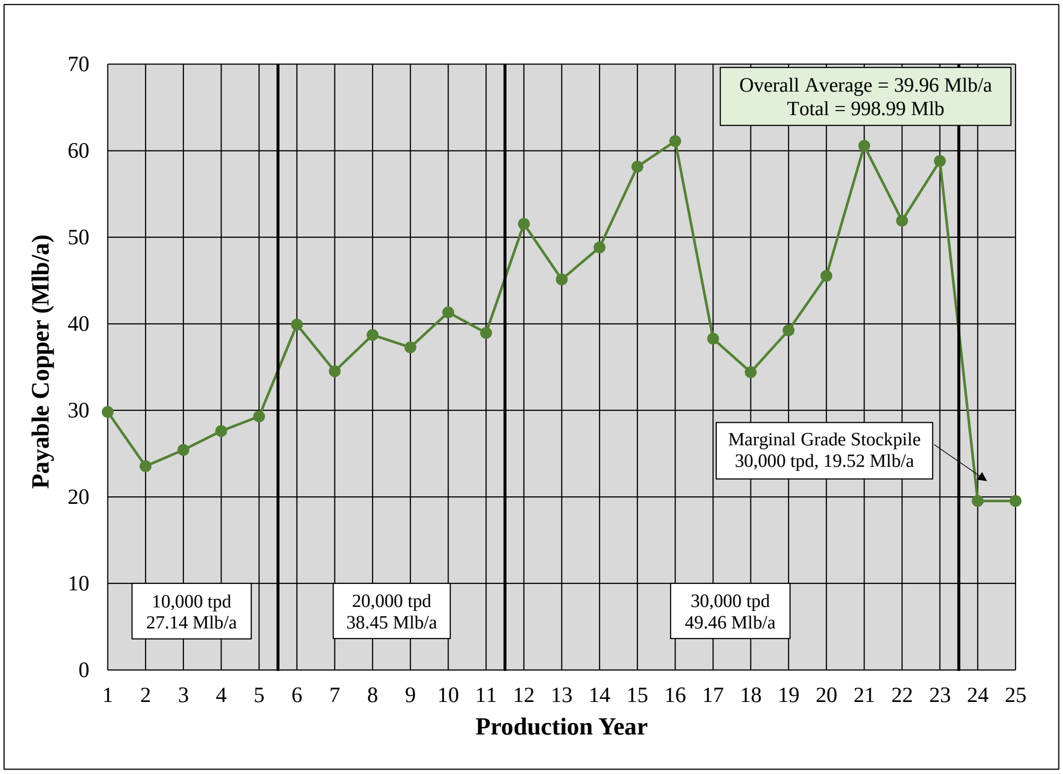


Figure 1.3 Payable Gold by Production Year, Spectrum-GJ Cu-Au Project

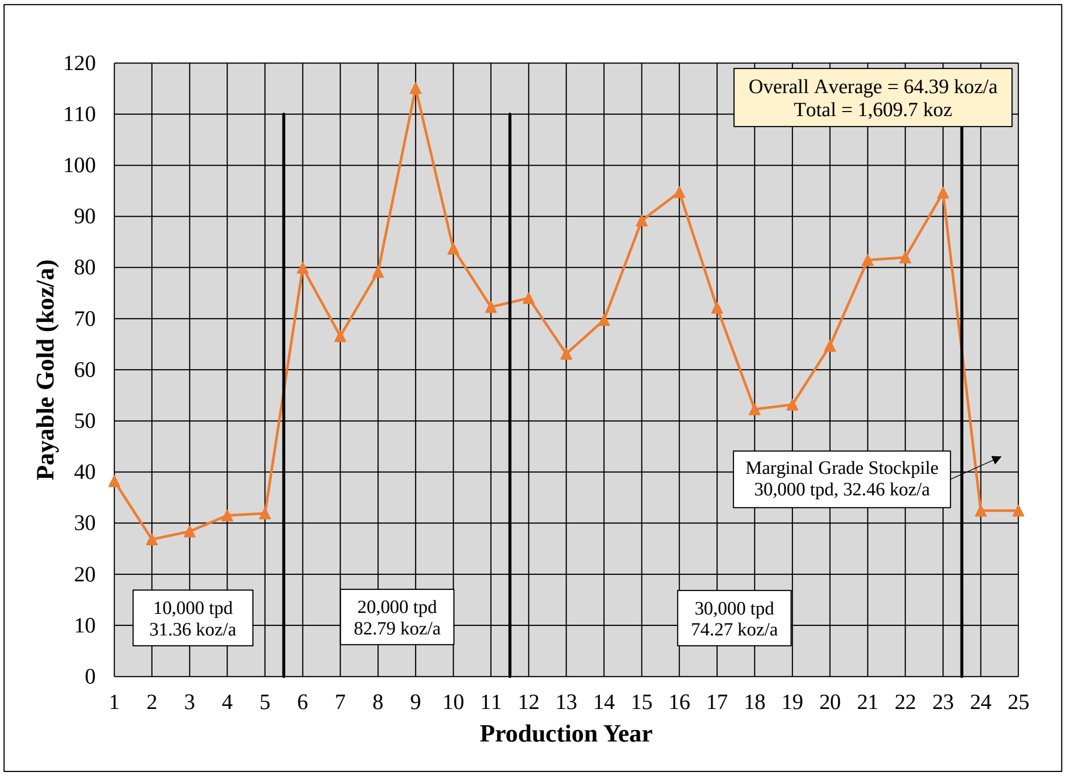
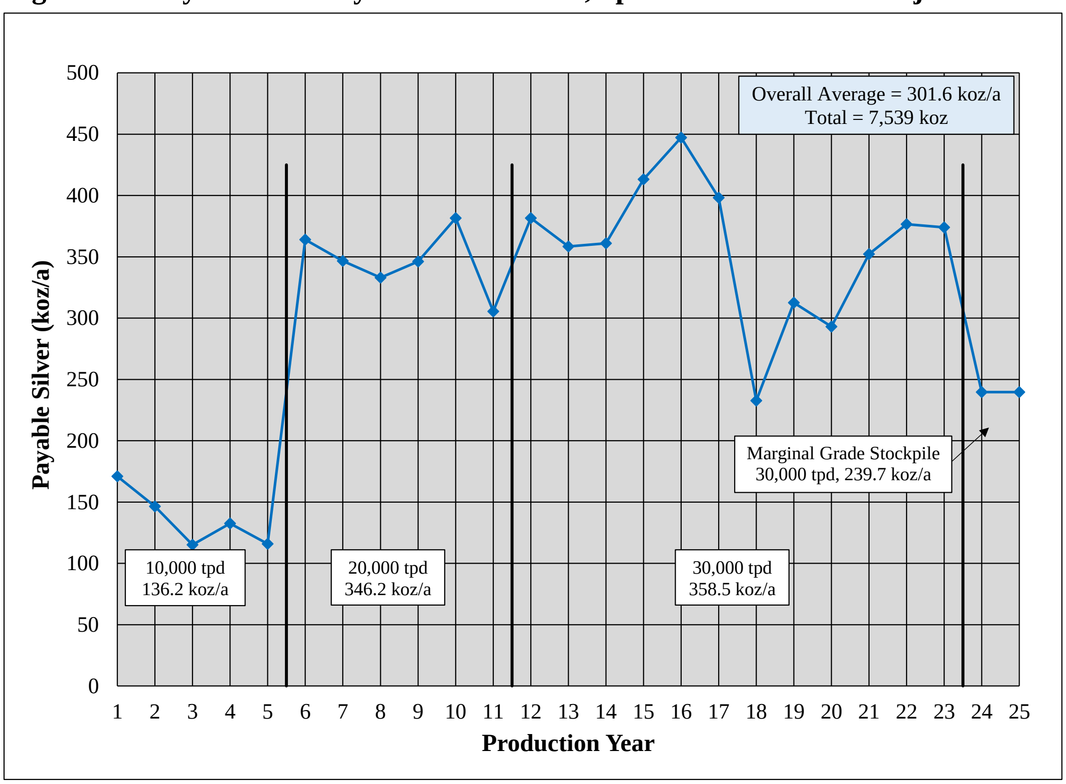


Figure 1.4 Payable Silver by Production Year, Spectrum-GJ Cu-Au Project



1.6.1 Environmental Design Principles

Even at this preliminary design stage, significant effort has been expended to integrate environmental design principles into the project layout and operating concept. This approach aims to limit adverse impacts to biophysical, economic, pre-existing land use and heritage & cultural environments within the Project Area. The following were achieved within the scope of the PEA:

- to the extent that is possible and practicable, infrastructure is located in one drainage basin (the only exceptions include portions of the site access road and powerline, a security gate and a take-off sub-station from the Northwest Transmission Line);
- viewscape values – to the extent that is practicable and sustainable, planning kept infrastructure visibility to a minimum;
- footprint values - to the extent that is possible, safe and practicable, existing infrastructure within the project area was utilized;
- wildlife conservation - off-pit muck handling systems have been planned to limit potentially adverse wildlife interactions, especially on Klastline Plateau on which the Donnelly Pit is located;
- project consolidation - a single, consolidated, life-of-of mine tailings storage facility has been identified and planned, the maximum capacity of which could accommodate additional tailings generated from expanded Spectrum and Donnelly openpits;
- archaeology & heritage – infrastructure planning encompasses considerations of identified archaeological and heritage resources, future project planning includes continued evaluations and the modification of infrastructure layouts that might reasonably be required; and
- design for closure - to the extent that is practicable, the project has been designed for closure and to minimize the risk of post-closure active management.

1.6.2 Metallurgy and Processing

The PEA process design and metallurgical forecast are based on a metallurgical testwork program conducted in late 2016 and Q1, 2017. Bond Ball Mill Work Index tests indicate an average Work Index for the Central Zone composites of 18.4 kWh/t and 19.8 kWh/t for Donnelly Deposit composites. The results reflect moderately hard material that is quite close to the median hardness levels for the B.C. copper-gold industry.

A series of conventional gravity, flotation and cyanidation tests were completed. The results show that the optimum grind size is P_{80} 120 microns and that a commercially viable bulk Cu-Au-(Ag) concentrate could be produced, along with gold-silver rich doré. Consideration of project economics resulted in the deferment of the CIL plant and doré recovery circuit to Year 6, prior to which a gravity gold concentrate is produced and sold.

Owing to its far greater tonnage contribution to the plant feed mix, metallurgy is mainly dictated by material from Donnelly. Consequently, to align with the PEA mine production schedule, metallurgical performance was projected for plant feed comprising 100% Donnelly material during Stages 1 and 3, and for co-mingled plant feed containing 75% Donnelly material and 25% Spectrum material during Stage 2. Table 1.4 summarizes the metallurgical forecast by production stage. The overall average, life-of-project metallurgical recovery rates are 72.3% Au, 57.1% Ag and 89.2% Cu.

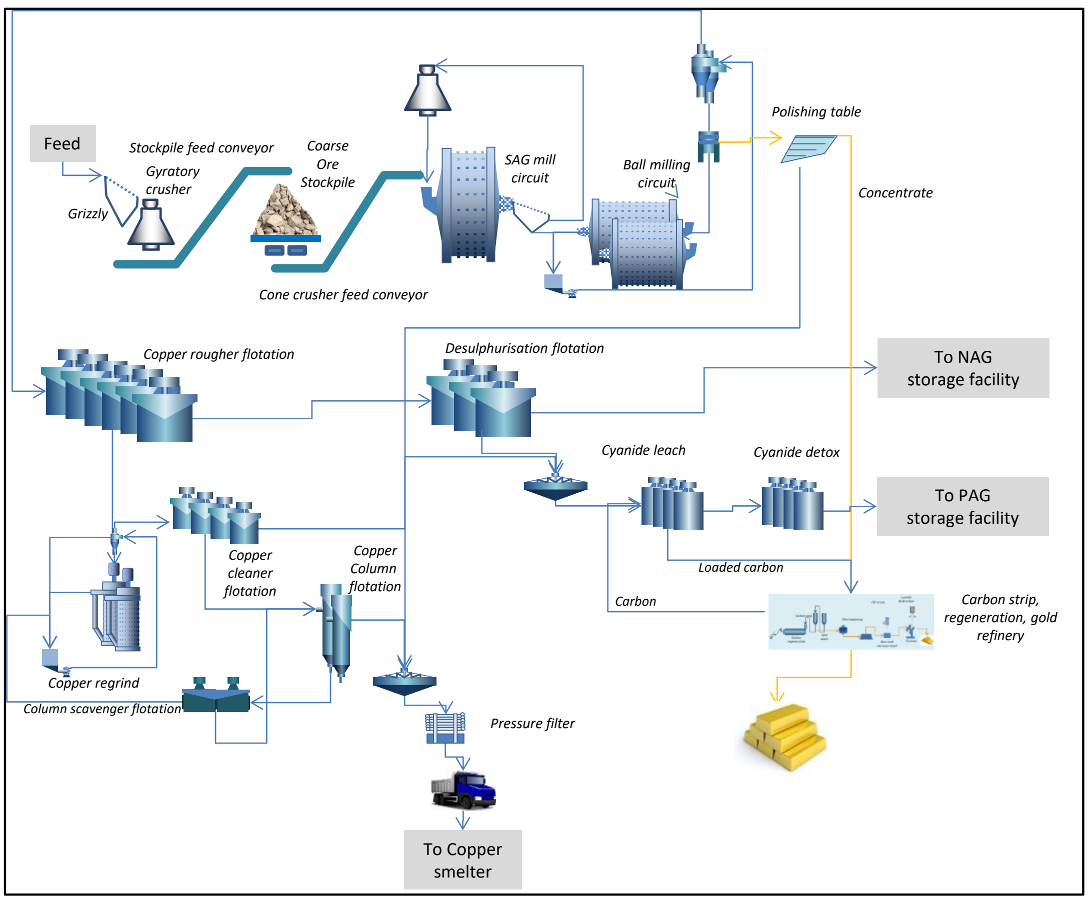
Table 1.4 A Summary of the Metallurgical Forecast, Spectrum-GJ Cu-Au Project

Production			Flotation Recovery				Gravity Conc.			Doré Recovery		
Stage	Rate (tpd)	Donnelly Feed	Conc. Grade	Au (%)	Ag (%)	Cu (%)	Au (%)	Ag (%)	Cu (%)	Au (%)	Ag (%)	Cu (%)
1	10,000	100%	22% Cu	55	49	90	10	-	-	-	-	-
2	20,000	75% av.	22% Cu	49	54	86	-	-	-	24	7	0
3	30,000	100%	22% Cu	55	49	90	-	-	-	18	8	0

A ramp-up in throughput on start-up has been assumed, with a target of 80% of nameplate throughput being achieved in Production Year 1. In reality, all selected major equipment is rated to achieve throughput rates slightly higher than those projected in both Stage 1 (10,000 tpd) and Stage 2 (20,000 tpd, including 5,000 tpd from Spectrum Pit). A ramp-up in recoveries has also been assumed on start-up, based on published, post-start up performance numbers for a selection of operating B.C. copper mines.

The as-designed process flow is essentially the same as many copper-gold circuits currently operating in B.C. Figure 1.5 summarizes the Stage 3 (30,000 tpd) process flow. The main product will be a bulk Cu-Au-(Ag) concentrate that PEA planning assumes will be shipped to smelters located in the Far East. Tailings will be deposited in an adjacent, life-of-mine tailings storage facility with an estimated maximum capacity of 375 Mt ± 35 Mt.

Figure 1.5 The Stage 3 (30,000 tpd) Process Flowsheet, Spectrum-GJ Cu-Au Project



Two small departures from common convention are included in the process flow. The first is driven by the need to design a processing facility capable of milling at three different throughput rates, defined as Stages 1 through 3. This has led to the use of the larger ball mill to act as a primary mill during Stage 1 (10,000 tpd), receiving feed from two stages of crushing. While currently unusual, such a circuit was widely used in the mining industry throughout most of the last century. This potentially reduces the project's technical risk by allowing the mine to operate prior to purchasing the semi-autogenous grinding ("SAG") mill, which in turn allows for more extensive sampling of the active pit and more careful checking of SAG mill sizing than would be otherwise be possible.

The second departure is the use of CIL processing of pyrite-rich products arising from the flotation circuit, which products have been demonstrated to be amenable to leaching. The CIL process involves: tailings from the copper rougher float being subjected to bulk sulphide flotation; and the bulk sulphide concentrate being combined with the copper cleaner tails, thickened and leached in a small CIL circuit to recover gold and silver. The carbon is treated at site to extract the gold (and minor silver), which is smelted and sold as doré. This approach yields a non-acid generating bulk tailings which is beneficial for the operation and ultimate closure of the tailings facility.

1.6.3 Capital Costs

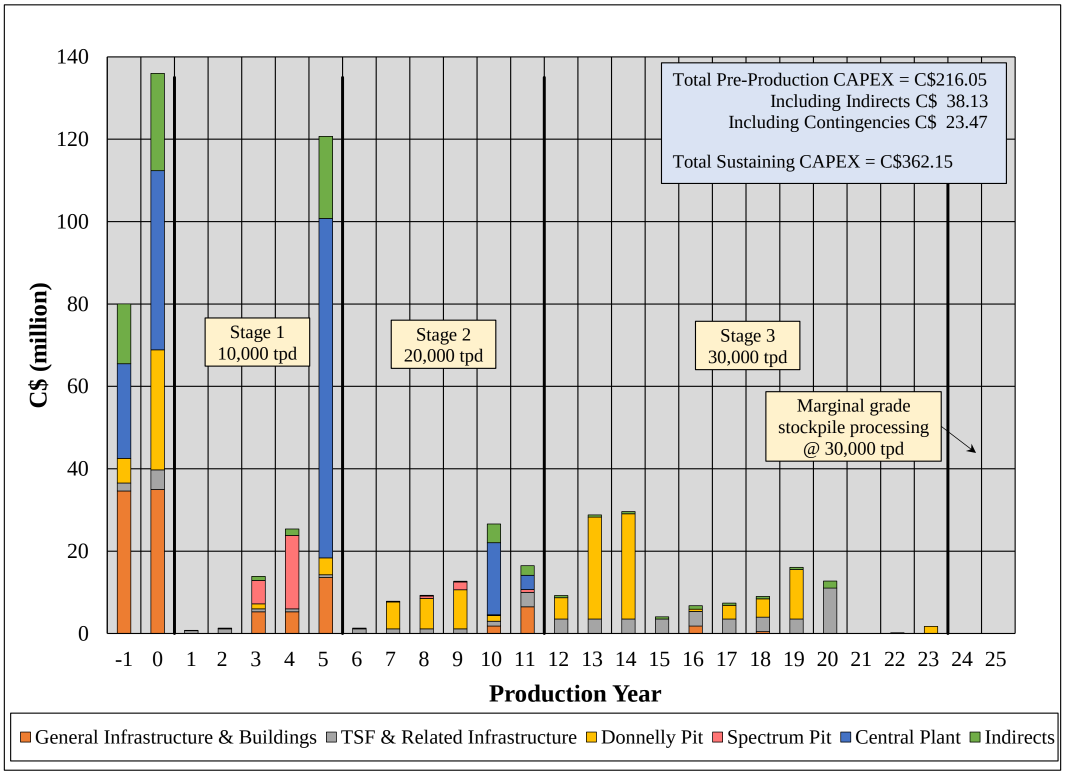
Table 1.5 provides a summary of the estimated capital costs for the planned Spectrum-GJ project; Figure 1.6 summarizes the capital expenditures by production year. The amounts include contingencies that reflect the level of uncertainty of the estimate: 15% contingencies have been applied to those estimates based on vendor or contractor quotes or on InfoMine's 2016 CostMine models; whereas 25% contingencies have been applied where experience-based and bench-marked estimates are used.

Table 1.5 A Summary of Estimated Capital Costs (C$, inclusive of contingencies), Spectrum-GJ Cu-Au Project

Cost Centre	Pre-Production	Sustaining	Total
General Infrastructure & Buildings	C$ 69.56	C$ 34.80	C$ 104.36
Tailings Storage Facility	C$ 6.72	C$ 52.52	C$ 59.25
Donnelly Pit (incl. equipment)	C$ 35.13	C$ 107.76	C$ 142.89
Spectrum Pit (incl. equipment)	-	C$ 26.82	C$ 26.82
Processing Plant	C$ 66.50	C$ 103.31	C$ 169.81
Capital Indirects	C$ 38.13	C$ 36.94	C$ 75.07
Totals	***C$ 216.05***	***C$ 362.15***	***C$ 578.20***

Notes: Capital cost estimates are inclusive of contingencies. Totals may not add up due to rounding.

Figure 1.6 A Summary of Capital Expenditures (C$) by Production Year, Spectrum-GJ Cu-Au Project



It should be emphasized that the low pre-production capital requirement (C$216.05 million) reflects one of the benefits of the phased approach adopted as regards project development: significant capital can be and has been deferred to the benefit of project economics. This has in part been achieved through the PEA planning process that encompasses considerations of the types of practical, physical and operational risks that are inherent to any new, start-up operation (a wealth of global mining experience shows that lengthy lead times are invariably required before such risks can be overcome and optimal results can routinely and sustainably be achieved, especially with greenfield projects). In combination, these and related issues form a central objective of the PEA: to engineer solutions that ensure practicably achievable and environmentally sustainable outcomes.

1.6.4 Operating Costs

Operating costs have been estimated in Q1, 2017 US dollars and do not include allowances for escalation or exchange rate fluctuations; a base case exchange rate of C$1.0 = US$0.75 was applied. The operating cost estimate is intended to be at the Class 4 level, as defined by AACE, with an expected accuracy range of Low: -15% to -30% and High: +20% to +50%.

Table 1.6 summarizes the estimated unit operating costs by area. The Stage 2 (20,000 tpd) operating cost estimates include Spectrum Pit contributing an average of 5,000 tpd of plant feed over six years. The general and administrative ("G&A") costs include reclamation and closure of Spectrum Pit, Donnelly Pit and all related infrastructure. An estimate of the

Company's head office cost is included on Table 1.6, although it was modelled as a separate drawdown cost from cashflow. The estimated head office cost was not included in the determinations of minimum grade cut-offs for Mineral Resource estimation.

Table 1.6 A Summary of Average Unit Operating Costs (C$ per tonne milled) by Production Stage, Spectrum-GJ Cu-Au Project

Cost Centre	Stage 1 (10,000 tpd)	Stage 2 (20,000 tpd)	Stage 3 (30,000 tpd)	Post-Production (30,000 tpd)
Spectrum & Donnelly Pits	-	C$ 8.85	-	-
Donnelly Pit	C$ 8.28	-	C$ 6.51	C$ 1.42
Processing Plant	C$ 5.57	C$ 6.07	C$ 5.51	C$ 5.51
G&A	C$ 4.26	C$ 2.69	C$ 1.79	C$ 1.09
Overall Unit Cost / t milled	***C$ 18.11***	***C$ 17.61***	***C$ 13.81***	***C$ 8.02***
Head Office Costs (/t milled)	C$ 0.83	C$ 0.30	C$ 0.26	C$ 0.26

Notes: The Post-Production stage is when 21.99 Mt of marginal grade material from the Donnelly pit is processed at a rate of 30,000 tpd. Reclamation and closure costs (reporting to G&A) include a 25% contingency.

1.6.5 Economic Analysis

Table 1.7 summarizes the financial outcomes of the PEA, Figure 1.7 summarizes the post-tax IRR sensitivity to changes in CAPEX, OPEX and metal prices and Figure 1.8 summarizes post-tax NPV sensitivity to the same variables. The analyses summarized on Figures 1.7 and 1.8 reflect model sensitivities by varying the percentage inputs of the sensitivity factors (variables) around the nested Base Case metal prices assumed in analysis (US$2.75/lb Cu, plus US$1,250/oz Au, plus US$17.75/oz Ag).

Table 1.7 A Summary of Financial Outcomes, Preliminary Economic Assessment, Spectrum-GJ Cu-Au Project

Base Case	Pre-Tax			Post-Tax		
	IRR	NPV (8%) (millions)	Pay-Back (years)	IRR	NPV (8%) (millions)	Pay-Back (years)
Cu Price: US$2.75/lb Au Price: US$1,250/oz Ag Price: US$17.75/oz	26.6%	C$546.18	3.81	20.6%	C$314.09	4.21
Upside Case 1	**Pre-Tax**			**Post-Tax**		
	IRR	**NPV (8%) (millions)**	**Pay-Back (years)**	**IRR**	**NPV (8%) (millions)**	**Pay-Back (years)**
Cu Price: US$3.00/lb Au Price: US$1,300/oz Ag Price: US$20.00/oz	31.0%	C$699.62	3.19	23.9%	C$412.99	3.68
Upside Case 2	**Pre-Tax**			**Post-Tax**		
	IRR	**NPV (8%) (millions)**	**Pay-Back (years)**	**IRR**	**NPV (8%) (millions)**	**Pay-Back (years)**
Cu Price: US$3.25/lb Au Price: US$1,350/oz Ag Price: US$22.50/oz	35.3%	C$853.86	2.71	27.1%	C$512.35	3.26

Note: US$0.75 = C$1.00

Figure 1.7 IRR Sensitivity to Changes in CAPEX, OPEX and Metal Prices, Spectrum-GJ Au-Cu Project

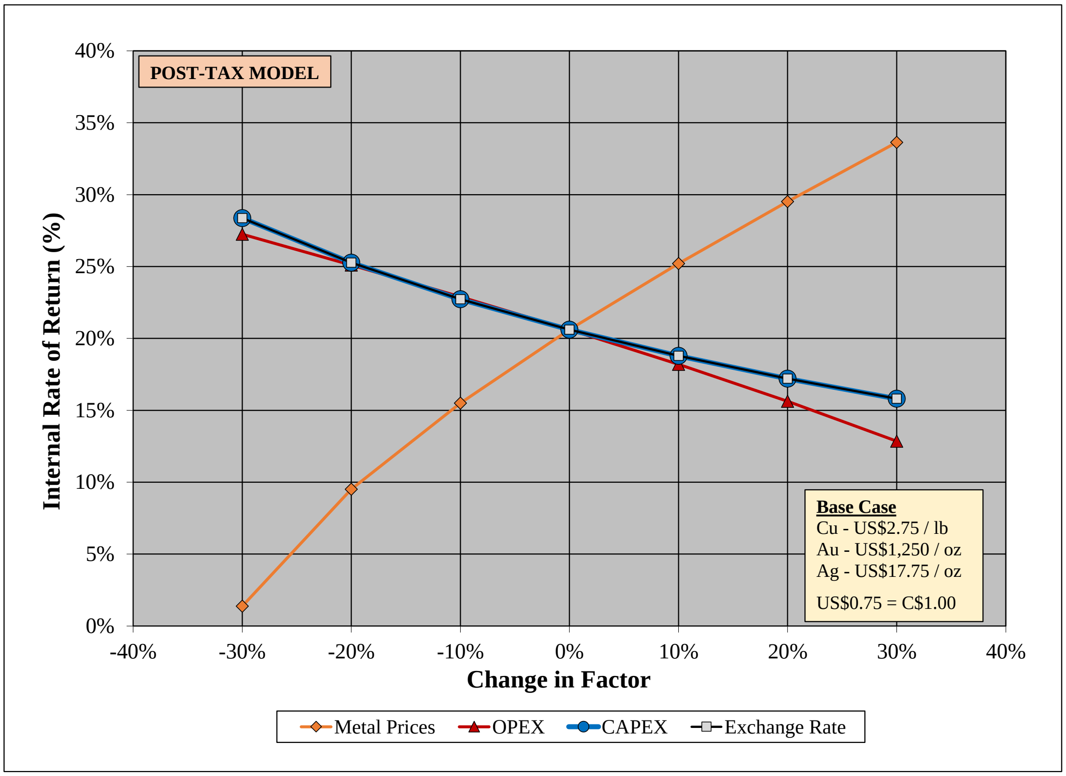
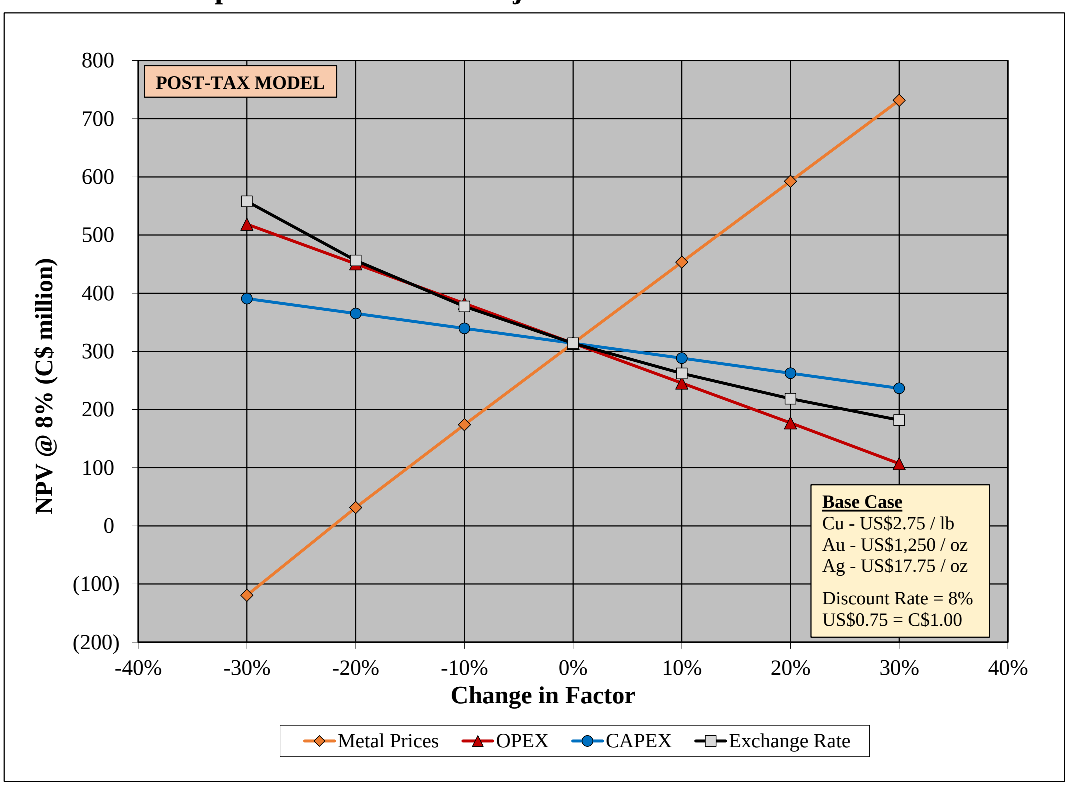


Figure 1.8 NPV Sensitivity to Changes in CAPEX, OPEX and Metal Prices, Spectrum-GJ Au-Cu Project



1.7 Conclusions and Recommendations

In the opinion of the Principal Author (Qualified Person Stephen Godden, C. Eng.), the financial outcomes of the PEA that is the subject of this technical report reflect a robust project that should be advanced to the pre-feasibility level of project development. Various risks and opportunities are identified in Section 25, based on the results of the PEA studies reported in this technical report. Mitigation of the risks and assessment of the opportunities form the basis for the pre-feasibility study surveys and studies recommended in Section 26, the objectives of which are to capture necessary baseline data, to resolve various technical and operational issues, and to optimize production throughputs, recovery rates and the life of project. Additional drilling is also recommended to define Indicated and Measured Mineral Resources within the ultimate pit shells.

The project undoubtedly benefits from existing infrastructure that includes Highway 37 and the Northwest Transmission Line located to the immediate east of the Project Area, as well as an industrial road that extends to within approximately 10 km of the planned location of the central processing plant (approximate straightline distance). The proximity of the Port of Stewart also enhances the project, insofar as it is an established deep water port from where the planned, bulk Cu-Au-(Ag) concentrate could be shipped to markets located in the Far East.

2 INTRODUCTION

2.1 Issuer

This Technical Report has been prepared at the request of the issuer, Skeena Resources Limited (the "Company") that is incorporated in British Columbia, Canada ("B.C."). The Company's corporate head office is at Suite 650, 1021 West Hastings Street, Vancouver, B.C. and it is listed on Tier 1 of the Venture Exchange of the Toronto Stock Exchange, with the trading symbol SKE.

The Company is focused on developing three projects located in the Golden Triangle region of northwest B.C.:

- evaluation and development of the Spectrum-GJ Copper-Gold project that is the subject of this Technical Report;
- exploration on the past-producing Snip gold mine, which was optioned from Barrick Gold Corporation ("Barrick") (see the Company's news release dated March 23, 2016); and
- exploration on the past-producing Porter Idaho silver mine, acquired from Mount Rainy Silver Inc., in which the Company holds a 100% interest (see the Company's news releases dated August 10, 2016 and September 23, 2016).

Under the terms of the option agreement with Barrick (the "Agreement") and subject to TSX Venture Exchange approval, the Company will acquire a 100% interest in the Snip property when the following conditions have been met:

- issuance to Barrick of up to 3,250,000 common shares of the Company (of which 2,000,000 shares have been issued; the balance [1,250,000 shares] will be issued once all other conditions of the option agreement have been met);
- a work commitment by the Company of C$500,000 within the first 12 months of the Agreement (complete – on January 24, 2017, the Company provided Barrick with notice of approximately C$3.0 million spending on the Snip property); and
- an additional work commitment by the Company of C$1,500,000 within 30 months of the Agreement.

Barrick retained a 1.0% net smelter return ("NSR") royalty interest on commercial production from the Snip property. Subject to exercise of the option and to the Company delineating in excess of 2.0 Moz of gold, Barrick may exercise a back-in right to purchase a 51% interest in the property in return for a payment of three times the Company's cumulative expenditures, following which the parties will form a joint venture.

In addition to the above and by virtue of acquiring all of the issued and outstanding common shares of Sona Resources Corporation ("Sona", see the Company news releases dated June 29, 2016 and September 09, 2016 and September 15, 2016):

- the Company holds a 100% interest in the past-producing Blackdome gold mine and its related infrastructure ("Blackdome"), located in the Clinton Mining District of southwest B.C.; and
- the Company has an option to acquire a 100% interest in the Elizabeth gold property located in the Lillooet Mining District of southwest B.C.

The Company's interest in the Elizabeth gold property stems from its proximity to Blackdome (the historical workings are approximately 30 km apart), hence the potential for a combined Blackdome-Elizabeth operation, with processing taking place at the Blackdome processing plant.

2.2 Spectrum-GJ Copper-Gold Project

The Spectrum-GJ Cu-Au project area (the "Project Area") comprises a combination of the properties that the Company previously reported as the Spectrum property or project and the GJ property or project (for example, see the technical reports referenced in Section 2.5). The Project Area is located in the Liard Mining Division within the Stikine River region of northwest B.C., approximately 200 km north of Stewart, B.C. (straightline distance). It comprises 99 mineral claims that cover a total of 43,518.849 ha in a single, contiguous block centred on Latitude 57º 39' 21" North and Longitude 130º 15' 41" West, which is the approximate centre point of the planned Donnelly openpit (see Section 16 for details of mine planning).

The Company acquired a 100% interest in ten of the mineral claims that comprise the portion of the Project Area called the Spectrum claims block during October 2014, following completion of the terms of an acquisition agreement with Eilat Exploration Ltd. (see Sub-Section 6.2.9 and the Company news release dated October 27, 2014). One additional claim was staked by the Company on December 14, 2017, thereby completing the Spectrum claims block detailed in this Technical Report (see Sub-Section 4.3.1).

The Company also holds a 100% interest in 85 of the mineral claims that comprise the portion of the Project Area called the GJ claims block, and a 50% interest in the remaining three mineral claims of the Nuttlude Group that completes the Project Area:

- 80 of the GJ property mineral claims were transferred under option to the Company on November 03, 2015 (see the Company's news release dated November 04, 2015), contingent on completion of the terms of an October 05, 2015 Asset Purchase Agreement between Teck Resources Limited ("Teck"), its 49% joint venture partner NGEx Resources Inc. and the Company (see Sub-Section 4.3.2 and the Company's news release dated October 27, 2014);
- five of the GJ Property mineral claims were staked either by the Company or on behalf of the Company (see Sub-Section 4.3.2); and
- the balance of interest (50%) in the three mineral claims that comprise the Nuttlude Group is held by Colorado Resources Ltd., from which the Company acquired its interest (see Sub-Section 4.3.3).

The three, non-contiguous claims of the Nuttlude Group cover an area of 1,298.811 ha, or approximately 3% of the Project Area. The Company acquired the claims to make the Spectrum and GJ claim blocks contiguous, for the purpose of mineral tenure assessment work filing, and to provide mineral tenure coverage over the full length of possible access routes to the Spectrum claims block area.

2.3 Terms of Reference

The amalgamation of the Spectrum and GJ claims blocks into a single, contiguous Project Area reflects the Company's plan to jointly exploit mineralization contained in the Central zone located on the Spectrum claims block (the "Spectrum Central Zone" or "Central Zone") and the Donnelly deposit located on the GJ claims block (the "Donnelly Deposit"). Mining by openpit methods is planned, with run-of-mine ("ROM") feed processed at a single plant facility located centrally between the two planned openpits.

2.3.1 Approach

A phased approach to project development was adopted for purposes of the preliminary economic assessment that is the subject of this Technical Report (the "PEA"). It was adopted following preliminary analyses, by the Company, of potential project development options that identified the benefits of a combined operation designed to limit operational, technical and capital risks by:

- limiting early mine production to achievable and sustainable levels;
- scheduling production from the two deposits to optimize early cashflows; and
- phasing capital expenditures by employing either a modular or progressive approach (as appropriate) to the development of plant throughput capacities, production fleet size and camp capacity in particular.

The alternatives – the development and construction of separate operations or the development of openpit mines with production capabilities sufficient to fill an ultimate capacity plant early in the project life – were considered inappropriate. The principal reasons include:

- the much increased personnel, infrastructure, support facilities and equipment requirements (hence costs) that two separate operations would require, despite their close proximity (the straightline distance between the two deposits is approximately 14 km); and/or
- the pre-production lead time and substantial capital that the construction of an ultimate/maximum capacity plant and related infrastructure would require; coupled with
- the technical and operational risks inherent to any new, start-up operation (a wealth of global mining experience shows that lengthy lead times are invariably required before such risks can be overcome and optimal results can routinely and sustainably be achieved, especially with greenfield projects).

2.3.2 Objectives

The principal objectives of the PEA were to engineer solutions that, to the extent possible within the scope of the PEA and the timeline available for its completion (approximately six months):

- reflect the benefits of economies-of-scale realized through the joint exploitation of the Central Zone and Donnelly Deposit;
- encompass safety considerations;
- consider practical, physical and operational constraints, thereby to ensure practicably achievable and environmentally sustainable outcomes;

- encompass and address Tahltan First Nation concerns; and
- exceed minimum study requirements for preliminary economic assessments.

2.3.3 Tahltan First Nation

The Company recognizes and respects the fact that the Project Area lies within the asserted traditional territory of the Tahltan First Nation. The Company continues to work closely with the Tahltan Central Government and its agencies as regards its exploration activities on and development plans for the Project Area. The scope of the Company's commitments, agreements and interactions with the Tahltan First Nation are discussed in Section 4.9.

2.3.4 Study Scope and Outcomes

A preliminary economic assessment is defined in NI 43-101 (Section 1.1) as '*a study, other than a pre-feasibility or feasibility study, that includes an economic analysis of the potential viability of mineral resources*'. In the opinion of the principal author of this Technical Report (Qualified Person Stephen Godden, C. Eng., the "Principal Author"), this may be interpreted to mean a study intended to demonstrate that the economics of a mining project are sufficiently robust (or not) to advance the project to the pre-feasibility stage (or not).

In the Companion Policy (43-101CP) to NI 43-101, it is further stated that '*A preliminary economic assessment might be based on measured, indicated, or inferred mineral resources, or a combination of any of these*'. Inferred Mineral Resources are used within the scope of the PEA reported herein, by definition they are defined by virtue of geological evidence that is sufficient to imply but not verify geological and grade or quality continuity. In other words, the quantities and grades of Inferred Mineral Resources are conceptual in nature. Uncertainty therefore exists as to whether additional exploration would result in the upgrading of Inferred Mineral Resources into the Indicated or Measured Mineral Resource categories.

Accuracy in cost estimation is advanced by the Association for the Advancement of Cost Engineering ("AACE"), which is a recognized and world-renowned organization that the industry looks to for guidance in defining the accuracy of estimates. Guidance is provided by AACE's system of five classes of cost estimate, where Class 1 is the most accurate and Class 5 the least accurate. It is AACE's system that has been applied within the scope of the PEA.

Particular effort was expended within the scope of the PEA when considering the key study outcomes of infrastructure planning, mine planning, production scheduling and mineral processing. The objective in each case was to ensure outcomes that exceed the minimum requirements of a preliminary economic assessment, inclusive of cost estimation accuracy. In the Principal Author's opinion, this study objective has been achieved. Despite this and for the reasons outlined above, the PEA outcomes are neither final nor definitive and they should be considered as such. Additional technical studies are required and various trade-off studies are recommended, for consideration at the pre-feasibility study stage, before an elevated level of confidence could be placed in the financial results. The required and recommended studies are summarized in Section 26.

2.4 This Technical Report

This report is entitled 'Technical Report on the 2017 Mineral Resource Updates and Preliminary Economic Assessment, Spectrum-GJ Copper-Gold Project, Liard Mining Division, British Columbia, Canada, the data cut-off date for which is April 20, 2017. It has been prepared with the purpose of providing:

- updated, National Instrument ("NI") 43-101 disclosures of the Company's 2017 Mineral Resource updates for the Central Zone and the Donnelly Deposit; and
- the results of a preliminary economic assessment of the joint exploitation by openpit mining of the Central Zone and Donnelly Deposit, with metallurgical processing at a single, central plant where a bulk Cu-Au-(Ag) concentrate and doré gold-silver will be produced for further beneficiation or sale, as appropriate.

Details of exploration drilling and data verification to January 06, 2017 are provided (i.e. to the effective date for the Mineral Resource updates presented herein), along with details of: the 2017 Mineral Resource updates; completed metallurgical testwork; mine design, planning and scheduling; preliminary process designs; project infrastructure planning; cost and price assumptions; marketing plans; risks and opportunities; post-tax cashflow modelling; and financial outcomes, including sensitivity analyses.

2.5 Sources of Information

The information contained in this Technical Report was compiled from various published and internal Company documents and reports by contributing consultants and the Qualified Persons ("QPs" or "authors") of this Technical Report, as well as documents sourced by means of web searches and observations made during the QPs' site visits. The various reports, documents and files are cited where appropriate. A full list of the cited reports, documents and files is provided in Section 27. The key documents referenced herein include:

- various news releases by the Company, sourced from its website (www.skeenaresources.com);
- a copy of a letter dated March 09, 2015 from Vector Corporate Finance Lawyers entitled 'Spectrum Property, Liard Mining Division, British Columbia';
- copies of the various legal agreements between individuals groups and/or companies that relate to claims' ownership transfers;
- Mineral Titles Online documents and plans for the mineral claims that comprise the Project Area (www.mtonline.gov.bc.ca);
- Mineral Tenure Act Regulation 'B.C. Reg. 529/2004' located at http://www.bclaws.ca/civix/document/id/complete/statreg/529_2004;
- 2015 and 2016 year-end, Annual Summary of Exploration Activities reports (for the Spectrum-GJ property) by the Company and to the B.C. Ministry of Energy and Mines;
- the Stikine Country Protected Areas Management Plan dated November 2003 and prepared by Skeena Regional Environmental Stewardship Division, Smithers, B.C.;
- B.C. Ministry of Forests and Range 'Permanent Bridge Inspection Reports' for the Iskut and Little Iskut Bridges, dated 2014 (the "Bridge Inspection Reports");

- an internal Company report by Laura MacNeill entitled 'Skeena Resources Winter Trail Traverse Field Note Compilation' and dated November 30, 2016 (the "Winter Trail Report");
- a consultancy report to the Company by Greenwood Environmental, Inc. entitled 'Spectrum-GJ Project: Summary of Environment Studies and Permitting' and dated January 31, 2017 (the "Greenwood Report");
- a consultancy report to the Company by DKT Geosolutions, Inc. entitled '2017 Mineral Resource Updates, Central Zone and Donnelly Deposit, Spectrum-GJ Cu-Au Project' and dated March 16, 2017;
- a consultancy report to the Company by SAB Mining Consultants Ltd. entitled 'Mine Design and Production Scheduling for the Spectrum-GJ Cu-Au Project and dated April 14, 2017;
- a consultancy report to the Company by Blue Coast Metallurgy Ltd. entitled 'Studies of the Metallurgy of Samples from the Spectrum and GJ Deposits, and Development of Processing Methods and Costs to support the 2017 PEA Study on the Spectrum-Donnelly Copper-Gold Project.' and dated April 18, 2017 (the "Blue Coast Report"); and
- a consultancy report to the Company by XFRM Canada entitled 'Projected Long-Term Metal Prices, USD/CAD Exchange Rate & Recommended Discount Rate for use in the Preliminary Economic Assessment (PEA) of the Spectrum-GJ Project' and dated March 30, 2017.

Certain historical, geographical, local resource and geological data was extracted from the following technical reports:

- 'Technical Report on the Spectrum Copper-Gold Property, Liard Mining Division, British Columbia, Canada' by Jacques R. Stacey, P. Geo., and Gary H. Giroux, P. Eng., and dated May 31, 2016 (the "May 2016 Technical Report"); and
- 'Revised Technical Report on the Donnelly-GJ Deposit Area, GJ Property, Liard Mining Division, British Columbia, Canada' by Giles R. Peatfield, P. Eng., Gary H. Giroux, P. Eng., and Michael S. Cathro, P. Geo., and dated April 11, 2016 (the "April 2016 Technical Report").

Reference was also made to a Technical Report entitled 'Evaluation and Technical Report on the Spectrum Gold Property, Liard Mining Division, British Columbia, Canada' by Jacques R. Stacey, P. Geo., and Robin Chisholm, dated August 05, 2014 (the "August 2014 Technical Report"). The April 2016 Technical Report, the May 2016 Technical Report and the August 2014 Technical Report are each listed on www.sedar.com.

Much of the background information on the Spectrum-GJ project, such as the history, past exploration, exploration drilling, sampling and assaying, has been reported by others. This past information has been updated only when it was relevant to do so and/or when it was clear that additional information was required.

2.6 Qualified Persons and Site Visits

The QPs (authors) of this Technical Report are:

Mr. Stephen J. Godden, F.I.M.M.M., C. Eng. – Independent Mining Consultant of North Vancouver, B.C. Mr. Godden is the principal author of this Technical Report. He is responsible for the identified on Table 2.1. He has reviewed earlier technical reports relating to the Spectrum and GJ Properties (collectively the Spectrum-GJ property), as well as project-related documents and news releases. He visited the Project Area from October 04 to October 06, 2015 and from October 08 to October 9, 2016. On both occasions he toured the Project Area, reviewed project-related geology plans and sections, discussed geotechnical logging procedures and practices, inspected drillcore at the Company's site exploration camps and held discussions with Company personnel.

Mr. David T. Mehner, P. Geo. – Independent Geological Consultant of Coldstream, B.C. Mr. Mehner is a co-author of this Technical Report. He is responsible for the identified on Table 2.1. He has reviewed earlier technical reports relating to the Spectrum and GJ Properties (collectively the Spectrum-GJ property), as well as project-related documents and news releases. He has worked on the Spectrum-GJ property for different companies from: August to October, 1989; July to October, 1990; July to August, 2003; June to August, 2004; June to October, 2005; June to October 2006; and June to September, 2007, and he was the principal author of the technical report entitled 'Technical Report on the GJ Cu-Au Porphyry Project, Liard Mining Division, British Columbia, Canada' by David T. Mehner, M.Sc., P. Geo., Gary H. Giroux, M.A.Sc., P. Eng. and Giles R. Peatfield, Ph.D., P. Eng., and dated April 30, 2007 (the "April 2007 Technical Report"). He visited the Project Area for the Company between August 25 and August 29, 2016, during which time he toured the Project Area, inspected drillcore at the Company's site exploration camps and held discussions with Company personnel.

Mr. Scott A. Britton, C. Eng. – Principal Consultant and Director of SAB Mining Consultants Ltd, of Hamilton, United Kingdom. Mr. Britton is a co-author of this Technical Report. He is responsible for the sections identified on Table 2.1. He has reviewed earlier technical reports relating to the Spectrum and GJ properties (collectively the Spectrum-GJ property), as well as project-related documents and news releases. He visited the Project Area from October 08 to October 9, 2016, during which time he toured the Project Area, reviewed project-related geology plans and sections, inspected drillcore at one of the Company's site exploration camps and held discussions with Company personnel.

Mr. David G. Thomas, P. Geo. – Geological Consultant and President of DKT Geosolutions, Inc. of Vancouver, B.C. Mr. Thomas is a co-author of this Technical Report. He is responsible for the sections identified on Table 2.1. He has reviewed earlier technical reports relating to the Spectrum and GJ properties (collectively the Spectrum-GJ property), as well as project-related documents and news releases. He visited the Project Area from September 15 to September 18, 2016, during which time he toured the Project Area, reviewed project-related geology plans and sections, inspected drillcore at one of the Company's site exploration camps and held discussions with Company personnel.

Mr. Christopher J. Martin, C. Eng. – Principal Metallurgist and President of Blue Coast Metallurgy Ltd. of Parksville, B.C. Mr. Martin is a co-author of this Technical Report. He is responsible for the sections identified on Table 2.1. He has reviewed earlier technical reports relating to the Spectrum and GJ Properties (collectively the Spectrum-GJ property), as well as project-related documents and news releases. In accordance with Section 6.2 (3) of Companion Policy 43-101CP to National Instrument 43-101 'Standards of Disclosure for Mineral Projects', Mr. Martin is not required to make a site visit and Mr. Martin has not made a site visit (The scope of his work relates exclusively to metallurgical testing, process design and cost estimation. The selection of samples for metallurgical testing was carried out in close co-operation with responsible Project Geologists and was overseen by the Project Manager).

Mr. M. John Brodie, P. Eng. – Principal Consultant and Director of Brodie Consulting Ltd. of West Vancouver, B.C. Mr. Brodie is a co-author of this Technical Report. He is responsible for the sections identified on Table 2.1. He has reviewed project-related documents and news releases. In accordance with Section 6.2 (3) of Companion Policy 43-101CP to National Instrument 43-101 'Standards of Disclosure for Mineral Projects', Mr. Brodie is not required to make a site visit and Mr. Brodie has not made a site visit (his work relates exclusively to tailings and waste management, and to closure planning).

Table 2.1 summarizes the sections of this Technical Report for which the QPs are individually responsible. Meetings have been held at various times between the authors of this Technical Report and Company staff members, either in the Company's Vancouver Offices or at the Company's Spectrum-GJ site exploration camps. The purpose was in each case to discuss a broad range of project-related issues and/or to collect and collate Company information about the Spectrum-GJ project.

2.7 Independent Third Party Review

The Company contracted Roscoe Postle Associates Inc. of Toronto, Ontario ("RPA"), as an independent, third party company, to review the PEA (see the Company's news release dated December 12, 2016). The principal RPA personnel tasked to undertake the review are:

- Deborah A. McCombe, P. Geo., and Jason J. Cox, P. Eng., Project Management;
- Luke Evans, P. Eng., and David W. Rennie, P. Eng., Geology and Mineral Resources;
- R. Dennis Bergen, P. Eng., and Ian Weir, P. Eng., Mine Planning and Design, Cost Estimation and Cashflow Modelling; and
- Kathleen Altman, P.E., metallurgy and mineral processing.

Table 2.1 A Summary of the Sections and Sub-Sections of this Technical Report for which the Qualified Persons are Individually Responsible

Report Section	Subject	Responsible Author or Co-Authors	Report Section or Sub-Section	Subject Area	Responsible Author
1	Summary	Stephen Godden, except for Sections 1.5 and 1.6.2	1.5	Mineral Resource Estimates	David Thomas
			1.6.2	Metallurgy and Processing	Christopher Martin
2	Introduction	Stephen Godden	-	-	-
3	Reliance on Other Experts	Stephen Godden	-	-	-
4	Property Description and Location	Stephen Godden, except Sections 4.7 and 4.8	4.7	Environmental Liabilities	John Brodie
			4.8	Required Permits	John Brodie
5	Accessibility, Climate, Local Resources, Infrastructure and Physiography	Stephen Godden	-	-	-
6	History	Stephen Godden, except Section 6.2	6.2	Historical Mineral Resource Estimates	David Thomas
7	Geological Setting and Mineralization	David Mehner	-	-	-
8	Deposit Types	David Mehner	-	-	-
9	Exploration	David Mehner	-	-	-
10	Drilling	Stephen Godden	-	-	-
11	Sample Preparation, Analysis and Security	David Mehner	-	-	-
12	Data Verification	David Thomas	-	-	-
13	Mineral Processing and Metallurgical Testing	Christopher Martin	-	-	-
14	Mineral Resource Estimates	David Thomas	-	-	-
15	Mineral Reserve Estimates	Stephen Godden	-	-	-
16	Mining Methods	Stephen Godden and Scott Britton	-	-	-
17	Recovery Methods	Christopher Martin	-	-	-
18	Project Infrastructure	Stephen Godden and Scott Britton	-	-	-
19	Market Studies and Contracts	Stephen Godden	-	-	-
20	Environmental Studies, Permitting and Social or Community Impact	John Brodie	-	-	-
21	Capital and Operating Costs	Stephen Godden and Scott Britton, except for Sub-Section 21.2.3 and the subject areas listed to the right (which are not detailed in separate sub-sections)	21.2.3	Processing Costs	Christopher Martin
			-	Plant Personnel and Plant CAPEX	Christopher Martin
22	Economic Analysis	Stephen Godden and Scott Britton	-	-	-
23	Adjacent Properties	Stephen Godden	-	-	-
24	Other Relevant Data and Information	Stephen Godden	-	-	-
25	Interpretation and Conclusions	Stephen Godden, except Section 25.7	25.7	Metallurgy and Mineral Processing Risks and Opportunities	Christopher Martin
26	Recommendations	Stephen Godden, except Section 26.3	26.3	Metallurgy and Mineral Processing Risks and Opportunities	Christopher Martin
27	References	Stephen Godden	-	-	-

3 RELIANCE ON OTHER EXPERTS

The Principal Author relied almost entirely on information derived from work completed by the authors of published data sources, Company staff members and Company consultants. Although the Principal Author has reviewed much of the available data and has visited the Project Area, these tasks only validate a portion of the entire dataset. The Principal Author has made judgements about the general reliability of the underlying data that is assumed to be both accurate and valid, based on the professional status of the reports' authors and the nature of their reports.

Details of the mineral claims that comprise the Project Area are based on information sourced from B.C. Mineral Titles Online ("MTO") and supplied by the Company. The claims information was cross-checked by reference to information contained on the MTO website (www. mtonline.gov.bc.ca). No attempt was made by the Principal Author to verify legal ownership of, or title to, the various claims that comprise the Project Area, although a letter dated March 09, 2015 from Vector Corporate Finance Lawyers, relating to legal title of the Spectrum claims block, was reviewed.

Signed copies of the various inter-company agreements relating to the Company's acquisition of the blocks or groups of mineral claims that comprise the Project Area were seen by the Principal Author. They were used to compile the agreement-related information contained in parts of Sections 4 and 6 of this Technical Report. The Principal Author is not, however, qualified to assess the validity of the agreements or the information contained therein.

The QP for Sections 4.7, 4.8 and 20 (John Brodie, P. Eng.) has made no attempt to verify or assess environmental issues or liabilities on the Project Area. When compiling Sections 4.7, 4.8 and 20 of this Technical Report, the QP instead relied on information contained in:

- the Company's year-end reports to the B.C. Ministry of Energy and Mines referenced in Section 2.5; and
- the Greenwood Report that is also referenced in Section 2.5.

4 PROPERTY DESCRIPTION AND LOCATION

The Principal Author is responsible for the following Sections 4.1 through 4.6 and Section 4.9. The QP for Sections 4.7 and 4.8 is John Brodie, P. Eng. ("QP Brodie"). The text was compiled from various internal Company documents, from observations made during the Principal Author's site visits, from information contained in the Greenwood Report referenced in Section 2.5 and from information contained in the April 2016 and May 2016 Technical Reports. Past information was updated only when it was relevant to do so and/or when it was clear that additional information was required.

4.1 Property Area and Location

The Spectrum-GJ property is a combination of the previously reported Spectrum and GJ properties and projects, as described in the May 2016 Technical Report for the Spectrum property and the April 2016 Technical Report for the GJ property. Six claims were added in 2016 to the previously reported mineral claims that now form a single contiguous block that herein is called the Project Area.

Figures 4.1 and 4.2 are regional and area location plans, respectively, for the Project Area that is located in the Liard Mining Division within the Stikine River region of northwest B.C. The location point for the Project Area (the notional centre point) is at Latitude 57º 39' 21" North and Longitude 130º 15' 41" West, which is the approximate centre of the planned Donnelly Pit that, by road, is approximately 300 km north of Stewart, B.C. It may be seen that the Project Area covers a significant part of Klastline Plateau to the east; to the south it extends to the junction of the Iskut and Little Iskut rivers. The western boundary adjoins Mount Edziza Provincial Park (see Sub-Section 4.2.2). The Project Area as a whole falls within the asserted traditional territory of the Tahltan Nation (see Section 4.9).

4.2 Mineral Tenures

The Project Area comprises 99 contiguous mineral claims covering 43,518.849 ha on B.C. government claim map sheets 104G048, 104G049, 104G059, 104G060, 104G068, 104G069, 104G070, 104G078, 104G079 and 104G080. Seventeen of the claims are of the four-post located variety (now referred to as legacy claims), while the remaining 82 mineral claims are of the cell variety that are located online using the MTO system. The boundaries of individual legacy claims have not been surveyed, but the co-ordinates of a number of legal corner posts have been established by the Company, using Differential Global Positioning System ("DGPS") technology.

The identifying numbers, names, issue dates, expiry dates (the "good-to dates") and areas for each of the 99 mineral claims are listed by claims block on Table 4.1, which is in two parts due to its overall length. Figure 4.3 is a generalized mineral tenure plan that shows the boundary of the Project Area and the distribution of claims contained therein. To facilitate legibility, the overall area is split into a North Block and a South Block on Figures 4.4 and 4.5, respectively. It is on these figures that the individual mineral claims listed on Table 4.1 are identified.

Figure 4.1 A Regional Location Plan for the Spectrum-GJ Property
(supplied by the Company)

Figure 4.2 An Area Location Plan for the Spectrum-GJ Property
(supplied by the Company)

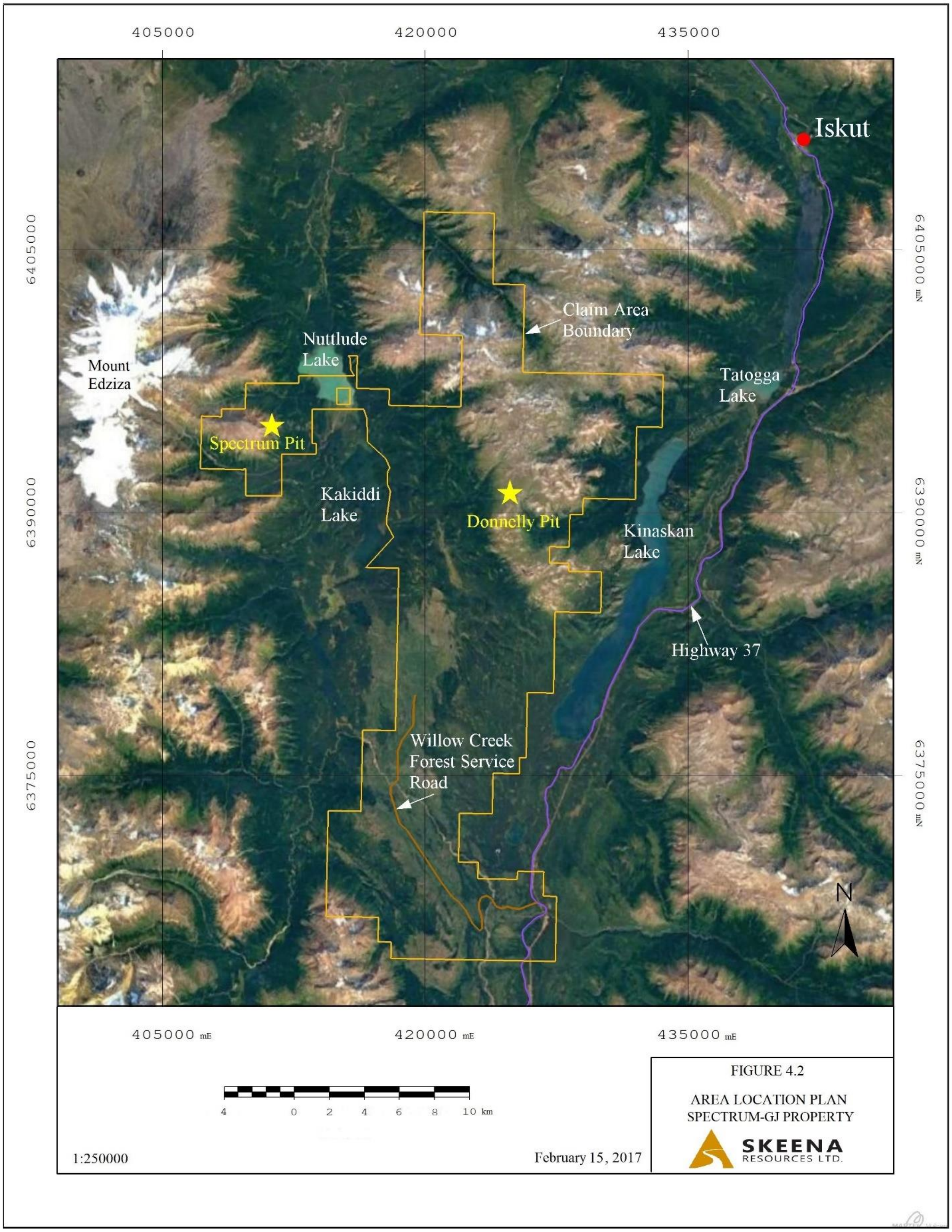


Table 4.1 A Summary of the Mineral Claims that Comprise the Single Claims Block Known as the Spectrum-GJ Project Area
(compiled from information supplied by the Company and cross-referenced to MTO files)

#	Mineral Claim Identifiers		Issue Date	Good-To Date	Title Type	Area (ha)	Claims Block or Group
	Number	Name					
1	222131	Red Dog #3	Aug. 06, 1981	July 02, 2026	Four Post Claim	250.146	Spectrum (total area = 3,685.150 ha, adjusted total area = 3,226.143 ha – see Sub-Section 4.2.2)
2	222132	Red Dog #4	July 16, 1981	July 02, 2026	Four Post Claim	200.111	
3	512024	-	May 03, 2005	July 02, 2026	Mineral Cell Title Submission	138.374	
4	515645	-	June 30, 2005	July 02, 2026	Mineral Cell Title Submission	432.263	
5	515647	-	June 30, 2005	July 02, 2026	Mineral Cell Title Submission	467.111	
6	515648	-	June 30, 2005	July 02, 2026	Mineral Cell Title Submission	466.838	
7	515649	-	June 30, 2005	July 02, 2026	Mineral Cell Title Submission	519.031	
8	515651	-	June 30, 2005	July 02, 2026	Mineral Cell Title Submission	519.355	
9	515654	-	June 30, 2005	July 02, 2026	Mineral Cell Title Submission	588.173	
10	1039623	NUT	Oct. 29, 2015	July 02, 2026	Mineral Cell Title Submission	86.443	
11	1048411	Sliver 2	Dec. 14, 2016	Dec. 14, 2017	Mineral Cell Title Submission	17.304	
12	392329	QC 1	Mar. 07, 2002	Mar. 17, 2026	Four Post Claim	500.325	GJ (total area = 38,534.888 ha, adjusted total area = 38,428.390 ha – see Sub-Section 4.2.2)
13	392330	QC 2	Mar. 07, 2002	Mar. 17, 2026	Four Post Claim	500.328	
14	392331	QC 3	Mar. 07, 2002	Mar. 17, 2026	Four Post Claim	500.324	
15	392332	QC 4	Mar. 07, 2002	Mar. 17, 2026	Four Post Claim	481.261	
16	392333	QC 5	Mar. 07, 2002	Mar. 17, 2026	Four Post Claim	500.331	
17	392335	QC 7	Mar. 07, 2002	Mar. 17, 2026	Four Post Claim	500.332	
18	392361	HORN 1	Mar. 07, 2002	Mar. 17, 2026	Four Post Claim	450.295	
19	392362	HORN 2	Mar. 07, 2002	Mar. 17, 2026	Four Post Claim	450.293	
20	392375	SH 1	Mar. 10, 2002	Mar. 17, 2026	Four Post Claim	500.333	
21	392376	SH 2	Mar. 10, 2002	Mar. 17, 2026	Four Post Claim	500.334	
22	392379[1]	SS 1	Mar. 10, 2002	Mar. 17, 2026	Four Post Claim	450.442	
23	392380	SS 2	Mar. 10, 2002	Mar. 17, 2026	Four Post Claim	450.311	
24	392381	SS 3	Mar. 10, 2002	Mar. 17, 2026	Four Post Claim	450.227	
25	392382	SS 4	Mar. 10, 2002	Mar. 17, 2026	Four Post Claim	450.310	
26	413153	KJ	Aug. 09, 2004	Mar. 17, 2026	Four Post Claim	483.970	
27	504206	MJ	Jan. 18, 2005	Mar. 17, 2026	Mineral Cell Title Submission	432.852	
28	504368	-	Jan. 20, 2005	Mar. 17, 2026	Mineral Cell Title Submission	432.858	
29	505097	-	Jan. 28, 2005	Mar. 17, 2026	Mineral Cell Title Submission	779.524	
30	505233	NJ	Jan. 31, 2005	Mar. 17, 2026	Mineral Cell Title Submission	311.781	
31	507681	-	Feb. 22, 2005	Mar. 17, 2026	Mineral Cell Title Submission	1,367.926	
32	508121	-	Mar. 01, 2005	Mar. 17, 2026	Mineral Cell Title Submission	1,471.308	
33	508187	-	Mar. 02, 2005	Mar. 17, 2026	Mineral Cell Title Submission	1,297.603	
34	511073	PJ	Apr. 19, 2005	Mar. 17, 2026	Mineral Cell Title Submission	311.537	
35	522331	RJ	Nov. 16, 2005	Mar. 17, 2026	Mineral Cell Title Submission	415.621	
36	532248	SJ	Apr. 17, 2006	Mar. 17, 2026	Mineral Cell Title Submission	311.717	
37	532251	TJ	Apr. 17, 2006	Mar. 17, 2026	Mineral Cell Title Submission	363.496	
38	532254	VJ	Apr. 17, 2006	Mar. 17, 2026	Mineral Cell Title Submission	415.191	
39	532258	WJ	Apr. 17, 2006	Mar. 17, 2026	Mineral Cell Title Submission	415.198	
40	532259	XJ	Apr. 17, 2006	Mar. 17, 2026	Mineral Cell Title Submission	415.221	
41	532260	YJ	Apr. 17, 2006	Mar. 17, 2026	Mineral Cell Title Submission	415.225	
42	532261	ZJ	Apr. 17, 2006	Mar. 17, 2026	Mineral Cell Title Submission	259.500	
43	553372	-	Mar. 02, 2007	Mar. 17, 2026	Mineral Cell Title Submission	433.202	
44	783442	Willow 01	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	364.126	
45	783462	Willow 02	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	433.453	
46	783482	Willow 03	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	433.461	
47	783502	Willow 04	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	433.475	
48	783522	Willow 05	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	398.774	
49	783542	Willow 06	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	433.503	
50	783562	Willow 07	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	433.720	
51	783582	Willow 08	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	433.707	
52	783602	Willow 09	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	433.709	
53	783622	Willow 10	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	433.712	
54	783642	Willow 11	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	433.689	
55	783662	Willow 12	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	433.980	
56	783682	Willow 13	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	433.968	
57	783702	Willow 14	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	433.962	
58	783722	Willow 15	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	433.954	
59	783742	Willow 16	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	347.155	
60	783762	Willow 17	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	434.226	
61	783782	Willow 18	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	434.224	
62	783802	Willow 19	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	434.219	
63	783822	Willow 20	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	434.208	
64	783842	Willow 21	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	434.472	

Table 4.1 continued… A Summary of the Mineral Claims that Comprise the Single Claims Block Known as the Spectrum-GJ Project Area
(compiled from information supplied by the Company and cross-referenced to MTO files)

#	Mineral Claim Identifiers		Issue Date	Good-To Date	Title Type	Area (ha)	Claims Block or Group
	Number	Name					
65	783862	Willow 82	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	434.472	GJ (total area = 38,534.888 ha, adjusted total area = 38,428.390 ha – see Sub-Section 4.2.2)
66	783882	Willow 23	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	434.479	
67	783902	Willow 24	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	434.475	
68	783922	Willow 25[2]	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	399.700	
69	783942	Willow 25[2]	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	434.710	
70	783962	Willow 26	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	434.714	
71	783982	Willow 27	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	434.732	
72	784002	Willow 28	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	434.732	
73	784022	Willow 29	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	434.933	
74	784042	Willow 30	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	434.939	
75	785062	Willow 31	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	434.948	
76	784082	Willow 32	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	434.972	
77	784102	Willow 33	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	435.176	
78	784122	Willow 34	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	435.178	
79	784142	Willow 35	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	435.186	
80	784162	Willow 36	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	435.210	
81	784182	Willow 37	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	417.955	
82	784202	Willow 38	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	417.990	
83	784222	Willow 39	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	435.567	
85	784242	Willow 40	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	435.590	
85	784262	Willow 41	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	435.594	
86	784282	Willow 42	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	435.596	
87	784302	Willow 43	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	435.594	
88	784322	Willow 44	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	417.983	
89	784342	Willow 45	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	400.497	
90	784362	Willow 46	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	435.385	
91	784382	Willow 47	June 01, 2010	Mar. 17, 2026	Mineral Cell Title Submission	348.205	
92	1039624	Kakiddi	Oct. 29, 2015	Mar. 17, 2026	Mineral Cell Title Submission	34.612	
93	1039625	Kiddi	Oct. 29, 2015	Mar. 17, 2026	Mineral Cell Title Submission	17.308	
94	1039626	-	Oct. 29, 2015	Mar. 17, 2026	Mineral Cell Title Submission	814.508	
95	1047873	Sliver 1	Nov. 15, 2016	Nov. 15, 2017	Mineral Cell Title Submission	69.171	
96	1048397	Fork in Road	Dec. 13, 2016	Dec. 13, 2017	Mineral Cell Title Submission	121.911	
97	603611	NUTT 6	Apr. 29, 2009	Mar. 17, 2026	Mineral Cell Title Submission	432.298	Nuttlude (total area = 1,298.811 ha, adjusted total area = 1,181.204 ha – see Sub-Section 4.2.2)
98	1039785	GJ KEY	Nov. 04, 2015	Mar. 17, 2026	Mineral Cell Title Submission	831.836	
99	1044199	GJ KEY 2	May 18, 2016	Mar. 17, 2026	Mineral Cell Title Submission	34.677	

Notes: [1] there is an error in the Teck Resources internal reporting for 2014 – mineral claim SS 1 is listed as 392380 rather than the correct number of 392379. Previously filed Assessment Reports have the correct information.

[2] there are two mineral claims named Willow 25; the name refers to two valid title numbers.

Figure 4.3 A Generalized Mineral Tenure Plan of the Spectrum-GJ Project Area, Detailing the Project Area Boundary and the Distribution of Claims Contained Therein
(supplied by the Company)

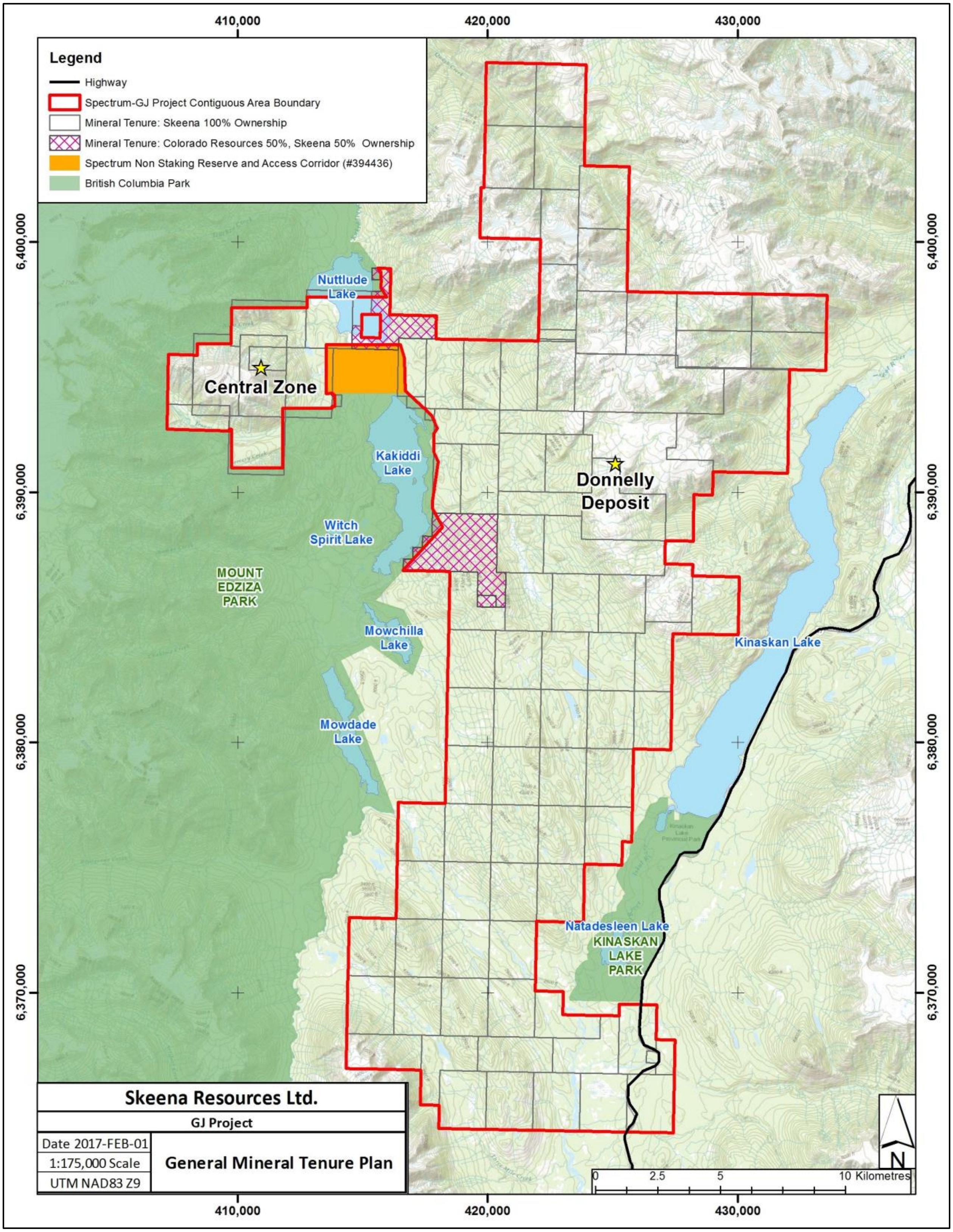


Figure 4.4 A Mineral Tenure Plan of the North Block of the Spectrum-GJ Project Area, Detailing the Individual Mineral Claims
(supplied by the Company)

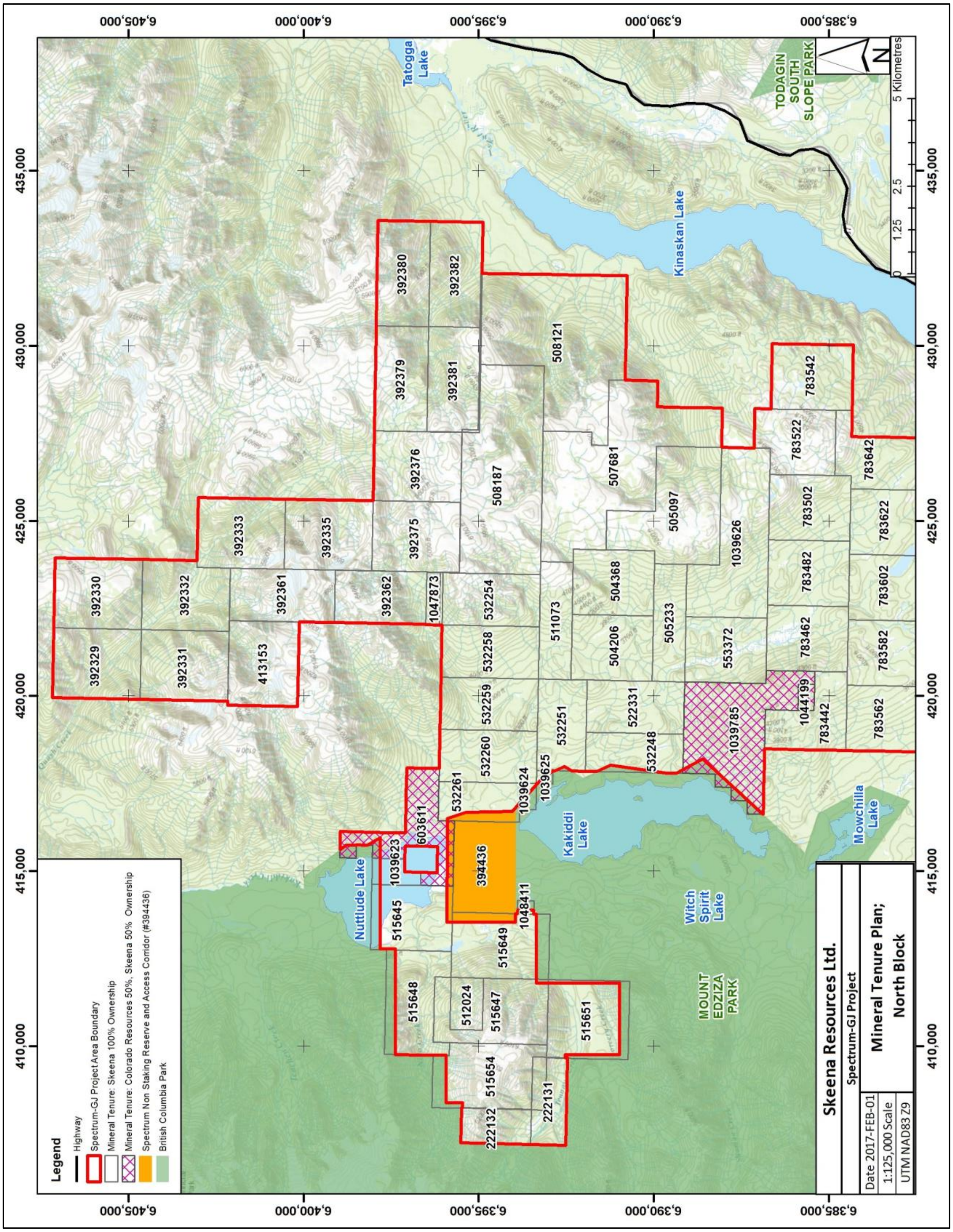
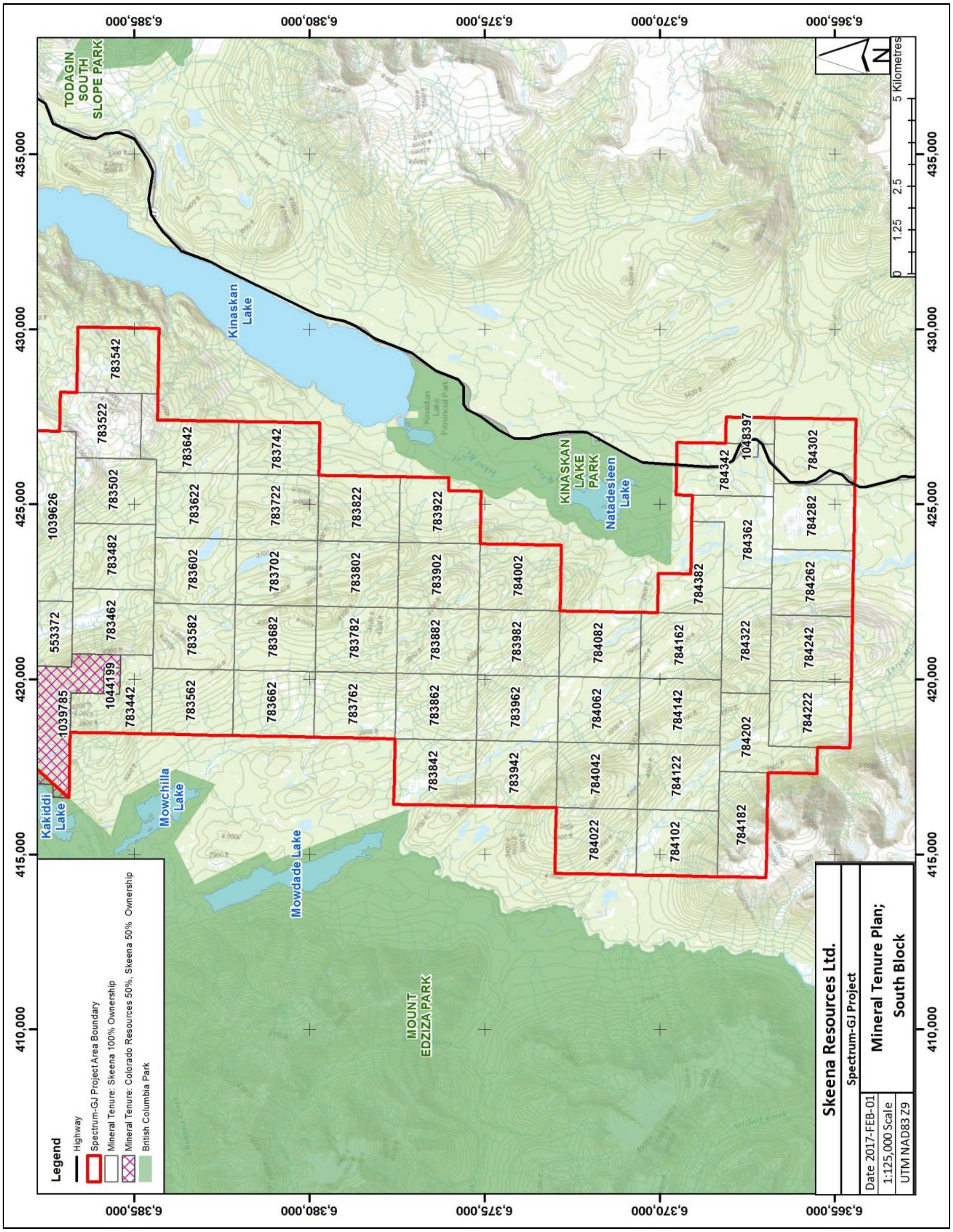


Figure 4.5 A Mineral Tenure Plan of the South Block of the Spectrum-GJ Project Area, Detailing the Individual Mineral Claims
(supplied by the Company)



As part of as wider due diligence process undertaken by the Principal Author, details of the Company's overall claim area were analyzed and reviewed. This led to:

- removal of errors concerning the areas of the 17 four-post located ("legacy") mineral claims (see Section 4.2.1);
- removal of the overlaps between various cell-based MTO mineral claims and the boundary of Mount Edziza Provincial Park, resulting in adjustments to the boundary of the Project Area, hence an adjustment to the overall area in which project development activities can (and will) take place (see Sub-Section 4.2.2); and
- staking, during December 2016, of three additional claims that are identified in Section 4.3.

4.2.1 Individual Claim Areas

The adjusted claim areas stated on Table 4.1 were defined by the Company using ArcGIS geometry calculations in B.C. ALBERS projection, the latter being the standard projection used by the B.C. government. The calculated areas of all the cell-type claims are the same as those stated on the MTO system. However, the calculated areas for the 17 legacy mineral claims differ from those stated on the MTO system: legacy claims are defined from unsurveyed physical claim posts, so the areas are only estimated. The calculated areas of the 17 legacy mineral claims are detailed on Table 4.2. It may be concluded that if the MTO mineral claim areas were used, the Project Area would comprise 43,549.177 ha rather than the 43,518.849 ha defined by the areas stated on Table 4.1 (it is the latter value [43,518.849 ha] that is stated above and in Section 2.2).

Table 4.2 A Summary of the Mineral Claims that are Subject to Area Adjustments for the Reasons Described in Sub-Section 4.2.1
(compiled from information supplied by the Company and cross-referenced to MTO files)

#	Mineral Claim Identifiers		Issue Date	Good-To Date	Title Type	Area (ha)	
	Number	Name				MTO	Adjusted
1	222131	Red Dog #3	Aug. 06, 1981	July 02, 2026	Four Post Claim	250.000	250.146
2	222132	Red Dog #4	July 16, 1981	July 02, 2026	Four Post Claim	200.000	200.111
3	392329	QC 1	Mar. 07, 2002	Mar. 17, 2026	Four Post Claim	500.000	500.325
4	392330	QC 2	Mar. 07, 2002	Mar. 17, 2026	Four Post Claim	500.000	500.328
5	392331	QC 3	Mar. 07, 2002	Mar. 17, 2026	Four Post Claim	500.000	500.324
6	392332	QC 4	Mar. 07, 2002	Mar. 17, 2026	Four Post Claim	500.000	481.261
7	392333	QC 5	Mar. 07, 2002	Mar. 17, 2026	Four Post Claim	500.000	500.331
8	392335	QC 7	Mar. 07, 2002	Mar. 17, 2026	Four Post Claim	500.000	500.332
9	392361	HORN 1	Mar. 07, 2002	Mar. 17, 2026	Four Post Claim	450.000	450.295
10	392362	HORN 2	Mar. 07, 2002	Mar. 17, 2026	Four Post Claim	450.000	450.293
11	392375	SH 1	Mar. 10, 2002	Mar. 17, 2026	Four Post Claim	500.000	500.333
12	392376	SH 2	Mar. 10, 2002	Mar. 17, 2026	Four Post Claim	500.000	500.334
13	392379[1]	SS 1	Mar. 10, 2002	Mar. 17, 2026	Four Post Claim	450.000	450.442
14	392380	SS 2	Mar. 10, 2002	Mar. 17, 2026	Four Post Claim	450.000	450.311
15	392381	SS 3	Mar. 10, 2002	Mar. 17, 2026	Four Post Claim	450.000	450.227
16	392382	SS 4	Mar. 10, 2002	Mar. 17, 2026	Four Post Claim	450.000	450.310
17	413153	KJ	Aug. 09, 2004	Mar. 17, 2026	Four Post Claim	500.000	483.970
					Totals (ha)	***7,650.000***	***7,619.672***

4.2.2 Claims Block Boundary

It may be seen on Figure 4.3 that the boundaries of the claims around the Spectrum claims block, the boundary of the Designated Access Corridor, a portion of the western boundary of the North Block of the GJ claims block and various claims of the Nuttlude Group (highlighted by RED cross-hatching on Figures 4.3 through 4.5) differ from the defined, overall Project Area boundary. This is because the claims defined on the MTO system overlap the boundary of Mount Edziza Provincial Park and/or the Mount Edziza Protected Area (the Designated Access Corridor).

Individual claims comprise up to 100 complete or partial adjoining cells that are not adjusted to reflect the boundaries of areas such as parks. However, it is stated in the Mineral Tenure Act Regulation 'B.C. Reg. 529/2004' (the "MTA Regulation") that '*Parks, Protected Areas, Ecological Reserves and Conservancies are considered Alienated Land*'. In Section 1 (Definitions) of the MTA Regulation, Alienated Land is defined as:

'*(a) land in a park established under an Act of British Columbia or Canada;*

(a.1) land in a conservancy established under an Act of British Columbia;

(b) an ecological reserve established under an Act of British Columbia or Canada;

(c) an area in which mining activity is prohibited under the Park Act or under an order under the Environment and Land Use Act; or

(d) Indian reserve land'.

In Section 4 (Registrations of New Claims) of the MTA Regulation it states under Point (2) that '*No mineral or placer rights in respect of alienated land are acquired by registering a cell claim under this section*'. It is for this reason that the boundary of the mineral claims comprising the Project Area has been adjusted on Figure 4.3 to adjoin the boundary of Mount Edziza Provincial Park, not overlap it. The MTA Regulations can be located at http://www.bclaws.ca/civix/document/id/complete/statreg/529_2004).

The mineral claims that are subject to the boundary adjustment are listed on Table 4.3 on which, for purposes of comparison, the claim areas, determined by means of ArcGIS geometry calculations in B.C. ALBERS projection, are also detailed. It may be seen that the adjustments reduce the total Project Area from 43,518.849 ha, as defined by the individual claim boundaries (and adjusted to preclude overlaps), to 42,825.736 ha, as defined by the adjusted, overall claims area boundary, per Figure 4.3. It is the latter area over which project development activities may (and will) take place.

Table 4.3 A Summary of the Mineral Claims that are Subject to Area Adjustments for the Reasons Described in Section 4.2.2 (elimination of overlaps with Mount Edziza Provincial Park)
(compiled from information supplied by the Company and cross-referenced to MTO files)

#	Mineral Claim Identifiers		Issue Date	Good-To Date	Title Type	Area (ha)	
	Number	Name				Per Table 4.1	Adjusted
1	515645	-	June 30, 2005	July 02, 2026	Mineral Cell Title Submission	432.263	365.641
2	515647	-	June 30, 2005	July 02, 2026	Mineral Cell Title Submission	467.111	463.578
3	515648	-	June 30, 2005	July 02, 2026	Mineral Cell Title Submission	466.838	382.909
4	515649	-	June 30, 2005	July 02, 2026	Mineral Cell Title Submission	519.031	404.324
5	515651	-	June 30, 2005	July 02, 2026	Mineral Cell Title Submission	519.355	424.369
6	515654	-	June 30, 2005	July 02, 2026	Mineral Cell Title Submission	588.173	523.259
7	1039623	NUT	Oct. 29, 2015	July 02, 2026	Mineral Cell Title Submission	86.443	68.823
8	1048411	Sliver 2	Dec. 14, 2016	Dec. 14, 2017	Mineral Cell Title Submission	17.304	4.608
					Sub-Total: Spectrum Property	*3,096.519*	*2,637.511*
9	532248	SJ	Apr. 17, 2006	Mar. 17, 2026	Mineral Cell Title Submission	311.717	292.297
10	532261	ZJ	Apr. 17, 2006	Mar. 17, 2026	Mineral Cell Title Submission	259.500	204.821
11	1039624	Kakiddi	Oct. 29, 2015	Mar. 17, 2026	Mineral Cell Title Submission	34.612	14.158
12	1039625	Kiddi	Oct. 29, 2015	Mar. 17, 2026	Mineral Cell Title Submission	17.308	8.354
					Sub-Total: GJ Property	*623.137*	*519.630*
13	603611	NUTT 6	Apr. 29, 2009	Mar. 17, 2026	Mineral Cell Title Submission	432.298	370.139
14	1039785	GJ KEY	Nov. 04, 2015	Mar. 17, 2026	Mineral Cell Title Submission	831.836	776.388
					Sub-Total: Nuttlude Group	*1,264.134*	*1,146.527*
					Totals (ha)	***12,010.653***	***11,403.710***

4.3 Tenure Ownership

The registered, 100% owner of 96 of the Project Area claims is the Company. The remaining three claims (Nutt 6, GJ Key and GJ Key 2, which together form the Nuttlude Group) are 50% owned by the Company and 50% owned by Colorado Resources Ltd., pursuant to a Purchase Agreement between the Company and Colorado dated November 03, 2016 (see Sub-Section 4.3.3).

4.3.1 Spectrum Claims Block

The 11 contiguous mineral claims that comprise the Spectrum claims block (3,685.150 ha, adjusted to 3,226.143 ha for the reasons described in Sub-Section 4.2.2) are listed at the top of Table 4.1. All but one of the 11 mineral claims were held at different times by different companies (see Section 6.1). The exception (mineral claim 1048411 called Sliver 2 and comprising 17.304 ha) was staked by the Company on December 14, 2016, to consolidate the overall claim boundary in the area of the Designated Access Corridor described in Sub-Section 4.9.3.

4.3.2 GJ Claims Block

The 85 contiguous mineral claims that comprise the GJ claims block (38,534.888 ha, adjusted to 38,428.390 ha for the reasons described in Sub-Section 4.2.2) form the bulk of the claims listed on Table 4.1. The registered, 100% owner of all 85 claims is the Company. Eighty of the mineral claims that comprise the GJ claims block were transferred to the Company on November 03, 2015, contingent on completion of the terms of an October 05, 2015, Asset Purchase Agreement between Teck, NGEx and the Company (see the Company's news release dated October 27, 2014). Under this Agreement, the Company may purchase a 100% interest in the North and Remaining claims (Figures 4.6 and 4.7), subject to royalties described in Section 4.5, by making the following payments to Teck and NGEx and in proportions that reflect their joint venture agreement (Teck 51%, NGEx 49% - see the Company's news release dated October 27, 2014):

- C$1,500,000 payable on closing, with C$500,000 payable in cash and C$1,000,000 payable by the issuance of Company shares to the Sellers with a market value of C$1,000,000 (paid); and
- on or before the date that is 24 months from the closing date, C$1,500,000 payable by the issuance of Company Shares to the Sellers with a market value of C$1,500,000; and
- on or before the date that is 60 months from the closing date, C$1,500,000 payable by the issuance of Company Shares to the Sellers with a market value of C$1,500,000; and
- on or before the date that is within 45 days of the commercial production date, C$4,000,000 in cash.

An additional three mineral claims were acquired on behalf of the Company by Mr. M. S. Cathro, P. Geo., on October 29, 2015 (mineral claim numbers 1039624 called Kakiddi, 1039625 called Kiddi and 1039626). All three mineral claims were transferred to the Company on November 08, 2015. Mineral claim 1047873 (called Sliver 1) was acquired by the Company on November 15, 2016, to consolidate a thin sliver of land that was not covered by the adjacent claims. Mineral claim 1048397 (called Fork in the Road) was acquired by the Company on December 13, 2016, to consolidate the area of the planned Northwest Transmission Line take-off sub-station, as well as to provide lay-down areas for mine site powerline construction.

4.3.3 Nuttlude Group

The three mineral claims that comprise the Nuttlude Group (mineral claim 603611 called Nutt 6, 1039785 called GJ Key and 1044199 called GJ Key 2, totaling 1,298.811 ha and adjusted to 1,181.204 ha for the reasons described in Sub-Section 4.2.2) are listed at the base of Table 4.1. Their locations are identified by RED cross-hatching on Figures 4.3 through 4.5. Pursuant to the terms of a purchase agreement between Colorado Resources Limited ("Colorado") and the Company, dated November 03, 2016, the Company acquired a 50% interest in the Nuttlude property claims by paying Colorado a total of C$5,000.

4.4 Surface Rights

Surface rights are not specifically included as part of the Project Area. However, mineral claims located in B.C. are administered by the B.C. Ministry of Energy and Mines, according to the Mineral Tenure Act of 1996 (the "1996 Act"). It is through the 1996 Act that a mineral title holder is granted the right to use the surface of the held claim or claims for the exploration and development or production of minerals and all operations related to the business of mining. In the opinion of the Principal Author, there is no readily identifiable reason to suppose that surface rights across the Project Area will be constrained in any way.

4.5 Royalties

To the Principal Author's best knowledge and understanding, no outstanding compensation agreements are in place as regards the Project Area, other than those relating to the GJ claims block, as specified in an Asset Purchase Agreement between Teck, NGEx and the Company (see Section 4.3.2).

4.5.1 Spectrum Claims Block

NSR royalties on all but two mineral claims of the Spectrum claims block amount to 1.75%. The two exceptions are mineral claim numbers 1039623 (called NUT) and 1048411 (called Sliver 2) to which no royalties apply. The 1.75% NSR royalty comprises a combination of the royalties held by Sandstorm Gold Limited (1.65%), Troon Ventures Limited (0.05%), International Northair Mines Limited (0.03%) and Silver Standard Resources Incorporated (0.02%).

4.5.2 GJ Claims Block

Figures 4.6 and 4.7 are mineral claims plans for the North Block (Figure 4.6) and South Block (Figure 4.7) portions of the Project Area, as earlier outlined. They summarize the applicable royalty types by mineral claim. It may be seen that in a few cases no royalties apply to the mineral claims that comprise the GJ claims block, but that in the majority of cases royalties are payable to different entities. In summary and as regards royalties, the GJ claims block may be described as comprising six distinct parts:

- a total of five mineral claims to which no royalty applies (mineral claim numbers 1039624, 1039625, 1039626, 1047873 and 1048397);

- a total of one legacy claim (mineral claim number 413153) and 65 MTO, cell-type claims (called Remaining Claims on Figures 4.6 and 4.7), including those claims covering the Donnelly Deposit, to which a 2% NSR royalty applies, in favour of Teck and NGEx. (1% [or half] of the NSR royalty on the Remaining Claims can be bought back at any time for C$2.0 million, paid in proportions that reflect their joint venture agreement (Teck 51%, NGEx 49%);
- a total of six legacy claims, which were –
  - originally held by 650399 BC Ltd. and which were subject to a previous agreement that includes an underlying NSR royalty in favour of the successor to 650399 BC Ltd., and
  - variously converted by NGEx into MTO cell-type claims (mineral claim numbers 508187, 508121, a portion of 507681 and a fraction of 511073 of the Remaining Claims group) and to which an NSR royalty applies, in favour of Teck, NGEx and the successor to 650399 BC Ltd.;
- 14 legacy claims (called North Claims on Figures 4.6 and 4.7) that were included in the same previous agreement noted above and to which the same underlying NSR royalty applies, in favour of Teck, NGEx and the successor to 650399 BC Ltd.;
- an underlying 1% NSR royalty is held in favour of the successor of 650399 BC Ltd., on the area shown by red cross-hatching on Figure 4.7; and
- a 1% NSR royalty in favour of Teck and NGEx exists on the North Claims shown on Figure 4.7. 0.5% (or half) of the NSR royalty on the North Claims can be bought back at any time for a payment of C$1 million, paid in proportions that reflect their joint venture agreement (Teck 51%, NGEx 49%).

For the year ended December 31, 2016, AuRico Metals Inc. ("AuRico") reported that on November 10, 2016, it completed an acquisition from NGEx of a 0.98% NSR on what Aurico calls the GJ Northern Block (described above as the Remaining Claims) and a 0.49% NSR royalty on the GJ Northern Block property (described above as the North Block), respectively. The project owner has the right to buy-back half of one or both royalties (see http://www.auricometals.ca/royalties/GJ-Royalty/default.aspx).

Figure 4.6 A Mineral Tenure Plan Identifying Royalty Types by Mineral Claim Across the North Block of the Spectrum-GJ Project Area
(supplied by the Company)

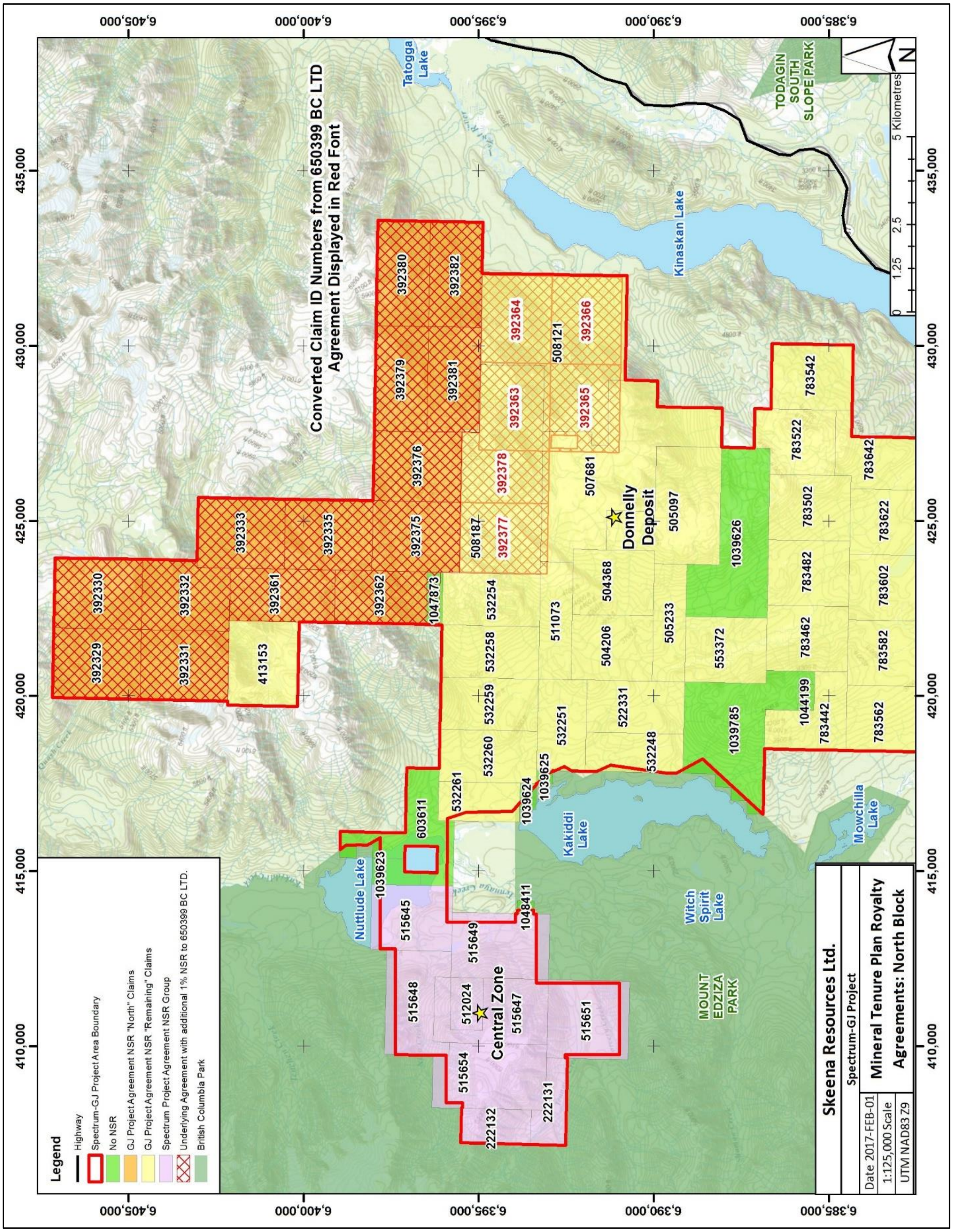
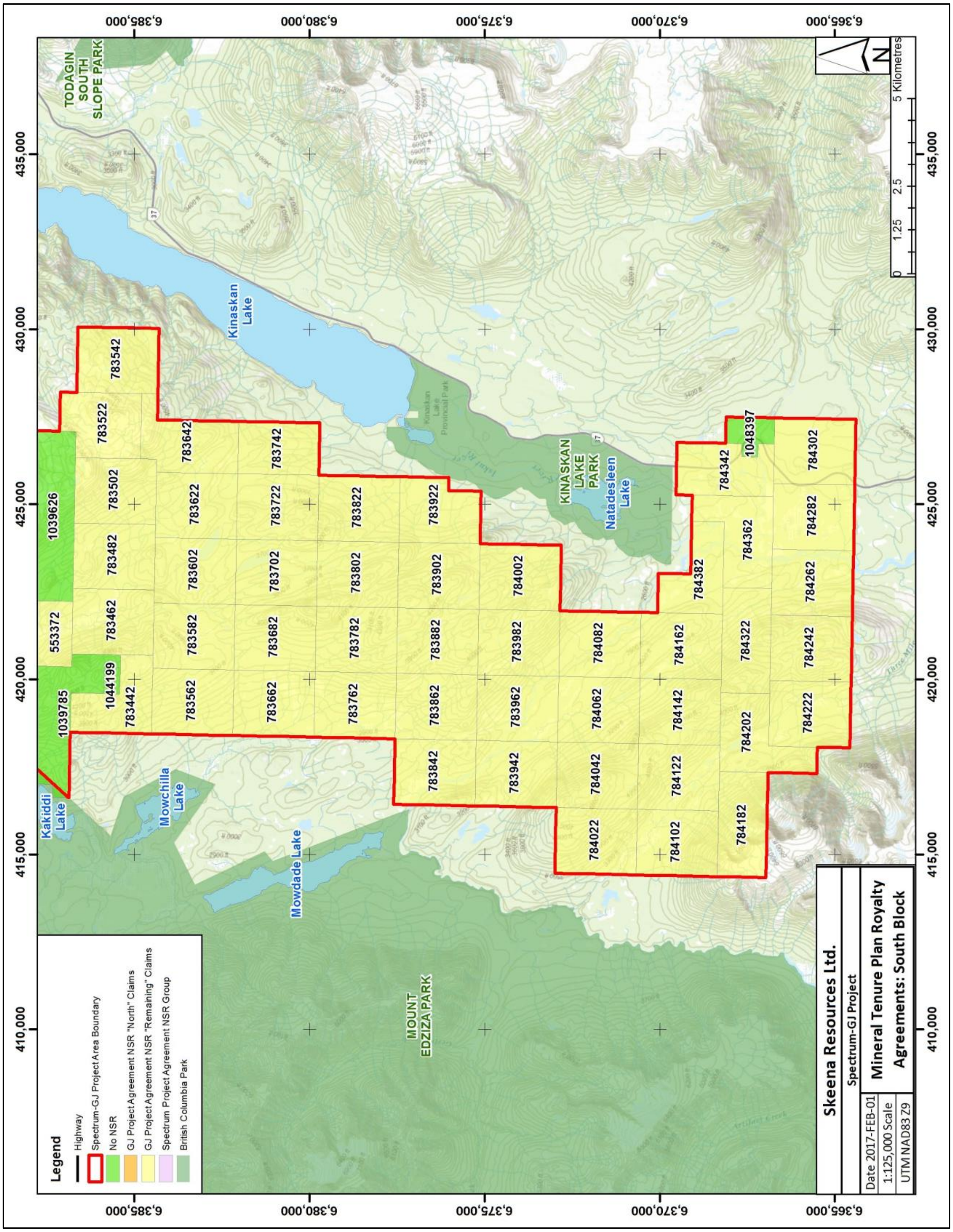


Figure 4.7 A Mineral Tenure Plan Identifying Royalty Types by Mineral Claim Across the South Block of the Spectrum-GJ Project Area
(supplied by the Company)



4.5.3 650399 BC Limited

650399 BC Limited was a numbered company that was a wholly owned subsidiary of SpectrumGold Inc., which in turn was controlled by NovaGold Resources Inc. Its emergence as a holder of an NSR royalty starts with the staking in 1975 and 1976 of the first mineral claims (GJ, Spike #1 and Spike #2, to cover what is now known as the GJ Zone) that made up part of the present GJ claims block. The claims were subsequently acquired (in the early 1980s) by Curator Resources Ltd. ("Curator"), which became International Curator Resources Ltd. ("International Curator") in October 1985 and subsequently Canadian Gold Hunter Corp. ("CGH") in December 2003.

In 2000, International Curator added to its holdings by staking the DJ and BJ claims west and northwest of the GJ claim to cover the Donnelly target. Further increases in the claims area were realized when:

- the OJ claim was staked to the north to cover approximately 75% of what is now called the North or Camp Zone;
- the JJ claim was staked (in 2003) immediately east of the GJ and Spike #2 claims, to cover the eastward projection of the GJ Zone;
- the LJ claim was staked (in 2004) immediately west of the BJ and DJ claims, to cover the westward projection of the Donnelly Zone; and
- the KJ was staked (in 2004) approximately 8 km to the north-northwest to cover a possible south-westward extension of the QC porphyry target.

Growing interest in the area was further reflected in March, 2002 when Viceroy Resource Corporation ("Viceroy") staked 27 claims (13,200 ha) to the north and north-east of International Curator's holdings, effectively covering the remaining portion of Klastline Plateau. A few months later (in May 2002) Viceroy granted an option to Consolidated Earth Stewards Inc. ("CEW") of Kelowna B.C. to earn a 100% interest in the property by making various share capital payments and by granting Viceroy a 1% NSR on production from any of the 27 mineral claims (i.e. not to any of the ground covered by the original Curator claims or claims subsequently acquired by CGH). CEW retained an option to pay Viceroy C$500,000 to buy back one-half of the NSR, over an option term of 25 years.

As part of a corporate reorganization, CEW subsequently changed its name to Royal County Minerals Corp. ("Royal County"). Approval from the TSX Venture Exchange for the Viceroy agreement was received in January, 2003 and the first 100,000 share payment was made. Later in 2003, Viceroy was reorganized into a number of different companies, with the underlying ownership of the 27 claims on Klastline Plateau ultimately being transferred to 650399 BC Ltd.

On August 4th, 2003, International Curator and Royal County merged into a single entity on the basis of one share of Royal County for every five shares of International Curator. The resulting company retained the name International Curator Resources Ltd.

In December, 2003, International Curator underwent a corporate re-organization and share consolidation, again on the basis of one new share for five old shares. At the same time the company changed its name to CGH. As a result of the merger with Royal County and subsequent 5:1 rollback in CGH, an outstanding (January 2004) payment of 100,000 shares of Royal County stock to 650399 BC Ltd. was converted to 80,000 shares of CGH stock. On January 21, 2005, CGH made the final 80,000 share payment to 650399 BC Ltd. to acquire a full 100% interest in the property, subject to the 1% NSR in favour of 650399 BC Ltd. As of 31 December 2014, 650399 BC Ltd. became Alexco Keno Hill Mining Corporation, a wholly owned subsidiary of Alexco Resource Corporation.

4.5.4 Nuttlude Group

To the Principal Author's best knowledge and understanding, no royalties are payable in respect of commercial production from any of the three mineral claims comprising the Nuttlude property.

4.6 Other Encumbrances

To the Principal Author's best knowledge and understanding, the only encumbrances, other than the royalties described above, that apply to the Project Area relate to claims maintenance fees and government taxes. These are described below.

4.6.1 Claims Maintenance

To maintain a mineral claim, the holder must, on or before the good-to date, either:

a) perform, or have performed, exploration and development work on that claim and register such work online; or

b) register a payment instead of exploration and development work (cash in lieu).

Failure to maintain a claim results in automatic forfeiture at the end (midnight) of the expiry date. No notice of forfeiture is provided to the claim holder, prior to forfeiture. All claim assessment requirements were reset to the first year when assessment fees were changed in 2012 (B.C. Regulation 89/2012). The new assessment work requirements are:

- C$5.00 per hectare for Anniversary Years 1 and 2;
- C$10.00 per hectare for Anniversary Years 3 and 4;
- C$15.00 per hectare for Anniversary Years 5 and 6; and
- C$20.00 per hectare for subsequent anniversary years.

At the time of writing (February 2017), according to information sourced online at www.mtonline.gov.bc.ca, all of the 99 claims listed on Table 4.1 were in good order. In the case of 96 of the 99 mineral claims that comprise the Project Area, the good-to dates extend to at least March 17, 2026. The three exceptions are those staked by the Company, using the MTO system, late in 2016 (mineral claims 1047873 called Sliver 1, 1048411 called Sliver 2 and 1048397 called Fork in the Road), which have good-to dates in late 2017. The Company has advised the Principal Author that the good-to dates for these mineral claims will be amended, in accordance with the 1996 Act, when Statements of Work for the 2017 exploration season are filed. It is anticipated that the good-to dates for the three mineral claims outlined will, at that time, be extended to 2026.

4.6.2 Government Taxes

Neither provincial nor federal royalties are levied on metallic mines located in B.C. However, B.C.'s Mineral Tax Act defines two taxes that are applicable specifically to mining operations in the province: Net Current Proceeds Tax ("NCP tax"); and Net Revenue Tax. NCP tax is levied at 2% of the gross revenue of an operation, less non-capital reclamation costs and operating expenses excluding rental costs, exploration costs, capital costs and pre-production development costs. NCP tax is fully creditable against Net Revenue Tax that is levied at 13% and which applies to net current proceeds of an operation, minus rental costs, exploration costs, capital costs and pre-production development costs.

In addition to the B.C. mining tax system, the Canadian corporate income tax system imposes profit-based taxes on mining operations. A combined federal and provincial income tax rate of 26% is expected to apply to net taxable income from the Spectrum-GJ project. B.C. mineral taxes are deductible from income that is subject to federal and provincial income tax.

4.7 Existing Environmental Liabilities

The following text was compiled from information contained in the Company's 2015 and 2016 year-end, Annual Summary of Exploration Activities reports (for the Spectrum-GJ property) to the B.C. Ministry of Energy and Mines.

To the best of the QP Brodie's knowledge and understanding, no production facilities have ever been established on the Project Area. Such environmental liabilities that may exist are believed to be related in general to either forestry activities and/or historical exploration, hence small-scale trenching, drillpad construction, trail construction and the provisioning of various exploration camp sites. In addition, historical exploration activity on the Spectrum claims block included the completion of approximately 313.5 m of exploration drifts and related exploration development on the Hawk Vein, as described in Section 6.

4.7.1 Spectrum Claims Block

As insurance against future environmental liabilities under its mineral exploration permit, the Company posted a C$90,000 bond with the B.C. government before commencing field work in 2015. A further C$23,000 was posted prior to commencement of the 2016 exploration program, thereby bringing the total amount to the required C$113,000 level (see Sub-Section 4.8.2).

During the Company's 2015 exploration program Company personnel cleaned-up and burned all of the camp materials, a small amount of garbage and all the drilling platform timbers left by previous operators. All six drillpads from the Company's 2014 drilling program were dismantled, cleaned-up and re-contoured, along with 52 of the 58 drillpads constructed during the 2015 season. Four helicopter pads constructed during 2015 were left in place for use in 2016.

During the Company's 2016 exploration program the previously utilized Mountain Exploration Camp (Figure 4.8) was reclaimed and a new exploration camp (called Valley Exploration Camp, Figure 4.9) was established. On completion of their intended use, the following surface disturbances were also cleaned up and re-contoured: five of the remaining 2015 drillpads; the four helicopter pads constructed in 2015; 23 of the 24 drillpads built during the 2016 exploration season and two of the four helicopter pads built during 2016. The Company has advised QP Brodie that the remaining one 2015 drillpad and one 2016 drillpad, along with the remaining two helicopter pads, will be dismantled, cleaned-up and re-contoured following completion of work at the site.

Figure 4.8 A General View of the Mountain Exploration Camp in 2015 (in the middle ground, looking approximately east-northeast) with the Core Shack at the Bottom Left and Nuttlude Lake in the Background, Spectrum Claims Block, Spectrum-GJ Property
(supplied by the Company)

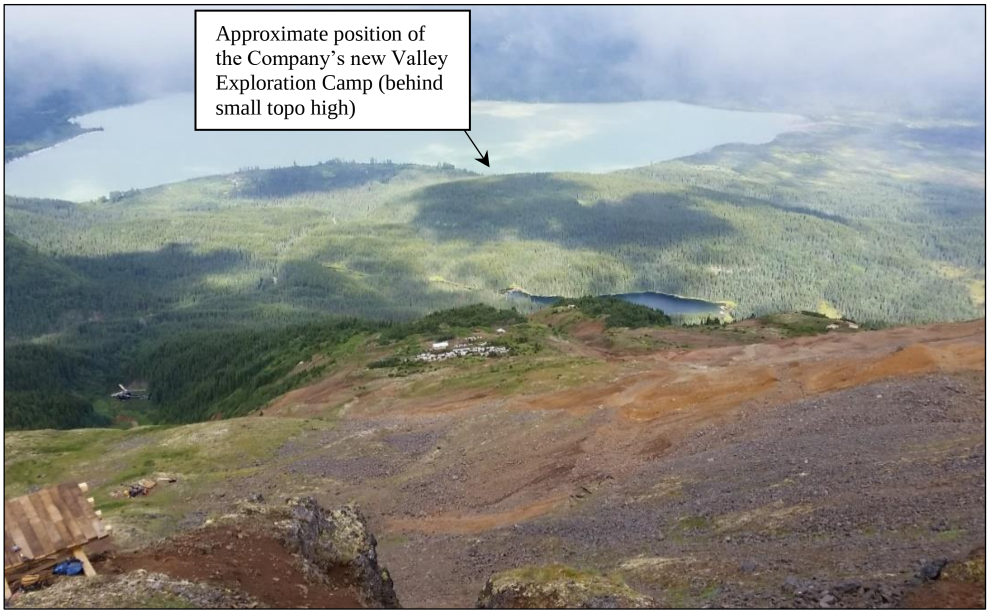


Figure 4.9 A General View of the Valley Exploration Camp in 2016 (looking approximately south), Spectrum Claims Block, Spectrum-GJ Property
(supplied by the Company)

4.7.2 GJ Claims Block

Following its acquisition of the GJ property, Company personnel winterized the then-existing exploration camp (Figure 4.10) and completed brushing of and minor repairs to the Willow Creek Forest Service Road (the "Willow Creek Road"), which affords access to more-or-less the geographic centre of the Project Area (see Section 5.3). As insurance against future environmental liabilities under its mineral exploration permit, the Company posted a C$103,000 with the B.C. government before commencing field work in 2016, which is the total required amount (see Sub-Section 4.8.3).

During the 2016 field season, a staging area and small diesel fuel tank farm were established at the end of the Willow Creek Road, from which the Company's two Project Area exploration camps are supported by helicopter. A portion of the then existing exploration camp was reclaimed and the remaining, helicopter-supported portion was utilized. Eight drillpads were built and, at the end of the 2016 season, reclaimed once drilling was completed. The Company has advised QP Brodie that the 1.45 ha of historical, un-reclaimed surface disturbances, left by previous operators, will be reclaimed (cleaned-up and re-contoured) following completion of work at the site. Apart from the remaining exploration camp, the historical surface disturbances include temporary trails for drill access, a drillcore storage facility, drillpad clearing, trenching and diamond drilling.

Figure 4.10 A General View of the Donnelly Exploration Camp in September 2015 (looking approximately west), GJ Claims Block, Spectrum-GJ Property
(supplied by the Company)

4.7.3 Nuttlude Group

To the best of QP Brodie's knowledge and understanding, no exploration activity has taken place on the Nuttlude Group of mineral claims. No environmental liabilities are, therefore, believed to exist.

4.8 Required Permits

The following text was compiled from information contained in various company documents, including the Company's 2015 and 2016 year-end, Annual Summary of Exploration Activities reports (for the Spectrum-GJ property) to the B.C. Ministry of Energy and Mines. Reference was also made to the Greenwood Report referenced in Section 2.5.

Exploration, development and mining on a mineral claim must be carried out in compliance with the 1996 Act, the Health Safety and Reclamation Code for Mines in B.C. and other applicable legislation. A Notice of Work and Reclamation ("NWR") must be filed with the Regional Inspector of Mines for any work that requires this under Section 10 of the 1996 Act. No mechanical disturbance of the ground and no excavation work can be carried out on a claim or lease without valid authorization.

4.8.1 Exploration Activity

In addition to a 1996 Act permit, an Occupant License to Cut ("OLTC") from the B.C. Ministry of Forests, Lands and Natural Resource Operations is required for the removal of up to 500 m^3 of timber. A Road Use Permit ("RUP") is required for Willow Creek Road.

4.8.2 Current Status – Spectrum Claims Block

Exploration activities by the Company to date on the Spectrum claims block has been carried out under Multi-Year, Area-Based ("MYAB") Permit Number MX1-813 for Mine Number 0100702. It was issued to the Company on July 15, 2010; it is updated annually to reflect the following season's planned exploration activities. The Company has also been issued an OLTC and a RUP for Willow Creek Road and, as earlier outlined, the Company has lodged a reclamation bond of C$113,000 with the B.C. Minister of Finance, which is the assessed amount required for reclamation of the exploration camp and drilling areas located on the Spectrum claims block.

Permit Number MX1-813, relating to the Company's NWR and Reclamation dated April 08, 2016, has been reviewed by QP Brodie. It permits the following activities through March 31, 2019:

- one 50 person camp and core logging facilities on the Spectrum claims block;
- a staging area and bulk storage of fuel at the end of Willow Creek Road;
- 50 line kilometres of ground geophysical surveys (Induced Polarization or "IP");
- surface drilling on up to 150 helicopter-supported drill sites / pads;
- excavation by hand and/or using a Candig mini-excavator of up to 50 small trenches;
- re-opening of 6.0 km of an historic mountain trial and 1.0 km of trail construction; and
- the cutting of up to 400 m^3 of timber.

According to the Company's analysis, as of the end of the 2016 exploration season:

- the balance of the Spectrum OLTC allows for the cutting of an additional 366.2 m^3 of timber; and

- the balance of the Spectrum MYAB permit allows for 34.4 line kilometres of geophysical surveys, drilling at 62 sites, trenching at 50 sites (2,500 m), the re-opening of 6.0 km of an historic mountain trial and the construction of 1.0 km of trail.

4.8.3 Current Status – GJ Claims Block

MYAB Permit Number MX-1-613, first issued on April 01, 2004 and relating Mine Number 0100700 on the GJ claims block, was transferred from Teck to the Company on October 20th, 2015. At the same time, a reclamation bond in the amount of C$103,000 was posted by the Company with the B.C. Minister of Finance, to replace Teck's bond and to cover the estimated cost of reclamation of the exploration camp and drilling areas (per MYAB Permit Number MX-1-613). Permit Number MX1-613, relating to the Company's NWR dated February 29, 2016, has been reviewed by QP Brodie. It permits the following activities through March 31, 2021:

- one 30 person camp and core logging facilities on the GJ claims block;
- 200 line kilometres of ground geophysical (IP) surveys, with no timber cutting;
- surface drilling on up to 100 helicopter-supported drill sites / pads;
- excavation by hand and/or using a Candig mini-excavator of up to 100 trenches or 5,000 m of trenching;
- the cutting of up to 50 m^3 of timber per year.

According to the Company's analysis, as of the end of the 2016 exploration season and apart from maintenance of an exploration camp and core logging facilities:

- the balance of the GJ MYAB allowed for 200 line kilometres of ground geophysical (IP) surveys, with no timber cutting;
- drilling at 92 helicopter-supported drill sites / pads; and
- trenching at 100 sites (5,000 m).

No timber cutting has taken place to date, not least because the area of exploration activity is above the tree line.

4.8.4 Future Exploration Activities

In the opinion of QP Brodie, the existing MYAB permits adequately cover the Company's short-term exploration plans for the Project Area. The Company has advised QP Brodie that further annual amendments will be sought, as appropriate, to cover future exploration activities. In QP Brodie's opinion, there is no readily identifiable reason to suppose that approvals for such amendments to the MYAB permits would not be secured.

4.8.5 Future Project Development Activities

The permit requirements, timelines and costs associated with project advancement through mine development to production and closure are discussed and described in Section 20.

4.9 Other Factors and Risks

Excerpts from applicable resource and protected areas management plans were used to compile the following text, along with information contained in the August 2014, April 2016 and May 2016 Technical Reports and the Greenwood Report that is referenced in Section 2.5.

4.9.1 Applicable Resource and Protected Areas Management Plans

The Project Area falls within the Cassiar Iskut-Stikine Land and Resource Management Plan ("CIS LRMP"; B.C. ILMB, 2000). LRMPs are sub-regional, integrated resource plans that establish the framework for land use as well as resource management objectives and strategies. The CIS LRMP (B.C. ILMB, 2000) was completed in October 2000, it encompasses an area of 5.2 million hectares that overlaps with the western portion of the Project Area (see also Sub-Section 4.9.2).

The CIS LRMP acknowledges the mineral and energy resource potential within the plan area. Under the plan, exploration and development of mineral deposits, as well as construction of access roads, are allowable activities outside of protected areas, providing they take place in full observance of relevant legislation. The CIS LRMP designated the area of the Spectrum claims block (defined in the plan as '*a developed gold-copper prospect*') as an Area-Specific Resource Management Zone called the Mount Edziza Zone. This zone is approximately 3,400 ha in size and includes specific objectives and strategies for distinct values including aquatic ecosystems and riparian habitat, recreation/tourism, visual quality, access management, mineral and energy resources and timber. The following abstracts are applicable to the Mount Edziza Zone:

- '*The intent of this zone is to promote a cooperative approach to managing mineral exploration, development and reclamation adjacent to a park. While mineral development is currently allowed in this zone, the intent in the long term is for the area to become part of Mount Edziza Provincial Park. To this end, any development in this zone should be undertaken in consideration of its eventual park status*'; and
- '*This zone will be available for staking, mineral exploration, and mine development for a period of 20 years from the date of LRMP approval. At the end of 20 years, if there are no mineral tenures in place, the zone will be added to Mount Edziza Provincial Park. If there are tenures in place 20 years from plan approval, the zone will be added to the park once tenures lapse*'.

The mineral claims that comprise the Spectrum claims block were, in the 1990s, included within the Mount Edziza Recreation Area. According to the Stikine Country Protected Areas Management Plan (2003) the Recreation Area status has been rescinded over the Spectrum claims block and the area is now designated as a Resource Management Zone. In this regard it is stated in the Stikine Country Protected Areas Management Plan (2003) that '*The Cassiar Iskut-Stikine Land and Resource Management Plan ("LRMP") also directed that a portion of Mount Edziza Provincial Park be converted to ELU Act protected area status to provide land access to mineral claims in the Mount Edziza Resource Management Zone (formerly the Mount Edziza Recreation Area) if required. If a road corridor is established, the balance of the protected area will be returned to Class A park status*' (non-staking reserve number 394436, called the Designated Access Corridor).

4.9.2 Mount Edziza Provincial Park Boundary

It is established in Sub-Section 4.2.2 that three sides of the Spectrum claims block, portions of the western margin of the North Block of GJ claims block and portions of the Nuttlude Group of claims are bounded by Mount Edziza Provincial Park. In the opinion of the Principal Author, this does not represent a significant factor or risk that will affect access, title or the right or ability to perform planned future work on the property, inclusive of openpit mining. This is stated because:

- the Project Area boundary has been adjusted such that it adjoins the boundary of Mount Edziza Provincial Park (i.e. it does not overlap it), per the discussions of Sub-Section 4.2.2;
- work, including openpit mining, is neither planned nor envisioned in areas immediately adjacent to the modified Project Area boundary (all project-related infrastructure and related activities have been planned such that they are as far away from the park boundary / the Project Area boundary as is practicably feasible); and
- as previously pointed out by Lally (2012), other mines located in B.C. operate within, or close to, Provincial Parks without difficulty (for example and as cited by Lally, Myra Falls Mine on Vancouver Island produces 1.4 Mt of Zn-Cu-Au-Ag mineralized material annually and is surrounded by the Strathcona Provincial Park [http://www.infomine.com]).

4.9.3 Access to the Spectrum Claims Block

Figures 4.2 and 4.3 identify a Designated Access Corridor to the Spectrum claims block, which extends over Mount Edziza Provincial Park land immediately south of the local Project Area boundary. The block of ground is designated as a Mount Edziza Protected Area under the Environmental Land Use Act and has a No Registration Reserve (#394436) under the Mineral Tenure Act. It has been set aside for possible future access to the Spectrum claims block, per the CIS LRMP. In the opinion of the Principal Author, this does not represent a significant factor or risk that will affect access, title or the right or ability to perform planned future work on the property, inclusive of openpit mining. This is stated because the access corridor was established in line with the CIS LRMP. No practicable alternative for accessing the Spectrum claims block to that described in Section 18 exists and, in any event, the following are stated in the CIS LRMP (BC ILMB 2000) and Stikine Country Protected Area Management Plan (BC WLAP, 2003):

- '*Access Management - Manage public use of any new access cooperatively between BC Parks and the responsible agencies in consideration of the park management plan for Mount Edziza Provincial Park*'; (BC ILMB 2000; page 102)
- '*Recommend that permits for a road through Mount Edziza Provincial Park be issued in a timely manner in the event of mine development being approved in the Mount Edziza Resource Management Zone. For advanced mineral exploration e.g., bulk sampling, consider allowing roaded access through Mount Edziza Park where reasonable review determines that no practicable alternative exists. Any decision to put a road through the park should be accompanied by an appropriate public review process.' (BC ILMB 2000; page 102)*

- *'Where roaded access is required, plan road layout to minimize visual impacts from Nuttlude Lake (e.g. using forest screening).' (BC ILMB 2000; page 102)*
- *'Work with the mining company and other land management agencies to minimize and mitigate impacts from access, mining exploration and mining activities on Mount Edziza Provincial Park and proposed Mount Edziza Protected Area values.' (BC WLAP 2003, page 106)*
- *'Install a gate on any road into and through the proposed Mount Edziza Protected Area. Deactivate the road after use associated with mining ends.' (BC WLAP 2003, page 106).*

It is further stated in the Stikine Country Protected Area Management Plan (BC WLAP, 2003) that if a road corridor is established and finalized, the balance of the access corridor will be upgraded to Class A Provincial Park and amalgamated into the Mount Edziza Provincial Park. The Principal Author has confirmed that the Company is aware of this requirement. However an easement totaling at least 25 m either side of the planned access road will be required for reasons of safety and to facilitate the location and construction of any future infrastructure that might include, but might not be limited to:

- a covered, overland conveyor to transport ROM material from the Spectrum Infrastructure Area ("SIA") to the Main Infrastructure Area ("MIA") for processing at the planned, central plant facility; and
- a powerline to supply electricity to the SIA.

Within the scope of the PEA, infrastructure planning is limited to an 8.0 m wide access road (graded dirt comprising non-acid generating rock) and two new, related bridges described in Section 18. This might in future change for the reasons described in Section 16.

4.9.4 General and Area-Specific Land Management Direction Components

The CIS LRMP defines specific land and resource management objectives and includes three management categories: General Management Direction; Area-Specific Management; and Protected Area Management. Objectives and strategies of the General Management Direction apply throughout the plan area, outside of Protected Areas, and include the following components:

- *'Biodiversity - Avoid disturbance of red- and blue-listed plants and plant communities when locating roads and mine infrastructure;*
- *Wildlife - Avoid disruption of the mineral lick along Tennaya Creek'* and '*Locate roads and mine infrastructure to minimize disruption of wildlife, in particular mountain goats during kidding season and the use of spring and summer range by mountain ungulates;*
- *Aquatic Ecosystems and Riparian Habitat - Maintain water quality and fisheries values, including within the Nuttlude Lake chain and its tributaries;*

- *Hunting, Trapping, Guide-Outfitting, Fishing*' - as per the General Management Direction ("GMD") that requires *'Backcountry and frontcountry protected areas in the Cassiar Iskut-Stikine LRMP Planning Area and Boya Lake Provincial Park will be managed to conserve natural, cultural and outdoor recreation values;*
- *Recreation/Tourism - Minimize potential to damage or destroy unique volcanic features (e.g. Pipe Organ Rock) during blasting;*
- *Visual Quality - As per GMD*' and '*where road access is required, plan road layout to minimize visual impacts from Nuttlude Lake (e.g., using forest screening); and*
- *Timber - Minimize the harvesting of timber during mine development (e.g., only harvest timber where necessary to clear mine sites and access roads). Timber required for mine construction should be harvested from outside the zone*'.

The GMD components summarized above, along with Heritage and Archaeology (see Sub-Section 4.9.10), have been considered within the scope of options analysis and related risk assessments for infrastructure planning for the Project Area (see Section 18).

4.9.5 Wildlife

Wildlife has been identified as an important environmental component for the Project Area and region, including the presence of large ungulates, grizzly bear and fur-bearers. Wildlife baseline studies on the Project Area have included: mountain ungulate summer aerial field study (Rescan, 2008); mountain ungulate winter aerial field study (RTEC, 2012a); mountain ungulate management plan (Hemmera, 2015); and mountain ungulate flight management plan (RTEC, 2016a). The studies found that significant populations of mountain goat and Stone's sheep appear to be distributed within the northern part of the study area, on Klastline Plateau, along with moose and a number of wolves (during the winter of 2012). Additional details on the wildlife studies and other environment baseline programs that have been completed to date (March, 2017) are provided in Section 20.1.

The Company respects and acknowledges the presence of wildlife on the Project Area and intends fully to ensure that its planned activities will incur the minimum practicable impacts on wildlife, within the Project Area. To this end, the Company has developed and implemented an Ungulate Management Plan that includes designated flight paths for helicopter activity during exploration, as well as consideration of potential wildlife impacts as part of the planning process for Project Area infrastructure.

4.9.6 Commercial Hunting and Guiding Rights

The Company acknowledges that Kinaskan Lake Outfitters holds the commercial hunting and guiding rights for Klastline Plateau and the areas of the Donnelly Deposit and Central Zone. As part of its work on the Project Area, the Company has verbally agreed to discuss its operations and mitigation of the potential effects of its activities on the Project Area on Kinaskan Lake Outfitters' operations. In the opinion of the Principal Author, this does not represent a significant factor or risk that will affect access, title or the right or ability to perform planned future work on the property, inclusive of openpit mining, the areas of which will be secured to preclude potentially adverse human and wildlife interactions.

4.9.7 Aboriginal Land Claims, Rights and Title

The Company recognizes and respects that the Project Area lies within the asserted traditional territory of the Tahltan Nation. The Tahltan collectively hold rights to hunt, fish, trap and harvest berries and other food and medicinal plants throughout their asserted traditional territory. As far as is known by the Company, the Tahltan Nation is the primary claimant of Aboriginal rights and title in the Project Area.

Aboriginal Rights and Title is a complicated matter. The following information is extracted from AME B.C. Aboriginal Engagement Guidebook (http://www.amebc.ca/docs/default-source/AE-Guidebook/aboriginal-engagement-guidebook-(revised-may-2015).pdf?sfvrsn=0). It is provided for information purposes only and may, therefore, not be complete, accurate or current:

'*The provincial and federal governments have a duty to consult, and where appropriate, accommodate Aboriginal peoples whenever they consider a decision or activity could impact Aboriginal or treaty rights. This duty stems from Canadian common law as expressed in court decisions. While the Province of British Columbia (or the federal government, as appropriate) is ultimately responsible for ensuring adequate and appropriate consultation and accommodation, the government often requests and encourages the company to contribute to the consultation process by engaging with potentially affected Aboriginal communities. Aspects of the consultation process involves:*

- *providing information about the proposed project to First Nations early in the planning process;*
- *obtaining and discussing information about specific Aboriginal interests that may be impacted with First Nations;*
- *considering modifications to plans to avoid or mitigate impacts to Aboriginal Interests;*
- *documenting engagement, specific Aboriginal Interests that may be impacted, and any modifications to address concerns; and*
- *providing this documentation to local Aboriginal groups and appropriate government agencies*'.

The Tahltan traditional territory encompasses approximately 93,500 km^2 and the Tahltan population is estimated by the Tahltan Central Government ("TCG") to total approximately 5,000 people, of which an estimated 1,000 people live within the Tahltan traditional territory at three communities located at Dease Lake, Telegraph Creek and Iskut (see Section 5.2). These communities rely primarily on the public sector and natural resource industries for economic opportunities (TNDC, 2007; ATCO Group, 2011).

The Tahltan traditional territory is rich in mineral resources and as such, the Tahltan have a long history of cooperation with the mining and exploration sectors. The Tahltan are also an important source of both skilled and semi-skilled labour. The Tahltan Nation Development Corporation ("TNDC"), a local and regional employer, has been involved in mining, road construction, hydroelectric power generation, forestry, catering, custodial work, heavy construction, road development and transportation (TNDC, 2007; ATCO Group, 2011). Mining projects with which TNDC has been involved have included the Snip, Eskay Creek, Red Chris and Golden Bear mines.

4.9.8 First Nations Land Use

The Tahltan Nation people have historically traveled extensively throughout their territory, based on seasonal cycles of fishing and hunting, to collect obsidian and to trade with other native groups. Fishing is an important traditional activity for the Tahltan who have numerous fish-bearing river systems running through their territory. Wildlife species important to Tahltan traditional culture include moose, black bear, grizzly bear and mountain goat. Caribou might traditionally have also been highly valued in some areas of the Tahltan territory. Generally, wild game provides the bulk of the diet for Tahltan families. Both hunting and fishing continue to be important subsistence activities.

The Company understands and respects that Tahltan Nation land use in their traditional territory includes camping, subsistence fishing, hunting, access trails, plant and berry harvesting and trapping. In this regard the Company understands and respects the fact that Tahltan members of local communities regularly hunt moose, caribou, sheep, goat and groundhog in the vicinity of the Project Area. The Company further understands that Tahltan people are active users of the Stikine Country Protected Areas and are interested in commercial opportunities within the protected areas systems.

4.9.9 First Nations Commitments and Agreements

Tahltan governance is administered through the band system under the Federal Indian Act (1985), with an elected chief and council who oversee the daily social and economic affairs of the community. The Tahltan Nation is comprised of two bands, the Iskut First Nation and the Tahltan Band (MARR 2008). The TCG represents the two bands and is governed by an Executive Committee and a Board of Directors comprised of family representatives, with an Elders Advisory Council providing guidance. The Tahltan Heritage Resources Environmental Assessment Team ("THREAT") represents the TCG on matters related to consultation and engagement with resource development.

In addition to the Company's environmental commitments stated above, the Company has committed to work closely with the TCG, with its agencies and with Tahltan Nation-owned businesses to identify and maximize employment and contracting opportunities arising from its mineral exploration and project development activities. To this end the Company and the TCG (the "Parties") have signed a Communications Agreement (see the Company news release dated January 24, 2017), which provides:

- guidance to the Parties for on-going discussions and engagement regarding the Company's projects in Tahltan Nation traditional territory;
- a framework for the sharing of information and for joint participation of the Parties in communications with Tahltan Nation membership and communities regarding the Company's activities in the territory; and
- the Company's on-going dialogue with THREAT ensures wildlife, environment and heritage values are readily identified and considered.

4.9.10 Heritage and Archaeology

The Heritage Conservation Act protects all archaeological sites, whether on provincial or private land, that predate AD 1846 (i.e. pre-contact). Burial sites and rock art sites are protected, regardless of age.

Archaeological Overview Assessments

In 2007, CGH contracted Rescan Tahltan Environmental Consultants ("RTEC") to complete an Archaeological Overview Assessment (the "AOA") of the area of the Donnelly Deposit. The AOA consisted of several components including: background research on the Project Area; a field visit to assess archaeological potential of the terrain; compilation of the information to assess the potential for archaeological resources; and the development of recommendations for further work, if required. No archaeological materials were located. However, at the south end of the Project Area a deeply incised trail was observed, following along the edge of Klastline Plateau, immediately south of the proposed location for the exploration camp, from where it travels west along a rock outcrop before descending towards Kakiddi Lake (RTEC, 2007). The top of the outcrop provides an excellent look-out over the plateau area, thereby providing a viewpoint to scout for game animals. Additional research would be needed to confirm whether this was a trail created and/or used by people pre-contact.

Archaeological Impact Assessments

RTEC (2007) reported that there likely is a moderate to high archaeological potential in the Project Area and recommended that prior to any ground altering activities, an Archaeological Impact Assessment ("AIA") should be carried out, which was duly the case in 2011, 2012, 2013, 2015, 2016, the latter two years as part of the Company's due diligence prior to drilling or other ground disturbance during the Company's exploration programs.

AIAs are carried out under a Section 14 Permit, pursuant to the Heritage Conservation Act. The assessment typically involves low-slow aerial surveys, followed by pedestrian surveys in areas of potential interest and subsurface testing (shovel tests) to find potential buried archaeological remains. Once sites have been identified as archaeological sites, the area with a 50 m buffer zone is marked as a No Work Areas on relevant plans. Should further work or ground altering activities be planned in these areas, a Site Alteration Permit under Section 12 of the Heritage Conservation Act ("SAP") would be applied. SAPs detail the management, mitigation and monitoring steps that are deemed appropriate for the site. The Company has advised the Principal Author that it will continue to complete AIAs, as required under the Heritage Conservation Act. Further to RTEC's recommendations, the Tahltan Archaeological Chance Find Procedure was developed to address the possibility of archaeological materials being encountered during exploration activities. The Company has adopted the Tahltan Archaeological Chance Find Procedure throughout the Project Area.

Site Alteration Permits

Once an area has been identified as an archaeological site, the area within a 50 m buffer zone is marked as a No Work Area on relevant plans. Should further work or ground altering activities be planned in these areas, a SAP would be applied. SAPs detail the management, mitigation and monitoring steps that are deemed appropriate for the site.

Current Status

Overall and to date, 14 archaeological sites have been identified throughout the Project Area (RTEC 2011e; 2012b; 2012c; 2013; 2015; 2016b; 2017). The sites primarily comprise of obsidian artifacts called lithic find and lithic scatter. RTEC (2013; 2015;

2016b) reported that such lithic finds are primarily debitage, which are waste flakes, chips and spalls produced during the manufacture and maintenance of lithic tools. The artifacts are believed by RTEC (RTEC, 2015) to either be carried by fluvial action from a site or obsidian source, or be carried from obsidian quarries located within Mount Edziza Volcanic Complex, at least 10 km southwest of the Project Area.

The Principal Author has confirmed that the known archaeological sites have been marked as No Work Areas on relevant Project Area maps. At the request of the Tahltan Nation, the locations of the archaeological sites is kept confidential and is not shown on any maps or plans intended for public dissemination.

<u>PEA and General Project Planning</u>

To the extent possible (and limited only by available data), consideration of heritage and archaeology formed part of the Project Area infrastructure planning process described in Section 18. If areas identified for planned infrastructure have not had AIAs carried out, the Company confirmed that they will be completed at the appropriate time or times and infrastructure planning will be adjusted, as appropriate and if required. Additional details of the heritage and archaeology of the Project Area are presented in Section 20.

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

The Principal Author is responsible for this section of this Technical Report. He compiled portions of the text from information contained in the Bridge Inspection Reports and Winter Trail Report referenced in Section 2.5, as well as information contained in the April 2016 and May 2016 Technical Reports. Various additional data was sourced on-line, from the websites cited in the following text. Key elements of the presented data were verified by the Principal Author, through observations made during his October 2015 and October 2016 site visits and by means of conversations held with Company personnel. Past information has been updated only when it was relevant to do so and/or when it was clear that additional information was required.

5.1 Topography, Elevation and Vegetation

The Project Area is located in the Northern Boreal Mountains Ecoprovince and lies in the Northern and Central Plateaus and Mountains physiographic region that is dominated by folded and faulted volcanic and sedimentary rocks originated in the Mesozoic era (Valentine *et al*., 1978). The topography changes dramatically across the Project Area, from the gently rolling hills of the southern portion of Klastline Plateau in the east, to the lowland valleys of the Iskut and Little Iskut rivers to the south, and the more mountainous and moderately rugged area to the west. Deeply incised creek valleys cut into the margins of Klastline Plateau, thereby creating locally steep slopes and cliffs. A few small glaciers and permanent snow fields are present in the general vicinity of the Project Area, but not in the areas of the proposed pits or related infrastructure.

The western margin of the Project Area is defined by the eastern slope of a small, flat-topped mountain that is dissected by east- to northeast-flowing streams and their tributaries. The Project Area is bounded by the Kinaskan, Tatogga and Eddontenajon lakes to the east and the Nuttlude, Kakiddi, Mowchilla and Mowdade lakes to the west. Glaciers occur at higher elevations to both the west and northwest.

The area is moderately rugged with elevations ranging from approximately 760 m to the south to 2,100 m in the plateau area and approximately 2,500 m on local mountain tops. The mineralization that is the subject of this Technical Report is located at elevations of approximately 1,550 m in the west (Spectrum Pit) and between approximately 1,400 m and 1,740 m across the plateau area to the east (Donnelly Pit).

Klastline Plateau is dominantly characterized by the Boreal Altai Fescue Alpine and Spruce Willow Birch biogeoclimatic ecosystem classification zones, with a variety of vegetation ranging from alpine graminoid and forb meadows, rock and lichen, with occasional shrubs and stunted spruce in hollows or wind-protected areas. The lower elevations fall within the Spruce-Willow-Birch zone, where birch and slide-alder are common at the lower elevations along creek valleys, while spruce and sub-alpine fir are common along the steeper slopes. The tree line is at approximately 1,370 m a.m.s.l.

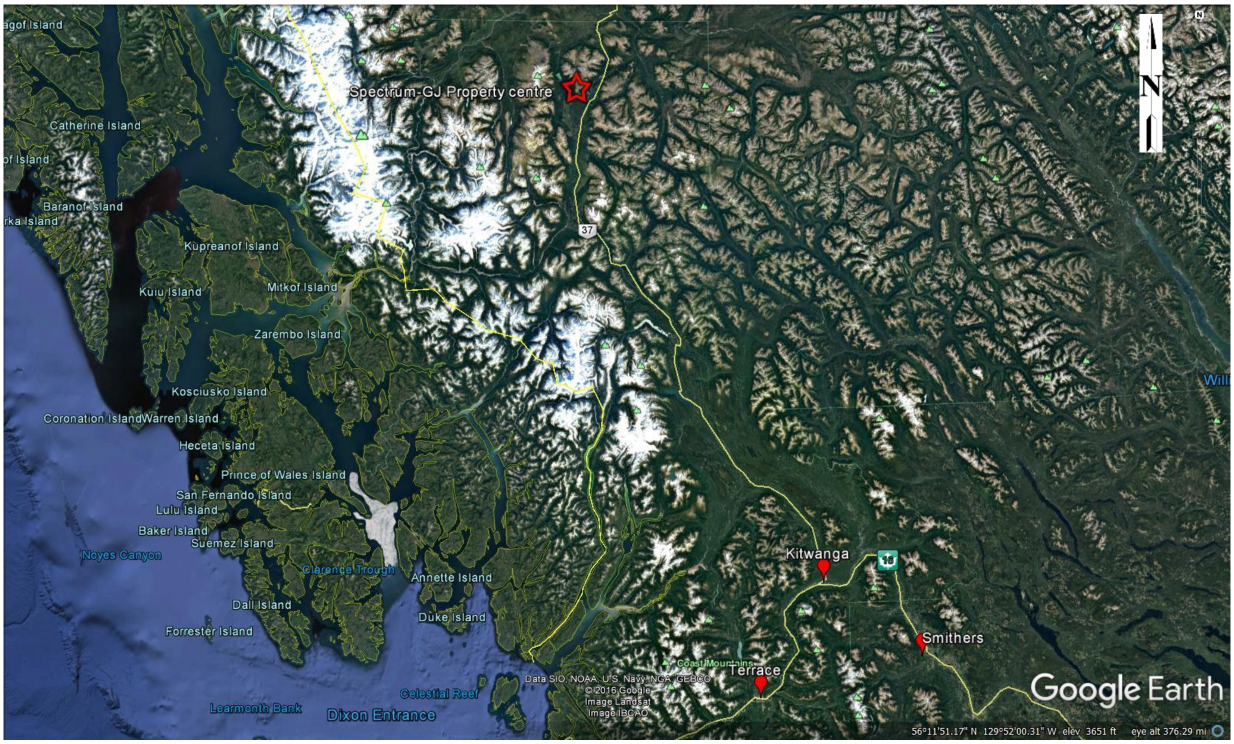
The Boreal White and Black Spruce zone is also present within the Project Area, at lower elevations near lakes to the north, as are the Engelmann Spruce Subalpine Fir and Sub-boreal Spruce zones. The dominant tree species are Engelmann spruce, sub-alpine fir and pine. Much of the southern portion of the Project Area has been affected by a recent forest fire, salvage logging and forest development, resulting in a large area of low elevation, early seral stage vegetation (Rescan, 2008).

5.2 Population Centres and Transport

5.2.1 Terrace and Smithers

Terrace, B.C. ("Terrace") and Smithers, B.C. ("Smithers") are the main population centres in the general area of the Spectrum-GJ property. Smithers is approximately 377 km to the south-southeast of the Project Area's centre point (the "Property Centre"). Terrace is approximately 362 km from the Property Centre (Figure 5.1). According to available census results (source: http://www.bcstats.gov.bc.ca/StatisticsBySubject/Census/2011Census/PopulationHousing/MunicipalitiesByRegionalDistrict.aspx), in 2011 Terrace had a population of 11,310 people and Smithers had a population of 5,404 people.

Figure 5.1 A Google Earth Image Showing the Locations of the Spectrum-GJ Project Area and Major Regional Centres



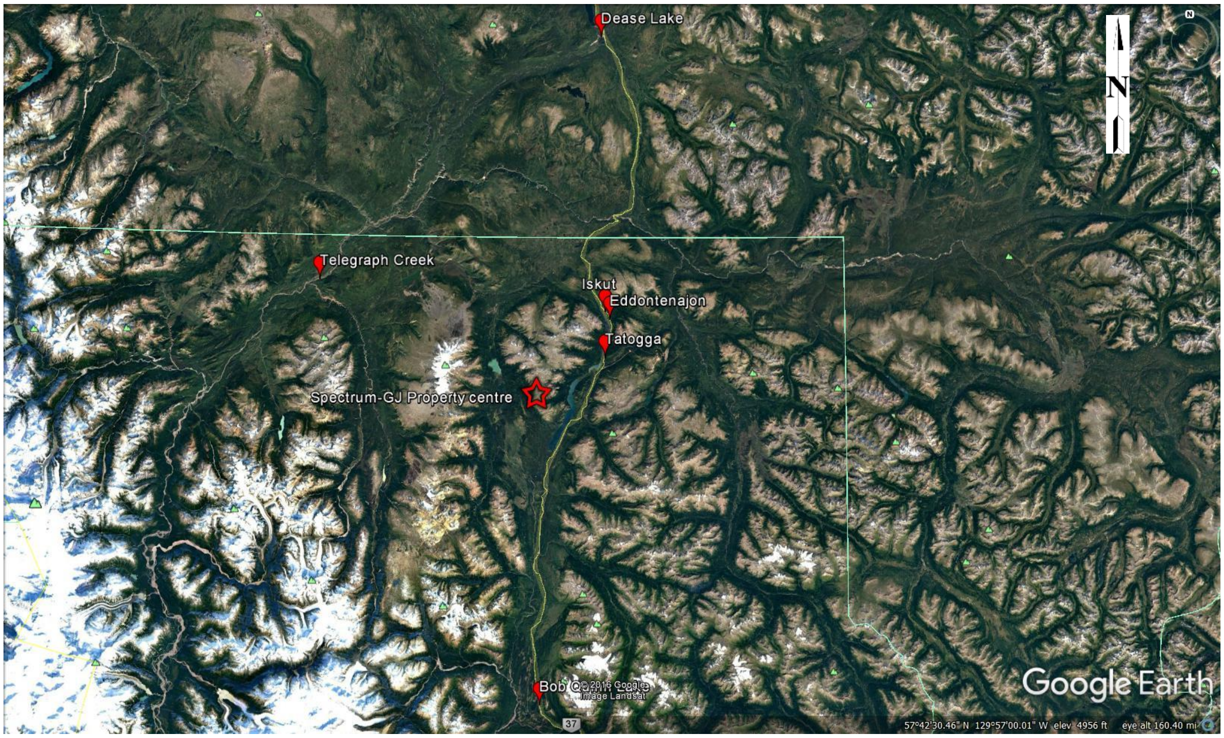
A broad range of facilities are available at both Terrace and Smithers, including airport facilities with regular flights to major centres such as Vancouver, B.C. and Toronto, Ontario. Both Terrace and Smithers are served by a railway line that is owned by CN Railway Company ("CN Rail"). The line extends from Prince Rupert on the B.C. coast and is linked to the North American rail network.

A railway roadbed, including many of the required bridges, was constructed in the mid-1980s, approximately 30 km east of the Project Area. This was part of BC Railway Company's ("BC Rail") plan to extend track to Dease Lake. In 2004, BC Rail was purchased by CN Rail. To the Principal Author's best knowledge and understanding, there are at present no plans to make this railway line operational.

5.2.2 Dease Lake

Dease Lake, located approximately 89 km to the north-northeast of the Property Centre (Figure 5.2), is the largest settlement on Highway 37. It is the service and government centre for residents of the region. The seasonally variable population peaks during summer months at around 450 people. The settlement includes a hardware and grocery store, banking services, a nursing station, a school, gas station, hotels and a seasonal restaurant. Recreation facilities include a community hall, a public library, an indoor skating rink and a school gym.

Figure 5.2 A Google Earth Image Showing the Locations of the Spectrum-GJ Project Area and Local Population Centres



Tahltan Reserve No. 9 is located at Dease Lake, as are the offices of TNDC and the TCG. The B.C. government has a Service B.C. office offering licenses, permits and other services. It also serves the communities of Lower Post, Good Hope Lake, Telegraph Creek and Iskut. Other public offices include School District No. 87, Northern Lights College, an RCMP detachment, a health clinic, a B.C. Ambulance Unit and, during summer months, a provincial forest fire fighting base.

Helicopter and fixed-wing charter air services are available at the Dease Lake airport (IATA: YDL, ICAO: CYDL). The airport has a paved runway capable of handling small commercial aircraft. A scheduled service from Prince George is operated during spring and summer months.

5.2.3 Iskut

The nearest significant settlement to the Project Area is the village of Iskut, located some 26 km to the northeast of the Property Centre (Figure 5.2). Most of the population of approximately 330 people are members of the Iskut Band of the Tahltan Nation. Iskut has a post office, gas station/grocery store, a school, fire station, community centre with an ice arena, community health facility and a Band office. The community serves as a staging area for the Mount Edziza and Spatsizi Plateau wilderness parks.

5.2.4 Telegraph Creek

A third Tahltan Nation community is located at Telegraph Creek, some 60 km to the west-northwest of the Property Centre and some 112 km from Dease Lake. It is situated beside Stikine River, at the foot of Stikine River Canyon, and it has a population of approximately 350 people. The majority of the residents are members of the Telegraph Creek Band of the Tahltan Nation. The settlement includes an airstrip, store and cafe, post office, police station, school, church and a small museum, as well as a nursing station.

5.2.5 Tatogga and Eddontenajon

Limited seasonal accommodation, communications and garage facilities are available at Tatogga Lake Resort, located approximately 19 km north-northeast of the Property Centre, as well as at Eddontenajon, some 2 km south of Iskut. There are helicopter staging areas, covered storage and local expediting services at both Tatogga and Eddontenajon, which are often used to assist with both the receiving and shipping of supplies and samples to and from Terrace or Smithers.

5.3 Means of Access

5.3.1 By Air

There is a scheduled air service, three times a week during the spring and summer months only, to Dease Lake from Prince George. As previously noted (Sub-Section 5.2) charter aircraft, both helicopter and fixed-wing, are available at Dease Lake Airport, which has a year-round and regularly maintained airstrip. Similar facilities are available at the unpaved Iskut airstrip and at the unpaved Bob Quinn Lake airstrip, located some 75 km due south of the Property Centre, adjacent to Highway 37. Infrastructure planning for project development includes the use of the airport facilities at Dease Lake and/or Bob Quinn Lake as staging posts for personnel, materials and equipment, with personnel bussed to the Project Area and materials and equipment trucked to the Project Area, as appropriate.

5.3.2 By Highway

Access to the general Project Area is gained via the two lane, paved Highway 37 (Stewart-Cassiar or Dease Lake Highway) that extends north from Kitwanga, B.C. (“Kitwanga”, Figure 5.1) to the Alaska Highway, near the Yukon community of Watson Lake. Kitwanga is located adjacent to Provincial Highway 16 (Yellowhead Highway), some 242 km by road from Prince Rupert and some 486 km by road from Prince George in central B.C.

5.3.3 Willow Creek Road

During the exploration phase of project development, access to more-or-less the geographic centre of the Project Area was by Willow Creek Road (Figures 5.3 and 5.4), a public, 4.0 m wide, graded dirt road with a maximum gradient of approximately 10%. The Company holds a non-exclusive Road Use Permit for industrial use of this road, issued by the Ministry of Forests, Lands and Natural Resources Operations, and is responsible for its maintenance. The road extends approximately 23.5 km from its turning off at Highway 37 to the Company's staging and fuel storage area (see Figure 5.3). It is from the Company's staging post that, starting in 2016, the Company's exploration camps and drillpads, etc were supported by helicopter.

Bridges cross Iskut River and Little Iskut River. The former comprises three spans of 'I' section steel over 57.7 m (see Figures 5.5 and 5.6) and the latter comprises one span of 'I' section steel over 56.4 m (see Figures 5.7 and 5.8). Both bridges were inspected in 2014, by a professional engineer from B.C. Forestry and Range (the Certificates of Inspection have been reviewed by the Principal Author). Both bridges were found to be in fair to good condition; the need for some minor repairs was identified. Both bridges were rated as having Gross Vehicle Weight ("GVW") carrying capacities of 68 t.

A replacement date of 2034 was identified in the 2014 inspection report for Iskut River Bridge and a replacement date of 2040 was identified for Little Iskut River Bridge. Infrastructure planning for project development includes additional professional bridge inspections, upgrades as identified and required by virtue of the inspections, and bridge replacements on or before the stated replacement dates. Details of this planning are presented in Section 18, which planning for project development through to production also includes:

- upgrades to Willow Creek Road and construction of new road sections to by-pass the planned tailings storage facility ("TSF") and to extend across the Designated Access Corridor to the Spectrum claims block (which alignment requires the construction of two new bridges); and
- construction of internal access roads leading to the planned operations' centres, pit areas and surface water by-pass ditches.

Figure 5.3 The Existing Infrastructure and the Claims Area Boundary, Spectrum-GJ Project Area (supplied by the Company)

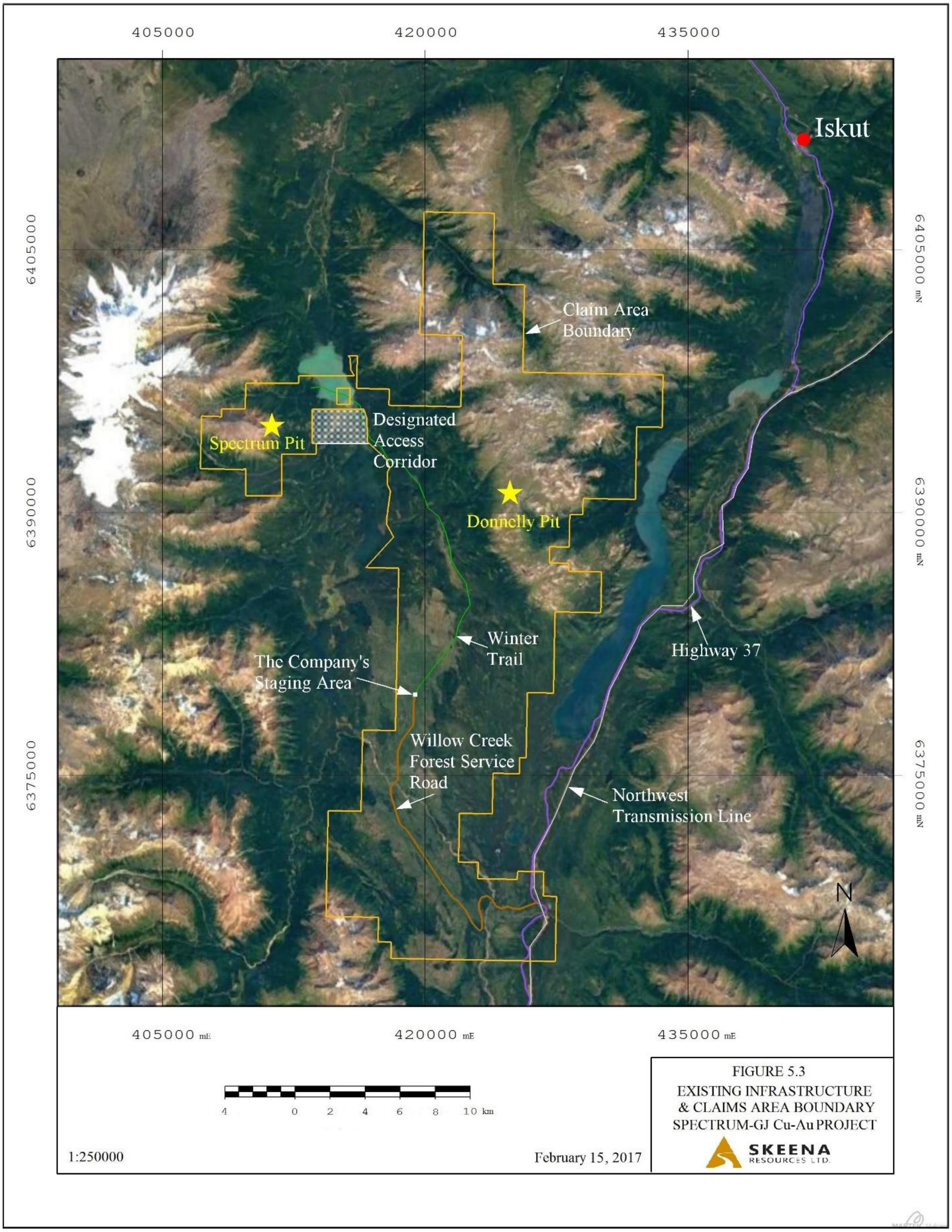


Figure 5.4 Willow Creek Forest Service Road (looking northeast), Near Little Iskut River Bridge, Spectrum-GJ Cu-Au Project Area
(supplied by the Company)

Figure 5.5 The Wooden Deck of Iskut Bridge (looking north-northwest), Spectrum-GJ Project Area
(supplied by the Company)

Figure 5.6 The Steel I Beams of Iskut Bridge (looking north-northwest), Spectrum-GJ Project Area (supplied by the Company)

Figure 5.7 The Concrete Deck of Little Iskut Bridge (looking northeast), Spectrum-GJ Project Area (supplied by the Company)

Figure 5.8 The Steel I Beams of Little Iskut Bridge (looking approximately north), Spectrum-GJ Project Area
(supplied by the Company)

In the opinion of the Principal Author, there is no practicable alternative to using the Willow Creek Road and its planned extensions for accessing the Project Area, infrastructure areas and deposits of interest. Similarly, there is no readily identifiable reason to suppose that the existing access roads and bridges, their planned upgrades and the planned extensions to Willow Creek Road will not be sufficient to meet at least the Company's medium-term needs. The heaviest vehicles that are planned to use Willow Creek Road and its extensions will be loaded and covered B-Train type road trucks with GVWs limited to 45 t (thereby allowing for safety factors approximating to 1.5 for the bridges' GVW ratings stated above). Where possible, planning encompasses the transport of heavy equipment, during the construction phase of project development, in lots weighing no more than 45 t, inclusive of the transport vehicle. If heavier loads are anticipated or required, the Ministry of Transportation and Infrastructure regulations will be followed as appropriate and for the individual case. For example and as minimum, when total weights greater than 45 t are moved across the existing bridges, a suitably qualified and certificated supervising engineer will be present at all times. The bridges will also be strengthened with stiffening plates and/or bracing, in accordance with the requirements or recommendations of the transportation contractor and/or supervising engineer.

