Report to:

PROPHECY PLATINUM

Wellgreen Project Preliminary Economic Assessment, Yukon, Canada

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TETRA TECH WARDROP

Report to:

WELLGREEN PROJECT PRELIMINARY ECONOMIC ASSESSMENT, YUKON, CANADA

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GLOSSARY

Units of Measure

above mean sea level	amsl
acre	ac
ampere	A
annum (year)	a
billion	B
billion tonnes	Bt
billion years ago	Ga
British thermal unit	BTU
centimetre	cm
cubic centimetre	cm^3
cubic feet per minute	cfm
cubic feet per second	ft^3/s
cubic foot	ft^3
cubic inch	in^3
cubic metre	m^3
cubic yard	yd^3
Coefficients of Variation	CVs
day	d
days per week	d/wk
days per year (annum)	d/a

dead weight tonnes	DWT
decibel adjusted	dBa
decibel	dB
degree	°
degrees Celsius	°C
diameter	ø
dollar (American)	US$
dollar (Canadian)	Cdn$
Euro	€
dry metric ton	dmt
foot	ft
gallon	gal
gallons per minute (US)	gpm
gigajoule	GJ
gigapascal	GPa
gigawatt	GW
gram	g
grams per litre	g/L
grams per tonne	g/t
greater than	>
gectare (10,000 m^2)	ha
hertz	Hz
horsepower	hp
hour	h
hours per day	h/d
hours per week	h/wk
hours per year	h/a
inch	"
kilo (thousand)	k
kilogram	kg
kilograms per cubic metre	kg/m^3
kilograms per hour	kg/h
kilograms per square metre	kg/m^2
kilometre	km
kilometres per hour	km/h
kilopascal	kPa
kilotonne	kt
kilovolt	kV
kilovolt-ampere	kVA
kilovolts	kV
kilowatt	kW
kilowatt hour	kWh
kilowatt hours per tonne (metric ton)	kWh/t
kilowatt hours per year	kWh/a
less than	<
litre	L

litres per minute	L/m
megabytes per second	Mb/s
megapascal	MPa
megavolt-ampere	MVA
megawatt	MW
metre	m
metres above sea level	masl
metres Baltic sea level	mbsl
metres per minute	m/min
metres per second	m/s
metric ton (tonne)	t
microns	µm
milligram	mg
milligrams per litre	mg/L
millilitre	mL
millimetre	mm
million	M
million bank cubic metres	Mbm^3
million bank cubic metres per annum	Mbm^3/a
million tonnes	Mt
minute (plane angle)	'
minute (time)	min
month	mo
ounce	oz
pascal	Pa
centipoise	mPa·s
parts per million	ppm
parts per billion	ppb
percent	%
pound(s)	lb
pounds per square inch	psi
revolutions per minute	rpm
second (plane angle)	"
second (time)	s
specific gravity	SG
square centimetre	cm^2
square foot	ft^2
square inch	in^2
square kilometre	km^2
square metre	m^2
thousand tonnes	kt
three dimensional	3D
three dimensional model	3DM
tonne (1,000 kg)	t
tonnes per day	t/d
tonnes per hour	t/h

tonnes per year	t/a
tonnes seconds per hour metre cubed	ts/hm^3
volt	V
week	wk
weight/weight	w/w
wet metric ton	wmt
year (annum)	a

Abbreviations and Acronyms

abrasion Index	Ai
Access Consulting Group	Access Consulting
acid rock drainage	ADR
atomic absorption spectroscopy	AAS
atomic absorption	AA
Ball Mill Work Index	BWI
borehole electromagnetic	BHEM
Bulk Mineral Analysis with an estimate of Liberation	BMAL
Canadian Environmental Assessment Act	CEAA
carboxymethyl cellulose	CMC
cobalt	Co
combined heat & power	CHP
Committee on the Status of Endangered Species in Canada	COSEWIC
copper	Cu
Coronation Minerals Inc.	Coronation Minerals
Designated Office	DO
diamond drillholes	DDHs
earnings before interest, tax, depreciation and amortization	EBITDA
Energy & Metals Consensus Forecasts	EMCF
Engineering, Procurement, and Construction Management	EPCM
Environmental Assessment	EA
Environmental Site Assessment	ESA
Fisheries and Oceans Canada	DFO
Foreign Exchange Consensus Forecasts	FECF
G&T Metallurgical Services Ltd.	G&T
general and administrative	G&A
global positioning system	GPS
harmful alteration, disruption and destruction	HADD
heating, ventilation, and air-conditioning	HVAC
Hudson Bay Exploration & Development	HBE&D
Hudson Bay Mining & Smelting Co., Limited	HBM&S
Hudson Yukon Mining Company	Hudson Yukon Mining
induced polarization	IP
inductively coupled plasma atomic emission spectroscopy	ICP-AES
inductively coupled plasma	ICP
internal rate of return	IRR

International All-North Resources Ltd.	All-North
International Electrotechnical Commission	IEC
International Organization for Standardization	ISO
inverse distance squared	ID^2
inverse distance	ID
iridium	Ir
Kaieteur Resource Corporation	Kaieteur
Kluane Joint Venture	Kluane JV
Lakefield Research Ltd.	Lakefield
Lerchs-Grossman	LG
levelized cost of electricity	LCOE
life-of-mine	LOM
liquefied natural gas	LNG
locked cycle test	LCT
London Metal Exchange	LME
maximum potential acidity	MPA
methyl isobutyl carbonyl	MIBC
Mill and Float Twice	MF2
National Instrument 43-101	NI 43-101
National Topography System	NTS
Navigable Waters Protection Act	NWPA
Navigable Waters Protection Program	NWPP
nearest neighbour	NN
net present value	NPV
net smelter return	NSR
neutralization potential	NP
nickel equivalent	NiEq
nickel	Ni
ordinary kriging	OK
osmium	Os
Pacific Coast Nickel Corp.	Pacific Coast
palladium	Pd
platinum group element	PGE
platinum group metal	PGM
platinum	Pt
potassium amyl xanthate	PAX
preliminary economic assessment	PEA
present value	PV
Prophecy Platinum Corp.	Prophecy Platinum
Prophecy Coal Corp.	Prophecy Coal
Qualified Person	QP
quality assurance/quality control	QA/QC
Quantitative Evaluation of Materials by Scanning Electron Microscopy	QEMSCAN
Quartz Mine License	QML
Quartz Mining Act	QMA
Revenue Factor	RF

rhenium	Re
rhodium	Rh
rock quality designation	RQD
run-of-mine	ROM
ruthenium	Ru
semi-autogenous grinding	SAG
SGS Vancouver	SGS
sodium isopropyl xanthate	SIPX
Species at Risk Act	SARA
specific gravity	SG
Standard Reference Material	SRM
Strategic Metals Ltd.	Strategic
tailings management facility	TMF
Universal Transverse Mercator	UTM
very low frequency	VLF
Tetra Tech Wardrop	Tetra Tech
Watts, Griffis and McOuat Limited	WGM
Wellgreen Project	the Project
Wellgreen Property	the Property
Yukon Contaminated Site Regulations	YCSR
Yukon Energy Company	YEC
Yukon Electrical Company Limited	YECL
Yukon Environmental and Socio-economic Assessment Act	YESAA
Yukon Environmental and Socio-economic Assessment Board	YESAB
Yukon Mining Company	Yukon Mining

1.0 SUMMARY

1.1 INTRODUCTION

Tetra Tech Wardrop (Tetra Tech) was retained by Prophecy Platinum Corp. (Prophecy Platinum) to prepare a National Instrument 43 101 (NI 43-101) compliant preliminary economic assessment (PEA) for the Wellgreen Project (the Project) located in Yukon, Canada. The Wellgreen Property (the Property) is being investigated as a potential source of platinum group metals (PGMs), nickel and copper, and is located approximately 317 km northwest of Whitehorse in south western Yukon (Figure 1.1). The Project will be a 32,000 t/d open pit operation with ore processed using a Mill and Float Twice (MF2) circuit.

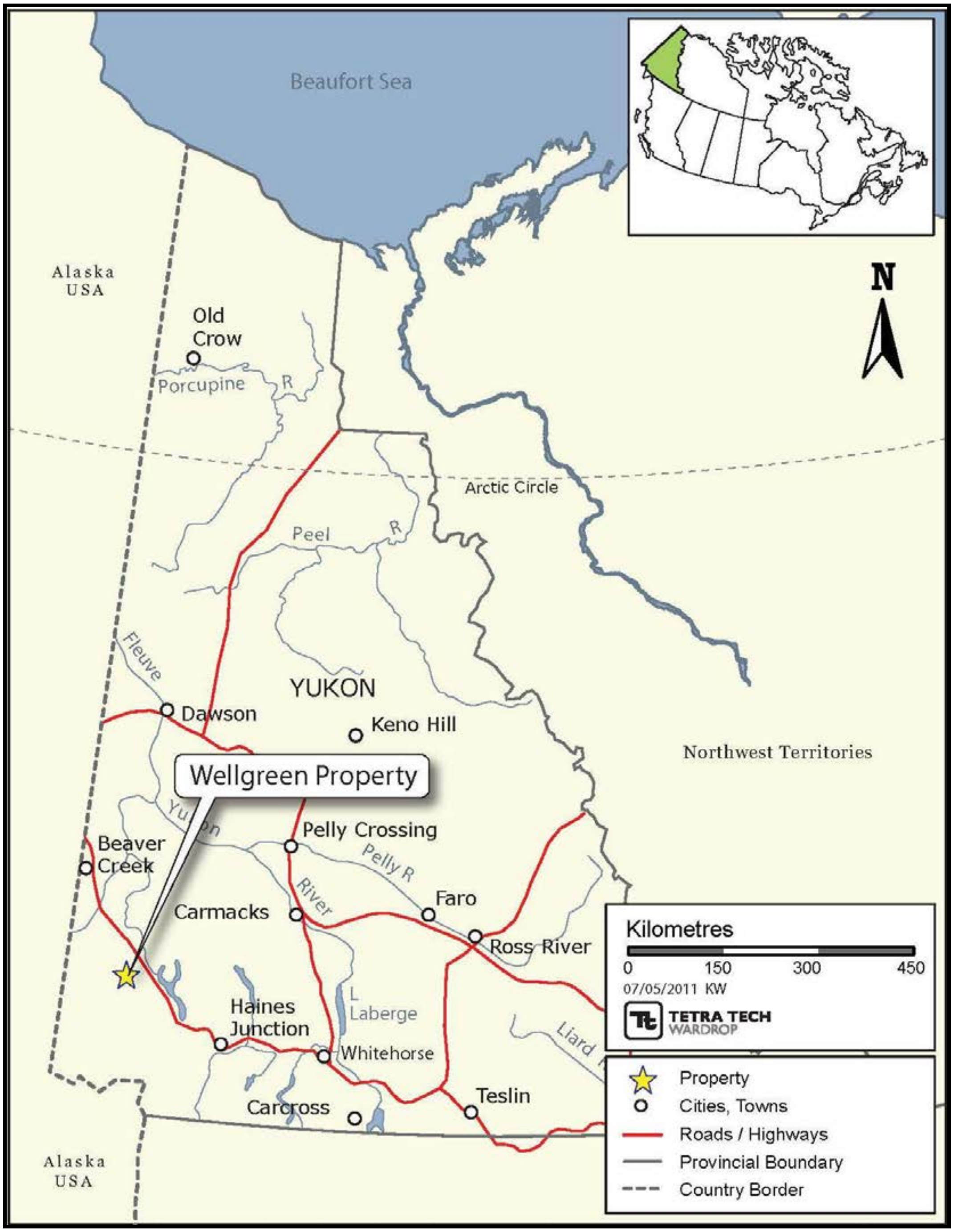
Table 1.1 outlines general information of the Project.

Table 1.1 General Project Information

Description	Unit	Amount
Estimated Pittable Mineral Resources (Measured + Indicated)	Mt	14.5
Estimated Pittable Mineral Resources (Inferred)	Mt	390.8
Mine Life	years	37
Milling Rate	t/d	32,000
Strip Ratio	t waste:t mineralized material	2.57:1
Total Project Capital Cost	US$ million	863.1
Average Overall Operating Cost	US$/t milled	29.74
Net Present Value (NPV) at 8% Discount Rate	US$ million	2,396
Internal Rate of Return (IRR)	%	32

All dollar figures presented in this PEA are stated in US dollars, unless otherwise specified. The London Metal Exchange (LME) three-year trailing metal prices, effective date of July 6, 2012, with an exchange rate of Cdn$1.00 to US$0.9794 has been used, unless otherwise specified.

Figure 1.1 Wellgreen Property Location



This PEA has been prepared by Tetra Tech for Prophecy Platinum based on work by the following independant consultants:

- Mr. Doug Ramsey, R.P. Bio (BC), for matters relating to environmental studies, permitting and social or community impact in Sections 1.0, 20.0 and 25.0 to 27.0.
- ALS Minerals for matters relating to history, sample preparation, analyses, and security and data verification in Sections 6.0, 11.0 and 12.0.
- Lakefield Research Ltd. (Lakefield) laboratories for matters relating to mineral processing and metallurgical testing in Sections 1.0, 13.0, 17.0, 25.0 and 26.0.
- SGS Vancouver (SGS) laboratories for matters relating to mineral processing and metallurgical testing in Sections 1.0, 13.0, 17.0, 25.0 and 26.0.
- Watts, Griffis and McQuat Limited (WGM) for matters relating to history, mineral processing and metallurgical testing in Sections 6.0 and 13.0.
- G&T Metallurgical Services Ltd. (G&T) for matters relating to mineral processing and metallurgical testing in Sections 1.0, 13.0, 17.0, 25.0 and 26.0.
- LME three-year trailing metal prices, effective date of July 6, 2012, for matters relating to resource model parameters, metal pricing and economic analysis, in Sections 1.0 and 22.0.
- Ms. Michelle Pockley of Fasken Martineau DuMoulin LLP for matters relating to the Old Mill Site in Sections 4.0 and 20.0.

1.2 PROPERTY DESCRIPTION

The Property is located approximately 317 km northwest of Whitehorse in southwestern Yukon, at approximate latitude 61°28’N, longitude 139°32’W on National Topography System (NTS) map sheet 115G/05 and 115G/06.

The Property can be reached from the Alaska Highway by a gravel road. An all-weather airstrip located 30 km southeast of the Property at Burwash Landing is maintained by NAV CANADA. An all-season, deep sea port is located in Haines, Alaska, 410 km to the southeast and is accessible by a high-quality paved highway.

The climate is alpine but tempered by west coast climate influences. Despite lengthy winter seasons, the temperatures are less extreme than areas further east. The daily average temperature at the Burwash Landing station is -22°C in January and 12.8°C in July. Average annual precipitation for the Burwash Landing station is 279.7 mm, of which 192 mm is rain and 106.4 cm is snow.

1.3 HISTORY

The Property has an exploration and production history dating back to its discovery in 1952. Please refer to Table 6.1 in Section 6.0 for more information on the history of the Property.

1.4 GEOLOGY

The Property is contained within the Kluane Ultramafic Belt, which is situated within the Wrangellia Terrane, a complex and variable terrane that extends from Vancouver Island to central Alaska. The Wrangellia Terrane is characterized by widespread exposure of Triassic flood basalts and complementary intrusive rocks. The ultramafic intrusives of the Wrangellia Terrane represents one of the largest tracts of nickel-copper-platinum group element (PGE) mineralization in North America, second in size to the Proterozoic Circum-Superior Belt (Thompson to Raglan).

The Wellgreen deposit occurs along the lower margin of an Upper Triassic ultramafic-mafic intrusion. Known as the Quill Creek Complex, it is 20 km long and is thought to have intruded along the contact between the Station Creek and Hasen Creek formations. The Station Creek formation consists of light to medium green volcanic breccia, tuffs, and tuffaceous sandstones. The Hasen Creek formation consists of a range of metasediments, including greywacke, thinly-bedded siltstone turbidites and limestones, together with volcaniclastics and tuffs.

The main body of the Quill Creek Complex is 4.2 km long, up to 700 m wide, and is located on the Northern Platinum claim group of the Property. A smaller, similar intrusive is located along strike to the northwest and southeast. The Quill Creek Complex consists of a main intrusion and an associated group of upright to locally overturned, steeply south dipping sills. These associated sills may be remnants of the main intrusion separated from the main mass by folding and shearing. The intrusions are crudely layered, variably serpentinized, and deformed. The sills locally have a lower gabbroic margin adjacent to a chilled contact with Paleozoic rocks. Mafic-rich skarns occur in the floor rocks adjacent to the marginal facies gabbro, particularly where the metasediment host includes limestone or calcareous rocks. The intrusives are zoned upwards away from the lower gabbroic zone through zones of clinopyroxenite, peridotite, and dunite.

Mineralization within the Quill Creek Complex has delineated into four zones of gabbro-hosted massive and disseminated mineralization known respectively as the East Zone, West Zone, Central Zone, and North Zone. Mineralization is typical of gabbro-associated nickel deposits such as Noril'sk, Russia; Stillwater, Montana; Duluth, Minnesota; and Sudbury, Ontario.

Numerous operators have worked on the Project since the initial discovery in 1952. Completed work includes 183 diamond surface drillholes, underground development and 519 holes underground diamond drillholes, together with mapping, trenching and geophysics. The majority of the work focused on the East Zone, which has underground development on six levels.

1.5 MINERAL RESOURCE ESTIMATE

This PEA is preliminary in nature and includes Inferred Mineral Resources that are considered too speculative geologically, on which to apply economic considerations to categorize them as mineral reserves. There is no certainty that the estimates contained in this PEA will be realized.

The resource estimation at a 0.2% nickel equivalent (NiEq) cut-off resulted in an Indicated Resource of 14.4 Mt at grades of 0.68% nickel, 0.62% copper, and 2.23 g/t platinum+palladium+gold. An additional Inferred Resource of 446.6 Mt at grades of 0.31% nickel, 0.25% copper, and 0.87 g/t platinum+palladium+gold. Table 1.2 summarizes the results of the resource estimate from within the optimized open pit.

Table 1.2 Wellgreen Mineral Resource Summary

NiEq Cut-off	Category	Zone	Tonnes	NiEq%	Ni (%)	Cu (%)	Co (%)	Au (g/t)	Pt (g/t)	Pd (g/t)
0.2	Indicated	Pitshell	14,432,900	1.4	0.68	0.62	0.05	0.51	0.99	0.73
0.2	Inferred	Pitshell	446,649,000	0.6	0.31	0.25	0.02	0.16	0.38	0.33

The fundamental difference between the 2011 Tetra Tech resource and the 2012 Tetra Tech resource is that the new metal pricing allowed for a greater amount of the PGE material to be included with the potential pit, resulting in the application of a lower NiEq cut-off. In addition, the application of engineering design at a PEA level supports the low mining cost per unit tonnes processed.

	Tonnes	Ni (%)	Cu (%)	Co (%)	Au (g/t)	Pt (g/t)	Pd (g/t)
2012 Tetra Tech PEA Model							
Indicated Resource @ 0.2% NiEq cut-off	14,423,900	0.68	0.62	0.05	0.51	0.99	0.73
Inferred Resources @ 0.2% NiEq cut-off	446,649,000	0.31	0.25	0.02	0.16	0.38	0.33
2011 Tetra Tech Resource Model							
Indicated Resource @ 0.4% NiEq cut-off	14,308,000	0.69	0.62	0.05	0.52	0.99	0.74
Inferred Resources @ 0.4% NiEq cut-off	289,246,000	0.38	0.35	0.03	0.23	0.53	0.42

Previous exploration has concentrated on the lower gabbroic section of the ultramafic body for semi-massive nickel sulphides. Recent exploration has concentrated on the evaluation of the Property's potential to host larger, but lower grade, tonnages of PGM-enriched nickel-copper mineralization for potential open pit extraction. Higher-grade pockets of semi-massive sulphides (more than 1% copper and nickel and more than 2 g/t platinum), as historically mined by Hudson Yukon Mining Company (Hudson Yukon Mining), are expected to be continually located through exploration efforts. These higher grade pockets, although not continuous, could be targeted in a potential open pit operation to accelerate the Project's pay back.

The Project database is relatively up-to-date, and includes the results of the 2011 drilling program. Coronation Minerals Inc. (Coronation Minerals), a previous owner, carried out the most recent twin-hole drilling program and this was generally successful in confirming historic results. As a result, Tetra Tech is of the opinion that using the historic drilling is appropriate for any future resource estimates, although additional analysis will be required before a definitive conclusion can be reached.

The Prophecy Platinum drilling confirmed the presence of a substantial mineralized system located in the hanging wall of the semi-massive sulphide pods previously targeted as the Wellgreen deposit, thus defining a new geological target previously untested at Wellgreen. Table 1.3 summarizes the parameters used to generate the resource block model.

Table 1.3 Resource Model Parameters

	2012 Tetra Tech PEA Model
Number of Drillholes	702 (55,000 m used)
Grade Capping	Parrish Analysis
	East Zone - 4.14% Cu, 2.05 g/t Au, 5.15 g/t Pd, 5.72 g/t Pt
	West Zone - 2.29 g/t Au
Composite Length	East Zone - 2.5 m
	West Zone - 2.5 m
Cut-off Grade	0.2% NiEq
Number of Mineral Zones	2
Block Size	20 x 10 x 20 (4,000 m^3)
Resource Summary	All blocks above cut-off within optimized pitshell
Estimation Method	Ordinary kriging (OK) with inverse distance (ID) and nearest neighbour (NN) validation

Note: *Obtained from the Energy & Metals Consensus Forecasts (EMCF) of metal prices, in effect for Q2 2012. The EMCF is a long term metal consensus amongst 20 international financial institutions and represents an average of the long-term (five to ten years) forecasts in nominal 2012 dollars. The estimate of metal prices used in the geological model was assumed to best represent the project economics.

A large portion of the drill data set does not include platinum and palladium assays or rhodium, ruthenium, rhenium, iridium, or osmium, which would potentially enhance an economic evaluation of the Property. Specific gravity (SG) measurements are also lacking with in the data set.

1.6 MINING METHODS

The Project is a 32,000 t/d open pit mine that will be mined using conventional open pit mining methods. A mine production schedule consisting of five mining stages was developed for the Project starting with the development of a starter pit, located roughly in the centre of the mineralized area. Table 1.4 summarizes key mining details.

Table 1.4 Summary of Mining Details

Description	Unit	Amount
Mine Life	years	37
Mining Rate (average)	t/d	111,500
Strip Ratio	t waste:t mineralized material	2.57:1
Milling Rate	t/d	32,000

An economic cut-off grade of 0.22% nickel was calculated for planning mine production. The total material (waste and mineralized material) produced annually at the mine will peak at 51,000,000 t/a and will average 39,000,000 t/a, with a 37-year life-of-mine (LOM) and a stripping ratio of 2.57:1.

1.7 MINERAL PROCESSING AND METALLURGICAL TESTING

1.7.1 MINERAL PROCESSING

The current proposal under consideration for Wellgreen includes a 32,000 t/d conventional crushing and grinding circuit comprising a jaw crusher and semi-autogenous grinding (SAG) mill combination followed by a MF2 type process in order to produce a bulk nickel-copper concentrate for sale and treatment off-site. Although developed primarily for UG2 ores (South African PGE deposit), the MF2 configuration offers certain advantages such as prevention of over-grinding and slimes generation, increased rejection of talc, chlorite and pyrrhotite and early recovery of PGM. The concept is to gradually reduce the size of the ore particles, and float the liberated material immediately after each size reduction. Secondary grinding will be by ball mills and tertiary grinding by vertimills. The process will be comprised of two trains, which are identical from crushing through to the concentrate and tailings thickeners. The concentrate will be thickened, filtered, and loaded on trucks to be transported for further processing off-site (eg. sale or toll smelting). The tailings will be thickened and pumped to the tailings management facility (TMF).

1.7.2 METALLURGICAL TESTING

A review of the test work by Lakefield, G&T, and the latest test program at SGS was completed. Favourable nickel, copper, platinum, and palladium grades and recoveries were achieved with the test samples. The flotation concentrate recoveries and grades from the current test program at SGS were used for the design and are summarized in Table 1.5.

Table 1.5 Summary Grade and Recovery Data

Metal	Flotation Concentrate Grade	Flotation Concentrate Recovery (%)
Nickel	5.7%	67.6
Copper	6.0%	87.8
Cobalt	0.6%	64.4
Gold	0.48 g/t	58.9
Platinum	3.57 g/t	46.0
Palladium	6.22 g/t	72.9

1.8 INFRASTRUCTURE

The Wellgreen open pit area is located approximately 14 km away from the Alaska Highway and is accessible by a gravel road. The process plant area is 5 km from the access road turn off and the open pit a further 9 km along the same access road.

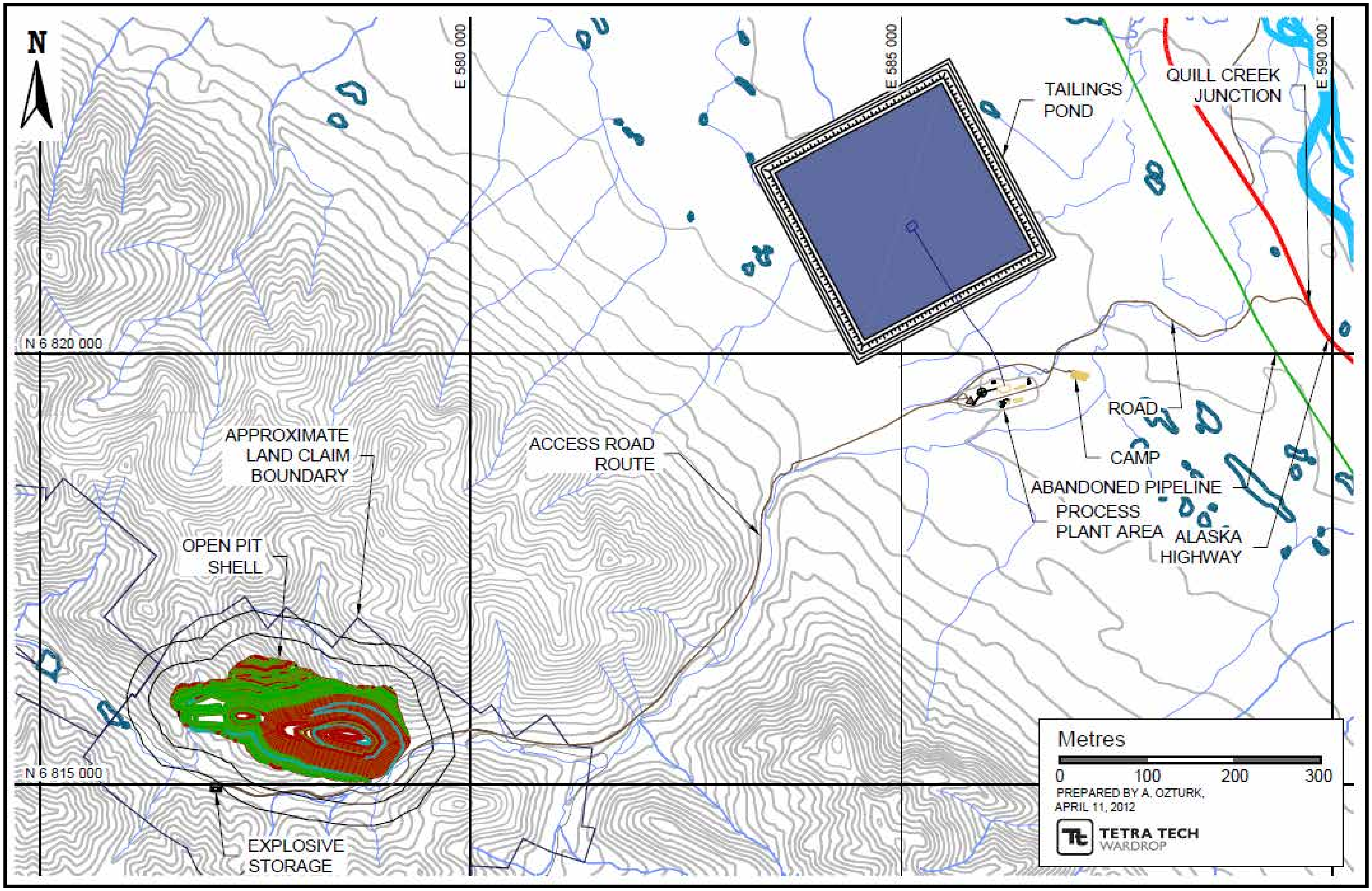
The processing plant, primary crusher, ancillary buildings, power plant and permanent camp are located within the process plant area.

A combined heat & power (CHP) plant with low speed engine generator sets (6x10 MW) operating at 13.8 kV, 60 Hz output voltage, has been considered to meet the Project's power demands. Fuel supply is assumed to be diesel which will be delivered by truck to the power plant.

The proposed tailings pond will be constructed of compacted rock fill using the downstream method with a geomembrane liner on the upstream face. The tailings impoundment footprint will be lined with a low density polyethylene liner over a layer of broadly graded silty sand and gravel, acting as low permeability bedding material and providing secondary containment.

Figure 1.2 illustrates the overall site plan for the Project.

Figure 1.2 Wellgreen Project Overall Site Plan



1.9 Environmental Studies, Permitting and Social or Community Impact

1.9.1 Environmental Considerations

Environmental permits and registrations that may be required for the Project are summarized in Section 20.0.

Environmental assessments (EAs) in Yukon are administered by the Yukon Environmental and Socio-economic Assessment Board (YESAB), as governed by the Yukon Environmental and Socio-economic Assessment Act (YESAA). The EA process in Yukon is a single assessment process that applies throughout Yukon, to all projects, and to the federal, territorial, and First Nations governments. Quartz mining projects that are conducted anywhere other than on an Indian Reserve, are subject to an EA. The Project will be subject to an EA under the YESAA.

1.9.2 Social Considerations

Several First Nations are identified as having interests encompassing the Property and access road. The implementation of an effective community and Aboriginal engagement program is fundamental to the successful environmental permitting of mining projects. Consultations with First Nations whose land is part of the Project (or who might be significantly affected environmentally or socioeconomically), must be conducted before submitting a proposal for an EA in Yukon. This is a legal obligation on the part of the industry under the YESAA.

1.10 Capital and Operating Costs

1.10.1 Capital Cost

The total capital cost required for the Project, including a 25% contingency is estimated at US$2.0 billion and is distributed based on the following costs:

- pre-production costs – US$0.9 billion
- sustaining capital for the LOM – US$1.1 billion.

The capital costs are itemized as pre-production and sustaining as summarized in Table 1.6.

Table 1.6 Capital Cost Summary (US$ billion)

Item	Pre-production (2012 to 2018)	Sustaining (2019 to 2054)	LOM Total (2012 to 2054)
Pre-production	0.9	0	0.9
Sustaining	0	1.1	1.1
Total	**0.9**	**1.1**	**2.0**

The total pre-production costs are shown in Table 1.7 and the total sustaining capital is show in Table 1.8.

Table 1.7 Pre-production Capital (US$ million)

	2012	2013	2014	2015	2016	2017	2018	Total
Project Execution	6.2	3.3	7.1	5.5	1.2	0.0	0.0	23.3
Surface Facilities	0.0	0.0	0.0	0.0	105.7	326.8	259.1	691.6
Mine Equipment	0.0	0.0	0.0	0.0	0.0	0.0	148.2	148.2
Total Pre-production	**6.2**	**3.3**	**7.1**	**5.5**	**106.9**	**326.8**	**407.3**	**863.1**

Table 1.8 Sustaining Capital (US$ million)

	Sustaining Capital (2019 to 2054)	
	Equipment Units	**Total Cost**
Major Mine Equipment	119	521.3
Other Mine Equipment	260	30.0
Support Mine Equipment	57	5.3
Refurbished Power Plant	-	61.7
Tailings Management Facility	-	503.5
Total Sustaining	**436**	**1,121.8**

1.10.2 OPERATING COST

The total operating cost for the Project LOM is estimated at US$12.1 billion. A summary of the Project LOM mine costs, organized by category, is shown in Table 1.9. Units are expressed in total US dollars, a unit per tonne mined and a unit per tonne milled.

Table 1.9 LOM Operating Cost Summary

Item	Cost (US$ million)	Cost (%)	Unit Cost US$/t mined	Unit Cost US$/t milled
Open Pit Mining	3,656.5	30	2.52	9.02
Site Services	436.9	4	0.30	1.08
G&A	931.6	8	0.65	2.29
Processing	7,030.8	58	4.85	17.35
Total	**12,055.8**	**100**	**8.32**	**29.74**

The total operating cost for the Project LOM is calculated based on the following area costs:

- The open pit mining LOM average unit cost was determined to be US$2.52/t mined.
- The site services LOM average unit cost was estimated to be US$0.30/t mined.
- The general and administrative (G&A) LOM average unit cost was estimated to be US$0.65/t mined.
- The mill process LOM average unit cost was estimated to be US$4.85/t mined.

1.11 ECONOMIC ANALYSIS

An economic evaluation of the Project was prepared by Tetra Tech based on a pre-tax financial model. The financial results and inputs for the Project are summarized in Table 1.10.

Table 1.10 Summary of Pre-tax Financial Results and Inputs

Item	Unit	Value
NPV (8%)	US$ million	2,396
IRR	%	32
Payback	Years	4.88
Gross Revenue	US$ million	33,240
Smelting & Refining Cost	US$ million	8,310
Net Revenue	US$ million	24,930
Operating Cost	US$ million	12,056
Operating Margin	US$ million	12,874
Capital Cost	US$ million	1,985
Closure Cost	US$ million	61
Pre-tax Cash Flow	US$ million	10,828

The following financial results were established for the Project:

- The Project has:
  - a pre-tax NPV of US$2.4 billion at a discount rate of 8%
  - an IRR of 32%
  - a payback period of 4.88 years.
- Gross metal revenue was determined from recovered metal grades and metal prices. Base case metal prices are listed in Table 1.12.
- Net smelter return (NSR) revenue was determined by applying a 25% cost factor against gross metal revenue to account for smelting, refining, transportation and marketing costs. The LOM net NSR revenue was determined to be US$24.9 billion. The smelting recoveries were 90.00% nickel, 98.00% copper, 96.00% platinum, 96.00% palladium, 96.00% gold and 90.00% cobalt.
- Pre-tax cash flow or earnings before interest, tax, depreciation and amortization (EBITDA), determined as net revenue less operating, capital and closure costs, was determined to be US$10.8 billion.

Metal production from the Project is presented in Table 1.11 and base case metal prices are shown in Table 1.12.

Table 1.11 Metal Production from the Wellgreen Project

Item	Unit	Value
Total Material to Mill	t	405,331,683
Average Annual Material to Mill	t	10,954,900
Mine Life	years	37
NSR		
Average LOM NSR*	US$/t milled	61.51
Average Grade		
Nickel	%	0.32
Copper	%	0.26
Cobalt	%	0.02
Gold	g/t	0.177
Platinum	g/t	0.411
Palladium	g/t	0.347
Total Production		
Nickel	lb	1,959,299,445
Copper	lb	2,057,705,063
Cobalt	lb	133,775,733
Gold	oz	1,355,782
Platinum	oz	2,463,685
Palladium	oz	3,299,404

table continues…

Item	Unit	Value
Average Annual Production		
Nickel	lb	52,954,039
Copper	lb	55,613,650
Cobalt	lb	3,615,560
Gold	oz	36,643
Platinum	oz	66,586
Palladium	oz	89,173

Note: *NSR revenue was determined by applying a 25% cost factor against gross metal revenue to account for smelting, refining, transportation and marketing costs.

Table 1.12 Wellgreen Project Base Case Metal Prices*

Base Case Metal Prices					
Ni (US$/lb)	Cu (US$/lb)	Co (US$/lb)	Au (US$/oz)	Pt (US$/oz)	Pd (US$/oz)
9.48	3.56	16.23	1,377.87	1,587.97	581.28

Note: *Obtained from the LME three year trailing metal prices, in effect July 6, 2012.

1.12 SENSITIVITY ANALYSIS

Sensitivity analysis was carried out on the following parameters:

- exchange rate
- nickel price
- operating costs
- capital costs.

Sensitivity analyses are presented graphically as financial outcomes in terms of NPV and IRR.

Table 1.13 shows the corresponding sensitivity parameters and the resulting NPVs.

Table 1.13 Sensitivity Parameters and NPV @ 8% (US$ million)

Parameter	Foreign Exchange	Nickel Price	Operating Costs	Capital Costs
-20%	3,045	1,820	2,890	2,551
-10%	2,721	2,108	2,643	2,474
Base	2,396	2,396	2,396	2,396
+10%	2,073	2,685	2,150	2,319
+20%	1,748	2,973	1,903	2,242

Figure 1.3 illustrates that the Project NPV (at 8% discount) is most sensitive to exchange rate, and in decreasing order, nickel price, operating cost and capital cost.

Figure 1.3 Pre-tax NPV at 8% – Sensitivity Analysis

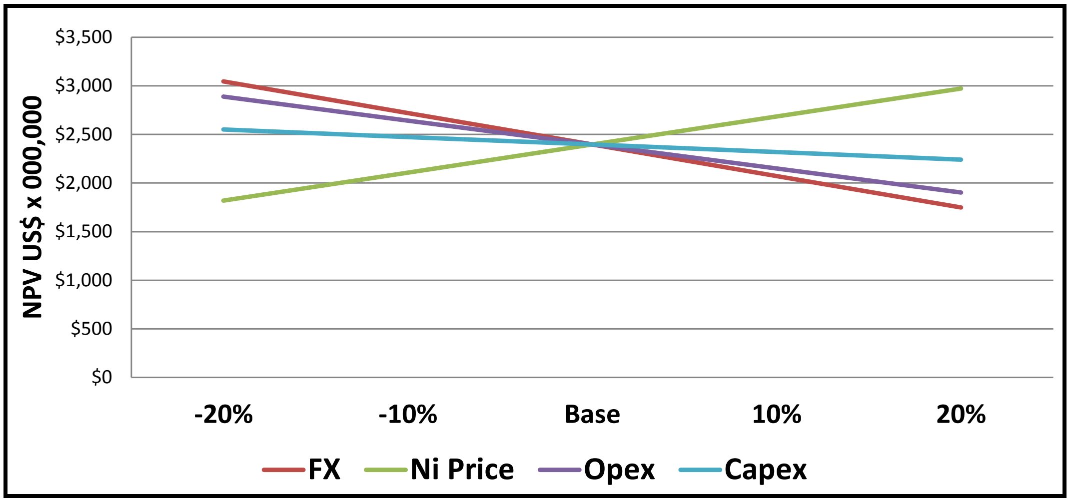


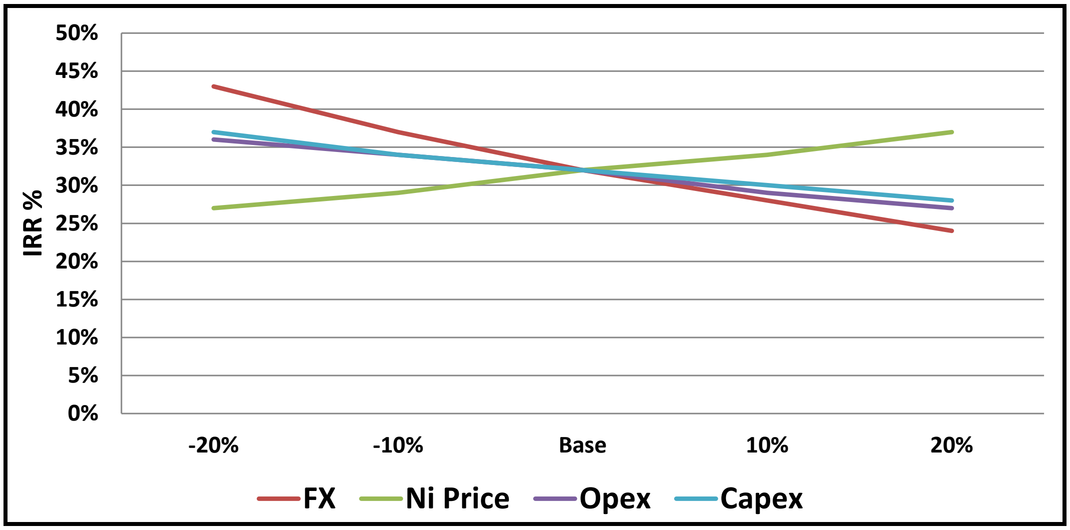
Table 1.14 shows the corresponding sensitivity parameters and the resulting IRRs.

Table 1.14 Sensitivity Parameters and IRRs (%)

Parameter	Foreign Exchange	Nickel Price	Operating Costs	Capital Costs
-20%	43	27	36	37
-10%	37	29	34	34
Base	32	32	32	32
+10%	28	34	29	30
+20%	24	37	27	28

Figure 1.4 illustrates the effect that the sensitivities have on IRR with exchange rate having the greater effect, and in decreasing order, nickel price, capital cost and operating cost.

Figure 1.4 Pre-tax IRR – Sensitivity Analysis



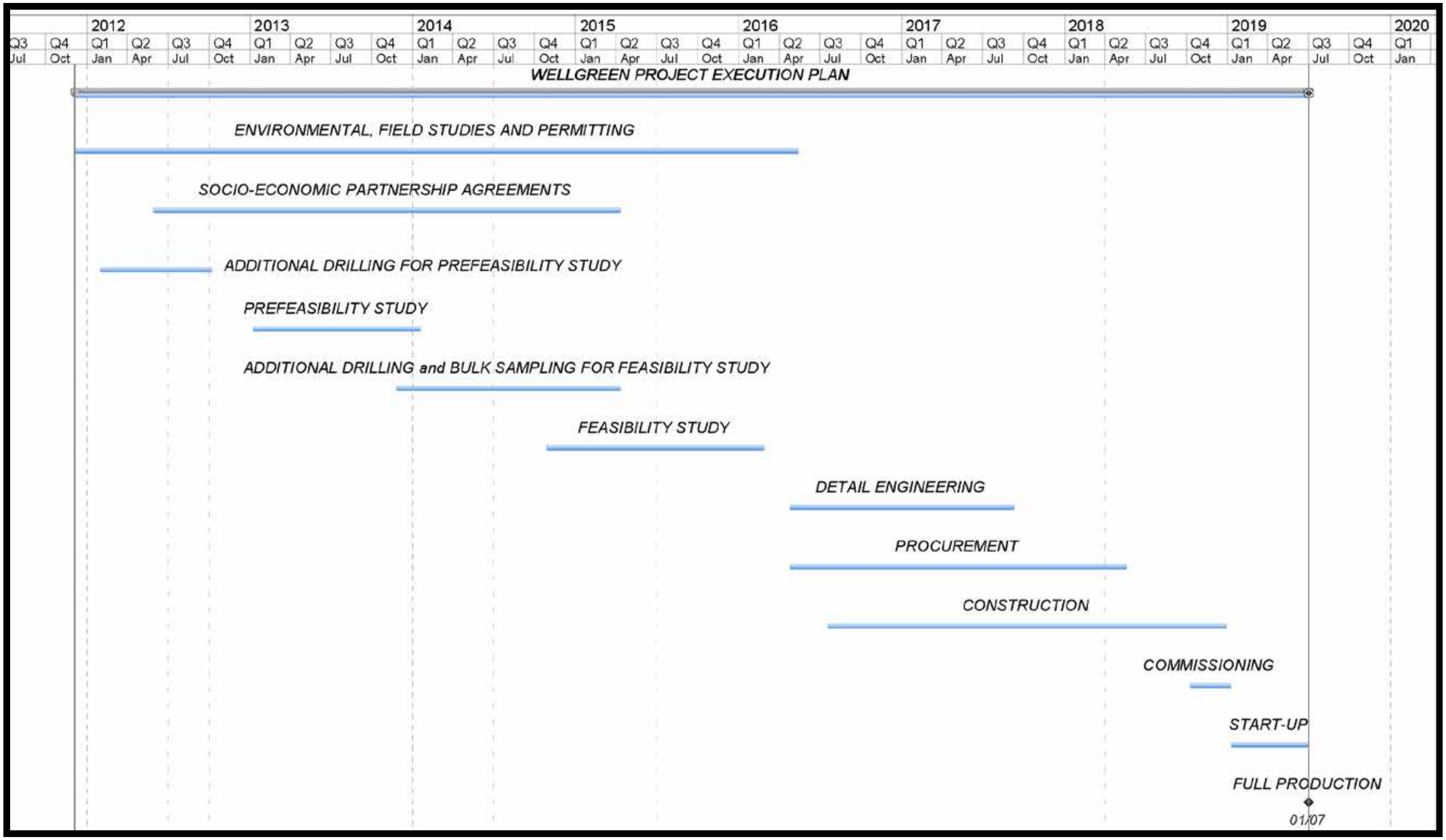
1.13 PROJECT DEVELOPMENT PLAN

The Project will take approximately 2.5 years of construction activities to complete. Construction permitting is expect in Q2 2016. The mine will commence operation Q3 2018. Figure 1.5 illustrates the execution plan for the Project.

TETRA TECH WARDROP

PROPHECY PLATINUM

Figure 1.5 Project Execution Plan



1.14 OPPORTUNITIES AND RECOMMENDATIONS

Opportunities for this project include the following:

- The use of liquid natural gas (LNG) to supply to energy needs of the Project. The results of a preliminary trade-off study indicate that the total cost (capital and sustaining) of the LNG may be less than diesel and that the operating costs decrease from $0.28/kWh to $0.18/kWh. The resulting decrease in operating costs over the lifetime of the Project would have a positive effect on the Project economics.
- The optimization of the process. The plant has been designed for a 32,000 t/d milling operation and is based on preliminary results. Additional modifications to the process may result in better recoveries than currently being stated in this PEA.
- The reduction of smelting charges via a split stream copper concentrate and nickel concentrate.
- The inclusion of revenue from the recoveries of rhodium, ruthenium, iridium, and osmium.
- The optimization of the pit. This PEA is based on an assumed mining rate of 32,000 t/d mining operation. It has been the observed that the resource lends itself to a higher mining rate and that this increased mining rate would have an additional positive effect on the overall economics of the Project.

Based on the work carried out in this PEA and the results of the economic evaluation, this study should be followed by phased work recommended in Section 26.0. The cost for Phase I of this work is US$8,497,000. Table 1.15 outlines the phased approach of the work for the Project. It should be noted that the work in Phase I and Phase II can be completed in series or in parallel.

Table 1.15 Cost by Phase

	Phase I (US$)	Phase II (US$)	Prefeasibility (US$)
Geology	6,372,000	6,372,000	200,000
Mining	50,000	75,000	100,000
Metallurgy	400,000	400,000	400,000
Infrastructure	1,250,000	0	1,000,000
Environmental	200,000	400,000	2,000,000
Social Considerations	50,000	250,000	350,000
Subtotal	**8,322,000**	**7,497,000**	**4,050,000**
NI 43-101 Report	175,000	250,000	1,000,000
Total	**8,497,000**	**7,747,000**	**5,050,000**

Detailed recommendations are provided in Section 26.0 of this report.

2.0 INTRODUCTION

Tetra Tech was commissioned by Prophecy Platinum to complete a technical report on the Project. Tetra Tech has prepared this report in accordance with guidelines provided in the NI 43-101 Standards of Disclosure for Mineral Projects.

The objectives of the report are to:

- prepare a technical report on the Project in accordance with NI 43-101
- summarize land tenures, exploration history, and drilling
- generate a resource estimate on the Wellgreen deposit
- provide a PEA of the Project based on an economic evaluation for processing 32,000 t/d PGM mineralized material and to assist Prophecy Platinum with the Project development
- provide recommendations and budget for additional work on the Property.

All data reviewed for the report was provided by Prophecy Platinum in digital format, with access to paper reports and logs when requested. The work completed by Prophecy Platinum encompasses exploration and primarily diamond drilling. Historical work conducted in the region has been compiled by previous consultants and was available for review.

A summary of Qualified Persons (QPs) responsible for each section of this report is listed in Table 2.1 and the QP certificates are provided in Section 28.0.

Table 2.1 Summary of QPs

Report Section		Company	QP
1.0	Summary	Tetra Tech	Sign off by Section
2.0	Introduction	Tetra Tech	Andrew Carter, C.Eng.
3.0	Reliance on Other Experts	Tetra Tech	Todd McCracken, P.Geo.
4.0	Property Description and Location	Tetra Tech	Todd McCracken, P.Geo.
5.0	Accessibility, Climate, Local Resources, Infrastructure, and Physiography	Tetra Tech	Todd McCracken, P.Geo.
6.0	History	Tetra Tech	Todd McCracken, P.Geo.
7.0	Geological Setting and Mineralization	Tetra Tech	Todd McCracken, P.Geo.
8.0	Deposit Types	Tetra Tech	Todd McCracken, P.Geo.
9.0	Exploration	Tetra Tech	Todd McCracken, P.Geo.
10.0	Drilling	Tetra Tech	Todd McCracken, P.Geo.

table continues…

Report Section		Company	QP
11.0	Sample Preparation, Analyses and Security	Tetra Tech	Todd McCracken, P.Geo.
12.0	Data Verification	Tetra Tech	Todd McCracken, P.Geo.
13.0	Mineral Processing and Metallurgical Testing	Tetra Tech	Andrew Carter, C.Eng.
14.0	Mineral Resource Estimate	Tetra Tech	Todd McCracken, P.Geo.
15.0	Mineral Reserve Estimate	Tetra Tech	Pacifico Corpuz, P.Eng.
16.0	Mining Methods	Tetra Tech	Pacifico Corpuz, P.Eng.
17.0	Recovery Methods	Tetra Tech	Andrew Carter, C.Eng.
18.0	Project Infrastructure	Tetra Tech	Andrew Carter, C.Eng.
19.0	Market Studies and Contracts	Tetra Tech	Andrew Carter, C.Eng.
20.0	Environmental Studies, Permitting, and Social or Community Impact	Tetra Tech	Andrew Carter, C.Eng.
21.0	Capital and Operating Costs	Tetra Tech	Philip Bridson, P.Eng.
22.0	Economic Analysis	Tetra Tech	Philip Bridson, P.Eng.
23.0	Adjacent Properties	Tetra Tech	Todd McCracken, P.Geo.
24.0	Other Relevant Data	Tetra Tech	Andrew Carter, C.Eng.
25.0	Interpretations and Conclusions	Tetra Tech	Sign off by Section
26.0	Recommendations	Tetra Tech	Sign off by Section
27.0	References	Tetra Tech	Sign off by Section

Mr. Pacifico Corpuz, P.Eng. and Mr. Todd McCracken, P.Geo. conducted a one day site visit on October 12, 2011. The team observed surface drilling activities, the open pit area, the access road route, the process plant area, and old Hudson Yukon underground and surface operations during the visit.

3.0 RELIANCE ON OTHER EXPERTS

Tetra Tech has reviewed and analyzed data and reports provided by Prophecy Platinum, together with publicly available data, and has drawn its own conclusions augmented by direct field examination.

Tetra Tech is not qualified to provide extensive comment on legal issues including status of tenure associated with the Property referred to in this report. A description of the Property and ownership is provided in Section 4.0. The list of claims included in Appendix A was provided by Prophecy Platinum for general information purpose only and has not been independently verified by Tetra Tech. The land tenture provided by Prophecy Platinum is sourced from the Government of Yukon Energy, Mines, and Resources website (http://www.yukonminingrecorder.ca/).

The QPs who prepared this report relied on information provided by the following experts who are not QPs:

- Mr. Doug Ramsey, R.P. Bio (BC), for matters relating to environmental studies, permitting and social or community impact in Sections 1.0, 20.0, 25.0, 26.0, and 27.0.
- LME three-year trailing metal prices, effective date of July 6, 2012, for matters relating to metal pricing and economic analysis in Sections 1.0 and 22.0.
- Ms. Michelle Pockley of Fasken Martineau DuMoulin LLP for matters relating to the old mill site in Sections 4.0 and 20.0.

4.0 PROPERTY DESCRIPTION AND LOCATION

The Property is located approximately 317 km northwest of Whitehorse in south western Yukon, at an approximate latitude: 61°28'N, longitude: 139°32'W (Figure 4.1) on NTS map sheet 115G/05 and 115G/06. Kluane National Park lies 25 km to the south. The Property lies within the Kluane Game Sanctuary.

The Property consists of four groups of claims (Figure 4.2).

The description below and the list of claims provided in Appendix A have been derived from records and information supplied by Prophecy Platinum and sourced from the Yukon Mine Recorder.

The Property is comprised of 371 claims, nominally 6,415 ha, which incorporates the known Wellgreen deposit. The claims were staked as early as 1952. Each claim is a Quartz Mining Lease and have expiry dates that ranged from August 2012 to February 2028. In Yukon, all hard rock mining claims (excluding coal) are administered through the Quartz Mining Act (QMA). A mining claim provides exclusive rights to the holder of the claim for the mines and minerals located within the area of that claim. The QMA also confirms that a claim holder has the following rights in relation to the minerals contained within the claim:

- the right to enter on and use and occupy the surface for the efficient and miner-like operation of mines and minerals
- the right to commercially produce a mineral and benefit from the sale of the mineral.

Figure 4.1 Location Map

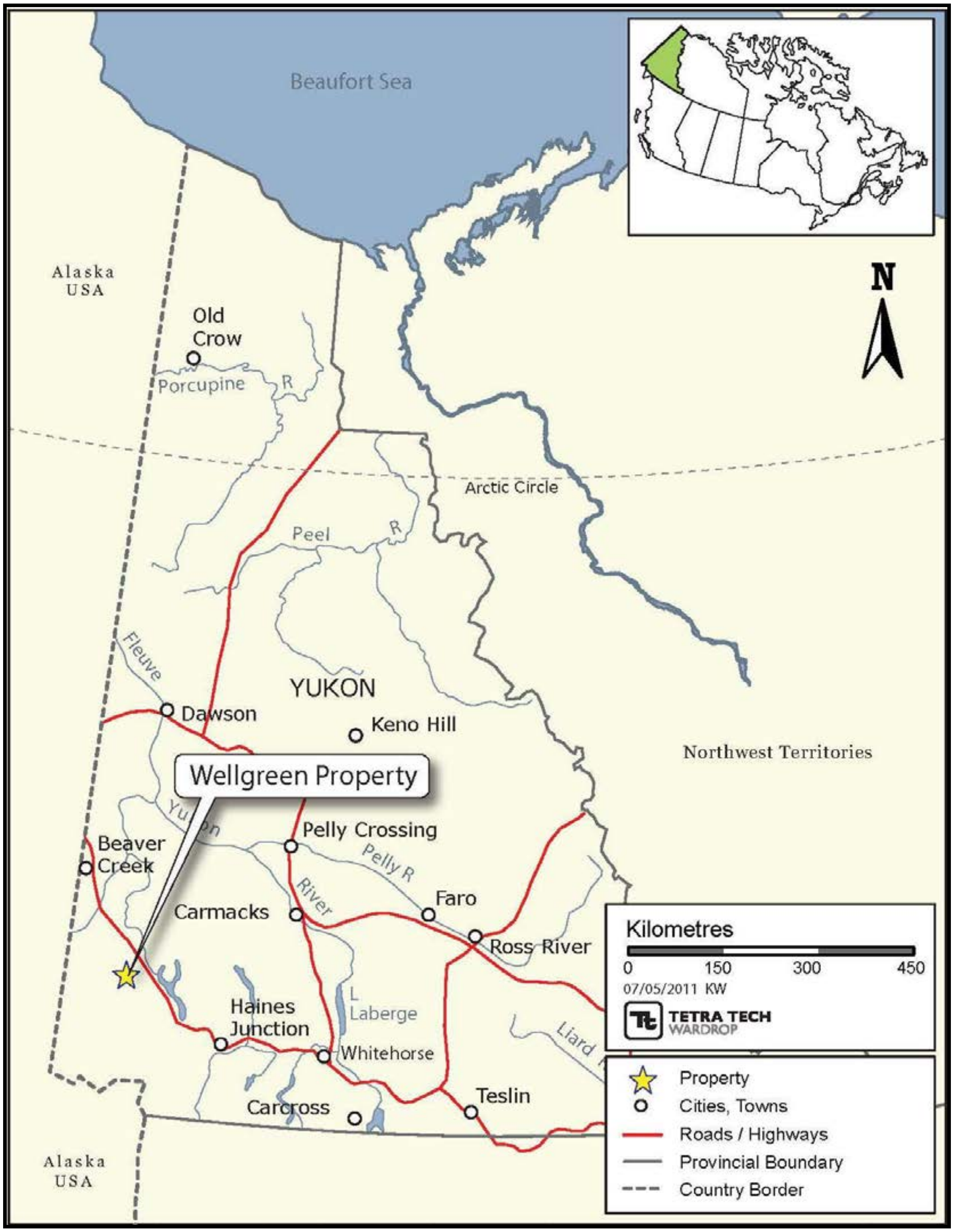
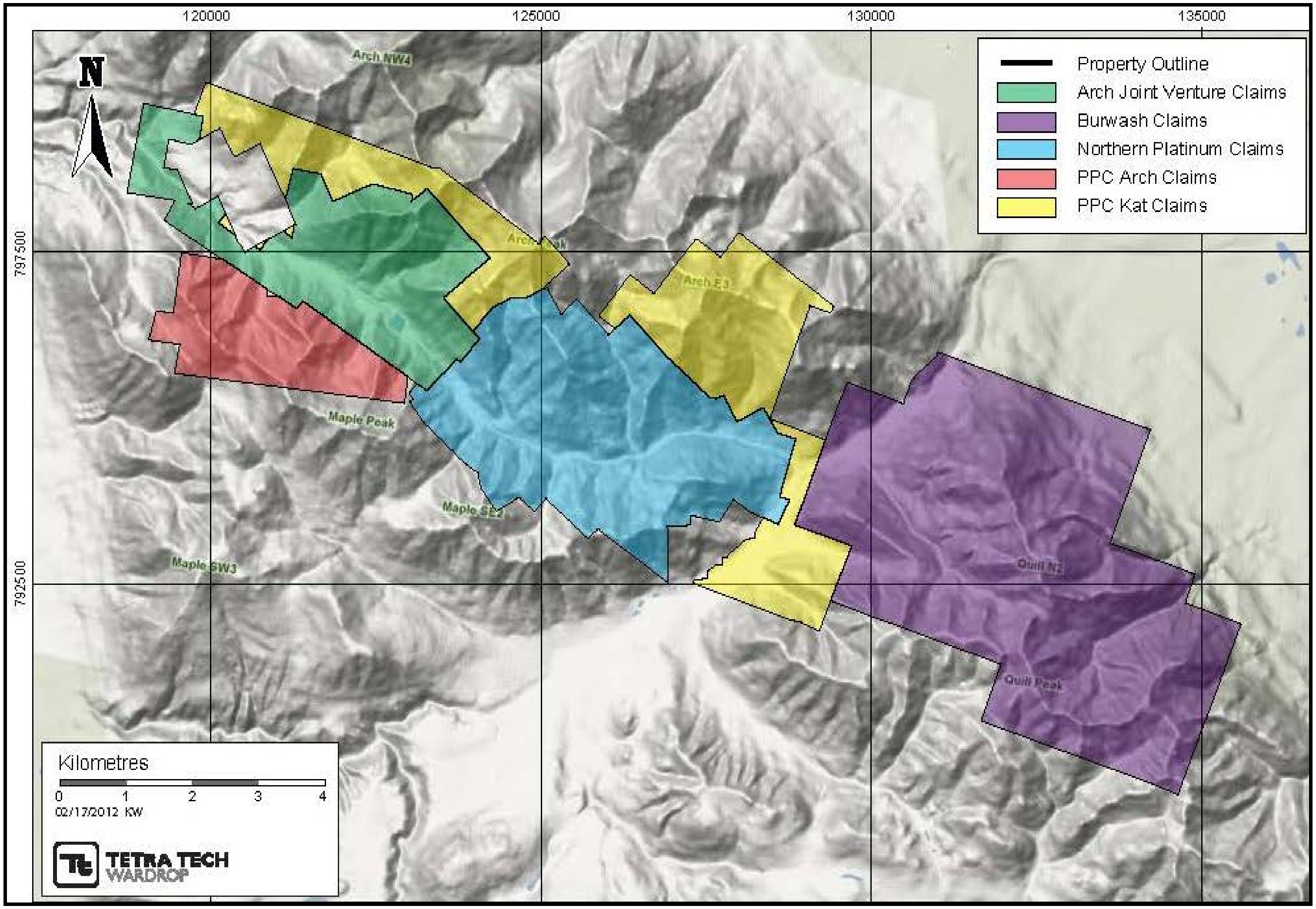


Figure 4.2 Claims Map



All work undertaken on the surface for claims and leases, is regulated under the QMA through the Quartz Mining Land Use Regulation. The QMA does not provide any mining claim holder with the exclusive right to use the surface of the land for any activity except for mining, and it does not convey any tenure in the surface of the land. Claims must be renewed on an annual basis by filing approved assessment work to a value of Cdn$100 per claim. A Quartz Mining Lease provides the leaseholder with the ability to hold claims for 21 years and a renewal clause. Annual rental fees are required to keep a Quartz Mining Lease in good standing.

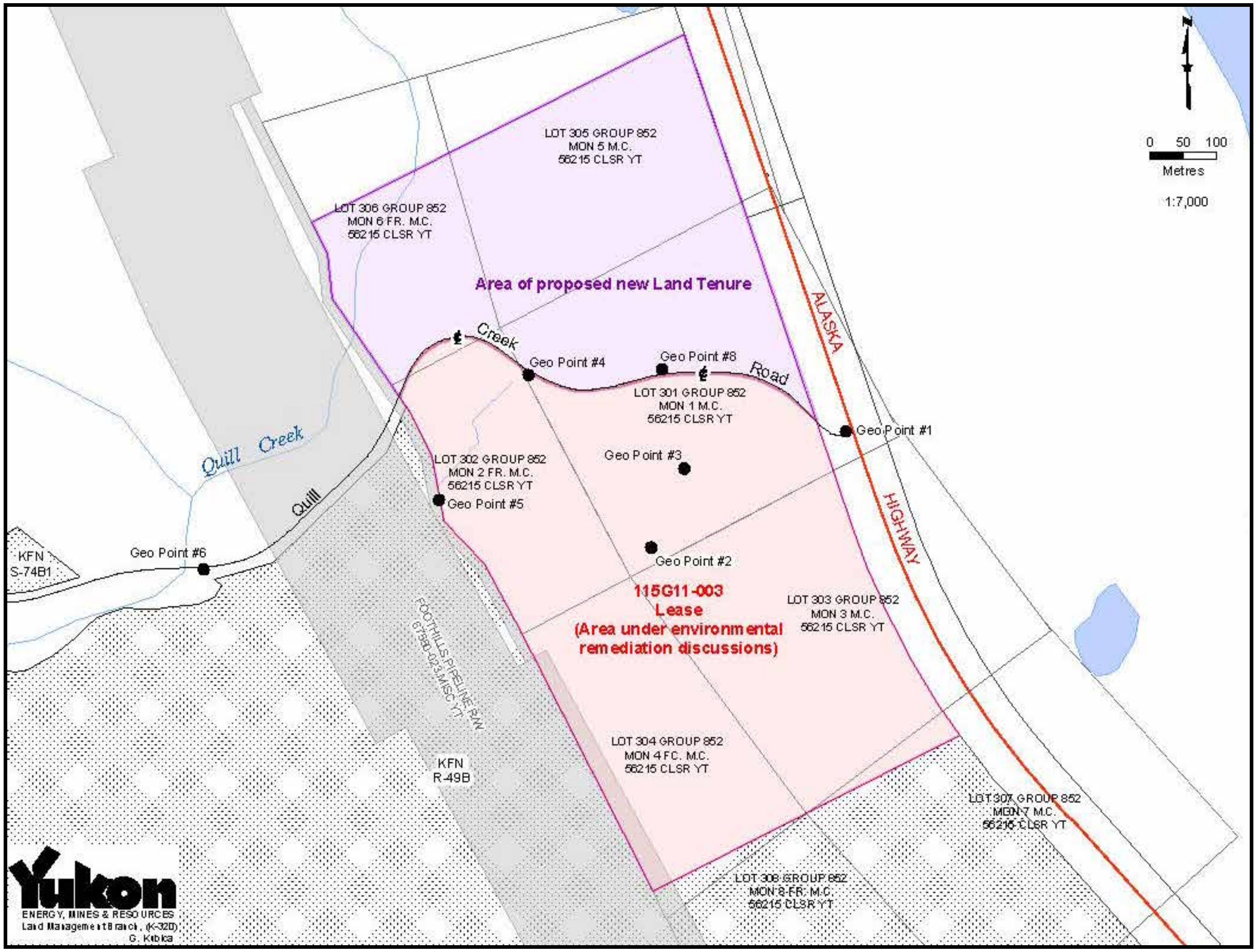
Prophecy Platinum's interest in the Property also consists of one surface lease issued by the Government of Canada and administered by the Government of Yukon. The lease covers a 69.754 ha parcel of land located at approximately Mile 1111 of the Alaska Highway (the Mine Site). Various operators have conducted historic exploration activities on this parcel of land since the 1950s, and exploration activities have been carried out by Northern Platinum since the late 1990s. The lease was held by Northern Platinum from the early 1990s until October 31, 2011. Prior to expiration, the Mine Site lease was assigned to Prophecy Platinum, which then applied for renewal of the lease. Prophecy Platinum is expecting to receive a renewal notice concerning the Mine Site lease in due course.

With the knowledge and consent of the Government of Yukon, Prophecy Platinum also occupies a 62.56 ha parcel of land approximately 1 km from the Mine Site and adjacent to the Alaska Highway (the Mill Site). Northern Platinum held a leasehold interest in this parcel from approximately the late 1990s until October 31, 2011. For approximately one-year, the Mill Site was operated by an entity unrelated to Prophecy Platinum in the early 1970s. Since the late 1990s, Northern Platinum has used the Mill Site for its core shack and to access the Mine Site. Pursuant to the requirements of the lease for the Mill Site, Northern Platinum finalized a Reclamation Plan for the Mill Site, which was approved by the Government of Yukon in early 2010. Prophecy Platinum is cleaning up surface debris at the Mill Site and some contaminated soils, pursuant to the Reclamation Plan and in accordance with the terms of the Mill Site lease. Such clean-up activities began in 2009 and are ongoing at a total cost ranging from Cdn$141,000 to Cdn$192,000. The Government of Yukon asserts that in addition to this clean-up work, Prophecy Platinum must also carry out reclamation activities in relation to the historic tailings impoundment, the former mill infrastructure and related adverse impacts alleged by the Government of Yukon to be occurring at the Mill Site (the Historic Liabilities). In August 2010, Prophecy Platinum advised the Government of Yukon that it is not legally responsible or liable for the Historic Liabilities. Prophecy Platinum and the Government of Yukon are in discussions concerning responsibility and liability for the Historic Liabilities. This will require a site assessment and futher consideration of legal responsibility and liability for the Historic Liabilities, the outcome of which cannot be reasonably determined at this stage.

Prophecy Platinum is working with the Government of Yukon toward concluding a lease agreement by which it will obtain a leasehold interest in a portion of the Mill Site, excluding the area containing the Historic Liabilities. Lease negotiations are in process and Propecy Platinum is in the process of applying for an approval from the YESAB for the issuance of such lease. Through the interim period and up until the finalization of a new Mill Site surface lease, the Government of Yukon has agreed not to:

- proceed with any enforcement actions against Prophecy Platinum under the Territorial Lands (Yukon Act) relating to its current occupation or use of the lands in the Mill Site
- sell, lease or dispose of the Mill Site area without prior reasonable notice to Prophecy Platinum
- alter the use of the Mill Site that is being made by Prophecy Platinum without prior reasonable notice or
- grant any other surface land use rights to persons other than Prophecy Platinum without prior reasonable notice to Prophecy Platinum. Refer to Figure 4.3 for an illustration of the Wellgreen surface lease.

Figure 4.3 Wellgreen Surface Lease



On September 22, 2010, Northern Platinum was acquired by Prophecy Coal Corp. (Prophecy Coal) by the way of corporate merger or share exchange.