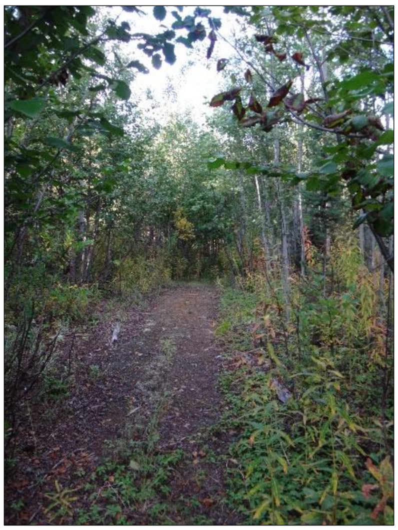
5.3.4 Winter Trail and Other Trails

The Winter Trail extends from the end of Willow Creek Road, through the heart of the Project Area and to the southern shore of Nuttlude Lake (Figure 5.3). It comprises an extensively overgrown, 1.0 m to 3.0 m wide, mostly ungraded cat trail with several sections of graded fire breaks. Its alignment has been overflown (by helicopter) by the Principal

Author and it has been walked by Company Geologists. While significant lengths of its alignment can clearly be seen from the air, it can be difficult to follow on the ground. Overall its alignment contains many steep up-slope and down-slope sections, as well as many sharp turns. Figure 5.9 is a collage of five photographs that demonstrate the variable conditions along the existing trail. Several other cat trails or rough roads access the Central Zone and Donnelly Deposit area. Their condition is poor, except in the immediate area of the Donnelly Deposit where they are in reasonable condition and passable by small utility vehicles.

Figure 5.9 A Collage of Five Photographs of Portions of the Winter Trail Showing Its Often Overgrown Nature and Occasional Steep Sections, Spectrum-GJ Project Area (supplied by the Company)

At 419,661 m east, 6,379,968 m north
Level, open ground

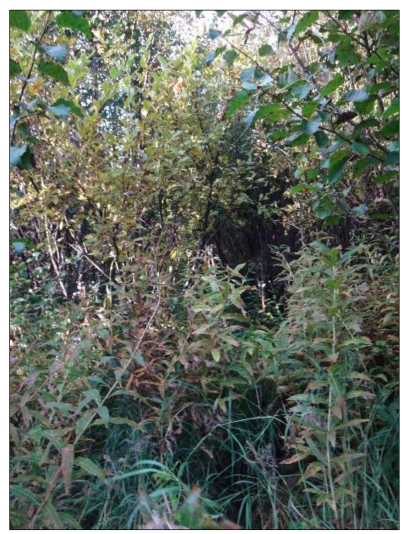


At 419,695 m east, 6,380,139 m north
25º slope, willow and alder growth

At 419,569 m east, 6,379,796 m north
Light to mod. balsam & alder growth

At 419,569 m east, 6,379,796 m north
Moderate willow and brush overgrowth

At 419,499 m east, 6,379,689 m north
Dense Willow Overgrowth



5.4 Climate and Operating Season

The climate in northwest B.C. is northern temperate to subarctic, with moderately warm summers and dry, cold winters. Climatic longitudinal and elevation gradients are located throughout the area due to influences such as mountain ranges, valley confluences, rain shadows and wind conditions, resulting in local climatic variations and even micro-climates. During the winter, temperature inversions can result in colder temperatures in valley bottoms than on the peaks, and chinook winds can result in rapid temperature changes.

Dease Lake is the closest population centre for which climate data is available (see http://www.deaselake.climatemps.com), but the weather patterns are sufficiently dissimilar to those found across the Project Area that the available data are not presented here. The Principal Author has instead relied on information contained in a consultancy report prepared for Teck by RTEC entitled 'GJ/Kinaskan Copper-Gold Porphyry Project, 2005 to 2008 Meteorology Data Report' and dated October 2011 (RTEC, 2011a). The data contained therein was captured from an automated meteorological weather station, located on Klastline Plateau, that '*collected data for the following parameters; wind speed and direction, air temperature, relative humidity, precipitation, and snow depth*' (see also Section 20).

5.4.1 Average Temperatures

Typical daily average temperatures across the Property Area vary between minus 18°C in winter (November through January) and plus 13°C in summer. The average, minimum and maximum monthly temperatures recorded by the meteorological station on Klastline Plateau ranged from minus 15.6°C to plus 12.8°C, minus 17.8°C to plus 11.4°C and minus 13.4°C to plus 17.8°C, respectively.

5.4.2 Wind Direction and Speeds

It is stated in RTEC (2011a) that '*The predominant wind direction was from the south*' and '*The predominant wind speed on Klastline Plateau is greater than 6 m/s and occurred approximately 30% of the time. Wind speeds were calm (i.e. hourly average wind speed less than 1 m/s) only about 3% of the time. The maximum wind speed was 47.9 m/s and was recorded during July 2008*'. A maximum instantaneous wind speed of 47.9 m/s equates to a wind speed of 172 kph.

5.4.3 Rainfall

A rain shadow effect caused by the Boundary Ranges limits the amount of moisture (hence snow) carried from the coast by the prevailing winds. The Stikine Plateau has a similar but moderated hydrologic regime with the spring freshet being the most common peak flood event of the year.

Rainfall is highest from May to September; it averages approximately 500 mm per year across the western portion of the Property Area and approximately 650 mm to the east (it is stated in RTEC, 2011, that '*Annual precipitation ranged from 567 to 574 mm during the two complete calendar years (2006 and 2007) but was likely affected by undercatch due to rime icing and high wind speeds*'). Fall precipitation events can generate large annual peak flows, but they are infrequent (Melymick, 2013). Unverified information suggests that rainfall during storm events can total at least 50 mm in approximately 12 hours.

5.4.4 Snow

Snow typically falls across the Project Area between October and April. In common with rainfall, the amount reflects the local topography: it typically varies from fairly thick accumulations across the west of the Property Area to, at worst, moderate accumulations in the valleys and on Klastline Plateau in the east. RTEC states that '*The maximum annual snow depths recorded during the measurement period* (on Klastline Plateau) *ranged from 85 cm to 110 cm and were recorded during mid-April*' (RTEC, 2011a). Overall, the Project Area is in the rain shadow of Mount Edziza, with the result that it receives significantly less snow than the Coast mountain range to the west.

The evidence of tree growth patterns suggests that a minor snow avalanche hazard exists on the west slopes of the Spectrum claims block, due mainly to the steep slope gradients. The avalanche season typically begins in early October at the higher elevations, and it often extends until late June or early July. Avalanches may be experienced from late October to late May in valet bottoms (Canadian Avalanche Association, 2017). Start zones are generally above 1,400 m within the alpine zone (Schwab, 2015).

5.4.5 Fieldwork and Operating Seasons

Fieldwork can normally start at lower elevations in early June and at upper elevations by July. Cold weather, winds and snow squalls can make fieldwork difficult at upper elevations past September, although drilling has continued into November on Klastline Plateau.

In the opinion of the Principal Author, there is no readily identifiable reason to suppose that with the exception of periods of extreme weather, mine production activities could not continue year round. Occasional and minor snow avalanches could, however, affect production activities in the planned Spectrum Pit. Both fieldwork and mine production activities are facilitated by the annual average of 12 daylight hours per day, rising to approximately 14.7 hours per day through June to early November.

5.5 Surface Rights, Power, Water and Personnel

5.5.1 Surface Rights

The existence of the Spectrum-GJ mineral claims is recognized within the CIS LRMP (see also Section 4.9). Mineral exploration, mine development and associated access continue to be recognized as appropriate activities within the CIS LRMP.

To the Principal Author's best knowledge and understanding, no restrictions as regards access to the Property Area or access within and across the Property Area exist, the latter for the reasons described in Section 4.4:

- save for the Nuttlude Group of mineral claims in which the Company has a 50% interest, the Company is the 100% owner of the mineral claims that comprise the Property Area;
- mineral claims are administered by the B.C. Ministry of Energy and Mines, according to the 1996 Act;

- it is through the 1996 Act that a mineral title holder is granted the right to use the surface of the held claim or claims for the exploration and development or production of minerals and all operations related to the business of mining;
- nearly all of the planned infrastructure for project development through to production is located on mineral claims that are 100% owned by the Company (the exception is the Designated Access Corridor identified on Figure 5.5 and discussed in Sub-Section 4.9.3); and
- as previously stated (Sub-Section 4.2), all project-related infrastructure and related activities have been planned such that they are as far away from the park boundary/the Project Area boundary as is practicably feasible.

As previously noted (Section 5.3), access to the Spectrum Pit area will require the construction of a new road and two new bridges within the Designated Access Corridor identified on Figure 5.5 and discussed in Sub-Section 4.9.3. This and related infrastructure planning for project development through to production is described in Section 18.

5.5.2 Power Supply

Hydroelectric power is available through B.C. Hydro's 287 kV Northwest Transmission Line (see Figure 5.3 and BC Hydro's news release dated August 13, 2014 available on www.bchydro.com). Infrastructure planning for project development includes a new off-take sub-station located on a Company mineral claim, adjacent to the Willow Creek Road turnoff from Highway 37, as well as a new, approximately 32 km long powerline extending to a project site sub-station located at the MIA. It is at the MIA where the camp, plant and other key infrastructure will be located (see Section 18).

5.5.3 Water Supply

No specific plans concerning mining, process, potable and fire water supplies have been formulated within the scope of the PEA. However, abundant water is locally available. In the Principal Author's opinion, there is no readily identifiable reason to suppose that sufficient water resources to service the needs of the planned Spectrum-GJ operations could not be secured from a combination of waterwells and runoff. Infrastructure planning for project development includes recycling water pumped from the planned TSF. A formal waterwell location study, pumping test program and other hydrogeologic studies are recommended, going forward (see also Section 5.9).

5.5.4 Personnel

A number of experienced and qualified operators, who were trained and are (or were) working at active and closed mines in the general region of the Spectrum-GJ project, are based in the Tahltan Nation communities at Dease Lake, Iskut and Telegraph Creek. Unskilled and skilled personnel are also available at many regional and provincial centres such as Terrace, Smithers and Prince George.

The Company has advised the Principal Author that it intends to continue to maximize employment opportunities for Tahltan Nation members at the Spectrum-GJ project, subject to skills and suitability, by actively recruiting and training employees from the local area. This will form a key element of the Company's overall project development plan that includes the fly-in/fly-out cycling of appropriately skilled crews and staff to the airport facilities at either Dease Lake and/or Bob Quinn Lake, from where personnel will be bussed to site where they will be accommodated at a central camp facility. Bussing personnel from the local population centres at Iskut, Telegraph Creek, Eddontenajon and Tatogga and will also be carried out, as required and appropriate.

Expediting services, drilling contractors and heavy equipment services can be sourced out of Terrace and Smithers, as well as through TNDC based at Dease Lake. The Company has advised the Principal Author that:

- it intends to contract for goods and services, as required, using industry-accepted tendering practices, with awards made based on price, quality, safety, value, availability and schedule;
- the letting of contracts for the provision of materials, labour, equipment, services or construction will be conducted in a competitive, businesslike, morally and ethically responsible manner;
- Tahltan Nation businesses will be provided competitive access to such economic opportunities, provided always that the Company is satisfied that the terms of the contract are competitive in all respects as to price, delivery, capability, performance and quality.

5.5.5 Communications

A local, land-based telephone service is provided by Northwestel, which operates throughout northern B.C. Mobile telephone services are not currently available in the region, except through local wi-fi. Northwestel also provides high- and low-capacity digital radio at Dease Lake and Iskut, respectively, as well as a satellite earth station in Telegraph Creek. All local communities have access to high-speed internet. Infrastructure planning for project development includes the installation of project-dedicated communications systems.

5.6 Tailings, Waste and Plant Areas and Sites

In the Principal Author’s opinion, there is ample room to locate and construct:

- all infrastructure required to safely sustain the planned production from Spectrum Pit, inclusive of ROM production handling facilities, mine offices, tank farms, a warehouse and a maintenance shop;
- all infrastructure required to safely sustain the planned production from Donnelly Pit, inclusive of a marginal grade material dump, a waste dump and ROM production handling facilities;
- all infrastructure related to the delivered ROM production from both planned pits, including ROM production storage areas and surge bins, an appropriately dimensioned plant facility (inclusive of a laboratory and reagent handling facility) located at the MIA;
- the construction of an appropriately laid-out MIA where, in addition to the plant and related infrastructure, mine site sub-station and distribution system will be located along with the main project warehouse and maintenance facility, cold storage room, fuel and water tank farms and distribution facilities, mine dry, main administration offices and camp;

- appropriately dimensioned and located explosive storage and handling facilities at both planned pit sites; and
- a life-of-mine TSF with surface water run-off by-pass ditches, an overflow by-pass channel, a polishing pond, recycled water pumping facility and a water treatment plant.

Figure 5.10 provides a general summary of the planned infrastructure, the majority of which is located on the Company's 100% owned mineral claims - the only exception is the portion of the access road to the Spectrum Pit area that extends over the Designated Access Corridor identified on Figure 5.10 and described in Sub-Section 4.9.3. Details of the planned infrastructure (and the related, risk-based planning process) are presented in Section 18.

Planning for project development to production does not include considerations of heap leaching, hence the need for heap leach pads and related infrastructure. However, from Year 5 a gold leaching plant will be located within the MIA and in an engineered containment area to ensure that there is no risk of release of leachate (cyanide) to the environment in the event of an upset condition.

5.7 Seismicity

A formal seismic risk assessment for the Project Area has not been carried out within the scope of the PEA. It is, however, known (and acknowledged by the Company) that the Project Area is located in a moderately high, seismic risk zone.

The national seismic hazard map produced by the Geological Survey of Canada for use in the 2015 National Building Code of Canada (source: www.earthquakescanada.nrcan.gc.ca/hazard-alea/zoning-zonage/NBCC2015maps-en.php), indicates that the Project Area is located in Acceleration Zone 2. At the location of the notional centre point of the Project Area (Latitude 57º 39' 21" N, Longitude 130º 15' 41" W), Natural Resources Canada's 2015 seismic risk calculator reports a peak horizontal ground acceleration of 0.044 g (g = 9.81 m/s^2) with a 2% chance of exceedance in 50 years (0.000404 per annum, or 1 in 2,475).

The Company has advised the Principal Author that it acknowledges that infrastructure for future mining that is located on the Project Area, and most especially the TSF dam, must be designed, constructed, operated and maintained to meet in full the applicable best practice standards.

5.8 Watersheds and Drainage Patterns

Two main watersheds are developed in the Project Area:

- the Stikine River system that covers the northwest of the Project Area, which drains to the north in the immediate vicinity of the Project Area and which includes the Mowdade, Mowchilla, Kakiddi and Nuttlude lakes; and
- the Iskut River system to the south and east of the Project Area that drains to the south-southwest in the immediate vicinity of the Project Area and which includes Eddontenajon, Tatogga and Kinaskan lakes (Figure 5.11).

Consideration of the watersheds identified on Figure 5.11 formed part of the planning process for Donnelly Pit described in Section 16. It also formed part of the risk analyses employed within the scope of the infrastructure planning process described in Section 18.

Figure 5.10 A Project Area Plan Showing the General Layout of the Planned Infrastructure, Spectrum-GJ Project Area
(compiled by the Principal Author, in conjunction with Company personnel)

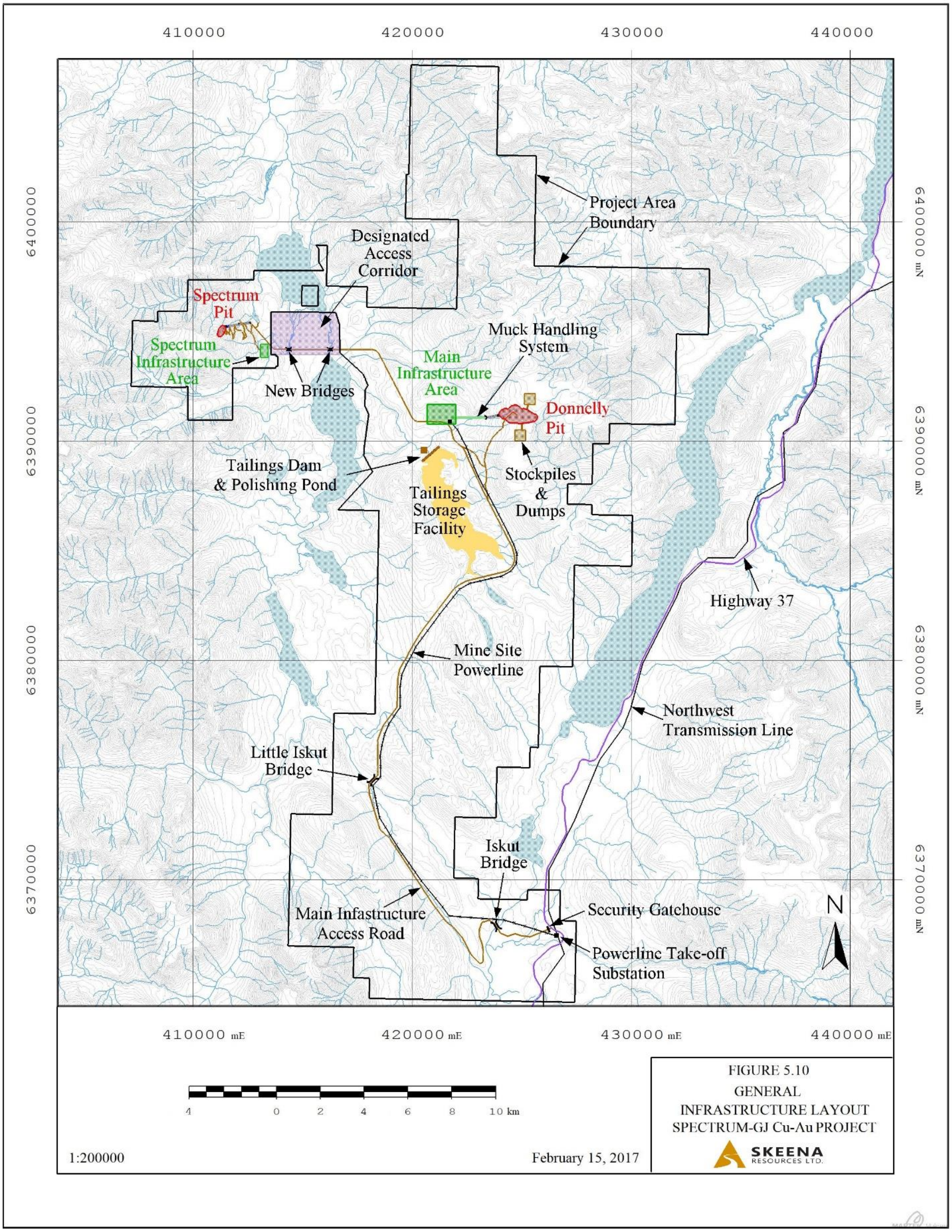
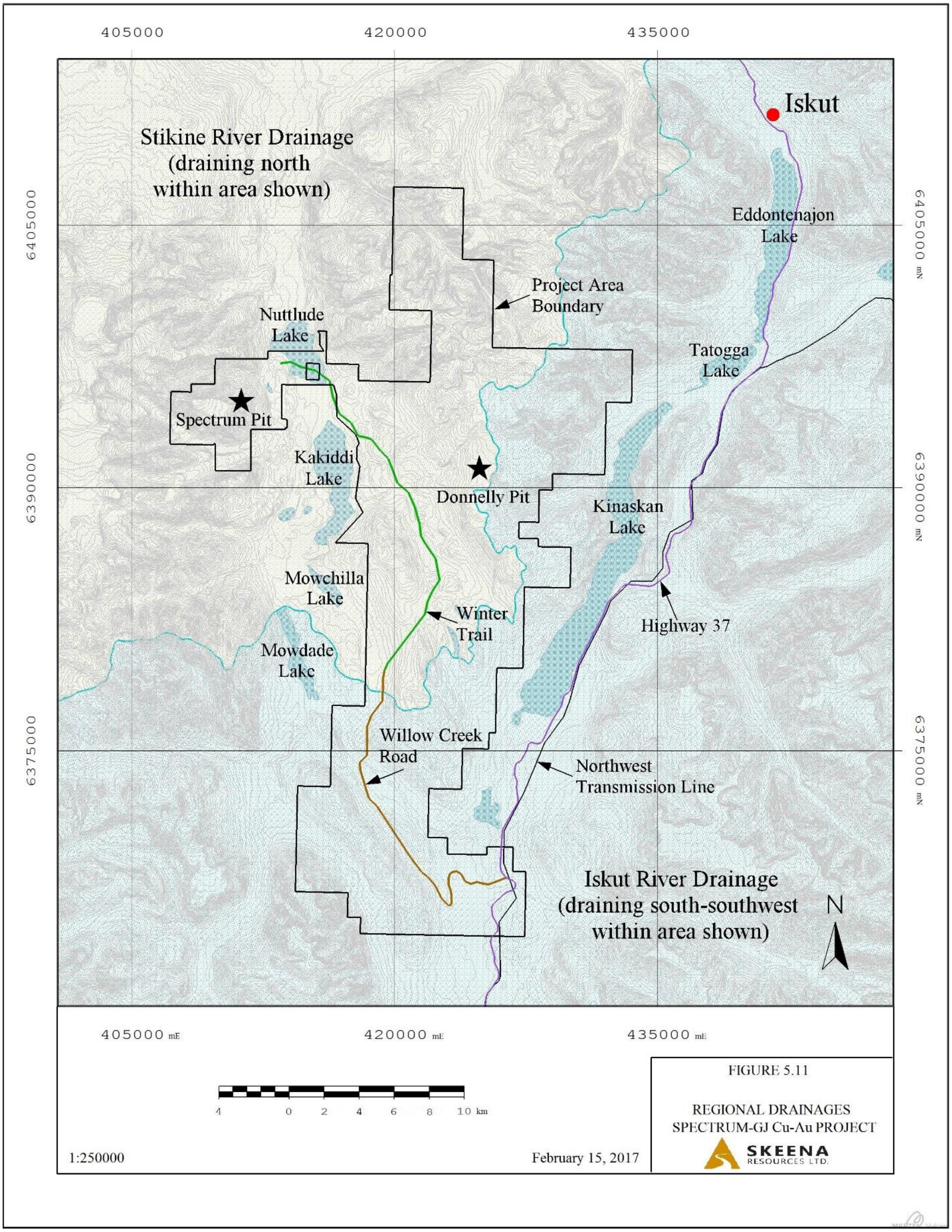


Figure 5.11 A Topographic and Watershed Plan for the Spectrum-GJ Project Area and Surrounding Terrain
(compiled by the Principal Author, in conjunction with Company personnel)



5.9 Qualified Persons' Opinion

In the Principal Author's opinion, there is no readily identifiable reason to suppose that the Company's Spectrum-GJ project development plans reported herein could not successfully and safely be carried out in an environmentally sustainable manner. Furthermore:

- there is sufficient area to allow construction of all required Project infrastructure, the vast majority of which will be located on claims that are 100% held by the Company (the only exception is that portion of the access road to the Spectrum Pit area that extends over the Designated Access Corridor);
- it is expected that any future mining operations could be carried out year-round, with only minor breaks caused by adverse weather conditions; and
- the Company has advised the Principal Author that it intends to file for mining leases, as and when appropriate.

In the opinion of the Principal Author, the planned infrastructure, availability of staff, the existing power, water and communications facilities, and the methods whereby goods and equipment could be transported to the proposed infrastructure sites are sufficient to support the declaration of Mineral Resources and a PEA for the Spectrum-GJ project. The requirement for supporting studies going forward is understood by the Company, in which regard the Principal Author understands that the Company will undertake, at the appropriate time and as required:

- confirmation drilling at the key infrastructure locations (especially the MIA and planned TSF described in Section 18);
- geotechnical studies, soil and vegetation characterizations, and geohazard assessments, as appropriate for the key infrastructure areas;
- suitable waterwell siting, pumping and drawdown studies designed to identify and prove-up water resources suitable to sustain the planned operations and camp facilities, inclusive of considerations of water balances and water recycling;
- hydrogeologic studies in and around the planned pit areas to establish pit dewatering requirements and pumping capacities;
- a location-specific seismicity risk assessment for application in infrastructure design, as appropriate; and
- the environmental baseline studies and surveys actions plans described in Section 20.

It is further noted that:

- the main economic activities of the general region of the Project Area are mining, limited forestry and seasonal tourism;
- a considerable amount of mining exploration has taken place in the region in recent years that has resulted in the spin-off of local support and service sectors;

- the CIS LRMP states that the area is endowed with provincially to globally significant mineralization and rich energy values and that the region has had several productive operating mines, including most notably the Red Chris and Brucejack mines (under construction), as well as Eskay Creek that closed in 2003;
- according to government statistics, at over 10% on average, unemployment rates in the region are high compared with the B.C. provincial average of approximately 6%, especially for males under 24 years of age (data as at February 2017);
- according to available census data, the levels of education attainment in the local communities are in general lower than the B.C. averages, but that a higher percentage than the provincial average have apprenticeships, trade or college certificates and diplomas, which suggests a skilled industrial workforce that is well-suited to the work-related demands of the development and operation of openpit mines; and
- TNDC has a long and successful history of mine contracting in the region, including at the Snip, Eskay Creek, Red Chris and Golden Bear mines.

6 HISTORY

The Principal Author is responsible for this section of this Technical Report, except for Section 6.2 for which David Thomas, P. Geo. ("QP Thomas") is responsible. The text was compiled from abstracts taken from the April 2016 and May 2016 Technical Reports. Past information has been updated only when it was relevant to do so and/or when it was clear that additional information was required.

As part of a larger due diligence process, the Principal Author cross-referenced information contained in the April 2016 and May 2016 Technical Reports with the Company's drillhole database, and plotted the collar positions and drill strings using ArcGIS to ensure they intersected the stated mineralized occurrences. It is the validated data relating to the mineralized occurrences noted in the following text that is reported here.

6.1 Background

The Project Area is located in a region known for its sub-alkalic to alkalic intrusions, associated porphyry Cu-Au mineralization and peripheral gold- and silver-bearing quartz veins. Geological mapping of the region was first carried out in the 1950s and 1960s by the Geological Survey of Canada (Souther, 1972). This was followed by airborne magnetic surveys carried out between 1975 and 1978, the results of which are detailed on Geophysical Series Map 9217G – Kinaskan Lake, Sheet 104 G/9. A regional geological mapping program (1:50,000 scale) over the Tatogga Lake area, including Klastline Plateau, was also carried out in 1997 by the B.C. Ministry of Energy, Mines and Petroleum Resources (Ash *et al*., 1997b).

Figures 6.1 and 6.2 are plans of the Spectrum claims block (Figure 6.1) and GJ claims block (Figure 6.2) on which are identified the mineralized occurrences and zones cited in the following text. In the case of the Spectrum claims block, the cited occurrences and zones reflect historical nomenclature: the Company's current Central Zone geological model includes the 500 Colour, 33, Skarn and Porphyry zones, which were previously considered to be separate mineralized occurrences. The 300 Colour and East Creek zones remain separate from the Central Zone.

6.2 Previous Owners and Exploration Activity

6.2.1 1950s and 1960s

The first recorded work within the Project Area dates from 1957 when Torbit Silver Mines Limited ("Torbit") carried out initial evaluation work on the Hawk vein, which is located in the far north of the current Spectrum claims block (see Figure 6.1). No further work appears to have been carried out by Torbit and its Hawk claim was allowed to lapse.

Shawinigan Mining and Smelting Company Limited re-staked the Hawk claim in 1967 and was reported to have drilled X-ray holes on the Hawk vein. Subsequent exploration activity focused mainly on what was then known as the Central showing (i.e. what eventually became known as the Central Zone), following the discovery in 1969 of a large gossan and porphyry-type copper mineralization to the southwest of Nuttlude Lake, by Spartan Explorations Limited ("Spartan"). It was shortly after the discovery that Spartan staked an area covering the mineralized occurrences outlined.

Figure 6.1 A Plan of a Portion of the Spectrum Claims Block Area Showing the Positions of the Mineralized Occurrences Cited in Section 6 of this Technical Report
(supplied by the Company)

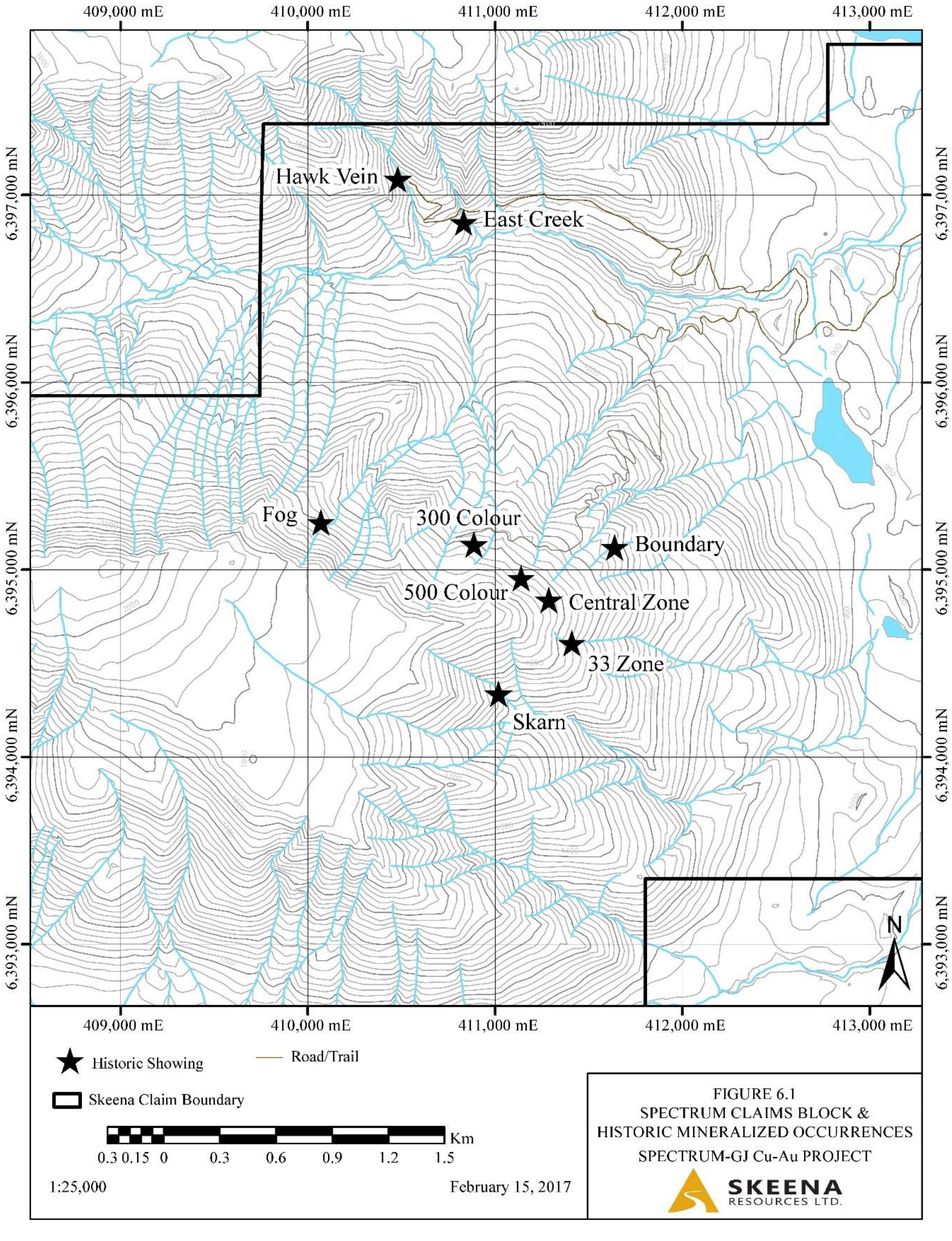
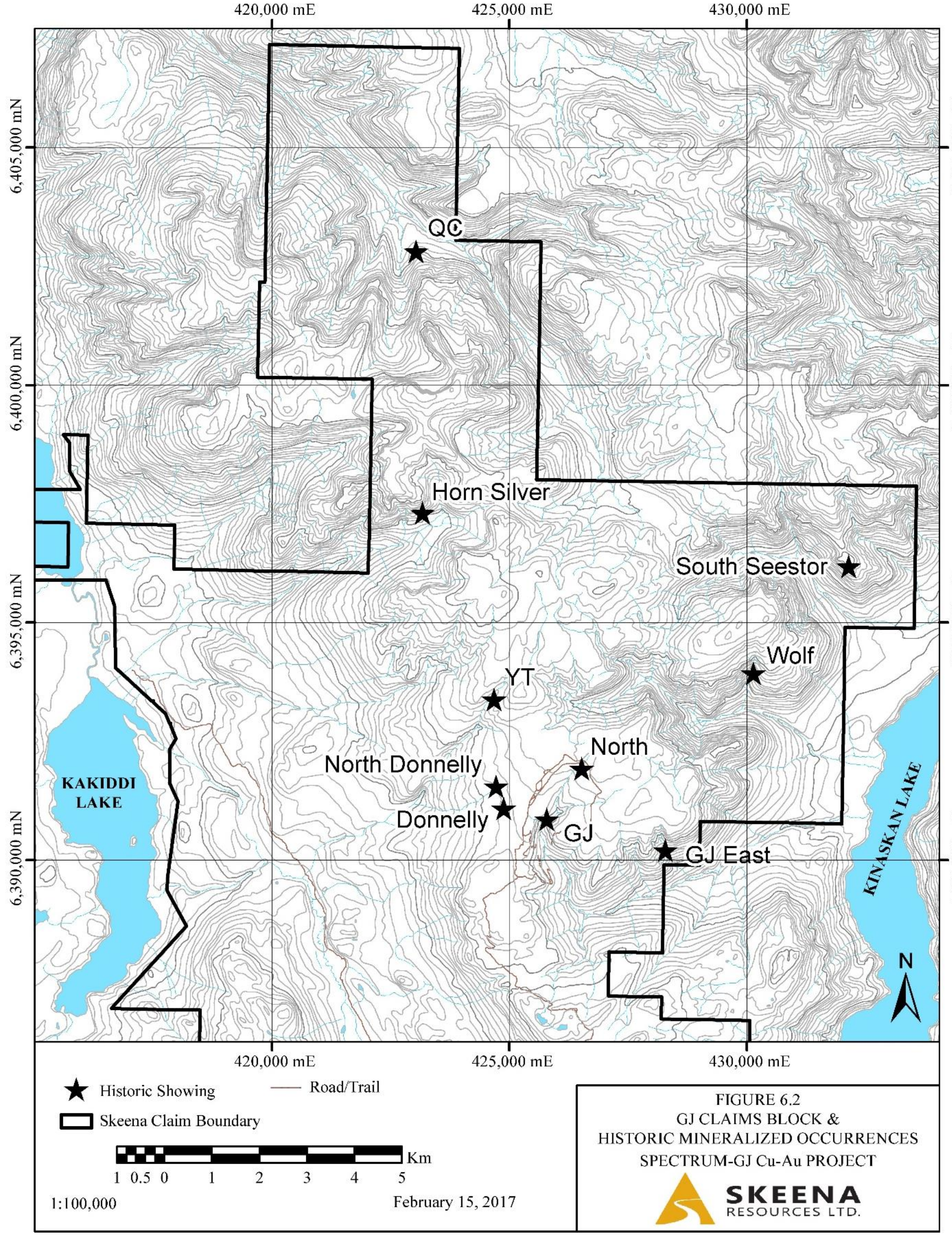


Figure 6.2 A Plan of a Portion of the GJ Claims Block Area Showing the Positions of the Mineralized Occurrences Cited in Section 6 of this Technical report
(supplied by the Company)



The first recorded exploration work in the eastern portion of the Project Area was in 1964 when Conwest Exploration Co. Ltd. ("Conwest") carried out a regional evaluation of Klastline Plateau. Several porphyry Cu-Au and precious metal shear-vein targets were identified, including the GJ and QC porphyry systems and the Horn Silver prospect (Hedley, 1966). Claims were staked over these prospects and a preliminary soil survey and a ground magnetic survey were carried out on the QC showing.

In 1965, Huntec Limited ("Huntec") carried out 2.19 line kilometres of IP and 1.83 line kilometres of ground magnetometer surveys along two lines on the QC claims, on behalf of Conwest. Huntec interpreted '*the high apparent chargeability readings to be caused by extensive sulphide mineralization. The magnetometer and resistivity I.P. readings were very flat*' (Dodds, 1965). Conwest also completed three AQ diameter diamond drillholes on the Horn Silver prospect (325.83 m). No details of Conwest's drillholes seem to have survived and they do not appear in the Company's drillhole database.

In 1969, additional silt sampling, geological mapping, soil sampling and a ground magnetometer survey were carried out by Conwest over the azurite-stained QC gossan zone.

6.2.2 1970s – Central Showing and Hawk Vein

In the 1970s, exploration activity gathered pace on the Central showing and Hawk vein, starting with Mitsui Mining and Smelting Company Limited that carried out geological, geochemical and geophysical surveys. In 1971, Imperial Oil Limited ("Imperial") optioned what had become known as the Spectrum property and carried out geological mapping along with additional geochemical and geophysical surveys. Imperial followed this up with four BQ diameter diamond drillholes totaling 463.44 m, thereby defining low-grade copper mineralization in monzonite with adjacent potassic-altered volcanics. Assays for gold were also completed, but the confidence in the results is low with the result that the data was not used in the Mineral Resource estimate presented in Section 14 (see also Sections 11.5 and 12.4). Imperial's claims were allowed to lapse in 1973.

In 1975, Racicot Syndicate re-staked the area of what was then considered the Central showing and named the Red Dog claims. Later in 1975 the property was optioned to Canex Placer who subsequently relinquished the claims. Consolidated Silver Ridge Mines Ltd ("Silver Ridge") optioned the Red Dog claims in 1977 and in 1978 added the Pink and Red claims, following geological mapping and surface geochemistry. Silver Ridge also completed 73 m of exploration drift (2.0 m by 2.6 m) along the Hawk vein and completed an unknown number of underground drillholes. This was followed up in 1979 with the Camp claim, staked to cover the exploration camp area and airstrip adjacent to Nuttlude Lake. An access road was constructed from the camp to the Central showing, following which a ten hole drilling program was completed for a total of 832.20 m (Table 6.1).

Table 6.1 A Summary of the 1979 Diamond Drilling Programs Completed by Consolidated Silver Ridge Mines Ltd. on its Spectrum Property, Spectrum-GJ Project Area
(compiled from information contained in the Company's drillhole database)

Drillhole	Showing	Length	Diameter
S79-01	Central	161.20	BQ
S79-02		115.50	
S79-03		94.80	
S79-06		121.90	
Subtotal	-	*493.40*	-
S79-04	500 Colour	21.30	BQ
S79-05		39.60	
S79-07		22.60	
S79-08		123.40	
S79-09		65.50	
S79-10		66.40	
Subtotal	-	*338.80*	-

6.2.3 1970s – GJ, QC and North Showings

Exploration activity also gathered pace from 1970 on the GJ property to the east of the Project Area. Amoco Corporation ("Amoco") initially optioned the property from Conwest, following which geological mapping was carried out and approximately 16 km of rough access road were constructed from Kinaskan Lake. A five hole diamond drilling program was completed on the original GJ showing (Carter, 1971), as well as a seven hole diamond drilling program on the QC showing for a total of 3,255.87 m (Table 6.2). An additional hole (QC-BC-70-1) was started, but no records exist, other than a comment to the effect that it did not reach the target mineralization.

Table 6.2 A Summary of the 1970 Diamond Drilling Programs Completed by Amoco on its GJ Property, Spectrum-GJ Project Area
(compiled from information contained in the Company's drillhole database)

Drillhole	Showing	Length	Diameter
AM-70-01	GJ	301.14	BQ
AM-70-02		305.10	
AM-70-03		304.50	
AM-70-04		306.63	
AM-70-05		312.72	
Subtotal	-	*1,530.09*	-
QC-BC-70-2	QC	163.07	BQ
QC-BC-70-3		181.36	
QC-BC-70-4		348.39	
QC-BC-70-5		304.80	
QC-BC-70-7		182.88	
QC-BC-70-8		240.18	
QC-BC-70-9		305.10	
Subtotal	-	*1,725.78*	-

In 1970 and 1971 Silver Standard Mines Ltd. ("Silver Standard") staked the A1 claims immediately west of the QC property to cover several copper occurrences discovered by prospecting (Seraphim, 1971). No details of any work carried out by Silver Standard are available.

In 1971, Amoco constructed a rough access road from the southwest end of Kinaskan Lake to the south end of Klastline Plateau from where it extended north across the plateau to the GJ showing and the headwaters of Groat Creek. Amoco carried out geological, geochemical and geophysical surveys and completed the 14 hole, 2,479.12 m drilling programs summarized on Table 6.3.

Table 6.3 A Summary of the 1971 Diamond Drilling Programs Completed by Amoco on its GJ Property, Spectrum-GJ Project Area
(compiled from information contained in the Company's drillhole database)

Drillhole	Showing	Length	Diameter
AM-71-06	GJ	292.91	BQ
AM-71-07		245.36	
AM-71-08		121.01	
AM-71-09		206.53	
AM-71-13		211.23	
AM-71-15		230.73	
AM-71-17		132.59	
AM-71-18		145.39	
AM-71-19		134.42	
Subtotal	-	*1,720.17*	-
AM-71-10	North	191.72	BQ
AM-71-11		182.88	
AM-71-12		126.80	
AM-71-14		149.96	
AM-71-16		107.59	
Subtotal	-	*758.95*	-

The Amoco claims were allowed to lapse in October 1975, after which a 12 unit GJ claim was staked over the GJ showing by United Mineral Services Ltd. ("UMS") (Good and Garratt, 1977). No exploration activity appears to have been carried out by UMS. However, in 1976 Great Plains Development Corp. ("Great Plains") optioned the GJ claim and carried out geological mapping, geochemical surveys and 22 m of trenching. A 15.5 km picket-line grid was also constructed for purposes of carrying out a ground magnetic survey (Winter *et al.*, 1976). During the following year, Great Plains carried out an IP survey over the 15.5 km GJ grid (Walcott, 1977) and an overburden geochemical sampling program (Good and Garratt, 1977). Great Plains dropped their option and, in October 1978, its assets were transferred to its parent company, Norcen Energy Resources Ltd.

TexasGulf Canada Ltd. ("TexasGulf") acquired the QC property in the mid-1970s (date unknown) and completed a small field program (geological mapping, sampling) before letting it go in favour of other prospects in the region (Newell, 1978).

6.2.4 1970s – Donnelly, North Donnelly and Wolf Zone

Subsequent to UMS staking its claims over the GJ showing, TexasGulf staked claims to the west, north and northeast, thereby effectively covering what are now known as the Donnelly and North Donnelly deposits, as well as part of the Wolf area (Donnelly, *et al.*, 1976), a small portion of the Wolf area being already covered by an internal claim (Racicot, 1976). In his report, Racicot mentioned that two short pack-sack holes were drilled, but very little core was recovered. No further details were provided.

In 1976 TexasGulf constructed 10.6 km of picket-line grid over the Donnelly showing, completed IP and ground magnetic surveys over the grid and carried out geological mapping and 51 m of trenching (Peatfield and Donnelly, 1976). The picket-line was extended by 13.1 km in 1977 on which 18.5 km of IP surveys were carried out and 75 bedrock surface samples were collected using a hand-held, gas powered Pionjaar drill. The ten hole, 1,523.90 m drilling program summarized on Table 6.4 was also completed (Forsythe *et al.*, 1977).

Table 6.4 A Summary of the 1977 Diamond Drilling Program Completed by TexasGulf on its GJ Property, Spectrum-GJ Project Area
(compiled from information contained in the Company's drillhole database)

Drillhole	Showing	Length	Diameter
TG-77-01	Donnelly	163.40	BQ
TG-77-02		172.50	
TG-77-03		160.30	
TG-77-04		178.60	
TG-77-05		148.10	
TG-77-06		132.90	
TG-77-07		148.10	
TG-77-08		181.70	
TG-77-09		123.70	
TG-77-10		114.60	
Total	-	1,523.90	-

No further work appears to have been carried out on the Donnelly showing until 1980 when TexasGulf drilled five, BQ diameter holes for 1,114.90 m in, including four new holes for 965.00 m and the deepening of hole TG-77-04 by 149.90 m (Peatfield, 1980). TexasGulf became Kidd Creek Mines Ltd., which was ultimately acquired by Falconbridge Limited ("Falconbridge"). In line with its corporate decision to discontinue exploration in B.C., Falconbridge did not carry out any further exploration work in the Project Area, prior to allowing its claims to lapse in 2000.

6.2.5 1980s – Spectrum Claims Block

In 1980, Silver Ridge completed an additional 240.5 m of exploration drifting and crosscut development on the Hawk Vein, along with nine underground drillholes (on the Hawk vein) totaling 430.20 m. These holes do not appear in the Company's drillhole database as no assay data is available. Silver Ridge also completed the 18 hole, 2,399.90 m drilling program summarized on Table 6.5. Silver Ridge relinquished its option over the Spectrum claims block in 1981, which then comprised the Red Dog, Pink, Red and Camp claims.

No further exploration activity was carried out in the Spectrum area until Cominco Ltd. ("Cominco") optioned the property in 1984 and completed a surface sampling program and a geophysical (very low frequency magnetic, or "VLF-Mag") surveys over the Central showing. In 1989, Cominco completed the ten hole, 1,199.0 m diamond drilling program summarized on Table 6.6.

Table 6.5 A Summary of the 1980 Diamond Drilling Program Completed by Silver Ridge Mines Ltd. on its Spectrum Claims Block, Spectrum-GJ Project Area
(compiled from information contained in the Company's drillhole database)

Drillhole	Showing	Length	Diameter
S80-14	Central	175.90	BQ
S80-16		107.00	
S80-17		135.90	
S80-18		206.30	
S80-19		171.20	
S80-20		151.50	
S80-21		203.30	
S80-22		137.50	
S80-23		115.80	
S80-24		106.40	
S80-25		106.10	
S80-26		106.70	
S80-27		106.40	
S80-28		81.10	
Subtotal	-	*1,911.10*	-
S80-11	500 Colour	132.90	BQ
S80-12		129.50	
S80-13		160.00	
S80-15		66.40	
Subtotal	-	*488.80*	-

Table 6.6 A Summary of the 1989 Diamond Drilling Program Completed by Cominco Ltd. on its Spectrum Claims Block, Spectrum-GJ Project Area
(compiled from information contained in the Company's drillhole database)

Drillhole	Showing	Length	Diameter
S89-34	Central	170.40	BTW
S89-35		124.70	
S89-36		136.80	
Subtotal	-	*431.90*	-
S89-33	33	65.20	BTW
S89-39		50.00	
S89-41		92.00	
S89-42		95.40	
Subtotal	-	*302.60*	-
S89-37	300 Colour	142.30	BTW
S89-38	Fog	197.20	BTW
S89-40	Skarn	125.00	BTW

If the 1980 to 1989 drillhole numbering sequences detailed on Tables 6.5 and 6.6 are considered, it may be seen that the possibility exists that an additional four holes were drilled (S80 or S89-29 through -32). No records for such holes exist.

Between 1987 and 1989, under an option agreement with Cominco, Moongold Resources Ltd. ("Moongold") completed rock and soil sampling, as well as VLF-mag and resistivity surveys over the Hawk vein. Moongold did not, however, pursue its option further.

6.2.6 1980 Through 1991 – GJ Claims Block

In 1979, Dimac Resources Corp. ("Dimac") purchased the GJ claims from UMS and, in 1981, optioned them to Canorex who drilled seven NQ diameter diamond drillholes for 1,865.07 m in the GJ showing, thereby earning a 50% interest in the property (McInnis, 1981). Dimac subsequently declared bankruptcy and, following reorganization of Canorex and the purchase of Dimac's interest in the GJ claims from the Royal Bank of Canada, Curator Resources Ltd., (which became International Curator in October 1985) emerged in 1983 as the sole owner of the GJ property.

Between July 20 and August 15, 1981, following a preliminary stage of geological mapping, prospecting and trenching, Tenajon Silver Corporation ("Tenajon") drilled a total of seven BQ diameter holes (710.94 m) on their five claim package that both covered and surrounded the Horn Silver showing. The Horn mineral claim was originally staked in 1979 and it was transferred to Tenajon in 1980 (previously ERL Resources Ltd.), which then located Silver Claims-1 through -4 (Thompson, 1981). Although no information is available, it is assumed that after 1981 Tenajon either sold the claims or allowed them to lapse.

In 1988, Geological Survey of Canada ("GSC") released the results of a regional stream sediment sampling program (National Geochemical Reconnaissance, 1988). Teck staked the QC l to QC15 claims in the Quash Creek area, to cover copper-gold geochemical anomalies resulting from the GSC survey. Teck did some silt and soil geochemical sampling which led to the discovery of Au-Ag-Cu-Zn veins 5.5 km northwest of the QC Porphyry Zone; four vein systems (Main, Top, Gordon's, Upper Gordon) were exposed by hand trenching (Delaney, 1988). Teck was reported to have done no work on the QC zone.

In 1989, Ascot Resources Ltd. ("Ascot") optioned a large number of claims covering the eastern half of Klastline Plateau, plus the GJ claims block from International Curator. Fieldwork in 1989 (under the direction of R. K. Netolitzky, now Chairman of the Company) included 73 silt samples from drainages around the GJ target and 62 rock chip samples from exposures along creek drainages. A flagged grid was also constructed, from which 389 bedrock surface rock chip samples were collected using a gas powered Wacker drill (Mehner, 1990). The following summer Ascot collected 274 soils from contour lines along the plateau edge and carried out 20.7 line kilometres of IP and ground magnetic surveys on a flagged grid. Before dropping the option, Ascot also completed the 12 hole, 1,921.20 m drilling program summarized on Table 6.7 (Mehner, 1991).

Table 6.7 A Summary of the 1990 Diamond Drilling Program Completed by Ascot Resources Ltd. on its GJ Claims Block, Spectrum-GJ Project Area
(compiled from information contained in the Company's drillhole database)

Drillhole	Showing	Length	Diameter
AS-90-01	GJ	178.96	BTW
AS-90-02		181.05	
AS-90-03		188.67	
AS-90-04		195.99	
AS-90-05		179.53	
AS-90-12		182.27	
Subtotal	-	*1,106.47*	-
AS-90-06	GJ East	178.92	BTW
AS-90-07		184.40	
AS-90-08		114.30	
AS-90-09		50.29	
AS-90-10		103.33	
Subtotal	-	*613.24*	-
AS-90-11	Donnelly	183.49	BTW

In 1990, Triumph Resources Ltd. ("Triumph") optioned the QC claims from Teck, carried out silt, contour soil and rock geochemical surveys over the QC zone and resampled the vein showings (Konkin, 1990). In September 1990, Dryden Resource Corporation optioned ten claims covering the QC showing from Teck, the 90% owner of the claims, Silver Standard Resources Ltd, the 10% owner of the claims and Triumph Resource Corporation that had an option to earn up to 50% of Teck's interest in the claims. To satisfy the option terms, Dryden carried out silt, soil and rock geochemical sampling and drilled three holes (546.80 m) into what is now known as the GJ showing, as well as two holes (174.64 m) into the western edge of a copper-gold anomaly identified in talus fines by Triumph (Mehner, 1991a), which anomaly is now known as the Gordon Vein. There is no record of Dryden's actions following its 1991 field program; it is assumed that the claims were allowed to lapse.

6.2.7 1990 Through 2010 – Spectrum Claims Block

The Spectrum claims block was optioned by Columbia Gold Mines Ltd. ("Columbia") in 1990. Columbia subsequently completed a trenching program and the 20 hole, 2,364.28 m diamond drilling program summarized on Table 6.8. It was in consequence of the 1990 drilling program that the main mineralized zones found on the Spectrum claims block were first identified as distinct mineralized occurrences – previous drilling programs were of a more general nature with the identifying names of the mineralized zones and occurrences attributed after the fact.

Table 6.8 A Summary of the 1990 Diamond Drilling Program Completed by Columbia Gold Mines Ltd. on its Spectrum Claims Block, Spectrum-GJ Project Area
(compiled from information contained in the Company's drillhole collar database)

Drillhole	Zone or Showing	Length	Diameter
S90-46	Central Zone	182.90	BQ
S90-47		182.90	
S90-48		30.50	
S90-50		109.10	
S90-52		169.50	
S90-53		44.20	
S90-54		118.90	
S90-55		115.82	
S90-56		137.20	
S90-57		48.80	
S90-58		149.40	
S90-59		152.40	
S90-60		129.54	
Subtotal	-	*1,571.16*	-
S90-45	500 Colour	108.20	BQ
S90-61		118.30	
S90-62		94.50	
Subtotal	-	*321.00*	-
S90-43	300 Colour	101.80	BQ
S90-44		121.90	
Subtotal	-	*223.70*	-
S90-49	33	121.92	BQ
S90-51	Boundary South	126.50	BQ

In 1991 Columbia followed up its 1990 programs with the 24 hole, 3,967.50 m diamond drilling program summarized on Table 6.9. Results were consolidated with the results of previous surface drilling programs and an initial Mineral Resource estimate for Central Zone was compiled (see Section 6.3). In 1992 Columbia added the six hole, 710.33 m, drilling program summarized at the foot of Table 6.9. At the same time, Columbia carried out a limited prospecting program to identify northerly extensions of what was now called the Central zone.

Table 6.9 A Summary of the 1991 and 1992 Diamond Drilling Programs Completed by Columbia Gold Mines Ltd. on its Spectrum Property, Spectrum-GJ Project Area (compiled from information contained in the Company's drillhole collar database)

Drillhole	Zone or Showing	Length	Diameter
S91-63	Central Zone	177.80	NQ2 (or NQTK)
S91-64		152.09	
S91-65		221.40	
S91-66		187.44	
S91-67		63.09	
S91-68		227.67	
S91-69		161.80	
S91-70		229.20	
S91-71		175.86	
S91-72		183.50	
S91-73		179.50	
S91-74		146.90	
S91-75		156.00	
S91-76		119.50	
S91-77		140.21	
S91-78		154.50	
S91-79		141.12	
S91-82		213.96	
S91-83		180.44	
S91-84		132.89	
S91-85		157.57	
S91-86		180.43	
Subtotal	-	*3,682.87*	-
S91-80	HC	142.33	-
S91-81	Boundary South	142.30	NQ2 (or NQTK)
S92-90	500 Colour	129.84	NQ2 (or NQTK)
S92-91		131.37	
S92-92		125.27	
Subtotal	-	*386.48*	-
S92-87	East Creek	103.94	NQ2 (or NQTK)
S92-88		120.70	
S92-89		99.21	
Subtotal	-	*323.83*	-

Columbia's 1992 work program marked the end of exploration activity on the Spectrum claims block, at least until 2014 when the Company gained a 100% interest in the property. Efforts were instead focused on lobbying the B.C. government to amend the Mount Edziza Provincial Park boundary, thereby to allow access and further mineral exploration work on the Spectrum property. Lobbying was first done by Arkaroola Resources Ltd., which purchased the property from Columbia in 1996, and then by Seeker Resources Corp. ("Seeker") when it took up ownership in 2002. During this process it was reported that Seeker's Spectrum property was maintained in good standing by cash payments in lieu of exploration work. The lobbying was ultimately successful as the Designated Access Corridor described in Section 4.9.3 was established.

Up to 2011 Seeker also carried out baseline environmental studies, applied for drilling and archaeological permits (in 2009), posted a C$20,000 bond with the B.C. government and optioned its Spectrum property holdings to Transpacific Mining Ltd. ("TPM"). TPM re-estimated the Mineral Resources for Central Zone and undertook a petrographic study, but did not pursue its option further.

6.2.8 1992 Through 2010 – Expanded GJ Claims Block

No further work on the GJ claims block appears to have been carried out following Dryden's 1991 program, until 2000 when International Curator collected 18 rock and 61 soil samples from newly staked ground covering the Donnelly and North targets. This was followed in 2002 with the first program of a multi-year, systematic evaluation of the Cu-Au porphyry mineralization that characterizes the Donnelly and North Donnelly deposits. The 2002 work program involved the construction of a picket-line grid and the completion of 17.85 line kilometres of IP and ground magnetic surveys over the Donnelly target.

In mid-2003, by merging with Royal County, International Curator acquired claims covering most of the remaining portions of Klastline plateau, including those immediately east and north of the North and GJ zones. The 2003 work program included extension of the Donnelly picket grid both east and north, thereby to cover the North Zone. Geological mapping, prospecting, hand trenching and sampling, contour soil sampling, bedrock surface (Wacker drill) sampling and 18.35 line kilometres of IP and ground magnetic surveys (Mehner, 2004) were also carried out. In the fall of 2003, an airborne magnetic survey was flown over the entire Klastline plateau area. In December 2003, International Curator underwent a corporate re-organization and changed its name to CGH.

In 2004, CGH extended the picket-line grids north of the Donnelly grid, as well as east and south of the North grid. A further 17.45 line kilometres of IP and 24.5 km of ground magnetic surveys were completed, additional Wacker drilling in the North, GJ East and Donnelly zones was carried out and detailed silt sampling programs in the drainages coming from the porphyry zones were completed, along with rock and soil sampling. The 20 hole, 4,241.51 m drilling program summarized on Table 6.10 was also completed (Mehner, 2005; Mehner and Peatfield, 2005).

In January 2005, CGH merged the GJ, JJ, BJ, LJ, DJ, OJ, Spike #1, Spike #2, T1 to T4 and SH3 and SH4 into new mineral claims using the MTO tenure management system implemented by the B.C. Ministry of Energy and Mines. CGH also acquired four new claims totaling 1,471.79 ha in the southwest portion of the GJ claims block. CGH also accelerated its exploration program in 2005, concentrating mainly on diamond drilling, as suggested by the numbers and total length of completed holes summarized on Table 6.10 (Mehner, 2006; Mehner and Peatfield, 2006). In addition to drilling, CGH also:

- completed 11.3 line kilometres of IP and 34.9 line kilometres of ground magnetometer surveying to expand and fill-in previous coverage;
- expanded the previous soil sampling surveys;
- excavated and sampled 13 hand trenches totaling 784 linear metres; and

- sampled and had assayed selected intervals of core from the Amoco, Canorex and TexasGulf drilling programs.

Table 6.10 A Summary of the Diamond Drilling Programs Completed by Canadian Gold Hunter Corp. in 2004 through 2007, GJ Claims Block, Spectrum-GJ Property (compiled from information supplied by the Company)

Year	Zone / Deposit	Number of Holes	Total Metres	Hole Diameter
2004	Donnelly	10	2,618.43	BTW
	North	10	1,623.08	
2005	Donnelly	38	11,362.92	NQ2 (or NQTK)
	GJ	11	3,339.68	
	North Donnelly	1	428.85	
	GJ East	4	645.56	
	North	5	1,013.44	
2006	Donnelly and North Donnelly	54	16,490.35	
	North	4	722.38	
	YT	4	920.49	
2007	Donnelly and North Donnelly	75	14,874.84	
	North	4	1,096.06	
	GJ	1	137.16	

In 2006, CGH acquired seven additional mineral claims (SJ, TJ, VJ, WJ, XJ, YJ, ZJ) totaling 2,595.56 ha and, in March 2007, a further, single un-named mineral claim (433.20 ha). The 62 hole, 18,133.22 m drilling program summarized on Table 6.10 was also completed (Mehner, 2007; Mehner *et al.*, 2007), with an additional 80 holes completed in 2007 for 16,108.06 m (Mehner, 2008). A Mineral Resource estimate for the Donnelly Zone was prepared and announced, prior to CGH changing its name to NGEx Resources Inc. ("NGEx") in September 2009 (see Sub-Section 6.2.3).

On 01 June 2010, Linda Marie Twerdohlib, on behalf of Teck, registered the 48 WILLOW claims that now form part of the GJ claims block. In August 2010, Teck entered into an Option Agreement with NGEx, in the process forming the 51% (Teck) : 49% (NGEx) joint venture agreement referred to in Section 2.2.

6.2.9 2011 through April 2014 – Spectrum Claims Block

Eilat Exploration Ltd. ("Eilat") took over the block of ten Spectrum mineral claims 2011, with a 10% stake held by Keewatin Consultants (2002) Ltd. ("Keewatin"). An airborne magnetic survey was completed in 2012 (flown by Fugro Airborne Surveys).

On April 14, 2014, the Company entered into a Conditional Asset Purchase Agreement ("CAPA") with Eilat and Keewatin with respect to the acquisition of a 100% interest in the Spectrum claims block. The Company was granted 100% ownership on October 27, 2014 (see the Company's news release dated October 27, 2014), following completion of the terms of CAPA, which required the Company to issue an aggregate of 80 million common shares of the Company at a deemed issue price of C$0.06 per common share. Sixty four million of these shares were issued to Eilat, with the balance (16 million shares) issued to Keewatin.

6.2.10 2011 through November 2015 – GJ Claims Block

The WILLOW claims were transferred to NGEx by a Bill of Sale registered on 21 March, 2011, but it was Teck that explored the GJ property from 2011 through 2013. Teck's work included the drilling campaigns summarized on Table 6.11, as well as a considerable amount of ancillary studies, including:

- geological mapping in several areas to augment previous work;
- a major program of re-logging of historic drillcore;
- various ground and airborne geophysical surveys;
- surface soil geochemical studies;
- an overview of archaeology pertinent to the property; and
- the collection of material for metallurgical testwork.

As part of Teck's work, the then existing camp facility was replaced by a more permanent facility (Hollis, 2011; Hollis, 2012; Hollis and Bailey, 2013; Hollis, 2014; and Hollis *et al.*, 2014).

Table 6.11 A Summary of the Diamond Drilling Programs Completed by Teck Resources Ltd. from 2011 Through 2013, GJ Claims Block, Spectrum-GJ Property
(compiled from information supplied by the Company)

Year	Zone / Deposit	Number of Holes	Total Metres	Hole Diameter
2011	Donnelly	6	2,853.2	NQ
	Wolf	3	1,043.5	
	GJ	1	416.0	
2012	Wolf	5	2,613.9	
	Seestor	1	461.0	
	North	2	926.2	
2013	Donnelly	3	2,028.1	

All 80 of the GJ property claims, held by Teck and its joint venture partner NGEx, were transferred to the Company on November 03, 2015 (see the Company's news release dated November 04, 2015), contingent on completion of terms of the October 05, 2015 Asset Purchase Agreement between Teck, NGEx and the Company (see the Company's news release dated October 27, 2014 and Section 4.3.2.

6.3 Historical Mineral Resource Estimates

The QP for this section of this Technical Report is David Thomas, P. Geo. ("QP Thomas"). He has not done sufficient work to classify the historical Mineral Resource estimates for Central Zone and Donnelly Deposit, presented in the following sub-sections, as current Mineral Resources. In consequence of this, the Company is not treating the historical estimates summarized here as current Mineral Resources. The historical Mineral Resources are, in any event, superseded by the 2016 Mineral Resource stated in the May 2016 Technical Report for the Central Zone and in the April 2016 Technical Report for the Donnelly Deposit. The 2016 Mineral Resource estimates are in turn superseded by the 2017 Mineral Resource updates that are the subject of this Technical Report (see Section 14).

6.3.1 1991 Estimates, Central Zone

Two Mineral Resource estimates were completed in 1991, for what at the time was defined as the Central zone, first by Columbia and then by Orcan Mineral Associates ("Orcan"), an independent engineering firm, for Columbia-Eurus Corporation. A subsequent report, completed in 1994 by Orcan, was never filed for assessment and it is presumed to be lost.

The 1991 estimates are summarized on Table 6.12 that was compiled from data contained in the May 2016 Technical Report that in turn was sourced from Kilby, Casselman and Roberts (1991) and from Saunders and Budinski (1991). The estimates were classified as Inferred, for reasons of '*poor correlation of high-grade gold zones between sections*'.

In QP Thomas's opinion, the 1991 estimates summarized on Table 6.12 do not meet the current criteria for Mineral Resource estimation, as defined in Sections 1.2 and 1.3 of NI 43-101. The reader should, therefore consider the Mineral Resources stated on Table 6.12 with caution, not least as they cannot be relied upon for the reasons described in the following Sub-Section 6.2.2.

Table 6.12 A Summary of the 1991 Inferred Mineral Resource Estimates for the Central Zone, Spectrum-GJ Property
(compiled from information contained in the May 2016 Technical Report)

Company	Cut-Off Grade (g/t Au)	Cutting	Minimum Width (m)	Projections	Method	Tonnes	Grade (g/t Au)
Columbus	5.0	None	1.5	25 m max.	Sectional Block	614,000	12.3
Orcan	5.0	50 g/t Au top cut	1.5	50 m max.	Sectional Block	593,000	11.3

6.3.2 2003 Review and Estimate, Central Zone

In 2003, Mining Associates Pty Ltd. ("Mining Associates") was contracted by TPM to review the 1991 Mineral Resource estimates and complete a new estimate to JORC Code reporting standards. At the time, TPM was considering listing on the Australian Stock Exchange, which requires Mineral Resource estimates to be compiled using the JORC code. JORC is recognized as a Mineral Resource reporting standard by most international financial institutions and is accepted by stock exchanges in Australia, London, Hong Kong and Canada (under some circumstances).

Mining Associates (2004) found that Columbia's 1991 estimate was affected by some estimation errors as regards vein true widths and grade, as well as a lack of a grade top-cut. The average grade estimated by Mining Associates was the same as that estimated by Orcan (11.3 g/t Au, at a 5.0 g/t Au grade cut-off) but, at 474,615 t, the quantity of estimated Mineral Resources was approximately 20% lower. Mining Associate's estimate was classified as Inferred because of '*poor correlation of high-grade zones between drill sections*' and because the historic drill data was not validated.

In QP Thomas's opinion, Mining Associates' 2003 Mineral Resource estimates do not meet the requirements of NI 43-101 and cannot, therefore, be relied upon. This is in part emphasized because drilling and geological interpretation completed by the Company since its acquisition of the Spectrum claims block in 2014 has shown that:

- the geological models used by the historical operators were over-optimistic with respect to the interpreted continuity of high-grade zones; and
- high-grade intervals are less continuous and are not confined to five discrete mineralized panels, as was interpreted by Columbia.

Instead of a high-grade, narrow-vein type deposit, the Company believes (and QP Thomas agrees) that Central Zone is a stockwork or porphyry-style occurrence with a significant amount of high-grade material present (see Sections 7 and 8). It is in consequence of this that the updated (2017) Mineral Resource estimate, that is the subject of this Technical Report, reflects lower average grades but a much higher tonnage than the historical estimates summarized above.

6.3.3 Donnelly Deposit

Historical Mineral Resource estimates for the Donnelly Deposit have been reported by Mehner and Peatfield (2005); Mehner and Peatfield (2006); Mehner, Giroux and Peatfield (2007); and in an NGEx news release dated 07 October 2008 (see the NGEx website news release archive for 2008). These historical estimates are summarized on Table 6.13.

Table 6.13 A Summary of Historical Mineral Resource Estimates, Donnelly Deposit, Spectrum-GJ Property
(compiled from information contained in the reports cited in Sub-Section 6.2.2)

Company	Year	Cut-Off Grade	Category	Tonnes (million)	Average Grades		
					Cu (%)	Au (g/t)	Ag (g/t)
Canadian Gold Hunter	2005	0.20% Cu	Inferred	71.22	0.397	0.398	-
Canadian Gold Hunter	2006	0.20% Cu	Indicated	91.73	0.373	0.381	2.3
			Inferred	28.04	0.354	0.369	2.3
Canadian Gold Hunter	2007	0.20% Cu	Indicated	116.93	0.361	0.398	2.2
			Inferred	9.87	0.336	0.365	1.8
NGEx Resources	2008	0.20% Cu	Measured	84.50	0.346	0.390	-
			Indicated**	68.80	0.290	0.344	-
			*M+I***	*153.30*	*0.321*	*0.369*	-
			Inferred**	23.00	0.260	0.310	-

Notes: * - CGH = Canadian Gold Hunter Corp.
** - These categories include Mineral Resources for the North Donnelly deposit. Insufficient information is available to allow separate reporting of Donnelly Deposit resources only.

The 2005 estimate was based on drilling to the end of the 2004 exploration season to which a manual, sectional polygonal method was applied with intercepts chosen by eye, based primarily on copper grades. Simple polygonal blocks were created around the intercepts and distances of influence were chosen arbitrarily, based on drilling density and the assumption of good continuity of mineralization between holes. It should also be emphasized that for the 2005 estimate '*it was necessary to assign assumed gold and silver grades to TexasGulf samples where none existed*' as '*To not do this would cause an unacceptably low bias for the overall grades for these two metals in the resource estimate*' (Mehner and Peatfield, 2005). Mehner and Peatfield (2005) also state that '*The question of in-situ bulk density (or specific gravity) is not fully resolved*'. It is mainly for these reasons that, in QP Thomas's opinion, the 2005 estimate does not meet the current criteria for Mineral Resource estimation, as defined in Sections 1.2 and 1.3 of NI 43-101. The 2005 estimate cannot, therefore, be relied upon.

The 2006 estimate was based on drilling to the end of the 2005 exploration season. A similar methodology was applied as that summarized above for the 2005 Mineral Resource estimate, although slightly different mineralized zones were defined and both Indicated and Inferred Mineral Resources were estimated. Despite this, in QP Thomas's opinion, the 2006 estimate suffers from the same limitations as the 2005 estimate, with the result that it too cannot be relied upon.

The 2007 estimate was based on drilling to end 2006 exploration season. Computer-based modelling was used to define a three-dimensional solid of the mineralized Donnelly Deposit. Copper and gold grades were interpolated into blocks containing some proportion of mineralization by ordinary kriging. A '*comprehensive program of collecting bulk density data was completed on the GJ Project*' during the 2005 and 2006 exploration programs. In the opinion of QP Thomas, the 2007 Mineral Resource may be relied upon, based on the likely reliability of the underlying data that is assumed to be both accurate and valid, as well as the professional status of the reports' authors and the nature of their reports.

Although there is no readily identifiable reason to question the veracity of the 2008 Mineral Resource estimate, few technical details are available. It is in consequence of this that, in QP Thomas's opinion, the 2008 Mineral resource estimate should be considered with caution as its basis and the applied assumptions cannot be verified.

6.4 Historical Mineral Reserve Estimates

To the Principal Author's best knowledge and understanding, no Mineral Reserve estimates have been compiled in respect of any mineralization located within the Project Area.

6.5 Mineral Production

To the Principal Author's best knowledge and understanding, no formal mineral production has taken place on the Project Area. An unknown quantity of mineralized material was, however, extracted by Silver Ridge in the 1970s and 1980 from the 313.5 m of exploration drift and crosscut development on the Hawk Vein, as described in Sub-Sections 6.1.2 and 6.1.5.

7 GEOLOGICAL SETTING AND MINERALIZATION

David Mehner, P. Geo. ("QP Mehner") is responsible for this Section of this Technical Report. Most of the descriptive information presented in Sections 7.1 and 7.2 has been compiled from Mehner *et al.* (2007), the April 2016 Technical Report and the May 2016 Technical Report, with minor changes or confirmations derived from recent work by Teck and the Company. It should, however, be noted that much of the published work for the region (for example, Ash *et al.* [1995, 1996, 1997a, 1997b], Logan *et al.* [2000] and Evenchick and Thorkelson [2005]) uses the previously accepted 208±7.5 Ma Triassic-Jurassic Boundary assignment of Harland *et al.* (1990), rather than the more recently proposed 200±1.0 Ma designation (see Okulitch [1999] and Pálfy *et al.* [2000]). For the purposes of the following text, QP Mehner has used the more recent chronology. The Stuhini Group strata and associated intrusive rocks are, therefore, referred to as Triassic and the overlying Hazelton rocks as Jurassic in age.

7.1 Regional Geology

The Project Area is located in the north-east part of the Stikine Arch within Stikine Terrane (or "Stikinia") rocks of the Canadian Cordillera. Figure 7.1 is a regional geology plan, as mapped by Souther (1972) and Ash *et al.* (1995; 1996; 1997a; and 1997b).

7.1.1 Stratigraphy

The regional stratigraphy may be summarized as follows:

- Upper Triassic Stuhini Group marine clastic sedimentary rocks (pelagic to fine grained wackes with minor volcanic conglomerate, limestone and mafic volcanics); unconformably overlain by
- Lower Jurassic strata (a lower volcaniclastic and derived epiclastic sequence of trachyandesite composition overlain by a bi-modal, basalt–rhyolite suite consisting of augite-andesite flows, pillow lavas, pyroclastics and derived volcaniclastic rocks alternating with felsic flows and pyroclastics); and, to the south,
- unconformably overlain by a chert pebble conglomerate, grit, greywacke and siltstone of the Middle Jurassic Bowser Lake Group (Ash *et al.*, 1997a).

The Lower Jurassic strata are considered by most to correlate with the (Jurassic) Hazelton Group. Transecting the Upper Triassic to Middle Jurassic assemblage are a distinctive suite of massive, flow-banded and locally spherulitic rhyolites and associated pyroclastics that have been variously interpreted as Lower Jurassic (Read, 1984) or Upper Cretaceous to Lower Tertiary (Souther, 1972) in age.

Capping the stratigraphy outlined at the higher elevations are Upper Tertiary and Pliocene to Recent basalt and olivine basalt flows, commonly (but not always) exhibiting columnar jointing. In the Spectrum claims block, the basaltic sequence is represented by the ca. 7.5 Ma Mount Edziza Volcanic Complex, which forms a non-columnar basalt cap to the mountain on which the Central Zone is located (Figure 7.2).

Figure 7.1 A Regional Geology Plan for the General Project Area
(supplied by the Company)

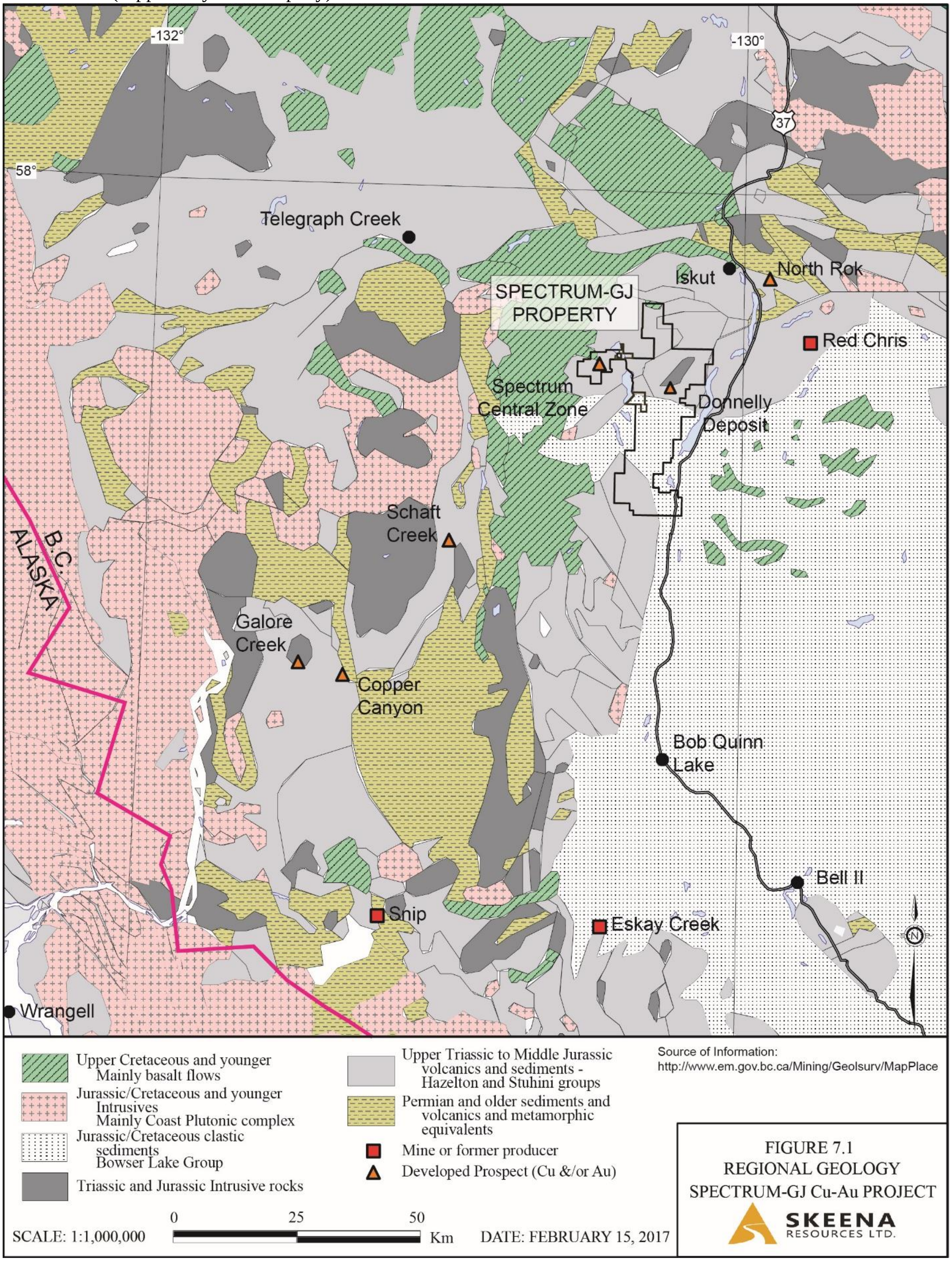


Figure 7.2 A General View (looking approximately south) of the Non-Columnar Basalt Cap at the Peak of the Mountain that Contains the Central Zone, Spectrum-GJ Property Area
(taken from a helicopter and supplied by the Company)

7.1.2 Intrusive Rocks

The intrusive rocks in the general Project Area fall within the Stikine Arch structural domain, a regional feature along which Late Triassic-Early Jurassic intrusive and related (island arc type) volcanic activity took place. The intrusives are typically fine to medium grained dykes, sills and plutons of Early Jurassic age (Ash *et al.*, 1997b), with compositions varying from diorite to granodiorite, monzodiorite, monzonite and syenite. A U-Pb zircon determination of 205.1 + 0.8 Ma for the Groat Stock near the Donnelly Deposit (Friedman and Ash, 1997) dates this intrusive as probably Late Triassic and suggests that it is slightly older than the presumed lower volcaniclastic sequence in the Hazelton Group, from which a U-Pb zircon date of 202.1 + 4.2 Ma was obtained from *"…quartz-phyric alkali trachyte clasts from the volcanic breccia unit…"* (Friedman, 1995, quoted in Ash *et al.*, 1997b). This occurrence is on the north side of Ealue Lake, some 12 km northeast of the Groat Stock. Friedman and Ash (1977) also reported a U-Pb age of 203.8 ± 1.3 Ma for the Red Stock, which hosts the Cu-Au mineralization at the producing Red Chris Mine to the northeast of the Project Area (see Section 23). More detailed dating information on the Groat Stock and its associated mineralization is presented in Section 7.2.

A sample for radiometric dating was collected from the monzonite intrusion at the Central Zone by the B.C. Geological Survey in 2016. At the time of writing (February 2017) the results are pending. However, this intrusion is interpreted to be coeval with the Groat intrusion dykes, based on the similarity of their lithologies and textures.

A younger intrusive suite includes alkali-granite to felsite dykes that range from a few metres to over a kilometre in width and are coeval with felsic volcanics in the upper volcanic sequence of the Hazelton Group. U-Pb zircon age dates were reported from an alkali granite dyke (180.0 +10.1/-1.0 Ma) and massive, fine-grained quartz porphyritic rhyolite (181.0 +5.9/-0.4 Ma) within the Hazelton sequence (Ash *et al.*, 1997b). The youngest intrusions in the area comprise mafic dykes associated with Miocene to Recent Mount Edziza volcanism.

7.1.3 Mineralization

The quartz deficient, alkalic and sub-alkalic intrusive rocks, including the Groat Stock and related dykes and sills located in the Project Area, typically have associated Cu-Au porphyry and/or precious metal vein systems. The younger, felsic intrusives are also mineralized with finely disseminated pyrite, with or without chalcopyrite, which contains elevated copper and gold values. These sulphides commonly occur in silicified zones within the dykes and adjacent country rocks.

7.2 Property Geology

Due to its steep topography the Central Zone area is covered by thin deposits of scree or colluvium that masks the outcrop. On the adjoining GJ claims, the gently undulating Klastline Plateau is blanketed by thin till deposits (generally less than 5 m) with scree and colluvium developing within the steep, deeply incised drainages that cut the margins of the plateau.

Parts of the Project Area have been mapped by Ash *et al.* (1997) and Oliver (2015). The results are presented as Figures 7.3 and 7.4. The Project Area is primarily underlain by Stuhini Group strata intruded by various diorite, monzodiorite to monzonite dyke and stock-like bodies. On the east side of the Project Area, the Stuhini Group is unconformably overlain by Lower Jurassic Hazelton Group volcanic rocks. On the west side of the property, Stuhini Group strata are unconformably overlain to the west and north by volcanic rocks of the Mount Edziza Volcanic Complex. Porphyry-style alteration and Cu-Au mineralization occur within and adjacent to the dyke and stock-like bodies in the Stuhini Group rocks, but not in the Hazelton volcanic sequence.

7.2.1 Spectrum Claims Block

Mapping by Oliver in 2015 on the Spectrum claims block defined a 1,000 m to 1,500 m thick Triassic volcanic sequence (Stuhini Group) which varies from mafic volcanic and sedimentary strata at its base, through a middle sequence of intermediate tuffaceous volcanics and culminating in a calcareous sedimentary sequence with minor limestone at the top. Recognized in diamond drillcore, syn-volcanic feldspar-porphyritic intrusions occur as dykes and sills within the volcanic stratigraphy and may represent the feeder system for the Stuhini volcanics. Four key units were recognized in the Triassic package, from bottom to top, as follows:

- pyroxene porphyritic mafic flows;
- finely bedded, well-stratified siltstones, argillites and sporadic ash tuffs; and
- fine grained plagioclase phyric tuffs with occasional clastic interbeds (a volcanic dominant sequence that is the main host of the Central Zone mineralization); and
- calcareous lithic wackes, volcanic wackes and lesser limestones (a clastic dominant sequence that is typically poorly bedded and transitional to fine-grained plagioclase phyric flows near its lower stratigraphic contact).

Figure 7.3 A Geology Plan of the Spectrum Claims Block, Spectrum-GJ Project Area
(after Oliver, 2015, and supplied by the Company)

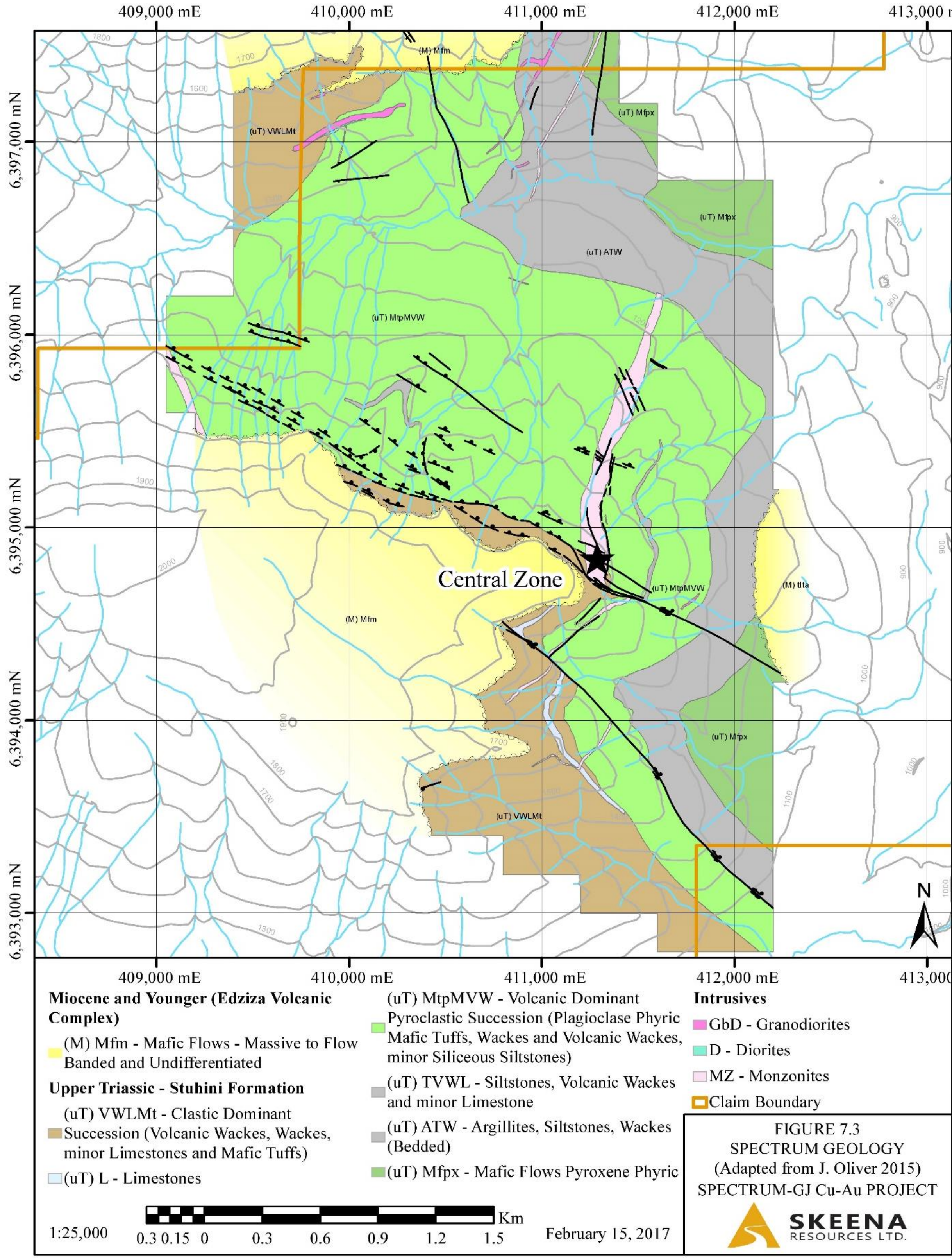
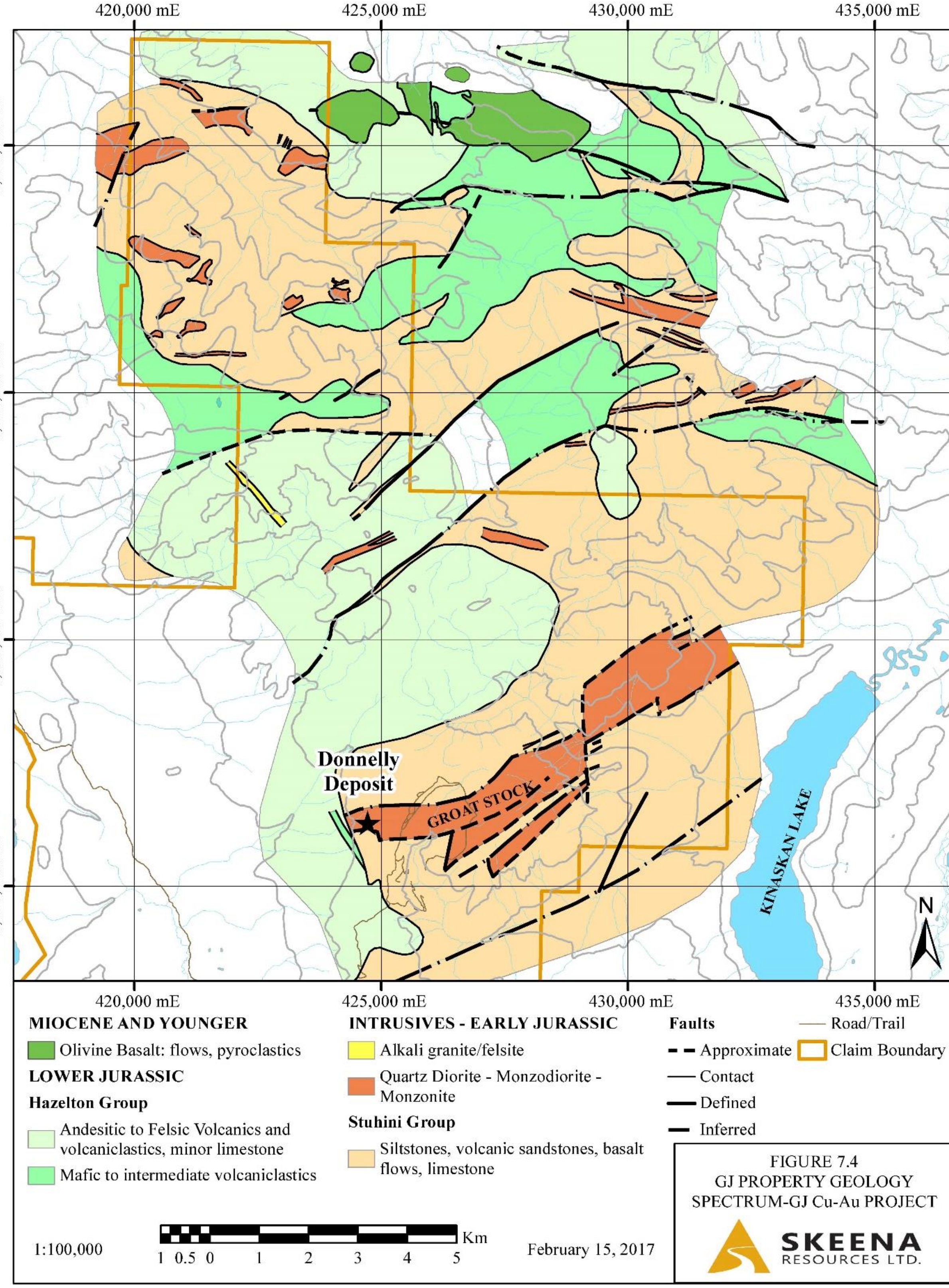


Figure 7.4 A Geology Plan of the GJ Claims Block, Spectrum-GJ Project Area
(after Ash, *et al*., 1997, and supplied by the Company)



Stuhini Group volcanics are unconformably overlain to the west and north by comparatively flat-lying Miocene and younger volcanic rocks of the Mount Edziza Volcanic Complex. Lower Jurassic Hazelton Group strata have not been identified in the area. However, Stuhini Group volcanics are known to be intruded by north-trending, Late Triassic to Early Jurassic dyke-like bodies emplaced along zones of structural weakness. Three intrusive phases have been mapped: monzonite; diorite; and granodiorite, the oldest of which is thought to be a monzonite dyke intersected by drilling in the Central Zone.

There are currently no age dates for any of the intrusive suites described above, but they are interpreted to be coeval with those identified in the area of the Donnelly Deposit. A sample for radiometric dating was collected by the B.C. Geological Survey in 2016. At the time of writing (February 2017) the results are pending. Stuhini Group volcanic strata and associated intrusives are also cut by less than one to two metre wide mafic dykes associated with the Mount Edziza Volcanic Complex.

7.2.2 GJ Claims Block

On the east side of the Project Area, Stuhini Group strata comprise a mixture of distal, deep marine basin sediments characterized by massive to thinly bedded cherts and graphitic cherts interbedded with minor siliceous siltstones, mudstones, feldspathic wackes, rare limestone and occasional augite phyric basalt flows over the GJ Zone and eastern portions of the Donnelly Zone. The strata grade to predominantly feldspathic wackes interbedded with siltstones, massive to laminated basalt tuff, lapilli tuff and volcanic breccia with discontinuous lenses of poorly sorted coarse sandstones to polymictic, pebble and cobble conglomerates over the west central portion of the Donnelly Deposit. These rocks have been intruded by the Groat Stock.

The siltstones vary from buff to light grey and pale green, cherts vary from white to black and the wackes vary from grey to brown depending on biotite content. Radiolarian fauna extracted from these fine grained sediments near the southwestern boundary of the Groat Stock are Middle(?) to Late Triassic in age (Ash *et al*., 1997b).

Conglomerates correlated to the Stuhini Group are reworked mafic to intermediate volcaniclastics and siltstones, likely representing debris flows or lahars related to intra-basinal slumping. Compositions of clasts(?) vary from laminated siltstones to augite porphyry basalt to probable andesite or trachyandesite. Some of these, which Mehner *et al.* (2007) interpreted as correlative with the Stuhini Group, may have been included by Ash *et al.* (1997a; 1997b) in the lower volcanic suite of the Hazelton Group. The strata vary from matrix- to clast-supported, with clasts ranging from millimeter size grains through pebbles to cobbles and locally boulders. The unit is typically light grey to grey-green.

The best exposure and thickest occurrence of the conglomerates occurs immediately northeast of the North Zone, the location of which is identified in Section 7.7. Similar but much thinner intervals of conglomerate interbedded with siltstones and wackes were intersected in drillholes in the central part of the North Zone and throughout the central and western portions of the Donnelly Deposit.

The basalt flows are dark grey to green or black. They appear to be massive, contain augite, with or without plagioclase phenocrysts, and are restricted to the GJ Zone and both northern and southern limits of the Donnelly Deposit. They vary from weakly altered and barren to strongly altered with quartz-chalcopyrite-pyrite and/or chalcopyrite-pyrite veining.

The basalt tuffs, lapilli tuffs and volcanic breccias vary from massive, dark grey-green-black, to thinly bedded dark grey to black with pale green siltstone to feldspathic wacke interbeds. Lapilli and volcanic fragments are generally difficult to identify. Intervals of pyroclastic basal strata are largely restricted to the western half of the Donnelly Deposit.

Intruding the entire Stuhini Group sedimentary-volcanic stratigraphy are a number of dark grey to black, massive, augite phyric basalt dykes that are best exposed in outcrop along the banks and bottom of Groat Creek. Distinguishing basalt dykes from flows is highly subjective as it is seldom possible to determine whether the unit is or is not conformable with the stratigraphy.

In the area of the Donnelly Deposit, the Stuhini Group strata is intruded by pre- to post-mineralization sills, dykes and small stocks of the Groat Stock comprised of fine to medium grained, equi-granular to rarely porphyritic monzodiorite with minor diorite, quartz diorite and monzonite phases. East and south of the North Zone, a large body of post-mineral Groat Stock outcrops as an elongate, east-west oriented, weakly altered, massive, medium grained, quartz-deficient diorite. Through the North zone, GJ zone and Donnelly Deposit, the Groat Stock occurs as numerous fault-bounded, pre- to syn-mineral dykes and sills up to 100 m thick that roughly parallel bedding in the host sedimentary rocks.

The east-west orientation of each of the North, Donnelly and GJ zones along with the east-west orientation of the post-mineral diorite phase of the Groat Stock is interpreted to be controlled by long lived, pre-, syn- and post-mineral, sub-parallel strike-slip faults, possibly related to the regional Ealue Lake fault.

The pre- to syn-mineralized monzodiorite phase of the Groat Stock, the primary mineralogy consists of between 25% to 55%, 1.5 mm to 2.0 mm euhedral plagioclase phenocrysts and 5% to 20% of similarly sized subhedral hornblende phenocrysts set in a very fine grained to aphanitic groundmass composed of anhedral K-feldspar, plagioclase, hornblende and/or biotite. This unit typically has a trachytic texture. Other intrusive phases are very similar and without rock staining, particularly given the intensity of alteration, it is often difficult to distinguish them. So-called diorites tend to have a slightly higher mafic content and often a weakly developed felted texture. Monzonites are typically more leucocratic. The distinctions are subtle and probably not of major significance.

Table 7.1 provides details of various radiometric dates obtained from rocks and associated minerals in the Groat Stock, as compiled from Appendix 16-1 in Bailey, *et al.* (2014).

Table 7.1 A Summary of Radiometric Ages for the Groat Stock and Associated Mineralization, GJ Claims Block, Spectrum-GJ Property
(compiled from information contained in Bailey, *et al.* [2014])

Sample	Area, Deposit or Zone	Dating Method	Mineral	Sampler	Age (Ma)
Groat-composite	General	Rb-Sr	Whole Rock	Schmitt, 1977	189
GJ-90	Wolf Plateau	K-Ar	Hornblende	Schmitt, 1977	195±8
PST95-262	Groat Stock	U-Pb	Zircon	Ash, 1995	205.1±0.8
CGH-05-036	Donnelly	U-Pb	Zircon	CGH/Aldrick	206.81±0.65
CGH-05-035	Donnelly	U-Pb	Zircon	CGH/Aldrick	206.25±0.39
GJK-11-JRR-0072	Donnelly	U-Pb	Zircon	Teck 2011	206.95±0.23
GJK-11-JRR-0070	GJ	U-Pb	Zircon	Teck 2011	207.39±0.90
GJK-11-JRR-0069	Wolf	U-Pb	Zircon	Teck 2011	204.94±0.21
GJK-12-229	Wolf	Re-Os	MoS2	Teck 2012	206.9±0.8
GJK-11-219	Donnelly	Re-Os	MoS2	Teck 2012	207.3±0.9
CGH-07-142	North Donnelly	Re-Os	MoS2	Teck 2012	208.2±0.9
CGH-05-048	GJ	Re-Os	MoS2	Teck 2012	203.6±0.8
CGH-05-064	Camp	Re-Os	MoS2	Teck 2013	200.0±0.8
CGH-06-084	Donnelly	Re-Os	MoS2	Teck 2013	200.2±0.8

Further north, in the QC area, the Stuhini Group strata are comprised of a thick andesitic volcaniclastic package overlain by a thick sedimentary sequence comprised of a thin wacke – siltstone turbiditic sequence. This in turn overlain by thick feldspathic wackes to conglomerates and well-bedded quartz wackes and siltstones (Devine *et al.*, 2013). Stuhini Group strata has been intruded by a series of sub-vertical, northwest trending diorite, monzodiorite to monzonite dykes that are up to 100 m wide and which are emplaced in a four kilometre long, east-west oriented structural zone. Two age dates determined by Teck in 2011 and 2012 yielded conflicting results with a U-Pb age of 203.55 ± 0.16 Ma and a Re/Os age of 216.1 ± 0.9 Ma. It is possible the Re/Os age could be suspect due to the small amount of sample used in the analysis.

Unconformably overlying both the Stuhini Group and the Groat Stock are grey to maroon volcaniclastics and flows of the Hazelton Group that include black shales, poorly sorted andesitic sandstones and debris flows, augite-phyric basalt flows, plagioclase with or without hornblende-phyric andesite flows, pyrite-bearing dacite lapilli tuffs, flows and high-level intrusives. They all occur within a flat to shallow, southwest dipping sequence that caps the underlying units. Aside from a few narrow shears that contain minor chalcopyrite-pyrite-malachite-chalcocite and the dacitic units which contain up to 4% finely disseminated pyrite, Hazelton Group strata are largely unaltered and un-mineralized. This is best seen in drillholes at the west end of the Donnelly Deposit and in outcrop at the YT showing (the location of which is identified in Section 7.7) where unmineralized, unaltered Hazelton Group strata overlie Cu-Au mineralization. This unconformity, north-northwest of the Donnelly Deposit, is illustrated in Hollis (2011).

7.3 Structural Geology

Rocks throughout the property are affected by large scale, open folding or warping and significant high-angle faulting.

7.3.1 Folding

Evidence of folding in thick bedded sequences is largely based on observations in the thinly bedded sediments where general variations in strikes and dips have been used to infer folding. In the North-GJ-Donnelly Deposit area, dips and strikes within the sediments differ substantially over short distances. However, at locations progressively more distal from the Groat Stock, bedding consistently strike approximately east-west. Dips to the north are generally between 55º to 75º to the north, while to the south of the Groat Creek they are between 55º to 75º to the south. This change is interpreted to suggest a broad anticline, with the Groat Stock localized along the hinge zone. Further north, in the QC area, the strata are moderate to steeply north dipping and disrupted by east-west structural breaks, resulting in localized panels of overturned strata. To the west, in the Spectrum claims block, Triassic Stuhini Group strata are gently folded around shallow southwest-plunging fold axes and dips shallowly to the west and northwest.

7.3.2 Faulting

Faulting is widespread throughout the Project Area. It extends along three principal directions with evidence for multiple periods of activity. In no particular order, the first major fault system strikes north-south to north-northeast. The Central Zone is associated with a north-south oriented structural zone. In the Donnelly and QC areas, faults of this orientation post-date emplacement of the intrusive bodies and Cu-Au mineralization. At the east end of the property, in the Wolf area, left lateral movement along these late faults is interpreted to have been responsible for the one kilometre offset between the relatively massive intrusive outcropping on Wolf Plateau and the more elongate sills and dykes observed in the Donnelly-GJ-North zones. In the Donnelly and North Donnelly Deposits, vertical movement appears to dominate along steeply west-dipping normal faults that are interpreted to define the eastern margins of a north-trending graben that developed after deposition of the Hazelton Group strata. It is likely the graben is part of the Middle Jurassic Eskay Creek Rift (Alldrick, *et al*., 2004 and 2005) which Alldrick traced north from the Eskay Creek deposit to within a few kilometres south of the Project Area. Late, north trending, post Cu-Au mineralization quartz-carbonate and dolomite veins, many with significant gold + arsenic + zinc + silver values, are observed throughout the property and are believed to be related to this fault system.

A second generally east-west striking fault system forms a splay off the regionally prominent east - north-east trending Ealue Lake fault. Emplacement of the Groat Stock and strike-slip faulting, related to this fault orientation, is interpreted to comprise the structural control that gave rise to the stock's elongated shape. Porphyry Cu-Au mineralization at Donnelly and other occurrences related to emplacement of the stock, is interpreted to be related to this long-lived, pre-, syn- and post-mineralization fault direction.

The east-northeast oriented fault set is regionally important in that it defines the northwest edge of the Bowser Basin (Evenchick and Thorkelson, 2005). It is especially prominent at the Red Chris deposit, where it is represented by the presently active South Boundary fault system (Newell and Peatfield, 1995; Rees, *et al.*, 2015). This fault system follows the general trend of the Todagin Creek Valley and lies parallel to and about 19 km southeast of the Ealue Lake fault system. Hollis and Bailey (2013) make the point that the Ealue Lake fault system appears to horsetail in the vicinity of the Groat Stock and that '*This type of horsetailing is typically accompanied by zones of local dilation that could have been an important control on the emplacement of the Groat Stock*'. The east-west orientation is also prominent at the QC prospect area where an east-west oriented structural corridor is interpreted to have controlled the emplacement of intrusive bodies and porphyry-style mineralization and alteration. Further west in the Spectrum area, post mineral east-west oriented structures are interpreted to have been responsible for offsets in the north-south trending Central Zone; quartz-sulphide veining in the West Creek area occurs along an east-west, subvertical orientation.

Finally, a northwest oriented, steep northeast to southwest dipping structural trend, exemplified by the northwest trending fault system and its associated quartz-sericite-pyrite alteration, cuts through the Central Zone. Other north-northwest oriented structures have been inferred from air photo interpretations and topographic lineaments, as well as from offsets in geophysical and geological data at the south end of the Central Zone and from drillholes at the west end of the Donnelly Zone, where Hazelton Group strata appears to be down-dropped along these normal faults. In a lineament analysis in the Spectrum claims block area by Oliver and Walcott (2016), one of their conclusions suggested that the three dominant structural directions formed under trans-tensional conditions and maximum dilation will likely be associated with extensional arrays, particularly northwest and east-west oriented faults.

7.4 Mineralization

The Project Area hosts two principal styles of mineralization that have been the target of past and current exploration. The first and older style is porphyry Cu-Au mineralization related to intrusion and alteration by Late Triassic alkalic to sub-alkalic diorite to monzonite dykes and stocks exemplified by the Central Zone and Donnelly Deposit. The second comprises later, structurally-hosted and high-grade gold zones associated with shearing, fracture zones and quartz-carbonate vein/fault controlled pyrite, arsenopyrite, sphalerite, galena and chalcopyrite hosted by altered volcanic units and monzonite dykes.

7.4.1 Porphyry-Style Mineralization - Central Zone

Porphyry-style Cu-Au mineralization occurs within a north-south trending, moderately west dipping and fault-bounded structural panel of Triassic Stuhini volcaniclastic lithologies intruded by syn- to late-mineral monzonite dykes. Porphyry-style mineralization has been defined over a strike length of 1,000 m, with widths of 70 m to 200 m, it has been tested to 400 m downdip and it remains open along strike and downdip. It was intruded by a late, predominantly barren monzonite intrusion at depth evident in Section 4900 N and climbing north towards surface by Section 5300 N where it over-prints porphyry Cu-Au mineralization.

Mineralization occurs as quartz-pyrite-chalcopyrite with or without magnetite veinlets, stockworks, fracture fills and fine grained disseminations of pyrite and chalcopyrite. Metal grades appear to be directly related to the abundance of quartz-sulphide-magnetite vein development.

The majority of monzonite dykes intersected in drilling are weakly mineralized, mainly with disseminated pyrite and chalcopyrite and with lesser quartz-pyrite-chalcopyrite with or without magnetite veining. They are interpreted to indicate intrusion during the waning stages of the porphyry Cu-Au mineralizing phase. Rarely have syn-mineralizing monzonite dykes been intersected that show similar degrees of quartz-pyrite-chalcopyrite-magnetite vein development, as found in the surrounding volcanic host rock. Spatially, the well mineralized syn-mineralization monzonite dykes have been intersected more frequently towards the northern third of the deposit, thereby interpreted to suggest a possible zonation. Rare molybdenite has been intersected to date; bornite is not present. No sulphide zonation has been identified to date (February 2017).

7.4.2 Porphyry-Style Mineralization – Donnelly Deposit

Of the many porphyry Cu-Au prospects located on the GJ claims block, the most advanced is an area measuring 3.5 km east-west and north-south where disseminated, fracture, quartz vein and quartz stockwork-controlled pyrite with variable chalcopyrite, rare bornite and trace molybdenite mineralization containing elevated gold values occurs. This area contains the Donnelly Deposit, the North Donnelly deposit and the GJ and North zones (the locations of which are identified in Section 7.7).

Typically, the best chalcopyrite mineralization occurs where pyrite is weaker and IP chargeability responses are moderate, which generally occurs on the flanks of more intense chargeability anomalies. Secondary magnetite, generally associated with chalcopyrite, is found as disseminations, irregular clots, in veins with K-feldspar with or without chlorite and/or epidote and/or as fillings in single or sheeted fractures that are one to three millimetres thick and millimetres to 10 cm apart. Exceptions to this association (the Donnelly Deposit and portions of the North zone) appear to be where magnetite has been altered to hematite.

Host rocks to all styles of mineralization include: various intrusive phases; basalt tuffs, flows and dykes; and sedimentary rocks dominated by wackes. Where mineralization occurs in siltstones or cherts, it tends to be restricted to a few metres laterally from intrusive rocks or fault structures, and then only where it is in close proximity to intrusive bodies. In wackes and basaltic rocks, the mineralization is largely disseminated with fracture and quartz-chalcopyrite-pyrite veins (with or without K-feldspar, magnetite, epidote and/or carbonate) constituting a smaller but significant portion. Where the mineralization occurs in intrusive rocks, it is largely confined to a fine- to medium-grained, equigranular monzodiorite phase, although mineralized monzonites, crowded feldspar porphyries and mafic leucocratic syenite phases have been noted.

Generally, the style of mineralization is similar to that of the volcanic and sedimentary rocks where disseminated pyrite and chalcopyrite dominate with fracture and quartz-chalcopyrite-pyrite veins (with or without K-feldspar and carbonate) constituting a slightly smaller percentage. However, in the 2005 drilling of the Donnelly Deposit, fault-bounded intervals of intensely altered intrusive, with up to 55% quartz veining as sheeted veins to stockworks, were encountered in a number of drillholes at depth, as well as over the western-most two gridlines, covering the last 120 m of the deposit that had by then been drilled. In these zones, sulphides appear to be finer grained, occur equally in the intrusive and quartz veins and yield significantly higher Cu-Au-Ag grades.

Throughout the eastern half of the Donnelly Deposit, most of the chalcopyrite mineralization is associated with K-feldspar altered monzodiorite. In these areas pyrite content tends to be low and IP chargeability readings are in the 10 MV/V to 18 MV/V range. Chalcopyrite is generally fine- to medium-grained, allowing for reasonable, visual grade estimation. A very common association with chalcopyrite is secondary magnetite as disseminations, irregular clots, in veins with K-feldspar, chlorite and epidote or as fillings in single or sheeted veins that are one to three millimetres thick.

In the western half of the Donnelly Deposit, mineralization is associated with a more leucocratic altered monzodiorite with weak argillic and weak to strong phyllic alteration (sericite-quartz-clays). Magnetite has since been altered to hematite; chalcopyrite is fine- to very fine-grained and is associated with significant amounts of finely disseminated pyrite, often with silica flooding. In these areas the better Cu grades typically occur where chargeability values exceed 18 MV/V.

Multiple intrusive phases are apparent in and around the Donnelly Deposit and to date (February, 2017) it has not been possible to determine which intrusive unit, if any, is the principal phase associated with porphyry mineralization. The mineralization is, however, closely associated with strong fracturing and brecciation, which is very common throughout the Donnelly Deposit and which is associated with east-west to east-northeast striking faults. The areas of faulting, strong fracturing and brecciation are interpreted as zones of weakness that both controlled emplacement of pre- to post-mineral intrusive phases and provided conduits for mineralizing hydrothermal fluids.

7.4.3 Porphyry-Related, Vein-Hosted Mineralization

The second style of mineralization found on the Project Area comprises higher grade gold mineralization that post-dates the porphyry Cu-Au mineralization described above. It is structurally controlled in that it occurs in veins, fracture zones and stockwork crackle zones and as gold-bearing quartz-carbonate-sulphide veinlets and stockworks proximal to faults and shear zones. Petrographic work by Oliver (2016) indicates gold is associated with late fractures / microveinlets in high sulphide veinlets cutting arsenopyrite, which is one of the younger veining events. Gold also occurs as free gold within strongly fractured and strongly chlorite-sericite-calcite-pyrite altered zones with no associated sulphide veining but close associations to coarse grained laths of chlorite and sericite, and only a weak linkage to secondary K-feldspar or quartz. Gold mineralization often shows additional enrichment of Ag, Cu, Pb, Zn, As and Sb.

The exact timing of the Au event(s) is not known and more than one Au mineralizing phase might be present across the Project Area. It is suggested some of the gold zones are related to the later, waning stages of a porphyry system where they overprint and are peripheral to porphyry mineralization, while others are significantly later such as the north striking, steeply dipping dolomite veins that can be up to two metres wide and contain pyrite, with or without arsenopyrite, chalcopyrite, sphalerite and galena, within the Groat Stock and the overlying Hazelton Group strata. The best known example of higher-grade gold mineralization on the property is located in the northern two thirds of the Central Zone. It is hosted by intermediate volcanic and volcaniclastic strata of the Stuhini Group and crosscutting, north-trending monzonite intrusions.

Drilling to the end of 2016 on the Central Zone has defined a 665 m long and 40 m to 200 m wide sub-vertical corridor that has been drill-tested to 400 m below surface and which hosts multiple zones of gold mineralization. The near surface, updip portions of the gold zone overprints moderately west dipping porphyry-style mineralization, thereby creating wide intersections of typical porphyry-style copper grades, but with elevated gold grades and increased concentrations of pathfinder elements As and Sb, with or without Pb and Zn. The superposition of a vertical Au zone over a dipping porphyry body suggests a period of deformation and tilting that may have occurred after porphyry mineralization and before the gold event.

The zone of elevated Au grades in the Central Zone has not been adequately defined along strike and it is open both to the north and vertically downdip. To the south, it is truncated by an east-west oriented structure at approximately Section 4625 N, south of which it has not been identified by drilling, although its continuation could be expressed by Au-As soil geochemical anomalies to the southeast. Alternatively, it might be related to gold mineralization intersected structurally beneath the porphyry Cu-Au mineralization, such as in drillhole S16-076 on Section 4525 N. Additional drilling is required to test these hypotheses.

7.5 Alteration

The alteration assemblages associated with porphyry-style Cu-Au mineralization found on the Project Area are typical of porphyry systems, but become more complicated by features unique to each deposit and by later faulting that can juxtapose different alteration assemblages.

7.5.1 Central Zone

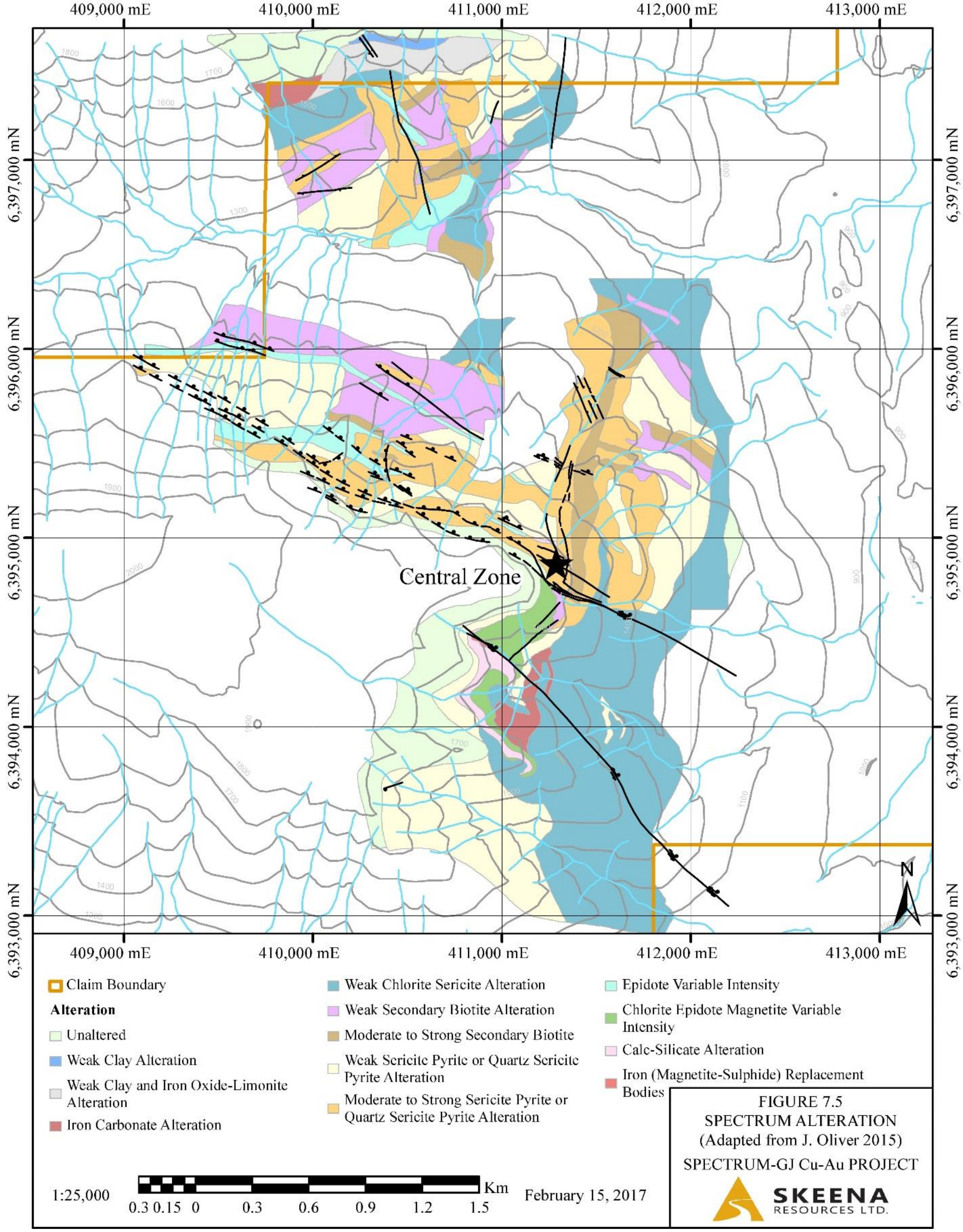
Figure 7.5 provides a summary of the alteration types found across the Central Zone area. The earliest alteration event in the Spectrum Claims block area is pervasive biotite hornfels developed within Stuhini Group volcanic lithologies:

- it is best preserved within the footwall of porphyry-style mineralization, where it is pervasive (little of the alteration type remains within porphyry-style mineralized mass, except near the north end of the deposit); but
- it is over-printed by alteration related to the higher grade gold mineralizing event.

Potassic alteration related to porphyry Cu-Au mineralization forms narrow, diffuse bands of K-feldspar with or without disseminated epidote within siltstone units. This alteration is cut by quartz-sulphide-magnetite veining with K-feldspar halos, selective replacement of mafic sites by biotite in some intrusive phases and more pervasive disseminated magnetite. The high temperature quartz-sulphide-magnetite veins zone laterally outwards to quartz-chlorite-chalcopyrite veins.

A large proportion of the Stuhini Group volcaniclastics with porphyry Cu-Au mineralization is associated with strong pervasive chlorite-epidote-magnetite alteration, which is interpreted as alteration of earlier biotite hornfels. This alteration may zone outwards to areas of weaker diffuse and selective chlorite-epidote-magnetite (with or without carbonate) replacement. In the Skarn and South Copper zones (located in Section 7.7) a calc-silicate alteration has been mapped that may include epidote, diopside, tremolite/actinolite, chlorite and magnetite as weak replacements of calcareous volcanic wackes and mafic tuffs. The calc-silicate alteration is gradational with chlorite-epidote-magnetite alteration. Quartz-sericite-pyrite alteration, which overprints the earlier alteration assemblages, can be expressed either as wide pervasive zones, such as in the hangingwall of a prominent northwest-trending structure crossing the Central Zone, as metre- to tens of metres-scale patchy and pervasive alteration or as finer, centimetre-scale haloes on quartz-pyrite veining.

Figure 7.5 A Geology Plan of the Spectrum Claims Block, Showing the Distribution of Alteration Types, Spectrum-GJ Project Area
(supplied by the Company)



Alteration associated with the gold mineralizing event overprints the earlier biotite hornfels and is centered on discrete zones of gold mineralization. Alteration varies from centimetre scale vein selvages to more pervasive zones up to tens of metres in scale. Alteration zonation around these discrete gold zones can have an inner core of secondary K-feldspar and/or silicification, sometimes with patchy epidote and chlorite grading outwards to chlorite dominated alteration. Gold-only mineralization is also associated with zones of strong to intense chlorite-sericite-calcite alteration in zones of strong fracturing and deformation with no associated quartz-sulphide veining. In a drillhole intersection on Section 4525 N, gold mineralization is associated with iron carbonate veining.

Quartz-sericite-pyrite and quartz-sericite-chlorite-pyrite alteration post-dates all other alteration assemblages. The distribution of alteration on surface in the area of and surrounding the Central Deposit was documented by Oliver in 2015 and is shown on Figure 7.5. Overprinting the alteration assemblages associated with both the porphyry Cu-Au and structural Au events is pervasive calcite and fine calcite veining and stockworks.

7.5.2 Donnelly Deposit

In the area of the Donnelly Deposit, all lithological units are micro-fractured and brecciated. In some drillholes, clasts in brecciated intervals are rounded and strongly altered and are reminiscent of hydrothermal breccias. In siltstones, micro-fractures are often filled with fine-grained, grey quartz. Where the siltstones are within or close to mineralization and/or intrusive rocks, they tend to be very hard, silicified and have a mottled, cream to grey-green to brown or red brown colouration. Whether this apparent silicification is due to alteration by post-mineral phases of the Groat Stock is unclear. At some localities, siltstones appear to have been altered and recrystallized into what are now best termed quartzites.

Within the mineralized zone, regardless of whether rocks are intrusive or wackes, alteration consists of an early, selective pervasive potassic alteration overprinted by later, phyllic and propylitic (carbonate) alterations (Petrascience Consultants, 2004). Potassic alteration includes:

- selective replacement of rims of plagioclase by K-feldspar;
- K-feldspar–magnetite-chalcopyrite, with or without quartz, epidote, bornite veins and/or K-feldspar vein selvages;
- patchy K-feldspar replacement;
- replacement of mafic phenocrysts or phases by actinolite or secondary biotite; and
- secondary biotite envelopes developed along veins.

Phyllic and propylitic alteration is represented by quartz-sericite, with or without carbonate, chlorite, pyrite and/or epidote, which overprints the potassic alteration and yields the following textures:

- selective replacement of plagioclase cores by sericite with or without carbonate;
- veinlets of quartz-pyrite-chalcopyrite with or without carbonate;
- patchy and disseminated carbonate alteration of plagioclase, biotite and hornblende;

- replacement of secondary biotite by chlorite, with or without carbonate, epidote and/or rutile; and
- magnetite, chalcopyrite and pyrite that is variably rimmed and replaced by hematite.

More recent work by Teck has confirmed the pattern outlined. For example, Hollis (2014) described the alteration assemblages and their geometry as follows:

'*Several different hydrothermal alteration mineral assemblages occur in the Donnelly resource area. These alteration assemblages typically define a rough pattern of zonation that is centered on areas of Cu-Au mineralization. This pattern of zonation is complicated and disrupted by pre-, syn- and post-mineral faults. These faults impose a control on the distribution of these alteration assemblages, and it is common to see drastically different alteration assemblages juxtaposed on either side of a fault. Similar alteration assemblages and zonation patterns occur in the Donnelly, North Donnelly, GJ, and North Zones, which is interpreted to reflect genetic similarities in mineralization at all these zones. Each of the major alteration assemblages that occur in the Donnelly resource area are described below*'.

'*A potassic assemblage comprised of K-feldspar-biotite ± magnetite ± epidote ± chlorite occurs in the central portion of the hydrothermal alteration mineral zonation. This alteration assemblage is typically coincident with chalcopyrite-pyrite mineralization and significant Cu-Au grades. This potassic mineral assemblage occurs as selective replacement of feldspar and/or mafic phenocrysts, within vein selvages, and locally as semi-pervasive to pervasive replacement of host rock alteration assemblages that are either vein-controlled or pervasive*'.

'*An alteration assemblage comprised of chlorite-sericite ± hematite locally overprints potassic alteration zones and also occurs on the flanks of potassic alteration zones. This alteration mineral assemblage occurs as selective replacement of mafic phenocrysts and as a vein selvage assemblage. The assemblage occurs predominantly in the Donnelly, GJ, and North Zones. The chlorite-epidote- sericite ± hematite assemblage grades outwards with diminishing epidote and chlorite into an assemblage comprised of carbonate-sericite ± chlorite ± hematite. This carbonate-sericite assemblage occurs peripherally around the margins of the Donnelly and GJ Zones*'.

'*A phyllic assemblage comprised of quartz-carbonate-sericite-pyrite pervasively overprints earlier alteration assemblages in the western portions of the Donnelly, North Donnelly and GJ Zones. This alteration assemblage is characterized by intense, texturally-destructive alteration that locally totally replaces groundmass and phenocrysts. Quartz-sulphide veins that are typically associated with potassic alteration are observed to occur within this phyllic alteration assemblage, although evidence for potassic alteration minerals that typically accompany these quartz veins is inferred to have been overprinted. This assemblage is also inferred to be grade-destructive, because portions of the North Donnelly and Donnelly zones that contain this assemblage are generally characterized by lower Cu-Au grades. The prevalence of this overprinting alteration assemblage in the western part of the Donnelly and North Donnelly Zones is interpreted to reflect a shallower exposure level in this area resulting from the NNW-NNE striking normal faults, which down-drop the resource area to the west*'.

'*A propylitic assemblage comprised of chlorite ± epidote ± hematite ± carbonate occurs throughout the Donnelly plateau area. The assemblage is prevalent in the less-altered rocks that are distal to Cu-Au mineralization. Most of the unmineralized portion of the Groat Stock and adjacent Stuhini Group rocks contain some degree of alteration that can be categorized as this sort of propylitic assemblage*'.

7.6 Geological Models

In preparation for the updated Mineral Resource estimates that are the subject of this Technical Report (see Section 14), simplified geologic models were prepared for the Central Zone and Donnelly Deposit. The models incorporated lithological descriptions and qua1itative analytical data from all the drilling and surface mapping programs, up to and including the Company's 2016 drilling programs described in Section 10.

7.6.1 Central Zone

To generate a geologic model for the Central Zone, interpreted cross-sections were simplified into nine domains defined by a group of unique lithologies, one (or more) styles of mineralization and/or structurally bound panels. Using these defined domains, every sample interval from each drillhole was then coded by domain number. The resulting database was imported into Leapfrog to generate a three-dimensional model. The nine defined domains are described below and are shown in Figures 7.6 and 7.7.

<u>Domain 0</u>

Overburden (scree and/or colluvium) or casing, except in the area of Domain 2a. In this latter case, some holes have exceptionally long lengths of casing, required to penetrate the broken rock (weathered scree) of Domain 2a. For these holes, some of the casing is assigned to Domain 2a.

<u>Domain 1</u>

This comprises a flat-lying, Miocene basalt of the Mount Edziza Volcanic Complex that unconformably overlies the Triassic Stuhini Group assemblage. Domain 1 does not include any Miocene basalt dykes that occur within the Stuhini Group stratigraphy.

<u>Domain 2</u>

Triassic Stuhini Group volcano-sedimentary lithologies in the hangingwall of the porphyry Cu-Au structural panel (Domain 3). At the north end of the Central Zone, Domain 2 hosts low-grade, gold only mineralization of the 300 Colour zone and rare, high-grade structural gold-silver-base metal veining such as in drillhole S16-085.

<u>Domain 2a</u>

A rotated slump block (or sackung) of broken, heavily weathered Stuhini Group strata that is generally barren but locally has a low-grade, gold only signature. Domain 2a lies towards the north end of the deposit and overlies porphyry Cu-Au mineralization. Casing in several pre-2014 drillholes extended through the sackung such that its base is in places somewhat interpretive.

Figure 7.6 A Plan View of the Central Zone Domain Model, Spectrum-GJ Project Area
(supplied by the Company)

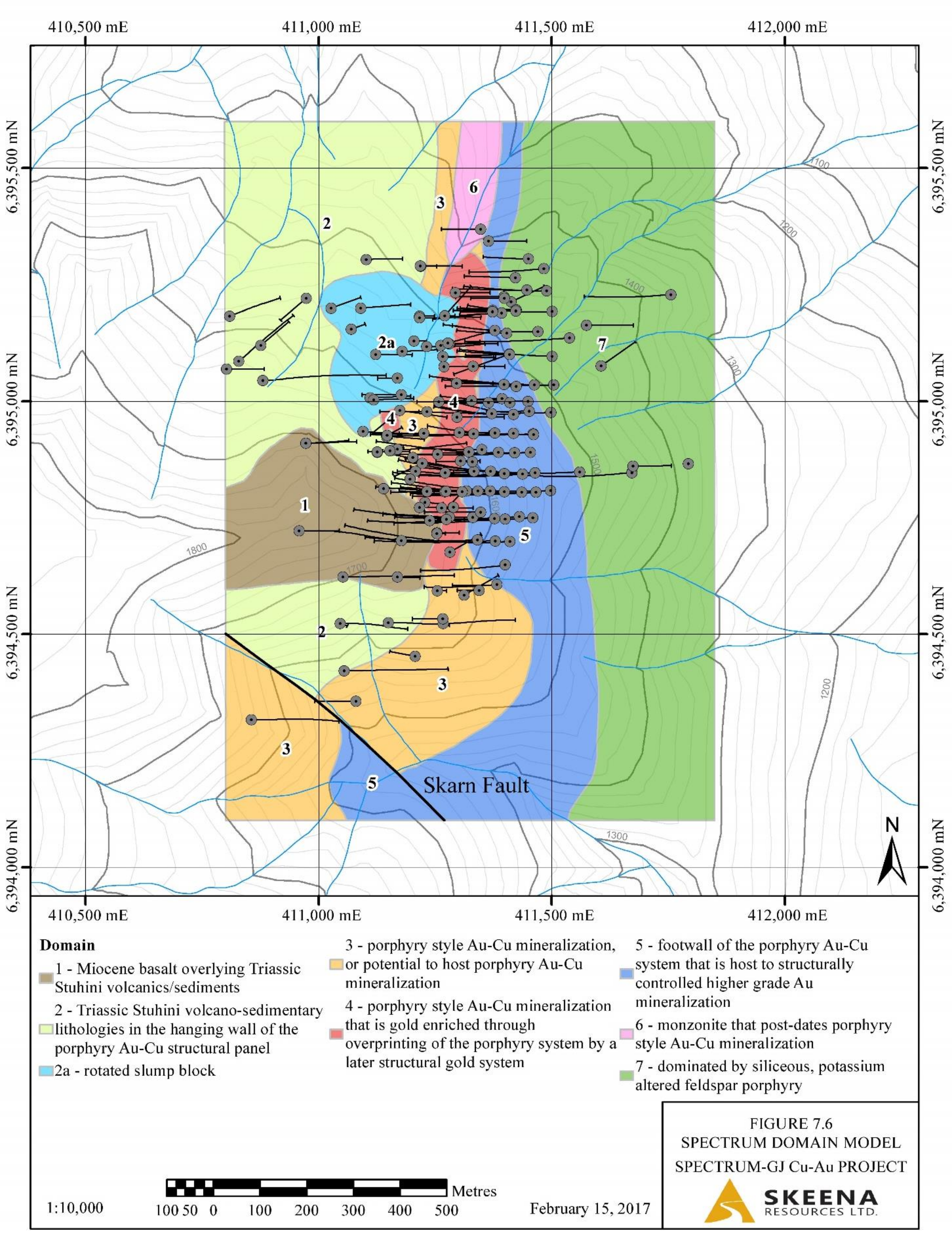
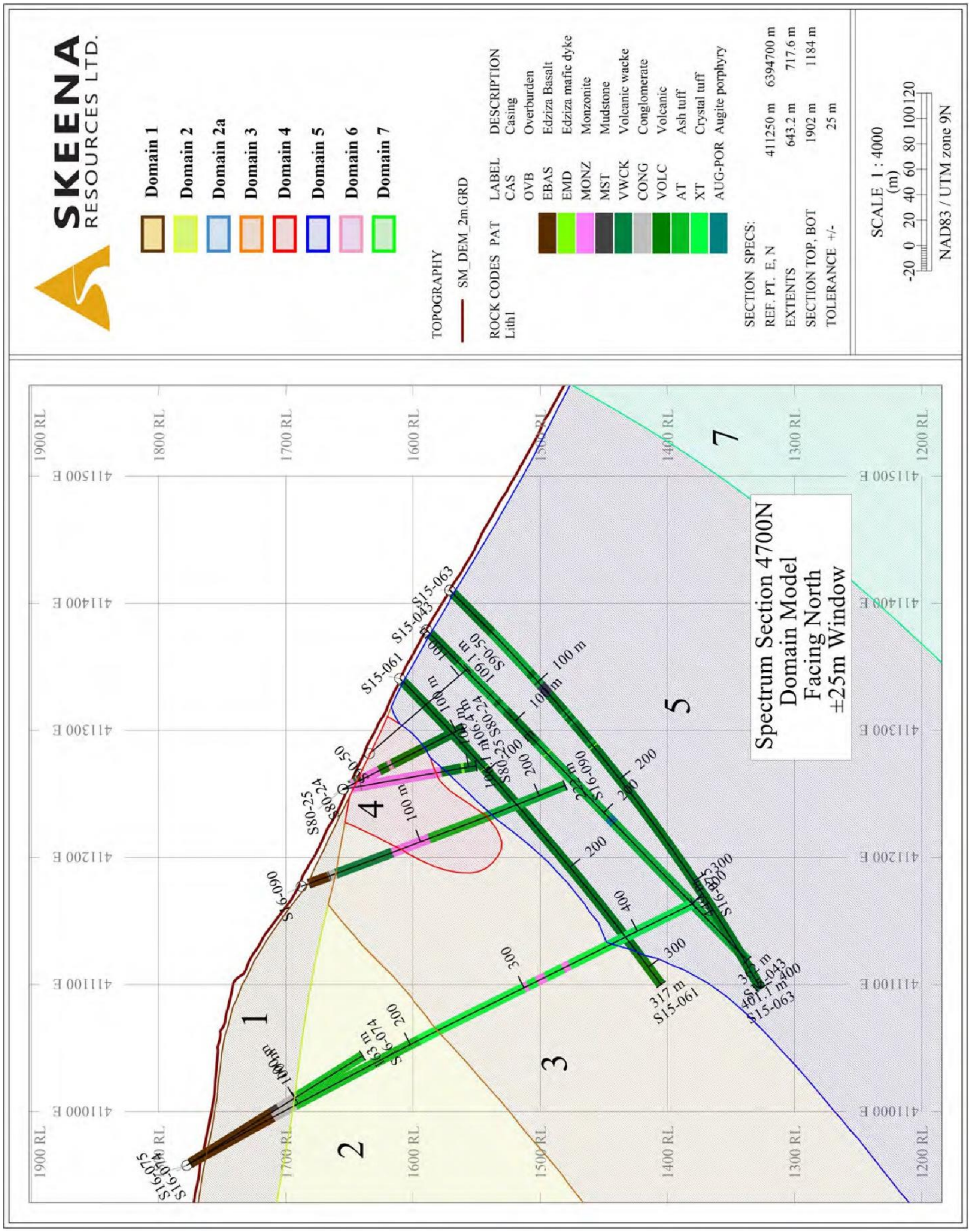


Figure 7.7 A Representative Cross-Section (4700N, looking north) through the Central Zone Domain Model, Spectrum-GJ Project Area
(supplied by the Company)



Domain 3

Porphyry-style Cu-Au mineralization or rock interpreted to have potential to host porphyry Cu-Au mineralization. At the south end of the Central Zone, Domain 3 is a north-south trending, moderately west dipping, structurally bounded panel within which porphyry-style mineralization can occur. Host rocks comprise Stuhini Group volcanic and volcano-sedimentary lithologies intruded by syn- to late-mineralization monzonite dykes. At the north end of the deposit, north of Section 4625 N, the hangingwall of porphyry-style mineralization is a west-dipping structural contact. However, the footwall contact to Domain 3 is defined by the 0.1% Cu contour.

Domain 4

This comprises porphyry-style, Cu-Au mineralization overprinted by a later, structurally controlled gold system (evident as low-level enrichment of As, Sb, Pb and Zn in multi-element, inductively coupled plasma ("ICP") data from 2014 through 2016). Domain 4 is geochemically defined as that portion of Domain 3, porphyry Cu-Au mineralization that has >0.1% Cu with >25 ppm As and >10 ppm Sb. In pre-2014 drillholes lacking multi-element analysis, Au:Cu ratios of approximately 2.5 or more define Domain 4. This method is not as accurate as using multi-element ICP data and is subject to revision.

Domain 5

Domain 5 is comprised of Stuhini Group volcaniclastic and sedimentary rocks in the footwall of Domain 3. It is host to structurally controlled, higher-grade gold mineralization with associated Ag, As, Pb, Zn and Sb enrichment.

Domain 6

A monzonite body that post-dates porphyry-style Cu-Au mineralization and whose age, relative to the structural gold mineralizing event, is still uncertain. High-grade, structurally controlled gold mineralization can occur in Domain 6, proximal to the margins of the intrusive.

Domain 7

Domain 7 lies east of Domain 5 and is dominated by siliceous, K-feldspar altered, feldspar porphyry interpreted as syn-volcanic sills or larger intrusions with subordinate Stuhini Group volcanic rocks. The contact between Domain 5 and Domain 7 is generally a north-south trending, steep and west dipping (70°) faulted contact, although south of Section 4850 N the contact has not been defined by drilling and the location is speculative. Gold mineralization is present in Domain 7, but it tends to be discontinuous in nature.

7.6.2 Donnelly Deposit

For the purposes of developing the simplified geologic model for the Donnelly Deposit, mineralization within two groups, termed Mineralized and Unmineralized, was defined as being greater or less than 0.1% Cu, respectively. A total of six domains were identified: Mineralized Intrusive; Unmineralized Intrusive; Mixed Mineralized; Mixed Unmineralized; Strong to Intensely Silicified Sediments; and Hazelton Group. The six defined domains are described below and are shown on Figures 7.8 and 7.9.

Figure 7.8 A Plan View of the Donnelly Deposit Domain Model, Spectrum-GJ Project Area
(supplied by the Company)

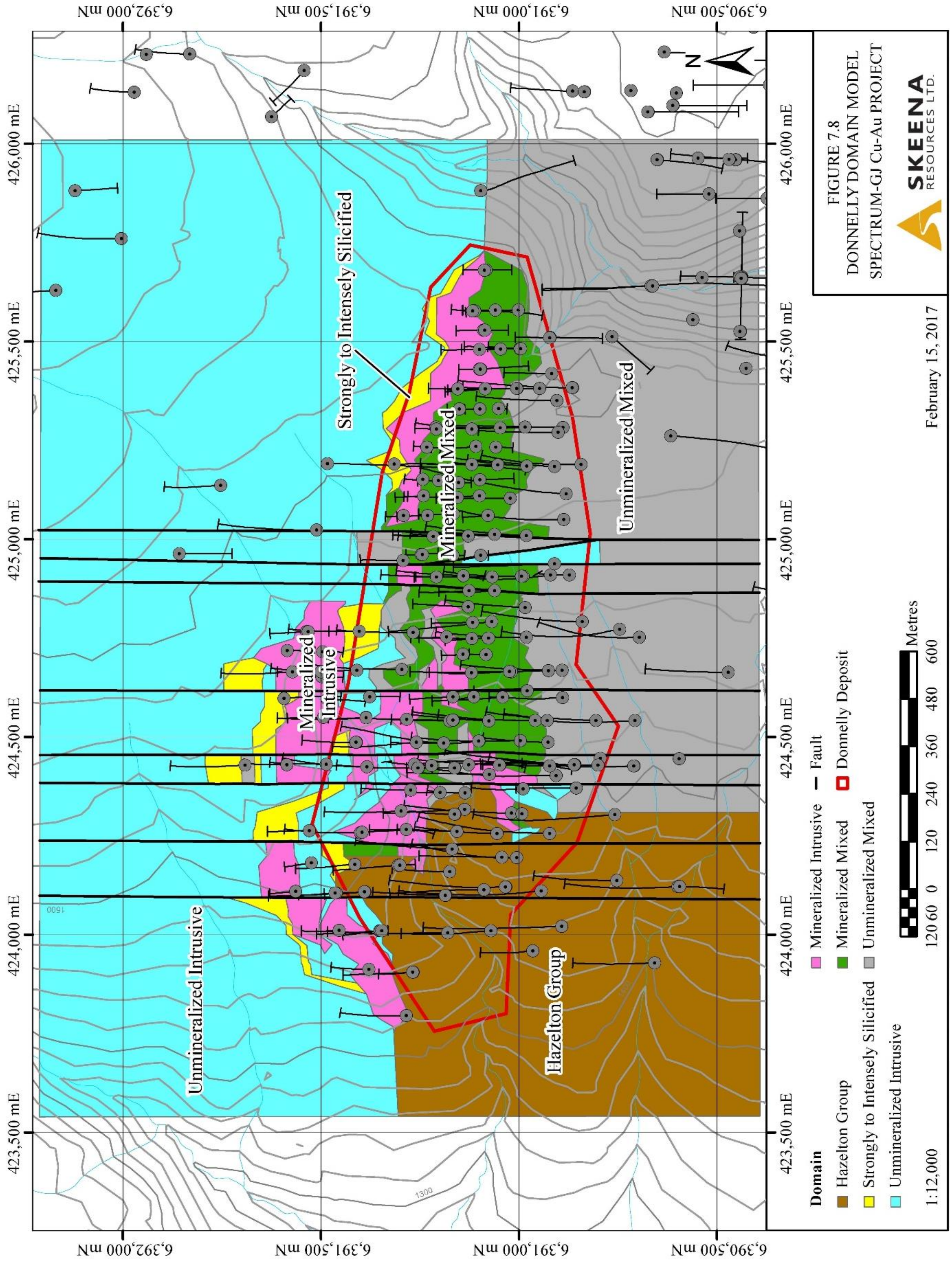
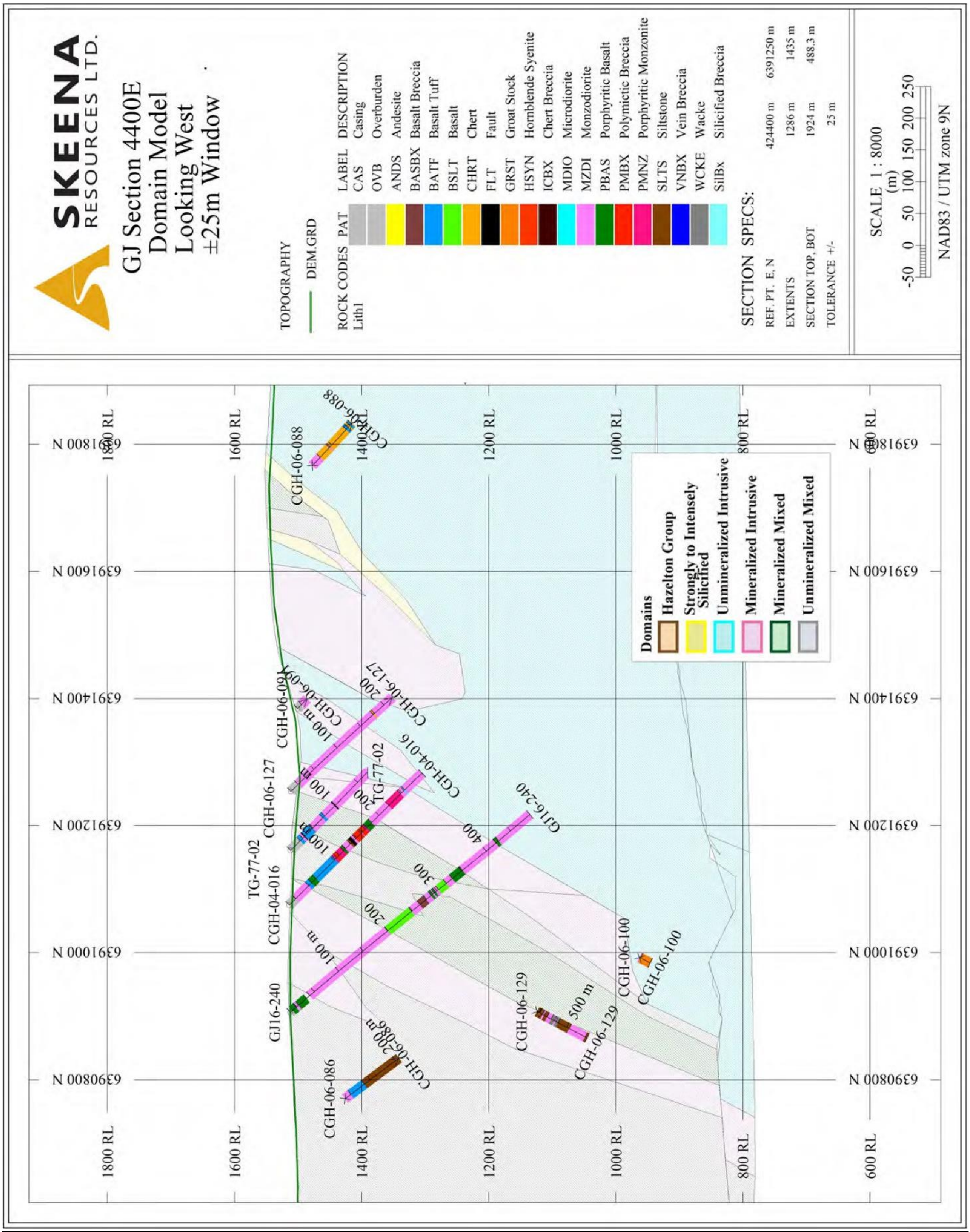


Figure 7.9 A Representative Cross-Section (4400E, looking west) through the Donnelly Deposit Domain Model, Spectrum-GJ Project Area
(supplied by the Company)



Mineralized Intrusive Domain

Mineralized Intrusive has been described from both the Donnelly Deposit and North Donnelly deposit. It is here interpreted to represent the same intrusive unit (although possibly different phases). The Mineralized Intrusive unit is a probable composite intrusion dominated by fine-grained to porphyritic, hornblende-bearing monzodiorite to monzonite. Probable altered equivalents include hornblende-feldspar porphyry, syenite, hornblende-biotite diorite to diorite and monzonite. More quartz-rich varieties have been described, including quartz monzonite and/or quartz monzodiorite.

Unmineralized Intrusive Domain

By definition, intrusive intercepts having less than 0.1% Cu have been assigned to the Unmineralized Intrusive Domain, correlated to the younger Groat Stock. The Groat Stock is mapped as very prominent at surface and in sub-surface drillhole intercepts northeast of the Donnelly Deposit and to the southeast at the GJ zone (Teck 2011). A large proportion of intrusive material in the sub-surface of the Donnelly Deposit is unmineralized. However, it is not interpreted to limit potential for additional mineralization at depth.

Mixed Domains

The Mixed Domain comprises two zones, Mineralized (north) and Unmineralized (south), extending west along the entire southern contact of the Donnelly Deposit to the contact with the overlying Hazelton Group. They comprise fairly thin intervals of volcanic and sedimentary (epiclastic) lithologies intruded by dykes and sills. They are interpreted to comprise both Hazelton Group (i.e. dacites) and Stuhini Group (Mineralized and Unmineralized Intrusive). Individual lithologies identified in drillholes are too thin, discontinuous or undergo rapid facies changes such that they cannot be correlated between two or more holes and/or sections, with the result that they have been grouped into a composite domain. In addition, due to rapid variation between lithologies and their respective susceptibility to mineralization, mineralized or non-mineralized units are not exclusively contained within their proper domain (i.e. some mineralized units are contained within the Unmineralized Domain, and vice versa; some Intrusive intervals are also contained within the Mixed Domain, and vice versa).

The Mixed Mineralized Domain comprises predominantly mineralized, non-intrusive intervals that returned analytical results greater than 0.1% Cu. This domain comprises the subordinate southern portion of the Donnelly Deposit and is located in the immediate hanging wall of the Mineralized Intrusive Domain, (Note: probably in the hanging wall of an east-west fault juxtaposing the two domains) with the Mixed Unmineralized Domain outboard to the south. The Mixed Mineralized Domain appears to thin both east and west from the centre of the deposit and is apparently absent west of approximately 424200 E. In addition, the domain, as modeled, generally thins with depth.

The Mixed Unmineralized Domain is lithologically equivalent to the “Mixed Mineralized Domain”, but is defined as having less than 0.1% Cu mineralization. It lies south, or outboard, of the Donnelly Deposit. A thin band of Mixed Unmineralized material, along the north-central margin of the Donnelly Deposit, partially separates the North Donnelly deposit from the Donnelly Deposit. This represents the westernmost exposure of the Mixed Domain north of the Donnelly Deposit.

Strongly to Intensely Silicified Domain

Silicification ranges from weak to intense (previously described as Chert), variably developed in all lithologies, although strong to intense silicification is best developed in very fine- to fine-grained volcanic to sedimentary (epiclastic) units.

Silicification is so extensive over some intervals that the only evidence of the protolith is relict ghost banding and/or ghost textures (i.e. interpreted as crystal tuff [or hornblende-phyric intrusives] or layering [tuffs and/or sediments]). Such intervals were previously interpreted as Chert, however, they are not chemical sediments (i.e. chert - *senso stricto*). Therefore, the previously identified Chert unit comprises, in fact, strongly to extensively altered equivalents of host Stuhini Group strata, predominantly volcanic and/or sedimentary protoliths. As such, pending further work to geochemically distinguish silicified protoliths from one another, a Strongly to Intensely Silicified Domain is defined in the current deposit model.

The Groat Stock is separated from the Triassic Stuhini Group sequence, including the Donnelly zone, by the Strongly to Intensely Silicified Domain. Strongly to intensely silicified strata have been described along the southeast margin of the Donnelly Deposit. However, the occurrences are too irregular and/or discontinuous to correlate as discrete zones and/or bands.

Hazelton Group

The stratigraphic sequence hosting mineralization on the GJ Property is comprised of the Late Triassic Stuhini Group unconformably overlain by the Lower Jurassic Hazelton Group. The unconformity is regionally interpreted as a generally flat-lying, weakly deformed erosional surface, characterized by a variably developed, rusty weathering regolith. Therefore, the unconformity in the deposit model has similarly been modeled as a low relief, erosional surface. The unconformity has been variably identified in the available drill logs, with some specifically noting a possible regolith, whereas others make no mention of an unconformity / regolith (if present), possibly interpreting it as a fault.

The main criteria for distinguishing between Stuhini Group and Hazelton Group strata are as follows:

1. The Stuhini Group is typically altered and commonly weakly mineralized. Alteration is commonly propylitic, consisting of variable chlorite alteration of the matrix and/or replacement of mafic phenocrysts. Variable sericitic alteration of felsic phenocrysts is common. In contrast, the Hazelton Group is typically only weakly altered, generally comprised of a ubiquitous purple coloured, hematitic staining.
2. Dacites and dacitic sub-volcanic intrusives and dykes cross-cutting the Stuhini Group, are interpreted to be coeval with the Hazelton Group.
3. Hornblende-bearing Monzonites, Monzodiorites, together with altered (Hornblende-Feldspar Porphyry) and quartz-enriched equivalents (Quartz Monzonite to Quartz Monzodiorite) are interpreted to be hosted by the Stuhini Group.
4. “Basalts” are present within both the Hazelton Group (unit HBAS – described as undifferentiated flows, dykes, sills and tuffs) and the Stuhini Group (unit BATF – described as fine- to medium-grained basaltic tuff, lapilli tuff and volcanic breccia). Amygdaloidal Basalts are correlated to the Hazelton Group. Basaltic Tuff, where

present, is correlated to the Stuhini Group. Where altered, however, it may be misidentified as Andesite and correlated to the Hazelton Group (as unit ANDS – described as undifferentiated flows, dykes, sills and tuffs; typically plagioclase ± hornblende phyric and/or unit MDRT – described a andesite to microdiorite dykes; includes equigranular and hornblende ± plagioclase phyric varieties).

5. Clinopyroxene-phyric Basalt (PBAS) is a very distinctive unit and has been correlated to the Stuhini Group.

The Donnelly Deposit is interpreted to be strongly fault controlled, exposed at surface over 1,990 m east-west before passing under younger Hazelton Group cover to the west. Emplacement of the Mineralized Intrusive is interpreted to have been controlled by east-west oriented faults, none of which have been incorporated into the deposit model. The Mineralized Intrusive was subsequently offset across later north-south faults.

There is reasonable continuity of both Mineralized Intrusive and Mineralized Mixed along the east-west axis such that no east-west faults were required to develop the block model. North-south faults are interpreted to have significant local offset, with several incorporated in the deposit model where the Mineralized Intrusive thins or thickens dramatically, or is locally truncated, both along trend and/or at depth. The deepest hole intersecting Mineralized Intrusive is GJK-13-238, which returned 580 ppm Cu between 744.52 m and 746.52 m downhole (approximately 734 m below surface). The Donnelly Deposit has, therefore, been modelled as a structurally controlled, moderately to steeply, south-dipping panel that remains open at depth.

7.7 Other Mineralized Zones and Occurrences

Apart from the Central Zone and Donnelly Deposit, many other porphyry-style Cu-Au and structurally-hosted gold zones and occurrences have been identified across the Project Area. Some were known before the Company acquired the claims blocks that comprise the Project Area, many have been examined by the Company and several have yet to be examined.

At the time of writing (February 2017) the Company was preparing an internal Company document detailing the scope of exploration, results and geological characteristics of the various additional mineralized zones and occurrences. Presented here are brief summaries of some of the key characteristics of the mineralized occurrences outside the Central Zone and Donnelly Deposit.

7.7.1 North Donnelly Deposit

The most advanced of the various known mineralized occurrences is the North Donnelly deposit. It is located immediately north of the Donnelly Deposit and is a similar style of porphyry Cu-Au mineralization. A Mineral Resource estimate for the North Donnelly deposit was published in the May 2016 Technical Report in which the following estimates are presented for the 0.2% Cu grade cut-off applied in analysis:

- Indicated Mineral Resources – 2.77 Mt grading 0.24% Cu and 0.30 g/t Au; and
- Inferred Mineral Resources – 4.67 Mt grading 0.23% Cu and 0.30 g/t Au.

No drilling on the North Donnelly deposit has been carried out since the 2016 Mineral Resource estimate was published and the mineralization falls outside that portion of the

Donnelly Deposit targeted for exploitation within the scope of the PEA. It is in consequence of this that the North Donnelly deposit is not included within the scope of the Mineral Resource updates and PEA presented herein.

7.7.2 Spectrum Claims Block

Prospecting and soil sampling completed by the Company in 2015 confirmed the location of historic showings identified in Section 6. Several new occurrences were also found around the Central Zone (Stacey *et al*., 2016), bringing to 13 the total number of occurrences that the Company believes have sufficient merit to follow up. Figure 7.10 is the same geology plan as presented as Figure 7.3 above, but with the locations of the known mineralized occurrences identified.

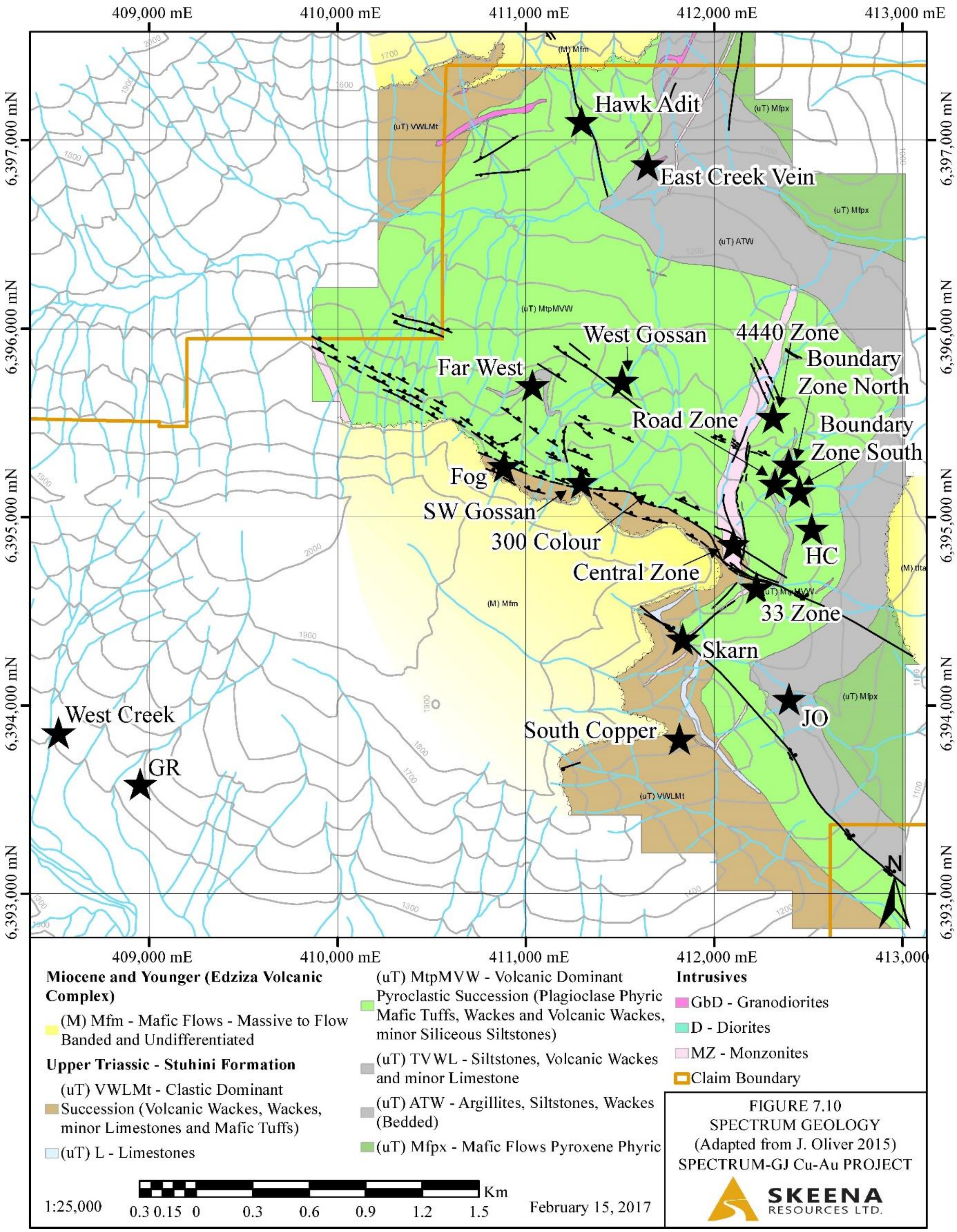
In 2016, ten of the known occurrences were re-examined with additional rock and soil sampling and geological mapping to better document the style, extent and controls on mineralization and determine their merits for eventual drill testing. Table 7.2 provides brief summaries of the key features of these ten occurrences.

Table 7.2 A Summary of the Key Features of Ten of the Known Mineralized Occurrences Located Outside the Area of the Central Zone, Spectrum Claims Block, Spectrum-GJ Property
(compiled from information supplied by the Company)

Occurrence or Zone	Mineralization	Comments
33 Zone	Au in quartz-arsenopyrite veining associated with monzonite dykes.	Located by historical trenching and one historical drillhole.
4440	Au in narrow, north-south trending and steeply dipping, fault hosting massive arsenopyrite-quartz veining.	Located by surface mapping. Au-As soil anomaly to the east not completely explained by surface mineralization.
Boundary	Au-As-(Pb-Zn-Cu-Sb) soil anomaly and mineralized bedrock on surface.	Located by historic trenching and limited drilling.
East Creek	Au in quartz-arsenopyrite veins with pyrite, chalcopyrite and sphalerite.	Located by limited drilling, rock grab sampling and trenching.
Far West	Cu-Mo soil anomaly with surface Cu-Mo mineralization located to west. Suggestive of buried Cu-Mo porphyry.	Found in 2015. 2016 soil sampling extended anomaly up to 250 m to the west.
HC Showing	250 m by 100 m Au-As-Sb-Zn soil anomaly.	Rock grabs in 2015 confirmed Au mineralization, but 2016 channel sampling did not duplicate results.
JO Showing	Sheeted and shallow dipping quartz-arsenopyrite veins containing gold.	Found in 2015 rock grab sampling and assaying. Soil sampling that identified a 600 m long anomaly.
Skarn	Calc-silicate altered limestone and porphyry Cu-Au quartz-magnetite-sulphide veining.	Located by drilling. Southern extension of Central Zone porphyry mineralization. Additional magnetic and IP geophysical targets remain to be tested.
South Copper	Cu-Au soil anomaly, outcropping porphyry-style alteration and quartz-magnetite-sulphide veining.	Magnetic geophysical survey shows continuation of a panel hosting porphyry-style alteration and mineralization. A single drillhole intersected porphyry-style alteration and weak Cu-Au mineralization.
West Creek-GR	Three zones of surface Au-Ag mineralization.	Tested by drilling 2016. GR shows similar style of veining to West Creek, but it is unknown if it is continuous with West Creek.

Figure 7.10 A Geology Plan of the Spectrum Claims Block, Showing the Locations of the Significant Exploration Prospects Located on the Claims Block, Spectrum-GJ Project Area

(after Oliver, 2015, supplied by the Company)



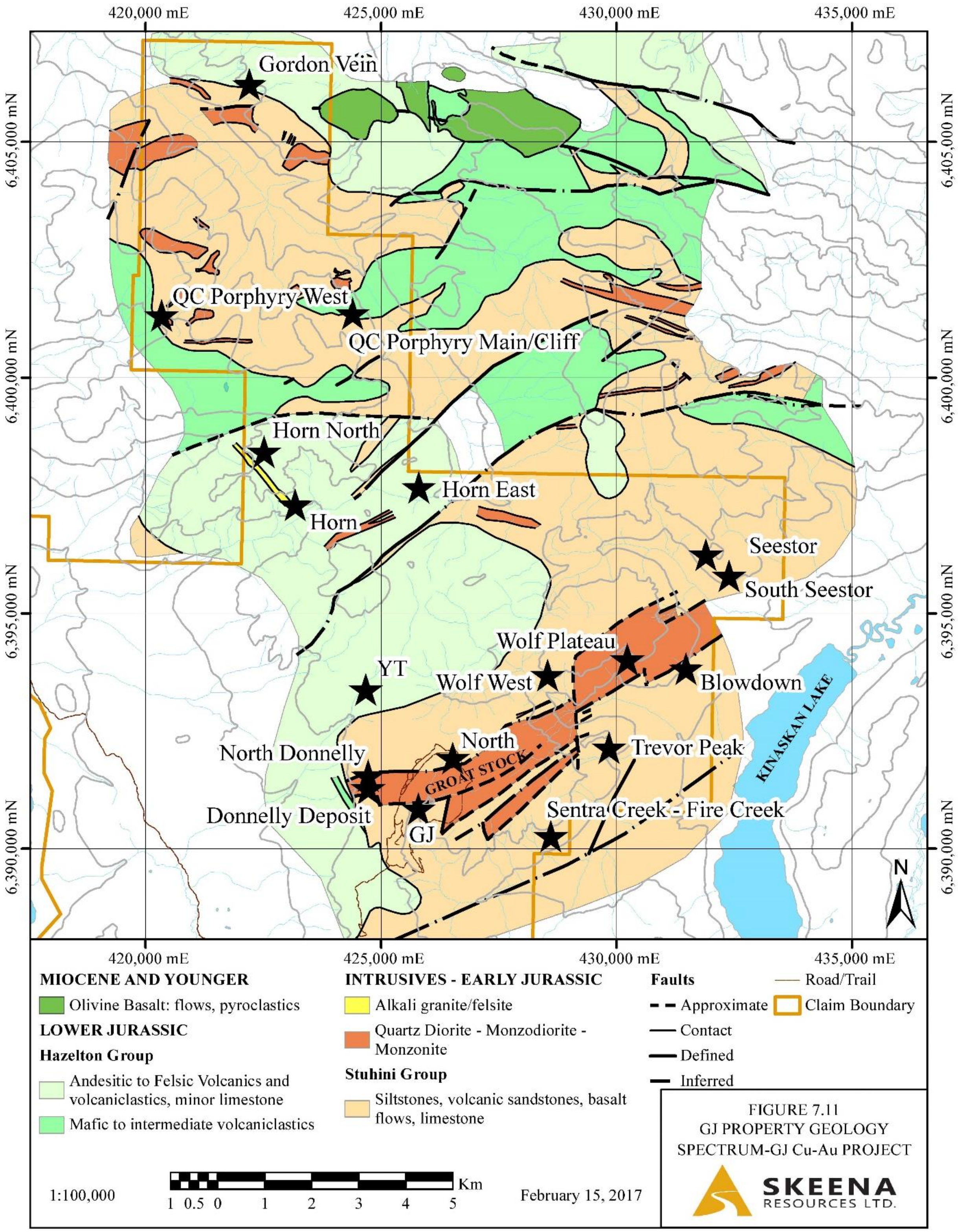
7.7.3 GJ Claims Block

Comparatively less effort has been expended by the Company on the known mineralized occurrences located outside the area of the Donnelly Deposit and North Donnelly deposit, due only to the timing of the transfer of the 80 claims comprising the GJ claims block in November 2015. Despite this, field work has been carried out and historical records have been examined as part of a preliminary round of interpretation and evaluation of the previously identified mineralized occurrences. Figure 7.11 is the same geology plan as presented as Figure 7.4 above, but with the locations of the known mineralized occurrences identified. Table 7.3 provides brief summaries of the key features of eleven of the occurrences that the Company has examined thus far.

Table 7.3 A Summary of the Key Features of Eleven of the Known Mineralized Occurrences Located Outside the Area of the Donnelly and North Donnelly Deposits, GJ Claims Block, Spectrum-GJ Property
(compiled from information supplied by the Company)

Occurrence, Area or Zone	Mineralization	Comments
Blowdown	400 m by 2,200 m chargeability anomaly with coincidental Cu-Au-Ag soil geochemical anomaly.	High priority porphyry target that has not yet been tested by drilling.
GJ	At least 154 mineralized drillhole intercepts over approx. 970 m by 270 m, spatially associated with chargeability / magnetic anomaly / peripheral soil anomaly.	Tested between 1970 and 1990 by 26 drillholes totaling 5,948.64 m. High priority porphyry target for further evaluation using extended IP survey, followed by drilling.
Gordon Area	Six <1.0 m wide Au-Ag bearing quartz-carbonate-sulphide veins exposed over a 960 m. Local wider pods of up to 3 m proximal to faults.	1,000 m southeast of Gordon Vein there is a 500 m by 800 m Au-Ag-As-Cu-Pb-Zn soil anomaly. 1,100 m northeast of Gordon Vein there is a 500 m long Au-Ag-As-Pb-Zn soil anomaly.
Horn East	Four sub-parallel, west trending and structurally controlled veins expressed as lineaments in the headwaters of Quash Creek.	-
QC	Monzodiorite to monzonite dykes one to 100 m wide and porphyry-style pyrite-chalcopyrite mineralization hosted within a 4 km long, east-west oriented structural zone that is open to the west.	The least explored of the porphyry targets, drill tested in 1970, 1990 and 1991 by 14 drillholes totaling 2,824.26 m. Mapping by Teck (Devine *et al.*, 2012, 2013) greatly increased understanding of alteration, mineralization and potential of this area.
North	Mineralized drill intercepts over approx. 490 m by 160 m, spatially associated with chargeability / magnetic anomaly.	Tested between 1971 and 2012 by 24 drillholes totaling 4,908.79 m. High priority porphyry target for further evaluation drilling.
Seestor	Hornfelsed fine clastic and cherty sedimentary rocks intruded by minor diorite dykes and sills. Narrow Au bearing quartz-sulphide veining and disseminated pyrite pyrrhotite ±arsenopyrite as irregular pods up to 2 to 3 m within hornfelsed sediments.	2,200 m long by 330 m wide Ag-Au-Pb-Zn-Cu-Mo-As-Sb coincidental with a >1200 m IP chargeability feature. Drill testing required.
Sentra Creek	Chargeability anomaly immediately west of Fire Creek where soil and rock samples returned erratic but elevated Au, Ag and As.	Au, Ag intersected in historical drillholes. Detailed prospecting in the vicinity of the hole is warranted to determine if the intersected mineralization outcrops.
Trevor Peak	Multiple north-northwest striking, west dipping quartz-carbonate+pyrite-arsenopyrite-chalcopyrite-pyrrhotite veins exposed in surface showings and trenches over a 230 m wide zone.	Tested by historical trenching only.
Wolf	300 m by 1500 m Cu-Au-Mo soil geochemical anomaly with coincidental 1500 m long IP chargeability anomaly.	Tested in 2011 and 2012 by eight holes totaling 3,666.5 m.
YT	Fine grained intrusives cutting Stuhini Group sediments, chalcopyrite blebs, disseminations and fractures cutting sediments and intrusives, magnetic high anomaly.	Tested by two drillholes (591.3 m) that did not reach the target.

Figure 7.11 A Geology Plan of the GJ Claims Block, Showing the Locations of the Significant Exploration Deposits and Prospects Located on the Claims Block, Spectrum-GJ Project Area
(after Ash, *et al*., 1997, and supplied by the Company)



7.8 Qualified Person's Opinion

In the opinion of QP Mehner:

- knowledge of the settings of the deposits, the lithologies and structural and alteration controls on mineralization is sufficient to support Mineral Resource estimation; and
- the mineralization styles and settings of the deposits of interest are sufficiently well understood to support Mineral Resource estimation; but
- other than the North Donnelly deposit, the various prospects and mineralized targets that are located on the Project Area are at an early stage of exploration and the lithologies, structural and alteration controls on mineralization are currently not sufficiently understood to support the estimation of Mineral Resources.

8 DEPOSIT TYPES

David Mehner, P. Geo. ("QP Mehner") is responsible for this Section of this Technical Report. The Central Zone and Donnelly Deposit are a combination of lower-grade, porphyry-style Cu-Au deposits and high-grade gold veins, veinlets, stockworks and shear zones that can contain Ag, As, Cu and Zn. The high-grade structures cross-cut and are peripheral to the porphyry-style mineralization. Litho-geochemical studies have shown that the Donnelly Deposit is of the quartz-deficient alkalic type of porphyry deposit whereas no litho-geochemical studies have been completed on the Central Zone.

Mineralization is spatially and genetically related to Late Triassic to Early Jurassic diorite, monzodiorite to monzonite dykes and larger stock like intrusion of alkaline affinity. Geological modeling has shown that porphyry Cu-Au mineralization and the development of syngenetic- to late-mineralizing intrusives are strongly influenced by linear structures that provide zones of structural preparation for hydrothermal alteration, mineralization and the intrusion of dykes, sills and stocks.

8.1 Characteristics of Porphyry Deposits

Porphyry deposits are typically large, low- to medium-grade deposits in which the mineralization is usually structurally controlled, and both genetically and spatially related to felsic-intermediate porphyritic intrusions (Figure 8.1). They differ from other granite-related deposits, such as skarns and mantos, by virtue of their large size and distribution of mineralization in stockworks, veins/vein sets, fractures and breccias (Sinclair, 2007), rather than as irregular replacement masses. The range of primary commodities present in porphyry deposits typically includes combinations of Au, Ag, Cu, Mo and Sn.

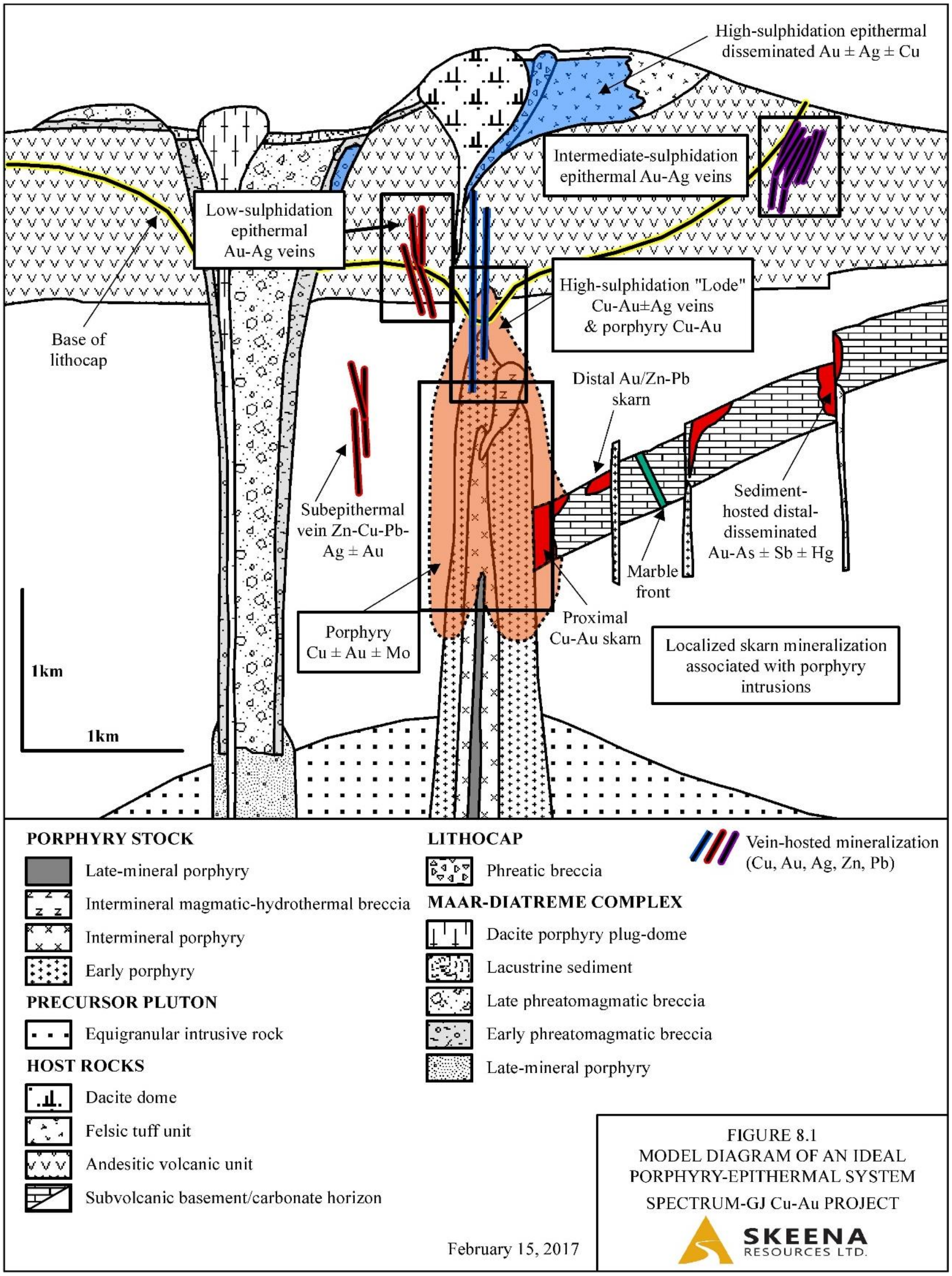
8.1.1 Tonnages and Average Grades

Porphyry deposits typically contain millions to billions of tonnes of mineralized material. Although higher grade zones are typically developed, average base metal grades are generally less than one percent (production grades for B.C. porphyry Cu-Au type deposits are typically less than 0.5% Cu) whereas average gold grades in porphyry Cu-Au deposits typically vary between approximately 0.2 g/t to 2.0 g/t Au (Sinclair, 2007). The Central Zone and Donnelly Deposit are no exceptions to this - at the grade cut-offs applied in analysis and for the volumes of mineralized material targeted for openpit mining within the scope of the PEA (see Section 16):

- the average diluted copper grades approximate to 0.12% Cu from the Central Zone and 0.35% in the Donnelly Deposit; and
- due to the presence of high-grade, cross-cutting and fracture-hosted gold mineralization in the material targeted for exploitation from the Central Zone, the average diluted gold grade approximates to 0.85 g/t Au; whereas
- the average diluted gold grade of the material targeted for exploitation from the Donnelly Deposit approximates to 0.35 g/t Au.

Despite their typically modest average grades, individual porphyry-type deposits can in three dimensions be substantial (Sinclair, 2007) and therefore contain substantial quantities of metal. It is because of this and because the grades can be consistent and reliable compared with other intrusion-related deposits that, as a rule, porphyry-type deposits are economically desirable, especially if openpit mining is feasible and stripping ratios are low.

Figure 8.1 A Model Diagram of an Ideal Porphyry-Epithermal System Indicating the Setting of Alkali Magmatic-Related Mineral Deposits of the Types Found in Northwest B.C. (modified after Sillitoe [2010] and copied from the August 2014 Technical Report)



8.1.2 Morphology

The overall morphology of individual porphyry deposits is highly variable: they may form irregular, oval, solid or even hollow cylindrical and inverted cup shapes around the tops of porphyry intrusions (Sinclair, 2007). Economic mineralization usually occurs in isolated masses within larger porphyry districts, but they may also be composed of two or more superimposed (or stacked) zones of mineralization within a single deposit. When porphyry systems are superimposed, average grades tend to be markedly higher than in isolated systems, due to the fact that multiple pulses of mineralization occur over time in the same volume of rock. Porphyry deposits are commonly zoned in three dimensions, often with barren cores and roughly concentric metal zones that are surrounded by barren pyritic haloes, with or without peripheral base- and/or precious-metal veins.

8.2 Porphyry-Style Mineralization

Porphyry-style mineralization tends to be concentrated around the top (or cupola) of sub-volcanic intrusions that are ultimately sourced from a larger magmatic body at depth (Figure 8.1). The tops of these intrusions are emplaced at mid- to upper-crustal levels and the intrusive body usually extends several kilometres downwards where it may or may not be contiguous with the parent pluton or batholith. Fractional crystallization in the parent magma causes incompatible metallic elements such as gold, silver, copper, lead, zinc, molybdenum and tin (among others) to be concentrated in hydrothermal fluids that collect in the cupola of the high-level intrusions.

Brittle deformation (e.g. fracturing) causes a release of the metal-charged fluids into the surrounding rock, resulting in the formation of mineralized breccias, stockworks and vein sets around and within the host intrusion. Brittle deformation may occur as a result of local- to regional-scale tectonic deformation (e.g. faulting or shearing) or through fluid over-pressure (hydraulic fracturing) in the cupola of the intrusion. Regardless of the mechanics of brittle fracturing, metallic minerals are probably deposited due to a rapid loss of confining pressure, which in most cases greatly reduces the solubility of metals in hydrothermal fluids.

8.3 Porphyry-Related, Vein-Hosted Mineralization

The various types of epithermal, vein-hosted deposits suggested by Figure 8.1 are intimately associated with porphyry systems, in that the fluids that form high-level veins are ultimately sourced from the same intrusions responsible for porphyry mineralization at deeper crustal levels (Taylor, 2007). In the case of high-sulphidation, lode-type epithermal veins, mineralization may be peripheral to, or superimposed on, older and lower-grade porphyry style mineralization.

Vein-hosted mineralization is often zoned in the vertical dimension, in that they contain comparatively more precious metals at higher structural levels and comparatively more base metals at deeper levels (Taylor, 2007). Intermediate- and high-sulphidation veins occur at higher structural levels above the porphyry system and tend to be enriched in precious metals compared with low-sulphidation veins.

The emplacement of lode-style and epithermal veins is probably controlled by local structures such as faults, shears, and fracture zones, which are typically located along zones where bedrock undergoes a change in rock competency. Competency contrasts usually exist along lithological boundaries (for example, bedding and dykes) or in altered areas such as zones of silicification. These structures may have formed prior to, or contemporaneous with, the emplacement of the porphyry intrusion(s) and their orientations are likely controlled by local stress regimes existing at the time of their formation.

9 EXPLORATION

David Mehner, P. Geo. ("QP Mehner") is responsible for this Section of this Technical Report. The presented information has been compiled from the April 2016 Technical Report, from internal Company documents and from an assessment report for the 2016 field season on the GJ claims block (Walcott, 2016; Russell and Baxter, 2017). At the time of writing (February 2017), the assessment report for the 2016 field season on the Spectrum claims block was being prepared, despite which the Company provided QP Mehner with all information required to complete the following text.

9.1 Summary of Programs

The majority of the Company's exploration efforts across the Project Area have been in the Spectrum Claims Block. This is due only to the timing of the Company's acquisition of the GJ claims block in November 2015, which limited the Company's exploration efforts to a single field season. Despite this, prospecting, rock and soil sampling programs were carried out in addition to the drilling program described in Section 10. On the Spectrum claims block and from September 2014 to the close of the last field season in October 2016, the Company has completed: an airborne LiDAR™ topographic survey and lineament analysis; geological mapping; prospecting; soil and rock geochemical sampling; an IP geophysical survey; and a ground magnetics geophysical survey.

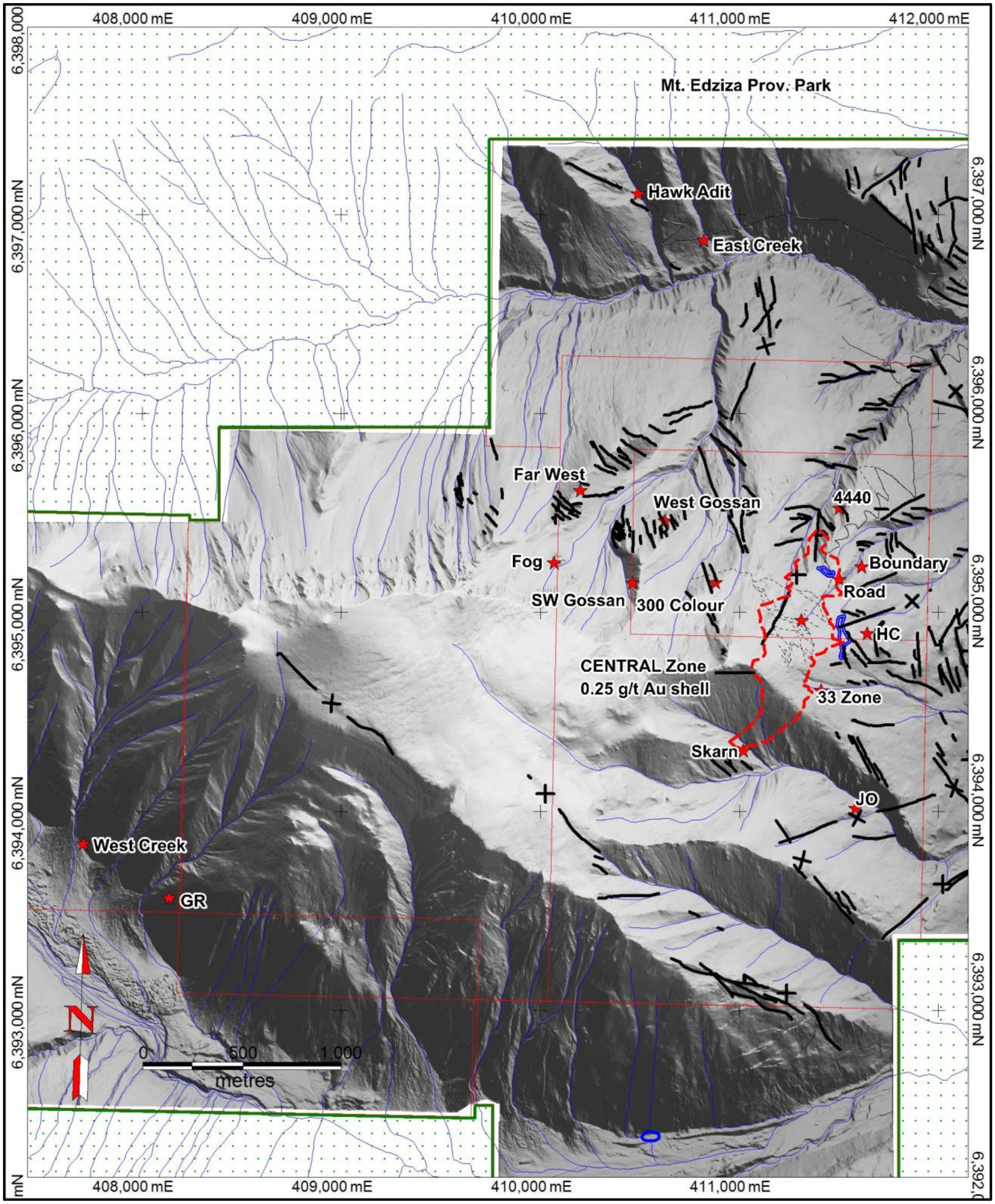
9.2 LiDAR™ Survey and Lineament Analysis

An airborne LiDAR™ survey was flown on October 3, 2015 by Eagle Mapping Limited of Port Coquitlam, B.C. LiDAR™, short for Light Detection and Ranging, is a topographic survey method that maps the ground surface to a few centimetres accuracy. The survey area included the entirety of the Spectrum claims block and a strip extending southward along a potential access route to Highway 37 (Figure 9.1).

Prior to the LiDAR™ survey, the most up-to-date topographic maps (the B.C. provincial Geographical Survey Branch's Terrain and Resource Inventory Maps ["TRIM"]) had 20 m contour intervals. With such a large contour interval, many of the cliffs and other topographic features were not visible. This has an impact on exploration targeting because topographic variations frequently reflect underlying structural features that may be mineralized. With the new LiDAR™ data, the Company was able to complete a lineament analysis over the Central Zone and surrounding areas, and in the process identify a number of interpreted structures associated with the underlying fault geometry (Oliver and Walcott, 2016). The key findings of the lineament analysis included:

- determination of the dominant lineament trends associated with mineralization and elevated gold values in soil (northwest-southeast, north-south, and east-west lineaments),
- identification of lineaments interpreted to post-date the mineralization event and are, therefore, not prospective for copper-gold mineralization (northeast trending faults of Neogene age); and
- interpretation of Triassic fault structures to be associated with mineralization formed under sinistral, trans-tensional conditions that correspond to the Reidel model of brittle failure (trans-tensional conditions allowed for maximum dilation along northwest-southeast, north-south, and east-west trending structures, which were subsequently exploited by monzonite intrusions and hydrothermal fluids).

Figure 9.1 A Shaded Topography of a Portion of the Spectrum Claims Block Area, Compiled Using LiDAR™ Survey Data, with the Locations of Mineralized Showing and Interpreted Lineaments Identified (the latter by heavy black lines), Spectrum-GJ Project Area
(after Oliver and Walcott, 2016 and copied from the April 2016 Technical Report)



9.3 Geological Mapping

Over a 14 day period in late June and early July, 2015, the area around the Central Zone was mapped in detail by Dr. James Oliver of Oliver Geoscience International Ltd. Bedrock lithology, alteration, mineralization and structural features were recorded at over 700 location points. A series of 1:5000 scale interpreted lithology and alteration maps were produced that were used, in part, to help direct exploration drilling and prospecting activities in 2015 and 2016. The results of the 2015 mapping program are presented in Sub-Section 7.2.1.

9.4 Prospecting and Rock Sampling

Prospectors and geologists were tasked by the Company with identifying and locating surface expressions of mineralization, including gossans, veins and mineralized float. GPS co-ordinates and the salient features of the mineralized occurrences were recorded in field notebooks. Where possible, a grab- or chip-sample was obtained for assay.

For clarity the term 'grab sample' refers to prospecting samples of rock, collected in a random or irregular manner, that appear to the sampler to be prospective. Chip samples comprise small pieces of rock taken from across the width of a mineralized outcrop. Assays for chip samples are reported as grade over interval – for example, *x* g/t Au over *y* metres. Chip samples can range from less than a metre to several metres in length.

Implicit in the types of samples outlined is that they may not be indicative of the overall grade of the mineralization being sampled. They are collected merely to establish if the elements of interest are present or not. There is no attempt in their collection to establish overall grade, width or continuity of the occurrence being sampled so there is no guarantee that the results can be inferred for the whole mineral occurrence or body of rock being sampled.

Grab and chip samples typically weigh between 1 kg and 5 kg, broken from mineralized outcrop or subcrop with a hammer and sealed in poly sample bags with a unique identifying sample number. Rock samples were shipped to an analytical laboratory for gold and multi-element geochemical analysis. No standards or duplicates were inserted into the Company's grab sample stream, but internal laboratory QA/QC results indicate no issues with the analyses. Activation Laboratories Ltd. ("ActLabs", ISO 9001 and 17025 accredited) of Kamloops, B.C. was used in 2015, ALS Chemex ("ALS", ISO 17025 accredited) of North Vancouver, B.C. was used in 2016:

- gold was determined by ActLabs using the 50 g fire assay method with an Atomic Absorption Spectrophotometry ("AAS") finish, samples reporting over-detection limit results for gold (>10 g/t Au) were re-run using 50 g fire assay with a gravimetric finish;
- ActLabs determined other elements by inductively coupled plasma optical emission spectrometry ("ICP-OES"), samples reporting values greater than 10,000 ppm for Cu, Pb or Zn and 100 ppm for Ag were re-run using four acid digestion with an AAS finish;
- ALS used the 50 g fire assay with AAS analysis for gold (samples reporting values greater than 10 g/t Au were re-run using 50 g fire assay with a gravimetric finish); and
- ALS used 0.5 g aqua regia digestion with inductively coupled plasma atomic emission spectrography ("ICP-AES") for multi-element analysis (samples reporting values greater than 10,000 ppm for Cu, Pb or Zn and 100 ppm for Ag were re-run using four acid digestion with an AAS finish).

Between June and October 2015, an area of approximately 4.5 km^2 was prospected around the Central Zone, including all the showings identified in Section 7.2.2. A total of 379 grab and chip samples were collected from mineralized bedrock, subcrop and float material. An additional 776 grab and chip rock samples were collected from June to September, 2016, covering an area of approximately 1.0 km^2 on the Spectrum claims block and approximately 3.4 km^2 on the GJ claims block. Figures 9.2 and 9.3 summarize the distributions of the 1,155 chip and grab samples collected by the Company in 2015 and 2016 across the Spectrum claims block (Figure 9.2) and across the GJ claims block (Figure 9.3). Table 9.1 provides a summary of the results.

Table 9.1 A Summary of the Company's Chip and Rock Sample Statistics, Spectrum-GJ Project Area
(compiled from information supplied by the Company)

Showing	# Rock Samples	Au Max. (ppm)	Ag Max. (ppm)	Cu Max. (ppm)	Au Avg. (ppm)	Ag Avg. (ppm)	Cu Avg. (ppm)
Spectrum Claims Block							
Central Zone	40	20.60	141	5,750	1.13	9.8	1,449
33 Zone	44	24.50	24	6,630	1.56	3.0	685
Skarn	83	5.16	143	38,900	0.49	5.7	1,418
Boundary-Road	126	42.30	126	2,810	3.35	6.6	243
4440 Zone	31	15.45	56.2	1,730	1.17	4.5	458
HC Showing	45	52.50	8.8	450	3.17	1.0	200
JO Showing	22	25.90	63	9,200	7.22	13.0	1,820
300 Colour Zone	36	19.80	4.2	413	0.69	0.4	123
West Gossan	42	37.20	544	8,170	1.92	19.7	434
Southwest Gossan	3	0.29	2.1	159	0.12	0.9	128
Fog	6	0.30	2.3	199	0.10	0.6	128
Far West	67	4.56	10.7	1,240	0.18	0.7	308
East Creek	22	52.60	187	1,955	7.05	18.8	348
Hawk Vein	10	0.78	7.7	1,220	0.09	1.2	464
West Creek - GR	116	74.30	1,465	55,800	1.91	63.9	3,152
South Copper	75	4.61	750	660	0.21	12.5	7,370
GJ Claims Block							
Blowdown	12	3.84	116	8,290	0.79	19.9	1,848
Gordon Vein	67	18.30	681	17,330	1.06	41.6	1,810
Horn East	57	40.50	242	11,970	0.92	9.4	926
QC Porphyry Main/Cliff	17	26.70	31.7	7,030	2.07	8.4	1,448
QC Porphyry West	153	29.50	42.3	13,430	0.97	3.4	924
Seestor	24	63.40	30.9	1,040	3.75	4.0	220
Sentra Creek-Fire Creek	6	9.80	4.8	586	3.01	1.9	178
Trevor Peak	33	43.80	50.8	33,980	3.88	5.8	2,291
Wolf Plateau	10	4.43	34.7	25,830	0.91	10.8	6,671
Wolf West	6	4.74	33.5	25,950	1.02	10.6	5,088

Figure 9.2 A Surface Location Plan for the Chip and Rock Samples Collected by the Company During the 2015 and 2016 Field Seasons, Spectrum Claims Block, Spectrum-GJ Project Area
(supplied by the Company)

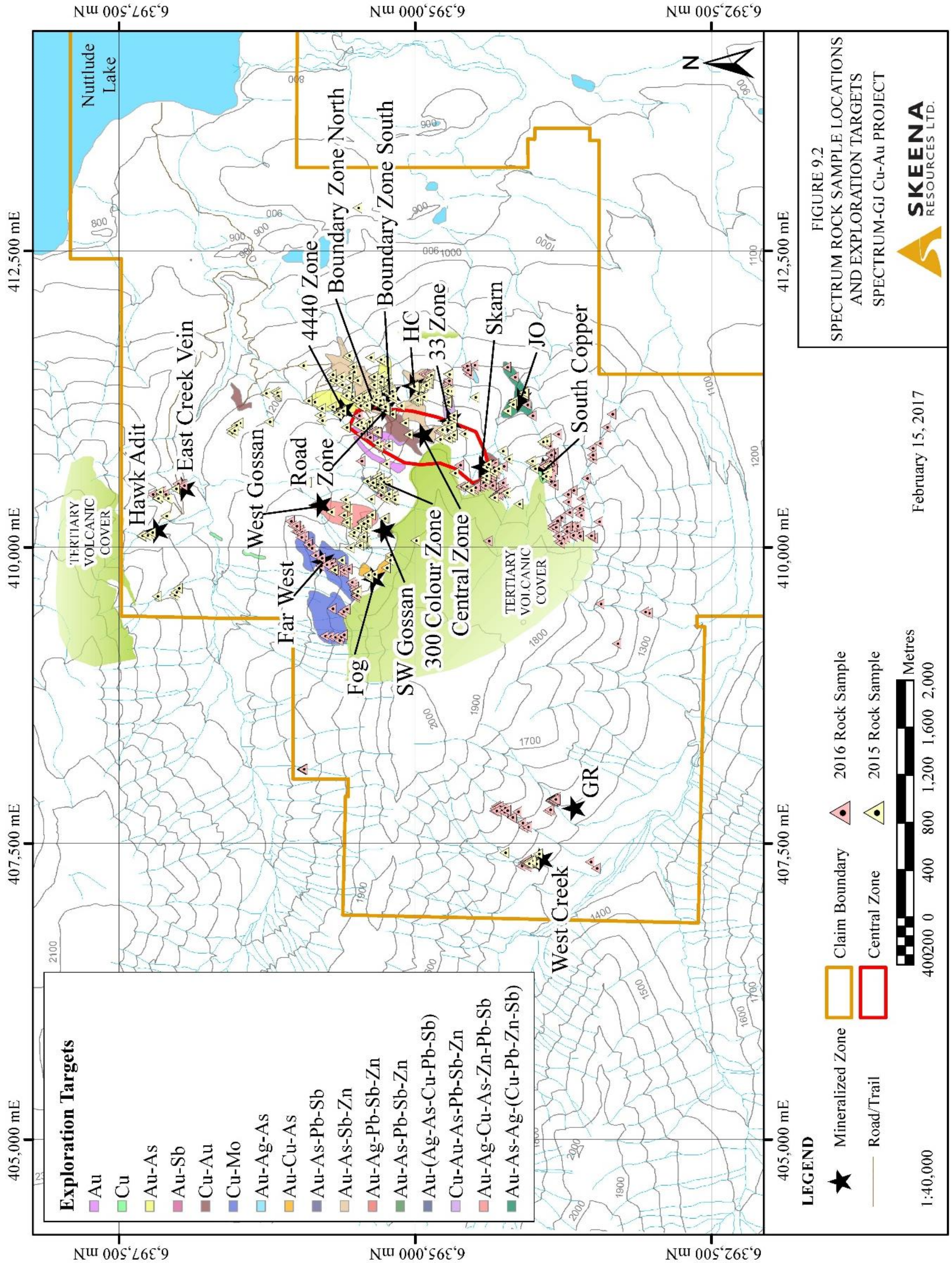
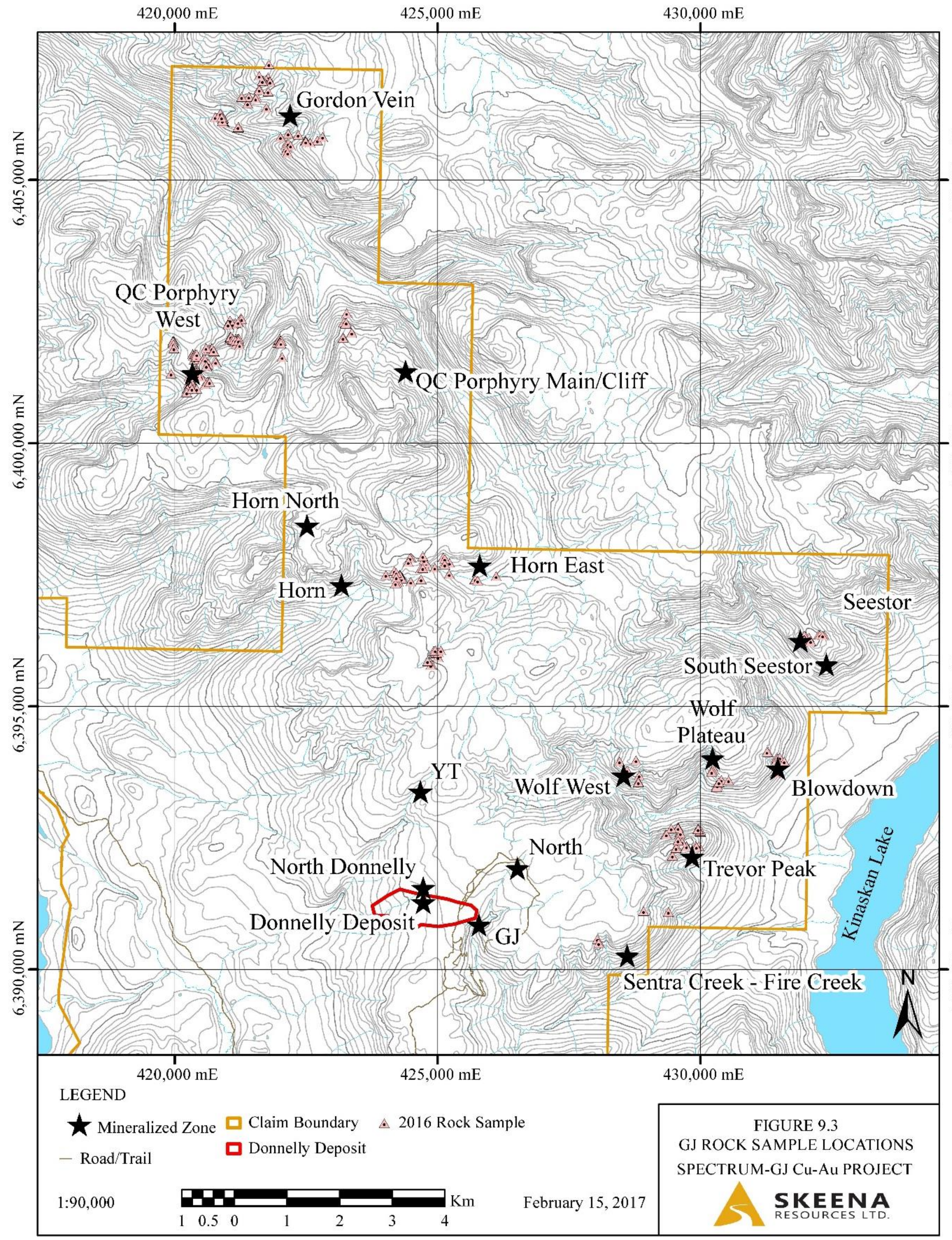


Figure 9.3 A Surface Location Plan for the Chip and Rock Samples Collected by the Company During the 2016 Field Season, GJ Claims Block, Spectrum-GJ Project Area
(supplied by the Company)



Prospecting during the 2015 season was successful in confirming and locating mineralized showings described in historical assessment reports. A number of new showings were also identified. Rock sampling and mapping/description of showings resulted in better understandings of the mineral assemblages and metal ratios of mineralization located outside of the Central Zone. It was in consequence of this that several mineralized showings were designated as high-priority targets for follow-up, due to their potential for high-grade Au or bulk-tonnage Cu-Au mineralization.

Prospecting during the 2016 season was successful in confirming the locations of showings identified in historical assessment reports, as well as helping to clarify and improve the understanding of the showings to determine whether additional work is required. On the west side of the property, prospecting and chip sampling in 2016 also advanced the understanding of the style, distribution and controls on mineralization of the targets leading to drill testing three new areas (West Creek, South Copper and Skarn). Prospecting also located new mineralization suggestive of buried Cu-Mo porphyry mineralization to the west of the Far West target. The targets outlined in 2015 (Stacey *et al.*, 2016) that were not examined in 2016 still require additional mapping and sampling. On the east side of the property, the Company carried out an initial examination of historic showings to confirm their locations and to both clarify and improve the understanding of the showings, as well as to determine whether additional work is required.

9.5 Soil Sampling

The Company has carried out three soil sampling programs:

- in October 2014, 36 soil samples were collected in the area of the East Creek and Hawk Vein showings;
- from late June to mid-October, 2015, a total of 2,982 soil samples was collected over an area of approximately 3.75 km^2 - the sampling program was designed to confirm historical results and fill-in sampling gaps; and
- from early June to mid-September, 2016, a total of 824 soil samples was collected from five areas covering approximately 2.7 km^2 – the purpose of the program was to confirm historical results, fill-in sampling gaps and expand current soil sampling coverage around selected mineralized showings.

The locations of the various soil samples are identified on Figures 9.4 and 9.5, along with the elemental signatures of the various showings. Table 9.2 provides a summary of results.

Figure 9.4 A Surface Location Plan for the Soil Samples Collected by the Company During the 2015 and 2016 Field Seasons, Spectrum Claims Block, Spectrum-GJ Project Area
(supplied by the Company)

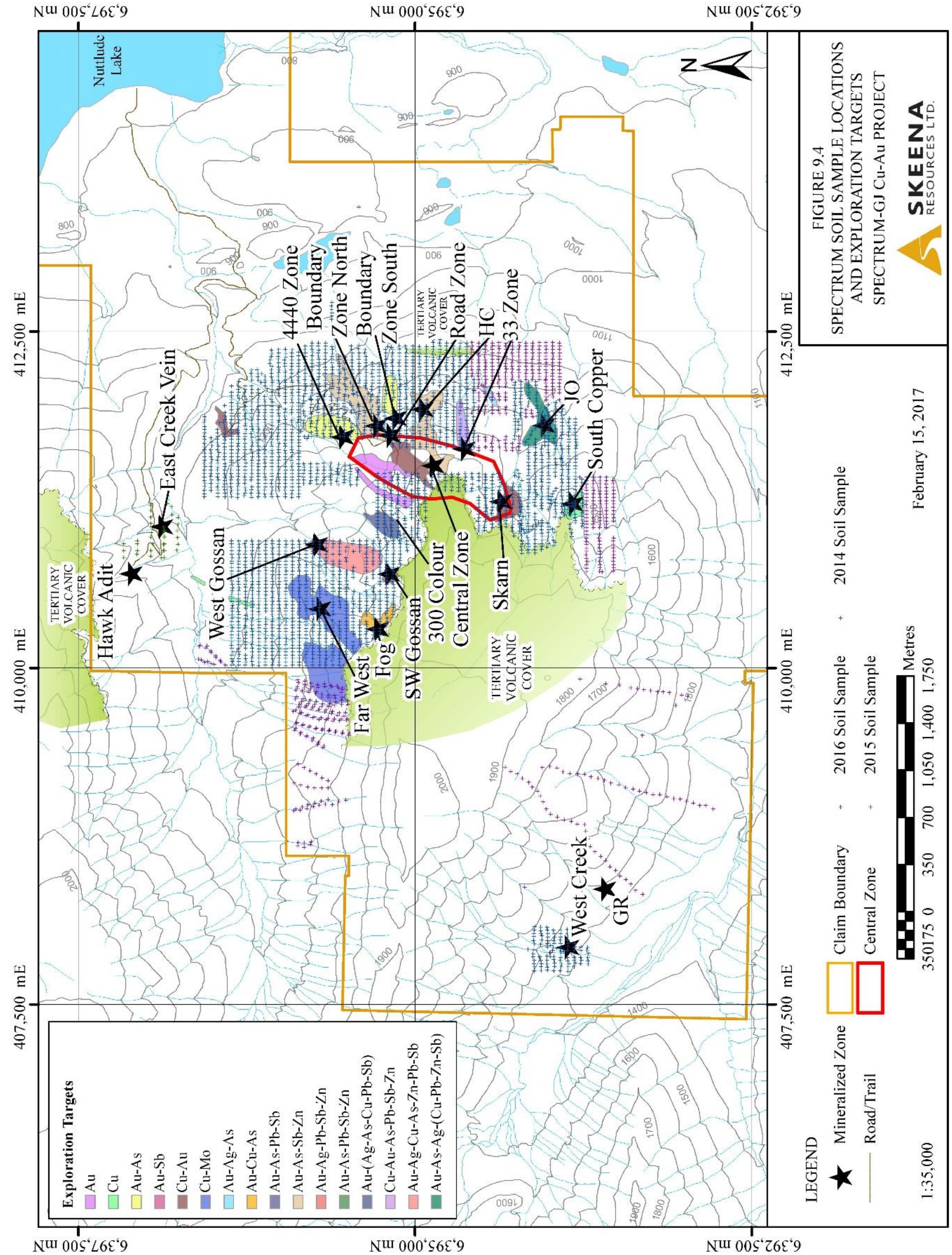


Figure 9.5 A Surface Location Plan for the Soil Samples Collected by the Company During the 2015 Field Season, GJ Claims Block, Spectrum-GJ Project Area
(supplied by the Company)

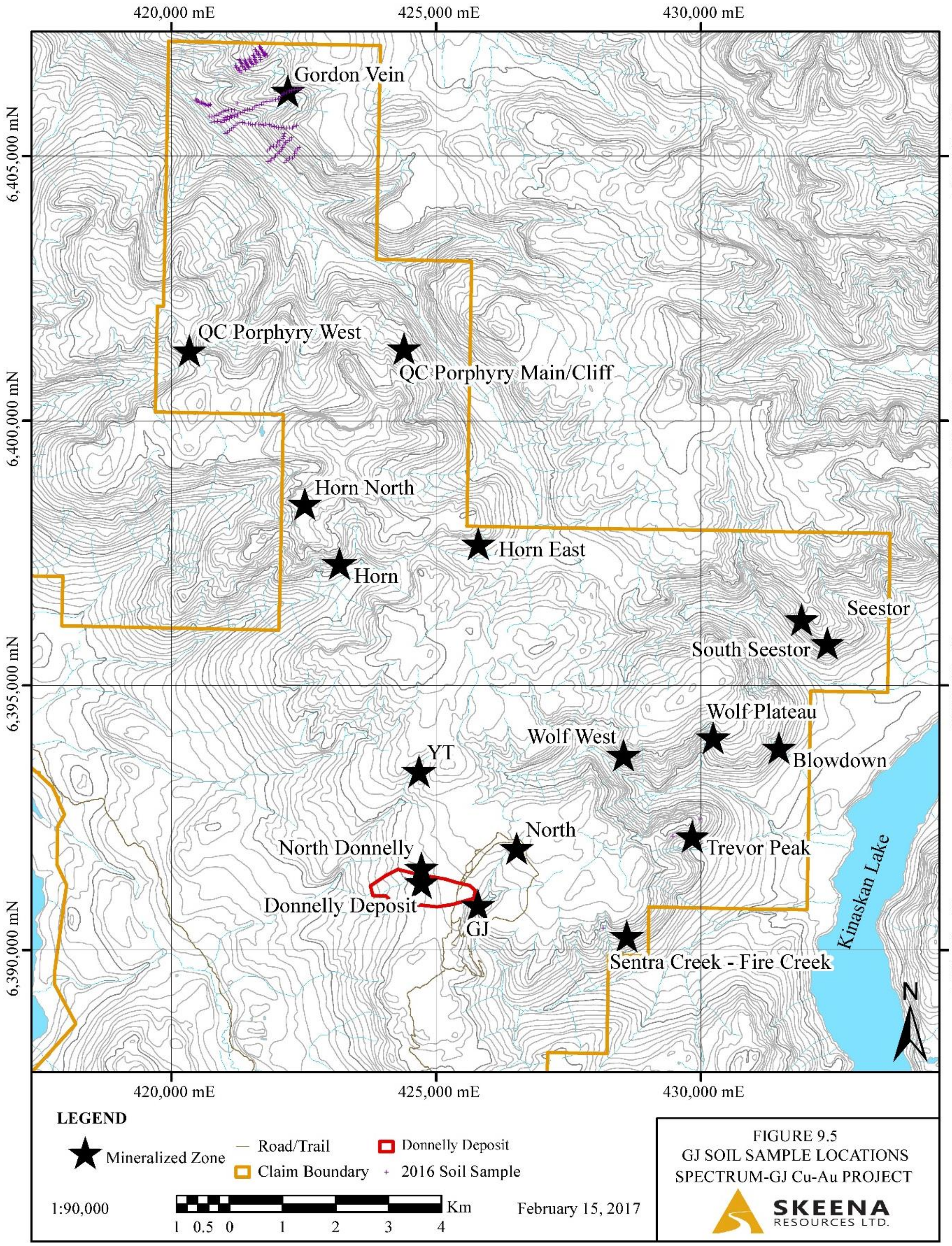


Table 9.2 A Summary of The Company's Soil Sample Statistics, Spectrum-GJ Project Area
(compiled from information supplied by the Company)

Showing	# Soil Samples	Au Max. (ppb)	Ag Max. (ppm)	Cu Max. (ppm)	Mo Max. (ppm)	Au Avg. (ppb)	Ag Avg. (ppm)	Cu Avg. (ppm)	Mo Avg. (ppm)
Spectrum Claims Block									
Central Zone	135	2,170	3.8	1,050	25	254	0.5	178	4
33 Zone	251	4,090	20.5	673	17	83	0.9	87	4
Skarn	207	2,500	21.8	3,490	53	125	0.8	273	5
Boundary-Road	391	19,500	7.4	1,780	48	310	0.9	135	5
4440 Zone	587	1,420	4.7	1,130	119	146	0.9	118	5
HC Showing	209	5,640	39.1	1,320	16	211	1.3	144	4
JO Showing	331	1,680	7.2	605	11	72	0.9	78	3
300 Colour Zone	73	8,830	10.2	693	16	538	0.7	140	3
West Gossan	170	2,960	12.0	1,170	33	250	1.3	268	10
Southwest Gossan	34	1,550	2.8	513	40	372	0.7	170	8
Fog	54	1,620	6.0	667	19	218	0.5	141	3
Far West	740	2,180	12.5	2,530	437	57	0.4	222	21
East Creek	25	486	0.7	268	9	50	0.4	84	5
Hawk Vein	11	62	1.0	117	14	16	0.5	71	9
West Creek - GR	171	1,120	68.9	3,360	37	24	1.2	93	3
South Copper	246	177	21.6	3,480	9	19	0.5	172	3
GJ Claims Block									
Gordon Vein	202	1,850	100	824	7	62	2.9	128	2
Sentra Creek-Fire Creek	1	201	5.5	187	4	201	5.5	187	4
Trevor Peak	2	6,770	10.1	1,190	12	4,655	6.6	913	10

In 2015, soil grids were designed using a GIS mapping program (MapInfo-Discover) to generate ideal UTM grid co-ordinates for each sample. Grid lines were drawn in the E-W direction, with optimum sample spacing of 25 m and a line spacing of 50 m. The points were then up-loaded to a hand-held GPS so that field workers could navigate to the location at site. In 2016, depending on the area and objective of the soil sampling, soil samples were collected either using the same grid method as was used in 2015 or as ridge-and-spur reconnaissance sampling lines with 25 m and 50 m sample spacings. Soil sampling in the Far West target area had to be modified due to extensive barren Miocene-aged basalt boulder talus and scree cover. In this area, soil samples were collected from lines that were located on both sides of hillside drainages that cut below the basalt talus to expose soils sourced from the underlying Triassic target lithologies.

Soil samples were collected from the "B" soil horizon using a shovel or mattock and placed in kraft paper soil sample bags. The bags were labeled with a unique sample number and the corresponding sample identification tag was sealed inside the bag. At each sample station, the sample UTM co-ordinates, sampler, sample depth, soil horizon, soil colour and composition, moisture content, and vegetative cover were recorded on field paper, for later computer database entry. Samples were air dried at camp, packed into large poly sample bags and sealed for delivery to the analytical laboratory for gold and multi-element geochemical analysis. ActLabs was used in 2015, ALS was used in 2016. Both laboratories used the same analytical methods as described in Section 9.4 for the Company's 2015 and 2016 rock sampling programs, although 30 g fire assays were employed rather than the 50 g fire assays used for rock samples.

The 2015 soil sampling program was successful in defining geochemical anomalies associated with the various known showings on the property, and identified a number of new anomalies for follow-up in 2016. Modern multi-element soil geochemistry has provided better information about metal ratios in soils. It has also been useful for determining the type of mineralization that may underlie anomalous areas (e.g. porphyry Cu-Au, porphyry Cu-Mo and/or polymetallic veins). The 2016 soil sampling program was successful in that:

- on the west side of the property, it outlined a new area of Au-As (with or without Ag-Cu-Pb) enrichment in two parallel, linear anomalies trending 600 m northeast from the JO showing;
- combined with prospecting, it extended the Far West Cu-Mo prospect by 250 m to the west;
- in the Gordon Area, sampling defined a 500 m long Au-Ag-As-Pb-Zn soil anomaly that coincides with the southwest projection of a 25 m wide, recessive saddle hosting less than 1 m wide quartz-galena-sphalerite veins;
- 1,000 m southeast of the main Gordon showing, sampling followed up 2002 elevated soils and rock geochemistry outlining a 500 m by 800 m area of Au-Ag-As-Cu-Pb-Zn soil enrichment that will require additional work to assess its significance; and
- two elevated Ag-Pb-Zn samples identified an area to the east of West Creek-GR that will require additional soil sampling and prospecting to assess its significance.

9.6 Induced Polarization Geophysical Survey

From June 21 to July 9, 2016, Peter E. Walcott and Associates of Vancouver, B.C., carried out an IP geophysical survey over the known Central Zone limits, as well as the southern projection of porphyry Cu-Au mineralization. The survey was performed over a north-south distance of 975 m on six, approximately 2.5 km long, east-west oriented grid lines spaced 200 m apart from geology Section 4325N to 5300N, as well as one reconnaissance grid line for a total of 16.7 line kilometres. The survey utilized a pole–dipole / dipole-pole survey method with a 100 m dipole separation and a maximum n separation of 19.5, giving a resolution to approximately 450 m depth. Survey station locations were determined using a Garmin GPSmap 60CSx handheld instrument.

The IP data was provided as Apparent Resistivity and Apparent Chargeability pseudo-sections at 1:10,000 scale. Two-dimensional and three-dimensional inversion models were also created using the Geotomo RES2DINV and RES3DINV algorithm. Key findings of the survey include:

- porphyry-style mineralization with higher grade gold mineralization overprinting in the northern two thirds of the deposit (Domains 3 and 4) are located on the western flanks of an IP chargeability high (see Figure 9.6);
- southern extension of porphyry style Cu-Au alteration and mineralization associated with weaker elevated chargeabilities;
- a higher-grade gold corridor lies in an area of low resistivity that can be traced across the survey area (see Figure 9.7); and
- the 300 Colour zone associated with a deeper, northwest trending, high chargeability feature (see Figure 9.8).

The results demonstrate that IP geophysics is a useful exploration tool for identifying mineralized zones and bodies on the Project Area. In QP Mehner's opinion, the IP survey should be expanded to the south, north and west of the presently covered area, to test for adjacent or contiguous mineralization.

Figure 9.6 A Surface Plan of the 2016 Chargeability Survey Results across The Central Zone, Spectrum Claims Block, Spectrum-GJ Project Area
(supplied by the Company)

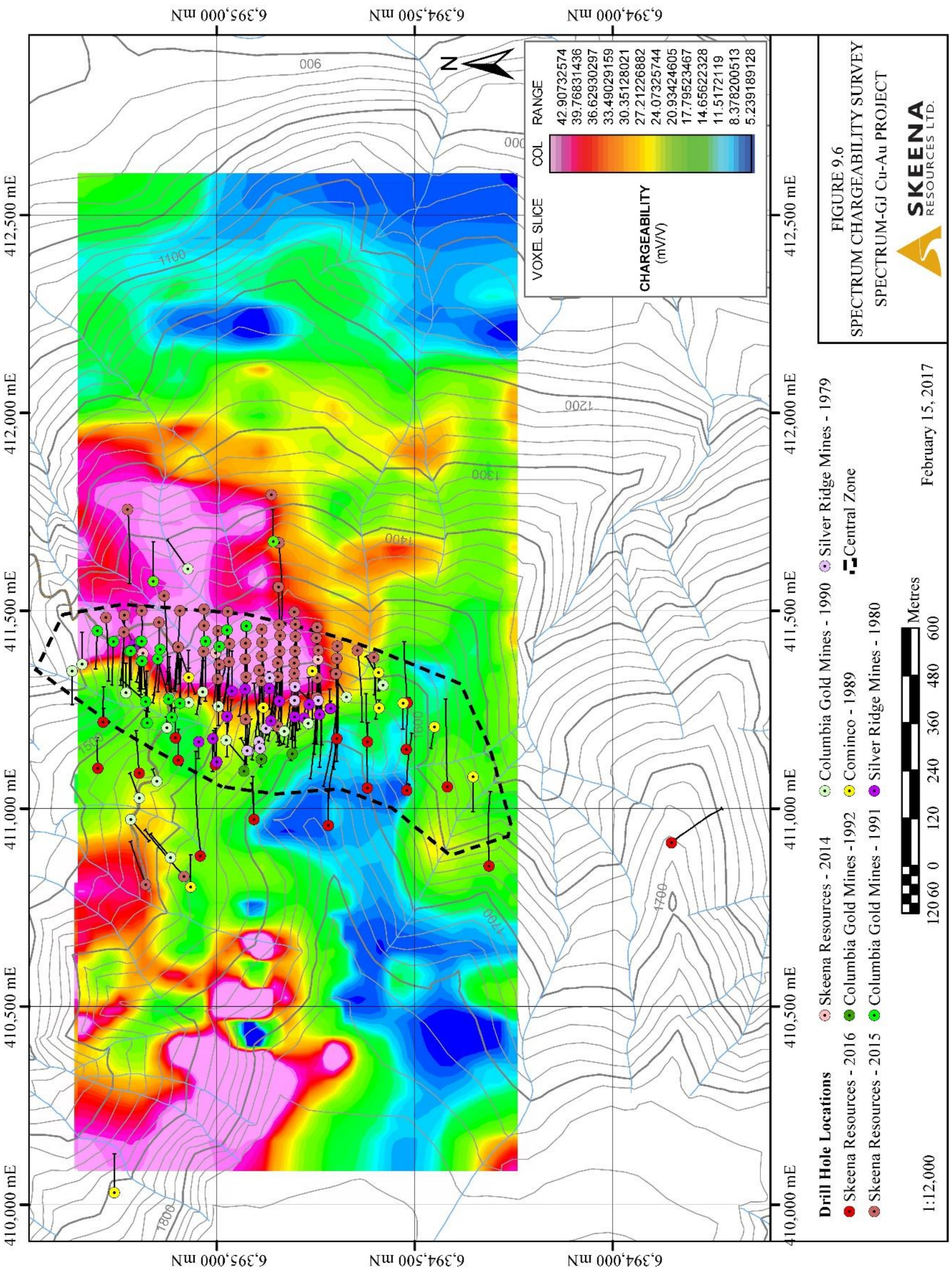


Figure 9.7 A Surface Plan of the 2016 Resistivity Survey Results across the Central Zone, Spectrum Claims Block, Spectrum-GJ Project Area
(supplied by the Company)

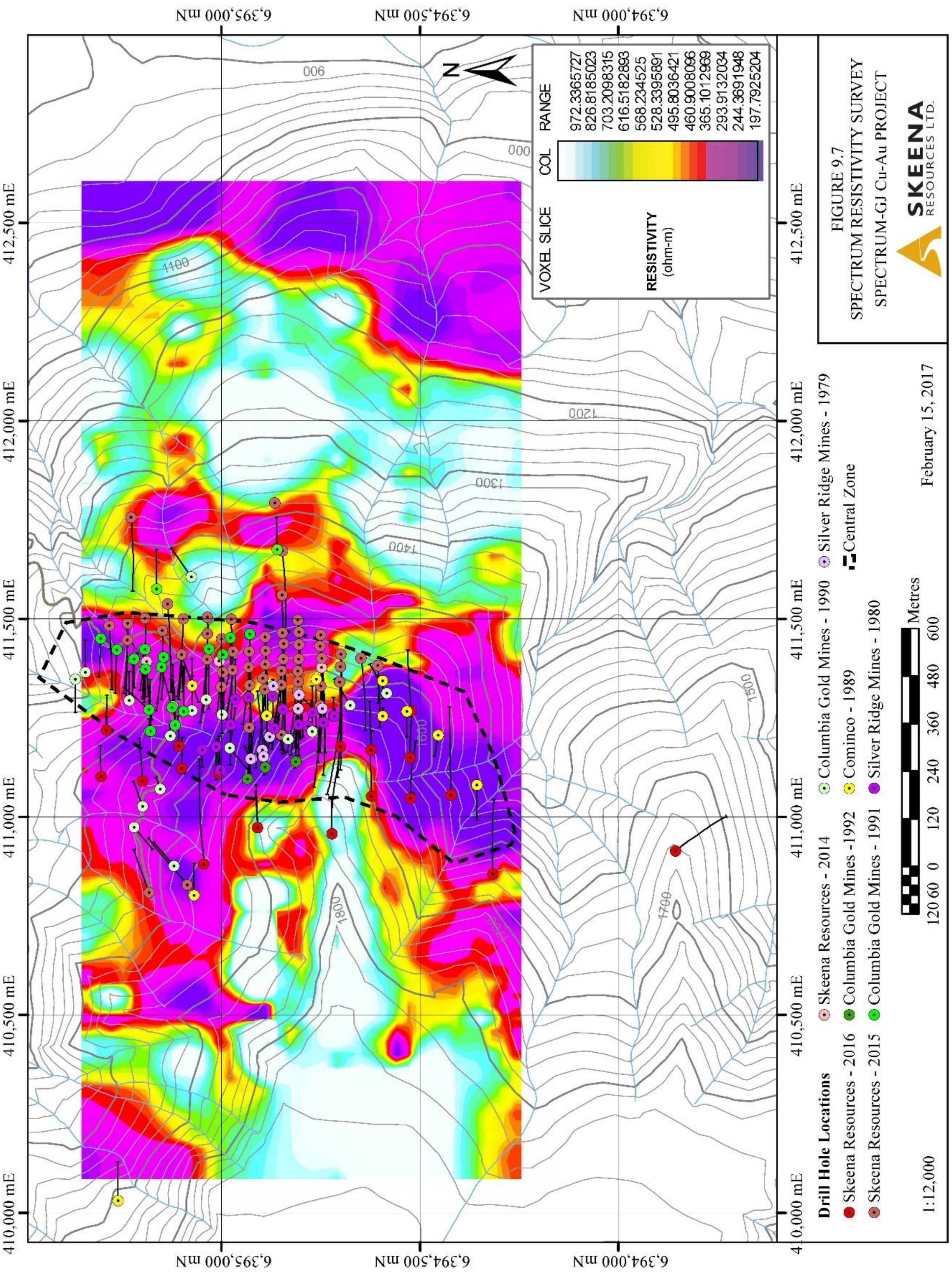
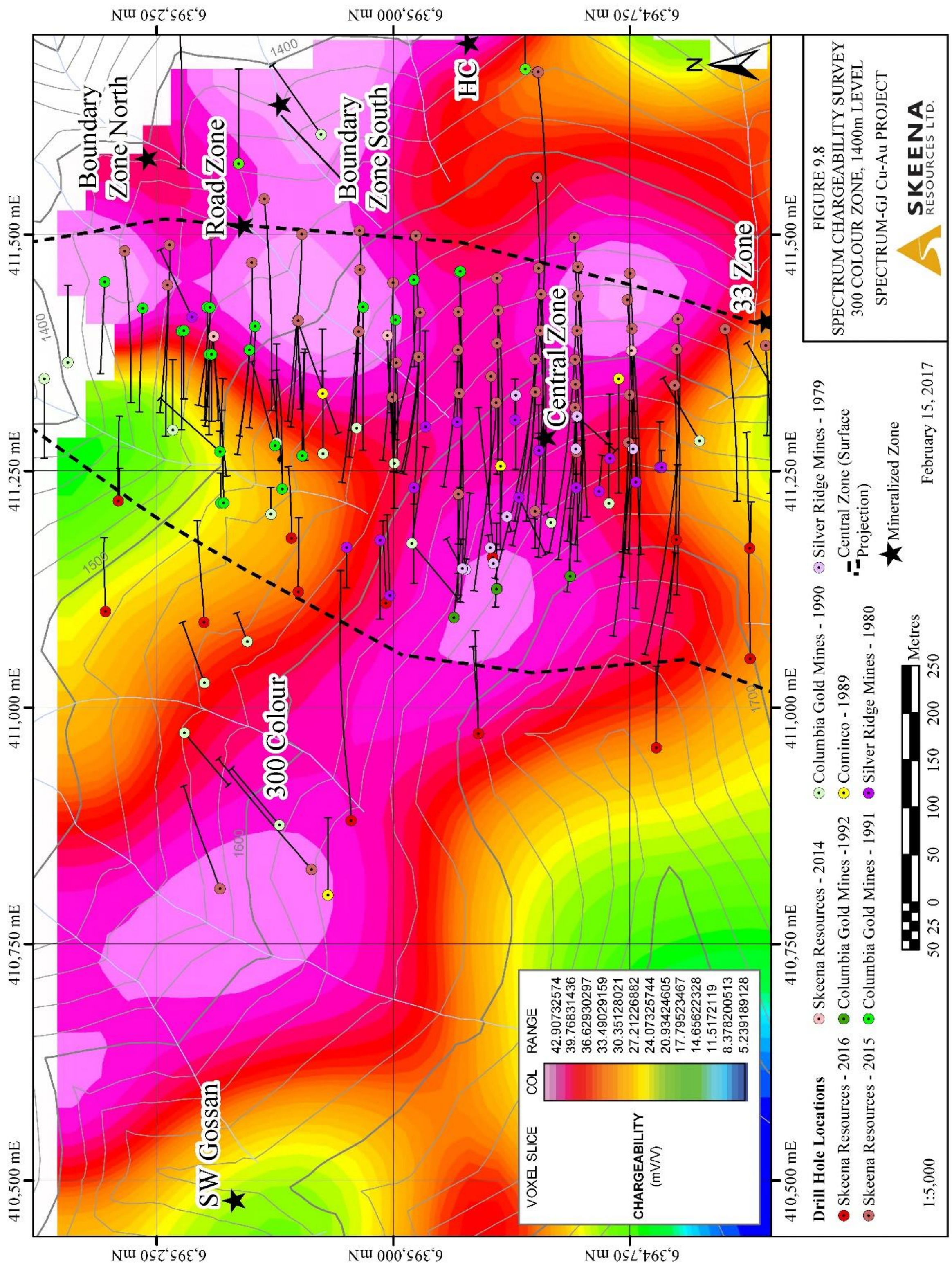


Figure 9.8 A Plan of the 2016 Chargeability Survey Results across the Central Zone and 300 Colour Zone at 1,400 m Level, Spectrum Claims Block, Spectrum-GJ Project Area
(supplied by the Company)



9.7 Ground Magnetic Geophysical Survey

From September 12 to September 18, 2016, a ground-based magnetometer survey was carried out over a limited area south of the Central Zone, to:

- cover an area deemed prospective for hosting the southern continuation of porphyry-style Cu-Au mineralization; and
- to define the magnetic signature of the alteration (and associated mineralization) as it would aid in tracing perspective geology through overburden covered areas and help rank and evaluate soil and rock geochemical targets.

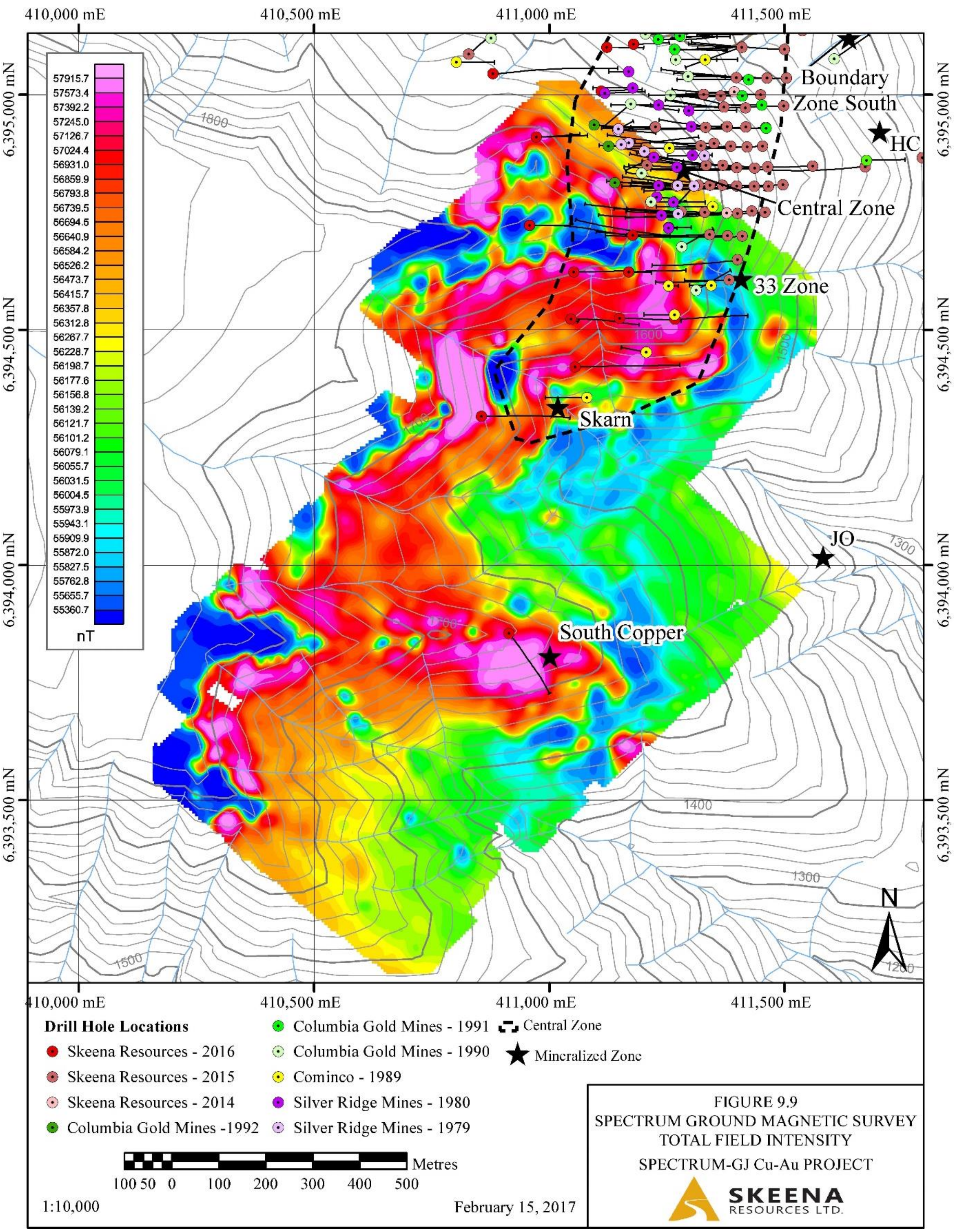
Drilling of porphyry Cu-Au mineralization on the south end of the Central Zone had previously identified a strong association with magnetite. It was on the basis of this association that the Company undertook the magnetic survey.

The survey was carried out over 44.6 line kilometres by Peter E. Walcott and Associates of Vancouver, B.C., utilizing a two-person crew, two GSM-19 Overhauser rover magnetometers equipped with GPS guidance and a GSM-19 proton precession base station magnetometer, both manufactured by GEM Instruments of Richmond Hill, Ontario. These instruments measure variations in the total intensity of the earth’s magnetic field to an accuracy of one nanotesla. The survey was undertaken on northwest-southeast oriented grid lines spaced 50 m apart. Readings were taken at one second intervals along the grid lines.

The ground-based magnetometer data was combined with magnetic susceptibility measurements from surface outcrops and downhole measurements to produce an inversion model for the survey area. The magnetic data was modelled using the Geosoft VOXI earth modeling platform, which is a cloud-based service that allows users to rapidly conduct three-dimensional inversions of potential field data such as magnetics and gravity. It allows constraints to be applied based on ground and drillhole observations in three-dimensional space. Figure 9.9 provides an example of the results.

The 2016 magnetic survey was successful in indicating areas of higher magnetic signature associated with drillholes intersecting porphyry Cu-Au alteration and mineralization within a panel of elevated magnetics. This extends 450 m south from current drilling, thereby defining a corridor of potential porphyry-style alteration that links soil and rock geochemical anomalies of the South Copper target with the area of known porphyry-style mineralization and alteration at the south end of the Central Zone. The results demonstrate that ground magnetics is a useful exploration tool for identifying mineralized zones and bodies on the Project Area. In QP Mehner’s opinion, magnetic surveys should be expanded to include a detailed ground based survey of the remainder of the Central Zone, as well as peripheral targets to the west and east of the Central Zone.

Figure 9.9 A Surface Plan Summarizing the Results of the 2016 Ground Total Field Intensity Magnetic Survey across a Portion of the Spectrum Claims Block, Spectrum-GJ Project Area
(supplied by the Company)



9.8 Exploration Potential

Potential exists to increase the known extent of the mineralizing systems within the Central Zone area, because:

- the porphyry-style mineralization remains open along strike and at depth; and
- the porphyry-related, vein-hosted zone of elevated Au grades has not been adequately defined along strike and is open to the north and vertically downdip.

Potential also exists to increase the known extent of the mineralizing system associated with the Donnelly Deposit;

- the structurally controlled, moderately to steeply, south-dipping mineralized panel remains open at depth; and
- it is immediately adjacent to or contiguous with the North Donnelly deposit that is under-explored.

Additional drilling is in both cases required to better define the extent of the mineralization and, in the case of the Central Zone, to establish whether adjacent mineralized zones such as the 300 Colour and South Copper zones are extensions of, or separate from, the currently defined Central Zone. Geological mapping, drilling, additional soil sampling and additional geophysical surveys are also required to better define the mineralization outlined for the many other porphyry-style Cu-Au and structurally-hosted gold zones and occurrences listed in Section 7.7.

9.9 Qualified Person's Opinion

In the opinion of QP Mehner:

- the exploration programs completed to date are appropriate to the style of the deposits and prospects located within the Project Area;
- the results of exploration work to date support the interpretations of the deposits; and
- the Project Area contains significant exploration potential (and the Company has planned additional work).

10 DRILLING

The Principal Author is responsible for this section of this Technical Report. As part of a larger due diligence process he cross-referenced information contained in the April 2016 and May 2016 Technical Reports with the Company's drillhole database, and plotted the collar positions and drill strings using ArcGIS to ensure they intersected the Central Zone or Donnelly Deposit, as appropriate. It is the validated data relating to the Central Zone and Donnelly Deposit that is presented here, because it is the mineralization contained therein that is the subject of the 2017 Mineral Resource updates and PEA presented in this Technical Report. Summaries of drilling activity on the other zones and mineralized occurrences located on the Spectrum-GJ Project Area are presented in Section 6. Brief summaries of the characteristics of the various other zones and occurrences are presented in Section 7.7.

10.1 Historical Drilling Programs

Prior to the Company acquiring the claims blocks that comprise the Project Area, 91,234.45 m of diamond drilling had been completed by previous operators in 407 drillholes. These totals do not include three holes (325.83 m) that were reported to have been drilled into the Horn Silver prospect in 1965, but for which no detailed information is available (with the result that the three holes do not appear in the Company's drillhole database).

The historical database relating to the Central Zone and Donnelly Deposit comprises:

- 80 holes (10,425.67 m) drilled on the Central Zone, including the 500 Colour, HC, Porphyry, 33 and Skarn zones that were separately identified in historical records (but which are now considered to be part of the Central Zone); and
- 168 holes (44,338.37 m) drilled on or into the Donnelly Deposit.

Table 10.1 summarizes the various historical drilling programs relating to the Central Zone and Donnelly Deposit. Table 10.2 (that is in two parts due to its overall length) provides a summary of the collar locations, azimuths, dips and lengths of the drillholes located on the Central Zone. Table 10.3 (that is in three parts due to its overall length) provides a summary of the same information as Table 10.2, but for the Donnelly Deposit.

Table 10.1 A Summary of Historical Drilling Programs on the Central Zone and Donnelly Deposit, Spectrum-GJ Project Area
(compiled from information contained in the April 2016 and May 2016 Technical Reports, cross-referenced to the Company's verified drillhole database)

Year	Company	Zone	Holes Drilled	Total Length (m)	Core Size
Central Zone					
1973	Imperial Oil	Central	4	463.44	-
1979	Silver Ridge Mines	Central 500 Colour	4 6	493.40 338.60	BQ
1980	Silver Ridge Mines	Central 500 Colour	13 5	1,795.30 604.60	NQ
1989	Cominco	Central 33 Skarn	3 4 1	431.90 302.60 125.00	BTW
1990	Columbia Gold Mines	Central 500 Colour 33	12 2 1	1,540.66 138.70 121.92	BTW
1991	Columbia Gold Mines	Central	22	3,682.87	NQ
1992		500 Colour	3	386.48	NQ2
		Totals – Central Zone	*80*	*10,425.67*	-
Donnelly Deposit					
1977	TexasGulf	Donnelly	10	1,523.90	BQ
1980	TexasGulf	Donnelly	4	1,114.90*	BQ
1990	Ascot Resources	Donnelly	1	183.49	BTW
2004	Canadian Gold Hunter	Donnelly	10	2,618.43	BTW
2005			37	11,071.20	NQ2
2006			36	12,665.73	NQ2
2007			65	13,114.48	NQ2
2011	Teck Resources	Donnelly	3	1,832.85	NQ
2013			2	1,328.29	NQ
		Totals – Donnelly Deposit	*168*	*44,338.37*	-

Note: ***** Including 149.90 m extension to drillhole TG-77-04

Table 10.2 A Summary of the Collar Locations, Drillhole Azimuths, Dips and Lengths of the 80 Historical Drillholes Completed on the Central Zone, Spectrum-GJ Property
(compiled from information contained in the Company's verified drillhole database)

Drillhole	Company	Zone	Collar Position			Azimuth	Dip	Length (m)
			Easting	Northing	Elev. (m)			
S1	Imperial Oil	Central	411,219.1	6,395,289.3	1,475.9	090º	-61º	70.10
S2		Central	411,262.2	6,395,120.0	1,531.5	000º	-90º	244.45
S3		Central	411,288.4	6,394,773.2	1,643.1	000º	-90º	12.95
S4		Central	411,288.9	6,394,773.2	1,642.8	000º	-90º	135.94
S79-01	Silver Ridge Mines	Central	411,273.3	6,394,807.2	1,645.0	090º	-80º	161.20
S79-02		Central	411,273.5	6,394,746.8	1,651.6	090º	-70º	115.50
S79-03		Central	411,307.7	6,394,805.8	1,627.5	222º	-55º	94.80
S79-06		Central	411,330.0	6,394,870.6	1,601.5	270º	-50º	121.90
S79-04		500 Colour	411,168.9	6,394,897.6	1,647.2	080º	-50º	21.30
S79-05		500 Colour	411,152.4	6,394,894.4	1,651.8	097º	-58º	39.60
S79-07		500 Colour	411,202.1	6,394,879.8	1,642.2	255º	-43º	22.60
S79-08		500 Colour	411,146.2	6,394,925.8	1,635.5	095º	-49º	123.40
S79-09		500 Colour	411,145.9	6,394,923.8	1,635.6	095º	-80º	65.50
S79-10		500 Colour	411,146.7	6,394,926.8	1,635.4	062º	-57º	66.40
S80-14	Silver Ridge Mines	Central	411,232.5	6,394,978.1	1,591.8	270º	-55º	175.90
S80-16		Central	411,228.4	6,394,782.7	1,661.8	095º	-69º	107.00
S80-17		Central	411,263.4	6,394,771.0	1,651.2	090º	-60º	135.90
S80-18		Central	411,238.2	6,394,743.8	1,660.6	090º	-77º	206.30
S80-19		Central	411,232.3	6,394,806.7	1,655.7	090º	-85º	171.20
S80-20		Central	411,301.7	6,394,932.6	1,587.1	090º	-65º	151.50
S80-21		Central	411,296.8	6,394,966.0	1,576.5	090º	-60º	203.30
S80-22		Central	411,412.5	6,395,212.9	1,468.4	065º	-55º	137.50
S80-24		Central	411,253.8	6,394,718.1	1,655.2	090º	-63º	106.40
S80-25		Central	411,253.8	6,394,716.1	1,654.8	090º	-80º	106.10
S80-26		Central	411,271.6	6,394,846.2	1,631.8	090º	-63º	106.70
S80-27		Central	411,271.6	6,394,846.2	1,631.8	090º	-80º	106.40
S80-28		Central	411,304.0	6,394,871.6	1,611.2	090º	-58º	81.10

Table 10.2 continued…. A Summary of the Collar Locations, Drillhole Azimuths, Dips and Lengths of the 80 Historical Drillholes Completed on the Central Zone, Spectrum-GJ Property

(compiled from information contained in the Company's verified drillhole database)

Drillhole	Company	Zone	Collar Position			Azimuth	Dip	Length (m)
			Easting	Northing	Elev. (m)			
S80-11	Silver Ridge Mines	500 Colour	411,118.3	6,395,003.6	1,594.2	088º	-50º	132.90
S80-12		500 Colour	411,176.9	6,395,014.0	1,589.9	270º	-50º	129.50
S80-13		500 Colour	411,173.4	6,394,980.2	1,604.7	098º	-50º	160.00
S80-15		500 Colour	411,169.2	6,395,049.4	1,577.2	270º	-50º	66.40
S80-23		500 Colour	411,222.1	6,394,867.1	1,639.4	245º	-55º	115.80
S89-34	Cominco	Central	411,347.4	6,394,762.1	1,612.5	270º	-45º	170.40
S89-35		Central	411,255.2	6,394,886.6	1,619.6	270º	-45º	124.70
S89-36		Central	411,331.8	6,395,074.9	1,532.8	090º	-60º	136.80
S89-33		33	411,343.9	6,394,594.4	1,594.7	270º	-45º	65.20
S89-39		33	411,253.9	6,394,593.7	1,644.6	090º	-65º	50.00
S89-40		33	411,266.1	6,394,533.0	1,629.0	270º	-45º	92.00
S89-41		33	411,206.5	6,394,453.3	1,591.4	280º	-55º	95.40
S89-42		Skarn	411,080.2	6,394,356.6	1,541.5	270º	-45º	125.00
S90-46	Columbia Gold Mines	Central	411,279.6	6,395,123.4	1,528.8	090º	-55º	182.90
S90-47		Central	411,215.9	6,394,772.2	1,669.2	090º	-70º	182.90
S90-50		Central	411,281.7	6,394,676.3	1,634.3	060º	-45º	109.10
S90-52		Central	411,270.6	6,395,183.2	1,501.7	042º	-60º	169.50
S90-53		Central	411,270.6	6,395,183.2	1,501.7	090º	-60º	44.20
S90-54		Central	411,347.5	6,395,369.0	1,380.7	270º	-45º	118.90
S90-55		Central	411,364.8	6,395,343.8	1,389.1	090º	-45º	115.82
S90-56		Central	411,295.4	6,395,038.6	1,553.8	090º	-55º	137.20
S90-57		Central	411,204.2	6,395,129.5	1,540.5	090º	-55º	48.80
S90-58		Central	411,293.3	6,395,232.9	1,469.3	090º	-60º	149.40
S90-59		Central	411,268.5	6,395,074.4	1,550.3	090º	-55º	152.40
S90-60		Central	411,258.0	6,394,999.2	1,579.7	090º	-55º	129.54
S90-45		500 Colour	411,173.4	6,394,980.2	1,604.7	230º	-45º	108.20
S90-48		500 Colour	411,195.7	6,394,833.3	1,663.4	060º	-70º	30.50
S90-49		33	411,312.1	6,394,584.2	1,610.2	060º	-46º	121.92
S91-63	Columbia Gold Mines	Central	411,276.8	6,395,125.1	1,528.8	075º	-58º	177.80
S91-64		Central	411,270.6	6,395,183.2	1,501.7	093º	-61º	152.09
S91-65		Central	411,231.3	6,395,117.5	1,534.8	090º	-60º	221.40
S91-66		Central	411,231.3	6,395,117.5	1,534.8	090º	-48º	187.44
S91-67		Central	411,216.4	6,395,182.5	1,517.0	090º	-60º	63.09
S91-68		Central	411,216.4	6,395,179.5	1,517.5	090º	-65º	227.67
S91-69		Central	411,266.3	6,395,096.4	1,544.6	091º	-45º	161.80
S91-70		Central	411,266.3	6,395,096.4	1,544.6	091º	-60º	229.20
S91-71		Central	411,423.4	6,395,196.6	1,470.6	270º	-45º	175.86
S91-72		Central	411,422.8	6,395,193.8	1,470.7	270º	-55º	183.50
S91-73		Central	411,409.9	6,394,997.6	1,523.7	270º	-45º	179.50
S91-74		Central	411,397.8	6,395,223.9	1,466.5	270º	-45º	146.90
S91-75		Central	411,398.4	6,395,221.0	1,467.3	270º	-60º	156.00
S91-76		Central	411,373.2	6,395,194.8	1,484.2	270º	-45º	119.50
S91-77		Central	411,373.2	6,395,192.1	1,484.7	270º	-60º	140.21
S91-78		Central	411,421.8	6,395,264.7	1,448.3	272º	-45º	154.50
S91-79		Central	411,449.8	6,395,305.2	1,435.0	272º	-45º	141.12
S91-82		Central	411,423.4	6,395,032.1	1,510.8	270º	-45º	213.96
S91-83		Central	411,461.2	6,394,929.2	1,522.3	270º	-45º	180.44
S91-84		Central	411,451.9	6,394,978.4	1,515.7	270º	-45º	132.89
S91-85		Central	411,378.1	6,395,152.3	1,492.9	274º	-45º	157.57
S91-86		Central	411,402.9	6,395,146.4	1,488.9	270º	-55º	180.43
S92-90	Columbia Gold Mines	500 Colour	411,095.0	6,394,935.7	1,642.3	095º	-50º	129.84
S92-91		500 Colour	411,125.4	6,394,891.1	1,659.3	090º	-58º	131.37
S92-92		500 Colour	411,138.8	6,394,813.1	1,694.0	090º	-55º	125.27

Table 10.3 A Summary of the Collar Locations, Drillhole Azimuths, Dips and Lengths of the 168 Historical Drillholes Completed on the Donnelly Deposit, Spectrum-GJ Property

(compiled from information contained in the Company's verified drillhole collar database)

Drillhole	Company	Collar Position			Azimuth	Dip	Length (m)
		Easting	Northing	Elev. (m)			
TG-77-01*	TexasGulf	424,428.4	6,391,220.7	1,511.9	000º	-45º	163.40
TG-77-02		424,422.2	6,391,161.0	1,511.8	000º	-45º	172.50
TG-77-03		424,305.1	6,391,161.8	1,490.5	000º	-45º	160.30
TG-77-04-11		424,429.8	6,390,861.0	1,514.0	000º	-45º	178.60
TG-77-05		424,667.4	6,390,925.6	1,543.4	000º	-45º	148.10
TG-77-06		424,906.8	6,390,993.3	1,565.7	000º	-45º	132.90
TG-77-07		424,306.2	6,390,992.4	1,501.8	000º	-45º	148.10
TG-77-08		424,543.0	6,391,165.4	1,529.3	000º	-45º	181.70
TG-77-09		424,665.7	6,391,024.3	1,545.8	180º	-45º	123.70
TG-77-10		424,909.2	6,390,872.4	1,564.8	000º	-45º	114.60
TG-77-04-12**	TexasGulf	-	-	-	000º	-45º	149.90
TG-80-12		424,370.7	6,390,855.1	1,505.0	001º	-45º	215.20
TG-80-13		424,427.3	6,390,923.0	1,516.6	001º	-45º	239.30
TG-80-14		424,486.7	6,390,926.6	1,523.2	001º	-45º	231.60
TG-80-15		424,428.6	6,390,800.8	1,509.1	001º	-45º	278.90
AS-90-11	Ascot	425,509.9	6,390,921.7	1,562.0	180º	-45º	183.49
CGH-04-001	Canadian Gold Hunter	425,283.4	6,390,984.3	1,592.0	358º	-46º	261.21
CGH-04-002		424,904.2	6,391,068.0	1,570.9	000º	-46º	287.12
CGH-04-003		425,103.7	6,391,021.9	1,582.6	359º	-47º	279.19
CGH-04-004		425,418.9	6,390,917.9	1,599.2	001º	-45º	169.77
CGH-04-015		424,196.2	6,391,043.6	1,487.0	001º	-45º	309.98
CGH-04-016		424,406.1	6,391,074.9	1,513.9	001º	-45º	294.74
CGH-04-017		424,662.3	6,391,119.5	1,545.0	001º	-45º	224.63
CGH-04-018		425,105.5	6,391,155.2	1,586.1	001º	-45º	188.06
CGH-04-019		425,282.9	6,390,889.0	1,592.6	001º	-45º	382.14
CGH-04-020		425,283.1	6,391,209.6	1,600.8	181º	-45º	221.59
CGH-05-021	Canadian Gold Hunter	425,278.5	6,391,118.9	1,597.6	003º	-45º	203.61
CGH-05-022		424,904.8	6,391,208.0	1,571.1	001º	-45º	73.60
CGH-05-022B		424,904.8	6,391,207.7	1,571.1	001º	-45º	187.76
CGH-05-022C		424,904.8	6,391,207.7	1,571.1	001º	-45º	187.76
CGH-05-023		425,380.6	6,391,004.4	1,603.7	000º	-45º	247.80
CGH-05-024		424,906.4	6,390,989.4	1,566.9	000º	-55º	345.94
CGH-05-025		425,380.1	6,391,154.5	1,606.3	000º	-45º	105.76
CGH-05-026		425,482.1	6,390,997.4	1,598.9	001º	-45º	201.77
CGH-05-027		424,664.9	6,391,019.5	1,546.4	359º	-50º	322.00
CGH-05-028		425,481.9	6,390,995.9	1,598.8	001º	-70º	246.28
CGH-05-029		425,114.9	6,390,880.9	1,579.0	003º	-45º	509.00
CGH-05-030		425,579.0	6,391,002.3	1,602.4	001º	-55º	242.92
CGH-05-031		425,189.1	6,391,118.4	1,588.1	001º	-45º	191.20
CGH-05-032		425,008.5	6,391,128.0	1,578.4	001º	-45º	252.06
CGH-05-033		425,185.0	6,390,980.8	1,586.4	003º	-45º	326.44
CGH-05-034		425,009.1	6,390,981.5	1,572.2	003º	-45º	367.89
CGH-05-036		425,382.6	6,390,865.0	1,599.1	001º	-45º	410.56
CGH-05-037		424,829.5	6,391,127.7	1,561.4	001º	-44º	194.16
CGH-05-038		424,827.2	6,390,984.9	1,561.2	003º	-45º	294.74
CGH-05-039		424,749.1	6,391,118.5	1,550.0	000º	-45º	224.63
CGH-05-040		424,752.3	6,390,981.8	1,553.0	000º	-45º	337.41
CGH-05-041		424,670.8	6,391,295.7	1,546.9	001º	-44º	346.56
CGH-05-042		424,216.3	6,391,168.7	1,477.9	002º	-45º	358.44
CGH-05-043		424,541.3	6,390,959.2	1,532.9	001º	-44º	422.75
CGH-05-044		424,542.1	6,390,806.1	1,524.6	001º	-46º	342.90
CGH-05-045		424,429.1	6,391,048.4	1,517.3	002º	-55º	390.75
CGH-05-046		424,307.8	6,391,019.6	1,500.8	001º	-45º	392.28
CGH-05-047		424,099.9	6,391,184.4	1,451.2	001º	-45º	258.17
CGH-05-067		425,183.7	6,390,910.6	1,583.8	003º	-55º	392.27
CGH-05-068		425,007.5	6,391,216.1	1,578.9	001º	-45º	145.38
CGH-05-069		425,509.3	6,390,922.2	1,560.0	001º	-70º	291.99
CGH-05-070		424,907.9	6,391,139.6	1,570.4	002º	-45º	244.45
CGH-05-072		424,540.4	6,391,075.7	1,529.5	003º	-45º	278.89
CGH-05-073		424,541.8	6,390,928.6	1,530.9	001º	-56º	505.05
CGH-05-074		424,256.6	6,390,922.2	1,499.2	001º	-46º	477.31
CGH-05-075		424,792.1	6,390,840.3	1,555.5	001º	-45º	358.75
CGH-05-076		424,120.8	6,391,033.3	1,475.7	000º	-44º	391.97

Notes: * TG-77-01 was collared on North Donnelly but it extends to the Donnelly Deposit
** TG-77-04-12 is a 149.90 m extension of TG-77-04-11. It is not therefore accounted as a separate hole.

Table 10.3 continued…. A Summary of the Collar Locations, Drillhole Azimuths, Dips and Lengths of the 168 Historical Drillholes Completed on the Donnelly Deposit, Spectrum-GJ Property

(compiled from information contained in the Company's verified drillhole collar database)

Drillhole	Company	Collar Position			Azimuth	Dip	Length (m)
		Easting	Northing	Elev. (m)			
CGH-06-077	Canadian Gold Hunter	425,480.1	6,391,099.0	1,604.4	359º	-45º	137.16
CGH-06-078		425,188.7	6,390,843.4	1,582.3	359º	-60º	527.30
CGH-06-079		425,577.0	6,391,111.7	1,609.8	179º	-45º	237.74
CGH-06-080		425,577.0	6,391,116.4	1,610.1	000º	-55º	91.44
CGH-06-081		424,195.1	6,391,006.3	1,487.6	359º	-55º	478.53
CGH-06-082		424,669.0	6,390,891.1	1,544.3	359º	-50º	408.43
CGH-06-083		424,111.4	6,390,944.3	1,471.8	354º	-47º	503.21
CGH-06-084		424,429.7	6,390,859.0	1,512.7	001º	-50º	536.45
CGH-06-085		424,010.3	6,391,070.8	1,439.6	356º	-45º	304.80
CGH-06-086		424,426.8	6,390,708.9	1,505.6	358º	-52º	621.79
CGH-06-089		424,304.4	6,390,757.8	1,492.2	355º	-45º	524.26
CGH-06-090		424,669.3	6,391,409.5	1,550.0	358º	-45º	304.80
CGH-06-091		424,424.7	6,391,384.0	1,500.8	001º	-45º	300.23
CGH-06-092		424,491.0	6,390,996.5	1,524.8	359º	-45º	405.38
CGH-06-093		424,549.4	6,391,386.1	1,524.3	357º	-43º	295.66
CGH-06-094		424,549.3	6,391,386.0	1,524.7	356º	-70º	295.66
CGH-06-095		424,541.8	6,390,707.6	1,517.5	356º	-50º	573.02
CGH-06-096		424,767.3	6,391,403.2	1,559.5	000º	-45º	256.03
CGH-06-097		424,258.6	6,391,400.0	1,511.4	359º	-45º	280.42
CGH-06-100		424,430.9	6,391,264.4	1,513.3	174º	-62º	633.98
CGH-06-101		424,484.7	6,391,189.8	1,522.4	000º	-45º	192.02
CGH-06-104		423,905.3	6,391,266.6	1,449.8	357º	-45º	255.33
CGH-06-105		424,021.9	6,390,892.3	1,457.7	357º	-45º	499.87
CGH-06-106		424,541.0	6,391,174.3	1,530.1	001º	-45º	207.26
CGH-06-107		424,772.8	6,390,746.0	1,550.5	348º	-50º	451.10
CGH-06-108		424,909.8	6,390,920.2	1,564.5	353º	-60º	439.42
CGH-06-109		424,137.0	6,390,753.3	1,450.7	001º	-45º	298.70
CGH-06-110		425,049.7	6,390,886.8	1,574.2	000º	-50º	470.92
CGH-06-122		425,680.3	6,391,082.8	1,606.5	179º	-45º	89.92
CGH-06-123		425,680.2	6,391,087.2	1,606.0	000º	-45º	75.29
CGH-06-125		425,190.1	6,391,314.5	1,596.0	179º	-45º	454.76
CGH-06-127		424,422.4	6,391,253.7	1,511.2	358º	-45º	304.80
CGH-06-128		425,109.6	6,391,241.1	1,587.7	357º	-45º	100.58
CGH-06-129		424,429.9	6,391,126.5	1,513.1	175º	-58º	536.45
CGH-06-130		424,259.0	6,391,396.5	1,511.7	176º	-45º	283.46
CGH-06-134		424,545.1	6,391,283.0	1,526.5	359º	-70º	289.56
CGH-07-139	Canadian Gold Hunter	424,317.0	6,391,136.8	1,497.8	357º	-45º	298.70
CGH-07-141		424,791.8	6,391,068.7	1,557.3	354º	-43º	354.60
CGH-07-142		424,108.6	6,391,389.4	1,491.1	355º	-70º	310.90
CGH-07-143		424,750.3	6,391,076.9	1,550.8	357º	-47º	161.54
CGH-07-144		424,178.2	6,391,414.7	1,504.1	355º	-60º	305.67
CGH-07-145		424,709.9	6,391,140.7	1,546.7	353º	-68º	152.40
CGH-07-146		424,266.2	6,391,284.2	1,469.9	359º	-44º	128.02
CGH-07-147		424,752.6	6,391,182.9	1,551.8	358º	-45º	97.54
CGH-07-148		424,159.8	6,391,174.2	1,467.2	359º	-54º	246.89
CGH-07-149		424,601.4	6,391,166.5	1,537.5	357º	-56º	201.17
CGH-07-150		424,176.2	6,391,304.8	1,478.9	355º	-45º	237.74
CGH-07-151		424,601.6	6,391,114.1	1,537.2	352º	-60º	216.41
CGH-07-152		424,176.3	6,391,300.9	1,477.7	177º	-70º	121.92
CGH-07-153		424,600.8	6,391,041.7	1,538.4	355º	-60º	268.22
CGH-07-155		424,312.9	6,391,297.3	1,479.5	357º	-45º	277.37
CGH-07-156		424,708.4	6,391,083.5	1,545.7	000º	-75º	164.59
CGH-07-157		424,261.8	6,391,156.3	1,488.8	000º	-56º	271.27
CGH-07-158		424,790.1	6,391,116.6	1,555.6	358º	-45º	146.30
CGH-07-159		424,010.9	6,391,351.0	1,478.4	356º	-50º	252.98
CGH-07-160		424,365.5	6,391,273.3	1,485.4	000º	-45º	179.83
CGH-07-161		424,010.2	6,391,349.9	1,476.1	353º	-70º	295.66
CGH-07-162		424,360.0	6,391,198.9	1,501.3	000º	-61º	176.78
CGH-07-163		424,010.2	6,391,346.5	1,476.4	176º	-60º	38.78
CGH-07-164		424,359.3	6,391,136.3	1,502.0	000º	-70º	268.22
CGH-07-165		423,905.7	6,391,267.7	1,451.3	355º	-70º	259.08
CGH-07-166		425,579.0	6,391,060.0	1,608.0	000º	-56º	144.00
CGH-07-167		425,528.1	6,391,089.7	1,605.7	359º	-60º	131.06
CGH-07-168		425,528.0	6,391,086.7	1,606.5	179º	-60º	115.82
CGH-07-169		425,480.5	6,391,047.0	1,602.0	359º	-45º	137.16
CGH-07-170		425,429.8	6,391,099.5	1,603.2	359º	-70º	158.50
CGH-07-171		425,430.0	6,391,096.8	1,603.2	176º	-46º	176.60

Table 10.3 continued…. A Summary of the Collar Locations, Drillhole Azimuths, Dips and Lengths of the 168 Historical Drillholes Completed on the Donnelly Deposit, Spectrum-GJ Property

(compiled from information contained in the Company's verified drillhole collar database)

Drillhole	Company	Collar Position			Azimuth	Dip	Length (m)
		Easting	Northing	Elev. (m)			
CGH-07-173	Canadian Gold Hunter	425,379.6	6,391,085.6	1,603.9	356º	-44º	140.21
CGH-07-175		425,381.1	6,390,947.7	1,595.8	000º	-45º	277.37
CGH-07-177		424,489.8	6,391,099.9	1,521.7	354º	-45º	484.63
CGH-07-178		425,328.8	6,391,150.2	1,601.6	000º	-75º	115.82
CGH-07-179		425,329.6	6,391,098.8	1,599.8	000º	-80º	234.70
CGH-07-180		425,329.9	6,391,051.9	1,600.8	180º	-80º	131.06
CGH-07-181		425,281.3	6,391,047.8	1,593.2	359º	-45º	216.41
CGH-07-182		424,487.3	6,391,258.8	1,521.8	354º	-44º	295.66
CGH-07-183		425,235.2	6,391,108.1	1,590.6	352º	-78º	304.80
CGH-07-185		425,233.0	6,391,182.4	1,594.3	356º	-75º	158.50
CGH-07-188		425,233.0	6,391,059.2	1,589.9	181º	-75º	179.83
CGH-07-190		425,143.2	6,391,152.1	1,585.7	178º	-82º	232.25
CGH-07-192		425,148.2	6,391,203.0	1,590.1	357º	-75º	204.22
CGH-07-193		424,602.0	6,391,376.4	1,538.1	179º	-59º	149.35
CGH-07-194		425,150.7	6,391,098.1	1,586.1	178º	-57º	158.50
CGH-07-195		424,487.4	6,391,410.1	1,508.6	359º	-46º	192.02
CGH-07-196		424,764.7	6,391,266.6	1,552.7	000º	-46º	268.22
CGH-07-197		425,109.3	6,391,099.4	1,583.6	358º	-44º	246.89
CGH-07-198		425,059.5	6,391,078.3	1,579.6	356º	-71º	201.17
CGH-07-199		425,059.9	6,391,230.4	1,583.7	358º	-65º	184.40
CGH-07-200		424,369.0	6,390,990.1	1,509.5	358º	-45º	179.83
CGH-07-201		425,064.3	6,391,165.0	1,580.8	358º	-71º	249.94
CGH-07-203		425,151.1	6,391,243.2	1,592.8	358º	-72º	156.97
CGH-07-204		425,187.7	6,391,054.1	1,585.6	000º	-45º	154.53
CGH-07-206		425,232.9	6,391,232.3	1,598.0	003º	-70º	97.54
CGH-07-207		426,623.1	6,392,353.8	1,682.5	179º	-45º	201.17
CGH-07-208		425,059.8	6,391,291.9	1,584.9	355º	-66º	112.78
CGH-07-210		425,011.9	6,391,062.3	1,576.7	358º	-45º	292.61
CGH-07-212		424,961.3	6,391,246.7	1,574.9	173º	-81º	273.10
CGH-07-214		424,870.2	6,391,062.2	1,565.6	355º	-50º	219.46
CGH-07-215		424,961.4	6,391,243.3	1,574.7	359º	-45º	59.81
CGH-07-216		424,870.4	6,391,125.9	1,565.9	356º	-49º	192.02
CGH-07-217		424,959.2	6,391,166.8	1,573.9	179º	-78º	143.26
CGH-07-218		424,959.4	6,391,095.9	1,574.3	184º	-80º	109.73
GJK-11-219	Teck Resources	424,446.1	6,390,794.1	1,516.3	000º	-90º	714.80
GJK-11-226		424,751.9	6,390,696.3	1,549.9	000º	-65º	588.55
GJK-11-228		424,005.0	6,391,180.0	1,460.0	000º	-55º	529.50
GJK-13-238	Teck Resources	423,960.0	6,390,965.0	1,451.0	000º	-80º	758.29
GJK-13-239		424,600.0	6,390,890.0	1,535.0	000º	-70º	570.00

10.1.1 Drillers and Drilling

No information is available concerning drilling contractor employed for Imperial's four hole program in 1973. This does not represent a limitation as regards the Company's database because Imperial's holes were excluded for the reasons described in Sections 11.5 and 12.4.

The 1977 TexasGulf drilling program was carried out by D.W. Coates Enterprises Ltd utilizing a Longyear 38 with BQ diameter coring equipment. Consolidated Silver Ridge Mines' ("Silver Ridge") 1979 drilling program was carried out by D.J. Drilling Company Ltd. of Surrey, B.C., again using BQ diameter equipment. In 1980, Longyear Canada carried out both TexasGulf's and Silver Ridge's programs, the former using BQ diameter equipment and the latter using NQ diameter equipment.

Cominco's 1989 diamond drilling program was completed by Falcon Diamond Drilling Ltd. of Prince George, B.C., utilizing BTW equipment. CGH's 1990, 1991 and 1992 drilling programs were completed by J.T. Thomas Diamond Drilling Ltd. of Smithers, B.C., with a hydraulic JT-600 diamond drill in 1990 (BQTK equipment) and a Longyear

Super 38 drill in 1991 and 1992 (NQ2 equipment). Helicopter support in 1991 was by Northern Mountain Helicopters with a Hughes 500D and Bell 205 helicopter. Helicopter support in 1992 was by Vancouver Island Helicopters with a Hughes 500D.

Ascot's 1990 program, as well as CGH's 2004 program, were carried out by Falcon Drilling Ltd. of Prince George, B.C., using a helicopter portable, Falcon 1000 fly rig to recover BTW size core. CGH's programs in 2005, 2006 and 2007 were carried out by Britton Brothers Diamond Drilling Limited of Smithers, B.C., using two 2500 fly rigs recovering NQ2 (or NQTK) diameter core.

10.1.2 Collar Co-ordinates

Limited information only is available concerning the procedures used to locate individual drillholes during the historical drilling programs on the Central Zone. Maps of drillhole locations are, however, available. Company geologists used this data to locate and verify individual collar positions in the field, the latter using a DGPS device. Collar elevations were checked by Company geologists using the LiDAR™ survey results summarized in Section 9.2 (see also Section 12.2).

No information is available concerning the procedures used to locate individual drillholes during TexasGulf's 1977 and 1980 drilling programs. During Ascot's 1990 program, individual drillhole collars were tied into a picket-line grid using hip-chain and compass. During CGH's 2004 through 2007 drilling programs, individual drillhole collars were surveyed by differential GPS at the end of the program by Steve Soby of Ranex Exploration Ltd. The collars of the holes drilled by Teck in 2011 and 2013 were surveyed following completion of the drilling programs, using a differential GPS unit.

In 2014, as part of a wider data verification process, Company geologists identified a total of 44 historical drillhole collars in the field and individually surveyed them using a GPS instrument. The positions of the 36 drillhole collars that could not be located in the field were estimated by establishing the mean difference between the original and re-surveyed positions of the 44 drillhole collars that could be located in the field and applying this to plan positions of the 36 drillhole collars that could not be located in the field (see also Section 12.3). In each case and where possible, collar elevations were checked by Company geologists using LiDAR™.

10.1.3 Downhole Surveys

A Sperry-Sun single-shot photographic instrument was used for downhole surveying during TexasGulf's 1977 and 1980 drilling programs, which provided azimuths and dips. Casing in holes TG-77-04 (extended in 1980) and TG-80-12 to -15 is reported to have been left in place. Downhole surveys were completed during Silver Ridge's 1979 and 1980 programs and Cominco's 1989 program, but the method or methods used are not reported in the available records. In 1990, CGH utilized acid downhole dip tests and in 1991 a Sperry-Sun single-shot photographic instrument. No mention is made in available records as to whether CGH completed downhole surveys in 1992. Ascot's single 1990 hole was downhole surveyed with a Sperry Sun photographic instrument, which recorded azimuths and dips.

CGH's 2004 downhole surveys were carried out using a Sperry Sun instrument for the first eleven holes; acids tests were used thereafter for dip measurements. During CGH's 2005, 2006 and 2007 programs, downhole surveying was carried out by the drillers using a reflex survey tool at the completion of each hole. Readings were taken every 80 m to 140 m in shorter holes and every 200 m in deeper holes.

Downhole surveys during Teck's 2011 and 2013 programs were carried out during the drilling of each hole and by the drillers, using a Reflexid tool. Readings were usually taken every 50 m.

10.2 The Company's Drilling Programs

Since acquiring the claims blocks that comprise the Project Area, the Company has completed three diamond drilling programs (in 2014 through 2016) to both further outline the Central Zone and to test peripheral targets on the Spectrum claims block, as well as one diamond drilling program on the Donnelly Deposit (in 2016). To the end of 2016, 105 holes had been completed by the Company for 29,427.6 m, including:

- 88 exploration holes (24,635.51 m) in the Central Zone (including the 500 Colour, HC, Porphyry, 33 and Skarn zones) and eight holes in the Donnelly Deposit (2,863.0 m) – see Table 10.4;
- three holes drilled into the 300 Colour zone (S15-066, S15-0068 and S16-093 for 810.0 m), one hole drilled into the Boundary zone (S15-065 for 265.0 m), one hole drilled into West Creek (S16-080 for 240 m) and one hole drilled into South Copper (S16-097 for 307m); and
- three geotechnical holes (S15-71 through -73 for 461.0 m) drilled along a potential adit alignment intended to access underground drilling sites in the Central Zone.

The 300 Colour, Boundary and West Creek zones are separate from the Central Zone and are not considered here. The HQ diameter holes listed on Table 10.4 were drilled primarily as exploration holes, but at a larger diameter to facilitate sampling for metallurgical testing.

Table 10.4 A Summary of the Company's Diamond Drilling Programs on the Central Zone and Donnelly Deposit, Spectrum-GJ Project Area
(compiled from information contained in the April 2016 and May 2016 Technical Reports)

Year	Zone or Deposit	Holes Drilled	Total Length (m)	Core Size
2014	Central	9	1,940.65	NQ
2015	Central	53	15,807.50	NQ
	500 Colour	2	177.50	
	33	3	682.30	
2016	Central	20	5,681.56	HQ/NQ
	Skarn	1	346.00	
Totals – Central Zone		*88*	*24,635.51*	-
2016	Donnelly	8	2,872.00	HQ/NQ
Totals – Donnelly Deposit		*8*	*2,872.00*	-

Figures 10.1 and 10.2 detail the collar positions and drillhole traces of both the historical and Company holes located on the Central Zone (Figure 10.1) and on the Donnelly Deposit (Figure 10.2). In both cases, the collars are colour-coded by drilling year and operator/company. Figures 10.3 and 10.4 are representative cross-sections of the Central Zone; Figures 10.5 and 10.6 are representative cross-sections of the Donnelly Deposit.

Figure 10.1 A Drillhole Collar Location Plan by Program Year for All Diamond Drillholes Located on or Drilled into the Central Zone (1973 to 2016), Spectrum-GJ Project Area
(supplied by the Company)

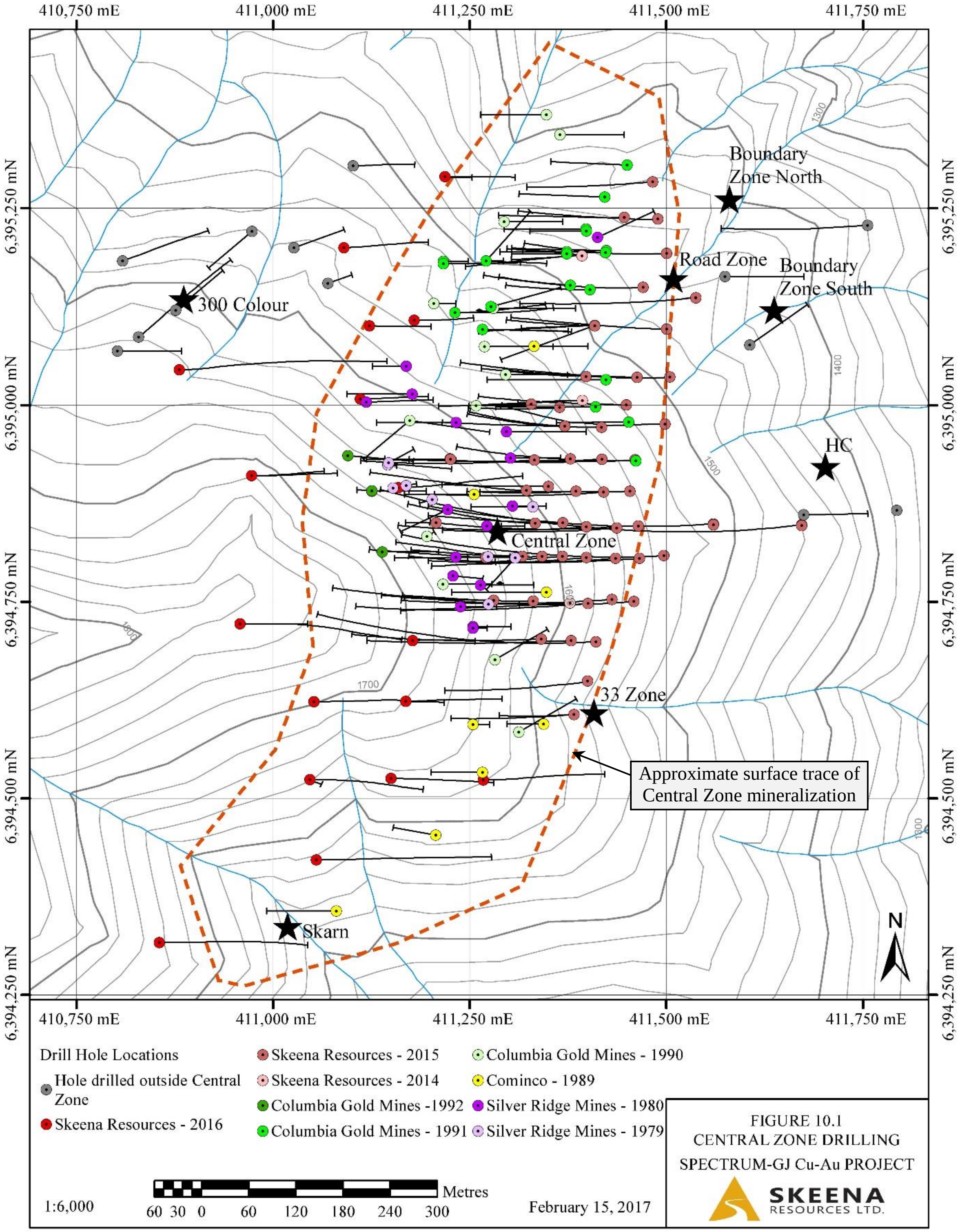


Figure 10.2 A Drillhole Collar Location Plan by Program Year for All Diamond Drillholes Located on or Drilled into the Donnelly Deposit (1977 to 2016), Spectrum-GJ Project Area
(supplied by the Company)

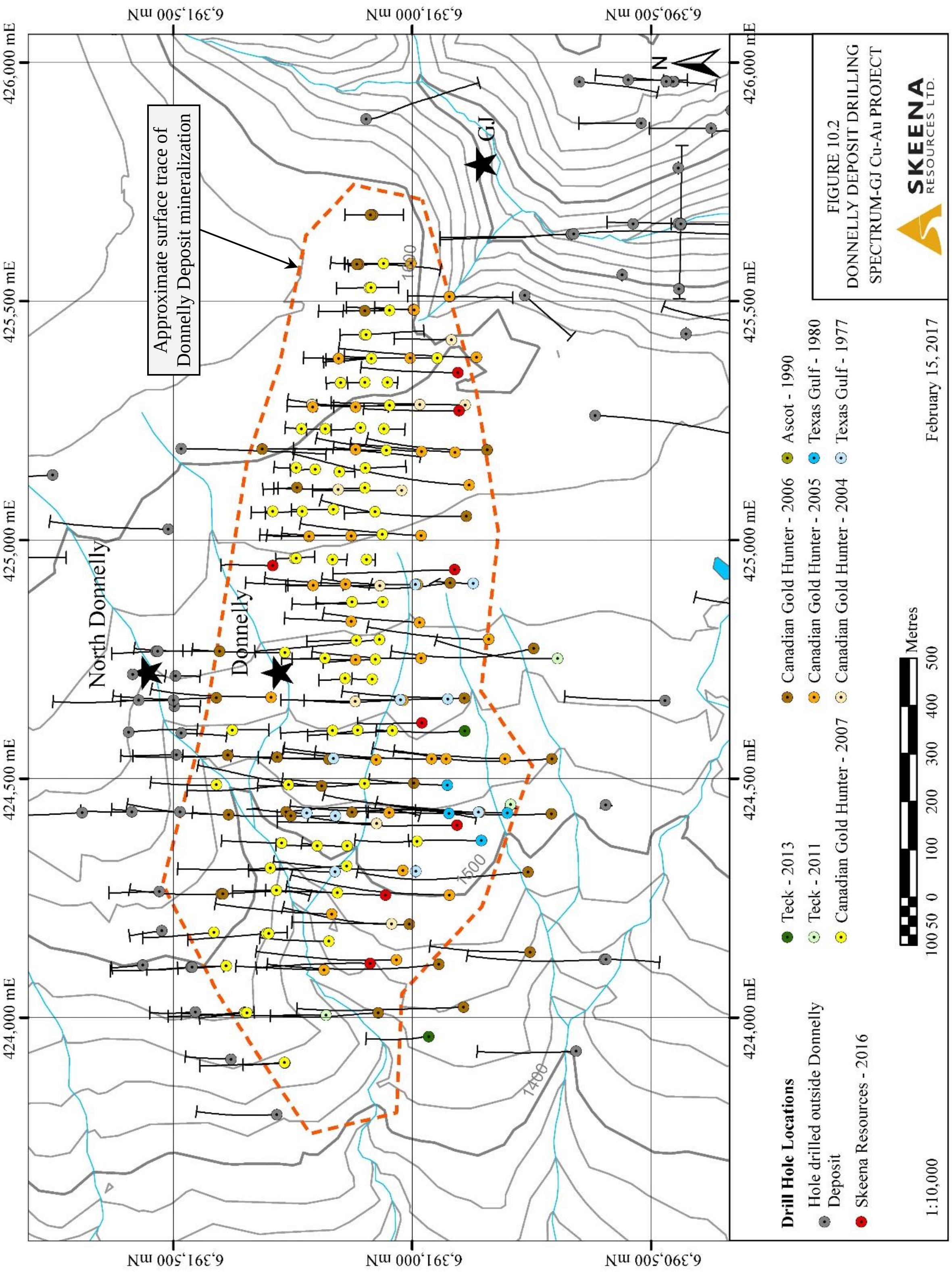


Figure 10.3 A Representative Section through the Central Zone (Section 4525N, looking north), Spectrum Claims Block, Spectrum-GJ Project Area
(supplied by the Company)

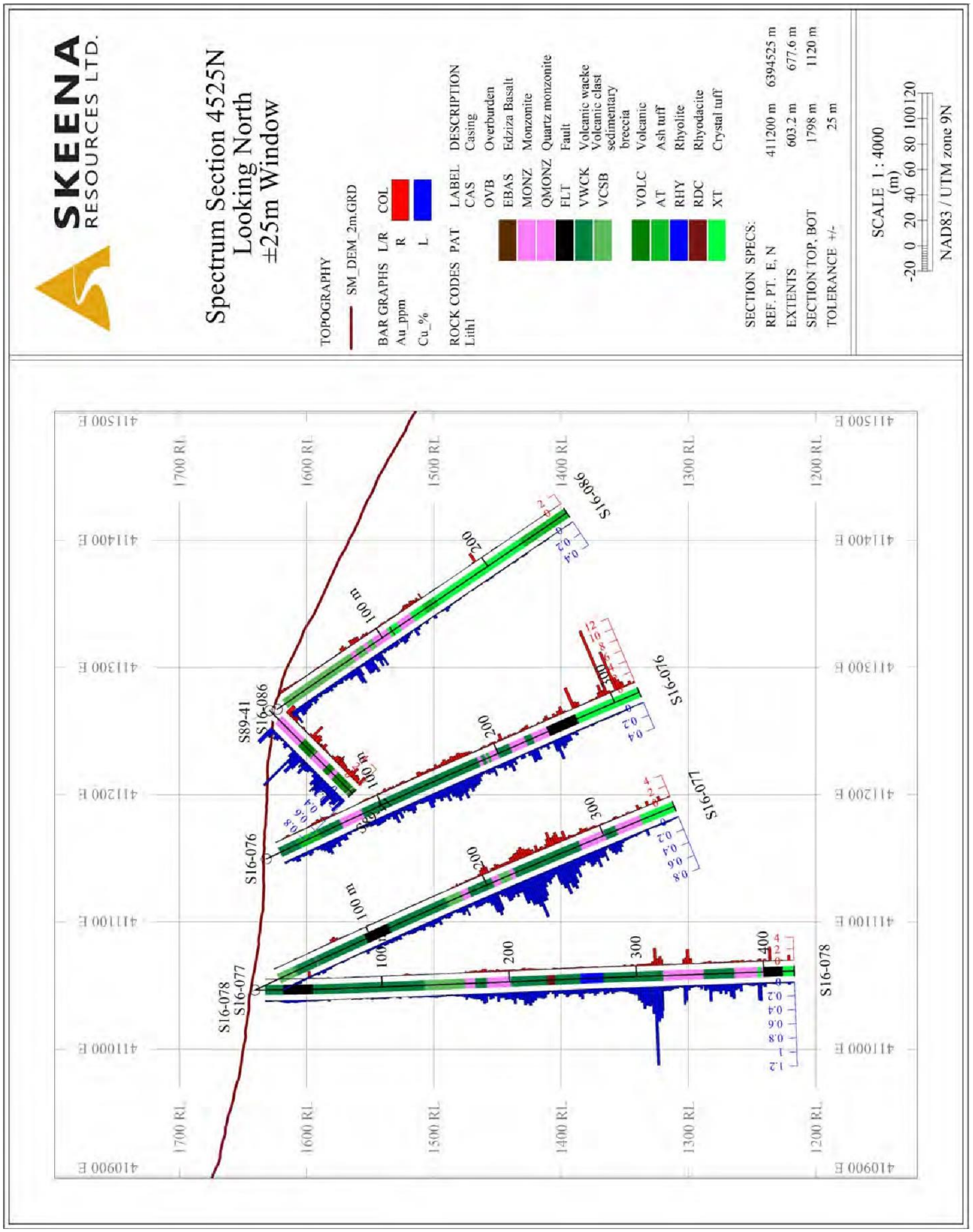


Figure 10.4 A Representative Section through the Central Zone (Section 4700N, looking north), Spectrum Claims Block, Spectrum-GJ Project Area
(supplied by the Company)

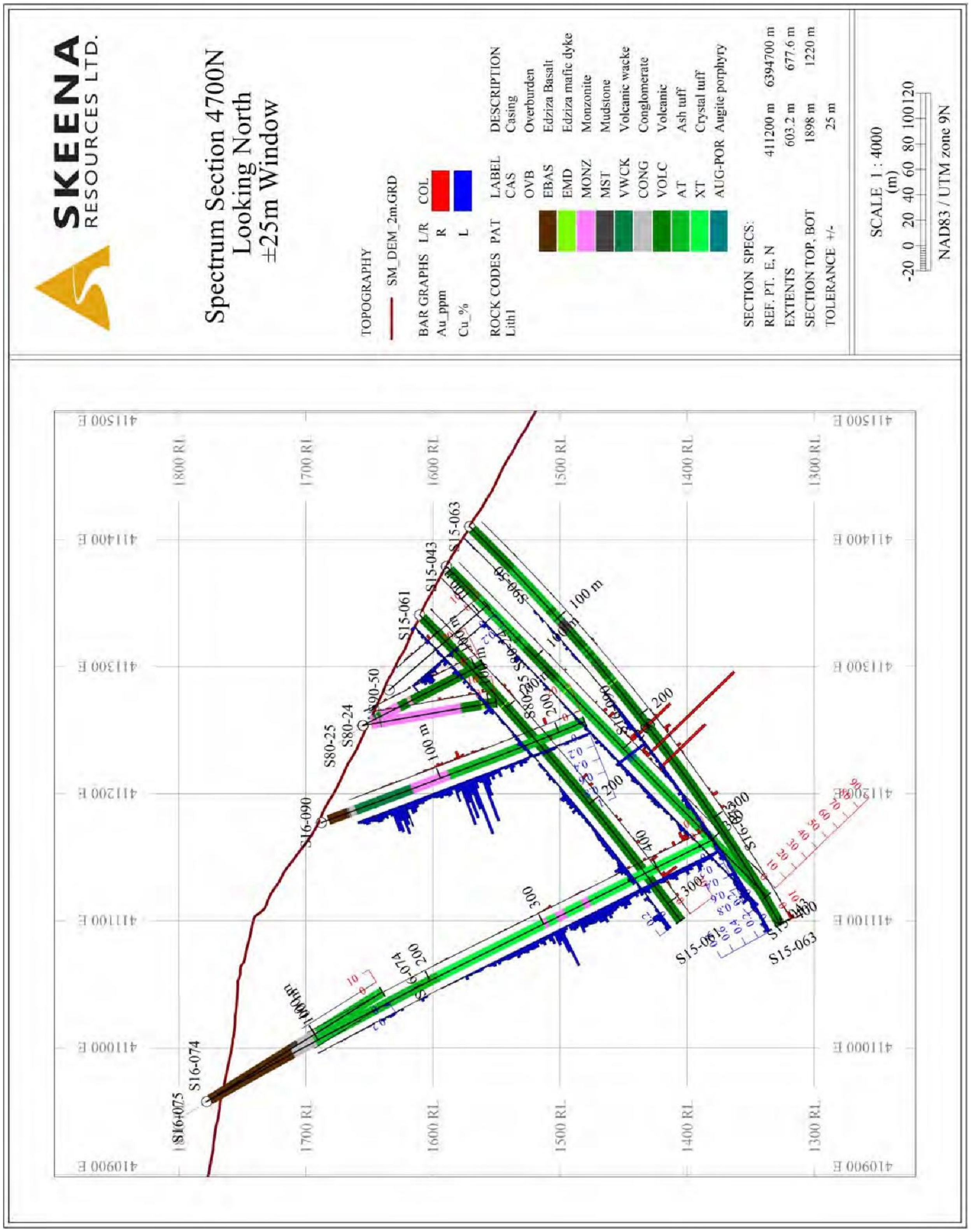


Figure 10.5 A Representative Section through the Donnelly Deposit (Section 4950E, looking west), GJ Claims Block, Spectrum-GJ Project Area
(supplied by the Company)

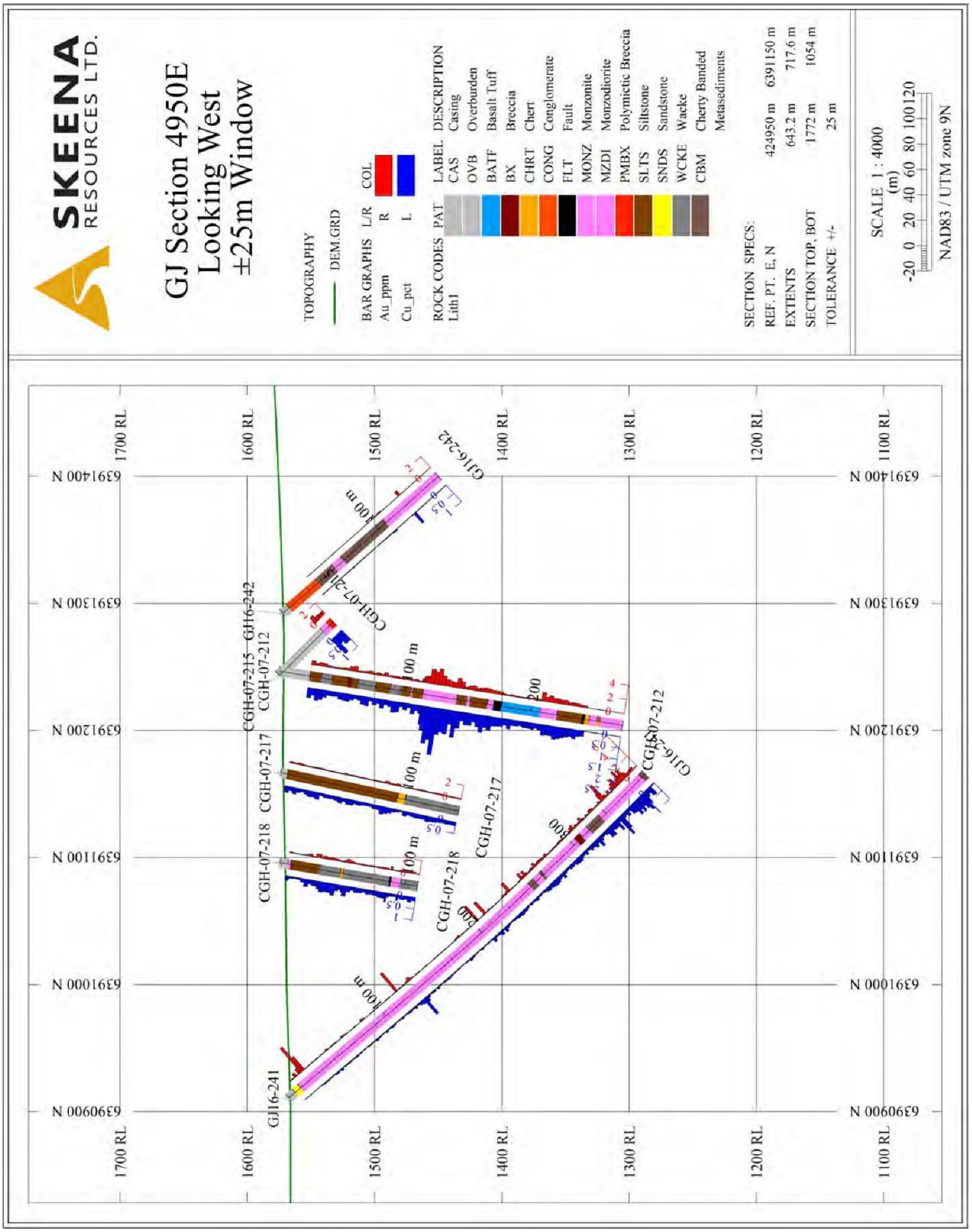
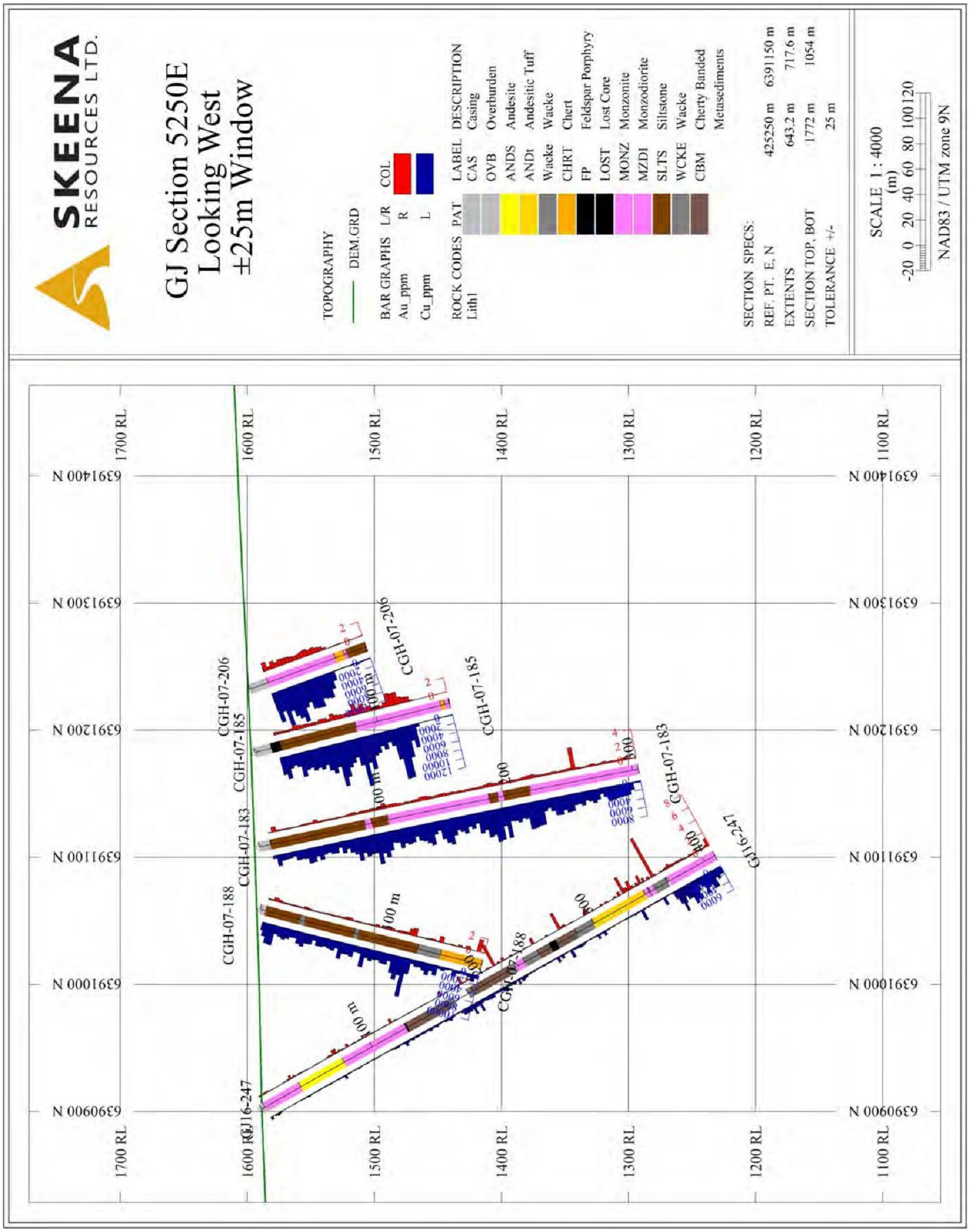


Figure 10.6 A Representative Section through the Donnelly Deposit (Section 5250E, looking west), GJ Claims Block, Spectrum-GJ Project Area
(supplied by the Company)



10.3 The Company's 2014 Drilling Program

In October 2014, the Company completed 1,940.65 m of NQ diameter diamond drilling in nine drillholes from four different drilling platforms (Table 10.5). Drilling was carried out by Black Hawk Drilling Ltd. of Smithers, B.C. Drillhole collars were located in the field by hand-held GPS and surveyed at the end of the drilling program using DGPS. Drillhole orientation surveys were taken approximately every 60 m to 100 m downhole using a Reflex orientation tool.

Drillcore was logged and sampled at core logging facilities located at the Iskut Motor Inn, approximately 30 km from the project site. Logging included observations of lithology, alteration, veining, mineralization and structure; geotechnical logging included core recovery and estimates of Rock Quality Designation ("RQD"). Drill moves and daily drill support was provided by Fireweed Helicopters of Whitehorse, Yukon. The drillcore is currently located at the Company's Mountain Exploration Camp storage facility.

Table 10.5 A Summary of the Collar Locations, Drillhole Azimuths, Dips and Lengths of the Nine Drillholes Completed by the Company in 2014 on the Central Zone, Spectrum-GJ Project Area
(compiled from information contained in the Company's verified drillhole datase)

Drillhole	Section	Zone	Collar Position			Azimuth	Dip	Length (m)
			Easting	Northing	Elev. (m)			
14-SP-001	5195 N	Central	411,392.5	6,395,189.9	1,481.3	270.0º	-45º	205.10
14-SP-002	5195 N	Central	411,392.5	6,395,189.9	1,481.3	270.0º	-65º	210.30
14-SP-003	5195 N	Central	411,392.5	6,395,189.9	1,481.3	280.0º	-50º	153.00
14-SP-004	5095 N	Central	411,408.9	6,395,101.5	1,498.2	270.0º	-45º	213.40
14-SP-005	5095 N	Central	411,408.9	6,395,101.5	1,498.2	270.0º	-65º	225.25
14-SP-006	5095 N	Central	411,408.9	6,395,101.5	1,498.2	250.0º	-50º	201.17
14-SP-007	5010 N	Central	411,393.2	6,395,006.1	1,529.4	270.0º	-45º	207.26
14-SP-008	5010 N	Central	411,393.2	6,395,006.1	1,529.4	270.0º	-67º	199.03
14-SP-009	4750 N	Central	411,377.3	6,395,748.2	1,596.3	270.0º	-45º	326.14

10.3.1 Purpose

The Company's 2014 drilling program focused exclusively on the Central Zone, with the purposes of confirming historical drilling results, in-filling gaps in historical drilling and to test for deeper extensions of high-grade gold zones.

10.3.2 Mineralized Intersections

Analysis of the derived data and outcomes shows that the Company's objectives for the 2014 drilling program were achieved, not least because all of the drilled holes intersected high-grade gold mineralization that exceeded 5.0 g/t Au over widths of at least 2.0 m (see Table 10.6, which was compiled from information contained in the May 2016 Technical Report, cross-referenced to the Company's news releases dated December 11, 2014 and January 14, 2015). All of the Company's 2014 drillholes also intersected broad intervals of lower-grade porphyry style copper-gold mineralization, many of which were locally crosscut by higher-grade structures (see Table 10.7, which was compiled from the same data sources as Table 10.6). The 2014 assay results summarized on Tables 10.6 and 10.7 are uncut. True widths were estimated to be 50% to 75% of the downhole intersection interval.

Table 10.6 A Summary of the High-Grade Gold Intersections in the Nine Drillholes Completed by the Company in 2014 on the Central Zone, Spectrum-GJ Project Area
(compiled from information contained in the May 2016 Technical Report, cross-referenced to Company news releases)

Drillhole	Azimuth	Dip	Length (m)	From (m)	To (m)	Interval (m)	Au (g/t)	Ag (g/t)	Cu (%)
14-SP-001	270º	-45º	205.10	43.00	51.00	8.00	2.45	-	-
				63.00	71.00	8.00	1.45	-	-
				65.00	66.00	1.00	3.64	-	-
				111.00	113.00	2.00	4.76	-	-
				118.60	120.70	2.10	1.50	-	-
				136.00	138.00	2.00	3.30	-	0.11
14-SP-002	270º	-65º	210.30	66.00	68.00	2.00	2.05	-	-
				94.00	99.00	5.00	2.24	10.2	-
				147.00	149.00	2.00	2.31	8.0	-
				154.00	156.00	2.00	7.80	-	0.10
				173.90	174.80	0.90	3.78	-	-
14-SP-003	280º	-50º	153.00	78.00	84.50	6.50	23.84	6.0	-
				incl. 79.50	83.00	3.50	40.43	11.0	-
				94.00	100.00	6.00	2.00	-	-
14-SP-004	270º	-45º	213.40	106.00	133.00	27.00	10.63	-	-
				incl. 111.40	113.40	2.00	66.00	12.0	-
				incl. 119.00	121.00	2.00	20.40	-	-
				incl. 121.00	123.00	2.00	9.20	-	-
				incl. 126.00	127.00	2.00	8.00	-	-
				incl. 131.00	133.00	2.00	22.70	-	-
				151.00	153.00	2.00	4.51	-	-
				161.80	169.70	7.90	2.86	-	-
14-SP-005	270º	-65º	225.25	80.00	82.00	2.00	18.60	-	-
				90.00	96.00	6.00	2.48	-	-
				144.00	146.00	2.00	7.32	-	-
				162.00	164.00	2.00	6.88	-	-
14-SP-006	250º	-50º	201.17	123.00	125.20	2.20	2.83	-	-
				139.00	141.00	2.00	1.19	-	-
				177.00	179.00	2.00	1.04	-	0.11
				195.00	197.00	2.00	43.80	-	-
14-SP-007	270º	-45º	207.26	22.00	24.00	2.00	2.31	-	-
				36.00	38.00	2.00	1.40	-	-
				54.00	56.00	2.00	1.04	-	-
				58.00	62.00	4.00	1.49	-	-
				88.00	90.00	2.00	1.49	-	-
				103.00	105.00	2.00	3.22	-	-
				113.00	117.00	4.00	5.26	-	-
				incl. 113.00	115.00	2.00	9.50	5.0	-
				136.00	140.00	4.00	1.44	-	-
				or 103.00	140.00	37.00	1.38	-	-
				158.00	160.00	2.00	1.65	-	-
				195.00	198.00	3.00	3.82	5.3	-
				incl. 196.00	197.00	1.00	7.60	10.0	-
14-SP-008	270º	-67º	199.03	11.00	13.00	2.00	1.18	9.0	-
				17.00	19.00	2.00	1.24	-	-
				65.00	69.00	4.00	1.40	-	-
				119.00	123.00	4.00	2.32	-	-
				incl. 119.00	121.00	2.00	3.30	-	-
				155.00	157.00	2.00	1.53	-	-
				159.00	161.00	2.00	2.22	-	-
				173.00	190.00	17.00	3.41	-	-
				incl. 175.00	184.00	9.00	4.58	-	-
				incl. 175.00	177.00	2.00	8.50	-	-
				and 182.00	184.00	2.00	8.42	-	-
				and 186.00	190.00	4.00	3.05	-	-
14-SP-009	270º	-52º	278.00	151.00	153.00	2.00	1.68	-	-
				157.00	159.00	2.00	1.07	-	-
				173.00	177.00	4.00	13.67	-	-
				incl. 173.00	175.00	2.00	5.24	-	-
				and 175.00	177.00	2.00	22.10	5.0	-
				181.00	183.00	2.00	1.79	8.0	-
				255.00	257.00	2.00	10.00	-	-
				259.00	260.00	1.00	11.10	6.0	0.18
				285.00	287.00	2.00	254.50	18.0	-
				295.00	301.00	6.00	3.12	7.0	-

Table 10.7 A Summary of the Lower-Grade, Porphyry Style Copper-Gold Intersections in the Nine Drillholes Completed by the Company in 2014 on the Central Zone, Spectrum-GJ Project Area
(compiled from information contained in the May 2016 Technical Report, cross-referenced to Company news releases)

Drillhole	Azimuth	Dip	Length (m)	From (m)	To (m)	Interval (m)	Au (g/t)		Cu (%)
							(top cut to 10 g/t Au)	Average	
14-SP-001	270º	-45º	205.10	95.0	138.0	43.0	0.87	0.87	0.08
14-SP-002	270º	-65º	210.30	79.4 and 147.0	102.0 174.8	22.6 27.8	0.82 0.99	0.82 0.99	0.06 0.07
14-SP-003	280º	-50º	153.00	14.0 and 76.0	63.5 143.0	49.5 67.0	0.26 1.14	0.26 2.73	0.07 0.08
14-SP-004	270º	-45º	213.40	81.0	169.7	88.7	2.16	3.94	0.05
14-SP-005	270º	-65º	225.25	80.0	187.0	107.0	0.90	1.06	0.05
14-SP-006	250º	-50º	201.17	111.0	199.0	88.0	0.58	1.34	0.06
14-SP-007	270º	-45º	207.26	11.8	140.0	128.2	0.77	0.77	0.05
14-SP-008	270º	-67º	199.03	119.0	190.0	71.0	1.18	1.18	0.06
14-SP-009	270º	-52º	278.00	149.0	301.0	152.0	0.91	4.29	0.05

10.3.3 Interpretation

Drilling to the end of October 2014 showed that the Central Zone comprises a broad, low-grade porphyry-style shell of Cu-Au mineralization, crosscut by fault-, fracture- and veinlet zones that typically carry higher gold grades. The mineralization model compiled as a result of the Company's 2014 drilling program formed the basis for its 2015 program, a key objective of which was to examine more closely the distribution and characteristics of the high-grade gold mineralization.

10.4 The Company's 2015 Drilling Program

From July through October 2015, the Company completed an additional 61 diamond drillholes from 58 different drilling platforms for a total of 19,269.95 m, not including three geotechnical holes totaling 461.0 m. Fifty eight of the holes were drilled into the Central Zone (16,667.30 m), one hole was drilled into the Boundary zone (265.0 m) and two holes were drilled into the 300 Colour zone (424.0 m). The drilling was carried out by Omineca Diamond Drilling Ltd. of Burns Lake B.C. utilizing two Multi Power Discovery 2 hydraulic fly rigs. Drillhole collars were located in the field by hand-held GPS with collar elevations cross-checked to the results of the 2015 LiDAR™ survey. Orientation surveys were taken approximately every 60 m downhole utilizing a Reflex orientation tool.

Drillcore was logged and sampled at core logging facilities at the Company's Mountain Exploration Camp. Logging included observations of lithology, alteration, veining, mineralization and structure; geotechnical logging included core recovery and RQD estimates. Specific gravity ("SG") and magnetic susceptibility measurements were also routinely taken. Drill rig moves and daily drilling support was provided by Mustang Helicopters out of Stewart B.C. and Heli-Inter Inc. from Quebec, utilizing a Eurocopter AS350 B2 helicopter. Most of the 2015 drillcore is stored at the Company's Mountain camp - several representative drillhole intersections were moved at the Company's Valley Exploration Camp that was constructed in 2016. Table 10.8 summarizes the collar locations, azimuths, inclinations and lengths of the 58 exploration holes drilled on the Central Zone during the Company's 2015 drilling program.

Table 10.8 A Summary of the Collar Locations, Drillhole Azimuths, Dips and Lengths of the 58 Drillholes Completed by the Company in 2015 on the Central Zone, Spectrum-GJ Project Area

(compiled from information contained in the Company's verified drillhole database)

Drillhole	Section	Zone	Collar Position			Azimuth	Dip	Length (m)
			Easting	Northing	Elev. (m)			
S15-010	4750 N	Central	411,330.63	6,394,750.57	1,623.45	270.0º	-52º	278.0
S15-011	4810 N	Central	411,317.17	6,394,807.87	1,622.07	270.0º	-45º	223.5
S15-012	4810 N	Central	411,317.17	6,394,807.87	1,622.07	270.0º	-55º	251.0
S15-013	4750 N	Central	411,280.24	6,394,751.75	1,648.14	270.0º	-45º	200.0
S15-014	4750 N	Central	411,280.24	6,394,751.75	1,648.14	270.0º	-58º	217.5
S15-015	4850 N	Central	411,368.38	6,394,850.19	1,586.49	270.0º	-50º	259.0
S15-016	4810 N	Central	411,270.23	6,394,806.26	1,645.34	270.0º	-48º	179.0
S15-017	5100 N	Central	411,409.05	6,395,100.73	1,498.28	270.0º	-55º	193.0
S15-018	5035 N	Central	411,462.60	6,395,035.44	1,500.13	270.0º	-45º	302.0
S15-019	4890 N	Central	411,349.92	6,394,896.76	1,584.66	270.0º	-50º	215.0
S15-020	5095 N	Central	411,500.26	6,395,096.72	1,477.90	270.0º	-45º	258.0
S15-021	4850 N	500 Colour	411,207.40	6,394,850.26	1,654.19	270.0º	-50º	60.5
S15-022	4975 N	Central	411,417.33	6,394,971.91	1,528.26	270.0º	-50º	254.0
S15-023	4975 N	Central	411,370.79	6,394,973.31	1,550.74	270.0º	-45º	223.0
S15-024	4975 N	Central	411,370.79	6,394,973.31	1,550.74	270.0º	-60º	244.0
S15-025	5035 N	Central	411,397.62	6,395,236.66	1,517.20	270.0º	-45º	181.0
S15-026	5150 N	Central	411,470.21	6,394,931.83	1,475.23	266.0º	-48º	260.0
S15-027	5195 N	Central	411,500.47	6,395,283.96	1,463.28	266.0º	-48º	262.0
S15-028	4850 N	Central	411,333.40	6,394,997.00	1,605.59	270.0º	-50º	254.0
S15-029	5235 N	Central	411,446.53	6,395,001.19	1,457.51	266.0º	-45º	219.0
S15-030	5000 N	Central	411,449.05	6,395,035.64	1,511.61	270.0º	-45º	265.0
S15-031	4890 N	Central	411,322.19	6,394,890.54	1,599.51	270.0º	-45º	283.0
S15-032	4975 N	Central	411,498.54	6,394,807.74	1,505.09	270.0º	-45º	294.6
S15-033	4930 N	500 Colour	411,225.13	6,394,700.42	1,612.18	270.0º	-45º	117.0
S15-034	4930 N	Central	411,225.71	6,394,930.29	1,612.19	270.0º	-57º	196.0
S15-035	5235 N	Central	411,489.09	6,394,747.73	1,456.02	265.0º	-45º	242.5
S15-036	4930 N	Central	411,378.15	6,394,931.32	1,560.50	265.0º	-45º	209.0
S15-037	5285 N	Central	411,482.75	6,395,136.49	1,441.43	265.0º	-45º	220.0
S15-038	5285 N	Central	411,364.28	6,394,807.91	1,543.70	265.0º	-45º	163.5
S15-039	5000 N	Central	411,327.92	6,394,805.95	1,554.69	270.0º	-45º	166.0
S15-040	5035 N	Central	411,504.24	6,395,035.64	1,493.51	265.0º	-45º	299.0
S15-041	4890 N	Central	411,385.23	6,394,890.54	1,569.04	265.0º	-50º	214.0
S15-042	4810 N	Central	411,341.64	6,394,807.74	1,608.54	265.0º	-55º	388.0
S15-043	4690 N	Central	411,379.02	6,394,700.42	1,589.25	265.0º	-45º	362.0
S15-044	4930 N	Central	411,332.30	6,394,930.29	1,580.83	265.0º	-45º	319.0
S15-045	4750 N	Central	411,400.22	6,394,747.73	1,582.18	265.0º	-45º	416.0
S15-046	4930 N	Central	411,418.10	6,394,931.32	1,539.70	265.0º	-45º	266.0
S15-047	5140 N	Central	411,537.66	6,395,136.49	1,466.29	265.0º	-45º	320.0
S15-048	4810 N	Central	411,367.83	6,394,807.91	1,594.68	265.0º	-55º	149.4
S15-049	4810 N	Central	411,398.23	6,394,805.95	1,580.86	265.0º	-45º	272.0
S15-050	4890 N	Central	411,419.95	6,394,889.43	1,555.68	265.0º	-50º	338.0
S15-051	4850 N	Central	411,398.23	6,394,845.07	1,574.30	265.0º	-50º	385.0
S15-052	4810 N	Central	411,435.32	6,394,805.03	1,563.38	265.0º	-46º	365.0
S15-053	4890 N	Central	411,453.72	6,394,890.44	1,539.72	265.0º	-50º	341.0
S15-054	4650 N	33 Zone	411,399.94	6,394,649.21	1,561.99	252.0º	-45º	256.0
S15-055	4750 N	Central	411,430.82	6,394,752.78	1,564.88	265.0º	-45º	381.3
S15-056	4850 N	Central	411,436.79	6,394,843.81	1,555.94	265.0º	-50º	365.0
S15-057	4810 N	Central	411,465.94	6,394,804.93	1,546.68	265.0º	-46º	395.0
S15-058	4600 N	33 Zone	411,382.44	6,394,606.68	1,573.77	265.0º	-45º	212.0
S15-059	4600 N	33 Zone	411,382.44	6,394,606.68	1,573.77	265.0º	-65º	214.3
S15-060	4930 N	Central	411,460.15	6,394,930.44	1,522.54	265.0º	-45º	422.0
S15-061	4690 N	Central	411,340.89	6,394,702.70	1,610.34	265.0º	-45º	317.0
S15-062	4850 N	Central	411,671.90	6,394,847.71	1,454.66	263.0º	-45º	740.0
S15-063	4690 N	Central	411,410.39	6,394,699.18	1,570.98	265.0º	-45º	447.2
S15-064	4750 N	Central	411,458.83	6,394,750.21	1,548.94	265.0º	-45º	473.0
S15-067	4850 N	Central	411,464.50	6,394,846.50	1,541.51	270.0º	-50º	404.0
S15-069	4810 N	Central	411,560.01	6,394,848.72	1,512.01	270.0º	-45º	467.0
S15-070	4850 N	Central	411,496.93	6,394,808.69	1,529.41	265.0º	-45º	449.0

10.4.1 Purpose

The purpose of the Company's 2015 drilling program was to test Central Zone mineralization in sufficient detail to enable a resource estimate to be compiled. Drilling was targeted at further in-filling gaps in the historical drilling and to expand the resource area along strike and down dip. High-grade gold mineralization was in particular targeted, with pierce points on nominal 50 m centres, both horizontally and vertically. By the end of October 2015, the Company had drilled-off an area extending 650 m north-south and 360 m east-west, to a depth of 400 m below surface and in 2016 an updated Mineral Resource estimate was released (see the May 2016 Technical Report and Section 14.1).

10.4.2 Mineralized Intersections

Analysis of the derived data and outcomes showed that the Company's objectives for the 2015 drilling program were achieved, not least because approximately 65% of the drilled holes intersected high-grade gold mineralization that exceeded 5.0 g/t Au over widths of at least 2.0 m (see Table 10.9 that is in five parts due to its overall length – it was compiled from information contained in the May 2016 Technical Report, cross-referenced to the Company's news releases dated August 20, 2015, September 08, 2015, October 08, 2015, October 26, 2015 and November 19, 2015). Only ten of the drilled holes did not intersect any significant values, two of which because they were abandoned before intersecting the mineralized zone.

All but eleven of the Company's 2015 drillholes on the Central Zone also intersected broad intervals of lower-grade porphyry style copper-gold mineralization, many of which were locally crosscut by higher-grade structures. Of the eleven, two intersected high-grade gold mineralization only and one was abandoned before intersecting the mineralized zone (see Table 10.10 that is in two parts due to its overall length – it was compiled from the same data sources as Table 10.9).

Table 10.9 A Summary of the High-Grade Gold Intersections in the 58 Drillholes Completed by the Company in 2015 on the Central Zone, Spectrum-GJ Project Area
(compiled from information contained in the May 2016 Technical Report, cross-referenced to Company news releases)

Drillhole	Azimuth	Dip	Length (m)	From (m)	To (m)	Interval (m)	Au (g/t)	Ag (g/t)	Cu (%)
S15-010	270º	-52º	278.00	3.40	7.00	3.60	16.40	-	-
				incl. 5.00	7.00	2.00	22.10	-	-
				94.30	96.00	1.70	4.19	-	-
				145.00	147.00	2.00	2.92	-	0.11
				199.00	200.40	1.40	15.90	-	-
S15-011	270º	-45º	223.50	6.00	12.00	6.00	7.86	-	-
				20.00	21.60	1.60	8.56	-	-
				48.00	84.00	36.00	1.04	3.0	0.10
				incl. 50.00	55.00	5.00	2.00	-	-
				and 62.00	64.00	2.00	3.28	-	0.11
				and 71.00	72.35	1.35	2.40	13.6	0.62
				110.00	117.38	7.38	1.79	5.6	0.13
				130.00	142.00	12.00	3.62	5.2	0.16
				incl. 140.00	142.00	2.00	9.50	9.0	0.24
S15-012	270º	-55º	251.00	35.00	73.00	38.00	1.28	-	-
				102.00	108.60	6.60	10.59	3.1	0.19
				incl. 105.50	106.90	1.40	37.80	-	-
				140.00	146.00	6.00	2.07	15.0	-
				197.60	216.00	18.40	6.40	8.8	-
				incl. 197.60	201.50	3.90	25.27	59.5	0.33
				incl. 199.60	201.50	1.90	49.80	118.0	0.63
				212.00	216.00	4.00	2.86	8.8	-
				234.00	238.00	4.00	7.08	17.5	0.12

Table 10.9 continued…. A Summary of the High-Grade Gold Intersections in the 58 Drillholes Completed by the Company in 2015 on the Central Zone, Spectrum-GJ Project Area (compiled from information contained in the May 2016 Technical Report, cross-referenced to Company news releases)

Drillhole	Azimuth	Dip	Length (m)	From (m)	To (m)	Interval (m)	Au (g/t)	Ag (g/t)	Cu (%)
S15-013	270º	-45º	200.00	3.00	130.00	127.00	1.26	5.2	0.15
				incl. 20.00	33.00	13.00	3.38	7.7	0.24
				and 27.20	29.40	2.20	9.60	11.5	0.36
				and 31.00	33.00	2.00	4.50	13.8	0.31
				and 48.00	50.00	2.00	2.22	-	-
				and 78.00	80.00	2.00	2.27	5.9	0.16
				and 108.00	110.00	2.00	2.90	-	0.11
				and 120.00	130.00	10.00	2.30	5.3	0.14
S15-014	270º	-58º	217.50	3.00	7.00	4.00	3.18	-	-
				19.00	21.00	2.00	2.43	-	-
				30.00	35.00	5.00	2.25	-	0.22
				51.00	55.00	4.00	1.60	-	0.24
				77.00	93.95	16.95	4.95	20.5	0.70
				incl. 83.00	90.00	7.00	7.95	35.5	0.93
				153.00	155.00	2.00	21.30	6.3	-
				171.00	172.75	1.75	11.70	-	-
				208.00	210.00	2.00	2.81	7.2	0.11
S15-015	270º	-50º	259.00	28.00	30.00	2.00	2.94	-	-
				38.00	40.00	2.00	2.88	-	-
				163.85	190.00	26.15	8.21	-	-
				incl. 163.85	173.00	9.15	4.73	-	-
				and 163.85	166.00	2.15	8.83	-	-
				and 167.50	169.00	1.50	6.13	-	-
				and 171.00	173.00	2.00	5.87	-	-
				and 180.50	184.00	3.50	44.2	7.5	-
				incl. 182.00	184.00	2.00	74.5	8.5	-
S15-016	270º	-48º	179.00	34.00	95.00	61.00	1.62	-	0.14
				incl. 34.00	36.00	2.00	2.38	-	-
				and 48.00	52.00	4.00	5.63	9.6	0.22
				incl. 48.00	50.00	2.00	9.18	11.0	0.22
				and 65.00	71.00	6.00	1.99	-	0.12
				and 87.00	89.00	2.00	2.47	-	0.11
				and 93.00	95.00	2.00	2.14	5.5	0.14
S15-017	270º	-55º	193.00	103.15	104.00	0.85	9.79	430.0	-
				128.00	136.00	8.00	10.46	8.3	-
				incl. 128.00	130.30	2.30	33.33	26.7	0.13
				157.40	161.00	3.60	11.68	-	-
				180.00	182.75	2.75	2.79	5.4	0.10
S15-018	270º	-45º	302.00	139.00	141.30	2.30	11.1	-	-
				183.00	185.00	2.00	6.13	-	0.10
				221.00	227.00	6.00	5.44	23.4	-
				incl. 225.00	227.00	2.00	13.2	63.8	-
				251.00	253.00	2.00	2.37	-	-
S15-019	270º	-50º	215.00	19.00	31.00	12.00	1.55	-	-
				incl. 19.00	21.00	2.00	2.43	-	-
				and 27.00	31.00	4.00	3.06	-	-
				96.00	117.00	21.00	0.90	-	0.10
				159.00	172.50	13.50	2.78	-	-
				incl. 163.00	165.00	2.00	6.97	-	-
S15-020	270º	-45º	258.00	236.00	238.00	2.00	2.51	-	-
S15-021	270º	-50º	60.50	Hole abandoned in fault – no significant values					
S15-022	270º	-50º	254.00	150.00	152.00	2.00	7.86	-	-
				168.00	170.00	2.00	13.50	-	-
				174.10	189.00	14.90	8.97	-	-
				incl. 174.10	177.00	2.90	38.51	5.4	-
				incl. 174.10	175.62	1.52	34.70	-	-
				and 175.62	177.00	1.38	42.70	8.1	-
S15-023	270º	-45º	225.00	60.00	85.90	25.90	0.77	-	0.11
				incl. 80.00	82.00	2.00	4.58	-	0.12
				165.00	167.00	2.00	2.43	-	0.10
				193.00	196.60	3.60	5.61	10.3	-
				incl. 193.00	194.60	1.60	9.17	13.5	-
				208.00	210.00	2.00	2.11	8.5	-

Table 10.9 continued…. A Summary of the High-Grade Gold Intersections in the 58 Drillholes Completed by the Company in 2015 on the Central Zone, Spectrum-GJ Project Area (compiled from information contained in the May 2016 Technical Report, cross-referenced to Company news releases)

Drillhole	Azimuth	Dip	Length (m)	From (m)	To (m)	Interval (m)	Au (g/t)	Ag (g/t)	Cu (%)
S15-024	270º	-60º	244.00	32.00	34.00	2.00	2.93	-	-
				76.00	80.00	4.00	3.59	-	-
				136.25	137.16	0.91	6.41	24.0	-
				170.20	172.20	2.00	3.14	5.1	-
				183.00	192.64	9.64	6.81	20.7	0.09
				incl. 187.00	188.70	1.70	14.10	20.4	0.14
S15-025	270º	-45º	181.00	11.00	13.00	2.00	3.14	-	-
				41.00	49.00	8.00	4.14	-	-
				incl. 41.00	42.15	1.15	17.20	9.8	015
				111.00	134.00	23.00	1.43	-	-
				incl. 111.00	113.00	2.00	2.76	-	-
				and 128.00	130.00	2.00	5.31	-	-
S15-026	270º	-45º	260.00	8.00	10.00	2.00	4.77	12.2	-
				122.50	124.50	2.00	2.24	-	-
				148.70	152.70	4.00	3.12	-	-
				182.50	190.50	8.00	5.67	-	0.15
				incl. 182.50	184.50	2.00	8.90	8.0	0.27
				and 188.50	190.50	2.00	10.10	-	0.14
S15-027	266º	-48º	266.00	194.00	196.00	2.00	2.51	-	-
S15-028	270º	-50º	254.00	5.00	49.00	44.00	1.12	-	-
				incl. 11.00	13.00	2.00	2.54	-	-
				and 35.00	36.50	1.50	12.20	-	-
				166.00	167.00	1.00	8.79	-	-
				198.00	204.00	6.00	5.55	5.4	-
S15-029	266º	-45º	219.00	147.40	149.00	1.60	4.11	-	0.11
				205.00	207.00	2.00	7.35	59.1	-
S15-030	270º	-45º	265.00	214.50	215.50	1.00	5.87	25.2	-
				247.00	249.00	2.00	2.13	-	-
S15-031	270º	-45º	283.00	5.50	230.00	224.50	0.60	5.1	0.22
				incl. 29.00	31.00	2.00	2.56	-	0.13
				and 93.00	97.00	4.00	2.71	5.8	0.21
				and 109.00	111.00	2.00	2.83	-	0.13
				and 135.00	136.00	1.00	8.29	6.7	0.11
				and 193.00	195.00	2.00	4.73	14.5	0.32
				and 217.00	218.35	1.35	5.82	22.8	4.35
S15-032	270º	-45º	294.30	No significant values					
S15-033	270º	-45º	117.00	No significant values					
S15-034	270º	-57º	196.00	No significant values					
S15-035	265º	-45º	242.50	29.00	31.00	2.00	2.55	-	-
				159.00	161.00	2.00	2.78	-	-
				167.50	169.00	1.50	6.70	71.3	0.84
				230.20	231.30	1.10	6.48	74.1	-
S15-036	265º	-45º	209.00	4.50	152.00	147.50	0.42	2.2	0.08
				incl. 142.15	146.75	4.60	1.80	7.5	-
S15-037	265º	-45º	220.00	37.00	41.00	4.00	3.15	5.4	-
				169.00	171.00	2.00	2.24	-	0.11
S15-038	265º	-45º	163.50	2.00	161.00	159.00	0.52	3.0	0.10
				incl. 10.00	12.00	2.00	3.34	-	-
				and 114.00	124.00	10.00	1.84	8.2	0.18
S15-039	270º	-45º	166.00	3.00	143.50	140.50	0.82	4.3	0.17
				incl. 17.00	61.00	44.00	1.40	6.8	0.17
				incl. 31.00	33.00	2.00	6.26	-	0.14
S15-040	265º	-45º	299.00	169.00	183.00	14.00	1.90	-	-
				incl. 169.00	170.00	1.00	7.04	7.7	-
				and 174.00	175.10	1.10	5.82	10.8	-
				205.70	207.80	2.10	4.46	12.6	0.23
				232.80	239.30	6.50	1.36	-	-
				232.80	233.50	0.70	5.30	25.9	0.41
S15-041	265º	-50º	214.00	85.00	87.00	2.00	5.86	7.8	-
				145.70	155.00	9.30	3.95	-	-
				incl. 145.70	147.00	1.30	18.60	-	-
				and 153.00	155.00	2.00	4.27	-	-
				190.50	192.00	1.50	9.95	-	-
				213.00	214.00	1.00	5.92	53.3	-

Table 10.9 continued…. A Summary of the High-Grade Gold Intersections in the 58 Drillholes Completed by the Company in 2015 on the Central Zone, Spectrum-GJ Project Area
(compiled from information contained in the May 2016 Technical Report, cross-referenced to Company news releases)

Drillhole	Azimuth	Dip	Length (m)	From (m)	To (m)	Interval (m)	Au (g/t)	Ag (g/t)	Cu (%)
S15-042	265º	-55º	388.00	5.60	211.40	205.80	0.94	1.9	0.05
				incl. 25.00	42.00	17.00	1.79	-	-
				incl. 25.00	27.00	2.00	6.83	5.3	-
				113.30	115.00	1.70	9.67	-	-
				165.00	176.00	11.00	3.10	-	-
				incl. 167.10	169.30	2.20	5.56	-	-
				192.00	198.00	6.00	5.44	11.1	-
				196.00	198.00	2.00	10.20	29.0	-
				207.00	208.50	1.50	4.56	-	-
S15-043	265º	-45º	362.00	197.00	201.00	4.00	24.24	-	-
				incl. 199.00	201.00	2.00	44.8	-	-
				210.60	222.00	11.40	16.73	-	-
				incl. 216.00	218.00	2.00	81.80	5.6	-
				230.00	234.00	4.00	26.59	-	-
				incl. 230.00	232.00	2.00	46.50	-	-
S15-044	265º	-45º	319.00	6.00	178.00	172.00	0.60	4.0	0.14
				incl. 57.00	59.00	2.00	6.62	6.8	0.27
				and 141.00	143.00	2.00	3.27	5.4	0.13
				202.00	249.73	47.73	0.49	3.0	0.13
S15-045	265º	-45º	275.00	185.00	187.00	2.00	2.13	-	-
				217.00	219.00	2.00	2.35	-	-
S15-046	265º	-45º	266.00	40.00	44.00	4.00	3.06	-	-
				159.00	161.00	2.00	4.19	-	-
				192.00	196.00	4.00	16.97	10.0	-
				incl. 194.00	196.00	2.00	29.80	15.0	0.15
S15-047	265º	-45º	320.00	122.00	124.00	2.00	2.33	-	-
				254.95	256.35	1.40	15.40	21.0	0.11
S15-048	265º	-55º	149.80	Abandoned before zone – no significant values					
S15-049	265º	-45º	269.00	125.00	127.00	2.00	2.31	-	-
				185.00	193.00	8.00	5.36	-	-
				incl. 187.00	189.00	2.00	12.0	-	-
				211.00	225.00	14.00	7.82	-	0.11
				215.00	217.00	2.00	35.00	7.9	0.22
				incl. 235.00	237.00	2.00	7.56	-	-
				243.00	245.00	2.00	5.90	-	-
S15-050	265º	-50º	338.00	288.00	290.00	2.00	9.83	-	-
S15-051	265º	-50º	385.00	28.00	30.00	2.00	2.22	-	-
				90.30	92.50	2.20	2.07	-	-
				219.50	221.50	2.00	2.86	11.7	0.13
				237.50	239.50	2.00	2.22	-	-
S15-052	265º	-46º	365.00	225.75	228.00	2.25	2.20	-	-
				296.50	298.00	1.50	4.51	-	-
S15-053	256º	-46º	341.00	No significant values					
S15-054	252º	-45º	256.00	No significant values					
S15-055	265º	-45º	381.30	200.00	206.00	6.00	3.09	-	-
				incl. 204.60	206.00	1.40	8.27	-	-
				286.50	287.50	1.00	23.10	-	-
S15-056	265º	-50º	365.00	256.00	258.00	2.00	2.25	-	-
				313.00	315.00	2.00	4.76	-	-
				359.00	360.00	1.00	26.70	-	-
S15-057	265º	-46º	395.00	217.00	219.00	2.00	2.36	37.1	-
				302.00	304.00	2.00	2.51	-	-
				328.00	330.00	2.00	8.32	12.7	0.38
S15-058	265º	-45º	212.00	No significant values					
S15-059	265º	-65º	214.30	No significant values					
S15-060	265º	-45º	422.00	207.00	213.00	6.00	3.27	-	-
				incl. 211.00	213.00	2.00	5.89	-	-
				252.00	270.00	18.00	6.13	-	0.08
				incl. 258.00	259.00	1.00	11.00	-	0.10
				and 264.00	265.00	1.00	30.00	5.2	0.06
				and 268.30	270.00	1.70	30.60	-	0.19
				304.00	306.00	2.00	2.10	-	-

Table 10.9 continued…. A Summary of the High-Grade Gold Intersections in the 58 Drillholes Completed by the Company in 2015 on the Central Zone, Spectrum-GJ Project Area
(compiled from information contained in the May 2016 Technical Report, cross-referenced to Company news releases)

Drillhole	Azimuth	Dip	Length (m)	From (m)	To (m)	Interval (m)	Au (g/t)	Ag (g/t)	Cu (%)
S15-061	265º	-45º	317.00	180.00 188.00 224.00 incl. 224.00 and 246.00 and 264.00 incl. 264.00 and 280.00 298.00	182.00 190.00 300.00 226.00 248.00 282.00 266.00 282.00 300.00	2.00 2.00 76.00 2.00 2.00 18.00 2.00 2.00 2.00	3.35 2.34 1.13 2.08 2.47 2.69 5.78 11.90 2.06	- - 2.4 - - - 6.3 - 8.4	- - 0.06 - - - - - -
S15-062	263º	-45º	740.00	No significant values					
S15-063	265º	-45º	447.20	219.30 236.00 284.00 396.00 incl. 396.00 incl. 402.00 418.00	221.30 238.00 286.00 420.00 404.00 404.00 420.00	2.00 2.00 2.00 24.00 8.00 2.00 2.00	4.85 2.73 4.05 1.87 4.04 8.75 2.89	64.2 - - - - - -	0.53 - - - - - -
S15-064	265º	-45º	473.00	191.00 336.00	193.00 338.00	2.00 2.00	3.25 5.75	106.0 -	- -
S15-067	270º	-50º	404.00	No significant values					
S15-069	270º	-45º	470.00	56.00 64.00 298.65 420.00 425.80	58.10 66.00 300.05 422.00 426.80	2.10 2.00 1.40 2.00 1.00	2.93 2.66 5.94 2.53 10.20	10.1 - 7.9 - 117.0	- - - 0.10 0.24
S15-070	270º	-46º	449.00	336.00 393.40 411.10	338.00 396.00 412.00	2.00 2.60 0.90	4.60 10.18 8.04	- 6.6 -	- 0.21 0.11

Table 10.10 A Summary of the Lower-Grade, Porphyry Style Copper-Gold Intersections in the 58 Drillholes Completed by the Company in 2015 on the Central Zone, Spectrum-GJ Project Area
(compiled from information contained in the May 2016 Technical Report, cross-referenced to Company news releases)

Drillhole	Azimuth	Dip	Length (m)	From (m)	To (m)	Interval (m)	Au (g/t)		Cu (%)
							(top cut to 10 g/t Au)	Uncut Average	
S15-010	270º	-52º	278.00	3.4 and 94.3	72.0 104.3	68.6 10.0	0.87 1.22	1.22 1.22	0.03 0.07
S15-011	270º	-45º	223.50	3.0	206.0	203.0	0.96	0.96	0.12
S15-012	270º	-55º	251.00	2.5	238.0	235.5	0.91	1.24	0.07
S15-013	270º	-45º	200.00	3.0	198.0	195.0	0.93	0.93	0.15
S15-014	270º	-58º	217.50	3.0	212.0	209.0	1.04	1.21	0.18
S15-015	270º	-50º	259.00	12.0 and 103.8	62.0 192.1	50.0 88.3	0.70 1.23	0.70 2.79	0.03 0.05
S15-016	270º	-48º	179.00	11.3	176.0	164.7	0.98	0.98	0.15
S15-017	270º	-55º	193.00	72.0	182.8	110.8	1.00	1.34	0.06
S15-018	270º	-45º	302.00	136.0 and 205.0	168.0 227.0	32.0 22.0	0.82 1.41	0.82 1.46	0.05 0.06
S15-019	270º	-50º	215.00	13.0 and 86.0 and 138.5	39.0 123.0 182.1	26.0 37.0 43.6	1.12 0.64 1.04	1.12 0.64 1.04	0.07 0.09 0.06
S15-020	270º	-45º	258.00	171.0 and 218.0	192.0 239.5	21.0 21.5	0.57 0.75	0.57 0.75	0.04 0.07
S15-021	270º	-50º	60.50	3.0	50.0	47.0	0.28	0.28	-
S15-022	270º	-50º	254.00	6.8 and 146.0	46.0 189.0	39.2 43.0	0.47 2.16	0.47 5.11	0.02 0.05
S15-023	270º	-45º	225.00	4.3 and 46.0 and 167.0	20.0 90.0 210.0	15.7 44.0 43.0	0.48 0.67 0.90	0.48 0.67 0.90	0.08 0.1 0.09
S15-024	270º	-60º	244.00	3.0	192.6	189.6	0.80	0.82	0.06

Table 10.10 continued… A Summary of the Lower-Grade, Porphyry Style Copper-Gold Intersections in the 58 Drillholes Completed by the Company in 2015 on the Central Zone, Spectrum-GJ Project Area

(compiled from information contained in the May 2016 Technical Report, cross-referenced to Company news releases)

Drillhole	Azimuth	Dip	Length (m)	From (m)	To (m)	Interval (m)	Au (g/t)		Cu (%)
							(top cut to 10 g/t Au)	Uncut Average	
S15-025	270º	-45º	181.00	11.0	166.0	155.0	0.64	0.67	0.06
S15-026	270º	-45º	260.00	120.5	221.0	100.5	0.88	0.88	0.06
S15-027	266º	-48º	266.00	190.0	220.0	30.0	0.46	0.46	-
S15-028	270º	-50º	254.00	5.0 and 112.0	49.0 206.0	44.0 94.0	0.84 0.76	0.84 0.86	0.06 0.07
S15-029	266º	-45º	219.00	103.5	161.0	57.5	0.46	0.46	-
S15-030	270º	-45º	265.00	169.3	215.5	46.2	0.43	0.43	0.06
S15-031	270º	-45º	283.00	5.5	230.0	224.5	0.57	0.57	0.23
S15-032	270º	-45º	294.30	No significant values					
S15-033	270º	-45º	117.00	No significant values					
S15-034	270º	-57º	196.00	8.5	52.0	43.5	0.36	0.36	0.15
S15-035	265º	-45º	242.50	13.0 and 150.3	39.0 187.0	26.0 36.7	0.47 1.03	0.47 1.03	- -
S15-036	265º	-45º	209.00	4.5	152.0	147.5	0.42	0.42	0.08
S15-037	265º	-45º	220.00	33.0 and 150.5	61.0 173.0	28.0 22.5	0.87 0.69	0.87 0.69	- -
S15-038	265º	-45º	163.50	2.0 68.3	46.0 161.0	44.0 92.7	0.73 0.52	0.73 0.52	0.08 0.11
S15-039	270º	-45º	166.00	3.0	143.5	140.5	0.80	0.8	0.17
S15-040	265º	-45º	299.00	167.0	247.0	80.0	0.87	0.87	0.06
S15-041	265º	-50º	214.00	29.0	214.0	185.0	0.63	0.69	0.04
S15-042	265º	-55º	388.00	5.6	211.4	205.8	0.94	0.96	0.05
S15-043	265º	-45º	362.00	158.2	234.0	75.8	1.67	5.23	0.04
S15-044	265º	-45º	319.00	6.0	178.0	172.0	0.60	0.60	0.15
S15-045	265º	-45º	275.00	181.6	221.0	39.4	0.56	0.56	-
S15-046	265º	-45º	266.00	5.7 and 149.0	87.6 198.0	81.9 49.0	0.54 1.28	0.54 2.10	0.03 0.05
S15-047	265º	-45º	320.00	High-grade gold intersections only					
S15-048	265º	-55º	149.80	Abandoned before zone – no significant values					
S15-049	265º	-45º	269.00	143.4	245.0	101.6	1.59	2.19	0.05
S15-050	265º	-50º	338.00	High-grade gold intersection only					
S15-051	265º	-50º	385.00	191.7	243.5	51.8	0.65	0.65	0.07
S15-052	265º	-46º	365.00	213.4	247.0	33.6	0.76	0.76	0.05
S15-053	256º	-46º	341.00	No significant values					
S15-054	252º	-45º	256.00	No significant values					
S15-055	265º	-45º	381.30	187.3	206.0	18.7	1.47	1.47	0.03
S15-056	265º	-50º	365.00	244.0 and 303.0	279.0 327.0	35.0 24.0	0.64 0.94	0.64 0.94	0.06 0.06
S15-057	265º	-46º	395.00	209.0 and 300.0	233.0 330.0	24.0 30.0	0.66 0.98	0.66 0.98	- -
S15-058	265º	-45º	212.00	No significant values					
S15-059	265º	-65º	214.30	No significant values					
S15-060	265º	-45º	422.00	205.0	277.8	72.8	1.23	1.79	0.07
S15-061	265º	-45º	317.00	76.0 and 180.0 and 220.0	142.0 194.0 306.0	66.0 14.0 86.0	0.42 1.07 0.89	0.42 1.07 0.94	0.04 0.08 0.06
S15-062	263º	-45º	740.00	No significant values					
S15-063	265º	-45º	447.20	201.0 and 278.0 and 374.0	244.0 297.6 436.0	43.0 19.6 62.0	0.74 0.96 0.99	0.74 0.96 0.99	0.07 - -
S15-064	265º	-45º	473.00	174.00	194.5	20.5	0.82	0.82	-
S15-067	270º	-50º	404.00	No significant values					
S15-069	270º	-45º	470.00	42.0 and 152.0 and 194.0 and 295.0 and 401.0	66.0 168.0 201.1 300.1 426.8	66.0 16.0 7.1 5.1 25.8	24 0.48 0.86 3.21 0.65	0.75 0.48 0.86 3.21 0.65	- - - - -
S15-070	270º	-46º	449.00	265.0 and 371.0	283.9 396.0	18.9 25.0	0.54 1.16	0.54 1.56	- -

10.4.3 Interpretation

Drilling to the end of October 2015 showed that the Central Zone comprises a broad, low-grade porphyry-style shell of Cu-Au mineralization, crosscut by fault-, fracture- and veinlet-zones that typically carry higher gold grades. The entire area is pervasively altered to biotite hornfels, quartz-sericite-pyrite, potassic, argillic and silicic assemblages proximal to the Central Zone, with propylitic alteration developed further afield. Higher grade gold zones may be accompanied by silver, copper and other base metals.