It is understood that in the 1994 agreement between Belleterre Quebec (J. Patrick Sheridan) and Northern Platinum, Belleterre Quebec assigned all of its interest in the option agreement with All North to Northern Platinum. In return Northern Platinum granted Belleterre Quebec a back in right of 50% of Northern Platinum's interest for a period of time up to and including the completion of a positive feasibility study. On September 24, 2010, Prophecy Coal acquired the Belleterre Quebec back in option.

An underlying agreement dated April 27, 1999 between Kaieteur Resource Corporation (Kaieteur) (formerly International All-North Resources Ltd. (All-North)), Northern Platinum, and J. Patrick Sheridan concerns the Northern Platinum interest in the Arch Joint Venture. Northern Platinum agreed to purchase from Kaieteur all of its All-North Wellgreen interest, and its interest in the Arch Joint Venture on an "as is" basis for a sum of Cdn$62,500 to be paid in cash and shares. The agreement acknowledges that Northern Platinum had already earned a 20% interest in the project and by this agreement Northern Platinum was acquiring the remaining 80% interest. Kaieteur warrants it is the beneficial owner of the All-North Wellgreen interest but does not warrant the same for the Arch Joint Venture because documentation for underlying agreements is incomplete – hence the "as is" stipulation. The agreement further acknowledges that Hudson Bay Mining & Smelting Co., Limited (HBM&S) is the holder of the Property, and is entitled to be paid royalty interest equal to 1.5% of the NSRs from the Property. Prophecy Platinum has not been able to determine to what portion of the Property, if any, such royalty would apply.

On January 17, 2011, Prophecy Coal (then known as Prophecy Resource Corp.) and Prophecy Platinum (then known as Pacific Coast Nickel Corp.) entered into a binding Letter of Agreement, whereby Prophecy Platinum would acquire all of Prophecy Coal's interest in Prophecy Coal's nickel projects including the Property along with Cdn$2 million in cash in consideration of the issuance of 450 million Prophecy Platinum shares, of which 225 million would be retained by Prophecy Coal and held in accordance with the terms and conditions of a three year escrow agreement. The remaining 225 million shares would be distributed to registered Prophecy Coal security holders pro rata in accordance with their holdings of Prophecy Platinum securities. In connection with the transaction, Prophecy Coal amalgamated with its subsidiary Northern Platinum and transferred beneficial ownership to the Property to 0905144 B.C. Ltd., all of the shares of which were transferred to Prophecy Platinum as part of the acquisition.

Immediately following the completion of the acquisition, Prophecy Platinum consolidated its shares on ten old shares for one new share and changed its name to Prophecy Platinum Corp. This was completed on June 13, 2011.

Other than those liabilities set forth in the Reclamation Plan for which Prophecy Plantinum is undertaking reclamation activities, the Property is not subject to any known environmental liabilities.

All permits and licenses to conduct exploration work on the Project are in place. It is anticipated that a surface lease for a smaller portion of the Mill Site lands to facilitate a staging area for furture exploration work will be issued shortly.

5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 SITE TOPOGRAPHY, ELEVATION, AND VEGETATION

The Property is located in the Kluane Ranges, which are a continuous chain of foothills situated along the eastern flank of the Saint Elias Mountains. The topography across the Property is relatively rugged. Slopes are usually in the 250 to 300 m range, and the highest peaks exceed an elevation of 1,800 m.

The main mineralized zone on the Property lies between an elevation of 1,300 and 1,700 m on a moderate to steep un-glaciated south-facing slope. Permafrost is discontinuous and probably exceeds 30 m in depth from surface.

Water drainage on the property is mainly east and then north into the Kluane River system.

Vegetation consists of typical alpine grasses and wildflowers on the hill sides, along with a mixture of pine, spruce and poplar trees located in the lower elevations and creek beds.

5.2 ACCESS

The Property is located approximately 317 km northwest of Whitehorse, just west of kilometre 1,726.5 on the Alaska Highway, which is a paved all-weather highway maintained by the Government of Yukon.

The Property can be reached from the Alaska Highway by a gravel road which runs south-west beside Quill Creek for a distance of 14 km. The mine access road requires ongoing maintenance due to the run-off from the mountains into Quill Creek to allow for year round use by small vehicles. It will require upgrading to be used as an all-weather haulage road for mining operations.

An all-weather airstrip located 30 km southeast of the Property at Burwash Landing is maintained by NAV CANADA. An all-season, deep-sea port is located in Haines, Alaska, 410 km to the southeast, and is accessible by a high-quality paved highway.

Work can be conducted on the Property year-round if required.

5.3 CLIMATE

The climate is alpine, but tempered by west coast climate influences. Despite lengthy winter seasons, the temperatures are less extreme than areas further east. Long-term weather records have been recorded at the Burwash Landing weather station (806.8 masl), the closest station to the Property. The daily average temperature at the Burwash Landing station is -22°C in January and 12.8°C in July. Since the area lies in the rain shadow of the Saint Elias Mountains, overall precipitation is generally light with short stretches of periodic heavy precipitation. Average annual precipitation for the Burwash Landing station is 279.7 mm, of which 192 mm is rain and 106.4 cm is snow.

5.4 INFRASTRUCTURE

A water supply, adequate for drilling operations, can be pumped from local creeks. Non-potable water was supplied for the camp from Nickel Creek, which flows past the portal to the underground workings. All local creeks freeze solid during the winter months. In order to maintain a year round camp or mining operation, drilling of water wells will be required.

Power on the Property is currently supplied by generators installed for the exploration programs. Haines Junction is the current limit of the southern grid of Yukon Energy Corporation (YEC).

Yukon has a favourable mining tax law which encourages the investment in the mining sector. Skilled labour and equipment is available in the city of Whitehorse (population 24,500) and the small village of Haines Junction (area population of approximately 800).

The villages of Burwash Landing and Destruction Bay, located 15 and 30 km southeast from the Wellgreen turn-off respectively from the Property, can provide basic food, fuel and lodgings if necessary.

6.0 HISTORY

The exploration and production history of the Property dates back to its discovery in 1952. Table 6.1 summarizes the history of the Property.

Table 6.1 Wellgreen Historical Activities

Year	Company	Activities
1952	Wellington Green, C. Aird, & C. Hankins	• Discovered surface showings
1952	Hudson Bay Exploration & Development (HBE&D)	• Property optioned from prospectors by HBM&S
1952	Yukon Mining	• Ownership transferred to HMB&S subsidiary Yukon Mining Company (Yukon Mining) from HBM&S subsidiary HBE&D
1952	Yukon Mining	• 45,500 m of surface drilling completed
1953	Yukon Mining	• 57,700 m of surface drilling completed
1954	Yukon Mining	• 60,400 m of surface drilling completed
1955	Hudson Yukon Mining	• Ownership transferred to HMB&S subsidiary Hudson Yukon Mining from HBM&S subsidiary Yukon Mining
1955	Hudson Yukon Mining	• 32,400 m of surface drilling completed
1953-1956	Yukon Mining/ Hudson Yukon Mining	• 4,267 m of underground development on 7 levels and 2 internal shafts • Metallurgical test work including a pilot plant • Historical mineralized material reserves estimated at 500,000 t @ 1.34% copper and 2.14% nickel
1956-1967	Hudson Yukon Mining	• Idle
1968	Hudson Yukon Mining	• Ground geophysics (magnetics and electromagnetics) • Soil survey • 762 m of surface drilling
1966-1970	Hudson Yukon Mining	• Metallurgical work completed at Lakefield, HBM&S, Lurgi-Frankfurt, and Sumitomo
1969	Hudson Yukon Mining	• Feasibility study completed with historical "Proven Reserves" estimated at 669,150 t @ 2.04% Cu, 1.42% Ni, 0.073% Co, 1.30 g/t Pt, 0.93 g/t Pd and 0.17 g/t Au

table continues…

Year	Company	Activities
1970	Hudson Yukon Mining	• Property placed in production with concentrate to be shipped to Sumitomo in Japan • Development consisted of slashing out exploration drifts, development of sub-levels, construction of mine dry, powerhouse, and compressor facility • Mill with a 600 t/d concentrator and town site established 11.5 km from mine adjacent to the Alaska Highway
1972	Hudson Yukon Mining	• Milling began on site
1973	Hudson Yukon Mining	• Milling suspended due to falling metal prices, excessive dilution, and unexpected erratic distribution of massive sulphide lenses • A total of 171,652 t were milled to produce 33,853 t of concentrate. Grades of the concentrate based on smelter returns were 2.23% Ni, 1.39% Cu, 1,300 ppb Pt, 920 ppb Pd, 171 ppb Au, 400 ppb Rh, 420 ppb Ru, 250 ppb Ir, 200 ppb Os, and 200 ppb Re • Mine and mill dismantled and all equipment shipped to Snow Lake, Manitoba
1981	Foothills Pipelines	• Leased the mill site and town site
1986	All-North/Chevron	• Option to earn 50% interest of the Property from Hudson Yukon Mining
1987	Galactic Resources	• Purchased 100% interest in Hudson Yukon Mining from HBM&S for Cdn$6.8 million and 3% NSR on the Hudson Yukon Mining portion of base metal and precious metal produced from the Property • Acquired All-North as a wholly owned subsidiary. Transfer title of the Hudson-Yukon Wellgreen to All-North. Resulting Wellgreen ownership All-North 75%, Chevron: 25%
1987	All-North/ Galactic Resources	• Conducted 1:2500 geological mapping, 50 m x 100 m spaced soil sampling, 100 m x 20 m spaced very low frequency (VLF)-electromagnetic and magnetic survey, 15 bulldozer trenching totalling 10,000 m^3 • 4,932 m of diamond drilling in 45 holes
1987	Kluane Joint Venture (Kluane JV)	• Joint venture formed between All-North, Chevron Minerals, Pak-Man Resources and Rockridge Mining to explore on the Arch Joint Venture Claims. Operated by Archer Cathro. • 1:10,000 geological mapping and sampling, VLF and magnetic survey, 50 h of bulldozer trenching

table continues…

Year	Company	Activities
1988	Kluane JV	• Road construction and bulldozer trenching • Three diamond drillholes totalling 173.5 m
1988	All-North/Chevron	• 4250 level was rehabilitated • 5,500 m of diamond drilling in 34 holes was completed underground • 6,073 m of diamond drilling in 37 holes completed on surface • Klohn Leonoff carried out preliminary engineering surveys to evaluate mill and tailings disposal sites • Norecol carried out preliminary environmental survey including water quality and wildlife study
1989	All-North	• All-North acquires Chevron Minerals interest in the Arch Joint Venture and the Property
1989	All-North/Chevron	• WGM complete a historical reserve estimate for both the East and West Zones • "Probable Reserve": 46,700,000 tons @ 0.34% Cu, 0.36% Ni, 0.015 oz/t Pt, 0.010 oz/t Pd • "Possible Reserve": 8,500,000 tons @ 0.36% Cu, 0.035% Ni, 0.012 oz/t Pt, 0.009 oz/t Pd • Metallurgical studies conducted at SGS Lakefield, Inco Tech, and CANMET • Prefeasibility completed by WGM
1993	Galactic Resources	• Files for bankruptcy in Canada
1994	Northern Platinum	• Signs option agreement with All-North to earn 80% interest in the Property, with a 50% back in right to J. Patrick Sheridan
1996	Northern Platinum	• Fifty-seven 4.5" rotary percussion drillholes totalling 3,900 m
1999	Northern Platinum	• Agrees to purchase the remaining interest (20%) of the Property from All-North
2001	Northern Platinum	• Surface drill program discovers the North Shear Zone, located 500 m north of the Wellgreen deposit
2005	Coronation Minerals	• Entered option agreement with Northern Platinum to earn 100% of the Property for $25 million
2006	Coronation Minerals	• Eleven diamond drillholes totalling 2,016 m
2007	Coronation Minerals	• Three underground diamond drillholes totalling 577 m

table continues…

Year	Company	Activities
2008	Coronation Minerals	• Thirteen diamond drillholes totalling 4,654 m • 854 line kilometres of helicopter-borne aeromagnetic survey • NI 43-101 report completed by WGM (see Section 17.0) • Dropped option, returned the Property to Northern Platinum
2009	Northern Platinum	• Ten diamond drillholes totalling 2,058 m
2010	Northern Platinum	• Six diamond drillholes totalling 2,138 m
2010	Prophecy Resources	• Acquires Northern Platinum • Completed one diamond drillhole totalling 117 m
2011	Prophecy Platinum	• New company created through the sale of Prophecy Resources nickel assets to Pacific Coast • Completed six diamond drillholes totalling 1,925 m

Historical estimates within the table above are considered relevant but not reliable. A QP has not done sufficient work to classify the historical estimate as a current mineral resource. Prophecy Platinum is not treating the historical estimates as current resources and the historical estimates should not be relied upon.

Results of the Prophecy Platinum drilling are reported in Section 10.0.

6.1 Coronation Minerals Drilling

The holes drilled on the Property by Coronation Minerals were for the purpose of validating the historical drilling done by the Kluane JV in 1986 and 1987.

All of the surface drilling was HQ, and were reduced to NQ as the depth increased. The underground drilling was all BTW. A total of 11 holes were completed in 2006 for a total of 2,016 m.

In 2007, three underground holes were completed totalling 577 m. Two of the holes were designed to “twin” historical holes.

In 2008, 13 additional holes were drilled by Coronation Minerals.

6.2 Historical Sample Preparation and Analyses Programs

6.2.1 Historical Programs

Tetra Tech is not aware of the procedures and analytical methods used prior to the Coronation Minerals' drilling programs.

6.2.2 Coronation Minerals' Programs

After the sample bags were sealed, company personnel took the samples into the Coronation Minerals' geological office. The samples were stored there and only the geologist and camp manager had access. When enough samples had accumulated, company personnel would pack them in plastic containers, label them, and take the containers to the shipper (Air North) in Whitehorse. Air North would deliver the samples to ALS Minerals in Vancouver for assaying.

All samples, including field-inserted Standards and Blanks, were sent to ALS Minerals in Vancouver, BC, for assaying. ALS Minerals has International Organization for Standardization (ISO)/International Electrotechnical Commission (IEC) 17025:2005 and ISO 9001:2000 certification.

The samples were assayed for copper, nickel, cobalt, gold, platinum, and palladium.

The following is a brief description of the sample preparation:

1. Samples are sorted into numerical order and then dried.
2. Once dried, the material was crushed using a jaw crusher.
3. The sample is then split to get a 250 g sample for pulverizing.
4. The total 250 g of split sample is pulverized to 85% passing 75 µm.

Gold, platinum, and palladium were assayed by fire assay fusion of 30 g with an inductively coupled plasma (ICP) finish. The resulting values were reported in parts per million.

Copper, nickel, and cobalt were assayed by four-acid "near total" digestion atomic absorption spectrometry (AAS). If any of the assays returned values above the detection limits, the sample would be re-assayed using a similar method (inductively coupled plasma atomic emission spectroscopy (ICP-AES) or AAS).

At no time was a Coronation Minerals employee or designate of the company involved in the preparation or analysis of the samples.

6.2.3 NORTHERN PLATINUM 2009 PROGRAMS

After the sample bags were sealed, company personnel would take the samples into the Northern Platinum geological office. The samples were stored there and only the geologist and camp manager had access. When enough samples had accumulated, company personnel would pack them in plastic containers, label them, and take the containers to the shipper (Air North) in Whitehorse. Air North would deliver the samples to Loring Laboratories in Calgary for assaying.

All samples, including field-inserted Standards and Blanks, were sent to Loring Laboratories in Calgary, AB for assaying. Loring Laboratories has ISO 9001:2000 certification.

A 30 element package, including copper, nickel and cobalt reported in parts per million was analyzed by aqua regia “partial digestion” followed by ICP analyses. Gold, platinum, palladium and rhodium were analyzed by four acid digestion followed by a 30 g fire assay with an atomic absorption (AA) finish.

At no time was a Northern Platinum employee or designate of the company involved in the preparation or analysis of the samples.

Historical results of metallurgical testing completed by companies prior to Prophecy Platinum are reported in Section 13.0.

7.0 GEOLOGICAL SETTING AND MINERALIZATION

7.1 GEOLOGICAL SETTING

7.1.1 REGIONAL GEOLOGY

The Property is located within the Insular Superterrane, which is mainly composed of two older terranes (Wrangellia and Alexander) that were amalgamated at approximately 320 Ma. These terranes are composed of island arc and ocean floor volcanic rocks with thick assemblages of overlying oceanic sedimentary rocks that range in age from 220 to 400 Ma old. Wrangellia has a package of platform-type limestones that are several kilometres thick. The Insular Superterrane also hosts a 230 Ma old package of volcanic rocks (the Nicolai Group) that hosts the Property, as well as the Windy Craggy copper-cobalt-gold deposit in northernmost BC (Hart undated).

The Project is contained within the Kluane Ultramafic Belt. The Kluane Ultramafic Belt is situated within the Wrangellia Terrane, which is a complex and variable terrane extending from Vancouver Island to central Alaska (Figure 7.1). This terrane is most commonly characterized by widespread exposure of Triassic flood basalts and complementary intrusive rocks. The ultramafic intrusives of the Wrangellia Terrane represents one of the largest tracts of nickel-copper-PGE mineralization in North America, second in size to the Proterozoic Circum-Superior Belt (Thompson to Raglan) (Hulbert and Stone 2006).

The exposed base of the Wrangellia is comprised of Pennsylvanian to Permian arc volcanic rocks and Permian sedimentary rocks of the Skolai Group and includes the Hasen Creek Formation and the Station Creek Formation. The Skolai Group is unconformably overlain by the Middle and Late Triassic Nikolai Group consisting of basalt flows with minor intercalated limestone. Mafic and ultramafic intrusions are common throughout the area and have been mostly intruded near the contact between the Station Creek and Hasen Creek formations. These sills, which form the Kluane mafic-ultramafic complex, are thought to be part of a sub-volcanic system that fed the Nikolai Formation flood basalts (Israel 2004). The intrusions commonly have associated magmatic sulphide concentrations of nickel-copper-PGE and gold (Figure 7.2).

The Kluane Belt is bound on the northeast by the Shakwak Fault, which is a major terrain boundary. The fault's latest movement is described as dextral (right-lateral).

Figure 7.1 Regional Geology Map

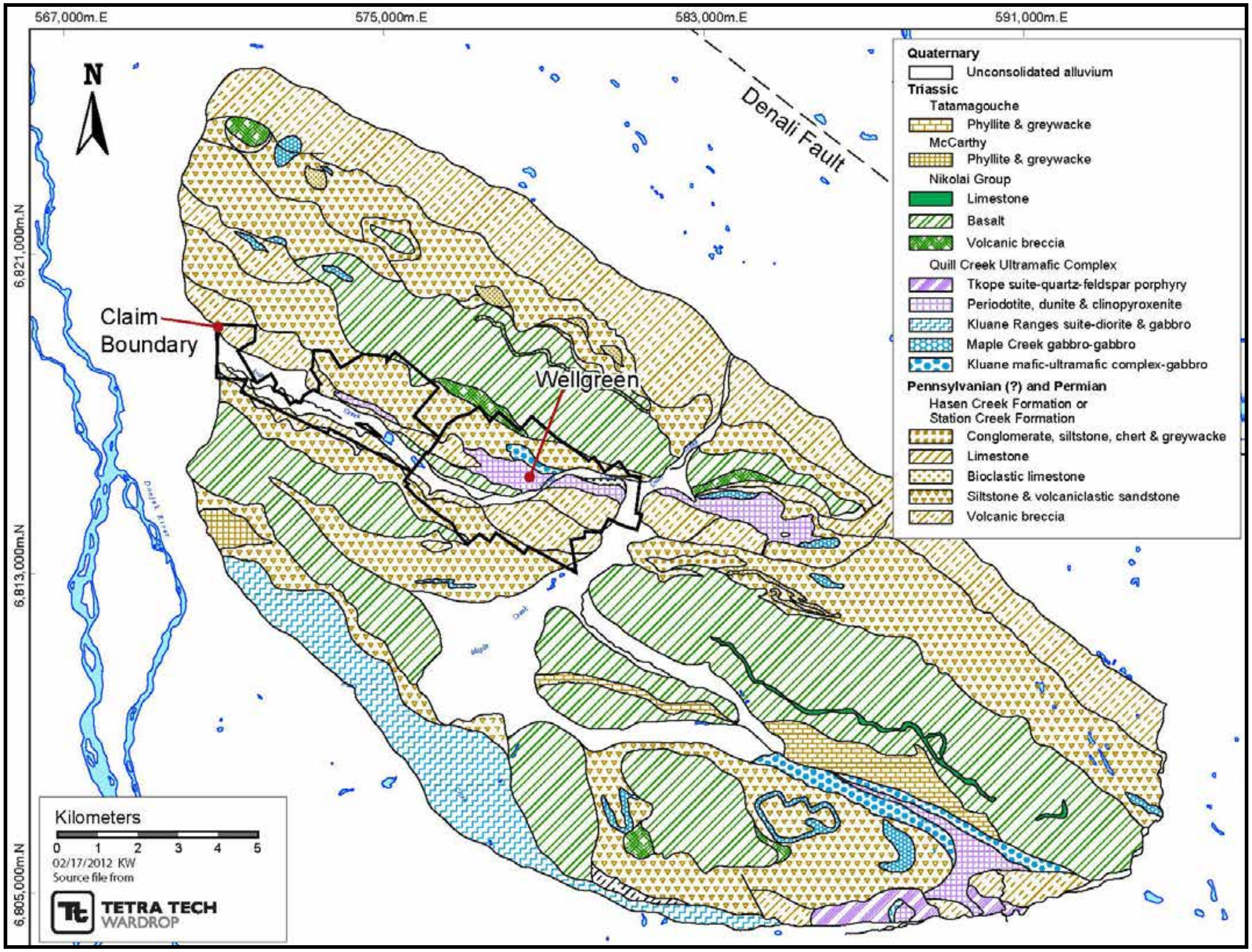
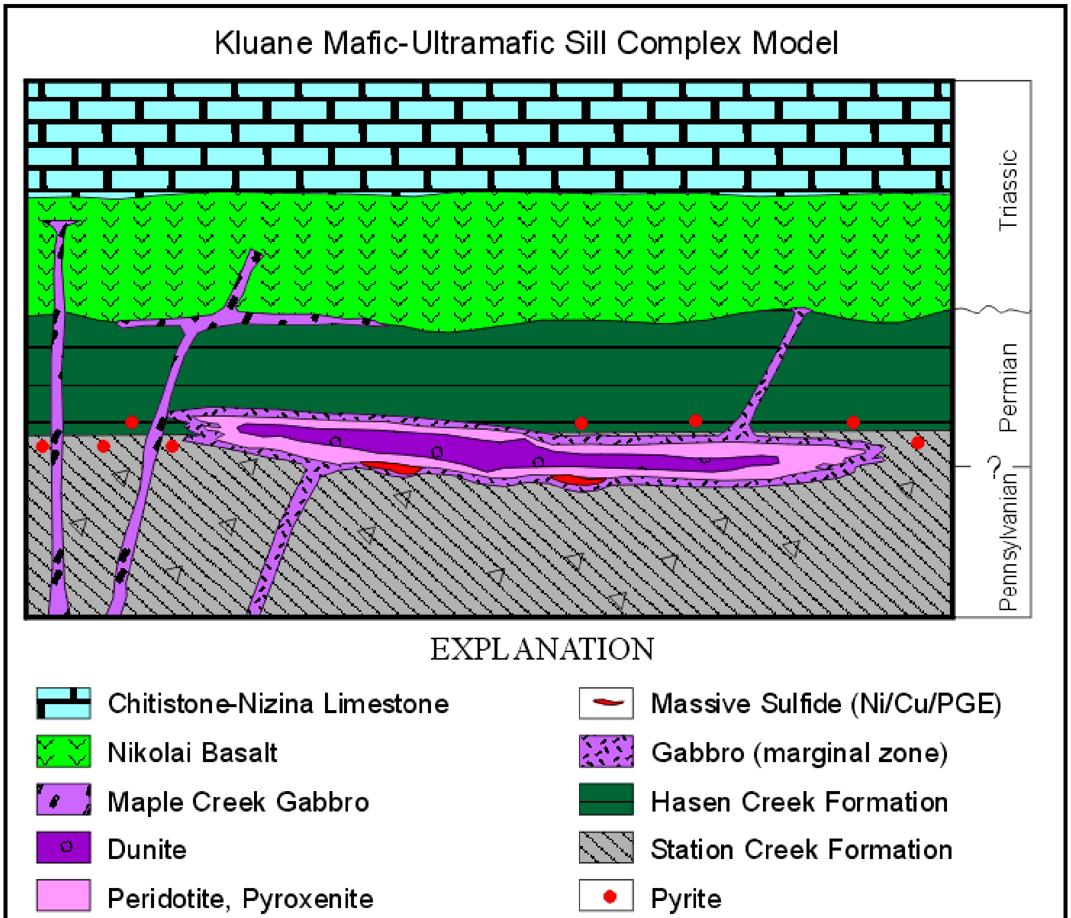


Figure 7.2 Kluane Mafic-Ultramafic Sill Complex Model

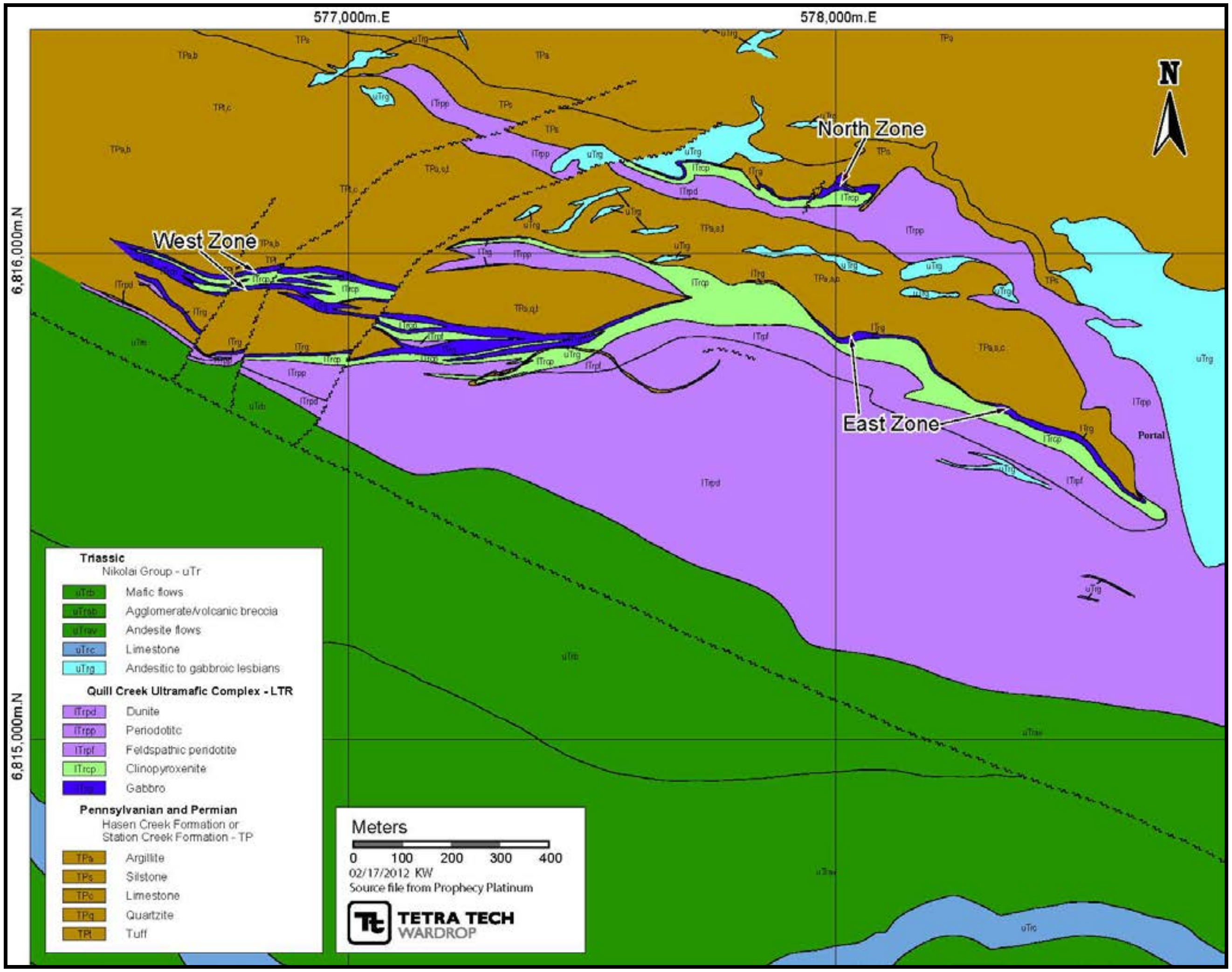


Schematic section of typical Kluane mafic-ultramafic intrusive complex model (pre-deformation) showing the outer marginal gabbroic envelope, and the zonal development of progressively more ultramafic rocks (i.e. Pyroxenite, peridotite and dunite, respectively) towards the core of the intrusion. Note the massive sulphide concentrations at the base of the complex and the intrusions preferential emplacement at or near the pyritic Station Creek-Hasen Creek Formations contact zone. (L. Hulbert 1995, GSC OF3057)

7.1.2 Property Geology

Israel and Zeyl (2004) provides the most recent geological mapping for the Property (Figure 7.3); Hulbert (1997) also provides a description and discussion. Detailed geology and interpretation covering the Wellgreen deposit area is available from maps completed by Archer, Cathro and Associates. They have compiled and reinterpreted exploration results for the Kluane JV programs carried out on behalf of All-North. The descriptions and classifications of the geological framework for the Property from these sources are not consistent.

Figure 7.3 Property Geology



The oldest rocks on the Property are represented by the Pennsylvanian and/or Permian Station Creek Formation. The Station Creek Formation underlies significant portions of the Property. The formation consists of light to medium green volcanic breccia, tuffs and tuffaceous sandstones and also contains a component of basalt. The Station Creek Formation is overlain conformably by the Pennsylvanian and/or Permian Hasen Creek Formation. The Hasen Creek Formation consists of a range of metasediments; greywacke, thin-bedded siltstone turbidites and limestones as well as volcaniclastics and tuffs. These rocks are folded into a series of parallel, sometimes overturned, synclines and anticlines.

The Station Creek formation rocks are unconformably overlain by amygdaloidal flood basalt, volcanic breccias and metasediments of the Upper Triassic Nikolai Group. The Nikolai Group rocks are also folded into a series of southeast-northwest trending anticlines and synclines.

The Wellgreen deposit occurs along the lower margin of an Upper Triassic ultramafic-mafic body. Known as the Quill Creek Complex, it is 20 km long and closely intrudes along the contact between the Station Creek and Hasen Creek formations. The main mass of this Quill Creek Complex is 4.2 km long and up to 700 m wide. It is located on the Northern Platinum claim group of the Property. A smaller mass of similar intrusive is located along the strike to the northwest and southeast. The Quill Creek Complex consists of a main intrusion and an associated group of upright to locally overturned, steeply south dipping sills. These associated sills may be remnants of the main intrusion separated from the main mass by folding and shearing. The intrusions are crudely layered, variably serpentinized, and deformed. Locally, the sills have a lower gabbroic margin adjacent to a chilled contact with paleozoic rocks. Mafic-rich skarns occur in the floor rocks adjacent to the marginal facies gabbro, particularly where the metasediment host includes limestone or calcareous rocks. The intrusives are zoned upwards away from the lower gabbroic zone through zones of clinopyroxenite, peridotite and dunite.

In the Wellgreen deposit area, Nikolai Formation mafic volcanics underlie the area immediately south of the Quill Creek Complex. The volcanics have been interpreted to be in fault contact with the upper part of the Quill Creek Complex and Station Creek Formation rocks (Israel and Zeyl 2004).

There is an abundant series of relatively small intrusions into Paleozoic metasediments and the Quill Creek Complex. They are mapped as andesitic to gabbroic dykes and are probably correlated with the Nikolai Formation. Hulbert (1997) describes these same rocks as felsic dykes. Many of these small intrusions are associated with the northeast-southwest oriented faults that cut the stratigraphic sequence and the Quill Creek Complex.

The youngest rocks on the Property are represented by the Cretaceous intermediate and mafic intrusive belonging to the Kluane Ranges suite.

Longitudinal faults and/or shears are common in the ultramafic rocks. Some of these occur along lithological contacts. The most prominent of these is coincident with Maple Creek. Hulbert (1997) describes two western faults as west-dipping reverse faults.

7.2 MINERALIZATION

Mineralization on the Property occurs within the Quill Creek Complex. This variably serpentinized, ultramafic-gabbroic body intrudes Permian sedimentary and volcanic rocks. Historic exploration and development programs defined three zones of gabbro-hosted massive and disseminated mineralization known as the East Zone, West Zone and North Zone (Figure 7.4).

7.2.1 EAST ZONE

The two main gabbro-hosted zones of mineralization are the East and West Zones. The East Zone has received the most detailed exploration, including 4,267 m of underground development on seven levels, three internal shafts and over 500 surface and underground diamond drillholes. The East Zone is gently west-plunging and moderately to steeply south-dipping and is in contact with Hasen Creek Formation calcareous sediments. At the base of this zone of mineralized peridotite re discontinuous massive sulphide lenses as well as skarn zones in calcareous footwall. The mineralized portion of the East Zone has been outlined by surface and underground diamond drilling over a strike length of 1,500 m and an average vertical extent of 700 m (Figure 7.5).

East of section 3500E, the peridotite unit thicken up considerably with an average of 400 m horizontal width. Around section 3500E, there is a repeated sequence of mineralized peridotite, footwall rocks from the Hasen Creek formation, and mineralized peridotite. This indicates the potential for some form of thrust faulting. This is also evident in the mineralized portion of the peridotite east of section 3500E, where mineralized grade profiles in boreholes, drop off and then increase. No significant faulting has been observed in the drill core to support this theory.

The East Zone was mined by Hudson Yukon Mining in 1972 and approximately 171,652 t at 2.23% nickel and 1.39% copper were extracted.

7.2.2 WEST ZONE

Hudson Yukon Mining discovered the West Zone. All-North's 1987 drilling program further outlined the zone, which extends over a strike length of 1,300 m and to a vertical depth of about 400 m. This area is located above the base of the Quill Creek Complex where its trend changes from northwest-southeast to east-west. The majority of the mineralized zones occur in gabbro and in a blanket clinopyroxenite, as is the case in the East Zone. However, mineralization also occurs to a considerable extent in inter-digitated gabbro-clinopyroxenite units. The West Zone only has limited exposure by underground workings, and consists of multiple mineralized units which are separated spatially; the basal gabbro unit, the upper clinopyroxenite unit, and a second basal unit which lies to the west of one of the several westerly shallow dipping north-easterly trending cross-faults.

The sill that hosts the mineralized West Zone appears to have a gabbroic margin on both its north and south contacts. The marginal gabbro magmatic zones are up to 110 m thick. They host the nickel-copper massive sulphide mineralization that forms the higher grade portions of the various mineralized zones of the Wellgreen deposit. The clinopyroxene magmatic zones, which range up to 100 m in thickness, host disseminated nickel-copper sulphides and minor net-textured and semi-massive sulphide lenses (Figure 7.5).

Figure 7.4 Wellgreen Plan View

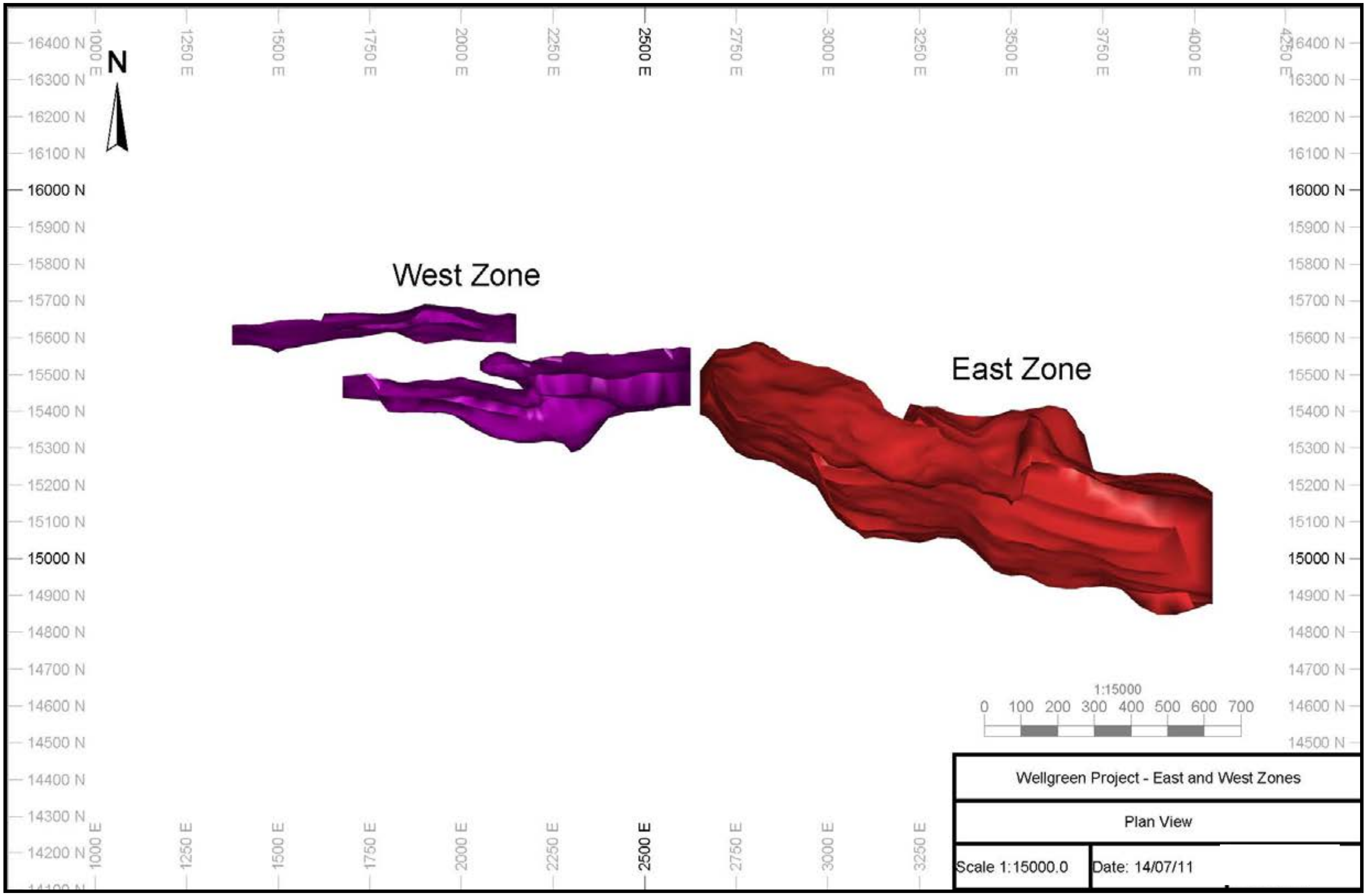
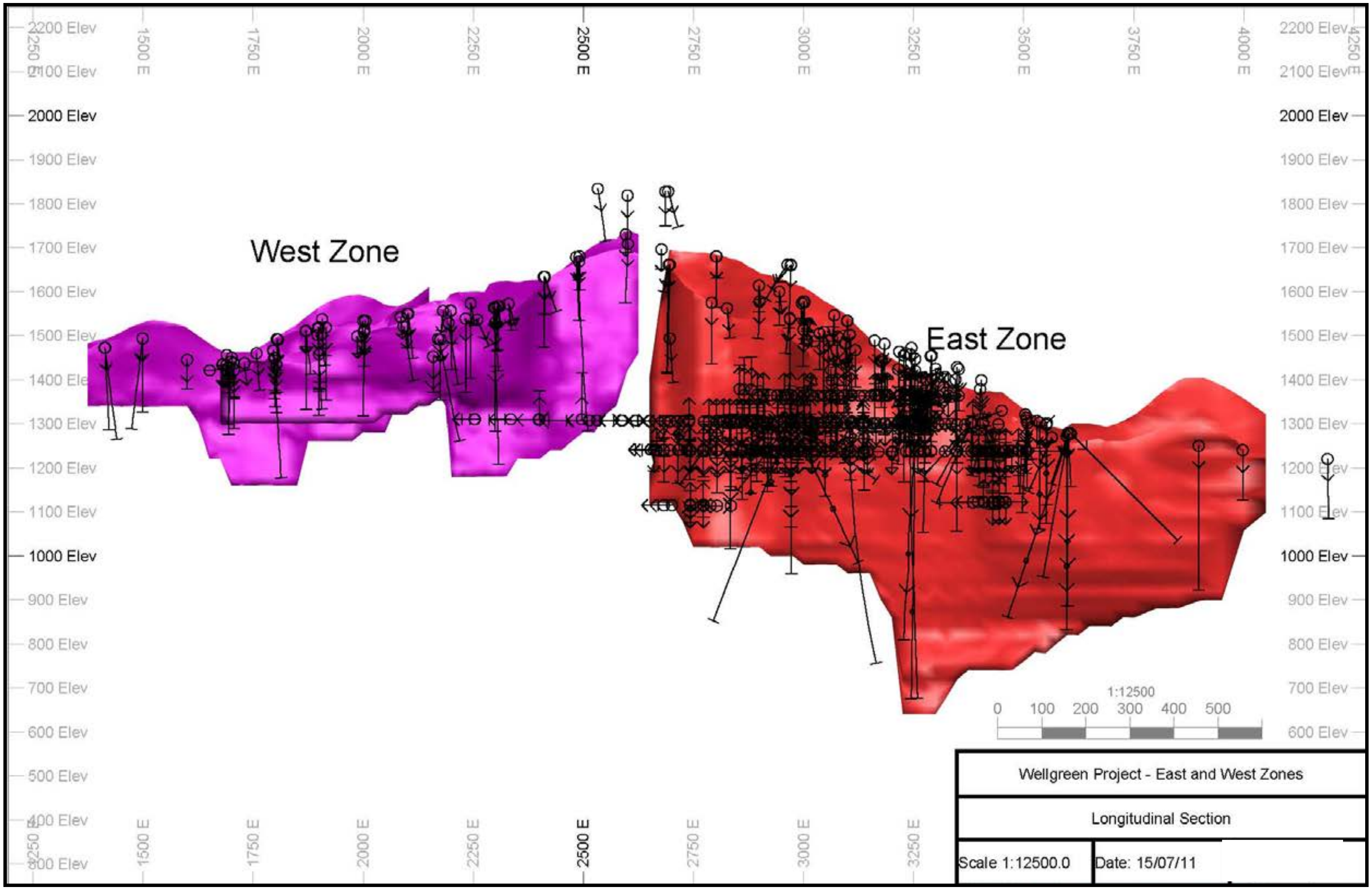


Figure 7.5 Wellgreen Long Section (Looking North)



7.2.3 NORTH ZONE

The North Zone is located in the east-central portion of a narrow 1,200 m long sill positioned approximately 150 m below the main ultramafic unit. It was discovered by Hudson Yukon Mining in the 1950s and explored in 1987 with three drillholes by All-North. All of these drillholes intersected mineralization, and the best reported intersection was 0.51% copper, 2.01% nickel, 0.96 g/t platinum and 0.65 g/t palladium over a core length of 3.4 m. The geology of this zone is similar to both the East and West Zones. Mineralization consists of massive sulphide lenses, disseminations in gabbro and ultramafic rocks, and as fracture fillings in footwall quartzite. The North Zone was tested in 1988 by limited drilling and was determined to have a northerly dip. This will make it difficult to adequately explore from the surface through drilling from the south, as has been done with the other zones on the Property. To-date, the North Zone appears to be a thin and discontinuous zone, but represents an interesting area of nickel-copper mineralization that warrants further work.

7.2.4 MINERALS

Table 7.1 to Table 7.3 after Cabri et al. (1993) lists the opaque minerals and PGM and PGE-bearing minerals found in the deposit. The elevated presence of rhodium, ruthenium, iridium, rhenium, and osmium within the mineral suite provided additional pay metals. If recoverable they could enhance the economics of an operation in the district.

Rhodium is present at Wellgreen in anomalous concentrations as compared to the concentrations found in Noril'sk ores in Russia (Hulbert 1997).

Table 7.1 Opaque Minerals Observed in the Wellgreen Deposit

Major Minerals*	
Pyrrhotite	Fe_1-xS
Pentlandite	(Fe, Ni)9S8
Chalcopyrite	$CuFeS_2$
Pyrite	FeS_2
Magnetite	Fe_2O_4
Ilinenite	$FeTiO_3$
Less Common to Rare Minerals*	
Violarite	$FeNi_2S_4$
Sphalerite	(Zn,Fe)S
Chromite	$FeCr_2O_4$
Cobaltite**	CoAsS/NiAsS
Arsenopyrite	FeAsS
Ulimannite	NiSbS
Siegenite argentopentlandite	(Ni, Ag(Fe,Ni)$_8$S$_8$

table continues…

Less Common to Rare Minerals*	
Gold/electrum	(Au,Ag)
Melonite	$NiTe_2$
Bismuth tellurides	Bi-Te (?)
Galena	PbS
Altaite	PbTe
Nickeline	NiAs
Covellite	CuS
Breithauptite	NiSb
Barite	$BaSO_4$
Titanite hessite	$CaTiSiO_2$ Ag_2Te
Matildite(?)	$AgBiS_2$
Undefined	Cu-Fe-Ba-S***

Notes: *Ideal formula
**Unidentified mineral of the cobalt-gersdorffite series
***Probably a new copper-iron-barium

Table 7.2 PGMs in the Wellgreen Deposit

Mineral	Symbol
Sperrylite	$PtAs_2$
Sudburyite	PdSb
Testibiopalladite	PdSbTe
Merenskyite	$PdTe_2$
Moncheite	$PtTe_2$
Michenerite	PdBiTe
Stibiopajiadinite	Pd_5Sb_2
Mertielte II	Pd_8Sb_3
Geversite	$PtSb_2$
Hollingworthite	RhAsS
Froodite	$PdBi_2$
Undefined	$(Pd,Ni)_2(Te,Sb)_3$
Undefined	$(Pd,Ni)_3(Te,Sb)_4$
Undefined	Pd(Bi,Te)
Undefined	$Pd_3Ni(Sb,Te,Bi)_5$
Laurite	RuS_2
Kotuiskite	PdTe
Pt-Fe alloy(s)	Pt_3Fe or PtFe(?)
Undefined	Re>Ir>Os>Ru alloy
Undefined	Pd-Hg
Iridium	Ir
Undefined	Re sulphide (?)

Table 7.3 PGE-Bearing Minerals in the Wellgreen Deposit

Element	Symbol	Metal Content
Melonite	(Ni,Pd,Pt)Te_2	Up to 15.1% Pd; up to 9.37% Pt
Undefined	(Ni, Pd)$_2$(Te,Sb)$_3$	Up to 22.8% Pd
Undefined	(Ni,Pd)$_3$(TeSb)$_4$	Up to 15.9% Pd
Breithauptite	(Ni,Pd)Sb	Up to 18.9% Pd
Hexatestibio-panickelite	(Ni, Pd)$_2$SbTe	Up to 15.9% Pd
Ullmannite	(Ni,Pd)SbS	Up to 0.09% Pd
Cobaltite	(Co,Rh)AsS	Up to 2.7% Rh, in zones
Pentlandite	(Pd,Rh,Ru)*	Up to 34 Pd, 12 Rh, 13 Ru (ppm)
Chalcopyrite	(RuRh,Pd)*	Up to 10 Ru, 10 Rh, 9 Pd (ppm)
Pyrrhotite	(Pd)*	Up to 5.6 ppm Pd

Note: *Trace levels as determined by proton microprobe.

8.0 DEPOSIT TYPES

The Wellgreen deposit is hosted in the Quill Creek Complex, one of a number of mafic-ultramafic sills that are enriched in nickel-copper-PGE mineralization that outcrop within the Kluane Ultramafic Belt of the Wrangellia Terrane in southwestern Yukon. The sills which form the Kluane mafic-ultramafic complex are thought to be part of a sub-volcanic system that feed the Nikolai Formation flood basalts and have been compared to the Noril'sk in Russia.

At Noril'sk, the ultramafic complex intruded a bed of gypsum/anhydrite and followed this bed for several kilometres. Upon encountering this bed, massive copper, nickel, and PGM sulphides accumulated along the footwall due to sulphur contamination. The sulphides became semi-massive several kilometres along the direction of flow and further along they became disseminated and then depleted. At this point the intrusion became depleted of copper and nickel and had become a feldspathic pyroxenite (McGoran 2008).

Salient characteristics of the Wellgreen deposit model can be classified as: gabbroid-associated nickel, copper, PGEs, subtype 12.2.a: layered intrusive, nickel-copper as summarized in Table 8.1 (Eckstrand 1984).

Table 8.1 Gabbro-associated Nickel Deposit

Gabbroid-associated Nickel, Copper, PGEs subtype 12.2.A: Layered Intrusive	
Commodities	Nickel, copper, PGEs (cobalt, gold, silver, sulphur, iron).
Examples	Sudbury Deposits; Great Lakes Nickel; Ont-Duluth Complex, Minnesota; Stillwater Complex, Montana; Brady Glacier, Alaska; Noril'sk-Talnakh, Russia; Pikwe and Selebi Deposits, Botswana.
Importance	Canada: the Sudbury deposits have, by a considerable margin, produced more nickel than any other district in the world, as well as substantial copper, precious metals and other by-products. World: this deposits estimated to account for about 80% of the world's reserve of sulphide nickel and about half of current world production of PGEs.
Typical Grade, Tonnage	The amount of mineralized material contained in the individual bodies may range from a few hundred thousand tonnes to tens of millions of tonnes, and each intrusive complex generally contains a number of mineralized bodies. Grades generally range from about 0.6 to 1.6% nickel, 0.2 to 1.3% copper but large, lower grade deposits are known (e.g. Great Lakes Nickel, 0.20% nickel, 0.36% copper). Combined PGEs content (palladium and platinum mainly) is generally in the order of 1 g/t, but Stillwater, Merensky Reef and Talnakh deposits contain PGEs ranging from 10 to 20 g/t.

table continues…

Gabbroid-associated Nickel, Copper, PGEs subtype 12.2.A: Layered Intrusive	
Geological Setting	(12.2.a), (12.2.b) Layered intrusions generally occur in a cratonic setting, in some cases associated with intracontinental rifts and flood basalts; some occur in Archean greenstone belts. The Sudbury deposits probably originated from a structure of meteoritic impact.
Host Rock	Various mafic phases of intrusive complexes includes norite, gabbro, troctolite, feldspathic pyroxenite, amphibolite, gabbro-diabase, picrite. The North Range deposits at Sudbury occur in pyroxenite, amphibolite, gabbro-diabase, and picrite. The North Range deposits at Sudbury occur in brecciated leucocratic footwall rocks. The Merensky Reef is coarse grained feldspathic pyroxenite associated with thin chromitite layers.
Associated Rocks	A variety of phases of the mafic intrusive complexes includes diorite, peridotite, pyroxenite, anorthosite, gabbro, norite; and wall rocks of the intrusive complexes.
Form of Deposit	(12.2.a) Conformable layers or lenses, commonly located in a local depression or embayment at or near the base of the host layered intrusion. Mineralized material consists of massive sulphides, sulphide-matrix breccia, interstitial sulphide network, and disseminated sulphide. In well preserved deposits, the rich mineralized material lie nearest the base, and are overlain by leaner disseminated sulphide. Sulphide veins and disseminations commonly penetrate the footwall rocks.
Principal Minerals	Pentlandite, chalcopyrite, cubanite, millerite; various PGE minerals including sulphides, tellurides, arsenides and alloys.
Associated Minerals	Pyrrhotite, pyrite, sphalerite, millerite, marcasite; plagioclase, hypersthene, augite, olivine, hornblende, biotite, quartz, and a variety of alteration minerals.
Host Rock Age	Various ages; most are Precambrian (Sudbury, 1.85 Ga; Great Lakes Nickel and Duluth Complex, 1.1 Ga; Bushveld Complex, 2.1 Ga; Stillwater Complex, 2.7 Ga; Lynn Lake) 1.8 Ga) but Noril'sk-Talnakh intrusions are Permo-Triassic, and other Paleozoic and Mesozoic examples are known.
Genetic Model	Mafic magma (probably mantle-derived in most cases) was generally emplaced quiescently as multiple pulses in upper levels of the crust, in some cases apparently in a tensional environment associated with rifting. Early sulphur saturation of the magma produced flow- and gravity-segregations of nickel-copper bearing sulphides at the base of the intrusion. Contamination of the magma probably made a significant contribution to the sulphide saturation in many deposits, either through the addition of sulphur, or assimilation of siliceous material. Most of the sulphur in several large districts (Noril'sk-Talnakh, Duluth Complex) was probably derived from the underlying sedimentary rocks.
Mineralized Material Control	The basal contacts (particularly embayments in the basal contacts) and immediate overlying zones (up to about 200 m) in layered intrusions, are the most common sites of nickel-copper sulphide mineralized material

9.0 EXPLORATION

Prophecy Platinum has not conducted any surface exploration on the Property between the issue date of the previous technical report in 2011 (McCracken 2011) and the date of this technical report.

The Prophecy Platinum drilling campaigns are described in Section 10.0.

10.0 DRILLING

10.1 HISTORICAL DRILLING

Considerable surface and underground drilling was completed in the 1950s by Hudson Yukon Mining, an operating subsidiary of HBM&S. Additional drilling was completed under the auspices of the Kluane JV (All-North, Chevron and Galactic Resources) in the 1980s. Drill logs, assay summaries and assay certificates for some of these historic drillholes are available and can be compiled into a database to support any future mineral resource estimates. This historic work has not been completely documented.

10.2 NORTHERN PLATINUM DRILLING

The drilling conducted by Northern Platinum was designed to extend and expand the potential resource of the Wellgreen deposit by targeting up dip of the East Zone and east along strike. A total of ten drillholes were completed during the 2009 drill program. All holes were drilled HQ and all drilling was run in five foot intervals (1.52 m).

10.3 PROPHECY DRILLING

10.3.1 2010 DRILL PROGRAM

The drilling conducted by Prophecy Platinum was designed initially to extend and expand the potential resource of the Wellgreen deposit by targeting the East Zone along strike. The focus of the program evolved to test the hanging wall disseminated sulphides located in the ultramafic unit.

Drilling was completed by E. Caron Drilling of Whitehorse. A total of seven drillholes were completed during the 2010 drill program from June to October. All holes were drilled HQ and all drilling was run in five foot intervals (1.52 m). Northern Platinum completed the first six holes prior to the closing of the acquisition of Northern Platinum by Prophecy Platinum.

The collars were initially spotted with a hand held global positioning system (GPS) or compass and chain, with the final completed collars again surveyed with a hand held GPS, compass and chain or a total station GPS. Down-hole surveys were completed using the ReflexIt© tool. Survey readings were collected approximately

9 m off the bottom of the hole and at approximately 152 m intervals up the hole. Erroneous directional readings located within the mineralized zones were discarded due to the magnetic influence of the pyrrhotite. Inclination readings were not affected by the magnetic minerals.

Table 10.1 provides the collar information for the drill program completed by Prophecy Platinum. Table 10.2 provides the highlights of the drill program completed by Prophecy Platinum. Core lengths in the table do not represent true widths. Figure 10.1 shows the position of the 2010 drillholes relative to the rest of the surface holes completed on the Project.

Table 10.1 Prophecy Platinum 2010 Drill Collars

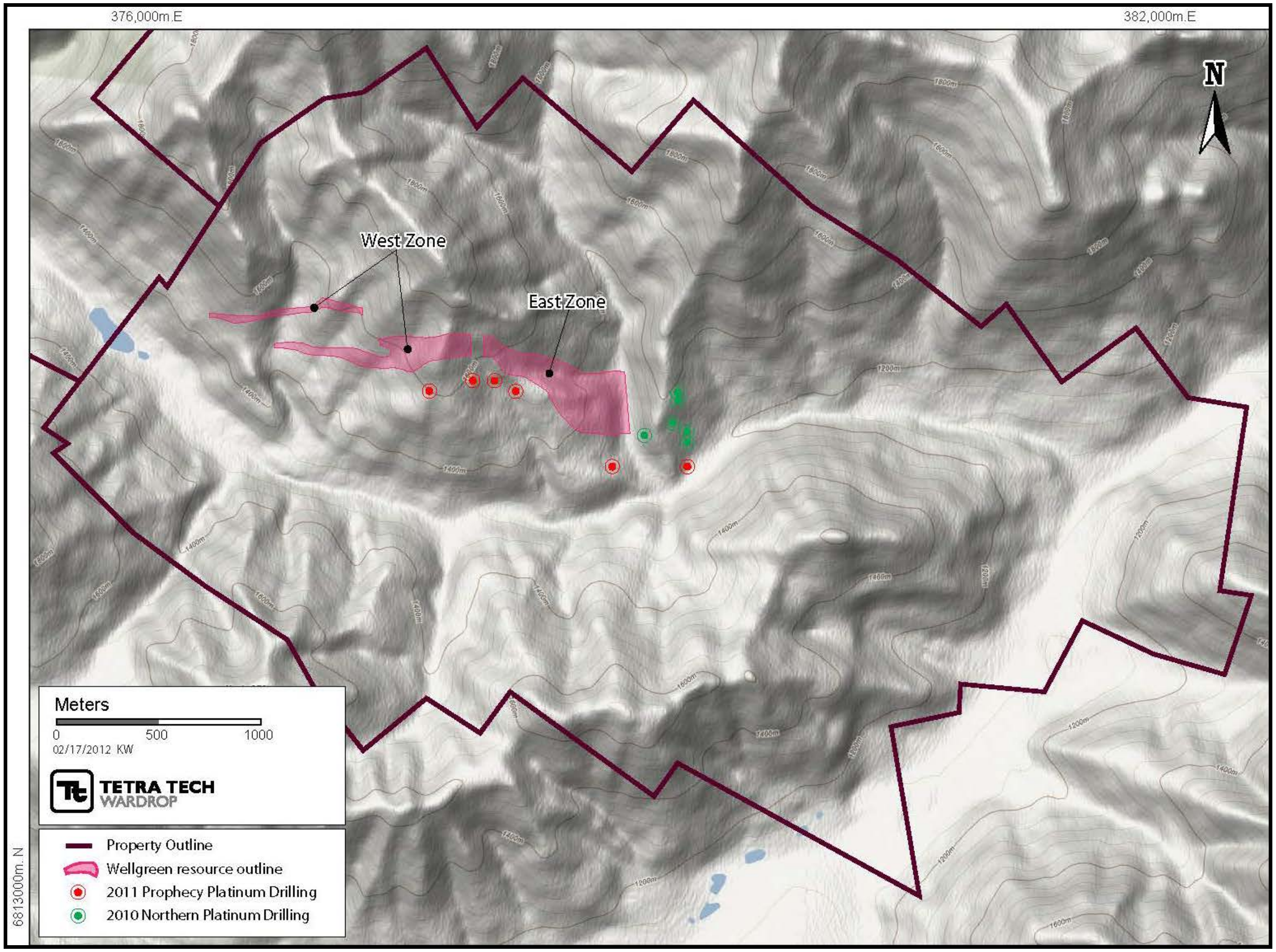
Borehole ID	Easting*	Northing*	Elevation* (m)	Depth (m)	Azimuth* (°)	Dip (°)
WS10-177	3,601.2	15,063.8	1,277.3	563.0	0	-45
WS10-178	3,597.6	15,015.5	1,271.9	601.1	0	-45
WS10-179	3,553.3	15,249.8	1,300.5	262.7	0	-45
WS10-180	3,552.5	15,198.4	1,297.3	299.3	0	-45
WS10-181	3,536.7	15,153.2	1,301.9	232.2	0	-45
WS10-182	3,530.8	15,102.3	1,354.5	88.7	0	-45
WS10-183	3,401.9	15,050.0	1,378.5	116.4	0	-50

Note: *Mine grid coordinate system

Table 10.2 Prophecy Platinum 2010 Drill Results

Borehole ID	From (m)	To (m)	Length (m)	Ni (%)	Cu (%)	Co (%)	Pt (g/t)	Pd (g/t)	Au (g/t)
WS10-177	5.3	531.2	525.9	0.26	0.17	0.02	0.248	0.248	0.054
WS10-178	5.2	572.0	566.8	0.23	0.16	0.01	0.247	0.219	0.051
WS10-179	0.9	179.7	178.8	0.16	0.03	0.01	0.093	0.109	0.009
WS10-180	23.2	244.9	221.8	0.18	0.03	0.01	0.082	0.114	0.010
WS10-181	10.2	291.0	280.9	0.17	0.06	0.01	0.079	0.095	0.011
WS10-182	0.0	71.2	71.2	0.31	0.22	0.02	0.277	0.153	0.036
WS10-183	0.0	43.6	43.6	0.26	0.09	0.02	0.226	0.224	0.031
WS10-183	88.8	116.7	27.9	0.30	0.15	0.02	0.347	0.235	0.043

Figure 10.1 Prophecy Platinum Drill Plan



10.3.2 2011 Drill Program

The drilling conducted by Prophecy Platinum in 2011 was designed initially to delinate the potential resource of the Wellgreen deposit by targeting the area between the East and West Zones to prove that the zones are not separate, but one continuous zone. The focus of the program evolved to test the hanging wall disseminated sulphides located in the ultramafic unit.

Drilling was completed by E. Caron Drilling of Whitehorse. A total of six drillholes were completed during the 2011 drill program from June to October. All holes were drilled HQ and all drilling was run in five foot intervals (1.52 m).

The collars were initially spotted with a hand held GPS or compass and chain, with the final completed collars again surveyed with a hand held GPS, compass and chain or a total station GPS. Down-hole surveys were completed using the ReflexIt© tool. Survey readings were collected approximately 9 m off the bottom of the hole and at approximately 152 m intervals up the hole. Erroneous directional readings located within the mineralized zones were discarded due to the magnetic influence of the pyrrhotite. Inclination readings were not affected by the magnetic minerals.

Table 10.3 provides the collar information for the drill program completed by Prophecy Platinum. Table 10.4 provides the highlights of the drill program completed by Prophecy Platinum. Core lengths in the table do not represent true widths. Figure 10.1 shows the position of the 2011 drillholes relative to the mineralized zones on the Property. Boreholes completed in 2011 are not incorporated into the resource estimation.

Table 10.3 Prophecy Platinum 2011 Drill Collars

Borehole ID	Grid East (m)	Grid North (m)	Elevation (masl)	Dip (°)	Azimuth (°)	Depth (m)
WS11-184	3600.00	14900.00	1,255.00	-45.00	0.00	507.49
WS11-185	3250.00	14900.00	1,380.00	-55.00	0.00	59.13
WS11-188	2600.00	15300.00	1,633.73	-70.00	0.00	491.03
WS11-190	2800.00	15250.00	1,554.48	-70.00	0.00	373.08
WS11-191	2400.00	15250.00	1,566.67	-70.00	0.00	89.92
WS11-192	2700.00	15300.00	1,604.80	-70.00	0.00	404.47

Table 10.4 Prophecy Platinum 2011 Drill Results

Borehole ID	From (m)	To (m)	Length (m)	Ni (%)	Cu (%)	Pt (g/t)	Pd (g/t)	Au (g/t)
WS11-184	8.20	478.80	470.60	0.29	0.13	0.20	0.23	0.03
includes	429.30	478.80	49.50	0.71	0.45	0.65	0.52	0.10
WS11-185	8.99	57.88	48.89	0.21	0.02	0.06	0.10	0.01
WS11-188	7.53	464.91	457.38	0.29	0.18	0.34	0.33	0.05
includes	268.38	389.29	120.91	0.36	0.30	0.63	0.54	0.08
WS11-190	4.27	364.57	360.30	0.24	0.09	0.16	0.21	0.03
WS11-191	7.07	89.92	82.85	0.21	0.02	0.08	0.14	0.02
WS11-192	9.45	394.35	384.90	0.30	0.15	0.28	0.30	0.04
includes	272.19	291.42	19.23	0.41	0.28	0.74	0.56	0.06

10.4 Sampling Methods

10.4.1 *Historical Methods*

Sampling details for historic programs have not been verified by Tetra Tech. No documented quality assurance/quality control (QA/QC) programs were available for review. Hudson Yukon Mining assayed all core at their internal lab in Flin Flon, Manitoba.

Tetra Tech recommends that Northern Platinum continue to research the details of the historical programs by Hudson Yukon Mining and the Kluane JV.

10.4.2 *Coronation Method and Approach*

The drill core was logged by the company geologist and assistants under the direct supervision of Mr. Rory Calhoun, P.Geo., at the designated facilities of the Coronation Minerals base camp on site. The geologist would record lithology, mineralization, structures, sample number, etc., and the assistants would record the geotechnical data (rock quality designation (RQD) and recovery).

Sample length would vary due to lithology and mineralization observed by the geologist and the core would be marked accordingly. Most sampled intervals were 1.52 m or 5 ft in length. The assistant would then take the core into the saw shack and cut it in half using a core saw. After cutting, the core would be returned to the core tray and the geologist would sample it. Half of the split core would be placed in a plastic sample bag with the sample tag. The sample number was also written on the outside of each bag for easy identification. No sample tags were left in the core trays.

All of the data from logging the core was recorded in hand written logs and then transferred to Microsoft Excel™ spreadsheets, for later import into a geological software package.

10.4.3 Prophecy Platinum Method and Approach

The following description of the sampling methodology was provided by Rory Calhoun, P.Geo.:

- Drill core is delivered to the core shack (Figure 10.2) by the diamond drill contractor.
- Core boxes are sorted and placed in groups of three.
- Group of boxes are photographed.
- Run markers and other marker blocks are checked for accuracy.
- The geologist collects RQD and recovery data on a paper form, to be transferred later to a spreadsheet.
- Core is logged by the geologist on a paper form.
  - There are no lithological codes, as the logs are written long hand.
  - There is only one geologist logging the core for consistency.
- The minimum sample unit is 2”; maximum sample length is 5 ft (1.52 m).
- Samples do not cross lithological contacts.
- The sample is marked on the box with the footage and sample number.
- Samples are taken to the core cutting facility for cutting by a technician (Figure 10.3).
  - The saw uses fresh water which drains into sump below the floor before decanting to the creek.
  - The core is cut and placed back into the core box.
  - The core box with cut core is returned to the core shack for sampling.
- The geologist and technician collect the cut core from the same side and place samples in clean plastic bags with a sample tag. The sample number is written on the outside of the sample bag.
- QA/QC samples are inserted into the sample stream at prescribed intervals. Full description of the QA/QC program is provided in Section 11.0.
- Five samples bags are placed in rice bags and a record is made of the sample number placed in each rice bag.
- The core is stored on core racks inside a secure building or shipping container on the Property which has a full time security guard living on site (Figure 10.4 and Figure 10.5).

- The course rejects returned from the laboratory are stored in sealed plastic tubs inside a secure building on site.

Figure 10.2 Core Shack

Figure 10.3 Core Saw Facility

Figure 10.4 Core Storage Facility

Figure 10.5 Shipping Container Storage

11.0 SAMPLE PREPARATION, ANALYSES, AND SECURITY

This section describes the Prophecy Platinum 2010 to 2011 Sample Preparation, Analyses and Security Program as well as the QA/QC program.

11.1 SAMPLE PREPARATION AND ANALYSES PROGRAM

Samples were taken into the Prophecy Platinum geological office in sealed bags, by company personnel. This secure office where the samples were stored, was only accessible by the geologist and camp manager. When enough samples were accumulated, company personnel packed the samples into rice bags, labelled them, and took the bags to the ALS Minerals preparation facility in Whitehorse.

All samples, including field-inserted Standards and Blanks, were sent to ALS Minerals in Vancouver, BC, for assaying. ALS Minerals has ISO/IEC 17025:2005 and ISO 9001:2000 certification.

The samples were assayed for copper, nickel, cobalt, gold, platinum, and palladium.