Mineralization at both high- and lower-grades was interpreted to be fracture controlled, insofar as it occurs in veins, fractures and breccias around faults and shear zones. The mineralization was found to consist of gold-bearing pyrite, native gold, arsenopyrite, chalcopyrite and sphalerite. As of the end of October 2015 the identified mineralization remained open along strike to the north and south, as well as down dip to the west.

10.4.4 Geotechnical Drilling

Three geotechnical holes totaling 461.0 m were drilled by the Company in October 2015, to the east of the Mountain Exploration Camp and along a potential adit alignment. Drilling, geotechnical logging, packer hydraulic conductivity testing and the installation of Vibrating Wire Piezometers to collect water level data was carried out and supervised by engineers of Knight Piésold Consulting Ltd. of Vancouver, B.C. ("Knight Piésold").

The geotechnical holes were drilled because, at the time, underground drilling of the high-grade gold zone was at the time planned, in part because underground mining was being contemplated. Work carried out since October 2015 has shown that openpit is the better short- to medium-term option for exploiting the Central Zone, with the result that development of the proposed adit is no longer being contemplated.

10.5 The Company's 2016 Drilling Programs

From July 05 to October 28 2016, the Company completed 9,669.6 m of drilling in 32 drillholes, including:

- 21 exploration holes for 6,027.56 m in the Central Zone, thereby bringing the total number of holes drilled into the deposit to 168 for a total of 35,060.98 m, as of the end of 2016 (historical drilling plus the Company's drilling); and
- eight infill exploration holes for 2,863.0 m in the Donnelly Deposit, thereby bringing the total number of holes drilled into the deposit to 178 for a total of 49,240.37 m (historical drilling plus the Company's drilling).

The collar locations, azimuths, inclinations and lengths of the 29 exploration holes drilled into the Central Zone and Donnelly Deposit are summarized on Table 10.11. Drilling was carried out by Omineca Diamond Drilling Ltd. of Burns Lake, B.C., utilizing two Multi Power Discovery 2 hydraulic fly rigs. Drillhole collars were located in the field by hand-held GPS and surveyed at the end of the drill program by DGPS. Orientation surveys were taken approximately every 60 m downhole utilizing a Reflex orientation tool. Drillcore was logged and sampled at core logging facilities at the Company's Valley Exploration Camp (Central Zone core) and GJ camp (Donnelly Deposit core) where the core is currently stored. Logging included observations of lithology, alteration, veining, mineralization and structure; geotechnical logging included core recovery and

RQD estimates. SG and magnetic susceptibility measurements were also routinely taken. Drill rig moves and daily drilling support was provided by Silver King Helicopters Inc. of Smithers, B.C., utilizing a Eurocopter AS350 B2 helicopter.

Table 10.11 A Summary of the Collar Locations, Drillhole Azimuths, Dips and Lengths of the 29 Drillholes Completed by the Company in 2016 on the Central Zone and Donnelly Deposit, Spectrum-GJ Project Area
(compiled from information supplied by the Company)

Drillhole	Section	Location	Collar Position			Azimuth	Dip	Length (m)
			Easting	Northing	Elev. (m)			
S16-074	4700 N	Central Zone	410,957.63	6,394,721.97	1,777.89	090º	-58º	163.0
S16-075	4700 N		410,957.63	6,394,721.97	1,777.89	090º	-60º	449.0
S16-076	4525 N		411,149.55	6,394,525.02	1,631.58	090º	-65º	321.0
S16-077	4525 N		411,046.42	6,394,523.54	1,640.56	090º	-65º	360.0
S16-078	4525 N		411,046.42	6,394,523.54	1,640.56	090º	-90º	424.0
S16-079	4325 N		410,855.28	6,394,316.49	1,646.46	090º	-55º	346.0
S16-081	5100 N		411,122.10	6,395,100.64	1,566.56	090º	-70º	224.0
S16-082	5300 N		411,218.25	6,395,290.52	1,474.24	090º	-70º	257.0
S16-084	4900 N		410,972.49	6,394,910.10	1,710.64	090º	-63º	245.0
S16-085	4900 N		410,972.49	6,394,910.10	1,710.64	090º	-68º	250.0
S16-086	4525 N		411,267.16	6,394,523.19	1,622.96	090º	-55º	275.0
S16-087	4425 N		411,054.79	6,394,421.36	1,578.75	090º	-50º	345.6
S16-088	4900 N		411,125.65	6,394,890.55	1,657.51	270º	-85º	274.0
S16-089	5100 N		411,179.04	6,395,107.73	1,560.68	090º	-67º	196.0
S16-090	4700 N		411,177.28	6,394,700.74	1,687.74	090º	-70º	222.0
S16-091	4625 N		411,051.61	6,394,622.85	1,699.19	090º	-61º	330.0
S16-092	4625 N		411,168.56	6,394,623.35	1,683.45	090º	-60º	241.0
S16-093	5050 N		410,880.38	6,395,044.80	1,638.09	090º	-50º	386.0
S16-094	5000 N		411,110.57	6,395,007.65	1,591.02	090º	-65º	206.0
S16-095	4900 N		411,158.79	6,394,895.12	1,649.01	090º	-55º	283.0
S16-096	5200 N		411,090.00	6,395,199.90	1,554.03	090º	-60º	230.0
GJ16-240	4400 E	Donnelly Deposit	424,402.61	6,390,905.90	1,512.24	360º	-50º	490.0
GJ16-241	4950 E		424,937.67	6,390,910.72	1,567.38	360º	-50º	379.0
GJ16-242	4950 E		424,946.49	6,391,292.28	1,572.05	360º	-50º	163.0
GJ16-243	4100 E		424,113.51	6,391,088.05	1,462.90	360º	-45º	340.0
GJ16-244	4250 E		424,256.61	6,391,056.08	1,492.12	360º	-55º	340.0
GJ16-245	4600 E		424,617.07	6,390,979.91	1,539.29	360º	-70º	395.0
GJ16-246	5350 E		425,350.42	6,390,904.58	1,593.48	360º	-55º	347.0
GJ16-247	4250 E		425,270.77	6,390,901.68	1,588.82	360º	-60º	409.0

10.5.1 Purpose

The purpose of the Company's 2016 diamond drilling program was to: better define the western and eastern boundaries of the Central Zone; to test the West Creek, South Copper and 300 Colour porphyry-style mineralized occurrences, as well as high-grade gold targets; and to provide additional geological and analytical information for less well constrained areas of the Donnelly Deposit. Although the primary purpose of the holes was to better define the target mineralization, some of the holes were drilled at HQ diameter to facilitate sampling for the metallurgical testing program described in Section 13.

10.5.2 Mineralized Intersections

Table 10.12 summarizes the significant grade intercepts in the 21 exploration holes drilled by the Company on the Central Zone during 2016; Table 10.13 summarizes the same information for the holes drilled on the Donnelly Deposit. Both tables were compiled from information contained in the Company news releases dated August 24, 2016 and December 12, 2016. The stated grades are un-cut; true widths are estimated by the Company to be 65% to 90% of the downhole intervals.

Table 10.12 A Summary of the Significant Grade Intercepts in the 21 Drillholes Completed by the Company in 2016 on the Central Zone, Spectrum-GJ Project Area
(compiled from information contained in Company news releases)

Drillhole	Azimuth	Dip	Length (m)	From (m)	To (m)	Interval (m)	Au (g/t)	Ag (g/t)	Cu (%)
S16-074	090º	-58º	163.0	Abandoned before zone. No significant values					
S16-075	090º	-60º	449.0	262.00	445.00	183.00	0.59	2.4	0.10
				and 369.00	445.00	76.00	0.99	4.4	0.07
				incl. 407.00	443.00	36.00	1.55	6.0	0.08
S16-076	090º	-65º	321.0	44.00	65.15	21.15	0.34	0.4	0.11
				90.00	318.00	228.00	0.61	1.0	0.08
				incl. 267.80	318.00	50.20	1.47	1.2	0.01
				incl. 296.00	298.00	2.00	11.85	-	-
S16-077	090º	-65º	360.0	174.00	354.00	180.00	0.55	1.0	0.15
				incl. 197.00	296.50	99.50	0.82	1.3	0.23
				incl. 199.00	272.00	73.00	0.97	1.2	0.26
				and 224.10	272.00	47.90	1.14	1.2	0.30
S16-078	090º	-90º	424.0	165.45	221.00	55.55	0.26	0.5	0.10
				290.00	406.00	116.00	0.40	2.5	0.14
				incl. 301.00	344.00	43.00	0.66	2.7	0.23
S16-079	090º	-55º	346.0	182.00	205.50	23.50	0.62	0.8	0.14
S16-081	090º	-70º	224.0	33.00	199.00	166.00	0.31	1.6	0.13
				incl. 147.00	199.00	52.00	0.40	2.1	0.20
S16-082	090º	-70º	257.0	26.00	74.00	48.00	0.40	1.8	0.09
S16-084	090º	-63º	245.0	42.00	74.00	32.00	0.63	1.1	0.03
				88.00	115.00	27.00	0.64	1.0	0.05
S16-085	090º	-68º	250.0	42.00	69.00	27.00	0.52	1.4	0.04
				87.00	115.00	28.00	0.92	0.7	0.02
				236.00	248.00	12.00	2.41	20.5	0.05
S16-086	090º	-55º	275.0	7.50	25.00	17.50	0.31	0.4	0.11
				67.00	143.25	76.25	0.35	0.8	0.08
				incl. 67.00	92.50	25.50	0.49	0.5	0.15
S16-087	090º	-50º	345.6	36.75	74.50	37.75	0.36	0.3	0.09
S16-088	270º	-85º	274.0	86.00	113.00	27.00	0.63	4.2	0.18
				174.00	212.00	38.00	0.26	1.3	0.25
				174.00	196.00	22.00	0.33	1.6	0.33
S16-089	090º	-67º	196.0	7.00	22.00	15.00	0.84	0.6	0.02
				49.00	177.00	128.00	0.44	1.6	0.15
				incl. 112.00	133.50	21.50	0.81	1.9	0.21
S16-090	090º	-70º	222.0	40.00	146.00	106.00	0.70	4.5	0.18
				83.80	146.00	62.20	0.97	6.9	0.20
				incl. 118.00	120.00	2.00	5.25	10.8	0.21
				incl. 192.00	194.00	2.00	4.78	0.7	0.03
S16-091	090º	-61º	330.0	182.00	241.26	59.26	0.53	0.6	0.15
				incl. 210.00	241.26	31.26	0.77	0.9	0.19
				304.90	321.83	16.93	1.21	1.8	0.15
				incl. 319.75	321.83	2.08	7.06	2.1	0.14
S16-092	090º	-60º	241.0	79.00	183.50	104.50	0.63	0.8	0.16
				incl. 93.00	162.00	69.00	0.73	0.7	0.20
				incl. 142.00	158.00	16.00	1.70	1.0	0.41
S16-093	090º	-50º	386.0	266.00	282.00	16.00	0.80	1.0	0.01
				333.56	344.00	10.44	0.91	8.7	0.15
S16-094	090º	-65º	206.0	48.00	183.00	135.00	0.25	2.7	0.11
				53.00	95.00	42.00	0.36	5.5	0.08
				136.00	174.95	38.95	0.24	1.4	0.20
S16-095	090º	-55º	283.0	23.15	248.00	224.85	0.79	1.8	0.12
				incl. 67.00	248.00	181.00	0.94	2.1	0.13
				incl. 148.00	210.00	62.00	1.45	3.3	0.11
				incl. 198.00	210.00	12.00	3.49	2.9	0.05
S16-096	090º	-60º	230.0	7.90	23.00	15.10	0.74	0.8	0.01
				211.00	226.60	15.60	0.49	1.5	0.29

Table 10.13 A Summary of the Significant Grade Intercepts in the Eight Drillholes Completed by the Company in 2016 on the Donnelly Deposit, Spectrum-GJ Project Area
(compiled from information contained in Company news releases)

Drillhole	Azimuth	Dip	Length (m)	From (m)	To (m)	Interval (m)	Au (g/t)	Ag (g/t)	Cu (%)
GJ16-240	360º	-50º	490.0	353.10	420.00	66.90	0.33	1.2	0.20
				incl. 387.00	412.50	25.50	0.53	1.8	0.29
GJ16-241	360º	-50º	379.0	14.00	24.00	10.00	1.63	0.4	0.01
				118.00	135.00	17.00	0.54	2.8	0.21
				203.00	217.00	14.00	0.72	8.5	0.13
				231.00	377.00	146.00	0.41	2.6	0.24
				incl. 305.55	375.10	69.55	0.58	3.2	0.36
GJ16-242	360º	-50º	163.0	129.00	131.00	2.00	0.73	5.5	0.55
GJ16-243	360º	-45º	340.0	177.35	193.10	15.75	1.72	2.5	1.04
				207.10	252.00	44.90	0.49	2.4	0.49
GJ16-244	360º	-55º	340.0	206.55	239.15	32.60	0.31	1.2	0.20
				267.00	329.10	62.10	0.25	1.7	0.41
				incl. 270.85	306.50	35.65	0.30	1.3	0.54
GJ16-245	360º	-70º	395.0	223.65	379.00	155.35	0.37	1.2	0.25
				incl. 276.70	379.00	102.30	0.47	1.5	0.29
GJ16-246	360º	-55º	347.0	288.32	339.00	50.68	0.42	2.5	0.35
GJ16-247	360º	-60º	409.0	327.00	409.00	82.00	0.49	1.7	0.17

It may be seen from the data presented on Tables 10.12 and 10.13 that the Company's objectives for the 2016 drilling program were met, insofar as all but one drillhole (S16-074, which was abandoned short of the mineralized zone) returned significant mineralized intercepts. In the case of the Central Zone, the drilling results summarized on Table 10.12 extended Central Zone mineralization to the west in particular, where the 2016 block model indicated the presence of waste, due mainly to the lack of drilling (which in part reflected the challenging topography). In the case of the Donnelly deposit, the mineralized intercepts summarized on Table 10.13 were expected by virtue of the 2016 block model (the purpose of the 2016 program was to infill areas identified from scrutiny of the 2016 block model). The same block model, inclusive of the 2016 results, indicates that the Donnelly Deposit remains open at depth.

10.5.3 Interpretation – Central Zone

The results of the 2016 drilling program on the Central Zone led to a significant improvement in the understanding of both the geology and spatial distribution of the mineralization contained within the target deposit. The Central Zone is now interpreted to comprise:

- a 1,000 m long, 70 m to 200 m thick, moderately west-dipping panel of porphyry-style copper-gold mineralization and alteration that has been tested to a maximum downdip depth of 400 m; with
- a cross-cutting, sub-vertical zone of higher grade gold with or without silver, arsenic, antimony, copper, lead and zinc mineralization that occurs in veins, fractures and in alteration around faults and shear zones.

The lower grade (copper-gold) porphyry-style mineralization is interpreted to remain open both along strike and down dip. The high-grade gold zone has been defined over a strike length of 665 m and over a 40 m to 200 m width. Drilling to date has shown that it:

- is developed along the northern portion of the porphyry-style mineralization.
- overprints the porphyry-style mineralization at its up-dip extent near surface; and

- remains open to the north and down-dip, but is truncated by faulting at its southern extent at approximately Section 4635 N.

An offset and continuation of mineralization is possible and may be expressed as soil and rock gold-arsenic enrichment to the southeast, but this interpretation has not been tested by drilling. Similar alteration and high-grade gold mineralization has also been intersected in the footwall of copper-gold porphyry mineralization on Section 4525 N, but its extent has not been tested by drilling.

10.5.4 Interpretation – Donnelly Deposit

Drilling to date has shown that the Donnelly Deposit is a structurally controlled, monzonite to monzodiorite hosted, porphyry-style copper deposit, with or without gold, that is oriented east-west and dips moderately to the south. The deposit is controlled by early east-west faults, subsequently cross-cut by north-south faults and exposed at surface over 1,990 m (east-west) before passing under younger Hazelton Group cover to the west. The western edge of the deposit has been juxtaposed against the Hazelton Group by both east-west and north-south faults, with mineralization documented to continue below cover to the west. The deposit is up to 300 m wide and has a down dip extent of at least 500 m. It remains open down dip and along strike to the west, where it is disrupted by strong vertical faulting.

10.6 Core Recovery and RQD

RQD is a function of the density of naturally occurring fractures ("discontinuities") and faults, while recovery is the ability of the drilling process to extract core. RQD determinations should reflect insitu rockmass conditions that can in many instances be difficult to assess, which inevitably leads to an element of subjectivity in RQD determinations, hence sometimes strongly (downwards) biased datasets. In the case of core recoveries and in common with RQD determinations, they should reflect the potential impacts key variables that can impact negatively on outcomes. For example:

- naturally occurring and mechanically induced fractures can often be difficult to tell apart, especially if, for example, extensive rockmass veining is present and the wallrock-vein contacts are weak;
- small diameter drillcores tend to be more susceptible to mechanical effects both downhole, during core extraction from the drilling tube and during transport and logging (conversely, large diameter cores reduce the likelihood of mechanically induced breaks/fractures);
- large diameter cores typically allow for high recovery rates in moderately to highly fractured ground and through gouge zones, although low recoveries can still be experienced in fault zones where material can be washed out by the drilling process; and
- high bit pressures can cause extensive damage to drillcores (rubble zones can be created), especially when discontinuities that are inclined more-or-less in the drilling direction are intersected and/or when open void discontinuities are intersected.

10.6.1 Core Recoveries

High bit pressures are typically employed and NQ core sizes (47.6 mm) or smaller are typically used in exploration programs, mainly for reasons of drillers' remuneration packages and overall drilling costs. Despite this, analysis of the Company's drillhole database shows that recoveries are in general very good to excellent away from fault- and joint-zones: recoveries in excess of 92% are common, but are low or even very low in fault zones where drillcore can be highly fractured, crumbly, broken and include intervals of gouge. Minor intervals reflecting core recoveries of 85% ±5% are reported, but these may be due to drilling and post-drilling mechanical effects and the presence of sometime closely veined rockmass intervals.

10.6.2 Rock Quality Designations

Deere (1964) proposed his quantitative index of rockmass quality based on core recovery by diamond drilling RQD, which has since become very widely used. Deere's original specification was that RQD's should be defined as the percentage of core recovered in intact pieces of 100 mm or more in length in the total length of a drillhole. More recently, RQDs have been determined for individual core runs by cumulatively adding the lengths of each piece of intact core that is longer than twice the diameter of the drilled core, and dividing the result by the length of the core run.

It is normally accepted that RQDs should be determined using core that is at least 50 mm in diameter (i.e. greater than NQ diameter that is 47.6 mm in diameter) and which was drilled using, as a minimum, double barrel diamond drilling equipment. Geotechnical logging should also be carried out as the core is retrieved from individual drilling runs, to thereby reduce post-drilling mechanical degradation of drillcore to a practicable minimum.

High bit pressures are commonly employed and NQ diameter (or smaller) holes are commonly used during exploration drilling programs, and for the reasons earlier outlined, to which can be added the use of single barrel drilling equipment. RQD determinations are, therefore, frequently biased to the downside of potential outcomes that can be further impacted by logging practices that sometimes vary widely between individuals. It is in consequence of this that RQD results should be used only as a guide within the scope of analysis and design, not as a source of robust or definitive information that can be applied in empirical analysis leading a design outcome.

NQ or smaller diameter core was in general drilled and single barrel equipment was uniformly used over the various exploration drilling programs carried out on the Project Area. It is mainly for these reasons that, in Principal Author's opinion, the recorded RQD determinations should be considered with caution:

- if the intersections logged by Company geologists as fault zones are excluded from analysis, then the average, logged RQD values typically vary between the middle of the 'Poor' range of rockmass qualities (RQD = 25% to 50%) to the middle of the 'Fair' range of rockmass qualities (RQD = 50% to 75%);
    - fault zones are uniformly logged as having 'Very Poor' to 'Poor' rockmass qualities (RQD <30%), as may reasonably be expected, and
    - some intervening rockmass intervals have logged RQD values at the top of the 'Fair' RQD value range (50% to 75%); however

- in the Principal Author's opinion, the results summarized above do not fully or fairly reflect what he observed in the drillcores examined at site - the majority of the Central Zone rockmass between fault zone intervals may be described as having RQD values between approximately 45% and 65%, increasing to approximately 55% to 75% or even 80% in the case of the Donnelly Deposit.

10.7 Qualified Person's Opinion

In the opinion of the Principal Author, there are no drilling, sampling or recovery factors that could materially impact the accuracy and reliability of the results. The quantity and quality of the lithological, collar, downhole survey and (notwithstanding the above) geotechnical data collected during the various exploration and infill drilling programs are sufficient to support Mineral Resource estimation, insofar as:

- core logging meets industry standards for porphyry-style mineralization;
- collar and downhole surveys were carried out using industry-standard instrumentation;
- core recovery and RQD data from drilling programs is in general acceptable, although the latter is probably on the low side;
- the drillhole intercepts appropriately reflect the nature of the target mineralization that includes areas of lower and higher grades; and
- drillhole orientations are generally appropriate for the mineralization style; although
- the Central Zone holes completed by the Company during 2014 and 2015 are uniformly towards azimuth 265º to 280º and consistently at dips of between 45º and 67º.

While the 2014 and 2015 drilling programs were successful in intersecting and better defining the high-grade gold zone of the Central Zone, it is recommended that opportunities for changing future drilling directions and dips into the high-grade zone should be reviewed and implemented, as appropriate. The same recommendation does not apply to the Company's 2016, Central Zone drilling program that was directed mainly at a west dipping porphyry target, with the result that the 090º azimuth for 20 of the 21 completed holes is considered appropriate.

11 SAMPLE PREPARATION, ANALYSIS AND SECURITY

David Mehner, P. Geo. ("QP Mehner") is responsible for this Section of this Technical Report. The following text summarizes the available material concerning sample preparation, analysis and security over the various drilling programs carried out on the Central Zone and Donnelly Deposit. The historical information was abstracted from the following technical reports that were prepared for CGH and are listed on www.sedar.com:

- 'Technical Report on the Donnelly - GJ - North Cu-Au Porphyry Zones, Kinaskan Lake Project, Liard Mining Division, British Columbia, Canada' by David T. Mehner, M.Sc., P. Geo. and Giles R. Peatfield, Ph.D., P. Eng., and dated May 15, 2005 (the "May 2005 Technical Report");
- 'Technical Report on the Kinaskan Lake Copper-Gold Porphyry Project, Liard Mining Division, British Columbia, Canada' by David T. Mehner, M.Sc., P. Geo. and Giles R. Peatfield, Ph.D., P. Eng., and dated April 11, 2006 (the "April 2006 Technical Report"); and
- 'Technical Report on the GJ Cu-Au Porphyry Project, Liard Mining Division, British Columbia, Canada' by David T. Mehner, M.Sc., P. Geo., Gary H. Giroux, M.A.Sc., P. Eng. and Giles R. Peatfield, Ph.D., P. Eng., and dated April 30, 2007 (the "April 2007 Technical Report").

Reference was also made to the August 2014, April 2016 and May 2016 Technical Reports cited in Section 2.5. The following assessment work reports also provided valuable data:

- 'Assessment Report on 2012 Drilling, Geological, Geochemical, and Geophysical work conducted during 2012 at the GJ/Kinaskan Cu-Au Porphyry Project', by L. Hollis and L. Bailey (2013). British Columbia Ministry of Energy, Mines and Natural Gas. Assessment Work Report No. 33,815; and
- 'Assessment Report on Drilling, Geological, Geochemical, and Geophysical work conducted during 2013 at the GJ/Kinaskan Cu-Au Porphyry Project', by L. Hollis (2014). British Columbia Ministry of Energy and Mines. Assessment Work Report No. 34,565.

11.1 Historical Sampling, Analysis and Security Programs

Samples collected by previous operators were prepared and analyzed by numerous laboratories using many different analytical techniques and sample preparation protocols. Over the years, not only have sample preparation procedures and analytical methods changed, but a number of the laboratories which analyzed many of the samples no longer exist. In most reports that pre-date 1990, details on sample procedures, analytical methods and the detection limits for each element are either non-existent or only partially summarized. In QP Mehner's opinion, this should not preclude the use of the pre-1990 assay database for purposes of Mineral Resource estimation: the analytical work was carried out by responsible companies and laboratories utilizing industry standards of the time; and the Company has expended significant effort validating the assay database (see Section 11.6).

The same limitations do not apply to the various historical sampling and assaying programs carried out from 1990 and up to the Company's acquisition of the mineral claim blocks that comprise the Project Area. Sufficient information is available to afford an acceptable level of confidence in the procedures and results, in part because all the assaying programs were carried out at independent laboratories that met industry standards of the time and in later years were ISO 17025 accredited.

Limitations concerning sample security could also be identified prior to CGH's 2004 field program: no specific security measures were taken with sample shipments, other than normal precautions regarding identities of shippers and other such procedures as were considered standard at the time. In QP Mehner's opinion, there is no reason to believe that there were any breaches of security such as would have compromised the results. In this and other regards it should be emphasized that, in the case of the Donnelly Deposit database, all sampling carried out since 1989 through 2007 was either performed by QP Mehner or was carried out under his supervision, while managing exploration work for Ascot and CGH. In addition, the Principal Author of the April 2016 Technical Report (Giles R. Peatfield, Ph.D., P. Eng.) was involved in the supervision of TexasGulf's 1977 and 1980 drilling programs, as well as CGH's 2004 through 2007 QA/QC programs.

11.1.1 TexasGulf, 1977 and 1980

The 16 TexasGulf holes drilled in 1977 and 1980 on the Donnelly Deposit were sampled at 3.0 m intervals and analyzed in their entirety for Cu and, where higher-grade intervals were visually estimated, for Au and Ag. The samples were analyzed by Bondar-Clegg & Co. Ltd. of North Vancouver, B.C. ("Bondar-Clegg"). At the time, Bondar-Clegg was a widely used and recognized independent laboratory.

11.1.2 Consolidated Silver Ridge Mines, 1979 and 1980

In 1979, diamond drillcore was sampled at less than or equal to 3.0 m intervals and routinely analyzed for Au reported as Troy ounces per tonne ("oz/t"). There is no information in the literature documenting the analytical laboratory or the gold analytical technique. Selective samples were also analyzed for Ag, reported as oz/t, and Cu, reported as percent, but the analytical techniques are unknown.

In 1980, diamond drillcore was sampled at less than or equal to 2.0 m intervals and routinely analyzed for Au by fire assay technique. There is no information in the literature documenting the analytical lab or the exact fire assay technique utilized. Samples from drillholes 80-11 and 80-13 were routinely analyzed for silver, by fire assay, the details of which are unknown.

11.1.3 Cominco Ltd., 1989

Core from the 1989 diamond drill program was logged and sampled from a tent camp on the property. Core was sampled at approximately 2.0 m intervals and routinely analyzed for Au and Cu and selectively analyzed for Fe, Mg, K and As. Analysis was conducted by Cominco Exploration and Research Laboratory in Vancouver, B.C. Analytical techniques are not documented but Au is reported in ppb units. Any sample reporting greater than 1,000 ppb Au was re-analyzed and results are reported as grams per tonne ("g/t"). Copper is reported using ppm units.

11.1.4 Ascot Resources, 1990

Core from the single hole drilled by Ascot on the Donnelly Deposit in 1990 was taken on a daily basis by helicopter to a core logging and sampling facility constructed near the site of Canorex drillhole CA-81-07 located on the GJ zone. Core was logged, recoveries measured and sample intervals marked at 3.0 m intervals by a geologist. Where higher grade mineralization was noted, sample intervals were reduced to 1.5 m.

The logged core was split with a manual core splitter. Half-core samples were individually bagged, tagged and submitted to Min-En Laboratories in Smithers, B.C. ("Min-En", an independent company) where they were dried at 95º C, crushed to minus 1/4 inch in a jaw crusher and then to minus 1/8 inch in a secondary roll crusher. Crushed samples were individually put through a Jones Riffle splitter to collect statistically representative 300 g to 400 g sub-samples that were pulverized in a ring pulverizer to P_{95} 120 mesh. The prepared pulps were then bagged, tagged and sent for analysis at Min-En's Vancouver facility.

The prepared samples were analyzed for gold using a geochemical technique involving aqua regia dissolution of 15.0 g and 30.0 g sub-samples with an AAS finish. Samples yielding >1,000 ppb (1.0 g/t) Au were re-analyzed by the one assay ton fire assay with an AAS finish. Cu, Pb, Zn and Ag were determined using 2.0 g sub-samples, by nitric-perchloric-hydrochloric acid digestion with an AAS finish. As, Sb and Mo were determined by ICP analysis of 0.5 g sub-samples using a Jarrall-Ash 9000 ICAP instrument.

11.1.5 Columbia Gold Mines, 1990 Through 1992

Core from Columbia's three Central Zone drilling programs carried out in 1990 through 1992 were sampled at less than 2.0 m intervals over their entire lengths. The samples were split, securely bagged and submitted to Min-En (an independent company), where they were dried at 95º C, crushed to minus 1/4 inch in a jaw crusher then to minus 1/8 inch in a secondary roll crusher.

Crushed samples were individually put through a Jones Riffle splitter to collect statistically representative 300 g to 400 g sub-samples that were pulverized in a ring pulverizer to P_{95} 120 mesh. The pulps were bagged, tagged and sent for analysis at Min-En Laboratories at North Vancouver, B.C. Ag, Cu, Pb, Zn, Ni, Co and Cd analyses were completed by aqua regia digestion of 0.5 g of prepared pulps followed by AAS analysis using appropriate standard sets. Gold analysis was completed either by:

- a wet geochemistry method that involved cintering 5.0 g prepared pulps at 800°C for three hours, followed by aqua regia digestion with further treatment by methyl iso-butyl ketone and then AAS analysis using a suitable standard set; or
- fire assay using one assay ton sample weight with an AAS finish (the analytic result had to be within three standard deviations of its known certificated grade or the whole set was re-assayed and likewise, inserted blanks had to be less than 0.015 g/t).

11.1.6 Canadian Gold Hunter, 2004 Through 2007

During each of CGH's four drilling programs on the Donnelly Deposit, core was quick-logged at each hole before being flown, on a regular basis, by helicopter to the core logging facility located at the North zone area. Prior to logging, core boxes were labelled and box-specific from-to intervals were inscribed on aluminium tags attached to the front of each box. Drillcore from holes CGH-04-001 to -003 was photographed, as was all the drillcore from the 2005, 2006 and 2007 programs.

Samples were marked out on 3.0 m intervals (with some variations where appropriate to honour geology); standards, blanks and duplicates were inserted into the sample stream by CGH geologists. In 2004 the core was split by one of the samplers using a manual core splitter. During subsequent programs, a diamond saw was used when core was deemed to be well-mineralized and/or competent. Boxes containing logged drillcore were stacked on pressure-treated four inch by four inch posts and stored near the core logging facility.

Individual split core samples were placed in separate plastic sample bags secured with sure-lock straps. Samples were then stored in numbered rice sacks that were also secured with sure-lock straps. The filled and secured rice sacks were stored at the project site until they were flown by helicopter to Tatogga Lake Resort where they were received by a local expediter. The received bags were stored in a locked building until they were picked up by a transport truck and shipped directly to ALS for preparation and analysis.

Sample preparation included drying followed by crushing the entire sample to better than 70% passing a 2 mm (Tyler 10 mesh) screen. A split of up to 250 g was taken and pulverized to better than P_{85} Tyler 200 mesh. The pulps were then sub-sampled for analysis.

ALS analyzed the prepared samples for 34 elements, including Ag and Cu, by conventional ICP-AES analysis using 0.50 g sub-samples digested with aqua regia. Samples yielding >10,000 ppm (1.0%) Cu or > 100 ppm Ag were re-assayed by dissolving 0.4 g to 2.0 g of sample pulp with concentrated nitric acid for half an hour followed by AAS analysis controlled by matrix-matched standards. The upper portions of each drillhole were also analyzed for non-sulphide (oxide) copper using a sulphuric acid leach and an AAS finish. In the case of drillhole CGH-05-076, a composite of six samples from a section averaging 1% Cu was checked for secondary copper by using a 0.5% cyanide leach on a 2.0 g sample that was then analyzed by AAS. Gold values were determined using 30 g sub-samples and the fire assay method with an AAS finish. All samples returning >1 ppm Au were re-assayed using a gravimetric procedure on 30 g sub-samples.

11.1.7 Teck Resources, 2011 and 2013

A total of five holes were drilled by Teck on the Donnelly Deposit, during its 2011 and 2013 drilling programs. Hollis (2013, 2014) described the sampling, assaying and security procedures as follows.

Core was flown on a regular basis by helicopter to a core logging facility located 200 m northwest of Teck's GJ camp. Prior to logging, core boxes were labelled and from-to intervals were inscribed on the front end and at the top left hand corner of each box. Teck geologists logged the core, marked out 3.0 m sample intervals and photographed core before it was sent to the samplers for splitting with an electrical or gas-powered saw. After sampling, the core boxes were stacked, aluminum tags with the drillhole number and interval were fastened to the front of each box and lids nailed to the top box of each stack. All the boxed drillcore was stored at site, adjacent to Teck's core logging facility.

The split-core samples were securely bagged and tagged at camp, and then flown by helicopter to Tatogga Lake Lodge where they were received by a Teck employee who drove the samples to the Bandstra Transportation Systems Ltd. ("Bandstra") shipping facility at Iskut, B.C. There they were put into a locked facility until picked up by Bandstra and shipped to Acme Analytical Laboratories Ltd. ("Acme", now Bureau Veritas Mineral

Laboratories – "Bureau Veritas" an independent company that is ISO 9001 accredited and, at the time of writing [February 2017] also ISO 17025 accredited) at Smithers, B.C. for preparation and analysis.

Sample preparation included drying followed by crushing the entire sample to P_{80} 10 mesh, splitting off 1,000 g and pulverizing the split to P_{85} passing 200 Tyler mesh. Each prepared sample was analyzed for 53 elements using aqua-regia digestion with inductively coupled plasma mass spectrometry ["ICP-MS"] analyses on a 0.5g split, and assayed for 24 elements using hot aqua-regia digestions with ICP-ES analysis. Gold values were determined using a standard fire assay procedure on 30 g sub-samples. All samples returning >1ppm Au were re-assayed using gravimetric analytical procedures on 30 g sub-samples. In addition, a limited number of samples from Teck's 2011 program were subjected to whole-rock analysis.

11.2 The Company's 2014 Drilling Program

Securely boxed core was flown on a regular basis by helicopter to the Company's core logging facility at Iskut, B.C. Prior to logging, core boxes were labelled, from-to intervals were inscribed on the front end and top left hand corner of each box.

Company geologists logged, marked out sample intervals (2.0 m, with some variations where appropriate to honour the geology) and photographed the core before it was sent to the samplers for splitting by diamond saw. Blanks, standards and duplicates were inserted into the sample stream (see Section 11.5). After sampling, aluminum tags with the drillhole number and interval were fastened to the front and lid of each box. The boxed and labelled drillcore was stored in Iskut over winter, from where, in the summer of 2015, it was flown by helicopter to the Company's Mountain core storage facility, where it remains.

11.2.1 Sample Security

The split, half-core samples were sealed by Company geologists in labeled, poly sample bags that were sorted and stored at the Company's core logging facility at Iskut, B.C., prior to shipping. At all times the samples were under the supervision and control of Company employees or contractors; detailed records were kept of where and when samples were shipped.

The bagged samples were sent in polyfiber rice bags to Acme at their preparation laboratory in Terrace, B.C. Each rice bag contained approximately five samples and weighed between 10 kg and 15 kg. The rice bags were indelibly labeled with the destination address, sender's address and sample numbers contained, and were doubly sealed with heavy-duty wire ties. Rice bags were labeled "1 of *n*", "2 of *n*", etc. to keep track of the number of bags in each shipment. Complete sample lists and laboratory requisition forms for a given shipment were inserted into "Bag 1 of *n*" and this bag was clearly identified with brightly-coloured flagging tape tied around the top.

The rice bags were stacked on pallets and secured with plastic wrap at Bandstra's depot at Iskut, B.C. From there, the pallets were sent by transport truck to Bureau Veritas' preparation facility at Terrace, B.C. Early in 2016, Bureau Veritas' preparation facility at Terrace, B.C., was closed. All reject materials were, as a result, sent to Bureau Veritas' main facility located at Vancouver, B.C.

11.2.2 Sample Preparation

The drillcore samples were crushed at Bureau Veritas' Terrace, B.C. facility to 70% passing 2 mm and were then split to a 250 g sub-sample which was pulverized to P_{85} 200 mesh. All coarse rejects and master pulps were retained at the facility for the duration of the program. In 2016, the Company had the 2014 rejects and pulps shipped from Bureau Veritas' Vancouver, B.C. facility to Kamloops, B.C., where they are now in secure storage.

11.2.3 Sample Analysis

The prepared samples were sent by courier to the main laboratory of Acme at Vancouver, B.C. The analytic methods employed were:

- 1.0 g aqua regia digestion with ICP-OES multi-element analysis, including gold; and
- 15 g aqua regia digestion (ignited at 550 Celsius) with ICP-MS Au analysis (samples reporting values greater than 5 g/t Au were re-run using 30 g fire assay analysis with a gravimetric finish).

11.3 The Company's 2015 Drilling Program

Securely boxed core was flown on a regular basis by helicopter to the Company's core logging facility at its Mountain exploration camp. Prior to logging, core boxes were labelled, from-to intervals were inscribed on the front end and top left hand corner of each box.

Company geologists logged, marked-out sample intervals (2.0 m, with some variations where appropriate to honour geology) and photographed the core before it was sent to the samplers for cutting by diamond saw or splitting using a hydraulic core splitter. Blanks, standards and duplicates were inserted into the sample stream (see Section 11.5). After sampling, aluminum tags with the drillhole number and interval were fastened to both the front of and lid of each box. The boxed and labelled drillcore was then palleted at the Company's Mountain core storage facility, where it remains.

11.3.1 Sample Security

The split, half-core samples were sealed by Company geologists in labeled, poly sample bags that were sorted and stored at the Mountain camp core logging facility, prior to shipping. At all times the samples were under the supervision and control of Company employees or contractors; detailed shipping records were kept.

The bagged samples were sent in polyfiber rice bags to ActLabs. Each rice bag contained approximately five samples and weighed between 10 kg and 15 kg. The rice bags were indelibly labeled with the destination address, sender's address and sample numbers contained, and were doubly sealed with heavy duty wire ties. Rice bags were labeled "1 of *n*", "2 of *n*", etc. to keep track of the number of bags in each shipment. Complete sample lists and laboratory requisition forms for a given shipment were inserted into "Bag 1 of *n*" and this bag was clearly identified with brightly-coloured flagging tape tied around the top. Shipments of rice bags were made every day or two by helicopter from the Mountain camp to a staging area on Highway 37. Samples were stored in a locked shipping container while awaiting transport to Bandstra's shipping facility at Smithers, B.C. by the Company's expediters (Matrix Helicopter Solutions of Langley, B.C.).

The rice bags were stacked on pallets and secured with plastic wrap at Bandstra's depot at Smithers, B.C. From there, the pallets were sent by transport truck to ActLabs' preparation facility at Kamloops, B.C. All reject materials and pulps are in secure storage in Kamloops.

11.3.2 Sample Preparation

The drillcore samples were crushed at ActLabs' Kamloops facility to 75% passing 2 mm, with 800 g being pulverized to P_{95} passing 200 mesh. All coarse rejects and master pulps were retained at ActLabs' Kamloops facility for the duration of the program.

11.3.3 Sample Analysis

The prepared samples (pulps) were analyzed by ActLabs for Au, Ag and Cu, using the ActLabs' standard methods:

- 0.5 g aqua regia digestion with ICP-OES multi-element analysis (samples reporting values greater than 10,000 ppm for Pb, Zn and Cu or greater than 100 ppm Ag were re-run using 4 acid digestion with an AAS finish);
- 50 g fire assay with AAS analysis for Au; and
- samples suspected to contain visible gold and samples that analyzed greater than 10 g/t Au by fire assay were analyzed by 1,000 g screen metallic and 50 g fire assay, with a gravimetric finish.

Check sample analysis were completed on 2015 pulps at the laboratory of ALS Geochemistry ("ALS") at North Vancouver, B.C. The analytic packages were:

- 0.5 g aqua regia digestion with ICP-OES multi-element analysis (samples reporting values greater than 10,000 ppm for Pb, Zn, Cu or greater than 100 ppm Ag were re-run using 4 acid digestion with an AAS finish); and
- 50 g fire assay with AAS analysis for gold (samples reporting greater than 10 g/t Au results were re-run using 50 g fire assay with a gravimetric finish.

Checks of 2014 gold analyses were also completed in 2015 (on the 2014 pulps) by Acme at Vancouver, B.C., using 50 g fire assay with an AAS finish. Those samples reporting values greater than 10 g/t Au were re-analyzed by 50 g fire assay with a gravimetric finish.

11.4 The Company's 2016 Drilling Programs

Securely boxed core was flown on a regular basis by helicopters to the Company's core logging facility at its Valley Exploration Camp (Central Zone core) or GJ exploration camp facility (Donnelly Deposit core), as appropriate. Prior to logging, core boxes were labelled, from-to intervals were inscribed on the front end and top left hand corner of each box.

Company geologists logged, marked out sample intervals (2.0 m, with some variations where appropriate to honour geology) and photographed the core before it was sent to the samplers for cutting by diamond saw or splitting using a hydraulic core splitter. Blanks, standards and duplicates were inserted into the sample stream (see Section 11.5). After sampling, aluminum tags with the drillhole number and interval were fastened to the front and lid of each box. The boxed and labelled drillcore was then stored at either the Company's Mountain core storage facility or GJ exploration camp core storage facility.

11.4.1 Sample Security

Prior to shipping, sample lots were prepared and stored at the Company's core logging facilities at Valley camp or GJ camp, as appropriate. Individual samples and their sample-relevant tags were placed in clear poly sample bags which were labelled with the sample number and sealed with plastic cable ties. Four to six samples were then placed in polyfibre rice bags; each filled bag weighed a total of 15 kg to 20 kg. The rice bags were indelibly labeled with the destination address, sender's address and sample numbers contained, and were doubly sealed with plastic cable ties. Rice bags were labeled "1 of *n*", "2 of *n*", etc. to keep track of the number of bags in each shipment. Complete sample lists and laboratory requisition forms for a given shipment were inserted into "Bag 1 of *n*" and this bag was clearly identified with brightly coloured flagging tape tied around the top. Differently coloured flagging tape was used to identify Central Zone and Donnelly Deposit samples.

Every few days samples were placed in mini-bulk bags and transported in slung nets by helicopter, from camp to the Company's staging area at the end of the Willow Creek Road. Samples were stored in a locked shipping container while awaiting transport to Bandstra's depot at Smithers, B.C. The staging area was manned 24 hours per day by a Company employee.

Samples were transported from the Willow Creek Road staging area, either by the contracted expediter (Rugged Edge Holdings of Smithers, B.C.) or by the Company's contracted shuttle operator (ERP Services of Burns Lake, B.C.). After pick-up and transport, the mini-bulk bags were placed on pallets at Bandstra's depot at Smithers, B.C., from where the pallets were sent by transport truck to ALS's preparation facility at Kamloops, B.C. On receipt of each shipment, ALS catalogued each sample and e-mailed a confirmation of receipt to the Company's QA/QC Manager. At the time of writing (February 2017), all reject materials are in secure storage in Kamloops and all pulp materials are in secure storage in North Vancouver.

11.4.2 Sample Preparation

Sample preparation in 2016 was carried out by ALS at their Kamloops, B.C. facility, except for one rush shipment of 95 drillcore samples that was prepared at ALS's laboratory at Terrace, B.C. At both laboratories, samples were crushed to 90% passing 2mm, then riffle split up to 1,000 g and pulverized to P_{95} 106 microns. All coarse rejects and master pulps were retained at ALS's facilities for the duration of the program.

11.4.3 Sample Analysis

The prepared samples (pulps) were sent by courier to ALS's analytical facility at North Vancouver, B.C. where the pulps were analyzed using the following (ALS) standard methodologies:

- 0.5 g aqua regia digestion with ICP-AES multi-element analysis (samples reporting values greater than 10,000 ppm for Cu, Mo, Pb and Zn or 100 ppm for Ag were re-run using four acid digestion with an AAS finish);
- 50 g fire assay with AAS analysis for gold (samples reporting values greater than 10 g/t Au were re-run using 50 g fire assay with a gravimetric finish); and
- selected 1,000 g screen metallic 50 g fire assay for gold, with a gravimetric finish.

11.5 QA/QC Procedures, Historical Drilling Programs

11.5.1 Central Zone, Prior to 1993

There is little documentation available of sample preparation, analytical techniques and QA/QC procedures employed for the drilling programs carried out on the Central Zone up to and including 1992. It was partly because of this that the four holes drilled by Imperial in 1973 were excluded from the Company's database, following its verification (see Section 12.4). Furthermore, it is stated in the August 2014 Technical Report that '*It was noted by the QP* (Jacques R. Stacey, MSc., P. Geo.) *that historical operators did not employ the regular use of Quality Assurance/Quality Control (QAQC) procedures, such as the regular insertion of Certified Reference Standard Materials, Blanks, or Duplicate samples during sampling of drill core. As such, the accuracy and precision of historical assays cannot be assessed, but the QP is satisfied that historical lab results were reasonably accurate and precise for the time, and that assays were performed by accredited analytical laboratories (e.g. Min-En Labs). The QP has no reason to believe that any of the historical results could be misleading or erroneous*'. This opinion is supported by the gold and copper assays for samples taken during Cominco's 1989 drilling program that were completed by Cominco Exploration and Research Laboratory, which at the time was a reputable firm.

11.5.2 Donnelly Deposit, Prior to 2004

There are no known reports of quality control procedures being implemented to either ensure assay accuracy or to determine the precision of results for the drilling programs carried out prior to 2004. However, as previously noted, all sampling carried out since 1989 through 2007 was either performed by the QP Mehner or was carried out under his supervision, while managing exploration work for Ascot and CGH. The Principal Author of the April 2016 Technical Report (Giles R. Peatfield, Ph.D., P. Eng.) was involved in the supervision of both of TexasGulf's drilling programs.

11.5.3 Canadian Gold Hunter's 2004 Drilling Program

Four dedicated standards (in addition to the laboratory's in-house standards) were used during CGH's 2004 drilling program:

- they were prepared by and purchased from CDN Resource Laboratories ("CDN") of Burnaby, B.C.;
- they comprised similarly altered and mineralized material from the nearby Red Chris porphyry copper-gold deposit;
- they were subjected to multiple round-robin analyses by ten different laboratories to establish confidence limits for copper and gold; and
- they were inserted in rotation inserted into the sample stream with an overall frequency of 5% (one in every 20 samples).

The controlling factor used in choosing the assay standards was copper grade and ensuring the copper-gold ratio approximated to that known to occur in the Donnelly, GJ and North zones. The four standards purchased had copper grades: near the probable cut-off grade for an openpit operation (0.155% Cu, as determined in 2004); near the mean grade expected for an openpit mine (0.596% Cu, as expected in 2004); and two near the upper limits of expected values (1.177% and 1.947% Cu). Corresponding gold grades were appropriate. Silver grades were not determined for these standards as silver was considered only a minor part of the potential value of the material.

Monitoring of the standards' assays indicated that the results were acceptable, in that the standards' assays fell within acceptable limits:

- in the case of the low-grade standard (grade of 0.155% Cu ± 0.006% Cu and 0.13 g/t Au ± 0.02 g/t Au at the 95% confidence level), four of 17 inserted standards returned Cu values slightly higher (to 0.165% Cu) and two yielded slightly higher gold values (to 0.151 g/t Au);
- the standard equating closest to the anticipated (in 2004) average grade for an openpit mine (0.596% Cu ± 0.029% Cu and 0.53 g/t Au ± 0.068 g/t Au at the 95% confidence level) yielded four of 18 inserted samples with elevated copper values (to 0.646% Cu) and one with a higher gold value (0.613 g/t Au); and
- of the two standards representing grades at the expected upper limits, one standard returned all 16 samples with copper-gold grades within ranges representing the 95% confidence levels while the second standard (1.947% Cu ± 0.062% Cu and 2.09g/t Au ± 0.15 g/t Au at the 95% confidence level) returned three of 15 samples with slightly elevated copper values (to 2.02% Cu) and two with lower gold values (to 1.785 g/t Au).

In addition, one sample in every 50 had a second pulp prepared from reject material. This was assayed and results of both pulps compared. Of 27 duplicate pairs, only two had Cu variances of more than 70 ppm: a sample pair in the 0.35% Cu range where the difference is 0.04% Cu; and a second sample pair in the 0.42% Cu range where the difference is 0.012% Cu. Gold values displayed the same reproducibility, with the exception of three samples: a sample pair in the 0.50 g/t Au range where the difference is 0.188 g/t Au; a second pair in the 0.30 g/t Au range where the difference is 0.07 g/t Au; and a third sample pair in the 0.15 g/t Au range where the difference is 0.038 g/t Au. It was concluded at the time (see the May 2005 Technical Report) that '*the control sample program has demonstrated reasonable results, and the assay values, especially for copper (which is the most economically important metal in the deposit) are statistically accurate and appropriate for use in a resource estimate*'.

11.5.4 Canadian Gold Hunter's 2005 Drilling Program

A more comprehensive QC program was instituted for the 2005 drill program, during which four purchased standards were inserted in rotation. These had slightly different values than those used in 2004, but they were chosen in a similar fashion. In addition, core samples known on the basis of previous assaying to be barren ("blanks") were inserted at regular intervals to check for possible preparation contamination. Core duplicates (where the second half of the core is assayed) were taken regularly. Preparation duplicates (second pulps prepared from rejects) were inserted regularly by the laboratory, as were pulp duplicates. In summary, every eleventh assay represented a control sample, be it standard, blank or a type of duplicate. This meant that every regular run of 80 core samples would have eight control samples, in addition to the laboratory's own standards. The controls were added at regular intervals and in constant order. This meant that controls were random in terms of the mineralized zones, but not in terms of the assay process. The decision to insert the controls in a regular fashion was based on a desire to minimize the risk of sample numbering errors in the field.

Monitoring of the standards' assays indicated that the results were acceptable, in that most of the standards' assays fell within acceptable limits (the very few that fell outside these limits were generally within runs of unmineralized rock and were not considered to warrant re-assay work). Correlation plots for the duplicates are presented in the April 2006 Technical Report, in which it is stated that:

- for copper, the plots show very little sign of bias and extremely good correlation (the correlation coefficients increase from drillcore to preparation to assay duplicates, as would be expected);
- the results for gold are less good than for copper, again as would be expected (the bulk of uncertainty would appear to be at the field sampling [core duplicate] stage as the preparation and assay duplicate results are by comparison much better); and
- silver duplicate assay results are much like those for gold (uncertainty again appears to be at the field sampling stage, rather than in sample preparation or assaying).

As part of CGH's 2005 program, several drillcore intervals from earlier Amoco, Canorex and TexasGulf drilling programs were sampled. The core was found to be generally in poor condition, but a limited number of sections were identified and recovered for assay. Most, but not all, samples represented previously assayed intervals; a few were not exactly equivalent. Details of this assaying, controlled by standards, etc., are presented in the April 2006 Technical Report in which it is stated that '*The general conclusion to be drawn is that while copper assays show good correspondence between original and re-sampling, original results for gold and especially silver in the Amoco and Canorex work are suspect and should be used with caution or not at all. TexasGulf gold results are acceptable*'.

11.5.5 Canadian Gold Hunter's 2006 Drilling Program

The QA/QC protocols for CGH's 2006 drilling program were modeled on those used by CGH in 2005. The only substantive difference was that only three standards were employed. The results of CGH's 2006 QA/QC program are presented in the April 2007 Technical Report, in which it is stated that '*the QC monitoring were satisfactory. Most standards assays for copper and gold were within acceptable limits. A very few were outside these limits; these were generally within runs of un-mineralized rock and were not considered to warrant re-assay work*'.

Duplicate sampling in 2006 employed the same procedures as used by CGH in 2005. The results are presented in the April 2007 Technical Report, in which it is stated that '*The results of the QC monitoring were satisfactory. Most standards assays for copper and gold were within acceptable limits. A very few were outside these limits; these were generally within runs of un-mineralized rock and were not considered to warrant re-assay work*'.

Details, including graphical plots, are included in in the April 2007 Technical Report in which correlation plots for the three types of duplicates are also presented and the following is stated: '*In the case of copper, the charts show very little sign of bias and extremely good correlations. The correlation coefficients increase from core to preparation to assay* *duplicates, as one would expect (and hope). Correlations for gold are less good, again as one would expect. Here the bulk of the uncertainty would appear to be at the field sampling (core duplicate) stage. Preparation and assay duplicate results are much better. Silver duplicate assay results are much like those for gold, the uncertainly appears to be at the field sampling stage rather than in sample preparation or assaying*'.

11.5.6 Canadian Gold Hunter's 2007 Drilling Program

The 2007 QC monitoring was essentially the same as for 2006. Three CDN standards were again employed. Duplicate samples were taken as in previous years, and barren material inserted as blanks to check for possible preparation contamination. The results were carefully monitored by Peatfield, who noted a small number of discrepancies that were successfully resolved by re-assaying selected samples.

11.5.7 Teck Resources' 2011 and 2013 Drilling Programs

Quality control and data verification during Teck's 2011 and 2013 drilling programs was effected using standards, blanks and duplicates that were randomly inserted into the sample stream at a rate of 1 in 20. Several certified standards were used, each of which was prepared by CDN, Ore Research & Exploration Pty. Ltd of Bayswater, North Victoria, Australia (ISO 9001 certified) or by Teck. Blank material consisted of garden-variety granite sourced from Acme at Smithers, B.C. Duplicates included field (drillcore) duplicates, preparation (crushed) duplicates and assay (pulp) duplicates. In the case of the drillcore duplicates, both drillcore halves were sampled so no material remained in the core boxes for these samples. Pulp duplicate assays were also carried out: 115 pulps, comprising approximately 5% of the total number of samples, were shipped to ALS at North Vancouver where Cu, Mo and Fe assay-grade concentrations were determined by ICP-AES analysis of a split digested by aqua regia. Gold concentrations were determined by fire assay with an ICP-AES finish of 30 g splits.

Quality control and data verification were monitored by Teck personnel. A small number of minor discrepancies were identified, which resulted in samples being re-assayed by Acme until the discrepancies were fully resolved (Hollis, 2012; Hollis and Bailey, 2013).

11.6 The Company's QA/QC Procedures

External control samples were systematically inserted into the sample streams during the Company's 2014, 2015 and 2016 drilling programs (Table 11.1). The control samples included field duplicates, blanks and certified reference materials (CRMs or "standards", supplied by CDN Resource Laboratories of Langley, B.C.) that were inserted at an overall frequency of approximately 10%: field duplicates, consisting of quarter cores, were inserted every 50 samples; blank material was inserted every 20 to 30 samples in 2014 and every 40 samples in 2015 and 2016; and a standard was inserted every 20 to 30 samples in 2014 and every 20 samples in 2015 and 2016. The results of the external control samples were monitored throughout the Company's drilling programs by a dedicated database manager. Any identified issues were resolved immediately by re-analyzing relevant samples and then re-verifying the results.

Table 11.1 A Summary of the Company's Overall QA/QC Program, 2014 through 2016, Spectrum-GJ Project
(compiled from information supplied by the Company)

Year	Claims Block	Analytical Laboratory	Drillcore Samples	Blanks	Standards	Field Duplicates	Check Assays (external laboratory)
2014	Spectrum	Acme	970	53	43	22	0
2015	Spectrum	ActLabs	8,816	314	513	189	435
2016	Spectrum	ALS	3,164	114	175	69	158
2016	GJ (Donnelly Deposit only)	ALS	1,406	46	77	30	71
		Totals	*14,356*	*527*	*808*	*310*	*664*

In 2015 and 2016, in addition to the use of control samples, 5% of all samples were re-analyzed by an external, independent laboratory (Table 11.1). The results were compared with the original assays; no analytical bias was detected. The three independent, analytical laboratories used during the Company's drilling programs also maintained internal QA/QC programs consisting of preparation duplicates, pulp duplicates, standards and blanks that were monitored by a certified assayer (Table 11.2). Internal QA/QC data was regularly reviewed, along with all external data.

Table 11.2 A Summary of the Independent Laboratories' Internal QA/QC Programs, 2014 through 2016, Spectrum-GJ Project
(compiled from information supplied by the Company)

Year	Claims Block	Analytical Laboratory	Laboratory Resplits (Prep. Duplicates)	Laboratory Repeats (Pulp Duplicates)
2014	Spectrum	Acme	33	99
2015	Spectrum	ActLabs	289	629
2016	Spectrum	ALS	49	218
2016	GJ (Donnelly Deposit only)	ALS	18	106
		Totals	*389*	*1,052*

11.6.1 Blanks

Figure 11.1 (for gold), Figure 11.2 (for silver and Figure 11.3 (for copper) 3 provide examples of the Company's blanks assay charts for 2014 through 2016. In 2014, blank material was sourced from inert road fill. The material was analyzed to ensure it was suitable material to use as a blank and then utilized during the 2014 drilling program. In 2015, blank material was sourced from the local Miocene Edziza basalt and consisted of less than 50 mm fragments with a mass averaging two kilograms. It was recognized that the Miocene Edziza basalt can contain elevated copper, albeit well below the levels of economic interest. It was because of this that the use of Miocene Edziza Basalt was discontinued in 2016.

In 2016, two sources of blank material were used. The first was sourced from Imasco Minerals Inc. and consisted of granite aggregate landscape rock. The second comprised white marble used for landscape rock, as packaged by Premier Tech Home & Garden of Mississauga, Ontario.

Analysis of the results shows no correlation between elevated Au or Cu values in blanks and the grade of the preceding sample. It was concluded that the results are consistent and no economically significant cross-contamination for Au, Ag or Cu is evident.

Figure 11.1 A Summary of Blanks Gold Assay Results for the Company's 2014, 2015 and 2016 Drilling Programs, Spectrum-GJ Project Area
(compiled from information supplied by the Company)

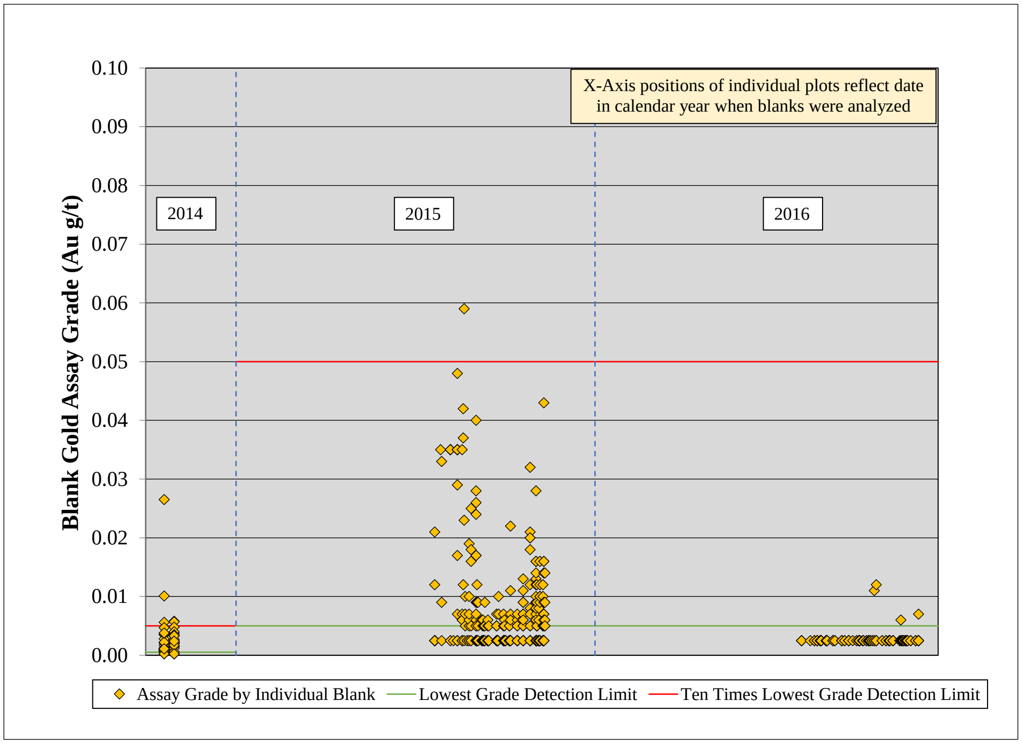


Figure 11.2 A Summary of Blanks Silver Assay Results for the Company's 2014, 2015 and 2016 Drilling Programs, Spectrum-GJ Project Area
(compiled from information supplied by the Company)

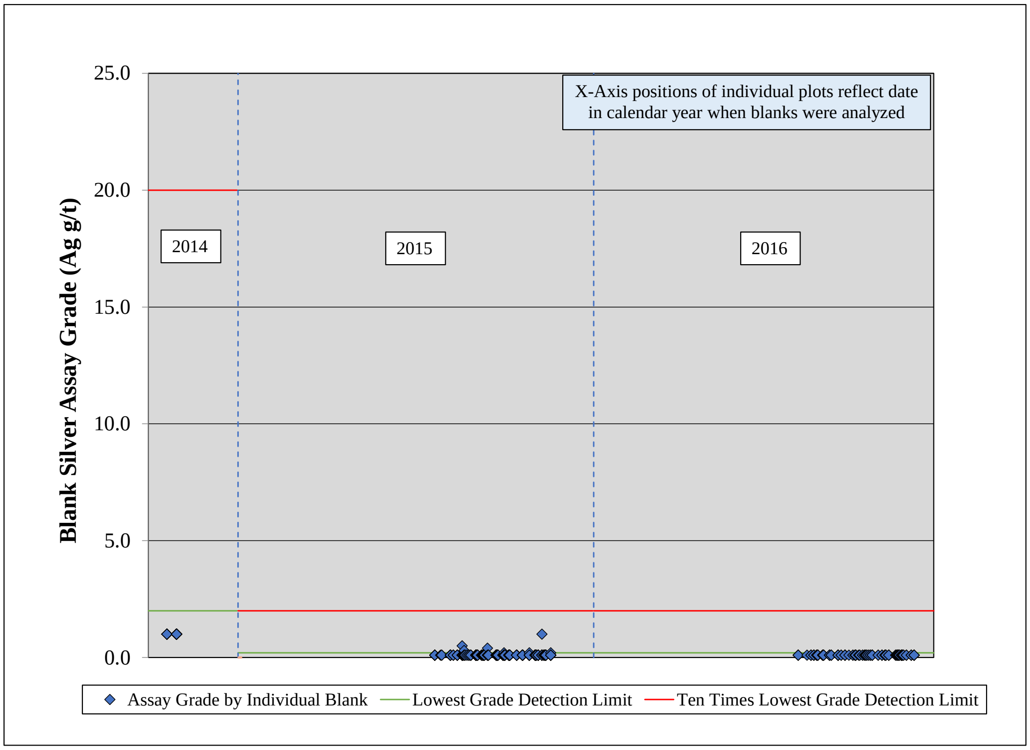
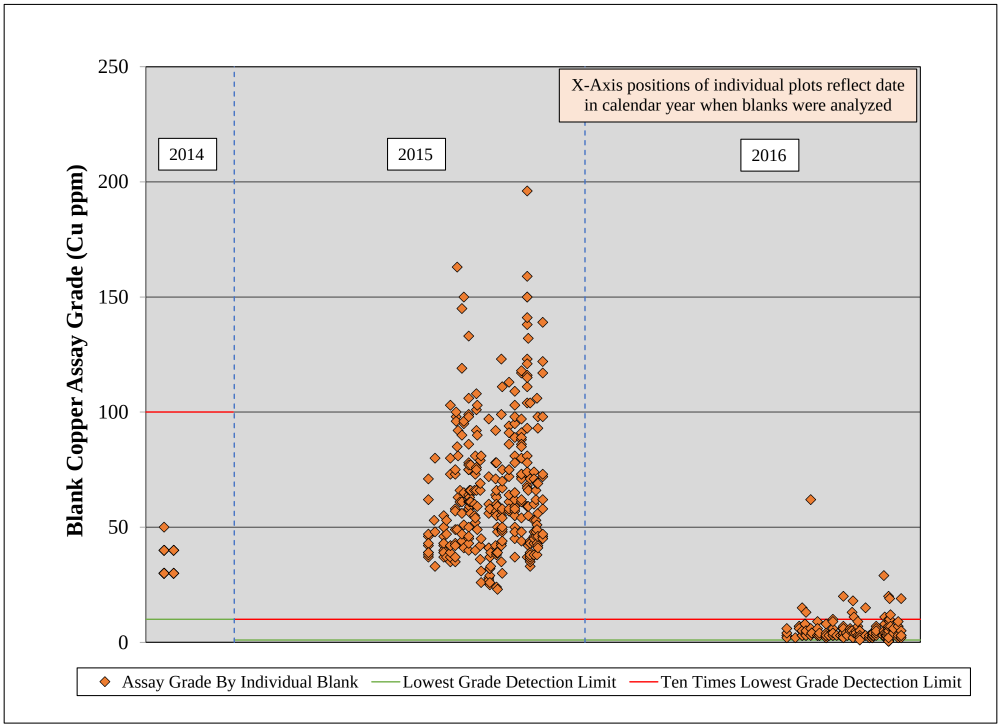


Figure 11.3 A Summary of Blanks Copper Assay Results for the Company's 2014, 2015 and 2016 Drilling Programs, Spectrum-GJ Project Area
(compiled from information supplied by the Company)



11.6.2 Standards

Throughout the Company's 2014 to 2016 drilling programs, standards (or certified reference materials) were inserted into the sample stream every 20 samples. A total of 11 different standards were used through the three years. The gold standards are summarized on Table 11.3, the silver standards on Table 11.4 and the copper standards on Table 11.5.

Individual standards were plotted along with their expected values, ±2 Standard Deviations ("SD") and ±3 SD. Values outside ±2 SD were flagged with a warning and values outside ±3 SD were considered failures. If a failure occurred, additional QA/QC data for other certified elements in the standard and from the laboratory's internal QA/QC was examined for acceptance. Should re-analysis be required, the series of samples above and below the failure were also re-analyzed. Examples of standard control charts are presented as Figures 11.4 (for gold), 11.5 (for silver) and 11.6 (for copper).

Standards GS-2P and GS-4E had high failure rates in 2014. The two standards were certified using 30 g fire assay with an AAS/ICP finish. However the gold analysis used in 2014 by Acme utilized a 15 g ICP-MS method, which method is not considered appropriate for these standards. To check the validity of the 2014 Acme gold results, the Company contracted Acme to re-analyze 492 samples from the 2014 drilling program by 50 g fire assay. Based on this study, there is no significant bias of the two sets of results: the standards that were re-assayed in the study all passed and the 2014 results are therefore deemed acceptable. In 2015, three instances of QA/QC discrepancies were noted but were deemed not significant enough to warrant re-analyzing. In 2016, seven instances of QA/QC sample discrepancies were noted that were successfully resolved by re-assaying selected samples.

Table 11.3 A Summary of the Gold Standards Employed by the Company During its 2014 through 2016 Drilling Programs, Spectrum-GJ Project
(compiled from information supplied by the Company)

Year	Claims Block	Standard	Results	Expected Au (g/t)	Certified Au Analysis	Laboratory Mean	Bias (%)	Failures
2014	Spectrum	CM23	11	0.549	30 g fire assay with ICP or AAS	0.522	-5.0	1
	Spectrum	GS-2P	21	1.99	30 g fire assay with AAS or ICP	1.83	-8.2	6
	Spectrum	GS-4E	11	4.19	30 g fire assay/Instrumental finish	2.64	-37.1	5
2015	Spectrum	CM23	43	0.549	30 g fire assay with ICP or AAS	0.549	0.1	0
	Spectrum	GS-2P	181	1.99	30 g fire assay with AAS or ICP	2.00	0.7	2
	Spectrum	GS-4E	159	4.19	30 g fire assay/Instrumental finish	4.12	-1.7	0
	Spectrum	GS-22	94	22.94	30 g fire assay/gravimetric finish (one lab used FA/ICP finish)	22.98	0.2	0
	Spectrum	GS-50	36	50.50	30 g fire assay/gravimetric finish	49.40	-2.2	0
2016	GJ	CM19	2	2.11	30 g fire assay with ICP or AAS	2.18	3.3	0
	Spectrum	CM23	1	0.549	30 g fire assay with ICP or AAS	0.569	3.6	0
	Spectrum	CM24	10	0.521	30 g fire assay with ICP or AAS	0.512	-1.7	0
	Spectrum/GJ	CM36	71	0.316	30 g fire assay with ICP or AAS	0.32	1.2	1
	Spectrum/GJ	CM38	70	0.942	30 g fire assay with ICP or AAS	0.949	0.8	2
	GJ	CM39	23	0.687	30 g fire assay with ICP or AAS	0.713	3.8	3
	Spectrum	GS-2P	17	1.99	30 g fire assay with ICP or AAS	2.02	1.6	0
	Spectrum	GS-4E	4	4.19	30 g fire assay/Instrumental finish	4.33	3.4	0
	Spectrum	GS-22	1	22.94	30 g fire assay/gravimetric finish (one lab used fire assay/ICP finish)	23.40	2.0	0

Table 11.4 A Summary of the Silver Standards Employed by the Company During its 2014 through 2016 Drilling Programs, Spectrum-GJ Project
(compiled from information supplied by the Company)

Year	Claims Block	Standard	Results	Expected Ag (g/t)	Certified Ag Analysis	Laboratory Mean	Bias (%)	Failures
2016	Spectrum	CM24	10	4.1	Aqua regia with ICP or AAS	4.21	2.7	1
	Spectrum/GJ	CM36	72	2.0	Aqua regia with ICP or AAS	2.00	0.1	0
	Spectrum/GJ	CM38	70	6.0	Aqua regia with ICP or AAS	6.02	0.33	1
	GJ	CM39	24	5.1	Aqua regia with ICP or AAS	5.19	1.8	0

Table 11.5 A Summary of the Copper Standards Employed by the Company During its 2014 through 2016 Drilling Programs, Spectrum-GJ Project
(compiled from information supplied by the Company)

Year	Claims Block	Standard	Results	Expected Cu (ppm)	Certified Cu Analysis	Laboratory Mean	Bias (%)	Failures
2014	Spectrum	CM23	11	4,710	Aqua regia with ICP-OES	4,672	-0.8	0
2015	Spectrum	CM23	43	4,710	Aqua regia with ICP or AAS	4,842	2.8	2
2016	GJ	CM19	2	20,400	Aqua regia with ICP or AAS	20,610	1.0	0
	Spectrum	CM23	1	4,710	Aqua regia with ICP or AAS	4,770	1.3	0
	Spectrum	CM24	10	3,710	Aqua regia with ICP or AAS	3,752	1.1	0
	Spectrum	CM31	51	820	Aqua regia with ICP or AAS	832	1.5	2
	Spectrum/GJ	CM36	72	2,270	Aqua regia with ICP or AAS	2,317	2.1	2
	Spectrum/GJ	CM38	70	6,810	Aqua regia with ICP or AAS	6,760	0.7	1
	GJ	CM39	24	5,330	Aqua regia with ICP or AAS	5,309	0.4	1

Figure 11.4 The Gold Control Chart for Standard GS-2P, the Company's 2014, 2015 and 2016 Drilling Programs, Spectrum-GJ Project Area
(compiled from information supplied by the Company)

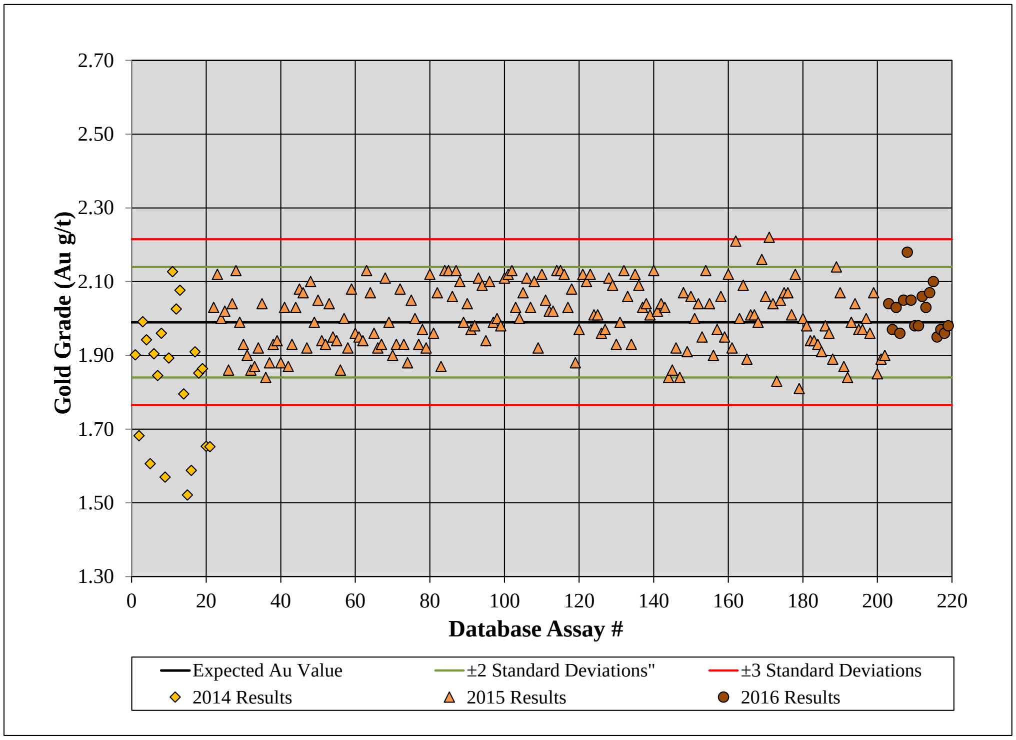


Figure 11.5 The Silver Control Chart for Standard CM36, the Company's 2016 Drilling Program, Spectrum-GJ Project Area
(compiled from information supplied by the Company)

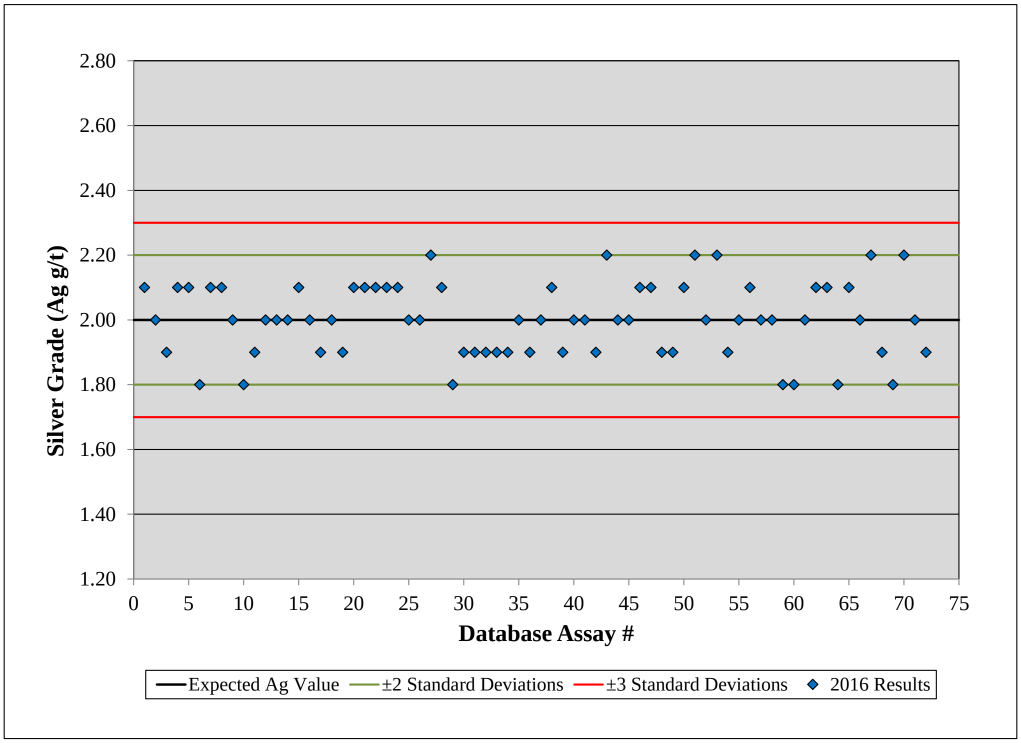
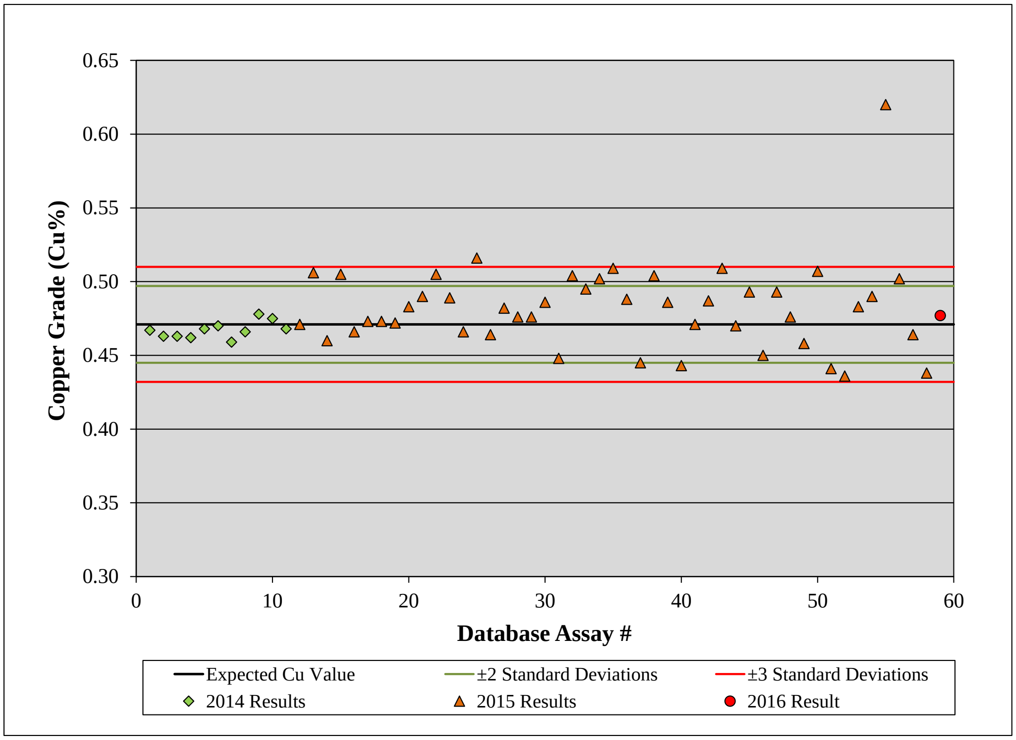


Figure 11.6 The Copper Control Chart for Standard CM23, the Company's 2014, 2015 and 2016 Drilling Programs, Spectrum-GJ Project Area
(compiled from information supplied by the Company)



11.6.3 Duplicates

Field duplicate results were compared to the original sample data by XY, absolute relative difference plots, relative precision (2 x the coefficient of variation) and relative percent difference plots to determine overall precision. Overall field duplicates showed a fairly high degree of variability for gold (which is typical for quarter-core field duplicates in vein gold deposits), while copper correlated better with the original sample values and with greater precision shown at higher grade ranges. Internal laboratory crush duplicates and pulp duplicates show an increasingly higher degree of correlation for gold, copper and silver than did the field duplicates, as might be expected.

11.6.4 The Company's 2015 Results' Analysis Programs

In 2015, to check the veracity of Acme's 2014, 15 g ICP-MS gold assays, the Company contracted Acme to re-analyze 492 samples from the 2014 drilling program for gold, using the 50 g fire assay method. The results show that there is no significant bias between the two sets of results (Figure 11.7); the 2014 results were deemed acceptable for purposes of Mineral Resource estimation.

At the end of the Company's 2015 diamond drilling program on the Spectrum claims block, a comparison of the results for gold analyzed using the 50 g fire assay method and the screened metallic method were compared. The results show that there is no significant bias between the two sets of results (Figure 11.8); the results were deemed acceptable for purposes of Mineral Resource estimation.

Figure 11.7 A Summary of 15 g ICP-MS versus 50 g Fire Assay Results for Gold, the Company's 2014 Drilling Program, Spectrum-GJ Project Area
(compiled from information supplied by the Company)

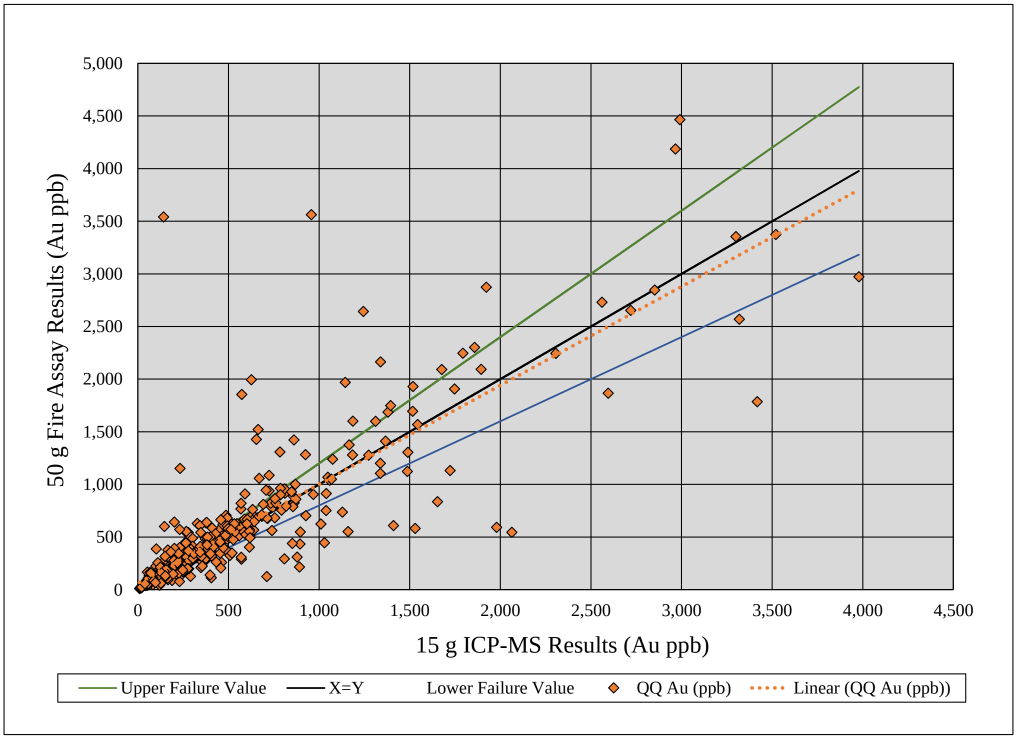
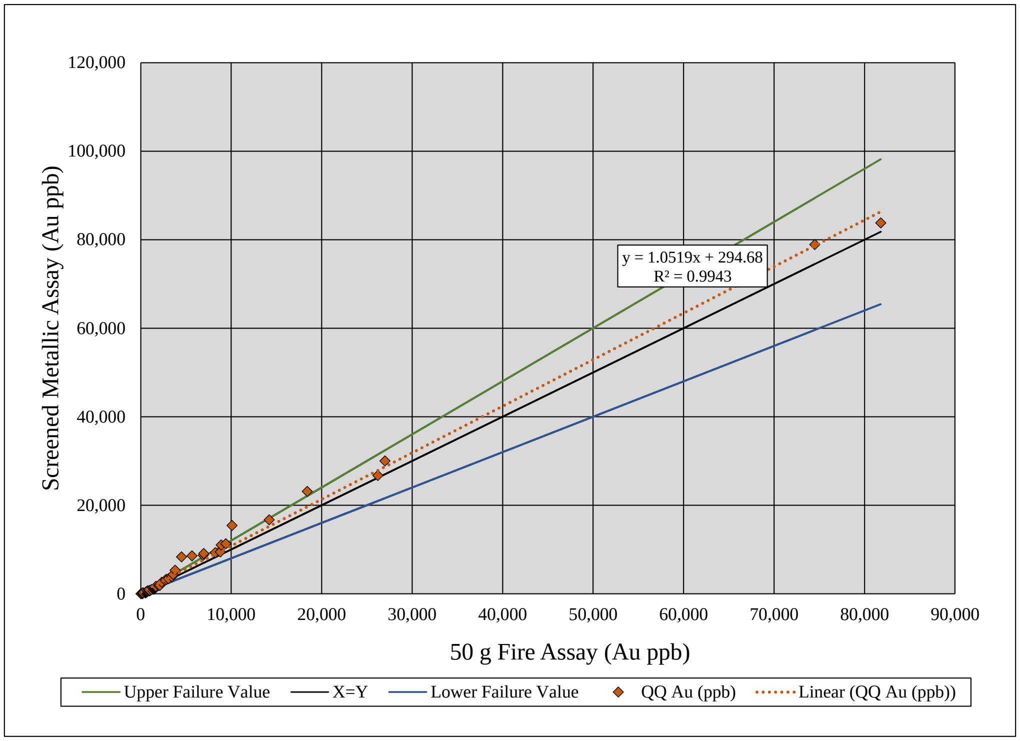


Figure 11.8 A Summary of 50 g Fire Assay versus Screened Metallic Assay Results for Gold, the Company's 2015 Drilling Program, Spectrum-GJ Project Area
(compiled from information supplied by the Company)



11.6.5 The Company's Check Assay Programs

On completion of the Company's 2015 and 2016 drilling programs, 5% of the samples were re-analyzed by second laboratories (ALS in 2015, ActLabs in 2016) by fire assay for gold and by ICP for multi-elements. Original and check analysis results for Au, Ag and Cu were compared using Q-Q plots. More variability was shown in the Au results, especially at higher grades, but this is expected to be due to a nugget effect. Overall the check assays correlated well, as Figures 11.9 (for gold), 11.10 (for silver) and 11.11 (for copper) suggest.

Figure 11.9 A Gold Accuracy Plot for Original vs. Check Assays, the Company's 2015 and 2016 Drilling Programs, Spectrum-GJ Project Area
(compiled from information supplied by the Company)

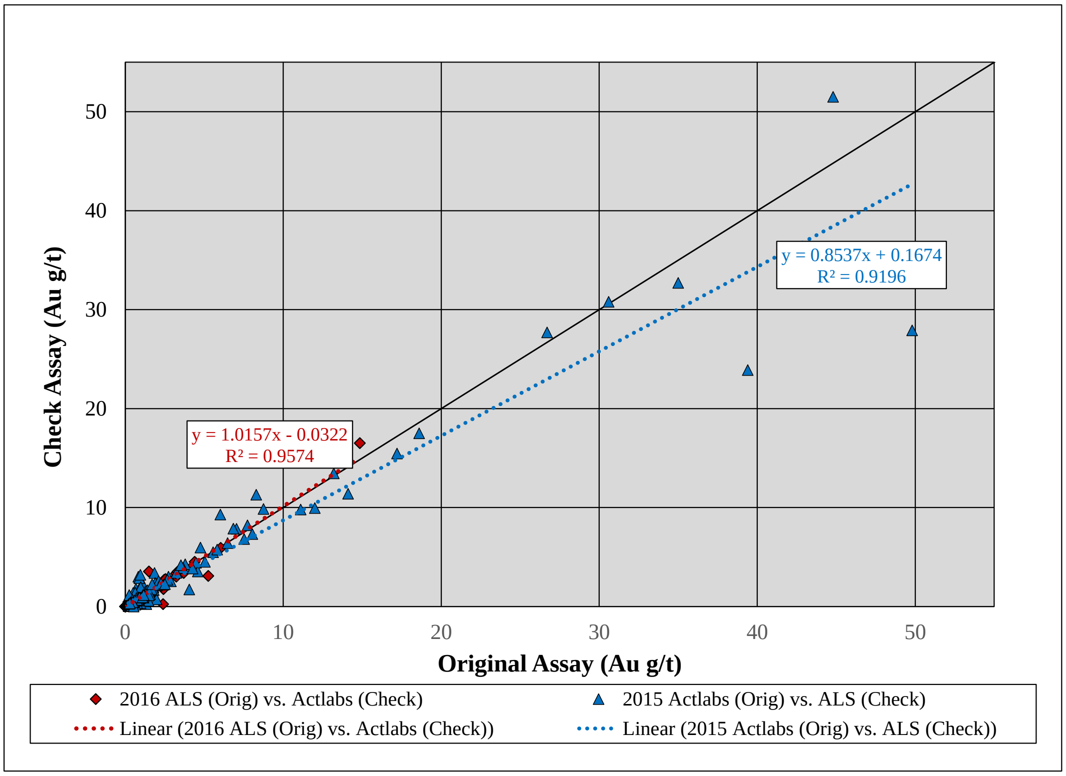


Figure 11.10 A Silver Accuracy Plot for Original vs. Check Assays, the Company's 2015 and 2016 Drilling Programs, Spectrum-GJ Project Area
(compiled from information supplied by the Company)

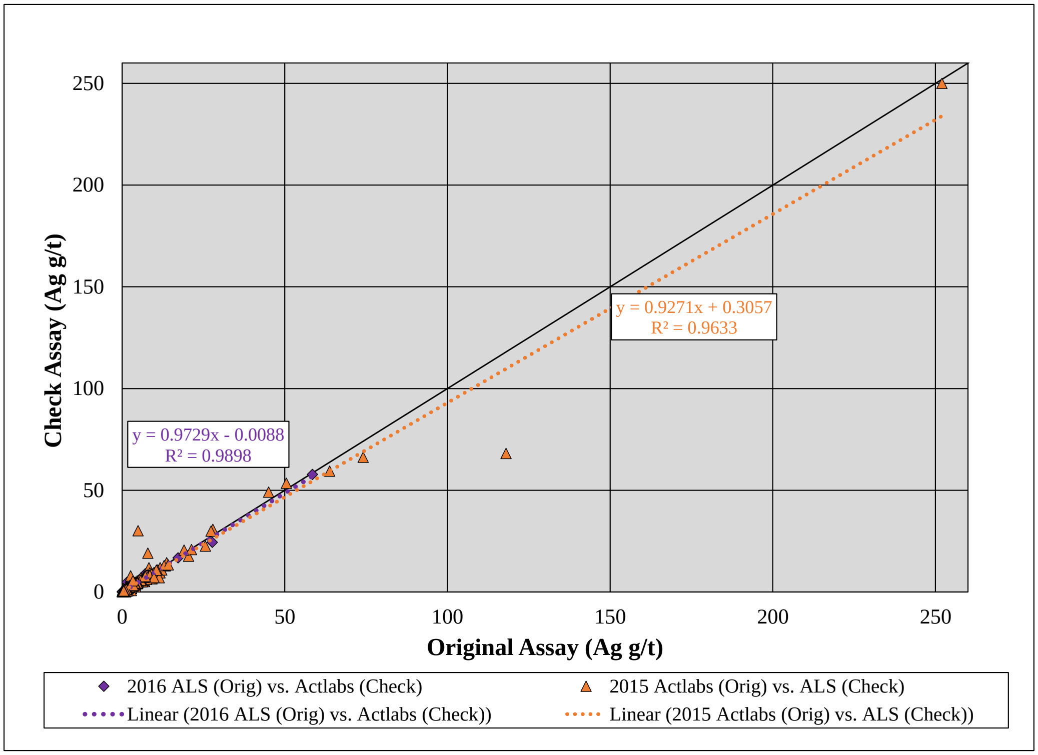
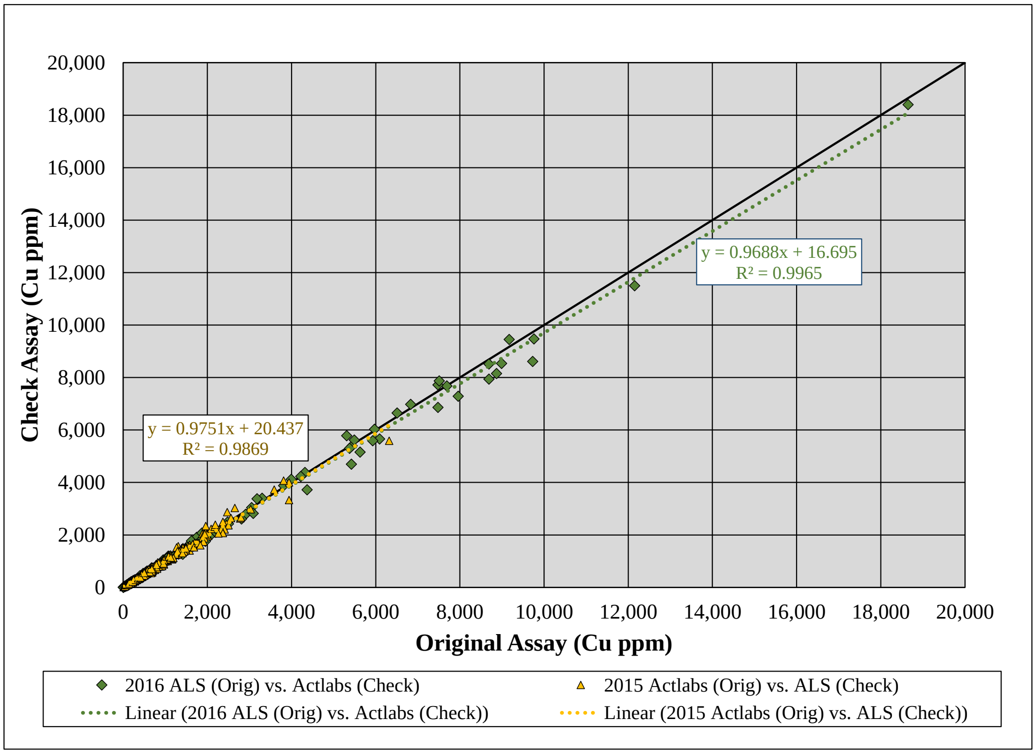


Figure 11.11 A Copper Accuracy Plot for Original vs. Check Assays, the Company's 2015 and 2016 Drilling Programs, Spectrum-GJ Project Area
(compiled from information supplied by the Company)



11.6.6 The Company's Re-Assay Programs

In 2014 and 2015, the Company re-sampled selected intervals of historical drillcore from programs at the Central Zone, completed by Cominco Ltd. in 1989 and Columbia Gold Mines Ltd. in 1990 through 1992. Although most of the high-grade gold intervals had been removed by previous operators, recognizable labels were present and the core could be sampled with confidence.

A total of 359 gold samples and 367 copper samples were re-sampled and then analyzed by Acme at Vancouver B.C. in 2014 and by ActLabs of Kamloops, B.C. in 2015. The sample security, sample preparation and sample analysis procedures in 2014 are described in Sub-Sections 11.2.1, 11.2.2 and 11.2.3, respectively and for 2015 they are described in Sub-Sections 11.3.1, 11.3.2 and 11.3.3, respectively.

The results showed that above 10 g/t Au, there is a strong bias towards the original sample results, which is attributed to incomplete core in the check samples due to the removal of high-grade, show pieces of core by previous operators. At lower Au grades, there is better correlation of original and check analysis results, but still a high degree of variability with both higher and lower Au results being returned. For copper, there is a very good correlation of check results to original results. Although there is a significant scatter in the Au data, on average, Au and Cu values are comparable to those reported by previous operators, indicating that these historical assays can be used with an acceptable degree of confidence.

The Company has not undertaken any data validation by re-sampling and independent analysis of historic core from the Donnelly Deposit. In QP Mehner's opinion, the Company's decision is appropriate as the historic drilling programs carried out by CGH and Teck utilized industry standard QA/QC protocols. In addition, QP Mehner was responsible for CGH's 2004 through 2007 sampling and QA/QC programs. Furthermore, in 2005, CGH re-sampled drillcore intervals from the 1970 and 1971 Amoco, 1981 Canorex and 1977 and 1980 TexasGulf drilling and concluded that while copper assays show good correspondence between original and re-sampling, original results for gold and especially silver in the Amoco and Canorex work are suspect and should be used with caution or not at all. The Amoco and Canorex holes are not located on the Donnelly Deposit and as such were not used for the Mineral Resource estimates reported herein, whereas TexasGulf's 16 holes drilled in 1977 and 1980 are as the data is acceptable.

11.7 Qualified Person's Opinion

Sample collection, preparation, analysis and security for historical data is in assumed line with industry-standard methods for porphyry-style deposits, but the data has not been verified with appropriate supporting QA/QC results. This is stated because there is little or no documentation available of sample preparation, analytical techniques and QA/QC procedures employed for the drilling programs carried out on the Central Zone up to and including 1992 and those carried out on the Donnelly Deposit prior to 2004, despite which:

- QP Mehner's concurs with the principal author of the August 2014 Technical Report (Jacques R. Stacey, MSc., P. Geo.) that '*the QP is satisfied that historical lab results were reasonably accurate and precise for the time, and that assays were performed by accredited analytical laboratories*' that may be considered reputable;

- QP Mehner agrees that there is no reason to believe that '*any of the historical results could be misleading or erroneous*';
- all sampling carried out since 1989 through 2007 was either performed by the QP Mehner or was carried out under his supervision, while managing exploration work for Ascot and CGH; and
- the principal author of the April 2016 Technical Report (Giles R. Peatfield, Ph.D., P. Eng.) worked as a project geologist and later manager for TexasGulf as that company explored the target area from 1976 to 1980, and consulted to CGH from 2004 to 2008.

All subsequent drilling programs included the insertion of blank, duplicate and standard reference material samples, and the program results do not indicate any problems with the analytical programs. The databases included checks on surveys, collar co-ordinates, lithology data and assay data. In QP Mehner's opinion, the checks are appropriate, and consistent with industry standards and include independent data audits. Furthermore, all core has been catalogued and stored in designated areas, and it is being appropriately safeguarded against damage by weather or machines.

In QP Mehner's opinion and subject to data verification (see Section 12):

- the quality of the gold, silver and copper analytical data available up to and including 1992 for the Central Zone and up to an including 2003 for the Donnelly Deposit are sufficiently reliable to support Mineral Resource estimation, but due to the lack of appropriate supporting QA/QC results, the data should not be used to support classification of Measured blocks; and
- the quality of the gold, silver and copper data from all the drilling programs carried out since 1992 on the Central Zone and since 2003 on the Donnelly Deposit are sufficiently reliable to support Mineral Resource estimation without limitation.

12 DATA VERIFICATION

David Thomas, P. Geo. ("QP Thomas") is responsible for this section of this Technical Report.

12.1 Drillhole Logging

During QP Thomas' September 2016 site visit to the Project Area, he examined core from three drillholes to verify the drillhole logging. Comparisons were made of the logged lithology, alteration and mineralization reported in the Company's drillhole database with QP Thomas' own observations. Only minor differences were found that, in QP Thomas' opinion, do not materially affect the quality or veracity of the Company's database.

12.2 Assay Database

12.2.1 2014 Verification

As part of a wider due diligence program, the principal author of the August 2014 Technical Report (Jacques R. Stacey, MSc., P. Geo.) examined and verified the digital drillhole database for the Spectrum claims block, supplied by Mining Associates (who had retained the database following their 2003 review of the historical Mineral Resource estimates summarized in Section 6.2, since when no additional drilling had been carried out on the Spectrum claims block). Data verification was '… *accomplished by plotting the digital data in a GIS workspace (MapInfo™/Discover™) and comparing the digital data to the original paper drill hole logs as contained in Assessment Reports found in the BC Ministry of Energy and Mines Assessment Report Indexing System (ARIS). Assessment reports for the property can be found at http://aris.empr.gov.bc.ca/ (search term: Spectrum)*'. The datasets that were verified included '*drill collar locations, downhole surveys, drill core lithologies, and, most importantly, historical gold assays*'. The principal author of the August 2014 Technical Report concluded that '*the data contained in the drill database obtained from Mining Associates is reasonably accurate, and match the historical records publicly available*'.

12.2.2 Qualified Person's Verification

QP Thomas carried out a detailed verification of the Company's drillhole database, during November and December 2016. By virtue of the 2014 analysis summarized above, QP Thomas' focus for the Central Zone was on the results of the Company's drilling programs carried out during 2014 through 2016. For the Donnelly Deposit, data from the Company's 2016 drilling program was reviewed, as well as a selection of historical assays.

All relevant, available data was utilized including reports, logs and ancillary data in digital format, as well as assay certificates in .pdf format that were sent direct to QP Thomas by the source assay laboratories used by the Company. Historical assay data was reviewed through reference to certified copies (in .pdf format, where possible) of the original assay certificates.

To complete the verification, data contained in the Company's drillhole assay database was compared directly with information contained on .pdf copies of the original assay certificates. Verification focused on the available data and its format, what data was collected, back-up reference material, data consistency and the accuracy and reliability of the data. QP Thomas was given unlimited access to all data stored on the Company's digital database and he was not limited as regards data acquisition and analysis. The results are summarized on Table 12.1.

Table 12.1 A Summary of the Qualified Person's Assay Database Verification Program, Spectrum-GJ Cu-Au Project
(compiled from information supplied by QP Thomas)

Laboratory	Year	Operator	Number Checked	Total Assays in Database	Percent Checked
Central Zone					
Acme	2014	Skeena Resources	238	970	33.8%
Actlab-BV			90		
Actlab-BV	2015	Skeena Resources	565	8,817	7.3%
Actlab SFA			80		
ALS	2016	Skeena Resources	3,074	3,522	87.3%
Database (Company drillholes only)			*4,047*	*13,309*	*30.4%*
Total database (historical + Company drillholes)			*4,047*	*19,575*	*20.7%*
Donnelly Deposit					
Loring	1981	Canorex	166	570	29.1%
Min-En	1990	Ascot Resources	256	505	50.7%
ALS	2004-2006	Canadian Gold Hunter	6,064	13,242	45.8%
ALS	2016	Skeena Resources	1,436	1,559	92.1%
Database (Company drillholes only)			*7,922*	*15,876*	*49.9%*
Total database (historical + Company drillholes)			*7,922*	*22,428*	*35.3%*

Verification of the data was hampered by the assay certificates not consistently reflecting the priority-based assay shown in the Company's database, by which the most reliable analytical method is used (for example, metallic assay is used ahead of 50 g fire assay, which is used ahead 30 g fire assay, which in turn is used ahead of ICP-MS). Any differences between assays in the Company database and the relevant assay certificate were resolved by the Company. In addition and in total, eight errors were found in the Ascot drillholes from 1990: the gold assays had been incorrectly calculated from the copper ppm field rather than the gold ppb field. The identified errors were also fixed.

It is in consequence of the outcomes of his verification program that QP Thomas recommends that:

- the Company's database structure is modified so that the final assays relate to the appropriate certificate number; and
- all the historical data is verified against the source documents.

12.3 Drillhole Collars

12.3.1 Central Zone

As stated in Section 10.1, significant effort was expended by the Company in 2014 to verify the collar positions of the 80 historic holes drilled on the Spectrum claims block. Forty four individual collars were located in the field and surveyed using a hand-held DGPS instrument and the collar elevations were checked by Company geologists using LiDAR^{TM}. The positions of the 36 drillhole collars that could not be located in the field were estimated:

- the original and re-surveyed positions of the 44 drillhole collars that could be located in the field were analyzed and an overall mean difference between the two datasets was determined;
- the mean difference was applied to the individual positions of the 36 historic holes that could not be located in the field, as defined on plans compiled by the original owners and operators;
- the validity of the collar co-ordinates defined using the method outlined above were checked by means of a review of the drilling patterns for the historic holes and the relative positions of individual holes assessed (no changes of any significance were found); and
- the collar elevations were checked by Company geologists using LiDAR^{TM}.

12.3.2 Donnelly Deposit

The historical drillholes located on the Donnelly Deposit were surveyed in 2004 by CGH personnel, using a DGPS device. All those drillholes completed since 2004 had drillhole collar surveys completed by DGPS, inclusive of: the 126 holes drilled by CGH between 2005 and 2007; the seven holes drilled by Teck in 2011 and 2013; and the eight holes drilled by the Company during 2016.

12.3.3 Qualified Person's Checks

The locations of 12 drillhole collars were checked by QP Thomas during his September 2016 site visit to the Project Area, using a hand-held GPS device. Eight checks were completed on the Central Zone and four checks were completed on the Donnelly Deposit. Only minor differences were found between the co-ordinates stated in the Company's database and co-ordinates collected during QP Thomas' site visit. The results are summarized on Table 12.2.

Table 12.2 A Summary of the Qualified Person's Drillhole Collar Co-ordinates Verification Program, Spectrum-GJ Cu-Au Project
(compiled from information supplied by QP Thomas)

Drillhole	Field Checks			Company Database			Differences		
	Easting	Northing	Elevation	Easting	Northing	Elevation	Easting	Northing	Elevation
S15-026	411,471	6,395,152	1,484	411,470.2	6,395,149.5	1,475.2	-0.8	-2.5	-8.8
S15-035	411,489	6,395,235	1,465	411,489.1	6,395,236.7	1,456.0	0.1	1.7	-9.0
S15-029	411,446	6,395,238	1,467	411,446.5	6,395,238.4	1,457.5	0.5	0.4	-9.5
S15-017	411,410	6,395,100	1,506	411,409.1	6,395,100.7	1,498.3	-0.9	0.7	-7.7
S15-030	411,448	6,395,000	1,519	411,449.1	6,395,000.3	1,511.6	1.1	0.3	-7.4
S15-032	411,502	6,394,972	1,512	411,498.5	6,394,975.9	1,505.1	-3.5	3.9	-6.9
S15-060	411,462	6,394,929	1,530	411,460.2	6,394,930.4	1,522.5	-1.8	1.4	-7.5
S16-089	411,169	6,395,111	1,569	411,179.0	6,395,107.7	1,560.7	10.0	-3.3	-8.3
CGH-07-175	425,381	6,390,946	1,599	425,381.1	6,390,948	1,595.8	0.1	2.0	-3.2
CGH-04-004	425,421	6,390,916	1,600	425,418.9	6,390,918	1,599.2	-2.1	2.0	-0.8
CGH-07-215	424,961	6,391,240	1,578	424,961.4	6,391,243	1,574.7	0.4	3.0	-3.3
CGH-07-212	424,962	6,391,243	1,577	424,961.3	6,391,247	1,574.9	-0.7	4.0	-2.1

12.4 Specific Gravity Database

12.4.1 Central Zone and Surrounding Prospects

In 2015 and 2016, whole core samples were measured at the Company's site exploration camp for SG, using the classic Archimedes method. In 2015, 572 samples were measured by Company personnel; 298 samples were measured by Company personnel in 2016. Of these 858 are for the Central Zone. To verify the 2015 and 2016 field SG measurements:

- in 2015, 373 samples from the Central Zone and surrounding prospects were submitted as SG checks to ActLabs of Kamloops, B.C., utilizing the pycnometer method; and
- in 2016, 86 samples from the Central Zone and surrounding prospects were submitted to ALS Minerals of North Vancouver, B.C., utilizing the paraffin coated, half-core method.

In both 2015 and 2016, a very slight negative bias in the SG data compiled at the Company's site exploration camp was found. This may be attributed to the different measurement techniques used at the Company's exploration camps and by the independent laboratories. In the opinion of QP Thomas, the slight difference does not materially affect the tonnage estimates of the 2017 Mineral Resource estimate for the Central Zone presented in Section 14. Table 12.3 summarizes a comparison, by lithology, of site-measured SG values with those determined in the laboratory. It may be seen that the results show very similar SG values.

Table 12.3 A Summary of Site-Determined and Laboratory Determined SG Values, by Lithology, Central Zone, Spectrum-GJ Cu-Au Project

Logged Lithology	Number	Mean Site SG (g/cm^3)	Mean Lab SG (g/cm^3)	% Difference
AT	14	2.73	2.71	1.0%
AUG-POR	3	2.80	2.80	0.1%
EBAS	1	2.92	2.91	0.4%
MONZ	15	2.67	2.69	-0.6%
VCSB	1	2.68	2.65	1.1%
VOLC	27	2.78	2.82	-1.8%
VWCK	5	2.74	2.72	0.5%
XT	17	2.88	2.77	4.0%
All	***83***	***2.77***	***2.76***	***0.3%***

12.4.2 Donnelly Deposit

Table 12.4 summarizes the SG database for the Donnelly Deposit. It may be seen that due to the limited amount of drilling carried out by the Company (eight holes in 2016), the SG database of 1,316 measurements (not including the 55 check measurements noted below), is skewed in favour of field data collected by CGH (using exclusively the classical Archimedes method) and Teck (by Acme, using exclusively their Standard G812 method).

Table 12.4 A Summary of the Available SG Database for the Donnelly Deposit, Spectrum-GJ Project Area
(compiled by QP Thomas from information contained in the Company's SG database)

Year	Company	Field Measurements	Acme Measurements	ALS Measurements
1981	Canorex		3*	
2005	Canadian Gold Hunter	461	-	-
2006		552	-	-
2007		154	-	-
2013	Teck Resources	-	146	-
2016	Skeena Resources	-	-	100

Note: * - Measurements collected by Canadian Gold Hunter in 2012, on Canorex drillcore

The 100 SG measurements taken during the Company's 2016 drilling program were determined by ALS Minerals of North Vancouver, B.C. ("ALS") using the paraffin half core method. Of these 100 samples, 55 were selected from CGH drillcore using, wherever possible, the same core pieces as those measured by CGH. Analysis of the results of the 2016 laboratory-based SG measurements shows that they agree favorably with CGH's field determined values, insofar as the laboratory-measurements are average only 1.1% lower than CGH's field measurements. In the opinion of QP Thomas, the slight difference does not materially affect the tonnage estimates of the 2017 Mineral Resource estimate for the Donnelly Deposit presented in Section 14.

12.5 Qualified Person's Opinion

Verification of the Company's drillhole database indicates that there are no errors or inconsistencies that would have any material effect on the Company's database. In the opinion of QP Thomas, the level of database accuracy is acceptable and the database is suitable for use in Mineral Resource estimation:

- the Company operated within the guidelines of best industry practice during its drilling, logging, sampling and assay data management programs;
- excluding standards, duplicates and blanks, there are approximately 22,581 assays for drillholes located on or drilled into the Central Zone and 16,410 assays for drillholes located on or drilled into the Donnelly Deposit - only minor errors were found during the verification process, which were itemized and rectified; however
- data for the four holes drilled by Imperial in 1973 were excluded from the database used to compile the Mineral Resource update for the Central Zone, due to the lack of documentation and a lack of drillhole logs;
- although the percentage of the Company's overall database that was verified within the scope of the verification programs reported here exceeds industry standards, it is recommended that the entire assay database is verified going forward;
- the database of drillhole collars is acceptable for purposes of Mineral Resource estimation; and
- the database of 858 SG results (not including verification results) for Central Zone and 1,316 SG results (not including verification results) for the Donnelly Deposit is acceptable for purposes of Mineral Resource estimation.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

Christopher Martin, C. Eng. ("QP Martin") is responsible for this section of this Technical Report. Presented in the following text are summaries of past metallurgical testing programs and the results of the testing program carried out for purposes of the PEA (the "PEA program").

13.1 Central Zone

13.1.1 Test Programs

Prior to the PEA program, little metallurgical testing had been completed on Central Zone samples. The process design and metallurgical forecast are, therefore, based on the PEA program that was carried out during late 2016 and Q1, 2017. The work was primarily done at Blue Coast Research Ltd. of Parksville, B.C. ("Blue Coast"), supported by testwork and mineralogical studies at AuTec Innovative Extractive Solutions of Vancouver, B.C. ("AuTec").

13.1.2 Samples Tested

Three metallurgical composites were generated using drillcore from 57 intervals, taken from 12 holes selected by Company geologists, in conjunction with QP Martin and overseen by Project management. The composites included:

- one assaying 0.18% Cu and 0.84 g/t Au from the copper-gold porphyry zone (Domains 3 and 4 material, as described in Section 7.6); and
- two from high-grade gold / low-grade copper zones that assayed 0.98 g/t Au and 0.58 g/t Au, respectively, with less than 0.05% copper (Domain 5 material, as described in Section 7.6).

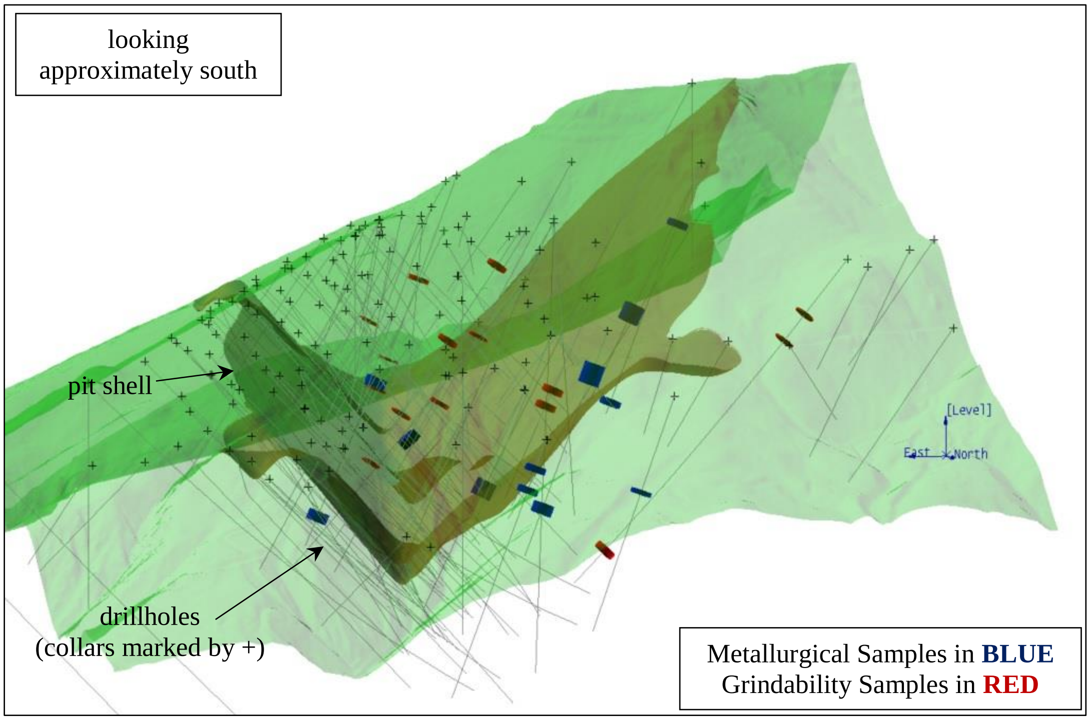
The objective was in each case to compile composites that reflected the expected average grades of the materials on mining. This was achieved, insofar as the production schedule for ROM material from Central Zone, that is (notionally) sent to the plant for processing, comprises a mixture of porphyry-related, vein-hosted, high-grade gold material (from Domain 5) and porphyry copper-gold material (from Domains 3 and 4), with overall average grades of 0.96 g/t Au (with a low of 0.70 g/t Au) and 0.13% Cu.

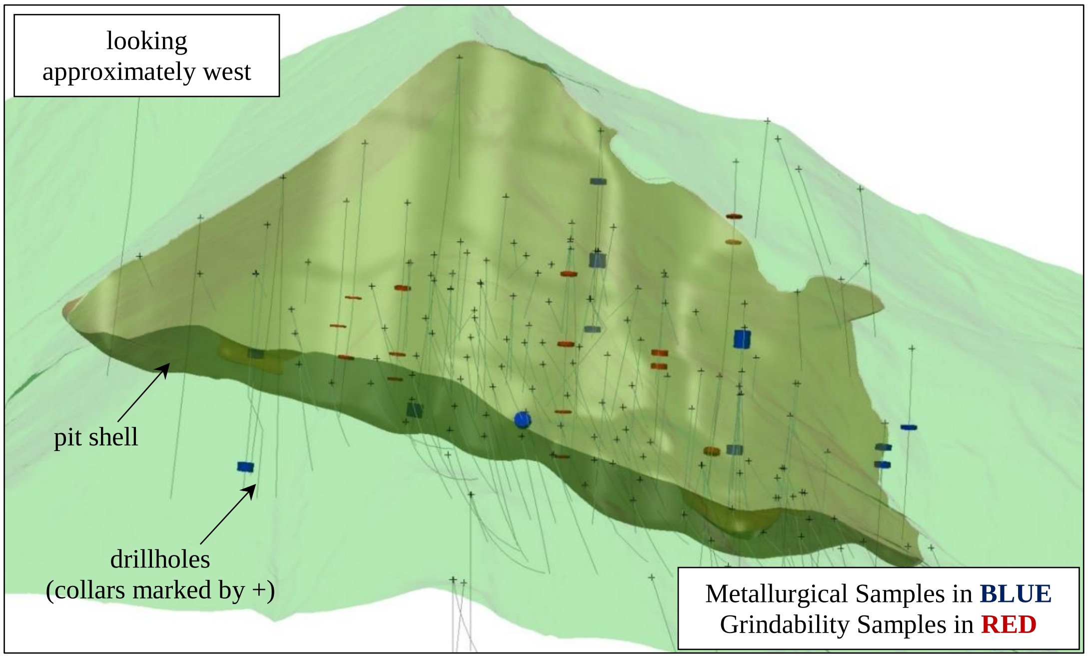
In addition to the metallurgical samples described, four composites were prepared from separate material for grindability testing. The samples were taken from intervals at different depths from seven drillholes, representing the four major lithologies deemed by Company geologists to most likely impact hardness (monzonite, crystal tuff, ash tuff and volcanic wacke).

Figure 13.1 identifies the distribution of the samples outlined, each of which is located within and or close to the volume of material expected to fall within the pit shell used to constrain the Central Zone Mineral Resources described in Section 14 (the PEA program was started before the pit shell used to constrain the Mineral Resources described in Section 14 was finalized, hence a best estimate of the likely pit shell was made for purposes of sample selection).

Figure 13.1 Vulcan™ Snapshots of the Distribution of the Central Zone Metallurgical and Grindability Samples, PEA Metallurgical Testing Program, Spectrum-GJ Cu-Au Project

(compiled by the Company, in conjunction with the Principal Author)

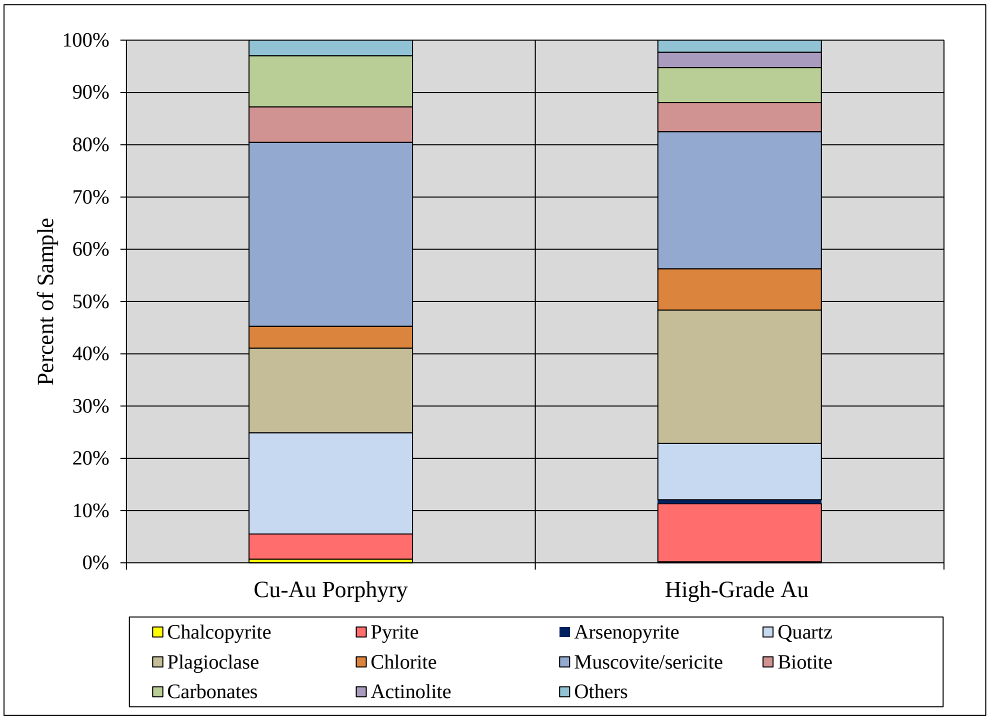




13.1.3 Mineralogy

The host rock mineralogy reflects the alteration of the resource: it is comprised of k-feldspar, sericite, chlorite, carbonates and quartz (see Figure 13.2). This has some impact on flotation efficiency, making the processing of Central Zone material alone somewhat challenging. The impacts of the mineralogy are, however, diluted and efficient processing appears to be possible by blending Central Zone material with material from the Donnelly Deposit. A small amount of actinolite was identified in the high-grade Au composite. Pyrite dominates the sulphide composition, with chalcopyrite in the porphyry composite and arsenopyrite in the high Au composite.

Figure 13.2 Modal Mineralogy of the Central Zone Composites, Spectrum-GJ Cu-Au Project



Gold in the tested samples/composites is mostly discrete and a fraction is quite coarse: gravity recovery of 28% was realized from a master composite comprising material from all three metallurgical composites, ground to P_{80} 150 microns. The nugget nature of some of the gold was also reflected in some of the challenges encountered in achieving an acceptable gold metal balance in some tests. The gold that was not liberated at the projected plant grind size is predominantly associated with pyrite, in the form of discrete, fine grains.

13.1.4 Grindability Testing

The average Bond Ball Mill work index for the four grindability composites tested within the scope of the PEA program was 18.4 kWh/t. Table 13.1 summarizes the overall grindability testwork program for the Central Zone composites.

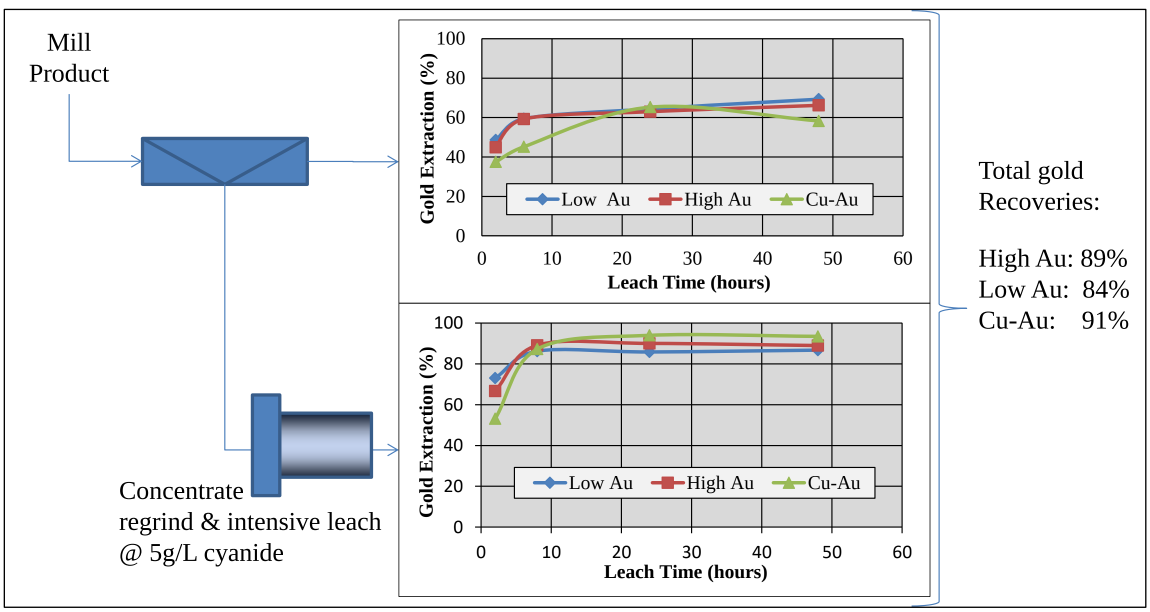
Table 13.1 A Summary of Bond Ball Work Index Results, Central Zone Composites, Spectrum-GJ Cu-Au Project

Composite	Bond Ball Mill Work Index
1 – Ash Tuff	21.8 kWh/t
2 - Monzonite	15.0 kWh/t
3 – Volcanic Wacke	19.2 kWh/t
4 – Crystal Tuff	17.6 kWh/t

13.1.5 Leaching

Gold contained within the tested Central Zone mineralization is amenable to leaching: direct leaching of each sample, ground to P_{80} 120 microns and using 1.0 g/L cyanide solution, yielded gold extractions of 89% for both the high-grade gold sample and the copper-gold porphyry sample. Furthermore, bulk sulphide flotation, regrinding the concentrate and leaching the reground product in conjunction with the flotation tails, yielded slightly higher recoveries, averaging 90% for both the high-grade gold and copper-gold porphyry samples. Figure 13.3 summarizes this.

Figure 13.3 Integrated Flotation and Leaching of Central Zone Samples, PEA Metallurgical Testing Program, Spectrum-GJ Copper-Gold Project



Leach times were fast, especially on the concentrate. While gold recovery was excellent, cyanide consumption rates were high and this, combined with the significantly higher capital cost of a leaching circuit over flotation, rendered cyanidation of the bulk flotation product unattractive.

Attempts to reduce cyanide consumption by dropping the concentration of cyanide used in the concentrate leach were somewhat successful, but led to poorer gold recoveries. However, there was a significant difference in gold leach extraction and cyanide consumption kinetics, with the gold leach essentially complete after eight hours while cyanide consumption was more modest at 2.4 kg/t (versus up to 13 kg/t after 48 hours). This difference in leach and cyanide consumption kinetics suggests the possibility of economic recovery of gold from pyrite concentrates through a short leach residence time, which has been exploited in the design of the leaching section of the plant (see also Sub-Section 13.2.8).

13.1.6 Flotation

Twenty two flotation tests were carried out on the three Central Zone metallurgical composites. Eight of these tests were used to determine the recoverability of gold and copper to a bulk sulphide flotation concentrate, with a view to possible fine regrinding and/or intensive cyanide leaching of the gold. Gold recoveries to bulk sulphide concentrate from higher grade samples reached as high as 96% at mass pull rates of 20%. In two tests the bulk rougher concentrates were cleaned to determine the maximum possible gold grade of cleaned bulk sulphide concentrates. These tests cleaned the concentrates to near-pure sulphides, but these assayed only 8 g/t to 9 g/t Au. In the opinion of QP Martin, these grades are too low for the concentrates to be saleable on the open market.

The majority of the tests were employed to examine the selective recovery of copper and/or gold to a high-grade flotation concentrate, with the chalcopyrite and gold floated selectively from the pyrite. The objective of these tests was to determine the recoverability of the pay metals to a concentrate that, either alone or blended with Donnelly Deposit concentrates, could potentially be saleable. The copper-gold porphyry material yielded concentrate grades of 26% Cu and 130 g/t Au at recoveries of up to 58% and 51%, respectively. The association of finer gold grains with pyrite limited the achievable gold recoveries.

13.2 Donnelly Deposit

13.2.1 Test Programs

A limited program of rougher flotation tests was completed in 2005 by Westcoast Mineral Testing Inc. of North Vancouver, B.C. (Hawthorn, 2006). Based on these results, copper recoveries of 75% to 85% were projected, into low-grade copper concentrates. Gold recoveries were projected at 60% to 63%.

In 2015, Teck interpreted the data, as well as some mineralogical data for the Donnelly Deposit, thereby to provide some general impressions of likely metallurgy for their GJ project (Rairdon, 2015). No gold recovery predictions were made, but Rairdon (2015):

- concluded that a conventional porphyry flowsheet would be appropriate for the project, with a primary grind size of 150 to 200 microns and a regrind size of 25 to 40 microns;
- forecast concentrate grades of 24% to 26% Cu at 85% to 87% Cu recovery from copper headgrades in the 0.5% to 0.6% range; and
- suggested that material from the Donnelly Deposit '*will produce a very clean concentrate, with very little risk of the project incurring penalties or facing concentrate rejection scenarios*'.

It should be emphasized that the conclusions of the study were made without the benefit of any additional metallurgical data over the rougher flotation data obtained in 2005.

The PEA program started in late 2016, with the objectives of developing an appropriate flowsheet and demonstrating metallurgical responses. In common with the work carried out on Central Zone composites, the program was carried out by Blue Coast, supported by Autec. The flowsheet designed for the PEA has been derived largely from the results of the PEA program (see Section 17).

13.2.2 Samples Tested

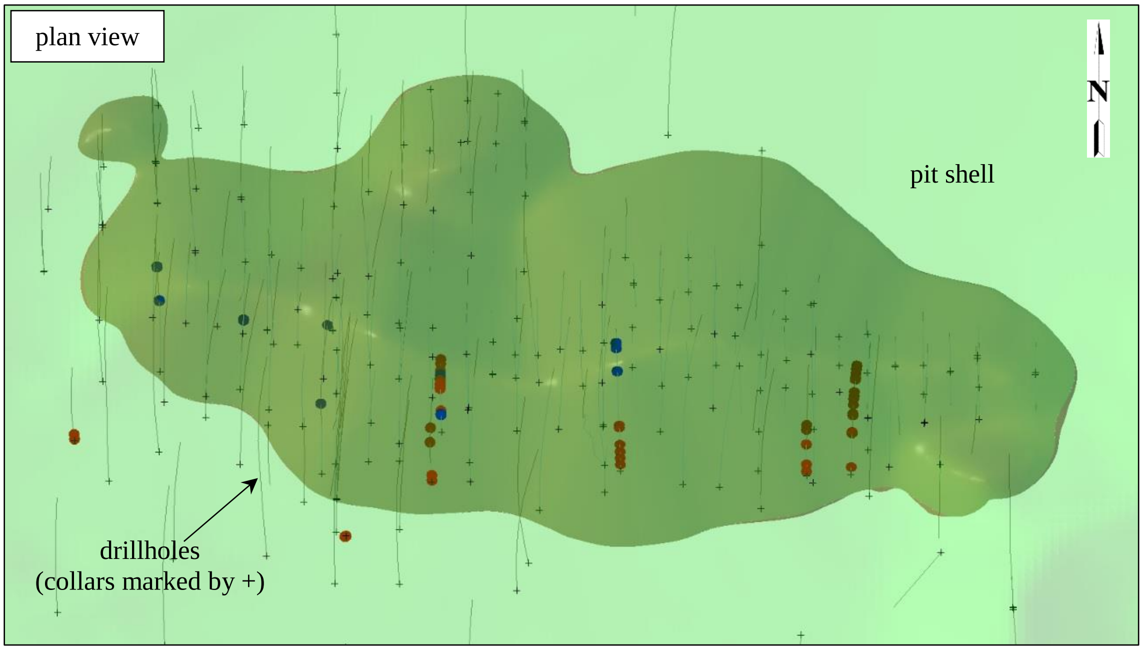
Two metallurgical composites were created using drillcore samples from the Donnelly Deposit. The composites were compiled to ensure they represented the two dominant mineralized units: the Mineralized Intrusive domain (the “Intrusive Composite”); and sedimentary-volcanic units of the Mixed Domain (the “Sedimentary-Volcanic Composite” - see Section 7.6). Each comprised of a variety of lithologies from a total of 43 drillcore intervals from 11 different drillholes at varying depths, within and immediately around the volume of material expected to fall within a pit shell used to constrain the Donnelly Deposit Mineral Resources described in Section 14 (see Figure 13.3, the PEA program was started before the pit shell used to constrain the Mineral Resource described in Section 14 was finalized, hence a best estimate of the likely pit shell was made for purposes of sample selection). The samples were selected by Company geologists, in consultation with QP Martin and overseen by Project management.

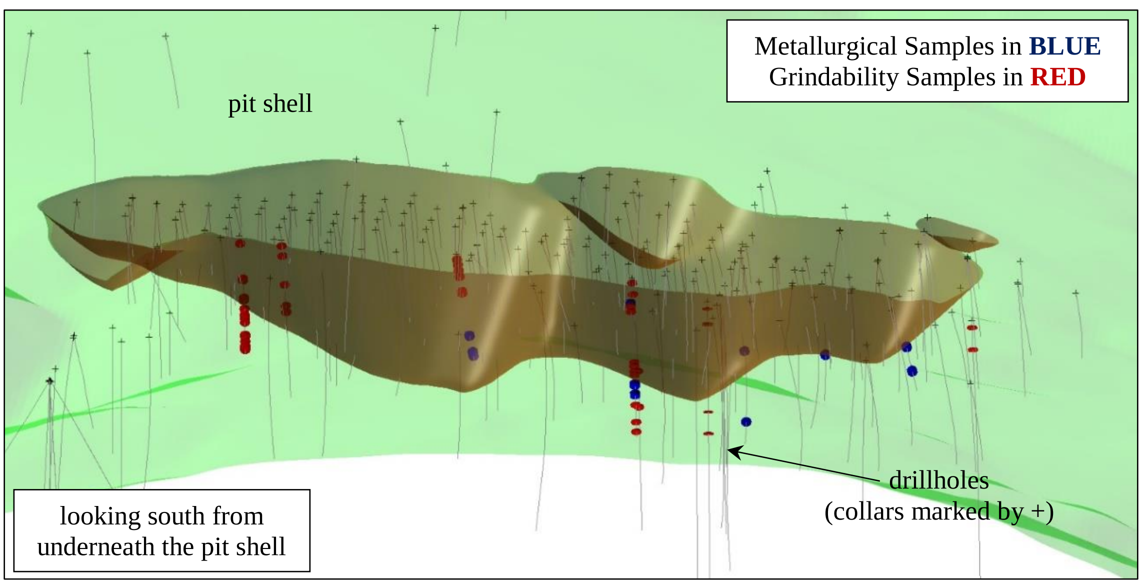
The Intrusive Composite and Sedimentary-Volcanic Composite assayed 0.39 g/t Au and 0.56 g/t Au, respectively, and 0.28% and 0.39% Cu, respectively. These grades reflect well the range of plant feed grades expected by virtue of the ROM production schedule for Donnelly Pit, presented in Section 16:

- the average grades of the ROM material (notionally) sent to the plant for processing during the first five years of production, when higher-grade material is targeted and notionally exploited, are 0.44 g/t Au and 0.41% Cu;
- the average grades of the ROM material (notionally) mixed with ROM material from the Spectrum Pit during production Years 6 through 11 are 0.36 g/t Au and 0.34% Cu; and
- the average grades of the ROM material from Donnelly Pit (notionally) sent to the plant for processing over the 23 year production life of Donnelly Pit are 0.32 g/t Au and 0.28% Cu.

In addition to the metallurgical composites described, two grindability composites were prepared, again representing the Mineralized Intrusive and mineralized sedimentary-volcanic units of the Mixed Domain (Figure 13.4). In common with the metallurgical composites, each of the grindability composites consisted of a variety of lithologies.

Figure 13.4 Vulcan™ Snapshots of the Distribution of the Donnelly Deposit Metallurgical and Grindability Samples, PEA Metallurgical Testing Program, Spectrum-GJ Cu-Au Project
(compiled by the Company, in conjunction with the Principal Author)

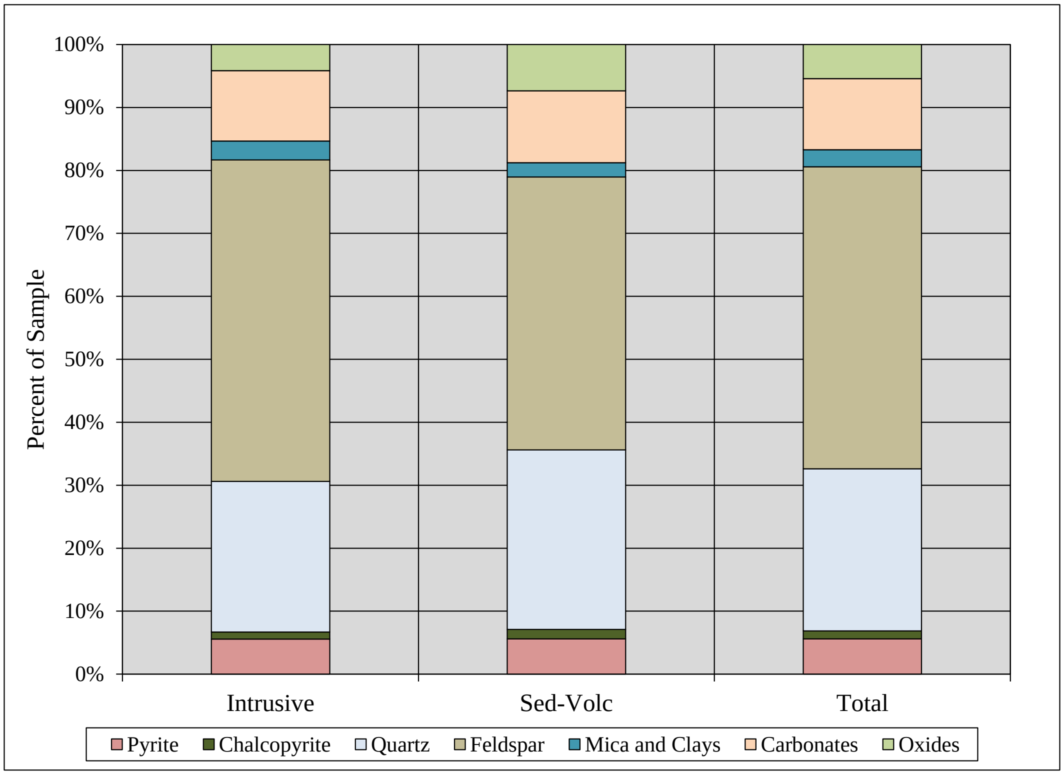




13.2.3 Mineralogy

The modal mineralogy of the two tested composites is summarized on Figure 13.5. Copper mineralization comprised chalcopyrite only; the only other sulphide mineral present in significant abundance was pyrite, which comprised 6% of both composites. Various feldspars comprised 43% to 50% of the material, while quartz comprised a further 25%. Carbonates (11%) were the next most abundant mineral group, comprising calcite and ferroan dolomite. In marked contrast to the Central Zone composites, clays were notably absent.

Figure 13.5 Modal Mineralogy of the Donnelly Deposit Composites, Spectrum-GJ Cu-Au Project



Textural analysis of the chalcopyrite pointed to medium- to coarse-grained mineralization, with approximately 70% of the copper sulphide being liberated at 120 microns. This typically points to selection of a moderately coarse primary grind size (for example, P_{80} 150 to 200 microns).

13.2.4 Grindability Testing

The average Bond Ball Mill Work Index from the two samples was 19.8 kWh/t. JK 'RTB Lite' testing at Autec yielded a SAG milling Axb value of 37.3, while the crusher work index was measured at 7.2 kWh/t (Table 13.2).

Table 13.2 A Summary of Grindability Parameters, Donnelly Deposit Composites, Spectrum-GJ Project

Composite	JK SimMet Axb	Crusher Work Index CWi	Bond Ball Mill Work Index (kWh/t)
Intrusive	37.3	7.2	20.1
Sedimentary-Volcanic			19.5

13.2.5 Gravity Recovery

The two Donnelly Deposit composites were subjected to gravity recovery testing using a Knelson concentrator. Both composites contained a small amount of gravity recoverable gold, with recoveries ranging from 9% to 24%, but to low-grade concentrates. This suggested that, in combination with gravity concentrates from Central Zone feed and the pyrite concentrates described in Sub-Section 13.2.8:

- economic cyanidation of the gravity and pyrite concentrates could be realized; and
- once the required capital for a cyanidation plant had been paid off, it could be economically sustained at the expected Donnelly Deposit ROM feed grades.

A preliminary trade-off study using factored capital and operating cost estimates of and for cyanidation of (low-grade) gravity concentrates from 100% Donnelly feed suggested a much longer pay-back period for the required capital expenditures, which outcome did not meet project planning objectives. A cyanidation plant for pyrite-rich products (plus an Acacia intensive cyanidation plant for gravity concentrates) was, therefore, deferred until Central Zone plant feed came online. It was further assumed that a refinery-grade gravity concentrate would be sold during the early project years.

13.2.6 Flotation

The mineralogy, and earlier studies by Rairdon (2015), pointed to Donnelly Deposit material being responsive to a conventional copper-gold flotation flowsheet, as practiced at several current B.C. operations. As such, the flowsheet was assumed to include primary grinding, copper rougher flotation, concentrate regrinding and two or three stages of laboratory cleaning (substituted in practice with column flotation). The presence of coarse gold, especially in Central Zone material, meant that gravity recovery would probably be incorporated in the circuit.

Twenty one batch, rougher and cleaner flotation tests were used to create the flowsheet employed for purposes of the PEA. The tested parameters included primary grind size, collector dosage and residence time in the copper and pyrite floats. Lime was used as a pH modifier to aid in the depression of pyrite in the copper circuit. For the sake of simplicity, the rougher pH was fixed at 10.5, which is typical of many B.C. Cu-Au circuits. Copper rougher recoveries of over 90% were achieved in many tests. Gold recoveries were closely linked with mass pull and approached 80%, at 10% mass pull.

Recoveries improved with primary grind size: while the incremental improvement in recoveries dropped at sizes finer than 150 microns, a preliminary trade-off study, using factored capital and operating cost estimates, pointed to the optimum recovery being close to P_{80} 120 microns. The chosen rougher flotation treatment scheme also included a small dose of potassium amyl xanthate collector (4.0 g/t), MIBC frother and a short laboratory rougher residence time of six minutes.

Regrinding was shown to be beneficial in cleaner flotation, but the regrind size was not optimized. Regrind sizes close to or finer than P_{80} 20 microns were employed. Three stages of cleaning at pH 11 with small doses of potassium amyl xanthate yielded saleable grade copper concentrates, typically at 80% copper recovery or higher. The metallurgical responses from the composites representing the intrusive and sedimentary volcanic units were similar.

Two locked cycle tests, testing different primary grind sizes, were carried out on a blended composite of Donnelly Deposit material comprising the two Domain types of interest. Both tests stabilized well, thereby validating the flowsheet. The projected metallurgy from the two tests is summarized on Tables 13.3 and 13.4.

Table 13.3 A Summary of the Projected Metallurgy from LCT-1 (P_{80} 85 microns), Spectrum-GJ Cu-Au Project

Product	Weight		Assays (%, g/t)				Distribution (%)*			
	g	%	Au	Ag	Cu	S	Au	Ag	Cu	S
Final Bulk Concentrate	23	1.2	32.6	91.7	24.3	31.1	63	46	91	16
Copper Cleaner Tail	145	7.3	1.2	8.8	0.10	17.4	14	27	2	57
Pyrite Rougher Concentrate	85	4.2	1.0	6.1	0.12	12.2	7	11	2	23
Pyrite Rougher Tails	1,740	87.3	0.11	0.42	0.02	0.08	15	16	5	3
Calculated Head	**1,993**	**100.0**	**0.60**	**2.30**	**0.31**	**2.20**	**100**	**100**	**100**	**100**

Note: The percentages may not total 100, due to rounding.

Table 13.4 A Summary of the Projected Metallurgy from LCT-2 (P_{80} 120 microns), Spectrum-GJ Cu-Au Project

Product	Weight		Assays (%, g/t)				Distribution (%)*			
	g	%	Au	Ag	Cu	S	Au	Ag	Cu	S
Final Bulk Concentrate	25	1.3	28.2	82.0	22.0	30.4	65	49	90	18
Copper Cleaner Tail	143	7.2	1.0	8.6	0.12	19.9	14	29	3	65
Pyrite Rougher Concentrate	74	3.7	0.9	5.5	0.16	8.2	6	10	2	14
Pyrite Rougher Tails	1,747	87.8	0.10	0.29	0.02	0.08	16	12	6	3
Calculated Head	**1,989**	**100.0**	**0.55**	**2.10**	**0.31**	**2.20**	**100**	**100**	**100**	**100**

Note: The percentages may not total 100, due to rounding.

13.2.7 Co-Mingled Flotation

Batch-scale testing was carried out on a blend of feed materials comprising 25% from the Central Zone and 75% from the Donnelly Deposit. The tests demonstrated that concentrate grades of 20% to 25% Cu could be made. Recoveries from these unoptimized tests were lower than with the identical processing of material from Donnelly Deposit alone: recoveries were typically 4% to 6% lower for copper and 5% to 7% lower for gold, at any given concentrate grade. In QP Martin's opinion, with fine tuning the difference in performance could probably be reduced.

13.2.8 Pyrite Rougher Concentrate

A pyrite concentrate from Donnelly Deposit material was floated after copper flotation. This was combined with the copper first cleaner tails that were reground and leached. This material, containing 20% to 21% of the gold in the ROM plant feed, yielded 48% extraction after four hours, with 2.4 kg/t cyanide consumption. Preliminary economic analysis indicated such a process, including carbon handling and cyanide destruction, could be economic so this was incorporated into the process flowsheet for the PEA.

13.3 Copper Concentrate Characterization

A concentrate sample from testing of blended Donnelly Deposit material was subjected to ICP analysis to determine if any minor elements were present at concentrations sufficient to attract a penalty. Table 13.5 summarizes the results. It may be seen that arsenic (As) is present at 0.026%, antimony (Sb) at 0.066% and mercury (Hg solid) at 6 ppm. At these levels and in the opinion of QP Martin, none of the potentially deleterious elements are likely to trigger penalties at most smelters. It may also be seen that silver (Ag) is present at a high enough level to attract by-product payments.

Table 13.5 A Summary of Multi-Element Analysis of the Concentrate Produced from Processing ROM Material, Spectrum-GJ Cu-Au Project

Element	Units	Assay	Element	Units	Assay	Element	Units	Assay
Ag	ppm	81	Cu	%	24.7	Ni	%	≤0.001
Al	%	1	Fe	%	28.3	P	%	0.012
As	%	0.026	Hg	ppm	≤10	Pb	%	0.112
Ba	%	0.006	Hg (solid)	ppm	6	S	%	28
Bi	%	≤0.001	K	%	0.244	Sb	%	0.066
Ca	%	0.437	Mg	%	0.201	Se	%	0.017
Cd	%	0.005	Mn	%	0.007	Ti	%	0.056
Co	%	0.005	Mo	%	0.119	W	%	≤0.020
Cr	%	≤0.001	Na	%	0.182	Zn	%	0.184

A similar analysis to that summarized on Table 13.5 was obtained of copper concentrate floated from a 25% blend of Central Zone material. This also showed the concentrate to be free from deleterious elements such as arsenic (As), antimony (Sb) and mercury (Hg).

13.4 Tailings Characterization

Samples of pyrite concentrate, copper cleaner tails and rougher tails from a test on material from the Donnelly Pit were submitted for ABA analysis and multi-element analysis. The pyrite concentrate and the copper cleaner tails will be co-mingled and, after leaching and cyanide destruction, be delivered to the potentially acid generating ("PAG") portion of the planned TSF where they will always be under water. The rougher tails will be delivered to the non-acid generating ("NAG") portion of the same TSF (i.e. at the front, behind the dam).

Table 13.6 A Summary of the Multi-Element Analysis of Pyrite Concentrate, Copper Cleaner Tails and Rougher Tails, Spectrum-GJ Cu-Au Project

Element	Units	Assay Results			Element	Units	Assay Results		
		Cu Cleaner Tails	Pyrite Concentrate	Rougher Tails			Cu Cleaner Tails	Pyrite Concentrate	Rougher Tails
Ag	ppm	9.19	6.37	0.53	Mo	ppm	49.3	34.0	6.56
Al	%	1.16	1.52	1.27	Na	%	0.02	0.07	0.04
As	ppm	670	576	8.80	Nb	ppm	0.07	<0.05	<0.05
Au	ppm	1.00	0.90	<0.2	Ni	ppm	72.2	43.3	10.60
B	ppm	<10	10	<10	P	ppm	720	930	1250
Ba	ppm	10	20	530	Pb	ppm	246	109	6.30
Be	ppm	0.45	0.57	0.42	Rb	ppm	8.70	10.0	6.40
Bi	ppm	3.23	1.99	0.14	Re	ppm	0.083	0.060	0.009
Ca	%	2.62	3.26	3.99	S	%	>10	>10	0.10
Cd	ppm	4.50	8.82	0.90	Sb	ppm	23.9	13.8	1.02
Ce	ppm	10.45	14.20	20	Sc	ppm	6.30	7.90	8.20
Co	ppm	138.5	69.9	4.90	Se	ppm	54.9	26.3	1.10
Cr	ppm	14	20	18	Sn	ppm	0.80	1.00	0.8
Cs	ppm	1.07	1.30	0.92	Sr	ppm	82.5	118	127
Cu	ppm	1,170	1650	222	Ta	ppm	<0.01	<0.01	<0.01
Fe	%	20.10	11.20	3.44	Te	ppm	3.36	1.71	0.15
Ga	ppm	4.56	5.89	5.52	Th	ppm	0.80	1.10	1.00
Ge	ppm	0.24	0.14	0.07	Ti	%	<0.005	<0.005	<0.005
Hf	ppm	0.11	0.11	0.05	Tl	ppm	0.68	0.28	0.04
Hg	ppm	0.90	0.73	0.11	U	ppm	0.30	0.34	0.24
In	ppm	0.185	0.144	0.088	V	ppm	61	78	80
K	%	0.18	0.21	0.14	W	ppm	0.22	0.19	0.13
La	ppm	5.40	7.20	10.6	Y	ppm	8.36	10.65	13
Li	ppm	10.20	13.3	11.9	Zn	ppm	249	435	104
Mg	%	0.93	1.24	1.32	Zr	ppm	4.30	4.20	1.70
Mn	ppm	500	612	681					

13.5 Metallurgical Forecast

The metallurgical forecast has assumed a process flowsheet described in Section 17 (Recovery Methods), which creates saleable products in the form of a copper-gold flotation concentrate and a gold-silver rich doré.

To align with the mine production schedule presented in Section 16, metallurgical performance has been projected for plant feed comprising 100% Donnelly Deposit material and for co-mingled plant feed containing 75% Donnelly Deposit material and 25% Central Zone material. The key drivers in recovery were:

- Cu recoveries are as demonstrated from locked cycle testwork and, in the case of the Central Zone / Donnelly Deposit blend, penalized to reflect its typical difference in recovery in batch testing, compared with that achieved from 100% Donnelly Deposit material;
- Au recoveries to doré included gravity recovered gold (penalized to reflect expected gravity cleaning losses ahead of Acacia leaching) and gold recovered in leach tests on sulphide products products (a 1% carbon and solution based gold loss was included);
- Au recoveries to flotation concentrate reflect locked cycle data, minus that reporting to the Acacia leach feed from the gravity circuit; and
- Ag metallurgy was calculated in a similar fashion to gold, and it was assumed the recovery of silver to the gravity concentrate would be negligible.