The following is a brief description of the sample preparation:

1. Samples are sorted into numerical order and then dried.
2. Once dried, the material was crushed using a jaw crusher.
3. The sample is then split to get a 250 g sample for pulverizing.
4. The total 250 g of split sample is pulverized to 85% passing 75 µm.

Gold, platinum, palladium were assayed by fire assay fusion of 30 g with an ICP finish. The resulting values were reported in parts per million.

Copper, nickel, and cobalt were assayed by four-acid “near total” digestion AAS. If any of the assays returned values above the detection limits, the sample was re-assayed using a similar method (ICP-AES or AAS).

At no time was a Prophecy Platinum employee or designate of the company involved in the preparation or analysis of the samples.

11.2 Quality Assurance/Quality Control Program

The same QA/QC program was in place for Coronation Minerals, Northern Platinum and Prophecy Platinum as described below.

Blanks, Standard Reference Material (SRM), and duplicates were inserted into the sample stream every 20th sample.

A duplicate sample was taken with every 20th sampling of core. The selected sample was sawn in half and both resulting pieces were also sawn in half. This quartered core was then placed into two different sample bags with different sample numbers and sealed.

The SRMs came from Natural Resources Canada and Analytical Solutions Limited. These were inserted into the sample stream immediately after the second duplicate. The SRMs are WMS-1a, WPR-1 and WGB-1. The certificates for the SRMs are found in Appendix B.

Sample blanks were obtained from two sources: granodiorite from a local road metal quarry, and garden marble from hardware stores in Whitehorse, Yukon. A blank sample was inserted into the sample stream after the SRM.

Tetra Tech has not compiled or reviewed the results of the QA/QC programs for either the Coronation Minerals or Northern Platinum drilling programs and cannot comment on the validity of the result.

In addition to the field-inserted QA/QC program, the laboratories operate their own laboratory QA/QC system. The labs insert quality control materials, blanks and duplicates on each analytical run.

No secondary laboratory check assaying was completed on the recent drilling programs.

Tetra Tech believes the sampling practices of Prophecy Platinum meet current industry standards. Tetra Tech provided Prophecy Platinum with recommendations on ways to improve the current QA/QC program to make it more effective. These recommendations include:

- The results of the field-inserted QA/QC data should be reviewed by the company geologist and it is also good practice for the geologist to review the laboratory-internal QA/QC data.
- A selection of course rejects or pulps samples up to 10% of the data set should be sent to a second laboratory as part of the QA/QC program.
- The insertion rate of one blank, one duplicate and one SRM should be maintained for every 20 samples.

12.0 DATA VERIFICATION

Tetra Tech's Mr. Todd McCracken, P.Geo., Principal Geologist and Mr. Pacifico Corpuz, P.Eng., Senior Mining Engineer, visited the Property from October 12 to October 13, 2011. The Tetra Tech team was accompanied by Mr. Rory Calhoun, P.Geo., Project Geologist with Prophecy Platinum. Tetra Tech reviewed the project, explored the underground and surface exposures, and reviewed numerous geological logs, assays and core from the storage facility.

Tetra Tech was able to observe the core handling, logging and sampling procedures being done by Northern Platinum and concludes that the procedures meet industry standards.

Tetra Tech has confirmed the locations of four surface borehole collars during the previous the site visit. Tetra Tech collected the collar locations using a Garmin GPSMAP 60Cx handheld GPS unit. Tetra Tech also observed the position of four underground boreholes. All collar locations were located within the acceptable error limit of the GPS unit (Table 12.1). The drillhole data is in a local mine grid and all drill logs prior to 2009 do not contain Universal Transverse Mercator (UTM) coordinates.

Table 12.1 Borehole Collar Validation

Borehole ID	Northern Platinum			Tetra Tech		
	Easting	Northing	Elevation (m)	Easting	Northing	Elevation (m)
WS06-144	-	-	1,490	576873	6815846	1,492
WS06-145	-	-	1,517	576968	6815846	1,520
WS08-155	-	-	1,510	576938	6815850	1,512
WS09-170	578321	6815453	1,457	578319	6815453	1,444

Eight independent samples of mineralized split drill core (¼ core) representing different styles of mineralization, were collected for check assaying during Tetra Tech's previous site visit. The samples were bagged, sealed on site and transported personally by Mr. McCracken by air, to Tetra Tech's Sudbury office. On arrival at the office, the bag was opened for verification purposes, re-sealed and personally delivered to the ALS Minerals preparation facility in Sudbury, Ontario. The pulps were then sent by courier to the ALS Minerals laboratory facility in Vancouver, BC, which is accredited to ISO/IEC 17025 for independent assaying. The samples were analyzed for nickel, copper, cobalt, platinum, palladium and gold, using analysis packages PGM-ICP23 (30 g fire assay, with ICP finish) for the precious metals and ME-OG62 (four-acid digestion ICP-AES) for nickel, copper and cobalt.

A NI-OG46 package was completed on the samples as well. This procedure tested for nickel in sulphides using a partial digestion (aqua regia) methodology. The partial digestion method easily digested all the sulphides in the sample and only a minor amount of the silicate minerals were digested. This provides a sense of the amount of nickel in the sulphides compared to how much nickel is in the silicate minerals such as olivine. The samples returned comparable results to the previous assays and indicate that over 90% of the nickel is likely found within the sulphides as showing in Table 12.2.

The borehole database was validated against the original drill logs and assay certificate up to the end of the 2010. Ten percent of the database was validated. Numerous errors were identified and corrected in the database prior to the resource estimation (Table 12.3).

The data is of sufficient quality to support the resource estimate.

Table 12.2 Check Assays

BHID	From (ft)	To (ft)	Prophecy Platinum Sample No.	Ni (%)	Cu (%)	Co (%)	Pt (ppm)	Pd (ppm)	Au (ppm)	Tetra Tech Sample No.	Ni (%)	Cu (%)	Co (%)	Pt (ppm)	Pd (ppm)	Au (ppm)	Partial Digestion Ni (%)
WS06-144	205.0	210.0	C505119	0.643	1.210	0.0385	1.635	0.693	0.313	40301	0.521	1.010	0.036	1.675	0.706	0.273	0.494
WS06-145	318.5	322.0	C505223	0.196	0.643	0.0195	0.800	0.408	0.258	40302	0.206	0.639	0.020	0.820	0.412	0.160	0.199
WS06-155	137.0	142.0	C509198	0.304	0.205	0.0206	0.630	0.326	0.039	40303	0.336	0.213	0.022	0.630	0.339	0.050	0.312
WS06-149	275.0	280.0	C505631	0.346	0.659	0.0266	1.375	0.732	0.310	40304	0.335	0.669	0.027	1.305	0.646	0.197	0.324
WS06-153	383.9	386.0	C506184	1.250	2.540	0.0778	1.750	2.290	0.365	40305	1.230	2.400	0.083	2.370	3.710	0.333	1.170
WS09-170	475.7	479.0	2107	2.830	1.530	0.1450	1.328	0.925	0.142	40306	2.310	1.560	0.115	1.450	1.190	0.235	2.210
WS08-165	2,159.0	2,164.0	C508049	0.250	0.948	0.0202	1.260	0.716	0.380	40307	0.272	1.015	0.022	1.210	0.668	0.313	0.250
WS10-178	1,823.3	1,824.8	-	-	-	-	-	-	-	40308	0.223	0.409	0.020	0.419	0.224	0.115	0.211

Table 12.3 Database Validation Summary

	Description	Value	Comments
Header	Number of Records	701	-
	Number of Records Validated	100	-
	Validation Rate	14%	-
	X Coordinate Error Rate	33%	Only 2008 holes
	Y Coordinate Error Rate	27%	Only 2008 holes
	Z Coordinate Error Rate	20%	Only 2008 holes
	Hole Length Error Rate	0%	-
Survey	Number of Records	400	-
	Number of Records Validated	66	-
	Validation Rate	17%	-
	Distance Error Rate	42%	2007 holes only have start and end reading, although reading taken at intervals downhole.
	Azimuth Error Rate	41%	2007 holes only have start and end reading, although reading taken at intervals downhole.
	Dip Error Rate	44%	2007 holes only have start and end reading, although reading taken at intervals downhole.
Litho	Number of Records	6,887	-
	Number of Records Validated	867	-
	Validation Rate	13%	-
	From Error Rate	0%	-
	To Error Rate	0%	-
	Rockcode Error Rate	35%	Need to understand why database has different codes compared to the logs.
Assay	Number of Records	7,347	-
	Number of Records Validated	965	-
	Validation Rate	13%	-
	From Error Rate	0.4%	-
	To Error Rate	0.1%	-
	Sample Number Error Rate	0.0%	-
	Gold Error Rate	9.9%	Primarily due to LA08-068 and LA08-069 containing no assay results in the database.
	Platinum Error Rate	9.5%	Primarily due to LA08-068 and LA08-069 containing no assay results in the database.
	Palladium Error Rate	9.9%	Primarily due to LA08-068 and LA08-069 containing no assay results in the database.
	Silver Error Rate	9.0%	Primarily due to LA08-068 and LA08-069 containing no assay results in the database.
	Cobalt Error Rate	10.7%	Primarily due to LA08-068, LA08-069 and LA08-071 containing no assay results in the database.
	Copper Error Rate	10.6%	Primarily due to LA08-068, LA08-069 and LA08-071 containing no assay results in the database.
	Nickel Error Rate	10.6%	Primarily due to LA08-068, LA08-069 and LA08-071 containing no assay results in the database.

13.0 MINERAL PROCESSING AND METALLURGICAL TESTING

Two historical metallurgical test programs and one current program were used for reference in the design of the process facilities in this PEA. The reports for the 1988 test work by Lakefield, Inco Tech, and CANMET were unavailable. However, the prefeasibility report from WGM was available and contained the results from the test work as described below. The G&T technical report from May 2011 was reviewed and the pertinent results are presented below. The latest program results from SGS are also presented in this section. The design of the process was based on these test results and the estimated flotation grades and recoveries.

13.1 LAKEFIELD, INCO TECH, AND CANMET – 1998

Drill core rejects from the 1987 drilling program were tested in 1988 and 1989 at Lakefield, Inco Tech, and CANMET to investigate the metallurgical behaviour and obtain data on the mineralization. This test work was summarized in the WGM 1989 prefeasibility report. Additional test work was done at CANMET in the 1990s and was summarized in Cabri et al. (1993).

Analysis of preliminary metallurgical tests in early 1988 indicated that a bulk concentrate of about 5% copper and 4% nickel would achieve recoveries up to 95% of the copper, 85% of the nickel, 80% of the platinum and 80% of the palladium. This was produced from a feed whose analysis was 0.87% copper, 0.65% nickel, 1.03 g/t platinum and 0.75 g/t palladium.

Additional samples of material from the Wellgreen deposit were tested during the second half of 1988 at Lakefield. Lower grade materials included in these samples more closely approximated the material that could be anticipated from an open pit operation. The major improvement to the results was the inclusion of high speed conditioning prior to the cleaning step of the bulk concentrate. This resulted in an increase in the grade of concentrates with an increase in recovery. The results from these flotation tests are shown in Table 13.1. The results from testing lower grade material utilizing the high speed conditioning are shown in Table 13.2.

Table 13.1 Lakefield Flotation Test Comparison (Lakefield 1988)

High Speed Conditioning	Test No.	Product	Weight (%)	Assays				Distribution			
				Cu (%)	Ni (%)	Pt (g/t)	Pd (g/t)	Cu (%)	Ni (%)	Pt (%)	Pd (%)
No	54	Bulk Cleaner Concentrate	8.26	10.260	5.690	9.470	7.010	94.1	76.8	68.3	70.6
		Bulk Combined Tail	91.74	0.058	0.160	0.396	0.263	5.9	23.2	31.7	29.4
		Head (Calculated)	100.00	0.900	0.610	1.150	0.820	100.0	100.0	100.0	100.0
Yes	80	Bulk Cleaner Concentrate	8.57	10.800	5.490	6.050	5.330	96.1	81.1	62.0	71.8
		Bulk Combined Tail	91.43	0.042	0.120	0.360	0.200	3.9	18.9	38.0	28.2
		Head (Calculated)	100.00	0.960	0.580	0.840	0.640	100.0	100.0	100.0	100.0
Yes	79	Bulk Cleaner Concentrate	10.22	8.760	4.610	6.230	4.700	95.5	82.1	68.0	71.4
		Bulk Combined Tail	89.78	0.047	0.115	0.330	0.210	4.5	17.9	32.0	28.6
		Head (Calculated)	100.00	0.940	0.570	0.940	0.670	100.0	100.0	100.0	100.0

Table 13.2 Lakefield Flotation Test Results for Lower Grade Mineralized Material (Lakefield 1988)

Test No.	Product	Weight (%)	Assays				Distribution			
			Cu (%)	Ni (%)	Pt (g/t)	Pd (g/t)	Cu (%)	Ni (%)	Pt (%)	Pd (%)
54	Bulk 3rd Cleaner Concentrate	4.38	12.100	6.990	8.72	7.12	93.7	74.1	51.0	63.2
	Bulk 1st Cleaner Concentrate	6.27	8.610	5.230	7.20	5.41	95.4	79.3	60.3	68.7
	Bulk Rougher Concentrate	11.63	4.700	3.000	4.31	3.11	96.6	84.2	67.0	73.2
	Bulk Rougher Tail	88.37	0.022	0.074	0.28	0.15	3.4	15.8	33.0	26.8
	Head (Calculated)	100.00	0.570	0.410	0.75	0.49	100.0	100.0	100.0	100.0

An elemental analysis of typical copper/nickel cleaner concentrate produced in the Lakefield laboratory was completed and the results are shown in Table 13.3. In this sample, the gold and PGEs appear to be at low levels in the concentrate while magnesium oxide is also at a low level.

Table 13.3 Lakefield Cleaner Concentrate Analysis (Lakefield 1988)

Element	Measurement	Content
Copper	%	11.5
Nickel	%	5.4
Cobalt	%	n/a
Gold	oz/t	0.091
Silver	oz/t	1.04
Platinum	oz/t	0.20
Palladium	oz/t	0.18
Rhodium	oz/t	0.005
Iron	%	36.6
Sulphur	%	29.0
Lead	%	0.02
Zinc	%	0.59
Arsenic	%	0.43
Antimony	%	0.004
Silica	%	8.54
Alumina	%	1.11
Lime	%	1.17
Magnesium oxide	%	3.13

The following is a summary of the results from this laboratory test work:

- The Wellgreen mineralized material is complex in composition and belongs to a group of finely disseminated semi-massive mineralized materials with relatively high pyrrhotite content and low nickel-copper and PGM content.
- The modified flowsheet which includes high-speed conditioning, gave satisfactory recoveries and significantly improved concentrate grades.
- Pre-concentration of the platinum and palladium from the mineralized material using gravity concentration was not successful, mainly due to liberation problems.
- In general, the flowsheet and reagent scheme developed for Wellgreen was effective and should accommodate variations in the mineralized material characteristics.

13.2 G&T Metallurgical Services Ltd. – May 2011

Coarsely crushed mineralized material from the Property was delivered by Prophecy Platinum to G&T for chemical, mineralogical, and metallurgical characterization work. A composite named Peridotite Composite 1 was created from the sample, and used for six batch flotation tests. Three rougher flotation tests and three cleaner flotation tests were carried out. The results from this test work and conclusions were gathered in G&T's report entitled, "Metallurgical Assessment of the Wellgreen Deposit, Yukon Territoy, Canada – KM2833; May 5, 2011". The results from this report are discussed below.

13.2.1 Mineralogical Work

The head grade analysis for Peridotite Composite 1 is presented in Table 13.4. This sample was relatively low in grade for nickel, copper, platinum, and palladium.

Table 13.4 Chemical Composition of Peridotite Composite 1 (G&T – May 2011)

Element Symbol	Cu (%)	Ni (%)	Fe (%)	S (%)	Pt (g/t)	Pd (g/t)	Co (%)
Peridotite Composite 1	0.29	0.26	10.3	1.80	0.28	0.25	0.17

The results from the Bulk Mineral Analysis with an estimate of Liberation (BMAL) from Quantitative Evaluation of Materials by Scanning Electron Microscopy (QEMSCAN) is presented in Table 13.5. The pentlandyte and chalcopyrite were 0.80% and 0.82% respectively. The most abundant sulphide mineral was pyrrhotite. The high concentration of pyrrhotite could result in the pyrrhotite diluting the concentrate grade since it would float along with the pentlandite and chalcopyrite. One benefit to flotation is that the talc content was low at 0.96%. This level is low enough that the talc should not become a hinderance to the flotation of the valuable minerals.

Table 13.5 Mineral Composition of Peridotite Composite 1 (G&T – May 2011)

Minerals	Peridotite Composite 1 Mineral Content (%)
Chalcopyrite	0.82
Pentlandite	0.80
Pyrite	0.09
Pyrrhotite	3.32
Magnetite/Hematite	1.36
Goethite	5.64
Quartz	0.04

table continues…

Minerals	Peridotite Composite 1 Mineral Content (%)
Micas	1.89
Feldspars	0.10
Chlorite	8.51
Talc	0.96
Amphibole	22.1
Serpentine	51.4
Calcite	0.83
Olivine	0.81
Titanium Minerals	0.44
Others	0.86
Total	**100***

Note: *Total comes to 99.97% and has been rounded up to 100%.

Table 13.6 is the mineral liberation data from QEMSCAN. A large quanitity of the unliberated pentlandyte and chalcopyrite are in a binary structure with non-sulphide gangue. The liberation of the chalcopyrite and pentlandyte was 34% and 35% respectively. The BMAL was performed at a grind of 93 µm. Based on this sample, a finer grind may be required to liberate the valuable minerals.

Table 13.6 Mineral Liberation Characteristics (G&T – May 2011)

Mineral Status	Mineral Liberations – Two Dimensional			
	Chalcopyrite	Pentlandite	Pyrrhotite/ Pyrite	Non-sulphide Gangue
Liberated	34	35	41	96
Binary – Chalcopyrite		8	6	1
Binary – Pentlandite	2		3	<1
Binary – Pyrrhotite/Pyrite	8	9		2
Binary – Non-sulphide Gangue	43	29	43	
Multiphase	13	19	7	<1

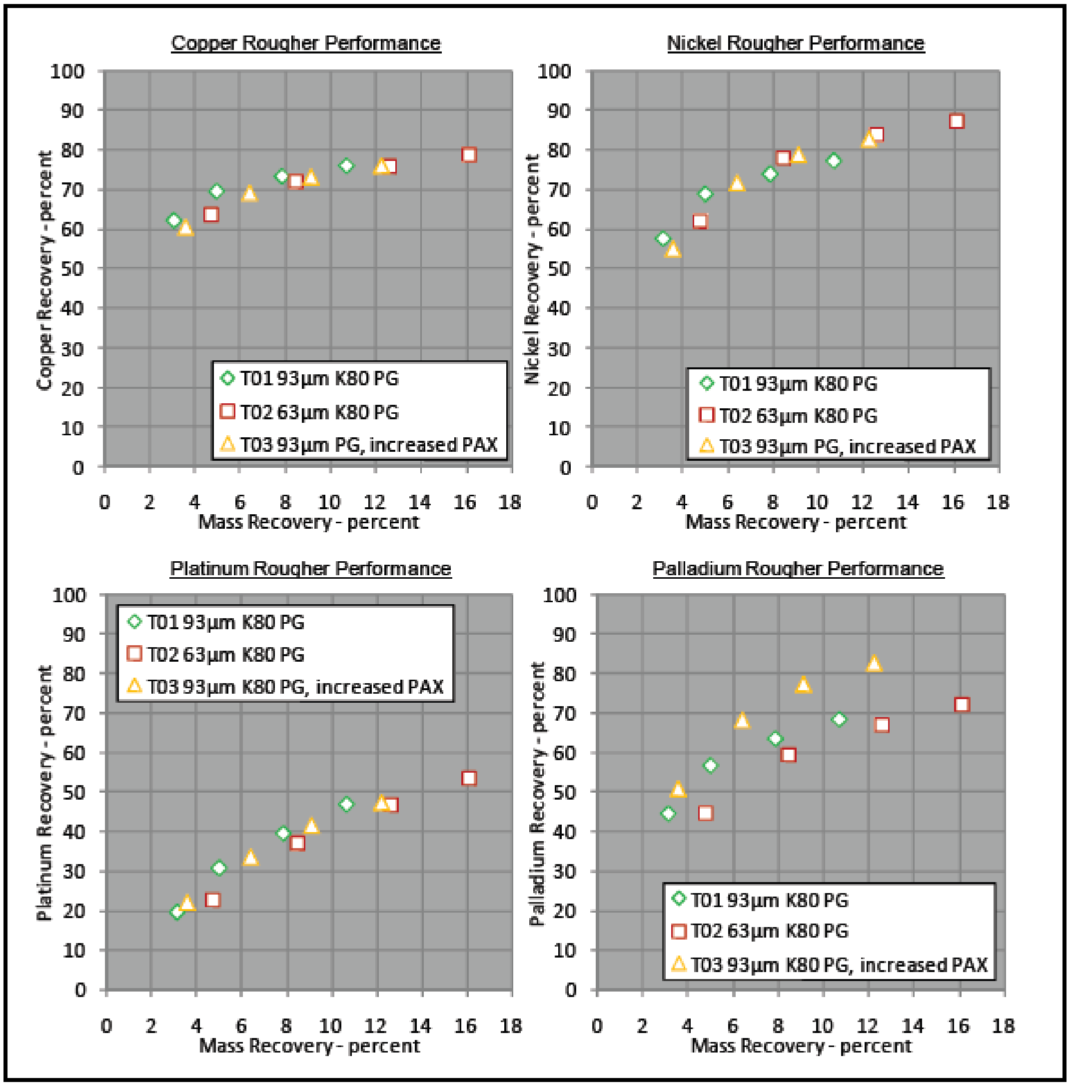
Note: Liberation data in %.

13.2.2 FLOTATION TEST WORK

The rougher and cleaner test work utilized potassium amyl xanthate (PAX) as the flotation collector and methyl isobutyl carbonyl (MIBC) as the frother. Among the different variables investigated were: primary grind sizes, regrind after rougher flotation, higher collector dosages, and the use of a dispersant (Calgon – sodium hexametaphosphate).

The graphs in Figure 13.1 illustrate the rougher flotation performance for nickel, copper, platinum, and palladium. From the results of the three rougher tests it can be seen that the reduction in grind size from 93 to 63 µm has little effect on the recovery of nickel, copper, platinum, and palladium. An increase in the PAX dosage also had little effect on the nickel, copper, and platinum recoveries, but it did appear to have a larger effect on the palladium recovery.

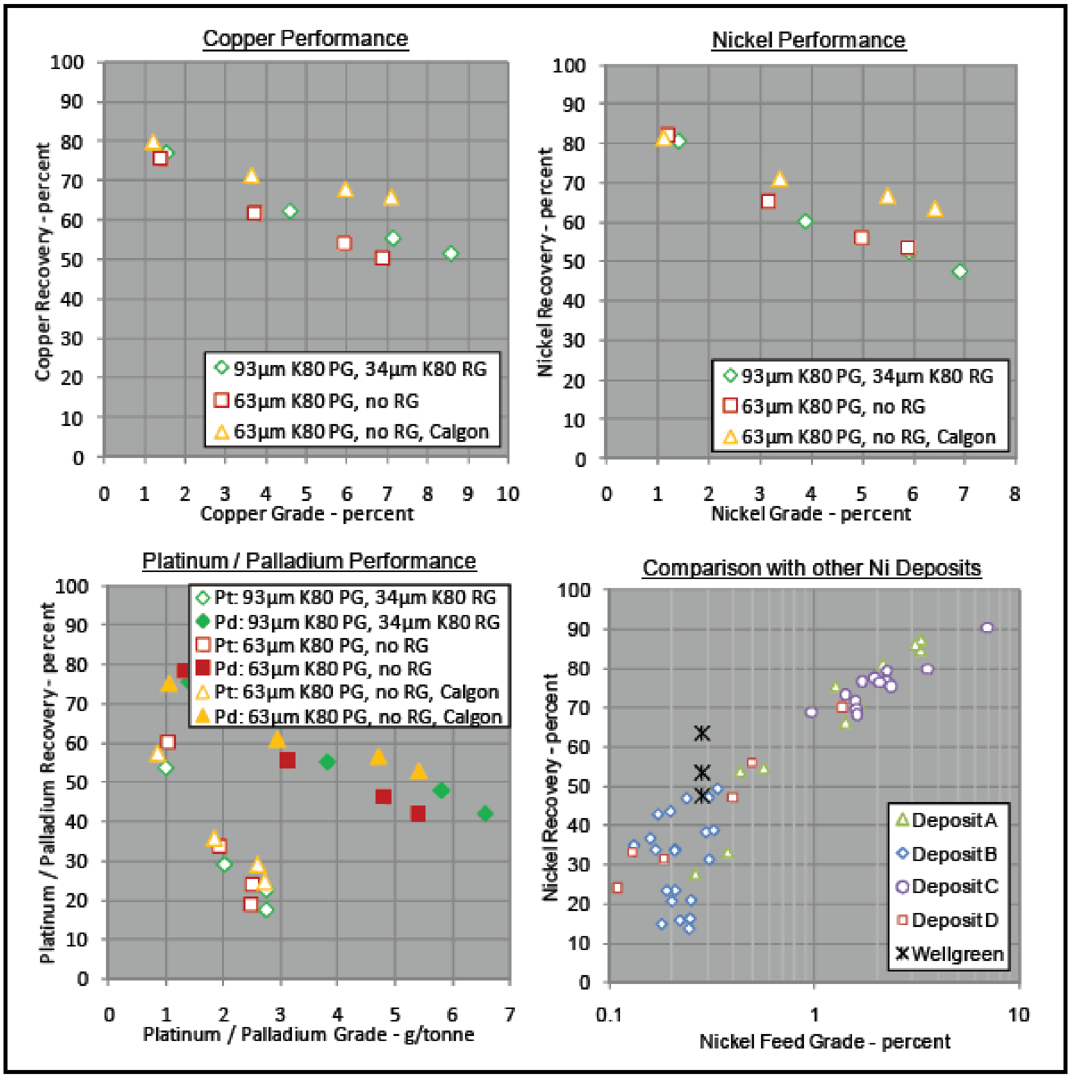
Figure 13.1 Rougher Test Performance Graphs (G&T – 2011)



The graphs in Figure 13.2 illustrate the cleaner flotation performance. From the results of these three tests it can be seen that the regrind after the rougher stage (designated by "RG" in the figure) had little effect on the metal recoveries. The reduction in the primary grind size also had little effect. The use of Calgon (sodium hexametaphosphate) made a marked improvement in the metal recoveries. The recoveries increased an average of 10%. The graph entitled "Comparison with other

Ni Deposits" shows that the grades and recoveries from the Wellgreen samples tested are about average as compared to the database of deposits available at G&T.

Figure 13.2 Cleaner Test Performance Graphs (G&T – 2011)



The concentrate from the final cleaner test was analyzed to determine the chemical constituents in the concentrate. The results of this analysis are presented in Table 13.7. The gold concentration is fairly high at 3.09 g/t. This could make the concentrate more attractive for sale, or create more pay metals if the metal were to be processed on site.

Table 13.7 Concentrate Quality (G&T – May 2011)

Element	Assay	Units	Test 6 Concentrate
Antimony	Sb	%	0.011
Arsenic	As	ppm	71
Bismuth	Bi	ppm	<20
Cadmium	Cd	ppm	18
Carbon	C	%	0.02
Cobalt	Co	ppm	4,034
Copper	Cu	%	7.10
Fluorine	F	ppm	82
Gold	Au	g/t	3.09
Iron	Fe	%	27.6
Lead	Pb	ppm	156
Mercury	Hg	ppm	<1
Molybdenum	Mo	%	0.005
Nickel	Ni	%*	6.40
Palladium	Pd	g/t	5.40
Platinum	Pt	g/t	2.72
Selenium	Se	ppm	73
Sulphur	S	%	21.3
Silver	Ag	g/t	11.6
Zinc	Zn	ppm	890
Aluminum Oxide	Al_2O_3	%	0.98
Calcium Oxide	CaO	%	1.06
Magnesium Oxide	MgO	%	10.9
Manganese Oxide	MnO	%	0.089
Phosphorus Pentoxide	P_2O_3	%	0.048
Silica	SiO_2	%	15.0

Note: *Table in G&T report incorrectly listed the units as g/t.

The magnesium oxide is present in the concentrate at a high level of 10.9%. This level of magnesium oxide could lead to smelter penalties if the concentrate were to be sold or toll smelted. The concentrate will need to be analyzed thoroughly in future test work, to determine if this is a consistent problem and if so, what minerals comprise the magnesium oxide. A strategy can then be created to reduce the levels of magnesium oxide in the concentrate.

13.3 SGS VANCOUVER – JUNE 2012

A new test program was started at SGS in October 2011. The sample was delivered to SGS by Prophecy Platinum. Tetra Tech did not supervise any of the test work involved in the program. The results from the final report from SGS were used for the predicted bulk concentrate grades and recoveries. The report is provided in Appendix C.

13.3.1 LOCKED CYCLE TEST WORK

Several batch tests were completed to develop the parameters for the locked cycle tests (LCTs). Table 13.8 summarizes the LCTs performed in the SGS study.

A calculated head feed grade of 0.45% nickel, 0.35% copper, 0.42 g/t platinum, and 0.46 g/t palladium was tested. Conventional flotation conditions were used to produce a concentrate with emphasis on base metal recoveries from locked cycle testing (LCT-1 to LCT-3).

While this preliminary phase focused on metal recovery from Wellgreen's mineralization of typical representative grade, an additional test (LCT-4) was conducted using material with a higher calculated head feed grade of 0.83% nickel, 0.55% copper, 0.57 g/t platinum, 0.57 g/t palladium, and 0.08 g/t gold.

Table 13.8 SGS – LCT Concentrate Grades and Recoveries

	Concentrate Grade						Concentrate Recovery					
	Ni (%)	Cu (%)	Co (%)	Pt (g/t)	Pd (g/t)	Au (g/t)	Ni (%)	Cu (%)	Co (%)	Pt (%)	Pd (%)	Au (%)
LCT-1	8.9	8.9	0.5	3.1	7.8	0.6	63.3	86.9	60.3	24.6	62.1	48.1
LCT-2	7.1	7.0	N/A	2.4	6.8	0.5	63.4	84.9	N/A	26.4	64.4	62.9
LCT-3	5.7	6.0	N/A	3.6	6.2	0.5	67.6	87.8	N/A	46.0	72.9	58.9
LCT-4	8.2	6.5	N/A	2.9	5.6	0.6	72.9	88.0	N/A	37.7	72.6	62.2

LCT-1 was an LCT which featured separate copper and nickel concentrates to try and achieve the maximum recovery of each metal. This is preliminary work carried out with respect to creating separate copper and nickel concentrates. More work should be carried out in the future to determine the PGE recoveries for each concentrate.

LCT-2 was a bulk concentrate LCT. LCT-3 was a repeat of LCT-1 but the concentrates were not split out. LCT-4 was a split concentrate LCT run on a higher nickel grade composite. LCT-3 was chosen as the most representative test and has been used for the design and predicted concentrate grades and recoveries in this study. There were no cobalt analyses for this test so the cobalt recovery was estimated by interpolation to be 64.4%. The estimated final grades and recoveries based on LCT-3 are shown in Table 13.9.

Table 13.9 Final Concentrate Grades and Recoveries for Design

	Concentrate Grade						Concentrate Recovery					
	Ni (%)	Cu (%)	Co (%)	Pt (g/t)	Pd (g/t)	Au (g/t)	Ni (%)	Cu (%)	Co (%)	Pt (%)	Pd (%)	Au (%)
LCT-3	5.7	6.0	0.24*	3.6	6.2	0.5	67.6	87.8	64.4	46.0	72.9	58.9

Note: *Inferred cobalt concentrate grade based on reported geological data and interpolated metallurgical recovery data.

14.0 MINERAL RESOURCE ESTIMATES

14.1 CURRENT RESOURCE

14.1.1 DATABASE

Prophecy Platinum maintains all borehole data in spreadsheet. Header, survey, assays, and lithology tables are saved on individual tabs in the spreadsheet. The Microsoft Excel™ spreadsheet provided to Tetra Tech was created on February 17, 2011.

The database contains 702 boreholes, of which 183 were drilled from surface and 519 drilling from various underground workings. There are a total of 13,532 assay records in the database. Table 14.1 summarizes the borehole database.

The resource estimation was conducted using Datamine™ Studio 3 (v. 3.19.3638.0) software.

Table 14.1 Drill Data Set

	No. of Holes		
	Surface	**Underground**	**Total**
West Zone	70	3	73
East Zone	80	516	596
Total	**183**	**519**	**702**

14.1.2 SPECIFIC GRAVITY

There is currently no SG data available on the project.

Tetra Tech used an SG of 3.22 for the resource estimate, which is the same number used in the previous estimate. An SG of 3.22 is within the accepted range of a peridotite which typically has an SG value between 3.2 and 3.4.

Tetra Tech recommends that Prophecy Platinum collect SG measurements from the various rock types and grade distributions in order to build up the data set. At a minimum, 2% of the data set should have SG measurements.

14.1.3 EXPLORATORY DATA ANALYSIS

ASSAYS

The portion of the deposit included in the mineral resource was sampled by a total of 16,498 nickel assays. A lesser numbers of assays were collected from copper, cobalt, platinum, palladium and gold. Table 14.2 summarizes the basic statistics for the assays at Wellgreen as a whole and for the East and West Zones individually.

Table 14.2 Borehole Assay Stats

Zone	Field	N Samples	Minimum	Maximum	Mean	Standard Deviation
Wellgreen	Length	27,682	0.00	339.83	1.91	6.19
	Pt	11,421	0.00	54.85	0.65	1.56
	Pd	11,335	0.00	91.53	0.55	1.94
	Au	7,687	0.00	25.71	0.15	0.70
	Ni	16,498	0.00	14.00	0.59	0.96
	Cu	16,109	0.00	16.29	0.53	0.90
	Co	11,720	0.00	2.59	0.02	0.05
West	Length	3,687	0.00	30.32	1.44	1.63
	Pt	2,267	0.00	13.71	0.49	0.76
	Pd	2,202	0.00	3.91	0.30	0.33
	Au	1,502	0.00	25.71	0.15	0.75
	Ni	3,070	0.00	3.50	0.29	0.34
	Cu	3,010	0.00	5.10	0.34	0.42
	Co	1,841	0.00	0.70	0.02	0.02
East	Length	14,630	0.00	74.88	1.18	1.88
	Pt	8,161	0.00	54.85	0.45	0.89
	Pd	8,168	0.00	91.53	0.37	0.85
	Au	5,521	0.00	20.91	0.08	0.34
	Ni	12,041	0.00	14.00	0.44	0.75
	Cu	11,756	0.00	16.29	0.37	0.63
	Co	8,961	0.00	2.59	0.02	0.04

GRADE CAPPING

Raw assay data for each zone was examined individually to assess the amount of metal that is at risk from high grade assays. The Datamine™ Decile function was used to determine if grade capping was required on any of the elements in either the West or East Zones. Tetra Tech elected to apply a top cut to the grades that exceeded 40% metal content in the ninetieth (90th) decile.

Table 14.3 summarizes the grade capping that was applied to the various elements on the both the West and East Zones.

Table 14.3 Grade Capping

Zone	Element	No. of Sample	No. of Samples Capped	Grade Range Capped	Capping Value	Capped (%)
WZ	Au	1,502	8	2.4 - 25.71	2.29	0.5
EZ	Pt	8,161	87	5.83 - 54.85	5.72	1.1
EZ	Pd	8,168	87	5.14 - 91.53	5.14	1.1
EZ	Au	5,521	39	2.40 - 15.08	2.05	0.7
EZ	Cu	11,756	136	4.15 - 16.29	4.14	1.2

Table 14.4 summarizes the statistics of the borehole data after grade capping was completed. The table indicates that although capping has been applied to selected elements, the resulting change to the mean grade is not significant.

Table 14.4 Borehole Capped Grade Statistics

Zone	Field	N Samples	Minimum	Maximum	Mean	Standard Deviation
West	Length	3,687	0.000	30.32	1.436	1.633
	Pt	2,267	0.000	13.71	0.423	0.559
	Pd	2,202	0.000	3.91	0.277	0.257
	Au	1,502	0.000	25.71	0.122	0.450
	Aucap	1,502	0.000	2.29	0.111	0.175
	Ni	3,070	0.000	3.50	0.246	0.247
	Cu	3,010	0.000	5.10	0.272	0.330
	Co	1,841	0.000	0.70	0.017	0.014
East	Length	14,630	0.000	74.88	1.182	1.876
	Pt	8,161	0.000	54.85	0.453	0.891
	Ptcap	8,161	0.000	5.72	0.441	0.652
	Pd	8,168	0.000	91.53	0.371	0.846
	Pdcap	8,168	0.000	5.14	0.359	0.505
	Au	5,521	0.000	20.91	0.085	0.341
	Aucap	5,521	0.000	2.05	0.078	0.180
	Ni	12,041	0.000	14.00	0.444	0.750
	Cu	11,756	0.000	16.29	0.373	0.633
	Cucap	11,756	0.000	4.14	0.367	0.564
	Co	8,961	0.000	2.59	0.018	0.035

COMPOSITING

Compositing of all the assay data was completed on 2.5 m downhole intervals honouring the interpretation of the geological solids. A 2.5 m composite was selected because it corresponds to approximately a third of the cell size to be used in the modelling process.

The backstitching process was used in the compositing routine to ensure all captured sample material was included. The backstitching routine adjusts the composite lengths for each individual borehole in order to compensate for the last sample interval. Composites were completed separately for the West Zone and East Zone. Table 14.5 summarizes the statistics for the boreholes after capping and compositing.

Table 14.5 Borehole Capped and Composited Statistics

Zone	Field	N Samples	Minimum	Maximum	Mean	Standard Deviation
West	Length	2,118	1.520	3.716	2.497	0.055
	Pt	1,514	0.000	7.343	0.471	0.488
	Pd	1,452	0.000	2.906	0.317	0.223
	Au	876	0.001	25.710	0.160	0.931
	Aucap	876	0.001	2.290	0.122	0.199
	Ni	1,955	0.000	3.192	0.254	0.235
	Cu	1,943	0.000	3.605	0.277	0.316
	Co	1,011	0.001	0.160	0.018	0.015
East	Length	6,917	1.250	3.660	2.493	0.121
	Pt	4,813	0.000	34.280	0.557	1.020
	Ptcap	4,813	0.000	5.723	0.530	0.716
	Pd	4,831	0.000	69.454	0.453	1.196
	Pdcap	4,831	0.000	5.136	0.425	0.543
	Au	3,213	0.001	16.454	0.146	0.612
	Aucap	3,213	0.001	2.054	0.119	0.260
	Ni	6,141	0.001	7.216	0.484	0.727
	Cu	5,994	0.001	9.186	0.409	0.607
	Cucap	5,994	0.001	4.139	0.400	0.553
	Co	3,662	0.000	0.515	0.024	0.033

14.1.4 GEOLOGICAL INTERPRETATION

Three-dimensional wireframe models of mineralization were developed for the West and East Zones based on a nickel equivalent grade of greater than 0.2%.

The NiEq value was assigned to all sample intervals to assist with the geological interpretation of the mineralization of both the West and East Zones. The NiEq value is based on a long range pricing index updated quarterly. At the time the resource models were completed, the following commodity prices were used:

- nickel – US$9.40/lb
- copper – US$2.96/lb
- cobalt – US$15.80/lb
- gold – US$1,200/ troy oz
- platinum – US$1938/ troy oz
- palladium – US$816 troy oz

The equation for the NiEq value is as follows:

NiEq = ((Ni grade x Ni price x 22.04622) + (Cu grade x Cu price x 22.04622) + (Co grade x Co price x 22.04622) + (Au grade x Au price x 0.02916) + (Pt grade x Pt price x 0.02916) + (Pd grade x Pd price x 0.02916)) / (Ni price x 22.04622)

Recovery has been assumed to be 100% in situ on all metals, as there has been no metallurgical recovery testing completed on the targeted material at the time the resource model was constructed.

Sectional interpretations were digitized in Datamine™ Studio 3 (v. 3.19.3638.0) software, and these interpretations were linked with tag strings and triangulated to build three dimensional solids. Table 14.6 tabulates the solids and associated volumes. The solids were validated in Datamine™ and no errors were found.

The zones of mineralization interpreted for each area were generally contiguous. However, due to the nature of the mineralization, there are portions of the wireframe that have grades less than 0.2% but are still within the mineralizing trend.

The non-assayed intervals were assigned void (-) value. Tetra Tech believes that non-assayed material should not be assigned a zero value, as this does not reflect the true value of the material.

Table 14.6 Wellgreen Wireframe Summary

	Wireframe Dimensions						
Zone	Minimum X	Maximum X	Minimum Y	Maximum Y	Minimum Z	Maximum Z	Volume (m^3)
West	1375	2625	15288	15692	1160	1736	21,905,348
East	2650	4050	14848	15590	639	1695	176,469,035

14.1.5 SPATIAL ANALYSIS

Variography, using Datamine™ Studio 3 (v.3.19.3638.0) software, was completed for nickel, copper, cobalt, gold, platinum and palladium individually for each zone. Downhole variograms were used to determine nugget effect and then correlograms were modelled to determine spatial continuity in the zones.

Table 14.7 summarizes results of the variography.

Table 14.7 Wellgreen Variogram Summary

Zone	VDESC	VREFNUM	VANGLE1	VANGLE2	VANGLE3	VAXIS1	VAXIS2	VAXIS3	NUGGET	ST1	ST1PAR1	ST1PAR2	ST1PAR3	ST1PAR4	ST2	ST2PAR1	ST2PAR2	ST2PAR3	ST2PAR4
East	ez ni	1	0	0	0	3	2	1	0.12	1	10	61	6	0.033	1	22	103	22	0.847
	ez cu	2	-72	70	45	3	2	1	0.14	1	30	29	21	0.493	1	85	61	67	0.367
	ez co	1	18	0	65	3	2	1	0.10	1	33	72	30	0.037	1	50	149	59	0.863
	ez au	4	-72	70	45	3	2	1	0.20	1	20	25	41	0.160	1	81	60	60	0.640
	ez pt	5	-72	70	45	3	2	1	0.18	1	11	25	11	0.338	1	65	35	30	0.482
	ez pd	6	-72	70	135	3	2	1	0.20	1	12	22	21	0.411	1	72	40	52	0.389
West	wz_ni	1	0	0	0	3	2	1	0.30	1	75	22	41	0.221	1	161	40	61	0.479
	WZ Cu	2	0	-90	135	3	2	1	0.10	1	41	40	22	0.304	1	180	60	40	0.596
	Wz Co	3	0	-90	135	3	2	1	0.05	1	48	60	84	0.093	1	158	105	101	0.857
	WZ au	4	0	-90	135	3	2	1	0.01	1	14	66	26	0.905	1	80	81	48	0.085
	WZ Pt	5	0	0	225	3	2	1	0.32	1	64	22	22	0.437	1	95	57	35	0.243
	WZ Pd	6	0	-90	135	3	2	1	0.05	1	7	31	13	0.372	1	81	60	24	0.578

14.1.6 RESOURCE BLOCK MODEL

Individual block models were established in Datamine™ for both zones using one parent model as the origin; the model was not rotated.

Drillhole spacing varies, though the majority of the surface drilling is spaced at 50 to 100 m sections. The underground drilling on the East Zone is spaced at 15 to 20 m, but only targeted the mineralization along the footwall. A block size of 20 m x 10 m x 20 m was selected in order to accommodate the nature of the mineralization and the open pit potential.

Sub-celling of the block model on a 1 x 1 x 1 pattern allows the parent block to be split once in each direction to fill the volume of the wireframes more accurately, and thus estimate the tonnage in the resource more accurately.

Table 14.8 summarizes details of the parent block model.

Table 14.8 Parent Block Model

Origin			Cell Size			Number of Cells		
X Origin	Y Origin	Z Origin	XINC	YINC	ZINC	NX	NY	NZ
1000	14500	300	20	10	20	165	150	85

The interpolations of the two zones were completed using the estimation methods: NN, inverse distance squared (ID^2) and OK. The estimations were designed for three passes. A minimum and maximum number of samples were required in each pass, as well as a maximum number of samples from a borehole in order to satisfy the estimation criteria. Table 14.9 and Table 14.10 summarizes the interpolation criteria for the two zones.

Table 14.9 Estimation Criteria

Zone	Edesc	EREFNUM	VALUE_IN	VALUE_OU	NUMSAM_F	SVOL_F	SREFNUM	IMETHOD	POWER	VREFNUM
East Zone	EstimaParam1	1	Ni	NiNN	-	-	1	1	-	-
	EstimaParam2	2	Cucap	CuNN	-	-	2	1	-	-
	EstimaParam3	3	Co	CoNN	-	-	3	1	-	-
	EstimaParam4	4	Aucap	AuNN	-	-	4	1	-	-
	EstimaParam5	5	Ptcap	PtNN	-	-	5	1	-	-
	EstimaParam6	6	Pdcap	PdNN	-	-	6	1	-	-
	EstimaParam7	7	Ni	NiID	-	-	1	2	2	-
	EstimaParam8	8	Cucap	CuID	-	-	2	2	2	-
	EstimaParam9	9	Co	CoID	-	-	3	2	2	-
	EstimaParam10	10	Aucap	AuID	-	-	4	2	2	-
	EstimaParam11	11	Ptcap	PtID	-	-	5	2	2	-
	EstimaParam12	12	Pdcap	PdID	-	-	6	2	2	-
	EstimaParam13	13	Ni	NiOK	NUMSAM	SVOL	1	3	-	1
	EstimaParam14	14	Cucap	CuOK	-	-	2	3	-	2
	EstimaParam15	15	Co	CoOK	-	-	3	3	-	3
	EstimaParam16	16	Aucap	AuOK	-	-	4	3	-	4
	EstimaParam17	17	Ptcap	PtOK	-	-	5	3	-	5
	EstimaParam18	18	Pdcap	PdOK	-	-	6	3	-	6

table continues…

Zone	Edesc	EREFNUM	VALUE_IN	VALUE_OU	NUMSAM_F	SVOL_F	SREFNUM	IMETHOD	POWER	VREFNUM
West Zone	EstimaParam1	1	Ni	NiNN	-	-	1	1	-	-
	EstimaParam2	2	Cucap	CuNN	-	-	2	1	-	-
	EstimaParam3	3	Co	CoNN	-	-	3	1	-	-
	EstimaParam4	4	Aucap	AuNN	-	-	4	1	-	-
	EstimaParam5	5	Ptcap	PtNN	-	-	5	1	-	-
	EstimaParam6	6	Pdcap	PdNN	-	-	6	1	-	-
	EstimaParam7	7	Ni	NiID	-	-	1	2	2	-
	EstimaParam8	8	Cucap	CuID	-	-	2	2	2	-
	EstimaParam9	9	Co	CoID	-	-	3	2	2	-
	EstimaParam10	10	Aucap	AuID	-	-	4	2	2	-
	EstimaParam11	11	Ptcap	PtID	-	-	5	2	2	-
	EstimaParam12	12	Pdcap	PdID	-	-	6	2	2	-
	EstimaParam13	13	Ni	NiOK	NUMSAM	SVOL	1	3	-	1
	EstimaParam14	14	Cucap	CuOK	-	-	2	3	-	2
	EstimaParam15	15	Co	CoOK	-	-	3	3	-	3
	EstimaParam16	16	Aucap	AuOK	-	-	4	3	-	4
	EstimaParam17	17	Ptcap	PtOK	-	-	5	3	-	5
	EstimaParam18	18	Pdcap	PdOK	-	-	6	3	-	6

Table 14.10 Search Parameters

Zone	SREFNUM	SMETHOD	SDIST1	SDIST2	SDIST3	SANGLE1	SAXIS1	SANGLE2	SAXIS2	SANGLE3	SAXIS3
East	1	2	100	20	20	18	3	-70	1	0	2
	2	2	85	60	60	18	3	-70	1	0	2
	3	2	150	50	60	18	3	-70	1	0	2
	4	2	80	60	60	18	3	-70	1	0	2
	5	2	60	30	35	18	3	-70	1	0	2
	6	2	70	40	50	18	3	-70	1	0	2
	SVOLFAC1	**MINNUM1**	**MAXNUM1**	**SVOLFAC2**	**MINNUM2**	**MAXNUM2**	**SVOLFAC3**	**MINNUM3**	**MAXNUM3**		
	1	8	15	2	5	15	4	2	10		
	OCTMETH	**MINOCT**	**MINPEROC**	**MAXPEROC**	**MAXKEY**						
	1	2	1	4	4						
Zone	**SREFNUM**	**SMETHOD**	**SDIST1**	**SDIST2**	**SDIST3**	**SANGLE1**	**SAXIS1**	**SANGLE2**	**SAXIS2**	**SANGLE3**	**SAXIS3**
West	1	2	160	40	60	-22	3	90	1	0	2
	2	2	180	60	40	-22	3	90	1	0	2
	3	2	160	100	100	-22	3	90	1	0	2
	4	2	80	80	50	-22	3	90	1	0	2
	5	2	100	60	40	-22	3	90	1	0	2
	6	2	80	60	25	-22	3	90	1	0	2
	SVOLFAC1	**MINNUM1**	**MAXNUM1**	**SVOLFAC2**	**MINNUM2**	**MAXNUM2**	**SVOLFAC3**	**MINNUM3**	**MAXNUM3**		
	1	8	15	2	5	15	5	2	10		
	OCTMETH	**MINOCT**	**MINPEROC**	**MAXPEROC**	**MAXKEY**						
	1	2	1	4	4						

14.1.7 RESOURCE CLASSIFICATION

Several factors are considered in the definition of a resource classification:

- NI 43-101 requirements
- Canadian Institute of Mining, Metallurgy and Petroleum (CIM) guidelines
- authors' experience with magmatic sulphide deposits
- spatial continuity based on variography of the assays within the drillholes
- the proportion of PGM assays to nickel and copper assays.

No environmental, permitting, legal, title, taxation, socio-economic, marketing or other relevant issues are known to Tetra Tech that may affect the estimate of mineral resources. Mineral reserves can only be estimated on the basis of an economic evaluation that is used in a preliminary feasibility study or a feasibility study of a mineral project; thus, no reserves have been estimated. As per NI 43-101, mineral resources, which are not mineral reserves, do not have to demonstrate economic viability.

14.1.8 MINERAL RESOURCE TABULATION

The resource reported as of July 2011 has been tabulated in terms of a nickel equivalent cut-off grade. The mineral resources for the pit shell at Wellgreen are tabulated in Table 14.11 to Table 14.12 for the Indicated and Inferred Resources respectively. The resources are tabulated using various cut-off grades up to an upper bound of greater than 1.0% NiEq.

Table 14.11 Wellgreen Pitshell Indicated Resource Cut-off Table

NiEq Cut-off	Tonnes	NiEq (%)	Ni (%)	Cu (%)	Co (%)	Pt (g/t)	Pd (g/t)	Au (g/t)
0.10	14,423,900	1.40	0.68	0.62	0.05	0.99	0.73	0.51
0.15	14,423,900	1.40	0.68	0.62	0.05	0.99	0.73	0.51
0.20	**14,423,900**	**1.40**	**0.68**	**0.62**	**0.05**	**0.99**	**0.73**	**0.51**
0.25	14,423,900	1.40	0.68	0.62	0.05	0.99	0.73	0.51
0.30	14,423,900	1.40	0.68	0.62	0.05	0.99	0.73	0.51
0.35	14,411,000	1.40	0.68	0.62	0.05	0.99	0.73	0.51
0.40	14,333,700	1.41	0.69	0.62	0.05	0.99	0.74	0.52
0.45	14,136,700	1.42	0.69	0.62	0.05	1.00	0.74	0.52
0.50	13,816,100	1.44	0.70	0.63	0.05	1.02	0.75	0.53
0.55	13,405,200	1.47	0.72	0.65	0.05	1.04	0.76	0.54
0.60	12,941,300	1.50	0.73	0.66	0.05	1.07	0.77	0.55
0.65	12,494,000	1.54	0.75	0.68	0.05	1.09	0.79	0.56
0.70	11,988,800	1.57	0.77	0.70	0.06	1.11	0.80	0.57

table continues…

NiEq Cut-off	Tonnes	NiEq (%)	Ni (%)	Cu (%)	Co (%)	Pt (g/t)	Pd (g/t)	Au (g/t)
0.75	11,521,600	1.61	0.79	0.71	0.06	1.13	0.81	0.59
0.80	11,216,800	1.63	0.80	0.72	0.06	1.14	0.82	0.59
0.85	10,723,200	1.67	0.82	0.73	0.06	1.16	0.83	0.61
0.90	10,257,200	1.70	0.84	0.75	0.06	1.18	0.85	0.62
0.95	9,758,600	1.74	0.87	0.77	0.06	1.20	0.86	0.63
1.00	9,354,300	1.77	0.88	0.78	0.06	1.22	0.87	0.63

Table 14.12 Wellgreen Pitshell Inferred Resource Cut-off Table

NiEq Cut-off	Tonnes	NiEq (%)	Ni (%)	Cu (%)	Co (%)	Pt (g/t)	Pd (g/t)	Au (g/t)
0.10	460,021,000	0.58	0.30	0.24	0.02	0.38	0.32	0.16
0.15	455,884,000	0.59	0.31	0.24	0.02	0.38	0.33	0.16
0.20	**446,649,000**	**0.60**	**0.31**	**0.25**	**0.02**	**0.38**	**0.33**	**0.16**
0.25	403,731,000	0.64	0.33	0.27	0.02	0.42	0.35	0.17
0.30	370,872,000	0.67	0.34	0.29	0.02	0.44	0.37	0.18
0.35	333,963,000	0.71	0.36	0.31	0.03	0.48	0.39	0.20
0.40	288,238,000	0.76	0.38	0.34	0.03	0.52	0.42	0.22
0.45	234,697,000	0.83	0.41	0.39	0.03	0.58	0.46	0.26
0.50	185,150,000	0.93	0.45	0.45	0.03	0.65	0.50	0.30
0.55	149,012,000	1.03	0.49	0.50	0.04	0.71	0.55	0.34
0.60	126,413,000	1.11	0.53	0.55	0.04	0.77	0.58	0.37
0.65	111,177,000	1.18	0.57	0.58	0.04	0.81	0.61	0.39
0.70	98,831,000	1.24	0.60	0.61	0.05	0.85	0.63	0.41
0.75	88,376,000	1.30	0.63	0.64	0.05	0.88	0.66	0.42
0.80	79,943,000	1.35	0.66	0.67	0.05	0.90	0.67	0.44
0.85	71,935,000	1.41	0.70	0.70	0.05	0.93	0.68	0.45
0.90	65,726,000	1.46	0.73	0.72	0.05	0.95	0.70	0.46
0.95	59,875,000	1.52	0.77	0.75	0.05	0.97	0.71	0.47
1.00	54,408,000	1.57	0.80	0.77	0.06	0.99	0.72	0.48

The corresponding grade-tonnage curves for the Indicated and Inferred Resources within the pitshell are displayed in Figure 14.1 to Figure 14.4.

Figure 14.1 Wellgreen Nickel and Copper Indicated Resource Grade-tonnage Curve

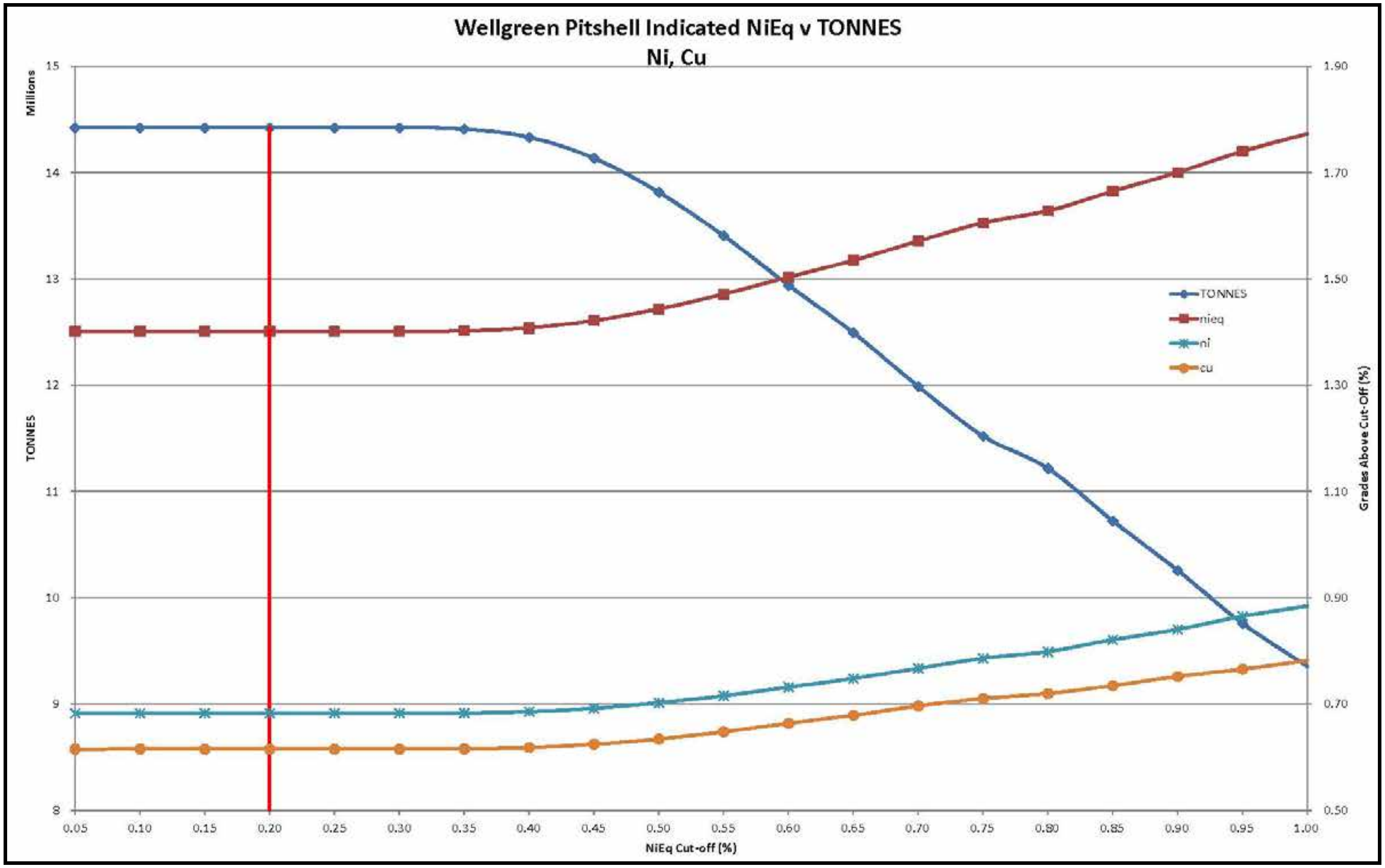


Figure 14.2 Wellgreen Platinum, Palladium and Gold Indicated Resource Grade-tonnage Curve

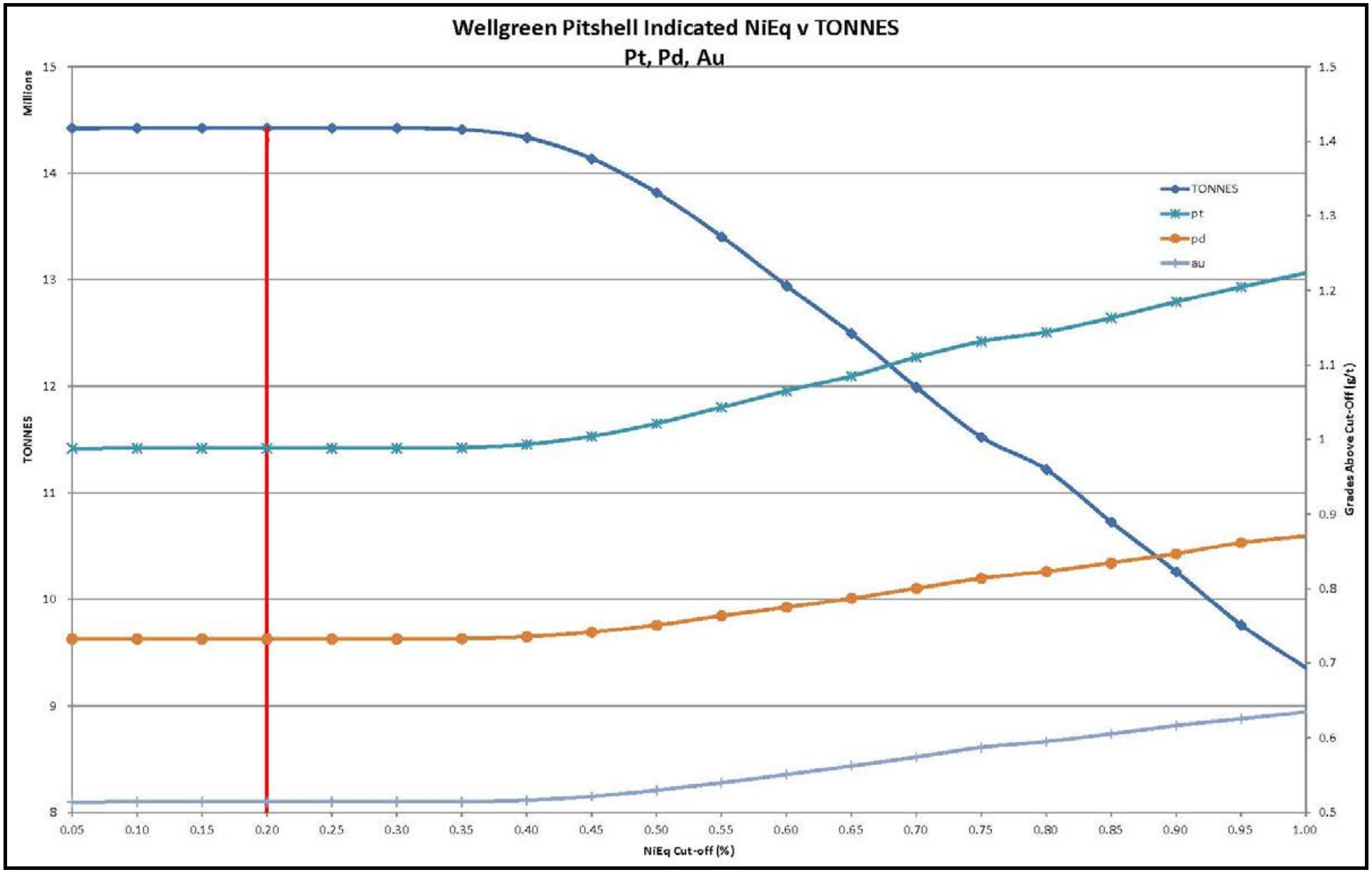


Figure 14.3 Wellgreen Nickel and Copper Inferred Resource Grade-tonnage Curve

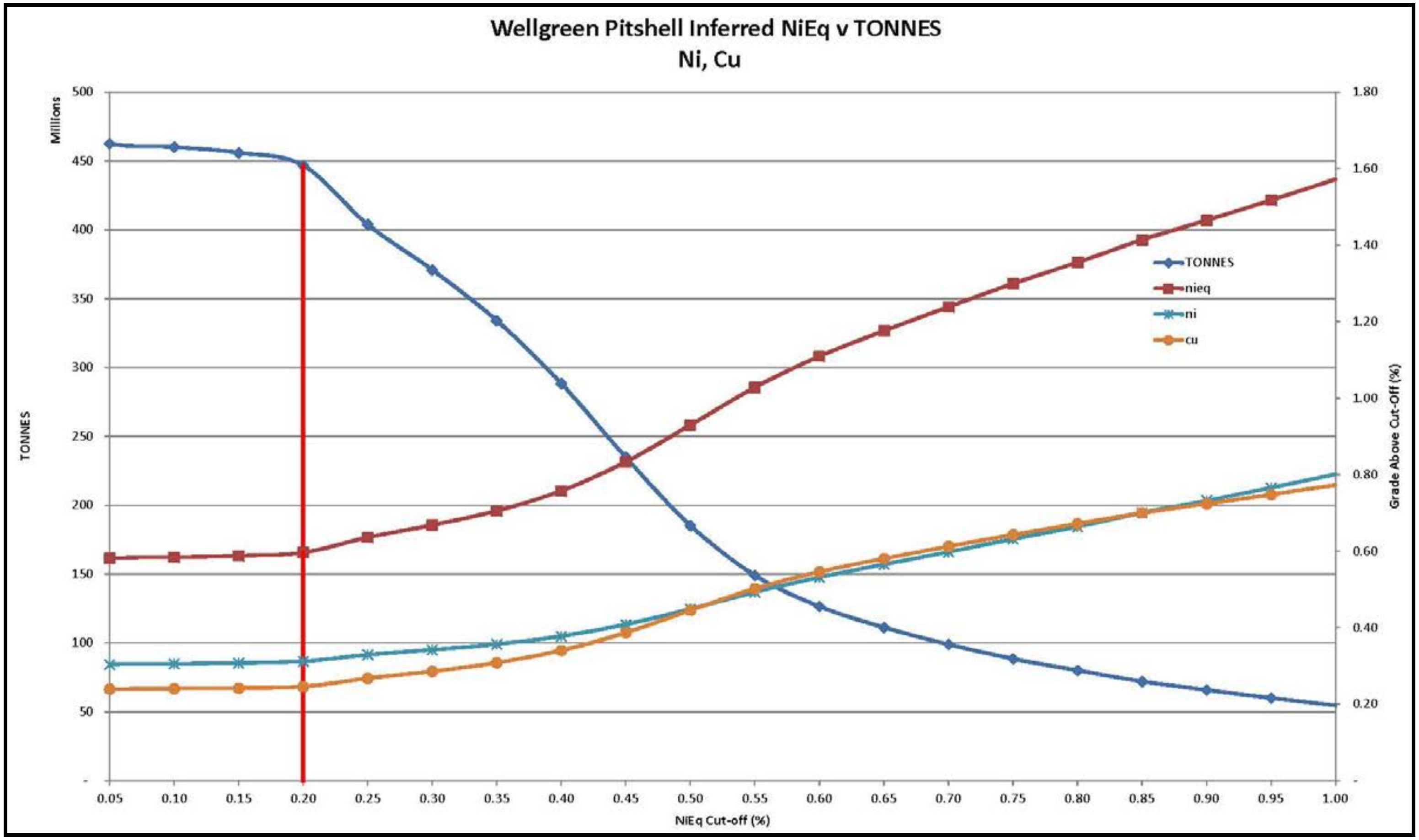
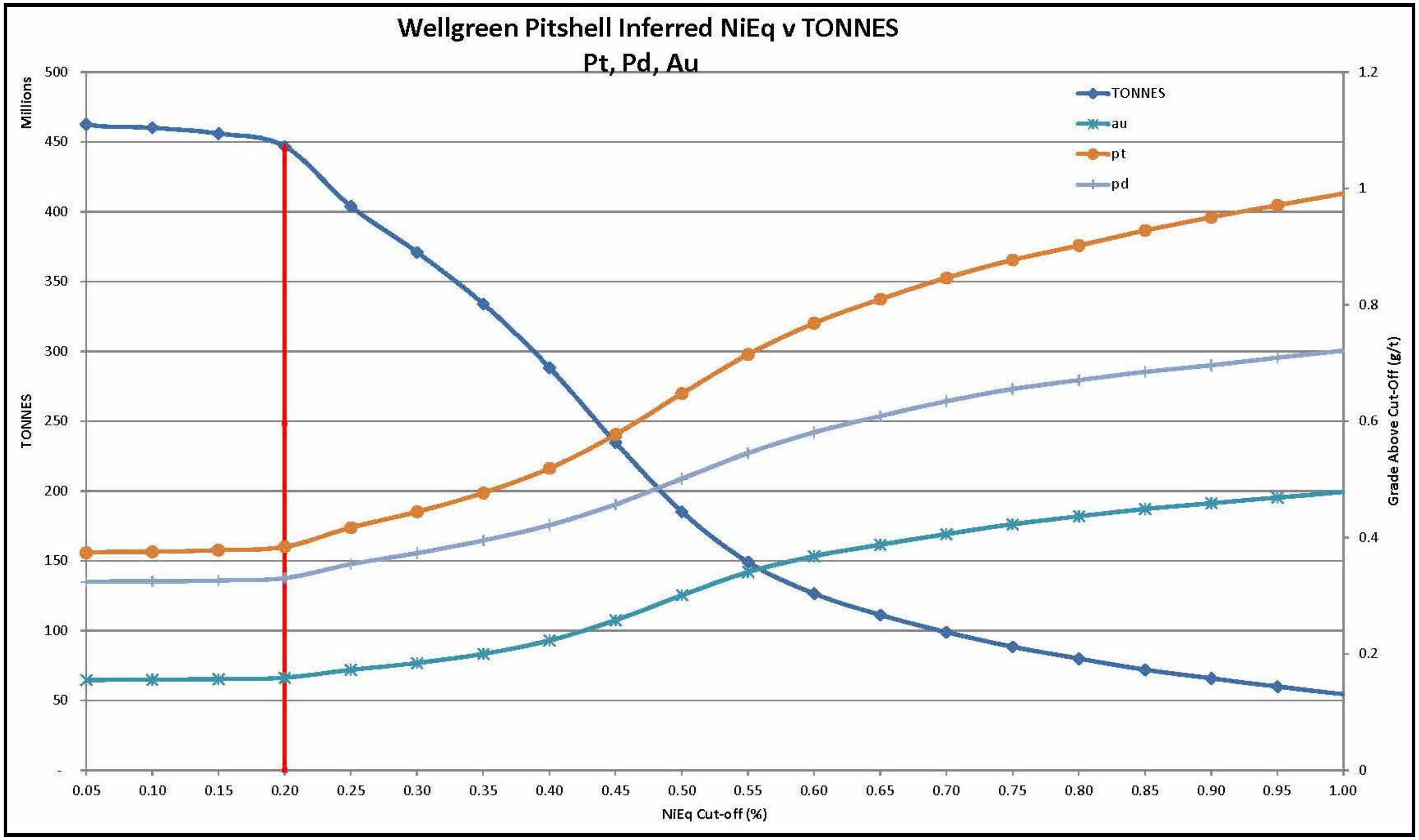


Figure 14.4 Wellgreen Platinum, Palladium and Gold Inferred Resource Grade-tonnage Curve



Based on the results of similar open pit nickel projects in Canada and the results of the engineering review of the Wellgreen deposit, a 0.2% NiEq cut-off was used to tabulate the total within the various categories. This is based on the following parameters:

- 2.5:1 stripping ratio
- operating cost of US$23.15/t at 32,000 t/d
- nickel of US$9.40/lb
- recovery of 67.9% nickel.

Table 14.13 summarizes the resource estimate at the 0.2% NiEq cut-off within the optimized pitshell.

Table 14.13 Wellgreen Resource Estimation

NiEq Cut-off	Category	Zone	Tonnes	NiEq%	Ni (%)	Cu (%)	Co (%)	Au (g/t)	Pt (g/t)	Pd (g/t)
0.2	Indicated	Pitshell	14,432,900	1.4	0.68	0.62	0.05	0.51	0.99	0.73
0.2	Inferred	Pitshell	446,649,000	0.6	0.31	0.25	0.02	0.16	0.38	0.33

Figure 14.5 displays the distribution of the resource classification of the blocks within the optimized open pit. The indicated material is concentrated in the footwall prtion of the mineral zone where the underground working and close spaced underground diamond drilling is located.

Figure 14.5 Wellgreen Pit Resource Classification Distribution (Oblique View Not to Scale)

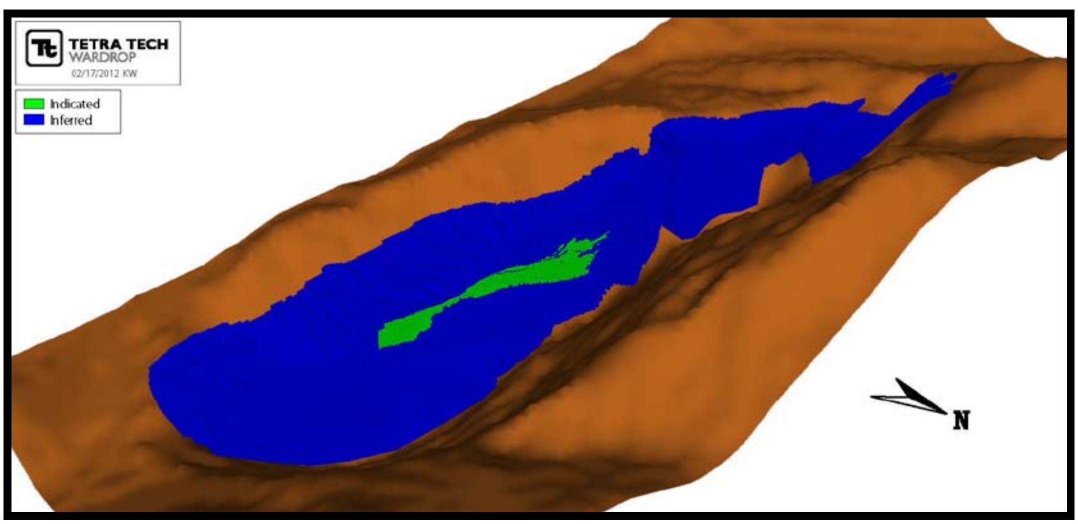


Figure 14.6 and Figure 14.7 display the NiEq grade distributions within the optimized open pit.

Figure 14.6 Wellgreen Pit Resource at 0.25% NiEq Cut-off (Oblique View Not to Scale)

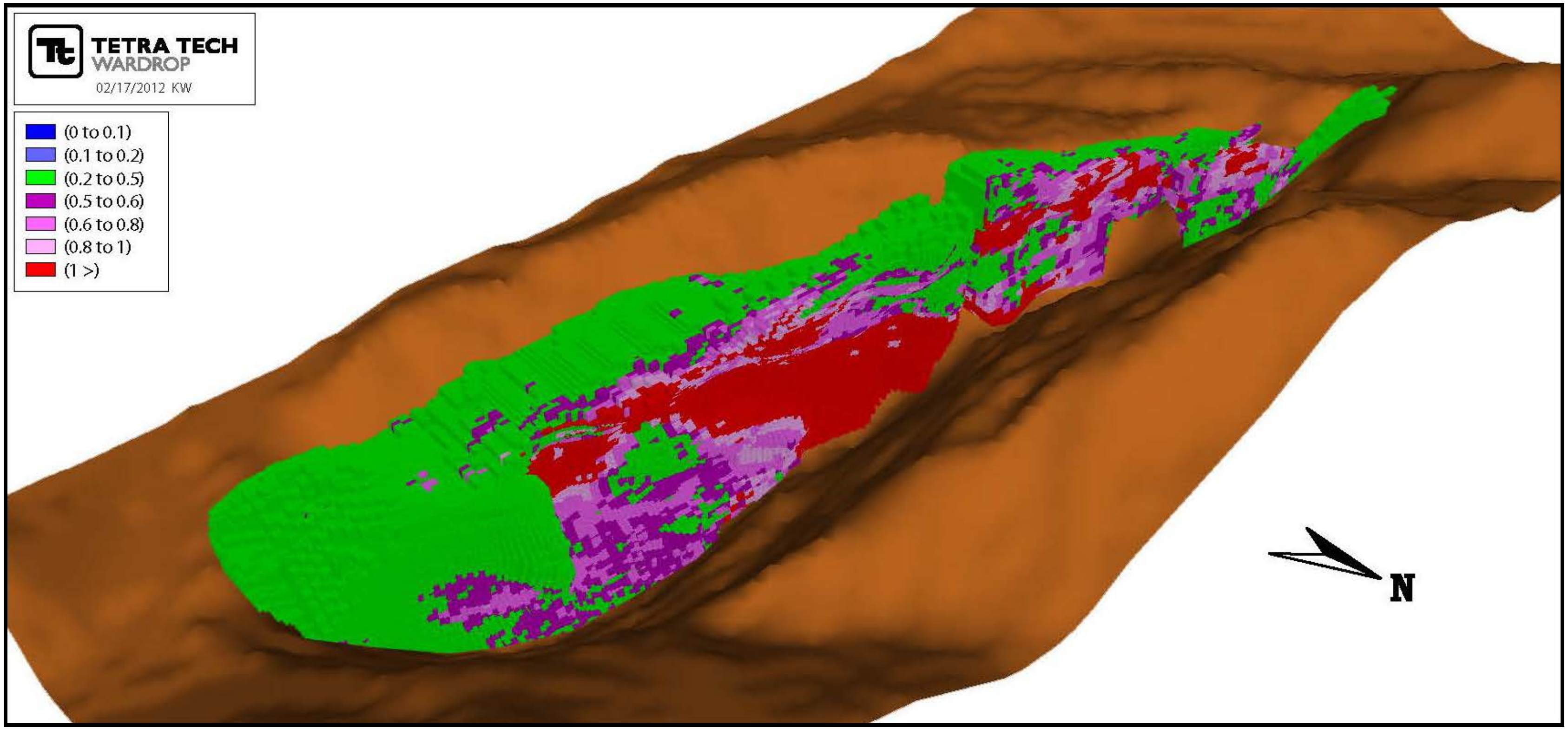
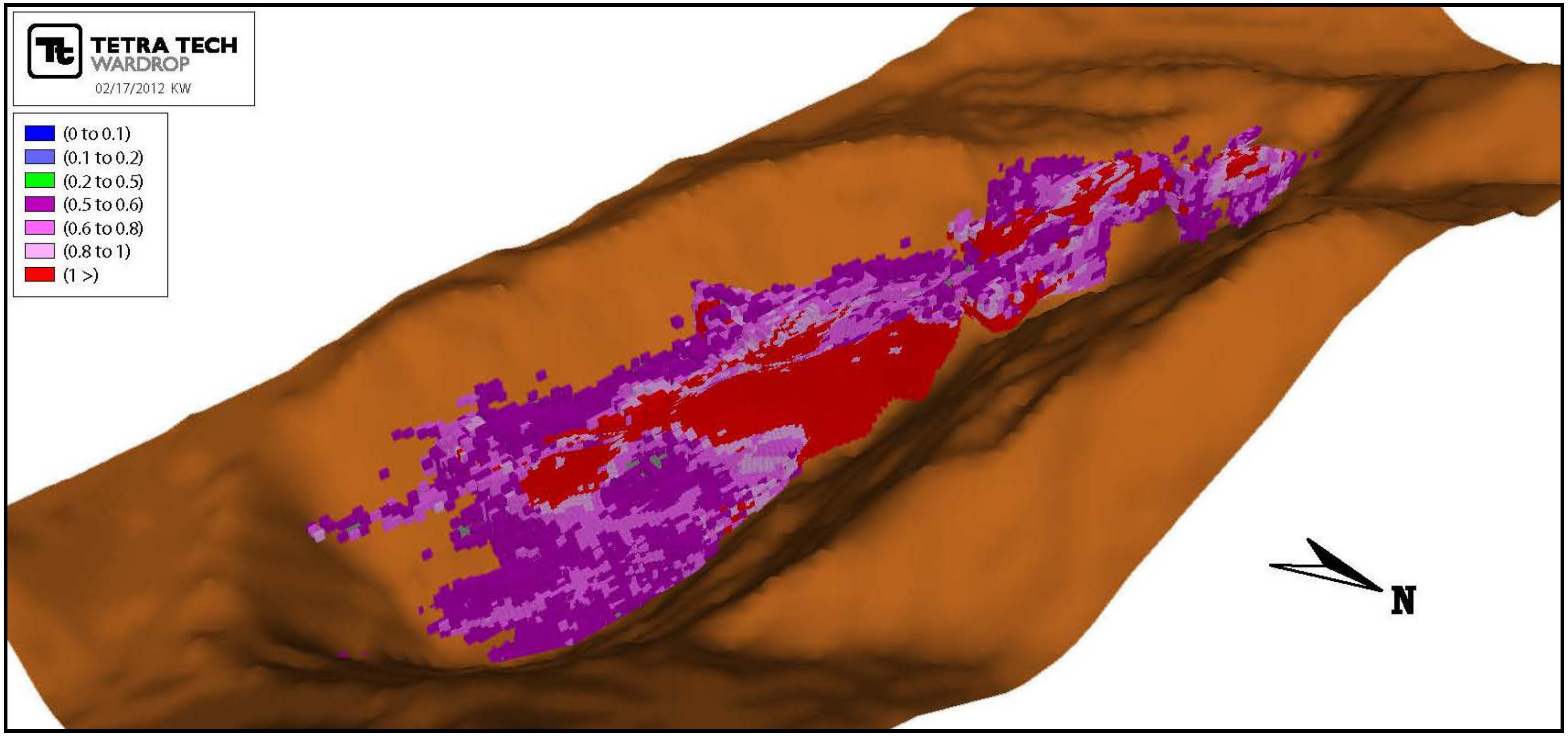


Figure 14.7 Wellgreen Pit Resource at 0.5% NiEq Cut-off (Oblique View Not to Scale)



14.1.9 VALIDATION

The Wellgreen models were validated by three methods:

- visual comparison of colour-coded block model grades with composite grades on section and plan
- comparison of the global mean block grades for OK, ID^2, NN and composites
- swath plots of the East and West Zones in both plan and section views

Visual Comparison

The visual comparisons of block model grades with composite grades for each of the two zones show a reasonable correlation between the values. No significant discrepancies were apparent from the sections and plans reviewed, yet grade smoothing is apparent (Figure 14.8 and Figure 14.9).

Figure 14.8 East Zone Cross Section at 2300E

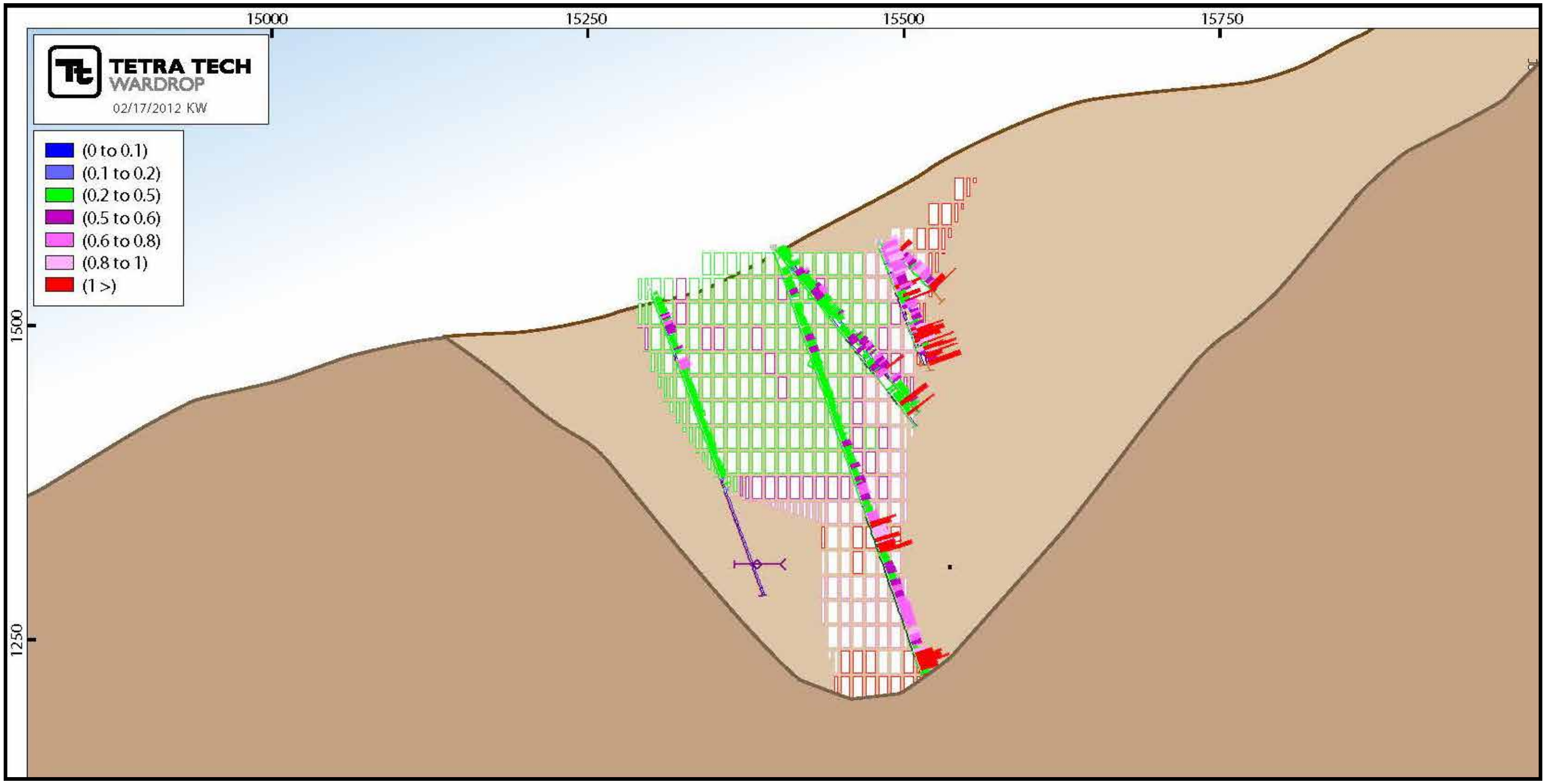
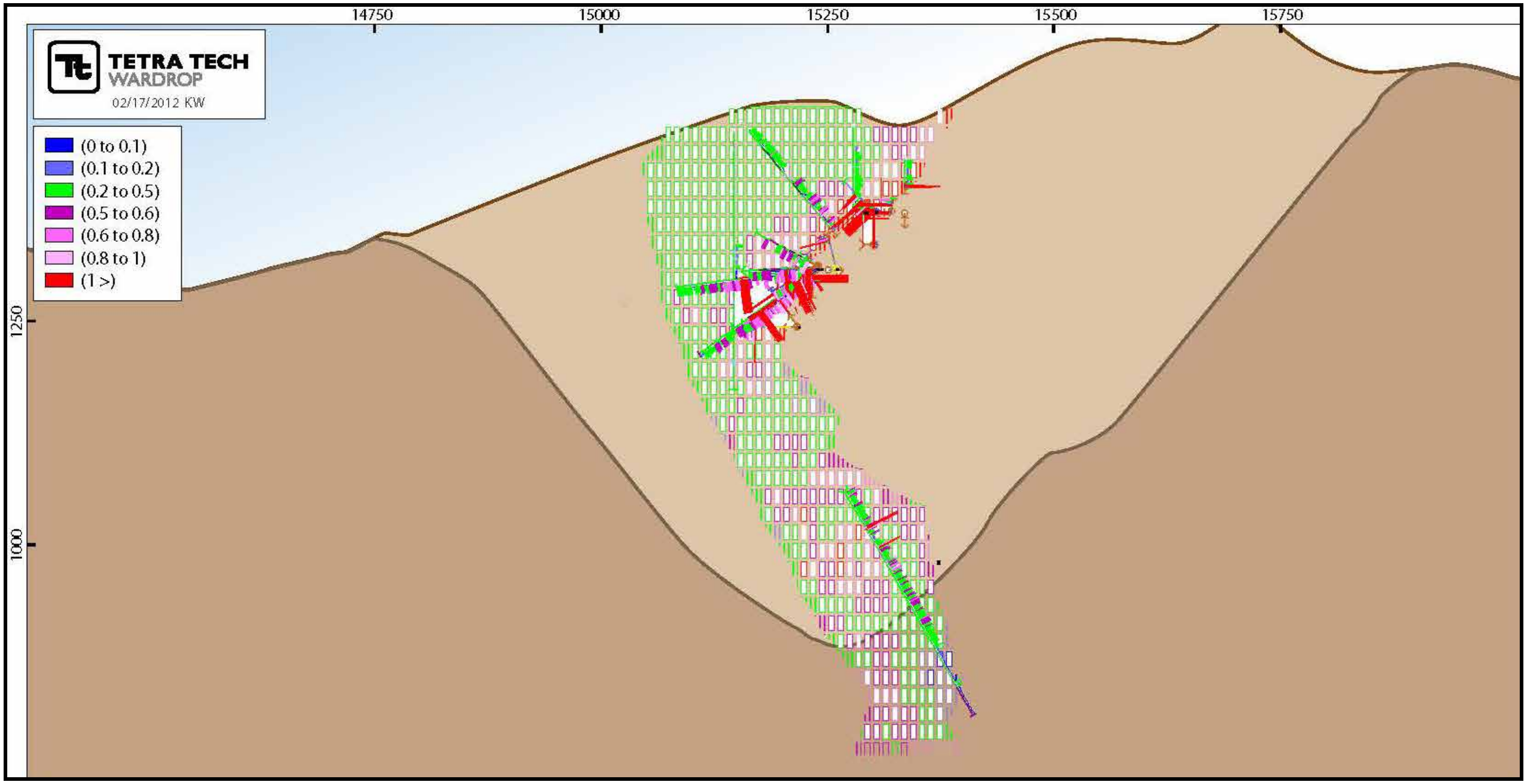


Figure 14.9 East Zone Cross Section at 3225E



Global Comparison

The global block model statistics for the OK model were compared to the global ID^2 and NN model values as well as the composite capped drillhole data. Table 14.14 shows this comparison of the global estimates for the three estimation method calculations. In general, there is agreement between the OK model and ID^2 model and NN model. Larger discrepancies are reflected as a result of lower drill density in some portions of the model. There is a degree of smoothing apparent when compared to the diamond drill statistics. Comparisons were made using all blocks at a 0% cut-off.

Table 14.14 Global Comparison Statistics

		DDH Capped Composite	NN Grade	ID^2 Grade	OK Grade
Ni	East	0.484	0.357	0.338	0.347
	West	0.254	0.281	0.266	0.282
Co	East	0.024	0.024	0.023	0.024
	West	0.018	0.018	0.018	0.019
Pt	East	0.530	0.449	0.413	0.428
	West	0.471	0.448	0.446	0.451
Cu	East	0.400	0.252	0.256	0.266
	West	0.277	0.331	0.288	0.310
Au	East	0.119	0.175	0.167	0.179
	West	0.122	0.134	0.104	0.111
Pd	East	0.453	0.355	0.339	0.347
	West	0.317	0.305	0.302	0.306

Note: DDH = diamond drillhole

Swath Plots

Swath plots were generated for nickel, copper, cobalt, gold, platinum and palladium for eastings and elevations, at 20 m intervals. These plots compare the OK estimates with the NN and ID^2 estimates, and are illustrated below in Figure 14.10 to Figure 14.21.

Figure 14.10 Wellgreen Nickel Section Swath Plot

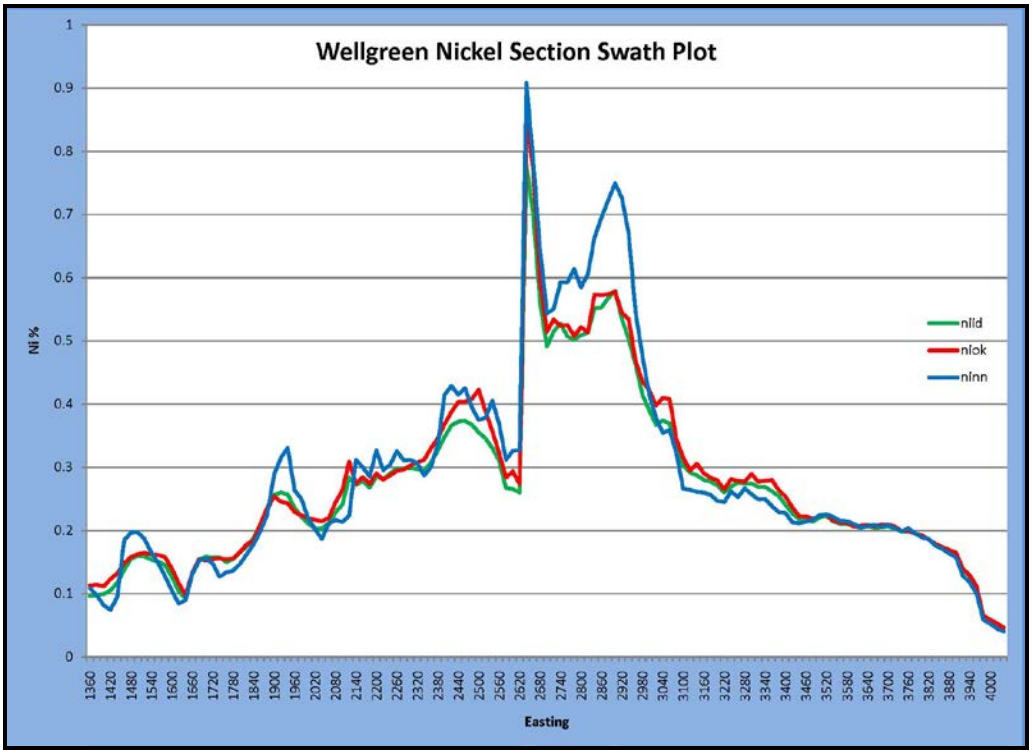


Figure 14.11 Wellgreen Copper Section Swath Plot

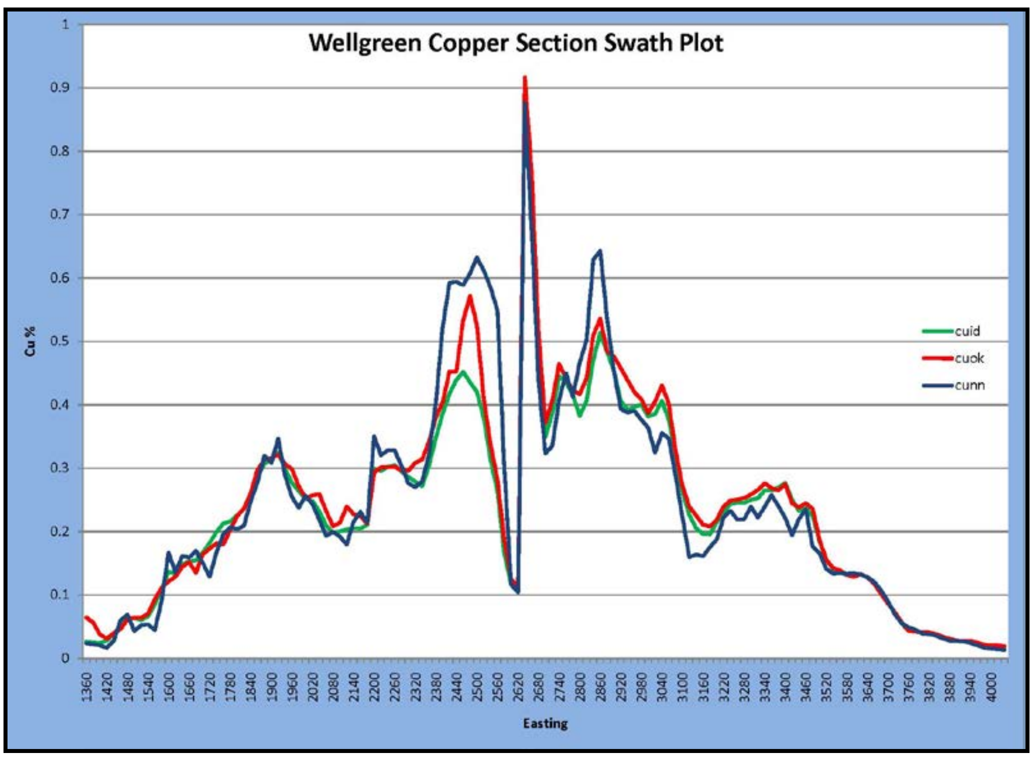


Figure 14.12 Wellgreen Cobalt Section Swath Plot

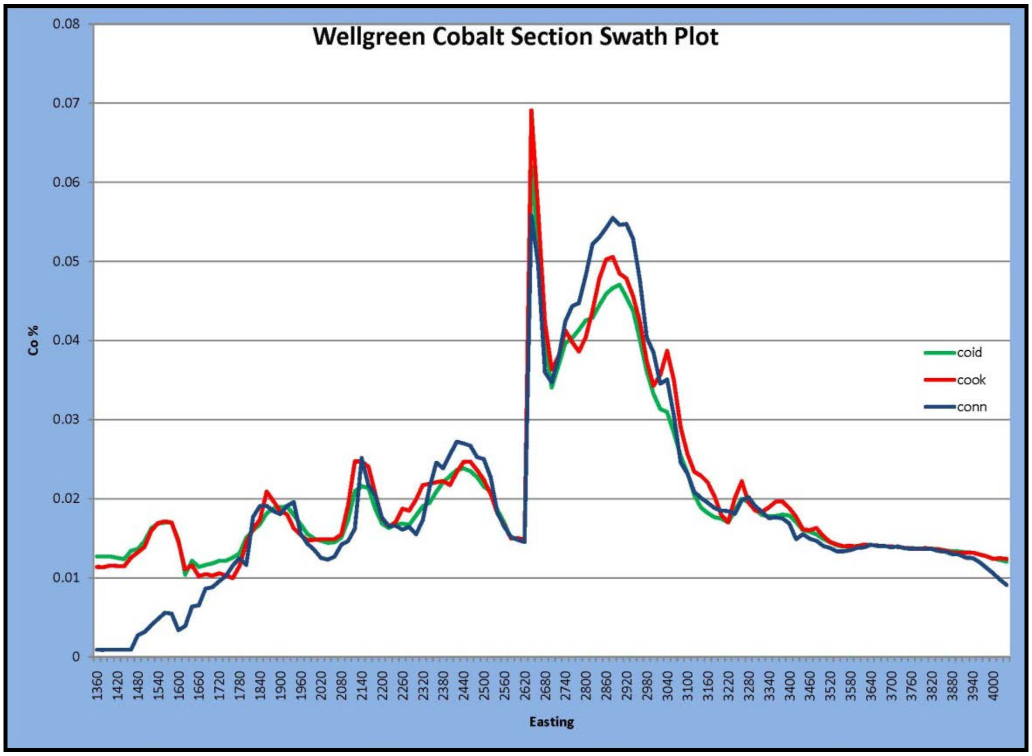


Figure 14.13 Wellgreen Gold Section Swath Plot

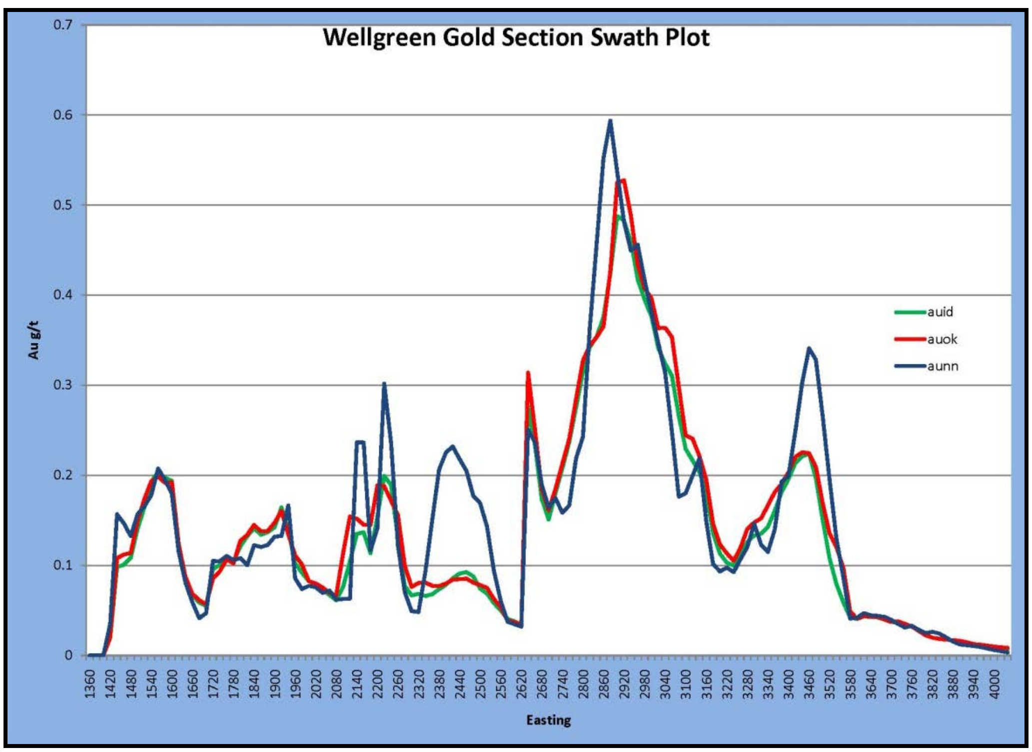


Figure 14.14 Wellgreen Platinum Section Swath Plot

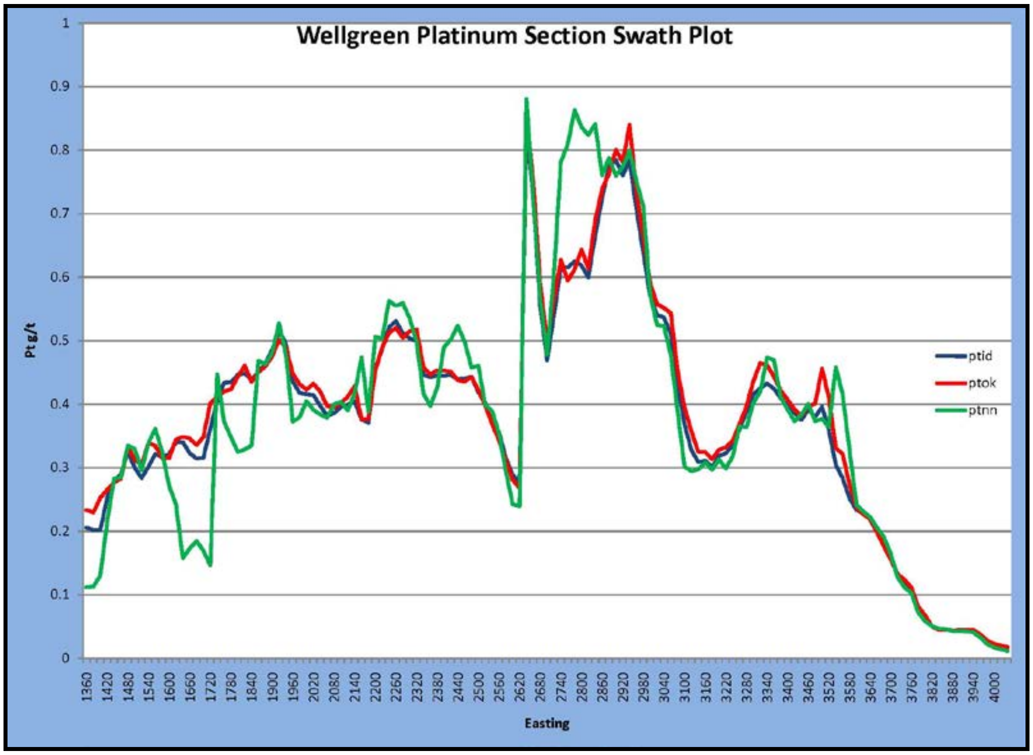


Figure 14.15 Wellgreen Palladium Section Swath Plot

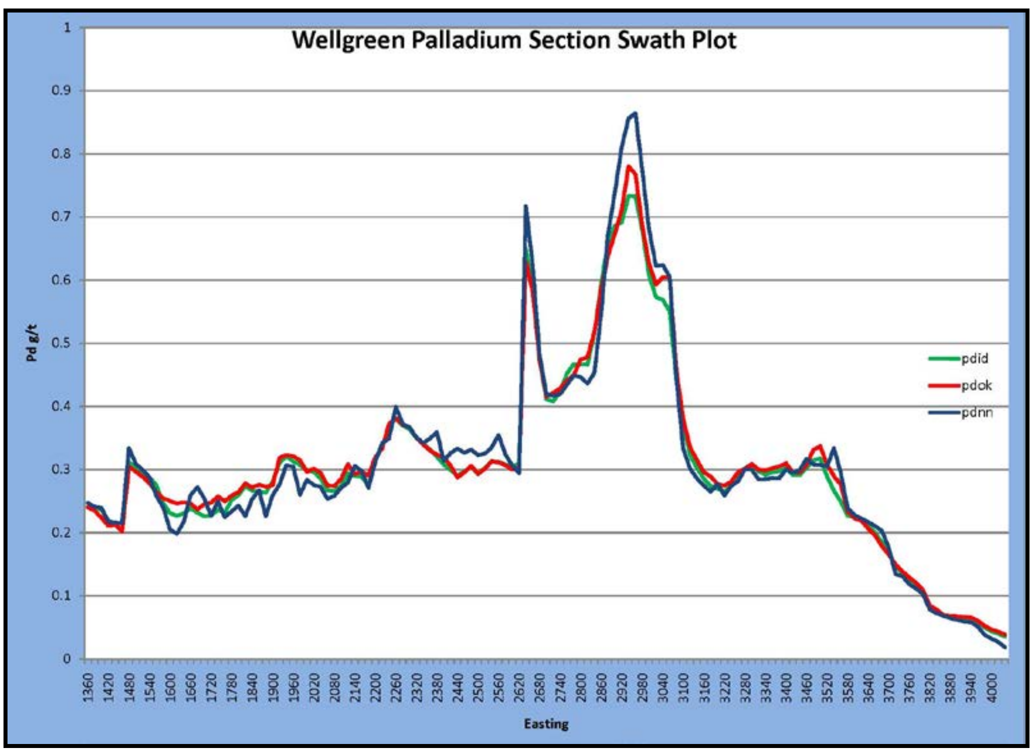


Figure 14.16 Wellgreen Nickel Elevation Swath Plot

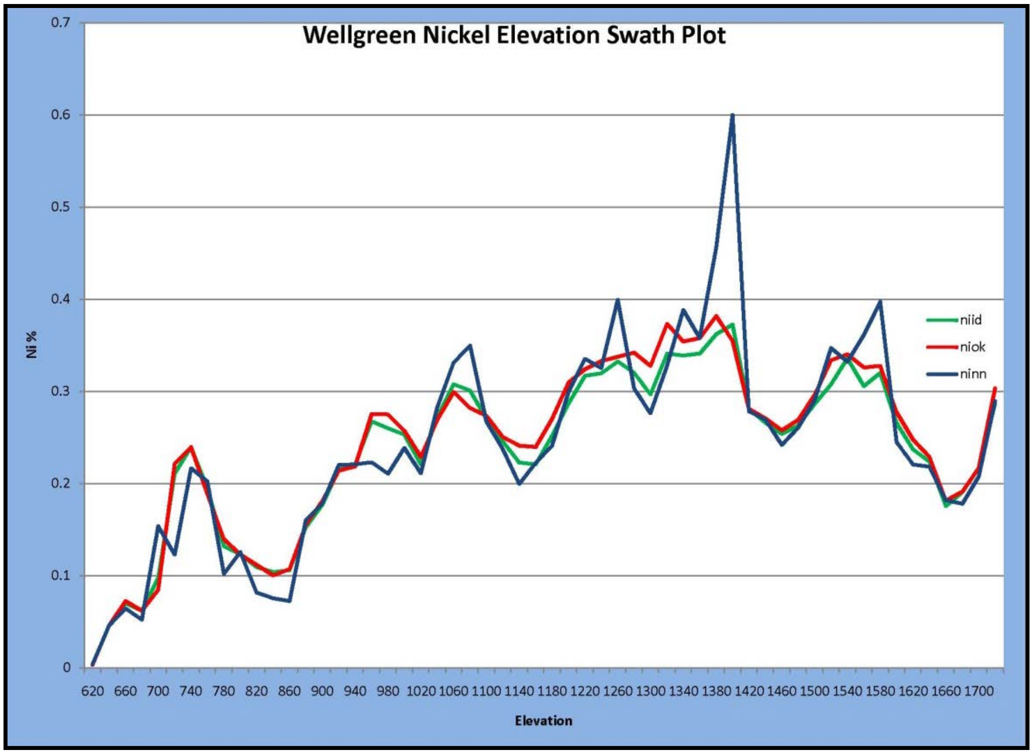


Figure 14.17 Wellgreen Copper Elevation Swath Plot

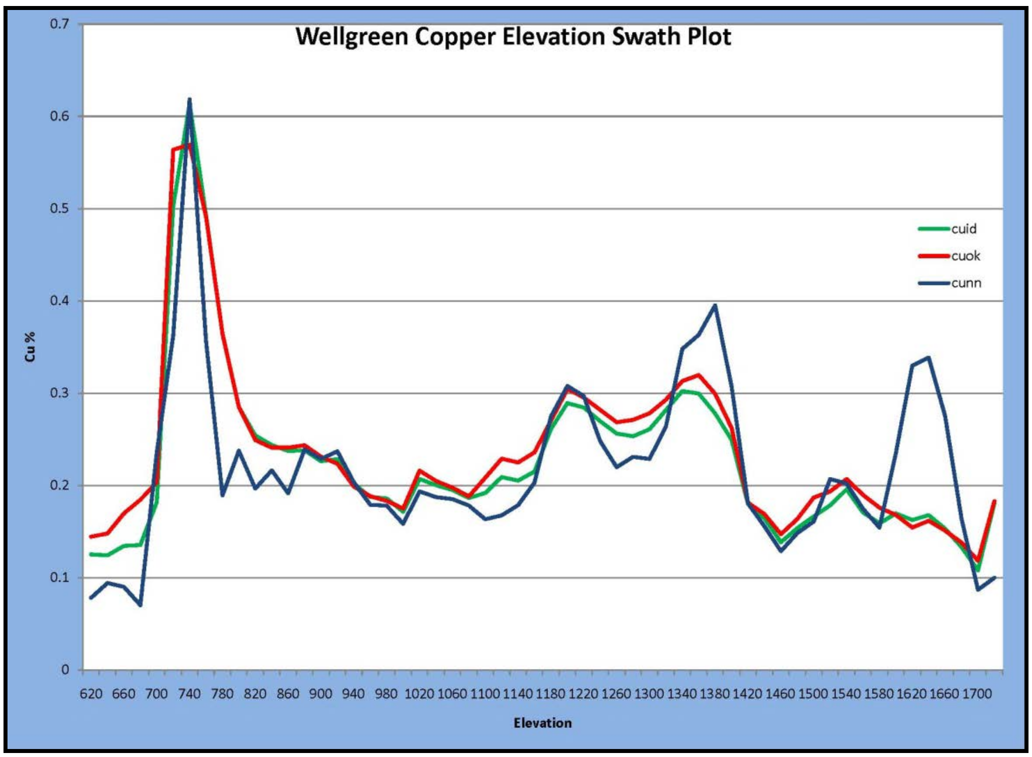


Figure 14.18 Wellgreen Cobalt Elevation Swath Plot

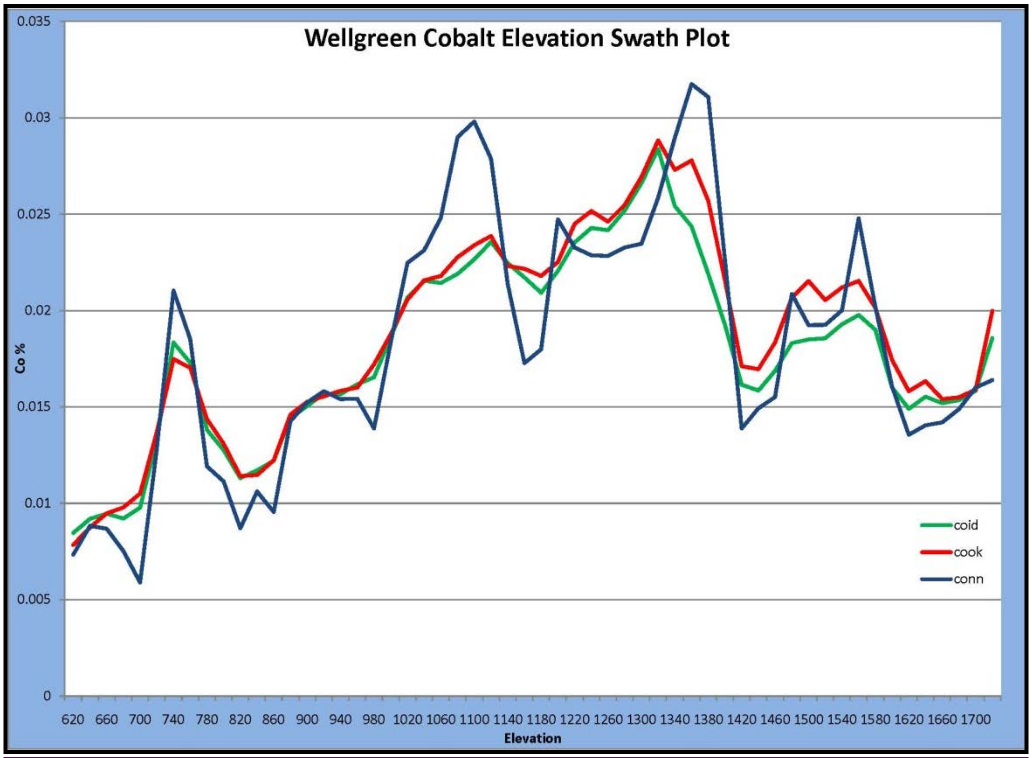


Figure 14.19 Wellgreen Gold Elevation Swath Plot

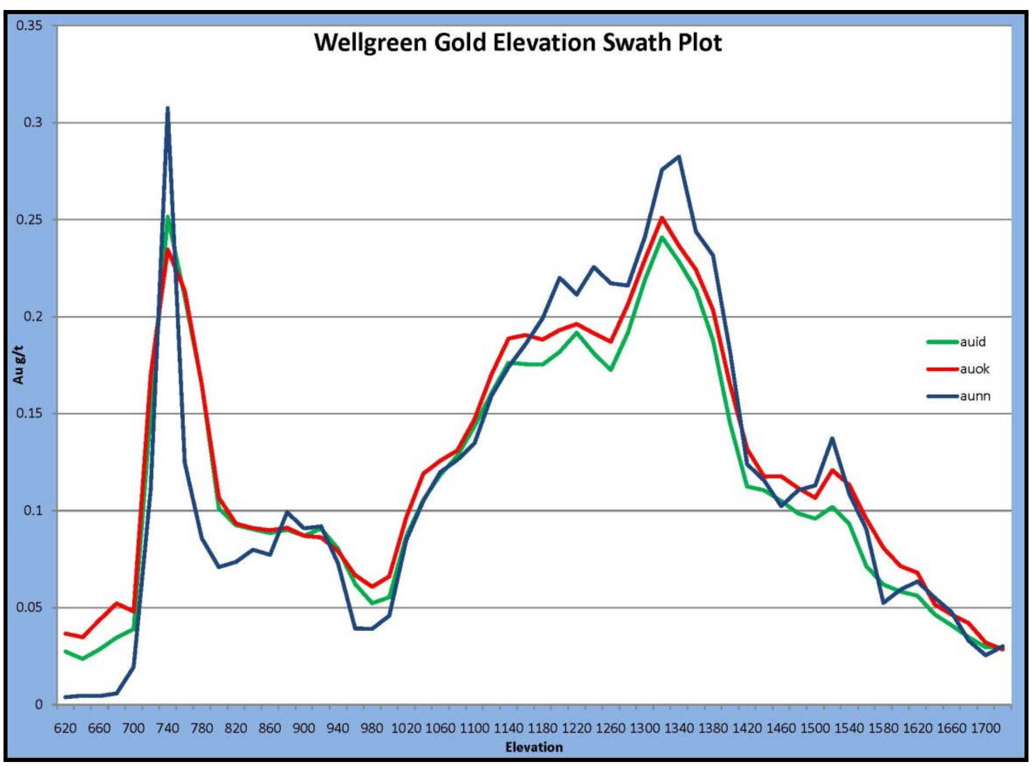


Figure 14.20 Wellgreen Platinum Elevation Swath Plot

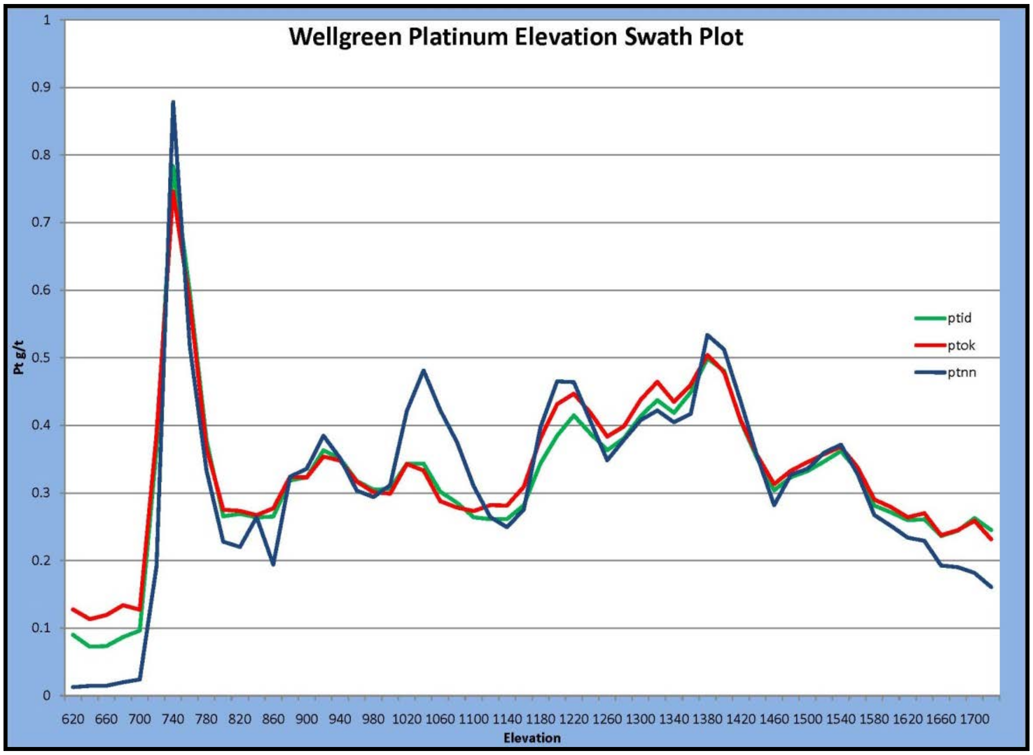
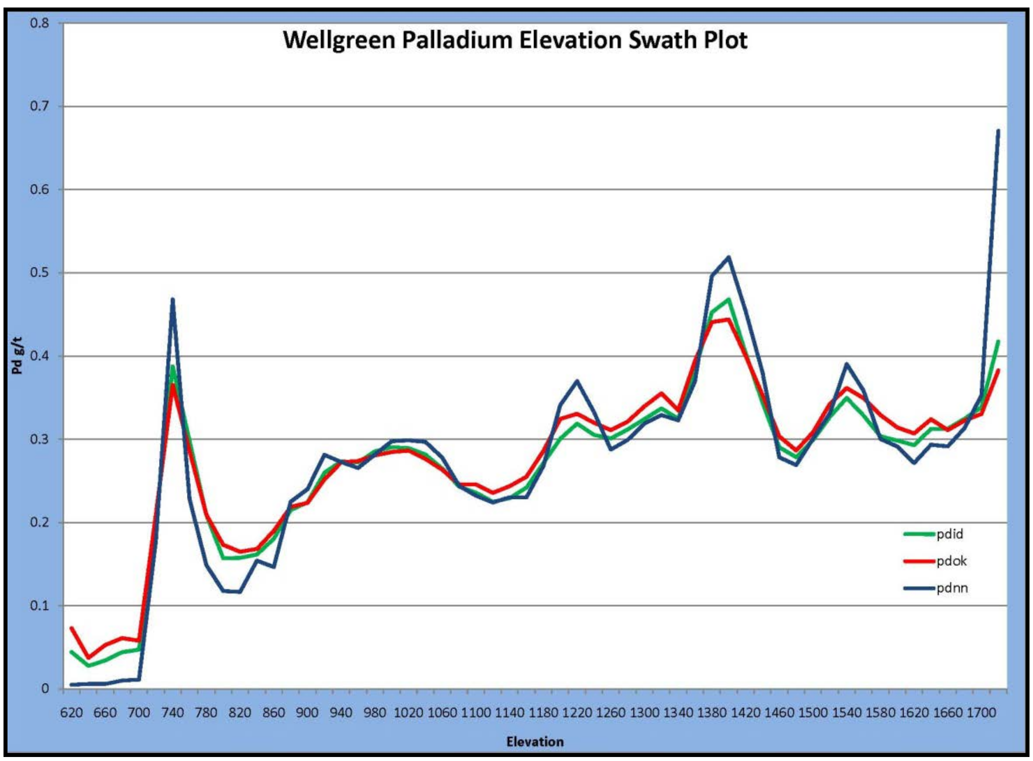


Figure 14.21 Wellgreen Palladium Elevation Swath Plot



14.2 PREVIOUS ESTIMATES

Table 14.15 compares the basic parameters of the historic 2011 estimate with the current 2012 NI 43-101 compliant resource.

Table 14.16 illustrates the differences in the historic resource estimate with the current NI 43-101 compliant resource.

Table 14.15 Model Differences

	2012 Tetra Tech PEA Model	2011 Tetra Tech Resource Model
Number of Drillholes	702	702
Grade Capping	Parrish Analysis	Parrish Analysis
	East Zone - 4.14% Cu, 2.05 g/t Au, 5.15 g/t Pd, 5.72 g/t Pt	East Zone - 4.14% Cu, 2.05 g/t Au, 5.15 g/t Pd, 5.72 g/t Pt
	West Zone - 2.29 g/t Au	West Zone - 2.29 g/t Au
Composite Length	East Zone - 2.5 m	East Zone - 2.5 m
	West Zone - 2.5 m	West Zone - 2.5 m
Metal Prices	US$9.40/lb Ni	US$9.52/lb Ni
	US$2.96/lb Cu	US$2.96/lb Cu
	US$15.80/lb Co	US$15.78/lb Co
	US$1,200/troy oz Au	US$1,085/troy oz Au
	US$1,938/troy oz Pt	US$1,776/troy oz Pt
	US$816/troy oz Pd	US$689/troy oz Pd
Cut-off Grade	0.2% NiEq	0.4% NiEq
Number of Mineral Zones	2	2
Block Size	20 x 10 x 20 (4,000 m^3)	20 x 10 x 20 (4,000 m^3)
Resource Summary	All blocks above cut-off within optimized pitshell	All blocks above cut-off
Estimation Method	OK with ID and NN validation	OK with ID and NN validation

Table 14.16 Model Comparisons

	Tonnes	Ni (%)	Cu (%)	Co (%)	Au (g/t)	Pt (g/t)	Pd (g/t)
2012 Tetra Tech PEA Model							
Indicated Resource @ 0.2% NiEq cut-off	14,423,900	0.68	0.62	0.05	0.51	0.99	0.73
Inferred Resources @ 0.2% NiEq cut-off	446,649,000	0.31	0.25	0.02	0.16	0.38	0.33
2011 Tetra Tech Resource Model							
Indicated Resource @ 0.4% NiEq cut-off	14,308,000	0.69	0.62	0.05	0.52	0.99	0.74
Inferred Resources @ 0.4% NiEq cut-off	289,246,000	0.38	0.35	0.03	0.23	0.53	0.42

The fundamental difference between the 2011 Tetra Tech resource and the 2012 Tetra Tech resource is that the new metal pricing allowed for a greater amount of the PGE material to be included with the potential pit, resulting in the application of a lower NiEq cut-off. In addition, the application of engineering design at a PEA level supports the low mining cost per unit tonnes processed.

15.0 MINERAL RESERVE ESTIMATES

A mineral reserve has not been estimated for the Project as part of this PEA.

A mineral reserve is the economically mineable part of a Measured or Indicated Mineral Resource.

16.0 MINING METHODS

16.1 INTRODUCTION

This section outlines the parameters and procedures Tetra Tech used to perform the pit optimization and mine planning work for the Project.

16.2 OVERVIEW

The deposit will be mined using a conventional truck-and-shovel open pit mining method, at a production rate of 111,500 t/d (39,000,000 t/a) waste plus mineralized material over a 37-year LOM.

The open pit was designed using a two-stage approach. In the first stage, a series of optimum pit shell were identified using the Lerchs-Grossman (LG) pit optimization method in Gemcom Whittle™ software program. The base case pit shell that represent the prices introduced in Table 16.3 was selected as the final pit.

In the second stage, the base case pit was used for mine planning to:

- determine phases of mine development
- establish production schedules
- select major equipment
- estimate mining capital and operating costs.

The ultimate pit design generated the key results provided in Table 16.1.

Table 16.1 Ultimate Pit Design Results

Description	Unit	Value
Mineralized Material Mined	Mt	405.3
Waste Material Mined	Mt	1,043
Strip Ratio	t waste:t mineralized material	2.57:1
Milling Rate	t/d	32,000
Mine Life	years	37

The selected base case pit contains mineralized material at the average diluted tonnes and grades shown in Table 16.2. Tetra Tech assumed an overall mining recovery of 95% and a waste rock dilution of 5%.

Table 16.2 Mineable Diluted Tonnes and Grade of Mineralized Material Contained in Base Case Pit

Mineralized Material	Tonnage (Mt)	Ni (%)	Cu (%)	Co (%)	Au (g/t)	Pt (g/t)	Pd (g/t)
Indicated	14.5	0.65	0.59	0.05	0.489	0.942	0.698
Inferred	390.8	0.31	0.25	0.02	0.165	0.391	0.334
Total	**405.3**	**0.32**	**0.26**	**0.02**	**0.177**	**0.411**	**0.347**

The LOM plan was developed using Gemcom Whittle™ software.

The mining equipment fleet will comprise three 251 mm diameter rotary blasthole drill rigs for all rock material, four 21 m^3 (bucket capacity) hydraulic face shovels and an initial fleet of 25 haul trucks, each with a 225 t capacity. These will be supplemented with support equipment consisting of loaders, graders, bulldozers and a backhoe excavator. (Table 16.11 outlines the major mine equipment fleet peak requirements for the Project.)

16.3 PIT OPTIMIZATION

16.3.1 PIT OPTIMIZATION PROCEDURES

Tetra Tech performed pit optimization to determine the economic pit limits and evaluate the mineralized material contained within the pit at the highest present value (PV). Tetra Tech used the 3D LG algorithm of the Gemcom Whittle™ commercial software package to perform the pit optimization.

A 3D geological block model and other required economic and operational variables were used as input parameters for the LG algorithm. These variables include overall pit slope angle, mining cost, milling cost, metal prices, concentrate treatment costs and other parameters as discussed in Section 16.3.2.

The LG algorithm progressively identifies economic blocks, taking into account waste stripping, resulting in a highest possible total value mined within the open pit shell, subject to the specified pit slope angles.

16.3.2 PIT OPTIMIZATION PARAMETERS

Tetra Tech and Prophecy Platinum jointly selected the required optimization parameters to determine the most economic open pit profile. Although these parameters are not necessarily final, a reasonable degree of caution was applied using the limited information available at the time of pit optimization. The economic and operating parameters used in the optimization are specified in Table 16.3.

Table 16.3 Economic Parameters of Pit Optimization (Base Case)

Items		Units	Value	Comments
Exchange Rate		Cdn$:US$	1:0.9794	-
Discount Rate		%	8	-
Metal Prices	Platinum	US$/troy oz	2,043.50	Quarterly Update of Long Term Metal Pricing (April 16, 2012)
	Palladium	US$/troy oz	932.00	
	Gold	US$/troy oz	1,347.50	
	Nickel	US$/lb	10.82	
	Copper	US$/lb	3.11	
	Cobalt	US$/lb	16.70	
Metal Recoveries	Platinum	%	46.0	From Table 13.9
	Palladium	%	72.9	
	Gold	%	58.9	
	Nickel	%	67.6	
	Copper	%	87.8	
	Cobalt	%	64.4	
Operating Costs	Mining Cost	US$/t mined	2.81	-
	Processing Cost	US$/t milled	20.79	-
Mining Recovery		%	95	-
Mining Dilution		%	5	-
Overall Slope Angle		degrees	45	-
Mill Throughput		t/d	32,000	-
		t/a	11,200,000	-

Geological Block Model

Tetra Tech prepared the resource geological block model using the Datamine™ software program. For optimization purposes, the model was reblocked using a block size of 40 m x 40 m x 20 m.

Historical production records indicate that between 1972 and 1973 Hudson Yukon Mining produced 171,652 tons (155,720 t) assaying 2.23% nickel, 1.39% copper, 0.065 oz/ton platinum and 0.073% cobalt. This likely does not include the drifting, which is both in and out of the mineralized material. Since the tonnage was small relative to the resource (less than 0.05% of the total resource), it was not considered to be significant to the overall resource. This will need to be addressed in advanced studies (prefeasibility and feasibility).

The block model uses a local mine grid coordinate system. The pit optimization and design were completed using the same coordinate system.

OVERALL OPEN PIT SLOPE ANGLE

Tetra Tech used an overall pit slope angle of 45°, in the absence of geotechnical data normally used to determine pit slope angles.

PIT OPTIMIZATION RESULTS

Thirty-six nested pit shells were generated by varying the revenue factor (RF) (multiples and fractions of the selling prices) from $5.41/lb nickel to $12.98/lb nickel with $0.22/lb increment. Pit Shell 26 represents the base case price, and is highlighted in Table 16.4. Figure 16.1 shows the NiEq content in the pit shells generated using the range of prices mentioned above. As Figure 16.1 indicates, the metal content in pit shells increases as the metal price increases, due to a change in both the size of the optimum pit and the change in cut off grade. The slope of the line in Figure 16.1 shows the sensitivity of the pit size to the price. The steeper area of the graph represents the range of price that has bigger influence on the size of the pit. The slope of the line is steeper for the pit shells less than $8.80/lb NiEq. The increase in metal content decreases after this point. Based on this model for prices less than $5.4/lb NiEq, there is little valuable rock to be mined.

Figure 16.1 Nickel Equivalent Content in Pit Shell Based on Nickel Equivalent Price

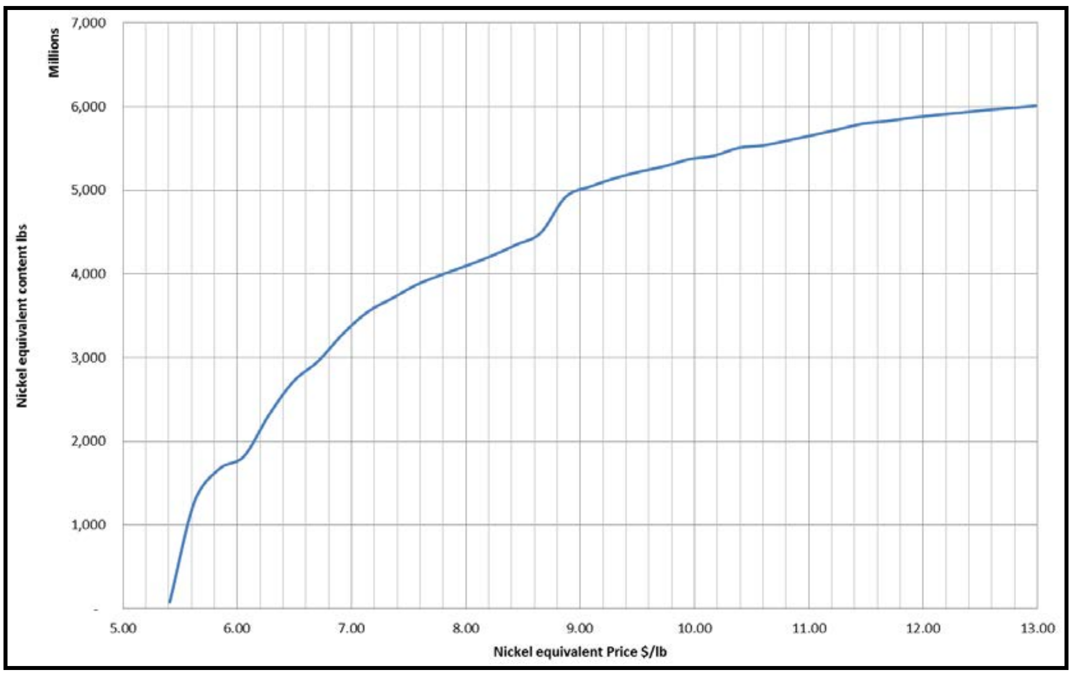


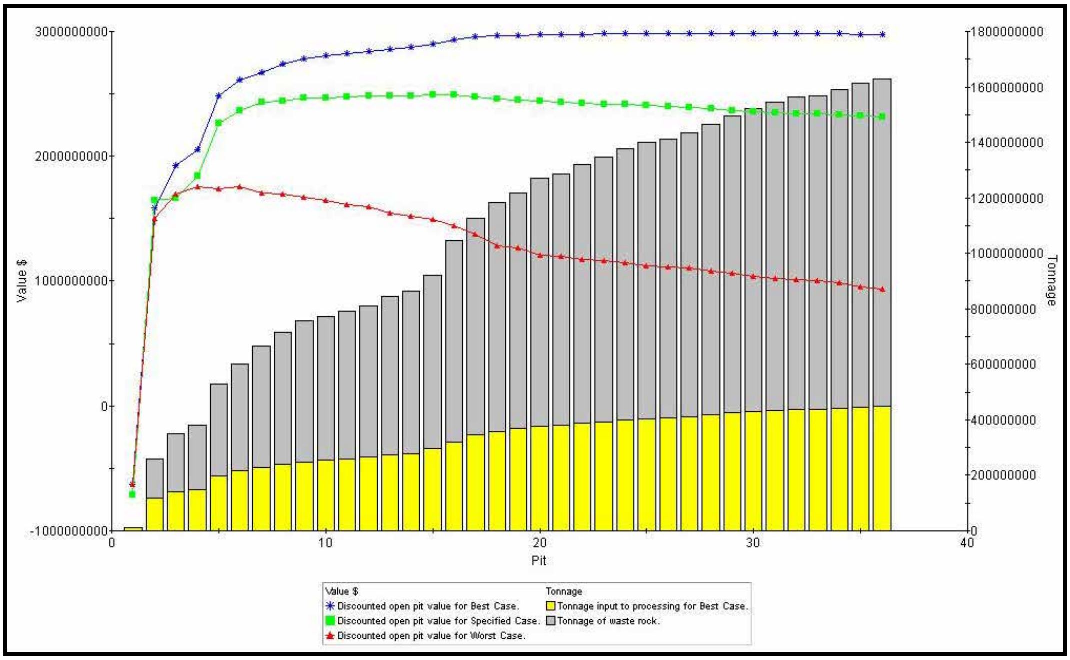
Figure 16.2 demonstrates the relationship between the mineralized material (yellow bar) contained within the pit shell and the PV for each of the nested pit shells. The blue line in this figure represents the cumulative PV of the pit shell for a best case scenario. The best case scenario consists of a schedule that mines out Pit Shell 1 (the smallest pit), and then mines out each subsequent pit shell from top down, before starting the next pit shell. In other words, there are as many intermediate mining pushbacks as there are pit outlines within the one that is being mined. This schedule is seldom feasible because the pushbacks are usually much too narrow; its usefulness lies in setting an upper limit to the PV.

The red line represents the worst case scenario in which the schedule consists of mining each bench completely before starting on the next bench. This schedule, or one that is very close to it, is usually feasible and also serves to set a lower limit to the PV.

The green line represents specified case that is a more realistic approach to mine a deposit.

The value curve is quite flat after Pit Shell 10 for both best case and specified cases. Since there is no significant difference between different pit shells, the base case pit shell was chosen as the final pit for production scheduling and financial analysis.

Figure 16.2 Present Value of the Pits for Different Optimum Pits



The tabulated results of the nested pit shells are presented in Table 16.4. The base case pit (Pit Shell 26) is highlighted.