Table 13.7 summarizes the metallurgical forecast. It has been assumed that the metallurgy from any blend of materials from Spectrum Pit and Donnelly Pit, besides a 100% Donnelly Pit feed and 75%:25% blended Donnelly Pit and Spectrum Pit feeds, would be calculated by interpolation or extrapolation of these two results, to a minimum of 70% Donnelly Pit feed.

Table 13.7 A Summary of the Metallurgical Forecast by Production Stage, Spectrum-GJ Cu-Au Project

Production			Flotation Recovery				Gravity Conc.			Doré Recovery		
Stage	Rate (tpd)	Donnelly Feed	Conc. Grade	Au (%)	Ag (%)	Cu (%)	Au (%)	Ag (%)	Cu (%)	Au (%)	Ag (%)	Cu (%)
1	10,000	100%	22% Cu	55	49	90	10	-	-	-	-	-
2	20,000	75% av.	22% Cu	49	54	86	-	-	-	24	7	0
3	30,000	100%	22% Cu	55	49	90	-	-	-	18	8	0

13.6 Ramp-Up Profiles

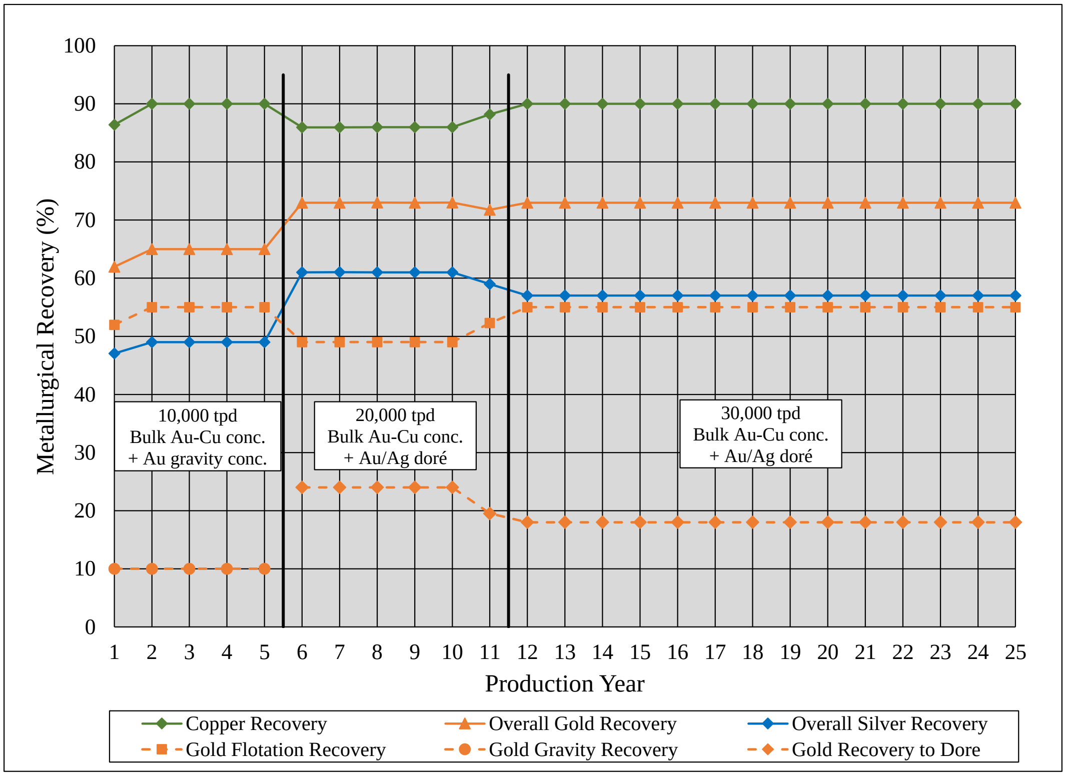
A ramp-up in throughput on start-up has been assumed with a target of 80% of nameplate throughput being achieved in Production Year 1. In reality, all selected major equipment is rated to achieve throughput rates slightly higher than those projected in both Stage 1 (10,000 tpd) and Stage 2 (20,000 tpd, including 5,000 tpd from Spectrum Pit) of the planned production schedule.

It is rare for plants to achieve target recoveries from Day 1. Accordingly, a ramp-up in recoveries has been assumed on start-up, based on published, post-start up performance numbers for a selection of operating B.C. copper mines. Table 13.8 summarizes the recommended recovery ramp-up profiles. Figure 13.6 summarizes the metallurgical recovery profiles by metal and project stage, as detailed in the PEA cashflow model and per Tables 13.7 and 13.8.

Table 13.8 A Summary of Ramp-Up Metallurgical Recoveries After Commissioning, Spectrum-GJ Cu-Au Project

Period	% of Final Recovery		
	Au	Ag	Cu
Q1, Y1	87	87	92
Q2, Y1	94	94	95
Q3, Y1	97	97	97
Q4, Y1	100	100	100

Figure 13.6 A Summary of the Metallurgical Recovery Profiles by Project Stage, PEA Cashflow Model, Spectrum-GJ Cu-Au Project
(compiled by the Principal Author from details of the metallurgical forecast and recovery ramp-up)



13.7 Qualified Person's Opinion

The metallurgical and mineralogical testwork completed to support the PEA has been completed at reputable Canadian testwork laboratories under the direct supervision of QP Martin. The metallurgical data provided in this Technical Report can, therefore, be considered to be of high quality and is of a level of robustness expected for a study of this magnitude. All chemical assays for base- and precious-metals were performed at reputable Canadian assay laboratories using conventional assay techniques and procedures.

The comments made in this section of this Technical Report are based on the samples as received by the testing laboratory. The sources of the samples has been described in the Sub-Sections 13.1.2 and 13.2.2. However, however beyond this information, no commentary can be made by QP Martin of the representativity of the samples, either lithologically or spatially to the potentially mined resources.

Owing to its far great tonnage contribution to the plant feed mix, metallurgy is mainly dictated by the material from the Donnelly Deposit. This material is moderately hard and resistant to grinding, falling quite close to the median hardness levels for the B.C. copper-gold industry.

Copper in Donnelly Deposit material occurs as chalcopyrite, with a grain size that is somewhat finer than is typical in B.C. mines. Gangue mineralization is straightforward and benign from a processing perspective. Accordingly, the projected primary grind (at P_{80} 120 microns) is slightly finer than typical of most recent projects in the province. However, the copper sulphides float well and copper recoveries of approximately 90% can be expected using conventional copper roughing, a moderately fine concentrate regrind and copper cleaner flotation. The copper concentrate is of saleable grade and free from deleterious elements that would typically attract smelter penalties.

Gold is mostly in discrete form and is mostly recoverable. An estimated 10% is recoverable by gravity in the grinding circuit, but a further 55% can be floated with the copper to the final bulk Cu-Au concentrate (a gold-rich, copper concentrate). The gold that is not captured in the copper flotation circuit is typically associated with pyrite and can be floated to a pyrite concentrate that responds to cyanide leaching. Total gold recoveries are projected to be approximately 73%.

Central Zone material contains more altered mineralization and reports lower average copper grades. This makes floating a saleable copper product more difficult when treated in isolation, but when blended with Donnelly Deposit material this problem is largely overcome. Copper recoveries are lower, at close to 50%, but gold recoveries by a combination of gravity, flotation and leaching are similar to those for Donnelly Deposit material. The presence of nugget gold in Central Zone material enhances the need for a gravity unit in the ball milling circuit.

A process flowsheet has been developed that has been demonstrated in the laboratory to respond to the processing of Donnelly Deposit material, as well as blends of Central Zone and Donnelly Deposit material, at least up a ratio of 25% Central Zone and 75% Donnelly Deposit material. This has been validated by locked cycle flotation testing.

14 MINERAL RESOURCE ESTIMATES

David G. Thomas, P. Geo., ("QP Thomas") is responsible for this section of this Technical Report. QP Thomas works as an independent mineral resource geologist with the geological consulting firm DKT Geosolutions Inc. of Vancouver, B.C. ("DKT").

14.1 2017 Mineral Resource Statement

The updated (2017) Mineral Resource estimates for the Central Zone and Donnelly Deposit are presented on Table 14.1. The estimates were prepared in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum standards on Mineral Resources and Mineral Reserves (2014). The estimate for the Central Zone is based on 164 diamond drillholes (88 completed by the Company) totalling 34,597.54 m and 22,581 assay intervals. The estimate for the Donnelly Deposit is based on 176 diamond drillholes (eight completed by the Company) totalling 48,325.27 m and 16,410 assay intervals.

The majority of the historical drillcore for both deposits is still available at site. A significant portion of the Spectrum material was re-logged and re-sampled by Company staff, as part of the Company's on-going Quality Assurance/Quality Control ("QA/QC") program of check assaying. All of the available, historical Donnelly core was previously re-logged (and partially re-sampled) by Teck.

Table 14.1 A Summary of the 2017 Mineral Resource Updates by David Thomas, P. Geo., Spectrum-GJ Cu-Au Project
(undiluted, pit constrained, 100% in-pit recovery, effective date January 06, 2017)

Category	Million Tonnes	Average Grades			Metal Content		
		Au (g/t)	Ag (g/t)	Cu (%)	Au (Moz)	Ag (Moz)	Cu (Mlb)
Spectrum Central Zone (0.40 g/t AuEq cut-off)							
Indicated	31.2	0.94	2.6	0.10	0.94	2.64	67.7
Inferred	29.8	0.47	1.4	0.12	0.45	1.34	76.4
GJ Donnelly Deposit (0.15% CuEq cut-off)							
Indicated	215.2	0.31	1.9	0.26	2.14	13.03	1,235.4
Inferred	28.3	0.31	1.8	0.14	0.28	1.64	85.1

Basis of Estimate

QP Thomas reviewed the Company's QA/QC programs on the Mineral Resources data. After removing samples with data quality issues, the QP concludes that the collar, survey, assay, and lithology data are adequate to support Mineral Resources estimation.

Domains were modelled in 3D to separate mineralized rock types from surrounding waste rock. The domains were modelled based on a combination of lithology, copper grades and gold grades.

Raw drillhole assays were composited to 4 m lengths broken at domain boundaries.

Capping of high grades was considered necessary and was completed for each domain on assays prior to compositing.

Block grades for gold and silver were estimated from the composites using an ordinary kriging interpolation method into 4 m x 4 m x 4 m blocks for Central Zone, and into 10 m x 10 m x 8 m blocks for the Donnelly Deposit.

Dry bulk density varies by domain. The dry bulk densities are based on 858 specific gravity measurements for Central Zone and 1,316 measurements for the Donnelly Deposit.

Blocks were classified as Indicated and Inferred in accordance with CIM Definition Standards, 2014.

For Central Zone, the results of a comparison with the previous Mineral Resource model, a drillhole spacing study and conditional simulation of gold grades were used to support the classification of Indicated Mineral Resources (Indicated Mineral Resources are classified on the basis of blocks falling within a drillhole spacing of 40 m x 40 m). Inferred Mineral Resources are classified on the basis of blocks falling within a drillhole spacing which varied by domain - for Domains 2 and 3 a spacing of 150 m was used and for Domains 4 and 5 a drillhole spacing of 75 m was used.

For the Donnelly Deposit, Indicated Mineral Resources are classified on the basis of blocks falling within a drillhole spacing of 75 m. Inferred Mineral Resources are classified using a drillhole spacing of approximately 150 m.

The Mineral Resource estimate is constrained within optimized pits with average slope angles of 45°. Metal prices of US$1,250/oz Au, US$2.75/lb Cu and US$17.75/oz Ag were used along with metallurgical recovery rates of 73% for gold, 90% for copper and 50% for silver and the estimated on-site operating costs.

Cautionary Notes

The contained copper, gold and silver values shown on Table 14.1 are in situ. No assurance can be given that the estimated quantities will be produced. All values have been rounded to reflect accuracy and to comply with securities regulatory requirements. Summations within the tables may not agree due to rounding.

Mineral Resources which are not Mineral Reserves do not have demonstrated economic viability. The estimate of mineral resources may be materially affected by environmental, permitting, legal, title, taxation, sociopolitical, marketing, or other relevant issues.

The quantity and grade of reported Inferred Mineral Resources in this estimation are conceptual in nature. There has been insufficient exploration to define these resources as an Indicated or Measured Mineral Resource and it is uncertain if further exploration will result in upgrading them to an indicated or measured mineral resource category.

Minimum Grade Cut-off

Minimum grade cut-offs for the Mineral Resource estimates were determined using the metal prices, metallurgical recovery rates and operating costs as outlined above, as well as smelter terms and applicable royalties applied to the following formula, the result of which is multiplied by 31.1035 to yield a precious metal cut-off but divided by 2,204.62 (assuming the metric system) and then multiplied by 100 to yield a base metal cut-off:

$$Xc = [(M_m - M_w) + (P_o - P_w) + (O_o - O_w)] / \{[r \cdot (V – R)] \cdot (1 – Gr)\}$$

where:

M_m = *the all-in unit cost of mining and delivering one ton of material to the primary crusher*

M_w = *the unit cost of mining, transporting and dumping one ton of waste on the waste dump*

P_o = *the unit cost of processing one ton of material (from primary crushing to production of a final, saleable product, inclusive of supervision and labour costs, consumables)*

P_w = *the unit cost of processing one ton of waste (inclusive of labour costs and consumables associated with avoiding potential water contamination and/or acid generation, as well as to satisfy any other applicable regulatory and environmental requirements)*

O_o = *the cost of on-site G&A*

O_w = *the unit cost of the additional on-site G&A associated with processing one ton of waste*

r = *recovery, or % of valuable product recovered on processing the mined material to a final saleable product*

V = *the value of one unit of the final saleable product*

R = *smelting, refining, transportation and other costs incurred per unit of final saleable product*

Gr = *payable NSR royalty (percent)*

Grade Equivalence

Grade equivalence for the Mineral Resource estimates were determined using the metal prices and metallurgical recovery rates summarized above, as well as smelter terms applied to the following formula:

AuEq = Au grade + [(Ag grade · (Ag revenue / Au revenue)] + [Cu grade · (Cu revenue / Au revenue)]

CuEq = (Cu grade + [(Au grade · (Au revenue / Cu revenue)] + [Ag grade · (Ag revenue / Cu revenue)]

where:

Au revenue = (1 / 31.1035) · Au plant recovery · Au smelter recovery · Au refinery recovery · unit Au price

Ag revenue = (1 / 31.1035) · Ag plant recovery · Ag smelter recovery · Ag refinery recovery · unit Ag price

Cu revenue = 2,204.62 · 0.01 · Cu plant recovery · Cu smelter recovery · Cu refinery recovery · unit Cu price

14.2 Sensitivity of Mineral Resources to Grade Cut-Off

14.2.1 Central Zone

Table 14.2 summarizes the sensitivity of the Central Zone Mineral Resources over an incremental range of grade cut-offs. A 0.4 g/t AuEq grade cut-off is applied to the Mineral Resource estimate stated in Section 14.1 that includes the applied gold equivalence formula.

Table 14.2 Mineral Resource Sensitivity to Grade Cut-Off, Central Zone, Spectrum-GJ Cu-Au Project

Grade Cut-Off (g/t AuEq)	Tonnes (million)	Average Grades			Metal Content		
		Au (g/t)	Ag (g/t)	Cu (%)	Au (Moz)	Ag (Moz)	Cu (Mlb)
Indicated Category							
0.25	37.2	0.82	2.4	0.09	0.98	2.90	74.0
0.30	35.4	0.85	2.5	0.09	0.97	2.84	72.5
0.35	33.5	0.89	2.6	0.10	0.96	2.76	70.6
0.40	**31.2**	**0.94**	**2.6**	**0.10**	**0.94**	**2.65**	**67.7**
0.45	28.9	0.99	2.7	0.10	0.92	2.53	64.2
0.50	26.5	1.05	2.8	0.10	0.89	2.39	60.1
0.55	24.1	1.12	2.9	0.10	0.87	2.25	55.7
Inferred Category							
0.20	39.9	0.41	1.2	0.10	0.52	1.57	87.6
0.25	37.5	0.42	1.3	0.10	0.51	1.52	85.9
0.30	35.1	0.44	1.3	0.11	0.49	1.47	83.6
0.35	32.8	0.45	1.3	0.11	0.48	1.42	80.8
0.40	**29.8**	**0.47**	**1.4**	**0.12**	**0.45**	**1.34**	**76.4**
0.45	26.2	0.50	1.5	0.12	0.42	1.24	70.5
0.50	22.3	0.54	1.6	0.13	0.38	1.12	62.6
0.55	18.6	0.58	1.7	0.13	0.35	0.99	54.1

14.2.2 Donnelly Deposit

Table 14.3 summarizes the sensitivity of the Donnelly Deposit Mineral Resources over an incremental range of grade cut-offs. A 0.15% CuEq grade cut-off is applied to the Mineral Resource estimate stated in Section 14.1 that includes the applied copper equivalence formula.

Table 14.3 Mineral Resource Sensitivity to Grade Cut-Off, Donnelly Deposit, Spectrum-GJ Cu-Au Project

Grade Cut-Off (%CuEq)	Tonnes (million)	Average Grades			Metal Content		
		Cu (%)	Au (g/t)	Ag (g/t)	Cu (Mlb)	Au (Moz)	Ag (Moz)
Indicated Category							
0.10	248.3	0.23	0.28	1.7	1,278.7	2.25	13.92
0.15	**215.2**	**0.26**	**0.31**	**1.9**	**1,235.4**	**2.14**	**12.86**
0.17	205.6	0.27	0.32	1.9	1,217.5	2.10	12.52
0.20	192.5	0.28	0.33	1.9	1,187.9	2.04	12.03
0.25	167.1	0.30	0.36	2.0	1,114.8	1.91	10.94
0.30	141.0	0.33	0.39	2.1	1,020.5	1.76	9.72
Inferred Category							
0.10	38.1	0.11	0.26	1.6	94.2	0.32	1.92
0.15	**28.3**	**0.14**	**0.31**	**1.8**	**85.1**	**0.28**	**1.62**
0.17	26.3	0.14	0.32	1.8	82.2	0.27	1.54
0.20	22.8	0.15	0.34	1.9	76.0	0.25	1.36
0.25	16.2	0.17	0.39	2.0	61.1	0.20	1.03
0.30	11.1	0.20	0.45	2.1	47.8	0.16	0.77

14.3 Key Assumptions/Basis of Estimates

QP Thomas reviewed the Mineral Resource data for the Company's Spectrum-GJ project and removed several low-confidence (due to magnetic host rocks) downhole survey measurements from the database. QP Thomas considers the verified drillhole collar, downhole survey, assay and lithology data to be adequate to support Mineral Resource estimation (see Section 12).

There are a total of 164 drillholes (88 were completed by the Company) totaling 34,597.54 m and 22,581 assay intervals within the Central Zone database used to support Mineral Resource estimation, not including the four holes drilled by Imperial Oil in 1973 (463.44 m). There are a total of 176 drillholes (eight were completed by the Company) totaling 48,325.27 m and 16,410 assay intervals within the Donnelly Deposit database used to support Mineral Resource estimation (Table 14.4 and Section 10). Drillholes have intercepted mineralization to depths of 450 m in the Central Zone and 727 m in the Donnelly Deposit (Teck drillhole GJK-13-238 on Section 3950).

Table 14.4 A Summary of The Central Zone and Donnelly Deposit Drillholes Used to Support the 2017 Mineral Resource Updates, Spectrum-GJ Cu-Au Project
(compiled from information contained in the April 2016 and May 2016 Technical Reports, cross-referenced to the Company's verified drillhole database)

Year	Company	Zone	Holes Drilled	Total Length (m)
Central Zone				
1979	Silver Ridge Mines	Central	4	493.40
		500 Colour	6	338.60
1980	Silver Ridge Mines	Central	13	1,795.30
		500 Colour	5	604.60
1989	Cominco	Central	3	431.90
		33	4	302.60
		Skarn	1	125.00
1990	Columbia Gold Mines	Central	12	1,540.66
		500 Colour	2	138.70
		33	1	121.92
1991	Columbia Gold Mines	Central	22	3,682.87
1992		500 Colour	3	386.48
2014	Skeena Resources	Central	9	1,940.65
2015		Central	53	15,807.50
		500 Colour	2	177.50
		33	3	682.30
2016		Central	20	5,681.56
		Skarn	1	346.00
		Totals – Central Zone	*164*	*34,597.54*
Donnelly Deposit				
1977	TexasGulf	Donnelly	10	1,523.90
1980	TexasGulf	Donnelly	4	1,114.90*
1990	Ascot Resources	Donnelly	1	183.49
2004	Canadian Gold Hunter	Donnelly	10	2,618.43
2005			37	11,071.20
2006			36	12,665.73
2007			65	13,114.48
2011	Teck Resources	Donnelly	3	1,832.85
2013			2	1,328.29
2016	Skeena Resources	Donnelly	8	2,872.00
		Totals – Donnelly Deposit	*176*	*48,325.27*

Note: ***** - Including 149.90 m extension to drillhole TG-77-04

DKT was provided with the drillhole databases in Microsoft Access databases and in MS Excel® files. The co-ordinates are in the NAD83 UTM Zone 9 North. The database cut-off date for Mineral Resource estimate purposes was January 06, 2017. QP Thomas imported the collar, survey, lithology and assay data into MineSight®, a commercial mining software program.

Topography was based on a digital surface supplied by the Company, which has contour lines spaced two metres apart. The topography is based upon GeoEye images collected at a resolution of 50 cm. QP Thomas compared the drillhole collars with the topographic surface and found only minor differences (less than one metre) in elevation between the surveyed drillhole collars and the topography. No corrections were made to the drillhole collar elevations.

14.4 Domain Models

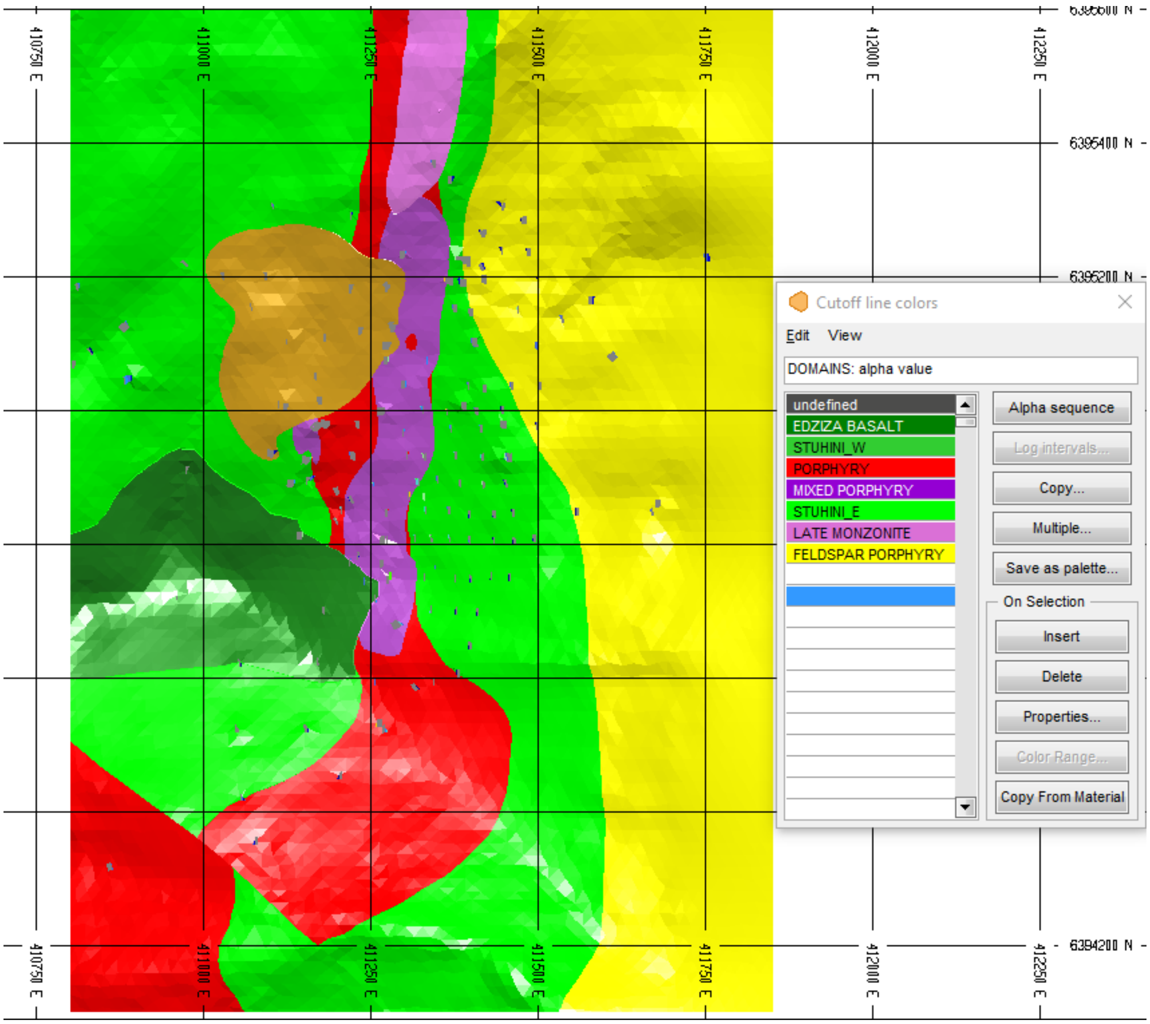
14.4.1 Central Zone

Copper-gold mineralization in the Central Zone is hosted by Late Triassic to Early Jurassic-aged monzonite intrusives and Triassic-aged Stuhini volcanic and sedimentary rocks (see Section 7). The mineralization is of three predominant types:

- lower grade porphyry-style Cu-Au mineralization occurring within a north-south striking, west-dipping zone, with dimensions of 950 m in a north-south direction and an average thickness of 100 m to 150 m and containing mineralization that is enriched in gold relative to copper with an Au:Cu ratio (Au g/t to Cu%) of approximately 3:1;
- a mixed type of higher grade copper-gold mineralization that is believed to represent overprinting of earlier porphyry-style mineralization by later-stage Au mineralization, which -
    - tends to flank the porphyry mineralization with an Au:Cu ratio (Au g/t to Cu%) of approximately 6.5:1,
    - occurs close to surface and has dimensions of approximately 650 m in a north-south direction, a horizontal width of 100 m and a vertical thickness of up to 175 m, and
    - is bounded to the south by a series of minor west-northwest to east-southeast striking faults; and
- gold-dominated mineralization hosted by the Stuhini group volcanic and sedimentary rocks to the east of the porphyry and mixed mineralization types, which –
    - occurs to vertical depths of up to 400 m and over a lateral, north-south distance of approximately 650 m and over a highly variable distance in the east-west direction, and
    - has poorly understood controls on its distribution that are likely to be lithological and structural in nature.

Minor mineralization is also present in other domains as structurally controlled mineralization in proximity to brecciated lithologic contacts. Figure 14.1 is a MineSight® snapshot of the Central Zone domain model, which repeats the geological domain model defined in Section 7.6.

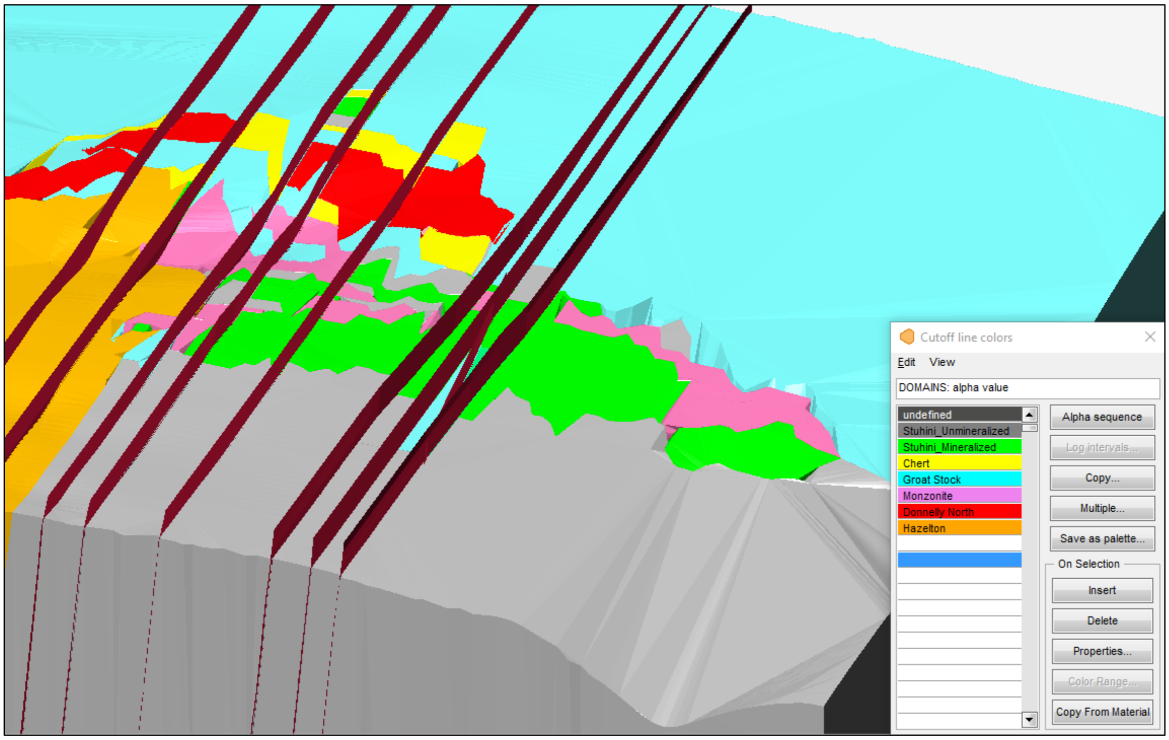
Figure 14.1 A MineSight® Snapshot of the Horizontal Projections of the Mineralization Wireframes, Central Zone, Spectrum-GJ Cu-Au Project



14.4.2 Donnelly Deposit

Mineralization in the Donnelly Deposit is hosted in Triassic-aged Stuhini volcanic and sedimentary rocks which have been intruded by the late-Triassic to early Jurassic-aged Groat Stock (see Section 7). The mineralization is unconformably overlain by unmineralized, Lower Jurassic-aged Hazelton volcanic rocks, it dips at approximately 70° to the south, it is abruptly truncated to the north by an east-west striking fault and it is locally offset by north-south striking faults. The mineralized zone is approximately 1,850 m long in the (east-west) strike direction, approximately 350 m in the north-south direction and up to 575 m in the vertical direction. The overall Au:Cu ratio (Au g/t to Cu%) is approximately 1:1. Figure 14.2 is a MineSight® snapshot of the Donnelly Deposit domain model, which repeats the geological domain model defined in Section 7.6.

Figure 14.2 An Oblique MineSight® Snapshot (looking north-northwest) of the Horizontal Projections of the Mineralization Wireframes, Donnelly Deposit, Spectrum-GJ Cu-Au Project



14.5 Central Zone Mineral Resource Estimate

14.5.1 Wireframe Models and Mineralization

The Company provided DKT with three-dimensional models of the Central Zone mineralization based on a combination of lithology, structure and geochemistry. QP Thomas reviewed the wireframe models in section and plan and concluded that they reflect the distribution of the different mineralization types. QP Thomas also inspected the drillholes displaying copper and gold grades. No significant zones of mineralization were found to fall outside of the wireframes.

Gold mineralization in Domain 60 (late monzonite intrusive) is restricted to the contact with Domain 50 (Stuhini East – higher grade gold). Discontinuous gold mineralization is also found along the contact between Domain 70 (feldspar porphyry) and Domain 50. In consequence of this, QP Thomas created wireframe models of the Domain 60 and Domain 70 mineralized zones, using drillhole intercepts with Minesight's implicit modeler. Each zone was coded separately. The zone codes are summarized on Table 14.5.

Table 14.5 A Summary of Domain Codes, Central Zone, Spectrum-GJ Cu-Au Project

Domain	Code
Overburden	1
Mount Edziza Volcanics	10
Stuhini West	20
Slump Block	21
Porphyry Zone	30
Porphyry Southern Fault Block	31
Mixed Mineralization	40
Stuhini East – Higher Grade Gold	50
Stuhini East – Southern Fault Block	51
Late Monzonite Intrusive	60
Feldspar Porphyry	70

14.5.2 Exploratory Data Analysis

Exploratory data analysis (“EDA”) comprised basic statistical evaluation of the assays and composites for gold, silver, copper and sample length. QP Thomas constructed contact plots to evaluate the changes in grade across domain boundaries.

14.5.3 Assays

Histograms and Probability Plots

Log-scaled histograms and probability plots for gold within Domain 50 show limited evidence for mixed populations. The log-scaled histogram for Domain 50 instead shows the presence of a long high-grade tail, comprising between 5% and 10% of the samples. Spatially, the higher grades are clustered in discrete zones. QP Thomas concluded that this amount of included higher-grade material warrants further domaining. The gold histograms and probability plots for Domain 50 are presented as Figure 14.3.

Grade Capping/Outlier Restrictions

QP Thomas evaluated length weighted, normal-scaled and log-scaled histograms and probability plots of the assays to separately define grade outliers for gold, silver and copper within each of the domains. The capping grade thresholds and the amount of metal removed within the domains are summarized on Tables 14.6 (for gold), 14.7 (for silver) and 14.8 (for copper). Capping was completed on the assays prior to compositing.

Figure 14.3 Domain 50 Histogram and Probability Plots, Gold Assays, Central Zone, Spectrum-GJ Cu-Au Project

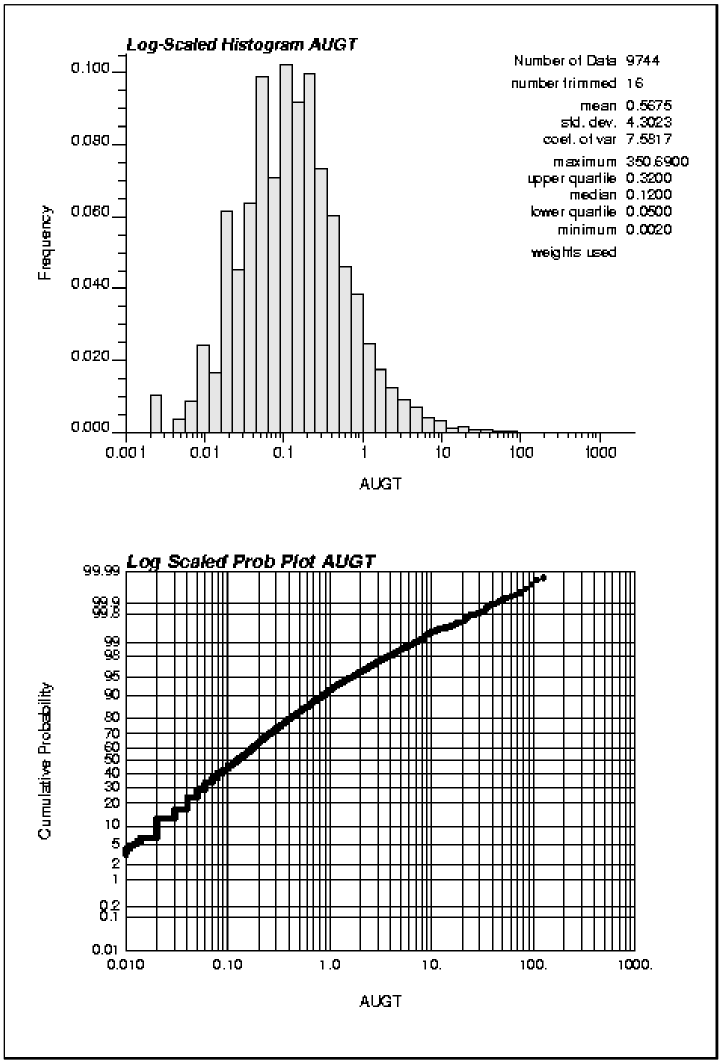


Table 14.6 A Summary of Length-Weighted Assay Statistics for Gold Within Each Domain, Central Zone, Spectrum-GJ Cu-Au Project

Domain	Number Of Au Assays	Min. (Au g/t)	Max. (Au g/t)	Mean (Au g/t)	CV	Capping				
						Threshold (Au g/t)	Mean (Au g/t)	CV	Metal	# Capped Assays
10	13	0.00	0.79	0.13	1.89	-	0.13	1.89	0.0%	0
20	1,365	0.00	29.45	0.20	3.47	6	0.19	2.58	-5.5%	3
21	95	0.01	1.97	0.25	1.35	-	0.25	1.35	0.0%	0
30	2,716	0.00	80.90	0.35	5.19	10	0.32	1.92	-9.3%	2
31	101	0.00	2.71	0.15	1.84	1.25	0.14	1.42	-6.3%	1
40	1,850	0.00	256.06	1.02	4.55	32	0.93	2.15	-8.7%	6
50	9,744	0.00	350.69	0.57	7.58	100	0.54	5.42	-4.7%	4
51	65	0.00	0.09	0.01	2.72	-	0.01	2.72	0.0%	0
60	1,049	0.00	78.90	0.40	8.14	12	0.27	4.24	31.4%	4
70	1,909	0.00	9.75	0.15	2.88	5	0.15	2.66	-1.6%	3
Global	*18,907*	*0.00*	*350.69*	*0.49*	*7.25*	*N/A*	*0.45*	*4.89*	*-7.0%*	*23*

Note: CV = Coefficient of Variation

Table 14.7 A Summary of Length-Weighted Assay Statistics for Silver Within Each Domain, Central Zone, Spectrum-GJ Cu-Au Project

Domain	Number of Ag Assays	Min. (Ag g/t)	Max. (Ag g/t)	Mean (Ag g/t)	CV	Capping				
						Threshold (Ag g/t)	Mean (Ag g/t)	CV	Metal	# Capped Assays
10	8	0.1	0.4	0.2	0.6	-	0.2	0.6	0.0%	0
20	969	0.1	341.0	1.1	10.8	31	0.7	3.5	-40.6%	3
21	77	0.1	34.2	0.9	4.2	6	0.6	1.8	-40.5%	2
30	1,943	0.1	277.5	1.3	4.4	17	1.2	1.7	-11.7%	8
31	101	0.1	1.5	0.4	0.7	-	0.4	0.7	0.0%	0
40	695	0.1	53.5	4.9	0.9	23	4.8	0.8	-1.7%	5
50	6,878	0.1	430.0	1.4	4.8	110	1.3	3.4	-4.5%	7
51	63	0.1	2.1	0.3	1.3	-	0.3	1.3	0.0%	0
60	798	0.1	74.1	1.5	3.6	28	1.3	2.6	-13.4%	6
70	1,325	0.1	49.2	0.4	4.1	13	0.4	2.5	-7.9%	2
Global	*12,857*	*0.1*	*430.0*	*1.4*	*4.6*	*N/A*	*1.3*	*2.8*	*-8.1%*	*33*

Note: CV = Coefficient of Variation

Table 14.8 A Summary of Length-Weighted Assay Statistics for Copper Within Each Domain, Central Zone, Spectrum-GJ Cu-Au Project

Domain	Number of Cu Assays	Min. (Cu%)	Max. (Cu%)	Mean (Cu%)	CV	Capping				
						Threshold (Cu%)	Mean (Cu%)	CV	Metal	# Capped Assays
10	11	0.00	0.14	0.01	2.07	-	0.01	2.07	0.0%	0
20	1,312	0.00	0.26	0.02	1.01	0.08	0.02	1.01	-2.74%	5
21	88	0.00	0.13	0.02	1.08	-	0.02	1.08	0.0%	0
30	2,471	0.00	4.35	0.11	1.08	0.90	0.11	1.08	-1.0%	3
31	101	0.00	0.38	0.05	0.94	0.20	0.05	0.94	-3.6%	2
40	1,386	0.00	2.30	0.15	0.84	1.10	0.15	0.84	-1.0%	5
50	9,199	0.00	0.84	0.04	0.79	0.45	0.04	0.79	-0.2%	7
51	65	0.00	0.06	0.00	2.43	-	0.00	2.43	0.0%	0
60	1,049	0.00	0.32	0.03	0.71	0.12	0.03	0.71	-1.8%	10
70	1,818	0.00	0.31	0.02	0.86	0.07	0.02	0.86	-2.2%	14
Global	*17,500*	*0.00*	*4.35*	*0.05*	*1.37*	*N/A*	*0.05*	*1.22*	*-0.8%*	*46*

Note: CV = Coefficient of Variation

Assay Statistics

QP Thomas tabulated length-weighted statistics for gold, silver and copper within each domain. The summary statistics are also summarized on Tables 14.6, 14.7 and 14.8. The statistics show that Domains 30, 40 and 50 have significantly higher means for all three elements and that Domains 30 and 40 have higher means for copper than the other domains.

Contact Plots

QP Thomas plotted gold and copper grades in distance bins from domain contacts. The plots were used to select boundary conditions during grade estimation. A matrix of the boundary conditions between domains was tabulated and the contacts were classified as either Soft (little change in grade across contact), Firm (gradational change in grade) or Hard (sharp change in grade). The contact matrices for gold and copper are summarized on Table 14.9. The critical contacts are those between Domains 30, 40 and 50. The contact between Domains 30 and 40 is hard for gold and soft for copper. Contact plots for Domains 30 and 40 for gold and copper are presented as Figures 14.4 and 14.5. The contact between Domain 50 and 60 for gold is classified as Firm; a grade shell in Domain 60 was used to constrain the estimation of mineralization close to the contact between Domains 50 and 60.

Table 14.9 A Summary of the Contact Matrices for Gold and Copper, Central Zone, Spectrum-GJ Project

Domain	10	20	30	40	50	60	70
Gold							
10	x	Soft	Hard	Hard	Hard	Hard	Hard
20		x	Hard	Hard	Hard	Hard	Hard
30			x	Hard	Hard	Hard	Hard
40				x	Hard	Hard	Hard
50					x	Firm	Hard
60						x	Hard
70							x
Copper							
10	x	Hard	Hard	Hard	Hard	Hard	Hard
20		x	Hard	Hard	Hard	Hard	Hard
30			x	Soft	Hard	Hard	Hard
40				x	Hard	Hard	Hard
50					x	Hard	Soft
60						x	Soft
70							x

Figure 14.4 Domains 30-40 Contact Plot, Gold Assays, Central Zone, Spectrum-GJ Cu-Au Project

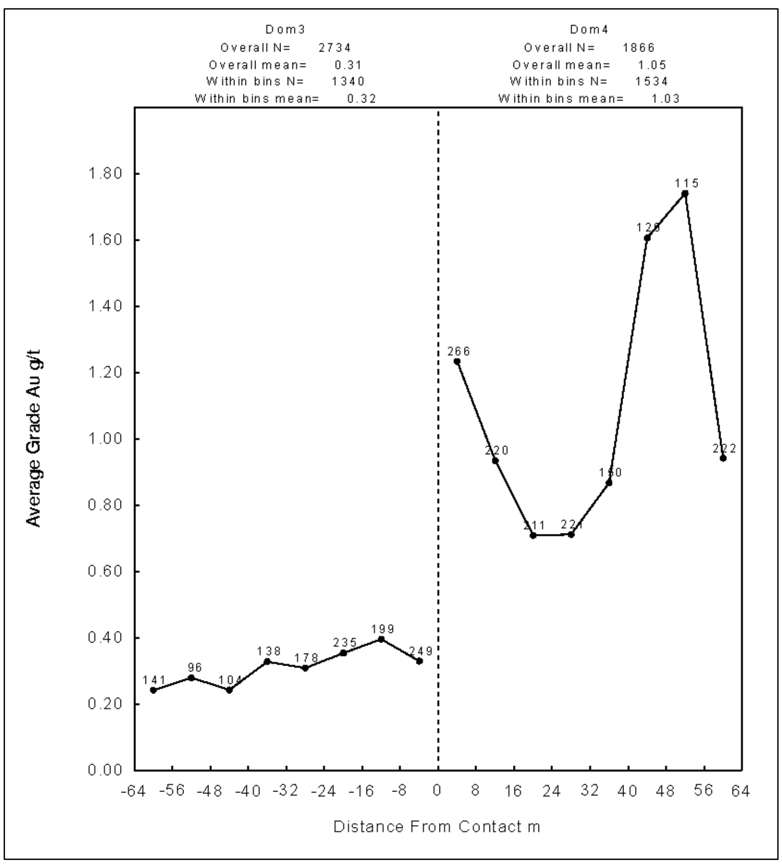
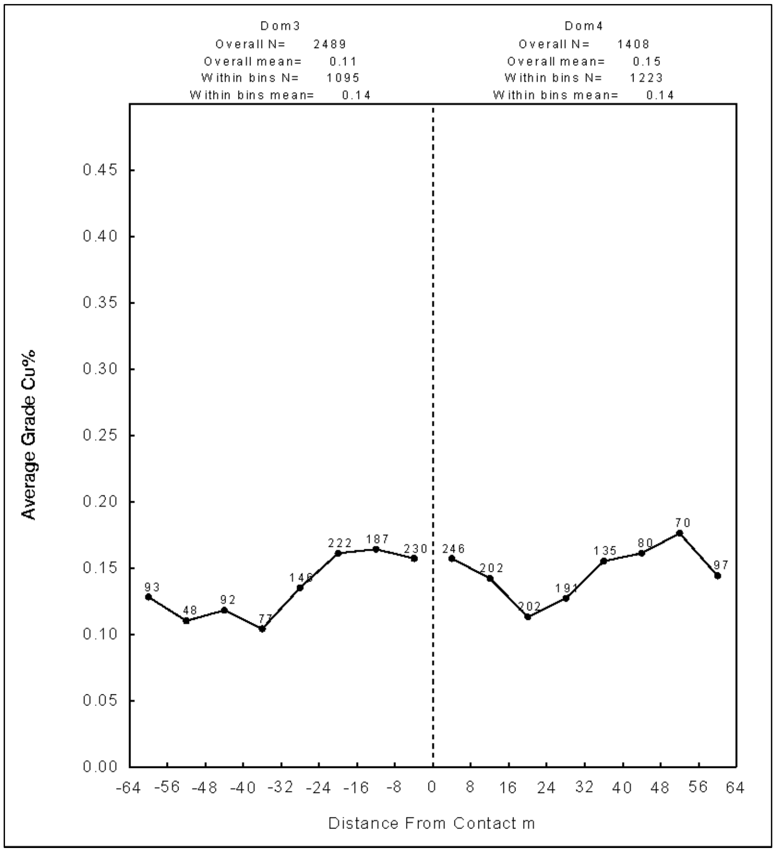


Figure 14.5 Domains 30-40 Contact Plot, Copper Assays, Central Zone, Spectrum-GJ Cu-Au Project



Silver Regression

The number of silver assays in the database is significantly lower than the number of gold and copper assays. QP Thomas examined scatterplots of gold and copper against silver by domain to evaluate whether silver values could be assigned by linear regression. Only Domains 40 and 60 showed a correlation coefficient greater than 0.6. In Domain 40, missing silver values were estimated from copper assays using the intercept and slope summarized on Table 14.10. In Domain 60, missing silver values were estimated from gold assays using the intercept and slopes summarized on Table 14.10.

Table 14.10 A Summary of Reduced Major Axis Regression Formulas For Silver, Central Zone, Spectrum-GJ Cu-Au Project

Domain	Intercept (c)	Slope (m)
40	-0.07974	31.9988
60	0.49947	2.86367

Assay EDA Summary

The coefficient of variation ("CV") values of the capped gold assays within the domains are generally below two, apart from Domains 20, 50, 60 and 70. QP Thomas concluded that further domaining of the higher gold grades in Domain 50 was warranted whereas further domaining of the low-grade gold, silver and copper values in other domains is not warranted.

14.5.4 Composites

The weight of influence of each sample assay interval was regularized by compositing the drillhole data into 4.0 m lengths using the mineralization zone domain boundaries to break the composites. The original samples are mostly 2.0 m in length. A 4.0 m composite length was chosen to approximate a 4 m bench height. Composites with lengths less than 2.0 m were back-stitched so that the composites are greater than 3.0 m and less than 6.0 m in length.

Summaries of the 3.0 m composite statistics are presented on Tables 14.11 (for gold), 14.12 (for silver) and 14.13 (for copper). It may be seen that the length-weighted mean copper and gold grades of the 4.0 m length composites are very similar to those of the assays. QP Thomas is, therefore, confident that the compositing process is working as intended. Capped gold composites within Domain 50 have a very high CV value of 3.46, which indicates that further domaining is warranted.

Table 14.11 A Summary of Length-Weighted Four Metre Composite Statistics for Gold Within Each Domain, Central Zone, Spectrum-GJ Cu-Au Project

Domain	Number of Au Composites	Min. (Au g/t)	Max. (Au g/t)	Mean (Au g/t)	CV	Capped		
						Mean (Au g/t)	CV	Assay Mean (Au g/t)
10	12	0.00	0.79	0.13	1.88	0.13	1.88	0.13
20	649	0.00	7.04	0.20	2.42	0.19	2.02	0.19
21	67	0.02	1.16	0.25	1.12	0.25	1.12	0.25
30	1,279	0.00	80.90	0.35	5.13	0.32	1.71	0.32
31	51	0.02	0.94	0.15	1.30	0.14	1.14	0.14
40	786	0.04	34.41	1.02	2.07	0.93	1.39	0.93
50	4,296	0.00	127.53	0.57	4.72	0.54	3.46	0.54
51	32	0.00	0.08	0.01	2.64	0.01	2.64	0.01
60	470	0.00	39.47	0.40	5.44	0.27	2.94	0.27
70	858	0.01	2.99	0.15	1.99	0.15	1.92	0.15

Note: CV = Coefficient of Variation

Table 14.12 A Summary of Length-Weighted Four Metre Composite Statistics for Silver Within Each Domain, Central Zone, Spectrum-GJ Cu-Au Project

Domain	Number of Ag Composites	Min. (Ag g/t)	Max. (Ag g/t)	Mean (Ag g/t)	CV	Capped		
						Mean (Ag g/t)	CV	Assay Mean (Ag g/t)
10	8	0.1	0.4	0.2	0.5	0.2	0.5	0.2
20	500	0.1	174.0	1.1	8.1	0.7	3.1	0.7
21	57	0.1	25.7	0.9	3.6	0.6	1.5	0.6
30	955	0.1	113.8	1.3	3.1	1.2	1.3	1.2
31	51	0.2	1.2	0.4	0.5	0.4	0.5	0.4
40	333	0.6	42.3	4.9	0.7	4.8	0.6	4.8
50	3,311	0.1	93.9	1.4	2.9	1.3	2.3	1.3
51	31	0.1	1.1	0.3	0.8	0.3	0.8	0.3
60	384	0.1	29.7	1.5	2.3	1.3	1.8	1.3
70	648	0.1	19.0	0.4	2.8	0.4	2.0	0.4

Note: CV = Coefficient of Variation

Table 14.13 A Summary of Length-Weighted Four Metre Composite Statistics for Copper Within Each Domain, Central Zone, Spectrum-GJ Cu-Au Project

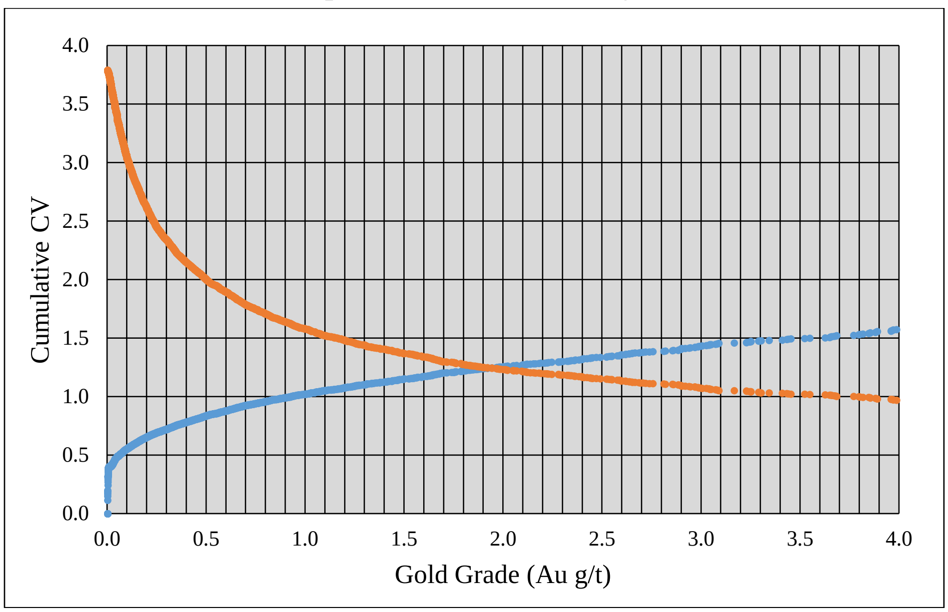
Domain	Number of Cu Composites	Min. (Cu%)	Max. (Cu%)	Mean (Cu%)	CV	Capped		
						Mean (Cu%)	CV	Assay Mean (Cu%)
10	10	0.00	0.14	0.01	2.06	0.01	2.06	0.01
20	624	0.00	0.20	0.02	0.84	0.02	0.65	0.02
21	62	0.00	0.13	0.02	1.05	0.02	1.05	0.02
30	1,155	0.00	1.38	0.11	0.84	0.11	0.77	0.11
31	51	0.01	0.19	0.05	0.77	0.05	0.70	0.05
40	573	0.03	1.33	0.15	0.66	0.15	0.59	0.15
50	4,045	0.00	0.36	0.04	0.68	0.04	0.67	0.04
51	32	0.00	0.04	0.00	2.02	0.00	2.02	0.00
60	470	0.00	0.18	0.03	0.54	0.03	0.44	0.03
70	825	0.00	0.14	0.02	0.71	0.02	0.61	0.02

Note: CV = Coefficient of Variation

14.5.5 Indicator Sub-Domaining

As a result of the high CV within Domain 5 identified by EDA, a probabilistic indicator model was created. The indicator grade threshold was selected by minimizing the total CV of the grades above and below the threshold (shown on Figure 14.6). A threshold of 2.0 g/t was selected.

Figure 14.6 A Plot of Cumulative CV Against Gold Grade Threshold, Domain 5, Central Zone, Spectrum-GJ Cu-Au Project



The composites with a value of one were coded if the gold grade was ≥ 2 g/t Au and a code of 0 if the grade was below 2.0 g/t Au. The composite indicator values were used to estimate block indicator values using ordinary kriging ("OK"). A nearest-neighbour ("NN") model was estimated and assumed to represent an unbiased estimate of the proportion of blocks above the grade threshold. A threshold indicator value of 0.088 was selected in the OK model such that a close approximation of the number of blocks with an indicator value of one in the NN model is achieved (see Table 14.14).

Table 14.14 A Summary of Indicator Block Sub-Domaining Results, Domain 5, Central Zone, Spectrum-GJ Cu-Au Project

Estimator	Global Mean	Number of Blocks
OK	0.0276	17,082
NN	0.0267	17,285
Relative Difference	3.6%	-1.2%

Blocks were coded above and below this indicator threshold. A limited amount of dilution was introduced by creating a transition zone with a width of two blocks on either side of the boundary between the lower-grade and higher-grade subdomains. The composites were then back-tagged with the codes from the blocks. The codes for the transition zones are presented in Sub-Section 14.3.7. Summary statistics of the coded composites are summarized on Table 14.15. Overall the indicator coding is successful in separating low-grade mineralization from higher grade mineralization.

Table 14.15 A Summary of Composite Sub-Domaining Results, Domain 5, Central Zone, Spectrum-GJ Cu-Au Project

Gold	Number	Min.	Max.	Mean	SD	CV
Low-Grade	3,871	0.00	2.86	0.27	0.33	1.25
Higher Grade	425	0.02	50.28	3.05	5.23	1.71

Notes: SD = Standard Deviation, CV = Coefficient of Variation

14.5.6 Variography

Downhole and directional correlograms were constructed for gold, silver and copper grades within the domains. A single spherical model, a nested exponential model and a nugget effect were used to fit the experimental correlograms. Tables 14.16 through 14.18 summarize the results for gold (Table 14.16), silver (Table 14.17) and copper (Table 14.18).

Table 14.16 A Summary of Gold Variogram Models, Central Zone, Spectrum-GJ Cu-Au Project

Domain	Nugget Effect	Sill		Structure Type		Ranges – 1st Structure			Ranges - 2nd Structure			Rotations		
		1st Structure	2nd Structure	First	Second	Y	X	Z	Y	X	Z	Z	X	Y
20	0.352	0.220	0.428	Spherical	Exponential	9	9	6	150	60	40	-40	0	0
30	0.100	0.455	0.445	Spherical	Exponential	10	10	10	140	45	45	10	-10	-75
40	0.15	0.453	0.397	Spherical	Exponential	5	5	5	110	45	30	25	-15	-58
50	0.526	0.371	0.103	Spherical	Exponential	10	10	10	100	100	40	10	-30	-75
60	0.200	0.599	0.201	Spherical	Exponential	8	8	8	150	30	25	10	-5	0
70	0.543	0.296	0.161	Spherical	Exponential	20	7	7	125	20	45	-80	-70	0

Note: Rotations are given using the GSLIB rotation convention (LRR). In Minesight® the last Y rotation is reversed.

Table 14.17 A Summary of Silver Variogram Models, Central Zone, Spectrum-GJ Cu-Au Project

Domain	Nugget Effect	Sill		Structure Type		Ranges – 1st Structure			Ranges – 2nd Structure			Rotations		
		1st Structure	2nd Structure	First	Second	Y	X	Z	Y	X	Z	Z	X	Y
20	0.416	0.160	0.424	Spherical	Exponential	13	7	7	180	120	20	-40	0	0
30	0.400	0.168	0.432	Spherical	Exponential	7	7	7	150	150	60	-80	-50	0
40	0.223	0.376	0.400	Spherical	Exponential	14	14	14	300	30	30	25	-10	42
50	0.463	0.302	0.235	Spherical	Exponential	12	12	10	150	60	60	20	-15	70
60	0.200	0.599	0.201	Spherical	Exponential	8	8	8	150	30	25	10	-5	0
70	0.543	0.296	0.161	Spherical	Exponential	20	7	7	125	20	45	-80	-70	0

Note: Rotations are given using the GSLIB rotation convention (LRR). In Minesight® the last Y rotation is reversed.

Table 14.18 A Summary of Copper Variogram Models, Central Zone, Spectrum-GJ Cu-Au Project

Domain	Nugget Effect	Sill		Structure Type		Ranges – 1st Structure			Ranges – 2nd Structure			Rotations		
		1st Structure	2nd Structure	First	Second	Y	X	Z	Y	X	Z	Z	X	Y
20	0.253	0.432	0.315	Spherical	Exponential	60	25	25	350	250	25	-50	0	0
30	0.005	0.639	0.356	Spherical	Exponential	40	25	17	450	270	105	-80	-50	0
40	0.223	0.376	0.400	Spherical	Exponential	14	14	14	300	30	30	25	-10	42
50	0.100	0.294	0.606	Spherical	Exponential	23	20	20	700	413	265	15	-15	-85
60	0.408	0.48	0.112	Spherical	Exponential	40	35	13	100	50	30	0	0	70
70	0.100	0.342	0.558	Spherical	Exponential	37	21	21	580	385	80	5	-20	-80

Note: Rotations are given using the GSLIB rotation convention (LRR). In Minesight® the last Y rotation is reversed.

14.5.7 Estimation/Interpolation Methods

The block model consists of regular blocks (4 m along strike x 4 m across strike x 4 m vertically). The block size was chosen such that geological contacts would be reasonably well reflected and to support selective mining scenarios.

QP Thomas used an OK grade interpolation method in three passes, using Minesight®. Grade estimation used a composite and block matching scheme based on the domain codes. For example, composites coded to Domain 50 were only used to estimate blocks falling within Domain 50. The same grade estimation plan was used for gold and silver. For copper, estimation of blocks in Domains 30 and 40 used composite sharing (i.e. a soft boundary). Blocks in Domain 30 used composites from both Domains 30 and 40.

In Domain 50, the gold indicator subdomain was used as a firm boundary, using the composite sharing schemes summarized on Tables 14.19 and 14.20. For example, in the first estimation pass, blocks coded as 10 were interpolated using only composites with the same code. Blocks coded 50 were interpolated using composites coded 50, 60 and 80.

Tables 14.21 (for Pass 1), 14.22 (for Pass 2) and 14.23 (for Pass 3) summarize the composite restrictions and search distances for the gold estimation domains. A slightly longer search distance was selected in the horizontal strike direction of the wireframe based on the variogram and visual inspection of a long-section along the strike of the deposit which shows a sub-horizontal plunge to the higher-grade mineralization.

Table 14.19 A Summary of the Composite and Block Sharing Scheme, Pass 1, Central Zone, Spectrum-GJ Cu-Au Project

Block Codes	Composite Codes			
	5	6	8	10
Low-Grade (5)	x	x	X	
Low-Grade Transition (6)		x	X	x
High-Grade Transition (8)			X	x
High-Grade (10)				x

Table 14.20 A Summary of the Composite and Block Sharing Scheme, Passes 2 and 3, Central Zone, Spectrum-GJ Cu-Au Project

Block Codes	Composite Codes			
	5	6	8	10
Low-Grade (5)	x			
Low-Grade Transition (6)		X	X	x
High-Grade Transition (8)			X	x
High-Grade (10)				x

Table 14.21 A Summary of the Gold Grade Model Interpolation Plan, Pass 1, Central Zone, Spectrum-GJ Cu-Au Project

Domain	Search Ellipse Dimensions, Pass 1			Composite Restrictions			Number of Holes		Rotations (ZXY) LRL MS GSLIB		
	Y-Axis	X-Axis	Z-Axis	Min.	Max.	Max. Per Hole	Min.	Max.	Z-Axis	X-Axis	Y-Axis
20	50	25	25	3	12	2	2	6	-40	0	0
21	50	25	25	3	12	2	2	6	-40	0	0
30	60	20	20	3	12	2	2	6	10	-10	75
31	60	30	30	3	12	2	2	6	10	-10	75
40	50	25	25	3	12	2	2	6	25	-15	58
50 (5)	50	50	25	3	8	2	2	4	10	10	10
50 (6)	50	50	25	3	8	2	2	4	10	10	10
50 (8)	50	50	25	3	8	2	2	4	10	10	10
50 (10)	50	30	25	3	8	2	2	4	10	-5	45
51	50	25	25	3	12	2	2	6	10	-30	75
60	50	25	25	3	12	2	2	6	10	-5	0
60 in Shell	50	25	25	3	12	2	2	6	10	-5	0
70	50	25	15	3	12	2	2	6	-80	-70	0
70 in Shell	50	25	15	3	12	2	2	6	-80	-70	0

Table 14.22 A Summary of the Gold Grade Model Interpolation Plan, Pass 2, Central Zone, Spectrum-GJ Cu-Au Project

Domain	Search Ellipse Dimensions, Pass 2			Composite Restrictions			Number of Holes		Rotations (ZXY) LRL MS GSLIB		
	Y-Axis	X-Axis	Z-Axis	Min.	Max.	Max. Per Hole	Min.	Max.	Z-Axis	X-Axis	Y-Axis
20	100	40	40	3	12	2	2	6	-40	0	0
21	100	40	40	3	12	2	2	6	-40	0	0
30	120	40	40	3	12	2	2	6	10	-10	75
31	125	60	60	3	12	2	2	6	10	-10	75
40	100	50	50	3	12	2	2	6	25	-15	58
50 (5)	100	100	50	3	8	2	2	4	10	10	10
50 (6)	100	100	50	3	8	2	2	4	10	10	10
50 (8)	100	100	50	3	8	2	2	4	10	10	10
50 (10)	100	60	50	3	8	2	2	4	10	-5	45
51	100	50	50	3	12	2	2	6	10	-30	75
60	100	40	40	3	12	2	2	6	10	-5	0
60 in Shell	100	40	40	3	12	2	2	6	10	-5	0
70	100	50	25	3	12	2	2	6	-80	-70	0
70 in Shell	100	50	25	3	12	2	2	6	-80	-70	0

Table 14.23 A Summary of the Gold Grade Model Interpolation Plan, Pass 3, Central Zone, Spectrum-GJ Cu-Au Project

Domain	Search Ellipse Dimensions, Pass 2			Composite Restrictions			Number of Holes		Rotations (ZXY) LRL MS GSLIB		
	Y-Axis	X-Axis	Z-Axis	Min.	Max.	Max. Per Hole	Min.	Max.	Z-Axis	X-Axis	Y-Axis
20	200	150	70	1	12	2	1	6	-40	0	0
21	200	70	70	1v	12	2	1	6	-40	0	0
30	250	100	100	1	12	2	1	6	10	-10	75
31	200	70	70	1	12	2	1	6	10	-10	75
40	200	100	100	1	12	2	1	6	25	-15	58
50 (5)	200	200	100	1	8	2	1	4	10	10	10
50 (6)	200	200	100	1	8	2	1	4	10	10	10
50 (8)	200	200	100	1	8	2	1	4	10	10	10
50 (10)	200	125	100	1	8	2	1	4	10	-5	45
51	200	200	100	1	12	2	1	6	10	-30	75
60	200	100	100	1	12	2	1	6	10	-5	0
60 in Shell	200	100	100	1	12	2	1	6	10	-5	0
70	200	100	50	1	12	2	1	6	-80	-70	0
70 in Shell	200	100	50	1	12	2	1	6	-80	-70	0

Note: Search ellipse orientations are given using the LRR rotation convention as used in GSLIB

14.5.8 Density Assignment

Average SG values were assigned to each domain. The average SG values have been used directly as the dry bulk density to report the tonnage estimates of the Mineral Resource. The rock types intercepted in the drillholes are generally not porous, therefore the amount of porosity is not expected to cause a significant difference between the SG and bulk density.

A total of 870 SG determinations have been performed on drillcore samples collected from material within the Central Zone mineralized zones. The determinations were carried out at site by Company geologists, using the unsealed immersion technique to measure the weight of each sample in air and in water. Analysis by QP Thomas of the SG database for Central Zone revealed 12 anomalous results (high and low values) that were removed as being unreliable, leaving a total of 858 measurements used for the Mineral Resource estimate (Table 14.24). The Company's check measurement program is discussed in Section 12.4.

Table 14.24 A Summary of SG Measurement Statistics, Central Zone, Spectrum-GJ Cu-Au Project

Domain Code	Number	Minimum (g/cm^3)	Maximum (g/cm^3)	Average (g/cm^3)
1	1	2.43	2.43	2.43
10	9	2.26	2.92	2.52
20	98	2.10	3.16	2.71
21	6	2.26	2.80	2.55
30	141	2.16	3.28	2.72
31	9	2.59	2.81	2.69
40	19	2.53	2.81	2.71
50	469	2.50	3.45	2.76
51	7	2.16	2.87	2.66
60	35	2.53	3.25	2.67
70	64	2.60	2.99	2.74
Total	***858***			

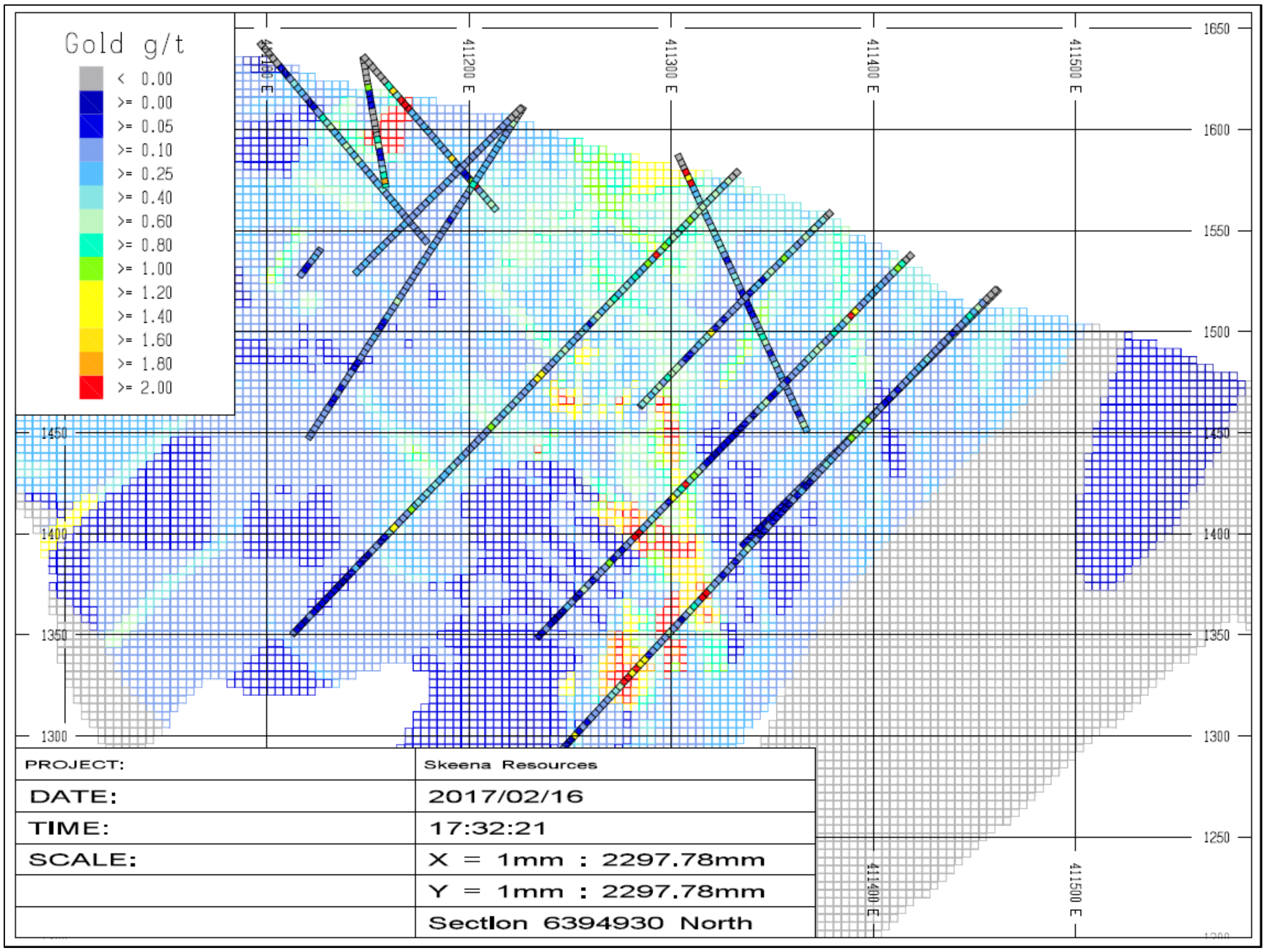
14.5.9 Block Model Validation

The Central Zone block model was validated to ensure appropriate honouring of the input data. NN grade models were interpolated from a set of four metre composites to validate the OK grade models.

Visual Inspection

A visual inspection of block grade versus composited data in section and plan view was carried out. The visual inspection of block grade versus composited data showed a good reproduction of the data by the model. Figure 14.7 is an east-west oriented cross-section.

Figure 14.7 East-West Cross Section, 6,394,930 N, Central Zone, Spectrum-GJ Cu-Au Project



Metal Removed by Capping

The impact of capping was evaluated by estimating uncapped and capped NN and OK grade models. The capped models show lower amounts of metal removed than the amounts calculated during the grade capping study on the assays. However, the amounts of metal removed from the OK models are consistent with the metal removed from the NN models. In QP Thomas' opinion, the difference between the metal removed from the assays and NN models is likely caused by the de-clustering effect.

Global Bias Checks

A comparison between the OK and NN estimates was completed on classified blocks to check for global bias in the grade estimates. Differences were generally within acceptable levels (<5% for the Indicated category and <10% for the Inferred category). Summary statistics are presented on Table 14.25.

Table 14.25 NN and OK Model Statistics Comparison, Central Zone, Spectrum-GJ Cu-Au Project

Grade	NN Blocks Capped		OK Blocks Capped		% Differences
	Mean	Number	Mean	Number	Mean (IDW^3-NN)
Gold (g/t)	0.25	2,534,578	0.26	2,438,396	0.3%
Copper (%)	0.04	2,721,896	0.05	2,702,202	4.3%
Silver (g/t)	1.0	2,414,172	1.0	2,414,172	3.5%

Local Bias Checks

A check for local bias was carried out by plotting the average gold and copper grades of composites, NN and OK models in swaths oriented along the model northings, eastings and elevations. QP Thomas reviewed the swath plots and found only minor discrepancies between the NN and OK model grades. In areas where there is significant extrapolation beyond the drillholes, the swath plots indicate less agreement for all variables.

Figure 14.8 is the gold swath plot; the copper swath plot is presented as Figure 14.9. The upper swath plots show grades, the lower swath plots show number of blocks or composites. The **RED** lines represent OK model, the **BLUE** lines represent the NN model and the **BLACK** lines represent composites.

Grade Smoothing/Model Selectivity Checks

A check on grade smoothing (model selectivity) was completed for potential openpit mining using a global change-of-support correction (Hermite Polynomial or “Herco”) to the NN model. The check was completed for gold in Domains 30, 40 and 50. The results show that in Domains 40 and 50 the amount of smoothing is acceptable for a block size of 4 m x 4 m x 4 m. Grade-tonnage curves comparing the OK model to the reference Herco is presented on Figures 14.10 (Domain 30), 14.11 (Domain 40) and 14.12 (Domain 50). It may be seen that the grade-tonnage curve for Domain 30 shows acceptable smoothing for a block size of 8 m x 8 m x 8 m. DKT notes that Domain 30 is a lower grade domain which would likely be mined with a less selective mining method. It is, therefore, reasonable to assume a larger block size to check grade smoothing for this domain.

Figure 14.8 Gold Swath Plots by Easting, Northing and Elevation, Central Zone, Spectrum-GJ Cu-Au Project

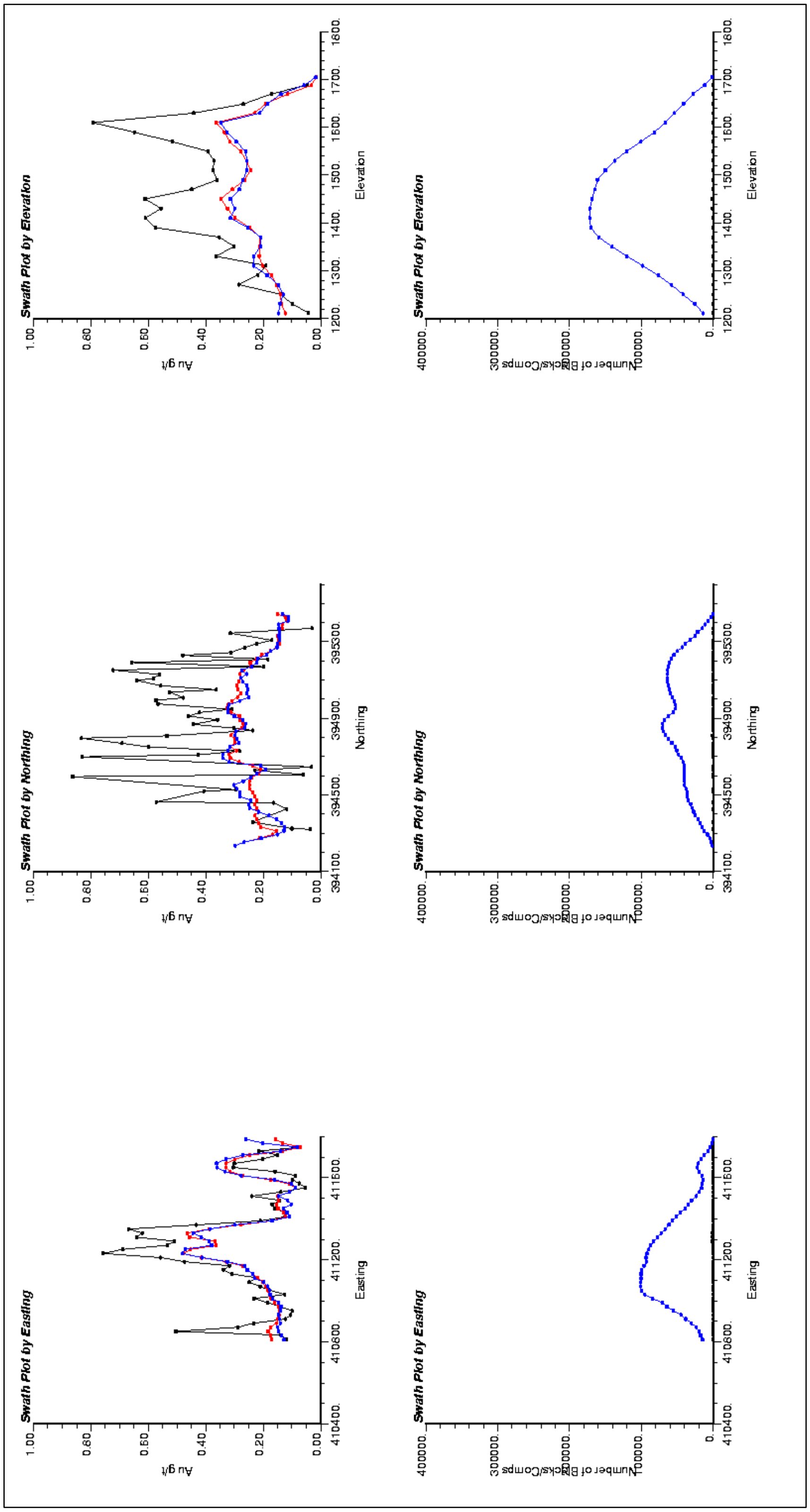


Figure 14.9 Copper Swath Plots by Easting, Northing and Elevation, Central Zone,

Spectrum-GJ Cu-Au Project

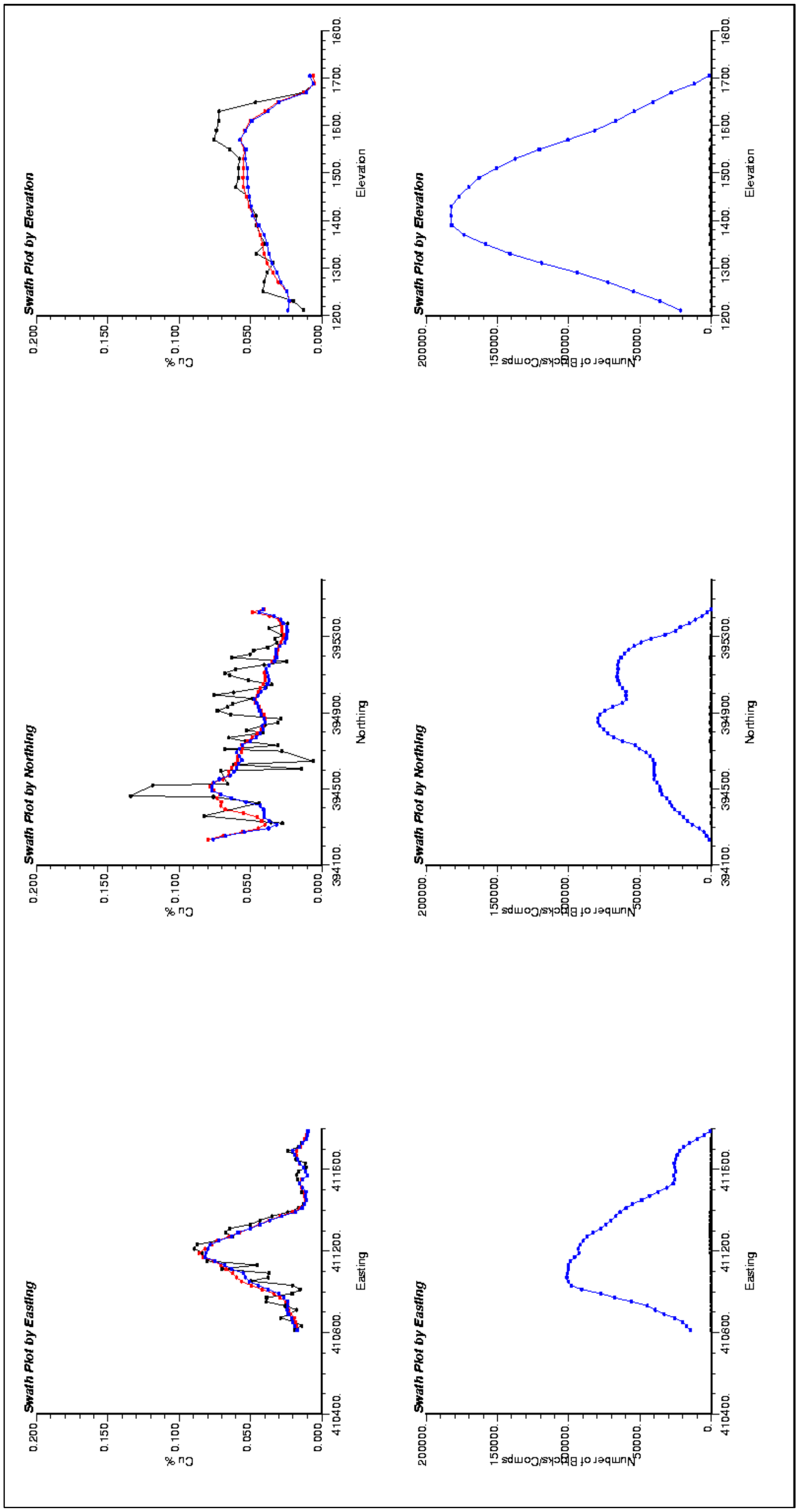


Figure 14.10 A Grade-Tonnage Curve Comparison of the OK Model with the NN and Herco Models, Domain 30, Central Zone, Spectrum-GJ Cu-Au Project

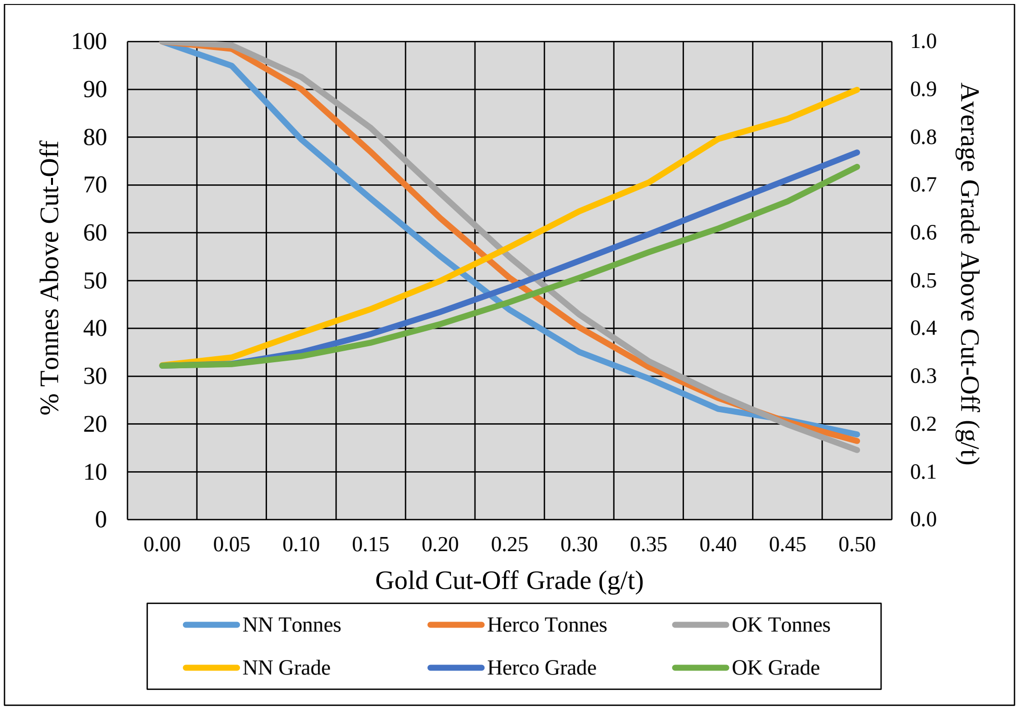


Figure 14.11 A Grade-Tonnage Curve Comparison of the OK Model with the NN and Herco Models, Domain 40, Central Zone, Spectrum-GJ Cu-Au Project

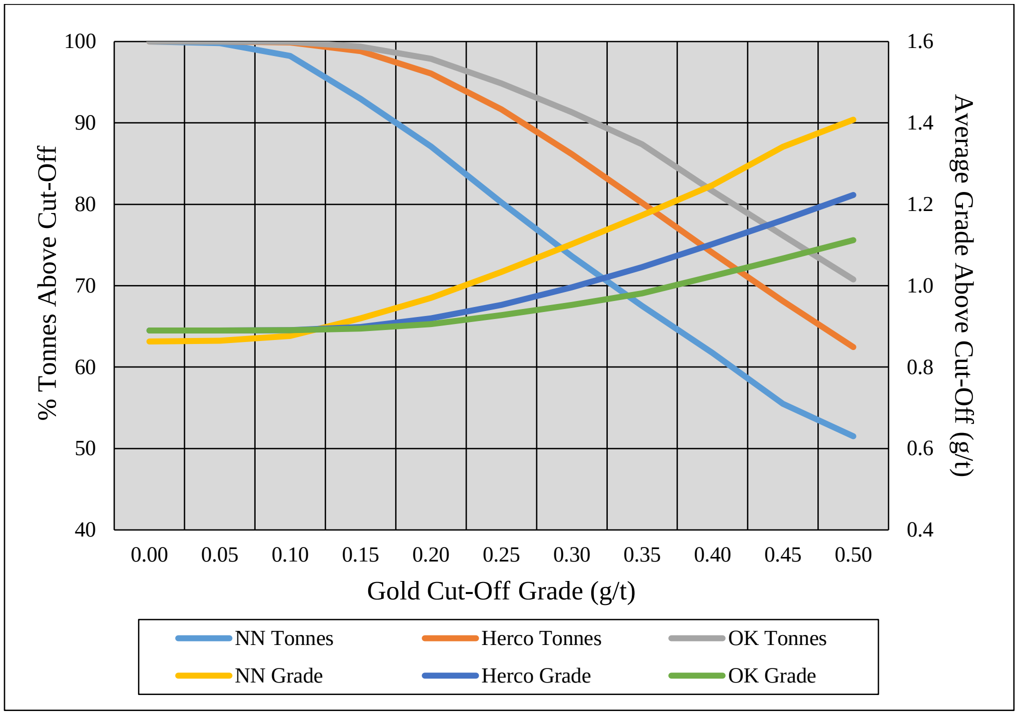
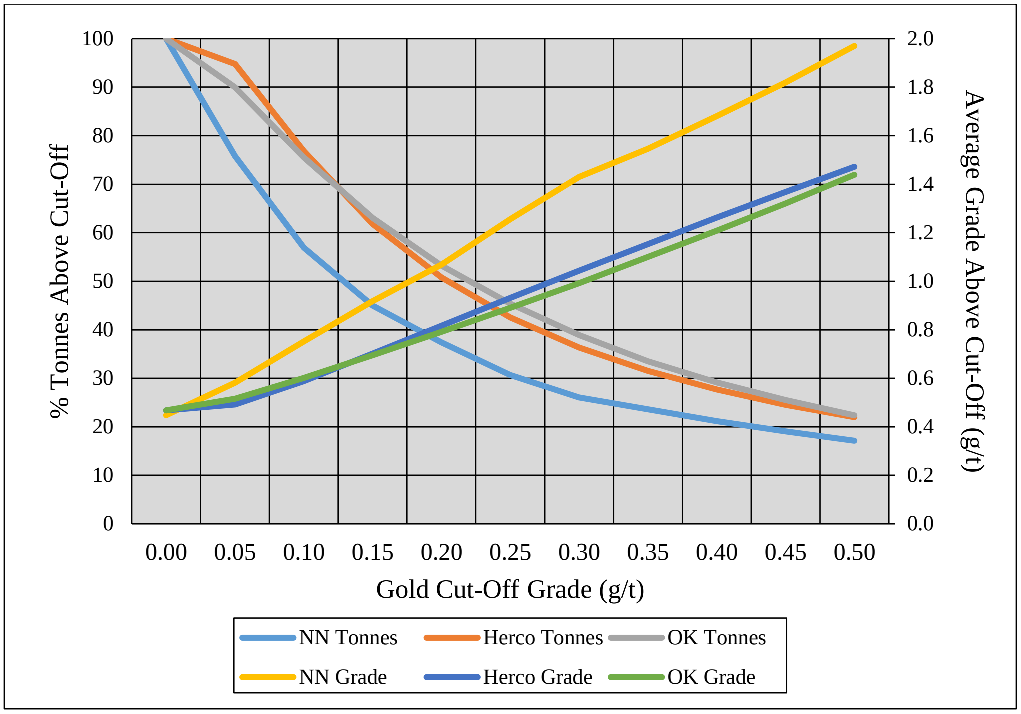


Figure 14.12 A Grade-Tonnage Curve Comparison of the OK Model with the NN and Herco Models, Domain 50, Central Zone, Spectrum-GJ Cu-Au Project

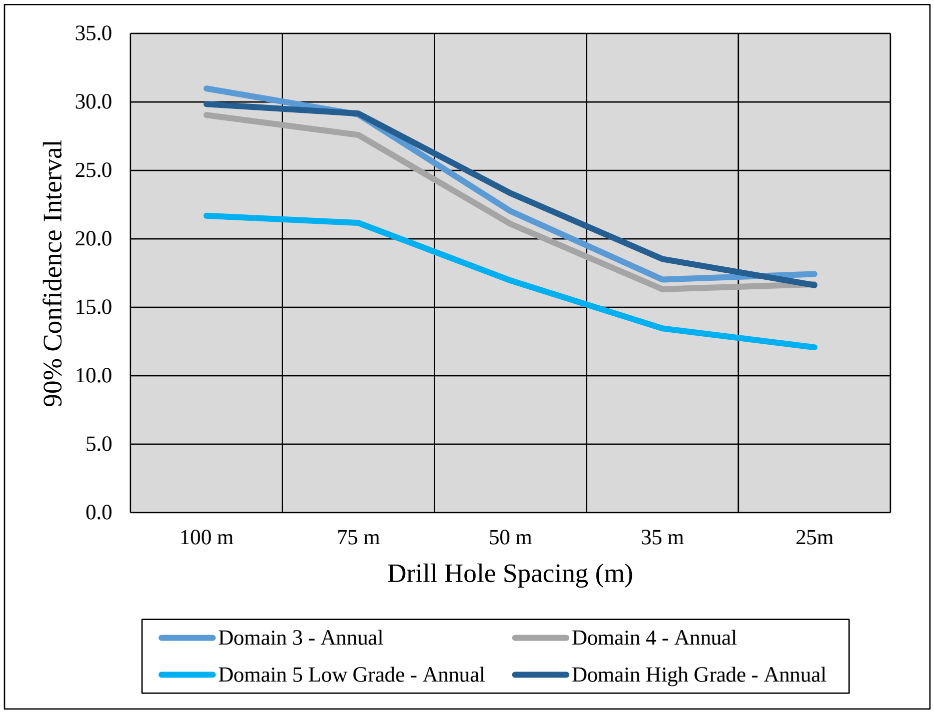


14.5.10 Classification of Mineral Resources

QP Thomas reviewed the geological model, data quality and geological continuity for classification of mineral resources. The mineralized domain wireframes are supported by drilling with a spacing of between 25 m and over 150 m. A 150 m distance is sufficient to assume that the mineralization is continuous between drillholes in Domains 20 and 30 where low-grade more continuous mineralization is present. A distance of 60 m in Domains 4 and 5 is more appropriate to assume mineralization continuity due to the larger amount of grade variability.

An analysis of confidence limits was carried out using quarterly panels of production for a 4,500 t/day openpit mine operation. The accuracy of grade estimates was then scaled to annual production. An accuracy of 15% or better at a 90% confidence limit on annual production was used as the criteria to select a drillhole spacing to be used to classify Indicated Mineral Resources. The results (Figure 14.13) show that a drillhole spacing of 40 m (along the easting) x 40 m (along the northing) is sufficient to classify Indicated Mineral Resources.

Figure 14.13 Drillhole Spacing Study Results, Central Zone, Spectrum-GJ Cu-Au Project



Blocks in Domains 30, 40 and 50 were classified to the Indicated category using the following criteria:

- a maximum distance to the closest hole of 30.0 m;
- a maximum distance to the second hole of 38.5 m; and
- a maximum average distance from two holes of 30 m (approximately half the diagonal distance within a 40 m x 40 m grid, with a 10% contingency).

Blocks in Domains 20 and 30 were classified to the Inferred category using the following criteria:

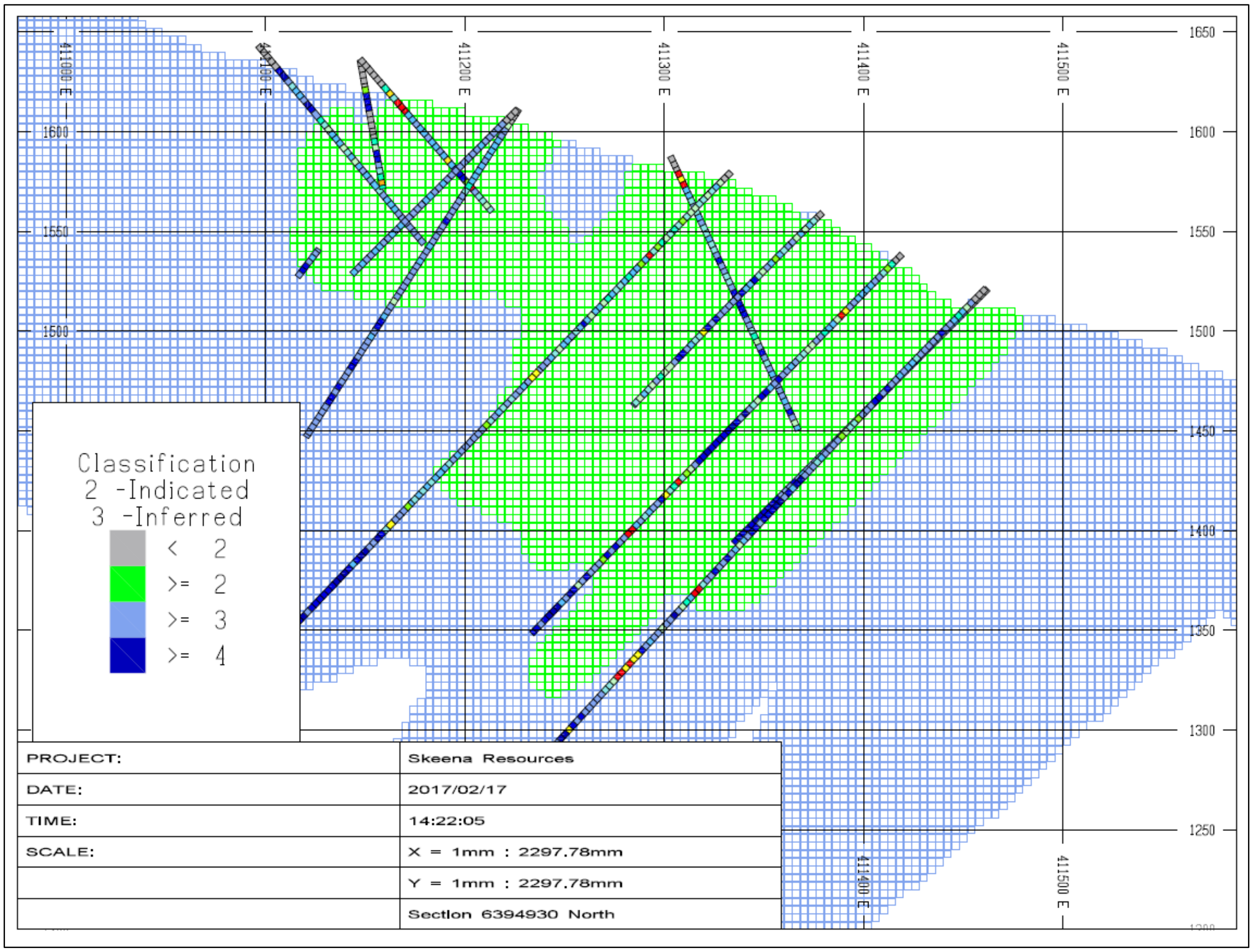
- a maximum distance to the closest hole of 120 m;
- a maximum distance to the second hole of 150 m; and
- a maximum average distance from two holes of 120 m.

Blocks in Domain 50 were classified to the Inferred category using the following criteria:

- a maximum distance to the closest hole of 60 m;
- a maximum distance to the second hole of 75 m; and
- a maximum average distance from two holes of 60 m.

The distance-based classification was smoothed to remove isolated Inferred and Indicated blocks. The algorithm used for smoothing minimizes the change in relative proportions of blocks in each category. Figure 14.14 is an east-west cross-section view of the resulting resource classification.

Figure 14.14 Mineral Resource Classification, Section 6,394,930 N, Central Zone, Spectrum-GJ Cu-Au Project



14.5.11 Comparison with the Previous (2016) Mineral Resource Estimate

Table 14.26 provides a comparison between the previous (2016) Mineral Resource estimate, detailed in the May 2016 Technical Report cited in Section 2.5, with the 2017 Mineral Resource estimate that is the subject of this Technical Report and which is presented in Section 14.1, for a grade cut-off of 0.40 g/t AuEq. The changes reflected on Table 14.26 are a result of:

- additional drilling, in 2016, of 6,027.6 m in 21 holes, primarily along the western side of the deposit;
- changes to grade estimation domains (the 2017 model uses a combination of lithology and grade to define domains, rather than the grade-based approach used for the 2016 estimate);
- changes to the grade estimation plan;
- use of change-of-support analysis to calibrate the model to anticipated mining selectivity;
- changes to the Mineral Resource classification methodology;

- updated metal price, metallurgical recovery and cost information; and
- an updated openpit shell used to constrain the mineral resource estimate.

Table 14.26 A Comparison of 2016 and 2017 Mineral Resource Models, Classified Blocks, Central Zone, Spectrum-GJ Cu-Au Project

2016 Model								
Category	**AuEq Cut-Off (g/t)**	**Tonnes (million)**	**Average Grades**			**Metal Content**		
			Au (g/t)	**Ag (g/t)**	**Cu (%)**	**Au (Moz)**	**Ag (Moz)**	**Cu (Mlb)**
Indicated	0.40	10.5	0.93	5.82	0.11	0.31	1.96	25.5
Inferred	0.40	31.2	0.87	3.30	0.11	0.88	3.30	75.6
2017 Model								
Category	**AuEq Cut-Off (g/t)**	**Tonnes (million)**	**Average Grades**			**Metal Content**		
			Au (g/t)	**Ag (g/t)**	**Cu (%)**	**Au (Moz)**	**Ag (Moz)**	**Cu (Mlb)**
Indicated	0.40	31.2	0.94	2.6	0.10	0.94	2.65	67.7
Inferred	0.40	29.8	0.47	1.4	0.12	0.45	1.34	76.4
% Difference (2017 Model – 2016 Model)								
Category	**AuEq Cut-Off**	**Tonnes**	**Au**	**Ag**	**Cu**	**Au**	**Ag**	**Cu**
Indicated	N/A	197.1%	1.1%	-55.3%	-9.1%	203.2%	35.2%	165.5%
Inferred	N/A	-4.5%	-46.0%	-57.6%	9.1%	-48.9%	-59.4%	1.1%

14.6 Donnelly Deposit Mineral Resource Estimate

14.6.1 Wireframe Models and Mineralization

The Company provided DKT with wireframe models based on a combination of lithology, mineralization, copper grades and gold grades. QP Thomas reviewed the wireframe models and found the wireframe boundaries correctly honour the drillhole intercepts. QP Thomas also inspected drillholes displaying gold and copper grades; no significant zones of mineralization were found to fall outside of the wireframes. However, some gaps in the lithological models were found during the coding of blocks, which were populated using a NN lithology assignment. Each zone was then coded separately. The zone codes are summarized on Table 14.27. The wireframe model used to constrain the Mineral Resource estimate is earlier presented as Figure 14.2.

Table 14.27 A Summary of Domain Codes, Donnelly Deposit, Spectrum-GJ Cu-Au Project

Domain	**Code**
Stuhini Mineralized	10
Stuhini Unmineralized	20
Strongly Silicified	30
Groat Stock	40
Monzonite	50

14.6.2 Exploratory Data Analysis

EDA comprised basic statistical evaluation of the assays and composites for gold, silver and copper, and sample length.

14.6.3 Assays

Histograms and Probability Plots

Log-scaled histograms and probability plots for copper, gold and silver within the zones show no evidence for mixed populations. QP Thomas concludes that further domaining is not warranted. Figures 14.15 and 14.16 are gold histograms and probability plots for Domain 10 and Domain 50, respectively.

Figure 14.15 Domain 10 Histogram and Probability Plots, Gold Assays, Donnelly Deposit, Spectrum-GJ Cu-Au Project

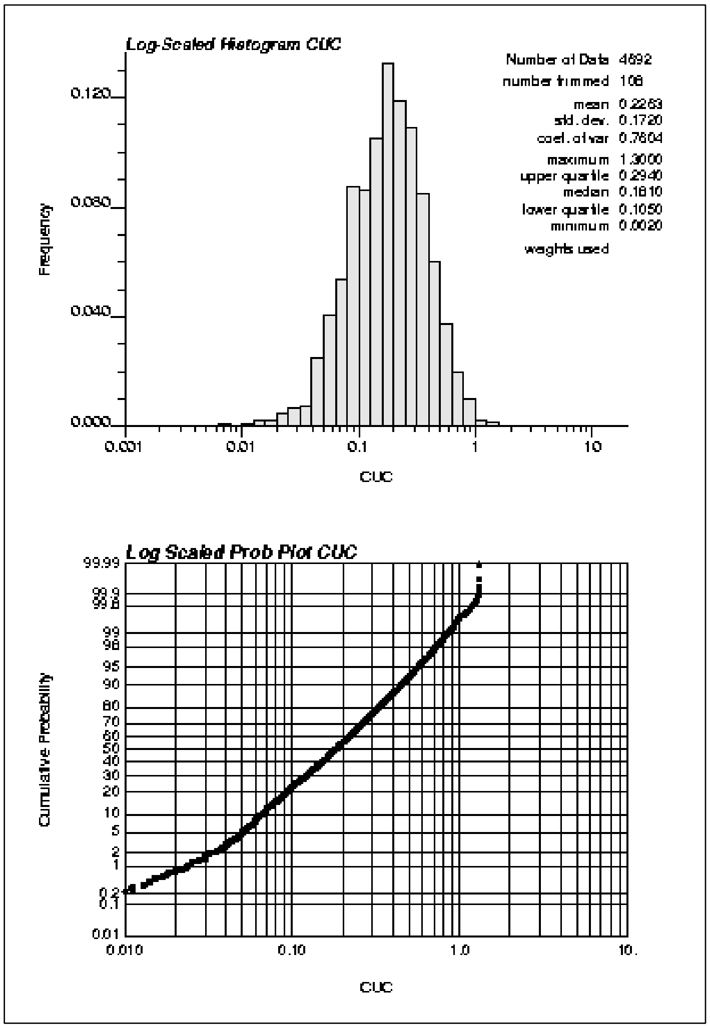
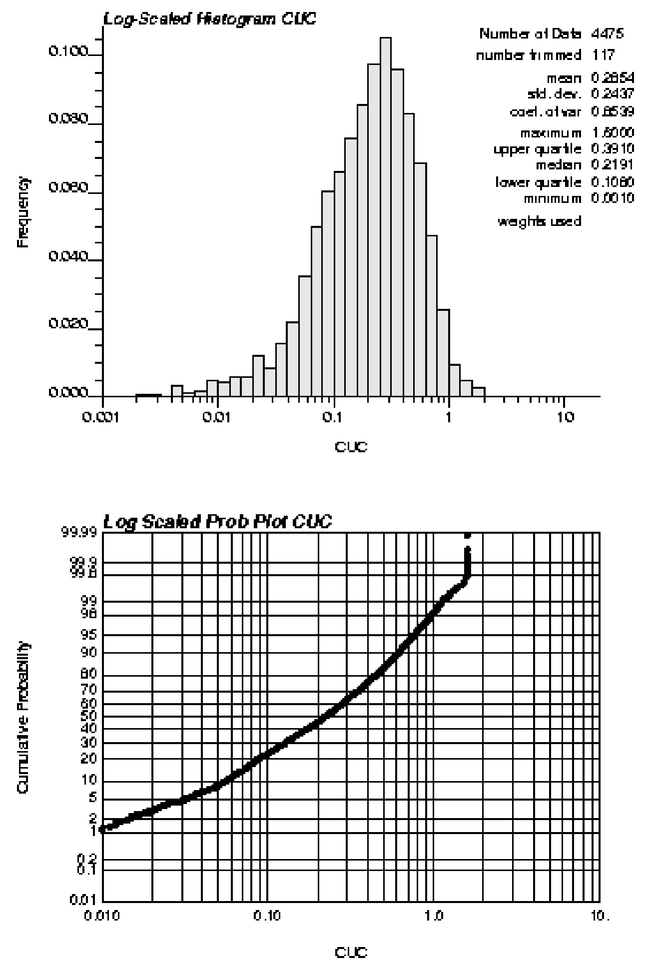


Figure 14.16 Domain 50 Histogram and Probability Plots, Gold Assays, Donnelly Deposit, Spectrum-GJ Cu-Au Project



Grade Capping/Outlier Restrictions

Length-weighted, normal-scaled and log-scaled histograms and probability plots of the assays were evaluated to define grade outliers for gold, silver and copper within each of the domains separately. The capping grade thresholds and the amount of metal removed within the domains are summarized on Tables 14.28 (for gold), Table 14.29 (for silver) and Table 14.30 (for copper). Capping was completed on the assays prior to compositing. Capping thresholds that are somewhat higher than might otherwise selected (based on the histograms and probability plots) as the higher grades occur spatially clustered in steeply plunging higher-grade zones within the mineralization.

Assay Statistics

Summary length-weighted statistics for gold, silver and copper within each domain were also tabulated. Tables 14.28 through 14.30 also summarize the statistics. The CV values of the capped assays within each zone are generally over two. QP Thomas concludes that further domaining of the copper and gold grades may be warranted.

Table 14.28 A Summary of Length-Weighted Assay Statistics for Gold Within Each Domain, Donnelly Deposit, Spectrum-GJ Cu-Au Project

Domain	Number of Au Assays	Min. (Au g/t)	Max. (Au g/t)	Mean (Au g/t)	CV	Capping			
						Threshold (Au g/t)	Mean (Au g/t)	Metal	# Capped Assays
10	4,719	0.00	15.15	0.26	1.78	4.0	0.26	2.7%	13
20	4,725	0.00	10.00	0.12	3.52	4.0	0.11	5.4%	14
30	421	0.00	0.47	0.07	1.08	None	0.07	0.0%	0
40	2,780	0.00	10.00	0.08	3.36	0.50	0.07	14.3%	20
50	4,476	0.00	42.40	0.33	2.35	4.00	0.32	3.7%	6
60	1,009	0.00	2.26	0.03	2.83	0.5	0.03	8.8%	8
70	6	0.01	0.10	0.05	0.82	0.10	0.05	0.0%	0
Global	18,136	0.00	42.40	0.20	2.62	N/A	0.20	4.2%	61

Note: CV = Coefficient of Variation

Table 14.29 A Summary of Length-Weighted Assay Statistics for Silver Within Each Domain, Donnelly Deposit, Spectrum-GJ Cu-Au Project

Domain	Number of Ag Assays	Min. (Ag g/t)	Max. (Ag g/t)	Mean (Ag g/t)	CV	Capping			
						Threshold (Ag g/t)	Mean (Ag g/t)	Metal	# Capped Assays
10	4,486	0.1	58.8	1.7	1.3	20.0	1.7	0.8%	8
20	4,602	0.0	100.0	1.1	2.9	30.0	1.0	4.7%	8
30	421	0.1	7.9	0.8	1.0	4.0	0.8	2.1%	3
40	2,716	0.0	36.3	0.7	1.6	15.0	0.7	1.3%	3
50	4,421	0.1	100.0	1.9	1.4	30.0	1.9	1.2%	5
60	1,009	0.0	23.4	1.0	1.8	12.0	0.9	2.5%	3
70	6	0.1	0.8	0.5	0.5	None	0.5	0.0%	0
Global	17,661	0.0	100.0	1.4	1.8	N/A	1.4	1.7%	30

Note: CV = Coefficient of Variation

Table 14.30 A Summary of Length-Weighted Assay Statistics for Copper Within Each Domain, Donnelly Deposit, Spectrum-GJ Cu-Au Project

Domain	Number of Cu Assays	Min. (Cu%)	Max. (Cu%)	Mean (Cu%)	CV	Capping			
						Threshold (Cu%)	Mean (Cu%)	Metal	# Capped Assays
10	4,719	0.00	2.07	0.23	0.77	1.30	0.23	0.2%	5
20	4,725	0.00	2.09	0.04	1.56	0.50	0.04	1.1%	8
30	421	0.00	0.54	0.04	1.29	0.30	0.04	2.5%	4
40	2,780	0.00	1.23	0.03	1.47	0.50	0.03	0.9%	4
50	4,476	0.00	4.49	0.29	0.92	1.60	0.29	0.8%	11
60	1,009	0.00	1.21	0.02	2.18	0.25	0.02	4.4%	5
70	6	0.01	0.09	0.05	0.66	None	0.05	0.0%	0
Global	18,136	0.00	4.49	0.15	1.31	N/A	0.15	0.6%	37

Note: CV = Coefficient of Variation

Contact Plots

QP Thomas plotted gold, silver and copper grades in distance bins from domain contacts. The plots were used to select boundary conditions during grade estimation. A matrix of the boundary conditions between domains were tabulated, the contacts are classified as either Soft (little change in grade across contact), Firm (gradational change in grade) or Hard (sharp change in grade). The contact matrices for each gold and copper are summarized on Table 14.31. It may be seen that the critical contacts are those between the better mineralized Domains 10 and 50, which are firm for both copper and gold. Grades in Domain 10 show a gradational increase towards the boundary with domain 50. Contact plots for Domains 10 and 50 for gold and copper are presented as Figures 14.17 and 14.18.

Table 14.31 A Summary of the Contact Matrices for Gold and Copper, Donnelly Deposit, Spectrum-GJ Project

Domain	10	20	30	40	50	60	70
Gold							
10	x	Hard	Hard	Hard	Firm	Hard	Hard
20		x	Soft	Soft	Hard	Hard	Hard
30			x	Soft	Hard	Hard	Hard
40				x	Hard	Hard	Hard
50					x	Hard	Hard
60						x	Hard
70							x
Copper							
10	x	Hard	Hard	Hard	Firm	Hard	Hard
20		x	Soft	Soft	Hard	Hard	Hard
30			x	Soft	Hard	Hard	Hard
40				x	Hard	Hard	Hard
50					x	Hard	Hard
60						x	Hard
70							x

Figure 14.17 Domains 10-50 Contact Plot, Gold Assays, Donnelly Deposit, Spectrum-GJ Cu-Au Project

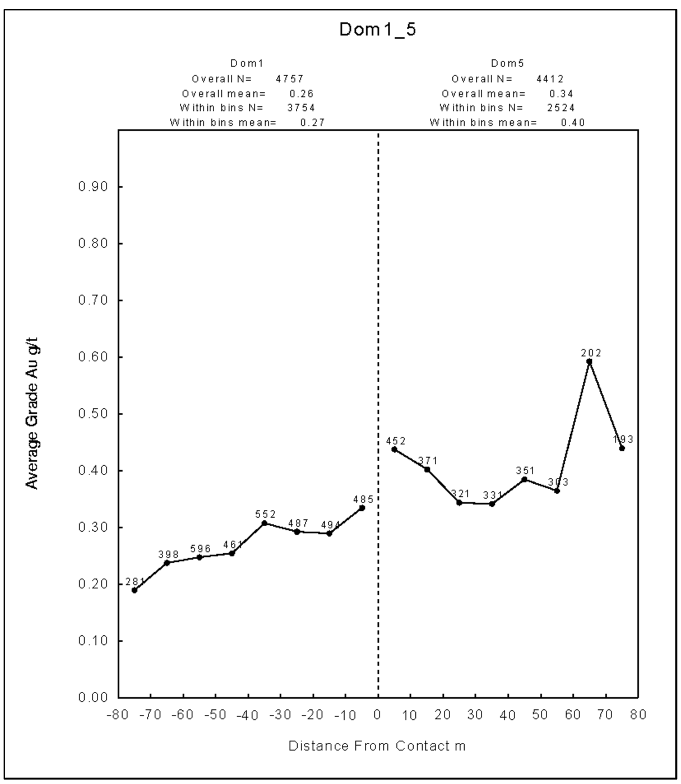
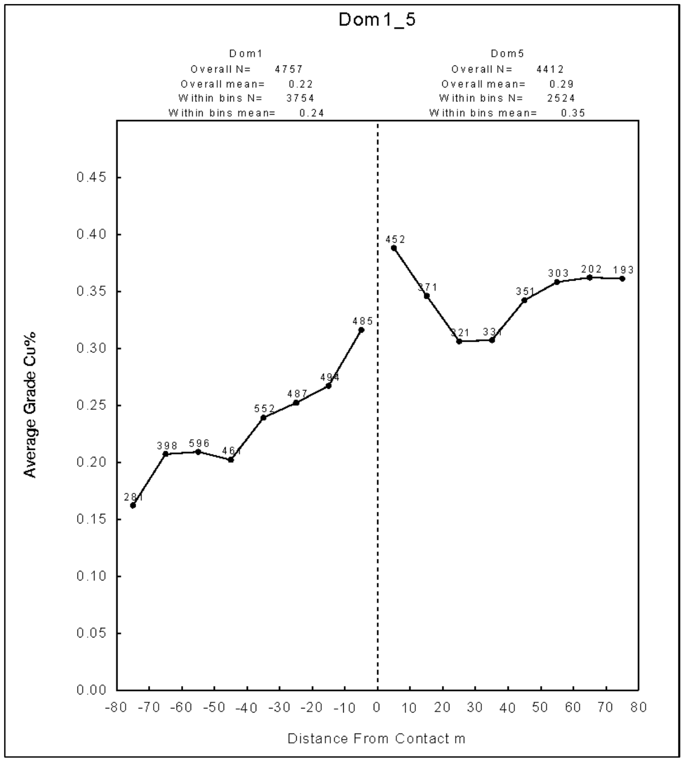


Figure 14.18 Domains 10-50 Contact Plot, Copper Assays, Donnelly Deposit, Spectrum-GJ Cu-Au Project



14.6.4 Composites

To normalize the weight of influence of each sample, the assay intervals were regularized by compositing the drillhole data into 4.0 m lengths using the mineralization zone domain boundaries to break the composites. The original samples are mostly 3.0 m in length; a composite length of 4.0 m was chosen to represent half the bench height of an 8.0 m high selective mining unit. The 4.0 m composites were back-tagged using the mineralization zone solids. Summary 4.0 m composite statistics are presented on Tables 14.32 (for gold), 14.33 (for silver) and 14.34 (for copper). QP Thomas notes that the length-weighted mean grades of 4.0 m length composites are very similar to those of the assays. QP Thomas is, therefore, confident that the compositing process is working as intended. The capped CV values are comparatively low in (the main mineralized) Domains 10 and 50.

Table 14.32 A Summary of Length-Weighted Four Metre Composite Statistics for Gold Within Each Domain, Donnelly Deposit, Spectrum-GJ Cu-Au Project

Domain	Number of Au Composites	Min. (Au g/t)	Max. (Au g/t)	Mean (Au g/t)	CV	Capped		
						Mean (Au g/t)	CV	Assay Mean (Au g/t)
10	3,363	0.01	7.00	0.26	1.48	0.26	1.24	0.26
20	2,873	0.00	5.71	0.12	2.68	0.11	2.21	0.11
30	321	0.00	0.38	0.07	0.94	0.07	0.94	0.07
40	1,846	0.00	5.77	0.08	2.56	0.07	1.01	0.07
50	3,155	0.00	26.57	0.33	1.83	0.32	1.08	0.32
60	705	0.00	0.91	0.03	2.10	0.03	1.65	0.03
70	8	0.01	0.10	0.05	0.82	0.05	0.82	0.05
Global	*12,271*	*0.00*	*26.57*	*0.20*	*2.09*	*0.20*	*1.51*	*0.20*

Table 14.33 A Summary of Length-Weighted Four Metre Composite Statistics for Silver Within Each Domain, Donnelly Deposit, Spectrum-GJ Cu-Au Project

Domain	Number of Ag Composites	Min. (Ag g/t)	Max. (Ag g/t)	Mean (Ag g/t)	CV	Capped		
						Mean (Ag g/t)	CV	Assay Mean (Ag g/t)
10	3,188	0.1	31.6	1.7	1.1	1.7	1.04	1.7
20	2,778	0.0	90.0	1.1	2.5	1.0	1.66	1.0
30	321	0.1	6.1	0.8	0.9	0.8	0.81	0.8
40	1,797	0.1	36.3	0.7	1.3	0.7	1.16	0.7
50	3,113	0.1	53.3	1.9	1.1	1.9	0.99	1.9
60	705	0.0	18.7	1.0	1.5	0.9	1.36	0.9
70	8	0.1	0.8	0.5	0.5	0.5	0.52	0.5
Global	*11,910*	*0.0*	*90.0*	*1.4*	*1.5*	*1.4*	*1.23*	*1.4*

Note: CV = Coefficient of Variation

Table 14.34 A Summary of Length-Weighted Four Metre Composite Statistics for Copper Within Each Domain, Donnelly Deposit, Spectrum-GJ Cu-Au Project

Domain	Number of Cu Composites	Min. (Cu%)	Max. (Cu%)	Mean (Cu%)	CV	Capped		
						Mean (Cu%)	CV	Assay Mean (Cu%)
10	3,363	0.00	1.45	0.23	0.71	0.23	0.70	0.23
20	2,873	0.00	0.99	0.04	1.41	0.04	1.32	0.04
30	321	0.00	0.44	0.04	1.16	0.04	1.04	0.04
40	1,846	0.00	0.41	0.03	1.26	0.03	1.22	0.03
50	3,155	0.00	4.20	0.29	0.88	0.29	0.81	0.29
60	705	0.00	0.38	0.02	1.68	0.02	1.40	0.02
70	8	0.01	0.09	0.05	0.67	0.05	0.67	0.05
Global	*12,271*	*0.00*	*4.20*	*0.15*	*1.25*	*0.15*	*1.21*	*0.15*

Note: CV = Coefficient of Variation

14.6.5 Sub-Domaining

Fault Sub-Domains

The impact of the fault blocks on grade were examined by constructing swath plots of the gold and copper grades along the easting direction in Domains 10 and 50. The swath plots are presented as Figures 14.19 (for Domain 10) and 14.20 (for Domain 50); the gold plots are to the left and the copper plots to the right. It may be seen that the copper and gold grades drop significantly at an easting between 424,800E and 425,000E. In Domain 10, the grades drop again between eastings of 424,300E and 424,500E, whereas the grades in Domain 50 increase. QP Thomas selected sub-domains of Domains 10 and 50 to represent the changes in grade along strike. The sub-domains are summarized on Figure 14.21.

Figure 14.19 Fault Boundary Swath Plots, Domain 10, Donnelly Deposit, Spectrum-GJ Cu-Au Project

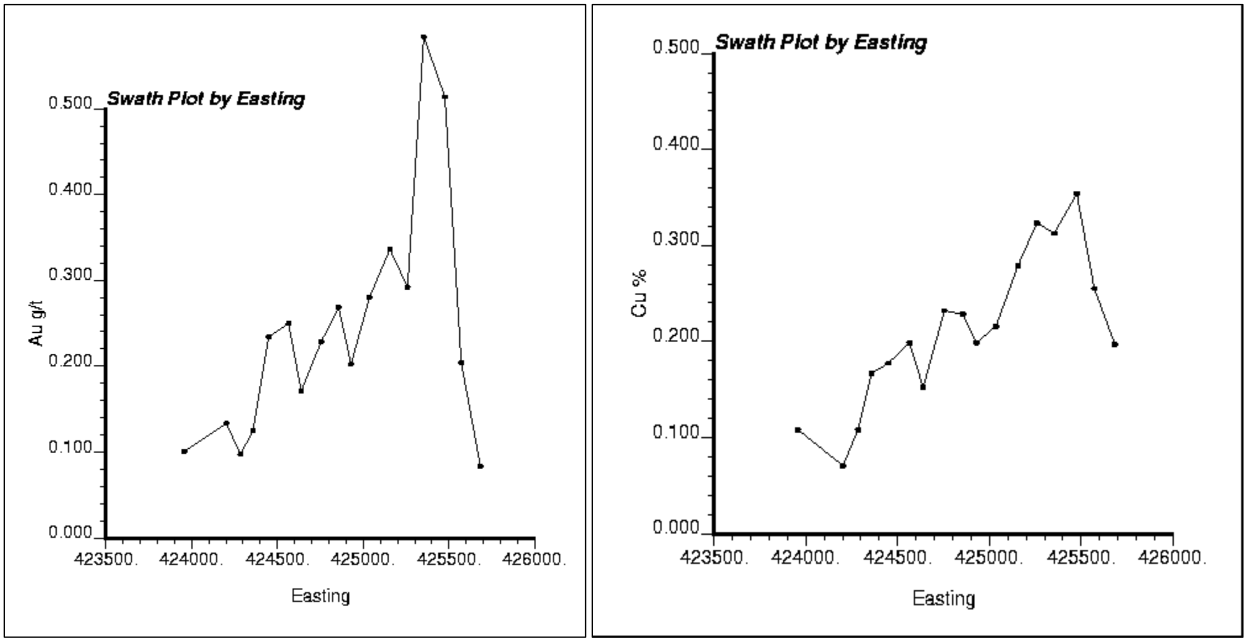


Figure 14.20 Fault Boundary Swath Plots, Domain 50, Donnelly Deposit, Spectrum-GJ Cu-Au Project

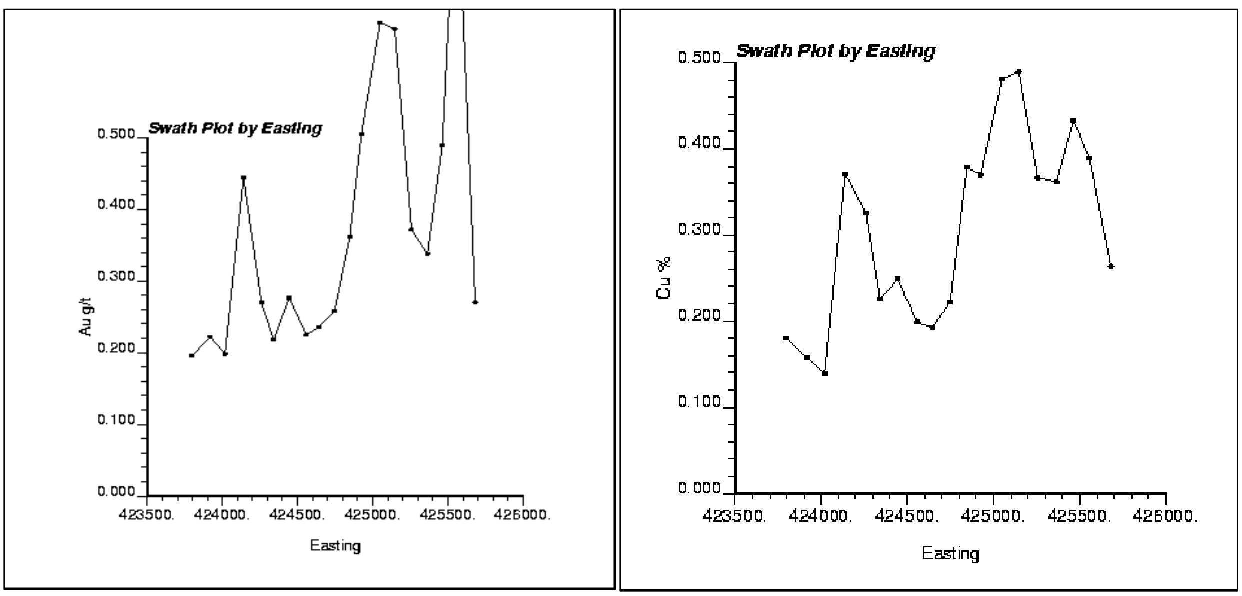
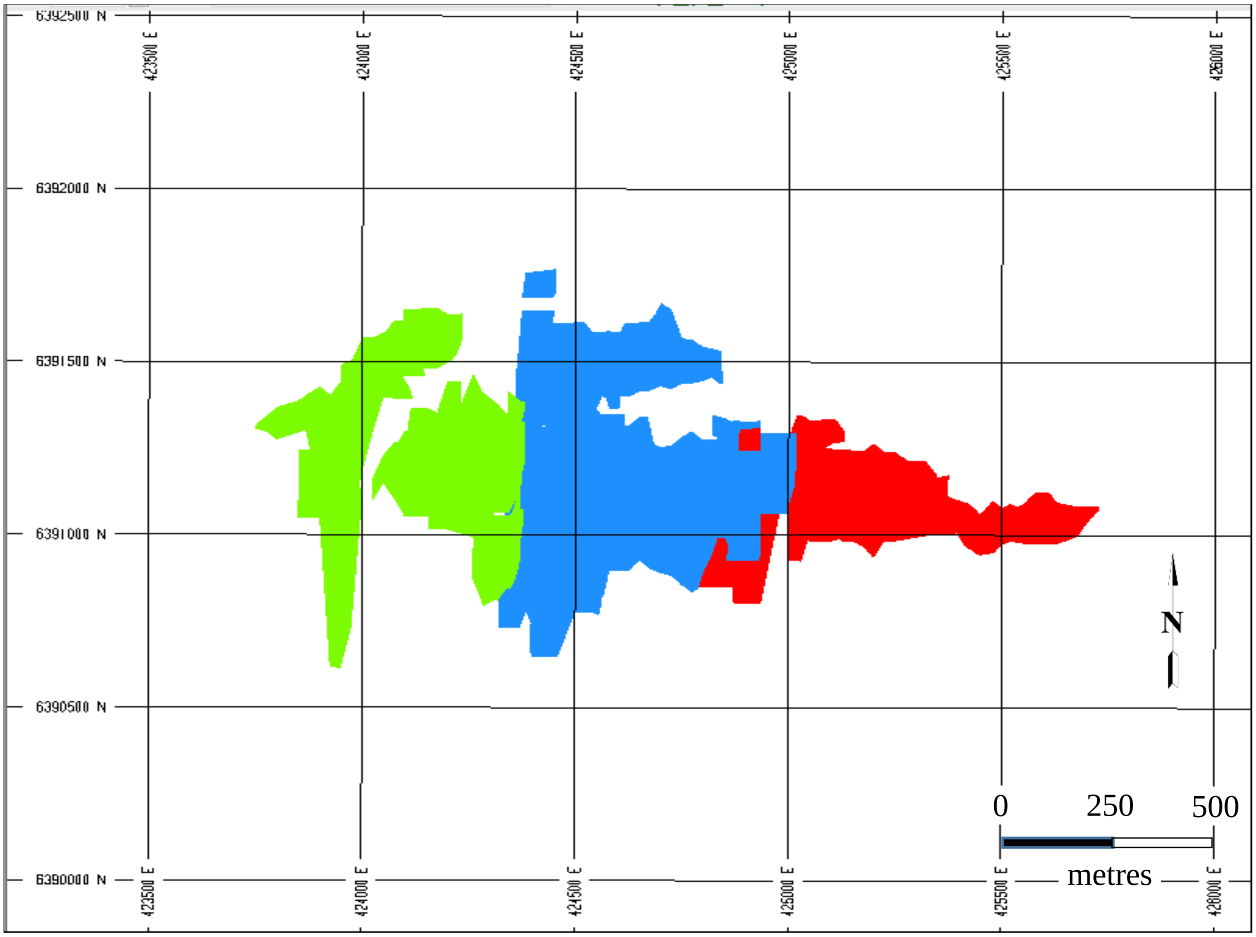


Figure 14.21 A Snaphot Plan View of the Fault Block Sub-Domains, Donnelly Deposit, Spectrum-GJ Cu-Au Project



Domain 10 Firm Boundary

A firm boundary code was created for blocks and composites within Domain 10 by interpolating a distance into blocks up to 36 m away from a block coded to Domain 50. The distance was used to code blocks. Composites were back-tagged with the resulting block sub-domain codes.

14.6.6 Variography

Down-hole and directional correlograms for gold, silver and copper grades were constructed within the mineralized domains. QP Thomas used a single spherical model and a nested exponential model and a nugget effect to fit the experimental correlograms. Tables 14.35 (for gold), 14.36 (for silver) and 14.37 (for copper) summarize the correlogram models.

Table 14.35 A Summary of Gold Variogram Models, Donnelly Deposit, Spectrum-GJ Cu-Au Project

Domain	Nugget Effect	Sill		Structure Type		Ranges – 1st Structure			Ranges - 2nd Structure			Rotations		
		1st Structure	2nd Structure	First	Second	Y	X	Z	Y	X	Z	Z	X	Y
10	0.04	0.33	0.63	Spherical	Exponential	10.0	10.0	10.0	115	55	55	-85	-35	0
20	0.33	0.43	0.24	Spherical	Exponential	30.0	30.0	12.5	140	135	55	90	0	70
30	0.05	0.49	0.46	Spherical	Exponential	9.0	9.0	9.0	315	315	315	0	0	0
40	0.26	0.44	0.33	Spherical	Exponential	30.0	30.0	30.0	250	250	250	0	0	0
50	0.14	0.49	0.37	Spherical	Exponential	25.0	25.0	20.0	450	350	180	-85	-10	-80
60	0.37	0.37	0.26	Spherical	Exponential	23.0	23.0	23.0	155	155	155	0	0	0

Note: Rotations are given using the GSLIB rotation convention (LRR). In Minesight® the last Y rotation is reversed.

Table 14.36 A Summary of Silver Variogram Models, Donnelly Deposit, Spectrum-GJ Cu-Au Project

Domain	Nugget Effect	Sill		Structure Type		Ranges – 1st Structure			Ranges – 2nd Structure			Rotations		
		1st Structure	2nd Structure	First	Second	Y	X	Z	Y	X	Z	Z	X	Y
10	0.15	0.62	0.24	Spherical	Exponential	20	20	20	300	150	150	-85	-35	0
20	0.20	0.39	0.41	Spherical	Exponential	20	20	20	145	145	21	90	0	70
30	0.10	0.58	0.32	Spherical	Exponential	17	17	17	45	45	45	0	0	0
40	0.10	0.75	0.14	Spherical	Exponential	20	20	20	75	75	75	0	0	0
50	0.15	0.63	0.22	Spherical	Exponential	30	30	20	450	350	235	-85	-10	-80
60	0.20	0.42	0.38	Spherical	Exponential	10	10	10	175	175	175	0	0	0

Note: Rotations are given using the GSLIB rotation convention (LRR). In Minesight® the last Y rotation is reversed.

Table 14.37 A Summary of Copper Variogram Models, Donnelly Deposit, Spectrum-GJ Cu-Au Project

Domain	Nugget Effect	Sill		Structure Type		Ranges – 1st Structure			Ranges – 2nd Structure			Rotations		
		1st Structure	2nd Structure	First	Second	Y	X	Z	Y	X	Z	Z	X	Y
10	0.05	0.33	0.63	Spherical	Exponential	30.0	30.0	25.0	350	120	120	-85	-35	0
20	0.01	0.34	0.65	Spherical	Exponential	40.0	40.0	15.0	400	350	180	90	0	70
30	0.01	0.59	0.36	Spherical	Exponential	16.0	16.0	16.0	51	51	51	0	0	0
40	0.19	0.71	0.10	Spherical	Exponential	40.0	40.0	40.0	326	326	326	0	0	0
50	0.10	0.36	0.55	Spherical	Exponential	70.0	40.0	35.0	500	400	200	-85	-10	-80
60	0.08	0.49	0.44	Spherical	Exponential	11.5	11.5	11.5	150	150	150	0	0	0

Note: Rotations are given using the GSLIB rotation convention (LRR). In Minesight® the last Y rotation is reversed.

14.6.7 Estimation/Interpolation Methods

The block model consists of regular blocks (10 m along strike x 10 m across strike x 8 m vertically). The block size was chosen such that geological contacts are reasonably well reflected, support the anticipated tonnage throughput rate and selectivity of the mining scenarios in the PEA. Ordinary kriging grade estimation used a composite and block matching scheme based on the domain codes. The fault sub-domains were used as hard boundaries, only composites coded as falling within the higher-grade sub-domains were used to estimate blocks falling within the higher-grade sub-domains. A firm boundary for blocks falling within Domain 10 was modelled by sharing composites from both Domains 10 and 50 within 36 m of the contact. Tables 14.38 (for Pass1), 14.39 (for Pass 2) and 14.40 (for Pass 3) summarize the composite restrictions and search distances for the gold estimation domains.

Table 14.38 A Summary of the Gold Grade Model Interpolation Plan, Pass 1, Donnelly Deposit, Spectrum-GJ Cu-Au Project

Domain	Search Ellipse Dimensions, Pass 1			Composite Restrictions			Number of Holes		Rotations (ZXY) LRL MS GSLIB		
	Y-Axis	X-Axis	Z-Axis	Min.	Max.	Max. Per Hole	Min.	Max.	Z-Axis	X-Axis	Y-Axis
10	70	60	40	4	12	3	2	4	-90	0	80
20	70	60	35	4	12	3	2	4	-90	0	80
30	70	60	35	4	12	3	2	4	-90	0	80
40	70	60	35	4	12	3	2	4	-90	0	80
50	70	60	35	4	12	3	2	4	-90	0	80
60	70	60	35	4	12	3	2	4	-90	0	80

Table 14.39 A Summary of the Gold Grade Model Interpolation Plan, Pass 2, Donnelly Deposit, Spectrum-GJ Cu-Au Project

Domain	Search Ellipse Dimensions, Pass 2			Composite Restrictions			Number of Holes		Rotations (ZXY) LRL MS GSLIB		
	Y-Axis	X-Axis	Z-Axis	Min.	Max.	Max. Per Hole	Min.	Max.	Z-Axis	X-Axis	Y-Axis
10	120	100	70	4	12	3	2	4	-90	0	80
20	120	100	60	4	12	3	2	4	-90	0	80
30	120	100	60	4	12	3	2	4	-90	0	80
40	120	100	60	4	12	3	2	4	-90	0	80
50	120	100	60	4	12	3	2	4	-90	0	80
60	120	100	60	4	12	3	2	4	-90	0	80

Table 14.40 A Summary of the Gold Grade Model Interpolation Plan, Pass 3, Donnelly Deposit, Spectrum-GJ Cu-Au Project

Domain	Search Ellipse Dimensions, Pass 2			Composite Restrictions			Number of Holes		Rotations (ZXY) LRL MS GSLIB		
	Y-Axis	X-Axis	Z-Axis	Min.	Max.	Max. Per Hole	Min.	Max.	Z-Axis	X-Axis	Y-Axis
10	250	250	100	4	12	3	2	4	-90	0	80
20	250	200	100	1	12	3	1	4	-90	0	80
30	250	200	100	1	12	3	1	4	-90	0	80
40	250	200	100	1	12	3	1	4	-90	0	80
50	250	200	100	4	12	3	2	4	-90	0	80
60	250	200	100	1	12	3	1	4	-90	0	80

Note: Search ellipse orientations are given using the LRR rotation convention as used in GSLIB

14.6.8 Density Assignment

There is little variability in SG values so average values were assigned to blocks by domain. There is an insufficient number of SG samples in overburden and the mean SG of 2.74 g/cm^3 is considered unrealistic, so QP Thomas used an average of 1.8 g/cm^3 for this domain. The SG values have been used directly as the dry bulk density to report the tonnage estimates of the mineral resource.

A total of 1,316 SG determinations have been performed on drillcore samples collected from material within the Donnelly Deposit mineralized zones (Table 14.41, not including the 55 check measurements noted in Section 12.4). The determinations were performed at site using unsealed immersion technique to measure the weight of each sample in air and in water.

Table 14.41 A Summary of SG Measurement Statistics, Donnelly Deposit, Spectrum-GJ Cu-Au Project

Domain Code	Number	Minimum (g/cm^3)	Maximum (g/cm^3)	Average (g/cm^3)
10	235	1.83	3.96	2.73
20	332	2.34	3.91	2.72
30	43	2.45	3.12	2.71
40	269	2.33	3.04	2.72
50	294	2.22	3.92	2.74
60	133	2.29	3.86	2.69
70	10	2.64	2.93	2.74
Total	***1,316***			

It is established in Section 12.4 that the Company selected 55 samples from CGH drillcore using, wherever possible, the same core pieces as those originally measured by CGH. Analysis of the results show that they agree favorably with CGH's field determined values, insofar as the laboratory measurements average only 1.1% lower than CGH's field measurements. In the opinion of QP Thomas, the slight difference does not materially affect the tonnage estimates of the Mineral Resource estimate for the Donnelly Deposit.

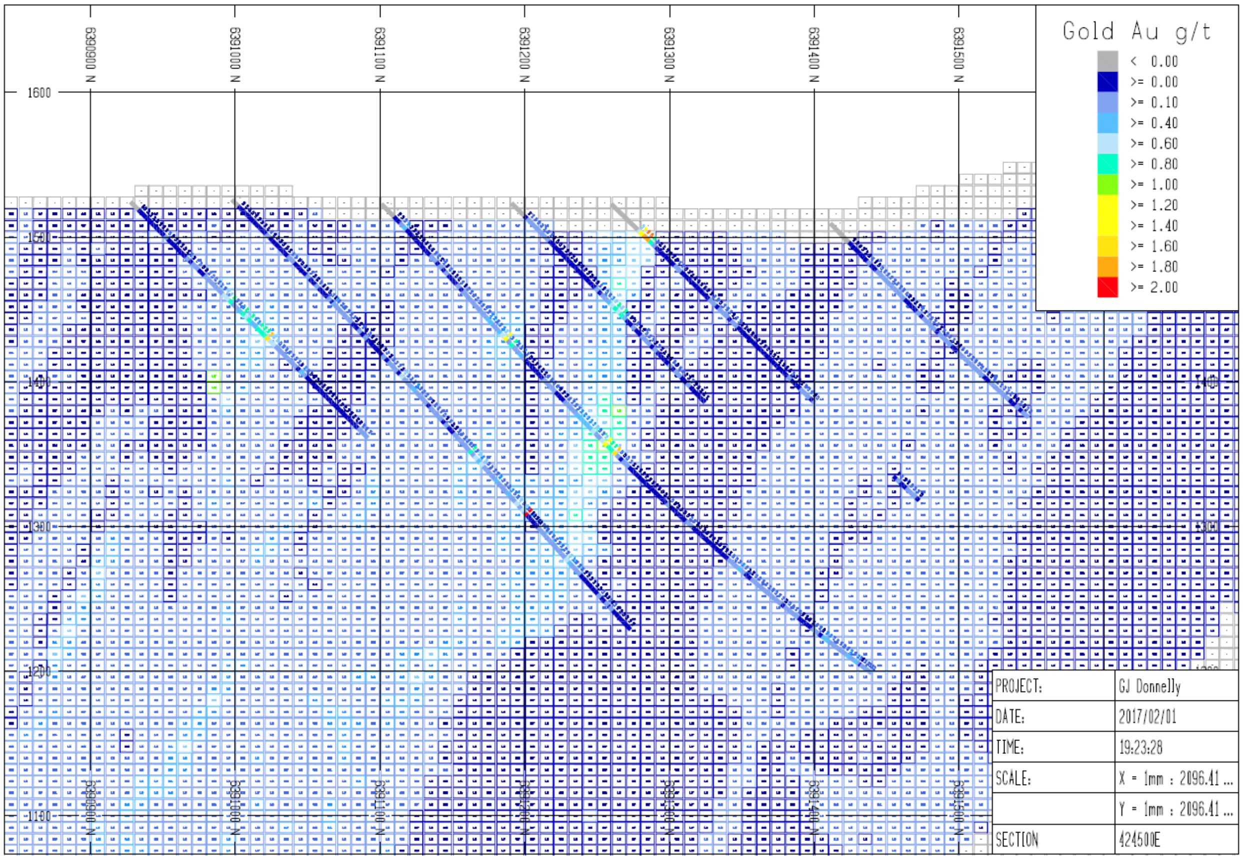
14.6.9 Block Model Validation

The Donnelly Deposit block model was validated to ensure appropriate honouring of the input data. NN grade models were created from 8 m composites to validate the OK grade models.

Visual Inspection

A visual inspection of block grade versus composited data in section and plan view was conducted. The visual inspection of block grade versus composited data showed a good reproduction of the data by the model. Figure 14.22 is an east-west oriented cross-section through the Donnelly Deposit.

Figure 14.22 Gold Grades, North-South Cross Section, 424,500 E, Donnelly Deposit, Spectrum-GJ Cu-Au Project



Metal Removed By Capping

The impact of capping was evaluated by estimating uncapped and capped grade models. The amounts of metal removed by capping in the models are in general consistent with the amounts removed from the NN models. The amounts of metal removed are summarized on Table 14.42.

Table 14.42 A Summary of the Metal Removed by Capping, Donnelly Deposit, Spectrum-GJ Cu-Au Project

Metal	OK Blocks			NN Blocks		% Differences Mean (NN-OK)
	Uncapped Mean	Capped Mean	% Difference	Uncapped Mean	Capped Mean	
Gold (g/t)	0.16	0.15	-8.7%	0.15	0.14	-4.7%
Silver (g/t)	1.30	1.18	-10.1%	1.4	1.2	-17.3%
Copper (%)	0.09	0.09	-0.5%	0.08	0.08	-0.2%

Global Bias Checks

A comparison between the OK and NN estimates was completed on classified blocks to check for global bias in the grade estimates. Differences were generally within acceptable levels (<5% for the Indicated category and <10% for the Inferred category). Tables 14.43 (for Indicated blocks) and 14.44 (for Inferred blocks) summarize the statistics.

Table 14.43 A Summary of the NN and OK Model Statistics Comparison, Indicated Blocks, Donnelly Deposit, Spectrum-GJ Cu-Au Project

Metal	NN Blocks Capped		OK Blocks Capped		% Differences Mean (NN-OK)
	Mean	Number	Mean	Number	
Gold (g/t)	0.18	263,691	0.19	264,038	2.9%
Copper (%)	0.13	263,691	0.14	264,044	2.7%
Silver (g/t)	1.3	263,691	1.3	264,044	1.2%

Table 14.44 A Summary of the NN and OK Model Statistics Comparison, Inferred Blocks, Donnelly Deposit, Spectrum-GJ Cu-Au Project

Metal	NN Blocks Capped		OK Blocks Capped		% Differences Mean (NN-OK)
	Mean	Number	Mean	Number	
Gold (g/t)	0.14	690,165	0.15	691,651	6.8%
Copper (%)	0.08	690,165	0.09	691,635	4.4%
Silver (g/t)	1.2	690,158	1.2	691,671	-1.9%

Local Bias Checks

A check for local bias was carried out by plotting the average gold and copper grades of composites, NN and OK models in swaths oriented along the model northings, eastings and elevations. QP Thomas reviewed the swath plots and found only minor discrepancies between the NN and OK model grades. In areas where there is significant extrapolation beyond the drillholes, the swath plots indicate less agreement for all variables.

Figure 14.23 is the gold swath plot; the copper swath plot is presented as Figure 14.24. The upper swath plots show grades, the lower swath plots show number of blocks or composites. The **RED** lines represent OK model, the **BLUE** lines represent the NN model and the **BLACK** lines represent composites.

Grade Smoothing/Model Selectivity Checks

A check on grade smoothing (model selectivity) was completed for potential openpit mining using a global change-of-support correction (a Hermite Polynomial or “Herco”) to the NN model. The check was completed for gold and copper in the mineralized domains. The results show that the amount of smoothing is acceptable for a block size of 10 m x 10 m x 8 m. Figure 14.25 (for gold) and 14.26 (for copper) detail grade-tonnage curves comparison of the OK model and the Herco model.

Figure 14.23 Gold Swath Plots by Easting, Northing and Elevation, Donnelly Deposit, Spectrum-GJ Cu-Au Project

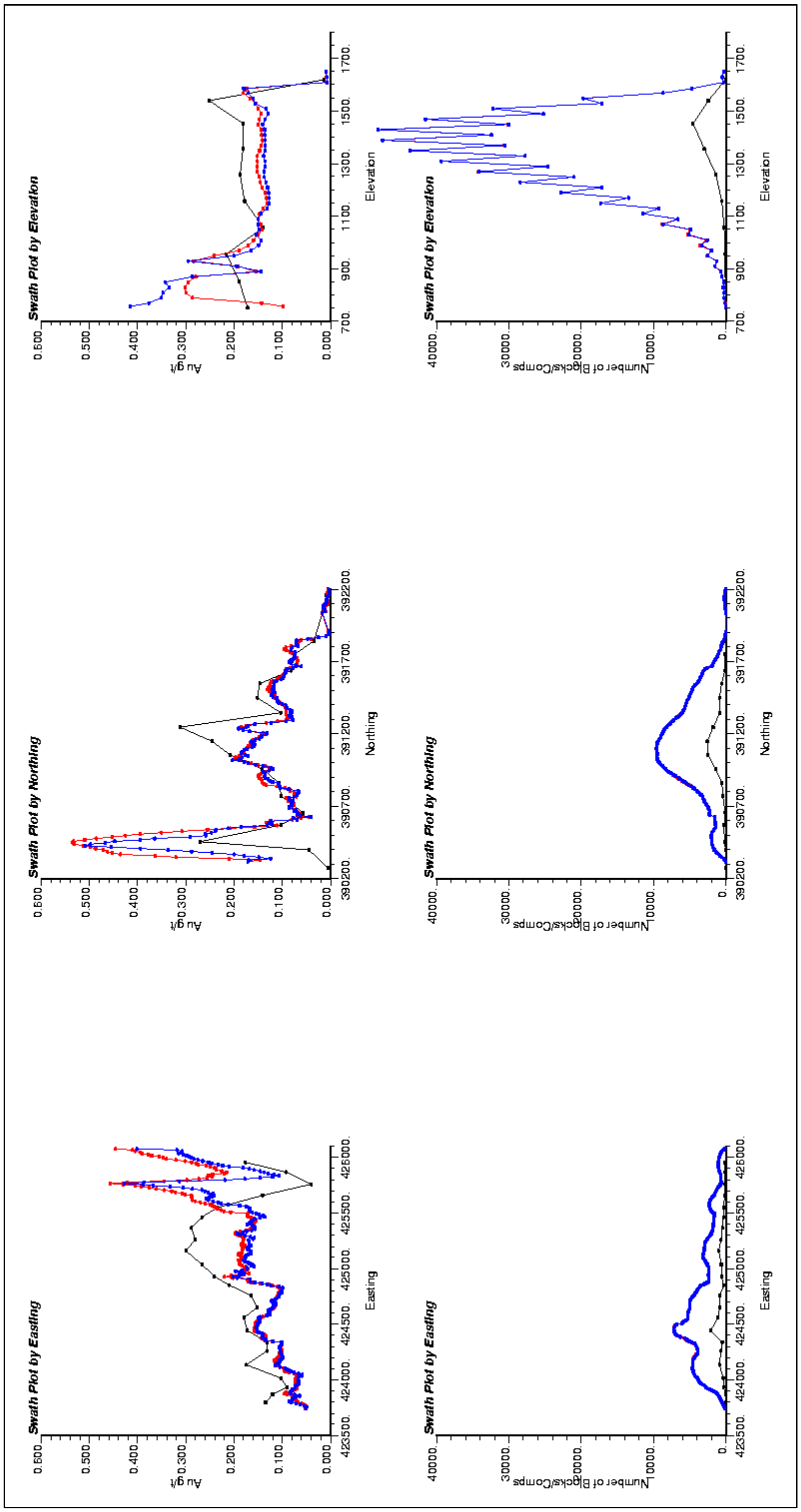


Figure 14.24 Copper Swath Plots by Easting, Northing and Elevation, Donnelly Deposit, Spectrum-GJ Cu-Au Project

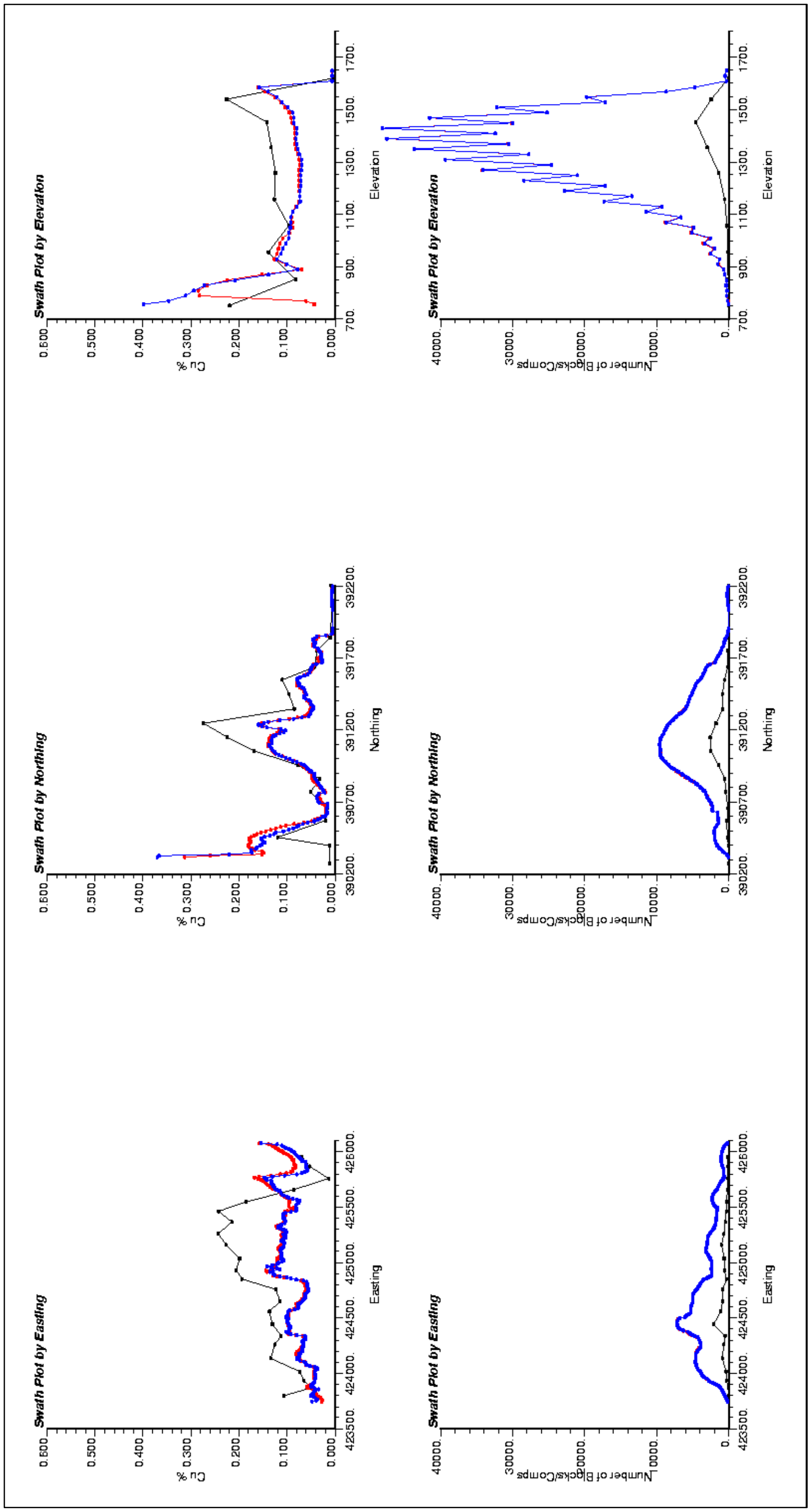


Figure 14.25 A Gold Grade-Tonnage Curve Comparison of the OK and Herco Models, Donnelly Zone, Spectrum-GJ Cu-Au Project

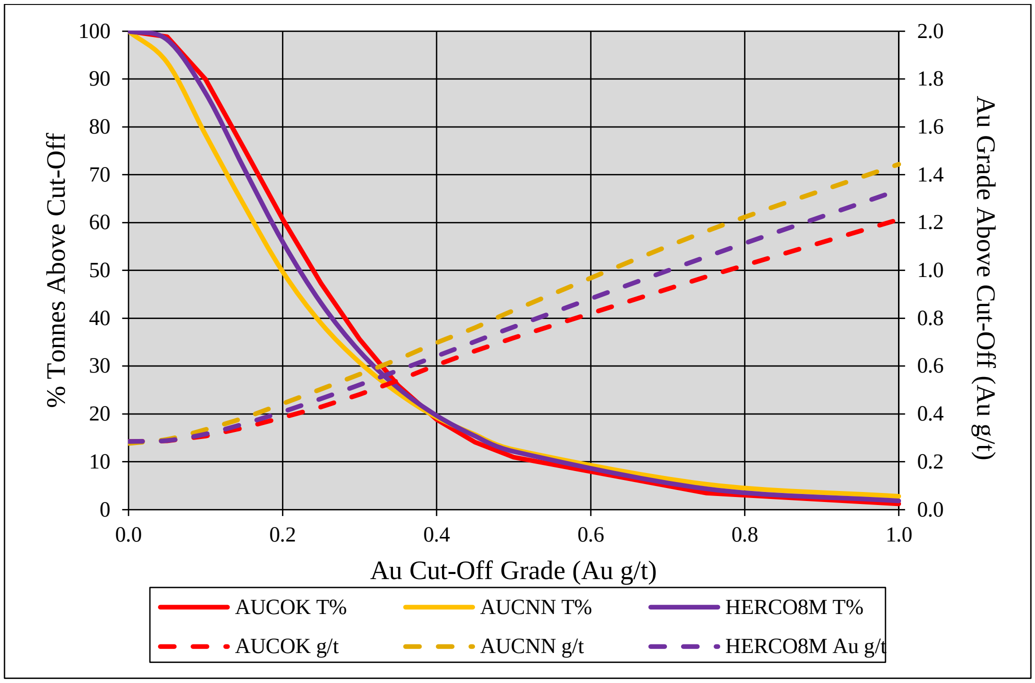
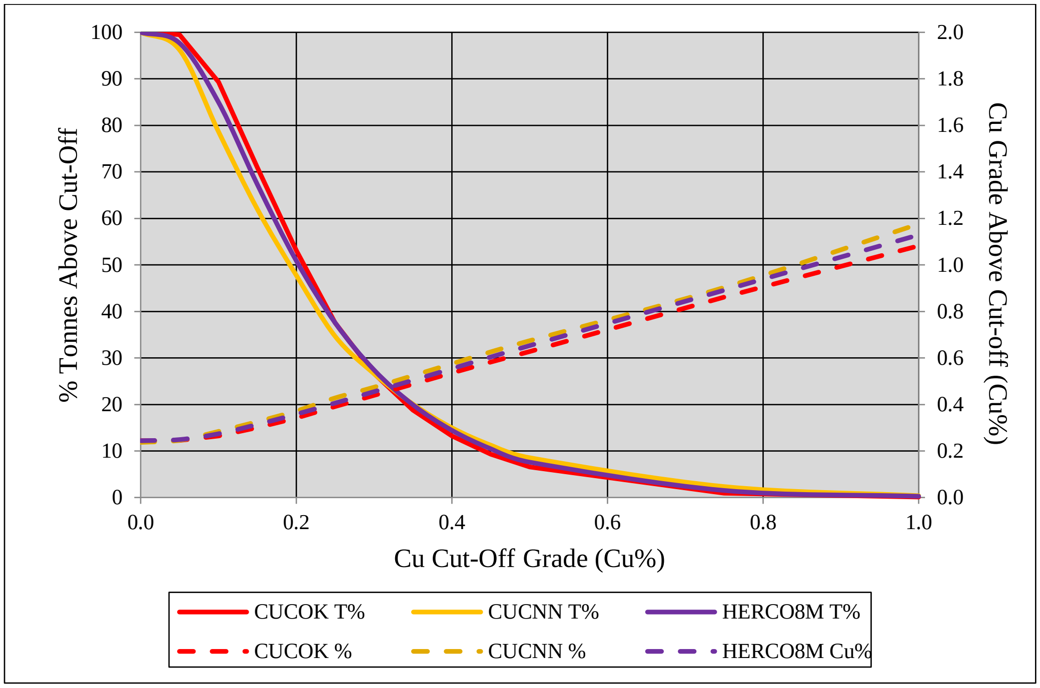


Figure 14.26 A Copper Grade-Tonnage Curve Comparison of the OK and Herco Models, Donnelly Zone, Spectrum-GJ Cu-Au Project

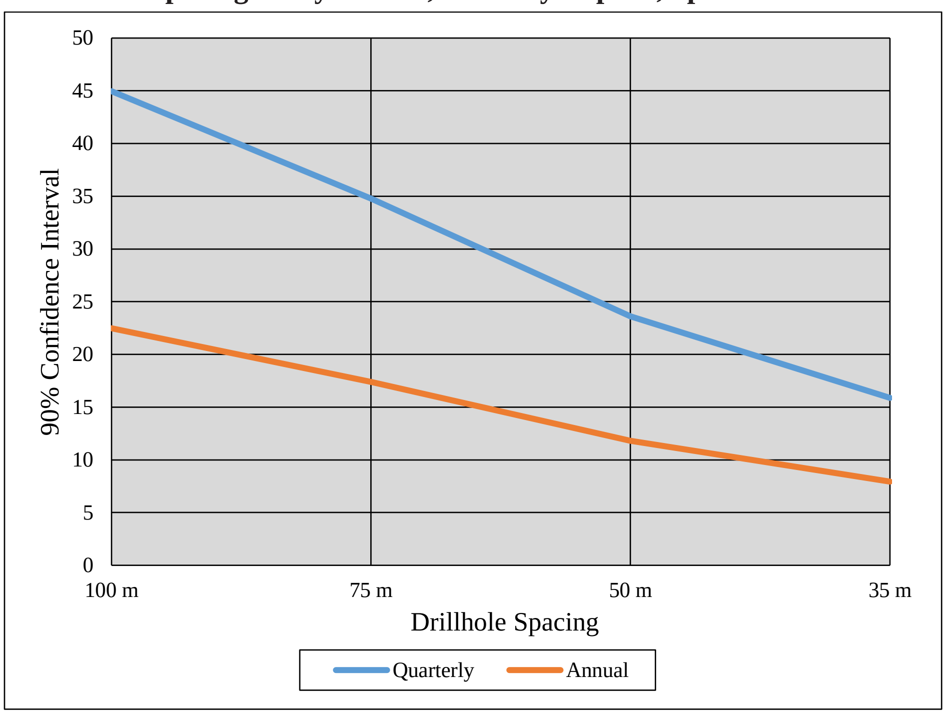


14.6.10 Classification of Mineral Resources

QP Thomas reviewed the geological model, data quality, geological continuity, grade continuity and metallurgical characteristics for classification of Mineral Resources. The mineralized zone wireframes are supported by drilling with a spacing of approximately 100 m in some areas. The continuity of the variograms suggests that grade continuity may be assumed over distances of more than 100 m; a drillhole spacing of 150 m was selected (by using a maximum distance to the closest hole of 125 m and a maximum distance to the second hole of 165 m). A maximum distance of 125 m to the closest hole permits a reasonable local estimate of grades (as demonstrated by model validation).

An analysis of confidence limits was carried out using quarterly panels of production for a 30,000 t/day openpit operation. The accuracy of grade estimates was then scaled to annual production. An accuracy of 15% or better at a 90% confidence limit on annual production was used as the criteria to select a drillhole spacing for classifying Indicated Mineral Resources. The results (see Figure 14.27) show that a drillhole spacing of 75 m (along the easting) x 75 m (along the northing) is sufficient.

Figure 14.27 Drillhole Spacing Study Results, Donnelly Deposit, Spectrum-GJ Cu-Au Project

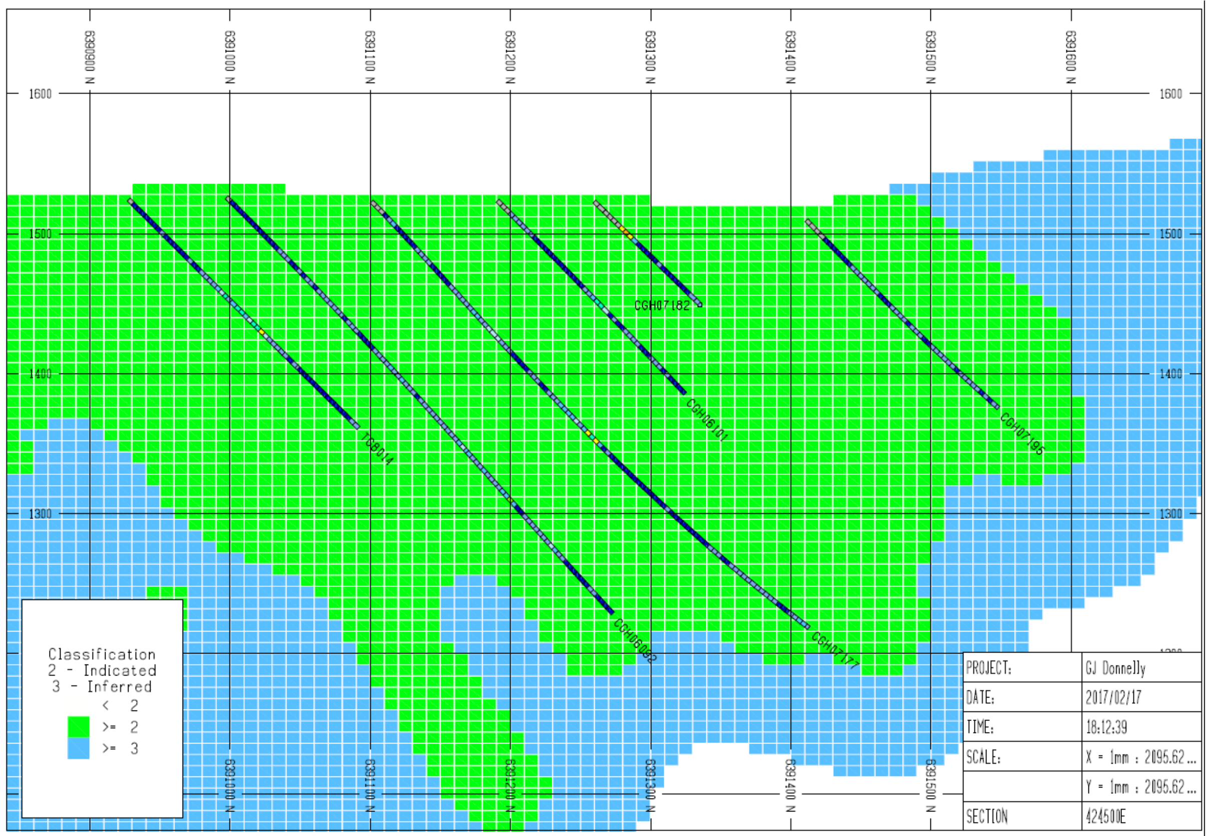


Blocks were classified into the Indicated category using the following criteria:

- a maximum distance to the closest hole of 58 m;
- a maximum distance to the second closest hole of 82.5 m; and
- a maximum average distance from two holes of 58 m (approximately half the diagonal distance within a 75 m x 75 m grid with a 10% contingency).

The distance-based classification model was smoothed to remove isolated Indicated and Inferred category blocks. The algorithm used for smoothing minimizes the change in relative proportions of blocks in each category. Figure 14.28 is a north-south cross-section view of the resulting resource classification.

Figure 14.28 Mineral Resource Classification, Section 424,500 E, Donnelly Deposit, Spectrum-GJ Cu-Au Project



14.6.11 Comparison with the Previous (2016) Mineral Resource Estimate

The previous Mineral Resource reported by the Company for the Donnelly Deposit is detailed in the April 2016 Technical Report referenced in Section 2.5. Table 14.45 (for Measured and Indicated Mineral Resources) and Table 14.46 (for Inferred Mineral Resources) compare the tonnes, grade and metal content of the models. The results of the comparison between Measured and Indicated blocks shows that the tonnage has increased by approximately 14% and the grades have increased by between approximately 7% and 8%, for an 0.2% Cu minimum grade cut-off. The comparison of the Inferred blocks shows that the tonnage has decreased by approximately 0.2% while the grades have increased by approximately 8%. Silver grades were not estimated within the scope of the 2016 Mineral Resource estimate

The change in the tonnages and grades observed in the 2017 model compared with the previous 2016 model is the result of the Company's 2016 drilling program (2,872 m in eight holes) and the use of a lithological domain model (for the 2017 update) to constrain grade estimation, compared with the single grade shell used to constrain grade estimation in 2016.

Table 14.45 Comparison of 2016 and 2017 Mineral Resource Models, Measured and Indicated Classified Blocks, Donnelly Deposit, Spectrum-GJ Cu-Au Project

2017 Model					2016 Model			% Difference, Tonnes & Grade (2017-2016)		
Cut-Off Cu (%)	Tonnes (million)	Average Grades			Tonnes (million	Average Grades				
		Cu (%)	Au (g/t)	Ag (g/t)		Cu (%)	Au (g/t)	Tonnes	Cu	Au
0.15	197.79	0.30	0.34	1.9	183.97	0.28	0.32	7.5%	6.2%	6.3%
0.20	146.09	0.34	0.38	2.1	133.67	0.32	0.36	9.3%	6.7%	6.8%
0.25	102.99	0.39	0.43	2.3	90.17	0.37	0.41	14.2%	5.6%	5.4%
0.30	73.10	0.44	0.48	2.4	60.69	0.41	0.45	20.4%	7.0%	6.4%
0.35	51.41	0.49	0.53	2.5	39.40	0.46	0.50	30.5%	5.9%	5.4%
0.40	36.21	0.54	0.58	2.7	25.88	0.50	0.54	39.9%	7.1%	7.1%
0.45	25.49	0.58	0.63	2.8	16.15	0.55	0.59	57.9%	5.9%	7.1%
0.50	18.02	0.63	0.68	3.0	9.51	0.60	0.66	89.5%	4.7%	3.3%

2017 Model				2016 Model			% Difference, Tonnes & Metal Insitu (2017-2016)		
Cut-Off Cu (%)	Tonnes (million)	Metal Content		Tonnes (million)	Metal Content				
		Cu (Mlb)	Au (Moz)		Cu (Mlb)	Au (Moz)	Tonnes	Cu	Au
0.15	197.79	1,296.87	2.16	183.97	1,135.83	1.90	7.5%	14%	14%
0.20	146.09	1,098.94	1.81	133.67	940.23	1.56	9.3%	17%	16%
0.25	102.99	886.59	1.43	90.17	725.71	1.18	14.2%	22%	21%
0.30	73.10	706.97	1.13	60.69	548.67	0.88	20.4%	29%	28%
0.35	51.41	552.14	0.87	39.40	397.90	0.63	30.5%	39%	39%
0.40	36.21	427.26	0.67	25.88	286.47	0.45	39.9%	49%	50%
0.45	25.49	327.34	0.52	16.15	195.86	0.31	57.9%	67%	69%
0.50	18.02	249.47	0.40	9.51	126.66	0.20	89.5%	97%	96%

Note: Silver was not considered within the scope of the 2016 Mineral Resource estimate.

Table 14.46 Comparison of 2016 and 2017 Mineral Resource Models, Inferred Classified Blocks, Donnelly Deposit, Spectrum-GJ Cu-Au Project

2017 Model					2016 Model			% Difference, Tonnes & Grade (2017-2016)		
Cut-Off Cu (%)	Tonnes (million)	Average Grades			Tonnes (million	Average Grades				
		Cu (%)	Au (g/t)	Ag (g/t)		Cu (%)	Au (g/t)	Tonnes	Cu	Au
0.15	62.53	0.24	0.31	1.6	100.19	0.22	0.28	-37.6%	10.1%	11.1%
0.20	40.84	0.28	0.36	1.7	53.69	0.26	0.33	-23.9%	7.3%	8.3%
0.25	23.53	0.32	0.40	1.9	29.51	0.30	0.36	-20.3%	6.4%	11.9%
0.30	12.74	0.36	0.46	2.1	11.59	0.34	0.41	9.9%	6.2%	11.4%
0.35	6.07	0.40	0.51	2.4	2.87	0.38	0.46	111.6%	5.9%	11.8%
0.40	2.46	0.45	0.60	2.8	0.51	0.46	0.46	382.2%	-1.9%	30.5%
0.45	1.00	0.49	0.68	3.0	0.24	0.51	0.49	316.5%	-3.5%	38.5%
0.50	0.25	0.57	0.67	3.3	0.11	0.56	0.58	123.2%	2.3%	15.2%

2017 Model				2016 Model			% Difference, Tonnes & Metal Insitu (2017-2016)		
Cut-Off Cu (%)	Tonnes (million)	Metal Content		Tonnes (million)	Metal Content				
		Cu (Mlb)	Au (Moz)		Cu (Mlb)	Au (Moz)	Tonnes	Cu	Au
0.15	62.53	333.93	0.63	100.19	490.44	0.91	-37.6%	-32%	-31%
0.20	40.84	251.14	0.47	53.69	312.54	0.57	-23.9%	-20%	-18%
0.25	23.53	165.58	0.30	29.51	193.91	0.34	-20.3%	-15%	-11%
0.30	12.74	101.40	0.19	11.59	85.87	0.15	9.9%	18%	24%
0.35	6.07	53.88	0.10	2.87	24.24	0.04	111.6%	122%	139%
0.40	2.46	24.46	0.05	0.51	5.17	0.01	382.2%	373%	493%
0.45	1.00	10.84	0.02	0.24	2.69	0.00	316.5%	303%	445%
0.50	0.25	3.10	0.01	0.11	1.35	0.00	123.2%	130%	164%

Note: Silver was not considered within the scope of the 2016 Mineral Resource estimate.

14.7 Reasonable Prospects of Economic Extraction

The classified blocks for both the Central Zone and Donnelly Deposit models were assessed for reasonable prospects of economic extraction by applying preliminary economics for potential openpit mining. Metallurgical testwork has been completed for the mineralization (see Section 13). Operating costs, metal prices, metallurgical recovery and a 45° slope angle were used to optimize a pit shell using a Lerchs-Grossman algorithm.

The assessment does not represent an economic analysis of the deposit, but was used to determine reasonable assumptions to report the Mineral Resource. The assumed long-term gold, silver and copper prices were US$1,250/oz Au, US$17.75/oz Ag and US$2.75/lb Cu, which are the Base Case values stated in Section 19. The assumed metallurgical recovery rates were 73% for gold, 50% for silver and 90% for copper, which are those stated in Section 13 for 100% Donnelly feed. The estimated on-site operating costs were those stated in Section 20.

14.8 Minimum Grade Cut-Offs

A minimum grade cut-off was determined for Central Zone mineralization using an all-in unit cost for mining mineralized material of US$7.07/t, factored by strip ratio to US$4.66/t of ROM material, a unit process cost (flotation) of US$4.55/t and a factored, all-in unit on-site G&A cost of US$0.46/t. On this basis and using the same metal prices and metallurgical recovery rates stated above, a gold equivalent cut-off grade of 0.417 g/t Au was calculated. A gold equivalent cut-off grade of 0.40 g/t AuEq was therefore selected for reporting the Mineral Resources, assuming an openpit mining method.

A minimum grade cut-off was determined for Donnelly Deposit mineralization using an all-in unit, long-term cost for mining mineralized material of US$4.36/t, factored by strip ratio to US$2.35/t ROM material, a long-term unit process cost (flotation) of US$4.13/t and an all-in, unit on-site G&A cost of US$1.34/t. On this basis and using the same metal prices and metallurgical recovery rates stated above, a copper equivalent cut-off grade of 0.145% Cu was calculated. An 0.15% CuEq cut-off grade was therefore selected for reporting the Mineral Resources, assuming an openpit mining method.

14.9 Factors that Might Influence the Mineral Resource Estimates

Areas of uncertainty that may materially impact the Mineral Resource estimate include:

- the applied, long-term commodity price and exchange rate assumptions;
- the operating cost assumptions;
- the applied metallurgical recovery rates and any changes that might result from additional metallurgical testwork;
- changes to the tonnage and grade estimates as a result of new assay and bulk density information;
- future tonnage and grade estimates may vary significantly as more drilling is completed;
- permitting of mining operations; and
- any changes to the slope angle of the pit walls as a result of geotechnical information would affect the pit shell used to constrain the Mineral Resources.

14.10 Qualified Person's Opinion

QP Thomas is of the opinion that the Mineral Resources for the Project, which have been estimated using core drilling, have been performed to industry practices and conform to the requirements of CIM Definition Standards (2014). The Mineral Resource estimation is well-constrained by three-dimensional wireframes representing geologically realistic volumes of mineralization. Exploratory data analysis conducted on assays and composites shows that the wireframes are suitable domains for mineral resource estimation.

As a result of validation of the Mineral Resource block models, QP Thomas concludes that:

- visual inspection of block grade versus composited data shows a good reproduction of the data by the model;
- checks for global bias in the grade estimates show differences generally within acceptable levels (<5% for Indicated and <10% for Inferred - domains with larger differences between the NN model and OK model have a low number of composites);
- checks for local bias (swath plots) indicate good agreement for all variables, except in areas where there is significant extrapolation beyond the drillholes;
- the impact of capping by estimating uncapped and capped grade models was evaluated - generally the amounts of metal removed by capping in the models are consistent with the amounts calculated during the grade capping study on the assays.

The Mineral Resource were classified using distances which permit a reasonable assumption of geological and grade continuity. Comparisons with the previous (2016) Mineral Resource estimates in the areas of infill drilling support the classification of Indicated Mineral Resources. Confidence limits analyses from a drillhole spacing studies (for both Central Zone and Donnelly Deposit) and conditional simulation of grades (at Central Zone) both support classification of Indicated Mineral Resources. The Mineral Resources are constrained and reported using economic and technical criteria such that the Mineral Resources have reasonable prospects of economic extraction.

QP Thomas recommends that the Company complete additional drilling on the Project. Infill drilling in both the Central Zone and Donnelly Deposit may result in upgrades in the Mineral Resource category from Inferred to the higher confidence Measured and Indicated categories. Furthermore, both deposits are open along strike and down-dip, and additional drilling is required to fully assess their potential.

The Company should also carefully evaluate and identify areas of both deposits with higher risk (e.g. either areas with significantly higher grades than the average grade of the deposit or areas with more discontinuous grades) and consider strategically located holes in those areas to mitigate the risks. Additional drilling would mitigate the risk by increasing local confidence in the estimated tonnage and grade above cut-off. Consideration should also be given to drilling in those areas that rely on pre-1993 drillholes at Central Zone and pre-2004 drillholes on the Donnelly Deposit (see Section 11.7 for details).

15 MINERAL RESERVE ESTIMATES

To the best knowledge and understanding of the Principal Author, no Mineral Reserve estimates have been compiled in respect of any mineralization located on the Project Area, including the Central Zone and Donnelly Deposit that are the subject of this Technical Report.

16 MINING METHODS

The Principal Author and QP Scott Britton, C. Eng. (the "Co-Authors") are jointly responsible for this section of this Technical Report.

16.1 Mining Method Selection

Surface and underground methods were considered for exploiting the Central Zone and Donnelly Deposit, including conventional truck and shovel openpit mining, longhole stoping, sub-level caving and block caving. Conventional truck and shovel openpit mining was selected because, overall, it represents the least risk, most sustainable option from both economic and environmental perspectives. The following discussions apply.

At first glance, topographic constraints, especially as regards Central Zone, favour the use of an underground mining method. However, preliminary analysis, using the block model used to compile the 2016 Mineral Resource estimate detailed in the May 2016 Technical Report, showed that while the target mineralization persists in a geological sense, its average grades are in general too low to support even a modest longhole stoping operation. High-/higher-grade areas could be targeted for selective extraction, through the application of a suitably high grade cut-off, but analysis shows that grade continuity quickly breaks down at grade cut-offs higher than approximately 0.5 g/t AuEq. This directly and inevitably results in:

- ever-smaller blocks of economically viable material, hence a quickly shrinking Mineral Resource base; and
- ever-worsening ratios of ROM tonnage production to development metres; hence
- ever-increasing operating costs that reach unsustainable levels at the estimated grade cut-off required to justify a longhole stoping operation (assessed by the Co-Authors to be in the 2.0 g/t to 3.0 g/t AuEq range for a stand-alone underground operation).

In the Co-Authors' opinion, there is no readily identifiable reason to suppose that the same findings would not be reached if the block model, used to compile the 2017 Mineral Resource estimate detailed and described in Section 14, was employed:

- the purpose of the drilling program completed by the Company in 2016 (i.e. subsequent to the 2016 Mineral Resource estimate for the Central Zone, stated in the May 2016 Technical Report) was to elevate the mineralization to the west of the high-grade gold zone to at least the Inferred category of Mineral Resources (it was previously defined as waste) and to infill gaps in historic drilling, thereby to increase confidence in Mineral Resources and to increase the quantity of Inferred Mineral Resources;
- comparison of the 2016 and 2017 Mineral Resource estimates (see Section 14.5) shows that –
    - the main difference is in the amount of tonnes remained approximately the same in the Inferred category but increased nearly threefold to 31.2 Mt in the Indicated category, whereas
    - the average grades (for an 0.4 g/t AuEq cut-off) in the Indicated category remained more-or-less the same (with the notable exception of silver).

The constraints outlined are even more significant as regards longhole stoping in the Donnelly Deposit, due mainly to the comparatively modest gold grades compared with the Central Zone. The constraints outlined do not, however, preclude the use of a longhole stoping method to selectively extract high-grade material that could not be economically exploited by openpit mining on either the Central Zone or Donnelly Deposit. Access could be either from extensions to the planned muck handling infrastructure described below (adits) or from the bottom of the planned pits. In the opinion of the Co-Authors, this potential opportunity should be assessed at the pre-feasibility stage of project development.

The constraints outlined do not necessarily apply if a caving method is used. For example, preliminary analysis showed that in general, Central Zone rockmass characteristics are amenable to block caving in particular, not least due to the presence of faults (suggesting good bulk caving characteristics) and the extensively (and weakly) veined nature of the mineralized zones (suggesting good comminution characteristics). However, the expected amounts of clay in a relative tension structure that cuts across Central Zone would act against drawpoint production efficiency, as would the assessed tendency for large blocks to be generated by block caving in the Donnelly Deposit (by virtue of its comparatively higher RQD values and poor [assessed] comminution characteristics). These issues to a large extent fall away if a sub-level caving method was employed.

Notwithstanding the above, both caving methods were ultimately discounted in favour of openpit mining, because:

- the geometries of the target mineralization would require above average amounts of access development, which would impinge on project economics if a sub-level caving method was employed;
- the footprint to vertical height ratios of the target mineralization are moderate at best, with the result that elevated dilution rates could reasonably be expected, along with moderate resource utilizations and a substantial pre-production capital requirement if a block caving method was employed; and, perhaps most importantly,
- the use of a caving method would inevitably incur bulk rockmass caving that would cause potentially large surface subsidence troughs that, in the case of the Central Zone, could ultimately encompass the local mountain slope and ridge.

16.2 Planning and Design Criteria

16.2.1 Practical, Physical and Operational Constraints

It is established in Section 2 that a key objective of the PEA is to engineer solutions that encompass safety considerations as well as practical, physical and operational constraints, thereby to ensure practicably achievable and sustainable outcomes. For purposes of mine planning, design and production scheduling, this study objective was achieved through consideration of:

- the topographic constraints of mining on the side of a minor mountain at Spectrum Pit and on Klastline Plateau in the case of the Donnelly Pit, which –

  - limit the size of equipment that can be used in Spectrum Pit, hence the production rate that can sustainably be achieved (a similar constraint does not apply at the Donnelly Pit that is amenable to bulk production mining), and
  - require the use of raisebore and adit access muck handling systems at both Spectrum Pit and Donnelly Pit; and
- the geohazard and geotechnical constraints described in the following sections that limit the ultimate size of Spectrum Pit, at least within the scope of the PEA; and
- the tonnage ramp-up profile for ROM plant feed that is described in Section 17.

It should be emphasized that by definition, the purpose of a preliminary economic assessment is to demonstrate that the economics of a mining project are sufficiently robust (or not) to advance the project to the pre-feasibility stage (or not). Upside potential exists as regards mine planning, design and production scheduling, through the undertaking of production optimization and trade-off studies that cannot and did not form part of the PEA. The recommended studies are described in the following sections and they are summarized in Section 26. In the opinion of the Co-Authors, the recommended studies could result in an increase to the production rate for Spectrum Pit in particular, as well as an extension to planned life-of-mine.

16.2.2 Production Scheduling

Phased production scheduling was adopted to match the overall approach applied for purposes of the PEA (see Section 2.3): preliminary analyses of potential project development options identified the benefits of a combined operation designed to limit operational, technical and capital risks by:

- limiting early mine production to achievable and sustainable levels;
- scheduling production from the two deposits to optimize early cashflows; and
- phasing capital expenditures by employing either a modular or progressive approach (as appropriate) to the development of plant throughput capacities, production fleet size and camp capacity in particular.

The alternatives – the development and construction of separate operations or the development of openpit mines with production capabilities sufficient to fill an ultimate capacity plant early in the project life – were considered inappropriate. Within the scope of mine planning, design and scheduling, the principal reasons include:

- the much increased personnel, infrastructure, support facilities and equipment requirements (hence costs) that two separate operations would require, despite their close proximity; and
- the technical and operational risks inherent to any new, start-up operation (a wealth of global mining experience shows that lengthy lead times are invariably required before such risks can be overcome and optimal results can routinely and sustainably be achieved, especially with greenfield projects).

16.3 Planning and Design Considerations

16.3.1 Environmental

It is stated in Section 4 that, to the extent possible planning and design should encompass the Tahltan Nation's requirements that, to the best knowledge and understanding of the Co-Authors, includes keeping the project within one watershed, unless existing infrastructure extends into or from a different watershed (see also Section 18.1). In common with the majority of the planned infrastructure, the planned pits are both within the Stikine River drainage system identified in Section 5.8. However, an incised creek exists immediately to the east of the planned Donnelly Pit. It flows southwest and then south to eventually drain east, off the Klastline Plateau, to thereby join the Iskut River drainage system. Pit optimization for purposes of Mineral Resource estimation showed that the eastern end of Donnelly Pit could, in theory, extend into the creek outlined. For purposes of ultimate pit design, the eastern end of Donnelly Pit was limited to/constrained at a point that ensured that the single watershed planning requirement was adhered to and that the creek's integrity was not compromised.

16.3.2 Physical Constraints

Within the scope of the PEA, access to Spectrum Pit is limited to a point mid-pit, which limits the size of the pit that could be safely be realized (see below and Section 18.9 for details of the pit access road). A potential for larger/higher overall tonnage pit exists, but this was not considered within the scope of PEA because it requires access to the top of the local mountain from where waste stripping would take place to thereby enable a larger tonnage pit to be mined.

Access to the local mountain top is problematic: it includes a section along a steep and deep ravine, as well as sections along known avalanche channels and areas of potentially unstable scree identified within the scope of the geohazards study described below (Sub-Section 16.3.3). These risks require examination and mitigation before an access road to the local mountain top could realistically and confidently be planned.

It is for the reasons outlined that the potentially significant benefit of sustained production from an enlarged Spectrum Pit was not included within the scope of the PEA. Production from Spectrum Pit is instead limited to what can practicably, safely and sustainably be realized by means of mid-pit access only, as required by virtue of the project planning criteria stated above. The studies required to enable low risk, sustainable enlargements to Spectrum Pit are recommended for completion at the feasibility stage of project development.

16.3.3 Geohazards

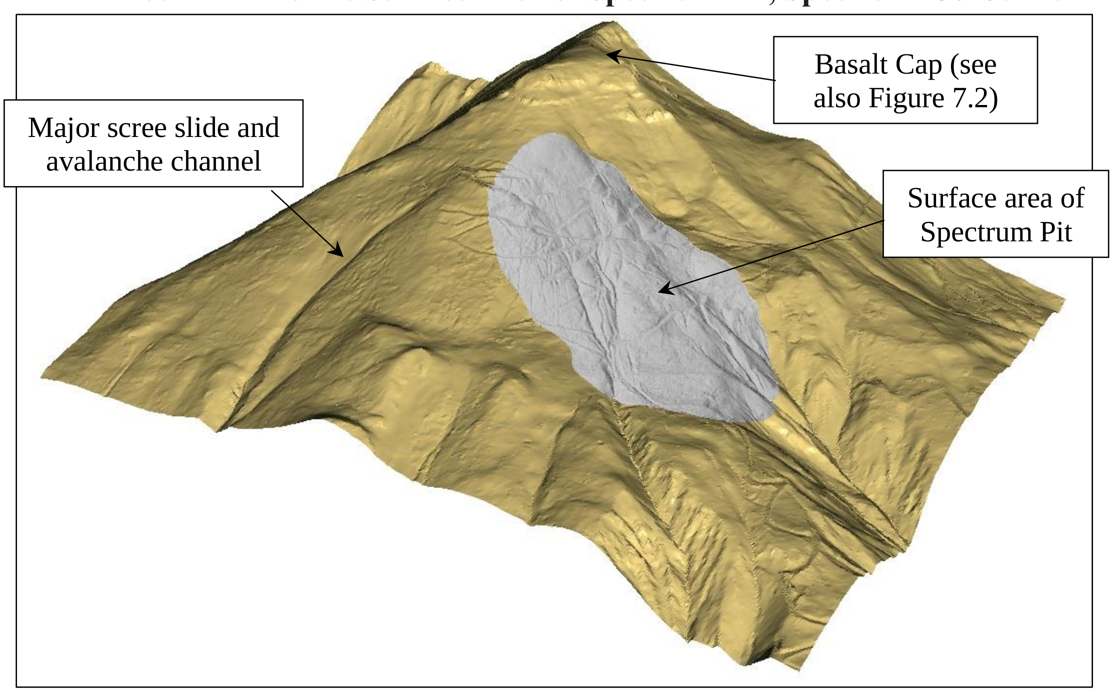
Both locally and regionally, geohazards are linked primarily to landslides and to avalanches. Landslide hazards are extensive throughout the region and are attributed to several factors, including: the presence of unstable surficial soils and weak bedrock; repeated glaciation events resulting in over-steepened valley sidewalls; the loss of slope buttress support following glacial recession; abundance of veneers that are shallow to bedrock; and the high precipitation environment (Tetra Tech, 2016).

The types of geohazards outlined are not primary sources of operational risk at the planned Donnelly Pit, due mainly to the generally flat and featureless local topography of Klastline Plateau. However, Central Zone is situated on a mountain slope that is occasionally subject to local landslides, debris flows and minor avalanches (see also Section 5.4). It is because of the types of hazards outlined that the Company, in June 2015, commissioned J. W. Schwab, P. Geo, Eng. L. to undertake a terrain stability hazard (geohazard) overview assessment of the general area of Central Zone. The objective was to determine the safety of camps and work sites for the Company's exploration programs (Schwab, 2015). The assessment involved a desk-top review of air photographs, computer analysis of slope stability (slope stability index mapping), a field visit and interpretive hazard identification of avalanche paths.

A number of terrain stability hazards were observed and reported, including debris flow channels, rockslides, slump-slides and avalanche channels. Terrain features suggest that the majority of these mass-wasting events occurred in the distant past. However, avalanches are a persistent hazard in winter and slope stability can be compromised during intense rainfall events.

Figure 16.1 is a Vulcan™ snapshot of the mountainside containing Central Zone, on which is identified the surface ares of the final pushback for the planned Spectrum Pit. It may be seen that a significant scree slide and avalanche channel exists to the immediate south of the planned pit. The northern edge of the channel marks the limit of the Spectrum Pit planned for purposes of the PEA. Without this constraint, the planned pit could be larger, but not significantly so (because of access limitations assumed within the scope of the PEA, hence the inability to mine waste, downwards from the basalt cap, which is required before a substantially larger pit could be developed).

Figure 16.1 A Vulcan™ Snapshot (looking approximately south-southwest) of the Local Mountain and the Surface Area of Spectrum Pit, Spectrum-GJ Cu-Au Project



It should be emphasized that Schwab's terrain assessment was limited to an evaluation of observed terrain features in the Spectrum claims block only, along with considerations of bedrock and surficial materials, landslides, terrain associated with avalanches, slope stability site indicators, sub-surface materials uncovered in soil pits dug by hand shovel and surficial materials observed in road cuts and in natural exposures. A detailed investigation of sub-surface geological conditions was not undertaken, nor was a formal risk assessment for avalanches (Schwab, 2015). Additional geohazard assessments are, therefore, recommended for the Project Area, inclusive of both the pit areas and the planned infrastructure locations described in Section 18.

16.3.4 Geology

It is established in Section 7.6 that the Central Zone geology includes a rotated slump block (or sackung) of broken, heavily weathered Stuhini Group strata that is generally barren but locally has a low-grade, gold only signature. For purposes of domain modelling, the sackung area is termed Domain 2a, which lies towards the north end of the deposit and overlies porphyry Cu-Au mineralization of the Central Zone.

Casing in several pre-2014 drillholes extended through the sackung such that its base is in places somewhat interpretive (see also Section 7.6). In view of this, the western wall of the planned Spectrum Pit was limited to a position where only a small amount of Domain 2a material was taken, with the remainder laid-back at an angle of 37° to ensure its stability. Without this constraint, the planned pit would be larger.

It is recommended that, at the pre-feasibility stage of project development, the profile hence volume of Domain 2a material is more closely defined than is currently the case. Realistic/safely achievable Spectrum Pit production plans could then be realized within the scope of pit design re-evaluations incorporating considerations of the physical, geohazard, geological and geotechnical constraints identified herein.

16.3.5 Geotechnical

A preliminary geotechnical characterization of the Central Zone and Donnelly Deposit rockmasses was carried out for purposes of the PEA. The study included considerations of rockmass quality designation ("RQD"), weathering profiles, structures and discontinuity trends, as well as preliminary slope stability analyses.

<u>Rock Quality Designations</u>

It is established in Section 10.6 that, in the opinion of the Principal Author, the majority of the Central Zone rockmass between fault zone intervals may be described as having RQD values between approximately 45% and 65%, increasing to approximately 55% to 75% or even 80% in the case of the Donnelly Deposit. Scrutiny of drillcore intervals shows the extensively veined nature of the Central Zone in particular; a qualitative assessment of core strength shows that Central Zone core tends to break readily at vein contacts (which, in the opinion of the Principal Author, is a significant contributor to the generally low to moderate RQD values reflected in the drillcore logging database). In the Principal Author's opinion, the results of the qualitative drillcore assessment suggests that Central Zone material will fracture readily on blasting and that good comminution will occur on draw-down of material tipped into the muck handling system described in Section 16.5. A similar conclusion was not arrived at following the Principal Author's analysis of Donnelly

Deposit core: it tends to be more competent and drillcore stick lengths of up to 0.7 m are not uncommon. Large blocks of competent rock are, therefore, expected to be a fairly common feature of ROM material from Donnelly Pit.

Weathering Profiles

General surface weathering appears to be limited to a few metres below the surficial material (deeply weathered scree across the Spectrum Pit area and approximately 5 m of till across the Donnelly Pit area – see Section 16.9). Analysis of the available data shows that, as may be expected, fault zones are uniformly logged as having 'Very Poor' to 'Poor' rockmass qualities (RQD <30%). Especially low values are recorded within what are interpreted to be relative tension fault zones associated with regional-scale, strike-slip faulting.

Structural Analysis

Discontinuity sets were determined for purposes of preliminary slope analysis, based on considerations of regional and local faulting trends that appear either on the regional and Project Area geology plans identified in Section 7 or on the BCGS provincial structural map (available at http://www.empr.gov.bc.ca/Mining/Geoscience/PublicationsCatalogue/OpenFiles/2015/Pages/2015-2.aspx). Topographic interpretation across the general Project Area was also used to identify persistent structural trends, as suggested by moderate to major drainages (rivers and significant creeks) and their associated lakes.

Figure 16.2 summarizes the interpreted major structural trends in the general Project Area. Figure 16.3 summarizes the mapped and interpreted structures across the general area of Spectrum Pit and Figure 16.4 summarizes the interpreted structures across the general area of Donnelly Pit, inclusive of the structures identified within the scope of the Donnelly geology model described in Section 7.6. In each case, the various structures are colour-coded according to the structural/fault sets identified below (Fault Set A in **RED**, Fault Set B in **BLUE** and Fault Set C in **GREEN**). It may be seen that persistent structural trends can be identified both on a regional and local scale. The trends matched closely the discontinuity orientations identified by structural and discontinuity field mapping, as reported in Oliver and Walcott (2016).

Modified strike-slip structural theory (Godden, 2005) was applied to the results from which the three structural sets summarized on Table 16.1 were identified, assuming an average conjugate angle for the dominant rock types of between 50° and 55° (based on a database of results for a wide variety of rock types, compiled and held by the Principal Author). A minimum of three data sources was required before any particular fault direction was considered valid. The only exception is F2 of Fault Set C, which has a similar trend to F2 of Fault Set A and is, therefore, probably masked within the available dataset.

Figures 16.5 through 16.7 are rose diagrams that summarize the structural orientations of the three strike-slip fault sets identified on Table 16.1. The trends were compared with those separately defined by Company geologists when compiling the geological models described in Section 7.6. Excellent repeatability between the two datasets was found.

Figure 16.2 The Main Interpreted Structural Trends in the General Area of the Spectrum-GJ Cu-Au Project

(compiled by the Principal Author, in conjunction with Company personnel)

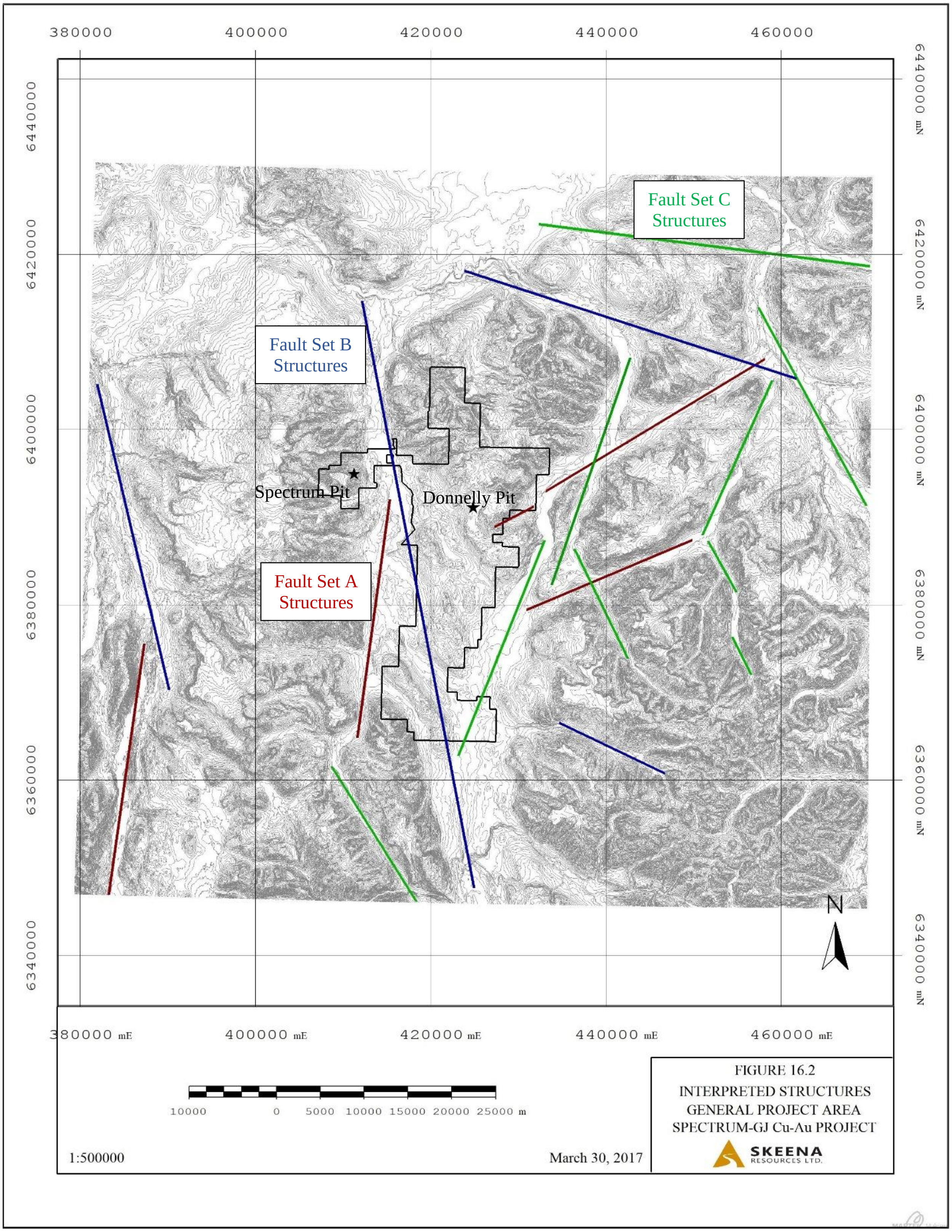


Figure 16.3 A Summary of the Mapped Faults and Interpreted Structural Trends in the General Area of Spectrum Pit, Spectrum-GJ Cu-Au Project

(compiled by the Principal Author, in conjunction with Company personnel, and including the structures mapped by Oliver and Walcott [2016])

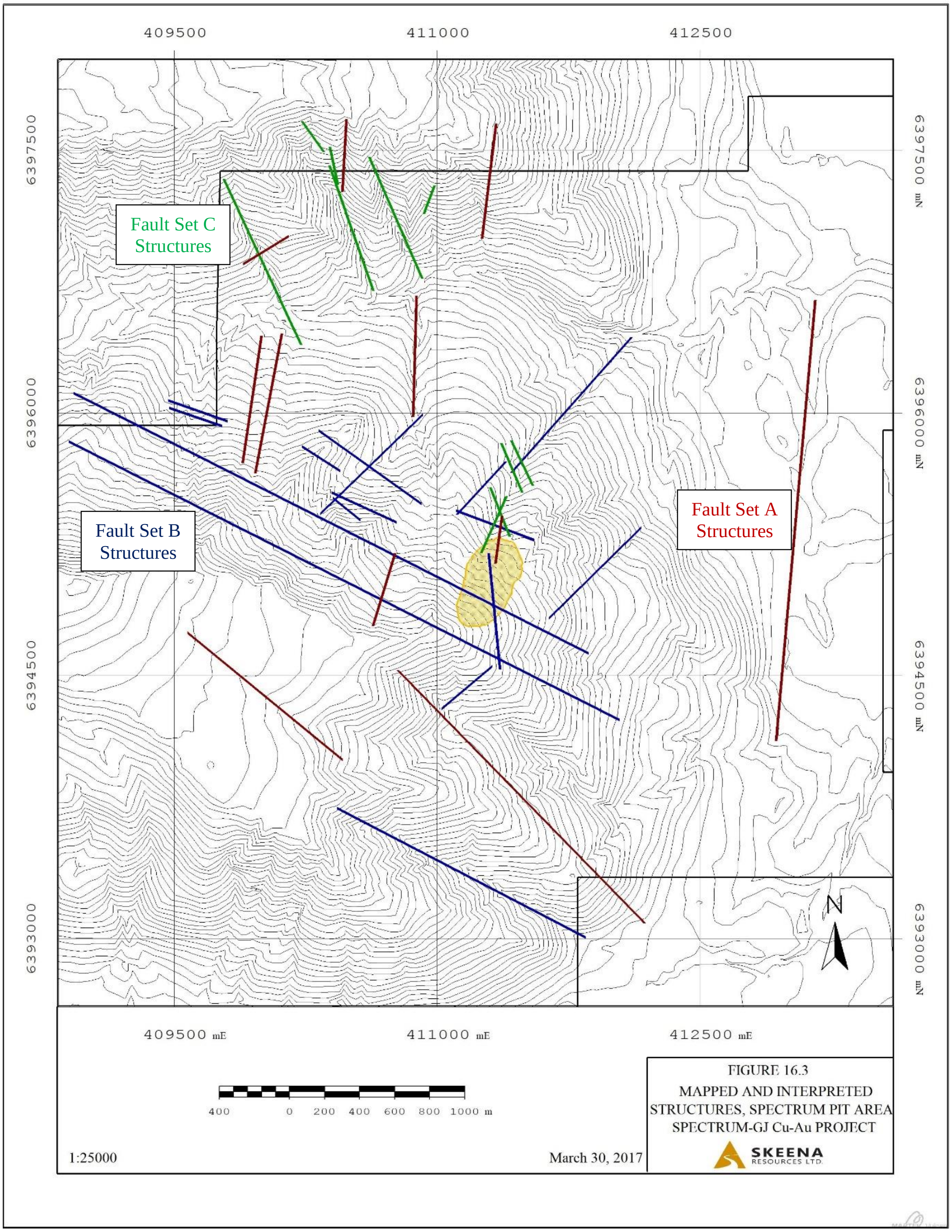


Figure 16.4 A Summary of the Interpreted Structural Trends in the General Area of Donnelly Pit, Spectrum-GJ Cu-Au Project

(compiled by the Principal Author, in conjunction with Company personnel, and including the structures identified within the scope of the Donnelly Geology Model described in Section 7.6)

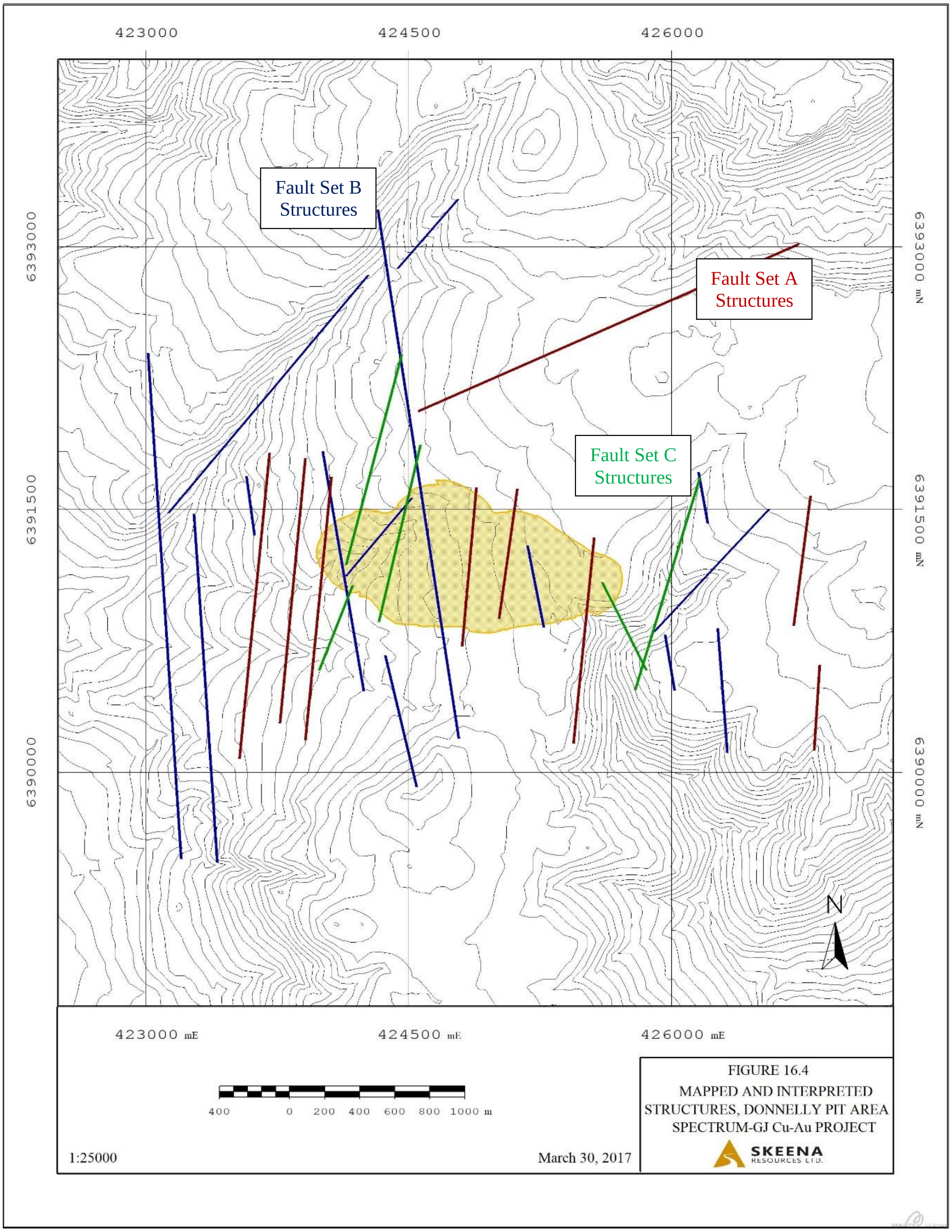


Table 16.1 A Summary of the Three Dominant Structural Sets Found Across the General Region and Within the Project Area, Spectrum-GJ Cu-Au Project

Strike-Slip Fault Type	Average Dip	Average Dip Direction	Comment
Fault Set A			
F1	90° ± 10°	N045°E ± 5° N225°E ± 5°	Major regional fault trend
F2	90° ± 15°	N280°E ± 5° N100°E ± 5°	Major regional fault trend
F2 Complementary	56°	N281°E ± 5° N096°E ± 5°	Weakly developed
F3	90° ± 10°	N350°E ± 10° N170°E ± 10°	Relative tension fault
F3 Complementary	56°	N345°E ± 5° N165°E ± 5°	Weakly developed
Fault Set B			
F1	81° ± 1°	N080°E ± 5°	Major regional fault trend
F1 Secondary	73° ± 3°	N260°E ± 5°	-
F2	88° ± 2°	N320°E ± 5°	Significant regional fault trend
F2 Complementary	58°	N322°E	-
F3	88° ± 2°	N025°E ± 10°	Strongly sigmoidal and en-echelon fault zone
Fault Set C			
F1	90° ± 10°	N235°E ± 5° N055°E ± 5°	Significant and distinct regional fault trend. Possibly late-stage (conjugate angle = 50°)
F2	85° to 90°?	N290°E ± 5°? N110°E ± 5°?	Weakly developed. Probably masked by F2 of Fault Set A.
F3	80° and 75° to 80°	N000°E ± 10° N180°E ± 10°	Well developed in Spectrum Pit area

Figure 16.5 A Rose Diagram (Dips Version 7.0) of the Average Trends of Fault Set A, Spectrum-GJ Cu-Au Project

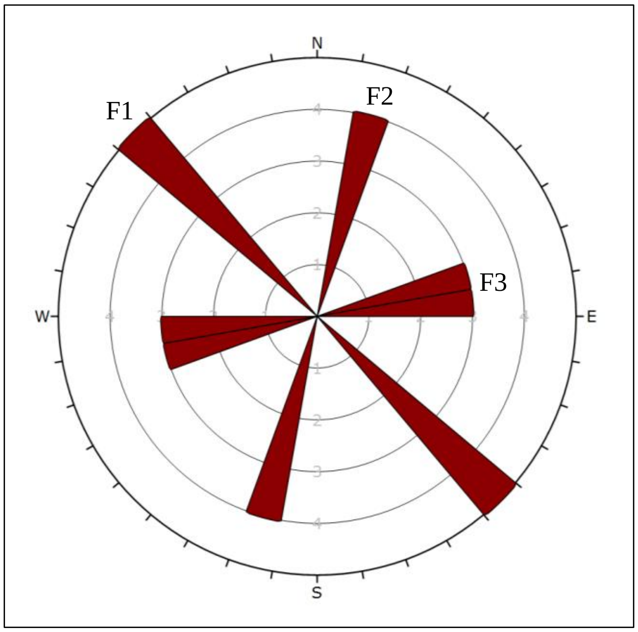


Figure 16.6 A Rose Diagram (Dips version 7.0) of the Average Trends of Fault Set B, Spectrum-GJ Cu-Au Project

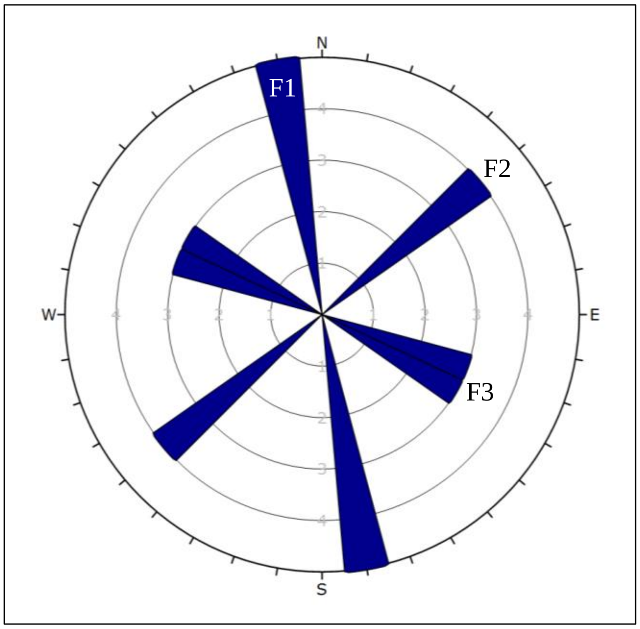


Figure 16.7 A Rose Diagram (Dips version 7.0) of the Average Trends of Fault Set C, Spectrum-GJ Cu-Au Project

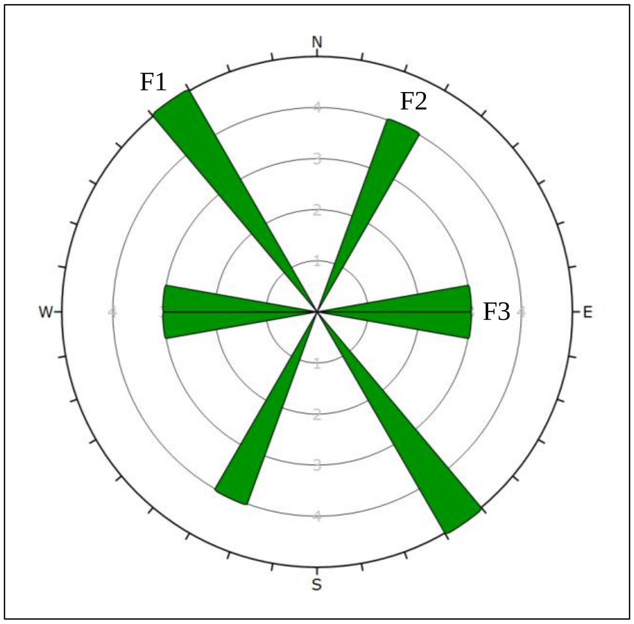
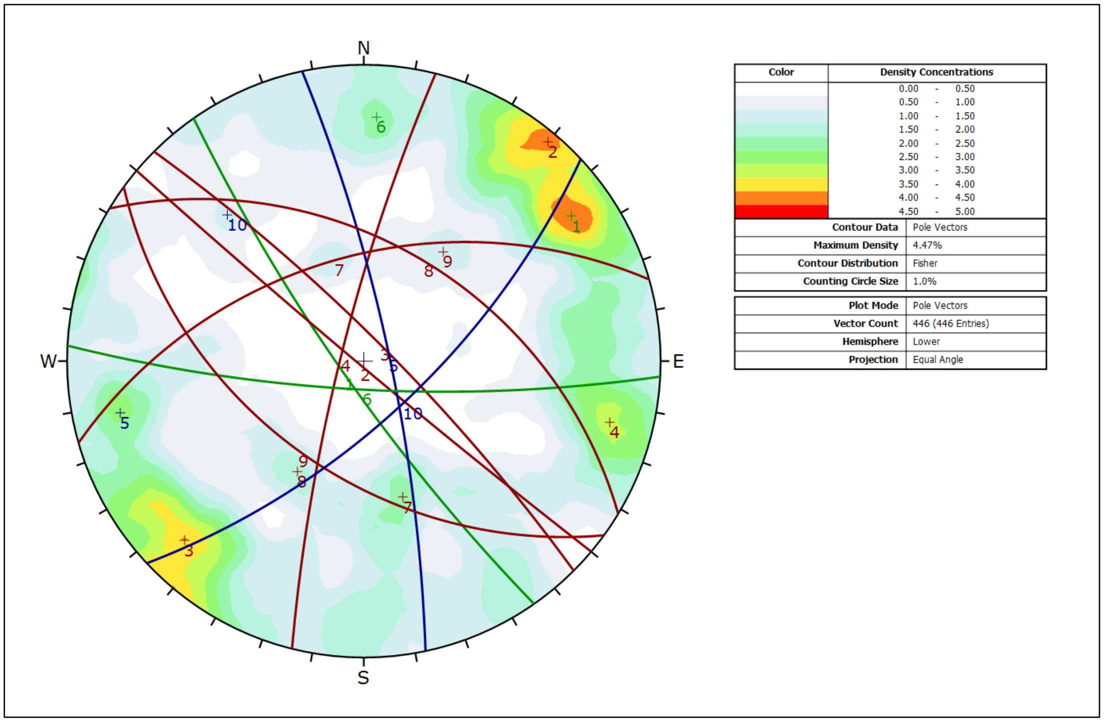


Figure 16.8 is a contoured pole plot of the total available project database of oriented discontinuity data with dips greater than 44°, with the assessed major and intermediate planes identified. It may be seen that four groups of near-vertical discontinuities dominate the dataset, with the result that the moderately dipping groups, of which there are at least six, are only weakly defined.

Figure 16.8 A Contoured Pole Plot (Dips version 7.0) of the Total Available Database of Oriented Discontinuity Data with Dips <45°, Spectrum-GJ Cu-Au Project



It is for the reasons apparent from consideration of Figure 16.8 that the available database was split into six logical sub-groups to help better identify the minor to intermediate discountinuity sets. The following sub-groups were analyzed: dips less than 45°; dips of between 45° and 59°, inclusive; dips of between 60° and 74°; dips greater than 74°; dips of between 45° and 74°, inclusive; and dips greater than 60°. Figure 16.9 is a contoured pole plot for those structures with dips less than 45°. It reflects a typical plot for flat-dipping structures assoicated with strike slip faults, in that the discontinuities dip in all directions and mostly at 30° or less. Figures 16.10 and 16.11 are contoured pole plots on which the major identified planes are defined, for the 45° to 74° and +60° sub-sets of discontinuity data, respectively.

Figure 16.9 A Contoured Pole Plot (Dips version 7.0) of the Discontinuities with Dips Less than 45°, Spectrum-GJ Cu-Au Project

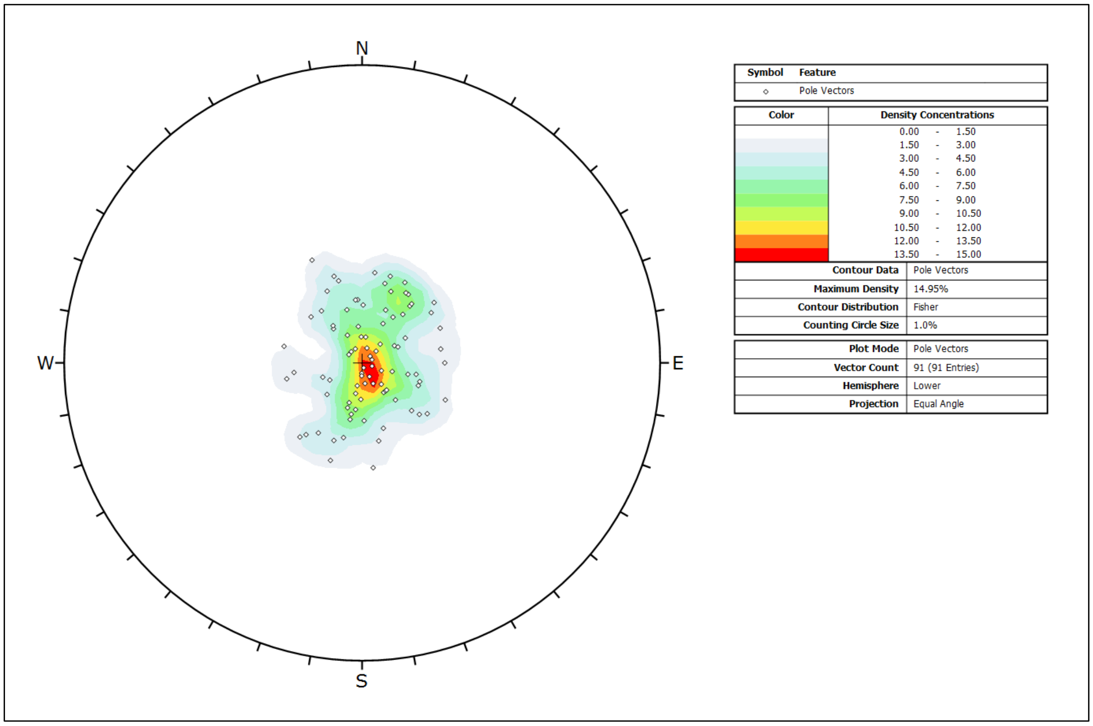


Figure 16.10 A Contoured Pole Plot (Dips version 7.0) of the Discontinuities with Dips Of Between 45° and 74°, Inclusive, Spectrum-GJ Cu-Au Project

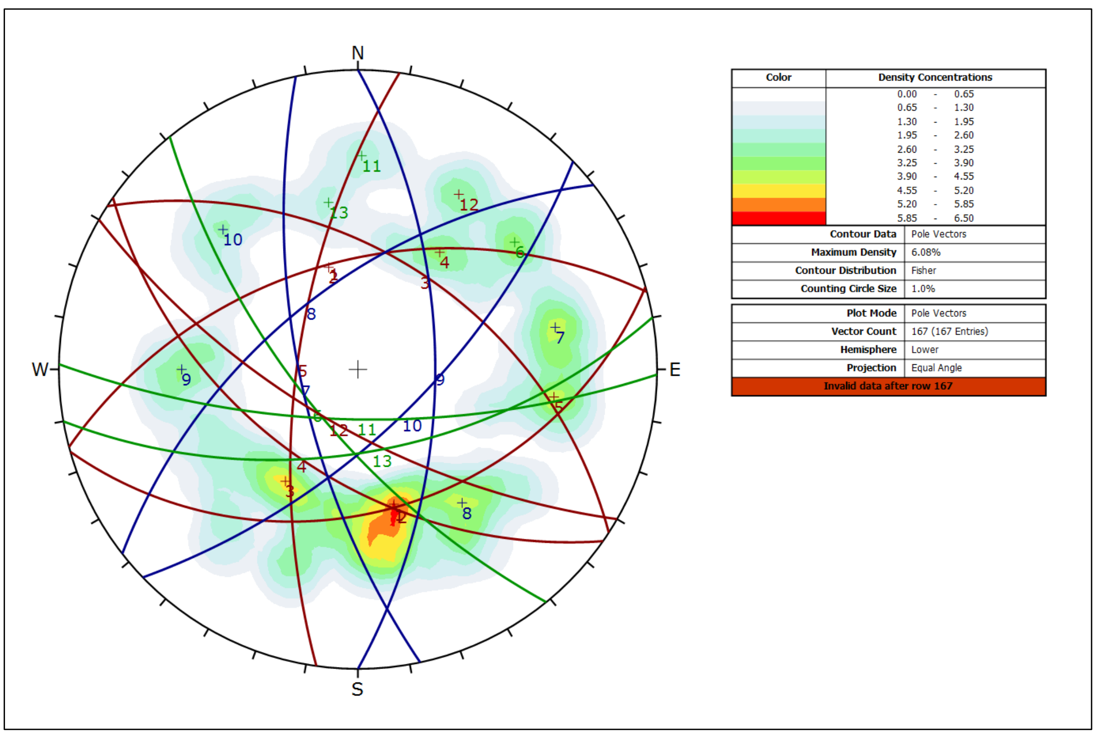
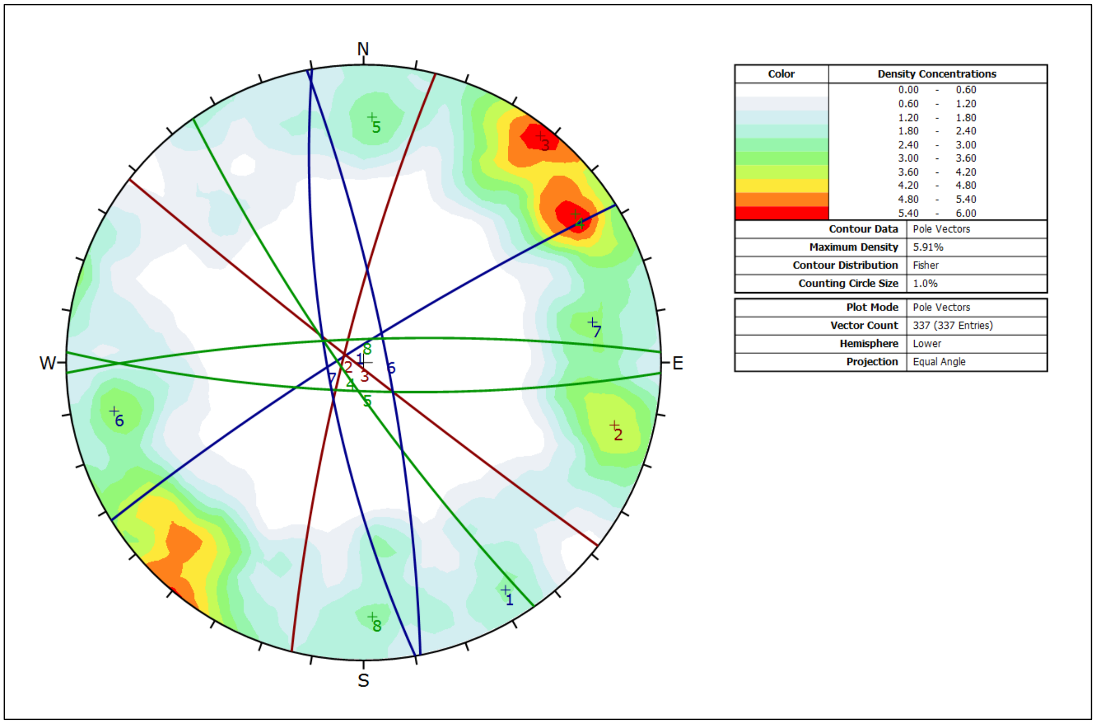


Figure 16.11 A Contoured Pole Plot (Dips version 7.0) of the Discontinuities with Dips Greater than 60°, Spectrum-GJ Cu-Au Project



It may be seen from the results presented as Figures 16.10 and 16.11 that (as is often the case) selective analysis of logical sub-sets results in the clearer identification of minor to intermediate structural sets. However, a number of sets remain weakly defined, which reflects the limited database (545 data points) available for analysis. As such, the structural analysis presented here should be considered preliminary and provisional, hence subject to change. Additional data is required before a robust structural analysis can be carried out, inclusive of field determinations of outcrop discontinuities across a wide area (i.e. across and, to the extent possible, outside the Project Area). A wide-ranging mapping exercise is possible due to the persistence of the results of the baseline structural analysis described above: the same structural trends were found to repeat over a large area.

Kinematic Analysis

Dips (version 7.0) was used to assess the stability of the walls of the planned pits, along with an average friction angle for the discontinuities of 30°. In the opinion of the Principal Author, the assumed average friction angle represents a reasonable worst case, insofar as thick discontinuity infillings were not identified in drillcore and discontinuity surfaces are slightly non-planar to planar-undulating, with the result that the average bulk insitu friction angle will exceed 30° in most cases.

Planar, wedge and sliding instability potential was assessed for a range of slope angles between 40° and 60° and slope dip directions at 45° increments from 000°. No potential for planar sliding was found, but a minor risk of wedge failures was found at all slope orientations: values of between 0.48% and 3.3% were found for an average slope angle of 45°, rising to between 1.43% and 5.24% for an average slope angle of 50°. As might be expected for the predominantly vertical to subvertical discontinuity sets found by means of analysis, toppling failure yielded the highest risk, with values varying between 5.24% and 13.33% for direct toppling and between 12.38% and 22.86% for indirect toppling. The highest risk of toppling instability occurred at the east and west ends of the planned pits, due to the predominance of north-south (or near north-south) faulting trends.

Conclusions

It should be emphasized that the results of the geotechnical analyses described above are preliminary and provisional, hence subject to change. Additional data is required before slope configurations can confidently be designed. As a minimum, this data should include:

- structural mapping and three-dimensional structural modelling to separately identify the locations and orientations of faults, hence the principal discontinuity trends, at the two deposits of interest;
- three-dimensional modelling of weathering/oxidation profiles to identify the locations and continuities of weathered zones below the surface oxidation zone at the two deposits of interest;
- discontinuity mapping over a large area as practicably possible to thereby develop a robust database of orientated discontinuity data;
- laboratory testing of the dominant rock types to identify their average strengths and the average shear strengths of the dominant discontinuity types; and
- hydrogeological testing to assess groundwater conditions and pit inflow rates.

Notwithstanding the above and in the opinion of the Principal Author, there is no readily identifiable reason to suggest that an overall average slope angle of 45° could not safely and sustainably be achieved in Spectrum Pit, rising to 50° in Donnelly Pit. Good toppling instability control and trim blasting will, however, be pre-requisites of success.

16.4 Production Equipment

The mining equipment has been sized to achieve the production targets with reference to assumed material haulage routes. Truck and shovel sizes in particular were matched, based on the Co-Author's knowledge and experience, and bench-marked to information contained in InfoMine's 2016 CostMine models. To achieve the planned 5,000 tpd output from Spectrum Pit, the equipment summarized on Table 16.2 was assumed for purposes of the PEA. Table 16.3 summarizes the production and mine support equipment fleets assumed for Stage 1 (10,000 tpd) production at Donnelly Pit. Table 16.4 summarizes the production and mine support equipment fleets assumed for Stage 2 (15,000 tpd) and Stage 3 (30,000 tpd) production at Donnelly Pit.

Table 16.2 A Summary of the Production and Mine Support Equipment Fleets, Spectrum Pit at 5,000 tpd, Spectrum-GJ Cu-Au Project

Equipment Type	Number	Comments
Production Equipment (Stage 2 - 5,000 tpd)		
Hydraulic/Diesel Excavator	1	Cat 345D, or similar
Articulated Dump Trucks	6	Volvo A40F, or similar
Front-End Loader	1	-
Tracked Bulldozers	1	-
Rotary Crawler Drills	2	-
Mine Support Equipment		
Tracked Bulldozer	1	-
Water Tanker	1	-
Front-End Loader	1	-
Fuel & Lube Trucks	1	-
Mechanic Field Service Trucks	1	-
Tyre Service Truck	1	-
Blaster’s Powder Truck	1	-
Blasthole Loader (ANFO)	1	-
Bus Crummy	2	30 Person
Light Plants	4	-
Submersible Pumps	2	-
Pick-Up Trucks	4	Ford F250, or similar

Table 16.3 A Summary of the Production and Mine Support Equipment Fleets, Donnelly Pit at 10,000 tpd, Spectrum-GJ Cu-Au Project

Equipment Type	Number	Comments
Production Equipment (Stage 1 – 10,000 tpd)		
Hydraulic/Diesel Shovel	1	Cat 390D, or similar
Articulated Dump Trucks	5	Cat 773G, or similar
Front-End Loader	1	-
Tracked Bulldozers	2	-
Rotary Crawler Drills	2	-
Mine Support Equipment (Stage 1)		
Water Tanker	2	One for access road
Fuel & Lube Truck	1	
Fuel & Lube Island	1	
Graders	2	One for road maintenance
Mechanic Field Service Trucks	2	-
Tyre Service Truck	1	-
Blaster’s Powder Truck	1	-
Blasthole Loader (ANFO)	1	-
Bus Crummy	4	30 Person
Light Plants	4	-
Submersible Pumps	3	-
Pick-Up Trucks	6	Ford F250, or similar

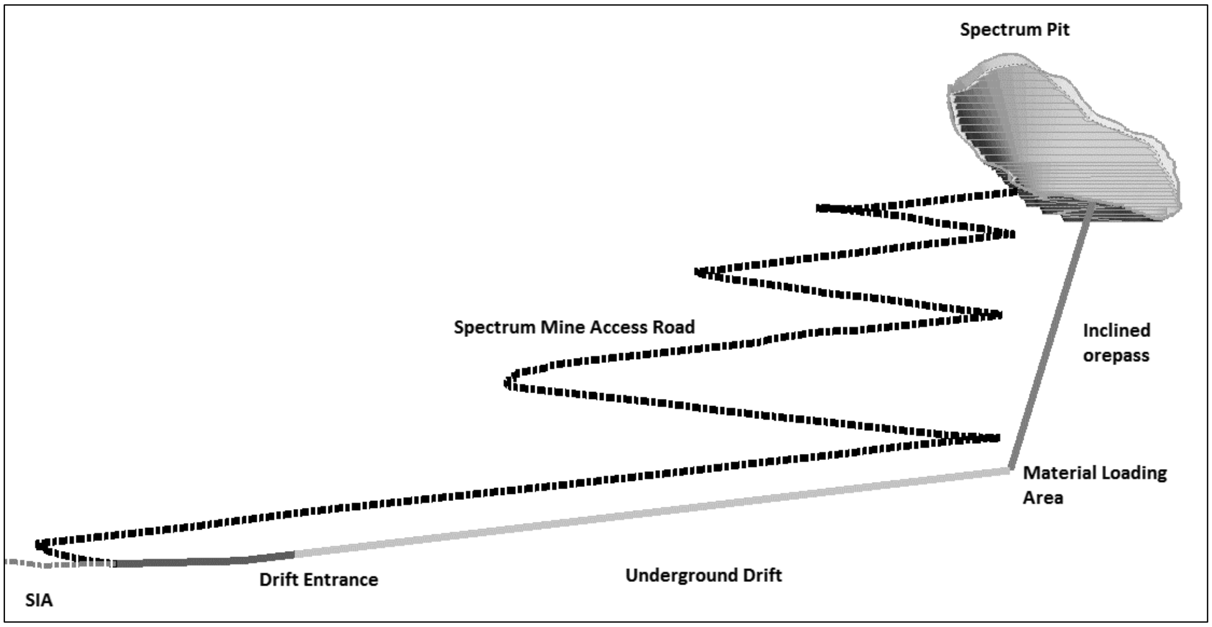
Table 16.4 A Summary of the Production and Mine Support Equipment Fleets, Donnelly Pit at 15,000 tpd and 30,000 tpd, Spectrum-GJ Cu-Au Project

Equipment Type	Number	Comments
Production Equipment (Stage 2 – 15,000 tpd)		
Hydraulic/Diesel Excavator	2	Cat 390D, or similar
Articulated Dump Trucks	8	Cat 773G, or similar
Tracked Bulldozers	2	-
Rotary Crawler Drills	2	-
Mine Support Equipment (Stage 2)		
Water Tankers	2	One for access road
Fuel & Lube Truck	1	
Fuel & Lube Island	1	
Graders	3	One for road maintenance
Mechanic Field Service Trucks	2	-
Tyre Service Truck	1	-
Blaster's Powder Truck	1	-
Blasthole Loader (ANFO)	1	-
Bus Crummy	4	30 Person
Light Plants	4	-
Submersible Pumps	4	-
Pick-Up Trucks	10	Ford F250, or similar
Production Equipment (Stage 3 – 30,000 tpd)		
Hydraulic/Diesel Shovels	2	Liebherr R9250, or similar
Articulated Dump Trucks	14	Cat 777G, or similar
Tracked Bulldozers	4	-
Rotary Crawler Drills	2	-
Trim Blast Rotary Drill	1	-
Mine Support Equipment (Stage 3)		
Water Tanker	2	One for access road
Fuel & Lube Truck	1	
Fuel & Lube Island	1	
Graders	3	One for road maintenance
Mechanic Field Service Trucks	4	-
Tyre Service Truck	2	-
Blaster's Powder Truck	1	-
Blasthole Loader (ANFO)	1	-
Bus Crummy	4	30 Person
Light Plants	4	-
Submersible Pumps	6	-
Pick-Up Trucks	14	Ford F250, or similar

16.5 Pit Infrastructure – Spectrum Pit

It is earlier established that for purposes of the PEA, access to the Spectrum Pit area is limited to a mid-pit point. A 6.0 m wide access road with a maximum gradient of 10% is planned (see also Section 18.9), along which passing cut-outs will be excavated (see Figure 16.12). Topographic constraints and the resultant truck cycling times preclude the use of the access road for muck hauling. ROM material from the Spectrum Pit will instead be tipped directly onto a grizzley with an associated rock breaker to reduce over-size blocks (for the reasons earlier outlined, few such blocks are anticipated). Material tipped on the grizzley will report directly to a raise bored, gravity fed muck pass system that reports to a loading box via a dog-leg to reduce the speed of muck reporting to the box front. The loading facility is located underground, at the back of a suitably dimensioned drift; B-Train trucks will be loaded at the box front, from where they will haul the muck to a laydown area at the MIA (see also Section 18.8).

Figure 16.12 A Perspective View of the Preliminary and Provisional Pit Infrastructure, Spectrum Pit, Spectrum-GJ Cu-Au Project

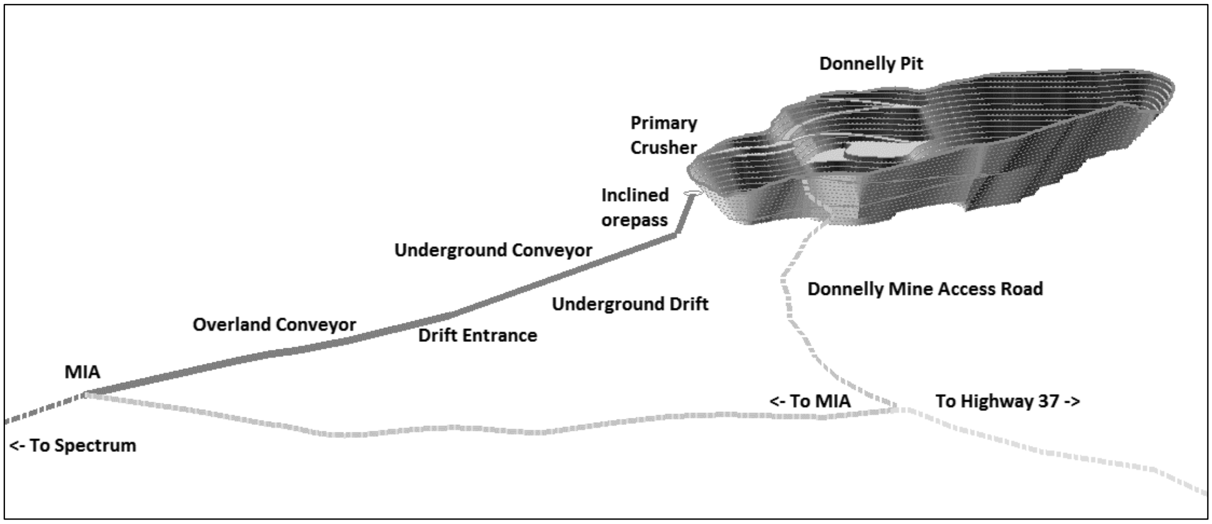


The muck handling system outlined yields much reduced truck cycle times, hence a reduced truck fleet requirement, as the haul trucks will be operated within the confines of the pit area only – unless they require maintenance at either the SIA facility or MIA maintenance facility in extreme cases. The system outlined also represents a project risk, insofar as planning and design for the muck pass system is at a preliminary and provisional stage only, hence subject to change. In this regard, it is recommended that the muck pass system is closely analyzed and engineered at the pre-feasibility stage of project development. Alternative muck handling systems should also be considered, including belt systems and other methods, the former to preclude the use of trucks for hauling muck to the MIA. These and related studies should form part of a larger series of trade-off studies looking at optimizing the production rate from Spectrum Pit, as well as the ultimate size of Spectrum Pit, the latter for the reasons earlier described.

16.6 Pit Infrastructure – Donnelly Pit

A similar muck handling system to the preliminary and provisional system described above for Spectrum Pit has also been adopted for Donnelly Pit (see Figure 16.13), except a 15 m wide pit access road is planned, along with a primary crusher located at the base of the raise bore muck pass. Crushed material reports to a loading pan and then a belt for conveyance to the coarse stockpile described in Section 17.3. As described in Section 18.9, it is anticipated that the access road could be used as a back-up for truck hauling muck to the MIA, in the event that the primary crusher goes down.

Figure 16.13 A Perspective View of the Preliminary and Provisional Pit Infrastructure, Donnelly Pit, Spectrum-GJ Cu-Au Project



16.7 Pre-Strip Requirements

One year of pre-production pre-stripping has been assumed at both pits. At Spectrum Pit, pre-stripping requirements total an estimated 0.9 Mt of deeply weathered scree material that overlies the first pushback. It is assumed for purposes of the PEA that this material is removed and used to build the waste retention dams described in Section 20.4. At Donnelly Pit, it has been estimated that the removal of approximately 2.1 Mt of till will enable sustained ROM production at a steady strip ratio for Years 1 through 5. The waste material will be used to form berms around the final pit area, to preclude potentially adverse animal and human interactions, as described in Section 4.9.

16.8 Cut-Off Grades

The minimum grade cut-offs for the Mineral Resource estimates are 0.40 g/t AuEq and 0.15% CuEq for Central Zone and Donnelly Deposit, respectively. To optimize the average grade of the notionally mined materials, a variable grade cut-off approach was adopted. The resultant average grade cut-offs are 0.435 g/t AuEq for Spectrum Pit and 0.204% CuEq for Donnelly Pit. In addition, a marginal grade cut-off of 0.105% CuEq has been applied applied to identify material for stockpiling and ultimately processing at the end of life of Donnelly Pit.

It is emphasized that the method employed for classifying material mined as ROM muck and waste should not be confused with the method for establishing the limits of mining. If a block of material falls inside the optimized mining limits then the question is not whether to mine the block but whether to process the material. The PEA study is based on the assumption that a block of material should be processed if the income derived from the sale of product covers at least the cost of haulage from the pit exit (or stockpile reclaim), processing and G&A. In other words, cut-off grades are calculated on a break-even basis and the approach assumes the cost of mining material out of the pit to the waste dump is a sunk cost as it is intrinsic to the mining process, regardless of whether the material is ROM muck or waste.

Minimum grade cut-offs were determined using the metal prices, metallurgical recovery rates and operating costs stated elsewhere in this Technical Report, applied to the following equation (which is the same as that stated in Section 14 for determination of cut-off grades for the Mineral Resource estimates that are the subject of this Technical Report).

For precious metal grade cut-offs:

$$\text{Cut-Off} = ([(M_m - M_w) + (P_o - P_w) + (O_o - O_w)] / \{[r \cdot (V – R)] \cdot (1 – Gr)\}) \cdot 31.1035$$

For base metal cut-offs:

$$\text{Cut-Off} = \{([(M_m - M_w) + (P_o - P_w) + (O_o - O_w)] / \{[r \cdot (V – R)] \cdot (1 – Gr)\}) / 2{,}204.6\} \cdot 100$$

where:

M_m = the all-in unit cost of mining and delivering one ton of material to the primary crusher

M_w = the unit cost of mining, transporting and dumping one ton of waste on the waste dump

P_o = the unit cost of processing one ton of material (from primary crushing to production of a final, saleable product, inclusive of supervision and labour costs, consumables)

P_w = the unit cost of processing one ton of waste (inclusive of labour costs and consumables associated with avoiding potential water contamination and/or acid generation, as well as to satisfy any other applicable regulatory and environmental requirements)

O_o = the cost of on-site G&A

O_w = the unit cost of the additional on-site G&A associated with processing one ton of waste

r = recovery, or % of valuable product recovered on processing the mined material to a final saleable product

V = the value of one unit of the final saleable product

R = smelting, refining, transportation and other costs incurred per unit of final saleable product

Gr = payable NSR royalty (percent)

16.9 Grade Equivalence

Grade equivalences were determined using the metal prices, metallurgical recovery rates, operating costs and smelter terms stated elsewhere in this Technical Report, applied to the following equation (which is the same as that stated in Section 14 for determination of cut-off grades for the Mineral Resource estimates that are the subject of this Technical Report).

AuEq = Au grade + [(Ag grade · (Ag revenue / Au revenue)] + [Cu grade · (Cu revenue / Au revenue)]

CuEq = (Cu grade + [(Au grade · (Au revenue / Cu revenue)] + [Ag grade · (Ag revenue / Cu revenue)]

where:

Au revenue = (1 / 31.1035) · Au plant recovery · Au smelter recovery · Au refinery recovery · unit Au price

Ag revenue = (1 / 31.1035) · Ag plant recovery · Ag smelter recovery · Ag refinery recovery · unit Ag price

Cu revenue = 2,204.62 · 0.01 · Cu plant recovery · Cu smelter recovery · Cu refinery recovery · unit Cu price

16.10 Ultimate Pit Designs

The main objective of the pit design process was to transform the pit shells obtained from Lerchs-Grossman ("LG") optimizations into practical pits, with the inclusion of ramps, bench and berm configurations by taking all the required inputs into account. The results form part of the critical inputs required for production scheduling. Table 16.5 summarizes the key inputs, defined as described in Section 16.4 and in the following sub-sections. Figure 16.14 is a Vulcan™ plan view snapshot of the ultimate Spectrum Pit. Figure 16.15 is a Vulcan™ plan view snapshot of the ultimate Donnelly Pit.

Table 16.5 A Summary of Pit Design parameters for Spectrum Pit and Donnelly Pit, Spectrum-GJ Cu-Au Project

Description	Spectrum Pit	Donnelly Pit
Bench Heights	12 m	16 m
Bench Angle	67°	70°
Bench Angle (weathered rock)	40°	70°
Berm Width	5 m	7.5 m
Overall Average Slope Angle	45°	45°
Haul Road Width	15 m	25 m
Haul Road Gradient	10%	10%

The Maptek Vulcan™ pit optimization outputs, the design criteria, the geohazards and geotechnical constraints were used as input parameters to design the practical final pits. Pushbacks were based on the interim selected pit shells and designed using the recommended geotechnical parameters and pit design criteria derived from the equipment strategy as well as current best practices. All pit designs were created using the Maptek Vulcan™ mining software.

Two important considerations for the pit designs were the mining pushback strategy and the positioning of the access ramps. The optimization exercise indicated that improved value can be generated through optimum extraction sequences for the planned pits. The starting point of an optimum scheduling sequence is an informed decision regarding pushbacks. Several interim pit shells, as well as the ultimate pit limit, were used as a basis for the practical pit and pushback designs.

The pit optimization exercise resulted in a series of pit shells with decreasing economic value, the combination of which provide an optimum extraction sequence that ensures that grade to the mill is maximized in the early years and waste stripping is deferred as far as possible into the future. The selected shells provided some guidance towards the location of interim stage designs.

Figure 16.14 A Vulcan^{TM} Plan View Snapshot of Spectrum Pit, Spectrum-GJ Cu-Au Project (compiled by the Principal Author, in conjunction with Company personnel, from datafiles supplied by QP Britton)

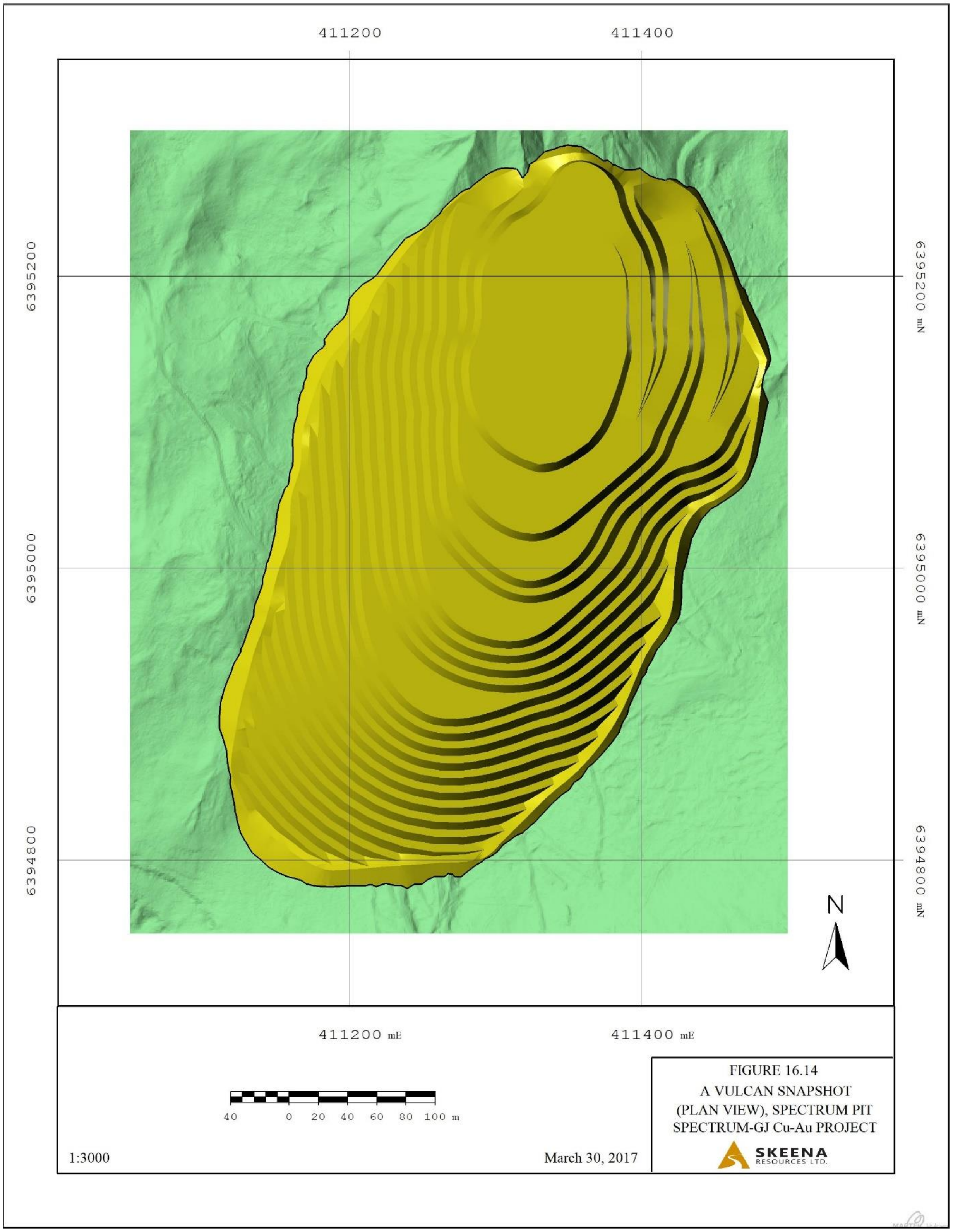
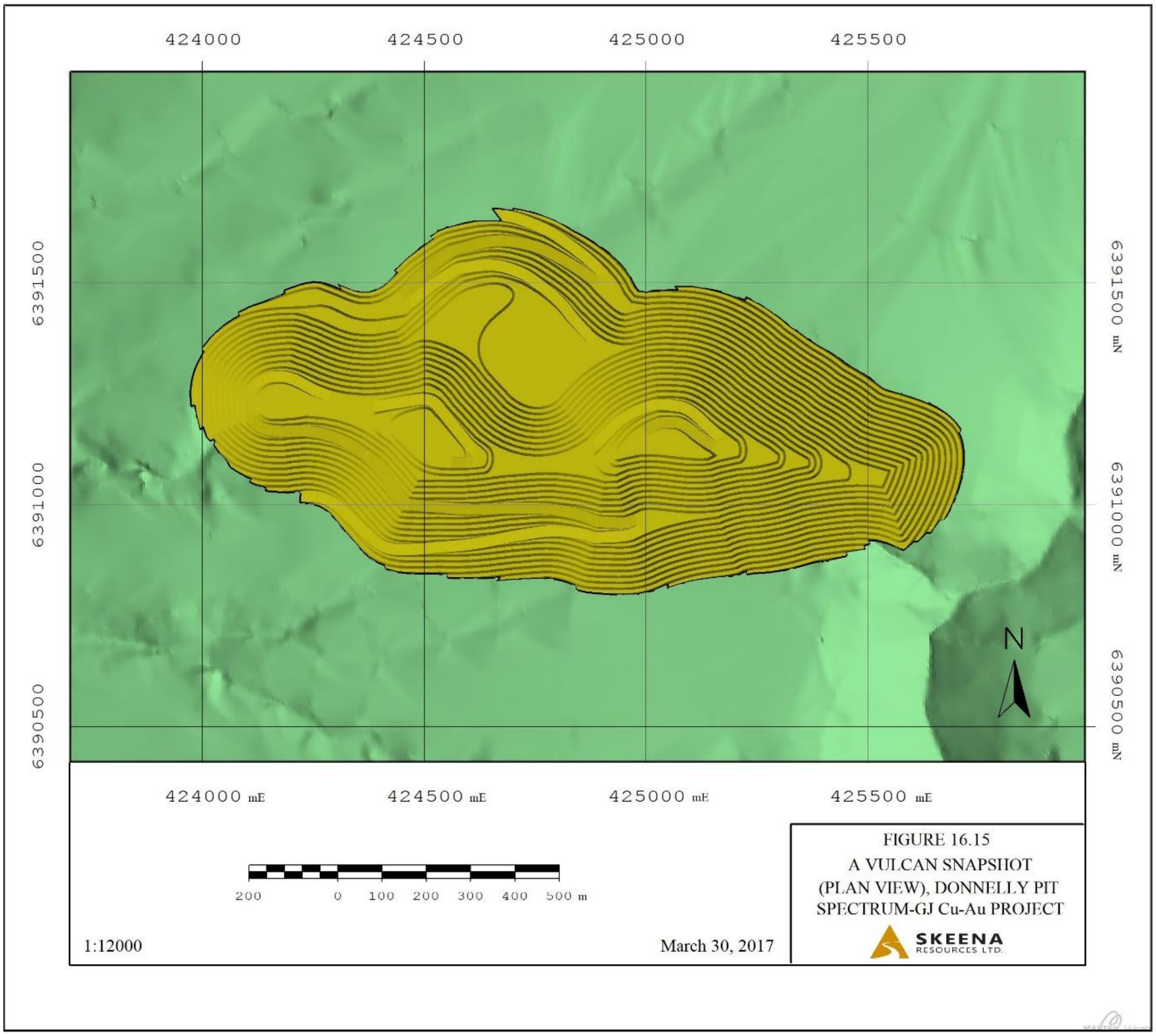


Figure 16.15 A Vulcan^{TM} Plan View Snapshot of the Donnelly Pit, Spectrum-GJ Cu-Au Project (compiled by the Principal Author, in conjunction with Company personnel, from datafiles supplied by QP Britton)



16.10.1 Bench Heights

The decision regarding the bench heights takes into account the geometry of the target zones, the planned mining rates and the various equipment types and sizes. With this in mind, it is assumed for purposes of the PEA that drilling and blasting in Spectrum Pit will be carried out in 6.0 m benches and mined selectively either in a single 6 m bench or split into smaller flitches where necessary, depending on local grade control issues. Spectrum bulk waste benches are designed to be blasted and loaded in 6 m lifts. At Donnelly, larger mining equipment is required to achieve the project production targets. As a result, it is assumed that drilling and blasting ROM material and selective waste at Donnelly will be performed using 8 m benches and mined selectively either in a single 8 m bench or split into smaller flitches, depending on grade control issues. Donnelly bulk waste benches have been designed to be blasted and loaded in 16 m lifts, where possible.

16.10.2 Pit Haul Roads

The haul road design parameters were established taking into consideration the type and size of material hauling equipment that will be used during the operation. For the Spectrum Pit, the dimensions of the haul road are based on 40 t articulated dump trucks using global standards of good practice (see Section 16.8). At Donnelly Pit, the dimensions of the haul road are based on typical 100 t rigid frame trucks that are planned for use during Stage 3 of the mine life (production at 30,000 tpd).

Many of the best practice guidelines specify that to determine the effective operating width of the haul road and to incorporate the road infrastructure such as the safety berm and drainage channel, the vehicle operating width should be multiplied by a factor of three for two-lane traffic and two for single-lane traffic. In the opinion of the Co-Authors, smaller widths create an uncomfortable and unsafe operating environment, resulting in slower traffic and constrained production. However, this needs to be balanced against the additional costs associated with increasing ramp widths purely for production purposes. With this in mind and:

- assuming the proposed 40 t articulated dump truck to be used at Spectrum Pit has a physical truck-operating width of approximately 4.0 m, the safety berm height = 1.0 m and the safety berm width = 2.5 m (based on an assumed tyre diameter of 1.9 m), and the drainage channel = 0.50 m, the design width for the in-pit haul road = (3 x 4.0 m) + 2.5 m + 0.5 m = 15.0 m; and
- assuming the proposed 100 t rigid frame dump truck to be used at Donnelly Pit has a physical truck-operating width of approximately 6.5 m, the safety berm height = 2.0 m and the safety berm width = 5.0 m (based on an assumed tyre diameter of 2.7 m), and the drainage channel = 0.50 m, the design width for the in-pit haul road = (3 x 6.5 m) + 5.0 m + 0.5 m = 25.0 m.

A reduction in road grade significantly increases a vehicle's attainable uphill speed, hence haulage cycle times and fuel consumption rates. Stress on mechanical components hence maintenance costs also vary with road gradient and they too can be minimized, to some extent, by limiting the severity of haul road grades. With this in mind, a maximum haul road gradient of 1:10 was selected for both the Spectrum Pit and for Donnelly Pit, based on world best practice for the type of trucks that will be utilized.

16.11 Pushback Designs

The following methodology was followed during the pushback design process:

- use the selected optimal pit shells derived from the pit optimisation as the design limit;
- use the block model to show the distribution and grade of mineralization; and
- apply the pit design criteria and geotechnical parameters.

The available pit footprints were utilized for pushback haul roads wherever possible, instead of expanding the pits' walls. All pit design work was performed in Maptek's Vulcan™ mine design software program. A total of three pushbacks were designed for Spectrum Pit, based on the selected interim pit shells. The designs were used to evaluate the tonnage and grades of the various material types for discreet mining zones, which in turn were applied to the production scheduling. For Donnelly Pit, a total of seven pushbacks were designed, based on the selected interim pit shells. The designs were used to evaluate the tonnage and grades of the various material types for discreet mining zones which in turn were applied to the production scheduling.

16.12 Pit Optimization Compliance

The openpit designs are based on the outputs from conventional LG-style pit optimization techniques that establish mineable shapes using information obtained from the block models used to compile Mineral Resource estimates that are the subject of this Technical Report. The block models were imported into Maptek's Vulcan™ pit optimization software for analysis.

The Maptek Vulcan™ program uses a series of economic constraints as well as slope angle limitations and material handling recoveries to establish the most economic mining envelope possible. Maptek Vulcan™ optimization is an iterative process using costs developed during previous studies, which are then refined to be as accurate as possible. The following summarizes the optimization process:

- creation of a range of nested pit shells of increasing size achieved by varying the product price and generating a pit shell at each price point;
- selection of the optimal pit shell by generating various production schedules for each pit shell and calculating the net present value ("NPV") for each schedule, the output of this process being a series of pit versus value curves; and
- the optimal LG shell for each pit represents the break-even mining limits based on the supplied input parameters when assessed in conjunction with the overall production targets (although the resultant mining envelope is not practical to mine as there are no access ramps or consideration for other surface constraints).

In general, when optimal shells are converted into practical pits, the NPVs of the resultant pits are expected to be lower because of the extra waste that has to be mined to make room for access ramps. Furthermore, additional surface constraints can impact on the maximum depths achievable within a pit, resulting in some loss of above-grade material. It is however important that the difference in volumes and overall value is kept at a minimum.

16.12.1 Spectrum Pit

It is established in Section 16.3 that the topographical constraints and uncertainties relating to access to the upper elevations of the target Central Zone mineralization (as defined by the Mineral Resource estimate detailed in Section 14) have resulted in a much smaller ultimate pit than could in theory be achieved:

- access to the upper benches of the optimal LG pit is considered by the Co-Authors to be problematic, in that it includes a section along a steep and deep ravine, as well as sections along known avalanche channels and areas of potentially unstable scree; and
- the risks require additional examination and mitigation before an access road capable of accessing the upper elevations could realistically and confidently be planned; therefore

- production from Spectrum Pit is instead limited to what can practicably, safely and sustainably be realized by means of mid-pit access only.

Table 16.6 provides a comparison between the ultimate Spectrum Pit design and the optimal LG shell used for purposes of compiling the 2017, Central Zone Mineral Resource estimate stated in Section 14. It may be seen that there is a significant decrease in the total waste tonnes (86%) and total ROM tonnes (79%). This results in a net decrease in the overall average stripping ratio from 1.29 to 0.61, inclusive of pre-strip, or 0.52 excluding pre-strip. There is also an overall increase in the average metal grades, which is due to a higher grade cut-off (0.435 AuEq) being applied for purposes of the ultimate pit design, compared with the 0.40 AuEq cut-off applied for purposes of Mineral Resource estimation.

Table 16.6 A Comparison of the Ultimate and Optimized Pits, Spectrum Pit, Spectrum-GJ Cu-Au Project

Parameter	Unit	Ultimate Pit Design	Optimal LG Pit Envelope	Variance
Insitu ROM Material	Mt	9.98	48.54	-79.4%
Total Waste (including 0.9 Mt of pre-strip)	Mt	6.05	62.66	-90.3%
Strip Ratio (including pre-strip)[1]	-	0.61	1.29	-53.0%
Strip Ratio (not including pre-strip)[2]	-	0.52	-	-
Cu Metal Content	Mlb	28.67	123.65	-76.8%
Average Cu Grade	%	0.13	0.12	+8.3%
Au Metal Content	Moz	0.308	1.272	-75.8%
Average Au Grade	g/t	0.96	0.82	+17.1%
Ag Metal Content	Moz	1,027.4	3,527.0	-70.9%
Average Ag Grade	g/t	3.21	2.26	+42.0%

Notes: The variances might not exactly agree with the stated amounts, due to rounding effects
1 – Strip Ratio = Total Waste / Insitu ROM Material
2 – Strip Ratio = (Waste + Marginal Grade Material) / Insitu ROM Material

The difference in the stripping ratios stated on Table 16.6 reflects the difference in approach suggested by different authors. For purposes of the PEA the 0.52 strip ratio is preferred and has been reported because the pre-strip material is capitalized as a pre-production activity.

16.12.2 Donnelly Pit

Table 16.7 provides a comparison between the ultimate pit design content and the LG optimization limits for Donnelly Pit. It may be seen that there is a 40% decrease in the total waste as well as a 12% decrease in the insitu tonnes of mineralized material above grade cut-off (0.105% CuEq for the ultimate pit, 0.15% for the LG pit envelope), at similar copper grades but at lower gold and silver grades. The lower grade cut-off for the ultimate design pit means that the results include marginal grade material that will be stockpiled and processed at the end of the production mine life (starting at the end of Year 23). This results in a net decrease in the stripping ratio from 1.31 to 0.64, inclusive of pre-strip and including marginal grade material in the quantity of insitu material. In the opinion of the Co-Authors, there is reasonable correlation between the LG optimized pit shell and the ultimate pit design, for a project of this type.

Table 16.7 A Comparison of the Ultimate and Optimized Pits, Donnelly Pit, Spectrum-GJ Cu-Au Project

Parameter	Unit	Ultimate Pit Design	Optimal LG Pit Envelope	Variance
Insitu Material (ROM + marginal grade)	Mt	206.47	235.86	-12.5%
Total Waste (including 2.13 Mt of pre-strip)	Mt	131.69	218.16	-39.6%
Strip Ratio (incl. pre-strip)[1]	-	0.64	1.31	-51.1%
Strip Ratio (not including pre-strip)[2]	-	0.86	-	-
Cu Metal Content	Mlb	1,148.14	1,305.74	-12.1%
Average Cu Grade	%	0.25	0.25	0.0%
Au Metal Content	Moz	1.96	2.39	-18.0%
Average Au Grade	g/t	0.29	0.32	-9.4%
Ag Metal Content	Moz	12.47	14.22	-12.3%
Average Ag Grade	g/t	1.88	1.87	+0.5%

Notes: The variances might not exactly agree with the stated amounts, due to rounding effects
1 – Strip Ratio = Total Waste / Insitu ROM Material
2 – Strip Ratio = (Waste + Marginal Grade Material) / Insitu ROM Material

The difference in the stripping ratios stated on Table 16.7 reflects the difference in approach suggested by different authors. For purposes of the PEA the 0.86 strip ratio is preferred and has been reported because the pre-strip material is capitalized and the marginal grade material might or might not be processed at the end of the mine life, depending on prevailing operating costs and metal prices at that time. For purposes of PEA cashflow modelling (see Section 22) it has been assumed that the marginal grade material is processed at the end of the mine life because unescalated operating costs and straight-line, long-term metal prices were assumed in analysis (which model assumptions render the stockpiled marginal grade material economic above a cut-off of 0.105% CuEq). For this case the stripping ratio would equal 0.63 (129.56 / 206.47).

16.13 Production Schedule

Several production scenarios were reviewed to determine the most economic and operationally sound solution. The main driving factors were the mining capacities that influence project costs, and the ability to separately mine ROM material, marginal material and waste. The primary goals for the chosen, combined production scenario were to limit capital while maintaining ROM production at 10,000 tpd from Production Year 1 through Year 5, at 20,000 tpd from Year 6 through Year 11 and then at 30,000 tpd from Year 12 onwards. The ROM production rate for Spectrum Pit limited to 5,000 tpd from Year 6, for the reasons earlier described. The tonnage profile also encompassed the tonnage ramp-up profile for plant throughput described in Section 13.6.

16.13.1 Methodology

The life-of-mine production schedule was compiled using an industry standard approach for strategic mine planning. The Maptek Evolution™ production scheduling program was used to optimize the mining sequence for each pushback at both Spectrum Pit and Donnelly Pit. For Spectrum Pit, muck handling constraints precluded the separation of marginal grade material from waste, with the result that ROM material and waste only were considered in analysis. For Donnelly Pit, scheduled blocks were categorized as ROM material, marginal grade material or waste, based on the grade cut-off for each block within the geological block models. The strategy to level waste stripping while still utilizing the value-adding strategy of delaying the processing of stockpiled marginal grade material from Donnelly Pit were also used to achieve the project goals. This strategy resulted in pushback life being minimized with as little as possible overlap for waste stripping, thereby making the schedule more practical. It also reduced the mining fleet requirement, especially during ramp-up.

16.13.2 Dilution

A preliminary analysis of dilution potential was carried out, assuming the 80% of the average grade for each metal of interest of a notionally mined block, plus 5% of the average grade for the same metals of interest in the four laterally adjacent blocks, thereby to yield a 100% overall, average diluted grade for the notionally mined block of interest. In the vast majority of cases the diluting effect outlined was negligible, due to the broadly uniform and persistent nature of the grade distributions (especially in Donnelly Pit).

16.13.3 PEA Production Plan and Schedule

The overall production plan is summarized on Table 16.8. Figure 16.16 summarizes the tonnage schedule for Spectrum Pit, Figure 16.17 summarizes the tonnage schedule for Donnelly Pit and Figure 16.18 summarizes the average and pit-specific grade profiles. Scrutiny of the classification of the Mineral Resources within the block models for the deposits of interest show that 76% of the ROM material from Spectrum Pit is in the Indicated category of Mineral Resources, rising to 96% in the case of Donnelly Pit. In both cases, the balance of notionally mined material is in the Inferred category of Mineral Resources.

Table 16.8 A Summary of the Combined ROM Production Schedule, Spectrum-GJ Cu-Au Project

Year	Tonnage Schedule							Plant Feed			
	Total Tonnes (Mt)	ROM Material (Mt)	Stockpile (Mt)	Waste (mt)	Strip Ratios A	Strip Ratios B	Stockpile Reclaim (Mt)	Tonnes (million)	Au g/t	Ag g/t	Cu %
1	4.42	2.92	0.04	1.46	0.50	0.51	0	2.92	0.67	3.93	0.56
2	5.35	3.58	0.01	1.76	0.49	0.49	0	3.58	0.36	2.64	0.35
3	4.89	3.65	0.59	0.65	0.18	0.34	0	3.65	0.38	2.03	0.37
4	4.90	3.65	1.17	0.08	0.02	0.34	0	3.65	0.42	2.34	0.40
5	5.12	3.65	0.00	1.47	0.40	0.40	0	3.65	0.42	2.05	0.42
6	9.72	7.23	0.09	3.20	0.50	0.51	0	7.23	0.48	2.61	0.31
7	13.99	7.23	0.52	6.25	0.86	0.94	0	7.23	0.40	2.48	0.26
8	13.65	7.30	1.06	5.28	0.72	0.87	0	7.30	0.47	2.36	0.29
9	14.38	7.30	2.00	5.08	0.70	0.97	0	7.30	0.68	2.46	0.28
10	15.06	7.30	2.03	5.73	0.78	1.06	0	7.30	0.49	2.71	0.31
11	19.31	7.30	1.27	10.75	1.47	1.65	0	7.30	0.43	2.24	0.29
12	30.37	10.27	5.52	14.58	1.42	1.96	0	10.27	0.31	2.06	0.27
13	21.14	10.95	0.01	10.19	0.93	0.93	0	10.95	0.25	1.81	0.22
14	18.58	10.95	1.28	6.35	0.58	0.70	0	10.95	0.27	1.83	0.24
15	15.33	10.95	0.44	3.94	0.36	0.40	0	10.95	0.35	2.09	0.28
16	16.90	10.95	0.86	5.09	0.46	0.54	0	10.95	0.37	2.26	0.30
17	22.59	10.95	0.01	11.63	1.06	1.06	0	10.95	0.28	2.02	0.18
18	26.66	10.95	4.29	11.42	1.04	1.43	0	10.95	0.21	1.18	0.17
19	23.62	10.95	0.53	12.13	1.11	1.16	0	10.95	0.21	1.58	0.19
20	17.48	10.95	0.53	5.99	0.55	0.60	0	10.95	0.26	1.48	0.22
21	17.62	10.95	0.67	6.00	0.55	0.61	0	10.95	0.32	1.78	0.29
22	15.79	10.95	1.15	3.70	0.34	0.44	0	10.95	0.32	1.91	0.25
23	14.26	10.86	1.42	1.97	0.18	0.31	0.09	10.95	0.37	1.89	0.28
24	0	0	0	0	0	0	10.95	10.95	0.13	1.21	0.09
25	0	0	0	0	0	0	10.95	10.95	0.13	1.21	0.09
Totals	**351.14**	**191.75**	**25.48**	**134.71**	**0.71**	**0.84**	**21.99**	**213.74**	**0.35**	**2.04**	**0.27**

Notes: Totals and averages might not be exact, due to rounding.
Strip Ratio A = ROM material/waste, Strip Ratio B = ROM material/(waste + stockpile)

Figure 16.16 The Tonnage Production Profile, Spectrum Pit, Spectrum-GJ Cu-Au Project

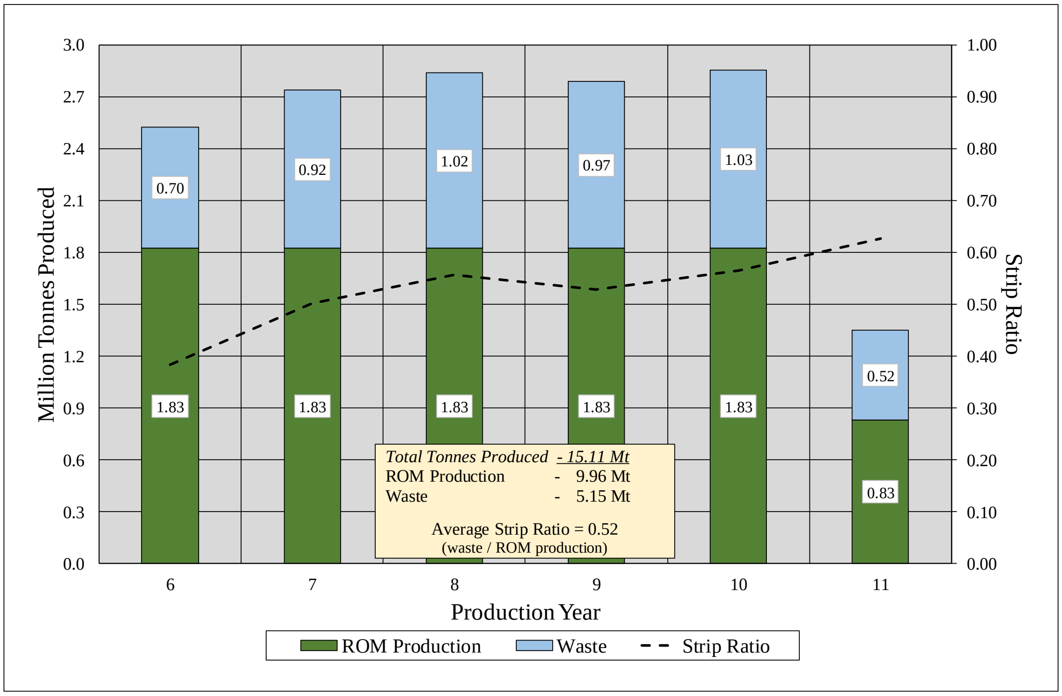


Figure 16.17 The Tonnage Production Profile, Donnelly Pit, Spectrum-GJ Cu-Au Project

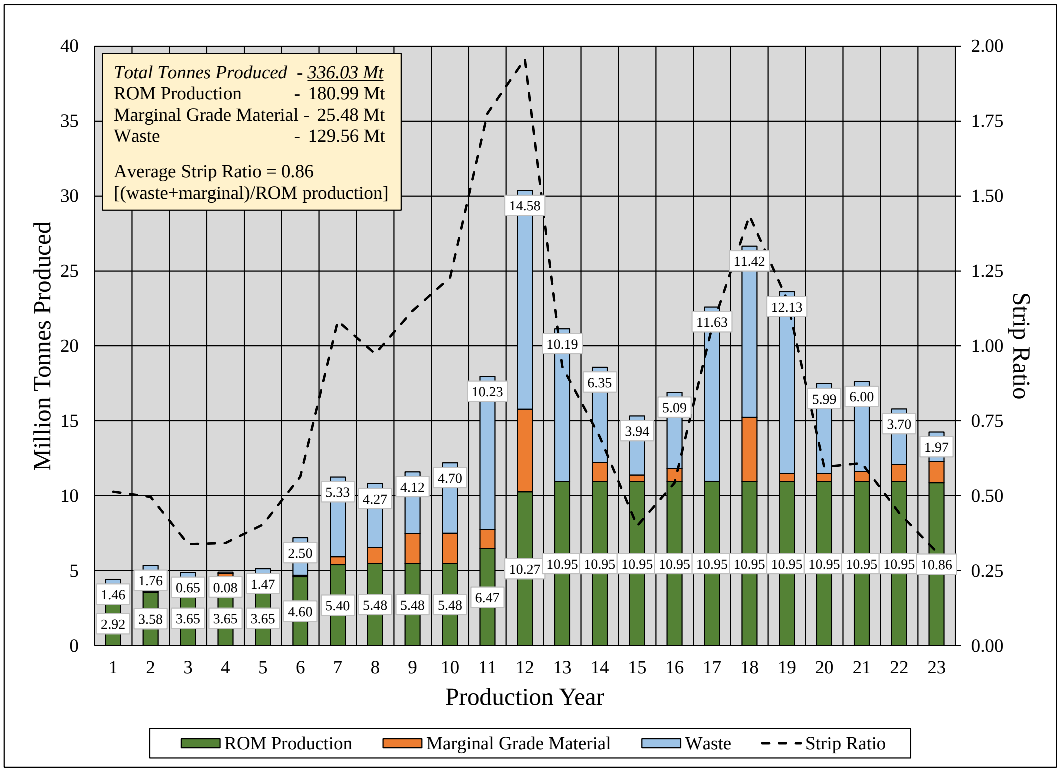
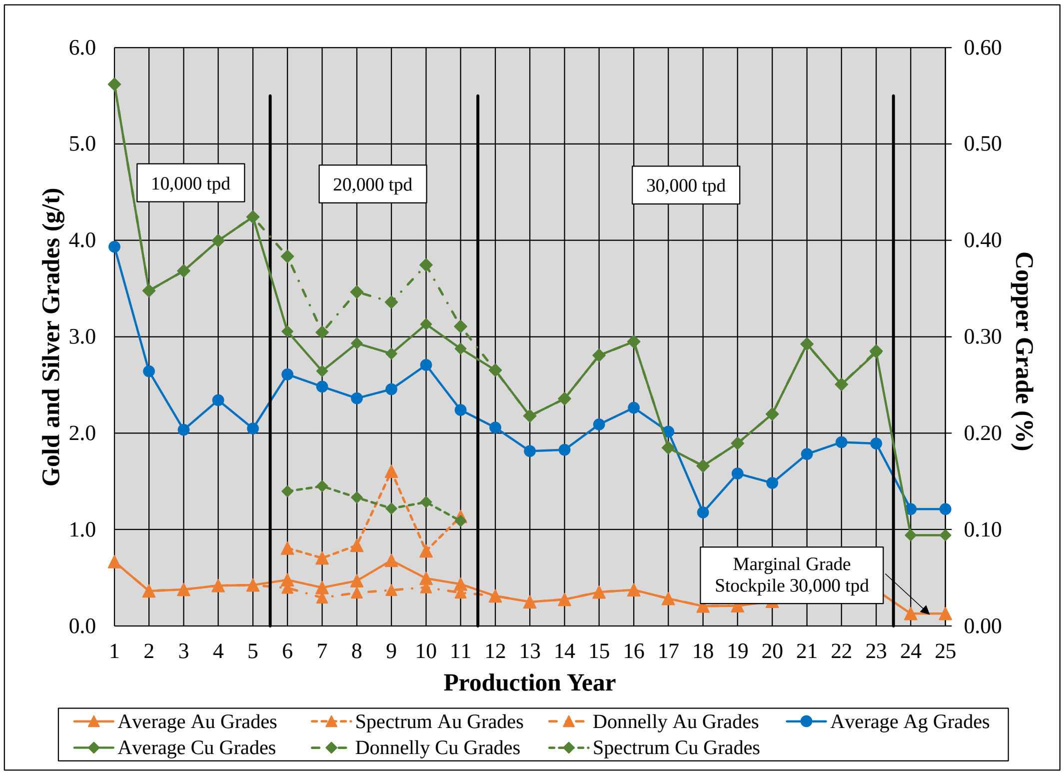


Figure 16.18 The Grade Profile for the ROM Plant Feed, Spectrum and Donnelly Pits, Spectrum-GJ Cu-Au Project



It may be seen from consideration of Figure 16.18 that the overall average ROM plant feed during Years 6 through 11 receives a significant boost in average gold grades and a modest reduction in the overall average copper grade. It is during Years 6 through 11 that Spectrum Pit contributes to the ROM plant feed, which is critical to overall project economics: the boost in the average gold grade quickly pays for the second tranche of capital, the majority of which is expended in Year 5, to bring Spectrum Pit on-line, to increase production capacity at Donnelly Pit and to both install a SAG mill and to increase plant throughput capacity to 20,000 tpd, per the discussions of Sections 17 and 22.

16.14 Qualified Persons' Opinion

In the Co-Authors' opinion the mine planning, design and scheduling studies detailed above are sufficient to support the PEA and are therefore sufficient to advance the Spectrum-GJ Cu-Au project to the pre-feasibility stage. The pit optimization, excavation design and production scheduling studies have been performed to best industry practices and conform to the requirements of CIM 2014 Definition Standards for Mineral Resources and Mineral Reserves. It should, however, be emphasized that the production schedule is provisional and preliminary, hence subject to change in the event that:

- additional drilling is carried out and the Mineral Resource estimates, on which the schedule relies, are as a result changed; and/or
- the assumed metal price, metallurgical recovery rates or operating costs change; and/or
- the recommended production optimization and trade-off studies are carried out; and/or

- an increased level of confidence in the geohazards and geotechnical environment lead to a change in the pit limits or overall average slope angles; and/or
- mineralization contiguous to the notionally mined pits is extracted (to the south in the Central Zone and to the north of the Donnelly Pit, in the North Donnelly deposit).

The geotechnical study carried out for purposes of the PEA is preliminary and provisional, hence subject to change. The additional data identified in Section 16.3 is required before pit slope configurations can be designed to a high level of confidence. Risk also exists as regards Spectrum Pit, production from which relies on a preliminary and provisional muck handling system that needs to be robustly engineered at the pre-feasibility stage of project development. This does not detract from the overall conclusion that the PEA studies reported here are sufficient to support the PEA, but it does emphasize the importance, going forward, of the recommended production optimization and trade-off studies.

17 RECOVERY METHODS

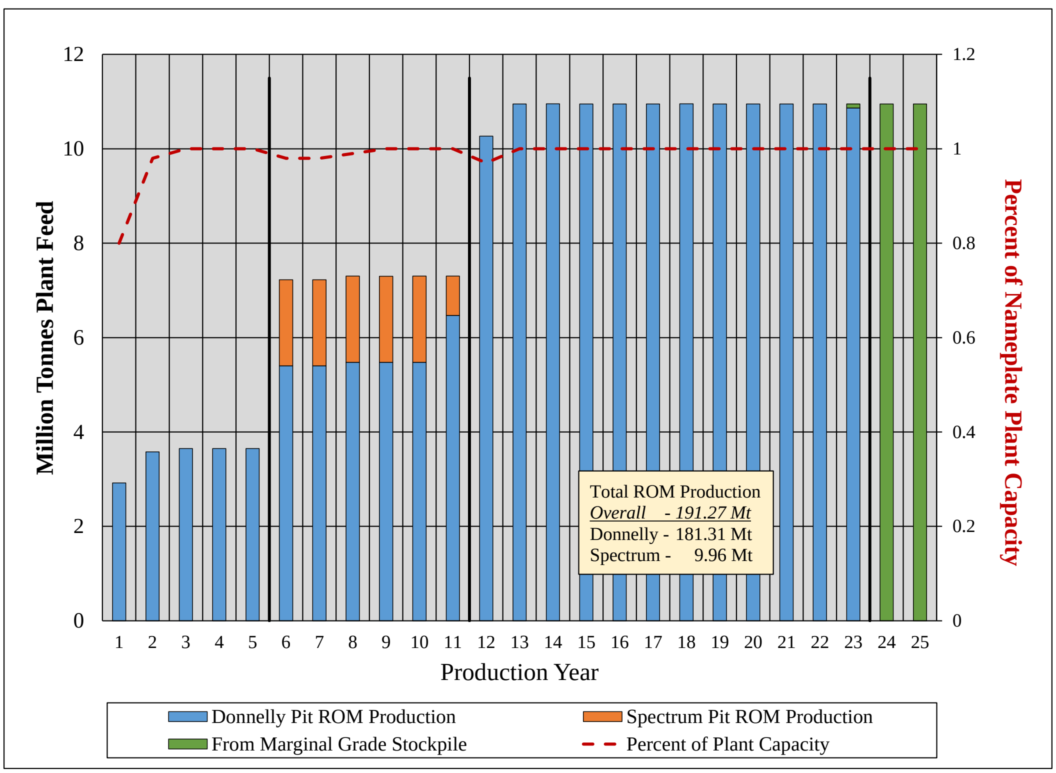
17.1 Overview

The as-designed process largely resembles many operating B.C. copper/gold plants. At 20,000 tpd or higher, the process employs crushing, SAG and ball milling to a product size of P_{80} 120 microns, then copper/gold rougher flotation to produce a concentrate which is re-ground and cleaned to yield a saleable-grade copper concentrate, enriched in gold and silver.

Tailings from the copper rougher float are subjected to bulk sulphide flotation. In a departure from typical B.C. porphyry treatment practice, the bulk sulphide concentrate is combined with the copper cleaner tails, thickened and leached by CIL to recover gold, with the cyanide subsequently destroyed in a detox circuit. The carbon is treated on site to extract the gold (and minor silver), which is smelted and sold as doré.

Doré is first produced at the start of Stage 2 of the project, when ROM feed at 5,000 tpd from Spectrum Pit is blended with ROM feed from Donnelly Pit at 15,000 tpd. During Stage 1, plant feed comprises 100% feed from Donnelly Pit, at a rate of 10,000 tpd, from which gold gravity concentrates are produced for sale in the market. Phase 3 starts in Production Year 12 when plant feed once again comprises 100% feed from Donnelly Pit, but at a rate of 30,000 tpd. Figure 17.1 provides a summary of the plant feed profile over the modelled 25 year project life, which profile includes the tonnage ramp-up profile discussed in Section 13.6. The phased approach to plant capacity was adopted for the reasons described in Section 2.3.1 (operational, technical and capital risk management).

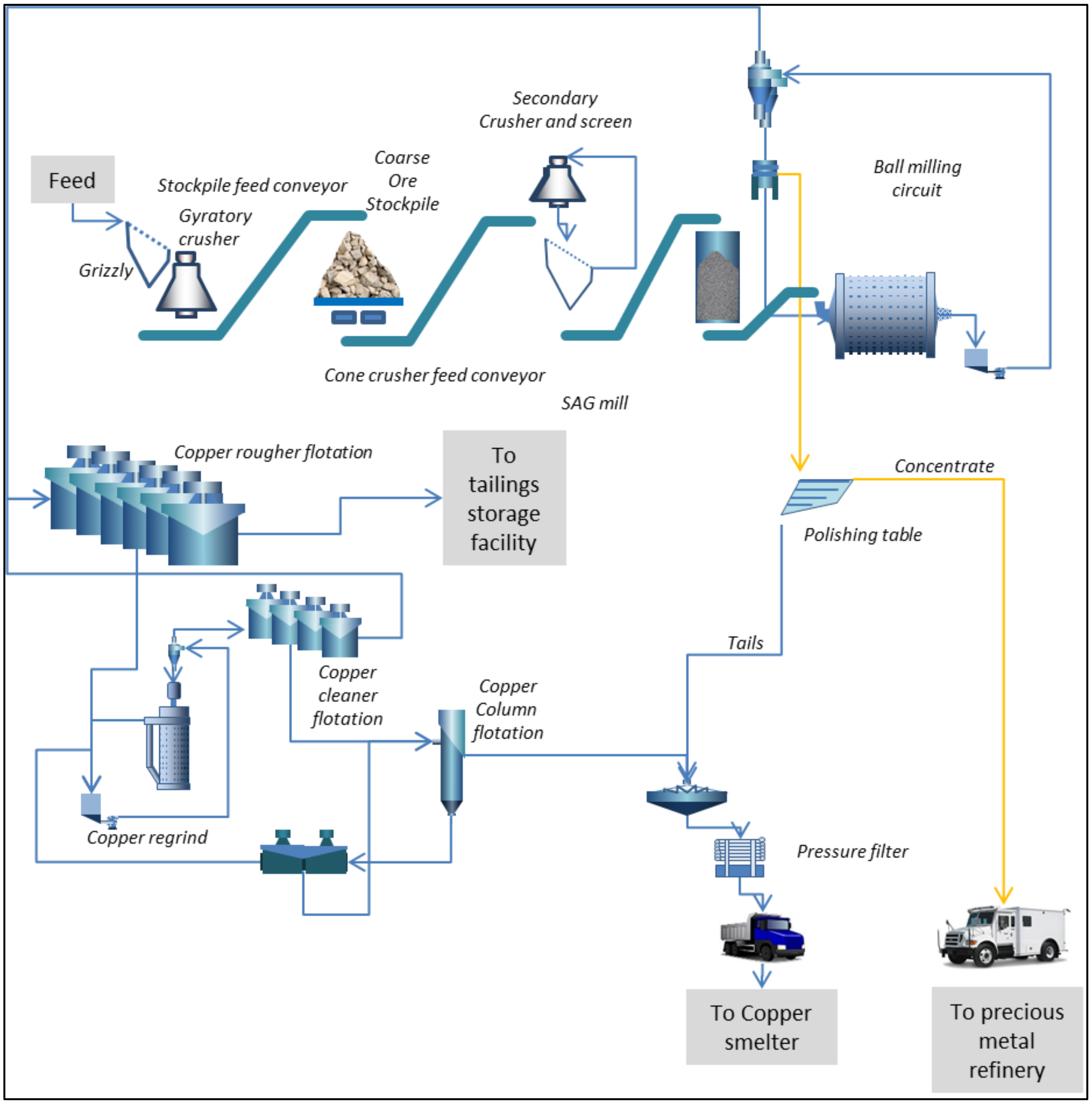
Figure 17.1 A Summary of the Plant Tonnage Throughputs by Project Stage, PEA Cashflow Model, Spectrum-GJ Cu-Au Project
(compiled by the Principal Author from the production schedule described in Section 16)



17.2 Stage 1 (10,000 tpd)

Processing during Stage 1 will be by a conventional copper/gold porphyry flowsheet, incorporating two stages of crushing and ball milling, followed by rougher flotation, concentrate regrinding and cleaner flotation to produce a pulp containing the final concentrate. A gravity circuit will be incorporated into the grinding circuit. The concentrate will be dewatered by thickening and filtration and loaded into trucks for delivery to Port of Stewart from where it will be shipped to smelters located in the Far East (see Section 19). Figure 17.2 summarizes the Stage 1 process flow.

Figure 17.2 The Stage 1 (10,000 tpd) Process Flowsheet, Spectrum-GJ Cu-Au Project



It is established in Section 16 that ROM material from Donnelly Pit will be tipped onto a production grizzley that reports direct to a rasebored muckpass. The tipped material reports to a second grizzley located at the bottom of the muckpass where the ROM material will be screened prior to primary crushing: oversize will be fed to a gyratory crusher; while undersize and the gyratory crusher product will be conveyed to a coarse ore stockpile with a 24 hour live capacity.

Material will be withdrawn from the stockpile through one of a series of feeders, then conveyed to a double deck screen, the lower deck of which will have 25 mm apertures:

- screen oversize will be fed to a secondary (cone) crusher for crushing to 25 mm, from where it will be returned to the screen;
- screen undersize will be fed to a fine ore storage bin; and
- material from the bin will be conveyed to a ball mill for primary grinding.

Lime will be added to the ball mill feed to condition the pyrite and to aid its depression in downstream copper flotation circuits. The ball mill will operate in closed circuit with hydrocyclones. Hydrocyclone underflow will be returned to the ball mill, while overflow will be delivered to copper rougher flotation. A gravity unit will be installed on a 20% bleed from the ball mill cyclone underflow to capture coarse gold trapped in the circuit. Potassium amyl xanthate will be added to the cyclone overflow.

The gravity concentrate will be collected and upgraded (using a shaking table) to refinery grade, and will be sold directly to refineries. Tailings from the shaking table will be delivered to the copper concentrate thickener.

Copper rougher flotation will be carried out using 5 x 130 m^3 conventional tank cells. The copper/gold concentrate produced from copper rougher flotation will be delivered to regrind cyclones. Underflow from the cyclones will gravitate to a vertimill, the product from which will be recycled to the regrind cyclones. Overflow from the hydrocyclones, sized at P_{80} 20 microns, will be delivered to a bank of 50 m^3 cleaner cells. Concentrate from these cleaner cells will be further cleaned using a flotation column. Tailings from the column will be scavenged using a bank of 25 m^3 mechanically agitated column scavenger cells, with the concentrate circulated back to the column feed. Column scavenger tails will be circulated to the regrind cyclone feed pump box.

17.3 Stage 2 (20,000 tpd)

During Stage 2, the plant will process a total of 20,000 tpd of a blended feed from the Spectrum and Donnelly Pits. Figure 17.3 summarizes the Stage 2 process flow.

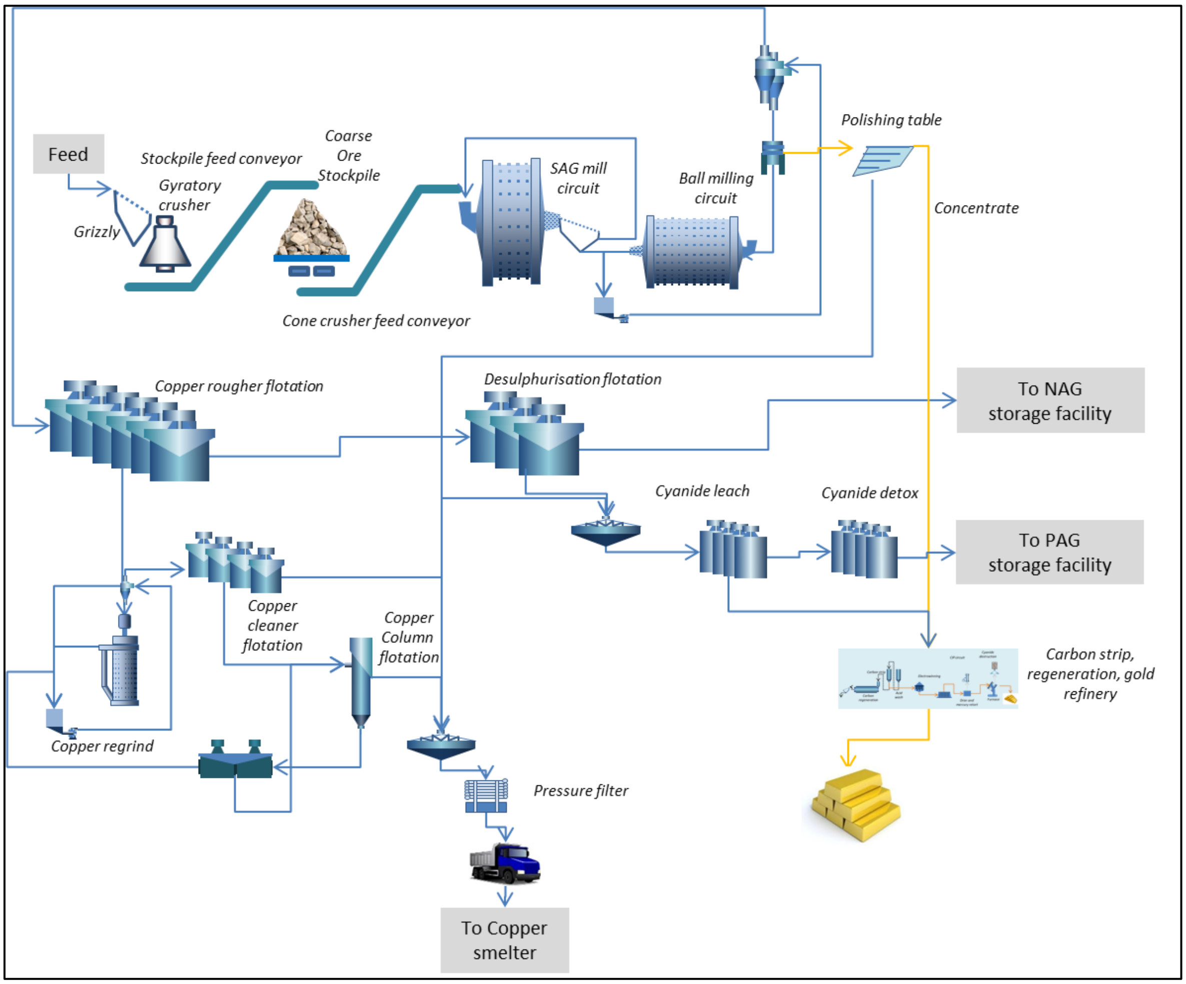
It is established in Section 16 that ROM material from Spectrum Pit will trucked from the bottom of the Spectrum muckpass system to the MIA where it will be dumped on a coarse material pad from where it will be lifted and belt fed onto the coarse stockpile, where it will be blended with ROM material from Donnelly Pit. Material from the Donnelly Pit will be crushed using the 54” x 75” gyratory crusher installed for Stage 1, and then delivered to the coarse stockpile.

Blended Spectrum-Donnelly ROM material will be fed from the coarse stockpile into a primary SAG mill. Product from the mill will be screened, with screen oversize (pebbles) returned by conveyor to the SAG mill feed. Screen undersize will be pumped to the ball mill cyclone feed pumpbox.

The ball milling, gravity recovery and copper flotation circuit will be the same as in Stage 1, but with extra flotation capacity added as needed to ensure provision of the necessary flotation residence time.

Copper flotation is largely unchanged from Stage 1, but the copper rougher tails will be subjected to a desulphurization pyrite float. Concentrate from this float will be combined with the copper first cleaner tails were it will be thickened to 55% solids, and then cyanide leached with carbon through a leach circuit with short residence time (12 hours). A regrind mill has not been included on the leach feed as the beneficial effect of regrinding has not been fully established. Cyanide will be added in the first four hours of the leach, but its concentration will be allowed to drop through the last eight hours. In addition, an SO_2/air cyanide detox circuit will be installed to ensure the leach residue contains negligible free cyanide. The activated carbon from the leach circuit, loaded with gold and silver, will be stripped and regenerated through a conventional carbon handling circuit including elution and regeneration, electrowinning of the precious metals, calcining in an oven and, finally, smelting into doré. A small Acacia refinery package has also been included, which will process the gravity concentrate, so allowing the precious metals to be delivered to the refinery for conversion to doré.

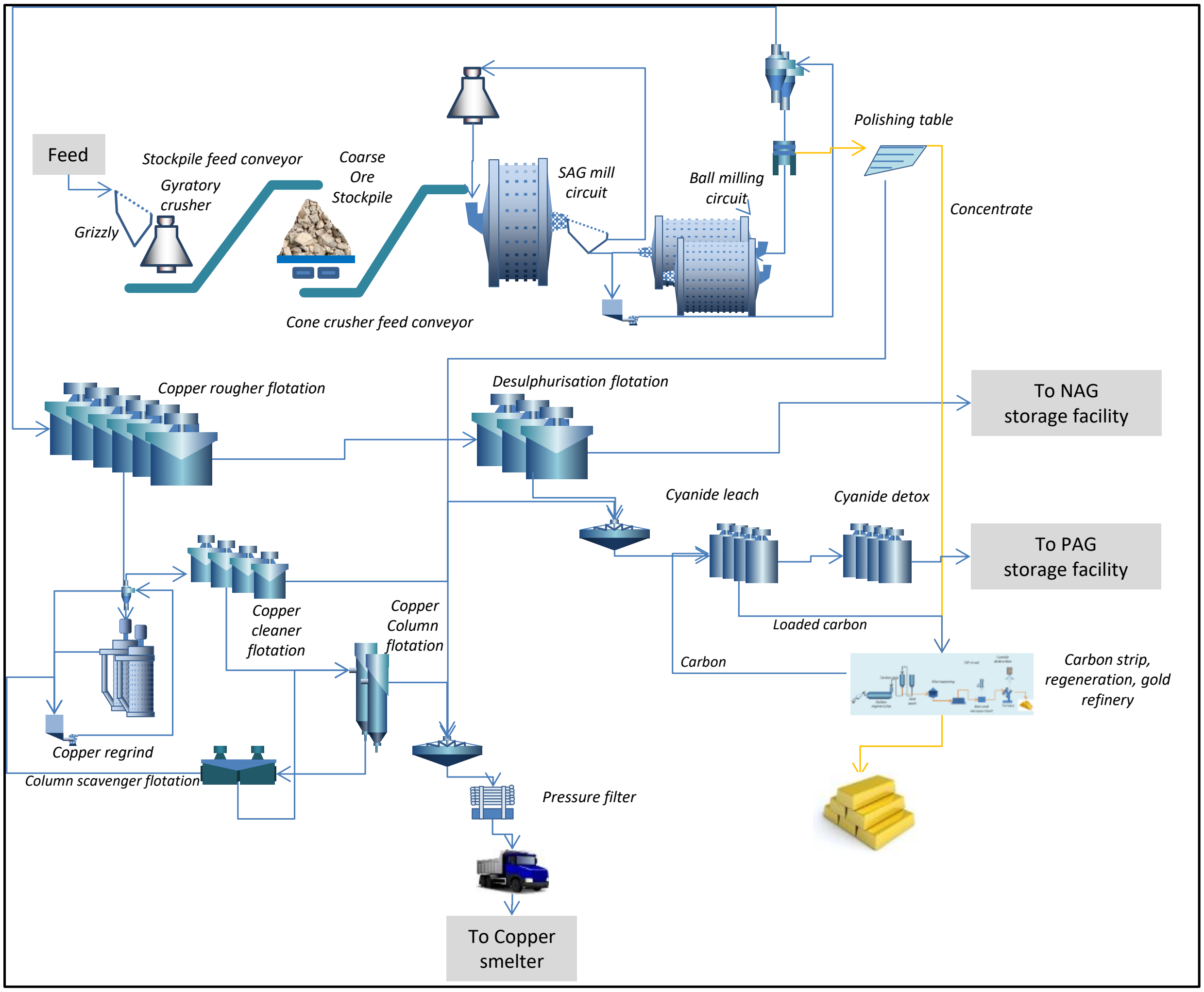
Figure 17.3 The Stage 2 (20,000 tpd) Process Flowsheet, Spectrum-GJ Cu-Au Project



17.4 Stage 3 (30,000 tpd)

Stage 3 will operate at 30,000 tpd, with 100% of the feed coming from the Donnelly Pit. The cone crusher used for secondary crushing in Stage 1 will be re-assigned for pebble crushing duty so enhancing SAG mill capacity. Additional grinding and flotation capacity will be added as needed to satisfy the process design criteria. Figure 17.4 summarizes the Stage 3 process flow that, other than the adjustments described, remains largely unchanged from Stage 2.

Figure 17.4 The Stage 3 (30,000 tpd) Process Flowsheet, Spectrum-GJ Cu-Au Project



17.5 Process Design Criteria

The key process design criteria, selected for the Spectrum-GJ project, are summarized on Table 17.1.

Table 17.1 A Summary of Key Process Design Criteria, Spectrum-GJ Cu-Au Project

	Parameter	Spectrum Pit	Donnelly Pit
Primary Crusher	Feed Top Size Grizzley Aperture Crusher	200 mm 200 mm none	1,000 mm 200 mm Gyratory
Parameter	**Stage 1**	**Stage 2**	**Stage 3**
Crusher utilization	70%	70%	70%
Grinding and Flotation Utilization	92%	92%	92%
Stockpile Live Capacity	10,000 t	20,000 t	30,000 t
SAG Mill Transfer Size	-	2 mm	2 mm
SAG Grindability (Axb)	-	37	37
Ball Mill Work Index	19.8	19.5	19.8
Cyclone Overflow (P_{80})	120 µm	120 µm	120 µm
Cu Rougher Flotation Residence Time Volume Capacity	 20 minutes 393 m^3	 20 minutes 787 m^3	 20 minutes 1,180 m^3
Concentrate Regrind Product Size	20 µm	20 µm	20 µm
Cu First Cleaner Flotation Residence Time Volume Capacity	 15 minutes 41 m^3	 15 minutes 73 m^3	 15 minutes 107 m^3
Cu Column Flotation Residence Time Volume Capacity Diameter	 45 minutes 32 m^3 2.0 m^2	 45 minutes 52 m^3 2.6 m^2	 45 minutes 74 m^3 3.1 m^2
Cu Column Scavenger Residence Time Volume Capacity	 20 minutes 15 m^3	 20 minutes 23 m^3	 20 minutes 35 m^3
Desulphurization Flotation Residence Time Volume Capacity	-	 10 minutes 300 m^3	 10 minutes 450 m^3
Sulphide Concentrate Mass Pull to Leach Leach % Solids Leach Residence Time	-	 10% 55% 12 hours	 10% 55% 12 hours
Cu Concentrate Thickener Feed Rate Underflow Density	 23 m^3/hour 60%	 45 m^3/hour 60%	 69 m^3/hour 60%
Cu Concentrate Filter Feed Rate Solids in Feed Moisture in Cake	 5 m^3/hour 60% 8%	 11 m^3/hour 60% 8%	 17 m^3/hour 60% 8%

17.6 Equipment Selection

Circuit design has been driven by the stage-based production growth schedule, but has striven to limit the installation of equipment left redundant in latter stages of the project. For example, the cone crusher has been sized to operate as a secondary crusher feeding a large ball mill at Stage 1, then later as a pebble crusher at Stage 3. Similarly, one of the two ball mills has been sized to mill 10,000 tpd of crushed (minus 25 mm) material for Stage 1, then as the unit for grinding the SAG mill product at Stage 2, before being augmented with a smaller ball mill for Stage 3. The larger ball mill is exactly twice the size of the smaller one, so the ball mill motors are standardized at 5.5 MW, with a twin drive on the larger mill and a single drive on the smaller mill.

Rougher flotation for Stage 1 uses smaller 130 m^3 tank cells to ensure enough tanks to limit short-circuiting. With higher tonnages, additional capacity is provided through the use of 200 m^3 tank cells. Table 17.2 summarizes these and other details of the main items of the selected equipment.

Table 17.2 A Summary of Major Processing Equipment, Spectrum-GJ Cu-Au Project

Application	Stage 1	Stage 2	Stage 3
Primary Crushing	Gyratory GC 54-75	Gyratory GC 54-75	Gyratory GC 54-75
Cone Crushing	Metso HP800*	-	Metso HP800**
SAG Milling	-	11.4 m x 6.7 m, 16.6 MW drive	11.4 m x 6.7 m, 16.6 MW drive
Ball Mill #1	7.1m x 11.1m, 2 x 5.5 MW drives	7.1 m x 11.1 m, 2 x 5.5 MW drives	7.1 m x 11.1 m, 2 x 5.5 MW drives
Ball Mill #2	-	-	5.8 m x 9.5 m, 1 x 5.5 MW drive
Copper Rougher Flotation	5 x 130 m^3 tank	5 x 130 m^3 tank 1 x 200 m^3 tank	5 x 130 m^3 tank 3 x 200 m^3 tank
Cu 1st Cleaner Flotation	3 x 50 m^3	3 x 50 m^3	3 x 50 m^3
Cu 2nd Cleaner Flotation	1 x 2.5 m x 12m	2 x 2.5 m x 12m	2 x 2.5 m x 12 m
Cu 2nd Cleaner Scavenger Flotation	2 x 25 m^3	2 x 25 m^3	2 x 25 m^3
Sulphide Flotation	-	3 x 200 m^3 tank	4 x 200 m^3 tank

Notes: * - operating as secondary crusher
** - operating as pebble crusher

17.7 Qualified Person's Opinion

The process flow, as described above, is similar to many copper-gold circuits that are currently operating in B.C. The selected equipment is also mostly typical of that in common use in B.C. and elsewhere. As such and in the opinion of QP Martin, the process flow presents little technological risk.

Two small departures from common convention are included in the design. The first is driven by the need to design a processing facility capable of milling at three throughput rates, as planned for the first 11 production years of the Project (the last – Stage 3 – lasting through to the end of the planned project life of 25 years). This has led to the use of the larger ball mill to act as a primary mill during Stage 1 (10,000 tpd), receiving feed from two stages of crushing. While unusual in the modern industry, such a circuit was widely used in mining throughout most of the last century. In the opinion of the QP Martin, this potentially reduces the technical risk to the project, by allowing the mine to operate prior to purchasing the SAG mill. This allows for more extensive sampling of the active pit and more careful checking of SAG mill sizing than would be otherwise be possible.

The second departure is the use of cyanide leaching of the pyrite-rich products arising from the flotation circuit, which products have been demonstrated to be amenable to leaching. This is very common practice in the gold mining industry but it is fairly uncommon in copper mining, because: either the gold contained in pyrite on most copper mines typically does not respond well to cyanide leaching; or the presence of secondary copper minerals in a pyrite-rich stream leads to excessive cyanide consumption. Neither of these constraints apply in the case of the Spectrum-GJ Cu-Au project.

In the opinion of QP Martin, the technical risks associated with the circuit design are within typical limits for a PEA level of design.

18 PROJECT INFRASTRUCTURE

The Principal Author and QP Scott Britton, C. Eng. (the "Co-Authors") are jointly responsible for this section of this Technical Report. Details concerning dam construction and details of TSF-related infrastructure were compiled from information supplied by QP M. John Brodie, P. Eng. Greenwood Environmental Inc. of Vancouver B.C. ("Greenwood") provided advice concerning the environmental elements related to infrastructure planning.

18.1 Planning Criteria

It is established in Section 2 that a key objective of the PEA is to engineer solutions that encompass safety considerations as well as practical, physical and operational constraints, thereby to ensure practicably achievable and sustainable outcomes. In addition, as stated in Section 4 and to the extent possible, planning and design should encompass the Tahltan Nation's requirements that, to the best knowledge and understanding of the Co-Authors, may be summarized as follows:

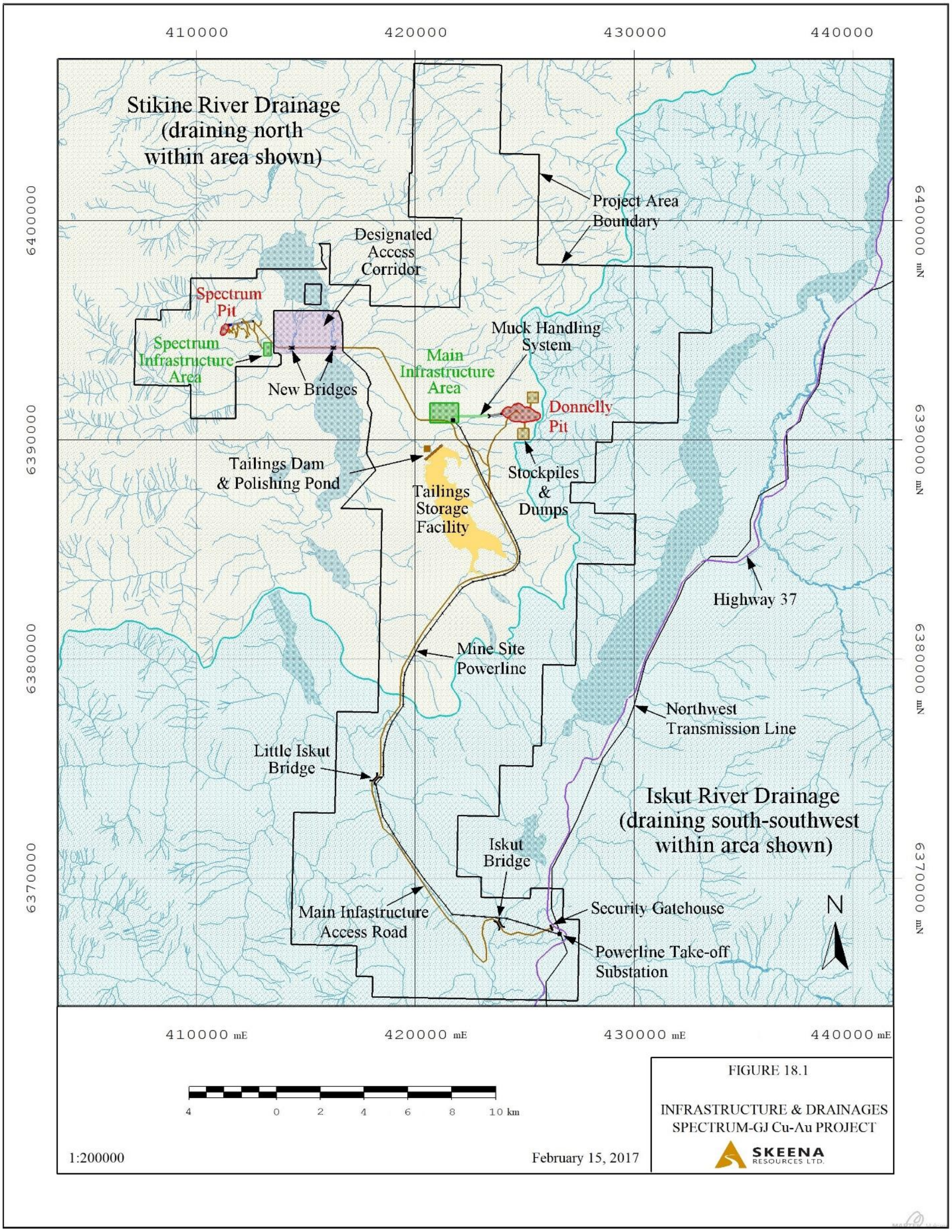
- minimize the project footprint by using existing infrastructure where possible and practicable;
- keep the planned infrastructure to one watershed, unless existing infrastructure extends into or from a different watershed;
- use best practice in design (which, for the most part, is applicable at the feasibility level of project development);
- respect wildlife, heritage/archaeology and Tahltan Nation rights;
- meet applicable environmental plans, including those detailed in the CIS LRMP (see Section 4.9); and
- engineer solutions that encompass considerations of zero contamination discharge to the environment.

18.2 Overview

Figure 18.1 (which is a compilation of Figures 5.10 and 5.11) provides a general summary of the planned infrastructure and its position with respect to the two main river drainages that occur in the general area of interest. It may be seen that:

- for the reasons described in Section 4.9 and to the extent that is practicable and possible, the infrastructure has been kept away from the Project Area boundary, most especially where it adjoins the Mount Edziza Provincial Park boundary;
- the majority of the planned infrastructure is located on claims that are 100% owned by the Company - the only exception is that portion of the access road to the Spectrum Pit area that extends over the Designated Access Corridor described in Section 4; and
- with the exceptions of the planned Northwest Transmission Line take-off sub-station, a security gate at the turning off of Willow Creek Road from Highway 37, approximately 98% of Willow Creek Road and a portion of the powerline to the MIA, all the planned infrastructure is contained within the Stikine River drainage.

Figure 18.1 A Project Area Plan Showing the General Layout of the Planned Infrastructure and its Position with Respect to the Two Main River Drainages, Spectrum-GJ Cu-Au Project (compiled by the Principal Author, in conjunction with Company personnel)



18.2.1 Heritage/Archaeology

Further to its on-going heritage/archaeological commitments to the Tahltan First Nation, the Company carries out AIAs, as and when required (as described in Section 4.9). The Company also maintains Project Area plans detailing archaeological sites, the areas where AIAs have been carried out and the areas where SAPs have been secured and known sites mitigated under Section 12 of the Heritage Conservation Act (as described in Section 4.9). To respect the Tahltan Nation's request that the locations of archaeological sites are kept confidential and are not shown on any maps or plans intended for public dissemination, the Company's archaeological plans are not presented here.

As part of a larger due diligence process, the Principal Author examined the Company's archaeological plans for the Project Area and concluded that key infrastructure elements are located in areas where AIAs have not been carried out. The Company has advised the Co-Authors that it acknowledges that AIAs will be required and that if one or more of the infrastructure locations coincides with an area identified as an archaeological site, infrastructure planning will have to be modified unless an SAP could be secured. The Company has advised the Principal Author that the undertaking of AIAs, across areas on which the planned infrastructure is located, forms part of the Company's project development plans going forward.

18.2.2 Geotechnical Site Investigations

No formal site geotechnical investigations have been carried out to characterize the ground across the planned areas of infrastructure development. Reasonable estimates of likely conditions, based on percentages of soil and rock, have instead been made. The Company acknowledges that site investigations will be required, and the Company has advised the Principal Author that their undertaking forms part of the Company's project development plans going forward.

18.3 Main Infrastructure Area

The first point of reference, in the iterative process leading to the planned infrastructure considered herein, is the location of the MIA. It will serve as the main operations centre for the Spectrum-GJ project, insofar as the following infrastructure elements will be located at the MIA:

- a laydown / storage area for the topsoil and till removed during the site preparation / earthworks phase of MIA construction;
- a powerline off-take and power distribution system, the latter including a powerline to the Donnelly primary crusher station (located underground, as described in Section 16.6);
- an emergency diesel generation facility and fuel supply, storage and distribution facility (including the main tank farm);
- a fresh, process and mine water supply, storage and distribution facility, including tank farms for potable and recycled water;
- a construction camp, first built for the construction phase and expanded as appropriate for the production phase, inclusive of sewerage and waste disposal facilities;

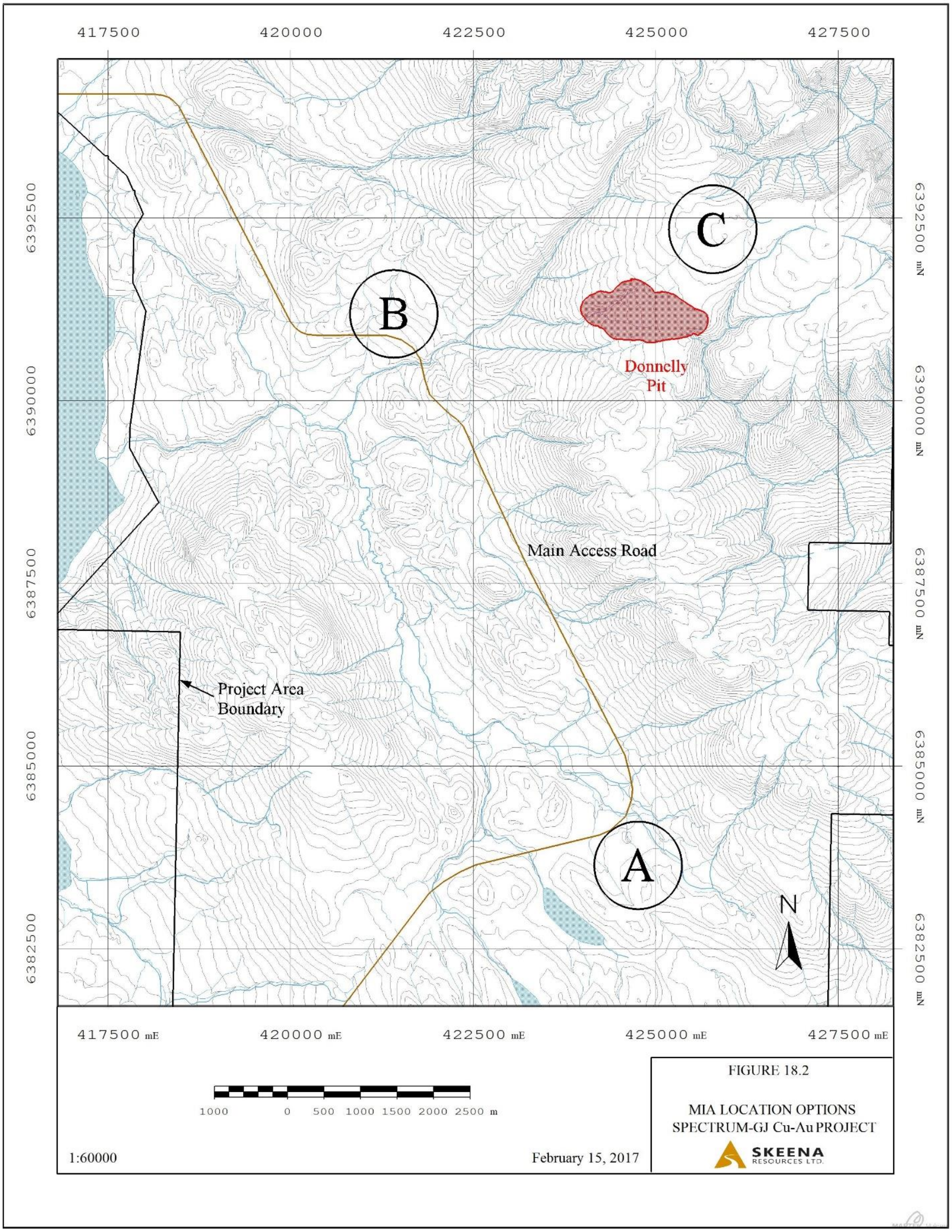
- a single storey mine dry for Spectrum Pit and Donnelly Pit personnel (Spectrum Pit personnel will be bussed to/from the MIA, as required), with a standard area allowance of 5.81 m^2 per hourly paid worker on shift;
- a single storey, general administration and Donnelly Pit offices block, with a standard area allowance of 25.5 m^2 per salaried employee;
- a 1,000 m^2 (floor area) maintenance shop where all major equipment repairs, etc will be carried out;
- a 750 m^2 (floor area) main warehouse and a cold storage building;
- a systems control and communications with a broadband satellite-based communication system and an office Management Information System (MIS) Network;
- a suitably located explosives handling and storage facility, with a standard capacity allowance of 0.00883 m^3 per kg/day of ANFO;
- an uncovered primary crushed ROM storage and load-out facility;
- a double height process plant with a total area allowance of 220,000 m^2, inclusive of a doré production facility, a reagent handling and storage facility, a concentrate storage shed and a laboratory;
- a fire protection and prevention facility, along with a first aid facility and medivac station; and
- a security gatehouse and related security fencing (the latter focusing mainly on the plant and office areas).

18.3.1 Location Options

Areas suitable for locating the MIA are limited by virtue of topography, drainage patterns and the proximity of the Mount Edziza Provincial Park. Three potential sites were, however, identified through scrutiny of topographic and water drainage plans for the Project Area. These are identified on Figure 18.2 as locations A, B and C (the location-identifying circles each have a diameter of 1.2 km [area = 1.13 km^2, with additional space if required] which, in the opinion of the Co-Authors, is sufficient to safely and sustainably accommodate the MIA infrastructure elements described above):

- Location A was identified because it is the first area of reasonably flat ground in the Stikine River drainage, north of the Willow Creek Road (as such it represents the option that results in the shortest length of powerline from the planned take-off substation adjacent to the turnoff of Willow Creek Road from Highway 37);
- Location B was identified because it is the closest area of reasonably flat ground to the southeast of the Spectrum Pit area where an MIA would be screened from view from Mount Edziza Provincial Park (as such it represents the option that results in the shortest practicable haul distance for ROM material from the Spectrum Pit area to the central processing plant located at the MIA); and
- Location C was identified as a potential site where all key infrastructure could be consolidated near to the planned Donnelly Pit from where the bulk of the ROM material for processing will be mined, at least within the scope of the PEA presented herein.

Figure 18.2 A Plan of the a Portion of the Project Area Showing the Locations of the Three Potential MIA Sites Considered Analysis, Spectrum-GJ Project Area
(compiled by the Principal Author, in conjunction with Company personnel)



18.3.2 Risk and Opportunity Analysis

A risk and opportunity approach was adopted for purposes of selecting a potentially suitable MIA location, inclusive of considerations of:

- the seven CIS LRMP components described in Sub-Section 4.9.4 (Biodiversity; Wildlife; Aquatic Ecosystems and Riparian Habitat; Hunting, Trapping, Guide-Outfitting and Fishing; Recreation/Tourism; Visual Quality; and Timber);
- Greenwood's advice concerning wildlife issues, acid drainage potential and heritage/archaeology; and
- safety, practicality and operational constraints including accessibility, groundwork, weather, powerline length, potential TSF location(s) and the lengths of tailings disposal lines.

Figure 18.3 summarizes the road access, powerline route and muck handling system required for Option A; Figure 18.4 summarizes the same infrastructure elements, but for Option B. Details of the infrastructure requirements for Site C (located on Klastline Plateau) were not compiled and are not presented here - early in the selection process the location was found to not be viable for the reasons described below.

Tables 18.1 through 18.3 provide summaries of the Co-Authors findings concerning each identified area of potential concern, as summarized above. It may be seen that data gaps concerning biodiversity and heritage/archaeology exist, the latter as described in 18.2. In both cases the Company has advised the Co-Authors that it recognizes that data gaps exist, that they need to be filled going forward and that the planned location of the MIA might have to be modified, depending on results. Greenwood's recommended action plans as regards biodiversity surveys and AIAs are described in Section 20.

Figure 18.3 A Plan of a Portion of the Project Area Showing the Main Infrastructure Elements Associated with the Option A Location for the MIA, Spectrum-GJ Project Area
(compiled by the Principal Author, in conjunction with Company personnel)

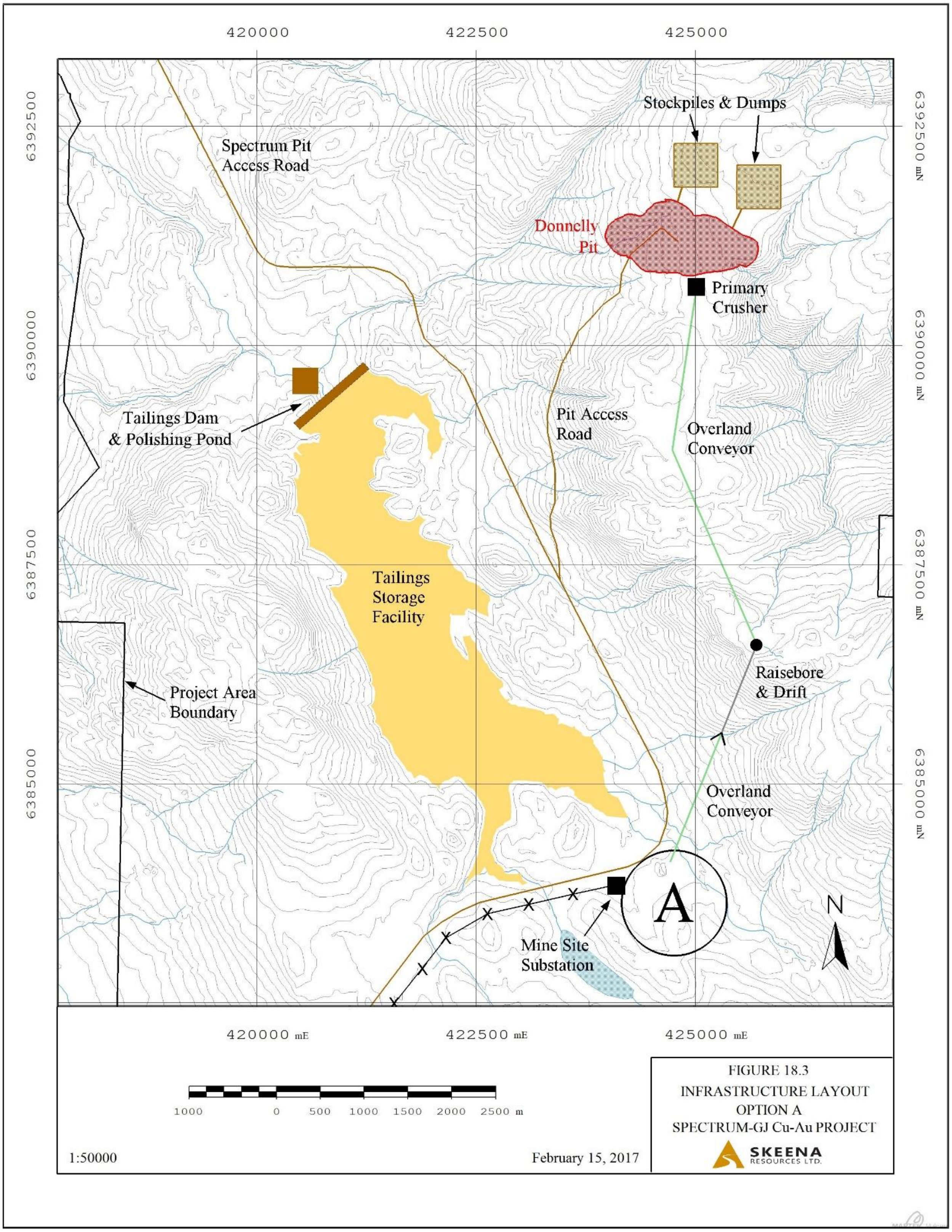


Figure 18.4 A Plan of a Portion of the Project Area Showing the Main Infrastructure Elements Associated with the Option B Location for the MIA, Spectrum-GJ Project Area
(compiled by the Principal Author, in conjunction with Company personnel)

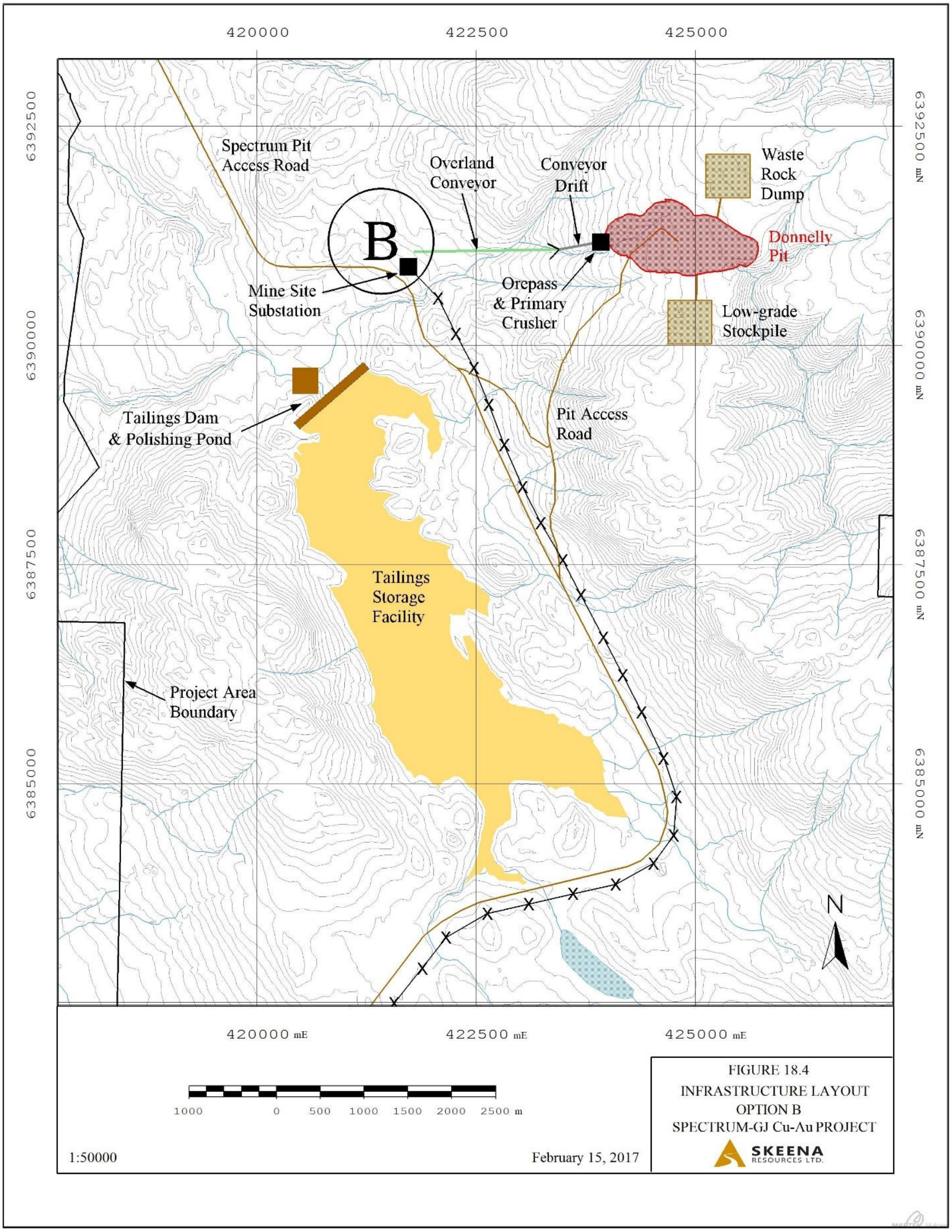


Table 18.1 A Summary of Opportunities and Risks, MIA Location Option A

Parameter	**Comments**
Biodiversity	Data gap - to be advised (appropriate surveys required, going forward).
Wildlife	Muck handling requires construction of an approx. 4.3 km long overland belt conveyance across the plateau area, extending south from Donnelly Pit. This would restrict wildlife movements, unless appropriately designed (which design would inevitably incur additional capital expenditures).
Aquatic Ecosystems, Riparian Habitat	Waste dump and marginal grade stockpile have to be sited to north of pit where local topography could result in water drainage from dump / stockpile draining into a south-flowing creek.
Timber	Location in moderately wooded area (visual assessment), tree cutting would be required (amount to be assessed at FS stage, but would be kept to a minimum, per the requirements of the Environmental Management Plan).
Recreation/Tourism	No '*unique volcanic features*' will be damaged or destroyed within the scope of the planned operations, as none exist in the target project development areas.
Visibility	MIA location naturally screened by vegetation and local topography (visibility risk very low), but plateau infrastructure probably highly visible from both the east and the west.
Heritage/Archaeology	Data gap - to be advised (AIA surveys required, going forward).
Accessibility	Straightforward 28 km from Highway 37 turnoff, along Willow Creek Road and then onto new road alignment (approx. 4.5 km). Donnelly Pit access road could be used as back-up for muck handling, in the event that the primary crusher goes down (located adjacent to the pit).
Groundworks	Thin till and thin soils anticipated, but this needs to be confirmed by means of an appropriate ground survey at the FS stage. No challenging topography exists and minor earthworks only are expected (average existing gradient approx. 8%).
Weather	Location sheltered from adverse weather, to the extent possible. Muck handling system located on plateau exposed to adverse weather (potential operational constraint, but only for what are expected to be short periods of extreme weather). Rime icing, of the type that hampered the automated meteorological station installed and operated on Klastline Plateau between June 2005 and September 2008 (see Section 5.4), would represent a more persistent operational risk.
Powerline Length	Approx. 24 km from take-off sub-station adjacent to Highway 37 to site sub-station located at MIA. Least length hence least capital expenditure for three options considered in analysis.
TSF Location(s)	Life-of-mine facility. Dam height not especially onerous. Most favourable / least risk option of all TSF locations considered in analysis (see Section 18.4).
Tailings Disposal Lines	Minor elevation change from MIA-located plant to TSF dam. NAG tailings disposal pipelines initially up to 6.5 km long – relay pump stations would be required (higher operational and environmental risks, and capital expenditure requirement than for Option B, but lower operational and environmental risks than for Option C). PAG tailings lines approx. 2 km long, capacity approx. 3 ktpd versus up to approx. 27 ktpd of NAG material.