Table 16.4 Pit Optimization Results

Pit	Ni Price ($/lb)	Rock (t)	Mineralized (t)	Waste (t)	Strip Ratio	Ni (%)	Cu (%)	Pt (g/t)	Pd (g/t)	Au (g/t)	Co (%)	NiEq (%)
1	5.41	7,910,999	2,839,025	5,071,974	1.79	0.635	0.471	1.058	0.753	0.443	0.036	1.27
2	5.63	271,358,318	44,705,879	226,652,439	5.07	0.638	0.51	0.896	0.823	0.519	0.045	1.30
3	5.84	363,083,798	60,568,874	302,514,924	4.99	0.619	0.516	0.844	0.751	0.468	0.045	1.25
4	6.06	390,866,839	68,612,862	322,253,977	4.70	0.594	0.502	0.809	0.719	0.449	0.044	1.20
5	6.28	526,119,703	91,984,437	434,135,266	4.72	0.557	0.521	0.755	0.639	0.397	0.041	1.14
6	6.49	614,557,064	116,294,840	498,262,224	4.28	0.513	0.492	0.715	0.585	0.375	0.038	1.06
7	6.71	654,581,123	134,213,032	520,368,091	3.88	0.486	0.461	0.675	0.551	0.351	0.036	1.00
8	6.92	729,496,458	157,624,568	571,871,890	3.63	0.462	0.432	0.636	0.517	0.324	0.035	0.95
9	7.14	772,030,794	180,369,072	591,661,722	3.28	0.438	0.403	0.599	0.490	0.303	0.033	0.89
10	7.36	794,730,729	196,297,396	598,433,333	3.05	0.424	0.384	0.575	0.473	0.287	0.031	0.86
11	7.57	819,453,236	213,210,580	606,242,656	2.84	0.409	0.366	0.553	0.456	0.272	0.03	0.82
12	7.79	835,835,313	226,653,113	609,182,200	2.69	0.398	0.352	0.537	0.444	0.261	0.029	0.80
13	8.01	852,847,296	237,764,102	615,083,194	2.59	0.39	0.343	0.524	0.435	0.253	0.029	0.78
14	8.22	887,525,586	249,469,074	638,056,512	2.56	0.383	0.336	0.514	0.426	0.246	0.028	0.77
15	8.44	921,902,120	264,656,803	657,245,317	2.48	0.374	0.325	0.499	0.415	0.238	0.027	0.75
16	8.66	971,440,926	278,885,827	692,555,099	2.48	0.367	0.317	0.489	0.407	0.23	0.027	0.73
17	8.87	1,159,902,117	318,664,740	841,237,377	2.64	0.356	0.299	0.465	0.39	0.21	0.026	0.70
18	9.09	1,223,052,794	332,072,577	890,980,217	2.68	0.351	0.295	0.458	0.384	0.204	0.025	0.69
19	9.31	1,252,637,872	344,002,098	908,635,774	2.64	0.347	0.288	0.449	0.377	0.198	0.025	0.68
20	9.52	1,290,046,510	353,536,759	936,509,751	2.65	0.344	0.284	0.444	0.373	0.194	0.024	0.67
21	9.74	1,322,604,260	360,860,737	961,743,523	2.67	0.341	0.282	0.44	0.370	0.192	0.024	0.66
22	9.95	1,361,611,574	371,161,851	990,449,723	2.67	0.337	0.278	0.435	0.365	0.188	0.024	0.66
23	10.17	1,372,149,455	376,729,605	995,419,850	2.64	0.335	0.275	0.431	0.362	0.186	0.024	0.65
24	10.39	1,409,613,395	389,814,662	1,019,798,733	2.62	0.33	0.269	0.422	0.356	0.182	0.024	0.64

table continues…

Pit	Ni Price ($/lb)	Rock (t)	Mineralized (t)	Waste (t)	Strip Ratio	Ni (%)	Cu (%)	Pt (g/t)	Pd (g/t)	Au (g/t)	Co (%)	NiEq (%)
25	10.60	1,427,660,474	396,190,524	1,031,469,950	2.60	0.327	0.267	0.418	0.352	0.18	0.023	0.63
26	**10.82**	**1,448,356,179**	**405,331,637**	**1,043,024,542**	**2.57**	**0.324**	**0.262**	**0.411**	**0.347**	**0.177**	**0.023**	**0.63**
27	11.04	1,472,835,263	414,186,643	1,058,648,620	2.56	0.321	0.259	0.405	0.343	0.174	0.023	0.62
28	11.25	1,502,281,944	423,626,678	1,078,655,266	2.55	0.318	0.255	0.4	0.339	0.171	0.023	0.61
29	11.47	1,541,511,045	436,462,405	1,105,048,640	2.53	0.314	0.25	0.392	0.332	0.167	0.022	0.60
30	11.69	1,555,563,258	443,273,713	1,112,289,545	2.51	0.311	0.247	0.387	0.329	0.165	0.022	0.60
31	11.90	1,579,065,421	449,817,143	1,129,248,278	2.51	0.309	0.244	0.384	0.326	0.163	0.022	0.59
32	12.12	1,600,519,083	454,784,196	1,145,734,887	2.52	0.307	0.243	0.382	0.324	0.162	0.022	0.59
33	12.33	1,611,648,651	459,141,767	1,152,506,884	2.51	0.306	0.241	0.379	0.322	0.161	0.022	0.59
34	12.55	1,629,610,241	464,435,154	1,165,175,087	2.51	0.304	0.24	0.376	0.32	0.159	0.022	0.58
35	12.77	1,645,688,044	468,463,134	1,177,224,910	2.51	0.303	0.238	0.374	0.318	0.158	0.022	0.58
36	12.98	1,669,946,346	471,981,495	1,197,964,851	2.54	0.302	0.237	0.373	0.317	0.158	0.022	0.58

The pit optimization process included Inferred geological resources that are considered too speculative geologically to be considered reserves and there is no certainty that the PVs as determined by the PV analysis will be realized.

Nickel Equivalent Calculation

There are six different metal values in this deposit. For ease of understanding and reporting, an equivalent grade was calculated for each block in the model. Tetra Tech applied the following NiEq:

$$NiEq = Ni + \frac{(P_{Cu} \times R_{Cu} \times Cu) + (P_{Pt} \times R_{Pt} \times Pt) + (P_{Pd} \times R_{Pd} \times Pd) + (P_{Au} \times R_{Au} \times Au) + (P_{Co} \times R_{Co} \times Co)}{P_{Ni} \times R_{Ni}}$$

Where:

- P_{Cu} is the copper price minus selling cost (all prices in $/lb)
- R_{Cu} is the copper processing recovery (in percent)
- Ni is the grade of nickel (all grades in percent)
- NiEq is the nickel equivalent (in percent).

Cut-off Grade

The milling cut-off grade is the grade above the mineralized rock sent to the mill and below what is sent to the waste dump the input parameters in Table 16.3, the milling cut-off grade for NiEq was calculated at 0.215%. The calculation for the cut-off grade is as follows:

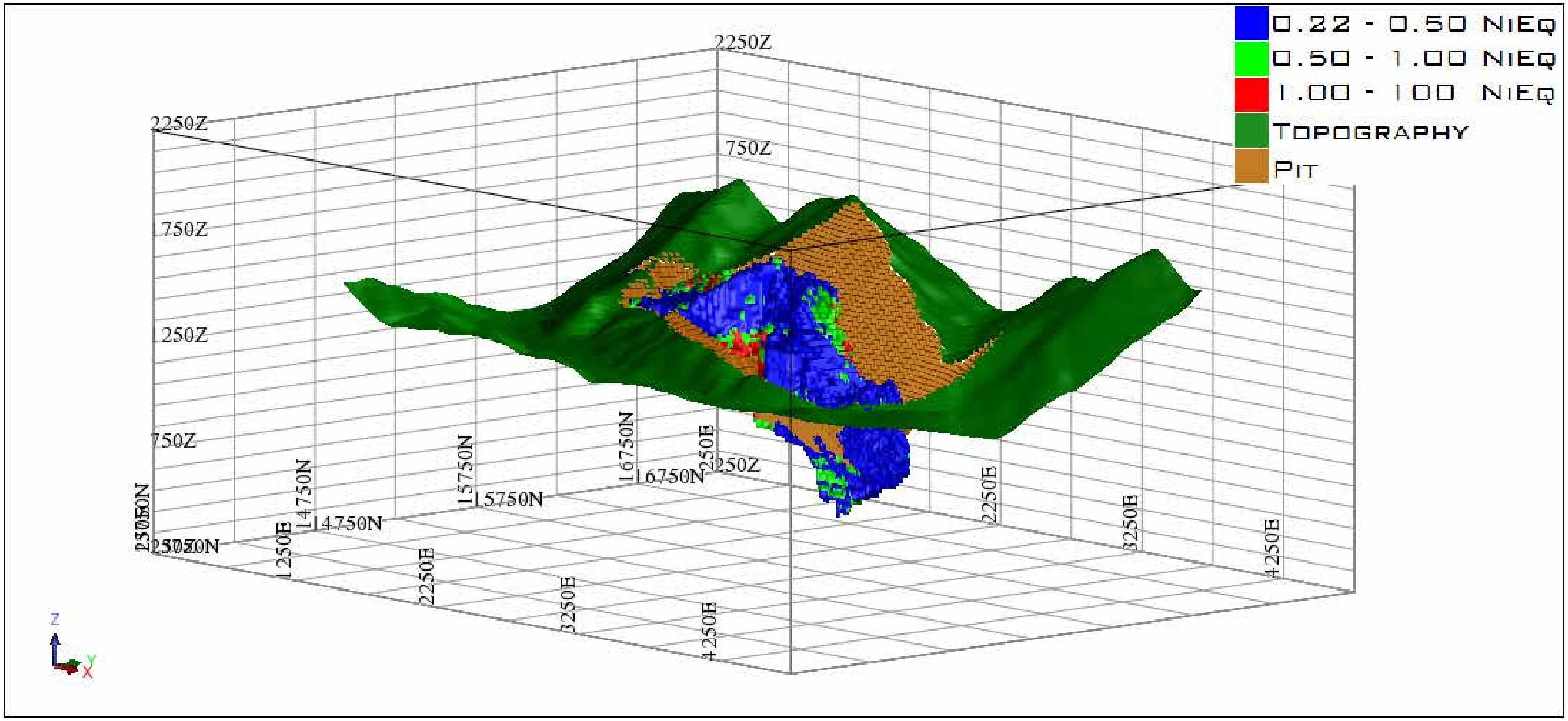
$$cut\ off\ grade = \frac{((processing\ operating\ cost + G\&A) \times (1 + dilution))}{(recovery * (metal\ price - selling\ cost) \times 22.046)}$$

Where:

- G&A costs (by $/t milled)
- processing operating cost (by $/t milled)
- dilution (by percent)
- recovery (by percent)
- metal price and selling cost (by $/lb)
- 22.046 is the conversion factor ($/lb to $/%)
- cut-off grade (in percent).

Figure 16.3 shows a perspective view of the optimum pit shell and the mineralized body above cut-off grade. The legend on the figure shows the grade for NiEq.

Figure 16.3 Optimized Pit Shell 26



16.4 PRODUCTION SCHDULE

Using Pit Shell 26 in Gemcom Whittle™, a preliminary mine production was developed and then smoothed for equipment utilization. The main goals for the production schedule were to minimize the mining of waste, and maximize the grades while satisfying mill capacity. Table 16.5 shows the criteria that was used in the preliminary production schedule.

Table 16.5 Inputs for Production Schedule

Item	Value
Pre-production	1 a
Ramp up period for mill	1 a
Maximum mill capacity	11,200,000 t/a
Maximum mill capacity	32,000 t/d
Working days in year	350 d
Maximum mining capacity	53,000,000 t/a

Figure 16.4 shows the amount of mineralized material (blue) and waste (red) mined per year for the period of mine life. Five million tonnes of waste must be mined as pre-stripping in Year -1, while the mill is constructed and prepared for commissioning. In Year 1 , the mill will process up to 5 Mt of mineralized material. Year 37, the final year of production, will be an incomplete year.

For first 20 years of operation, the mining capacity will stay at approximately 30 Mt and then gradually increase to 52 Mt in Year 22. Table 16.6 shows the mine production schedule by year for the LOM.

Figure 16.4 Mine Production Schedule

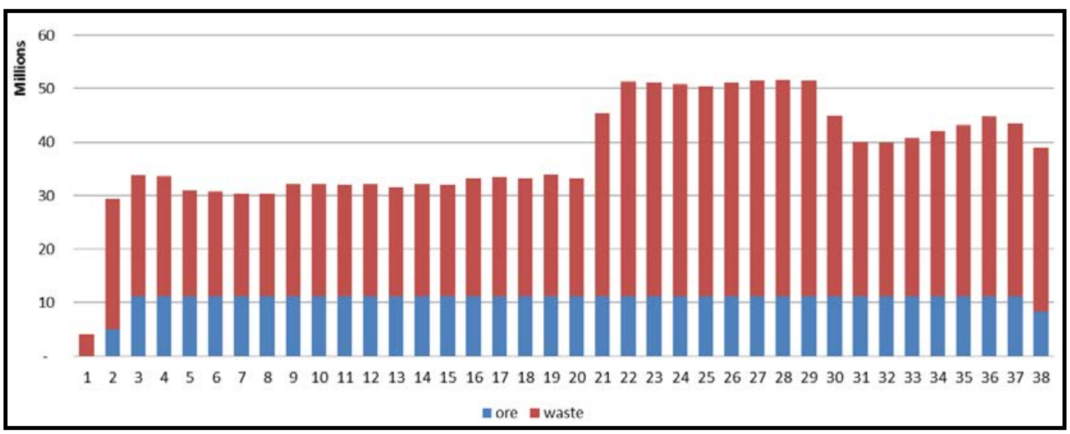


Table 16.6 Mine Production Schedule

Year	Waste (t)	Total (t)	Strip Ratio	Total Material Sent to Mill Tonnes	Ni (%)	Cu (%)	Pt (g/t)	Pd (g/t)	Au (g/t)	Co (%)	NiEq (%)
-1	4,089,349	4,089,349	-	-	-	-	-	-	-	-	-
1	24,448,680	29,448,680	4.89	5,000,000	0.414	0.283	0.655	0.526	0.312	0.026	0.83
2	22,571,631	33,771,631	2.02	11,200,000	0.251	0.161	0.284	0.315	0.077	0.016	0.46
3	22,475,438	33,675,438	2.01	11,200,000	0.299	0.129	0.269	0.334	0.09	0.018	0.50
4	19,798,772	30,998,772	1.77	11,200,000	0.274	0.103	0.274	0.333	0.086	0.019	0.46
5	19,582,863	30,782,863	1.75	11,200,000	0.282	0.095	0.259	0.294	0.101	0.021	0.46
6	19,099,176	30,299,176	1.71	11,200,000	0.302	0.135	0.342	0.411	0.129	0.018	0.53
7	19,112,717	30,312,717	1.71	11,200,000	0.383	0.188	0.437	0.500	0.181	0.023	0.68
8	20,996,989	32,196,989	1.87	11,200,000	0.470	0.268	0.509	0.550	0.268	0.032	0.85
9	20,914,633	32,114,633	1.87	11,200,000	0.433	0.339	0.544	0.506	0.394	0.037	0.87
10	20,878,094	32,078,094	1.86	11,200,000	0.484	0.404	0.737	0.582	0.578	0.042	1.04
11	20,937,407	32,137,407	1.87	11,200,000	0.740	0.781	1.041	0.946	0.633	0.049	1.58
12	20,426,829	31,626,829	1.82	11,200,000	0.337	0.256	0.377	0.291	0.07	0.020	0.60
13	20,935,761	32,135,761	1.87	11,200,000	0.575	0.541	0.679	0.546	0.352	0.045	1.13
14	20,809,268	32,009,268	1.86	11,200,000	0.348	0.323	0.444	0.360	0.199	0.026	0.69
15	21,986,936	33,186,936	1.96	11,200,000	0.222	0.291	0.378	0.274	0.074	0.015	0.49
16	22,392,909	33,592,909	2.00	11,200,000	0.385	0.429	0.396	0.278	0.111	0.022	0.73
17	22,088,015	33,288,015	1.97	11,200,000	0.475	0.535	0.661	0.431	0.274	0.041	0.99
18	22,836,786	34,036,786	2.04	11,200,000	0.274	0.229	0.369	0.271	0.134	0.018	0.53
19	22,090,960	33,290,960	1.97	11,200,000	0.276	0.194	0.415	0.282	0.194	0.018	0.54
20	34,272,727	45,472,727	3.06	11,200,000	0.391	0.509	0.636	0.421	0.363	0.037	0.90
21	40,171,074	51,371,074	3.59	11,200,000	0.333	0.338	0.500	0.343	0.216	0.026	0.69
22	40,068,984	51,268,984	3.58	11,200,000	0.39	0.391	0.541	0.361	0.264	0.034	0.80

table continues…

Year	Waste (t)	Total (t)	Strip Ratio	Total Material Sent to Mill							
				Tonnes	Ni (%)	Cu (%)	Pt (g/t)	Pd (g/t)	Au (g/t)	Co (%)	NiEq (%)
23	39,638,971	50,838,971	3.54	11,200,000	0.316	0.319	0.456	0.347	0.294	0.028	0.68
24	39,188,844	50,388,844	3.50	11,200,000	0.243	0.215	0.401	0.297	0.128	0.017	0.50
25	39,924,780	51,124,780	3.56	11,200,000	0.23	0.231	0.373	0.267	0.147	0.018	0.49
26	40,220,320	51,420,320	3.59	11,200,000	0.218	0.189	0.313	0.239	0.12	0.017	0.44
27	40,447,049	51,647,049	3.61	11,200,000	0.245	0.186	0.283	0.26	0.123	0.015	0.46
28	40,264,989	51,464,989	3.60	11,200,000	0.244	0.171	0.252	0.208	0.08	0.017	0.43
29	33,827,817	45,027,817	3.02	11,200,000	0.193	0.065	0.165	0.156	0.036	0.013	0.30
30	28,824,393	40,024,393	2.57	11,200,000	0.241	0.157	0.276	0.296	0.075	0.017	0.44
31	28,617,600	39,817,600	2.56	11,200,000	0.313	0.236	0.382	0.329	0.075	0.020	0.57
32	29,625,267	40,825,267	2.65	11,200,000	0.312	0.265	0.413	0.279	0.084	0.018	0.58
33	30,988,851	42,188,851	2.77	11,200,000	0.237	0.101	0.196	0.197	0.047	0.014	0.37
34	31,931,212	43,131,212	2.85	11,200,000	0.246	0.175	0.304	0.262	0.067	0.015	0.45
35	33,650,124	44,850,124	3.00	11,200,000	0.231	0.183	0.304	0.236	0.085	0.017	0.44
36	32,276,685	43,476,685	2.88	11,200,000	0.205	0.133	0.213	0.198	0.061	0.015	0.36
37	30,611,698	38,943,381	3.67	8,331,683	0.211	0.133	0.210	0.182	0.059	0.015	0.37
LOM	1,043,024,598	1,448,356,281	2.57	405,331,683	0.320	0.260	0.411	0.347	0.177	0.020	0.63

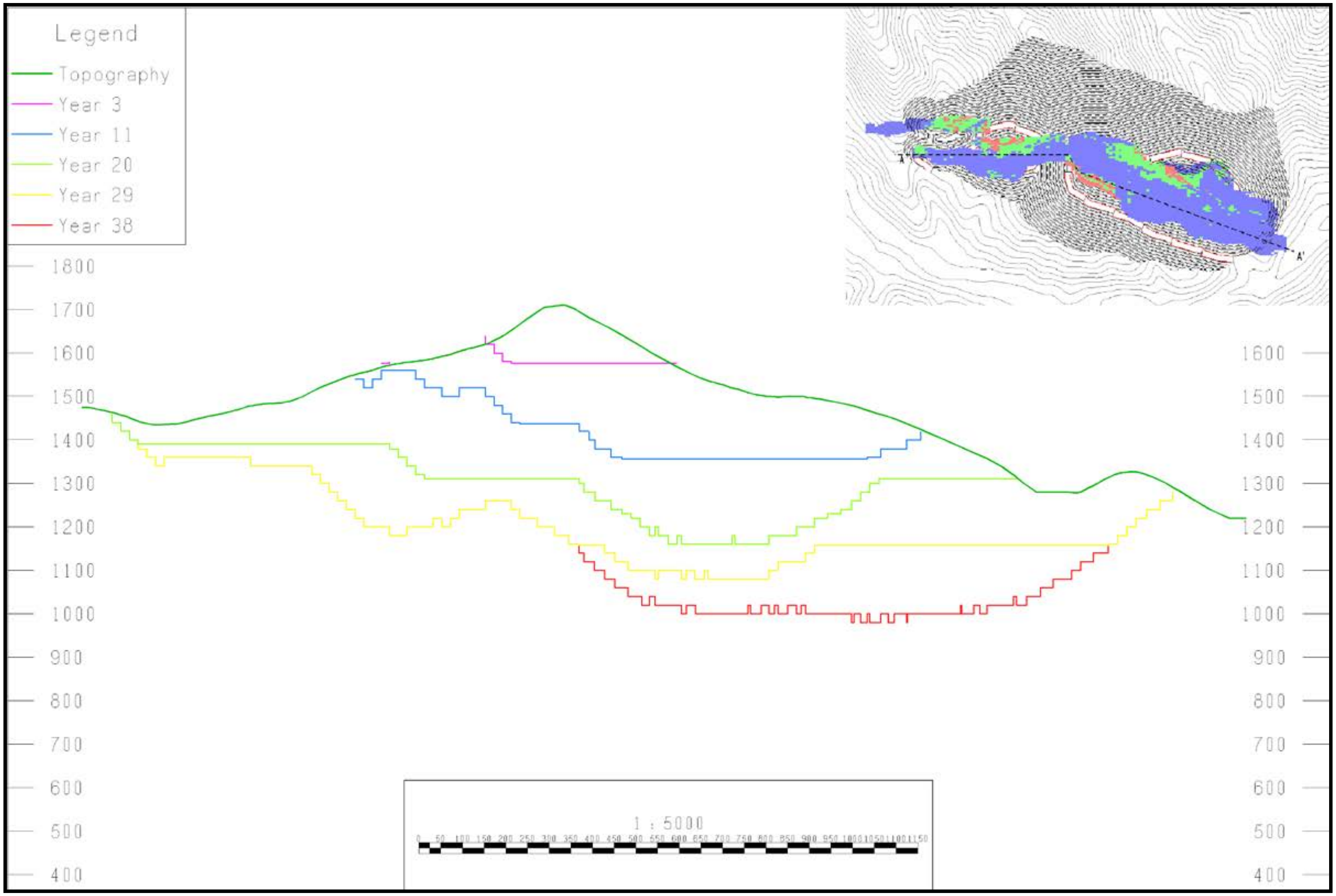
16.5 Mine Development Sequences

Mining activities will be divided into five phases; each phase, or pushback, represents certain periods of mine life and satisfies all the mine design criteria. Figure 16.5 represents the spatial relationship between the five phases. These pushbacks are related to the end of Years 3, 11, 20, 29, and 37. Detailed pit designs for the starter pit and subsequent pushbacks were not completed for this level of study.

Mining activities will include a sequence of pushbacks, or phases, to meet the following objectives:

- enable the mining of high-grade material as early as possible
- effectively reduce stripping ratio in the initial mining stage
- balance the stripping ratio over the period of the mine life.

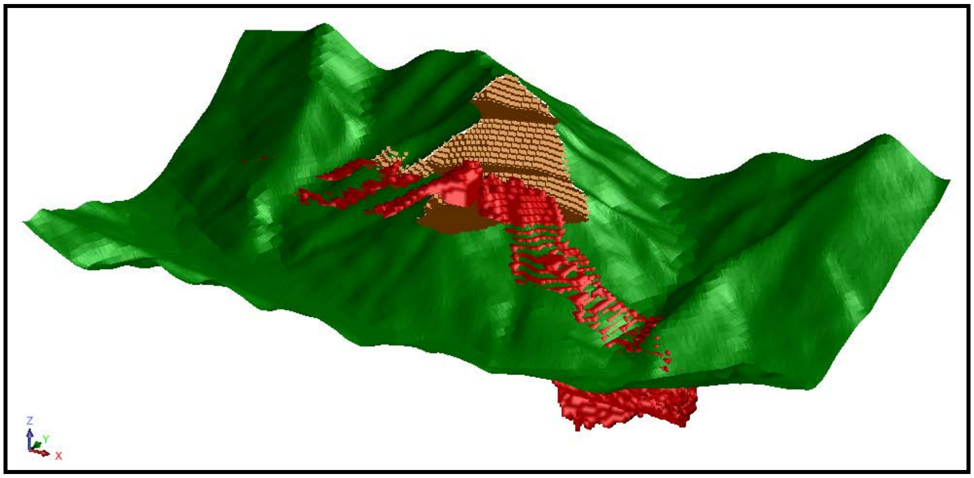
Figure 16.5 Sequence of Development



PHASE I

Phase I consists of the pre-production year, the ramp-up period and the first year of full mill production. The initial pushback prioritizes the higher grade mineralization at the top-centre portion of the resource body, and at the lowest amount of waste stripping. This will maximize cash flow and speed the capital recovery during the initial years. Phase I will mine 67.3 Mt of rocks including 16.2 Mt of mineralized material at 0.57% NiEq. Figure 16.6 illustrates the Phase I pit at the end of Year 3.

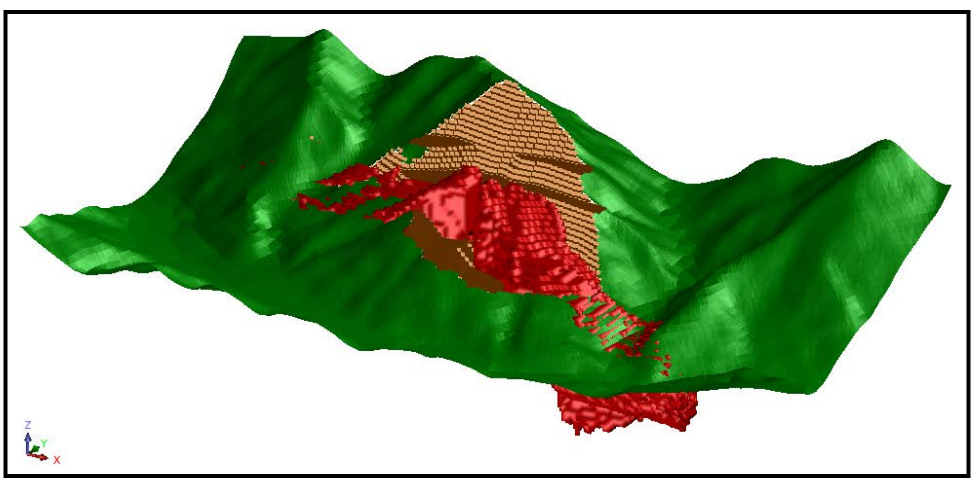
Figure 16.6 3D Rendered Image of Phase I Pit and Mineralized Area



PHASE II

During Phase II, the pit will deepen and expand to the west. Phase II will involve the mining of 89.6 Mt of mineralized material, which will satisfy the capacity of the mill for 8 years. Figure 16.7 illustrates the Phase II pit at the end of Year 11.

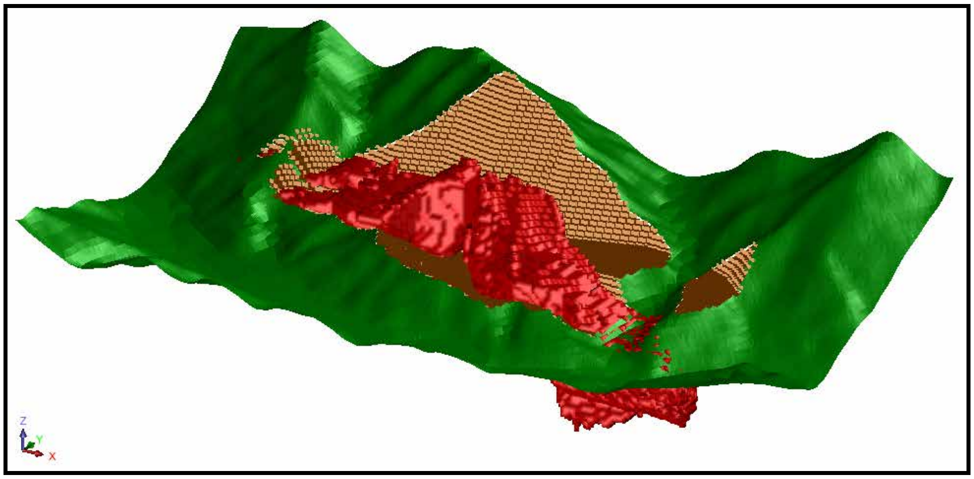
Figure 16.7 3D Rendered Image of Phase II Pit and Mineralized Area



PHASE III

During Phase III, the pit will deepen and expand to the east, west, and south. Phase III will involve the mining of 100.8 Mt of mineralized material, which will satisfy the capacity of the mill for 9 years. Figure 16.8 illustrates the Phase III pit at the end of Year 20.

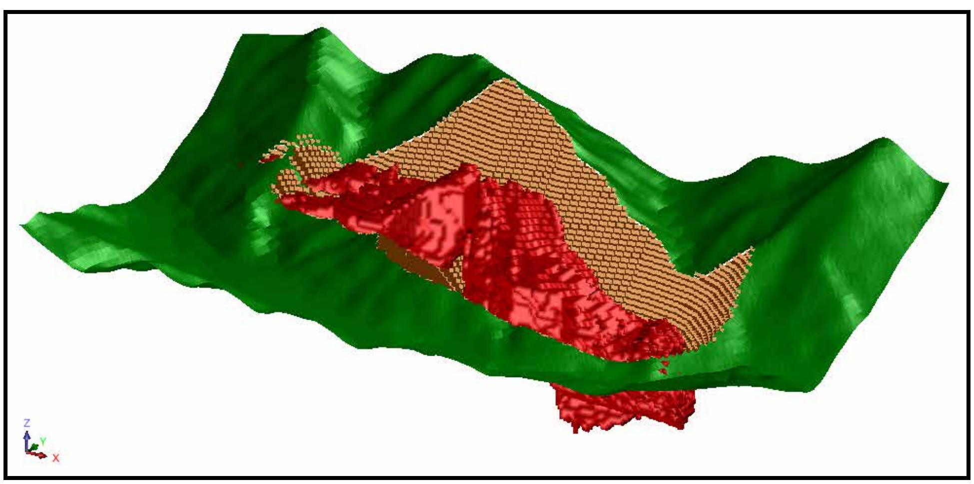
Figure 16.8 3D Rendered Image of Phase III Pit and Mineralized Area



PHASE IV

During Phase IV, the pit will deepen and expand primarily to the east. Phase IV will involve the mining of 100.8 Mt of mineralized material, which will satisfy the capacity of the mill for 9 years. Figure 16.9 illustrates the Phase IV pit at the end of Year 29 of the mine life.

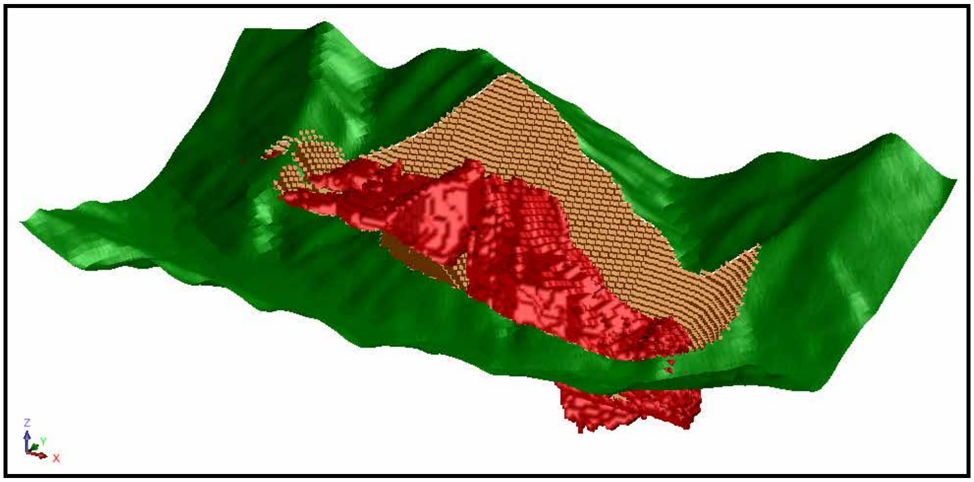
Figure 16.9 3D Rendered Image of Phase IV Pit and Mineralized Area



Phase V

During Phase V, the pit will expand to the east and south; the remaining mineralized material inside the base case pit will be mined to achieve the final highwall. Phase V will involve mining 97.9 Mt of mineralized material. Phase V corresponds to Pit Shell 26 and the end of the LOM.

Figure 16.10 3D Rendered Image of Year 38 Pit and Mineralized Area



16.5.1 *In-pit Road Width*

In-pit ramps were designed with an overall ramp width of 35 m, and a maximum gradient of 10%. A safety berm and an internal water ditch will be provided for two lane traffic to accommodate 225 t haul trucks.

16.5.2 *Pit Water Handling*

The progressive development of the open pit will result in increasing water infiltration from precipitation and groundwater inflows. As the pit deepens and increases in footprint, it will be necessary to control water inflow through the construction of in-pit dewatering systems such as drainage ditches, sumps, pipelines and pumps.

16.5.3 *Waste Rock Disposal*

Waste rock stockpile locations will be established at the east side and the south side of the final pit boundary.These locations will be further evaluated in the next level of study, with further discussion on terrain, geotechnical, environmental, etc. aspects.

16.5.4 EXPLOSIVES

A contractor will supply, deliver and load explosives into the blastholes under the supervision of the drill/blast foreman. The contractor will erect a plant and storage facility on-site.

16.6 ULTIMATE PIT DESIGN

Based on the optimization results and current geological model, Tetra Tech used Pit Shell 26 as the guide for the ultimate pit design, the results of which are provided in Table 16.7. Tetra Tech assumed an overall mining recovery of 95% and a waste rock dilution of 5%. The design has 4% less mineralized material and waste contained in the pit compared to Pit Shell 26. The pit design can be improved with further design work. This ultimate pit was designed to check the practicality of the final pit shell that was used in the production schedule.

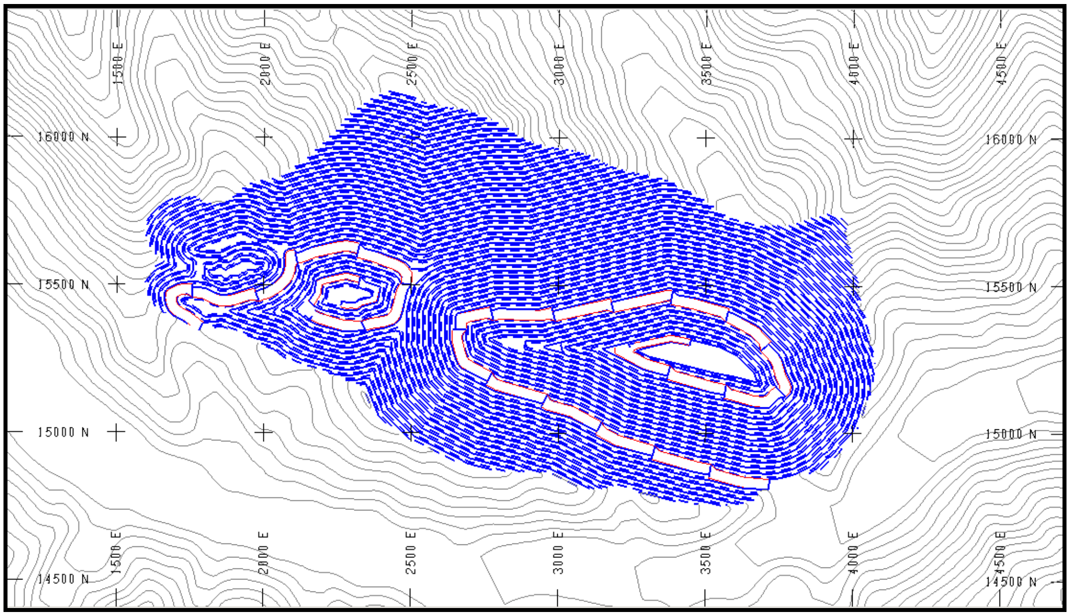
Table 16.7 Ultimate Pit Design Results*

Rock	NiEq (%)	Tonnes	Ni (%)	Cu (%)	Pt (g/t)	Pd (g/t)	Au (%)	Co (%)	NiEq (%)
Indicated	0.22 > 100.0	14,567,641	0.69	0.62	0.99	0.73	0.51	0.05	1.40
Inferred	0.22 > 100.0	374,446,759	0.33	0.25	0.40	0.35	0.17	0.02	0.63
Total Mineable Resource		389,014,400	0.34	0.27	0.42	0.36	0.19	0.02	0.66
Inferred	0.0 > 0.22	28,417,639	0.07	0.03	0.04	0.06	0.02	0.01	0.13
Waste	0.0 > 0.22	978,436,132	-	-	-	-	-	-	-
Total Waste		1,006,853,771	-	-	-	-	-	-	-
Total Rocks Mined		1,395,868,171	-	-	-	-	-	-	-
Stripping Ratio		2.59	-	-	-	-	-	-	-

Note: *These numbers were not used in production scheduling. Production scheduling was done based on optimum pit shell.

Figure 16.11 illustrates the ultimate pit design. The pit can be accessed either a west side or east side entrance. There are two distinctive bottoms for the pit that are separated by a discountinuity in the deposit. The east side of the pit is the deepest part and will be mined at the end of the mine life.

Figure 16.11 Ultimate Pit Design – Plan View



The dimensions and related statistics of the ultimate pit design are provided in Table 16.8.

Table 16.8 General Pit Statistics

Item	Size
Approximate Pit Top Elevation	1,920 m
Pit Bottom Elevation	920 m
Approximate Pit Depth	1,000 m
Volume of Pit	508,000,000 m^3
Area of Pit Limits	2,200,000 m^2
Perimeter of Pit Limits	6,420 m
Length from East to West	2,500 m
Length from North to South	1,400 m

16.6.1 ULTIMATE PIT DESIGN CRITERIA

The ultimate pit design was based on the design criteria presented in Table 16.9.

Table 16.9 Pit Design Criteria

Item	Value
Overall Pit Slope Angle	45°
Bench Height	10 m
Batter Angle	72°
Catch Bench Width	12.0 m
Benching	Double
Ramp Width, Double Lane	35 m
Ramp Gradient	10%
Minimum Mining Width	40 m

Table 16.10 summarizes the calculation for the double lane ramp width complete with allowances for safety berms and ditches.

Table 16.10 Pit Design Ramp Width Calculation

Item	Value
Truck Parameters	
Selected Truck Size	225 t
Operating Width	8.3 m
Operating Width Multiplier	3.5
Double Lane Road Width	29.1 m
Berm	
Tire Overall Diameter	3.6 m
Height (3/4 of largest tire)	2.7 m
Slope (H:V)	1.3:1
Berm Width	7.0 m
Ditch	
Depth	1 m
Slope (H:V)	1:1
Ditch Width	2.0 m
Total Road Width	**40.0 m**

The proposed minimum mining width must be greater than the minimum double-side loading width for an excavator (35 m). Based on a 21 m^3 (bucket capacity) diesel hydraulic shovel loading 225 t haul trucks, an approximate minimum mining width was determined to be 40 m. Mining widths throughout the open pit easily exceed this minimum mining width requirement; only two benches at the bottom of the pit will have a 40 m mining width. For this area, smaller equipment will be utilized.

16.7 Mine Equipment Selection

The type, size, and number of required equipment units are included in Appendix D. The fundamental criteria in the selection of the mining fleet are:

- mine production rate of 32,000 t/d of mill feed and 80,000 t/d of waste rock
- work schedule of 350 d/a, 2 shifts/d, 12 h/shift.

Each major piece of equipment was selected based on the following:

- drilling: blasthole diameter and pattern size
- blasting: amount of explosives to be supplied, delivered and loaded into blastholes by contractor
- handling of materials: load the material into trucks, haul the mineralized material 8 km to mill and haul the waste material 4 km to waste dump.
- performance rate: equipment specifications and productive time.

Auxiliary equipment will be required for:

- road construction and maintenance
- servicing major equipment.

Table 16.11 shows the proposed mining equipment and the peak number of units required during the life of mine.

Table 16.11 Major Mine Equipment Fleet Peak Requirements

Equipment Fleet	Size	Units
Haul Trucks	225 t	35
Shovels	21 m^3 bucket	4
Loader	18 m^3 bucket	1
Primary Drills	251 mm	3
Track Dozers	433 kW, 306 kW	7
Graders	164 kW	3
Water Truck	50 t	1
Backhoe Excavator	4.3 yd^3	1
Utility Loader/Tire Handler	-	1
Boom Truck	20 t	1
Welding/Service Truck	-	1
Fuel/Lube Truck	13,000 L	1
Flatdeck/Float	20 t	1
Crane	25 t	1
Light Vehicles (Pick-up Trucks)	0.5 t	25

table continues…

Equipment Fleet	Size	Units
Crew Buses	40 passengers	3
Portable Light Towers	6 kW	8
GEN-SET (Site Back-up)	-	2
Pumps	-	2

17.0 RECOVERY METHODS

17.1 PROCESS DESCRIPTION

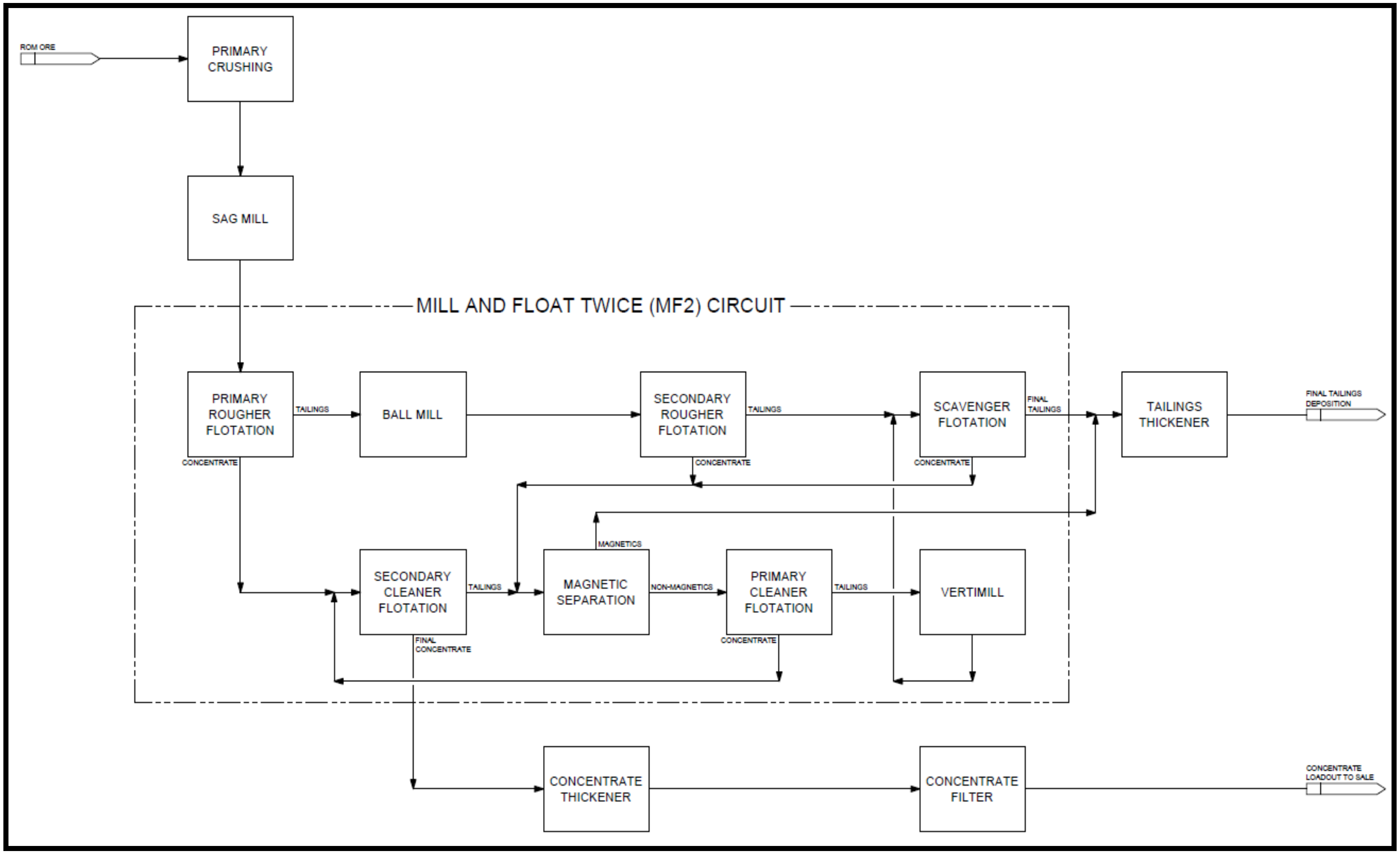
A description of the proposed process that will be used to create a bulk nickel/copper concentrate at the Property is presented below. The throughput will be 32,000 t/d. The Wellgreen run-of-mine (ROM) mineralized material will be subjected to primary crushing, primary grinding, a MF2 flowsheet, tailings and concentrate thickening, concentrate load out, and tailings disposal in a TMF. A bulk concentrate will be created for sale or toll-smelting off of the Property. The entire process from crushing to concentrate load out will be carried out in two identical trains. For simplicity, only one of the trains is described below and is presented in Figure 17.1.

The primary crusher will be a jaw crusher fed by a loader off of the ROM stockpile. The loader will dump onto a grizzly, with the oversize from the grizzly feeding the jaw crusher. The undersize from the grizzly will fall directly to an apron feeder along with the jaw crusher product. The combined product from the jaw crusher and the grizzly undersize, will be fed by apron feeder and conveyor to the coarse mineralized material stockpile. Material will be drawn at a constant rate by apron feeders below the coarse mineralized material stock pile, feeding the SAG mill feed conveyor. The conveyor will deliver the crushed material to the SAG mill feed chute.

The SAG mill grinding will be done on a slurry. The SAG mill product will be passed through a double deck vibrating screen. The first deck will have a 13.2 mm aperture and the second deck will have a 2 mm aperture. Material smaller than 2 mm (-2 mm) will continue on to primary rougher flotation. Material larger than 13.2 mm (+13.2 mm) will be recycled back to the SAG mill. Material which is smaller than 13.2 mm but larger than 2 mm (-13.2 mm and +2 mm) will be fed directly to the ball mill feed inlet with the primary rougher tail. The SAG mill product will be subjected to a MF2 flowsheet which was developed in South Africa for processing PGE mineralized material.

In the first stage of the MF2 flowsheet, the SAG product will be subjected to a flash flotation (i.e. primary rougher) to recover as much of the platinum, palladium, nickel, and copper minerals as possible at a coarse grind. Pyrrhotite depressants will be used to try and optimize the grade of the concentrate. The concentrate from the primary rougher will be sent to the secondary cleaner. The tail from the primary rougher will be subjected to secondary grinding in a ball mill.

Figure 17.1 Overall Wellgreen Process Block Flow Diagram



The feed to the secondary cleaner consists of the primary rougher concentrate and the primary cleaner concentrate. The secondary cleaner concentrate is the final concentrate that will be pumped to the concentrate thickener. The overflow from the concentrate thickener will be recycled as process water where needed. The underflow from the concentrate thickener will be pumped to a concentrate holding tank. The final concentrate will be pressure filtered and loaded out for sale and/or toll smelting. Load out will be done by conveyor directly into 50 t trucks. The secondary cleaner tail will be sent for magnetic separation prior to being fed to the primary cleaner.

The primary cleaner feed consists of the secondary cleaner tail, the secondary rougher concentrate, and the scavenger concentrate. The primary cleaner feed will be subjected to a high-intensity magnetic separator which will be used to remove the magnetic pyrrhotite present in the primary cleaner feed. The magnetic pyrrhotite, if not separated out, would float with the valuable platinum, palladium, nickel and copper sulphide minerals and lower the grade of the subsequent concentrate. The magnetic material pulled off by the magnetic separator will be conveyed to the tailings thickener for disposal in the tailings impoundment. The non-magnetic material will be pumped as feed to the primary cleaner.

The primary cleaner tail is subject to tertiary grinding in a vertimill. The product from the vertimill is 80% passing 45 µm. This becomes the feed to the scavenger along with the secondary rougher tail. The scavenger tail is the final tail which is thickened and disposed of in the TMF. The overflow from the tailings thickener will become process water where needed and the underflow will be pumped to the TMF.

As mentioned previously, the primary rougher tail is pumped to a ball mill for secondary grinding. The ball mill is in closed circuit with a hydrocyclone cluster. The underflow from the hydrocyclones will be oversize material recycled back to the ball mill. The overflow will be the 80% passing 75 µm which will be pumped to the secondary rougher as flotation feed. Pyrrhotite depression will be used in the secondary rougher to try and create a high grade concentrate.

The MF2 circuit has been used successfully in South African platinum mines (e.g. UG2 mineralized material) to generate PGE concentrates. Although developed primarily for UG2 mineralized material, the MF2 configuration offers certain advantages such as prevention of over-grinding and slimes generation, increased rejection of talc, chlorite and pyrrhotite and early recovery of PGM. The gradual size reduction will ensure that the quick floating valuable sulphide minerals are obtained in the primary rougher, and the secondary and tertiary stages of grinding should liberate the locked valuable minerals to be floated in later stage concentrates. Pyrrhotite depression and magnetic separation will be employed to remove some of the pyrrhotite and try to optimize the final concentrate grade. This is the proposed ciruit based on the available test work, however the final circuit configuration remains to be determined.

17.2 PROCESS DESIGN CRITERIA

The design criteria have been based on the previous laboratory work completed by Lakefield (et al.), G&T and the latest program at SGS (refer to Appendix C for SGS's report). The key items have been listed in Table 17.1.

Table 17.1 Process Design Criteria

Criteria	Measurement
Throughput	
Mill Availability	95%
Operating Days	350
Annual Throughput	11,200,000 t/a
Daily Throughput	32,000 t/d
Hourly Throughput	1,334 t/h
Hourly Throughput per Train	667 t/h
Feed Grade, Ni	0.32%
Feed Grade, Cu	0.26%
Feed Grade, Co	0.02%
Feed Grade, Pt	0.41 g/t
Feed Grade, Pd	0.35 g/t
Feed Grade, Au	0.18 g/t
Mineralized Material SG	3.22 t/m^3
Grind	
Abrasion Index (Ai)	0.088
SAG Recirculating Load	15%
SAG Feed Size	-340 mm
SAG Transfer Size, T_{80}	1,000 µm
Ball Mill Work Index (BWi)	19.7 kWh/t
Ball Mill Product Size, P_{80}	74 µm
Ball Mill Recirculating Load	250%
Vertimill Product Size	45 µm
Float	
Collector	SIPX
Frother	MIBC
Modifier	CMC

Note: SIPX = sodium isopropyl xanthate; MIBC = methyl isobutyl carbinol; CMC = carboxymethyl cellulose

17.3 MAJOR EQUIPMENT LIST

The major pieces of equipment that have been used to determine the capital and operating costs are listed in Table 17.2.

Table 17.2 Equipment List

Equipment	Quantity	Size	Unit Power (kW/unit)
Stockpile Feed Conveyor	1	200 m long x 106.7 cm wide	75
Primary Jaw Crusher	2	122 cm x 152 cm	225
SAG Mill Feed Conveyor	1	200 m long x 106.7 cm wide	75
SAG Mill and Drive	2	7.0 m diameter x 3.0 m long	2,710
Grinding Mill Liner Crane	2	-	56
Ball Mills and Drives	2	6.24 m diameter x 14.68 m long	11,750
Primary Rougher Flotation Cell Bank	2	10 cell; 14.2 m^3/cell	30
Secondary Rougher Feed Thickener	2	122 m diameter	56
Secondary Rougher Flotation Cell Bank	2	10 cell; 111 m^3/cell	150
Primary Cleaner Flotation Cell Bank	2	10 cell; 14.2 m^3/cell	30
Secondary Cleaner Flotation Cell Bank	2	10 cell; 8.5 m^3/cell	22
Scavenger Flotation Cell Bank	2	10 cell; 200 m^3/cell	150
Air Compressor	2	235 cm capacity	1,500
Concentrate Thickener	2	15.2 m diameter	2
Concentrate Pressure Filter	2	121 m^2 filtration area	15
Tailings Thickener	2	122 m diameter	56

Allowances have been made for pumps to move slurry and solutions where required. Also, equipment for reagent preparation, storage, concentrate load out, and an assay/test laboratory have been considered.

17.4 REAGENTS

The reagents used in the design and costing are based on the current metallurgical test program at Lakefield. SIPX will be used as the collector for the nickel/copper sulphide flotation. MIBC will be used as the frother and CMC will be used as a modifier.

17.5 PROCESS PLANT

The process plant is located along the main access road to the Property, approximately 5 km from the Alaska Highway turn off as shown in Figure 18.1. It is located approximately 9 km from the pit and 1 km from the TMF. Both the dump pocket and the primary crusher will be housed in an open structure. All grinding, flotation, reagent preparation, concentrate loadout, and ancilliaries will be housed in a heated building to protect the equipment from the cold Yukon climate. The large tailings thickeners will remain outside.

17.6 PROCESS CAPITAL AND OPERATING COSTS

The process capital and operating costs have been summarized in Table 17.3 and Table 17.4 respectively. The process capital costs are based on the equipment list as shown in Table 17.2 as well as estimates for the buildings and supporting infrastructure required for the equipment.

Table 17.3 Process Capital Cost Summary

Process Area	Capital Cost (US$)
Mineralized Material Storage and Recovery	5,980,804
Crushing	10,126,321
Milling (Building and Mills)	135,723,509
Flotation	19,278,854
Concentrate Dewatering, Storage, and Load-out	3,314,964
Reagent Preparation	2,943,091
Grand Total	**177,367,543**

The process operating costs are based on the power, labour, and consumables estimated for the mill in operation.

Table 17.4 Process Operating Costs

	US$/t milled	Annual Cost (US$)	Percentage (%)
Electrical Power	8.28	92,737,776	47
Labour	0.69	7,706,981	4
Consumables	8.68	97,271,303	49
Grand Total	**17.65**	**197,716,060**	**100**

18.0 INFRASTRUCTURE

The overall site plan for the Project is illustrated in Figure 18.1.

18.1 ACCESS ROADS

The Wellgreen open pit area is approximately 14 km away from the Alaska Highway and is currently accessed by a gravel road. The process plant area is located 5 km from the access road turn off and the open pit a further 9 km along the access road.

The access road will require upgrading for the Project.

18.2 PROCESS PLANT AND ANCILLARY FACILITIES

The process plant building includes grinding, flotation, concentrate thickening, reagents and process ancillaries. The primary crusher building and mineralized material stockpile feed to the process plant with conveyors.

The administration building/clinic, core logging facility, cold storage, maintenance shop/warehouse and truck shop buildings as well as fuel storage are located in the vicinity of the process plant area.

The permanent camp is located approximately 1.5 km away from the process plant area.

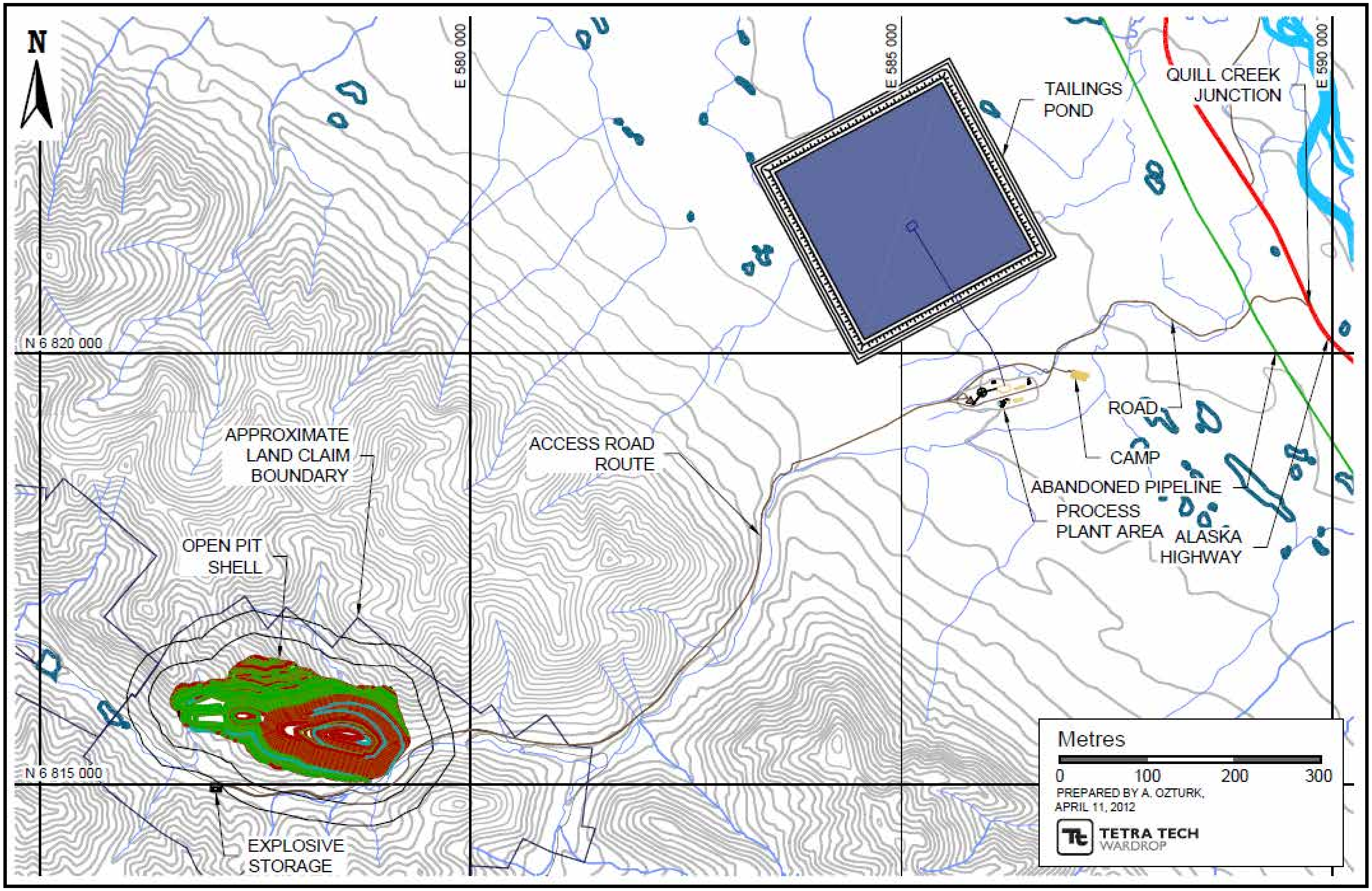
18.3 POWER

Power supply sources for the Property have been considered in two groups:

- draw power from a utility-owned power grid.
- generate power on-site without a connection to the utility power grid.

The total electrical running load for the Project is estimated to be 37 MW.

Figure 18.1 Wellgreen Project Overall Site Plan



As of September 2011, the generating capacity of the Yukon Electrical Company Limited (YECL) is 112 MW (75 MW from hydroelectric power generation stations, 36 MW from diesel generators and 1 MW from wind turbines). YEC is exploring the possibility of increasing its hydroelectric generating capacity by 30 to 40 MW between 2012 and 2020.

Drawing power from the YEC power grid will not be sufficient for the Project power demand at present. Therefore several options for on-site power generation without a connection to a power grid were considered for the property of the Project.

After overall evaluation (based on the criteria of the levelized cost of electricity (LCOE)), fuel supply availablity, power supply availability and continuity of service, constructability, ease of operation, maintainability, safety, and emission from combustion), a CHP plant with diesel fuel generator has been selected for the Wellgreen PEA. Fuel supply is assumed to be diesel natural gas which will be delivered by truck to the plant. The total power demand for the Project is estimated to be 40 MW which includes allowances of 10% for the power plant load, losses, contingency and future loads.

A power plant consisting of 6x10 MW (site condition performance) low speed engine generator sets (N+1), operating at 13.8 kV, 60 Hz output voltage, is considered sufficient to meet this demand.

Recovered heat energy from the CHP plant will be used for heating the process plant area infrastructure.

The LCOE for the Wellgreen PEA is estimated to be Cdn$0.28/kWh.

18.4 PROPOSED TAILINGS STORAGE

All tailings dams will be constructed of compacted rock fill using the downstream method with a geomembrane liner on the upstream face. The tailings impoundment footprint will be lined with a low density polyethylene liner over a layer of broadly graded silty sand and gravel, to act as low permeability bedding material and provide secondary containment.

Material for construction will be sourced from the site during initial construction and from the open pit, for the later raises during operations.

Based on the tailings storage requirements, the starter dams required to store one year of tailings plus freeboard will be 2.25 m high based on a conservative “rate of rise” for the dam. The final wall height will be 60 m.

In Year 28, a second impoundment will be built to contain the remaining tails. The TMF will have an ultimate capacity of approximately 280 Mm^3, corresponding to an ultimate impoundment surface area of 555 ha. The total catchment area of the TMF will be 740 ha.

Water dams are required during the construction period and initial years of operation. They will protect the lined upstream faces of the tailings starter dams from significant flood events, provide a reliable source of fresh water during operation of the process plant, and minimize runoff from the TMF. The water dams will be incorporated into the downstream toe of the dam and have been planned so that they will be constructed simultaneously with the starter dams before tailings placement.

19.0 MARKET STUDIES AND CONTRACTS

While the defaults occurring in the European economy and the risk of further defaults is a concern to the metals markets, the emerging economies will still support growth in the demand for metals. However, the outlook for the metals markets is still volatile despite continued growth in the demand for metals in China and India and a forecast that worldwide demand for metals will surpass that of 2011.

19.1 PLATINUM AND PALLADIUM

There is positive growth predicted for the platinum and palladium markets, but at a lower rate than anticipated. Table 19.1 and Table 19.2 show the demand and supply for platinum and palladium respectively, as well as predicted values for 2012. These predictions and the data in the tables, were sourced from a presentation created by Implats (a South African platinum miner) in February 2012. For 2012, Implats forecasted that the global supply will be short 335,000 oz of platinum and 980,000 oz of palladium.

Table 19.1 Platinum Demand and Supply

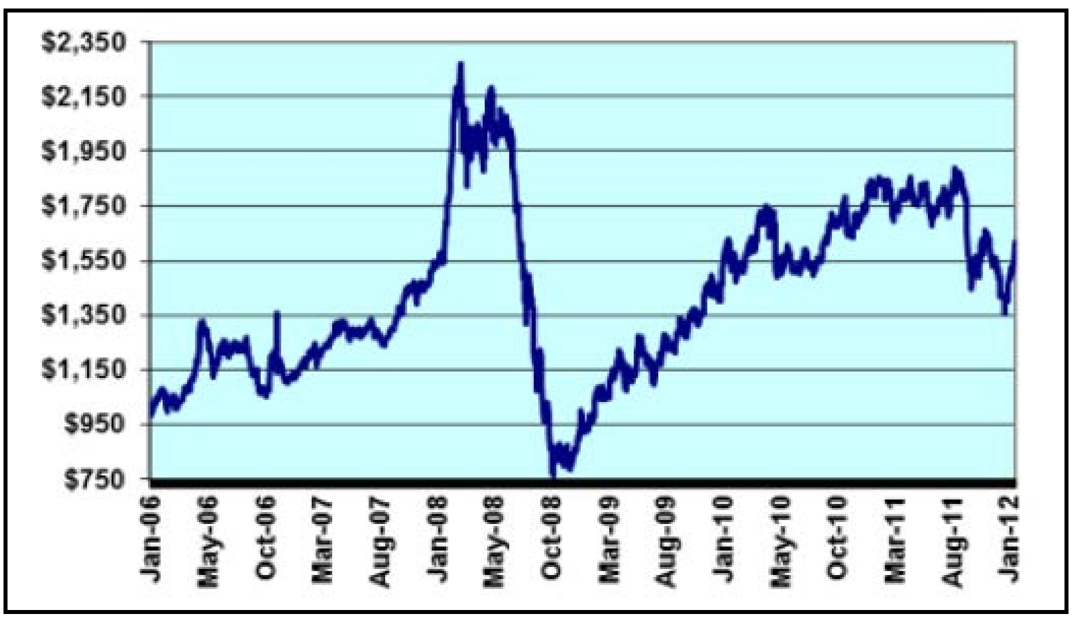
	2010 ('000 oz)	2011 ('000 oz)	2012 Forecast ('000 oz)
Platinum Demand			
Automobile	3,270	3,450	3,750
Jewellery	2,260	2,430	2,445
Industrial	1,695	1,725	1,780
Investment	650	150	100
Total Demand	**7,875**	**7,755**	**8,075**
Platinum Supply			
South Africa	4,735	4,705	4,625
North America	230	360	370
Other	1,015	920	830
Recycle	1,020	1,100	1,130
Russian Sales	800	790	785
Total Supply	**7,800**	**7,875**	**7,740**
Balance	**-75**	**120**	**-335**

Table 19.2 Palladium Demand and Supply

	2010 ('000 oz)	2011 ('000 oz)	2012 Forecast ('000 oz)
Palladium Demand			
Automobile	5,200	5,800	6,300
Industrial	3,155	3,160	3,130
Investment	1,055	-520	300
Total Demand	**9,410**	**8,440**	**9,730**
Palladium Supply			
South Africa	2,530	2,620	2,605
North America	665	865	930
Other	860	635	665
Recycle	1,370	1,530	1,800
Russian Sales	3,350	3,500	2,750
Total Supply	**8,775**	**9,150**	**8,750**
Balance	**-635**	**710**	**-980**

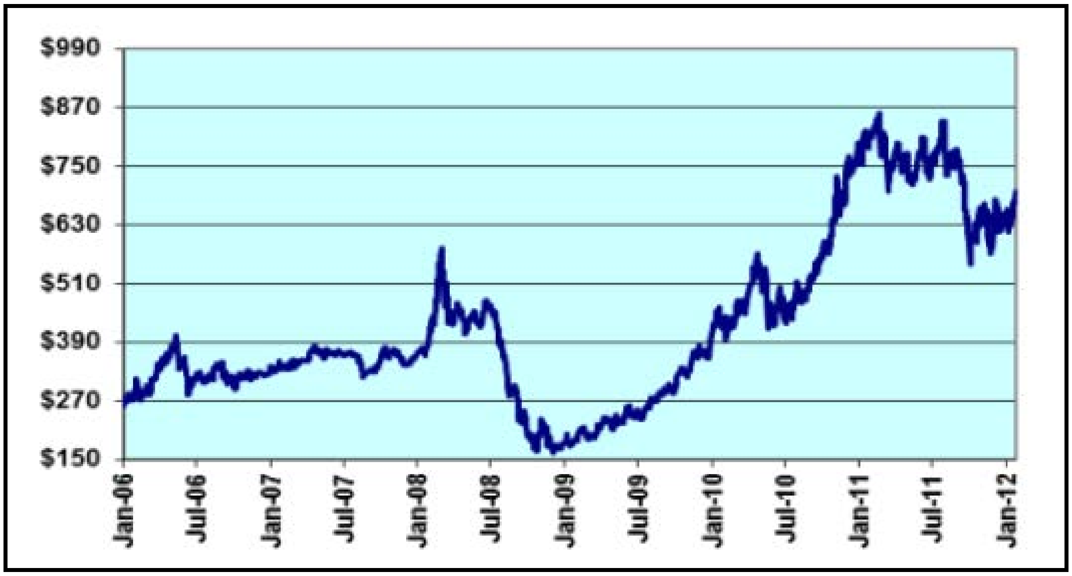
Platinum and palladium prices are also trending upwards as shown in Figure 19.1 and Figure 19.2.

Figure 19.1 Platinum Price



Note: Magilligan – Platinum Market Review – January 2012

Figure 19.2 Palladium Price



Note: Magilligan – Platinum Market Review – January 2012

19.2 COPPER AND NICKEL

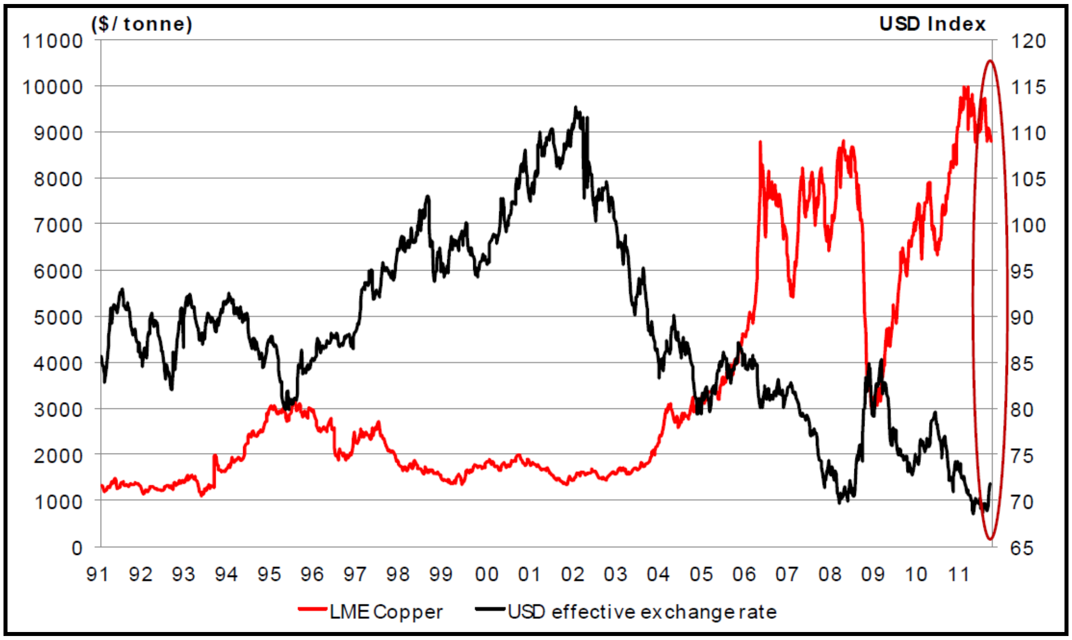
Copper and nickel demand is expected to grow but at slower rates than previously seen due to the economic uncertainty in the current marketplace. Copper supply is forecasted to exceed demand as presented in Table 19.3. The data in the table was sourced from a presentation by Société Générale from September 2011, on their outlook for copper.

Table 19.3 Copper Supply and Demand

	2010 (Mt)	2011 (Mt)	2012 Forecast (Mt)
World Refined Production	18.70	19.27	20.14
World Refined Production	18.78	19.40	19.96
Balance	**-0.08**	**-0.16**	**0.18**

As illustrated in Figure 19.3 the copper price has been trending upwards for the past three years and has achieved prices higher than pre-recession prices.

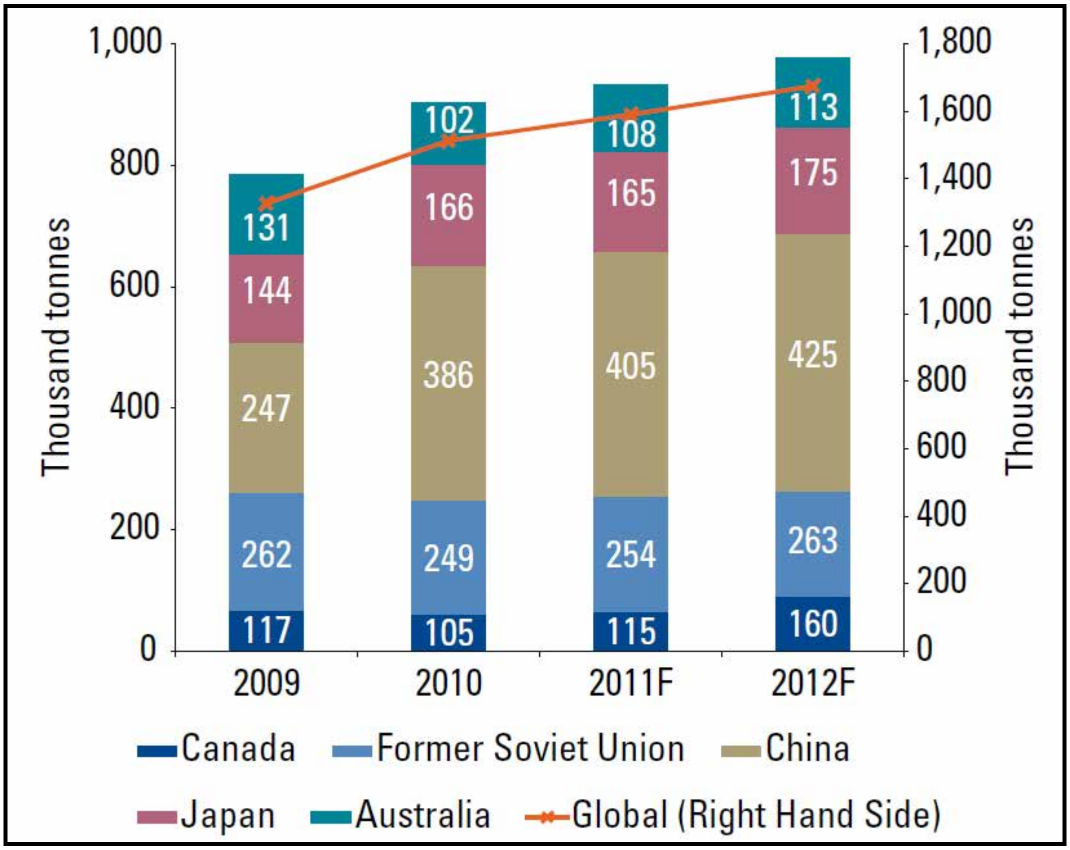
Figure 19.3 London Metals Exchange Copper Price and US Dollar Exchange Rate by Year



Note: Société Générale – September 2011

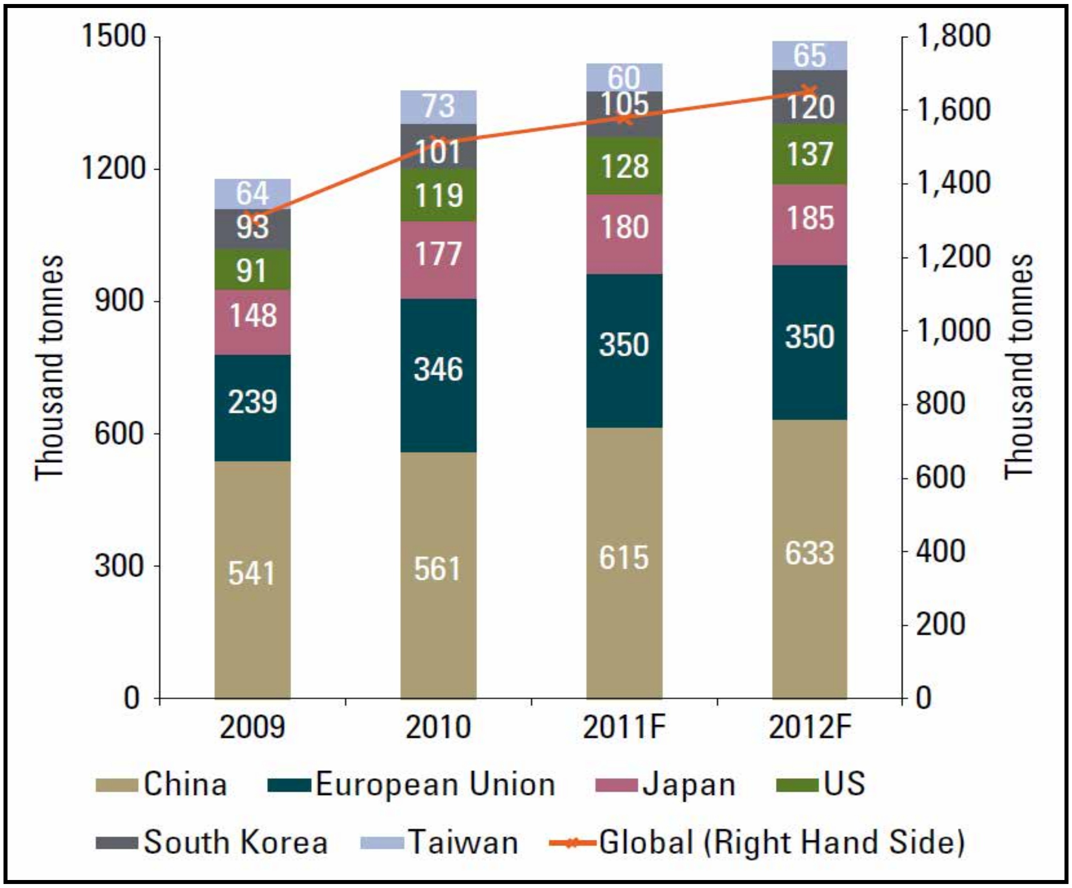
The concern for nickel, aside from the European defaults, is the lower cost in the production of nickel pig iron for the creation of stainless steel. The nickel pig iron is believed to be a key factor in regulating the demand and supply of nickel in the future. The forecast however, is that there will be surpluses of nickel in the next two years. It is also believed that the growing demand in the Brazil, Russia, India and China (BRIC) nations will create a deficit in the nickel production required to meet the demand in the years 2015 and 2016. Figure 19.4 and Figure 19.5 illustrate the global supply and demand for nickel (right hand chart axis) as well as supply and demand in selected nations (left hand chart axis).

Figure 19.4 Nickel Supply (2009 to 2012 Forecast)



Note: KPMG Commodity Outlook: Nickel, December 2011

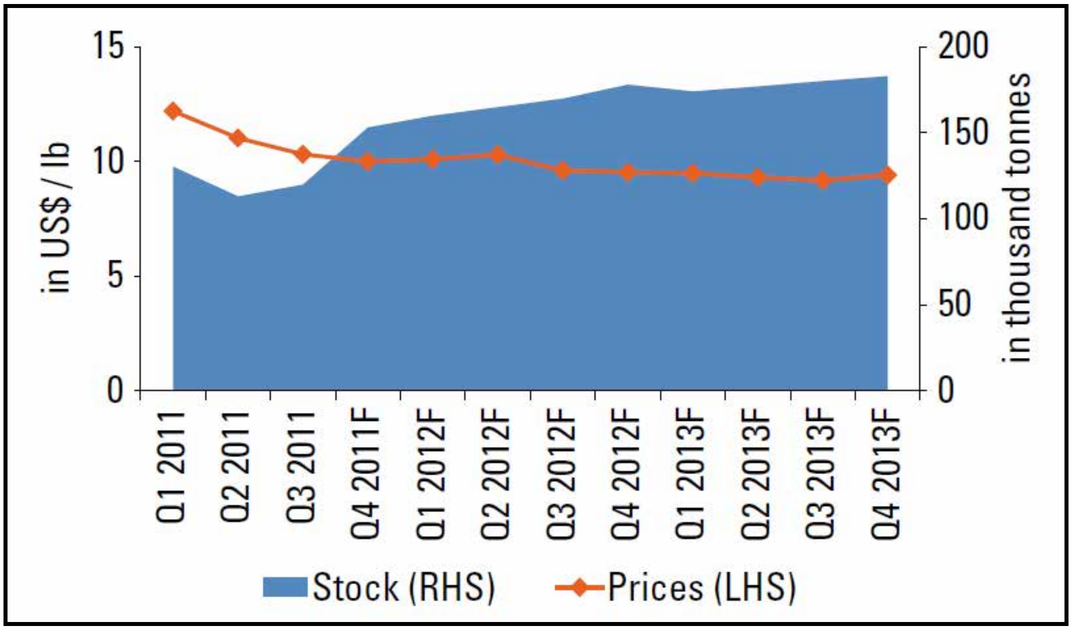
Figure 19.5 Nickel Demand (2009 to 2012 Forecast)



Note: KPMG Commodity Outlook: Nickel, December 2011

The current trend shown by a comparison of Figure 19.5 to Figure 19.4 indicates that nickel demand is increasingly surpassing supply. It is thought that there are not enough greenfield nickel projects and nickel exploration projects currently underway to fill this gap. Figure 19.6 illustrates the nickel stock and a flattening nickel price for the immediate future.

Figure 19.6 International Refined Nickel Stocks and Prices



Note: KPMG Commodity Outlook: Nickel, December 2011

For the metals discussed, the market trends indicate a continued softening copper demand owing to current over supply, a potential threat to nickel from increased nickel pig iron substitution in stainless steel and strong fundamental support for PGMs.

20.0 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

20.1 ENVIRONMENTAL CONSIDERATIONS

Development of the Property is expected to include an open pit mine, a conventional flotation mill, a tailings management area, and other surface facilities including a mine office, truck shop, warehouse, and permanent camp. The Property can be accessed from the Alaska Highway by a 14 km gravel road that parallels Quill Creek. Some portions of the access road will require upgrading, other portions will require rerouting.

This section of the PEA describes the following environmental and social considerations associated with the Project:

- environmental setting
- EA and permitting process
- socio-economic assessment and consultation process.

20.2 ENVIRONMENTAL SETTING

The Property is located approximately 317 km north west of Whitehorse in southwestern Yukon, at approximately 61°28'N latitude and 139°32'W longitude (Figure 20.1).

The Property is located in the Whitehorse Mining District, and lies within the Kluane Ranges, which are a continuous chain of foothills situated along the eastern flank of the Saint Elias Mountains. The topography across the Property is relatively rugged; most slopes are 250 to 300 m in height, and the highest peaks exceed elevation of 1,800 masl.

The climate in this area is alpine, but is tempered by the influence of the west coast. Winters are long, but temperatures are less extreme than those of areas located farther east. The weather station closest to the Project site with long-term data record is located in Burwash Landing, Yukon, which experiences an daily average temperature of -22°C in January, and an average daily temperature of 12.8°C in July. Overall area precipitation is generally light, with short periods of heavy precipitation. Average annual precipitation for Burwash Landing is 279.7 mm, 192 mm of which is rain, and 106.4 cm of which is snow. The area also experiences sporadic discontinuous (10 to 50%) permafrost (Yukon Water 2011).

20.2.1 Current and Historical Activity

The Project comprises two major areas: the mine site and the mill site. The mine site is composed of a lease covering a 69.754 ha parcel of land, located at approximately Mile 1111 of the Alaska Highway. Various operations have occurred in the area of the mining lease since the 1950s. Details of the operations are found in Section 6.0.

The mill site is a 62.56 ha parcel of land located approximately 1 km from the mine site, adjacent to the Alaska Highway. This area has been previously used as a mill site, as well as a tailings impoundment area (Section 4.0 and Section 6.0). Recent activities on the site include the use of the mill as a core shack and access to the mine site.

Prophecy Platinum and the Government of Yukon are in discussions concerning the responsibility for the Historic Liabilities identified at the mill site. These include the historic tailings impoundment, the former mill infrastructure and related alleged impacts at the mill site. While Prophecy Platinum believes there is a strong legal basis upon which to deny liability or responsibility in relation to the Historical Liabilities, it is uncertain whether Prophecy Platinum will be subject to any such liability or responsibility at this time.

20.2.2 Previous Environmental Work

Various independent environmental studies have been completed on site from 2008 through to 2011 by Access Consulting Group (Access Consulting) of Whitehorse, Yukon. The investigations include sampling pertaining to water quality, soil quality and tailings analysis. Reports included “Phase I Environmental Site Assessment, Wellgreen Mill Site” (Access Consulting 2009a), and “Wellgreen Property – Reclamation Progress Report” (Access 2011).

Phase I Environmental Site Assessment

In 2008 and 2009, a Phase I Environmental Site Assessment (ESA) was undertaken by Access Consulting. As part of the Phase I ESA, environmental sampling to characterize some areas of concern was completed, water quality, soil quality and tailings. Soil samples were collected from areas of concern, an area of battery storage, assorted storage of materials, such as functional and non-functional machinery and spots of hydrocarbon staining. Localized spots of apparent hydrocarbon staining were sampled, and indicted that most of the hydrocarbon staining exceeded the Yukon Contaminated Site Regulations (YCSR). The report identified four areas of potential environmental concern; the battery scrap area, the tailings pond, the mill concentrate and the isolated areas of hydrocarbon staining.

Tailings and mill concentrate samples were evaluated for acid rock drainage (ADR) characteristics and leachable metals. All samples had a neutralization potential (NP)/maximum potential acidity (MPA) ratio of less than 1, which is likely to be acid producing. All tailings samples exceeded the Canadian Council of Ministers of the Environment (CCME) Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health Guidelines for nickel and copper. Approximately 1.5 to 2 ha of the tailings are exposed to air and not underwater. Evidence of tailings were located in vegetated areas down gradient and outside of the tailings compound. This migration is believed to be the result of flooding; therefore, moving tailings to areas outside of the compound in 1988. This is observed in low laying areas surrounding the mill area.

Water quality samples were collected from water within the tailings compound in 2008. None of the samples exceeded the YCSR for aquatic life. One water sample characterizing the water to be removed from the tailings management area was collected in 2009. The sample exceeded the YCSR for aquatic life for cadmium, cobalt, copper, lead, molybdenum and zinc.

Soil samples were collected on site in 2009 in two areas identified as areas of potential concern, vehicle battery storage area and area of hydrocarbon staining. All three soil samples collected from the vehicle battery storage area exceeded the YCSR Soil Standards – Generic Numerical for lead and two samples exceeded the YCSR Industrial Soil Standards – Toxicity to Soil Invertebrates and Plants for antimony. Seven of the eight locations of hydrocarbon staining sampled exceeded the YCSR for petroleum hydrocarbons.

Wellgreen Property – Reclamation Progress Report

In 2011, Access Consulting provided a report outlining the activities that were completed as a condition of the 2009 Reclamation Plan. Work in two main focus areas was completed in 2010 and 2011; tailings pond monitoring and reclamation work.

Sampling of the tailings pond was completed twice annually, in June and August. YCSR standards for aquatic life exceedences were reported for total copper, cobalt, nickel concentrations at one sampling location, WGN-WQS3 in June 2010. In August 2010, exceedence for total cobalt and nickel were reported at two sampling locations, WGN-WQS2 and WGN-WQS3. No exceedences were reported in 2011. All exceedences were observed when water levels within the tailings pond were low and not decanting through the dam culvert.

As part of the reclamation work, several tests pits for removal of petroleum hydrocarbons, and antimony and lead contamination were completed. All petroleum hydrocarbon soil was removed from site and confirmatory samples were collected on all sides of the excavation. Sampling of soil potentially contaminated with lead and antimony was completed during 2010 and 2011. All contaminated soil was removed from situ and placed on-site on a sheet of plastic and covered. The soil remains on site until further discussion with the Government of Yukon have taken place to determine appropriate disposal methods.

20.2.3 Wildlife and Vegetation

The Property is located in the Boreal Cordillera Ecozone, within the Kluane Range of the Saint Elias Mountains ecoregion. This ecoregion contains vast ranges of ice fields and high elevation mountain peaks, and is a combination of permanent ice and snowfields with minor areas of rock outcrop, rubbly colluvium, and alpine tundra vegetation. Vegetation consists of typical low growing heather, dwarf birch, willow, grass and lichen. Wet areas surrounding water sources support cottonwood and sedges (Ecological Stratification Working Group 1996).

Characteristic wildlife in the Saint Elias Mountains ecoregion includes caribou, grizzly bear, Dall's sheep, and mountain goat (Environment Canada 1995). At least 150 species of birds have been observed in Kluane National Park and Reserve, of which 118 nest in the park. Extensive mapping of wildlife habitat use has been conducted within and around the Property (Figure 20.2 to Figure 20.7).

Habitat uses on the Property include:

- early winter habitat for thinhorn sheep
- all season habitat for mountain goat
- spring, summer and fall habitat for grizzly bear in areas on and surrounding Property along the Donjek River, Maple Creek, and Wade Creek
- migration corridor, fall rut, and winter range for Woodland caribou (Kluane and Aishihik herds)
- summer nesting habitat for Golden Eagle, Osprey (along Kluane River), Bald Eagle (along Kluane River), waterfowl and Peregrine Falcon (southeast of the Property).

Of the species listed above, the grizzly bear and the Woodland caribou (Northern Mountain population, including the Kluane and Aishihik herds) have been identified as Special Concern by the Committee on the Status of Endangered Species in Canada (COSEWIC). Woodland caribou (Northern Mountain population) are also listed as Special Concern on Schedule 1 of the federal *Species at Risk Act* (SARA).

The Baikal sedge is the only plant species in Yukon considered threatened by COSEWIC; it is also listed as threatened on Schedule 1 of SARA. The range of this species overlaps with the Property; it is also known to occur in the Kluane National Park and Reserve. The Baikal sedge occurs only on semi-stabilized or active sand dunes (COSEWIC 2005).

20.2.4 AQUATIC RESOURCES

The Property is located in the White River watershed, which is in the Upper Yukon minor drainage area of the Yukon River major drainage area, which drains north-west toward the Bering Sea (Environment Yukon 2010). The Yukon River watershed is the fifth largest drainage in North America in terms of discharge volume (YRITWC 2002).

The Property is located across the crest of a watershed divide. The western portion of the Property drain west via Arch Creek, Maple Creek and Wade Creek to Donjeck River. The remainder of the Property drains east, primarily via Nickel Creek to Quill Creek, and then to the Yukon River (Figure 20.8). Both the Kluane and Donjeck rivers flow north, and merge approximately 45 km north of the Property.

Project-specific aquatic resources studies have not yet been initiated. Hydrology and water quality data have been collected from five sampling stations located within 15 km of the Property. Samples have been collected from 2008 to present from Quill Creek (at Alaska Highway), Swede Johnson Creek (at Alaska Highway), Donjeck River (at Alaska Highway), and Arch Creek (near the mouth of Donjek River) (Yukon Water 2011).

Common fish species occurring in the region include Lake chub, pikes, Longnose sucker, Chum salmon, Chinook Salmon, Inconnu (predatory whitefish), Lake trout, Arctic grayling, Northern pike, Lake whitefish, Round whitefish, Slimy sculpin and burbot (Government of Yukon 2010).

20.2.5 PARKS AND PROTECTED AREAS

The Property is located within the Kluane Wildlife Sanctuary, created in 1942, which covers an area of approximately 22,000 km^2. Mineral tenures and exploration are permitted in Yukon wildlife sanctuaries as long as they are in compliance with the *Yukon Wildlife Act.* Activities such as hunting and trapping are prohibited within the Sanctuary, as prescribed by the *Yukon Wildlife Act* (B. McLean, pers. comm.).

Kluane National Park and Reserve is located immediately south of the sanctuary and the Tatshenshini-Alsek Wilderness Park abuts the sanctuary to the west (Environment Canada 1995). The proposed Asi Keyi Territorial Park is located immediately west of the Project area across the Donjek River. The Asi Keyi Territorial Park is yet to be established under the *Yukon Parks and Land Certainty Act* (Environment Yukon 2012).

Figure 20.1 Site Location

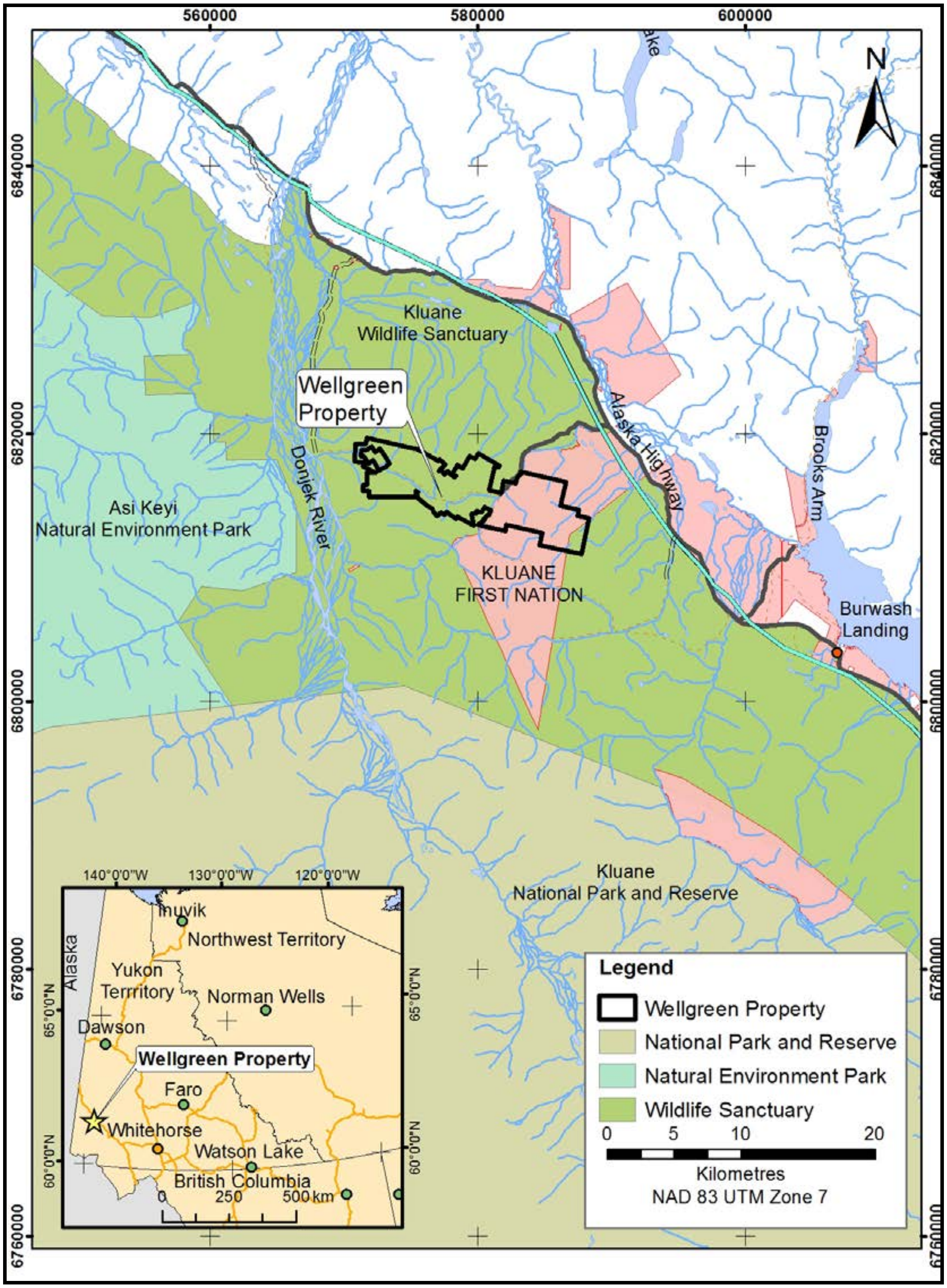


Figure 20.2 Wildlife Ranges-Woodland Caribou Key Areas and Mineral Licks

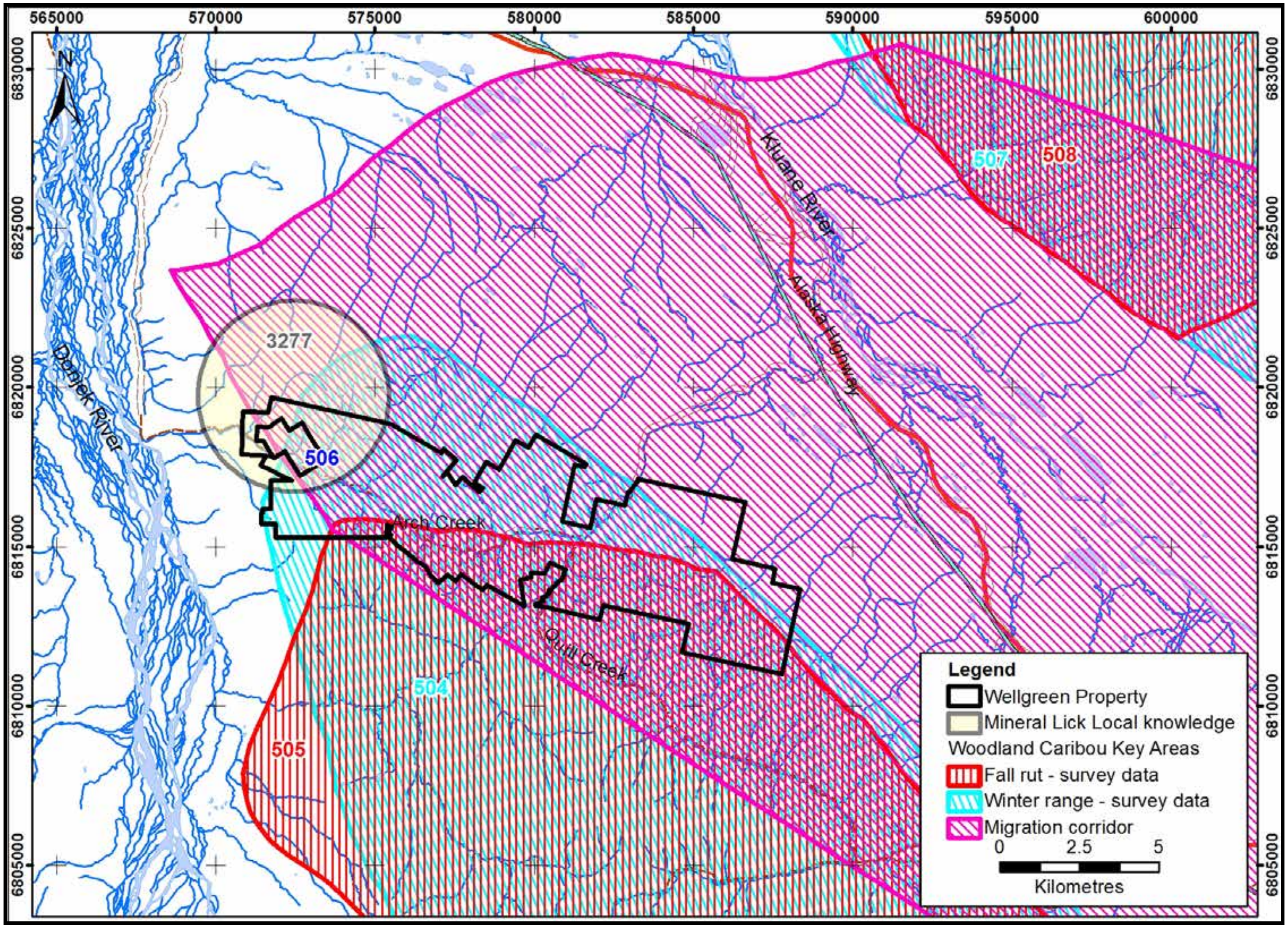


Figure 20.3 Wildlife Ranges-Thin Horn Sheep Key Areas

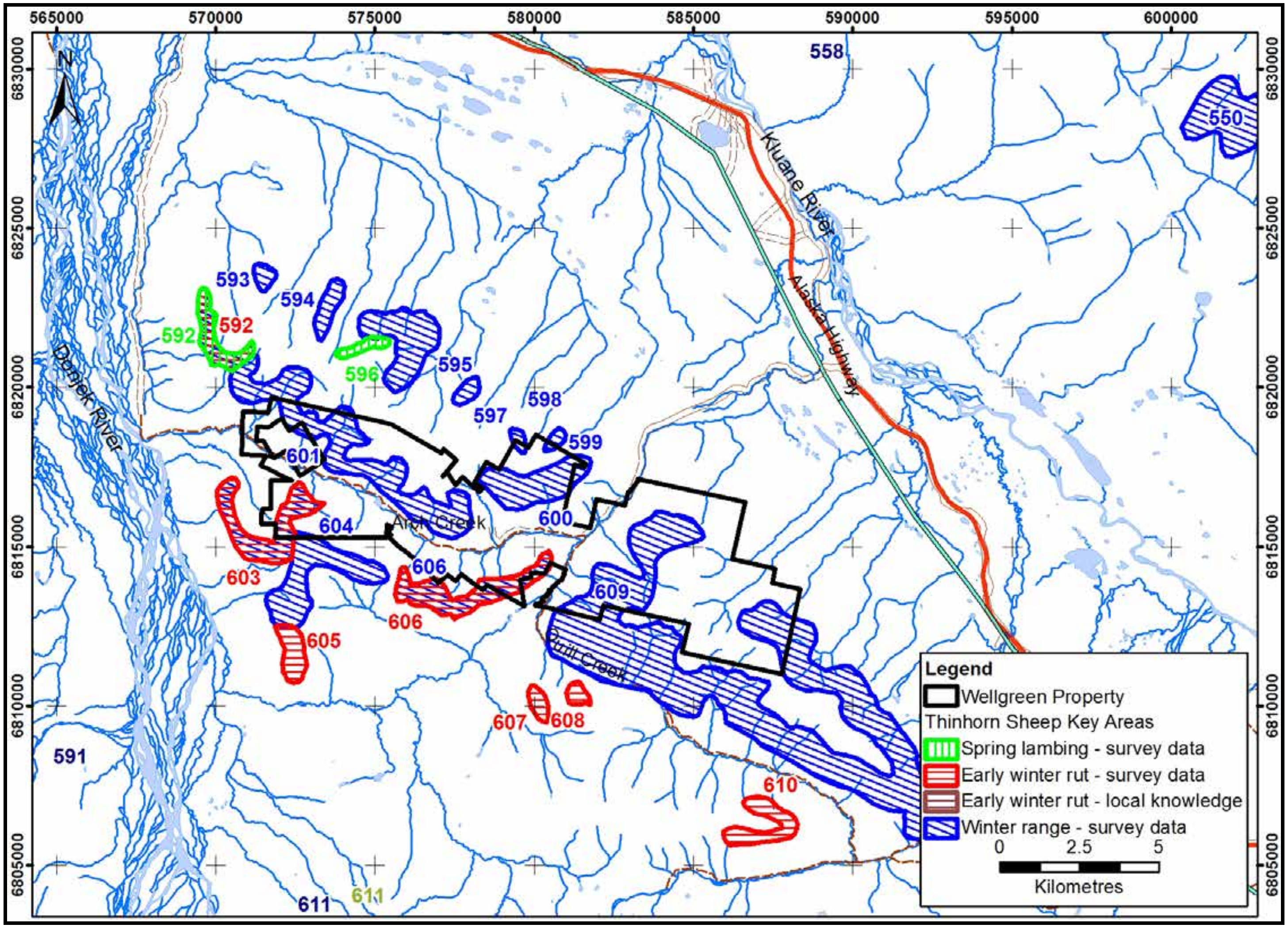


Figure 20.4 Wildlife Ranges-Mountain Goat Key Areas

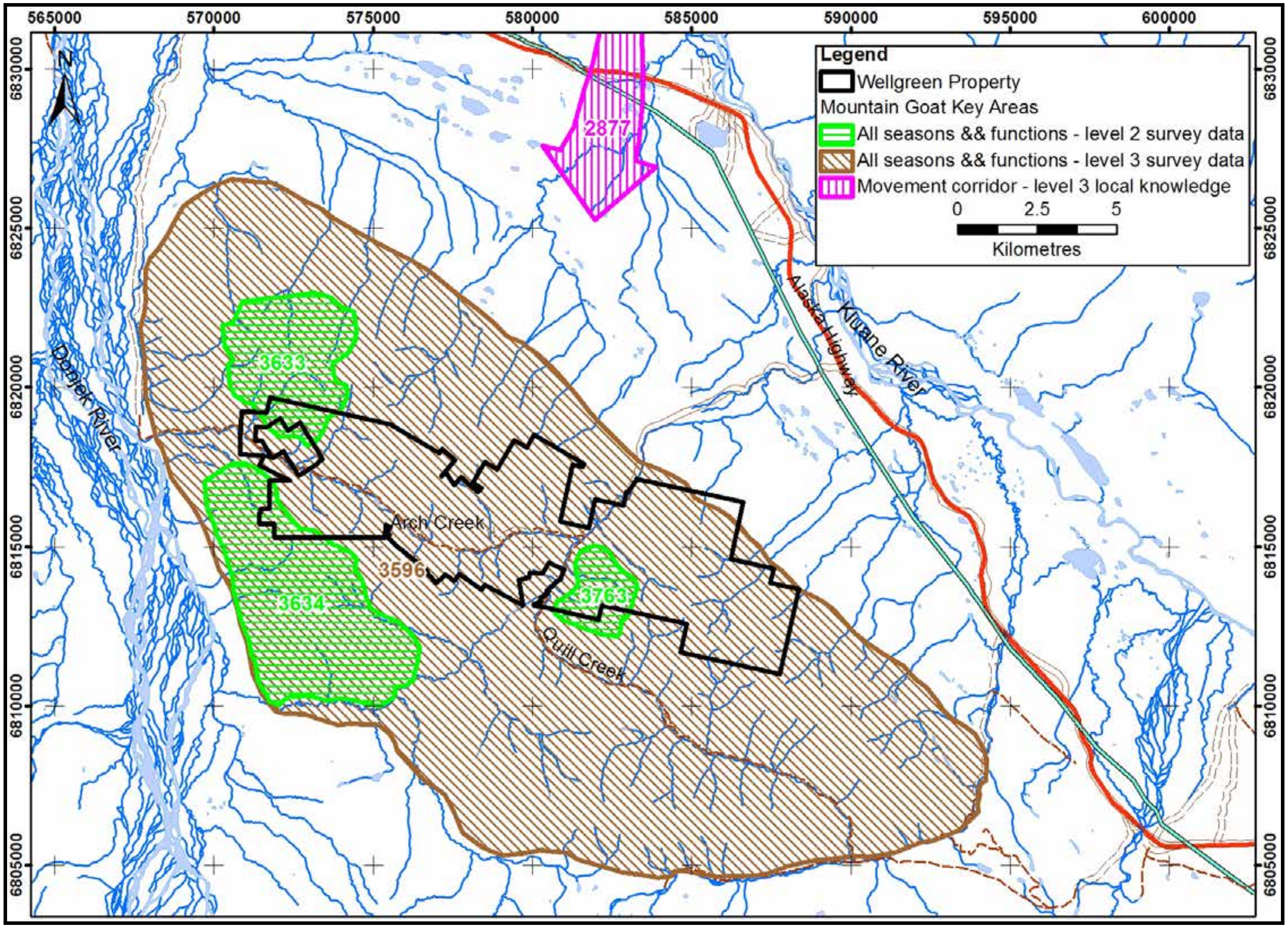


Figure 20.5 Wildlife Ranges-Moose Key Areas

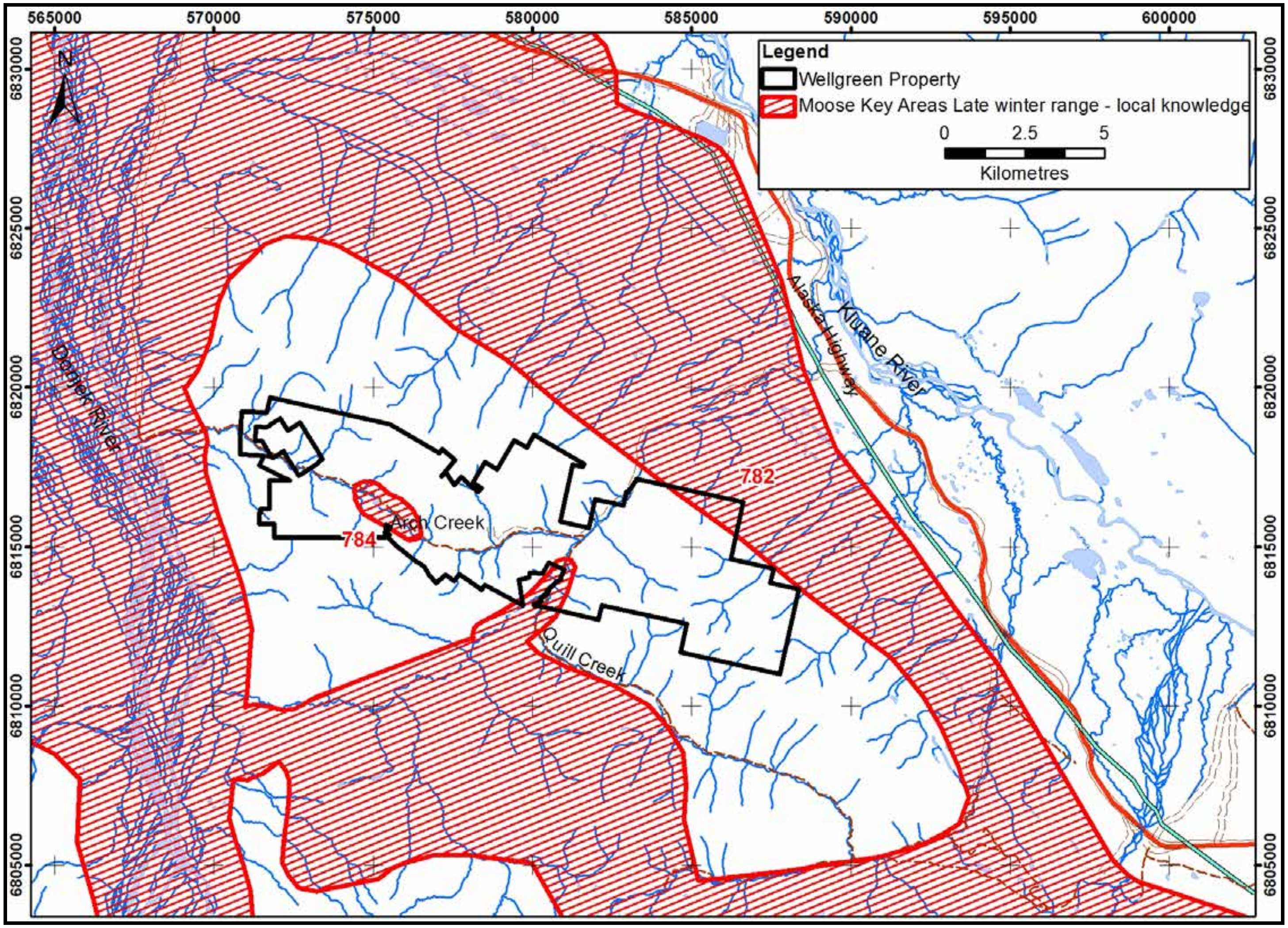


Figure 20.6 Wildlife Ranges-Grizzly Bear

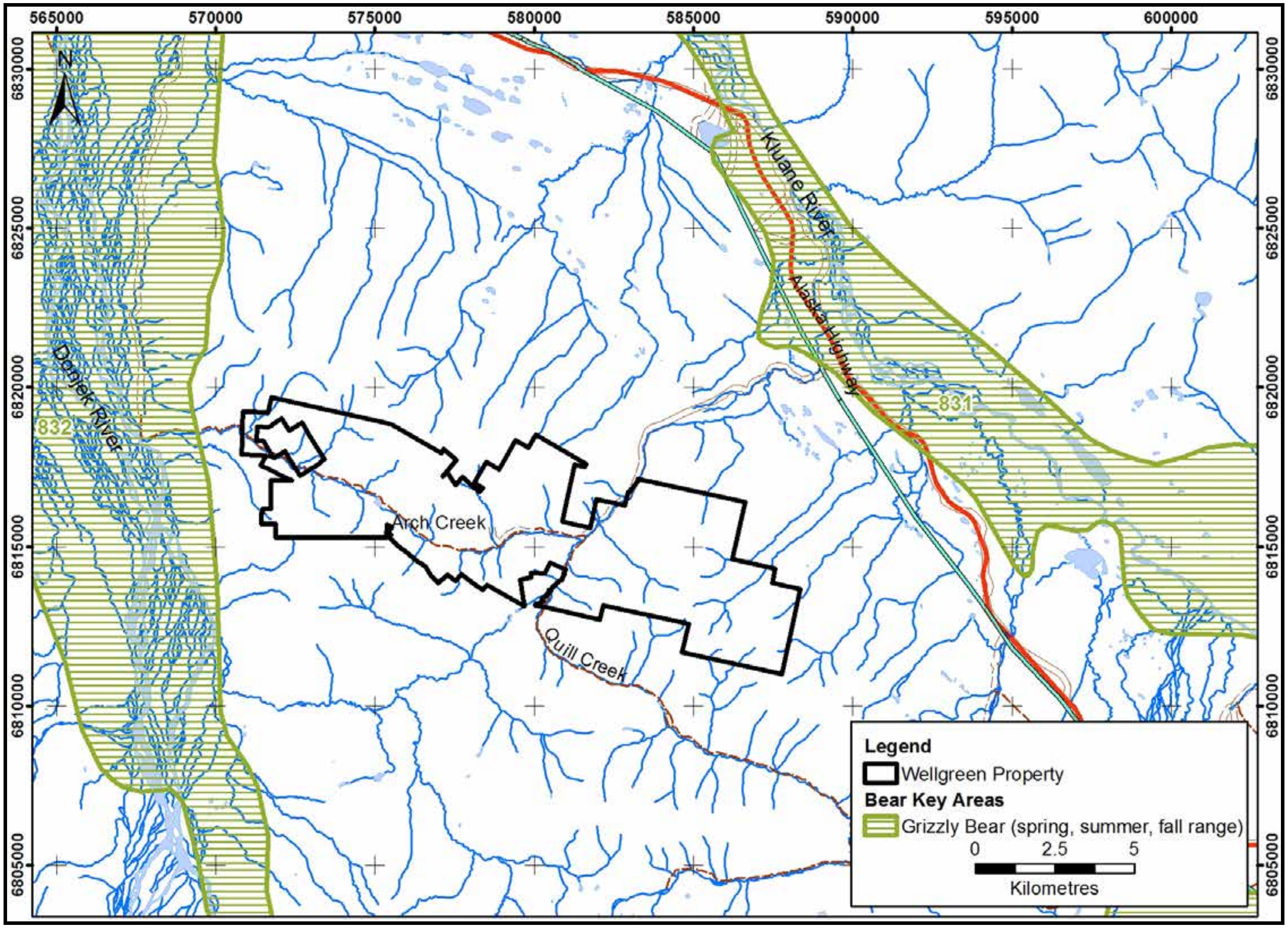


Figure 20.7 Wildlife Ranges-Birds

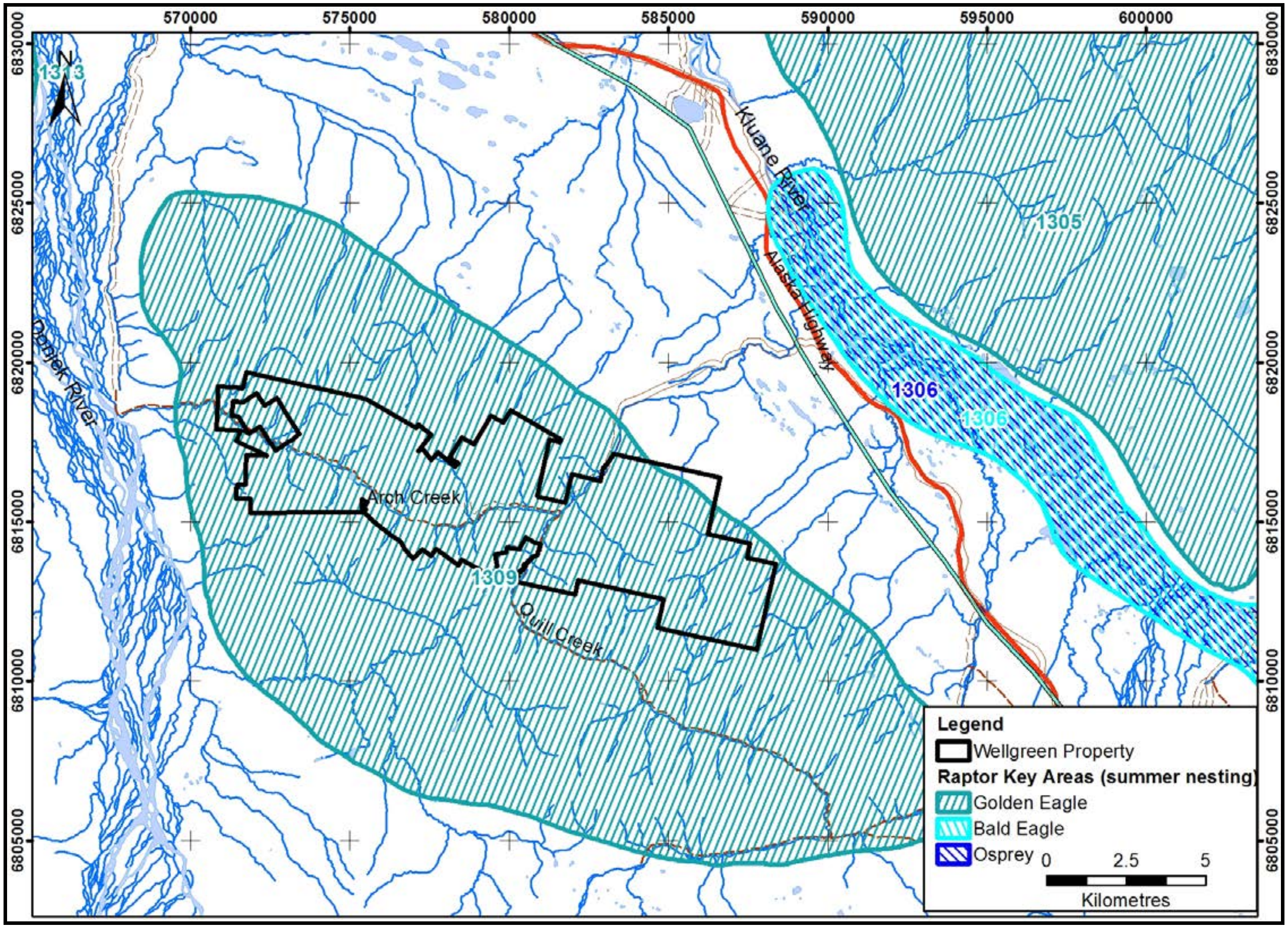
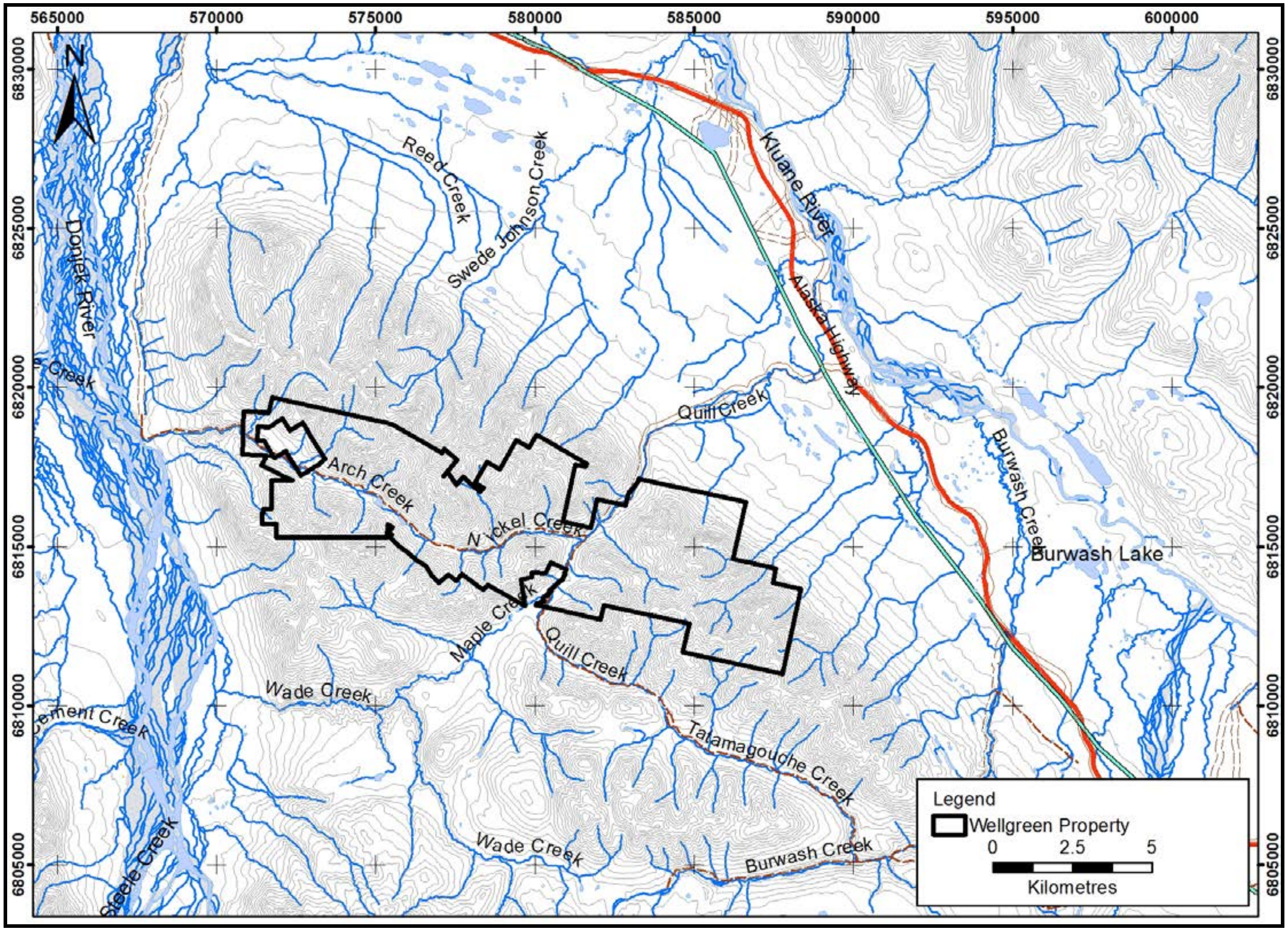


Figure 20.8 Aquatic Resources



20.3 Environmental Assessment and Permitting

Mining development projects similar to the Project are assessed and permitting in two phases. First, an EA is usually completed; then, projects proceed to the licensing phase (regulatory).

20.3.1 Environmental Assessment

EAs in Yukon are administered by the YESAB, as governed by the YESAA. The EA process is a single-assessment process that applies throughout Yukon, to all projects, and to federal, territorial, and First Nations governments. Quartz mining projects conducted anywhere other than on an indian reserve are subject to an EA. Even though a portion of Project is located on Category B land owned by the Kluane First Nation, permits may be granted pursuant to the *Quartz Mining Act* (QMA) for persons holding a right, title or interest on the land prior to the time the area was claimed as Settlement Land, in 2003 (Minister of Public Works and Government Services Canada 2003) (Section 20.5.1). The Project will be subject to an EA under the YESAA. The Property falls within the southwest assessment district (YESAB 2011).

The Project requires an Executive Committee screening because it is a quartz exploration program that involves the movement of 250,000 t or more of rock. Projects assessed by the Executive Committee of YESAB generally require between one and three years (not more than 918 days, including time required for a government decision).

Detailed information requirements for this process are outlined in the Information Requirements for Executive Committee Project Proposal Submissions under the YESAA, which is available through the YESAB office.

Once assessments are complete, recommendations are forwarded to a decision body or bodies. The recommendations will be one of the following (YSEBA 2011):

- The Project will not have significant adverse effects and should proceed.
- The Project will have significant adverse effects that cannot be mitigated and should not proceed.
- The Project should proceed with terms and conditions that will mitigate the effects.
- The Project should be assessed at a higher level. (Note: This can only occur when the assessment was done at the Designated Office (DO) or Executive Committee level.)

In some cases, assessments may also recommend project audits or effects monitoring.

20.3.2 LICENSING

The Project will be subject to territorial legislation, and will require a number of permits and approvals (Table 20.1). The Project may also be subject to federal legislation, depending upon the specific project characteristics.

TERRITORIAL

Quartz Mine License

In Yukon, all hard rock mining claims are administered through the QMA. The QMA enables the Government of Yukon to issue licenses and regulate mining developments, from design through to construction, operation, reclamation, decommissioning, and finally to closure. The Quartz Mine License (QML) is administered by the Government of Yukon Department of Energy, Mines, and Resources (Table 20.1). Proposed quartz mines require an assessment under the YESAA (Section 20.3.1); a mine license cannot be issued prior to an assessment (Figure 20.9). Although permits and licenses cannot be issued in advance of completing the assessment, regulatory processes can be initiated simultaneously while the assessment is underway (Yukon Energy, Mines, and Resources 2010).

Even though a portion of Project is located on Category B land owned by the Kluane First Nation, permits may be granted pursuant to the QMA for persons holding a right, title or interest on the land prior to the time the area was claimed as Settlement Land, in 2003 (Minister of Public Works and Government Services Canada 2003) (Section 20.5.1).

The licensing process is initiated by the submission of a letter of intent from the proponent requesting a license. Proponents are also required to submit various plans outlining the detail needed to understand the functionality and feasibility of the proposed development. These plans depend on the stage of project development, and can be described in two categories (Yukon Energy, Mines, and Resources 2010) (Figure 20.6):

- mine development (provides proponents with permission to proceed with initial site construction activities that do not require a water licence)
  - general site plan
  - reclamation and closure plan
- mine construction and operation (enables proponents to proceed with mine construction and operation after a water license is issued)
  - project specific mine plans
  - environmental protection plans.

Water License

Under the *Yukon Waters Act*, the Yukon Water Board is responsible for licensing the use of water and the discharge of wastes into waters within the Yukon Territory (Yukon Water Board 2006). The Project will require a Type A license since the milling rate is anticipated to exceed the 100 t or more requirement of a Type A license. As with the QML, the Yukon Water Board cannot issue a water license if the issuance of the license is contrary to the YESAA decision (Yukon Water Board 2006) (Figure 20.6).

Storage Tank Systems Permit

In Yukon, all storage of fuel; such as diesel and gasoline, is regulated under the Storage Tank Regulation of the Yukon *Environment Act*. All storage tanks for activities, such as storage of diesel as a power source and heavy equipment require a Storage Tank System Permit and must be installed according to territorial and nation standards. An assessement under YESAA may be required for the storage tank proposal and will require additional information, such as a specific spill response plan. A pre-permit inspection of the storage tanks may be required prior to approval of the permit.

FEDERAL

Fisheries Act

Fisheries and Oceans Canada (DFO) is responsible for protecting fish and fish habitat in Canada under section 35(1) of the federal *Fisheries Act* (DFO 2002).

If an authorization is required it can take anywhere from one month to several years to obtain, depending on the type of approval required, the complexity of the Project, and any associated field studies. Project activities, such as construction of crossing structures (e.g., culverts) or any work in or about a watercourse, will require an authorization under the *Fisheries Act* if they result in a harmful alteration, disruption and destruction (HADD).

Habitat compensation is an option for achieving no net loss when residual impacts of projects on habitat productive capacity are deemed harmful after relocation, redesign, or mitigation options have been implemented. Habitat compensation involves replacing the lost fish habitat with newly created habitat or improving the productive capacity of some other natural habitat. Depending on the nature and scope of the compensatory works, habitat compensation may require, but not be limited to, five years of post-construction monitoring (DFO 2002).

Navigable Waters Protection Act

In general, navigable waters include all bodies of water that are capable of being navigated by any type of floating vessel for transportation, recreation or commerce

(Transport Canada 2010). New construction occurring in, on, over, under, through or across navigable waters, that has the potential for interfering with navigation, must be reviewed under the *Navigable Waters Protection Act* (NWPA), administered by Transport Canada. An application under NWPA subsection 10(1) is also required for the repair, rebuilding or alteration of existing work (Transport Canada 2010).

The Navigable Waters Protection Program (NWPP) has been established to guide proponents through the NWPA process. Information required by the NWPP to determine if an authorization is required includes details regarding the applicant, the nature of the work, other approvals obtained, property ownership, and drawings and plans of the proposed work. A NWPP officer will determine if the work will interfere with navigation (i.e. whether the Project will or will not interfere substantially). If the work will interfere substantially with navigation, then the approval process is longer and there are additional steps to complete (e.g. advertising the Project to the public, the *Canadian Environmental Assessment Act* (CEAA) is triggered). These steps may still be required by Transport Canada (2010), even if the work is determined to not interfere substantially with navigation.

OTHER

The Kluane First Nation has a settled land claim within the mineral claims, which provides them with access, rights and obligations to land and resources, and the right to govern their own affairs (Section 20.5.1). The Kluane First Nation should be consulted if permits or authorization are required for operation of the Project.

Figure 20.9 Relative Sequence of Events from Mine Start-up to Closure (from Yukon Energy, Mines, and Resources 2010)

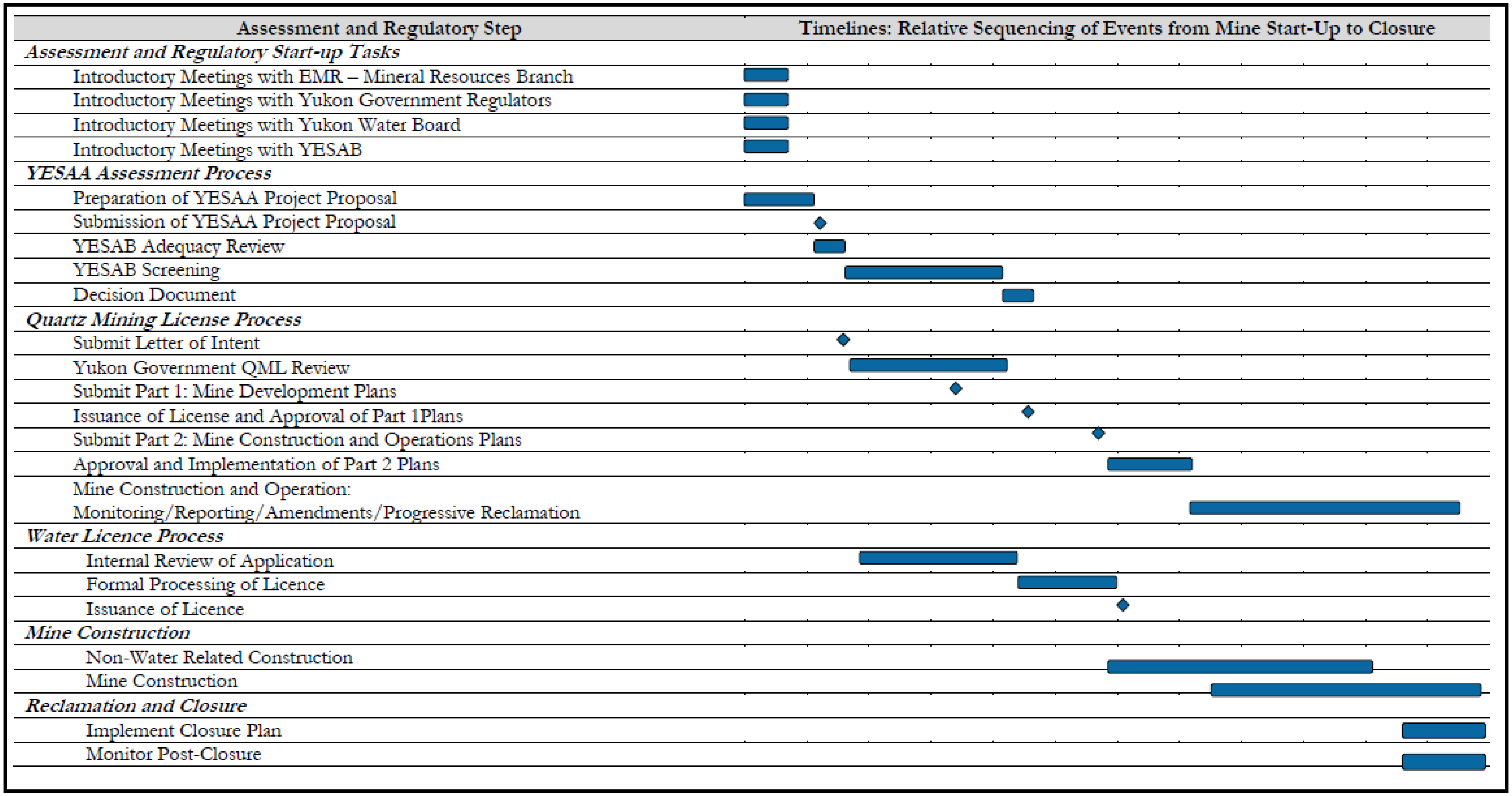


Table 20.1 Applicable Legislation, Permits, and Regulations That May Apply to the Project

Applicable Legislation/ Regulation	Permit/Approval	Responsible Agency
Territorial		
• YESAA	• Yukon Environmental and Socio-economic Assessment Approval	• YESAB
• QMA	• QML	• Government of Yukon, Energy, Mines, and Resources
• *Yukon Waters Act* • Waters Regulations	• Water License – Type A	• Yukon Water Board
• *Wildlife Act*	• N/A	• Government of Yukon, Environment Yukon
• *Territorial Lands (Yukon) Act* • Land Use Regulations • Quarry Regulations	• Land Use Permit • Quarry Permit • Timber Permit	• Government of Yukon, Energy, Mines, and Resources
• *Yukon Public Utilities Act*	• Energy Certificate and Operating Certificate	• Government of Yukon
• *Environment Act* • Air Emissions Regulations • Special Waste Regulations • Solid Waste Regulations • Storage Tank Regulations	• Air Emissions Permit • Special Waste Permit • Storage Tank Systems Permit	• Government of Yukon, Environment Yukon • Government of Yukon, Community Services
• *Forest Protection Act* • Forest Protection Regulations	• Burning Permit	• Government of Yukon, Community Services
• *Building Standards Act* • *Electrical Protection Act*	• Building Permit • Plumbing Permit • Electrical Permit	• Government of Yukon, Community Services, Building Safety
• *Dangerous Goods Transportation Act*	• Permit – Certificate for Transportation of Dangerous Goods	• Government of Yukon, Highways and Public Works

table continues…

Applicable Legislation/ Regulation	Permit/Approval	Responsible Agency
• *Occupational Health and Safety Act* • Occupational Health and Safety Regulations	• Blaster's Permit	• Yukon Workers' Compensation Health and Safety Board
• *Yukon Historic Resources Act*	• Archaeological Sites Permit – if archaeological or historic resources are identified	• Government of Yukon, Tourism and Culture
• *Yukon Public Health and Safety Act* • Regulations Respecting Public Health • Sewage Disposal System Regulations	• Compliance with Public Health Regulations • Permit to install sewage disposal system	• Government of Yukon, Health and Social Services, Environmental Health Services
Federal		
• *Fisheries Act* • Metal Mining Effluent Regulations	• Section 35(2) Authorization – if project works result in a HADD • Fisheries Authorization Section 32 – destruction of fish by means other than fishing	• DFO
• NWPA	• Navigable Waters Authorization – if project activities interfere with navigable waters	• Transport Canada
• SARA	• N/A	• Environment Canada
• *Canadian Environmental Protection Act*	• N/A	• Environment Canada and Health Canada
• *Migratory Birds Convention Act* • Migratory Birds Regulations	• N/A	• Environment Canada
• *Explosives Act* and Regulations	• Blasting Permit, Explosives Magazine Permit, Permit to Transport Explosives, Factory License, Ammonium Nitrate/Fuel Oil (ANFO) Permit	• Natural Resources Canada, Minerals & Metals Sector

20.4 MINE CLOSURE AND RECLAMATION PLAN

All mines must have an approved reclamation and closure plan that has been approved by the Government of Yukon before mine development can commence (Yukon Energy, Mines, and Resources 2006). A Reclamation Plan for the mill area and a Tailings Pond Environmental Monitoring Plan have been designed and implemented in 2009 (Access 2009b; 2009c). These plans will have to be updated to reflect the new mine plan.

Financial assurance must be posted to secure the rehabilitation works, and the determination of the outstanding mine reclamation and closure liability associated with the Project technical features and structures must be sealed by a professional engineer who is licensed to practice in Yukon (Yukon Energy, Mines, and Resources 2006).