Table 18.2 A Summary of Opportunities and Risks, MIA Location Option B

Parameter	**Comments**
Biodiversity	Data gap - to be advised (appropriate surveys required, going forward).
Wildlife	Pit-side infrastructure requirement the least for the three locations considered - a loading / tipping apron only is required (muck is tipped direct into a muckpass for primary crushing underground). Wildlife interactions the least for three options considered in analysis.
Aquatic Ecosystems, Riparian Habitat	Waste dump and marginal grade stockpile sited to north and south of pit, respectively, from where water drainage from dump / stockpile reports to the pit.
Timber	Location in moderately to densely wooded area (visual assessment), tree cutting would be required (volume to be assessed at FS stage, but would be kept to a minimum, per the requirements of the Environmental Management Plan).
Recreation/Tourism	No '*unique volcanic features*' will be damaged or destroyed within the scope of the planned operations, as none exist in the target project development areas.
Visibility	Location naturally screened by vegetation and local topography. Visibility risk very low, including tipping point adjacent to Donnelly Pit.
Heritage/Archaeology	Data gap - to be advised (AIA surveys required, going forward).
Accessibility	Straightforward 36 km from Highway 37 turnoff onto Willow Creek Road then onto new road alignment (approx. 12.5 km). Donnelly Pit access road could be used as back-up for muck handling from pit, in the event that the primary crusher (located underground) goes down.
Groundworks	Thin till and thin soils anticipated, but this needs to be confirmed by means of an appropriate ground survey at the FS stage. No challenging topography exists and minor earthworks only are expected (average existing gradient approx. 10%).
Weather	Location sheltered from adverse weather, to the extent possible. Muck handling system unlikely to be adversely affected, except over short periods of extreme weather.
Powerline Length	Approx. 33 km from take-off sub-station adjacent to Highway 37 to site sub-station located at MIA. Additional capital expenditure compared with Option A, but less than for Option C.
TSF Location(s)	Life-of-mine facility same as for Option A. Best / least risk option of all TSF locations considered in analysis (see Section 18.4).
Tailings Disposal Lines	Slightly larger elevation change from MIA-located plant to TSF dam than for Option A. NAG tailings disposal pipeline approx. 2.0 km long. Significantly reduced environmental and operational risks compared with Option A. Lower capital expenditure too. PAG tailings disposal pipeline up to approx. 4.5 km long. Increased environmental and operational risks compared with Option A. Lower overall capital expenditure.

Table 18.3: A Summary of Opportunities and Risks, MIA Location Option C

Parameter	Comments
Biodiversity	Data gap - to be advised (appropriate surveys required, going forward).
Wildlife	Potentially significant interactions would occur in a popular hunting area known to be populated with a number of wildlife species (see Section 4.9). Wildlife could become habituated to the presence of extensive infrastructure, especially the camp (as previously reported around GJ camp, during a March 2007 ungulate survey - Rescan, 2008). Risk of adverse human interactions highest for the three MIA location options considered.
Aquatic Ecosystems, Riparian Habitat	Water management from TSFs would be problematic; water could report to both local drainages. High risk option.
Timber	No tree cutting would be required because vegetation is sparse and no trees exist on the plateau area (the location is above the tree line).
Recreation/Tourism	No '*unique volcanic features*' will be damaged or destroyed within the scope of the planned operations, as none exist in the target project development areas.
Visibility	MIA and related pit infrastructure might be seen from designated recreation areas and from Highway 37. Screening using trees would not be possible as the plateau area is above the tree line. Visibility risk the greatest of the three MIA location options considered.
Heritage/Archaeology	Data gap - to be advised (AIA surveys required, going forward).
Accessibility	Straightforward approx. 33 km long road from Highway 37 turnoff to Donnelly Pit / MIA access road that is a moderately straightforward, 5.0 km long road with maximum 10% gradient (average approximately 8%). Donnelly Pit / MIA access road would have to be used to haul Spectrum ROM material to MIA, which represents the highest environmental and operational risk of the three MIA location options considered in analysis.
Groundworks	Approx. 5 m of till and very thin soils only across plateau area. Topography essentially flat so minor earthworks only required during MIA construction.
Weather	MIA and all related infrastructure exposed to adverse weather. Severe winds pose greatest potential risk (see Section 5.4).
Powerline Length	Approx. 40 km from take-off sub-station adjacent to Highway 37 to site sub-station located at MIA, including a challenging section up the steep, west facing slope of the plateau area (400 m elevation gain). Additional capital expenditures compared with both Option A and Option C.
TSF Location(s)	Purpose of siting MIA on plateau area would be access to incised creeks leading off western margin of plateau. Several TSFs would be required, each of which would be perched (high risk approach in seismically active area), despite which capacity constraints would mean a TSF in the same area as for Options A & B would inevitably be required. Operational and environmental risks therefore at maximums for the three MIA location options considered. Capital expenditures also highest due to the number and configurations of dams located in steep-sided, incised creek locations.
Tailings Disposal Lines	Complicated (operational and environmental risk) but elevation changes best suited to gravity-assisted tailings disposal.

18.3.3 MIA Site Selection

The findings summarized Tables 18.1 through 18.3 were used to compile the risk matrix presented as Table 18.4. What is considered by the Co-Authors to be the best option for each parameter of interest is signified by the ✓ symbol, the intermediate option by the **o** symbol and the least attractive / highest risk option by the **x** symbol. If the same parameter for two different options is assessed to have approximately the same level of environmental or operational risk and/or cost, then both are signified by the ✓ or **O** symbol, with the same parameter for the least attractive option signified by the **X** symbol.

Table 18.4 A Risk Matrix for the Three MIA Siting Options Considered in Analysis, Spectrum-GJ Project Area

Parameter	Assessed Risk		
	Option A	Option B	Option C
Biodiversity (to be advised)	Data gap – to be advised		
Wildlife	O	✓	X
Aquatic Ecosystems, Riparian Habitat	X	✓	X
Timber	O	O	✓
Recreation / Tourism	✓	✓	✓
Visibility	O	✓	X
Heritage/Archaeology (to be advised)	Data gap – to be advised		
Accessibility	✓	✓	X
Groundworks	O	O	✓
Weather	✓	✓	X
Powerline Length	✓	O	X
Haul Length, Spectrum Pit area to MIA	O	✓	X
TSF Location(s)	✓	✓	X
Tailings Disposal Lines	O	✓	X

It may be concluded from consideration of Tables 18.1 through 18.4 that although there are capital expenditure benefits associated with the Option A site, the Option B site is preferred, mainly for reasons of its low wildlife interaction risk, the lower environmental risk for gravity assisted tailings disposal and the shorter haul distance for ROM material from the Spectrum Pit area. It is the access road layouts and powerline details related to Option B that are considered in the following sections. As previously stated, the Company acknowledges that biodiversity and heritage/archaeological surveys are required before details of the planned MIA can be finalized.

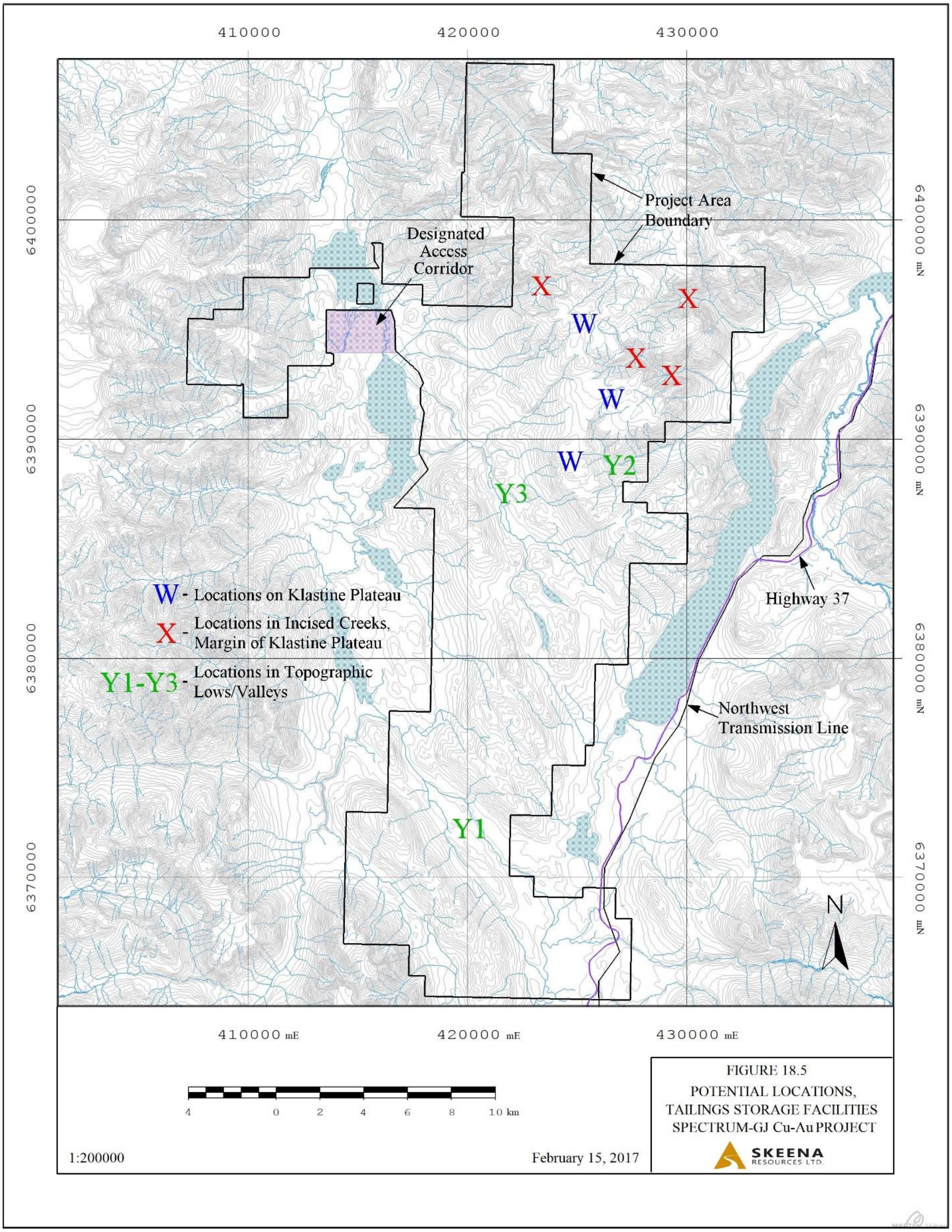
18.4 Tailings Storage Facility - Location

An integral part of the MIA site selection process was consideration of suitable TSF location(s). In common with siting the MIA, options are limited by topography and the proximity of Mount Edziza Provincial Park. A number of possible sites were, however, identified through scrutiny of topographic and water drainage plans for the Project Area. The identified sites are summarized on Figure 18.5, at the positions labelled **W**, **X** and **Y1** through **Y3**:

- the potential sites identified by the letter **W** are located on flat to gently sloping areas on Klastline Plateau;
- the sites identified by the letter **X** are located in incised creeks around the margins of Klastline Plateau; and
- the sites identified by the symbols **Y1** through **Y3** are located in the only topographic lows/valleys located on the Project Area.

Figure 18.5 A Plan of the Project Area Showing the Ten Potential Locations for Tailings Disposal Facilities, Spectrum-GJ Project Area

(compiled by the Principal Author, in conjunction with Company personnel)



18.4.1 On Klastline Plateau

The **W** sites (those located on Klastline Plateau) were found to be unsuitable, for the following reasons:

- more than one facility would be required, which increases the statistical probability of potential dam failure;
- each facility would have to be individually located to optimize natural containment opportunities, which would be challenging due to the essentially flat topography - potentially very long dams would be required that would further increase the statistical probability of potential failure;
- potential wildlife interactions would be at a maximum for the options considered in analysis (the results of environmental surveys indicate the presence of a number of significant herds of animals on Klastline Plateau [see Sections 4.9 and 20.1], and Klastline Plateau is known to be a favoured hunting area);
- the visibility risk from both Highway 37 and Mount Edziza Provincial Park would be the highest for the options considered in analysis;
- Klastline Plateau is known to suffer occasionally very high winds (see Section 5.4), which could result in significant and persistent dust problems;
- there would be significant water management challenges, not least because drainage could in theory extend to both the Stikine and Iskut river systems; and
- for operational, cost and efficiency reasons, the MIA would have to be sited at Location C identified in Section 18.3, which is by far the least favourable option of the three considered in analysis.

18.4.2 Around the Margins of Klastline Plateau

In the opinion of the Co-Authors, the **X** sites (those located in the steep- to very steep-sided and deeply incised creeks along the east and west margins of Klastline Plateau), would present higher environmental risks than the **W** sites, because:

- several TSFs would be required (even then the capacity would be constrained) and the dams would be tall to very tall, perched and readily visible;
- perched dams have the highest statistical risk of potential instability in seismically active areas (such as across the Project Area – see Section 5.7); and
- the statistical probability of dam failure also increases with the number and dimensions of dams.

In common with the **W** sites, there would be significant water management challenges if one or more of the **X** sites was selected, not least because drainage could in theory extend to both the Stikine and Iskut river systems. Furthermore and in common with the **W** sites, the MIA would have to be sited at Location C identified in Section 18.3, which is by far the least favourable option of the three considered in analysis.

18.4.3 In Topographic Lows/Valleys

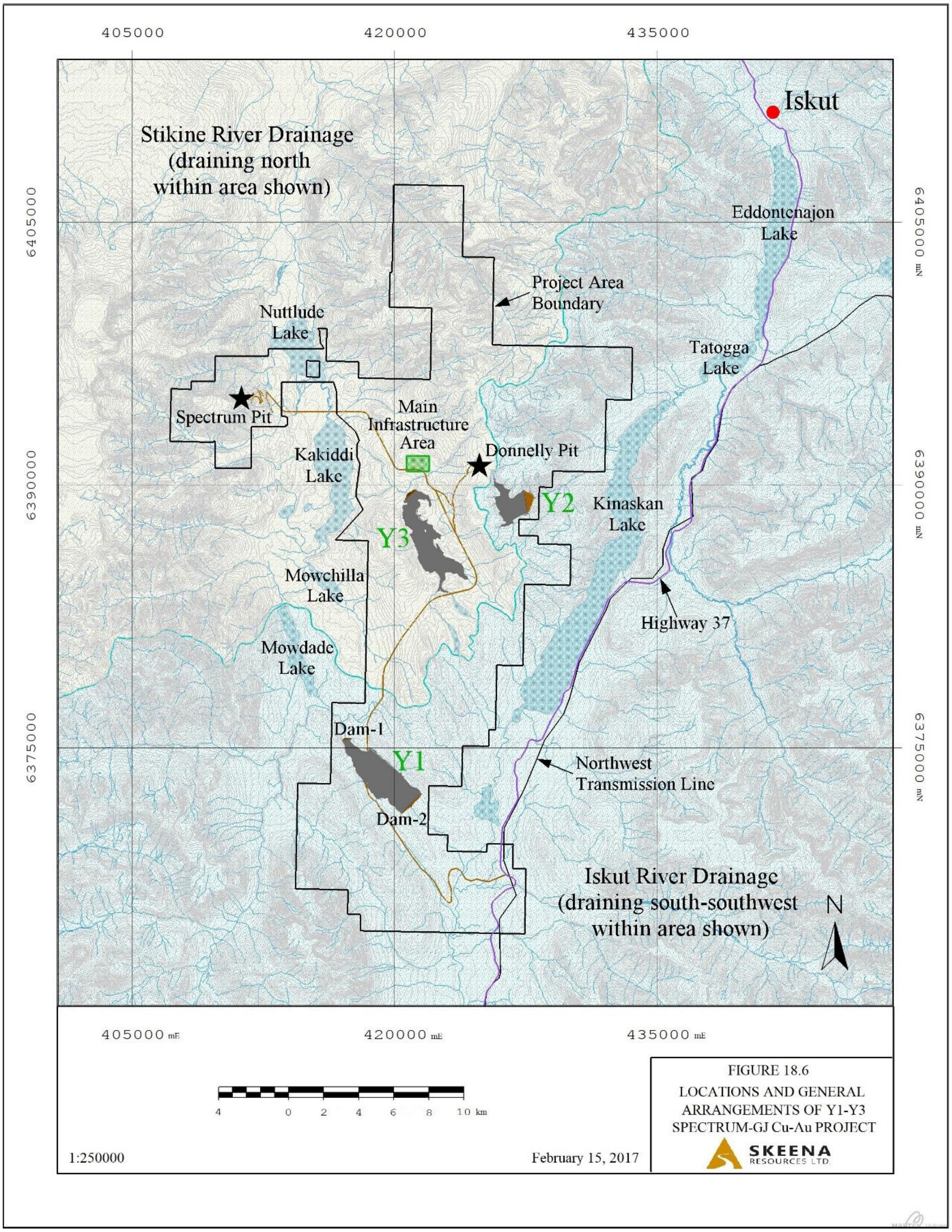
Figure 18.6 identifies the locations and general outlines, at maximum capacity, of the TSFs that could be located in the three topographic lows/valleys located on the Project Area. Each has the potential to be a life-of-mine facility, as Table 18.5 suggests (the required storage capacity for the PEA production schedule described in Section 16 is approximately 210 Mt [approximately 142 ±14 million m^3 of tailings], although future planning might increase this requirement to at least 340 Mt, or approximately 232 ±20 million m^3 of tailings). Option **Y1** requires two dams, one upstream (#1) and one downstream (#2) of a southwest draining creek. Options **Y2** and **Y3** require only one dam each. The stated potential capacities, estimated dam volumes and estimated wall heights (at maximum capacity) are preliminary and provisional estimates that are subject to change.

Table 18.5 A Summary of the Estimated Capacities and Dam Heights of and for the Tailings Storage Facilities that could be Located in Topographic Lows/Valleys Within the Spectrum-GJ Project Area

Option	Estimated Potential Capacity		Estimated Dam Volume		Estimated Max. Dam Height	
			#1	#2	#1	#2
Y1	254 million m^3	380 Mt ± 40 Mt	1.4 million m^3	6.0 million m^3	70 m	70 m
Y2	221 million m^3	330 Mt ± 30 Mt	70 million m^3	-	310 m	-
Y3	248 million m^3	375 Mt ± 35 Mt	6.5 million m^3	-	70 m	-

Figure 18.6 A Plan of the Project Area Showing the Locations and General Outlines of the Three Potential Tailings Storage Facilities that Could be Located Within Topographic Lows/Valleys, Spectrum-GJ Project Area

(compiled by the Co-Authors, in conjunction with Company personnel)



In the opinion of the Co-Authors, Option **Y2** represents the least favourable of the three possible options, because:

- it is located in a separate watershed from all the other main infrastructure elements (the only exceptions being elements of the planned road access and powerline for which no practicable alternatives exist);
- it is very close to the local Project Area boundary;
- it party overlies the GJ zone, where Mineral Resources could in future be defined;
- at 310 m, the dam would be excessively high and it would, therefore, have an above-average statistical probability of instability risk;
- construction access would be complex, challenging and require additional access roads, which would be contrary to the minimum footprint requirement; and
- tailings disposal would be very challenging (and represent an elevated statistical probability of environmental risk), unless the MIA was sited at the Option C location, which is by far the least favourable of the three potential MIA sites considered in analysis.

In the opinion of the Co-Authors, Option **Y1** is less favourable than Option **Y3** because:

- it is located in a separate watershed from all the other main infrastructure elements (the only exceptions being elements of the planned road access and powerline for which no practicable alternatives exist);
- at both ends it is very close to the Project Area boundary;
- it straddles the existing Willow Creek Road, thereby requiring the construction of a new access road alignment, which would be contrary to the least footprint objective and which would inevitably be very close to the Project Area boundary;
- a by-pass system for the southeast draining creek would be required, which would further increase the footprint of the facility; and
- the tailings disposal lines from the processing plant would be very long and thereby pose an above average statistical probability of environmental risk.

Option **Y3** is the preferred and selected option for a TSF, because:

- it is located in the same watershed as all the other main infrastructure elements (the only exceptions being elements of the planned road access and powerline for which no practicable alternatives exist);
- it is remote from the Project Area boundary and it is located between two steep mountain slopes that significantly reduce visibility risk;
- it represents a single, consolidated life-of-mine facility;
- the dam height is modest, it has an excellent dam to contained volume ratio and the south end of the facility is naturally constrained;

- its length to width ratio facilitates the safe disposal of PAG tailings (they could selectively be placed at the back / at the south end of the dam where they would always be under water);
- the facility is close to potential MIA locations A and B, which reduces tailings pipeline lengths to practicable minimums, which in turn realizes environmental and operational benefits; and
- it could readily be accessed from the planned site access road (an extensive internal access road system would not be required, which benefit is consistent with the minimum footprint requirement).

Figure 18.7 provides a summary of the general layout of the planned TSF and related infrastructure. The discussions of Section 18.5 justify the selection of a conventional wet TSF. Surface water run-off ditches are required to limit the amount of surface water run-off reporting to the TSF, which the Co-Authors consider an important design element due to:

- the large catchment area for the dam site (estimated at 50 km^2 without surface water run-off ditches, reducing to 37 km^2 reporting to a maximum surface area for the dam of approximately 7.0 km^2 – see Figure 18.8); and
- the average annual precipitation for the area that can be at least 650 mm, not including storm events that can result in rainfall events of at least 50 mm in 12 hours (see Section 5.4).

The preceding points are emphasized because a persistent net positive precipitation to evaporation balance is anticipated for the planned TSF (and indeed any TSF located within the Project Area), with the possible exception of short periods during dry summer periods. This key consideration resulted in:

- the assumption of a 5 m free board for the dam, to safely confine water within the TSF from where process water would either be recycled to the plant or pumped to a water treatment plant, via a polishing pond, to ensure zero contamination discharge to the environment;
- the construction, in Production Year 20 of a spillway when the final planned dam height is acheived; and
- the selection of a conventional wet TSF within the scope of project planning and cost estimation.

Figure 18.7 A Plan of a Portion of the Project Area Showing of the General Arrangement of the Planned Tailings Storage Facility and Related Infrastructure, Spectrum-GJ Project Area

(compiled by the Principal Author, in conjunction with Company personnel)

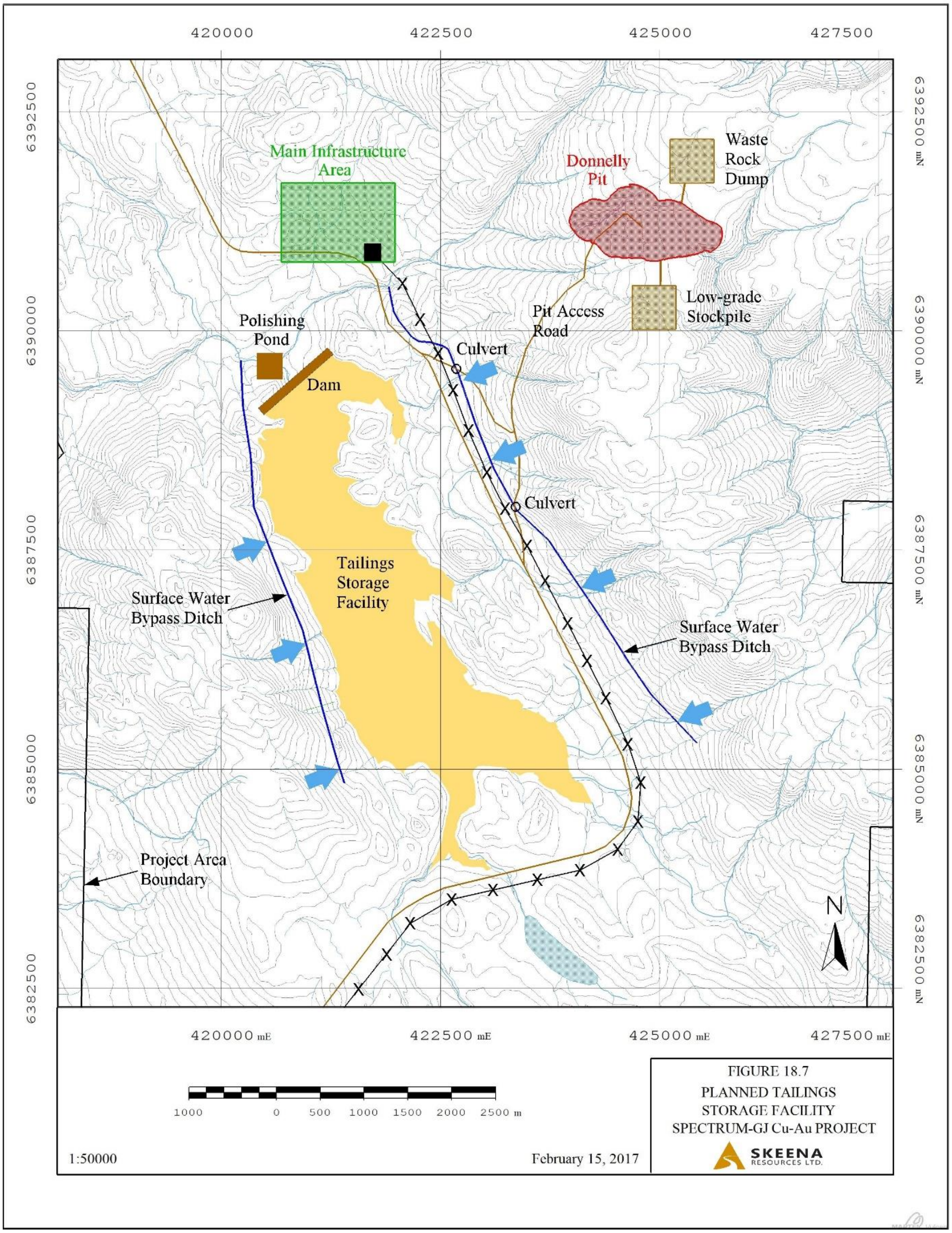
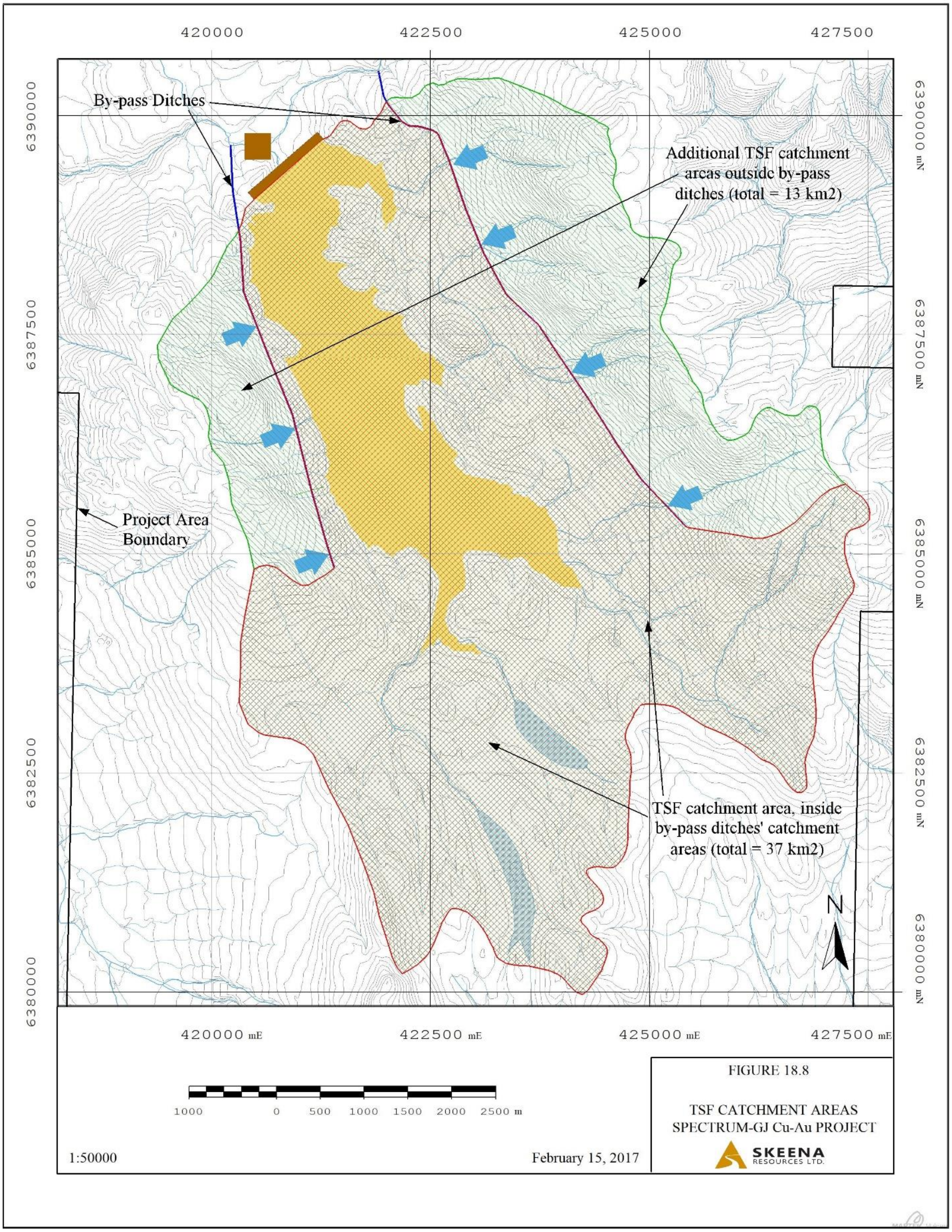


Figure 18.8 A Surface Contour Plan for the General Area of the Planned TSF Showing the Estimated Surface Water Catchments, Spectrum-GJ Project Area

(compiled by the Principal Author, in conjunction with Company personnel)



18.5 Dam Construction

For purposes of project planning and cashflow modelling, it was assumed that a 17 m high starter dam, with a five year production capacity, would be constructed prior to production start-up. The dam would then be raised by every production year thereafter until Production Year 20 when the final dam height will be achieved and a spillway will be constructed. Prior to this, a water reclaim barge will operate in the TSF pond at the southern end of the impoundment, from where water will be pumped back to the processing plant for re-use. Excess water contained within the TSF will be pumped to a water treatment plant, via a polishing pond and prior to release to the general environment.

Preliminary and provisional estimates of the required dam heights and volumes were made at Production Years 5, 10 and 25, assuming: centreline construction (a vertical upstream face supported by the tailings beach and a 2:1 / 45° downstream face), a 5 m freeboard and a 15 m wide top surface. It was further assumed that the core zone/filters of the dam will comprise till and processed sand/gravel and that the downstream shell will comprise compacted rock. Table 18.6 summarizes the results to which unit construction costs were applied for purposes of cost estimation. It was assumed, for purposes of the PEA, that suitable materials could be found within the Project Area, inclusive of NAG waste rock from Donnelly Pit.

Table 18.6 A Summary of the Preliminary and Provisional Material Volumes for the Planned Tailings Storage Facility Dam, Spectrum-GJ Project Area
(compiled by the Principal Author from information supplied by QP John Brodie)

Dam Segment	Production Years	# Years	% of Total Dam Volume	Volume of Material
Core Zone	Pre-Production	-	27%	37,800
	Years 1 through 5	5	24%	56,400
	Years 6 through 10	10	21%	105,000
	Years 11 through 25	10*	17%	401,540
Downstream Shell	Pre-Production	-	73%	102,200
	Years 1 through 5	5	76%	178,600
	Years 6 through 10	10	79%	395,000
	Years 11 through 25	10*	83%	1,960,460

Note: * - The final dam height is planned for construction in Production Year 20

18.6 By-Pass Ditches

The alignments of the surface water by-pass ditches identified on Figure 18.7 are preliminary and provisional, hence subject to change. For purposes of planning and cost estimation, it was assumed that the ditches would be capable of routing, without over-topping, the flows corresponding to a 1 in 200 year return period, 24 hour precipitation event, with an 0.3 m freeboard. Their purpose will be to limit surface water inflows to the TSF, thereby to reduce the net annual water balance surplus that would require discharge to the general environment. For purposes of the PEA, it has been assumed that:

- the diversion ditches will be constructed on variably sloping terrain (approximate horizontal to vertical ratio = 3:1), which will require grubbing of about 15 m^3/m of ditch length and excavation of about 5 m^3/m of ditch length;
- erosion protection will form part of ditch construction, depending on the excavation material (till or bedrock), design discharge and velocities;

- rock weir-drop structures might be required along some ditch sections;
- a minimum bench width of 3.0 m, on the downslope sides of the ditches, to facilitate access and maintenance; and
- diversion plugs will be constructed at the intersections with existing creeks, which will likely be excavated into the up-slope to effectively intercept seepage.

18.7 Tailings Storage Facility - Type Selection

The discussions of Section 18.5 and 18.6 assume the construction and use of a conventional wet tailings disposal facility. The discussions of the following sub-sections justify this selection, based on technical and environmental analyses relating to TSF use within the specifics of the climate prevailing across the Project Area, as described in Section 5.4. The risks and opportunities relating to a conventional wet facility versus a dry stack facility are considered and assessed. The results show clearly that, given the potential climatic impacts, a dry stack facility would be neither technically feasible, practicable nor sustainable. In marked contrast, a conventional wet facility at Site Y3 does not appear to have material negative aspects. It is for these and related reasons that a conventional wet TSF is preferred and has been assumed within the scope of the PEA.

18.7.1 Definitions

The term ‘conventional wet facility’ insinuates that the tailings are saturated to facilitate their pumping to a disposal site:

- the tailings are transported from a processing plant by tailings pipelines, using a combination of gravity and pumps;
- the transported material is deposited in a pond that is impounded by a dam;
- gravity induced settlement of placed material in time results in a progressive increase in density as water is squeezed out under pressure at a rate that is dependent on the time and depth of placed material to any point of interest, as well as the permeability of the placed material; and
- for an average expected density of approximately 2.81 t/m^3 for ROM feed to the central processing plant, the average density of placed tailings would probably vary between approximately 1.35 t/m^3 and 1.60 t/m^3, depending on the placed depth of tailings and the residence time of the same.

The term ‘dry stack facility’ insinuates dewatered tailings (otherwise referred to as dry cake, by some authors) that cannot be pumped because the moisture content is below approximately 20%. Dewatering is typically achieved using a combination of belt, drum, horizontal and vertical stacked pressure plates and vacuum filtration systems. Dewatered tailings are typically transported by belt conveyor or truck, tipped or dumped on the tailings impound and then spread and compacted using appropriately sized equipment to form an unsaturated tailings deposit. The use of equipment working on placed material is integral to design; appropriate designs and applications result in stable tailings deposits that do not usually require a dam but can require either waterproof berms and/or surface water by-pass ditches. For an average expected density of approximately 2.81 t/m^3 for ROM plant feed, the average density of placed tailings would probably vary between approximately 1.65 t/m^3 and 1.80 t/m^3.

18.7.2 Disposal of Potentially Acid Generating Material

The planned process flow for the expected ROM plant feed (see Section 17) includes a de-sulphuration flotation circuit, at the back-end of the main flotation circuit, to produce a pyrite concentrate that contains gold. Planning further assumes that the desulphurization circuit will be constructed during Production Year 5, for start-up in Production Year 6 when the planned Spectrum Pit first produces ROM material for processing at the centrally located plant.

Multi-element analysis of the tailings to be produced at the processing plant (as expected by virtue of metallurgical testwork - see Section 13) shows that it will have an average carbonate content of at least 10%, an average total feldspar content that could be as high as 50% and a residual sulphur content of approximately 0.05%, when a pyrite rougher concentrate is produced. The expected average carbonate and feldspar content remains the same when a pyrite concentrate is not produced, but the average residual content increases to approximately 1.5%. On this basis and for purposes of the PEA, pyrite-cleaned / de-sulphurized tailings are considered NAG whereas tailings that are not cleaned of pyrite are assumed to be PAG (although, given the residual sulphur content is less than 2% and the neutralizing potential of the tails might be in excess of at least 25%, the tails could prove to be NAG – see also Sections 20.1 and 20.4, in which the need for additional testing and acid rock drainage characterizations is identified).

In conventional wet tailings facilities, NAG tailings are typically and routinely placed behind the dam, thereby to form a so-called beach that moves the pond away from the dam, whereas PAG material is usually placed remote from the dam and in the deeper part of the pond to ensure it is always underwater. In the case of dry stack tailings, if PAG material can be cleaned from the tailings stream then it is typically deposited in a separate, conventional wet tailings disposal facility. If the tailings stream cannot be de-sulphurized then, in the opinion of the Principal Author, the scope for using a dry stack facility becomes limited, especially in wet and cold climates and most especially where a risk of inundation exists.

Neither of the hypothetical dry stack alternatives outlined are considered practicable or environmentally sustainable within the Project Area, by virtue of the potential impacts of the local climate. The discussions of the following sub-sections substantiate this, insofar as the potential climatic impacts render the design requirements for both a conventional wet facility and a notional dry stack facility substantially the same. The purpose and objectives of attempting to construct a safe and environmentally sustainable dry stack facility in the first place may therefore reasonably be questioned.

18.7.3 Discussion

A dry stack TSF may be preferred where it can be demonstrated to be a viable, practicable and sustainable option:

- they are suited to topographically challenged areas were an increased statistical risk of conventional wet facility dam instability can exist (although aggressive contouring of a planned site can sometimes be required, which in itself can be environmentally challenging);

- due to their inherent stability, true dry stacks are considered appropriate for seismically active areas;
- true dry stacks are perceived to be environmentally safer because –
  - a dam is not in theory required, due to the inherent stability of well-designed dry stack facilities and because outflow potential is at a theoretical minimum (by definition and design, water content is kept to a practicable minimum),
  - they may be easier to close and rehabilitate (depending on the scope of erosion control measures), and
  - they may result in somewhat smaller footprints compared with conventional wet TSFs, due to the higher average density of the placed material.

While the preceding benefits can be realized in environments where net negative precipitation to evaporation balances persist (i.e. in dry, hot climates), it should be emphasized that the terms ‘dry stack’ and ‘dry cake’ can be misleading:

- placed dry stack material typically has a moisture content that is only a few percent below saturation point (there is a limit to the moisture content of placed material that can realistically and sustainably be achieved, for reasons of cost);
- the addition of surface water, by virtue of rain, can rapidly change the characteristics of placed material, turning it into sludge or even conventional wet tailings, most especially if a persistent net positive precipitation to evaporation balance is anticipated or exists (as is the case for the planned TSF described in Section 18.4);
- equipment traction is typically limited when operating on sludge, with the result that equipment efficiencies suffer and temporary halts to tailings production might be required; and
- for a number of practical / operational reasons, temporary halts to tailings production can mean plant shutdowns with dramatic (and unsustainable) impacts on an operation as a whole - unless the TSF footprint is substantially larger than the quantity of delivered tailings, in which case the TSF surface could be compartmentalized and tailings could be placed and compacted accordingly (although this approach could be severely limited if there was a persistent net positive precipitation to evaporation balance).

Risk could be mitigated through the addition of cement or other binders, to limit the potential impacts of rain. However, success is limited by particle size distribution and void spaces, hence the porosity and permeability of placed material:

- porosity is important because it determines the void space available for binder crystals to grow - the smaller the voids the smaller the binding crystals and the weaker the bond between tailings particles and binder, hence the smaller the benefits and the greater the operational risks; and
- permeability is important because that determines the ability of the placed material to discharge excess water through its mass - if excess water remains in the tailings mass either

- the binder never sets (rendering the placed mass a wet slurry at worst or a wet paste at best), or
- weak crystal growth of the binder occurs, resulting in weak bonding of the placed material that can be prone to deterioration through the further addition of surface water.

By definition, particle size distributions hence tailings porosity and permeability vary with grind size, which in turn is determined by the non-linear relationship between the cost of milling/grinding and the metallurgical recovery of a target metal or metals. Grind sizes are comparatively coarse for massive sulphide-style mineralization where the addition of binders in the tailings mix, prior to dry stack placement, can make operational sense. However, to ensure adequate liberation of a target metal or metals, grind sizes can be much finer in the case of porphyry Cu-Au style mineralization. The Spectrum-GJ project is no exception to this, for which a grind size of 120 microns (or 0.12 mm) has been determined as optimal (see Section 13).

Similar constraints to those outlined for wet climates (i.e. where persistent net positive precipitation to evaporation balances exist) equally apply in cold weather climates. For example, where snowfall occurs or ice accumulates, either or both would have to be removed and treated (to preclude tailings contamination into the general environment) before further tailings could be added to the pile. Moreover, during especially cold weather, material can freeze prior to placement with the result that compaction efficiency is reduced and the contained water is released as the placed material warms up (with the result that sludge is created to the detriment of equipment efficiencies, etc.). This is not necessarily a problem if the TSF footprint was significantly larger than the routine operational requirement, in which case a compartmentalized approach to dry stack tailings disposal might be both a feasible and sustainable option.

In areas where an inundation potential exists (i.e. where periodic, significant rainfall events occur, such as in the Project Area) water run-off and associated scouring of the placed fill can occur, with the consequence that tailings can be introduced to general environment. Risk could be mitigated if a dam, polishing pond (and ultimately a spillway) and water treatment plant were constructed to control water movement and to mitigate discharge hazards. However, it may readily be seen that such design requirements, for what may be termed a notional dry stack facility, would not differ from those typically associated with a conventional wet facility at the same location, which renders the objective of attempting to construct and maintain a dry stack facility questionable at best. This finding is further supported by the potential impacts of the type of significant wind storms that are known to occur in the general Project Area: if, for whatever reason, a dry stack facility could be designed, built, operated and sustainably maintained, fine tailings would persistently be transported by the wind to the general environment. This risk is substantially reduced when conventional wet stack TSFs are operated.

18.7.4 Conclusions

In the opinion of the Principal Author, operating and sustaining a dry stack facility is neither feasible nor practicable in cold, wet climates, unless the footprint of the TSF was sufficiently large to allow a compartmentalized approach to tailings placement and compaction. A compartmental approach would not, however, be sustainable if a persistent net positive precipitation to evaporation balance was anticipated or existed, and/or if there existed a TSF inundation risk during significant precipitation events.

A dry stack facility may mitigate the risks associated with a dam. However additional risks are introduced, specifically the need for measures to control wind and water erosion of the stacks in the long-term. In addition, dry stack would introduce additional risk associated with the PAG tailings of the first five years of operation and the PAG pyrite tailings from the remainder of the mine life. In summary, the significant extra cost of dry stack appears to offer little benefit to the Project and it is not, therefore, the preferred strategy for tailings management.

18.7.5 Risk and Opportunity Analysis

To support the conclusions outlined, the risks and advantages of conventional wet and dry stack facilities were considered and condensed into four main areas: geography and capacity; design parameters; sulphide/pyrite concentrate disposal and acid water outflow potential; and operational constraints. The results are summarized on Table 18.7 that considers risks and opportunities within the context of the climate found across the Project Area (as described in Section 5.4). Table 18.7 is in two parts due to its overall length.

Table 18.7 The Assessed Risks and Opportunities, Conventional Wet TSF versus a Notional Dry Stack Facility, Spectrum-GJ Project Area

Parameter	Conventional Wet Facility - Comments	Dry Stack Facility - Comments
Geographic and Capacity Considerations		
Valley Location	Topographic low, natural drainage between steep mountain slopes.	Same as for conventional wet facility, but significant pre-preparation of TSF site would probably be required to ensure maintenance of a dry facility in the long-term.
Catchment Area	Large, at 37 km^2, if the planned surface water by-pass ditches were constructed. However, manageable for a conventional (and appropriately designed) facility.	Same as for conventional wet facility, but geographic constraint contrary to efficiency of a conventional dry stack facility, even if surface water by-pass ditches were constructed (see Climatic and Operational Considerations below).
Natural Water Drainage from Site	Only to north.	Same as for conventional wet facility.
Life-of-Mine Facility	375 Mt ± 35 Mt at planned facility (estimated maximum capacity).	Same as for conventional wet facility.
Practicable Alternative(s) (location)	Other sites available, but risks greater than for selected site (see Section 18.4).	Same as for conventional wet facility, but aggressive contouring of a selected site might be required. Sites located on Klastline Plateau considered inappropriate for environmental, safety and operational reasons.
Parameter	**Conventional Wet Facility - Comments**	**Dry Stack Facility - Comments**
Design Considerations		
Surface Water By-Pass Ditches	Yes, near bases of east- and west-bounding mountain slopes. Designed for 1:200 year event.	Same as for conventional wet facility, but at closure they would have to be up-graded for a large event to prevent channel failure and erosion of tailings.
Tailings Impoundment	Yes, at north end of planned facility. Standard design requirement. Planned facility naturally constrained to south.	Yes, for reasons of potential climatic impacts (design requirement would be the same as for conventional wet facility – see also Operational Considerations). Non-standard design requirement and significant additional capital costs (without any significant benefits).
Floor Lining	Not considered necessary as all PAG material would permanently be underwater, unless process included a cyanidation circuit.	Probably required at toe of slopes.
Seismic Risk	Important design consideration.	Underdrains will be required to ensure elevated phreatic surface does not develop.
Tailings Disposal Pipelines	Yes, standard design requirement.	No.
Equipment	Small fleet earth moving equipment for dam construction.	Large thickener and filtration equipment in mill, plus large fleet of earthmoving equipment to transport and place tailings.
Water Spillway	Yes, incorporated within scope of preliminary facility design.	Yes, because of wet weather impacts and inundation potential.
Polishing Pond	Ditto.	Ditto.
Water Treatment Plant	Ditto.	Ditto.
Parameter	**Conventional Wet Facility - Comments**	**Dry Stack Facility - Comments**
Sulphide/Pyrite Concentrate Disposal and Acid Water Drainage Considerations		
Sulphide/pyrite Concentrate Disposal	At back-end of TSF (always under water). Desulphurized tails at front-end (approximately 10% dolomite in tailings, approx. 0.05% residual sulphur), resulting in a strongly non-PAG tailings beach.	Desulphurized tailings managed in a dry stack would be strongly non-PAG. However, a separate 'wet' disposal facility would be required for small PAG fraction of total tailings, which would have to be located in a separate watershed.
Acid Water Drainage	Oxidation threat at practicable minimum – PAG always underwater (by design).	Persistent potential for acid water drainage, unless lining installed, bunding and dam constructed, along with water spillway, polishing pond and water treatment plant and other mitigating measures.

Table 18.7 continued…. The Assessed Risks and Opportunities, Conventional Wet TSF versus a Notional Dry Stack Facility, Spectrum-GJ Project Area

Parameter	Conventional Wet Facility - Comments	Dry Stack Facility - Comments
Operational Considerations		
Wet Weather Impact(s)	Rainfall accumulation on placed material inevitable. No significant impact identified, if best practice design standards adhered to.	Rainfall accumulation on placed material inevitable, resulting in its progressive saturation, hence potentially significant operational constraints (equipment access and efficiencies) and scouring of placed material (creating environmental issue if water run-off discharges to the general environment). Although rainfall impacts likely short-term during and after each event, they represent a potentially significant production constrain because the plant would probably have to be shut down during and immediately after each event, thereby resulting in significant cost implications (loss of product in cashflow pipeline + significant fixed plant operating costs). Potential for surface water run-off also means that a tailings impoundment would be required with water run-off by-pass/spillway and catchment/polishing pond system required for long-term environmental control (i.e. the same design criteria as for a conventional wet facility would apply)
Dry Weather Impact(s)	No significant impact identified, if best practice design standards adhered to.	Potentially uncontrollable dust issues, especially during periods of high winds.
Cold Weather Impact(s)	Frozen pipelines a potential operational constraint, unless pipelines appropriately designed. Snow and/or ice cover would not impact operation and use of the planned facility.	Material could freeze before it is compacted; compaction could be limited to 60% of terminal/final compaction under dry conditions. Water would be released as the placed material warmed up, creating sludge at best that could not be compacted until sufficiently dried (which is unlikely due to the expected persistent net positive precipitation to evaporation balance. Indirect, potential operational constrain relating to snow and/or ice cover (equipment access and efficiencies), unless snow and/or ice routinely removed (same cashflow and operating cost constraints apply as for Wet Weather Impact[s]). Snow and/or ice melt could contribute to progressive degradation of placed material, thereby turning a portion into slurry and resulting in same operational constraints as for Wet Weather Impact(s). Any snow and/or ice would therefore have to be routinely removed. The removed material would have to be treated to remove any contained/attached tailings. Additional capital and operating expenditures.

Table 18.8 summarizes the results of the risks and opportunities analysis detailed on Table 18.7. Text highlighted in:

- **GREEN** reflects either a positive outcome or the better option;
- **ORANGE** reflects either a standard design requirement or an outcome that is approximately the same for both options considered in analysis; and

- **RED** reflects a design requirement that results in a significant increase in capital expenditure requirements, without any additional benefits, or an operational consideration that could not safely and sustainably be managed using a conventional facility type (additional, non-standard design elements would be required).

It may clearly be seen that for the climatic conditions that prevail across the Project Area, a conventional wet TSF is a far better / lower risk option than a dry stack facility, the design requirements for which would be similar if not the same as for a conventional wet facility.

Table 18.8 A Summary of Assessed Risks and Opportunities, Conventional Wet TSF Versus a Notional Dry Stack Facility, Spectrum-GJ Project Area

Parameter	Conventional Wet Facility	Dry Stack Facility
Geographic and Capacity Considerations		
Valley Location	Selected site considered best of the available options	Problematic
Catchment Area	Large but manageable	Large and problematic
Natural Water Drainage from Site	Only to north	Only to north
Life-of-Mine Facility	Yes	Yes
Practicable alternative (location)	Selected site considered best of the available options	No suitable, large volume alternative
Design Considerations		
Surface Water By-Pass Ditches	Required	Required
Dam	Standard requirement	Non-standard requirement
Floor Lining	Not required	Probably required, at toe of slopes
Seismic Risk	Standard requirement	Non-standard requirement
Tailings Disposal Pipelines	Standard requirement	Not Required
Equipment	Standard requirement	Manageable
Water Spillway	Standard requirement	Non-standard requirement
Polishing Pond	Standard requirement	Non-standard requirement
Water Treatment Plant	Standard requirement	Non-standard requirement
Sulphide/Pyrite Concentrate Disposal and Acid Water Drainage Considerations		
Sulphide/Pyrite Concentrate Disposal	Standard consideration, manageable	Problematic
Acid Water Drainage	Standard consideration, manageable	Problematic
Operational Considerations		
Wet Weather Impact(s)	Standard design consideration, manageable	Problematic, non-standard design requirement
Dry Weather Impact(s)	Risk related to NAG beach area only	Problematic
Cold Weather Impact(s)	Routine and manageable in cold weather climates	Problematic

18.8 Spectrum Infrastructure Area

The planned infrastructure located on the Spectrum claims block is limited to production-related activities only. As such, it includes:

- temporary site offices for production personnel and technical support (modular office trailers);
- a first aid station and medivac facility;
- communications linked to the MIA system;
- a small maintenance shop and warehouse;
- explosives handling and storage facility, located in safe area, with a capacity allowance of 0.00883 m^3 per kg/day of ANFO;
- a small diesel power generating facility for the mine-site offices, maintenance shop and warehouse;
- a fuel supply, storage and distribution facility (including a small tank farm); and
- a sewerage disposal facility.

As previously noted, personnel will be bussed to/from the SIA and MIA, as appropriate. The mine dry will be located at the MIA and all major maintenance will be carried out at the MIA. Planning encompasses the use of: two 40 t articulated trucks (owner operated) to haul waste to the disposal site; and B-Train trucks (contractor operated) hauling ROM material from the bottom of the planned muckpass system to the central plant located at the MIA. The SIA has been located to preclude adverse interactions between personnel vehicles (pick-up trucks and busses) and the trucks outlined. No production equipment will be either located or active in the SIA, other than for reasons of maintenance.

18.9 Access Roads

Willow Creek Road forms the first element of the planned main access road to the planned TSF, the planned location of the MIA and ultimately the SIA. In the opinion of the Co-Authors, there is no practicable alternative to using Willow Creek Road, by virtue of the proximity of Mount Edziza Provincial Park and the generally mountainous terrain to the north, east and west of the Project Area.

The planned access road does not include the winter trail that extends north from the end of Willow Creek Road (see Section 5.3), because its alignment:

- includes numerous sharp corners and undulations that are inconsistent with safe road useage (locally significant earthworks would be required to achieve a safe and practicable alignment);
- includes a section that is very close to the Project Area boundary that it eventually crosses to thereby extend into the Mount Edziza Provincial Park; and
- extends under the planned position of the TSF.

The overall alignment of the planned main access road to the MIA (located per Option B) and SIA is detailed on Figure 18.1. The Company acknowledges that modifications to the planned alignment might be required, depending on the outcomes of AIAs and whether or not SAPs can be secured and known sites mitigated under Section 12 of the Heritage Conservation Act.

The majority of the planned road is located on claims that are 100% owned by the Company – the only exception is that portion of the road leading to the SIA that extends over the Designated Access Corridor described in Section 4.9. Radio-controlled access will at all times be employed, with security checks made at a Security Gatehouse located close to the turnoff of Willow Creek Road from Highway 37 (although Willow Creek Road is a public facility, as designated principal user the Company would seek the appropriate permit and thereby exercise its rights to control access to the road, for reasons of safety. To this end, it is anticipated that all vehicles intending to use the road would have to have an operable VHF radio, a buggy whip and an amber strobe light before access would be allowed).

18.9.1 MIA Access Road

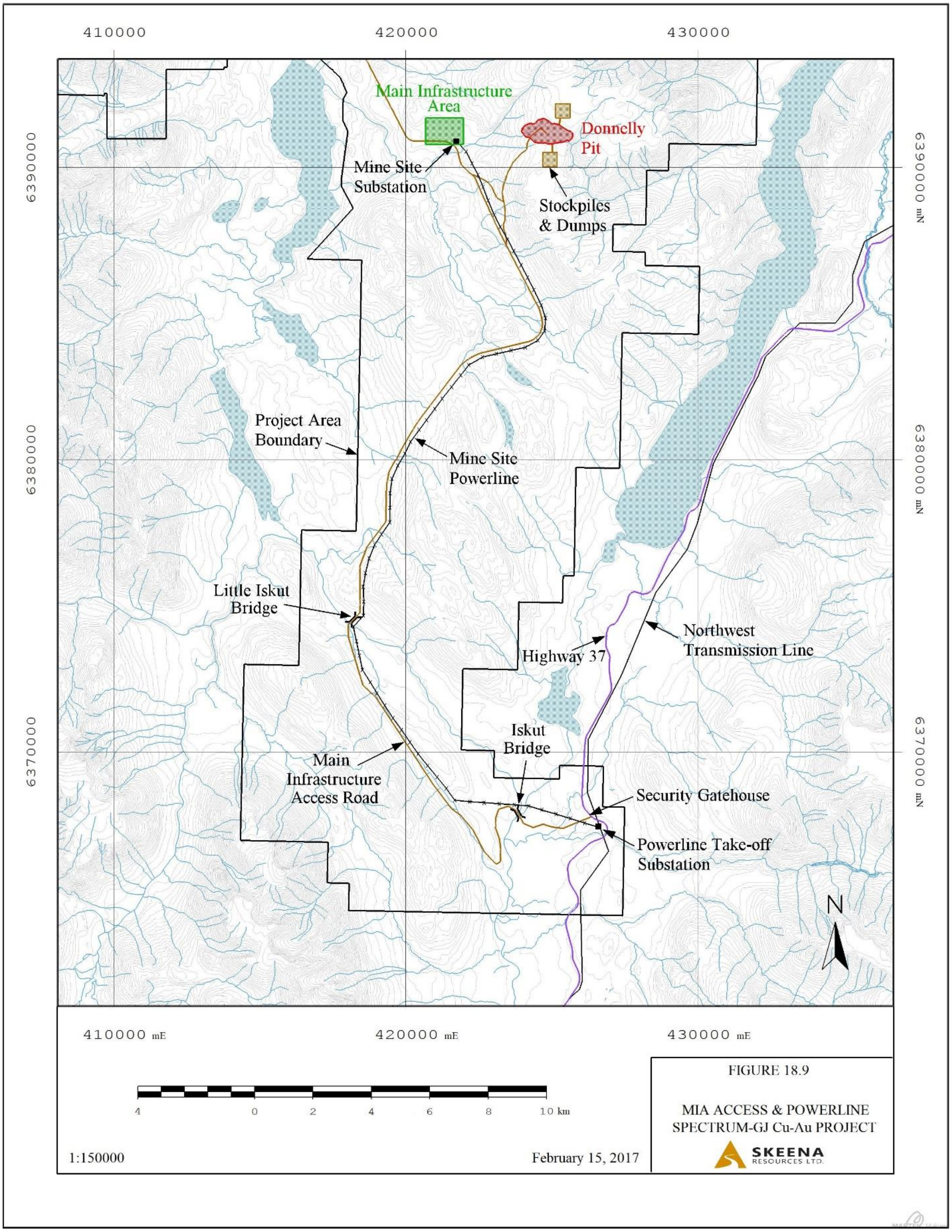
Figure 18.9 details the planned alignment of the MIA access road. The largest vehicle using the road in the long-term will be covered B-Train surface haul trucks hauling bulk Cu-Au-(Ag) concentrate to the bulk terminal at the deep water Port of Stewart, B.C. (a distance of approximately 262 km by road, from the Highway 37 turnoff to Willow Creek Road). It is established in Section 5.3 that the GVWs of loaded B-Train type road trucks will be limited to 45 t, thereby allowing for safety factors approximating to 1.5 for the bridges' 68 t GVW ratings (the Iskut and Little Iskut bridges, described in Section 5.3 and located at the positions identified on Figure 18.9). Where possible, planning encompasses the transport of heavy equipment, during the construction phase of project development, in lots weighing no more than 45 t, inclusive of the transport vehicle. If heavier loads are required during the construction phase, the Ministry of Transportation and Infrastructure regulations will be followed as appropriate and for the individual case. For example and as minimum, when total weights greater than 45 t are moved across the existing bridges, a suitably qualified and certificated supervising engineer will be present at all times. The bridges will also be strengthened with stiffening plates and/or bracing, in accordance with the requirements or recommendations of the transportation contractor and/or supervising engineer.

<u>Willow Creek Road Portion</u>

The first 23.5 km of the planned MIA access road follows the existing Willow Creek Road to the Company's existing staging post. The existing, 4.0 m wide road will have to be widened to 6 m and have passing cut-outs every kilometre to allow for safe and sustainable operating conditions. Widening the existing road will require minor tree cutting and brush clearing, ditch cleaning, surface grading and the upgrading of existing culverts that will be of the fish-bearing type.

Willow Creek Road has regularly been used by Company personnel and has been travelled by the Co-Authors. No challenging topography exists and no particular issues are anticipated as regards road construction. However, the two existing bridges will have to be upgraded, as will the existing culverts, to safely accept fully loaded B-Train surface trucks.

Figure 18.9 The Planned Alignment of the MIA Access Road, Spectrum-GJ Project Area
(compiled by the Principal Author, in conjunction with Company personnel)



Bridge Replacements

It is established in Section 5.3 that, according to the 2014 government bridge surveys, the Iskut River Bridge will need to be replaced in 2034 and the Little Iskut River Bridge will need to be replaced in 2040. For purposes of cashflow modelling, these dates have been assumed to arise in Project Years 10 and 16.

New Road Alignment

A new road alignment will be required to access the MIA from the Company's existing staging post at the end of Willow Creek Road. A new alignment was selected in preference to upgrading the existing winter trail because:

- the MIA access road needs to skirt the planned TSF, to the east (the winter trail extends along the centre of the planned TSF and there is no viable alternative to the west of the TSF, due to the topography);
- the winter trail alignment is too convoluted to allow for safe and sustainable use by road haul trucks, without extensive earthworks; and
- the winter trail is currently (March 2017) a largely overgrown, narrow (2.0 m) and poorly maintained track (see Section 5.3).

The new road alignment from the end of Willow Creek Road to the MIA totals approximately 12.5 km. In common with an enlarged Willow Creek Road, it will comprise a 6 m wide graded dirt road with passing cut-outs every one kilometre and fish-bearing culverts, as required. The planned alignment was estimated using LiDAR™ to define the least risk alignment (i.e. the alignment that avoided adverse topography and limited the number of corners to a practicable minimum). The maximum gradient along the planned alignment is 8.5%; the majority is either flat or has gradients of less than 5%. In the opinion of the Co-Authors, the planned alignment presents the least risk layout, both from environmental and operational perspectives. No viable alternative to the alignment summarized on Figure 18.9 could be found, due to the mountainous nature of the surrounding topography and the proximity of Mount Edziza Provincial Park.

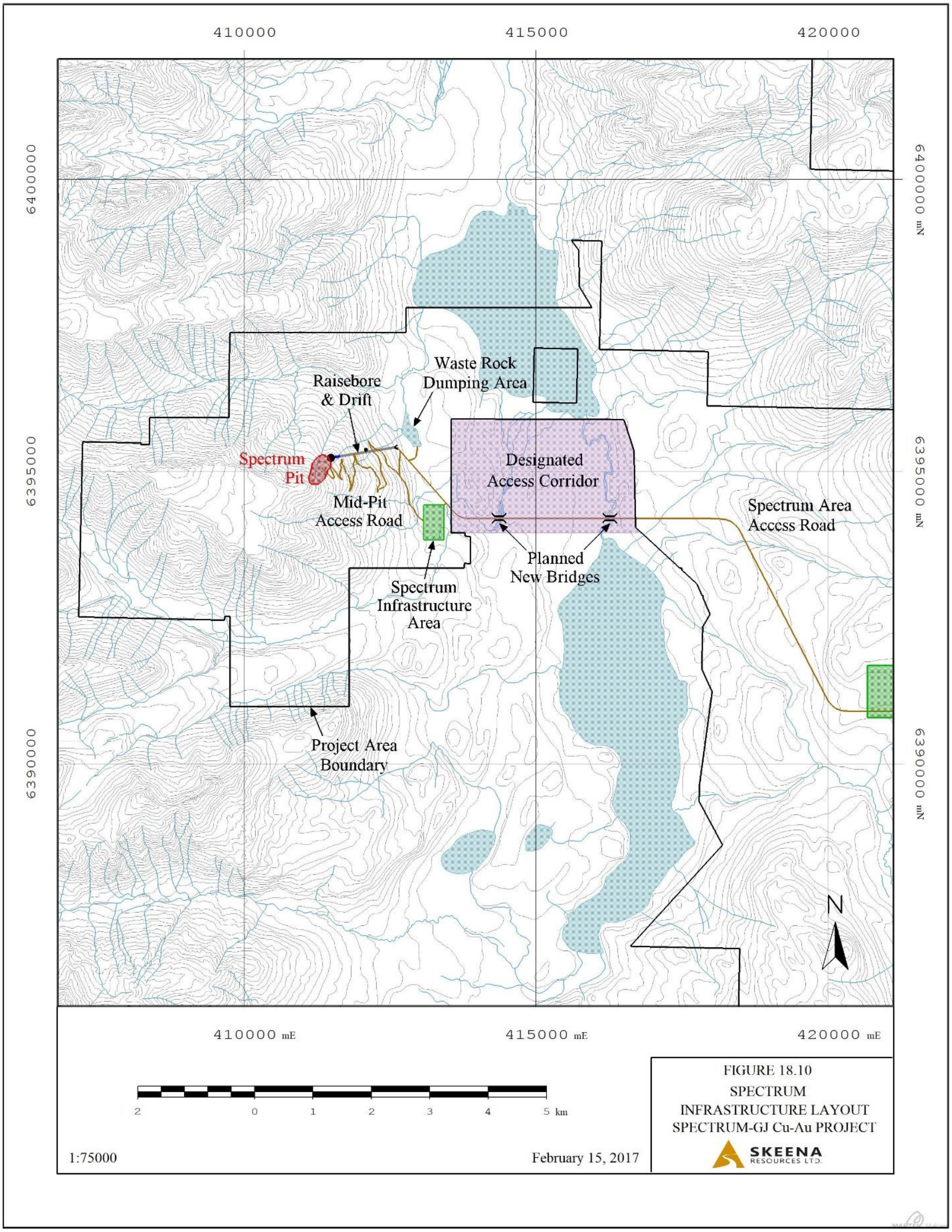
It is recommended that the planned alignment of the MIA access road is ground-truthed and robustly engineered at the feasibility stage of project development. For purposes of the PEA, it has been estimated that:

- the road structure will comprise 1,300 mm of engineered NAG fill and a top layer of minus 19 mm NAG crush; and
- the planned road alignment will require groundworks comprising 60% with no rock and 40% with moderate rock that might require limited blasting.

18.9.2 SIA Access Road

Figure 18.10 identifies the planned alignment of the access road to/from the MIA and SIA. The Company acknowledges that the access road footprint will of necessity be larger than in theory might be possible because it does not incorporate the existing winter trail, for the reasons earlier described.

Figure 18.10 The Planned Alignment of the Access Road from the Main Infrastructure Area to the Spectrum Infrastructure Area, Spectrum-GJ Project Area
(compiled by the Principal Author, in conjunction with Company personnel)



In the opinion of the Co-Authors, the planned alignment of the SIA access road presents the least risk layout, both from environmental and operational perspectives. No viable alternative to the planned alignment could be found, due to the mountainous nature of the surrounding topography and the proximity of Mount Edziza Provincial Park.

It is acknowledged modifications to the planned alignment might be required, depending on the outcomes of AIAs. The Company acknowledges that AIAs will be required before infrastructure planning can be finalized. If a SAP for an identified heritage/archaeological site could not be secured then the planned alignment might have to be modified.

Road Use

Current planning assumes that SIA to MIA access road will primarily be used by B-Train road trucks hauling ROM material from the bottom of the planned muck handling system, to a concrete lay-down pad located at the MIA. The only other vehicles that will use the SIA access road will be busses at the start and end of individual shifts, occasional pick-up trucks for senior personnel and emergency vehicles, if required. Radio-controlled access will at all times be employed.

According to the Spectrum Pit production plan presented in Section 16, the maximum quantity of ROM material that will require hauling to the MIA over a full production year is 1.825 Mt. This equates to approximately 5,000 tpd requiring approximately 120 round trips per day, over a 20 hour period (i.e. two 12 hour shifts, less change over and meal break times), hence six round trips by B-Train haul trucks an hour.

Planned Alignment

The planned alignment was determined using the same methodology as outlined for the new section of the MIA access road (i.e. the portion that extends to the MIA, from the end of Willow Creek Road). It comprises an approximately 11 km long, 8.0 m wide, graded dirt road with passing cut-outs every 1.0 km, fish-bearing culverts as required, and a maximum gradient of 10%.

It should be emphasized that planning for the SIA access road might in future change: depending on the results of the recommended trade-off studies described in Section 16, production planning for Spectrum Pit might include a longer pit life and an increased production rate. For these reasons, and as stated in Sub-Section 4.9.3, an easement totaling at least 25 m either side of the planned access road alignment will be required for reasons of safety and to facilitate the location and construction of any future infrastructure that might include, but might not be limited to:

- a covered, overland conveyor to transport ROM production material from the SIA to the MIA, for processing at the central plant facility; and
- a powerline to supply electricity to the SIA.

In common with the new road alignment to the MIA, it is recommended that the planned alignment of the SIA is ground-truthed and robustly engineered at the feasibility stage of project development. For purposes of the PEA, it has been estimated that:

- the road structure will comprise 1,300 mm of engineered NAG fill and a top layer of minus 19 mm NAG crush; and

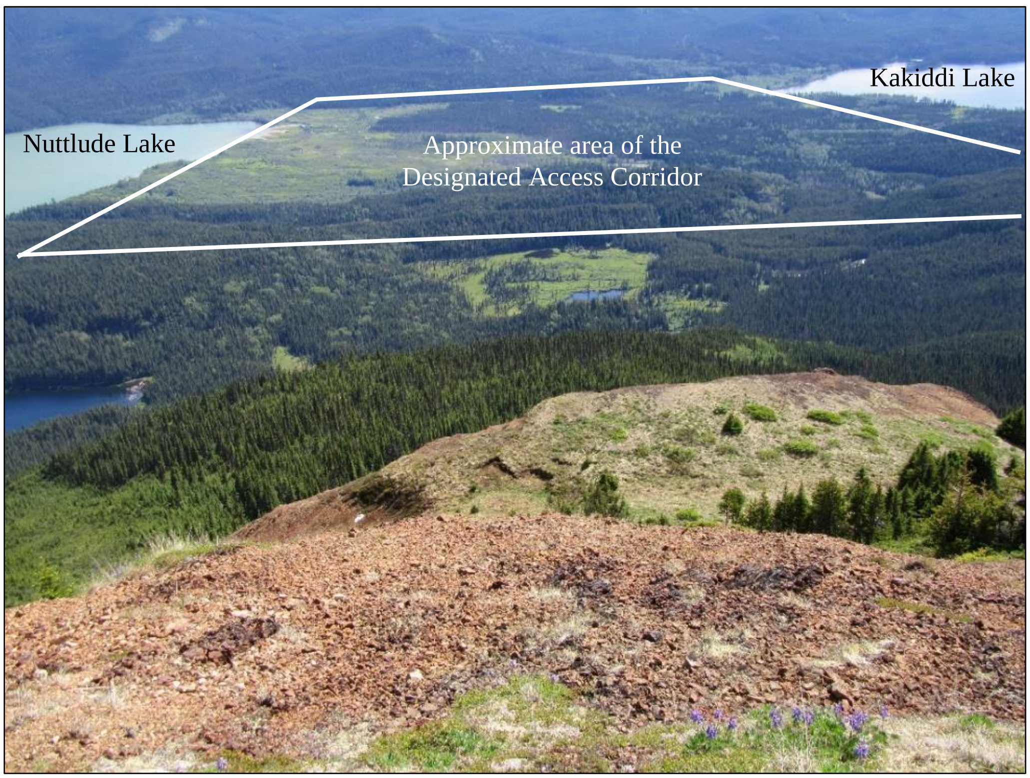
- the planned road alignment will require groundworks comprising 40% with no rock, 30% with moderate rock and 30% with significant rock that would require blasting.

Designated Access Corridor

The new road alignment along the southern portion of the Designated Access Corridor was selected following observations made by the Co-Authors during their site visits, as well as by Company personnel who walked the proposed route at the end of the 2016 exploration season. The selected alignment over the Designated Access Corridor:

- extends over a modest topographic high that elevates the land above the otherwise marshy area to the north (Figure 18.11);
- allows the two required, new bridges to span the creeks/streams at points where the topography and prevailing geology are favourable for robust bridge construction; and
- maximizes vehicle screening/limits equipment visibility, by virtue of the presence of the fairly dense tree growth.

Figure 18.11 A General View of the Designated Access Corridor (looking due east), Spectrum-GJ Project Area
(supplied by the Company)



Provisional and preliminary planning suggests that the two new bridges will require deck widths of 4.3 m and have spans of approximately 55 m. Due to the planned, short duration of production from Spectrum Pit, bridge replacements have not been considered within the scope of cashflow modelling but, in common with rehabilitation of the SIA access road, their removal at the end of the mine life has planned (see Section 20.11).

18.9.3 Pits' Access Roads

An 6.0 m wide road is planned to access the Spectrum Pit, based on the use of 40 t articulated trucks. A 15.0 m wide road is planned to access the Donnelly Pit, based on the use of 100 t rigid frame trucks (from Year 12). Regular passing cut-outs will be developed and a maximum gradient of 10% has been applied, based on world best practice for the types of trucks outlined. Construction of the access roads will follow the same principles as described for the new road alignments to the MIA and SIA.

Donnelly Pit

The access road to Donnelly Pit (see Figure 18.9) is fairly straightforward and, in the opinion of the Co-Authors, it does not present difficulties or limitations in terms of equipment and fleet access to the pit area. As such, it could readily be used as a back-up haul route in the event that the Donnelly Pit primary crusher goes down.

Spectrum Pit

Topographic challenges in the area of Spectrum Pit mean that the pit access road includes switch-backs that limit the size of production equipment that could readily be moved up the planned road (see Figure 18.10). This in turn limits the potential production rate from Spectrum Pit that, for the reasons described in Section 16, should be optimized at the feasibility stage of project development.

Within the scope of the PEA, access to Spectrum Pit is limited to a point mid-pit. The potential for a larger/higher overall tonnage pit exists, but this was not considered within the scope of PEA planning for the technical and operational reasons described in Section 16. The operational reasons include access to the top of the local mountain from where waste stripping would take place to enable a larger tonnage pit to be mined.

Access to the local mountain top is problematic, in that it includes a section along a steep and deep ravine, as well as sections along known avalanche channels and areas of potentially unstable scree identified within the scope of the geohazards study described in Section 16.3. These risks require examination and mitigation before an access road to the local mountain top could realistically and confidently be planned.

It is for the reasons outlined that the potentially significant benefit of sustained production from an enlarged Spectrum Pit was not included within the scope of the PEA. Production from Spectrum Pit is instead limited to what can practicably, safely and sustainably be realized by means of mid-pit access only, as required by virtue of the project planning criteria stated in Section 18.1 (to engineer solutions that encompass safety considerations and consider practical, physical and operational constraints, thereby to ensure practicably achievable and sustainable outcomes). The studies required to enable low risk, sustainable enlargements to the Spectrum Pit are recommended for completion at the feasibility stage of project development.

18.9.4 Powerline Access and Maintenance

Access for maintenance of the planned mains powerline, which extends to the MIA from the main take-off sub-station adjacent to Highway 37, will be from the planned MIA access road.

18.9.5 By-Pass Ditches' Access

Access for maintenance of the planned surface water by-pass ditch to the east of the TSF will be from the MIA access road. Access to the planned surface water by-pass ditch to the west of the TSF will be by means of the 3 m benches identified in Section 18.4.

18.9.6 Road Maintenance

The main access road for the Project Area, from the turnoff of Willow Creek Road from Highway 37 to the MIA and on to the SIA, will be operated and maintained by the Company. Maintenance equipment and equipment operators have been included in the equipment and personnel estimates. Preliminary estimates of road maintenance costs during winter and summer months were compiled, inclusive of: damping during dry periods (for dust control); snow removal during winter months, periodic grading and spot ballast repair.

Maintenance of Highway 37 is funded by the B.C. Provincial government; local contractors undertake proactive and effective year-round road maintenance. To the best knowledge and understanding of the Principal Author, the longest period of road closure to date (March 2017) has been approximately 100 hours, for reasons of avalanche control.

18.10 Power Supply and Distribution

PEA project planning encompassed the construction of a new take-off substation from the Northwest Transmission Line and a project-dedicated, 138 kV, 33 km long powerline to the MIA. Two potential routes were considered during the planning process: the planned route summarized on Figure 18.9; and a route extending from the existing Red Chris sub-station located adjacent to the Red Chris Mine turnoff from Highway 37, some 13.5 km southwest of Iskut. The former option was selected because:

- the required infrastructure is located entirely on claims that are 100% owned by the Company, including the planned lay-down area adjacent to Highway 37 that is noted in Section 4.3 (the alternative route required the crossing of wetland areas and a lake to the east of the Project Area);
- the planned route precludes the need for any component of the planned infrastructure to cross Highway 37 (the location of the planned take-off sub-station is at one of the few places where the existing Northwest Transmission Line is to the west of Highway 37 [see Figure 18.9]);
- the planned route best protects the project-dedicated powerline from the potential impacts of adverse weather (the alternative route would expose a powerline to periodically severe winds of the type noted in Section 5.4, as well as to rime icing of the type that hampered the efficiency of the automated meteorological station installed and operated on Klastline Plateau between June 2005 and September 2008 [see Section 5.4 and RTEC, 2011a]);
- line construction will be fairly straightforward, in that no adverse topography exists along the planned route (which is in marked contrast to the alternative route, which requires line construction up to and across Klastline Plateau);

- access to the planned powerline, for construction, maintenance and other work, may readily be realized from the MIA access road (except for the first few kilometres, the planned powerline route parallels the planned MIA access road, thereby meeting the requirements of minimal footprint for the project as a whole, which would not be the case for the alternative route, which would require the development of extensive, additional access roads); and
- due to the prevailing topography to the east and west of the planned route, visibility risk is at a practicable minimum – the only components that will be seen will be the planned take-off sub-station and first few powerline masts (both from Highway 37, in the immediate vicinity of the Willow Creek turnoff).

Specifics of the site electrical sub-station and distribution system were not planned as part of the PEA. Capital costs estimates only were compiled from reasonable estimates of infrastructure and distribution requirements. The planned line capacity is sufficient to meet the estimated power demand at the MIA, plus the Donnelly Pit primary crusher located underground, at the base of the planned Donnelly muck handling system.

The Company acknowledges that periodic Northwest Transmission Line power outages are reported to occur (personal communication to the Principal Author). A 1.3MW diesel-powered emergency generator and distribution facility will be installed near the process building to provide emergency power, via an automatic transfer switch, for critical heating, lighting, fire protection and process loads. Power at the SIA will be provided by a small diesel generation facility located at the SIA, from which power to light and heat the planned offices facilities, warehouse and maintenance facility will be provided.

18.11 Services and Utilities

The following reasonable assumptions were made within the scope of the PEA:

- fresh water can readily be sourced from within the Project Area (see Section 5.5);
- a water reclaim barge will operate in the TSF pond at the southern end of the impoundment, from where water will be pumped back to the processing plant for re-use; and
- excess water contained within the TSF will be pumped to a water treatment plant, via a polishing pond and prior to release to the general environment.

Beyond application of the assumptions outlined, details of fresh water, fire water, potable water, process water and sewerage treatment have not been planned as part of the PEA. Capital costs estimates only were compiled from reasonable estimates of infrastructure, distribution and consumption requirements.

As earlier stated (Section 18.3), a systems control and communications with a broadband satellite-based communication system and an office Management Information System (MIS) Network will be installed at the MIA, to which the communications system located at the SIA will be linked. It is anticipated that diesel fuel for mine production and maintenance vehicles will arrive by fuel contractor road tanker from supply depots in Terrace or Smithers. Average annual diesel consumption is estimated at approximately 14 million litres a year. This corresponds to approximately seven road tankers per week, each with 40,000 L capacity (hence a GVW approximating to the 45 t limit for the Iskut and Little Iskut bridges). Details of the fuel storage facility and distribution system have not been planned as part of the PEA. Capital costs estimates only were compiled.

18.12 Camp Facility

A single, central and permanent camp facility will be located at the MIA. The camp will initially be built to accommodate contractor and other personnel during the construction phase of project development. Camp capacity has been defined from consideration of the estimated personnel compliments at site at any time over the planned mine life, to which a capacity contingency of 5% has been applied. The Stage 1 camp (for production and processing throughput of 10,000 tpd) will be expanded prior to the start of Stage 2 (20,000 tpd production and processing throughput), at which stage camp capacity will be sufficient for the remaining mine life. Spectrum Pit personnel will be bussed to/from the MIA, as required and at the start and end of each shift.

18.13 Mine Infrastructure

Mine infrastructure for handling muck from the Donnelly Pit area to the MIA and from the Spectrum Pit area to the SIA are described in Section 16.

18.14 Concentrate Handling

As earlier noted, bulk Cu-Au-(Ag) concentrates will be hauled by B-Train surface trucks along the MIA access road and then to the bulk terminal at the deep water Port of Stewart (an overall distance from the MIA of approximately 296 km). It is anticipated that individual trucks will carry loads of approximately 40 wmt of bulk concentrate (average moisture content = 8%). This payload limit has been assumed to conform to the 68 t GVW capacities of the existing Iskut and Little Iskut bridges, at a minimum run-of-operation safety factor of 1.5.

Trucks will be loaded and weighed inside the concentrate storage building located in the central plant facility at the MIA. At the design mill feed rate of 30,000 tpd, concentrate production will average between 180 wmt and 210 wmt per day and will require an average of five or six trucks per day to deliver concentrate to the Port of Stewart.

18.15 Qualified Persons' Opinion

In the opinion of the Co-Authors, infrastructure planning for purposes of the PEA exceeds the minimum requirements of preliminary economic assessments. Risk-based planning has been utilized, with the objective of encompassing the project planning criteria stated in Section 18.1 (thereby to ensure practicably achievable and sustainable outcomes). The following conclusions are made:

- the infrastructure planned within the scope of the PEA is sufficient to safely and sustainably support the long-term production and processing plans for the project, as detailed in Sections 16 and 17;
- in all respects, the minimal footprint requirement has been met by planning consolidated facilities and by using, to the extent that is practicable and feasible, existing infrastructure;
- in all respects, visibility risks have been kept to practicable minimums;
- with the exceptions of elements of the planned road access and powerline for which no practicable alternatives exist, the planned infrastructure is located within a single watershed (the Stikine river system);

- planning has encompassed wildlife considerations by limiting potential interactions to practicable minimums, especially on Klastline Plateau that is a known to contain important wildlife populations;
- to the extent that is possible, heritage/archaeology has been encompassed within the scope of infrastructure planning, in which regard the Company acknowledges that AIAs are required and that adjustments to the planned infrastructure might be required unless SAPs can be secured and known sites can be mitigated under Section 12 of the Heritage Conservation Act; and
- to the extent that is possible at this early stage of project development, applicable environmental laws have been considered and planning has encompassed considerations of zero contamination discharge to the environment.

In addition to the AIA's noted above, biodiversity and other environmental surveys and studies are required before infrastructure planning can be finalized – the required studies are discussed and described in Section 20. Geotechnical studies will be required; earthworks requirements and quantities will need to be estimated and optimized during feasibility-level studies.

All major infrastructure will be located at the central MIA, inclusive of a camp facility and processing plant. The MIA has been located using a risk and opportunity approach to options analysis. Infrastructure at the SIA is limited to production-related requirements only.

A new, project-dedicated 138 kV transmission line will be constructed to supply the power demand at the proposed MIA and for the Donnelly primary crusher. Although it is anticipated that planned facilities will have sufficient capacity to service the power demand for mining and process equipment throughout the life of the mine facility, power consumption rates should be reviewed and details of the power distribution system should be engineered at the feasibility stage of project development.

Process tailings will be stored in a single, consolidated, life-of-mine facility with an estimated maximum capacity of 375 Mt ± 35 Mt, although storage for only some 210 Mt is required for the current mine plan. The planned TSF includes water diversion ditches and a polishing pond (constructed prior to production), and a spillway (constructed during Year 20 when the ultimate dam height will be reached). Excess water contained within the TSF will be pumped to a water treatment plant, via the polishing pond, for processing prior to release to the general environment. Detailed designs of and for the dam will be required before the planned TSF can be finalized.

A diesel storage and pumping facility will be located at the MIA. Diesel will be delivered to the facility by trucks, and then pumped to fuel storage tanks from where it will be distributed as required. Freshwater will be provided from wells; process water will mostly comprise recycled water pumped from the planned TSF to dedicated holding tanks for distribution to the processing plant. Detailed engineering of the storage and distribution systems will be required at the feasibility level of project development.

19 MARKET STUDIES AND CONTRACTS

The Principal Author is responsible for this section of this Technical Report. Table 19.1 summarizes the ranges of metal prices, exchange rates and discount rates applied within the scope of the PEA. The base case prices and rates are highlighted in **bold**. The various prices and rates were compiled from information contained in a consultancy report by XFRM Canada of New Westminster, B.C. (Wood, 2017), in which data up to and including March 30, 2017 was considered in analysis.

Table 19.1 A Summary of the Ranges and Base Case (long-term) Metal Prices, Exchange Rates and Discount Rates Applied Within the Scope of the PEA, Spectrum-GJ Project
(compiled from information contained in a consultancy report to the Company [Wood, 2017])

Variable	Units	Case 1	Case 2	Case 3	Case 4	Case 5
Gold	US$ / oz	1,150	1,200	**1,250**	1,300	1,350
Silver	US$ / oz	12.50	15.00	**17.75**	20.00	22.50
Copper	US$ / lb	2.25	2.50	**2.75**	3.00	3.25
Exchange Rate	US$ / C$	0.73	**0.75**	0.77	0.79	0.81
Discount Rate	%	-	6.0	**8.0**	10.0	12.0

The base case prices and/or rates summarized on Table 19.1 were applied within the scope of:

- openpit optimization for constraining the Mineral Resources considered in Section 14;
- minimum grade cut-off analysis for purposes of Mineral Resource estimation, per the results presented in Section 14;
- mine planning and production scheduling, using an NSR hence variable grade cut-off approach (inclusive of the smelter and refining terms and factors stated in Section 19.3), per the discussions of Section 16; and
- cashflow modelling and analysis, per the discussions of Section 22.

The ranges of prices and rates summarized on Table 19.1 also formed the basis for the sensitivity analyses described in Section 22.

19.1 Metal Prices

19.1.1 Gold

Wood (2017) assessed the likely range of long-term gold prices, primarily through consideration of six factors: US Federal Reserve monetary policy (principally interest rates and the indication of them changing or not); economic data (jobs reports, wage data, manufacturing data, GDP growth, etc.); supply and demand (growing demand and constrained supply have been a major factor in recent price increases); inflation; currency movements and uncertainty. Wood concluded that as at March 30, 2017, US$1,250 would be a reasonable long-term gold price for use in the PEA, along with a price range of US$1,150 to US$1,350 / oz.

19.1.2 Silver

Wood (2017) states the following in his consultancy report to the Company: '*The two-fold function of silver means that it is influenced to some extent by the same factors as is gold but, at the same time, it is considered to be an industrial metal. Apart from its uses in jewellery, medicine and electronics, the strong demand for solar panels is set to maintain upward pressure on silver. Persistent supply hurdles will likely exacerbate this in the medium term. Major analyst prices range from US$15.10/oz to US$20.75/oz with an average of US$17.77/oz. For the purposes of this study, it is recommended that a base price of US$17.75/oz be used*'.

19.1.3 Copper

Wood (2017) states the following in his consultancy report to the Company: '*Copper, being an industrial metal, waxes and wanes with general economic perceptions. Over the short term to medium term, prices are expected to remain subdued and may possibly drop below US$2.00/lb. However, dwindling reserves, falling grades and the very long lead time required to bring significant greenfield properties on stream imply recovery of prices over the longer term. Major analysts forecast an average price of US$2.75/lb for 2017. Significant volatility is expected over the coming years but the same figure is considered to be a good one for the long-term price of copper*'.

19.2 Exchange Rates

Wood (2017) states the following in his consultancy report to the Company: '*Over the last five years, the US$/C$ exchange rate has ranged from 0.69 to 1.03 with an average of 0.86. Currently (February 2017) around 0.74, there is a general sense that the Canadian economy fares well when its currency is trading around 0.75 US$/C$. It is recommended that this figure be used as the base case exchange rate and the rate be varied from 0.73 level up to 0.81*'.

19.3 Discount Rates

A financial discount rate represents a combination of the cost of capital, opportunity cost and a factor for perceived risk. In these regards Wood (2017) states the following in his consultancy report to the Company: '*Recently, there has been a tendency for mining projects to use particularly low discount rates that focus only on the currently low cost of capital and largely ignore the risk factor. Mining projects inherently have a degree of risk, particularly in the case of multi-metal mines with the presence of potential penalty metals. It is recommended that the base case discount rate should be no lower than 8% for this project, however, this can be varied from 6% to 12% or wider, if so desired*'.

19.4 Product Sales and Terms

The final products generated at the Spectrum-GJ plant will be a Cu-Au-(Ag) concentrate in Stage 1 through Stage 3, a gold-rich gravity concentrate in Stage 1 and Au-Ag doré during Stages 2 and 3. The expected average copper grade of the Cu-Au-(Ag) concentrate is 22% Cu throughout the planned project life (see Section 13).

No contracts or arrangements for the smelting, refining and/or sale of the Spectrum-GJ products are in place and none have been sought for purposes of the PEA. The following assumptions have instead been applied:

- the gold-rich gravity concentrate and Au-Ag doré will probably be transported to a North American-based precious metals refinery, with the refined product sold to precious metals traders; and
- 100% of the Cu-Au-(Ag) concentrate will be transported by B-Train truck from the Spectrum-GJ plant to the bulk container facility at Port of Stewart, B.C. for onward shipment to the Far East.

The smelter terms summarized on Table 19.2 have been assumed for purposes of the PEA. The copper pay factor is based on the assumption that the copper unit deduction will be 1%.

Table 19.2 Assumed Smelting and Refining Terms and Factors, Spectrum-GJ Project

Parameter	Unit Rate	Comments
Concentrate Treatment Charge	US$85.0 / dmt	dmt = dry metric ton
Penalty Allowance	NIL	See Section 13 for multi-element analyses
Gold Refining Charge	US$5.00 / oz Au	-
Average Gold Pay Factor	98.5%	-
Gold Refinery Recovery	99.9%	-
Silver Refining Charge	US$0.40 / oz Ag	-
Average Silver Pay Factor	98.5%	-
Silver Refinery Recovery	99.9%	-
Copper Refining Charge	US$0.085 / lb Cu	-
Copper Pay Factor	96.5%	-
Copper Refinery Recovery	99.5%	-

19.5 Contracts

No contracts or arrangements have been sought or are in place as regards mining, concentrating, transportation, handling, sales, hedging or forward sales. For purposes of the PEA, it has instead been assumed that the planned openpits and processing plant will be almost exclusively owner-operated – the exceptions, for which contracts will be let, are:

- hauling ROM material from the Spectrum Pit site to the central processing facility (a distance of approximately 11 km, at a unit cost of C$3.0/t of ROM material); and
- hauling, by B-Train trucks, the Cu-Au-(Ag) concentrate to the bulk handling facility at Port Stewart, B.C.

Table 19.3 summarizes the assumed concentrate haulage costs, port charges and ocean freight rates that were applied within the scope of the PEA. The basis for the unit rates is in an analysis, by the Principal Author, of data contained in recent, public domain documents and reports for operations of a similar type and size to the Spectrum-GJ project.

Table 19.3 Assumed Concentrate Haulage, Port and Ocean Freight Charges and Costs, Spectrum-GJ Cu-Au Project

Parameter	Unit Rate	Comments
Average moisture content, bulk Cu-Au-(Ag) concentrate	8%	-
Concentrate haulage, MIA to Port Stewart, B.C.	C$70 / wmt	Based on assumption of C$0.25 / km / wmt (wmt = wet metric ton)
Port Storage & Handling Marketing & Umpiring Ocean Freight (5,000 t ship)	C$10.00 / wmt C$ 1.00 / dmt C$35.00 / wmt	- - -
Transport/Transit Losses Insurance Costs	0.10% 0.04%	of Net Insurance Value (“NIV”) of NIV

19.6 Qualified Person’s Opinion

The Principal Author has reviewed the estimates and assumptions presented above, as well as the supporting studies and analyses. In the Principal Author’s opinion, the following conclusions may be drawn:

- the applied metal prices, exchange rates and discount rates are reasonable and fair for the market conditions at the effective date of this Technical Report (April 20, 2017);
- the expected average grades of the Cu-Au-(Ag) concentrate will make it attractive to most smelters;
- based on the currently available and limited, multi-element analyses of concentrates, the Cu-Au-(Ag) concentrate is not expected to contain any deleterious elements to which deductions might apply;
- the Spectrum-GJ project, as envisaged in the PEA, is of a small to medium size and it will not have a significant impact on the global market; and
- geographically, the most economic markets for Spectrum-GJ Cu-Au-(Ag) concentrate are probably China, Japan and Korea (India and Europe are comparatively longer shipping destinations and are therefore more expensive); however
- the likely long lead-time to production start-up could mean that the Cu-Au-(Ag) concentrate might be marketed under conditions that differ from the assumptions and forecasts that support the PEA.

The Principal Author recommends that, at the feasibility stage of project development and in order to both support more detailed project studies and ensure stable and reliable sales:

- that expressions of interest or letters of intent supported by cost estimates from haulage contractors, Port of Stewart and potential shipping lines are sought;
- more detailed projections of marketing terms are prepared, based on major custom-smelting companies in the world that are logistically practical for the delivery of concentrates; and
- that as a minimum and to support more detailed project studies, expressions of interest or letters of intent from smelters are sought.

20 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACTS

M. John Brodie, P. Eng. ("QP Brodie") is responsible for this section of this Technical Report. The environmental portions were compiled from a consultancy report to the Company by Greenwood Environment Inc. of Vancouver, B.C. The report is entitled 'Spectrum-GJ Project: Summary of Environment Studies and Permitting' and it is dated March 17, 2017 (referenced as "the Greenwood Report" in Section 2.5).

20.1 Environmental Studies

The environmental setting of the biophysical aspects of the Project Area are described in the following sub-sections. The discussions include summaries of the results of baseline studies completed by the Company and by previous owners. Data gaps are identified and study requirements defined to support the project through the feasibility study, environmental assessment ("EA") and permitting stages of development. The discussions of future requirements have been informed by mining projects in the general region for which environmental studies have been completed or environmental programs have been initiated, or for which federal and/or B.C. environmental assessment processes have been gone through or are being gone through. Publically available documents for these projects include the following:

- Ghaffari, H. *et al*. '2016 KSM (Kerr-Sulphurets-Mitchell) Prefeasibility Study Update and Preliminary Economic Assessment', an NI 43-101 technical report prepared for Seabridge Gold, Inc. by Tetra Tech and others, dated October 6, 2016 ("Tetra Tech, 2016");
- 'Application for an Environmental Assessment Certificate / Environmental Impact Statement for the KSM Project', prepared for Seabridge Gold, Inc. by Rescan Environmental Services Ltd. ("Rescan") and dated July 2013 ("Rescan, 2013");
- Gillstrom, G., *et al.* (February 14, 2012, amended and restated in September 30, 2015) 'Technical Report on the Red Chris Copper-Gold Project', an NI 43-101 technical report prepared by and for Imperial Metals Corporation ("Gillstrom, 2015"); and
- Red Chris Development Company Ltd. 'Application for an Environmental Assessment Certificate Red Chris Project British Columbia, Canada' dated October 2004.

20.1.1 Climate and Atmospheric Conditions

Data from nearby climate stations may be used for both background and current data, and historical data to 2000 is available from many stations in the general area of the Spectrum-GJ project. However, for the reasons described in Section 5.4, local climatic variations and even micro-climates exist across the region, with the result that such data might not fully or fairly reflect climatic and atmospheric conditions across the Project Area. Local monitoring is instead required.

An automated meteorological station (the "Kinaskan Station") was operated and maintained on Klastline Plateau between June 2005 and September 2008 (RTEC, 2011a). A summary of the principal findings is presented in Section 5.4, but this provides only a portion of data required for planning purposes. Additional monitoring of meteorological data will be required to support project development and operations, including temperature, relative humidity, precipitation and snow depth, solar radiation, barometric pressure and evaporation.

It is for the reasons outlined that a formal meteorological monitoring study is recommended that, as a minimum, should include year-round collection of site-specific data to ensure a robust dataset. This would enable better characterizations of the range of climatic conditions experienced across the Project Area and allow more meaningful comparisons of the results with data collected at regional, government-operated meteorology stations.

20.1.2 Topography and Soils

No terrain or soil classification mapping or surveys have been conducted on the Project Area to date (March 2017). As part of baseline programs to support and EA and permitting, a terrain and soil baseline study will be required and should include, as a minimum, terrain distribution and soil quantity and distribution of soil types. Surface soil sampling will also be required. The following B.C. provincial standards and procedures typically direct terrain and soil baseline programs developed to support mine permitting:

- Guidelines and Standards to Terrain Mapping in British Columbia, developed by the Surficial Geology Task Group Earth Sciences Task Force (RISC, 1996);
- Terrain classification system for British Columbia (Howes and Kenk, 1997); and
- Canadian System of Soil Classification (SCWG 1998).

It should be emphasized that geology as well as climate history, local topography and vegetation affect the soil landscapes found across the Project Area. For example, at high elevations, three main processes (nivation, solifluction, and cryoturbation) displace and mix soil horizons. The cold climate slows down mineral weathering and organic decomposition and this, along with the predominance of volcanic rocks, tend to result in coarse-textured, acidic parent materials. In areas of steep terrain soil development is further slowed by mass wasting, or movement, of surficial materials. In combination, the influences outlined typically lead to weak soil development.

On steep slopes, the most common parent material is colluvial, while on the lower slopes morainal parent material is more common. The anticipated primary soil types include regosols and cryosols at the higher elevations, and brunisols and humic podzols at middling and low elevations where waterlogged soils are common.

20.1.3 Geochemistry and Acid Generating Potential

Property geology is described in Section 7, in which it is established that the mineralized zones typically contain sulphides. Where sulphide minerals such as pyrite are present, oxidation can create acid rock drainage (“ARD”), unless sufficient quantities of neutralizing minerals are available.

ARD occurs when materials that contain sulphide minerals oxidize when exposed to atmospheric conditions, thereby resulting in acidity. However, impacts on water quality are often more specifically related to the soluble constituents and trace metals that are leached as a result of mineralogical reactions on contact with atmospheric conditions. This is commonly referred to as metal leaching (“ML”) potential.

It is stated in Phase Geochemistry (2016) that the practice of predicting the potential for ML/ARD is essentially the evaluation of a material's mineralogy, the likely behavior of those minerals when processed, stored and exposed to atmospheric conditions and the resulting pore water quality (at a range of pH conditions) and secondary mineral precipitation.

Based on a preliminary geochemistry review of the geological descriptions by Phase Geochemistry (2016, 2017), minerals that could contribute to acid potential and metal leaching include pyrite, pyrrhotite, arsenopyrite, chalcopyrite, sphalerite and galena. Neutralization potential ("NP") could be provided by carbonates and, to a lesser extent, due to slower rates of dissolution, by feldspars and other silicates (Phase Geochemistry, 2016). Based on preliminary ML/ARD testwork results, Phase Geochemistry (2016) concluded that a potential for ML and ARD exists for material extracted from the Central Zone and Donnelly Deposit, but this varies according to the following preliminary criteria:

- regardless of lithology –
    - samples tend to be non-potentially acid generating (non-PAG or "NAG") if neutralization potential ("NP") is greater than 20%,
    - samples tend to be PAG if the sulphide content is greater than 2%, and
    - samples with NP values lower than 20% and sulphide contents less than 2% show variability;
- a higher proportion of the samples from the Donnelly Deposit classified as NAG than from the Central Zone (which is a reflection of slightly higher NP in the Donnelly sample set);
- due to higher carbonate NP than NP derived from titration for some samples, particularly within the Donnelly sample set, some of the carbonate content may not be reactive – additional mineralogical quantification is required to more fully assess NP values;
- NP values in many samples are higher than for many porphyry deposits, suggesting that there could be a notable time-lag prior to the onset of acidic conditions (quantifying the lag time is not yet possible, additional testing and kinetic work is required to assess this in more detail);
- those lithologies that were predominantly NAG included the basalt, conglomerate and low sulphide intrusives from the Donnelly Deposit, as well as the ash tuff, conglomerate and volcanic wacke from the Central Zone; and
- both sample sets show elevated contents of some metals that could be problematic for metal leaching, even at neutral pH, but this requires additional testing to allow conclusions to be more confidently drawn.

Mineralogical analysis by AuTec of the composites used for metallurgical testing (see Section 13) showed that sulphides were in general present in minor to trace amounts only. Very minor to negligible pyrrhotite, arsenopyrite, sphalerite and galena were found in the Central Zone and Donnelly Deposit composites, and:

- chalcopyrite content comprised 0.2% and 0.7% of the two, tested Central Zone composites and pyrite contributed a further 4.8% and 11.1%, respectively, whereas arsenopyrite (0.8%) was found in only one composite;
- plagioclase (a feldspar) content comprised 16.2% and 25.5% of the two, tested Central Zone composites, with carbonates contributing a further 9.8% and 6.7%, respectively;
- chalcopyrite content comprised 1.11% and 1.51% in the two, tested Donnelly Deposit composites, with pyrite contributing a further 5.57% and 5.59%, respectively (no arsenopyrite was found); and
- overall feldspar content in the two Donnelly Deposit composites comprised 50.95% and 43.31%, with carbonates contributing a further 11.8% and 11.4%, respectively.

It should, however, be emphasized that the tested composites comprised material that would be sent to the central plant for processing (as might be expected with metallurgical testwork samples). The mineralogy of below cut-off grade material and waste rock in particular can be expected to differ from the results summarized above, especially as regards sulphide content. Whatever the case, in the opinion of QP Brodie, the data summarized above are insufficient to support the project through permitting to construction and production. Additional site-specific geochemistry data collection for predictions and management of materials with the potential to generate ML/ARD (pit walls, waste rock, marginal grade material and tailings, the latter inclusive of the two fractions of desulphurized tailings) is therefore required, including the following, as recommended by Phase Geochemistry (2016, 2017):

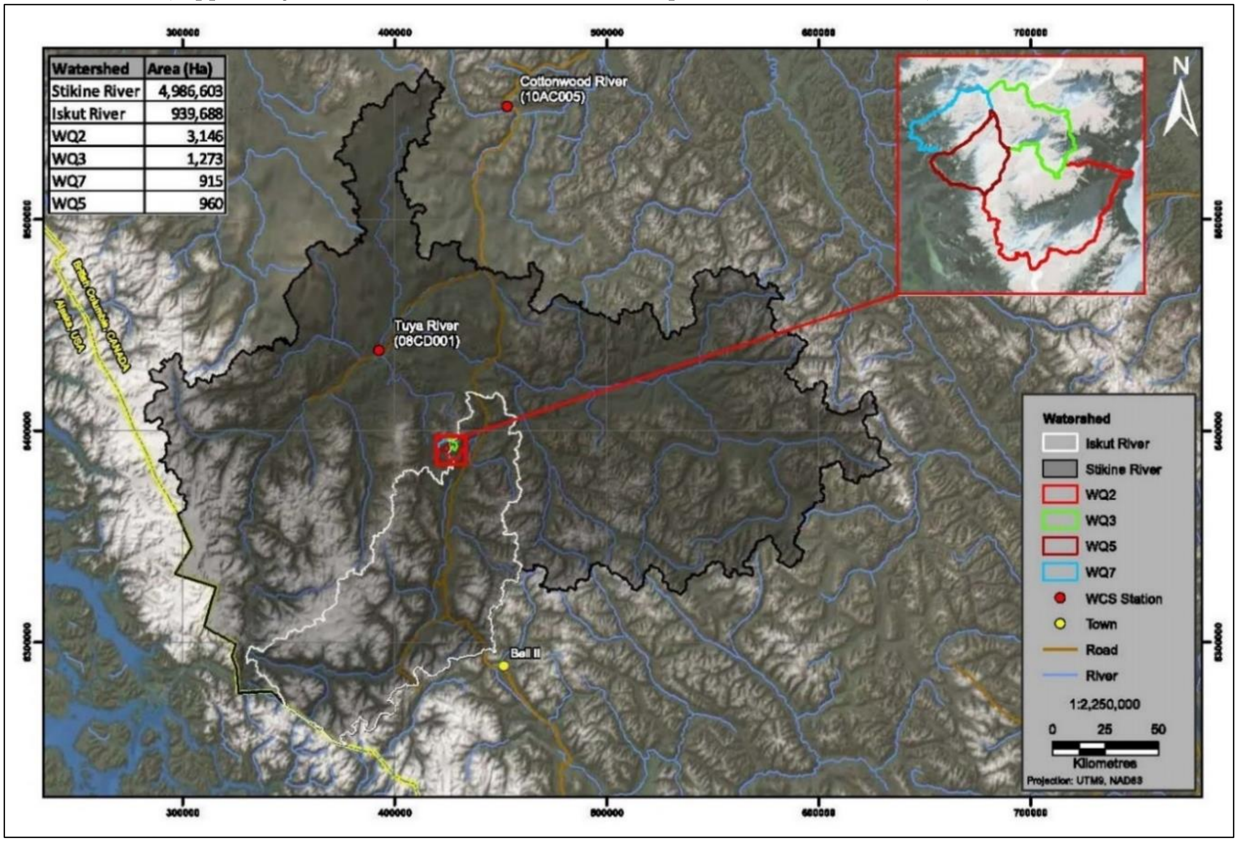
- additional work on carbonate (and feldspar) mineralogy and reactivity for both the Central Zone and Donnelly Deposit;
- development of a composite sulphide and lithological block model from which the timings and quantities of different materials can reasonably be identified within the scope of the production schedules for the planned openpits;
- initiation of kinetic testing (e.g., humidity cells and/or field barrels) on key litho-alteration units; and
- further assessment of waste segregation of PAG vs NAG rock, which may include the development of site-specific sorting criteria.

Any plans for the prediction, prevention, mitigation and management of ML and ARD will have to be prepared in accordance with the Guidelines for Metal Leaching and Acid Rock Drainage at Minesites in British Columbia (Price and Errington, 1998).

20.1.4 Hydrogeology and Watershed Characterization

It is established in Section 5.4 that two main watersheds are developed in the general Project Area: the Stikine River watershed and the Iskut River watershed. Figure 20.1 summarizes the regional drainage patterns. Figure 5.11, which is not repeated here, summarizes their drainage patterns local to the Project Area.

Figure 20.1 The Regional Drainage Patterns of the Stikine and Iskut Rivers, Northwest B.C.
(supplied by Greenwood Environmental and copied from RTEC [2011])



In May 2005, a hydrologic monitoring program was initiated in the eastern portion of the Project Area. Four automated hydrometric monitoring stations were installed in two creeks that flow into Kinaskan Lake and in two creeks that flow into Kakiddi Lake. Annual hydrologic monitoring continued until October 2008. Limited documentation regarding data quality was available for review, and a comparative regional analysis was not carried out because the quality of the data for each station was considered to be low (compared to provincial hydrometric standards, RISC 2009) and therefore statistically unreliable (RTEC, 2011b). The Company is not aware of any hydrologic monitoring on the western portion of the Project Area.

The data outlined are insufficient to support the project through permitting to construction and production: environmental assessments require at least one full year of hydrological measurements to ensure seasonal coverage, which requirement the available data does not meet. A thorough baseline hydrology monitoring program is therefore recommended that, as a minimum, should include year-round data collection from hydrometric stations in all streams potentially affected by the proposed mine plan. Such a program should:

- characterize and document current streamflow conditions, including the potential for channel instabilities and bed load transport processes;
- provide a means of determining and assessing hydrological changes related to the project, for comparison against regional long-term hydrometric data from Water Survey of Canada hydrometric stations; and

- prediction of extreme flow events for design of ditches, spillways and water-crossings.

20.1.5 Surface Water

Between May 2005 and October 2008, RTEC undertook a limited program of environmental baseline surveys that included the collection and analysis of water quality data at eight sites within five streams, downstream of the Donnelly deposit (RTEC, 2011c). Two of the streams flow east into Kinaskan Lake and are within the Iskut River watershed; three of the streams flow west into Kakkidi Lake and are within the Stikine River watershed. The water quality analyses included general physical parameters, anions, nutrients, total organic carbon, total metals and dissolved metals.

In 2015, five additional surface water quality sampling sites were sampled. The sites included key watercourses near the Central Zone. The program included one site in Nuttlude Lake and four stream sites on the western side of Nuttlude Lake. In April 2016, the program was expanded to include four additional sampling sites within the eastern portion of the Project Area: one within the Iskut River watershed; and three within the Stikine River watershed. Both the 2005 to 2008 and 2015/2016 water sampling programs included QA/QC programs encompassing sampling, handling and shipping procedures, as well as the use of laboratory-cleaned water bottles, duplicate samples, travel blanks and field blanks.

RTEC (2011c) reported that in 2005 to 2008, the streams in the eastern portion of the Project Area were overall slightly basic, with moderate buffering capacity and with soft to very hard water. All sites reported slightly basic pH values that were within the Canadian Council of Ministers of Environment ("CCME") water quality guidelines for the protection of aquatic life. Alkalinity was moderate and was lowest during the summer months, due to the dilution from freshet and glacial melt waters. As may be expected, these events resulted in increased total suspended solids ("TSS") concentrations during late spring (May and June) at most sites. The highest TSS and metal concentrations were recorded in 2006 and the lowest was recorded in 2008. TSS and total metal concentrations were also found to increase from upstream to downstream sites. Several concentrations were found to exceed federal and/or provincial water quality guidelines ("natural exceedances"), including total cyanide (which might be erroneous), sulphate, total aluminum, arsenic, cadmium, chromium, copper, iron and selenium (RTEC, 2011c).

Water quality data from 2015 and 2016 sampling sites in the eastern portion of the Project Area are similar to the 2005 to 2008 data, with water being slightly basic, with good buffering capacity and with hardness ranging from soft to hard. Although inconsistent month to month, natural exceedances included aluminum, copper, iron and zinc, as well as (in some samples) cadmium, chromium, lead, selenium and silver.

Within the western portion of the Project Area, water quality results indicated pH levels that are mostly slightly basic, with the exception of one stream (WC-01) that was neutral to slightly acidic (in situ pH ranging from 5.2 to 7.4). Regular natural exceedances included fluoride, aluminum, arsenic and copper with variable exceedances of beryllium, cadmium, chromium, cobalt, lead, iron, manganese, mercury, nickel, silver, and zinc (this includes exceedances of B.C. working water quality guidelines that are not yet approved). The exceedances were variable by stream, but site WC-01 had the most regular natural exceedances that, in addition to the preceding list, also included selenium.

Although in many respects detailed, the database of surface water results summarized above is insufficient to support the project through permitting to construction and production. The significant number of natural exceedances are emphasized in this regard, hence the importance of establishing a comprehensive baseline dataset. A comprehensive/robust surface water quality monitoring program with sample sites located throughout the Project Area is, therefore, recommended. Parameters previously included in analysis should be continued. Various additional parameters should also be included to meet current guidelines. A minimum of monthly sampling with additional weekly sampling during periods of maximum hydrograph fluctuation (high flow and low flow) are typically required for EAs.

20.1.6 Groundwater

Groundwater data collection was initiated by the Company in 2015 when a hydrogeologic site investigation was carried out by Knight Piésold (2016a). Its purpose was to collect groundwater data to support the characterization of hydrogeologic conditions along a potential adit alignment intended to access underground drilling sites in the Central Zone (which is no longer being considered within the scope of the Company’s project development plans). The site investigation included packer hydraulic conductivity testing and the installation of multi-point vibrating wire piezometers to collect water level data in three geotechnical holes. Comparison of piezometric elevations between the drillholes suggests that:

- groundwater flow is towards the east (i.e. away from the mountain core, as may be expected by virtue of pore pressure mechanics in a relative compression environment); and
- water levels generally increase at all piezometers annually between May and June (which may also be expected as the timing coincides with Spring freshet).

The data collected during 2015 and 2016 is for only a small part of the Project Aarea. It can, however, be used to develop an expanded and robust groundwater quality monitoring program, to assist with groundwater inflow analysis to the planned openpits and other key areas. One year of quarterly data is typically the minimum requirement for groundwater baseline programs to support project permitting and development. The program should include the collection of hydrogeological data through a network of strategically located groundwater monitoring wells, including wells within the proximity to the proposed openpits, waste rock dumps, marginal grade stockpile, TSF and MIA.

20.1.7 Fisheries and Aquatic Habitat

Kakiddi Creek is a tributary of Klastline River, which flows into the Stikine River near Telegraph Creek. It is near the headwaters of the Klastline River and it collects water from the western portion of the Project Area. Kakiddi Lake is fairly large and shallow (mean depth of 9.4 m). It was surveyed in 1982, 1985, 1987 and 1995 and was found to contain rainbow trout (Oncorhynchus mykiss), Coho salmon (O. kisutch) and sockeye salmon (O. nerka) (DFO Mapster data source as report in RTEC, 2011d). Sockeye and Coho salmon and rainbow trout have been observed at the southern inflow to the lake. Rainbow trout were recorded in several tributaries to the south and west (B.C. MOE data sources: EcoCat, Habitat Wizard, FISS).

The large Kinaskan Lake is located to the east of the Project Area, at the headwaters of the Iskut River watershed. It has been sampled near the outlet at its southern end; rainbow trout were captured (B.C. MOE data sources: EcoCat, Habitat Wizard, FISS). The upper Iskut River watershed is known to also contain mountain whitefish (Prosopium williamsoni), longnose sucker (Catostomus catostomus), Arctic grayling (Thymallus arcticus) and Dolly Varden (Salvelinus malma), which species have not been recorded in Kinaskan Lake (B.C. MOE data sources: EcoCat, Habitat Wizard, FISS).

In 2011, a fisheries baseline study program for the eastern portion of the Project Area was undertaken to collect reconnaissance level information on fish habitat and communities in streams within the area (RTEC, 2011d). A total of 13 sites on nine streams were surveyed for fish habitat quality, characteristics and fish community composition. Of these, six sites were located in the Kinaskan Lake drainage, two sites were located in the Nuttlude Lake drainage and five sites were located in Kakiddi Lake drainage. In general it was found that habitat in the low-lying areas adjacent to the surrounding lakes was of fair to good quality for all life stages of rainbow trout; quality decreased at the higher reaches (some habitat was still present). Rainbow trout was the only species captured in the streams during the study.

Two natural barriers to fish passage (waterfalls) were identified during the 2011 field assessment, one approximately 3 km upstream of Kinaskan Lake on Groat Creek and one on an unnamed tributary approximately 1 km upstream of Kakiddi Lake. No fish were observed upstream of the barriers, but further assessment was recommended to confirm fish presence as electro-fishing was not possible at some locations.

One other fish barrier was identified in the provincial database review, on an unnamed tributary to Nido Creek, downstream of the wetland known within the Project Area as Beaver Pond. A number of other barriers are identified in the provincial database on Nido Creek further upstream, and they too require confirmatory field assessments.

Aquatic resource baseline surveys typically include sediment chemistry and determination of biological productivity of aquatic systems by characterizing fish habitat and communities, as well as assessing benthic invertebrates, zooplankton and phytoplankton. The aquatic information collected from the streams in the eastern portion of the Project Area will support a portion of the required data and inform the development of a more thorough fish baseline program required for Project permitting and an EA. As a minimum, a formal aquatic baseline study should:

- include fish habitat, population, species surveys, biological productivity and spawning assessments on all streams and waterbodies potentially affected by the proposed mine plan and development; and
- reference locations for future baseline comparison.

A minimum of one complete survey of aquatic life for the baseline study is required, but data from two or more consecutive years is typically preferred as two years is the minimum time required to define inter-annual variability. In addition, an aquatic baseline program should identify and further assess any potential fish barriers within the Project Area, especially downstream of the planned infrastructure, to determine whether potential fish and fish habitat effects occur, per the Fisheries Act and Schedule 2 of the Metal Mining Effluent Regulation.

20.1.8 Terrestrial Ecosystems

Terrestrial ecosystems can support important ecological communities and vegetation, such as mature and old forest, provincially red- and blue-listed ecological communities and plants, federally listed plants, alpine communities, flood communities and wetland communities. Wetlands have the ability to provide ecological values and functions; a wetland function assessment is often needed to support an EA application.

No terrestrial ecosystem and wetland field studies have been carried out on the Project Area. However, an internal desktop review was completed in July 2015, in preparation for exploration environmental management plans for the Central Zone area. It was found that two blue listed species have potential to be located within the Project Area: Milky Draba (Draba lactea) and Dotted Saxifrage (Micranthes nelsoniana var. carlottae). These species are considered vulnerable because they are rare or uncommon in B.C.

A desktop review of publically available imagery and B.C. Broad Ecosystem Inventory data indicates that wetlands are present in the Project Area, which can provide a range of ecological functions such as biogeochemical, hydrological and habitat functions. It is expected that the area contains primarily fen and swamp wetland classes with some potential for bog, marsh and shallow openwater wetlands.

The findings outlined are insufficient to support the project going forward and that additional desktop and baseline field studies are required, including:

- ecosystem mapping, vegetation inventory and targeted data collection of plant and ecological communities of concern, such as wetlands;
- plant tissue sampling and analytical testing for metals to support project permitting and development; and
- surveys to identify the presence of (or lack of) -
  - red- and blue-listed plants;
  - plant species either listed by the Species at Risk Act (2002) or listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), and
  - old forest, alpine communities, traditionally or culturally important species and communities and invasive plants.

The Company has advised QP Brodie that it is aware that the Federal Policy on Wetland Conservation (1991) applies to federal departments and agencies when addressing the loss of wetlands and their functions, if that project requires a federal permit, license or authorization, and through the issuance of, would result in affecting wetland(s) designated as ecologically or socio-economically important to a region. It is for these reasons that the required baseline studies will include an assessment of wetlands, including identification of wetland ecosystems at risk within the Project Area.

20.1.9 Wildlife and Wildlife Habitat

It is established in Section 4.9 that current wildlife studies or reports completed to date include: mountain ungulate summer aerial field study (Rescan, 2008); mountain ungulate winter aerial field study (RTEC, 2012a); mountain ungulate management plan (Hemmera, 2015); and mountain ungulate flight management plan (RTEC, 2016a).

Moose are abundant in northern B.C., with an estimated average population of 170,000 (Kuzyk, 2016). Winter habitat is often considered critical habitat for maintaining moose populations, the majority of which occurs along rivers, in wetlands, in burned and logged areas and in the sub-alpine SWB zone, all of which features occur within or in the vicinity of the Project Area. A moose winter survey identified the presence of 53 moose in the Project Area (RTEC, 2012a), as well as a number of wolf observations (predators of moose; Rescan, 2008). Further studies will be required to establish baseline conditions for the moose population, as well as habitat suitability and distribution.

Mountain ungulates, particularly Stone's sheep, mountain goat and northern mountain caribou, have been identified as an important wildlife resource within the region. They are species at risk or of conservation concern, they are important to local First Nations and they are known to be both present and potentially affected by exploration or other development activities (Hemmera, 2015). The species have also been identified as socially and economically important for both traditional harvest by the Tahltan Nation and recreational harvest by resident and non-resident hunters (Rescan 2008).

The B.C. population of mountain goats has been estimated at between 39,000 and 66,000 individuals, with the Skeena region supporting almost half the B.C. population (B.C. MOE, 2010). Stone's sheep are part of what is thought of as a metapopulation of thin horn sheep, the B.C. population of which is estimated at 12,300 to 15,000 individuals (Demarchi and Hartwig, 2004). Stone's sheep inhabit open mountain slopes up to the BAFA alpine zonezone.

A baseline report was produced summarizing the results if an aerial survey carried out in August 2007. The survey represented a two-day snapshot of the distribution of mountain ungulates in a study area covering 90,000 ha west and northwest from Kinaskan Lake, including portions of the Project Area (Rescan, 2008). In addition, one winter aerial study was completed in March 2012. Both studies were conducted according to provincial standards. Summer 2007 observations included 271 goats and 246 sheep; their distribution appeared to primarily occur within the northern part of the Project Area, due probably to the presence of escape terrain habitat. A herd of 44 goats was located near the 2007 exploration camp, east of the Donnelly Deposit, which appeared to be habituated to camp activities. A substantial and regionally important population of sheep and goat exist north of the Project Area. Important geological features such as salt licks, that appeared to be used by sheep and goat to ingest minerals, were also identified.

No northern mountain caribou were noted during summer surveys described. However, shed antlers were observed suggesting that caribou may inhabit parts of the Project Area during winter. Other wildlife observations have included grizzly bear, golden eagle and wolf. Winter aerial surveys resulted in mountain goat (216) and mountain sheep (268) observations (RTEC, 2012a). This suggests fairly high winter populations of mountain goat and Stone's sheep that are consistent with summer observation data.

Grizzly bears are distributed throughout B.C., from sea level and low-elevation river-valleys to alpine elevations. The B.C. population is estimated at 15,000 individuals (B.C. Ministry of Forests, Lands, and Natural Resource Operations, 2012). They are considered a species of special concern by the COSEWIC and are blue-listed in B.C. By comparison, black bears are common and widespread throughout B.C. No field surveys or habitat suitability modeling for either grizzly or black bear has been carried out in the Project Area. However, both grizzly- and black-bear have been incidentally observed during the winter mountain ungulate surveys (for grizzly bear, RTEC, 2012a and 2015; 2016 crew observations).

Other fur-bearer species that are probably present within the Project Area include wolf, American marten, American beaver and red squirrel, as well as the provincially blue-listed fisher and the federally-listed wolverine. No formal fur-bearer studies have been completed to date. However, wolf (RTEC, 2012a) and fox (2016 crew observations) have been seen.

Birds are important to provincial and federal government agencies, First Nations and other stakeholders in the vicinity of the Project Area. No bird surveys have been conducted to date. However, golden eagle was recorded as an incidental species during the winter 2012 (RTEC, 2012a).

Amphibians are important to provincial and federal government agencies, First Nations and other stakeholders in the vicinity of the Project Area. No amphibian studies have been conducted to date on the Project Area. It is likely that the western toad occurs in the Project Area as this is a wide ranging species. In B.C., the western toad is considered secure, but it is protected under the Wildlife Act.

No specific species-at-risk surveys have been carried out on the Project Area to date (species at risk include those that are either identified on Schedule 1 of Species at Risk Act or COSEWIC, or are provincially listed).

The data gaps outlined show that desktop and field studies will required to supplement the findings collected to date and to characterize the wildlife resource and wildlife habitat of the Project Area and surrounding areas. Ecosystem mapping and wildlife habitat suitability mapping is recommended that, at a minimum, should include moose, mountain goat, mountain sheep and grizzly bear. Baseline programs should follow B.C.'s wildlife suitability mapping standards (RIC 1999) and other wildlife survey provincial standards. In addition, bird, amphibian and bat surveys are recommended. Bird surveys typically include raptors (hawks, falcons, owls and other birds of prey), wetland birds (ducks, geese, shorebirds and other bird families associated with water bodies), forest and alpine birds (songbirds, hummingbirds, woodpeckers and game birds in terrestrial areas). Species at risk in all categories should be targeted in baseline surveys. Consultation with government agencies, First Nations and community members are important steps to establish the species and habitat of concern for baseline studies.

20.2 Potential Environmental Issues

No significant environmental risks have been identified that could prevent the Spectrum-GJ Cu-Au Project from advancing to the next phase of development towards becoming an operating mine. However, projections of environmental and community matters, their associated costs and permitting schedule, are subject to a number of known and unknown risks, uncertainties and other factors that may cause actual results to differ materially from those presented here. These risks include:

- projections as to permitting time lines, timing and conditions of permits required to initiate mine construction, and potential delays in the issuance of permits; and
- changes to government regulation of mining operations, environmental issues, permitting requirements and social risks; or
- unrecognized environmental, permitting and social risks, and title disputes or claims.

It should also be emphasized that the baseline studies, programs and surveys recommended in Section 20.1 are required to support the project going forward. The Company has advised QP Brodie that it is aware of the study and survey requirements and intends to undertake the studies and surveys at the appropriate time or times.

20.3 Water and Waste Management

20.3.1 Concept Criteria

The following provide a basis for identifying those measures that require inclusion in the water and waste management plans for the Spectrum-GJ Cu-Au project:

- fish habitat exists in the rivers and lakes in the vicinity of the Project Area (as discussed and described in Sub-Section 20.1.7);
- as stated in Sub-Section 20.1.3, many of the notionally mined materials have potentially adverse geochemical properties (ML/ARD) with respect to protection of the environment;
- some industrial materials (fuel, explosives, metallurgical reagents, cyanide) have potentially adverse properties with respect to protection of the environment.

20.3.2 Preliminary Planning

For purposes of the PEA, preliminary plans have been formulated with respect to the preceding points. The Company has advised QP Brodie that when detailed designs are compiled at the feasibility stage of project development, water and waste management plans for operation and closure will encompass best management practices to ensure a proactive approach to protection of the environment. This includes the design, construction, operation and closure of the planned TSF such that it always meets or exceeds the objectives set out in the Canadian Dam Association 2014 publication 'Application of Dam Safety Guidelines to Mining Dams' and BC MEM HSRC of July 2016. The preliminary plans include the following:

- diversion of clean water around mine facilities (as stated in Section 18, surface water run-off ditches form an integral part of the planned TSF layout);
- collection and processing/treatment of contact water –

- as stated in Section 18, processing water is captured in the planned TSF and then either pumped back to the processing plant for re-use or, in the case of excess water, pumped via a polishing pond to a treatment plant, prior to release to the general environment, and
- as described in Section 17, water from the CIL plant is send through a cyanide detox plant, prior to being released to the TSF;

- design for closure of all mine facilities, with the objective of avoiding long-term risk to the environment from residual mine components, and avoiding the need for long-term active water treatment (as described below); and
- permanent underwater disposal of PAG materials, in mined-out pits, in constructed facilities (the TSF) or in constructed waterbodies (as described below).

20.4 Waste and Tailings Disposal

The main driver in the development of the water and waste management plans for the project is the geochemical properties of the mined materials. For purposes of the PEA, geochemistry, as discussed in Sub-Section 20.1.3, has been advanced to the preliminary level only. With this in mind, the comments and conclusions made in the following sub-sections are made, as regards planning for purposes of the PEA.

20.4.1 Spectrum Pit

PEA planning for Spectrum Pit envisions the production of 9.96 Mt of ROM plant feed (see Section 16.13). Approximately 5.15 Mt of low-grade mineralization will be generated as waste, with an estimated total, post-blast volume of approximately 3.0 million cubic metres. For purposes of the PEA, it is anticipated that 100% of this material will be PAG, although it might prove possible in a production environment to separate NAG material, based on the characterizations and recommended studies described in Section 20.1.3.

Project planning for the PEA assumes that the PAG rock will be trucked for immediate underwater disposal in a small, sub-alpine lake located approximately one kilometre north of the planned adit portal. The Company acknowledges that the suitability of the site will need to be confirmed by means of a detailed survey of the lake, per the requirements of the Fisheries Act (1985, the “1985 Act”) described in Sub-Section 20.7.6. The required survey will form part of the larger fisheries and aquatic habitat baseline survey recommended in Sub-Section 20.1.7.

The available contour data for the target lake’s area is insufficient to estimate storage volume with confidence at this early stage. However, it is estimated that containment of 3.0 million cubic metres of waste rock can safely be achieved through the construction dams at both the north and south ends of the small lake:

- the lake is approximately 650 m long and approximately 240 m wide, and it is estimated to be approximately 10 m deep on average, thereby affording containment for up to approximately 1.56 Mt of waste; and
- if 20 m high dams were constructed with individual crest lengths of 300 m, the containment capacity would increase to approximately 3.9 million cubic metres of waste.

The downstream shell of the dam will comprise NAG rock, sourced either from the pre-strip material (deeply weathered scree with negligible to no sulphide mineralization) and/or from sorted NAG material mined in Spectrum Pit. The latter case would both reduce the total footprint of waste dump and reduce the cost of managing the PAG rock. If additional capacity was required by virtue of future planned increases the size of Spectrum Pit, per the discussions of Section 16.3, this could readily be achieved by increasing the height and crest lengths of the dams. For example, if 25 m high dams were constructed with individual crest lengths of 350 m, the containment capacity would increase to approximately 5.7 Mt of waste.

It is anticipated that the constructed PAG storage lake will receive only incident precipitation on what would be a small catchment. A spillway to pass the probable maximum flood will be required for closure. An allowance of C$2.5 M has been made within the construction and operation cost estimate stated in Section 20.11, for construction of core and filters in the dams (60,000 m^3) and excavation of a closure spillway.

20.4.2 Donnelly Pit

PEA planning for Donnelly Pit envisions the production of approximately 181 Mt of ROM plant feed, along with approximately 25.5 Mt of marginal grade material (above a grade cut-off of 0.1% CuEq, but below the ROM grade cut-off of 0.2% CuEq). Approximately 129.6 Mt of waste will also be produced, the latter containing negligible to no sulphide mineralization. Production planning further envisions approximately 800 kt of the marginal grade material being processed in Year 6 (to fill the mill, due to a shortfall in ROM tonnes), with an additional 21.99 Mt of marginal grade material processed in the central plant facility from the end of Year 23 through to the end of the planned project life at the end of Year 25. This leaves approximately 2.69 Mt of stockpiled, marginal grade material that might or might not be processed at the start of Year 26.

PEA planning assumes that the Donnelly waste rock will be dumped to the north of the proposed pit, in a fairly flat area that is underlain by known mineralization of the North Donnelly deposit. The marginal grade material will be stockpiled to the south of the pit area, on fairly flat ground, to facilitate its later removal and trucking to the tipping point at the top of the Donnelly muck handling system described in Section 16.6. In both cases, preliminary analysis of available contour plans (20 m contours) suggests that surface water run-off from the dump and stockpile would report to the pit, or at least it could readily be made to flow back into the pit where it could be managed.

For purposes of PEA planning, it has been assumed that the waste rock dump will be contoured and revegetated at the end of the mine life. It is further assumed that the remaining stockpile of marginal grade material would be shoved back into the pit, using remaining production equipment, at a cost of C$1.0/t. The Company acknowledges that for purposes of government bonding, a contractor rate might be required, but given the fact that the marginal grade material would probably be processed at the start of Year 26 (which eventuality has not been considered in the project cashflow model), the owner-operator cost has been applied.

20.4.3 Tailings Storage Facility

It is established in Section 18 that tailings from the central processing plant will be contained in a valley located immediately to the south of the plant. It is further established that prior to the desulphurization circuit coming on-line in Year 6, that the tailings will on average have a residual sulphur content of approximately 1.5% S, reducing to approximately 0.05% S in the case of desulphurized tails. Preliminary analysis (see Sub-Section 20.1.3) further suggests that the average carbonate content of the tails will be at least 10%, with up to an additional 50% of the tails comprising feldspars. Additional ML/ARD testing is required to firm up the results, but on the basis of the preliminary testwork that has been performed for purposes of the PEA, it has been assumed that:

- prior to the delsulphurization circuit coming on stream in Year 6, the processing tails will be PAG (although, given the residual sulphur content is less than 2% and the NL of the tails is probably in excess of 25%, the tails could prove to be NAG);
- once the desulphurization circuit comes on line the tails will be NAG, but the pyrite concentrate tails will certainly be PAG.

For the mine plans presented herein, there will be a total estimated mass of some 210 Mt of tailings. Of this total, approximately 17 Mt will be produced prior to the desulphurization circuit coming on-line, following which approximately 174 Mt will comprise NAG tailings and the balance (approximatley 10%, or 19 Mt) will comprise strongly PAG, residual pyrite tailings.

Tailings from the first five years of production will be disposed of such that the tails are always submerged in water. Thereafter, the tailings will be separated into NAG and PAG streams, with the latter deposited into either the deep pond area of the TSF or a geomembrane-lined cell at the south end of the planned TSF, thereby to ensure permanent underwater disposal with very low seepage release. The main TSF will provide secondary seepage containment for this facility. All excess water in the lined pyritic storage area will be pumped in a dedicated pipeline back into the leaching circuit or to the cyanide destruction treatment plant. No waste rock from either pit will be deposited in the planned TSF, the maximum capacity of which will be required for future production that has not been planned within the scope of the PEA.

The dam concept and quantities for construction have been developed assuming that a water-retaining type dam is needed for prevention of ARD. With the proposed segregation of pyrite concentrated tailings and no disposal of waste rock in the TSF, a simpler dam may be possible for the project. This will be assessed at the feasibility level of project development. Details of the preliminary dam design and related infrastructure are presented in Section 18.5 and are not repeated here.

20.5 Water Management - Operations

It is established in Section 20.1.3 that there is a potential for ML/ARD issues with the mined materials from both the Spectrum Pit and Donnelly Pit. In particular it is anticipated that poor water quality might be associated with:

- the planned Spectrum and Donnelly Pits, including incident precipitation and groundwater inflow;

- the planned Donnelly Pit waste rock area, including seepage at toe of the dump (although that might report/be engineered to report to the pit) and, if necessary, groundwater flow;
- local run-off in the processing plant area located at the MIA;
- incident precipitation, by-pass of the planned diversion ditches and excess process water reporting to the planned TSF; and
- pyritic tailings disposal area, the potential for residual (trace) levels of cyanide and high ARD potential.

Due to significant neutralization potential in many of the mined materials, it is anticipated that drainage waters might have elevated metal contents (relative to standards for discharge of water to the environment). Acidic waters with depressed pH levels are not expected. The comments made in Sub-Section 20.1.5 concerning natural exceedances in streams and creeks across the Project Area are emphasized. A wide range of compounds and metals, that naturally exceed discharge standards, have been identified, which emphasizes the importance of robust baseline surface water studies across the Project Area.

It is established in Section 18.5 that a polishing pond will be constructed downstream of the water treatment plant. The pond will have capacity for a minimum of five days effluent from the plant, or approximately 10,000 m^3 (nominally 3 m deep x 60 m x 60 m). The pond will be lined with local, low permeability soil or a geomembrane. Water treatment will be based on lime addition to raise pH (near neutral to pH 9 – 9.5), followed by flocculent addition to remove precipitates. The alkaline precipitates will be added to the tailings discharge into the main TSF, which will also be alkaline (NAG material and alkaline plant reagents), which will ensure long-term chemical stability. A cyanide detox plant forms part of the process design described in Section 17. For purposes of the PEA, it is anticipated that a secondary water treatment plant will not be needed for surplus water from the planned CIL circuit. This will, however, be further assessed at the feasibility stage of project development.

A preliminary water budget for the project suggests near zero water balance once full production is reached. Most of the net accumulation of water will be stored in void spaces within the tailings volume. It is anticipated that a net of about 650,000 m^3/yr (0.22 L per second) of water will be treated and released. The water balance might be more negative in early years when a TSF pond will be developed. These estimates are based on an assumed mean annual net precipitation of 650 mm per year.

20.6 Water Management - Closure

Although the project will be constructed and operated to minimize post-closure requirements for water management, it is expected that some passive post-closure activities will be required (some of the waste and marginal grade material that will be mined and then stockpiled or will be PAG, as described in Sub-Section 20.1.3). The specific amounts and timings of PAG material disposal cannot be defined at this time. However, passive treatment in pit lakes involving sulphate reducing bacteria has been considered for other mines. Similarly, wetlands have been considered for surface and seepage water from tailings areas. These concepts will be applied to the Spectrum-GJ Cu-Au project, going forward.

As it may take some time after mine closure to fully develop the passive treatment systems, the site water treatment plant will remain fully functional until such time as it is determined to be no longer required. The reclamation and closure cost estimate presented in Section 20.11 includes a cost centre for post-closure, passive water treatment and monitoring.

20.7 Licensing and Permitting

20.7.1 Applicable Acts and Regulations

The Spectrum-GJ Project is subject to the B.C. Environmental Assessment Act ("B.C. EAA") and the Canadian Environmental Assessment Act ("CEAA") review process, which can be co-led by the B.C. Environmental Assessment Office ("EAO") and the Canadian Environmental Assessment Agency ("CEA Agency").

The B.C. EAA and accompanying regulations and guidance documents establish the over-arching regulatory framework for undertaking an EA in B.C. Within this framework, each project must assess its potential environmental, economic, social, heritage and health effects using project-specific scope, procedures and methods that are tailored specifically to the circumstances of the proposed project. This approach allows for each assessment to focus on key issues relevant to the project, when determining whether or not the project should proceed. The B.C. EAA is supported by the following regulations:

- Reviewable Projects Regulation (B.C. Reg. 370/2002), which establishes the criteria for determining whether proposed projects should be subject to the B.C. EAA;
- Prescribed Time Limits Regulation (B.C. Reg. 372/2002), which establishes time limits, in calendar days, for different stages of the assessment process –
  - Section 2 prescribes a 30-day time limit for screening of the Application by the Executive Director,
  - Section 3(a) establishes a 180-day period for the review of the Application, and
  - there is a 45-day time limit for making a decision after the Application has been referred to the Ministers;
- public Consultation Policy Regulation (B.C. Reg. 373/2002): applies to reviewable project under the B.C. EAA when a Section 10 Order has been issued (the regulation requires proponents to undertake a public consultation program, as well as provide a summary and evaluation of public consultation activities carried out during the assessment process);
- Concurrent Approval Regulation (B.C. Reg. 371/2002) allows proponents with a reviewable project undergoing assessment to apply for concurrent review and approval of eligible provincial authorizations which are needed to construct, operate, undertake and decommission a project; and
- Environmental Assessment Fee Regulation (B.C. Reg. 50/2014): came into force in April 2014 and requires project proponents and EAC holders to pay stipulated fees at certain times during the assessment process.

While the B.C. EAA prohibits issuance of provincial permits before an EA Certificate is issued, the Concurrent Approval Regulation (B.C. Reg. 371/2002) allows for parallel review of related provincial permit applications. This regulation applies to provincial permits, authorizations and approvals necessary to undertake works that are within the scope of the assessment under the B.C. EAA. Statutory permit approval processes are normally more specific than those required for the EA level of review, for certain permits require detailed and possibly final engineering design information. To be eligible for concurrent review, the approval must be required to construct, operate, modify, abandon, or otherwise undertake part of all the reviewable project that is the subject of the EA. The B.C. Major Mine Permitting Office typically leads the permitting process for major mines across B.C. This office works with proponents, First Nations and government technical advisors to coordinate multi-agency regulatory permits and implement the efficient and timely review of applications for new major mines and major expansion projects.

20.7.2 Regulatory Authorities

The B.C. EAO and the CEA Agency coordinate a project's review process by either entering into a substitution agreement, which allows the provincial process (see below) for a project to be substituted for the federal process, or working together to complete their project reviews. Substituted EA projects are carried out by the EAO and CEA Agency in accordance with a Memorandum of Understanding (EAO and CEA Agency, 2013), which establishes expectations, roles and procedures for implementing substituted EA review processes in B.C.. Under Section 32 of CEAA 2012, where there is an appropriate EA process in place to substitute the federal EA process, the Minister of the Environment must approve the substitution request.

Under substitution, B.C. EAO prepares an EA report for both B.C. and Canada. The respective federal and provincial ministers base their separate decisions on the single EA report as to the proposed project's significance of environmental effects, the sufficiency of Aboriginal consultation and whether to approve the project. Throughout both the provincial and federal processes, consultation and community engagement are required, along with clear documentation. A working group is formed once a project enters into the EA process, which is comprised of applicable provincial, federal, local government regulators and First Nations ofor the territory or territories the project potentially effect.

On approval, the project proponents receive an EA Certificate and a Federal Ministerial Decision on the significance of project and its cumulative effects. These come with enforceable conditions for mitigation and follow-up programs required to proceed with permitting.

20.7.3 Provincial Process

The B.C. EAA process and regulations apply to major projects, as defined by criteria contained in the B.C. EAA Reviewable Projects Regulation (B.C. Reg. 370/2002). New mineral mines that, during operations, will have a production capacity greater than 75,000 tpa, must obtain an EA Certificate. The Spectrum-GJ Project will have an annual plant throughput of between 3,650,000 tpa (at Stage 1) and 10,950,000 tpa (Stage 3).

The decision to issue an EA Certificate for a mining project is made by the Minister of Energy and Mines and by the Minister of Environment (the "Responsible Ministers"). In making their decision, the Responsible Ministers must consider the Assessment Report (prepared by the EAO) and any recommendations accompanying the Assessment Report, and may consider any other matters they consider relevant to the public interest. If the project is allowed to proceed, an EA Certificate is issued under Section 17(3) of the B.C.

EAA, with conditions applied to the certificate, as deemed necessary by the Responsible Ministers.

An EA Certificate is comprised of general provisions, a description of the physical works and activities of the project. It specifies a time limit by which a project must have substantially started, which is generally at least three years and not more than five years after the issue date of an EA Certificate, although the holder may apply for a one-time extension. Once the project has substantially started construction, the EA Certificate remains in effect for the life of the project, unless it is suspended or cancelled for breaches of the conditions. Proponents may apply to amend their EA Certificate as project circumstances change.

20.7.4 Federal Process

The Spectrum-GJ Project is also subject to federal EA requirements pursuant to CEAA 2012, which replaced the CEAA 1992 and its 2003 and 2010 amendments. The Regulations Designating Physical Activities (SOR/2012-147) identify thresholds for projects that may be subject to a federal EA process, as follows:

Section 16: The construction, operation, decommissioning and abandonment of a new:

- *a) Metal mine, other than a rare earth element mine or gold mine, with an ore production capacity of 3 000 t/day or more;*
- *b) Metal mill with an ore input capacity of 4 000 t/day or more;*
- *c) Rare earth element mine or gold mine, other than placer mine, with an ore production capacity of 600 t/day or more.*

If a project is described in the regulation (i.e. it is considered a Designated Project), a project description must be submitted to the CEA Agency or designated Responsible Authority for the purposes of determining whether a federal EA is required for the Designated Project. The project description is screened to determine if there are potential adverse effects in areas of federal jurisdiction under Section 5 of CEAA 2012. The project description must also be posted for public comment.

Once the CEA Agency reviews and approves the project description, there is a 45 day screening period, including a 20 day public comment period, to determine whether a federal EA for the project is required. If this is determined, an EA conducted by the CEA Agency must be completed within 365 days, which would include issuance of a federal EA Decision Statement by the Minister of the Environment as to approve or reject the EA for the project. Under CEAA 2012, the decision-maker considers the potential for the designated project to cause significant adverse environmental effects. If it is determined the designated project is likely to cause significant adverse environmental effects, then the Minister of the Environment must refer to the Governor in Council as to whether those effects are justified in circumstances.

If it is decided that the designated project is not likely to cause significant adverse environmental effects or the Governor in Council decides that the significant adverse environmental effects that the designated project are likely to cause are justified in the circumstances, then conditions must be set with which the proponent must comply. For this purpose, the Minister of the Environment issues an EA Decision Statement containing the conditions the proponent must meet, including any mitigation measures and/or follow-up programs. Federal authorities are prohibited from exercising any power or performing any duty or function that could permit a project to be carried out in whole or in part unless the EA Decision Statement indicates that the designated project is not likely to cause significant adverse environmental effects or that significant adverse environmental effects are justified in the circumstances.

20.7.5 Required Provincial Permits

Once a project proponent has received an EA Certificate, a number of authorizations, licenses and permits are required from provincial and federal government agencies, prior to construction and operation. Provincial permitting for a project can be pursued concurrently with the EA process, if the proponent chooses to so do. However, such permit approvals cannot be granted until after a provincial EA Certificate has been issued. Table 20.1 provides a list of provincial authorizations, licenses and permits that are anticipated to be required for the construction and / or operation of the Spectrum-GJ Project. The list is not intended to be exhaustive due to the complexity of government regulatory processes and the large number of minor permits, licences, approvals, consents, authorizations and potential amendments that would be required throughout the planned life of the Spectrum-GJ Cu-Au project.

Table 20.1 A Summary of Anticipated Provincial Authorization, License and Permit Requirements, Spectrum-GJ Cu-Au Project

Authorization	Statute	Authorized by
Environmental Assessment Certificate	Environmental Assessment Act (2002)	B.C. Ministry of Energy & Mines
Permit Approving the Work System and Reclamation Program	Mines Act (1996)	ditto
Explosives Storage and Use Permit	ditto	ditto
Mining Lease	Mineral Tenure Act (1996)	ditto
Air Emissions Discharge Permit	Environmental Management Act (2003)	B.C. Ministry of Environment
Effluent Discharge Permit	ditto	ditto
Fuel Storage Permit	ditto	ditto
Refuse Discharge Permit	ditto	ditto
Hazardous Waste Registration	Environmental Management Act (2003) Hazardous Waste Regulation (1988)	ditto
Sewage Permit; Municipal Effluent Discharge Registration	Environmental Management Act (2003) Municipal Sewage Regulation (1999) Municipal Wastewater Regulation (2012)	ditto
Special Waste Generator Identification	Environmental Management Act (2003) Hazardous Waste Regulation (1988)	ditto
Potable Water System Construction Permit	Drinking Water Protection Act (2001) Drinking Water Protection Regulation (2003)	B.C. Ministry of Health Northern Health Authority
Potable Water System Operation Permit	ditto	ditto
Food Premises Permit	Public Health Act (2008) Food Premises Regulation (1999)	ditto
Water Licence	Water Sustainability Act (2014) Water Sustainability Regulation (2016) Water Protection Act (1996)	B.C. Ministry of Forests, Lands and Natural Resource Operations
Approval or notification of "changes in and about a stream"	Water Sustainability Act (2016)	ditto
Groundwater Well Registration	Water Sustainability Act (2014) Groundwater Protection Regulation (2016)	ditto
Occupant Licence to Cut	Forest Act (1996)	ditto
Licence of Occupation	Land Act (1996)	ditto
Road Use Permit	Forest and Range Practices Act (2002) Forest Use Regulations (2009)	ditto
Special Use Permit	Forest and Range Practices Act (2002) Provincial Forest Use Regulation (1995)	ditto
Heritage Inspection Permit	Heritage Conservation Act (1996)	ditto
Burn Registration	Wildfire Act (2004)/Wildfire Regulation (2005)	ditto
Wildlife salvage and removal, general permit	Wildlife Act (1996)/Permit Regulation (2000)	ditto
Approval for oversized loads or bulk haul	Motor Vehicles Act (1996)	B.C. Ministry of Transport and Infrastructure
Controlled Access Permit	Transportation Act (2004)	ditto
Safety permits (various)	Safety Standards Act (2003)	B.C. Safety Authority

20.7.6 Required Federal Permits

To proceed to construction and in addition to the EA Decision Statement by the Minister of the Environment, the Project may also require the federal permit authorizations summarized on Table 20.3 and described in the subsequent footnotes.

Table 20.2 A Summary of Anticipated Federal Authorization, License and Permit Requirements, Spectrum-GJ Cu-Au Project

Authorization	Statute	Authorized by
Environmental Assessment Decision Statement	Canadian Environmental Assessment Act (2012)	Minister of the Environment
Explosives Factory Licence	Explosives Act (1985) Explosives Regulation (2013)	Natural Resources Canada
Explosives Magazine Licence	ditto	ditto
Radio Licence	Radiocommunication Act (1985)	Innovation, Science and Economic Development Canada

Fisheries Authorization

Fish and fish habitat are protected under the 1985 Act, as well as other federal Acts, regulations and principles. In 2012, the 1985 Act was amended to:

- legislate the federal government's direction to focus efforts on protecting the productivity of commercial, recreational and Aboriginal fisheries;
- institute enhanced compliance and protection tools that are more easily enforceable;
- provide clarity, certainty, and consistency of regulatory requirements; and
- enable/enhance partnerships with stakeholders.

The changes to the 1985 Act include a prohibition against causing serious harm to fish that are part of or support a commercial, recreational or Aboriginal fishery (Section 35 of the 1985 Act), provisions for flow and passage (Sections 20 and 21 of the 1985 Act), and a framework for regulatory decision-making (Sections 6 and 6.1 of the 1985 Act). Any project or activity that causes a serious harm to fish that are part of, or support, a commercial, recreational or Aboriginal fishery requires an authorization under Section 35(2) of the 1985 Act.

Metal Mining Effluent Regulation (MMER; SOR/2002-222)

The Metal Mining Effluent Regulation (the "MMER"; SOR/2002-22) is enacted under the 1985 Act and applies to all metal mines in Canada. These regulations impose effluent discharge limits for cyanide, arsenic, copper, lead, zinc, nickel, radium-226 and total suspended soils, as well as maximum and minimum pH levels. The regulations also prohibit the discharge of effluent that is acutely lethal to fish (rainbow trout). Under the regulations, proponents must conduct environmental effects monitoring programs to monitor and report on mine effluent quality, flows and the results of periodic effluent scans to identify adverse effects of mine effluent (if any) on fish, fish habitat and on the use of fisheries resources. Environmental effects monitoring studies include effluent characterization, receiving water quality monitoring, sub-lethal effluent toxicity tests, site characterization, fish population surveys, fish tissue analysis and benthic invertebrate community surveys.

Schedule 2 Amendment of the Metal Mining Effluent Regulation

Section 5(1)(a) of the MMER authorizes a proponent to deposit waste rock or effluent that contains any concentration of a deleterious substance into a tailing impoundment area that is listed as a waterbody set out in Schedule 2 – Tailings Impoundment Areas. An amendment to Schedule 2 of the MMER is required if a project intends to construct the tailing management facility and dispose of tailings in habitat or natural waterbody frequented by fish. Environment Canada administers the Schedule 2 Amendment process. Under Section 27.1 of the MMER, a Fish Habitat Compensation Plan is required to offset losses of fish habitat.

The Spectrum-GJ TMF is located within the upper tributaries of creeks draining northwest into Kakiddi Lake chain. Further baselines studies to support project feasibility and environmental assessment would include an assessment of fish habitat and identification of any present fish barriers to help inform whether a Schedule 2 Amendment and / or a Fisheries Authorization would be required for project development.

20.8 EA and Permitting Schedule

The EA process consists of two main stages: Pre-Application (including application development and evaluation); and Application Review (including application review and decision), followed by a Post Certification stage. Timeframes vary by project. However, a typical EA takes at least 16 to 20 months to complete (EAO, 2015).

An EA schedule is strongly influenced by the proponent’s timing in gathering and providing information necessary to conduct the assessment. The Pre-Application stage for B.C. mines typically, but not always, consists of two years of baseline studies and application development, but the schedule can vary. The Application Review stage has timeline restrictions of 180 days for EAO to complete its review and 45 days for the responsible ministers to make a decision whether to issue an EA Certificate for the project to proceed. Throughout the Pre-Application and Application Review stages, First Nation consultation is required to address First Nations concerns whose territories overlap the proposed project area. Figure 20.2 illustrates the key stages and components of the B.C. environmental assessment process and timeline periods (EAO 2017).

Figure 20.2 The B.C. Environmental Assessment Process

(copied from the Greenwood Report dated March 17, 2017)

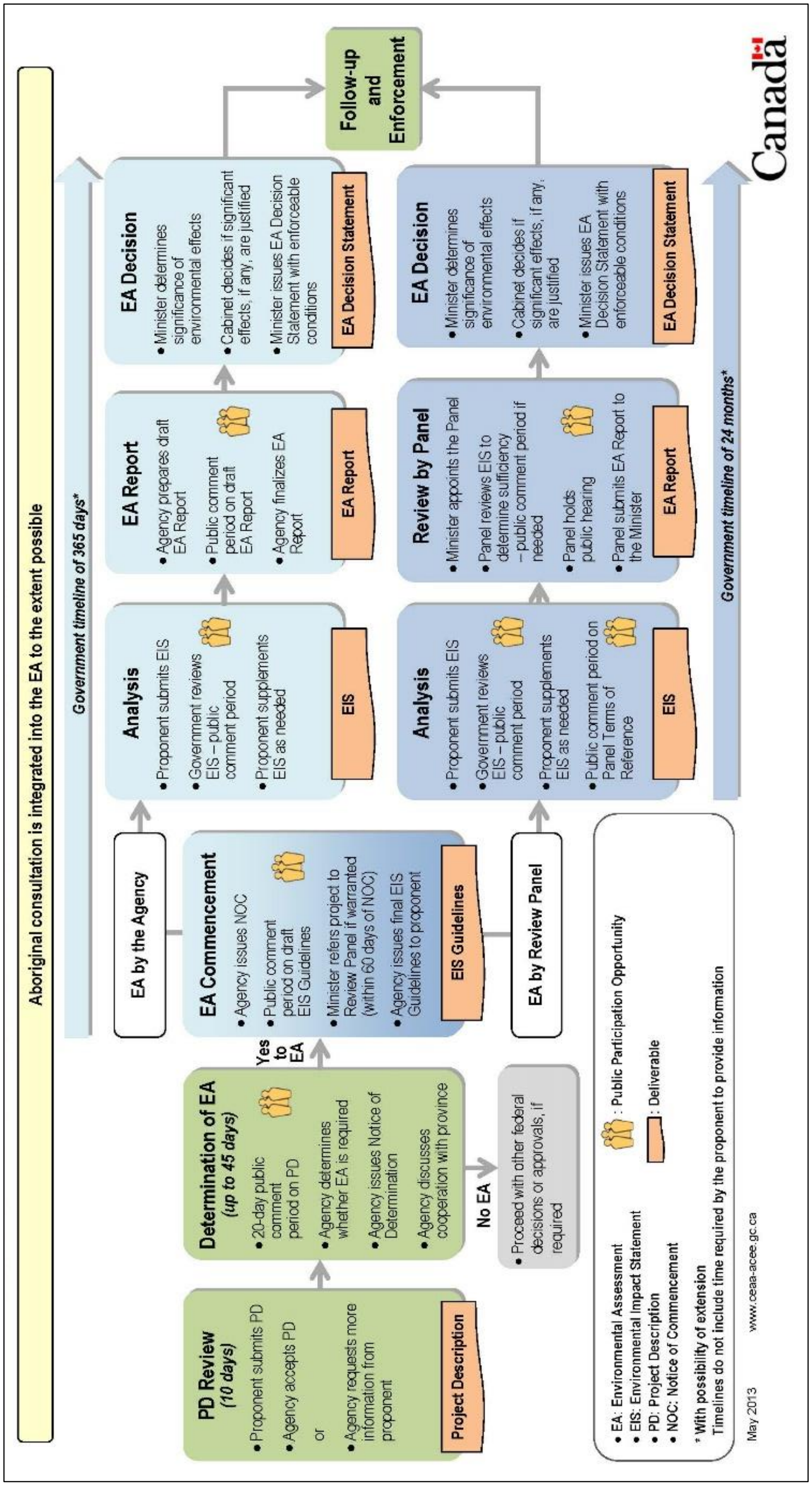
Source: Environmental Assessment Office (EAO). 2017. Environmental Assessment Roadmap. Available: http://www.eao.gov.bc.ca/ea_process.html

The Federal process, under CEAA 2012, has similar requirements and similar time restrictions to those described for the provincial process. The two processes run in parallel with the federal decision typically lagging behind the B.C. decision by three to six months. Figure 20.3 illustrates the key steps and processes of the federal EA process.

As previously stated, provincial permits can be developed concurrently and decisions made by government typically within six months of EA decisions. However, a higher level of detail is required for key permits to commence construction (Mines Act and Environmental Management Act [discharge] permits) and as such appropriate engineering must be available to support concurrent permitting.

In and of itself, the EA and permitting process takes approximately three to four years. There is opportunity to condense the schedule with the key factors being First Nation and community concerns and/or support of and for project, project complexity, level of engineering and availability of relevant and recent environmental baseline information.

Figure 20.3 The Federal Environmental Assessment Process



20.9 Environmental Management System and Plan

A conceptual Environmental Management System ("EMS") and an associated Environmental Management Plan ("EMP") for the Project will need to be developed. An EMS:

- is an integrated system that identifies shared mitigations among the many objectives and identifies key timelines in each project phase;
- defines the environmental approach through all phases of the Project, is based on avoidance, mitigation and management of effects identified and in consultation with regulators and First Nations;
- aims to organize and guide activities during all project phases to ensure safe, compliant, and environmentally and socially responsible operations.

The EMS for the Project could be constructed in a way that includes: an organizational structure and reporting structure; the assignment of responsibilities; communication protocols; company policies; methods to evaluate environmental practices, procedure, and processes; and resource allocation.

A high-level framework supporting each EMP is required in the B.C. Mines Act Permit. EMPs include the detailed goals, objectives and procedures for the protection of worker health and safety, environmental monitoring and operating procedures that show the regulatory agencies how legislation and regulations will be met for the Project. They are applied during each project stage that may be summarized as planning, construction, operation, closure and post-closure. They detail environmental protection measures to mitigate potential environmental effects and include the environmental practices and procedures to be applied during each phase of the Project.

EMPs are developed to be site-specific and to ensure that necessary measures are identified and implemented to protect the environment and comply with environmental legislation. They include legislative requirements, policies, best management practices, committed mitigation measures, monitoring and reporting commitments. EMPs may include, but are not limited to the flowing plans that are not listed in any particular order of importance:

- Surface Water and Groundwater Management and Monitoring;
- Rock Storage Facility and Waste Management and Monitoring;
- Metal Leaching and Acid Rock Drainage Management;
- Dangerous Goods and Hazardous Materials Management;
- Fish and Aquatic Habitat Management;
- Wildlife Management and Monitoring;
- Vegetation and Wetland Management;
- Sediment and Erosion Control;
- Noise Management;
- Air Quality Management and Monitoring;
- Emergency and Spill Response;
- Archaeological and Cultural Resources Management; and
- Transportation, Traffic and Access Management.

20.10 Economic, Social and Cultural Setting and Studies

Federal, provincial, regional, municipal and Aboriginal community governance occurs in the Project Area and surrounding vicinity. The Project Area lies within the Regional District of Kitimat-Stikine. District of Stewart, the City of Terrace and the Town of Smithers are the closest communities with municipal governance, but they are far removed from the Project Area. The non-Aboriginal bodies that are unincorporated and are governed by the regional district in which they are situated include Dease Lake, South Hazelton, Bell II, Meziadin Junction and Bob Quinn Lake.

The base level of governance for Aboriginal communities is the Nation or Band. Five Tahltan communities apply or may apply to the Project, including Telegraph Creek 6 and 6A, Guhthe Tah 12, Dease Lake 9 and Iskut 6. The Tahltan Reserve No. 9 is located at Dease Lake. It is established in Section 4.9 that Tahltan governance is administered through the band system under the Federal Indian Act (1985), with an elected chief and council who oversee the daily social and economic affairs of the community. The Tahltan Nation is comprised of two bands, the Iskut First Nation and the Tahltan Band (B.C. MARR 2017). The TCG represents the two bands and is governed by an Executive Committee and a Board of Directors comprised of family representatives, with an Elders Advisory Council providing guidance. THREAT represents the TCG on matters related to consultation and engagement with resource development.

20.10.1 Socio-Economic Setting

According to B.C. MOE (2017), regional population sizes have decreased in northwest B.C., of which the Stikine has had the largest recent decrease – the 2015 population was half of what it was in 1986. Smithers and Terrace provide supplies and services to the majority of the remote region in which the Project Area is located. Communities are scattered and the region’s economic and social growths have been limited due to poor infrastructure and access, as well as the cold climate hosting long winters.

Northwest B.C. has a history of depending on natural resources, especially forestry, mining and fishing, as its main economic drivers. For example, the regional mining industry is a source of employment for a significant number of Smithers and Terrace residents and, in recent years, it has provided approximately 30% of the jobs available for communities along Highway 37 (Tetra Tech 2016). However, the economy in northwest B.C. is becoming ever-more diversified with new industries being developed (for example hydroelectric power generation). In addition, employment levels have increased in the public service, sales and service, tourism, transportation (Highways 16, 37 and 37A are the primary transportation corridors in the northwest) and mineral exploration sectors.

It may be anticipated that the Spectrum-GJ Cu-Au Project will provide economic benefits to the local communities through direct and indirect employment opportunities. The overall local economic impacts are likely to be beneficial, as will the benefits to the northern region and B.C. as a whole. The benefits accrue from employee incomes, Company expenditures, as well as contributions to potential annual government revenues from property tax, royalties, licensing fees and income tax.