The amount and form of security to be provided by the proponent will be determined by the Government of Yukon. The government will also ensure that security is maintained at all times. Financial security will comprise an initial payment, prior to commencement of development, and a periodic adjustment to ensure that full security is held for outstanding reclamation and closure liability throughout the development, operation, and closure of a mine site. Security for mitigative contingencies will be required for higher risk components, if required. Progressive reclamation may reduce the amount of financial security required to be provided and maintained by the proponent.

The proponent must file an annual report stating what progressive reclamation has been accomplished and the results of environmental monitoring programs. As progressive reclamation and closure work is completed, monitoring will be conducted by the proponent to determine the effectiveness of the mitigation measures (Yukon Energy, Mines, and Resources 2006).

A reclamation and closure plan should fully address, but not be limited to, the following (Yukon Energy, Mines, and Resources 2006):

- reclamation objectives, including closure design criteria
- the progressive reclamation of the site during the life of the operation
- the removal or stabilization of any structures and workings
- the design of tailings and waste rock disposal areas
- the reclamation and re-vegetation of the surface disturbances wherever practicable
- methods for protection of water resources
- a temporary closure plan
- a cost estimate of the work required to close and reclaim the mine

- a plan for ongoing and post-closure monitoring and reporting at the site. A plan should include the establishment of thresholds and identified adaptive management responses should such thresholds be reached.

20.5 Social Considerations

This section of the PEA:

- identifies aboriginal and non-aboriginal communities that may potentially be affected by the development of the Project
- identifies potential positive and adverse effects of the Project on local First Nations and other communities
- advises on further study requirements.

20.5.1 *Project Location and First Nations*

The Property is located partial on Category B land (R-49 B) and slightly overlaps Category A (R-01A) land owned by the Kluane First Nation (Figure 20.10) (Minister of Public Works and Government Services Canada 2003). As of the signing of the Kluane First Nation Final Agreement, on Category A land the First Nation holds both the surface rights and the subsurface/mineral rights, while on Category B land the Kluane First Nation owns the surface rights to this land, but not to that which is below the surface. However, land belonging to persons holding a right, title, interest, licence, and permit on the land prior to the time the area was claimed as Settlement Land are not applicable to this legislation (Minister of Public Works and Government Services Canada 2003).

Surface Rights Legislation for Yukon First Nations is provided under the Umbrella Final Agreement between the Government of Canada, Government of Yukon, and Yukon First Nations. This legislation provides a mechanism to resolve disputes over access rights (Mining Yukon 2011 and Minister of Public Works and Government Services Canada 2003).

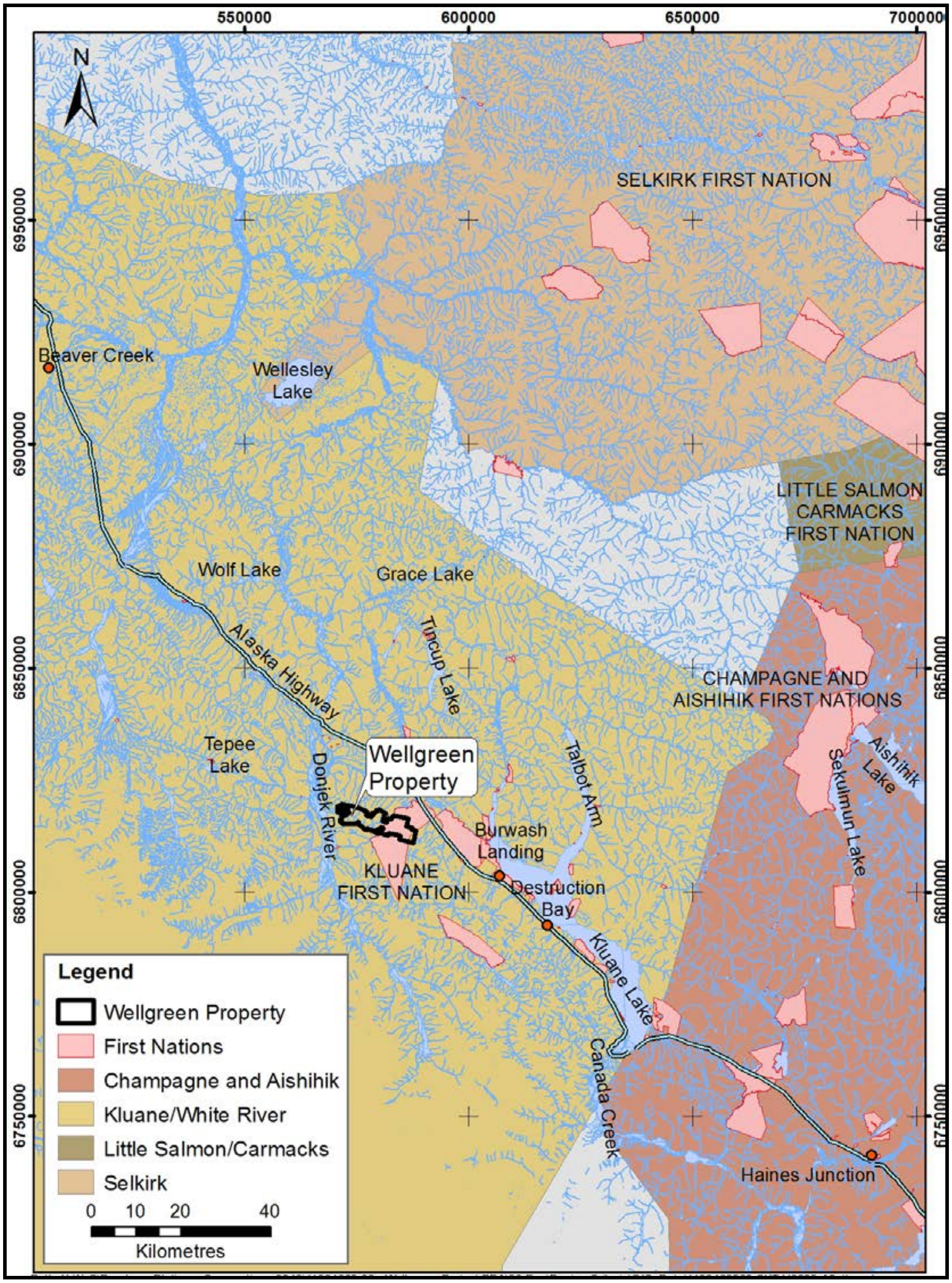
The Kluane First Nation has a settled land claim, which provides them with access, rights and obligations to land and resources, and the right to govern their own affairs. The Kluane First Nation signed final and self-government agreements with the Yukon and Canadian governments on October 18, 2003. The effective date of these agreements was February 2, 2004 (Yukon ECO 2011a).

The White River First Nation finalized negotiations toward final and self-government agreements with the Canadian and Yukon governments in 2002, when a Memorandum of Understanding was signed signifying the completion of the negotiation process. However, the White River First Nation decided not to ratify the negotiated agreements and there have been no negotiations since. As such, the White River First Nation does not have a settled land claim. Under the terms of the

Umbrella Final Agreement, the White River First Nation was allocated Category A and Category B land, which have been “interim protected” from third-party interests, pending the settlement or abandonment of a land claim agreement (Yukon ECO 2011b).

In addition, the Property is located within the traditional territory of the Kluane First Nation and the White River First Nation. The territories of the two nations overlap completely, although each has identified a smaller “core area” of use exclusive of the other. In the late 1950s, the federal government began to organize native communities into “bands” and with that came the establishment of the Burwash Band. A few years later, the Burwash and White River bands were joined and were renamed the Kluane Indian Band, existing as one band until 1990 when the two separated into two distinct First Nations: the Kluane First Nation and the White River First Nation (Yukon ECO 2011a). Burwash Landing is home of the Kluane First Nation (Yukon ECO 2011a). Beaver Creek, near the Yukon/Alaska border, is the home of the White River First Nation (Yukon ECO 2011b).

Figure 20.10 Traditional Territories



20.5.2 NON-ABORIGINAL COMMUNITIES

The primary non-aboriginal communities affected by the Project are Beaver Creek, Burwash Landing and Destruction Bay (Figure 20.1). Beaver Creek located approximately 120 km north of the site, near the Yukon/Alaska border, and serves as a US/Canada Customs post (Yukon ECO 2011b). Burwash Landing is located approximately 35 km southeast of the mineral claim and mine site. Destruction Bay, located approximately 50 km southeast of the mineral claim and mine site, is a centre for construction and maintenance on the Alaska Highway (Yukon ECO 2011a). Additional land users that may be affected by the Project include users of the wildlife sanctuary.

20.5.3 RESOURCE HARVEST SECTION

No trapping concessions are registered within the immediate vicinity of the Property, although registered trapping concessions are present north of the Alaska Highway (Environment Yukon 2011). Hunting access to the wildlife sanctuary is only open to Kluane and White River First Nation subsistence hunters, with the exception of two permits for Dall's sheep hunting. These permits are acquired by an annual draw; however, a draw was not held in 2011 (C. Coppard, pers. comm.).

20.5.4 CONSULTATION WITH LOCAL FIRST NATIONS

The implementation of an effective community and Aboriginal engagement program is fundamental to the successful environmental permitting of mining projects. According to YESAA, industry is required to consult with First Nations in whose territory the Project will be located (or may have significant environmental or socio-economic effects) before submitting a proposal for an EA. First Nations consultations, as part of a comprehensive community engagement program, should be initiated as soon as possible. Consultation will include addressing settlement land, heritage sites and/or resources, if any, which may be present within or adjacent to the Property.

Consultation and the development of a working relationship with local First Nations typically involves the development of a series of agreements that lay the groundwork for conversations. These include:

- memorandums of understanding
- protocol agreements
- community consultation/participation agreements.

As project exploration and development proceeds, other agreements will become necessary, including:

- socio-economic/community economic benefits agreements

- environmental monitoring agreements
- training agreements
- accommodation/impact benefit agreements.

The timing for the negotiation of each agreement will be developed in the course of consultation with the First Nations.

Potential Positive Effects on Local Communities

Potential positive effects of the proposed project development include:

- long-term, meaningful employment for local First Nations in mining operations and related positions (e.g. environmental monitors, service industry sector)
- economic development and contract opportunities for local First Nations (existing and new businesses), community infrastructure improvements, and capacity development of First Nations
- support for First Nations Research Projects associated with mining operations.

Potential Adverse Effects on Local Communities

Potential adverse effects of the proposed project development are provided below.

- Several community groups may have concerns regarding various impacts to the environment. To mitigate this, assurances that development will not exacerbate existing concerns regarding impacts to the environment will be required. In addition, engagement of First Nations environmental and heritage monitors, to work closely with biologists, archaeologists and other professionals on monitoring programs associated with development of the Property, is recommended.
- Impacts (real and/or perceived) upon Aboriginal title and rights, including the potential impacts of the Project on settlement lands, traditional and contemporary use sites, spiritual and archaeological sites, is not currently known. General concerns and/or perceptions by local First Nations regarding over-development of mining in the region may need to be addressed.
- Lack of First Nations' capacity to participate in the Project may be an issue, due to the scale and number of industry-related initiatives in the area.
- Inability to adequately meet local First Nations' expectations of agreements may be an issue, for example accommodation agreements because of precedents set by agreements already negotiated in the region.

21.0 CAPITAL AND OPERATING COSTS

21.1 SUMMARY

The total pre-production cost of the capital cost for the Project is US$863 million. The total capital cost required for the Project including sustaining capital is estimated at US$1,985 million. This estimate includes a 25% contingency.

The capital costs are itemized as pre-production capital cost and sustaining capital cost and are summarized in Table 21.1.

Table 21.1 Capital Cost Summary (US$ million)

	Pre-production (2012 to 2018)	Sustaining (2019 to 2054)	LOM Total (2012 to 2054)
Pre-production Capital Cost	863	0	863
Sustaining Capital Cost	0	1,122	1,122
Total	**863**	**1,122**	**1,985**

The total operating costs for the LOM are US$12.1 billion. The total cost and unit costs (US$/t) are summarized in Table 21.2.

Table 21.2 LOM Operating Cost Summary (US$ million)

	Cost (US$)	Cost (%)	Unit Cost US$/t mined	Unit Cost US$/t milled
Open Pit Mining	3,656.5	30	2.52	9.02
Site Services	436.9	4	0.30	1.08
G&A	931.6	8	0.65	2.29
Processing	7,030.8	58	4.85	17.35
Total	**12,055.8**	**100**	**8.32**	**29.74**

21.2 CAPITAL COSTS

21.2.1 PRE-PRODUCTION

The pre-production period from 2012 through 2018 has an estimated total capital cost of US$863.1 million (including 25% contingency). The pre-production costs include project execution for (US$23.3 million), surface facilities (US$691.6 million) and mine equipment (US$148.2 million). A detailed breakdown of the pre-production capital cost is show in Table 21.3.

Table 21.3 Pre-production Capital (US$ million)

	2012	2013	2014	2015	2016	2017	2018	Total
Project Execution								
Environmental & Permitting	0.6	0.5	0.5	0.5	0.3	0.0	0.0	2.4
Drill for Prefeasibility	4.4	0.0	0.0	0.0	0.0	0.0	0.0	4.4
Prefeasibility Study	0.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0
Drill for Feasibility	0.0	1.1	4.6	1.2	0.0	0.0	0.0	6.9
Feasibility Study	0.0	0.0	0.6	2.7	0.6	0.0	0.0	3.9
Contingency	1.2	0.7	1.4	1.1	0.3	0.0	0.0	4.7
Total Project Execution	**6.2**	**3.3**	**7.1**	**5.5**	**1.2**	**0.0**	**0.0**	**23.3**
Surface Facilities								
Direct Costs								
Contractor Waste	0.0	0.0	0.0	0.0	0.0	20.0	0.0	20.0
Siteworks	0.0	0.0	0.0	0.0	39.8	0.0	0.0	39.8
Open Pit Infrastructure	0.0	0.0	0.0	0.0	1.4	0.0	0.0	1.4
Coarse Ore Crushing	0.0	0.0	0.0	0.0	0.0	15.8	0.0	15.8
Grinding & Classification	0.0	0.0	0.0	0.0	0.0	103.4	51.7	155.1
Concentrate Storage	0.0	0.0	0.0	0.0	0.0	0.0	3.3	3.3
Tailings & Water Management	0.0	0.0	0.0	0.0	8.5	17.1	0.0	25.6
Ancilliary Buildings	0.0	0.0	0.0	0.0	0.0	0.0	40.9	40.9
Control Systems	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.5
Utilities	0.0	0.0	0.0	0.0	0.0	4.8	4.9	9.7
Power	0.0	0.0	0.0	0.0	0.0	42.3	42.3	84.6
Site Mobile Equipment	0.0	0.0	0.0	0.0	0.0	0.0	4.8	4.8
Temporary Facilities & Services	0.0	0.0	0.0	0.0	5.9	0.0	0.0	5.9
Indirect Costs								
Construction	0.0	0.0	0.0	0.0	24.8	49.7	49.6	124.1
Owner's Cost	0.0	0.0	0.0	0.0	4.2	8.3	8.3	20.8
Contingency	0.0	0.0	0.0	0.0	21.1	65.4	51.8	138.3
Total Surface Facilities	**0.0**	**0.0**	**0.0**	**0.0**	**105.7**	**326.8**	**259.1**	**691.6**

table continues

	2012	2013	2014	2015	2016	2017	2018	Total
Mine Equipment								
Major Mine Equipment	0.0	0.0	0.0	0.0	0.0	0.0	111.9	111.9
Other Mine Equipment	0.0	0.0	0.0	0.0	0.0	0.0	5.6	5.6
Support Mine Equipment	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0
Contingency	-	-	-	-	-	-	29.7	29.7
Total Mine Equipment	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**148.2**	**148.2**
Total Pre-production	**6.2**	**3.3**	**7.1**	**5.5**	**106.9**	**326.8**	**407.3**	**863.1**

21.2.2 Sustaining

The sustaining capital period from 2019 through 2054 has a cost of US$1,121.8 million, including a 25% contingency. It is comprised of major mine equipment at US$521.3 million, other mine equipment at US$30.0 million, support mine equipment at US$5.3 million, refurbished power plant at US$61.7 million and a TMF at US$503.5 million.

Sustaining capital costs are estimated to cover major repairs and replacement of mine equipment to maintain continuous mine production levels at an average rate of 39 Mt moved annually for the 37-year LOM.

Pricing for major mine production equipment was obtained from Tetra Tech's in-house cost database and CostMine's 2010 Mine and Mill Equipment Costs Guide and has been escalated to 2012 dollars.

A summary of the sustaining mine capital cost is outlined in Table 21.4.

Table 21.4 Sustaining Capital (US$ million)

	Sustaining Capital (2019 to 2054)	
Pre-production	**Equipment Units**	**Total Cost**
Major Mine Equipment	119	521.3
Other Mine Equipment	260	30.0
Support Mine Equipment	57	5.3
Refurbished Power Plant	-	61.7
Tailings Management Facility	-	503.5
Total Sustaining	**436**	**1,121.8**

A breakdown of the mine equipment fleet required for the Project is provided in Table 21.5. The table itemizes fleet units and equipment costs during pre-production, sustaining and total LOM.

Table 21.5 Mine Equipment Fleet Units & Costs (US$ million)

	Pre-production (2012 to 2018)		Sustaining (2019 to 2054)		LOM Total (2012 to 2054)	
	Units	Cost	Units	Cost	Units	Cost
Major Mine Equipment						
Haul Trucks	15	66.0	57	250.6	72	316.6
Shovels	3	21.4	12	85.5	15	106.9
Drills	2	4.3	3	6.5	5	10.8
Dozers	8	11.6	32	46.5	40	58.1
Graders	3	2.8	12	11.2	15	14.0
Wheel Loaders	1	5.6	3	16.7	4	22.3
Labour	-	0.2	-	0.0	-	0.2
Contingency	-	28.0	-	104.3	-	132.3
Total Major Mine Equipment	**32**	**139.9**	**119**	**521.3**	**151**	**661.2**
Other Mine Equipment	49	5.6	260	24.0	309	29.6
Contingency	-	1.4	-	6.0	-	7.4
Total Other Mine Equipment	**49**	**7.0**	**260**	**30.0**	**309**	**37.0**
Support Mine Equipment	16	1.1	57	4.2	73	5.3
Contingency	-	0.2	-	1.1	-	1.3
Total Support Mine Equipment	**16**	**1.3**	**57**	**5.3**	**73**	**6.6**
Total	**97**	**148.2**	**436**	**556.6**	**533**	**704.8**

21.2.3 CLOSURE

An estimated closure cost of US$61.2 million, including a 25% contingeny, has been applied in the last four years of the mine life, 2051 through 2054, as shown in Table 21.6.

Table 21.6 Closure (US$ million)

	Closure Capital				
	2051	**2052**	**2053**	**2054**	**Total**
Closure	15.3	15.3	15.3	15.3	61.2

21.2.4 CONTINGENCY

A contingency of 25% was applied to the capital cost for a total of US$409.2 million. A breakout of the Project LOM contingency for pre-production capital, sustaining capital and closure is shown in Table 21.7.

Table 21.7 Contingency (US$ million)

	Pre-production (2012 to 2018)	Sustaining (2019 to 2054)	Closure (2051 to 2054)	LOM Total (2012 to 2054)
Project Execution	4.7	0.0	0.0	4.7
Surface Facilities	138.3	0.0	0.0	138.3
Major Mine Equipment	28.0	104.3	0.0	132.3
Other Mine Equipment	1.4	6.0	0.0	7.4
Support Mine Equipment	0.2	1.1	0.0	1.3
Refurbish Power Plant	0.0	12.3	0.0	12.3
TMF	0.0	100.7	0.0	100.7
Closure	0.0	0.0	12.2	12.2
Total Contingency	**172.6**	**224.4**	**12.2**	**409.2**

21.2.5 PROCESSING EQUIPMENT CAPITAL COSTS

The capital costs for the process equipment were derived from those in the equipment list shown in Table 21.8. These are the main pieces that have been used to determine the capital and operating costs.

Table 21.8 Major Process Equipment List

Equipment	Quantity	Size
Stockpile Feed Conveyor	1	200 m long x 106.7 cm wide
Primary Jaw Crusher	2	122 cm x 152 cm
SAG Mill Feed Conveyor	2	200 m long x 106.7 cm wide
SAG Mill and Drive	2	7.0 m diameter x 3.0 m long
Grinding Mill Liner Crane	4	-
Ball Mills and Drives	2	6.24 m diameter x 14.68 m long
Primary Rougher Flotation Cell Bank	2	10 Cell; 14.2 m^3/cell
Secondary Rougher Feed Thickener	2	122 m diameter
Secondary Rougher Flotation Cell Bank	2	10 Cell; 111 m^3/cell
Primary Cleaner Flotation Cell Bank	2	10 Cell; 14.2 m^3/cell
Secondary Cleaner Flotation Cell Bank	2	10 Cell; 8.5 m^3/cell
Scavenger Flotation Cell Bank	2	10 Cell; 200 m^3/cell
Air Compressor	2	235 cm capacity
Concentrate Thickener	2	15.2 m diameter
Concentrate Pressure Filter	2	121 m^2 filtration area
Tailings Thickener	2	122 m diameter

The costs for these pieces of equipment were compiled from the InfoMine, Mine and Mill Equipment Costs: An Estimator's Guide 2011, as well as historic data from other projects. Historical pricing was escalated to Q2 2012 dollars using InfoMine cost indices. InfoMine Estimator's Guides are annual collections of industry prices for equipment costs based on surveys of operating companies and vendors. Allowances were made for process pumping, reagent preparation, and an assay/process laboratory. The total process capital cost including installation/construction is US$174.3 million.

21.2.6 Initial Capital Costs

The initial capital costs consist of four main parts: direct costs, indirect costs, contingency and owner's costs.

The initial direct and indirect capital costs are summarized in Table 21.3.

Estimate Structure

Any costs incurred with work that is scheduled to start after Year 1 are included in the sustaining capital costs and are not in the initial capital cost estimate.

Pricing

This PEA study estimate was prepared with a base date of Q1 2012 and has not included any escalation beyond this date.

Construction Labour Rates and Productivity

A blended labour rate of Cdn$108/h is used throughout. Tetra Tech has assumed a "three weeks in, one week out" work schedule.

The labour rates include the following items:

- vacation and statutory holiday pay
- fringe benefits and payroll burdens
- overtime and shift premiums
- small tools
- consumables
- personal protection equipment
- contractor's overhead and profit.

In addition, indirect costs which are calculated separately, are included in the following categories:

- all additional construction equipment, cranes, and incidental equipment rentals; contractors and construction costs are included in the individual line items of estimate

- mobilization and demobilization costs
- freight costs relating to contractors materials are included in the mobilization and freight sections
- turnaround costs for contractors and construction management/owner personnel
- travel time for personnel if appropriate
- construction camp catering, housekeeping, and maintenance costs (daily rate).

The labour hours' productivity factor for the capital cost is assumed to be 1.2, or 83% efficiency.

PROJECT DIRECT COSTS

Overview

The direct costs have been based on the following information:

- prices for mechanical equipment based on recent projects, in-house data, and current cost books
- labour rates reflecting those of both local and regional construction contractors
- productivities for installing equipment and materials obtained from other projects as well as in-house data

Civil

Bulk earthworks cost was estimated based on preliminary site drawings.

Concrete

Concrete cost was estimated as allowance based on building sizes from similar projects.

Structural

Structural steel cost was estimated from factors in similar projects.

Architectural

All buildings are assumed to be pre-engineered. The estimates for pre-engineered buildings are calculated as allowance based on the estimated building sizes derived from similar projects.

Mechanical

The mechanical equipment list is provided by the metallurgy team.

Building Services

Costs for heating, ventilation, and air-conditioning (HVAC), fire protection and other building services are estimated as allowance based on percent of mechanical equipment cost.

Piping

The piping cost is estimated as allowance based on percent of mechanical equipment cost.

Process Mobile Equipment

The process mobile equipment cost is based on recent similar projects.

Electrical

The electrical cost is estimated as allowance based on percent of mechanical equipment cost.

Instrumentation and Controls

The instrumentation cost is estimated as allowance based on percent of mechanical equipment cost.

INDIRECT COSTS

Construction Indirect

The construction indirect costs are based on a percentage of the direct costs and include the following:

- field supervision and indirect staff support
- temporary facilities and structures
- temporary support systems and utilities including weather protection
- construction equipment (part of direct cost except for special requirements, i.e., large lifting equipment for 100 t and larger)
- construction consumables including welding and cutting supplies
- other medical and first aid, including tests for substance abuse

- safety including safety officer, training, supplies, equipment, and vehicle
- quality assurance and control
- temporary power supply and distribution and power costs
- temporary water supply and distribution
- contractors' mobilization and demobilization
- temporary heating and hoarding
- warehouse and lay-down costs
- temporary toilets
- temporary communications (phone, fax and internet services)
- ongoing and final clean-up
- yard maintenance
- janitorial services
- site safety personnel and training
- contractor's turnaround costs
- travel to and from site.

Spares

Allowances of 3% are included in the indirect costs for capital and commissioning spares.

Initial Fills

An allowance is included in the indirect costs for initial fills.

Commission and Start-up

An allowance is included in the indirect costs for commissioning and start-up.

Freight and Logistics

An allowance is included in the indirect costs for freight and logistics.

EPCM Cost

Engineering, Procurement, and Construction Management (EPCM) cost is included as an allowance based a percentage of the direct cost.

Vendor and Consultant Assistance

An allowance is included in the Indirect costs for vendor and consultant assistance.

OWNER'S COSTS

An allowance based on a percentage is included for owners costs.

CONTINGENCY AND RISK

A contingency of 25% was applied to the direct and indirect capital costs for the PEA to meet anticipated but defined costs.

ASSUMPTIONS AND EXCLUSIONS

Assumptions

The initial capital costs estimate includes the following assumptions:

- Labour productivities have been adjusted for remote northern locations. Bulk materials such as cement, rebar, structural steel and plate, cable, cable tray, and piping will be available when they are required.
- Capital equipment will be available when it is required.

Exclusions

This initial capital cost estimate excludes consideration for:

- capital cost during the exploration phase
- salvage value
- cost escalation during construction
- scope changes
- taxes and duties
- cost outside battery limits.

21.3 Operating Costs

21.3.1 General

Mine operating costs were developed by Tetra Tech on a first principle basis using Tetra Tech's in-house cost database, CostMine 2010 Mine Cost Guide and InfoMine 2009 Mine Salaries.

Operating costs, where required, were escalated to reflect Q1 2012 dollars.

The Project LOM mine operating costs have been categorized and summarized in Table 21.9. The costs are expressed in total US dollars, unit per tonne mined and unit per tonne milled.

Table 21.9 LOM Operating Cost Summary (US$ million)

	Cost (US$)	Cost (%)	Unit Cost US$/t mined	Unit Cost US$/t milled
Open Pit Mining	3,656.5	30	2.52	9.02
Site Services	436.9	4	0.30	1.08
G&A	931.6	8	0.65	2.29
Processing	7,030.8	58	4.85	17.35
Total	**12,055.8**	**100**	**8.32**	**29.74**

21.3.2 Mining

The mining operating cost is estimated at US$3.66 billion which equates to US$2.52/t of material mined or US$9.02/t of material milled.

Manpower salaries, diesel price, and explosive price were obtained from Tetra Tech's internal cost database. Table 21.10 and Table 21.11 present a summary of the mining operating costs, grouped by waste mining costs and material mining costs, for a nominal mill throughput 32,000 t/d, with an average strip ratio of 2.57:1 (tonnes waste/tonnes mineralized material) during the 37-year LOM.

Table 21.10 Mining Operating Cost by Function (US$ million)

Year	Waste Mining						Material Mining					
	Drill	Blast	Load	Haul	Total	US$/t Waste	Drill	Blast	Load	Haul	Total	US$/t Material
1	2.570	9.004	8.444	39.770	**59.788**	**2.45**	0.513	1.833	1.589	8.133	**12.069**	**2.41**
2	2.204	8.131	7.321	40.486	**58.141**	**2.58**	1.065	4.016	3.325	20.089	**28.496**	**2.54**
3	2.358	8.009	7.297	40.417	**58.172**	**2.59**	1.147	4.018	3.329	20.141	**28.634**	**2.56**
4	1.986	7.227	6.671	36.703	**52.587**	**2.66**	1.096	4.070	3.466	20.762	**29.394**	**2.62**
5	1.971	7.158	6.622	34.511	**50.262**	**2.57**	1.099	4.075	3.479	19.738	**28.392**	**2.53**
6-10	10.101	36.799	33.844	174.409	**255.153**	**2.53**	5.462	20.315	17.236	96.824	**139.838**	**2.50**
11-15	10.436	38.145	42.125	168.762	**259.468**	**2.47**	5.421	20.235	17.025	89.963	**132.644**	**2.37**
16-20	12.082	44.134	31.967	180.162	**268.346**	**2.17**	5.338	19.953	16.368	81.497	**123.156**	**2.20**
21-25	18.452	68.172	56.127	331.502	**474.254**	**2.38**	5.052	19.093	14.268	93.315	**131.728**	**2.35**
26-30	17.286	63.167	52.697	385.691	**518.840**	**2.83**	5.153	19.205	14.608	118.183	**157.150**	**2.81**
31-35	15.175	54.073	45.971	342.445	**457.664**	**2.96**	5.353	19.474	15.108	123.895	**163.829**	**2.93**
36-37	6.239	22.031	18.988	140.295	**187.554**	**2.98**	1.883	6.805	5.358	43.645	**57.691**	**2.95**
Total	**100.860**	**366.140**	**318.075**	**1,915.154**	**2,700.229**	**2.59**	**38.582**	**143.094**	**115.160**	**736.186**	**1,033.022**	**2.55**

Table 21.11 Summary of Mining Operating Cost by Function

Item	Cost (US$ million)	Cost (%)	Cost (US$/t mined)	Cost (US$/t milled)
Drilling	136.6	3.8	0.10	0.34
Blasting	498.8	13.6	0.34	1.23
Loading	424.3	11.6	0.29	1.05
Hauling	2,596.8	71	1.79	6.40
Total	**3,656.5**	**100.0**	**2.52**	**9.02**

The open pit operating costs including the mining cost, site services, mine engineering supervision, mine operations supervision, geology, administration, office supplies, accommodations and travel for mine technical, operations, and maintenance staff and light duty vehicle operating costs are summarized in Table 21.12.

Table 21.12 Summary of Open Pit Operating Costs

Item	Cost (US$ million)	Cost (%)	Cost (US$/t mined)	Cost (US$/t milled)
Drilling	136.6	2.8	0.10	0.34
Blasting	498.8	9.9	0.34	1.23
Loading	424.3	8.4	0.29	1.05
Hauling	2,596.8	51.7	1.79	6.40
Site Services	436.9	8.7	0.30	1.08
G&A	931.7	18.5	0.65	2.29
Total	**5,025.0**	**100.0**	**3.47**	**12.39**

Open Pit Operations Manpower

Total available working time was based on 350 d/a, 24 h/d for a total of 8,400 h/a. The labourers will be working a schedule of two weeks on, two weeks off. Table 21.13 lists the proposed manpower for the open pit operation and maintenance during peak operations (Year 7).

The labour details (Table 21.12) were prepared and estimated by Tetra Tech for the purposes of this study, based on the required personnel for a 32,000 t/d open pit mining operation. Rates from other similar Tetra Tech projects were considered for the purposes of the PEA mining plan. An additional burden of 42.5% is considered for health benefits, pension, overtime, training, bonus, etc.

Table 21.13 Mine Operations Manpower Example (Year 7)

Position	No.	Annual Cost Per Person (Cdn$)	Total Annual Cost (Cdn$)	Cost (Cdn$/t mined)	Cost Cdn$/t milled)
General Mine Expense					
Mine Manager	1	195,300	195,300	-	-
Mine Superintendent	2	176,500	353,000	-	-
Admin. Assistant	4	78,400	313,600	-	-
Mine General Foreman	2	150,300	300,600	-	-
Senior Mine Foreman	4	134,200	536,800	-	-
Mine Foreman	4	110,000	440,000	-	-
Drill & Blast Foreman	2	116,900	233,800	-	-
Maintenance Superintendent	1	162,700	162,700	-	-
Maintenance Forman	4	142,700	570,800	-	-
Chief Engineer	1	186,800	186,800	-	-
Senior Mine Engineer	2	170,200	340,400	-	-
Mine Planning Engineer	2	155,800	311,600	-	-
Ore Control Engineer	4	106,900	427,600	-	-
Geotechnical Engineer	2	114,000	228,000	-	-
Mine Technician	4	108,200	432,800	-	-
Chief Surveyor	1	106,900	106,900	-	-
Surveyor	4	92,700	370,800	-	-
Surveyor Assistant	4	71,300	285,200	-	-
Environmental Engineer	1	137,300	137,300	-	-
Environmental Technician	4	105,500	422,000	-	-
Maintenance Planner	2	112,800	225,600	-	-
Chief Geologist	1	171,000	171,000	-	-
Geologist	2	155,800	311,600	-	-
Geology Technician	4	92,700	370,800	-	-
Accountants	1	127,800	127,800	-	-
Accounts Payable	2	104,400	208,800	-	-
Payroll Clerk	2	95,000	190,000	-	-
HR Specialists	2	127,800	255,600	-	-
Health/Safety/Training	2	127,800	255,600	-	-
Pension & Benefits Administrator	2	127,800	255,600	-	-
Safety Supervisor	1	150,300	150,300	-	-
Security/Safety/First Aid	8	86,100	688,800	-	-
System Analyst	1	104,400	104,400	-	-
Network Analyst	1	104,400	104,400	-	-
Buyer	2	104,400	208,800	-	-
Receiving/Counter Attendant	2	95,000	190,000	-	-
Janitor	2	78,300	156,600	-	-
Subtotal	**90**	**-**	**10,331,700**	**0.34**	**0.92**

table continues…

Position	No.	Annual Cost Per Person (Cdn$)	Total Annual Cost (Cdn$)	Cost (Cdn$/t mined)	Cost Cdn$/t milled)
Mine Operations					
Drill Operator	6	98,500	591,000	-	-
Drill Helper	4	92,500	370,000	-	-
Blaster	4	108,200	432,800	-	-
Blaster Helper	4	92,500	370,000	-	-
Shovel Operator	11	108,200	1,190,200	-	-
Loader Operator	4	98,500	394,000	-	-
Haul-Truck Operator	58	95,500	5,539,000	-	-
Dozer Operator	24	98,500	2,364,000	-	-
Grader Operator	11	98,500	1,083,500	-	-
Backhoe Excavator Operator	4	98,500	394,000	-	-
Water Truck Operator	4	98,500	394,000	-	-
Fuel/Lube Truck Operator	4	95,000	380,000	-	-
Shift Labourer	8	67,000	536,000	-	-
Subtotal	**146**	**-**	**14,038,500**	**0.46**	**1.25**
Mine Maintenance					
Heavy Duty Mechanic	16	106,200	1,699,200	-	-
Welder	8	106,200	849,600	-	-
Wash Bay	4	86,000	344,000	-	-
Light Duty Mechanic	8	83,600	668,800	-	-
Electrician	8	107,500	860,000	-	-
Junior Mechanics	16	98,500	1,576,000	-	-
Subtotal	**60**	**-**	**5,997,600**	**0.20**	**0.54**
Total Labour	**296**	**-**	**30,367,800**	**1.00**	**2.71**

21.3.3 Process Operating Costs

The operating costs were determined by estimating the quantities of consumables, manpower, and electrical power required on a “per tonne milled” basis. Consumables considered were reagents, supplies (e.g. mechanical, safety, and laboratory), and electrical power required for mineralized material processing. Pricing for reagents and supplies were taken from historical project pricing and InfoMine Estimating guides. InfoMine Cost Indices for commodities were used to adjust historical pricing to 2012 dollars. The power costs were taken as per calculations from the Infrastructure team based on natural gas generator power.

The reagent dosages, bond abrasion, and bond work indices were based on the current metallurgical test work at Lakefield. The bond abrasion test work by Lakefield, calculated wear rates for liners and grinding media which were used to determine the cost of those supplies. The SAG and ball grinding mills were sized and the power consumption determined by bond formulae calculations using the bond work indices generated through laboratory test work at Lakefield. The connected loads for the other process equipment were taken from the InfoMine Estimator's guide.

The labour cost was determined by compiling a list of the required compliment for the process plant. Salaries were taken from the InfoMine, Canadian Mine Salaries Wages & Benefits – 2010 Survey Results. Adjustments were made for 2011 dollars. A summary of the consumables, labour, and electrical power costs, as well as the total operating cost, is shown in Table 21.14. The operating costs are based on a 32,000 t/d mill throughput.

Table 21.14 Process Operating Costs

	US$/t milled	Annual Cost (US$)	Percentage (%)
Electrical Power	8.14	91,157,689	47
Labour	0.68	7,569,050	4
Consumables	8.53	95,545,544	49
Grand Total	**17.35**	**194,272,283**	**100**

22.0 ECONOMIC ANALYSIS

22.1 INTRODUCTION

This PEA is preliminary in nature and includes Inferred Mineral Resources that are considered too speculative geologically, on which to apply economic considerations to categorize them as mineral reserves. There is no certainty that this PEA will be realized.

This PEA has been completed to a +/-40% level of accuracy.

An economic evaluation of the Wellgreen project was prepared by Tetra Tech based on a pre-tax financial model. For the 37-year LOM and 405 Mt Indicated Resources and Inferred Resources, the pre-tax financial model was based on the following:

- LME three year trailing metal prices, effective date July 6, 2012 (see Table 22.1).
- Cdn$/US$ exchange rate based on a two year forecast, in effect Q2 2012 (Source: Foreign Exchange Consensus Forecasts (FECF) effective date April 10, 2012) (see Table 22.2).

Table 22.1 Base Case Metal Prices Used in the Financial Model

Ni (US$/lb)	Cu (US$/lb)	Co (US$/lb)	Au (US$/oz)	Pt (US$/oz)	Pd (US$/oz)
9.48	3.56	16.23	1,377.87	1,587.97	581.28

Table 22.2 Foreign Exchange Used in the Study

Currency Exchange	Rate
Cdn$1 = US$	0.9794
Cdn$1 = €	1.2831

22.2 PRINCIPAL ASSUMPTIONS

For the purpose of this Project's financial analysis, Tetra Tech applied the following study results and assumptions:

- All costs, revenues, and financial evaluation are calculated and presented in US dollars.
- The Project LOM will be 37 years.
- A detailed mine production schedule was included in the financial model.
- An average of 24,000 t of nickel will be produced annually.
- The processing recoveries used were 67.60% nickel, 87.80% copper, 64.40% cobalt, 58.90% gold, 46.00% platinum, and 72.90% palladium.
- The Project's average annual throughput will be 39,000,000 t combined waste and mineralized material.
- The initial capital cost for the Project is estimated at US$863 million.
- The mine sustaining capital cost for the project is estimated at US$1,122 million.
- The TMF sustaining capital estimates are included in the financial model.
- The end-of-project salvage value was not included.
- The average operating cost was estimated to be US$29.74/t milled.
- The smelting recoveries used were 90.00% nickel, 98.00% copper, 90.00% cobalt, 96.00% gold, 96.00% platinum, and 96.00% palladium.
- Smelting, refining and transportation charges were assumed to be 25% of the gross metal revenues.
- No royalties or product insurance costs were included.
- A discount rate of 8% was applied.

22.3 PRE-TAX MODEL

The mine production schedule has been incorporated into the 100% equity pre-tax financial model to develop annual recovered metal production from the relationship between tonnage milled, head grades and recoveries.

The LOM mineralized material tonnages, grades and metal production are indicated in Table 22.3.

Table 22.3 Metal Production from the Wellgreen Project

Item	Unit	Value
Total Material to Mill	t	405,331,683
Average Annual Material to Mill	t	10,954,900
Mine Life	years	37
NSR		
Average LOM NSR*	US$/t milled	61.51
Average Grade		
Nickel	%	0.32
Copper	%	0.26
Cobalt	%	0.02
Gold	g/t	0.177
Platinum	g/t	0.411
Palladium	g/t	0.347
Total Production		
Nickel	lb	1,959,299,445
Copper	lb	2,057,705,063
Cobalt	lb	133,775,733
Gold	oz	1,355,782
Platinum	oz	2,463,685
Palladium	oz	3,299,404
Average Annual Production		
Nickel	lb	52,954,039
Copper	lb	55,613,650
Cobalt	lb	3,615,560
Gold	oz	36,643
Platinum	oz	66,586
Palladium	oz	89,173

Note: *NSR revenue was determined by applying a 25% cost factor against gross metal revenue to account for smelting, refining, transportation and marketing costs.

Gross metal revenue was determined from recovered metal grades and metal prices. The LOM gross metal revenue was determined to be US$33,240 million or US$22.95/t mined.

NSR revenue was determined by applying a 25% cost factor against gross revenue to account for smelting, refining, transportation and marketing costs. The smelting recoveries were 90.00% nickel, 98.00% copper, 96.00% platinum, 96.00% palladium, 96.00% gold and 90.00% cobalt.

The smelting, refining, transportation and marketing costs were estimated to be US$8,310 million. The LOM NSR revenue was determined to be US$24,930 million or US$17.21/t mined.

LOM net revenue, determined as NSR revenue less royalties, was US$24,930 million or US$17.21/t mined.

Unit operating costs for open pit mining, site services, G&A and mineralized material processing were applied to annual tonnages mined and milled, to determine the overall mine site operating cost which has been deducted from the net revenue to derive annual operating margin. The LOM operating cost is US$12,056 million or US$8.32/t mined.

The LOM operating margin, net revenue less operating costs, was determined to be US$12,874 million or US$8.89/t mined.

Pre-production capital and sustaining capital were considered in the year spent. The LOM pre-production capital, including a 25% contingency, consisting of expenditures for project execution, surface facilities and mine equipment was determined to be US$863 million or US$0.60/t mined for the 2012 through 2018 period. The LOM sustaining capital, including a 25% contingency, consisting of expenditures for major mine equipment, other mine equipment, support mine equipment and a TMF, was determined to be US$1,122 million or US$0.77/t mined for the period of 2019 through 2054.

The LOM closure cost, including a 25% contingency, was estimated at US$61 million or US$0.04/t mined and was applied equally in the period 2051 through 2054.

Pre-tax cash flow or EBITDA, determined as net revenue less operating costs, capital and closure costs was estimated at US$10,828 million. The Project has:

- a pre-tax NPV of US$2.4 billion at a discount rate of 8%
- an IRR of 32%
- a payback period of 4.88 years.

A summary of the Project’s inputs, and estimated costs and financial results are presented in Table 22.4.

Table 22.4 Summary of Pre-tax Financial Results and Inputs

Item	Unit	Value
NPV (8%)	US$ million	2,396
IRR	%	32
Payback	Years	4.88
Gross Revenue	US$ million	33,240
Smelting & Refining Cost	US$ million	8,310
Net Revenue	US$ million	24,930
Operating Cost	US$ million	12,056
Operating Margin	US$ million	12,874
Capital Cost	US$ million	1,985
Closure Cost	US$ million	61
Pre-tax Cash Flow	US$ million	10,828

The LOM average cost per pound of nickel (C1) is US$2.59 when byproduct credits for copper, PGMs, and gold are applied.

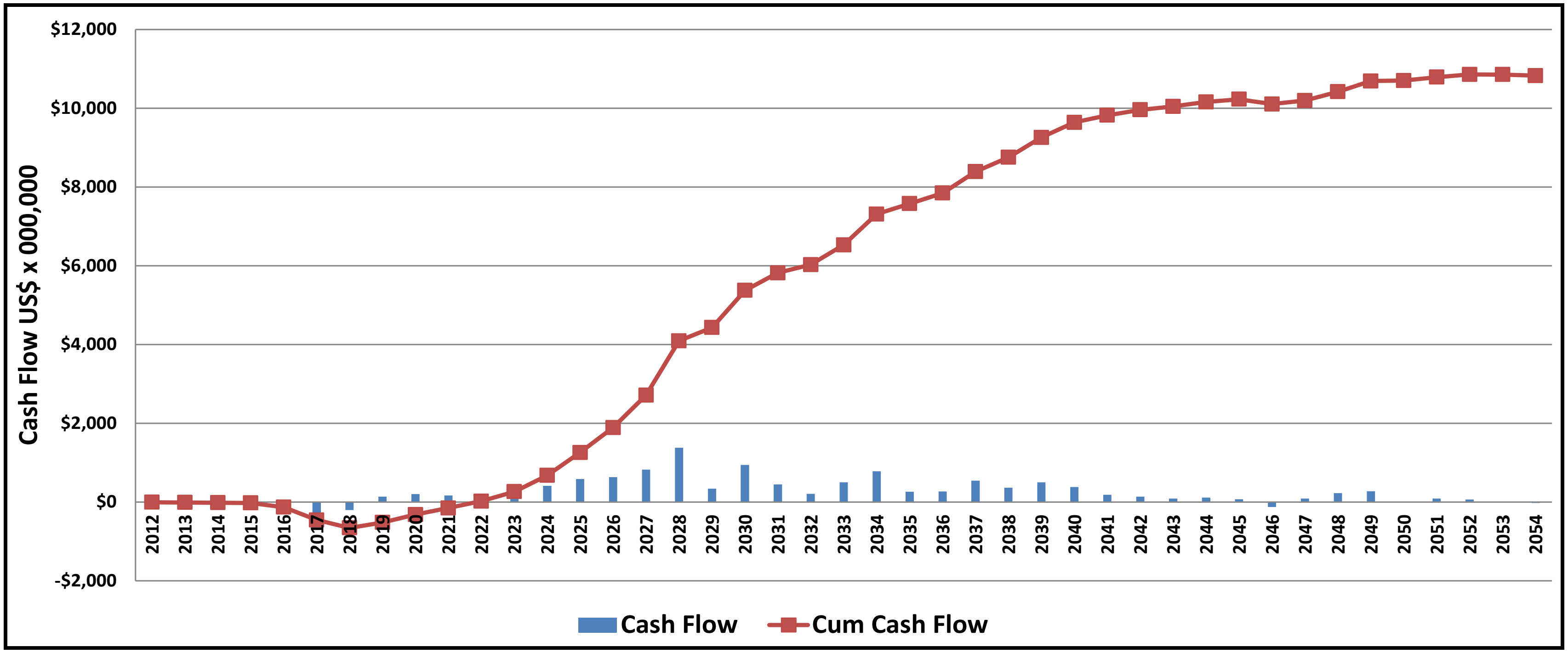
A breakdown of the gross revenue by metal is shown in Table 22.5.

Table 22.5 Gross Revenue Breakdown by Metal

	Gross Revenue (US$ million)	%
Nickel	16,716.7	50.29
Copper	7,178.9	21.60
PGMs + Gold	9,344.4	28.11
Total	**33,240.0**	**100.00**

The annual undiscounted pre-tax cash flow is illustrated in Figure 22.1.

Figure 22.1 Annual Undiscounted Pre-tax Cash Flow



22.4 METAL PRICE SCENARIOS

The LOM average metal prices for three cases, +20%, base, and -20%, were identified with their corresponding NPVs at a discount rate of 8%. The results are shown in Table 22.6.

Table 22.6 Pre-tax NPV by Metal Price Scenario

Case	LOM Average Metal Prices						NPV (US$ million) @ 8%
	Ni (US$/lb)	Cu (US$/lb)	Co (US$/lb)	Au (US$/oz)	Pt (US$/oz)	Pd (US$/oz)	
Base +20%	11.38	4.27	19.48	1,653.44	1,905.56	697.54	3,525
Base +10%	10.43	3.92	17.85	1,515.66	1,746.77	639.41	2,962
Base	9.48	3.56	16.23	1,377.87	1,587.97	581.28	2,396
Base -10%	8.53	3.20	14.61	1,240.08	1,429.17	523.15	1,831
Base -20%	7.58	2.85	12.98	1,102.30	1,270.38	465.02	1,268

The financial model was run at the LME spot metal prices, effective date of July 6, 2012 and the resulting NPV was US$1,783 million and the IRR was 26%.

22.5 SENSITIVITY ANALYSIS

NPV and IRR sensitivity analyses were carried out on the following parameters:

- exchange rate
- nickel price
- operating cost
- capital cost.

The analyses are presented graphically as financial outcomes in terms of the pre-tax NPV and IRR.

Table 22.7 shows the corresponding sensitivity parameters and the resulting NPVs.

Table 22.7 Sensitivity Parameters and NPV at 8% (US$ million)

Parameter	Foreign Exchange	Nickel Price	Operating Cost	Capital Cost
-20%	3,045	1,820	2,890	2,551
-10%	2,721	2,108	2,643	2,474
Base	2,396	2,396	2,396	2,396
+10%	2,073	2,685	2,150	2,319
+20%	1,748	2,973	1,903	2,242

Figure 22.2 illustrates the Project NPV (at 8% discount) is most sensitive to the exchange rate, and in decreasing order, nickel price, operating cost and capital cost.

Figure 22.2 NPV at 8% Sensitivity Analysis

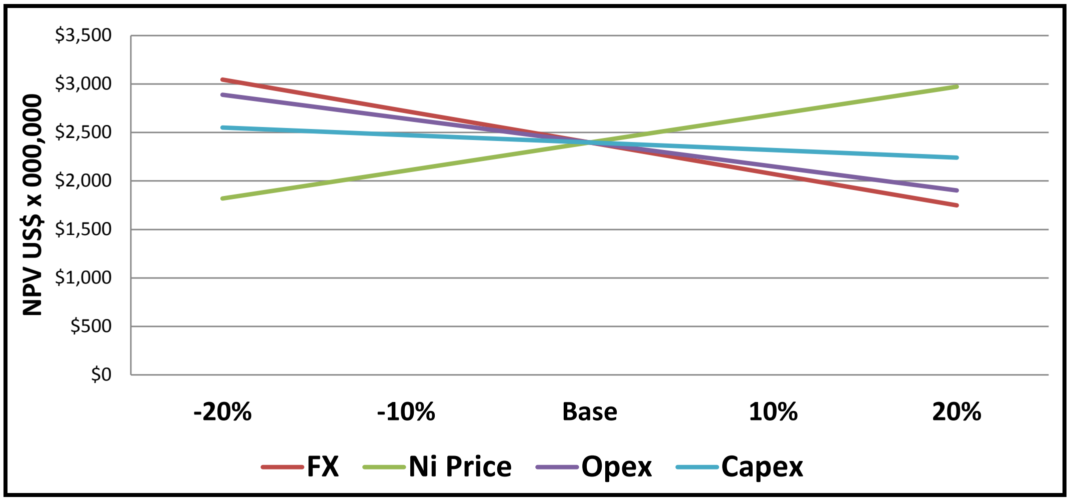


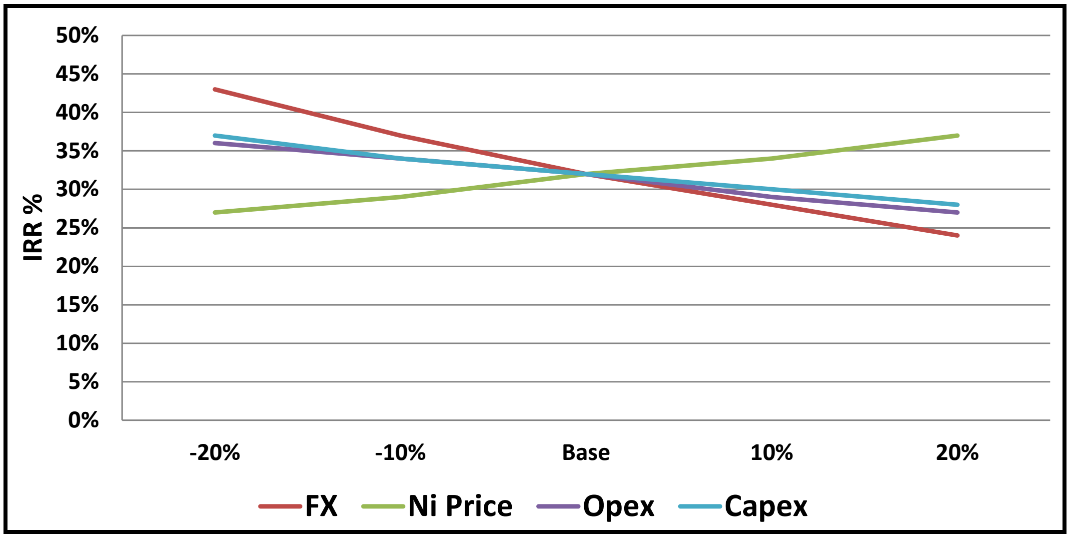
Table 22.8 shows the corresponding sensitivity parameters and the resulting IRRs.

Table 22.8 Sensitivity Parameters and IRR (%)

Parameter	Foreign Exchange	Nickel Price	Operating Cost	Capital Cost
-20%	43	27	36	37
-10%	37	29	34	34
Base	32	32	32	32
+10%	28	34	29	30
+20%	24	37	27	28

Figure 22.3 illustrates the effect that the sensitivities have on IRR with exchange rate having the greater effect, and in decreasing order, nickel price, capital cost and operating cost.

Figure 22.3 IRR Sensitivity Analysis



23.0 ADJACENT PROPERTIES

There are two active claim blocks in the vicinity of the Property (Figure 23.1). All information presented in this section was gathered through searches of the Government of Yukon, Energy, Mines and Resources Mine Recorder website, internet searches of publicly traded companies, and SEDAR postings. Tetra Tech is not able to verify the information reported in this section.

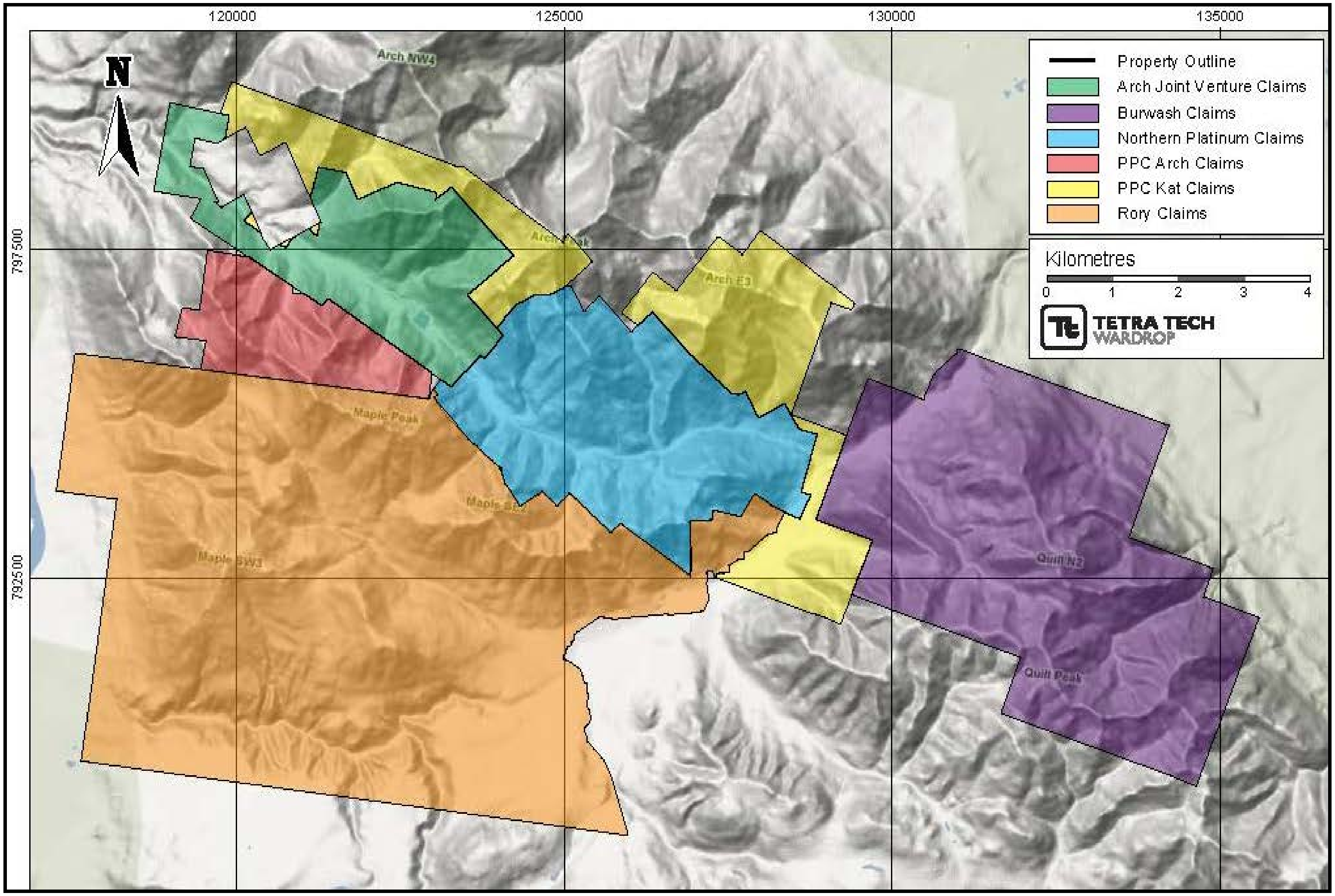
Coronation Minerals (renamed Guyana Precious Metals) is currently listed as the holder of the Rory claims, which are located immediately to the south of the Property. There has been no recorded assessment work filed by Coronation Minerals and the claims are active until October 3, 2013. Prophecy Platinum holds a 50% back in on the Rory claims if Coronation Minerals was to spend Cdn$1 million in exploration on the Property. It is unknown if similar geological units or mineralization occurs on the Rory claims.

In 2008, Pacific Coast announced it had entered into an agreement to option the Burwash Property from Strategic Metals Ltd. (Strategic). The Burwash Property overlies the east half of the Quill Creek Mafic-Ultramafic Complex and adjoins the Property on its southeast edge. Widespread nickel-copper-PGE mineralization is known to exist on the Burwash Property, as first discovered in 1952 during work done on a larger property. In late 2008, Pacific Coast announced results from a drilling program conducted by Strategic and their contractor Archer, Cathro and Associates. The results of the drilling are provided in Table 23.1. Pacific Coast has re-negotiated the option agreement twice with Strategic, the most recent of which occurred March 8, 2010. In June 2011, Pacific Coast acquired the nickel assets of Prophecy Resources, including Wellgreen and formed a new company Prophecy Platinum.

Table 23.1 Pacific Coast Nickel Drill Result on the Burwash Claim

Hole	Target	From (m)	To (m)	Width (m)	Ni (%)	Cu (%)	Pt (g/t)	Pd (g/t)
08-03	Main Sill	4.37	49.94	42.57	0.16	0.12	0.170	0.075
		56.08	74.37	18.29	0.15	0.06	0.149	0.105
		75.40	83.52	8.12	0.14	0.03	0.135	0.108
08-05	Main Sill	4.57	15.24	10.67	0.23	0.06	0.151	0.252
		33.90	101.70	67.80	0.22	0.07	0.147	0.198
		108.45	111.45	3.00	0.25	0.17	0.360	0.130

Figure 23.1 Adjacent Properties

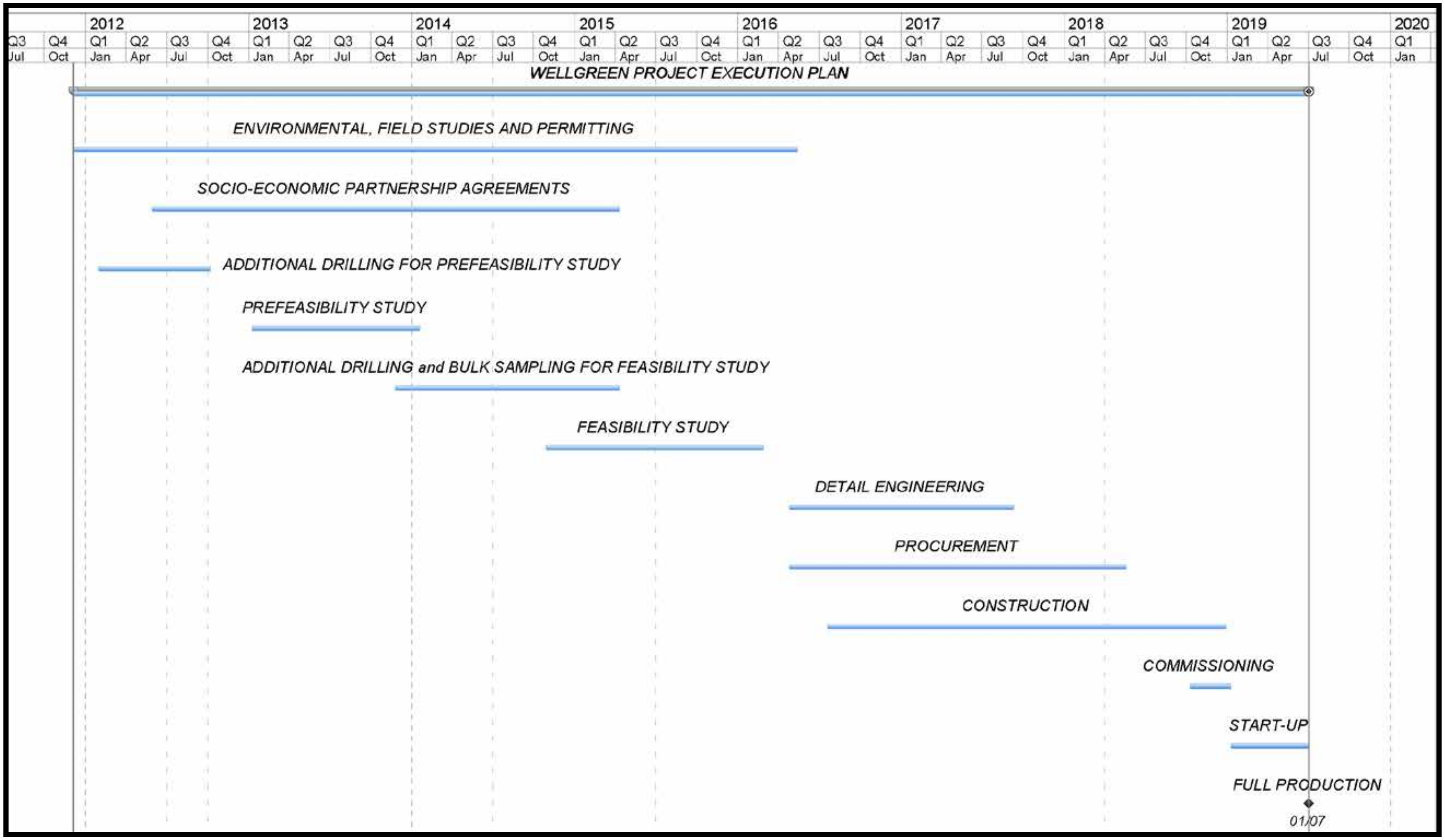


24.0 OTHER RELEVANT DATA AND INFORMATION

24.1 PROJECT EXECUTION PLAN

A suggested high-level schedule of the Project execution plan has been prepared and is provided in Figure 24.1.

Figure 24.1 Wellgreen Project Execution Plan – High Level Schedule



25.0 INTERPRETATIONS AND CONCLUSIONS

25.1 GEOLOGY

The Property is ideally situated, hosting approximately 10 km of strike length and 22.1 km^2 of the Quill Creek Ultramafic intrusion. The Quill Creek Ultramafic intrusion is one of several ultramafic intrusions found within the Wrangellia terrane.

The Property is currently held 100% by Prophecy Platinum and all the claims are in good standing.

The Quill Creek Ultramafic intrusion has similar characteristics to the Noril'sk deposit in Russia, containing zones and layered mineralized massive, semi-massive and disseminated nickel-copper sulphides with elevated PGE, associated with the sulphides.

Two main zones of mineralization known as the East Zone and West Zone have been drill outlined on the Property. The highest grade mineralization in the East Zone occurs in massive sulphide pods and lenses along the base of the ultramafic body, whereas the best grades in the West Zone are found in inter-digitated gabbro and clinopyroxenite. A total of 171,652 tons assaying 2.23% nickel, 1.39% copper, 0.065 oz/ton platinum and 0.073% cobalt were mined and milled in 1972 and 1973 by Hudson Yukon Mining.

The Property database is relatively up-to-date with the current results of the 2011 drilling program. In general, the twin hole drilling program completed by Coronation Minerals was successful in confirming past results. Therefore, Tetra Tech is of the opinion that using the historic drilling is appropriate for any future resource estimate although some additional analysis will be required before a definitive conclusion can be reached.

The 2011 Prophecy drilling confirmed the presence of a substantial mineralized system located in the hanging wall of the semi-massive sulphide pods previously targeted as the Wellgreen deposit.

The resource estimation of a 0.2% nickel equivalent cut-off resulted in an Indicated Resource of 14.4 Mt at grades of 0.68% nickel, 0.62% copper and 2.23 g/t platinum+palladium+gold. An additional Inferred Resource of 446.6 Mt at grades of 0.31% nickel, 0.25% copper and 0.87 g/t platinum+palladium+gold. Table 25.1 summarizes the result of the resource estimate within the optimized pit shell.

Table 25.1 Wellgreen Resource Estimate Summary

NiEq Cut-off	Category	Zone	Tonnes	NiEq%	Ni (%)	Cu (%)	Co (%)	Au (g/t)	Pt (g/t)	Pd (g/t)
0.2	Indicated	Pitshell	14,432,900	1.4	0.68	0.62	0.05	0.51	0.99	0.73
0.2	Inferred	Pitshell	446,649,000	0.6	0.31	0.25	0.02	0.16	0.38	0.33

There is good potential to expand the quantity and grade of mineralization on the Property to cover the entire Quill Creek Ultramafic intrusive. The Quill Creek intrusive has been outlined by an aeromagnetic survey. Drilling on the adjacent Burwash claims held by Prophecy Platinum indicates that the mineralizing system has the potential to continue along the entire 10 km strike length.

Exploration to date has concentrated on the lower gabbroic section of the ultramafic body. Recent exploration has concentrated on the evaluation of the Property's potential to host larger, but lower grade, tonnages of PGM enriched nickel-copper mineralization for potential open pit extraction. The occurrences of higher grade pockets of semi-massive sulphides (more than 1% copper and nickel and more than 2 g/t platinum) as historically mined by Hudson Yukon Mining are expected to be continually located through exploration efforts. These higher grade pockets, although not continuous, could be targeted in a potential open pit operation in order to accelerate the Project's pay back.

A large portion of the drill data set does not include platinum, palladium assay, rhodium, ruthenium, rhenium, iridium, osmium, which would potentially enhance any sort of economic evaluation of the Property.

Little in the way of SG is available despite several years of exploration and limited operations.

25.2 MINING

Based on the economic parameters and optimized pit shell determined from the pit optimization analysis, the ultimate pit design for the project generated the key results shown in Table 25.2.

Table 25.2 Optimum Pit Shell Results

Item	Tonnes (Mt)	Ni (%)	Cu (%)	Co (%)	Au (g/t)	Pt (g/t)	Pd (g/t)
Mineralized Material							
Indicated	14.5	0.65	0.59	0.05	0.489	0.942	0.698
Inferred	390.8	0.31	0.25	0.02	0.165	0.391	0.334
Waste Rock	1,043.0	-	-	-	-	-	-
Stripping Ratio	2.57:1	-	-	-	-	-	-

Mining will be done by conventional open pit methods at a rate of 32,000 t/d of mineralized material resulting in the 37-year LOM.

25.3 MINERAL PROCESSING

The current proposal under consideration for Wellgreen includes a 32,000 t/d conventional crushing and grinding circuit comprising a jaw crusher and SAG mill combination followed by a MF2 type process, in order to produce a bulk nickel-copper concentrate for sale and treatment off site. Although developed primarily for UG2 mineralized material, the MF2 configuration offers certain advantages such as prevention of over-grinding and slimes generation, increased rejection of talc, chlorite and pyrrhotite and early recovery of PGM. The concept is to gradually reduce the size of the mineralized material particles, and float the liberated material immediately after each size reduction. Secondary grinding will be by ball mills and tertiary grinding by vertimills. The process will comprise two trains, identical from crushing through to the concentrate and tailings thickeners. The concentrate will be thickened, filtered, and loaded on trucks to be transported for further processing off-site (e.g. sale or toll smelting). The tailings will be thickened and pumped to the TMF.