No Project-specific socio-economic baseline studies have been conducted to date. Baseline studies will be needed and will include consultation with the Tahltan Nation, local communities and government. The Tahltan Social Cultural Working Committee will be consulted for socio-cultural assessment inputs. Health Canada will be consulted to determine health concerns and information. Data collection, including field interviews, will be needed to obtain information on governance, population and demographics, economy and employment, health, education, social issues, culture and community services and infrastructure.

20.10.2 Aboriginal Groups

In 2006, approximately 32% of the Regional District of Kitimat-Stikine's population was reportedly Aboriginal (Tetra Tech 2016). It is established in Section 4.9 that indigenous people have a physical, cultural and historical presence within the Project Area and surrounding region.

The forestry and fishing industries have declined since the 1980s and have negatively impacted Aboriginal communities. However, the current socio-economic setting of the region's Aboriginal communities is starting to improve due to opportunities provided by the mineral industry and tourism in particular (Tetra Tech 2016). The Company is keenly aware of its responsibilities in these regards and, as stated in Section 4.9, it has committed to work closely with the TCG, with its agencies and with Tahltan Nation-owned businesses to identify and maximize employment and contracting opportunities arising from its mineral exploration and project development activities.

20.11 Reclamation and Closure Costs

Rehabilitation and reclamation of ground disturbances caused during the Company's field exploration programs are detailed in Section 4.7. Preliminary reclamation and closure plans and related cost estimates have been developed for the Spectrum-GJ Cu-Au Project, by QP Brodie, based mainly on knowledge and experience of similar operations in B.C. Preliminary reclamation and closure plans and costs were separately estimated for:

- Spectrum and Donnelly Pits, including bulkheads in the planned drifts, removal of infrastructure from the pits and from underground, in-pit water treatment and road closure;
- waste dumps and stockpiles, including closure of the dam and spillway at the planned Spectrum PAG waste rock dump, recontouring the NAG waste dump at Donnelly Pit and shoving the remaining PAG, marginal grade material back into the pit using existing mine equipment (at a rate of C$1.00/t, although for purposes of bonding, the Company acknowledges that a contractor rate might be applied);
- closure of the TSF spillway and dam, decommissioning the by-pass ditches and the removal of any access roads;
- hazardous waste and contaminated soils' removal from the SIA and MIA, demolition of buildings and the removal of temporary structures, rehabilitation of the access roads and bridges, and revegetation;
- mobilization and demobilization of contractors, engineering and project management at 5% each of the estimated costs, interim care and maintenance and an overall 25% cost contingency; and
- water management and post-closure costs, the latter including environmental monitoring, dam safety inspections/reviews and maintenance of spillways and wetlands.

The overall estimated total cost for planned mine life is C$56.23 million, inclusive of indirects and a 25% contingency. For purposes of cashflow modelling, reclamation and closure costs report to G&A, with 15% of the total estimated cost for each cost centre notionally paid as a bond in Year 1 (Year 6 in the case of the Spectrum Pit), with the balance apportioned pro-rata over the remaining mine life (24 years in the case of Donnelly Pit and 5 years in the case of Spectrum Pit).

21 CAPITAL AND OPERATING COSTS

The Principal Author and Scott Britton, C. Eng. (the "Co-Authors") are responsible for this section of this Technical Report, along with Christopher Martin, C. Eng. ("QP Martin"), who is responsible for the capital and operating cost estimates for the processing plant, inclusive of the plant personnel complements. The TSF, related infrastructure and waste rock dam cost estimates were compiled from information supplied by M. John Brodie, P. Eng. Overall, the estimates are intended to be at the Class 4 level, as defined by AACE, with an expected accuracy range of Low: -15% to -30% and High: +20% to +50%.

21.1 Capital Costs

Capital costs have been estimated in Q1, 2017 US dollars and do not include allowances for escalation or exchange rate fluctuations. A base case exchange rate of C$1.0 = US$0.75, as defined in Section 19.2, was applied. Table 21.1 provides a summary of the overall estimated capital costs by cost centre; Figure 21.1 summarizes the capital expenditures by production year. The amounts include contingencies and capital indirects.

Table 21.1 A Summary of Estimated Capital Costs (C$, inclusive of contingencies), Spectrum-GJ Cu-Au Project

Cost Centre	Pre-Production	Sustaining	Total
General Infrastructure & Buildings	C$ 69.56	C$ 34.80	C$ 104.36
Tailings Storage Facility	C$ 6.72	C$ 52.52	C$ 59.25
Donnelly Pit (incl. equipment)	C$ 35.13	C$ 107.76	C$ 142.89
Spectrum Pit (incl. equipment)	-	C$ 26.82	C$ 26.82
Processing Plant	C$ 66.50	C$ 103.31	C$ 169.81
Capital Indirects	C$ 38.13	C$ 36.94	C$ 75.07
Totals	***C$ 216.05***	***C$ 362.15***	***C$ 578.20***

Notes: The capital cost estimates are inclusive of contingencies. Totals may not add up due to rounding.

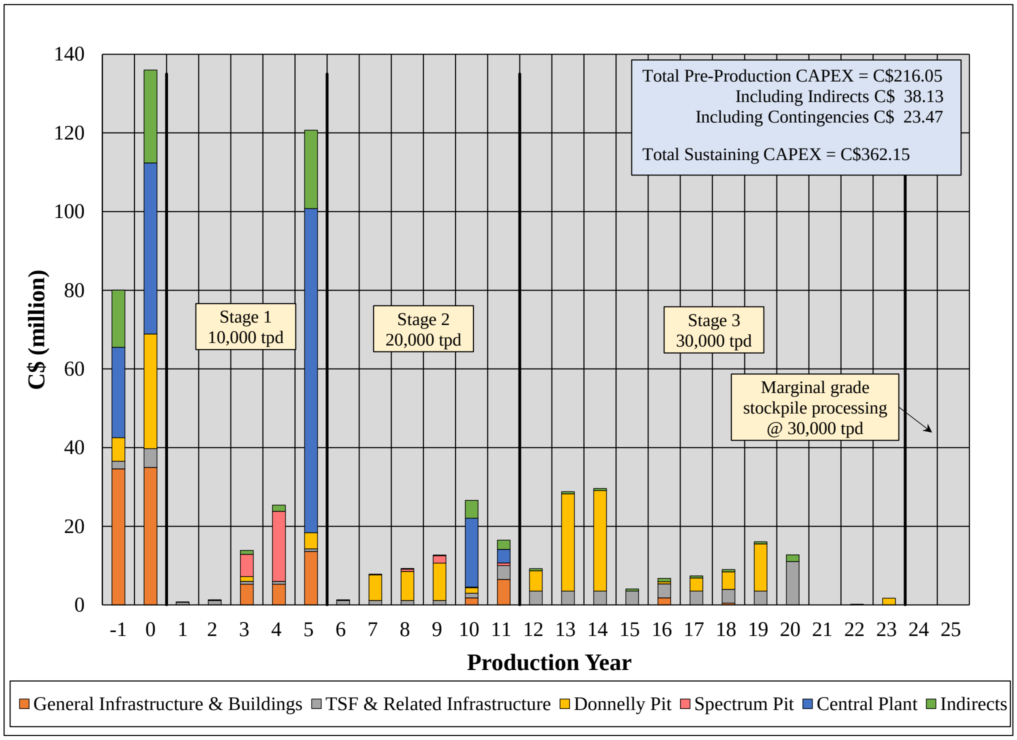
It should be emphasized that the low pre-production capital requirement (C$216.05 million) reflects one of the benefits of the phased approach adopted as regards project development: significant capital can be and has been deferred to the benefit of project economics. This has in part been achieved through a planning process that encompassed considerations of the types of practical, physical and operational risks that are inherent to any new, start-up operation (a wealth of global mining experience shows that lengthy lead times are invariably required before such risks can be overcome and optimal results can routinely and sustainably be achieved, especially with greenfield projects). Key elements of capital deferral include:

- production from Spectrum Pit to Year 6, hence the related capital costs for SIA access, pit infrastructure and production equipment (C$26.82, including contingencies but not capital indirects) to Years 3 through 5, as appropriate –
  - metallurgical testwork showed that gold recovery by flotation was poor for high (gold) grade material from Spectrum Pit (i.e. the material targeted for early extraction, per the discussions of Section 16), due to the low copper grades of such material, whereas

- ○ good gold recovery was achieved when co-mingled with material from Donnelly Pit, due to the comparatively higher copper grade that generates a strong froth on flotation that facilitates good gold recovery;

- the SAG mill to Year 5, as described in Section 17.6; and
- the CIL plant to Year 5 - preliminary analysis of potential financial outcomes showed that the amount of gold captured from ROM material from Donnelly Pit in Years 1 through 5 was insufficient to justify the capital cost of the CIL plant, which outcome was reversed when Spectrum Pit came on-line in Year 6, due to the comparatively much higher gold grades in the planned ROM feed from Spectrum Pit.

Figure 21.1 A Summary of Capital Expenditures by Production Year (C$), Spectrum-GJ Cu-Au Project



21.1.1 Direct Capital Costs

Direct capital costs total C$503.13 million over the planned life of the project, inclusive of contingencies. The estimates were compiled using a variety of sources, including:

- vendor and contractor quotes for the planned camp, road construction, bridges and culverts, muck handling belts and plant equipment;
- industry sources, benchmarked to information contained in public domain documents and reports for projects similar in nature and size to the planned Spectrum-GJ project, for the powerline, Northwest Transmission Line take-off substation, site sub-station and distribution system;

- InfoMine's 2016 CostMine models, benchmarked to information contained in public domain documents and reports for similar projects and backed by knowledge and experience of the Co-Authors, for mining equipment, underground development and buildings; and
- knowledge and experience of QP Brodie, benchmarked to information contained in public domain documents and reports for similar projects, for the TSF, by-pass ditches, water treatment plant, spillway, polishing pond and Spectrum waste rock dams.

Details of the production equipment, pit infrastructure and pre-strip quantities are presented in Section 16, details of the capital schedule for plant equipment are presented in Section 17 and details of the infrastructure elements are presented in Section 18. Maintenance shop tools were estimated at 3% of total equipment cost.

21.1.2 Sustaining Capital

Other than the deferred direct capital costs outlined and the year-on-year cost of raising the TSF dam, as described in Section 18.5, the sustaining capital amounts centre around production, support and surface mining equipment rebuilds and replacement purchases. A rebuild and replacement schedule was developed for purposes of cost estimation, taking into account the staged increases in plant throughput, hence changing size and/or capacity requirements for major mining equipment such as shovels and trucks. For purposes of analysis it was assumed that:

- major mining equipment would run for an average of 8,000 hours per annum for five years, after which equipment rebuilds would be required at 40% of the original capital cost, following which the equipment would be good for another two to three years before being scrapped;
- other mining equipment and surface equipment would run for an average of 6,000 hours per annum for seven years, after which equipment rebuilds would be required at 40% of the original capital cost, following which the equipment would be good for another three years before being scrapped.

Scrap values were not included in analysis, on the basis that any residual value would be off-set by the cost of removing the equipment from site.

21.1.3 Indirect Capital Costs

Indirect capital costs total C$75.07 million over the life of the Spectrum-GJ project. The estimates include:

- consultants' fees and start-up commissioning (pre-production only, with the estimates based on the QPs knowledge and experience, bench-marked to information contained in public domain documents and reports for projects similar in nature and size to the planned Spectrum-GJ project;
- EPCM at 10.5% of all direct capital costs, except for mine pre-production capital, mine production equipment and support equipment;
- construction indirects at 50% of the EPCM estimates;

- capital spares at 1.5 months of Y1 operating costs; and
- freight at 7.5% of equipment and material costs, except for mining equipment.

21.1.4 Contingencies

Contingencies were applied to all direct capital cost estimates, at rates that reflect the level of uncertainty of the estimate. Where vendor or contractor quotes were secured or costs were estimated using InfoMine's 2016 CostMine models, 15% contingencies were applied. 25% contingencies were applied where experience-based and bench-marked estimates were used. The one exception was Spectrum Pit infrastructure – for the reasons described in Section 16.5, a contingency of 20% was applied.

21.2 Operating Costs

Operating costs have been estimated in Q1, 2017 US dollars and do not include allowances for escalation or exchange rate fluctuations. A base case exchange rate of C$1.0 = US$0.75, as defined in Section 19.2, was applied.

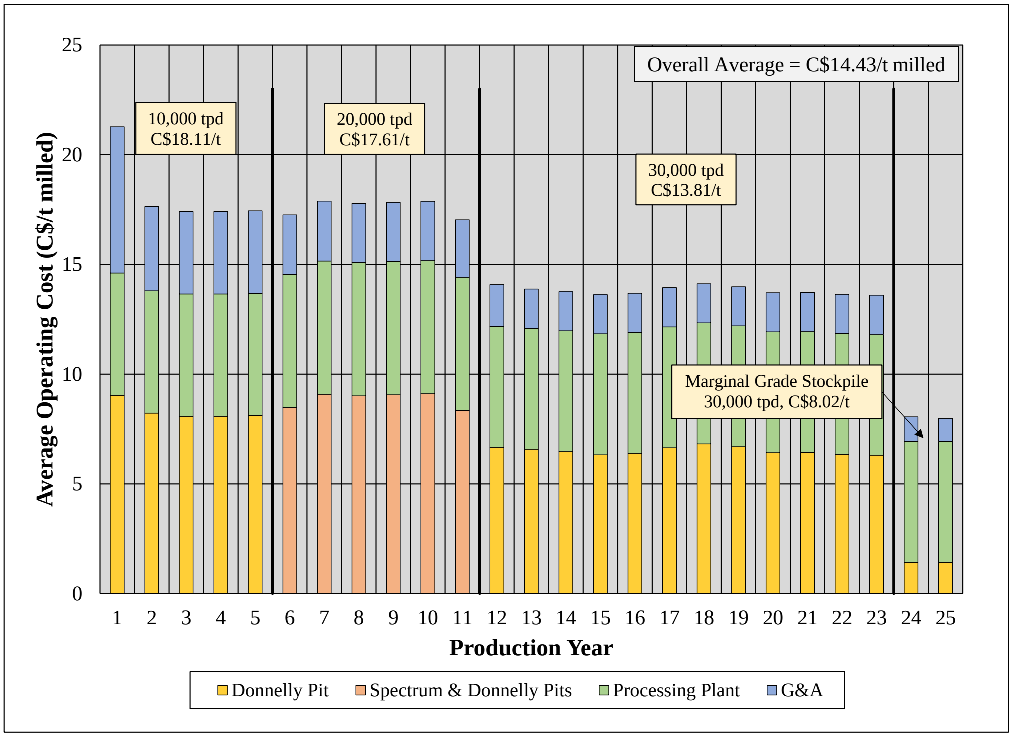
Operating costs were separately compiled for the planned openpits, central processing plant and general and administrative ("G&A"). Table 21.2 summarizes the estimated unit operating costs by area; Figure 21.2 summarizes the estimated operating costs by production year. The Stage 2 (20,000 tpd) operating cost estimates include Spectrum Pit contributing an average of 5,000 tpd of plant feed over six years. The G&A costs include reclamation and closure of Spectrum Pit, Donnelly Pit and all related infrastructure. An estimate of the Company's head office cost is included on Table 21.2, although it was modelled as a separate drawdown cost from cashflow. The estimated overall, life-of-mine and on-site operating cost is C$14.34 / t milled.

Table 21.2 A Summary of Average Unit Operating Costs (C$ per tonne milled) By Production Stage, Spectrum-GJ Cu-Au Project

Cost Centre	**Stage 1 (10,000 tpd)**	**Stage 2 (20,000 tpd)**	**Stage 3 (30,000 tpd)**	**Post-Production (30,000 tpd)**
Spectrum & Donnelly Pits	-	C$ 8.85	-	-
Donnelly Pit	C$ 8.28	-	C$ 6.51	C$ 1.42
Processing Plant	C$ 5.57	C$ 6.07	C$ 5.51	C$ 5.51
G&A	C$ 4.26	C$ 2.69	C$ 1.79	C$ 1.09
Overall Unit Cost / t milled	***C$ 18.11***	***C$ 17.61***	***C$ 13.81***	***C$ 8.02***
Head Office Costs	C$ 0.83	C$ 0.30	C$ 0.26	C$ 0.26

Notes: The Post-Production stage is when 21.99 Mt of marginal grade material from the Donnelly pit is processed at a rate of 30,000 tpd. Reclamation and closure costs (reporting to G&A) include a 25% contingency.

Figure 21.2 A Summary of Operating Costs (C$) by Production Year, Spectrum-GJ Cu-Au Project



21.2.1 Personnel Complements and Costs

G&A complements were estimated by production rate and included operations management and support staff (human resources, IT, accountants, purchasing and expediting, clerks, secretaries and security), senior mine and plant management, and technical services. Shift and maintenance foreman were included with the operating costs for the planned openpits and central processing plant.

The complements of hourly paid mine and mine maintenance personnel were estimated from consideration of the required mine and support equipment fleets, by production rate. The complements of hourly paid plant and plant maintenance personnel were estimated from consideration of the process flows, by production rate. In both cases general surface labour was included in the estimates that were based on the assumption of a two-week-on, two-week-off crew rotation and 12 hour shifts, 365 days a year. Table 21.3 summarizes the estimated personnel complements.

Table 21.3 A Summary of Personnel Complements by Production Rate, Spectrum-GJ Cu-Au Project

Cost Centre	Stage 1 (10,000 tpd)	Stage 2 (20,000 tpd)	Stage 3 (30,000 tpd)	Post-Production (30,000 tpd)
Donnelly Pit	64	97	127	47
Spectrum Pit	-	46	-	-
Processing Plant	74	86	90	90
G&A	37	58	64	31
Overall Complements	***175***	***287***	***281***	***168***

Notes: The Post-Production stage is when 21.99 Mt of marginal grade material from the Donnelly pit is processed at a rate of 30,000 tpd.

Remuneration rates for salaried and hourly paid personnel were based on a balance between the Co-Authors' and QP Martin's knowledge and experience of similar operations located in B.C., remuneration rates detailed in InfoMine's 2016 CostMine models and data for similar projects contained in public domain documents and reports. An average burden rate of 30% was applied to the estimated base remuneration rates, thereby to include all statutory Canadian and B.C. social insurance, medical and insurance costs, pension and vacation costs, but not camp and travel costs that were separately estimated.

21.2.2 Mining Costs

Apart from personnel costs, mining cost estimation included considerations of drilling, blasting, mucking (to the tipping points at the pit rims), hauling and dumping (ROM material and waste, from the bottom of the planned ROM materials passes, as appropriate and described in Section 16), stockpile maintenance (at Donnelly only), geotechnical (slope stability), pumping, equipment operation and maintenance. Site and buildings maintenance and office consumables were included in the Spectrum Pit cost estimate. For Donnelly Pit, the same costs were included in the G&A cost estimate due to the location of the offices in the main administration block at the MIA.

Blasting costs were estimated from first principles assuming powder factors of 0.33 kg/t for ROM plant feed, 0.29 kg/t for marginal material and waste, and a 70:30 mix of ANFO and emulsion blasting agents. Unit costs for blasting consumables were based on vendor information and data contained in InfoMine's 2016 CostMine models. In the case of the Spectrum Pit operations, diesel generated power was assumed with a unit diesel cost of C$1.00 /litre. The Spectrum Pit cost estimate also included the estimated cost of hauling ROM plant feed by B-Train type trucks over 11 km to the central processing plant located at the MIA. Table 21.4 summarizes the annual and unit costs for each stage of production throughput.

Table 21.4 A Summary of Average Mining Costs (C$), Spectrum-GJ Cu-Au Project

Cost Centre	Stage 1 (10,000 tpd)		Stage 2 (20,000 tpd)		Stage 3 (30,000 tpd)		Post-Production (30,000 tpd)	
	Annual Cost	Unit Cost	Annual Cost	Unit Cost	Annual Cost	Unit Cost	Annual Cost	Unit Cost
Mine Personnel	C$12.77M	C$3.66/t	C$27.81M	C$3.81/t	C$25.29M	C$2.31/t	C$ 9.03M	C$0.82/t
Drilling & Blasting Supplies	C$ 3.96M	C$1.26/t	C$ 8.69M	C$1.19/t	C$10.84M	C$0.99/t	-	-
Equipment Operation	C$ 8.38M	C$2.40/t	C$16.64M	C$2.28/t	C$17.52M	C$1.60/t	C$ 6.57M	C$0.60/t
Other	C$ 3.77M	C$1.08/t	C$11.46M	C$1.57/t	C$17.63M	C$1.61/t	-	-
Overall Costs	***C$28.88M***	***C$8.28/t***	***C$64.61M***	***C$8.85/t***	***C$71.28M***	***C$6.51/t***	***C$15.60M***	***C$1.42/t***

Notes: Totals might not add up due to rounding

21.2.3 Processing Costs

Average annual costs and unit costs for the central processing plant by production throughput are summarized on Table 21.5. The cost estimates include considerations of the planned flotation, gravity, CIL and doré circuits and facilities, inclusive of estimate reagent consumption rates and maintenance. Unit rates for power costs are based on current knowledge of rates in the area, some earlier meetings with BC Hydro in British Columbia and recent estimates from other developing operations in the area. A rate of $0.050/kWh is used. Power costs are based on the unit rates for power and the electrical load analysis developed for the project. The Stage 2 (20,000 tpd) and Stage 3 (30,000 tpd) costs include the planned CIL circuit that, during Stage 2, is estimated to cost C$1.17/t milled, reducing to C$1.07/t milled during Stage 3. For purposes of cashflow modelling, fixed costs included labour, 25% of the estimated power cost and maintenance. Variable costs include all consumables and 75% of the estimated power cost.

Table 21.5 A Summary of Plant Operating Costs (C$), Spectrum-GJ Cu-Au Project

Cost Centre	Stage 1 (10,000 tpd)	Stage 2 (20,000 tpd)	Stage 3 (30,000 tpd)	Post-Production (30,000 tpd)
	Unit Costs (C$/t milled)			
Plant Personnel	1.67	1.26	0.87	0.87
Consumables	1.86	2.58	2.64	2.64
Power	1.60	1.73	1.61	1.61
Maintenance Supplies	0.44	0.50	0.39	0.39
Overall Costs	***5.57***	***6.07***	***5.51***	***5.51***

21.2.4 General and Administrative Costs

Table 21.6 summarizes the G&A cost centres and related cost estimates, not including Reclamation and Closure Costs that are considered separately in Sub-Section 21.4.5. Unit costs are in Canadian dollars per tonne milled.

Table 21.6 A Summary of G&A Operating Costs (C$), Spectrum-GJ Cu-Au Project

Cost Centre	Stage 1 (10,000 tpd)		Stage 2 (20,000 tpd)		Stage 3 (30,000 tpd)		Post-Production (30,000 tpd)	
	Annual Cost (C$M)	Unit Cost ($/t)	Annual Cost (C$M)	Unit Cost ($/t)	Annual Cost (C$M)	Unit Cost ($/t)	Annual Cost (C$M)	Unit Cost ($/t)
Personnel	3.79	1.04	5.75	0.79	6.34	0.58	3.11	0.28
Consumables	0.57	0.16	0.86	0.12	0.95	0.09	0.47	0.04
Communications	0.08	0.02	0.08	0.01	0.75	0.01	0.04	0.00
Camp Costs	3.69	1.01	6.05	0.83	5.92	0.54	3.54	0.32
Transport (flights & bus)	0.87	0.24	1.43	0.20	1.40	0.13	0.84	0.08
Community & Environment	0.67	0.18	0.67	0.09	0.67	0.06	0.33	0.03
Legal, Permits & Fees	0.17	0.05	0.17	0.02	0.17	0.02	0.17	0.02
Insurance	0.20	0.05	0.20	0.03	0.20	0.02	0.20	0.02
First Aid & Fire Prevention	0.10	0.03	0.10	0.01	0.10	0.01	0.10	0.01
Training & Safety	0.13	0.05	0.20	0.03	0.23	0.02	0.00	0.00
Recruiting	0.10	0.03	0.11	0.02	0.13	0.01	0.00	0.00
Road & Powerline Maintenance	1.20	0.33	1.20	0.16	1.20	0.11	0.60	0.05
Geotechnical Oversight of TSF	0.12	0.03	0.12	0.02	0.12	0.01	0.12	0.01
Water Treatment Plant	0.18	0.05	0.18	0.03	0.18	0.02	0.18	0.02
Overall Costs	***11.90***	***3.26***	***17.12***	***2.35***	***17.70***	***1.62***	***9.70***	***0.89***

Notes: Totals might not add up due to rounding. Totals do not include Reclamation & Closure costs that report to G&A in the project cashflow model.

Consumables were assumed to equal 15% of the estimated personnel cost. Communication expenses includes monthly fees for landline and mobile telephone services, satellite transmission services and Internet services, based on an annual allowance estimated from experience with similar operations and bench-marked to similar operations for which public domain documents and reports are available. All-in camp costs were based on a contractor quote of C$55/person/day for personnel at site, plus a 5% personnel contingency. An allowance for Community & Environment was assumed for costs associated with public disclosure and information programs, assistance programs for communities and other related programs, as well as for costs associated with quality sampling and monitoring, analysis of surface and groundwater, and surface flow measurements. All other G&A costs were estimated from knowledge and experience of similar operations, bench-marked to similar operations for which public domain documents and reports are available.

22 ECONOMIC ANALYSIS

The QPs for this section of this Technical Report are the Principal Author and Scott A. Britton, C. Eng. (the "Co-Authors"). Pre- and post-tax models were compiled from linked, year-on-year spreadsheet analyses of the production profiles, metal production (ex. the central processing plant), payable metal, capital expenditures ("CAPEX"), operating cost expenditures ("OPEX"), cashflow and taxes. The model was compiled by Graham Wood of XFRM Canada of New Westminster, B.C. The tax model was compiled by Andrew MacRitchie, CPA, CA, Chief Financial Officer and Corporate Secretary of the Company, and reviewed by the Principal Author.

The results represent forward-looking information that is subject to several of known and unknown risks, uncertainties and other factors that may cause actual results to differ materially from those presented here. Forward-looking information includes Mineral Resource estimates, commodity prices and exchange rates, the proposed mine production plans, projected recovery rates, mine infrastructure costs, general infrastructure costs, the use of the deep water Port of Stewart and that the required permits will be secured.

22.1 Methodology

Financial analysis of the Spectrum-GJ Cu-Au Project was carried out using a discounted cashflow ("DCF") approach. This method of valuation requires projecting yearly cash inflows (or revenues) and subtracting yearly cash outflows such as operating costs, capital costs, royalties and taxes. The resulting net annual cashflows are discounted back to the date of valuation and totalled to thereby determine the NPV of the project, at selected discount rates. The internal rate of return ("IRR") is expressed as the discount rate that yields a zero NPV. Payback periods are the time, in years, calculated from the start of significant project cashflows until all the initial CAPEX have been recovered. In the case of the cashflow models presented here, the term initial CAPEX means pre-production CAPEX only (i.e. that spent in Production Years -1 and 0, to enable production to start in Year 1).

Sensitivities to variations in OPEX, CAPEX, the US$ to C$ exchange rate and nested metal prices (for copper, plus gold and silver) are presented. All monetary amounts are presented in Canadian dollars ("C$"). For purposes of discounting, cashflows are assumed to occur at the end of each period. NPV calculations were adjusted so as to make the project start in Production Year 1, to which a calendar year has not been attributed. The project cashflow models do not include considerations of interest or equipment scrap values, the latter on the assumption that the residual value of any equipment will be offset by the cost of removing scrapped equipment from site.

22.2 Model Parameters

The following parameters, which are not repeated here, were used for purposes of DCF modelling:

- the NSR royalties and government taxes detailed in Section 4;
- the metallurgical forecast and the process ramp-up profiles detailed in Section 13;
- the production schedules for the Donnelly and Spectrum Pits detailed in Section 16;
- the metal prices, discount rates, smelting and refining terms and factors, and the haulage, port charges, ocean freight charges and costs detailed in Section 19;
- the reclamation and closure costs detailed in Section 20; and

- the operating costs and the direct and indirect capital costs (pre-production and sustaining) detailed in Section 21.

22.3 Payable Metal

Figures 22.1 through 22.3 summarize the payable metal produced over the three stages of plant throughput and when stockpiled, marginal grade material is processed at the end of the mine life. It may be seen that nearly a billion pounds of payable copper are produced over the project's life, along with 1.61 Moz of payable gold and 7.54 Moz of payable silver.

Figure 22.1 Payable Copper by Production Year, Spectrum-GJ Cu-Au Project

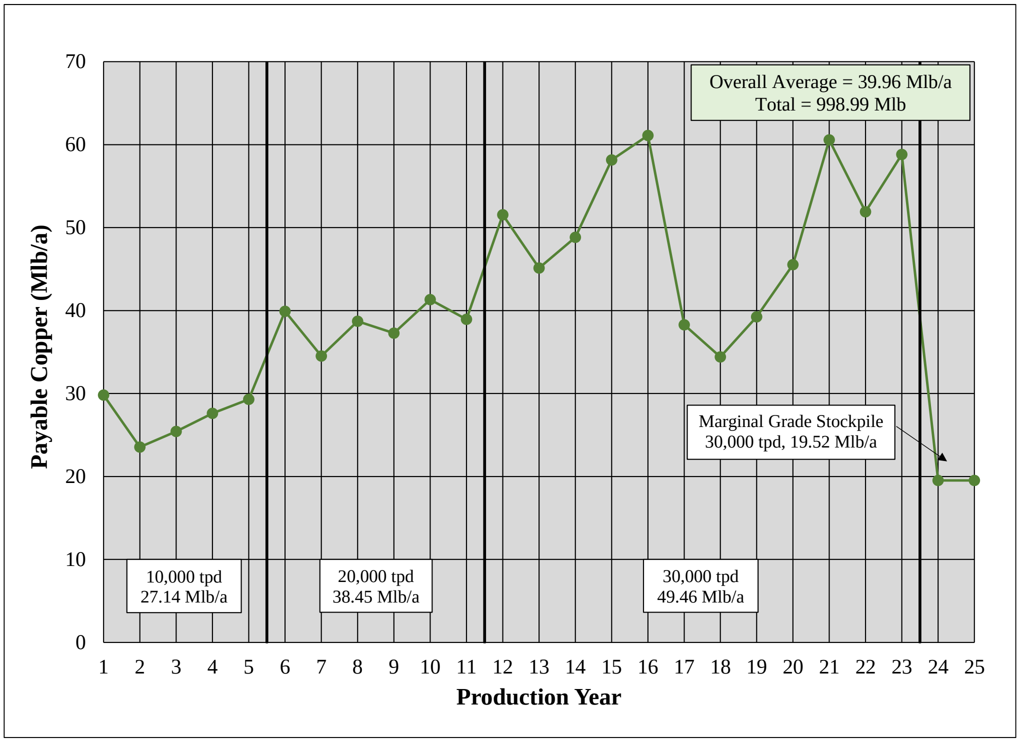


Figure 22.2 Payable Gold by Production Year, Spectrum-GJ Cu-Au Project

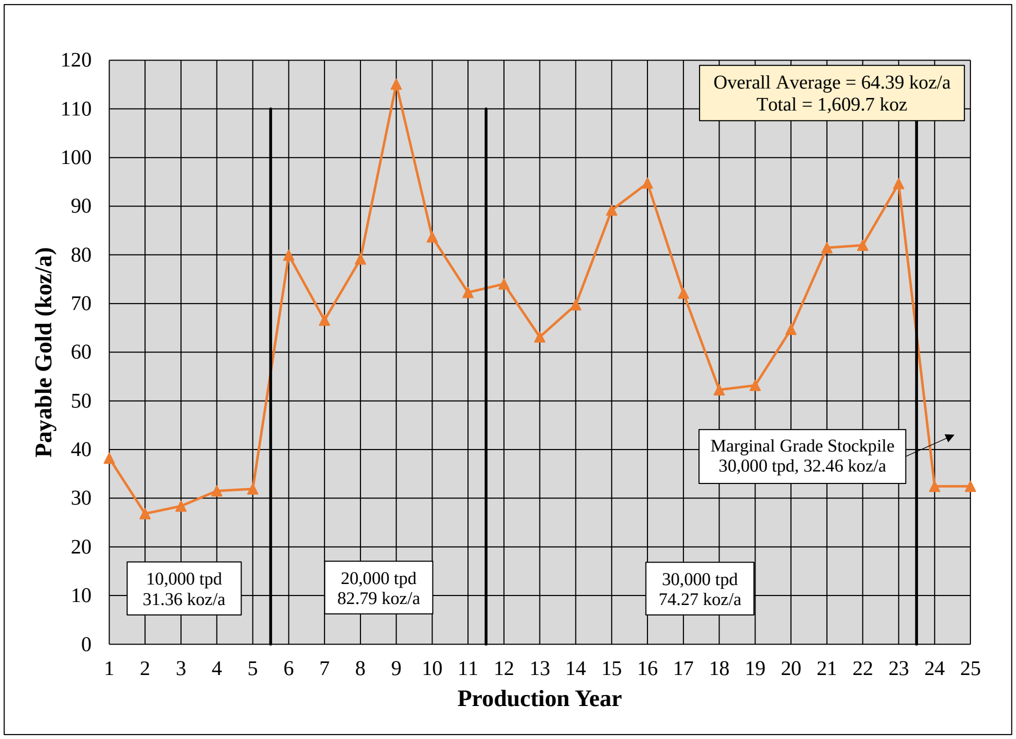
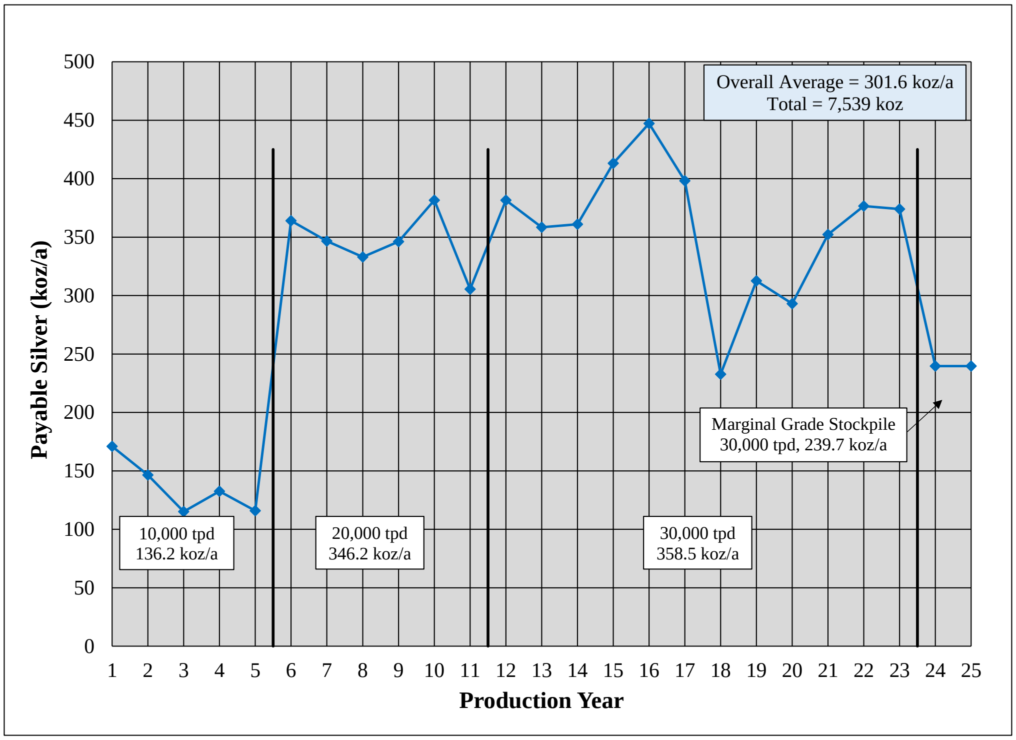


Figure 22.3 Payable Silver by Production Year, Spectrum-GJ Cu-Au Project



22.4 Cash Costs and All-In Costs

Table 22.1 summarizes the average cash costs and all-in costs by payable pound of copper and per payable Troy ounce of gold, for the Base Case and two upside metal prices scenarios assumed in analysis. The results are inclusive of by-product credits.

Table 22.1 A Summary of Overall Average Cash Costs and All-In Costs by Payable Pound of Copper and Per Payable Troy Ounce of Gold, Spectrum-GJ Cu-Au Project

Case	Metal Prices	Cash Cost		All-In Cost	
		Per lb Cu (C$)	Per lb Cu (US$)	Per lb Cu (C$)	Per lb Cu (US$)
Base Case	Cu – US$2.75/lb Au – US$1,250/oz Ag – US$17.75/oz	1.83	1.37	2.41	1.81
Upside Case 1	Cu – US$3.00/lb Au – US$1,300/oz Ag – US$20.00/oz	1.75	1.31	2.33	1.75
Upside Case 2	Cu – US$3.25/lb Au – US$1,350/oz Ag – US$22.50/oz	1.67	1.25	2.25	1.69
Case	**Metal Prices**	**Cash Cost**		**All-In Cost**	
		Per oz Au (C$)	**Per oz Au (US$)**	**Per oz Au (C$)**	**Per oz Au (US$)**
Base Case	Cu – US$2.75/lb Au – US$1,250/oz Ag – US$17.75/oz	615.42	461.56	974.63	730.97
Upside Case 1	Cu – US$3.00/lb Au – US$1,300/oz Ag – US$20.00/oz	453.18	339.89	812.39	609.30
Upside Case 2	Cu – US$3.25/lb Au – US$1,350/oz Ag – US$22.50/oz	289.78	217.34	649.00	486.75

Notes: US$0.75 = C$1.00. The per payable pound of copper cash include gold and silver credits. The per Troy ounce of gold costs include copper and silver credits.

22.5 Cashflow

Figure 22.4 summarizes the cumulative cashflows for the Base Case and two Upside Cases considered in analysis, the applicable (nested) metal prices are detailed on Table 22.1. Table 22.2 summarizes the key results of the PEA cashflow model, for the Base Case and two upside metal prices scenarios assumed in analysis. It may be seen that Base Case, DCF cashflow analysis of the Spectrum-GJ Cu-Au Project, as detailed in this Technical Report and using a discount rate of 8%, indicates that the post-tax NPV is $314.09 M and the IRR is 20.6%. The cumulative undiscounted, post-tax cashflow value for the Project is C$1,306 M and the post-tax payback period for the pre-production CAPEX only is 4.2 years.

It should be emphasized that the payback periods stated on Table 22.2 are for pre-production CAPEX only. As may be seen from consideration of Figure 22.4, the post-tax cumulative cashflows in particular drop slightly below the zero cashflow line in Year 5. This is due to the second tranche of capital required to bring Spectrum Pit on-line, to increase production capacity at Donnelly Pit and to both install a SAG mill and to increase plant throughput capacity to 20,000 tpd, per the discussions of Section 17. If payback for this additional CAPEX is considered in analysis, the overall, post-tax payback period extends to 6.2 years, for the Base Case assumed in analysis.

Figure 22.4 Cumulative Pre- and Post-Tax Cashflows (0% discount), PEA DCF Cashflow Analysis, Spectrum-GJ Cu-Au Project

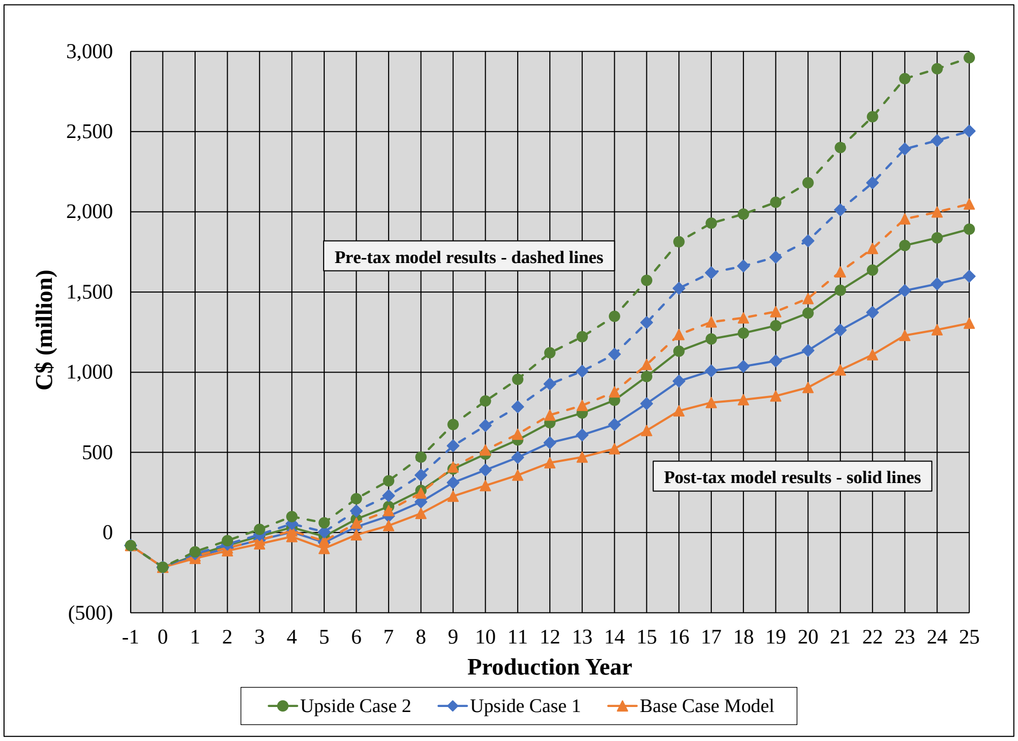


Table 22.2 A Summary of Financial Outcomes, Preliminary Economic Assessment, Spectrum-GJ Cu-Au Project

Base Case	**Pre-Tax**			**Post-Tax**		
	IRR	**NPV (8%)** (millions)	**Pay-Back** (years)	**IRR**	**NPV (8%)** (millions)	**Pay-Back** (years)
Cu Price: US$2.75/lb Au Price: US$1,250/oz Ag Price: US$17.75/oz	26.6%	C$546.18	3.8	20.6%	C$314.09	4.2
Upside Case 1	**Pre-Tax**			**Post-Tax**		
	IRR	**NPV (8%)** (millions)	**Pay-Back** (years)	**IRR**	**NPV (8%)** (millions)	**Pay-Back** (years)
Cu Price: US$3.00/lb Au Price: US$1,300/oz Ag Price: US$20.00/oz	31.0%	C$699.62	3.2	23.9%	C$412.99	3.7
Upside Case 2 2	**Pre-Tax**			**Post-Tax**		
	IRR	**NPV (8%)** (millions)	**Pay-Back** (years)	**IRR**	**NPV (8%)** (millions)	**Pay-Back** (years)
Cu Price: US$3.25/lb Au Price: US$1,350/oz Ag Price: US$22.50/oz	35.3%	C$853.86	2.7	27.1%	C$512.35	3.3

Note: US$0.75 = C$1.00. The stated payback periods are for pre-production capital only.

22.6 Sensitivities

Table 22.3 summarizes the model sensitivities (pre-tax and post-tax) for the metal price scenarios and range of discount rates considered in analysis. The results highlighted in **BOLD** are for the Base Case model (nested metal prices of US$2.75/lb Cu, US$1,250/oz Au and US$17.75/oz).

Table 22.3 A Summary of Model Sensitivities for the Nested Metal Price Scenarios and Discount Rates Considered in Analysis, Preliminary Economic Assessment, Spectrum-GJ Cu-Au Project

Parameter	Case 1	Case 2	**Case 3**	Case 4	Case 5
Pre-Tax Sensitivities					
Au Price (US$)	1,150	1,200	**1,250**	1,300	1,350
Ag Price (US$)	12.50	15.00	**17.75**	20.00	22.50
Cu Price (US$)	2.25	2.50	**2.75**	3.00	3.25
Cumulative Net Cashflow (million C$)	1,132	1,589	**2,048**	2,503	2,960
NPV 6% (million C$)	356	552	**749**	944	1,140
NPV 8% (million C$)	237	391	**546**	700	854
NPV 10% (million C$)	152	276	**400**	523	646
NPV 12% (million C$)	91	192	**293**	393	493
IRR	17.0%	22.0%	**26.6%**	31.0%	35.3%
Post-Tax Sensitivities					
Au Price (US$)	1,150	1,200	**1,250**	1,300	1,350
Ag Price (US$)	12.50	15.00	**17.75**	20.00	22.50
Cu Price (US$)	2.25	2.50	**2.75**	3.00	3.25
Cumulative Net Cashflow (million C$)	717	1,011	**1,306**	1,598	1,891
NPV 6% (million C$)	193	320	**447**	573	699
NPV 8% (million C$)	113	214	**314**	413	512
NPV 10% (million C$)	57	138	**218**	298	377
NPV 12% (million C$)	16	83	**149**	213	278
IRR	13.0%	17.0%	**20.6%**	23.9%	27.1%

Note: US$0.75 = C$1.00.

Figures 22.5A and 22.5B summarize the post-tax IRR sensitivity to changes in CAPEX, OPEX, US$ to C$ exchange rate and metal prices. Figures 22.6A and 22.6B summarize post-tax NPV sensitivity to the same sensitivity factors. The analyses summarized on Figures 22.5A and 22.6B reflect model sensitivities by varying the percentage inputs of the sensitivity factors around the nested Base Case metal prices assumed in analysis (US$2.75/lb Cu, US$1,250/oz Au and US$17.75/oz). It may be seen that:

- the Spectrum-GJ Cu-Au project (IRR and NPV) is by far the most sensitive to changes in the nested metal prices;
- project IRR is equally sensitive to changes in the CAPEX and the exchange rate (which is the reason that the CAPEX and exchange rate plots cannot readily be separated on Figure 22.5A – their trends are exactly the same);
- project IRR is least sensitive to changes in OPEX; and
- the second-most sensitive factor as regards project NPV is the exchange rate, followed by OPEX and the by CAPEX to which the project NPV is not especially sensitive.

Figure 22.5A IRR Sensitivity to Changes in Metal Prices, OPEX, CAPEX and US$ to C$ Exchange Rate, Spectrum-GJ Au-Cu Project

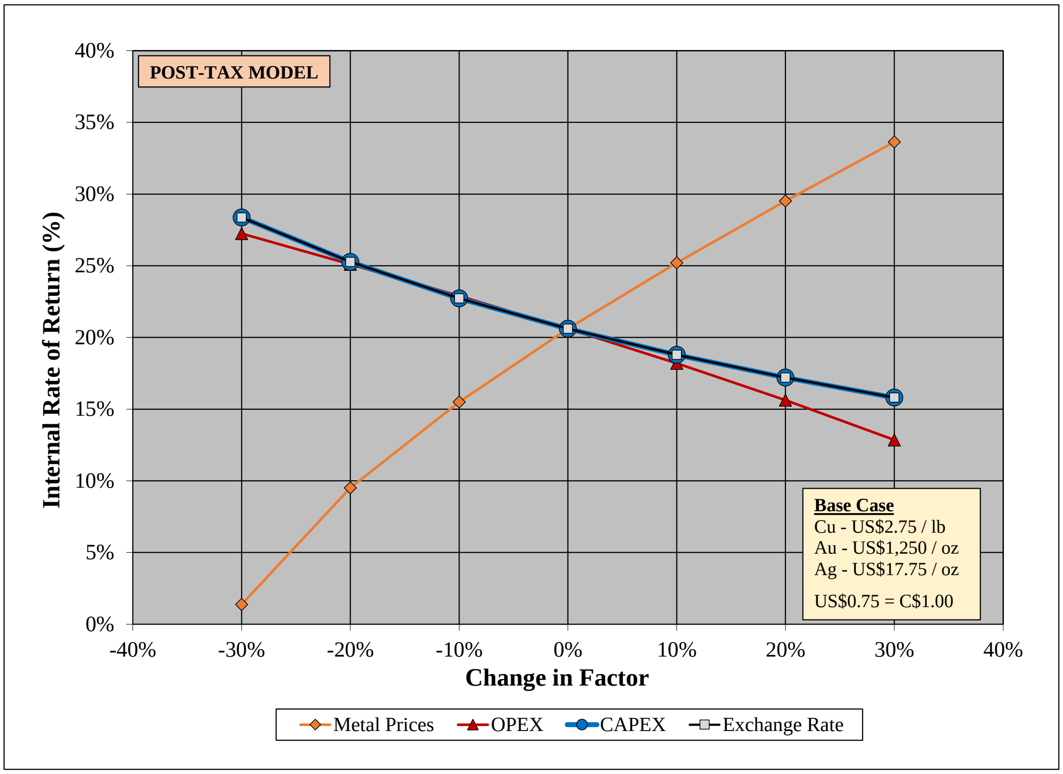


Figure 22.5B IRR Sensitivity to Changes in Metal Prices, OPEX, CAPEX and US$ to C$ Exchange Rate, Spectrum-GJ Au-Cu Project

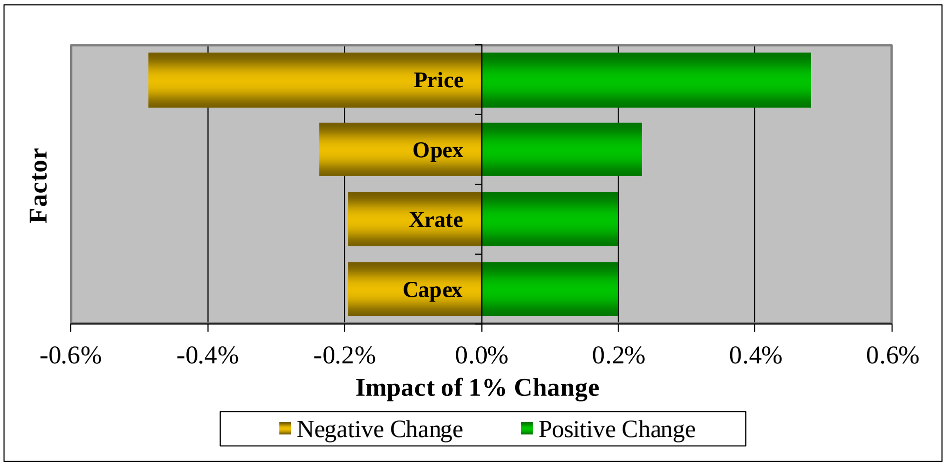


Figure 22.6A NPV Sensitivity to Changes in Metal Prices, OPEX, CAPEX and US$ to C$ Exchange Rate, Spectrum-GJ Au-Cu Project

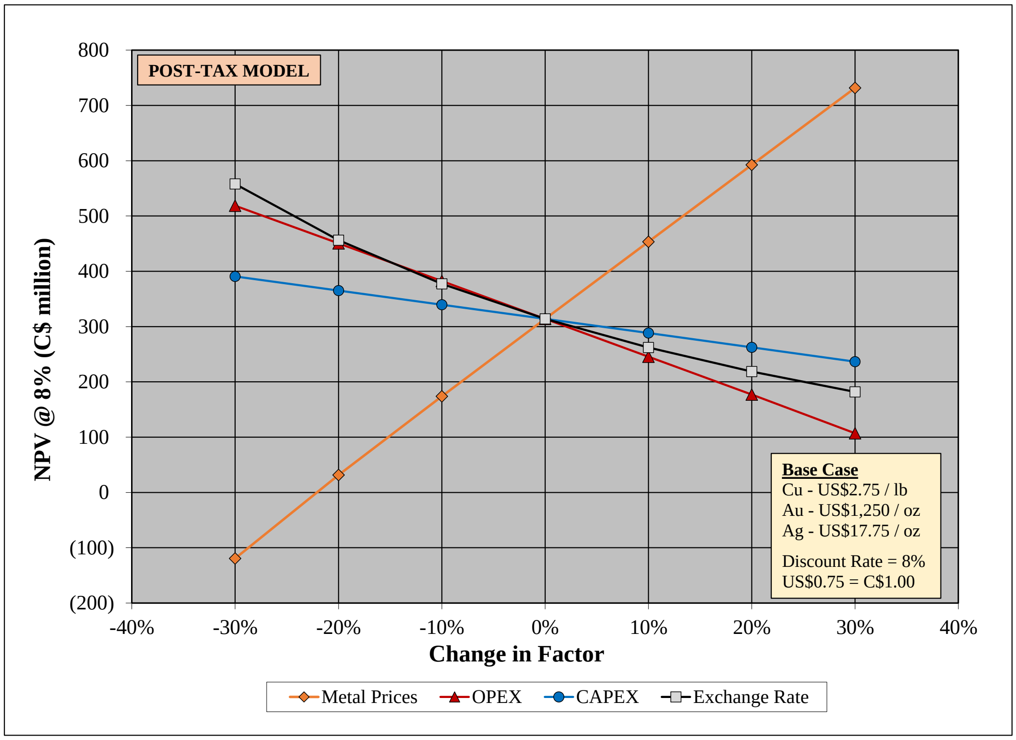
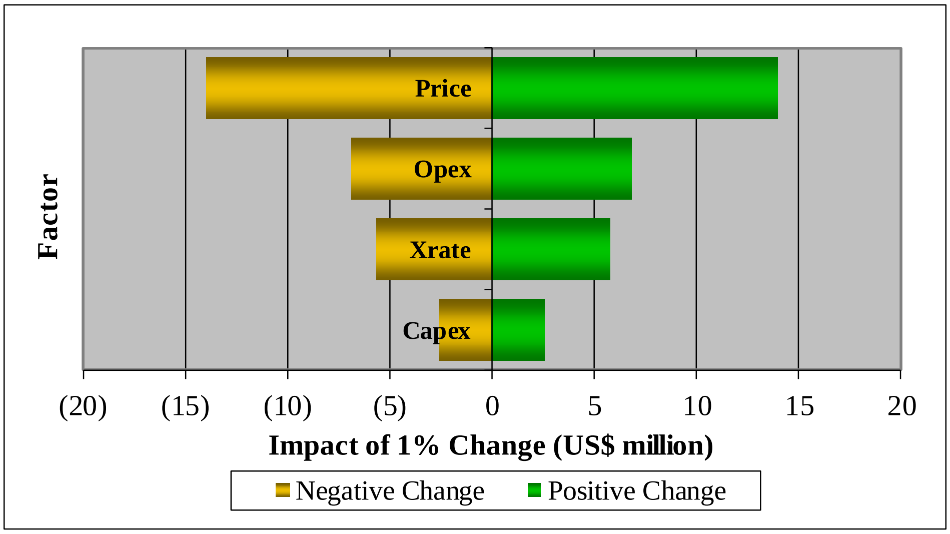


Figure 22.6B NPV Sensitivity to Changes in Metal Prices, OPEX, CAPEX and US$ to C$ Exchange Rate, Spectrum-GJ Au-Cu Project



23 ADJACENT PROPERTIES

The Principal Author is responsible for this section of this Technical Report.

23.1 Geological Setting

The Project Area is hosted in the Stikine Terrane (or Stikinia) rocks of the Canadian Cordillera, in what is known as the Golden Triangle of northwest B.C. It is established in Sections 7 and 8 that the geology is characterized by a suite of Upper Triassic to Lower Jurassic rocks that in many areas are associated with porphyry-style and/or epithermal to mesothermal Au-Ag-Cu mineralization. It is because of this that the Golden Triangle is widely known as a prolific mineral belt that contains numerous deposits, advanced projects and significant prospects. According to the B.C. Geological Survey Minfile database, there are more than 900 documented mineral occurrences of which some 67 have documented historical Mineral Resources.

23.2 Significant Mines and Mining Prospects

Numerous small to large past-producing mines (primarily gold mines) have also operated in the region, dating back to the early 1900s. Early production was primarily from small, high-grade underground gold mines such as the Premier Mine near Stewart, B.C. This early trend persisted through to the 1990s at operations such Snip Mine, which was discovered in 1964 and which triggered a claim-staking rush. This led to the discovery of a number of deposits, the most notable of which is perhaps Eskay Creek, a high-grade, submarine exhalative deposit that was mined using underground methods from January 1995 through December 2003 (the mine produced a reported annual average of approximately 320,800 ounces of gold and approximately 15.5 million ounces of silver - unverified data sourced from http://www.eskaymining.com/).

With the notable exception of Brucejack that is under construction (it will be a high-grade, underground gold mine), the focus of exploration and development within the Golden Triangle has more recently shifted towards the many porphyry Cu-Au deposits that exist in the region. These deposits have significantly lower grades than past producers such as Premier Mine, Snip Mine and Eskay Creek, but they generally encompass very large tonnages, hence metal endowments that far exceed any historical resources.

Table 23.1 summarizes the latest, publically available Mineral Resource estimates for the five significant porphyry Cu-Au projects (with or without silver and molybdenum) located in the Golden Triangle of Northwest B.C., not including the Central Zone and Donnelly Deposit that are the subject of this Technical Report. The presented information was compiled by the Principal Author from the following technical reports that can be sourced on www.sedar.com:

- Gillstrom, G., *et al*. (February 14, 2012, amended and restated in September 30, 2015) 'Technical Report on the Red Chris Copper-Gold Project', NI 43-101 technical report prepared by and for Imperial Metals Corporation;
- Bender, M.R., *et al*. (November 28, 2008, amended and restated on June 17, 2010) 'Preliminary Feasibility Study on the Development of the Schaft Creek Project Located in Northwest British Columbia, Canada', NI 43-101 technical report prepared for Copper Fox Metals, Inc. by Samuel Engineering, Inc.;

- Giroux, G., P. Eng., and Rebagliati, M., P. Eng. (March 12, 2014) 'Technical Report on the North ROK Copper-Gold Project, Liard Mining Division, British Columbia, Canada', NI 43-101 technical report prepared for Colorado Resources Ltd. by Rebagliati Geological Consulting Ltd.;
- Gill, R., P. Eng., *et al.* (September 12, 2011) 'Galore Creek Project, British Columbia, NI 43-101 Technical Report on Pre-Feasibility Study', prepared for Galore Creek Mining Corporation, NovaGold Resources Inc. and Teck Resources Limited by AMEC Americas Ltd.; and
- Ghaffari, H. P. Eng. *et al.* (2016). '2016 KSM (Kerr-Sulphurets-Mitchell) Prefeasibility Study Update and Preliminary Economic Assessment', NI 43-101 technical report prepared for Seabridge Gold, Inc. by Tetra Tech and others.

Table 23.1 A Summary of the Latest, Publically Available Mineral Resource Estimates for the Five Significant Cu-Au Porphyry Projects Located in the Golden Triangle of Northwest B.C., Not Including the Central Zone and Donnelly Deposit that are the Subject of this Technical Report

(compiled from information contained in the technical reports listed above)

Name	Owner/Operator	Cut-Off	Year	Resource Category	Million Tonnes	Average Grades			
						Au (g/t)	Ag (g/t)	Cu (%)	Mo (%)
Red Chris Mine	Imperial Metals Corp.	0.56% CuEq[1]	2012, restated 2015	Measured	830.7	0.36	1.17	0.36	-
				Indicated	203.0	0.29	1.01	0.30	-
				M + I	*1,033.7*[2]	*0.35*	*1.14*	*0.35*	-
		0.48% CuEq[1]		Inferred	787.1	0.32	1.04	0.29	-
Schaft Creek	Copper Fox Metals Inc. / Teck Resources Ltd.	0.20% CuEq[3]	2007, restated 2010	Measured	463.5	0.23	1.55	0.30	0.019
				Indicated	929.8	0.15	1.56	0.23	0.019
				M + I	*1,393.3*	*0.18*	*1.55*	*0.25*	*0.019*
				Inferred	186.8	0.09	1.61	0.14	0.018
North ROK	Colorado Resources Ltd.	0.20% CuEq[4]	2014	Inferred	142.3	0.26	-	0.22	-
Galore Creek	NovaGold Resources Inc. / Teck Resources Ltd.	NSR C$10.08/t Milled[5]	2011	Measured	39.5	0.39	2.58	0.25	-
				Indicated	247.2	0.26	3.81	0.34	-
				M + I	*286.7*	*0.27*	*3.64*	*0.33*	-
				Inferred	346.6	0.24	4.28	0.42	-
KSM	Seabridge Gold Inc.	NSR C$9.00/t for openpit[6] NSR C$16.00/t for block cave[6]	2016	Measured	750.1	0.63	3.20	0.17	0.0058
				Indicated	2,152.4	0.50	2.50	0.23	0.0040
				M + I	*2,902.5*	*0.54*	*2.70*	*0.21*	*0.0044*
				Inferred	2,719.2	0.35	2.00	0.32	0.0029

Notes: Mineral Resources which are not Mineral Reserves do not have demonstrated economic viability. Inferred Mineral Resources have a high degree of uncertainty as to their existence and great uncertainty as to their economic and legal feasibility. It cannot be assumed that all or any part of an Inferred Resource will ever be upgraded to a higher category.

1 - CuEq % = [Cu % + (0.60415 · Au g/t)], Cu \$3.50 /lb, Au 1,450/oz

2 - The total amount of Measured and Indicated (M + I) Mineral Resources stated in Gillstrom et.al. (2012, amended and restated in 2015) is 1,034.7 t, which exceeds the total tonnes of the two categories

3 - CuEq % = {(Cu % ·10 · 2.2046 · Cu price · Cu recovery) + (Mo % ·10 · 2.2046 · Mo price · Mo recovery) + (Au g/t · 0.03215 · Au price · Au recovery) + (Ag g/t · 0.03215 · Ag price · Ag recovery)} / (10 · copper price · 2.2046)

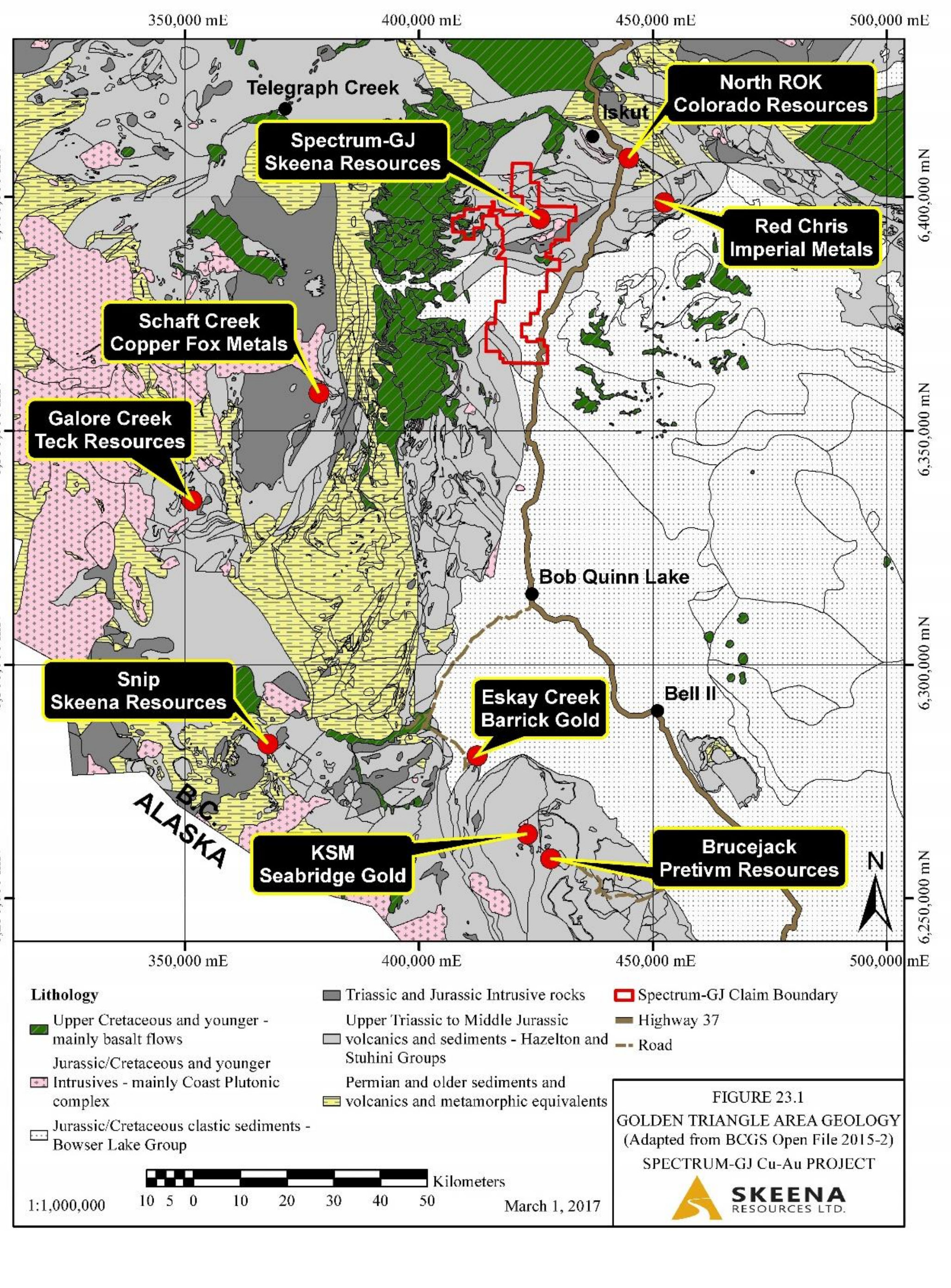
4 - CuEq % = {(Cu % · 71.65) + (Au g/t · 42.37)} / (71.65), Cu \$3.25 /lb, Au 1,320/oz

5 - NSR = Recoverable Revenue - TCRC (on a per tonne basis), where: NSR = Diluted Net Smelter Return; TCRC = Transportation and Refining Costs; Recoverable Revenue = Revenue in C\$ for recoverable Cu, recoverable Au and recoverable Ag

6 - NSR = Recoverable Revenue on a per tonne basis, where the cut-offs = a summation of the estimated unit mining, processing and G&A costs

Figure 23.1 identifies the locations of the various cited mines and mining projects. For purposes of reference, Figure 23.1 also identifies the location of the Project Area. The reader is cautioned that the Principal Author has been unable to verify the presented information (Mineral Resource estimates and the summaries presented below) and that the information is not necessarily indicative of the mineralization on the property that is the subject of this Technical Report. It is further emphasized that the QPs for this Technical Report have not undertaken any work to verify the Mineral Resource estimates summarized on Table 23.1. However, the estimates were all sourced from Technical Reports that are listed on www.sedar.com and which were prepared by QPs, as defined under NI 43-101. The Principal Author does not, therefore, have any readily identifiable reason to suppose that the Mineral Resource estimates are either erroneous or misleading.

Figure 23.1 A Regional Location Plan on which are Identified the Locations of the Historical Mines, Significant Mining Projects and the Spectrum-GJ Project Area



23.3 Red Chris Deposit and Mine

The Red Chris porphyry Cu-Au deposit is the closest to the Project Area: it lies approximately 11 km east of Highway 37 and 82 km south of Dease Lake. The following text is, for the most part, abstracted from Gillstrom *et al.* (2012, amended and restated in 2015). Summary details of current mining were compiled from the same reference, backed by observations and the results of conversations held with mine personnel during a visit, in October 2016, to Red Chris mine by the Principal Author.

23.3.1 Geological Setting

The southern half of the Red Chris property lies on a broad physiographic upland called the Todagin plateau, which is '*underlain mainly by the Stuhini Group, and numerous Late Triassic to Early Jurassic intrusions. The southern edge of the plateau in the Red Chris area is marked by a ridge composed of Middle Jurassic, upper Hazelton Group and Bowser Lake Group sedimentary rocks, which were originally deposited unconformably on the Red Stock and the Stuhini Group after Early Jurassic uplift and erosion. In places the northern edge of the unconformity is truncated by a high-angle fault*'.

'*The northern half of the property is largely in topographically lower ground of the Ealue Lake valley and the plain containing the Klappan River, where the geology is less well known due to limited rock exposure. At higher elevations, a mountain east of Ealue Lake consists of Stuhini Group and an Early Jurassic intrusion (Ealue Stock). Slopes to the north and northeast of the lake are underlain by Stuhini/Hazelton rocks and Stikine Assemblage, respectively. A swarm of Early Jurassic granitic dikes north of the lake trends NW-SE. A northeast-trending fault is inferred to follow the trace of Coyote Creek and the Ealue Lake valley. It continues to the east for an additional 30 kilometres where it has been designated the McEwan Creek Fault with a south side-down movement sense*'.

23.3.2 Mineralization

The Red Chris '*deposit is hosted by the Red Stock, an east-northeast elongated intrusive body of pervasively quartz-sericite-ankerite-pyrite (phyllic) altered, and faulted sub-volcanic, hornblende monzonite porphyry intrusion. The stock intrudes and alters Upper Triassic Stuhini Group massive volcanic wackes, siltstone and augite-porphyritic basalt in the southwestern area of the Todagin Plateau*'.

The '…*mineralization has good near-vertical and longitudinal continuity, controlled largely by post-mineral faulting superimposed on and along the ancestral, en-echelon, central axis fault zone. Pyrite, chalcopyrite, bornite, with minor chalcocite are the principal sulphide minerals of the shallower portions of the Red Chris deposit. Minor covellite occurs as inclusions in pyrite, and molybdenite, sphalerite and galena occur locally in trace amounts. Gold, second in economic importance to copper, occurs spatially and genetically associated with the copper mineralization*'.

23.3.3 Operations

Exploitation of the Red Chris deposit is by openpit mining in '*two open pits* (called) *the Main and East pits*'. Later in the mine life these will be merged into one large pit. Mining is by conventional shovel and truck feeding a 30,000 tpd processing plant in which standard mineral flotation technology is used. '*The mine has been phased and scheduled to* *maximize the production of high-grade ore, especially during the first five years, to minimize the capital payback period*'. Waste rock, depending on the neutralizing potential to acid generating potential ratio, is stockpiled as PAG or NAG waste rock. NAG waste rock is reported to be used as base below the PAG rock storage area, as road topping material and as a general construction material.

23.4 Schaft Creek Deposit

The Schaft Creek property is approximately 60 km south of Telegraph Creek, 45 km due west of Highway 37 and approximately 375 km northwest of the town of Smithers, B.C. The following text comprises abstracts from Bender et.al. (2007, amended and restated in 2010), which have been modified for the sake of brevity.

'*The Schaft Creek deposit is situated in the valley of Schaft Creek along the western slope of Mount LaCasse*' in which Stuhini group volcanics are exposed. '*The deposit is bounded to the west by the Hickman batholith and to the east by volcanic rocks of the Mess Lake facies*'. It:

- comprises '*a large, multi-phase, complex, porphyry copper-molybdenum-gold-silver system consisting of three distinct, semi-continuous and structurally modified zones genetically related to the Hickman batholith*'….that 'is considered to be the source of the magmatic-hydrothermal fluids, which ultimately formed the mineralized breccias, veins and stockworks of the deposit';
- '*is hosted by north striking, steep, easterly dipping volcanic rocks comprised of a package of andesitic pyroclastics ranging from tuff to breccia tuff and aphanitic to augite-feldspar-phyric andesite*' ('*narrow, discontinuous feldspar porphyry and quartz feldspar porphyry dikes, related to the Hickman batholith, intrude the volcanic package*'); and
- '*is bounded to the west by the Hickman batholith and to the east by volcanic rocks of the Mess Lake facies*'.

The deposition of sulphides is considered (by Copper Fox Metals Inc.) to be '*the result of a complex polyphase series of mineralizing events. Macroscopic determinations on the Copper Fox drill core define the deposit's sulphide mineral composition as: chalcopyrite (50%), pyrite (22.8%), bornite (14.2%) and molybdenite (13%)'. Chalcopyrite and bornite, the most essential copper ore minerals, occur in stockworks, as disseminations and in breccias. Less commonly, chalcopyrite is observed as very thin (10-100 micron) partial coatings on ubiquitous, dm spaced fractures and joints*'. Molybdenite '*…occurs as disseminated blebs and stringers in stockworks and veins and is quite common in the breccia zones. Quite often it forms thin coatings on slickensides and fractures*'.

23.5 North ROK Deposit

The North ROK property is a recently discovered deposit that is located near Highway 37, approximately 190 km north of Stewart, 67 km south of Dease Lake and 15 km north-northwest of Red Chris porphyry Cu-Au deposit. The following text comprises abstracts from Giroux and Rebagliati (2014), which have been modified for the sake of brevity.

The North ROK property '*is underlain by volcanic and sedimentary rocks of the Upper Triassic, Stuhini Group to Lower Jurassic, Hazelton Group, that are intruded by Upper Triassic to Early Jurassic stocks and dykes. Auriferous pyrite-chalcopyrite mineralization is associated with the* *intrusive rocks*'. Exploration has focused on the large Mabon mineralized alteration zone that encompasses the historic Mabon and Edon Cu-Au occurrences. Other historic occurrences on the property include HI or Klappan Rose and Plateau.

'*The Mabon Zone represents 'an Upper Triassic alkalic porphyry Cu-Au system, where mineralization is predominately hosted in an elongate, 3,000 m x 1,000 m fine-grained, quartz deficient plagioclase phyric monzodiorite intrusion (the Mabon Stock)* (that is dated) *at 215.8 +/- 3 Ma. The Mabon Stock and enclosing volcanic rocks are imprinted by a well-defined zoned hydrothermal and contact metamorphic alteration assemblage. The alteration zones from: (high temperature) potassic alteration to quartz-pyrite (phyllic) to epidote to chlorite (low temperature)*'. '*A well-developed early biotite hornfels alteration assemblage is documented in the volcanic rocks along the northeastern flank of Mabon Stock. Copper and gold mineralization, as disseminated and vein-hosted chalcopyrite, has been identified by diamond drilling over a strike length of 900 m at the Mabon Zone*'.

23.6 Galore Creek Deposit

The Galore Creek project is located approximately 70 km west of the Quinn Lake airstrip on Highway 37, 150 km northeast of the Port of Stewart and 370 km northwest of the town of Smithers, B.C. The following text comprises abstracts from Gill *et al.* (2011), which have been modified for the sake of brevity.

'*The Galore Creek property is interpreted to be an example of an alkalic porphyry copper–gold–silver system*'. It is… '*situated within the Stikine Terrane, an exotic terrane accreted to the ancestral North American craton. A sequence of Permian, Mississippian and Devonian age calc-alkaline and bimodal flows and volcaniclastic rocks, interbedded carbonate and minor shale and chert, termed the Stikine assemblage, form the basement of the terrane. Unconformably overlying the Stikine assemblage is a succession of Lower to Middle Triassic sedimentary and upper Triassic volcanic rocks*'.

'*The Galore Creek Syenite Complex, of Tertiary age, is centered in the west fork of Galore Creek and is* (five kilometres in length and two kilometres) *in width. The deposits are hosted by potassium-enriched volcanic rocks and pipe-like breccias adjacent to syenite stocks and dykes. They are manto-shaped and trend north to northeast, following either, or both, syenite contacts and structural breaks. To date, 14 deposits and prospects have been identified, five of which, the Central Zone, Southwest Zone, Junction Zone West Fork Zone and Middle Creek Zone are of economic interest*'.

'*The Galore Creek property has undergone at least three temporally different mineralizing events. These include the early formation of the nearby Copper Canyon eruptive centre and its associated mineralization; deposition of the Central Zone mineralization at the Central and Junction deposits, and Butte prospect; and emplacement of the West Fork mineralization at the Southwest and West Fork deposits*'.

'*Bornite and generally higher-grade gold are developed in the intense potassic alteration zone, and are associated with magnetite and sparse pyrite. Within the propylitic zone, zones of moderate potassic alteration have developed, and have associated chalcopyrite and pyrite mineralization. External to these potassic zones, but still within the propylitic zone, replacement lodes of gold, silver and base metals have formed*'.

23.7 KSM Deposit

The KSM project is named for the Kerr, Sulphurets and Mitchell deposits found on the KSM property. It is located in northwest B.C., off Highway 37, approximately 68 km by air north-northwest of Stewart, B.C. and approximately 21 km south-southeast of the historic Eskay Creek Mine. The following text comprises abstracts from Ghaffari *et al.* (2016), which have been modified for the sake of brevity.

‘*The property lies within an area known as Stikinia, which is a terrain consisting of Triassic and Jurassic volcanic arcs that were accreted onto the Paleozoic basement. Early Jurassic sub-volcanic intrusive complexes are scattered through the Stikinia terrain and are host to numerous precious and base metal rich hydrothermal systems*’.

‘*The Kerr deposit is a strongly-deformed Cu-Au porphyry, where copper and gold grades have been upgraded due to remobilization of metals during later and/or possibly syn-intrusive deformation. Alteration is the result of a relatively shallow, long lived hydrothermal system generated by intrusion of monzonite. Subsequent deformation along the Sulphurets Thrust Fault (STF) was diverted into the Kerr area along pre-existing structures. The mineralized area forms a fairly continuous, north-south trending west dipping irregular body measuring about 1,700 m long and up to 200 m thick’.*

‘The Sulphurets deposit is comprised of two distinct zones referred to as the Raewyn CopperGold Zone and the Breccia Gold Zone. The Raewyn Copper-Gold Zone hosts mostly porphyry style disseminated chalcopyrite and associated gold mineralization in moderately quartz stockworked, chlorite-biotite-sericite-magnetite altered volcanics. The Raewyn Copper-Gold Zone strikes north-easterly and dips about 45° to the northwest. The Breccia Gold Zone hosts mostly gold-bearing pyritic material mineralization with minor chalcopyrite and sulfosalts in a potassium-feldspar-siliceous hydrothermal breccia that apparently crosscuts the Raewyn Copper-Gold Zone. The Breccia Gold Zone strikes north and dips to the west’.

‘*The Mitchell Zone….is underlain by foliated, schistose, intrusive, volcanic, and clastic rocks that are exposed in an erosional window below the shallow north dipping Mitchell Thrust Fault (MTF). These rocks tend to be intensely altered and characterized by abundant sericite and pyrite with numerous quartz stockwork veins and sheeted quartz veins (phyllic alteration) that are often deformed and flattened. Towards the west end of the zone, the extent and intensity of phyllic alteration diminishes and chlorite-magnetite alteration becomes more dominant along with lower contained metal grades. In the core of the zone, pyrite content ranges between 1 to 20%, averages 5%, and typically occurs as fine disseminations. Gold and copper tends to be relatively low-grade but is dispersed over a very large area and related to hydrothermal activity associated with Early Jurassic hypabyssal porphyritic intrusions. In general, within the currently drilled limits of the Mitchell Zone, gold and copper grades are remarkably consistent between drill holes, which is common with large, stable, and long-lived hydrothermal systems*’.

24 OTHER RELEVANT DATA AND INFORMATION

To the best of the Principal Author’s knowledge and understanding, there is no additional information or explanation necessary to make this Technical Report understandable and not misleading.

25 INTERPRETATIONS AND CONCLUSIONS

In the opinion of the Principal Author, the financial outcomes of the PEA reflect a robust project that should be advanced to the pre-feasibility level of project development.

The project undoubtedly benefits from existing infrastructure that includes Highway 37 and the Northwest Transmission Line, both of which are located to the immediate east of the Project Area, as well as Willow Creek Road that extends to within approximately 10 km of the planned location of the processing plant (approximate straightline distance). Access to the Project Area is in consequence straightforward and the capital cost associated with bringing mains power to an otherwise remote site is reduced to the need for a 33 km long powerline to the planned location of the MIA, from a take-off sub-station located at the turn-off of Willow Creek Road from Highway 37. The proximity of the Port of Stewart also enhances the project, insofar as it is an established deep water port from where the planned, bulk Cu-Au-(Ag) concentrate could be shipped to markets located in the Far East. The Port of Stewart is approximately 262 km by road, from the Highway 37 turnoff to Willow Creek Road.

The project also benefits from the staged approach to plant throughput hence mine production which, in combination with the infrastructure benefits described above, result in a low pre-production capital requirement of C$216.05 million. Significant capital can be and has been deferred to the benefit of project economics, which in part is achieved through the PEA planning process that encompasses considerations of the types of practical, physical and operational risks that are inherent to any new, start-up operation (a wealth of global mining experience shows that lengthy lead times are invariably required before such risks can be overcome and optimal results can routinely and sustainably be achieved, especially with greenfield projects). In combination, these and related issues form a central objective of the PEA: to engineer solutions that ensure practicably achievable and environmentally sustainable outcomes.

It should be emphasized that the financial outcomes of the PEA are strongly dependent on metal prices: analysis shows that significant upside or downside variance from the nested, base case prices for gold (US$1,250 / oz Au) and copper (C$2.75 / lb Cu) result in significantly different NPV, IRR and payback period outcomes. Various other risks (apart from metal prices) and a number of opportunities are identified in the following sections, based on the results of the PEA studies reported in this Technical Report. Mitigation of the risks and assessment of the opportunities form the basis for the surveys and studies recommended in Section 26, the principal objective of which is to support the project through to completion of a pre-feasibility study.

While further assessments and studies are required, the mining and processing opportunities described below indicate that improvements to the project's economics could be realized through sustainable increases to the plant throughput during Production Stages 1 and 2 (10,000 tpd and 20,000 tpd, respectively), and that the life of project could be extended beyond the 25 years planned within the scope of the PEA.

25.1 General

It is established in Section 5.5 that no specific plans concerning mining, process, potable and fire water supplies have been formulated within the scope of the PEA, based on the reasonable assumption that sufficient water resources could be secured from a combination of waterwells and runoff. While this does not necessarily present a project risk (there are abundant water resources available across the general Project Area), a formal waterwell location study, pumping test program and other hydrogeologic studies are required to prove-up a robust and sufficient supply, inclusive of considerations of water balances and water recycling.

It is established in Section 4.4 that no restrictions as regards access to the Property Area or access within and across the Property Area exist. There is, however, a risk that Highway 37 might be closed during periods of adverse weather, but to the best knowledge and understanding of the Principal Author, the longest period of road closure to date (March 2017) has been approximately 100 hours, for reasons of avalanche control.

It is established in Section 4.9 that three sides of the Spectrum claims block, portions of the western margin of the North Block of GJ claims and portions of the Nuttlude Group of claims are bounded by Mount Edziza Provincial Park. This does not represent a significant risk that will affect access, title or right or ability to perform planned future work on the property because:

- an access corridor to the Spectrum claim blocks has been established in line with regional land management plan (CIS LRMP); and
- exploration and mining development are allowable activities within the Area-Specific Management zones of the CIS LRMP, where the Project Area is located.

It is established in Section 18.10 that periodic, Northwest Transmission Line power outages occur. Such outages would impinge on production flow-through in the plant, hence project economics. This risk has been mitigated within the scope of the PEA by the inclusion of a 1.3 MW diesel-powered emergency generator and distribution facility at the MIA. Power consumption rates and emergency power back-up requirements need to be more closely assessed at the pre-feasibility level of project development.

25.2 First Nations and Heritage

It is established in Section 4.9 that the Project Area lies within the asserted traditional territory of the Tahltan Nation, throughout which Tahltan Nation people have historically and extensively travelled. The Company respects this, as well as the Tahltan's collective right to hunt, fish, trap, harvest berries and other food and medicinal plants.

The Company also respects the importance of heritage and archaeological sites to the Tahltan Nation. The Company has carried out AIAs within the Project Area and will continue implementation of the Tahltan Archaeological Chance Find Procedure going forward. The Company also recognizes that AIAs will be required at the appropriate time or times, as the Project is advanced towards the construction phase (see also Section 25.4).

The Company has committed to work closely with the TCG and its agencies, to which end the Company has signed a Communications Agreement with TCG that provides guidance for on-going discussions and engagement related to economic opportunities, as well as dialogue to ensure wildlife, environment and heritage values are readily identified and considered. The Company will also continue to identify and maximize employment and contracting opportunities with Tahltan Nation-owned businesses, as the Project advances through the planned mineral exploration and project development activities.

25.3 Environmental and Permitting

It is established in Section 20.2 that no significant environmental risks have been identified that could prevent the Spectrum-GJ Cu-Au Project from advancing to the next phase of development towards becoming an operating mine. However, projections of environmental and community matters, their associated costs and permitting schedule, are subject to a number of known and unknown risks, uncertainties and other factors that may cause actual results to differ materially from those presented herein. These risks include:

- projections as to permitting time lines, timing and conditions of permits required to initiate mine construction, and potential delays in the issuance of permits; and
- changes to government regulation of mining operations, environmental issues, permitting requirements and social risks; or
- unrecognized environmental, permitting and social risks, title disputes or claims.

25.4 Infrastructure

It is established in Section 18 that AIAs will be required across the planned infrastructure areas and that if one or more of the infrastructure locations coincides with an area identified as an archaeological site, infrastructure planning will have to be modified unless an SAP could be secured under Section 12 of the Heritage Conservation Act (as described in Section 4.9). Geotechnical studies and geohazard assessments are also required to ensure that the infrastructure locations are both suitable and sustainable over the life of the project. If risks are identified that cannot be mitigated using reasonable and sustainable measures, changes to the planned infrastructure will have to be made.

25.5 Mineral Resources

It is stated in Section 14.1 that the quantities and average grades of the stated 2017 Mineral Resource updates are for grade cut-offs of 0.40 g/t AuEq for Central Zone and 0.20% CuEq for the Donnelly Deposit. Changes to the metal prices and/or the metallurgical recovery rates and/or the operating costs assumed in analysis will change these grade cut-offs, with the result that the quantities and average grades of the stated Mineral Resources will also change. The reasonable prospects of economic extraction of the stated Mineral Resources might also materially be affected by environmental, permitting, legal, title, taxation, sociopolitical, marketing or other relevant issues. While the latter may be construed as risks, the former (changes to the cut-off grades) may be construed as either a risk or an opportunity, depending on whether each influencing parameter (metal prices, recovery rates and operating costs) go up or down. As regards metallurgical recovery rates, the opportunities listed within the scope of Section 25.3 should be emphasized.

It is also stated in Section 14.1 that the quantity and grade of the Inferred Mineral Resources that form part of the 2017 Mineral Resource updates that are the subject of this Technical Report are conceptual in nature. As regards the notionally extracted material from the planned pits, it is established in Section 16.13 that:

- 24% of the ROM material from Spectrum Pit is in the Inferred category of Mineral Resources, with the balance (76%) in the Indicated category; and
- 4% of the ROM material from Donnelly Pit is in the Inferred category, with the balance (96%) again being in the Indicated category.

The Company acknowledges that Inferred Mineral Resources have to be treated as waste, within the scope of pre-feasibility mine planning and production scheduling. The drilling program described in Section 26.2 is in part planned to elevate the Inferred Mineral Resources to the Indicated category.

25.6 Mining

Table 25.1 summarizes the mining and production risks identified within the scope of the PEA. Table 25.2 summarizes the identified opportunities, the production rate elements of which should be considered within the scope of the opportunity to increase plant throughput during Stages 1 and 2, as identified in Section 25.6.

Table 25.1 Mining and Production Risks, Spectrum-GJ Cu-Au Project

Risk	Area	Comments
Spectrum Pit	Pit access road	A preliminary pit mid-point access road has been planned for purposes of the PEA, the alignment of which includes a number of switchbacks. While the size of the production equipment for Spectrum Pit has been limited to accommodate this constraint, options and risk analyses are required before an elevated level of confidence can be attributed to the design.
	Muck Handling	The muck handling system assumed within the scope of the PEA is on the limit of practicability, in terms of the raisebore, gravity fed muck handling system. Options analysis is required to improve the level of confidence in the muck handling system that might have to comprise staged handling in two, sequential muck passes. This change will affect overall capital requirement for Spectrum Pit.
	Primary crushing	It has been assumed within the scope of the PEA that ROM muck from Spectrum Pit will not require primary crushing ahead of loading the material into B-Train trucks for transport to the MIA for blending and processing with ROM material from Donnelly Pit. This requires closer analysis and confirmation.
	Pit slopes and clay	Preliminary analysis indicates that a significant fault zone extends across the central portion of Central Zone and might intersect Spectrum Pit. Preliminary analysis of weathering profiles suggests the fault zone might be the locus of preferential insitu alteration of weathering-prone alteration mineralogies to produce clay. This needs to be more closely examined as the presence of significant amounts of clay might compromise both local slope stability and flotation efficiency in the plant.
Donnelly Pit	Primary Crusher	Highly silicified material is known to exist in parts of the Donnelly Deposit (i.e. material from the Strongly to Intensely Silicified Domain identified in Section 7.6). Such material can compromise the efficiency and maintenance of gyratory crushers, unless they are specifically designed to accommodate such material. Analyses of the distribution and timing of such material within the ROM production stream is required to enable appropriate assessments and risk mitigation plans to be devised.
Spectrum Pit	Weather	There is no readily identifiable reason to suppose that with the exception of periods of extreme weather, mine production activities could not continue year round. Occasional and minor snow avalanches could, however, affect production activities in the planned Spectrum Pit.
Donnelly Pit	Weather	Klastline Plateau is known to suffer occasional severe winds that could impinge on in-pit productivity during storm events.

Table 25.2 Mining and Production Opportunities, Spectrum-GJ Cu-Au Project

Opportunity	Area	Comments
Improve stripping ratio	Donnelly Pit	Within the scope of the PEA, average overall pit slope angles of 45° are assumed for both pits, based on the results of a preliminary geotechnical study. It might be possible to increase the overall slope angle at Donnelly Pit in particular, depending on the results of a detailed geotechnical study.
Increase Production Rates	Spectrum Pit	For purposes of the PEA the production rate was fixed at 5,000 tpd. This needs to be more closely assessed as it could increase, depending on the ultimate size of pit and the ease of access for equipment up the mountain slope/along the pit access road.
	Donnelly Pit	Following an initial period of a year to 18 months, the reasonable expectation is that ROM production from Donnelly Pit could outperform the PEA production schedule during Stage 1 and 2. This needs to be more closely considered, especially as regards sustainable plant throughput capacities.
Extend Life of Project	Spectrum Pit	For purposes of the PEA, Spectrum Pit has been limited in size, hence life, due to a number of practical, technical and operational issues that are described in Section16. These need to be closely examined to establish whether above cut-off material to the south of the PEA pit could safely and sustainably be mined.
	Donnelly Pit	For purposes of the PEA, Donnelly Pit was limited to the north along an arbitrary boundary with the North Donnelly deposit. As Donnelly Deposit and the North Donnelly deposit are contiguous along at least some of their lengths, the opportunity exists to extend the planned Donnelly Pit into the North Donnelly deposit.
	Both Pits	Goodbye cuts are possible in both pits. This is not considered within the scope of the PEA.
	Underground mining	Scrutiny of the block models for both Central Zone and Donnelly Deposit indicate high-grade zones beneath the planned pits. These might be amenable to selective underground mining via low CAPEX access from either the planned muck handling infrastructure and/or the mined pits.

25.7 Metallurgy and Mineral Processing

Table 25.3 summarizes the metallurgical and process flow risks identified within the scope of the PEA. Table 25.4 summarizes the identified opportunities to which the following comments apply:

- the plant throughput elements should be considered within the scope of the opportunity to increase the ROM production rates during Stages 1 and 2, as described in Section 25.5; and
- the metallurgical recovery and cost elements should be considered within the scope of the potential Mineral Resource base for the Spectrum Cu-Au Project, as well as the potential financial outcomes – the former would increase and the latter would improve on the back of enhanced copper and gold metallurgical recovery rates.

Table 25.3 Metallurgical and Process Flow Risks, Spectrum-GJ Cu-Au Project
(compiled from information supplied by Blue Coast Metallurgy)

Risk	**Area**	**Comments**
Sampling	Sample representivity	Sample selection has been done to a level of representivity commensurate with a preliminary study, while the forecasted metallurgy is entirely driven by test results based on these samples. There is, therefore, potential for changes in metallurgy arising from the testing of more samples.
Mineralogy	Central Zone arsenic content	Parts of the Central Zone are known to be enriched in arsenic, but the current testwork did not show this to be evident in the Cu-Au-(Ag) concentrate from blended Central Zone/Donnelly Deposit material. This needs further checking as more material is tested from Central Zone.
Testing	Variability flotation and leach testing	No variability flotation and leach testing has been carried out. The potential for life-of-mine changes in metallurgical performance is unknown at this stage.
	Cyanide leaching	Cyanide leaching of the gold-rich sulphide concentrates is not currently practiced in B.C. copper mines. It is economic in this case due to very rapid gold leaching rates, but cyanide consumption rates are very high if longer leach times are needed. Accordingly, gold leaching kinetics need to be fully confirmed, together with cyanide consumption kinetics.
	Concentrate dewatering	No concentrate dewatering testing has been conducted on bulk Cu-Au-(Ag) concentrate; dewatering performance is assumed within the scope of the PEA.
SAG Mill	Sizing	The size of the SAG mill defined as part of the PEA should be considered preliminary as more testing is required before an optimum size can be defined. However the staged approach proposed for the project, with crushing and ball milling in Stage 1, allows for opportunity for extra sampling and testing, and thereby specifically offers an opportunity to minimize SAG mill sizing risk.
	Testing	No SAG testing has been carried out on Central Zone materials. If they prove to be SAG resistant, it is possible that the cone crusher, that is off-line in Stage 2, might be needed to fine-crush this material ahead of feeding the SAG mill.
	Conversion	Converting the circuit from two-stage crushing and ball milling to SAG milling in Year 6 needs further careful thought, to ensure minimum downtime during the tie-in period.
Operation	Au gravity concentrate	Production of a refinery grade gravity concentrate during Stage 1 has been assumed for purposes of the PEA, but it has not been adequately demonstrated.
	Grizzley screening	Two-stage grizzley screening ahead of primary crushing, as envisaged for Stage 1, needs careful design as this is not a conventional configuration and may add to the overall capital cost for the plant.

Table 25.4 Metallurgical and Process Flow Opportunities, Spectrum-GJ Cu-Au Project
(compiled from information supplied by Blue Coast Metallurgy Ltd.)

Opportunity	Action	Comments
Increase tonnage throughput of planned plant	Match production to SAG & ball mill capacities	Most major equipment (SAG and ball mills) is sized for 30,000 tpd, leaving it potentially over-sized during Stages 1 (at 10,000 tpd) and 2 (20,000 tpd). Adjusting the mine production rate to match the capacity of this equipment should enhance project economics.
	Modify cone crusher duty	Between Years 6 and 11 (i.e. during Stage 2), the cone crusher is off-line. Assigning the cone crusher for pebble crushing duty earlier could increase mill capacity long before Year 11, allowing for a ramp-up in capacity during Stage 2 to approximately 22,000 tpd or even 25,000 tpd for the planned process flow. The ball mill may then become the bottleneck in the circuit, but running at a higher tonnage, coarser grind size and hence lower recovery (see below), might still be economic overall. This needs to be assessed at the feasibility stage of project development.
	Increase Stage 1 utilization	Utilization in Stage 1 is assumed to be 92%, though typical primary ball mill and flotation circuits often achieve 95% to 96% utilizations. Once more confidence can be placed in the workability of running the circuit in two-stage crusher/ball mill configuration during Phase 1, 95% utilization should be assumed.
Reduce OPEX and CAPEX	Coarsen primary grind	Locked cycle tests at 85 and 120 microns showed a lower loss in recovery at 120 microns than expected. If this trend continues, then the primary grind could be coarsened, thereby reducing upfront capital costs.
	Optimize regrind	Regrind optimization should reduce regrinding costs.
	Improve desulphurization and leaching process	Lower pH flotation in the copper roughers, if still allowing for production of saleable copper concentrates, will reduce operating costs and may allow for better pyrite recovery in the desulphurization float and the downstream gold recovery.
		Further testing of the leach process should enhance process economics by improving precious metal recoveries and/or reducing costs.
		Cyanide destruction costs are based on an assumed higher level of cyanide in the leach residue than likely would occur in practice. Accordingly there is potential for lower cyanide destruction costs.
Improve Metal Recoveries	Additional metallurgical testing	Very little testing of the blended feed materials was carried out for purposes of the PEA. The metallurgical forecast stated in Section 13.5 is conservative as a result. Further testing should lead to an improvement in overall performance.

25.8 Waste and Water Management

No significant opportunities as regards waste and water management have been identified. Table 25.5 summarizes the principal risks going forward.

Table 25.5 Water and Waste Management Risks, Spectrum-GJ Cu-Au Project

Risk	Area	Comments
Materials	ML/ARD characterization	Additional testing is required to enable NAG/PAG characterizations to be more closely defined than is (and could be) the case within the scope of the PEA. No information is available regarding the lag time to onset of acidic conditions or the associated water quality when that occurs. Further work is required to develop rational plans for management of tailings, waste rock, marginal grade stockpiles, submerged waste rock, flooded pits and exposed pit walls. The sources, and timings of PAG material generation need to be established to identify disposal quantities and needs, as well as post-closure risk mitigation measures as regards protection of the environment. The sources and quantities of NAG material need to be established to identify whether sufficient material is available at the right time or times to build the various infrastructure elements (dams, roads, etc) that require NAG material. Depending on results, a quarry in which NAG material is extracted might be required, which eventuality was not considered within the scope of the PEA.
Mineralogy	Central Zone arsenic content	As stated in Section 25.5, parts of the Central Zone are known to be enriched in arsenic, but the current testwork did not show this to be evident in the Cu-Au-(Ag) concentrate from blended Central Zone/Donnelly Deposit material. This may pose issues for TSF pond and seepage water. Further study is required.
Spectrum Pit	Waste dump (constructed lake)	The PEA design of the Spectrum waste dump for underwater disposal of PAG material is highly preliminary and provisional only, hence subject to change. The required quantity of NAG material suitable for dam construction and more detailed topographic data of the local area are required.
TSF	Design	The PEA design of the TSF and related infrastructure is preliminary and provisional only, hence subject to change. More detailed estimates of quantities are required; design at the pre-feasibility stage of project development should meet or exceed the objectives set out in the Canadian Dam Association 2014 publication - Application of Dam Safety Guidelines to Mining Dams and BC MEM HSRC of July 2016. The overall cost of TSF construction might exceed the estimate assumed for purposes of the PEA. The presence of glacial-lacustrine units in the location of the planned tailings dam could significantly impact the design.
Rehabilitation and Closure	Bonding	The C$56.23 million assumed for purposes of the PEA was based on the assumption that stockpiled marginal grade material at Donnelly Pit is processed at the end of the mine life, with the result that only some 2.7 Mt has to be shoved back into the pit, using owner-operated equipment. For purposes of bonding, the full amount of stockpiled material might have to be assumed to require disposal in the mined-out pit, and at contractor rates. This would increase the total amount of required bonding for the project to C$70 million or more (albeit that the portion relating to the marginal grade material would be refunded if such material was processed at the end of the mine life).

25.9 Marketing and Contracts

The haulage costs, shipping costs, port charges and smelter terms stated in Section 19 should be considered preliminary and provisional, hence subject to change. This is emphasized in part because of the likely long-lead time to production start-up could mean that the planned Cu-Au-(Ag) concentrate might be marketed under conditions that differ from the assumptions and forecasts that support the PEA.

The securing of expressions of interest and more detailed projections of marketing terms are recommended at the pre-feasibility level of project development. The study should also encompass considerations of concentrate storage charges at the Port of Stewart. For example, if concentrate shipments were made in 5,000 t lots, then at a ROM production throughput rate of 30,000 tpd and depending on the mass pull, it would take between approximately 20 days and 27 days of concentrate production to generate sufficient material to complete a shipment lot. The cost of concentrate storage has not been included within the scope of the PEA, not least because of uncertainty about the quantity that could be stored at site prior to its batch-transport to the Port of Stewart.

It should also be emphasized that only limited analyses of potentially deleterious elements in the planned Cu-Au-(Ag) concentrate have been carried out within the scope of the PEA. While no deleterious elements were found, this needs to be more closely examined.

26 RECOMMENDATIONS

Various surveys, studies and programs are recommended in this Technical Report to support a pre-feasibility study and to enable the risks and opportunities summarized in Section 25 to be mitigated and/or assessed, as appropriate. The various recommendations relate to the capture of baseline data, resolution of various technical and operational issues, and optimization of production rates, plant throughputs, metallurgical recovery rates and the life of project that could extend beyond the 25 years planned within the scope of the PEA. Summaries of the recommendations are presented in the following sections.

Table 26.1 summarizes the estimated costs that total C$16.0 million over two years, inclusive of: a 10% contingency; the estimated cost of a pre-feasibility study, beyond the recommended studies and programs summarized below; and environmental baseline studies (although not required for purposes of a pre-feasibility study, the undertaking, in parallel, of the first two years of baseline studies is recommended to preclude delays in advancing the project to the Environmental Assessment [“EA”] and permitting stages). The EA and Permitting elements of project development will cost an estimated C$3.24 million, inclusive of disbursements and over the timelines detailed in Section 20.8. An additional C$0.5 million has been assumed following completion of the pre-feasibility study, to cover the possibility of additional environmental baseline data being required.

Table 26.1 A Summary of Estimated Costs by Area, Pre-Feasibility Study and Follow On (post pre-feasibility) Studies, Spectrum-GJ Cu-Au Project

Area	**Estimated Cost (million C$)**		
	Year One	Year Two	Follow-On
Project Management & Disbursements	0.05	0.20	-
Pre-Feasibility Study (general)	-	0.25	-
Database	-	-	-
Resource Drilling	6.18	-	-
Mineral Resource Updates	0.10	-	-
Metallurgical Sampling (drilling)	0.50	-	-
Metallurgical Testing	-	0.58	-
Process Engineering	-	0.25	-
Geohazard & Geotechnical	0.30	0.10	-
Mine Planning & Design	0.05	0.23	-
Infrastructure	-	0.95	-
TSF & Spectrum Waste Dump Design	-	0.48	-
Marketing and Contracts	-	0.05	-
Environmental Baseline Studies (incl. disbursements)	2.78	1.50	0.50
Environmental Assessment	-	-	2.06
Permitting	-	-	1.18
Sub-Total	*9.95*	*4.59*	*3.74*
10% Contingency	1.00	0.46	0.37
TOTAL	**10.95**	**5.05**	**4.11**

Note: The totals might not exactly agree with the stated amounts, due to rounding effects

26.1 Database

It is established in Section 12.2 that data verification was hampered by the assay certificates not consistently reflecting the priority-based assay shown in the Company’s database, by which the most reliable analytical method is used. It is in consequence of this that QP Thomas recommended that:

- the Company's database structure is modified so that the final assays relate to the appropriate certificate number; and
- all the historical data is verified against the source documents.

It is stated in Section 12.5 that although the percentage of the Company's overall database that was verified (and was found to) exceed industry standards, it is recommended (by QP Thomas) that the entire assay database is verified going forward. The tasks outlined can be completed internally, by Company staff. No direct cost has, therefore, been estimated for purposes of budgeting.

26.2 Drilling and Mineral Resources

It is established in Section 16.13 that 76% of the notionally mined material from Spectrum Pit is in the Indicated category of Mineral Resources, with the balance (24%) falling in the Inferred category. Similarly, 96% of the notionally mined material from Donnelly Pit is in the Indicated category of Mineral Resources, with the balance (4%) falling in the Inferred category. It is further established that the life of project could be extended by mining material contiguous to the notionally mined pits (to the south in the case of Spectrum Pit and to the north in the case of Donnelly pit, in the North Donnelly deposit).

The Company acknowledges that Inferred Mineral Resources have to be treated as waste, within the scope of pre-feasibility mine planning and production scheduling, and that opportunities exist to extend the project life beyond the 25 years planned for purposes of the PEA. To these ends, the Company has developed a definition drilling program to increase confidence in the Mineral Resource estimates by:

- elevating approximately 10% of the higher grade material, targeted for early extraction in both Spectrum Pit and Donnelly Pit, to the Measured category of Mineral Resources;
- elevating the balance of material within the overall, planned pit envelopes to the Indicated category; and
- elevating a targeted portion of the Mineral Resources within the North Donnelly deposit to the Indicated category of Mineral Resources.

To achieve the above, the Company has defined a C$6.18 M drilling program, inclusive of 4,200 m of drilling in 50 holes on the Central Zone and 15,000 m in 200 holes on the Donnelly Deposit and a portion of the North Donnelly deposit. Based on 2016 drilling costs, the all-in cost (inclusive of drilling, sampling, geology, analytical, camp and transportation costs) of drilling on Central Zone is estimated at C$400 per metre; the all-in cost of drilling on the Donnelly Deposit and North Donnelly deposit is estimated at C$300 per metre. The lower unit cost at Donnelly is due to the more subdued terrain and the ability to minimize helicopter costs and drill-pad construction by using a rubber-track, self-powered drillrig and ATVs for low-impact access.

It should be emphasized that the drilling program outlined is subject to change, depending on the optimization and trade-off mining studies described below (Section 26.4). For example, if a larger Spectrum Pit than planned for purposes of the PEA is ultimately defined, additional drilling (hence a second-season program) will be required. In the case of the North Donnelly deposit, the exact drilling requirements will only be known once pit optimization studies are completed and the exact volume of North Donnelly material that could be profitably mined through an extension of the planned Donnelly Pit is known. As such, the C$6.18M program should be considered a best estimate rather than a definitive program. It should also be emphasized that, for the reasons described in Section 10.7, it is recommended that within the scope of the Central Zone drilling program, opportunities for changing drilling directions and dips into the high-grade zone should be reviewed and implemented, as appropriate.

Once the drilling programs outlined are completed, to support a pre-feasibility study it is recommended that Mineral Resource updates are compiled for both Central Zone and the Donnelly/North Donnelly Deposit. The estimated cost for the Mineral Resource updates is C$100,000.

26.3 Metallurgical Testing and Process Design

A metallurgical testwork program has been developed to support a pre-feasibility study for the Spectrum-GJ Cu-Au Project (see Table 26.2). The total budget is C$584,000 and the program duration is estimated at six months. Process engineering will in addition be required, at an estimated cost of C$250,000.

The quantities of metallurgical samples required for the pre-feasibility study, as detailed on Table 26.2 will, to the extent that is possible and practicable, be sourced from the planned drilling program outlined in Section 26.2. For purposes of budgeting, an additional C$500,000 has been assumed for drilling large diameter (PQ) holes, specifically for purposes of metallurgical sampling.

Table 26.2 A Summary of the Planned Metallurgical Testing Program to Support a Pre-Feasibility Study of the Spectrum-GJ Cu-Au Project
(compiled from information supplied by Blue Coast Metallurgy)

Area	**Sub-Area**	**Estimated Cost (C$)**
Sample Preparation & Head Assays	-	45,990
Grindability	-	75,350
Mineralogy	-	28,500
Testwork	Gravity Cyanidation Flotation & Cyanidation Flotation Variability Dewatering	18,000 11,500 9,600 135,900 42,100 23,500
Management & Reporting	-	117,132
Sub-Total	-	*507,572*
Consulting Support	At 15% of sub-total	76,136
TOTAL	**-**	**583,708**

26.4 Geohazards and Geotechnical

It is established in Section 16 that the following data collection, analysis and modelling programs are required to support a pre-feasibility for the Spectrum-GJ Cu-Au Project:

- geohazard assessments across both pit areas and across the planned infrastructure locations described in Section 18;
- determinations of the profile hence volume of Domain 2a material at Central Zone;

- structural mapping and three-dimensional structural modelling to separately identify the locations and orientations of faults, hence the principal discontinuity trends, at the two deposits of interest;
- three-dimensional modelling of weathering/oxidation profiles to identify the locations and continuities of weathered zones below the surface oxidation zone at the two deposits of interest;
- discontinuity mapping over a large area as practicably possible to thereby develop a robust database of orientated discontinuity data;
- laboratory testing of the dominant rock types to identify their average strengths, along with laboratory testing of the dominant discontinuity types to determine their average shear strengths; and
- hydrogeological testing to assess groundwater conditions around and within the planned pits, as well as pit inflow rates hence pumping requirements and capacities.

Once the required data is in place, data consolidation, structural analyses, slope stability analyses and slope profile designs will be required, for inclusion in the mine planning and design elements of the pre-feasibility study. For this reason, it is recommended that the data collection, data analysis and geotechnical design programs summarized above are started in Year One, for completion early in Year Two. The duration of the data capture program is estimated at six months, with an additional three months required for the data consolidation, analysis and design elements.

Table 26.3 summarizes the estimated costs for each study element, not including the cost of a geohazard study and hydrogeological testing that are covered under the environmental baseline studies discussed in Section 26.9. Domain 2a profiling includes 250 m of drilling, at an estimated all-in cost of C$400 per metre, in addition to the resource drilling program described in Section 26.2.

Table 26.3 A Summary of Estimated Costs, Geohazard and Geotechnical Programs, Pre-Feasibility Study, Spectrum-GJ Cu-Au Project

Element	Estimated Cost (C$)	
	Year One	Year Two
Domain 2a Profiling	120,000	-
Structural Mapping & Modeling	75,000	-
Weathering/Oxidation Modeling	25,000	-
Discontinuity Mapping (included with structural mapping)	-	-
Laboratory Testing	75,000	-
Data Consolidation & Analysis	-	25,000
Pit Slope Stability Analysis & Design	-	75,000
Totals	**295,000**	**100,000**

26.5 Mine Planning and Design

It is established in Section 16 that the following trade-off, optimization and design studies are required to support a pre-feasibility for the Spectrum-GJ Cu-Au Project:

- trade-off studies concerning the maximum size of Spectrum Pit that can safely and sustainably be achieved, inclusive of considerations of top access (to the local mountain top), the geohazards and geotechnical constraints identified per the studies summarized in Section 26.4;
- production rate optimization for Spectrum Pit, inclusive of considerations of pit access and the size of equipment that can safely be moved to the pit area;
- material handling trade-off and design studies from Spectrum Pit to the SIA, and from the SIA to the MIA, including considerations of belt conveyances, trucking and a raisebore muck handling system;
- options analyses concerning the maximum size of Donnelly Pit that can sustainably be achieved by mining into the North Donnelly deposit; and
- trade-off studies concerning the economic viability of higher-/high grade zones accessible either from the mined pits or through extensions to the planned muck handing systems (adits), if these are ultimately decided upon.

Table 26.4 summarizes the estimated costs of the trade-off, optimization and options analysis studies summarized above. The following comments apply:

- the trade-off studies related to Spectrum Pit sizing can start in Year One with considerations of the required pit access roads, the studies can then be completed in Year Two, once the required geohazard and geotechnical information is available (the pit access road element will also form the basis for the production optimization study for Spectrum Pit);
- finalization of the resource drilling requirements on the North Donnelly deposit will to a large extent be driven by the amount of material that can economically be extracted in an expanded Donnelly Pit - options analysis for determining the largest practicable and sustainable Donnelly Pit is, therefore, costed for completion early in Year One;
- the trade-off studies related to selective underground mining beneath the mined openpits is costed for completion across Years One and Two –
  - preliminary analyses can be completed using the 2017 block models used for estimating the Mineral Resources that are the subject of this Technical Report, and the designs can be finalized using the Mineral Resource updates recommended on the back of the resource drilling programs, and
  - it is assumed that the results will be identified only as upside potential (with preliminary designs) within the scope of the recommended pre-feasibility study;
- the overall duration of the mine planning and design program is estimated at six months.

Table 26.4 A Summary of Estimated Costs, Mine Planning and Design Studies, Pre-Feasibility Study, Spectrum-GJ Cu-Au Project

Element	Estimated Cost (C$)	
	Year One	Year Two
Sizing Spectrum Pit	25,000	100,000
Production Optimization, Spectrum Pit	-	15,000
Material Handling Studies	-	75,000
Sizing Donnelly Pit	10,000	15,000
Underground Mining Potential	10,000	20,000
Totals	**45,000**	**225,000**

26.6 Infrastructure

The following are recommended in Sections 5.9 and 18, as regards baseline and supporting studies for the planned infrastructure:

- confirmation drilling at the key infrastructure locations;
- AIAs across those areas covered by the planned infrastructure;
- geotechnical studies, soil and vegetation characterizations and geohazard assessments, as appropriate for the key infrastructure areas;
- suitable waterwell siting, pumping and drawdown studies designed to identify and prove-up water resources suitable to sustain the planned operations and camp facilities, inclusive of considerations of water balances and water recycling;
- hydrogeologic studies in and around the planned pit areas to establish pit dewatering requirements and pumping capacities; and
- a location-specific seismicity risk assessment for application in infrastructure design, and especially the TSF, as appropriate.

The required AIAs, soil and vegetation characterizations, geohazard assessments and pit site hydrogeological studies are primarily included within the scope of the Year 1 environmental baseline studies discussed in Section 26.8. The hydrogeological program, considered and costed within the scope of the environmental studies and assessment, includes a groundwater model; the hydrology study encompasses water quality data. This data will be used to inform the required waterwell siting, pumping and drawdown studies. An additional C$100,000 has been assumed for follow-on studies and detailed designs of water supply and distribution for the planned operations and camp.

For budgeting purposes, a total of 2,000 m of confirmation drilling has been assumed, at an all-in unit cost of C$300 per metre (total C$600,000), along with C$250,000 for geotechnical site investigations at key infrastructure locations. The required seismic risk assessment forms part of the TSF design cost estimate.

26.7 TSF and Spectrum Waste Dump Design

For budgeting purposes, an all-in cost of C$400,000 has been assumed for the design of a TSF that meets or exceeds the objectives set out in the Canadian Dam Association 2014 publication - Application of Dam Safety Guidelines to Mining Dams and BC MEM HSRC of July 2016. The cost estimate includes field work (test pits, drilling and oversight), laboratory testwork, a seismic risk assessment and the following design considerations: the tailings disposal lines; the dam, the TSF lining (as required), the by-pass ditches and the polishing pond. An additional C$75,000 has been assumed for the design of the Spectrum waste dump, as described in Section 20.4. The required hydrology and geohydrology elements are included in the environmental baseline studies described in Section 26.8.

26.8 Marketing and Contracts

It is recommended in Section 19.6 that to both support more detailed project studies and ensure stable and reliable sales:

- that expressions of interest or letters of intent supported by cost estimates from haulage contractors, Port of Stewart and potential shipping lines are sought;
- more detailed projections of marketing terms are prepared, based on major custom-smelting companies in the world that are logistically practical for the delivery of concentrates; and
- that as a minimum and to support more detailed project studies, expressions of interest or letters of intent from smelters are sought.

None of the tasks outlined above are especially onerous in terms of cost. With the addition of metal price and exchange rate forecasting, a nominal C$50,000 has been assumed for budgeting purposes.

26.9 Environmental

The following baseline studies are recommended in Section 20.1:

- a formal meteorological monitoring study that, as a minimum, should include year-round collection of site-specific data to ensure a robust dataset;
- a terrain and soil study including, considerations of terrain distribution, soil quantity and distribution of soil types, as well as surface soil sampling;
- site-specific geochemistry data collection of all mined materials with the potential to generate ML/ARD for predictions and preparation of management plans, including the following -
  - additional work on carbonate (and feldspar) mineralogy and reactivity for both the Central Zone and Donnelly Deposit,
  - development of a composite sulphide and lithological block model from which the timings and quantities of different materials can reasonably be identified within the scope of the production schedules for the planned openpits,
  - initiation of kinetic testing (e.g., humidity cells and/or field barrels) on key litho-alteration units, and
  - further assessment of waste segregation of PAG vs NAG rock, which may include the development of site-specific sorting criteria;
- a hydrology monitoring program that should include year-round data collection from hydrometric stations in streams potentially affected by the proposed mine plan and -

  - characterize and document current streamflow conditions, including the potential for channel instabilities and bed load transport processes,
  - provide a means of determining and assessing hydrological changes related to the project, for comparison against regional long-term hydrometric data from Water Survey of Canada hydrometric stations, and
  - prediction of extreme flow events for design of ditches, spillways and water-crossings;
- a comprehensive/robust surface water quality monitoring program with sample sites located throughout the Project Area, with parameters that meet current guidelines and a minimum of monthly sampling with additional weekly sampling during periods of maximum hydrograph fluctuation (high flow and low flow);
- an expanded and robust groundwater quality monitoring program for the Project Area, inclusive of one year of quarterly data and the collection of hydrogeological data through a network of strategically located groundwater monitoring wells, including wells within the proximity to the proposed TSF;
- a formal aquatic resources baseline survey for two or more consecutive years, including considerations of –
  - sediment chemistry and determination of biological productivity of aquatic systems by characterizing fish habitat and communities, as well as assessing benthic invertebrates, zooplankton and phytoplankton,
  - include fish habitat, population, species surveys, biological productivity and spawning assessments on all streams and waterbodies potentially affected by the proposed mine plan and development,
  - identification and assessment of potential fish barriers, especially downstream of the planned infrastructure, and
  - reference locations for future baseline comparison;
- a terrestrial ecosystems study, including –
  - ecosystem mapping, vegetation inventory and targeted data collection of plant and ecological communities of concern, such as wetlands,
  - plant tissue sampling and analytical testing for metals to support project permitting and development,
  - surveys to identify the presence of (or lack of) red- and blue-listed plants, plant species either listed by the Species at Risk Act (2002) or listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and old forest, alpine communities, traditionally or culturally important species and communities and invasive plants, and
  - an assessment of wetlands, including identification of wetland ecosystems at risk within the Project Area; and
- including wildlife habitat suitability mapping to B.C.'s mapping standards (RISC, 1999) and other wildlife species-specific surveys and habitat assessments following provincial standards

for species including moose, mountain goat, sheep, and grizzly bear, and wildlife groups such as birds, amphibians and bats.

Table 26.5 summarizes the estimated costs for the baseline studies outlined above, which will be carried out over two years. For purposes of budgeting, an additional C$0.5 million has been assumed, post pre-feasibility study, for any additional studies that might be required. As earlier stated, although not required to support a pre-feasibility study, the undertaking of the Years One and Two baseline studies in parallel with the pre-feasibility study and related resource drilling program (in Year One) is recommended to preclude delays in advancing the project to the EA stages, the estimated costs for which are included on Table 26.5.

Table 26.5 A Summary of Estimated Environmental and Permitting Costs (C$), Spectrum-GJ Cu-Au Project
(compiled from information supplied by Greenwood Environmental Inc.)

Element	Professional Fees (C$)	Disbursements (C$)	Total (C$)
Baseline Studies – Year 1	1,600,000	1,180,000	2,780,000
Baseline Studies – Year 2	870,000	630,000	1,500,000
Environmental Assessment	1,510,000	550,000	2,060,000
Permitting	1,080,000	100,000	1,180,000

The Year 1 baseline studies include: water and air quality determinations; meteorology; aquatic biology; fish and fish habitat; human and ecological health & toxicology; hydrology; hydrogeology (including considerations of the planned TSF location and groundwater conditions around the planned pits); geochemistry; soils and vegetation (including in and around the areas of planned infrastructure); wildlife; Terrestrial Ecosystem Mapping (TEM); geohazards around the planned infrastructure and planned pits; land status and use; socio-economics; First Nation rights and interest; and archaeology (including the required AIAs in the areas of planned infrastructure). With the exceptions of the air quality, meteorology and aquatic biology elements that are completed in Year One, the Year Two baseline studies are the same (but extensions of) the Year One studies outlined.

27 REFERENCES

Alldrick, D.J., Stewart, M.L., Nelson, J.L. and Simpson, K.A. (2004): Geology of the More Creek – Kinaskan Lake area, northwestern British Columbia; BC Ministry of Energy, Mines and Petroleum Resources, Open File Map 2004-2, Scale 1:50 000.

Alldrick, D.J., Nelson, J.L. and Barresi, T. (2005): Tracking the Eskay Rift through northern B.C. - Geology and Mineral Occurrences of the upper Iskut River area; Geological Fieldwork 2004, BC Ministry of Energy, Mines and Petroleum Resources, Paper 2005-1, pp.1-30.

Alldrick, D.J. (2006): Eskay Rift Project (NTS 103O, P, 104A, B, G, H), Northwestern BC. In Geological Fieldwork 2005. British Columbia Ministry of Energy, Mines and Petroleum Resources, Geological Survey Branch, Paper 2006-1, pp. 1-4.

Ash, C., Fraser, T.M., Blanchflower, J.D. and Thurston, B.G. (1995): Tatogga Lake Project, Northwestern British Columbia (104H/11, 12). British Columbia Ministry of Energy, Mines and Petroleum Resources, Geological Survey Branch, Paper 1995-1, pp. 343-360.

Ash, C.H., Stinson, P.K. and Macdonald, R.W.J. (1996): Geology of the Todagin Plateau and Kinaskan Lake Area, Northwestern British Columbia (104H/12, 104G/9). in Geological Fieldwork 1995. British Columbia Ministry of Energy, Mines and Petroleum Resources, Geological Survey Branch, Paper 1996-1, pp. 155-174.

Ash, C., Macdonald, R., and Friedman, R.M. (1997a): Stratigraphy of the Tatogga Lake Area, Northwestern British Columbia, in Geological Fieldwork 1996 British Columbia Ministry of Employment and Investment, Geological Survey Branch, Paper 1997-1, pp. 283-290.

Ash, C., MacDonald, R.W.J., Stinson, P.K., Fraser, T.M., Nelson, K.J., Arden, K.M., and Lefebure, D.V. (1997b): Geology and Mineral Occurrences of the Tatogga Lake Area (104H12NW & 13SW; 104G/9NE & 16SE). British Columbia Ministry of Employment and Investment, Geological Survey Branch, Open File 1997-3, Map – Scale 1:50,000.

Bailey, L., Hollis, L., Beckman, S., Rae, S., Heppe, K., Sterritt, A. and Devine, F. (2014): Technical Report on Drilling, Geological, Geochemical and Geophysical Work Conducted during 2013 at the GJ/Kinaskan Cu-Au Porphyry Project. Teck Resources Limited, Unpublished Internal Report.

Bailes, R.J. (2002): Geophysical Report on the G.J. Property. B.B. Ministry of Energy and Mines, Assessment Work Report No. 26,985.

B.C. Ministry of Environment (B.C. MOE). EcoCat: The Ecological Reports Catalogue (available at www2.gov.bc.ca/gov/content/environment/research-monitoring-reporting/libraries-publication -catalogues/ecocat

B.C. Ministry of Environment, Ecosystems Branch (B.C. MOE). Habitat Wizard (available at www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/ecosystems/habitatwizard

B.C. Ministry of Environment (B.C. MOE). Fisheries Information Summary System (FISS) (available at www.env.gov.bc.ca/fish/fiss/

B.C. Ministry of Environment (B.C. MOE) (2010): Management Plan for the Mountain Goat (Oreamnos americanus) in British Columbia (available at www.env.gov.bc.ca/wld/documents/recovery/management_plans/MtGoat_MP_Final_28May2010.pdf

B.C. Ministry of Environment (B.C. MOE) (2017): Trends in B.C.'s Population Size & Distribution. Environmental Protection, Sustainability. Available at: www.env.gov.bc.ca/soe/ indicators /sustainability/bc-population.html

B.C. Ministry of Environment Lands and Parks (2000): Management Plan Background Report for Stikine Country Protected Areas. July 31, 2000 Draft.

B.C. Ministry of Forests, Lands, and Natural Resource Operations (BC FLNRO) (2012): 2012 Grizzly bear population estimate for British Columbia (available at www.env.gov.bc.ca/ fw/wildlife/docs/Grizzly_Bear_Pop_Est_Report_Final_2012.pdf).

B.C. Ministry of Integrated Land Management Bureau (BC ILMB, 2000): Cassiar-Iskut Stikine Land and Resource Management Plan. British Columbia Integrated Land Management Bureau (available at www.for.gov.bc.ca/tasb/slrp/lrmp/smithers/cassiar/plan/files/CIS-LRMP-November-2006.pdf).

Bender, M.R., McCandlish, K., Gray, J. and Hyyppa, R. (November 28, 2008, amended and restated on June 17, 2010): 'Preliminary Feasibility Study on the Development of the Schaft Creek Project Located in Northwest British Columbia, Canada', NI 43-101 technical report prepared for Copper Fox Metals, Inc. by Samuel Engineering, Inc.

Bentzen, A. and Sinclair, A.J. (1993): P-RES – a computer program to aid in the investigation of polymetallic ore reserves. Mineral Deposit Research Unit, Dept of Geological Sciences U.B.C. Technical Report MT-9.

Britton, S.A. (2017): 'Mine Design and Production Scheduling for the Spectrum-GJ Cu-Au Project'. A consultancy report to Skeena Resources by SAB Mining Consultants Ltd. April 14, 2017.

Canadian Avalanche Association. (2017): Database (available at www.avalancheassociation.ca/)

Canadian Gold Hunter Corp. (2008): Measured & Indicated Resource at Main and North Donnelly Zone Increased by 25 Percent: Company news release dated Oct 7, 2008, http://ngexresources.mwnewsroom.com/press-release/Canadian-Gold-Hunter-Corp-Measured-Indicated-Resource-Main-North-Donnelly-Zone-Increased-907682.

Carter, N.C. (1971): GJ. in Geology, Exploration and Mining in British Columbia 1970 B.C. Department of Mines and Petroleum Resources, pp. 58-60.

CIM 2014. CIM Definition Standards (May 2014) on Mineral Resources and Mineral Reserves as adopted by CIM Council, as those may be amended. The Canadian Institute of Mining, Metallurgy and Petroleum (CIM).

Collins, J., Colquhoun, W., Giroux, G.H., Nilsson, J.W. and Tenney, D. (2004): Technical Report on the Red Chris Cu-Au Project, Liard Mining Division. Merit Consultants International Inc., AMEC Americas Ltd., Giroux Consultants Ltd., Nilsson Mine Services Ltd. and Mine Geology Services. Report prepared for Red Chris Development Company Ltd. and bcMetals Corporation.

Colpron, M., Nelson, J.L., and Murphy, D.C. (2007): Northern Cordilleran terranes and their interactions through time: GSA Today, v. 17, pp. 4-9.

Cukor, D. and Cukor, V. (1989): Moongold Resources Inc., Hawk Mineral Claims, Report on 1989 Exploration Program: Assessment report prepared for Moongold Resources Inc., BC Mines Department Assessment Report Number 19717.

Delaney, T.M. (1988): Assessment Report on Hand Trenching, Geology and Geochemistry, Quash Creek, B.C., Liard Mining Division, NTS 104Gl16W.

Demarchi, R.A., and Hartwig, C.L. (2004): Status of Thinhorn Sheep in British Columbia. Prepared for BC Ministry of Water, Land and Air Protection, Biodiversity Branch, Victoria BC. Wildlife Bulletin No. B-119.

Devine, F. (2012): Geology and Mineralization in the QC Area, GJ Property, summary report following 10 days of mapping in July 2012 for Teck Resources. Unpublished Company Report, Teck Resources Limited

Devine, F. (2013): Geology and Mineralization of the Al Area, GJ Property, Northwestern BC. Summary report following 7 days of mapping in July 2013 for Teck Resources. Unpublished Company Report, Teck Resources Limited

Dodds, A.R. (1965): Report on an Induced Polarization and Magnetometer Survey, GJ Claim Group, Kinaskan Lake, British Columbia (Prepared by Huntec Limited for Conwest Exploration Company Limited). British Columbia Ministry of Mines and Petroleum Resources. Assessment Work Report No. 0700.

Dodds, A.R. (1965): Report on an Induced Polarization and Magnetometer Survey, QC Claim Group, Kinaskan Lake, British Columbia. (Prepared by Huntec Limited for Conwest Exploration Company Limited). British Columbia Ministry of Mines and Petroleum Resources. Assessment Work Report 0701.

Dodge, J.S. (1970): Geological report on the Spectrum Claims, Liard Mining Division: Assessment report prepared for Spartan Explorations Ltd., BC Mines Department Assessment Report Number 02735.

Donnelly, D.A., Peatfield, G.R. and Gasteiger, W.A. (1976): Report on Geological and Geophysical Surveys & Supporting Work on the Groat Creek claims (Canyon, Gully & Plateau Groups). British Columbia Ministry of Mines and Petroleum Resources. Assessment Work Report No. 6,073.

Dunne, K. and Thompson, A. (2004a): Petrography Report, GJ Property, B.C. Petrascience Consultants Inc., Unpublished report prepared for Canadian Gold Hunter Corp.

Dunne, K. and Thompson, A. (2004b): Petrographic Report, GJ/Kinaskan Copper/Gold Project. Petrascience Consultants Inc., Unpublished report prepared for Canadian Gold Hunter Corp.

Environmental Assessment Office (2015): Environmental Assessment Office User Guide: An Overview of Environmental Assessment in British Columbia. June 2015.

Environmental Assessment Office and Canadian Environmental Assessment Agency (2013): Memorandum of Understanding between the Canadian Environmental Assessment Agency (the Agency) and the British Columbia Environmental Assessment Office (EAO) on Substitution of Environmental Assessment. (available at www.eao.gov.bc.ca /pdf/EAO_CEAA_Substitution_ MOU.pdf).

Evenchick, C.A. and Thorkelson, D.J. (2005): Geology of the Spatsizi River Map Area, North-Central British Columbia, Geological Survey of Canada, Bulletin 557.

Farah, A., Friedman, D, Yang, D.Y., Pow, D.J., Trout, G., Ghaffari, H., Stoyko, H.W., Huang, J., Karrei, L.I., Danon-Schaffer, M., Morrison, R.S., Adanjo, R. da P., and Hafez, S.A. (2013): Feasibility Study on the Schaft Creek Project, BC, Canada: NI43-101 Technical Report and Feasibility Study prepared for Copper Fox Metals Inc. by Tetra Tech, 604 p.

Forsythe, J.R., Peatfield, G.R. and Gasteiger, W.A. (1977): Report on geochemical and geophysical surveys, diamond drilling and supporting work on the Groat Creek claims (Canyon, Gully and Plateau Groups). British Columbia Ministry of Mines and Petroleum Resources. Assessment Work Report No. 6,541.

Friedman, R.M. (1995): Current Research at the UBC Geochronology Laboratory: Progress Report of 1994-1995 U-Pb Dating for the British Columbia Geological Survey Branch. The University of British Columbia, in-house report.

Friedman, R.M. and Ash, C., (1997): U-Pb age of intrusions related to porphyry Cu-Au mineralization in the Tatogga Lake Area, Northwestern British Columbia (104H/12W, 104G/9E), in Geological Fieldwork 1996. British Columbia Ministry of Employment and Investment, Geological Survey Branch, Paper 1997-1, pp. 291-297.

Fugro Airborne Surveys (2012): Geophysical Survey Report, HM1 Stinger-mounted Magnetic Survey, Spectrum Area, Project 12089, Keewatin Consultants (2002) Inc.: Survey report prepared for Keewatin Consultants (2002) Inc.

Gallagher, C. (2016): Sample Prep, Analysis and Security, and Data Verification, Spectrum 2015. Internal memo submitted to Skeena Resources, April 2016.

Ghaffari, H., Huang, J., Jones, K., Gray, J.H., Hammett, R., Parolin, R.W., Kinakin, D., Lechner, M.J., Parkinson, J.G., Pelletier, P., Brazier, N., Allard, S., Lipiec, T. and Ramirez, M. (2016): 2016 KSM (Kerr-Sulphurets-Mitchell) Prefeasibility Study Update and Preliminary Economic Assessment. NI 43-101 technical report prepared for Seabridge Gold, Inc. by Tetra Tech and others. October 6, 2016.

Gill, R., Kulla, G., Wortman, G., Melnyk, J., and Rogers, D. (September 12, 2011): 'Galore Creek Project, British Columbia, NI 43-101 Technical Report on Pre-Feasibility Study': prepared for Galore Creek Mining Corporation, NovaGold Resources Inc. and Teck Resources Ltd. by AMEC Americas Ltd.

Gillstrom, G., Anand, R., Robertson, S., and Sterling, P. (February 14, 2012, amended and restated in September 30, 2015): Technical Report on the Red Chris Copper-Gold Project, NI 43-101 technical report prepared by and for Imperial Metals Corporation.

Giroux, G.H. and Ostensoe, E.A. (2003): Summary Report Status and Resource Estimate, Schaft Creek Property, Northwestern British Columbia. Giroux Consultants Ltd. and E.A. Ostensoe Report prepared for 955528 Alberta Ltd. (quoted in McCandlish, 2004).

Giroux, G. and Rebagliati, M. (2014): Technical Report on the North ROK CopperGold Project, Liard Mining Division, British Columbia, Canada: NI 43-101 technical report prepared for Colorado Resources Ltd. by Rebagliati Geological Consulting Ltd.

Godden, S. (2005): Chapter 3 and Appendix E (available on request) of an unpublished book entitled 'Planning and Design for Underground Bushveld Mining'.

Good, D.R. and Garratt, G.L. (1977): Geological, Geochemical and Geophysical Report, GJ Option, Kinaskan Lake Area. British Columbia Ministry of Mines and Petroleum Resources. Assessment Work Report No. 6,500, Part 2 of 2.

Government of Canada (1991): The Federal Policy on Wetland Conservation (available at nawcc.wetlandnetwork.ca/Federal%20Policy%20on%20Wetland%20Conservation.pdf).

Gray, J.H., Morris, R.J., and Giroux, G.H. (2005): Geology and Resource Potential of the Copper Canyon Property, Liard Mining Division, British Columbia. Hatch Ltd., GR Technical Services Ltd. and Giroux Consultants Ltd. Report prepared for NovaGold Resources Inc.

Greenwood Environmental, Inc. (2017): Spectrum-GJ Project: Summary of Environment Studies and Permitting, a consultancy report to Skeena Resources Ltd. by Greenwood Environmental, Inc., March 17, 2017.

Harland, W.B., Armstrong, R.L., Cox, A.V., Craig, L.E., Smith, A.G. and Smith, D.G. (1990): A Geological Time Scale 1989. Cambridge University Press. Cambridge, 263 pages.

Harris, S. (2006): 2005 Geological, Geochemical and Geophysical Report on the Kinaskan Lake/GJ Property. Equity Engineering Ltd. Unpublished report prepared for Canadian Gold Hunter Corp.

Hawthorn, G. (2005): Process Metallurgy, Progress Report No. 1, GJ / Kinaskan – Copper / Gold Project, Donnelley (sic) Zone. Westcoast Mineral Testing Inc. Unpublished report prepared for Canadian Gold Hunter Corp., dated April 15, 2005.

Hawthorn, G. (2005): Process Metallurgy, Progress Report No. 1, GJ / Kinaskan – Copper / Gold Project, Donnelley (sic) Zone. Westcoast Mineral Testing Inc. Unpublished report prepared for Canadian Gold Hunter Corp., dated March 6, 2006.

Heberlein, D.R. (2010): An Assessment of Soil Geochemical Methods for Detecting Cu-Au Porphyry Mineralization theough Quaternary Glaciofluvial Sediments at the WBX-MBX and 66 Zones, Mt. Milligan, North-Central British Columbia. Geoscience BC Report 2010-08, 75 p.

Heberlein, D.R. (2012): GJ-Kinaskan Project (NTS104G09). A report on the 2011 soil geochemistry program for Teck Resources Ltd. (Appendix X in Hollis, 2012).

Heberlein, D.R. (2013a): GJ-Kinaskan Project (NTS104G09). A report on the 2011/2012 soil geochemistry results for Teck Resources Ltd. (Appendix 11 in Hollis & Bailey, 2013).

Heberlein, D.R. (2013b): GJ-Kinaskan Project (NTS104G09). A report on the 2013 soil geochemistry program for Teck Resources Ltd. (Appendix VI in Hollis, 2014). HEDLEY, M.S. 1966. QC, SF and G.J. in Annual Report of the Minister for 1965. B.C. Department of Mines and Petroleum Resources, pages 41-43.

Hemmera Envirochem, Inc. (2015): Mountain Ungulate Management Plan, Spectrum Property. Report prepared for Skeena Resources Ltd. June 2015.

Hollis, L. (2011): Assessment Report on the 2010 Geological Mapping, Core re-logging, Spectral and Geophysical program at the GJ/Kinaskan Property, BC, Canada. British Columbia Ministry of Energy and Mines. Assessment Work Report No. 32,303.

Hollis, L. (2012): Assessment Report on the 2011 Drilling, Geophysical and Geochemical Programs at the GJ/Kinaskan Property, BC, Canada. British Columbia Ministry of Energy and Mines. Assessment Work Report No. 33,085A, 33,085B and 33,085C.

Hollis, L. and Bailey, L. (2013): Assessment Report on 2012 Drilling, Geological, Geochemical, and Geophysical work conducted during 2012 at the GJ/Kinaskan Cu-Au Porphyry Project. British Columbia Ministry of Energy, Mines and Natural Gas. Assessment Work Report No. 33,815.

Hollis, L. (2014): Assessment Report on Drilling, Geological, Geochemical, and Geophysical work conducted during 2013 at the GJ/Kinaskan Cu-Au Porphyry Project. British Columbia Ministry of Energy and Mines. Assessment Work Report No. 34,565.

Hollis, L., Rae, S., Bailey, L., Bayliss, S. and Stock, L. (2014): Technical Report on Geological and Geochemical Work Conducted during August and September 2014 at the GJK Mineral Tenure, Liard Mining Division, British Columbia, Canada. Internal report for Teck Resources Limited.

Howes, D.E., and Kenk, E. (1997): Terrain classification system for British Columbia. Version 2. Victoria, BC.

Hylands, J.J. (1991): Summary report on the 1990 exploration program, Spectrum Property: Assessment report prepared for Columbia Gold Mines Ltd., BC Mines Department Assessment Report Number 20861.

Imperial Oil Ltd. (1972): Line cutting – Control survey – Topographic report, Liard Mining Division, Spectrum, Owl Claims: Assessment report prepared for Imperial Oil Enterprises Ltd., BC Mines Department Assessment Report Number 03866.

Jollymore, K. (2012): GJ Cu-Au Project, Archaeological Impact Assessment Final Report, Heritage Inspection Permit 2012-0145. Prepared for Teck Resources Ltd. by Rescan Tahltan Environmental Consultants, Smithers, British Columbia. (Appendix 14 in Hollis & Bailey, 2013).

Jones, I.W.O. (2013): Pretium Resources Inc.: Brucejack Project Mineral Resources Update Technical Report, Effective Date – 19 December 2013: NI 43-101 Technical Report prepared for Pretium Resources Ltd. by Snowden Mining Industry Consultants.

Kent, G.R. (1957): Geological report on the Nuttlude Lake Property: Assessment report prepared for Torbrit Silver Mines Ltd., BC Mines Department Assessment Report Number 00201A.

Kilby, D.B., Casselman, S., and Roberts, W.J. (1991): Report on the 1991 exploration program, Spectrum Project, Columbia-Eurus Joint Venture (Spectrum and Hawk Properties): Unpublished internal report prepared for Columbia Gold Mines Ltd.

Knight Piésold Ltd. (2016a): 2015 Hydrogeologic Site Investigation. Consultancy report prepared for Skeena Resources Ltd., April 27, 2016.

Knight Piésold Ltd. (2016b): Memorandum 2016 Vibrating Wire Piezometer Data at Spectrum Project. Prepared for Skeena Resources Limited. Dated December 6, 2016.

Konkin, K. (1990): Geochemical Sampling Report on the Quash Creek Claim Group, Northwestern British Columbia, Liard Mining Division, NTS 104G116W.

Kuzyk, G. (2016): Provincial Population and Harvest estimates of Moose in British Columbia. Ministry of Forests, Lands and Natural Resource Operations. Victoria, British Columbia. Alces Vol. 52: 1–11 (2016). (available at alcesjournal.org/index.php/alces/article/viewFile/155/199).

Lally, J. (2012): Technical report on the Spectrum Property, British Columbia, Canada: Unpublished technical report prepared by Mining Associates Pty Ltd. for Eilat Exploration Ltd.

Logan, J.M. and Mihalynuk, M.G. (2014): Tectonic controls on Early Mesozoic paired alkaline porphyry deposit belts (Cu-Au ± Ag-Pt-Pd-Mo) within the Canadian Cordillera: Economic Geology, v. 109, pp. 827-858.

Logan, J.M., Drobe, J.R. and McClelland, W.C. (2000): Geology of the Forrest Kerr-Mess Creek Area, Northwestern British Columbia (NTS 104B/10, 15 & 104G/2 & 7W). British Columbia Ministry of Energy and Mines, Geological Survey Branch. Bulletin 104.

MacLeod, J.W. (1979): Diamond drill data on Red Dog Group, Nuttlude Lake, Liard Mining Division: Assessment report prepared for Consolidated Silver Ridge Mines Ltd., BC Mines Department Assessment Report Number 07586.

MacLeod, J.W. (1979): Geochemical report on White Claim, Nuttlude Lake, Liard Mining Division, for Suneva Resources Ltd. Assessment report prepared for Suneva Resources Ltd., BC Mines Department Assessment Report Number 07585.

MacNeill, L. (2016): Skeena Resources Winter Trail Traverse Field Note Compilation, an internal Company Report, November 2016.

MacRobbie, P.A. (1989): Assessment report: Diamond drilling, rock sampling, and mapping on Red Dog 1, Red Dog 2, Red Dog 4, Red Dog 3, Pink Mineral Claims: Assessment report prepared for Cominco Ltd., BC Mines Department Assessment Report Number 19364.

Mason, R. (2005): Petrological Study of Eight Drill Core Rock Samples from Drill hole S91-76 at the Spectrum Gold Deposit, British Columbia. In Salfinger R, 2005 Report on resource, geology and petrographic surveys: Spectrum Properties, BC. BC Mines Department Assessment Report number 27688.

McAndlish, K. (2004): Preliminary Assessment of the Schaft Creek Deposit, British Columbia – Project Status Report No. 1. Associated Mining Consultants Ltd. Report prepared for 955528 Alberta Ltd.

McDermid, R. (2005): Kinaskan Lake Project-G.J. Property Cost Estimate for Access Road Construction, September, 2005. Ranex Exploration Ltd. Unpublished report prepared for Canadian Gold Hunter Corp.

McInnis, M.D. (1981): Drilling Report on the GJ and Spike 1 and Spike 2 Claims, Liard Mining Division. Canorex Minerals Ltd. Unpublished report prepared for Dimac Resources Corp.

McKnight, S. (2012): Spectrum Project, Archaeological Impact Assessment, Final Report, Heritage Inspection Permit 2011-0296: Archaeological Impact Assessment report prepared for Eilat Exploration Ltd.

McLeod, J.A. (2005): RE: GJ Project (Cdn Gold Hunter) / G.D.L. Job V05-0164R. Teck Cominco Ltd. (Global Discovery Labs). Unpublished letter appended to Hawthorn, 2005.

Mcleod, J.A. (2006): RE: Canadian Gold Hunter) / G.D.L. Job V06-0017R. Teck Cominco Ltd. (Global Discovery Labs). Unpublished letter appended to Hawthorn, 2006.

Mehner, D.T. (1990): Assessment Report on Overburden Drilling, Geological Mapping, Prospecting and Stream Silt Sampling of the GJ Property, Liard Mining Division, B.C. British Columbia Ministry of Energy, Mines and Petroleum Resources, Assessment Work Report No. 19,907.

Mehner, D.T. (1991): Assessment Report on Diamond Drilling, Contour Soil Sampling and Geophysical Surveys of the GJ Property, Liard Mining Division, B.C. British Columbia Ministry of Energy, Mines and Petroleum Resources, Assessment Work Report No. 20,933.

Mehner, D.T. (2004): Geological Report on the Kinaskan Lake Project. British Columbia Ministry of Energy and Mines. Assessment Work Report No. 27,387.

Mehner, D.T. (2005): Diamond Drilling, Wacker Drilling, IP, Resistivity & Ground Magnetic Geophysical Surveys, Silt, Soil & Rock Geochemical Sampling, Trenching and Prospecting On the Kinaskan Lake Property, GJ Project, 2004. *British Columbia Ministry of Energy, Mines and Petroleum Resources.* Assessment Work Report No. 27,769A, 27,769B, and 27,769C.

Mehner, D.T. (2006): Diamond Drilling On the GJ, GJ East and North Zones, Kinaskan Lake Property, GJ Project, 2005. British Columbia Ministry of Energy, Mines and Petroleum Resources. Assessment Work Report No. 28,333A and 28,333B.

Mehner, D.T. (2007): Diamond Drilling On the Donnelly North, Saddle, YT and North Zones, Kinaskan Lake Property, GJ Project, 2006. British Columbia Ministry of Energy, Mines and Petroleum Resources. Assessment Work Report No. 28,999A, 28,999B and 28,999C.

Mehner, D.T. (2008): Diamond Drilling On the Donnelly and North Donnelly Zones, Kinaskan Lake Property, GJ Project, 2007. British Columbia Ministry of Energy, Mines and Petroleum Resources. Assessment Work Report No. 29,989A, 29,989B.

Mehner, D.T. (2016): Review of Exploration Targets on the Kinaskan Lake Property, GJ Project. Liard Mining Division, British Columbia, Canada. Report prepared for Skeena Resources Ltd. January 03, 2016.

Mehner, D.T. and Peatfield, G. R. (2005): Technical Report on the Donnelly – GJ – North Cu-Au Porphyry Zones, Kinaskan Lake Project, Liard Mining Division, British Columbia, Canada. Report prepared for Canadian Gold Hunter Corp. as required under NI 43-101.

Mehner, D.T. and Peatfield, G. R. (2006): Technical Report on the Kinaskan Lake CopperGold Porphyry Project, Liard Mining Division, British Columbia, Canada. Report prepared for Canadian Gold Hunter Corp. as required under NI 43-101.

Mehner, D.T., Giroux, G.H., and Peatfield, G.R. (2007): Technical Report on the GJ Cu-Au Porphyry Project, Liard Mining Division, British Columbia, Canada. NI43-101 Technical Report prepared for Canadian Gold Hunter Corp.

Melymick, C. (2013): Stikine and Upper Nass Current Social-Ecological Conditions Summary. Prepared for the Bulkley Valley Centre for Natural Resource Research & Management. April 2013. (available at bvcentre.ca/files/integrated/StikineandUpperNass15Jan2014v3.pdf

Micko, J., Tosdal, R.M., Bissig, T., Chamberlain, C.M., and Simpson, K.A. (2014): Hydrothermal alteration and mineralization of the Galore Creek alkalic Cu-Au porphyry deposit, northwestern British Columbia, Canada. Economic Geology, v. 109, pp. 891-914.

Mine Environment Neutral Drainage (MEND) (2005): Case Studies of ML/ARD Assessment and Mitigation: Snip Gold Mine: MEND Report 9.1b.

Mining Associates Pty Ltd. (2004): Spectrum resource review: Internal report prepared for Trans Pacific Mining Ltd.

Morrice, M.G. (1991): Assessment Report on the QC Property. Keewatin Engineering Inc. Assessment report prepared for Dryden Resource Corporation.

Morris, R.J. (2010): Resource Estimate, Copper Canyon Property. Moose Mountain Technical Services. Report prepared for Copper Canyon Resources Ltd. as required under NI 43-101 and posted on SEDAR.

Mortensen, J.K., Ghosh, D.K., and Ferri, F. (1995): U-Pb geochronology of intrusive rocks associated with Cu-Au porphyry deposits in the Canadian Cordillera: Canadian Institute of Mining, Metallurgy, and Petroleum Special Volume 46, pp. 142-158.

National Geochemical Reconnaissance, 1:250,000 Map Series (1988): Geological Survey of Canada, Open File.

Newell, J.M. (1978): Report on Geological and Geochemical Surveys on the Al Group and the Quash Creek Claims, situated northwest of Kinaskan Lake in the Liard Mining Division, Assessment Report 6760.

Newell, J.M. and Peatfield, G.R. (1995): The Red-Chris porphyry Cu-Au deposit. In T.G. Schroeter, Editor, Porphyry Deposits of the Northwestern Cordillera of North America. Canadian Institute of Mining, Metallurgy and Petroleum, Special Volume 46.

Noel, G.A. (1978): Geological and geochemical report, Red Dog 1 & 2 Claims, Liard Mining Division: Assessment report prepared for Consolidated Silver Ridge Mines Ltd., BC Mines Department Assessment Report Number 07000.

Noel, G.A. (1980): Geological and geochemical report, Hawk 1 claim, Liard Mining Division: Assessment report prepared for Highhawk Mines Ltd., BC Mines Department Assessment Report Number 07189.

Noel, G.A. (1981a): Report on 1980 drilling, Red Dog claims: Assessment report prepared for Consolidated Silver Ridge Mines Ltd., BC Mines Department Assessment Report Number 08853.

Noel, G.A., (1981b): Report on the 1980 fieldwork, Hawk 1 Claim, Liard Mining Division: Assessment report prepared for Newhawk Gold Mines Ltd., BC Mines Department Assessment Report Number 09082.

Noel, G.A. and Taylor, B. (1981): Summary report, Red Dog Property, Nuttlude Lake Area, Liard Mining Division, B.C. Assessment report prepared for Northcal Resources Inc., BC Mines Department Assessment Report Number 10117.

Norman, G. (1992): Report on the 1992 Exploration Program on the Spectrum Project (Spectrum and Hawk Properties) for Columbia Gold Mines Ltd., BC Mines Department Assessment Report number 22838.

Oliver, J. (2015): Geological Mapping of the Spectrum Property for Skeena Resources. A consultancy report to Skeena Resources Ltd. By Oliver Geoscience International Ltd.

Oliver, J. (2016): Petrographic Report on 28 Polished Thin Sections: Skeena Resources Spectrum Gold Occurrence, Northwest British Columbia, Canada. A consultancy report to Skeena Resources Ltd. By Oliver Geoscience International Ltd.

Oliver, J. and Walcott, A. (2016): Interpretation of LiDAR™ Image Structural Lineaments, Skeena Resources Spectrum Gold-Copper Project, North Central B.C. A consultancy report to Skeena Resources Ltd. By Oliver Geoscience International Ltd. February 16, 2016.

Okulitch, A.V. (1999): Geological time scale 1999. Geological Survey of Canada, Open File 3040 (National Earth Science Series, Geological Atlas) – Revision.

Pacific Climate Impacts Consortium (2017): http://tools.pacificclimate.org/dataportal/pcds/map/.

Pálfy, J., Smith, P.L. and Mortensen, J.K. (2000): A U-Pb and 40Ar/39Ar time scale for the Jurassic. NRC Canada. Canadian Journal of Earth Sciences, Volume 37, pages 923-944.

Pauwels, A.M. (1984): Assessment report on soil and silt sampling for copper, gold, arsenic, and silver on Hawk 1, 2, Red Dog, Pink mineral claims: Assessment report prepared for Cominco Ltd., BC Mines Department Assessment Report Number 13,243.

Peatfield, G.R. and Donnelly, D.A. (1976): Geological and Geophysical Report on the Groat Creek Claim Group, Iskut, B.C. British Columbia Ministry of Mines and Petroleum Resources. Assessment Work Report No. 6,073.

Peatfield, G.R. (1980): Report on diamond drilling on the Goat Hide M. C. (part of the GOAT-80 Group). British Columbia Ministry of Energy, Mines and Petroleum Resources, Assessment Work Report No. 8,498.

Peatfield, G.R., Giroux, G. H., and Cathro, M. S. (2016): Revised Technical Report on the Donnelly-GJ Deposit Area, GJ Property, Liand Mining Division, British Columbia, Canada. NI 43-101 Technical Report prepared for Skeena Resources Ltd.

Peter E. Walcott & Associates Ltd. (1971): A report on an induced polarization survey, Kinaskan Lake Area, British Columbia for Imperial Oil Enterprises Ltd.: Assessment report prepared for Imperial Oil Enterprises Ltd., BC Mines Department Assessment Report Number 03501.

Phase Geochemistry (2016): Scoping Level ML/ARD Assessment for the Spectrum – GJ Project. Consultancy report prepared for Skeena Resources Ltd. January 2017.

Phase Geochemistry (2017): Scoping Level ML/ARD Assessment for the Spectrum Project. Consultancy report prepared for Skeena Resources Ltd. January 2016.

Price, W. and Errington, J. (1998): Guidelines for Metal Leaching and Acid Rock Drainage at Minesites in British Columbia. Prepared for the Ministry of Energy and Mines. August 1998.

Racicot, A.C. (1976): Assessment Work Report on Goat Claim Two Units Liard Mining Division, Located Approximately Three Miles West of the North End of Kinniskan (sic) Lake. British Columbia Ministry of Energy, Mines and Petroleum Resources. Assessment Work Report No. 6,090.

Rairdan, B. (2015): GJ Deposit – Mineralogy Based Preliminary Processability Estimate. Unpublished internal report prepared for Teck Resources Limited, dated February 20, 2015.

Ramsay, A. and Dyck, S. (2012): 2012 Airborne Geophysical Survey and Archaeological Impact Assessment on the Spectrum Property, Northwestern British Columbia: Assessment report prepared for Eilat Resources Inc., BC Mines Department Assessment Report Number 33512.

Read, P.B. (Compiler) (1984): Geology, Klastline River (104G/16E), Ealue Lake (104H/13W), Cake Hill (104I/4W) and Stikine Canyon (104J/1E). Geological Survey of Canada, Open File 1080, Map – Scale 1:50,000.

Red Chris Development Company Ltd. (2004): Application for an Environmental Assessment Certificate Red Chris Project British Columbia, Canada. October 2004.

Rees, C., Riedell, K., Profett, J.M., MacPherson, J. and Robertson, S. (2015): The Red Chris Porphyry Cu-Au deposit, Northern British Columbia, Canada: Igneous Phases, Alteration, and Controls of Mineralization. Society of Economic Geologists, Inc. Economic Geology, Volume 110, pages 857-888.

Rescan (2008): GJ Kinaskan Mountain Ungulate Summer Survey Report. Prepared by Rescan Environmental Services Ltd. for Canadian Gold Hunter Corporation. January 2008.

Rescan (2013): Application for an Environmental Assessment Certificate / Environmental Impact Statement for the KSM Project. Prepared for Seabridge Gold Inc. July 2013.

Rhys, D. A. (1993): Geology of the Snip Mine, and its Relationship to the Magmatic and Deformational History of the Johnny Mountain Area, Northwestern British Columbia; unpublished M.Sc. thesis, The University of British Columbia.

Resources Inventory Committee (RISC, 1996): Guidelines and Standards to Terrain Mapping in British Columbia. Developed by the Surficial Geology Task Group Earth Sciences Task Force. (available at www.for.gov.bc.ca/hts/risc/pubs/earthsci/012/assets/012.pdf).

Resource Inventory Standards Committee (RISC, 1999): British Columbia Wildlife Habitat Rating Standards. Prepared for BC Ministry of Environment, Lands and Parks, Resource Inventory Committee. Ver.n 2.0. May 1999. (available at www.env.gov.bc.ca/wildlife/whr/essentials.html).

Resources Information Standards Committee (RISC, 2009): Manual of British Columbia Hydrometric Standards. Ministry of Environment.

RTEC (2007): Archaeological Overview Assessment for Kinaskan (GJ) Project in Northwestern, BC. Prepared for Canadian Gold Hunter, April 2007.

RTEC (2011a): GJ/Kinaskan Copper-Gold Porphyry Project, 2005 to 2008 Meteorology Data Report. Report prepared for Teck Resources Ltd. by Rescan Tahltan Environmental Consultants Ltd., October 2011.

RTEC (2011b): GJ/Kinaskan Copper-Gold Porphyry Project: 2005 to 2008 Surface Water Hydrometric Data Report. Report prepared for Teck Resources Ltd. by Rescan Tahltan Environmental Consultants. October 2011 Draft.

RTEC (2011c): GJ/Kinaskan Copper-Gold Project: Water Quality Data Report, 2005 to 2008. Report prepared for Teck Resources Ltd. by Rescan Tahltan Environmental Consultants. November 2011 Draft.

RTEC (2011d): GJ Project 2011 Fish and Fish Habitat Baseline Report. Report prepared for Teck Resources Ltd. by Rescan Tahltan Environmental Consultants. October 2011 Draft.

RTEC (2011e): GJ Copper-Gold Project Archaeological Impact Assessment Final Report, Heritage Inspection Permit 2011-0174. Report prepared for Teck Resources Ltd. by Rescan Tahltan Environmental Consultants. December 2011.

RTEC (2012a): Memorandum dated March 22, 2012. Trip Report, March 2 to 12, 2012, for the GJ Project.

RTEC (2012b): GJ Copper-Gold Project Archaeological Impact Assessment Final Report, Heritage Inspection Permit 2012-0145. Report prepared for Teck Resources Ltd. December 2012.

RTEC (2012c): Spectrum Project Archaeological Impact Assessment Final Report, Heritage Inspection Permit 2011-0296. Report prepared for Eilat Exploration Ltd. December 2012.

RTEC (2013): GJ Copper-Gold Project Archaeological Impact Assessment Final Report, Heritage Inspection Permit 2013-0155. Report prepared for Teck Resources Ltd. November 2013.

RTEC (2015): Spectrum Project Archaeological Impact Assessment Final Report for Heritage Inspection Permit 2014-0316. Report prepared for Skeena Resources Limited. November 2015 Draft.

RTEC (2016a): Memorandum dated June 29, 2016. Mountain Ungulate Flight Management Plan for GJ Project.

RTEC (2016b): Archaeological Impact Assessment Final Report for Heritage Inspection Permit 2014-0316. Report prepared for Skeena Resources Ltd. by Rescan-Tahltan Environmental Consultants Ltd., January 2016.

RTEC (2017): Spectrum and GJ Projects, 2016 Archaeological Impact Assessment Draft Interim Report, Heritage Inspection Permit 2016-0162. Report prepared for Skeena Resources Ltd. by Rescan Tahltan Environmental Consultants, Vancouver, British Columbia. January 2017 Draft.

Salfinger, R. (2005): Report on resource, geology, and petrographic surveys: Spectrum Properties, B.C.: Assessment report prepared for Trans Pacific Mining Ltd., BC Mines Department Assessment Report Number 27688.

Saunders, C.R. and Budinski, D.R. (1991): Geological reserves for the Spectrum Gold Deposit, Iskut Area, British Columbia: Internal report prepared for Eurus Resource Corporation.

Schmitt, H.R. (1977): A Triassic-Jurassic Granodiorite Monzodiorite Pluton South-East of Telegraph Creek, B.C. University of British Columbia. Unpublished Bachelor of Science Thesis.

Schwab, J.W. (2015a): Geohazard Assessment Spectrum Gold Property, Skeena Resources Limited. Internal company report. July 20, 2015.

Schwab, J.W. (2015b): Access Evaluation, Spectrum Gold Property, October 5 and 6, 2015. Internal memo prepared for Skeena Resources Ltd., October 10, 2015.

Seraphim, R.H. (1971): Geological Report on Al Claim Group, Quash Creek, Liard Mining Division, Assessment Report 3,239.

Siega, A.D. (2006): Preliminary site visit to identify the possibility of winter drilling for the Spectrum Property, BC: Internal report prepared for Seeker Resources Corp.

Sillitoe, R.H. (2010): Porphyry Copper Systems: Economic Geology, v. 105, pp. 3-41.

Simpson, R.G. (2014): Ascot Resources Ltd., Premier-Dilworth Gold-Silver Project, British Columbia: NI 43-101 Technical Report prepared for Ascot Resources Ltd.

Sinclair, A.J. (1974): Applications of probability graphs in mineral exploration. Association of Exploration Geochemists. Special Volume No. 4.

Sinclair, W.D. (2007): Porphyry Deposits, in Goodfellow, W.D., ed., Mineral Deposits of Canada: A Synthesis of Major Deposit-Types, District Metallogeny, the Evolution of Geological Provinces, and Exploration Methods: Geological Association of Canada, Mineral Deposits Division, Special Publication No. 5, pp. 223-243.

Skeena Region Environmental Stewardship Division, Smithers BC (2003): Stikine County Protected Areas Management Plan, November 2003.

Sobara J.P. (2000): Summary Report of the Spectrum Property, Liard Mining Division, British Columbia. Report for Arkaroola Resources Ltd.

Soil Classification Working Group. (1998): Canadian System of Soil Classification. Agriculture and Agri-Food Canada (available at sis.agr.gc.ca/cansis/taxa/cssc3/index.html)

Souther, J.G. (1972): Telegraph Creek Map Area, British Columbia. Geological Survey of Canada, Paper 71-44.

Stacey, J.R. (2016): Report on Diamond Drilling, Prospecting and 3D modeling on the Spectrum Gold Property, September 27, 2014 - April 30, 2015, Liard Mining Division, British Columbia, Canada. British Columbia Ministry of Energy, Mines and Petroleum Resources Assessment Work Report.

Stacey, J.R. and Giroux, G.H. (2016): Technical Report on the Spectrum Gold-Copper Property, Liard Mining Division, British Columbia, Canada. NI 43-101 Technical Report prepared for Skeena Resources Limited.

Taylor, B.E. (2007): Epithermal Gold Deposits, in Goodfellow, W.D., ed., Mineral Deposits of Canada: A Synthesis of Major Deposit-Types, District Metallogeny, the Evolution of Geological Provinces, and Exploration Methods: Geological Association of Canada, Mineral Deposits Division, Special Publication No. 5, pp. 113-139.

Thomas, D.G. (2017): Mineral Resource Updates, Central Zone and Donnelly Deposit, Spectrum-GJ Cu-Au Project. A consultancy report to Skeena Resources Ltd. by DKT Geosolutions, Inc. March 2017.

Thomson, G.R. (1981): Diamond Drilling Report on the Horn Claim, Kinaskan Lake Area, Liard Mining Division, B.C. Consultancy report to Tenajon Silver Corporation, September 22, 1981.

Valentine, K., Sprout, P., Baker, T. and Lavkulich, L. (1978): The soil landscapes of British Columbia. BC Ministry of Environment, Resource Analysis Branch: Victoria, BC.

Walcott, P.E. (1971): A Report on an Induced Polarization Survey, Kinaskan Lake Area British Columbia for Imperial Oil Enterprises Limited. British Columbia Ministry of Energy, Mines and Petroleum Resources. Assessment Work Report No. 3,501.

Walcott, P.E. and Associates (1977): A Report on an Induced Polarization Survey, Stikine Area, Liard M.D., British Columbia. British Columbia Ministry of Mines and Petroleum Resources. Assessment Work Report No. 6,500, Part 1 of 2.

Wernecke, B.P. and Klepacki, D.W. (1988): Escape hypothesis for the Stikine block: Geology, v. 16, pp. 461-464.

Winter, C.Q., Good, D.R. and McInnis, M.D. (1976): Geochemical Report on the GJ Claim, Kinaskan Lake Area, British Columbia. British Columbia Ministry of Mines and Petroleum Resources. Assessment Work Report No. 6,095.

Wood, G. (2017): Projected Long-Term Metal Prices, USD/CAD Exchange Rate & Recommended Discount Rate for use in the Preliminary Economic Assessment (PEA) of the Spectrum-GJ Project. Consultancy report to the Skeena Resources by XFRM Canada.

Yakimchuk, M.E. (2015a): Skeena Resources Ltd.: Spectrum Property – QC Zone & Porphyry Zone Evaluation of Gold Recovery by Gravity & Cyanide Leaching Operations. Internal memo prepared for Skeena Resources Ltd., July 13, 2015.

Yakimchuk, M.E. (2015b): Skeena Float Test Summary. Internal memo prepared for Skeena Resources Ltd., July 13, 2015.