For the purpose of the current study, laboratory test work estimated flotation concentrate grade and average process recovery data drawn from the industry have been used and are summarized in the Table 25.3.

Table 25.3 Summary Grade and Recovery Data

Metal	Flotation Concentrate Grade	Flotation Concentrate Recovery (%)
Nickel	5.7%	67.6
Copper	6.0%	87.8
Cobalt	0.6%	64.4
Gold	0.48 g/t	58.9
Platinum	3.57 g/t	46.0
Palladium	6.22 g/t	72.9

The process capital and operating costs described in Section 17.0 are summarized in Table 25.4 and Table 25.5.

Table 25.4 Process Capital Cost Summary

Process Area	Capital Cost (US$)
Mineralized Material Storage and Recovery	5,980,804
Crushing	10,126,321
Milling (Building and Mills)	135,723,509
Flotation	19,278,854
Concentrate Dewatering, Storage, and Load-out	3,314,964
Reagent Preparation	2,943,091
Total	**177,367,543**

Table 25.5 Process Operating Costs

	US$/t milled	Annual Cost (US$)	Percentage (%)
Electrical Power	8.14	91,157,689	47
Labour	0.68	7,569,050	4
Consumables	8.53	95,545,544	49
Total	**17.35**	**194,272,283**	**100**

These estimates reflect the costs entailed in producing a concentrate for sale or toll treatment only. Although further downstream pyrometallurgical or hydrometallurgical treatment of concentrates has not been assessed in the current study, additional treatment will almost certainly be evaluated in subsequent, more detailed, studies. Future work will also require testing the MF2 process flowsheet and additional downstream pyrometallurgical and hydrometallurgical concentrate treatments as described in Section 26.0 in this report. The estimated cost of the above test work is approximately US$400,000.

25.4 INFRASTRUCTURE

Additional studies for the locations of the TMF and the process plant area will be required. Some geotechical and detailed topographical surveys will be required in order to complete these studies.

A trade-off study has been commissioned to compare power generation diesel fuel versus LNG for the Project.

26.0 RECOMMENDATIONS

26.1 GEOLOGY

The nature of the geological environment and the data collected to date by the various operators (using an assortment of exploration tools), warrant additional exploration expenditures to advance the Project. Two separate exploration programs for the Project are proposed. The programs are independent and can be run concurrently because the result of one program does not affect the work proposed in the second program.

26.1.1 PHASE 1 – WELLGREEN EXPANSION

An aggressive program of diamond drilling, geophysics, and re-sampling is proposed for the Wellgreen deposit in order to expand the quantity of the mineral inventory.

The program would entail drilling 24 NQ diamond drillholes on 12 two hundred-metre spaced fences, with each fence having one or two drillholes to cross the stratigraphy. This would make it possible to extend the strike of the Wellgreen deposit by an additional 2,400 m, and to test the hanging wall environment.

It is recommended that the drilling program sample surface drill core in areas where the holes have been passed through the hanging wall PGE target. It is also recommended that the program be continued to re-assay pulps from the Coronation Minerals and Northern Platinum drilling campaign for rhodium, ruthenium, iridium, rhenium, and osmium. The results should be added to the drillhole database.

A preliminary metallurgical test should be conducted on the material that best represents the potential minable resource. This will indicate if the Wellgreen mineralogy is amenable to separation and recovery using traditional methods.

Tables 20.1 summarizes the estimated budget for the recommended drill program for the 2012 spring and summer seasons.

Table 26.1 Wellgreen Expansion Budget

Project	Activity	Rate (US$)	Units	Cost (US$)
Wellgreen	Diamond drilling*	TBD	TBD	TBD
	Metallurgical test	TBD	TBD	TBD
	Downhole geophysics	TBD	TBD	TBD
	Re-assay old core for Ni, Cu, Co, Pt, Pd, Au	TBD	TBD	TBD
	Re-assay old pulps for Rh, Ru, Re, Ir, Os	TBD	TBD	TBD
Indirect Costs	Salaries	TBD	TBD	TBD
	Fuel	TBD	TBD	TBD
	Administration – Camp	TBD	TBD	TBD
	Consumables	TBD	TBD	TBD
			Total	**6,372,000**

Note: *Includes all drilling related charges, sample analysis, dozing, support.

26.1.2 *Phase 2 – Quill Creek Ultramafic Delineation*

A large scale reconnaissance drilling campaign should delineate the extent of the mineralization within the Quill Creek Ultramafic Complex on the Property as outlined by an airborne magnetic survey.

Drill fences at 400 to 500 m spacing should test the full width of the Quill Creek complex both to the northwest and southeast along the strike. The goal is to delineate the mineralizing system in order to identify the potential overall size of the system. Down-hole geophysics in the form of induced polarization (IP) (good for disseminated sulphides) and borehole electromagnetic (BHEM) surveys (designed for stringer to massive sulphides) should be conducted to provide information on the potential continuity of the mineralized system. A high resolution topographic survey should be conducted over the region with coordinates in both the UTM and local mine grid.

A continuation of the re-assaying program from the Coronation Minerals and Northern Platinum drilling campaigns for rhodium, ruthenium, rhenium, iridium and osmium is proposed.

Table 20.2 outlines the proposed cost to complete the program.

Table 26.2 Quill Creek Ultramafic Delineation Budget

Project	Activity	Rate (US$)	Units	Cost (US$)
East Zone	Diamond drilling*	TBD	TBD	TBD
	Downhole geophysics	TBD	TBD	TBD
	High resolution topographic survey	TBD	TBD	TBD
	Re-assay old pulps for Rh, Ru, Ir, Os	TBD	TBD	TBD
Indirect Costs	Salaries	TBD	TBD	TBD
	Fuel	TBD	TBD	TBD
	Administration – Camp	TBD	TBD	TBD
	Consumable	TBD	TBD	TBD
			Total	**6,372,000**

Note: *Includes all drilling related charges, sample analysis, dozing, support.

26.1.3 OTHER RECOMMENDATIONS

Tetra Tech recommends that Prophecy Platinum compile the historic information in a comprehensive drillhole and assay database and validate the historic collar locations as far as possible through search and survey. The database should include, but not necessarily be limited to, a program name for each drillhole record, drillhole start date, completion date, logger, down-hole survey methods, collar survey comment, an indication whether the collar has been validated, where the samples were assayed and the method of analysis (including digestion method), if this can be determined.

Recommendations made for the QA/QC program include the following items:

- The company geologist should review the results of the field-inserted QA/QC data and it is also good practice for the geologist to review the laboratory-internal QA/QC data.
- A selection of course rejects or pulps samples (up to 10%) should be sent to a second laboratory.
- The insertion rate of one blank, one duplicate and one SRM should be maintained for every 20 samples.
- The insertion location of the blank QA/QC sample should be moved away from the SRM sample. The blank sample is currently placed immediately after the SRM. Blank samples should be placed immediately after or within suspected high grade intervals to monitor contamination within the preparation facility.

In order to improve the potential economics of the project, additional assays should be run for rhodium, ruthenium, rhenium, iridium and osmium. This would provide a dataset of sufficient size and quality to complete co-kriging. It is recommended that 20 to 25% of the pulps or coarse rejects from the past drilling campaigns and all future drilling campaigns be selected and that a PGE suite of analysis be run. The sample selection should be distributed from across the entire mineralized system and from various grade groups. If platinum and palladium assays do not exist for the selected samples, platinum and palladium analyses should be completed as well.

Tetra Tech also recommends that all drilling programs with SG samples should be collected systematically in the various rock types and grade ranges. This will generate enough data to develop a robust regression formula for SG values, based on the grades of the resource blocks.

26.2 MINING

BLOCK MODEL

The block model used in the optimization is a whole mass although there had been mining operations in the past. Reports from production records indicate that Hudson Yukon Mining produced 171,652 tons (155,720 t) assaying 2.23% nickel, 1.39% copper, 0.065 oz/ton platinum and 0.073% cobalt between 1972 and 1973. This likely does not include the drifting, which is both in and out of the mineralized material. Since the tonnage was so small relative to the resource (less than 0.05% of the total resource), it was not considered to be material to the overall resource. For the advanced levels of study, prefeasibility and feasibility, this needs to be addressed.

PIT OPTIMIZATION

The pit optimization should be updated with the recent results of the metallurgical test work and the costs derived from the economic analysis.

The economic cut-off grade determined in the current pit optimization should be validated with metallurgical test results of samples within this low grade range.

OVERALL PIT SLOPE ANGLE

A comprehensive geomechanical study is required for the next level of study, since the pit slope angles were based on conservative estimates from previous experience. A steepening of pit walls may improve the mine plan and economic evaluation.

Details on wall slope stability by orientation and by rock type is required.

HYDROGEOLOGY

A comprehensive hydrological study is required for the next level of study. Pit dewatering parameters need to be determined and the extent of the requirement for dewatering wells needs to be assessed if dewatering is required. A detailed topographic survey of the open pit and waste stockpiling areas at a suitable scale, will be required for the next level of study design.

Waste Rock Dump Design

The stability of the waste rock piles placed near the open pit needs to be determined. Testing on the load carrying capacity of the overburden and its deformation characteristics will be required to determine a suitable setback from the pit limits to ensure that the overburden does not flow towards the pit. Time constraints on how long it will take to compress the overburden material, need to be determined in order to sequence the waste placement.

Waste dump progression planning should be an integral part of subsequent levels of study, in order to optimize rock placement for stability and optimize waste haul cycle times.

The acid generating potential of the waste rock needs to be assessed. Sequencing of the waste placement and remedial measures to mitigate any potential problems requires assessment.

The possibility of metal leaching also needs to be tested to determine if this is an issue.

Production Rate

Based on the 32,000 t/d (11.2 Mt/a) open pit base case scenario, the potential to improve the overall project economics exists with increased throughput. That rate should be determined by a trade-off study.

Another potential trade-off studiy that could be considered in the future includes haul truck versus conveyor for mineralized material transport to the mill. This study would be highly dependant on the Mill site location.

The estimated cost for the first phase of the above work is US$50,000.

26.3 Metallurgy

It is recommended that further metallurgical test work be undertaken in order to develop the metallurgical process flowsheet. An MF2 type flowsheet as suggested in this report or similar arrangement can be considered. A laboratory program to analyze the appropriate flotation reagents and dosages as well as other flotation variables is currently underway. Once this is completed an MF2 or similar flowsheet should be tested in the laboratory to determine how it will perform on this material. Test work should include the creation of a bulk concentrate and separate nickel and copper concentrates, to determine the extent to which the PGEs follow the nickel, the copper or how they may be distributed between two concentrates.

Trade-off studies should be completed on the concentrate loadout strategy. The current design is a storage hopper which will deliver the concentrate into 50 t trucks driving under a load-out conveyor. Other load out options should be explored, such as a concentrate building where the concentrate is stored on a cement pad and handled with a loader onto a conveyor to load the trucks, as well as bagging or drumming of the concentrate.

A series of additional trade-off studies should be undertaken to determine if the concentrate can be further beneficiated economically. A number of process options can be considered including:

- smelting (in particular flash smelting)
- converting
- slow cooling of converter matte to produce separate high grade PGM and base metal concentrates
- toll treatment of high grade concentrates
- hydrometallurgical treatment of both concentrates and mattes including acid leaching, base and precious metal refining, Platsol, HydroCopper, and related processes.

The estimated cost for this work is approximately US$400,000.

26.4 INFRASTRUCTURE

The TMFs and the process plant area locations are preliminary and require further work to assess final locations. Costing has been based upon selection of the preliminary locations.

Power supply for the site needs to be investigated and explored for the next level study.

Tetra Tech recommends the following for the next level of the study:

- TMF location study by a team including geotechnical, mining, metallurgical/process, environmental, civil, mechanical disciplines
- process plant area location study for optimizing the capital and operating costs
- overall site detail topographical survey

The total cost of the above work is US$1,250,000.

26.5 ENVIRONMENTAL

The Project will be subject to an EA under YESAA, prior to submitting a YESAA Project Proposal Form (quartz exploration) to a DO, proponents are strongly encouraged to contact all regulators responsible for regulating the proposed project activities and attach copies of all completed regulatory applications, forms or notices to their submission. Doing so will provide the YESAB with the information required to conduct an assessment and may reduce assessment timelines.

In addition, this assessment will need to be supported by site-specific environmental baseline data. The period of study needs to be of sufficient duration to fully describe the potential affect on the environment and to understand the potential effects of the project. A minimum period of 12 to 24 contiguous months of study will be required to provide coverage of all four seasons. Studies often continue beyond the minimum 12 mo period, particularly in cases of abnormal seasonal conditions. Most projects taken into the EA process in Yukon have had two or more years of baseline study. The Environmental Baseline Studies (EBS) scope is typically developed in consultation with the local and regional resource management and regulatory agencies in order to ensure that agency concerns can be addressed with the study results. The initial EBS report is typically completed within 24 to 28 mo of the start of the field program and the Environmental Impact Assessment is typically based upon this initial EBS report.

Baseline studies will need to focus on site specific weather conditions, hydrogeology, mineralized material/waste rock/soil geochemistry, aquatic resources (hydrology, water quality), fish and fish habitat; birds, including migratory birds and raptors; vegetation, including rare plants and ecosystems; wildlife, such as grizzly bear and Woodland caribou; and areas of archaeological significance.

The total estimated cost for the first phase of the above work is US$200,000. This estimate does not include specific studies of animals, such as those involving radar-tracking.

26.5.1 *SOCIAL CONSIDERATIONS*

Further study requirements and advice on communications include:

- ongoing discussions with local First Nations to establish meaningful relationships regarding consultation processes and address concerns
- determine local First Nations heritage interests within and around the development area
- work with designated First Nations representatives on development of mitigation alternatives to address potential impacts (e.g. environment, heritage, health) to First Nations communities
- develop a communications strategy for the community

- develop a negotiation strategy and strategic plan for engagement with local First Nations for the next phase of the Project, including:
  - development of materials in appropriate formats for community distribution and community presentations (e.g., information in clear, accurate, complete and plain language)
  - review existing Agreements and Treaty-related documents to determine relevance to the Project
  - ascertain how the Project might be integrated with other natural resource development projects within the region, to the maximum benefit of local First Nations.

The total estimated cost for the above work is US$50,000. Note that this estimate does not include any work on potential liablitiy issues surrounding the old mill site (Historical Liabilities).

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28.0 CERTIFICATES OF QUALIFIED PERSON

EUR. ING. ANDREW J. CARTER, C.ENG., MIMMM, SAIMM, SME

I, Eur. Ing. Andrew Carter, C.Eng., MIMMM, SAIMM, SME of Swindon, United Kingdom, do hereby certify:

- I am the Director of Metallurgy with Tetra Tech WEI Inc. with a business address at Ground Floor, Unit 2, Apple Walk, Kembrey, Swindon, United Kingdom, SN2 8BL.
- This certificate applies to the technical report entitled Wellgreen Project Preliminary Economic Assessment, Yukon, Canada, dated August 1, 2012 (the "Technical Report").
- I am a graduate of the University of Leeds, (B.Sc. Minerals Processing, 1980). I am a member in good standing of the Institute of Materials, Minerals and Mining, Membership #46421. My relevant experience is the extractive metallurgy of nickel, copper and platinum group metals. I am a "Qualified Person" for purposes of National Instrument 43-101 (the "Instrument").
- I did not complete a personal inspection of the Property.
- I am responsible for Sections 1.1, 1.7 to 1.9, 1.13 to 1.14, 2.0, 13.0, 17.0 to 20.0, 24.0, 25.3, 25.4, 26.3 to 26.5, 27.0 (except the Geology section), and 28.0 of the Technical Report.
- I am independent of Prophecy Platinum Corp. as defined by Section 1.5 of the Instrument.
- I have no prior involvement with the Property that is the subject of the Technical Report.
- I have read the Instrument and the parts of the Technical Report that I am responsible for has been prepared in compliance with the Instrument.
- As of the date of this certificate, to the best of my knowledge, information and belief, the parts of the Technical Report that I am responsible for contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Signed and dated this 1st day of August, 2012 at Swindon, United Kingdom

"Original document signed and sealed by
Eur. Ing. Andrew Carter, C.Eng., MIMMM, MSAIMM, SME"

Eur. Ing. Andrew Carter, C.Eng., MIMMM, MSAIMM, SME
Director of Metallurgy
Tetra Tech WEI Inc.

TODD MCCRACKEN, P.GEO.

I, Todd McCracken, P.Geo., of Sudbury, Ontario, do hereby certify:

- I am a Principal Geologist with Tetra Tech WEI Inc. with a business address at #101 – 957 Cambrian Heights, Sudbury, Ontario, P3C 5M6.
- This certificate applies to the technical report entitled Wellgreen Project Preliminary Economic Assessment, Yukon, Canada, dated August 1, 2012 (the "Technical Report").
- I am a graduate of the University of Waterloo, (B.Sc. Honours, 1992). I am a member in good standing of the Association of Professional Engineers and Geoscientists of Ontario, License #0631. My relevant experience is 19 years of experience in exploration and operations, including several years working in nickel-PGE sulphide deposits. I am a "Qualified Person" for purposes of National Instrument 43-101 (the "Instrument").
- My most recent personal inspection of the Property was October 12, 2011 for one day.
- I am responsible for Sections 1.2 to 1.5, 1.14, 3.0 to 12.0, 14.0, 23.0, 25.1, 26.1, 27.0 (Geology section only), and 28.0 of the Technical Report.
- I am independent of Prophecy Platinum Corp. as defined by Section 1.5 of the Instrument.
- I have no prior involvement with the Property that is the subject of the Technical Report.
- I have read the Instrument and the parts of the Technical Report that I am responsible for has been prepared in compliance with the Instrument.
- As of the date of this certificate, to the best of my knowledge, information and belief, the parts of the Technical Report that I am responsible for contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Signed and dated this 1st day of August, 2012 at Sudbury, Ontario

"Original document signed and sealed by Todd McCracken, P.Geo."

Todd McCracken, P.Geo.
Principal Geologist
Tetra Tech WEI Inc.

PACIFICO CORPUZ, P.ENG.

I, Pacifico Corpuz, P.Eng., of Stoney Creek, Ontario, do hereby certify:

- I am a Senior Mining Engineer with Tetra Tech WEI Inc. with a business address at #900 – 330 Bay Street, Toronto, Ontario, M5H 2S8.
- This certificate applies to the technical report entitled Wellgreen Project Preliminary Economic Assessment, Yukon, Canada, dated August 1, 2012 (the "Technical Report").
- I am a graduate of Mapua Institute of Technology with a degree of Bachelor of Science in Mining Engineering, 1961. I am a member in good standing of the Professional Engineers of Ontario, License #9428509. My relevant experience with respect to mine planning includes over 40 years of international experience in mine operation and planning from conceptual stage to project implementation. I am a "Qualified Person" for purposes of National Instrument 43-101 (the "Instrument").
- My most recent personal inspection of the Property was October 12, 2011 for one day.
- I am responsible for Sections 1.6, 1.14, 15.0, 16.0, 25.2, 26.2, and 28.0 of the Technical Report.
- I am independent of Prophecy Platinum Corp. as defined by Section 1.5 of the Instrument.
- I have no prior involvement with the Property that is the subject of the Technical Report.
- I have read the Instrument and the parts of the Technical Report that I am responsible for has been prepared in compliance with the Instrument.
- As of the date of this certificate, to the best of my knowledge, information and belief, the parts of the Technical Report that I am responsible for contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Signed and dated this 1st day of August, 2012 at Toronto, Ontario

"Original document signed and sealed by Pacifico Corpuz, P.Eng."

Pacifico Corpuz, P.Eng.
Senior Mining Engineer
Tetra Tech WEI Inc.

PHILIP BRIDSON, P.ENG.

I, Philip Bridson, P.Eng., of Lively, Ontario, do hereby certify:

- I am a Senior Mining Engineer with Tetra Tech WEI Inc. with a business address at #900 – 330 Bay Street, Toronto, Ontario, M5H 2S8.
- This certificate applies to the technical report entitled Wellgreen Project Preliminary Economic Assessment, Yukon, Canada, dated August 1, 2012 (the "Technical Report").
- I am a graduate of the Michigan Technological University (B.Sc., Mining Engineering, 1972 and B.Sc., Engineering Administration, 1972). I am a member in good standing of the Association of Professional Engineers of Ontario, License #5181011. My relevant experience includeds expertise in underground long range and short range mine planning and scheduling, financial evaluations, life of mine development and analysis, project evaluations and strategic planning. From 1972 to 2008 I worked at Canadian and US underground mines holding positions as a miner, Blasthole Engineer, First Line Supervisor, Design Engineer, Sr. Development Engineer, Sr. Project Engineer, Sr. Long Range Planning Engineer, Sr. Planning Supervisor and Sr. Business Planner. Since 2009 I have worked as a consultant mining engineer. As a Mining Engineer I have completed a variety of projects for mining companies involving scoping studies, pre-feasibility studies, feasibility studies, project evaluations, and life-of-mines for projects in Canada, US and Australia. I am a "Qualified Person" for purposes of National Instrument 43-101 (the "Instrument").
- I did not complete a personal inspection of the Property.
- I am responsible for Sections 1.10 to 1.12, 21.0, 22.0, and 28.0 of the Technical Report.
- I am independent of Prophecy Platinum Corp. as defined by Section 1.5 of the Instrument.
- I have no prior involvement with the Property that is the subject of the Technical Report.
- I have read the Instrument and the parts of the Technical Report that I am responsible for has been prepared in compliance with the Instrument.
- As of the date of this certificate, to the best of my knowledge, information and belief, the parts of the Technical Report that I am responsible for contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Signed and dated this 1st day of August, 2012 at Toronto, Ontario

"Original document signed and sealed by Philip Bridson, P.Eng."

Philip Bridson, P.Eng.
Senior Mining Engineer
Tetra Tech WEI Inc.

APPENDIX A

LIST OF CLAIMS

District	GrantNumber	RegType	ClaimName	ClaimNbr	ClaimOwner	OperatingRecordingDate	ClaimExpiryDate	Status	QuartzLease	NTS MapN	Area (ha)	Ops Number
Whitehorse	YE69511	Quartz	ARCH	11	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	20	94067553
Whitehorse	YE69513	Quartz	ARCH	13	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	21	94012206
Whitehorse	YE69514	Quartz	ARCH	14	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	20	93850435
Whitehorse	YE69515	Quartz	ARCH	15	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	21	94049413
Whitehorse	YE69516	Quartz	ARCH	16	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	20	94045674
Whitehorse	YE69517	Quartz	ARCH	17	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	21	94067773
Whitehorse	YE69518	Quartz	ARCH	18	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	20	94072148
Whitehorse	YE69519	Quartz	ARCH	19	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	19	93850436
Whitehorse	YE69520	Quartz	ARCH	20	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	18	93850437
Whitehorse	YE69521	Quartz	ARCH	21	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	20	93979568
Whitehorse	YE69522	Quartz	ARCH	22	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	19	94035278
Whitehorse	YE69523	Quartz	ARCH	23	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	21	94104779
Whitehorse	YE69524	Quartz	ARCH	24	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	20	93850438
Whitehorse	YE69525	Quartz	ARCH	25	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	12	93975262
Whitehorse	YE69526	Quartz	ARCH	26	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	18	93850439
Whitehorse	YE69527	Quartz	ARCH	27	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	3	93850440
Whitehorse	YE69528	Quartz	ARCH	28	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	17	94104777
Whitehorse	YE69529	Quartz	ARCH	29	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	21	94127283
Whitehorse	YE69530	Quartz	ARCH	30	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	21	94122950
Whitehorse	YE69531	Quartz	ARCH	31	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	19	94109055
Whitehorse	YE69532	Quartz	ARCH	32	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	21	94090684
Whitehorse	YE69533	Quartz	ARCH	33	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	9	94090685
Whitehorse	YE69534	Quartz	ARCH	34	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	21	94049412
Whitehorse	YE69535	Quartz	ARCH	35	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	19	93850441
Whitehorse	YE69536	Quartz	ARCH	36	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	16	93850442
Whitehorse	YE69537	Quartz	ARCH	37	Bill Harris - 100%	8/18/2011	8/18/2012	Pending		115G05	6	93850443
Whitehorse	YA94968	Quartz	BARNY	1	0905144 B.C. Ltd - 100%	6/12/1986	2/11/2014	Active		115G05	22	94007160
Whitehorse	YA94969	Quartz	BARNY	2	0905144 B.C. Ltd - 100%	6/12/1986	2/11/2014	Active		115G05	21	94062684
Whitehorse	YA94970	Quartz	BARNY	3	0905144 B.C. Ltd - 100%	6/12/1986	2/11/2014	Active		115G05	21	94062699
Whitehorse	YA94971	Quartz	BARNY	4	0905144 B.C. Ltd - 100%	6/12/1986	2/11/2014	Active		115G05	20	94088718
Whitehorse	YA94972	Quartz	BARNY	5	0905144 B.C. Ltd - 100%	6/12/1986	2/11/2014	Active		115G05	21	94085671
Whitehorse	YA94973	Quartz	BARNY	6	0905144 B.C. Ltd - 100%	6/12/1986	2/11/2014	Active		115G05	21	93855756
Whitehorse	YA96002	Quartz	BARNY	7	0905144 B.C. Ltd - 100%	8/22/1986	2/11/2014	Active		115G05	22	93988633
Whitehorse	YA96003	Quartz	BARNY	8	0905144 B.C. Ltd - 100%	8/22/1986	2/11/2014	Active		115G05	14	93855835
Whitehorse	YA96004	Quartz	BARNY	9	0905144 B.C. Ltd - 100%	8/22/1986	2/11/2014	Active		115G05	22	94081285
Whitehorse	YA96005	Quartz	BARNY	10	0905144 B.C. Ltd - 100%	8/22/1986	2/11/2014	Active		115G05	21	94117982
Whitehorse	YA96006	Quartz	BARNY	11	0905144 B.C. Ltd - 100%	8/22/1986	2/11/2014	Active		115G05	21	93855836
Whitehorse	YA96007	Quartz	BARNY	12	0905144 B.C. Ltd - 100%	8/22/1986	2/11/2014	Active		115G05	21	93855837
Whitehorse	YA96008	Quartz	BARNY	13	0905144 B.C. Ltd - 100%	8/22/1986	2/11/2014	Active		115G05	19	94087202
Whitehorse	YA96009	Quartz	BARNY	14	0905144 B.C. Ltd - 100%	8/22/1986	2/11/2014	Active		115G05	17	93855838
Whitehorse	YA96867	Quartz	BARNY	19	0905144 B.C. Ltd - 100%	2/11/1987	2/11/2014	Active		115G05	21	93855734
Whitehorse	YA96868	Quartz	BARNY	20	0905144 B.C. Ltd - 100%	2/11/1987	2/11/2014	Active		115G05	22	93977591
Whitehorse	YA96869	Quartz	BARNY	21	0905144 B.C. Ltd - 100%	2/11/1987	2/11/2014	Active		115G05	21	94030278
Whitehorse	YA96870	Quartz	BARNY	22	0905144 B.C. Ltd - 100%	2/11/1987	2/11/2014	Active		115G05	21	93855735
Whitehorse	YA96871	Quartz	BARNY	23	0905144 B.C. Ltd - 100%	2/11/1987	2/11/2014	Active		115G05	22	94011620
Whitehorse	YA96872	Quartz	BARNY	24	0905144 B.C. Ltd - 100%	2/11/1987	2/11/2014	Active		115G05	22	93996238
Whitehorse	YA96873	Quartz	BARNY	25	0905144 B.C. Ltd - 100%	2/11/1987	2/11/2014	Active		115G05	10	94051761
Whitehorse	YA96874	Quartz	BARNY	26	0905144 B.C. Ltd - 100%	2/11/1987	2/11/2014	Active		115G05	17	93855736
Whitehorse	YA96875	Quartz	BARNY	27	0905144 B.C. Ltd - 100%	2/11/1987	2/11/2014	Active		115G05	18	93988634
Whitehorse	YA96876	Quartz	BARNY	28	0905144 B.C. Ltd - 100%	2/11/1987	2/11/2014	Active		115G05	18	93855766
Whitehorse	YA96877	Quartz	BARNY	29	0905144 B.C. Ltd - 100%	2/11/1987	2/11/2014	Active		115G05	18	93855767
Whitehorse	YA96878	Quartz	BARNY	30	0905144 B.C. Ltd - 100%	2/11/1987	2/11/2014	Active		115G05	9	94044331
Whitehorse	YA96879	Quartz	BARNY	31	0905144 B.C. Ltd - 100%	2/11/1987	2/11/2014	Active		115G05	14	94062700
Whitehorse	YA96880	Quartz	BARNY	32	0905144 B.C. Ltd - 100%	2/11/1987	2/11/2014	Active		115G05	20	93855768
Whitehorse	YA97896	Quartz	BARNY	33	0905144 B.C. Ltd - 100%	6/23/1987	2/11/2014	Active		115G05	6	93855618
Whitehorse	YA97897	Quartz	BARNY	34	0905144 B.C. Ltd - 100%	6/23/1987	2/11/2014	Active		115G05	13	93855619
Whitehorse	YA97898	Quartz	BARNY	35	0905144 B.C. Ltd - 100%	6/23/1987	2/11/2014	Active		115G05	18	94053321
Whitehorse	YA97899	Quartz	BARNY	36	0905144 B.C. Ltd - 100%	6/23/1987	2/11/2014	Active		115G05	16	93855865
Whitehorse	YA97900	Quartz	BARNY	37	0905144 B.C. Ltd - 100%	6/23/1987	2/11/2014	Active		115G05	18	94117993
Whitehorse	YA97901	Quartz	BARNY	38	0905144 B.C. Ltd - 100%	6/23/1987	2/11/2014	Active		115G05	11	94025854
Whitehorse	YA97902	Quartz	BARNY	39	0905144 B.C. Ltd - 100%	6/23/1987	2/11/2014	Active		115G05	11	93970041
Whitehorse	YA97904	Quartz	BARNY	41	0905144 B.C. Ltd - 100%	6/23/1987	2/11/2014	Active		115G05	19	93855769
Whitehorse	YA97905	Quartz	BARNY	42	0905144 B.C. Ltd - 100%	6/23/1987	2/11/2014	Active		115G05	15	93855770
Whitehorse	YA97906	Quartz	BARNY	43	0905144 B.C. Ltd - 100%	6/23/1987	2/11/2014	Active		115G05	13	93855771
Whitehorse	YA97908	Quartz	BARNY	45	0905144 B.C. Ltd - 100%	6/23/1987	2/11/2014	Active		115G05	15	94105661

District	GrantNumber	RegType	ClaimName	ClaimNbr	ClaimOwner	OperatingRecordingDate	ClaimExpiryDate	Status	QuartzLease	NTS MapN	Area (ha)	Ops Number
Whitehorse	YA97910	Quartz	BARNY	47	0905144 B.C. Ltd - 100%	6/23/1987	2/11/2014	Active		115G05	15	93855820
Whitehorse	YA97911	Quartz	BARNY	48	0905144 B.C. Ltd - 100%	6/23/1987	2/11/2014	Active		115G05	9	94044345
Whitehorse	YA97912	Quartz	BARNY	49	0905144 B.C. Ltd - 100%	6/23/1987	2/11/2014	Active		115G05	13	94099731
Whitehorse	YB08307	Quartz	BARNY	50	0905144 B.C. Ltd - 100%	10/2/1987	2/11/2014	Active		115G05	5	93855720
Whitehorse	63029	Quartz	BETTY	1	0905144 B.C. Ltd - 100%	7/23/1952	12/5/2020	Active	OW00138	115G05	10	93855607
Whitehorse	63030	Quartz	BETTY	2	0905144 B.C. Ltd - 100%	7/23/1952	12/5/2020	Active	OW00139	115G05	12	93855608
Whitehorse	63031	Quartz	BETTY	3	0905144 B.C. Ltd - 100%	7/23/1952	12/5/2020	Active	OW00140	115G05	12	94081333
Whitehorse	63032	Quartz	BETTY	4	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00141	115G05	11	93976036
Whitehorse	63033	Quartz	BETTY	5	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00142	115G05	18	94044369
Whitehorse	63034	Quartz	BETTY	6	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00143	115G05	18	93994661
Whitehorse	63035	Quartz	BETTY	7	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00144	115G05	20	93855609
Whitehorse	63036	Quartz	BETTY	8	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00145	115G05	21	94050175
Whitehorse	YC26564	Quartz	BUR	1	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93858881
Whitehorse	YC26565	Quartz	BUR	2	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93858882
Whitehorse	YC26566	Quartz	BUR	3	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93858522
Whitehorse	YC26567	Quartz	BUR	4	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93858896
Whitehorse	YC26568	Quartz	BUR	5	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	94081830
Whitehorse	YC26569	Quartz	BUR	6	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	94063209
Whitehorse	YC26570	Quartz	BUR	7	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	94100357
Whitehorse	YC26571	Quartz	BUR	8	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	94100356
Whitehorse	YC26572	Quartz	BUR	9	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93977724
Whitehorse	YC26573	Quartz	BUR	10	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93858897
Whitehorse	YC26574	Quartz	BUR	11	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	94117335
Whitehorse	YC26575	Quartz	BUR	12	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	94063275
Whitehorse	YC26576	Quartz	BUR	13	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93858898
Whitehorse	YC26577	Quartz	BUR	14	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	94110243
Whitehorse	YC26578	Quartz	BUR	15	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93987977
Whitehorse	YC26579	Quartz	BUR	16	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	94036497
Whitehorse	YC26580	Quartz	BUR	17	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859039
Whitehorse	YC26581	Quartz	BUR	18	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859040
Whitehorse	YC26582	Quartz	BUR	19	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	94025175
Whitehorse	YC26583	Quartz	BUR	20	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	94007747
Whitehorse	YC26584	Quartz	BUR	21	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	94025174
Whitehorse	YC26585	Quartz	BUR	22	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859041
Whitehorse	YC26586	Quartz	BUR	23	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859042
Whitehorse	YC26587	Quartz	BUR	24	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	94026518
Whitehorse	YC26588	Quartz	BUR	25	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859043
Whitehorse	YC26589	Quartz	BUR	26	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	94011197
Whitehorse	YC26590	Quartz	BUR	27	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	94007746
Whitehorse	YC26591	Quartz	BUR	28	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859044
Whitehorse	YC26592	Quartz	BUR	29	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	94036495
Whitehorse	YC26593	Quartz	BUR	30	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859071
Whitehorse	YC26594	Quartz	BUR	31	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859072
Whitehorse	YC26595	Quartz	BUR	32	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93976289
Whitehorse	YC26596	Quartz	BUR	33	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859073
Whitehorse	YC26597	Quartz	BUR	34	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	94108854
Whitehorse	YC26598	Quartz	BUR	35	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	94036496
Whitehorse	YC26599	Quartz	BUR	36	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859074
Whitehorse	YC26600	Quartz	BUR	37	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859075
Whitehorse	YC26601	Quartz	BUR	38	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93970626
Whitehorse	YC26602	Quartz	BUR	39	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859076
Whitehorse	YC26603	Quartz	BUR	40	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859077
Whitehorse	YC26604	Quartz	BUR	41	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	94050397
Whitehorse	YC26605	Quartz	BUR	42	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859078
Whitehorse	YC26606	Quartz	BUR	43	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859079
Whitehorse	YC26607	Quartz	BUR	44	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859080
Whitehorse	YC26608	Quartz	BUR	45	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859081
Whitehorse	YC26609	Quartz	BUR	46	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93970627
Whitehorse	YC26610	Quartz	BUR	47	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859082
Whitehorse	YC26611	Quartz	BUR	48	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859083
Whitehorse	YC26612	Quartz	BUR	49	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859084
Whitehorse	YC26613	Quartz	BUR	50	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859085
Whitehorse	YC26614	Quartz	BUR	51	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859086

District	GrantNumber	RegType	ClaimName	ClaimNbr	ClaimOwner	OperatingRecordingDate	ClaimExpiryDate	Status	QuartzLease	NTS MapN	Area (ha)	Ops Number
Whitehorse	YC26615	Quartz	BUR	52	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859087
Whitehorse	YC26616	Quartz	BUR	53	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859088
Whitehorse	YC26617	Quartz	BUR	54	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859089
Whitehorse	YC26618	Quartz	BUR	55	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	94100358
Whitehorse	YC26619	Quartz	BUR	56	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93977728
Whitehorse	YC26620	Quartz	BUR	57	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	94033494
Whitehorse	YC26621	Quartz	BUR	58	Prophecy Platinum Corp. - 100%	3/5/2004	2/23/2024	Active		115G06	21	93859090
Whitehorse	YB36423	Quartz	BURWASH	1	Prophecy Platinum Corp. - 100%	8/23/1991	2/23/2028	Active		115G06	21	93857561
Whitehorse	YB36424	Quartz	BURWASH	2	Prophecy Platinum Corp. - 100%	8/23/1991	2/23/2028	Active		115G06	21	93988622
Whitehorse	YB36425	Quartz	BURWASH	3	Prophecy Platinum Corp. - 100%	8/23/1991	2/23/2028	Active		115G06	21	94048640
Whitehorse	YB36426	Quartz	BURWASH	4	Prophecy Platinum Corp. - 100%	8/23/1991	2/23/2028	Active		115G06	21	93857562
Whitehorse	YB36427	Quartz	BURWASH	5	Prophecy Platinum Corp. - 100%	8/23/1991	2/23/2028	Active		115G06	21	94088717
Whitehorse	YB36428	Quartz	BURWASH	6	Prophecy Platinum Corp. - 100%	8/23/1991	2/23/2028	Active		115G06	21	94054749
Whitehorse	YB36429	Quartz	BURWASH	7	Prophecy Platinum Corp. - 100%	8/23/1991	2/23/2028	Active		115G06	21	93857563
Whitehorse	YB36430	Quartz	BURWASH	8	Prophecy Platinum Corp. - 100%	8/23/1991	2/23/2028	Active		115G06	21	94117981
Whitehorse	YB36431	Quartz	BURWASH	9	Prophecy Platinum Corp. - 100%	8/23/1991	2/23/2028	Active		115G06	21	93857564
Whitehorse	YC18485	Quartz	BURWASH	10	Prophecy Platinum Corp. - 100%	3/7/2000	2/23/2024	Active		115G06	17	94029861
Whitehorse	YC18486	Quartz	BURWASH	11	Prophecy Platinum Corp. - 100%	3/7/2000	2/23/2024	Active		115G06	4	94121588
Whitehorse	YC18487	Quartz	BURWASH	12	Prophecy Platinum Corp. - 100%	3/7/2000	2/23/2024	Active		115G06	21	93977590
Whitehorse	YC18488	Quartz	BURWASH	13	Prophecy Platinum Corp. - 100%	3/7/2000	2/23/2024	Active		115G06	21	94029384
Whitehorse	YC18489	Quartz	BURWASH	14	Prophecy Platinum Corp. - 100%	3/7/2000	2/23/2024	Active		115G06	21	93858392
Whitehorse	YC18490	Quartz	BURWASH	15	Prophecy Platinum Corp. - 100%	3/7/2000	2/23/2024	Active		115G06	21	93858393
Whitehorse	YC18491	Quartz	BURWASH	16	Prophecy Platinum Corp. - 100%	3/7/2000	2/23/2024	Active		115G06	21	93858394
Whitehorse	YC18492	Quartz	BURWASH	17	Prophecy Platinum Corp. - 100%	3/7/2000	2/23/2024	Active		115G06	21	93858395
Whitehorse	YC18493	Quartz	BURWASH	18	Prophecy Platinum Corp. - 100%	3/7/2000	2/23/2024	Active		115G06	21	93858396
Whitehorse	YC18494	Quartz	BURWASH	19	Prophecy Platinum Corp. - 100%	3/7/2000	2/23/2024	Active		115G06	21	94128383
Whitehorse	YC18495	Quartz	BURWASH	20	Prophecy Platinum Corp. - 100%	3/7/2000	2/23/2024	Active		115G06	21	94044231
Whitehorse	YC18496	Quartz	BURWASH	21	Prophecy Platinum Corp. - 100%	3/7/2000	2/23/2024	Active		115G06	21	94025788
Whitehorse	YC18497	Quartz	BURWASH	22	Prophecy Platinum Corp. - 100%	3/7/2000	2/23/2024	Active		115G06	21	93858397
Whitehorse	YC18498	Quartz	BURWASH	23	Prophecy Platinum Corp. - 100%	3/7/2000	2/23/2024	Active		115G06	21	93858398
Whitehorse	YC18499	Quartz	BURWASH	24	Prophecy Platinum Corp. - 100%	3/7/2000	2/23/2024	Active		115G06	21	94099628
Whitehorse	YC18500	Quartz	BURWASH	25	Prophecy Platinum Corp. - 100%	3/7/2000	2/23/2024	Active		115G06	21	94014597
Whitehorse	YC18501	Quartz	BURWASH	26	Prophecy Platinum Corp. - 100%	3/7/2000	2/23/2024	Active		115G06	21	93858399
Whitehorse	YC18502	Quartz	BURWASH	27	Prophecy Platinum Corp. - 100%	3/7/2000	2/23/2024	Active		115G06	21	94108638
Whitehorse	YC18503	Quartz	BURWASH	28	Prophecy Platinum Corp. - 100%	3/7/2000	2/23/2024	Active		115G06	21	93858400
Whitehorse	YC18504	Quartz	BURWASH	29	Prophecy Platinum Corp. - 100%	3/7/2000	2/23/2024	Active		115G06	21	94014645
Whitehorse	YC18505	Quartz	BURWASH	30	Prophecy Platinum Corp. - 100%	3/7/2000	2/23/2024	Active		115G06	21	94051720
Whitehorse	YC18506	Quartz	BURWASH	31	Prophecy Platinum Corp. - 100%	3/7/2000	2/23/2024	Active		115G06	21	94062586
Whitehorse	YC18507	Quartz	BURWASH	32	Prophecy Platinum Corp. - 100%	3/7/2000	2/23/2024	Active		115G06	21	94063210
Whitehorse	YC18508	Quartz	BURWASH	33	Prophecy Platinum Corp. - 100%	3/7/2000	2/23/2024	Active		115G06	21	94044260
Whitehorse	60775	Quartz	DISCOVERY	1	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00089	115G05	10	93854862
Whitehorse	60776	Quartz	DISCOVERY	2	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00090	115G05	10	94036317
Whitehorse	60777	Quartz	DISCOVERY	3	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00091	115G05	16	93854863
Whitehorse	60778	Quartz	DISCOVERY	4	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00092	115G05	17	93854864
Whitehorse	60779	Quartz	DISCOVERY	5	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00093	115G05	13	94062644
Whitehorse	60780	Quartz	DISCOVERY	6	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00094	115G05	17	93854865
Whitehorse	60781	Quartz	DISCOVERY	7	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00095	115G05	14	94066500
Whitehorse	60782	Quartz	DISCOVERY	8	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00096	115G05	12	93854866
Whitehorse	63001	Quartz	IRISH	1	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00113	115G05	20	93855597
Whitehorse	63002	Quartz	IRISH	2	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00114	115G05	15	94081256
Whitehorse	63003	Quartz	IRISH	3	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00115	115G05	11	93855598
Whitehorse	63006	Quartz	IRISH	6	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00116	115G05	16	93855599
Whitehorse	64122	Quartz	JEEP	238	0905144 B.C. Ltd - 100%	9/14/1952	12/5/2020	Active	OW00162	115G05	7	93854682
Whitehorse	64742	Quartz	JEEP	96	0905144 B.C. Ltd - 100%	8/6/1952	12/5/2020	Active	OW00163	115G05	12	93854683
Whitehorse	64828	Quartz	JEEP	234	0905144 B.C. Ltd - 100%	9/14/1952	12/5/2020	Active	OW00164	115G05	4	94104135
Whitehorse	64830	Quartz	JEEP	236	0905144 B.C. Ltd - 100%	9/14/1952	12/5/2020	Active	OW00165	115G05	6	94034825
Whitehorse	64832	Quartz	JEEP	240	0905144 B.C. Ltd - 100%	9/14/1952	12/5/2020	Active	OW00166	115G05	6	93854684
Whitehorse	64834	Quartz	JEEP	242	0905144 B.C. Ltd - 100%	9/14/1952	12/5/2020	Active	OW00167	115G05	8	94110076
Whitehorse	64836	Quartz	JEEP	244	0905144 B.C. Ltd - 100%	9/14/1952	12/5/2020	Active	OW00168	115G05	12	94011689
Whitehorse	66569	Quartz	JEEP	265	0905144 B.C. Ltd - 100%	8/22/1953	12/5/2020	Active	OW00169	115G06	10	93992220
Whitehorse	66571	Quartz	JEEP	267	0905144 B.C. Ltd - 100%	8/22/1953	12/5/2020	Active	OW00170	115G06	20	93854887
Whitehorse	66572	Quartz	JEEP	268	0905144 B.C. Ltd - 100%	8/22/1953	12/5/2020	Active	OW00171	115G06	18	93854888
Whitehorse	YD127061	Quartz	KAT	1	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	18	93849502

District	GrantNumber	RegType	ClaimName	ClaimNbr	ClaimOwner	OperatingRecordingDate	ClaimExpiryDate	Status	QuartzLease	NTS MapN	Area (ha)	Ops Number
Whitehorse	YD127062	Quartz	KAT	2	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	21	93849503
Whitehorse	YD127063	Quartz	KAT	3	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	18	94058909
Whitehorse	YD127064	Quartz	KAT	4	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	14	94095920
Whitehorse	YD127065	Quartz	KAT	5	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	17	94077441
Whitehorse	YD127066	Quartz	KAT	6	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	10	93849504
Whitehorse	YD127067	Quartz	KAT	7	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	16	94003425
Whitehorse	YD127068	Quartz	KAT	8	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	7	94095921
Whitehorse	YD127069	Quartz	KAT	9	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	16	93848302
Whitehorse	YD127070	Quartz	KAT	10	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	3	93848303
Whitehorse	YD127071	Quartz	KAT	11	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	6	93984889
Whitehorse	YD127072	Quartz	KAT	12	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	20	94003424
Whitehorse	YD127073	Quartz	KAT	13	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	3	94077473
Whitehorse	YD127074	Quartz	KAT	14	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	21	94003451
Whitehorse	YD127075	Quartz	KAT	15	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	6	93848743
Whitehorse	YD127076	Quartz	KAT	16	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	21	94095949
Whitehorse	YD127077	Quartz	KAT	17	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	7	93849025
Whitehorse	YD127078	Quartz	KAT	18	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	21	94095950
Whitehorse	YD127079	Quartz	KAT	19	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	11	94040618
Whitehorse	YD127080	Quartz	KAT	20	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	21	93984920
Whitehorse	YD127081	Quartz	KAT	21	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	16	94077442
Whitehorse	YD127082	Quartz	KAT	22	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	21	93849026
Whitehorse	YD127083	Quartz	KAT	23	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	11	94040619
Whitehorse	YD127084	Quartz	KAT	24	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	21	93849027
Whitehorse	YD127085	Quartz	KAT	25	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	14	94132788
Whitehorse	YD127086	Quartz	KAT	26	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	21	94040617
Whitehorse	YD127087	Quartz	KAT	27	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	8	93849028
Whitehorse	YD127088	Quartz	KAT	28	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	16	93848588
Whitehorse	YD127089	Quartz	KAT	29	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	8	94114266
Whitehorse	YD127090	Quartz	KAT	30	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	2	93984924
Whitehorse	YD127091	Quartz	KAT	31	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	2	94132789
Whitehorse	YD127092	Quartz	KAT	32	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	1	94095951
Whitehorse	YD127093	Quartz	KAT	33	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	1	93848589
Whitehorse	YD127094	Quartz	KAT	34	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	3	94003452
Whitehorse	YD127095	Quartz	KAT	35	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	5	93848590
Whitehorse	YD127096	Quartz	KAT	36	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	3	93848657
Whitehorse	YD127097	Quartz	KAT	37	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	17	93848658
Whitehorse	YD127098	Quartz	KAT	38	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	20	94021560
Whitehorse	YD127099	Quartz	KAT	39	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	17	93848659
Whitehorse	YD127100	Quartz	KAT	40	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	20	93848660
Whitehorse	YD127101	Quartz	KAT	41	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	16	94058510
Whitehorse	YD127102	Quartz	KAT	42	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	20	94077006
Whitehorse	YE70953	Quartz	KAT	43	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	14	93848661
Whitehorse	YE70954	Quartz	KAT	44	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	20	93848662
Whitehorse	YE70955	Quartz	KAT	45	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	10	93848663
Whitehorse	YE70956	Quartz	KAT	46	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	20	93848664
Whitehorse	YE70957	Quartz	KAT	47	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	18	93848665
Whitehorse	YE70958	Quartz	KAT	48	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	14	94077007
Whitehorse	YE70959	Quartz	KAT	49	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	21	94058509
Whitehorse	YE70960	Quartz	KAT	50	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	20	94003026
Whitehorse	YE70961	Quartz	KAT	51	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	21	93848666
Whitehorse	YE70962	Quartz	KAT	52	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	14	93848667
Whitehorse	YE70963	Quartz	KAT	53	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	21	93848668
Whitehorse	YE70964	Quartz	KAT	54	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	12	93848669
Whitehorse	YE70965	Quartz	KAT	55	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	21	93848670
Whitehorse	YE70966	Quartz	KAT	56	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	21	94040100
Whitehorse	YE70967	Quartz	KAT	57	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	21	93848671
Whitehorse	YE70968	Quartz	KAT	58	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	21	93848672
Whitehorse	YE70969	Quartz	KAT	59	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	21	93848673
Whitehorse	YE70970	Quartz	KAT	60	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	21	94040086
Whitehorse	YE70971	Quartz	KAT	61	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	21	94021570
Whitehorse	YE70972	Quartz	KAT	62	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	21	94113892
Whitehorse	YE70973	Quartz	KAT	63	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	21	93848674
Whitehorse	YE70974	Quartz	KAT	64	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	21	93848675

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Whitehorse	YE70975	Quartz	KAT	65	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	21	94058511
Whitehorse	YE70976	Quartz	KAT	66	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	21	93848676
Whitehorse	YE70977	Quartz	KAT	67	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	21	93848677
Whitehorse	YE70978	Quartz	KAT	68	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	21	94132334
Whitehorse	YE70979	Quartz	KAT	69	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	17	94113894
Whitehorse	YE70980	Quartz	KAT	70	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	20	94077008
Whitehorse	YE70981	Quartz	KAT	71	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	9	94003028
Whitehorse	YE70982	Quartz	KAT	72	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	20	93848678
Whitehorse	YE70983	Quartz	KAT	73	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	14	94040101
Whitehorse	YE70984	Quartz	KAT	74	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	18	93848679
Whitehorse	YE70985	Quartz	KAT	75	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	3	93848680
Whitehorse	YE70986	Quartz	KAT	76	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	8	94058512
Whitehorse	YE70987	Quartz	KAT	77	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	4	93848681
Whitehorse	YE70988	Quartz	KAT	78	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	8	94021571
Whitehorse	YE70989	Quartz	KAT	79	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	10	94040102
Whitehorse	YE70990	Quartz	KAT	80	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	8	93848682
Whitehorse	YE70991	Quartz	KAT	81	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	11	94040103
Whitehorse	YE70992	Quartz	KAT	82	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G06	6	93848683
Whitehorse	YE70993	Quartz	KAT	83	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	12	93848684
Whitehorse	YE70994	Quartz	KAT	84	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	20	93984921
Whitehorse	YE70995	Quartz	KAT	85	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	9	93848685
Whitehorse	YE70996	Quartz	KAT	86	0905144 B.C. Ltd - 100%	7/12/2011	7/12/2013	Active		115G05	19	94022006
Whitehorse	63021	Quartz	MAC	1	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00130	115G05	13	93855603
Whitehorse	63022	Quartz	MAC	2	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00131	115G05	12	93855604
Whitehorse	63023	Quartz	MAC	3	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00132	115G05	14	94044370
Whitehorse	63024	Quartz	MAC	4	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00133	115G05	11	93855605
Whitehorse	63025	Quartz	MAC	5	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00134	115G05	10	93855606
Whitehorse	63026	Quartz	MAC	6	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00135	115G05	8	94081332
Whitehorse	63027	Quartz	MAC	7	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00136	115G05	8	93979092
Whitehorse	63028	Quartz	MAC	8	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00137	115G05	14	94068485
Whitehorse	YA94966	Quartz	MUS	5	0905144 B.C. Ltd - 100%	6/12/1986	2/11/2014	Active		115G05	21	93976121
Whitehorse	YA94967	Quartz	MUS	6	0905144 B.C. Ltd - 100%	6/12/1986	2/11/2014	Active		115G05	21	94017711
Whitehorse	YA96015	Quartz	MUS	12	0905144 B.C. Ltd - 100%	8/22/1986	2/11/2014	Active		115G05	21	94085666
Whitehorse	YA96017	Quartz	MUS	14	0905144 B.C. Ltd - 100%	8/22/1986	2/11/2014	Active		115G05	20	93855617
Whitehorse	YA96019	Quartz	MUS	16	0905144 B.C. Ltd - 100%	8/22/1986	2/11/2014	Active		115G05	16	93855620
Whitehorse	60767	Quartz	QUILL	1	0905144 B.C. Ltd - 100%	7/2/1952	12/5/2020	Active	OW00081	115G05	17	93854856
Whitehorse	60768	Quartz	QUILL	2	0905144 B.C. Ltd - 100%	7/2/1952	12/5/2020	Active	OW00082	115G05	17	93854857
Whitehorse	60769	Quartz	QUILL	3	0905144 B.C. Ltd - 100%	7/2/1952	12/5/2020	Active	OW00083	115G05	21	94070147
Whitehorse	60770	Quartz	QUILL	4	0905144 B.C. Ltd - 100%	7/2/1953	12/5/2020	Active	OW00084	115G05	21	93854858
Whitehorse	60771	Quartz	QUILL	5	0905144 B.C. Ltd - 100%	7/2/1952	12/5/2020	Active	OW00085	115G05	21	93854859
Whitehorse	60772	Quartz	QUILL	6	0905144 B.C. Ltd - 100%	7/2/1952	12/5/2020	Active	OW00086	115G05	21	93854860
Whitehorse	60773	Quartz	QUILL	7	0905144 B.C. Ltd - 100%	7/2/1952	12/5/2020	Active	OW00087	115G05	14	93854861
Whitehorse	60774	Quartz	QUILL	8	0905144 B.C. Ltd - 100%	7/2/1952	12/5/2020	Active	OW00088	115G05	17	94033432
Whitehorse	70829	Quartz	QUILL	0	0905144 B.C. Ltd - 100%	8/9/1955	12/5/2020	Active	OW00117	115G05	11	94099756
Whitehorse	60791	Quartz	RAM	1	0905144 B.C. Ltd - 100%	7/2/1952	12/5/2020	Active	OW00105	115G05	16	93854890
Whitehorse	60792	Quartz	RAM	2	0905144 B.C. Ltd - 100%	7/2/1952	12/5/2020	Active	OW00106	115G05	21	93854891
Whitehorse	60793	Quartz	RAM	3	0905144 B.C. Ltd - 100%	7/2/1952	12/5/2020	Active	OW00107	115G05	20	94099681
Whitehorse	60794	Quartz	RAM	4	0905144 B.C. Ltd - 100%	7/2/1952	12/5/2020	Active	OW00108	115G05	20	93855490
Whitehorse	60795	Quartz	RAM	5	0905144 B.C. Ltd - 100%	7/2/1952	12/5/2020	Active	OW00109	115G05	8	93855491
Whitehorse	60796	Quartz	RAM	6	0905144 B.C. Ltd - 100%	7/2/1952	12/5/2020	Active	OW00110	115G05	22	94013095
Whitehorse	60797	Quartz	RAM	7	0905144 B.C. Ltd - 100%	7/2/1952	12/5/2020	Active	OW00111	115G05	16	94062643
Whitehorse	60798	Quartz	RAM	8	0905144 B.C. Ltd - 100%	7/2/1952	12/5/2020	Active	OW00112	115G05	14	93855492
Whitehorse	63037	Quartz	RED	1	0905144 B.C. Ltd - 100%	7/8/1952	12/5/2020	Active	OW00146	115G06	15	94025885
Whitehorse	63038	Quartz	RED	2	0905144 B.C. Ltd - 100%	7/8/1952	12/5/2020	Active	OW00147	115G05	14	94105544
Whitehorse	63039	Quartz	RED	3	0905144 B.C. Ltd - 100%	7/8/1952	12/5/2020	Active	OW00148	115G05	16	93976037
Whitehorse	63040	Quartz	RED	4	0905144 B.C. Ltd - 100%	7/8/1952	12/5/2020	Active	OW00149	115G05	21	93855610
Whitehorse	63041	Quartz	RED	5	0905144 B.C. Ltd - 100%	7/8/1952	12/5/2020	Active	OW00150	115G05	21	94048324
Whitehorse	63042	Quartz	RED	6	0905144 B.C. Ltd - 100%	7/8/1952	12/5/2020	Active	OW00151	115G05	16	93855611
Whitehorse	63043	Quartz	RED	7	0905144 B.C. Ltd - 100%	7/8/1952	12/5/2020	Active	OW00152	115G05	15	93988672
Whitehorse	63044	Quartz	RED	8	0905144 B.C. Ltd - 100%	7/8/1952	12/5/2020	Active	OW00153	115G05	19	93970062
Whitehorse	64066	Quartz	ROSS	25	0905144 B.C. Ltd - 100%	7/7/1952	12/5/2020	Active	OW00156	115G06	16	93855613
Whitehorse	64076	Quartz	ROSS	15	0905144 B.C. Ltd - 100%	7/9/1952	12/5/2020	Active	OW00154	115G06	21	93988673
Whitehorse	64077	Quartz	ROSS	16	0905144 B.C. Ltd - 100%	7/9/1952	12/5/2020	Active	OW00155	115G06	21	93855614

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Whitehorse	64084	Quartz	ROSS	94	0905144 B.C. Ltd - 100%	7/16/1952	12/5/2020	Active	OW00159	115G05	22	93855615
Whitehorse	64085	Quartz	ROSS	95	0905144 B.C. Ltd - 100%	7/16/1952	12/5/2020	Active	OW00160	115G05	24	94104148
Whitehorse	64086	Quartz	ROSS	85	0905144 B.C. Ltd - 100%	7/16/1952	12/5/2020	Active	OW00157	115G06	21	93854680
Whitehorse	64087	Quartz	ROSS	86	0905144 B.C. Ltd - 100%	7/16/1952	12/5/2020	Active	OW00158	115G06	21	93854681
Whitehorse	64587	Quartz	ROSS	96	0905144 B.C. Ltd - 100%	7/16/1952	12/5/2020	Active	OW00161	115G06	24	93977675
Whitehorse	71432	Quartz	ROSS	1	0905144 B.C. Ltd - 100%	10/12/1955	12/5/2020	Active	OW00118	115G05	16	93855496
Whitehorse	71433	Quartz	ROSS	2	0905144 B.C. Ltd - 100%	10/12/1955	12/5/2020	Active	OW00119	115G05	20	93855497
Whitehorse	71434	Quartz	ROSS	3	0905144 B.C. Ltd - 100%	10/12/1955	12/5/2020	Active	OW00120	115G06	13	94025886
Whitehorse	71435	Quartz	ROSS	4	0905144 B.C. Ltd - 100%	10/12/1955	12/5/2020	Active	OW00121	115G06	12	93855498
Whitehorse	YC40144	Quartz	RUB	1	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	94127160
Whitehorse	YC40145	Quartz	RUB	2	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	93859753
Whitehorse	YC40146	Quartz	RUB	3	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	93970870
Whitehorse	YC40147	Quartz	RUB	4	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	93859754
Whitehorse	YC40148	Quartz	RUB	5	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	94016472
Whitehorse	YC40149	Quartz	RUB	6	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	93859755
Whitehorse	YC40150	Quartz	RUB	7	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	94012108
Whitehorse	YC40151	Quartz	RUB	8	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	94090565
Whitehorse	YC40152	Quartz	RUB	9	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	94026754
Whitehorse	YC40153	Quartz	RUB	10	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	93970871
Whitehorse	YC40154	Quartz	RUB	11	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	94063516
Whitehorse	YC40155	Quartz	RUB	12	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	94032118
Whitehorse	YC40156	Quartz	RUB	13	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	94026753
Whitehorse	YC40157	Quartz	RUB	14	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	93859341
Whitehorse	YC40158	Quartz	RUB	15	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	94072029
Whitehorse	YC40159	Quartz	RUB	16	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	94053619
Whitehorse	YC40160	Quartz	RUB	17	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	94063515
Whitehorse	YC40161	Quartz	RUB	18	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	93859342
Whitehorse	YC40162	Quartz	RUB	19	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	94087544
Whitehorse	YC40163	Quartz	RUB	20	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	94070407
Whitehorse	YC40164	Quartz	RUB	21	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	93859863
Whitehorse	YC40165	Quartz	RUB	22	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	94082141
Whitehorse	YC40166	Quartz	RUB	23	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	14	94070549
Whitehorse	YC40167	Quartz	RUB	24	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	93974377
Whitehorse	YC40168	Quartz	RUB	25	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	94108928
Whitehorse	YC40169	Quartz	RUB	26	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	93859864
Whitehorse	YC40170	Quartz	RUB	27	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	93992642
Whitehorse	YC40171	Quartz	RUB	28	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	94012107
Whitehorse	YC40172	Quartz	RUB	29	Prophecy Platinum Corp. - 100%	8/25/2005	2/23/2021	Active		115G06	21	94125757
Whitehorse	63013	Quartz	SAM	1	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00122	115G05	6	94031770
Whitehorse	63014	Quartz	SAM	2	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00123	115G05	10	93855600
Whitehorse	63015	Quartz	SAM	3	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00124	115G05	16	93855601
Whitehorse	63016	Quartz	SAM	4	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00125	115G05	11	94118027
Whitehorse	63017	Quartz	SAM	5	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00126	115G05	13	93855602
Whitehorse	63018	Quartz	SAM	6	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00127	115G05	17	94070148
Whitehorse	63019	Quartz	SAM	7	0905144 B.C. Ltd - 100%	7/30/1952	12/5/2020	Active	OW00128	115G05	14	94036302
Whitehorse	63020	Quartz	SAM	8	0905144 B.C. Ltd - 100%	7/3/1952	12/5/2020	Active	OW00129	115G05	10	94044368
Whitehorse	60783	Quartz	WAGONER	1	0905144 B.C. Ltd - 100%	6/27/1952	12/5/2020	Active	OW00097	115G05	18	94081331
Whitehorse	60784	Quartz	WAGONER	2	0905144 B.C. Ltd - 100%	6/27/1952	12/5/2020	Active	OW00098	115G05	18	93854867
Whitehorse	60785	Quartz	WAGONER	3	0905144 B.C. Ltd - 100%	6/27/1952	12/5/2020	Active	OW00099	115G05	14	93854868
Whitehorse	60786	Quartz	WAGONER	4	0905144 B.C. Ltd - 100%	6/27/1952	12/5/2020	Active	OW00100	115G05	14	93854869
Whitehorse	60787	Quartz	WAGONER	5	0905144 B.C. Ltd - 100%	6/27/1952	12/5/2020	Active	OW00101	115G05	16	93854870
Whitehorse	60788	Quartz	WAGONER	6	0905144 B.C. Ltd - 100%	6/27/1952	12/5/2020	Active	OW00102	115G05	16	94108569
Whitehorse	60789	Quartz	WAGONER	7	0905144 B.C. Ltd - 100%	6/27/1952	12/5/2020	Active	OW00103	115G05	14	94128352
Whitehorse	60790	Quartz	WAGONER	8	0905144 B.C. Ltd - 100%	6/27/1952	12/5/2020	Active	OW00104	115G05	15	93988671

APPENDIX B

SRM Certificates

CCRMP
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Certificate of Analysis

First issued: 1994 Last revision: August 1997

WGB-1

Gabbro Rock PGE Reference Material

Certified Values and 95% Confidence Intervals

Constituent	Certified Value	95% C.I.
Au, ng/g	2.9	± 1.1
Pd, ng/g	13.9	± 2.1
Pt, ng/g	6.1	± 1.6
Fe_2O_3, %	6.71	± 0.14
K_2O, %	0.94	± 0.04
MgO, %	9.40	± 0.19
Cr, µg/g	291	± 13

Provisional Values and 95% Confidence Intervals

Constituent	Provisional Value	95% C.I.
Ir, ng/g	0.33	0.17
Rh, ng/g	0.32	0.21
Ru, ng/g	0.3*	---

* Informational value

Source

WGB-1 was obtained from the Wellgreen Complex, Yukon Territory, Canada. WGB-1 was prepared and certified in cooperation with the Analytical Method Development Section of the Mineral Deposits Division of the Geological Survey of Canada (GSC).

Description

The mineralogy of this gabbro rock consists of plagioclase feldspar, pyroxene, chlorite, prehnite and calcite. Sulphide mineralization in the sample is sparse and includes chalcopyrite, pyrrhotite, pentlandite and galena (intimately associated with the pyrrhotite). Other minerals identified include titanite, ilmenite and rutile.

Intended Use

WGB-1 is intended for analysis of platinum-group elements in exploration samples and for other samples where very low concentrations of gold and PGEs are required. WGB-1 is also intended for general rock analysis for a gabbro-type rock.

Instructions for Use

WGB-1 should be used "as is" without drying.

Method of Preparation

The rock was hand-picked by a GSC geologist. The raw material was dried, comminuted and sieved to obtain a sub-74-micron (-200 mesh) product which was blended and bottled.

State of Homogeneity

The homogeneity of the stock with respect to its gold, platinum and palladium contents was confirmed using bottles chosen according to a stratified random sampling scheme. The analytical method was a fire-assay preconcentration followed by an inductively-coupled plasma - mass spectrometric (ICP-MS) finish performed at GSC. The homogeneity was also confirmed, at a commercial laboratory, for all major constituents by X-ray fluorescence.

Method of Certification

WGB-1 was certified by an interlaboratory analysis program. Thirty-three university, commercial, and government laboratories from Canada, United States, Europe, Australia, Africa, and Japan participated in an interlaboratory certification program. Up to 80 elements were analyzed by methods of each laboratory's choice. A statistical analysis of the data yielded certified values for gold, palladium, platinum, Fe_2O_3, K_2O, MgO, and chromium. Provisional values were assigned for rhodium, iridium and thirty-two others. Informational values for ruthenium and other elements are also given.

Legal Notice

The Canadian Certified Reference Materials Project has prepared this reference material and statistically evaluated the analytical data of the interlaboratory certification program to the best of its ability. The purchaser, by receipt hereof, releases and indemnifies the Canadian Certified Reference Materials Project from and against all liability and costs arising out of the use of this material and information.

Reference

The preparation and certification procedures used for WGB-1, including values obtained by individual laboratories, are given in CANMET report *CCRMP 94-3E*. This report is available free of charge on application to:

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Certifying Officers

W. S. Bowman
William S. Bowman

Maureen E. Leaver.
Maureen E. Leaver

Additional provisional values and 95% confidence limits

Provisional Constituents	Mean	95% Conf. Limits
Al_2O_3, %	11.15	± 0.27
CaO, %	15.78	± 0.85
MnO, %	0.143	± 0.014
Na_2O, %	2.15	± 0.08
P_2O_5, %	0.099	± 0.034
SiO_2, %	49.1	± 0.8
TiO_2, %	0.84	± 0.07
Ba, µg/g	851	± 61
Co, µg/g	29.8	± 1.7
Cs, µg/g	0.52	± 0.15
Cu, µg/g	106	± 9
Eu, µg/g	1.27	± 0.06
Hf, µg/g	1.5	± 0.2
Ho, µg/g	0.52	± 0.07
La, µg/g	8.7	± 1.1
Mo, µg/g	1.2	± 0.5

Provisional Constituents	Mean	95% Conf. Limits
Nb, µg/g	8	± 4
Nd, µg/g	9.9	± 0.9
Ni, µg/g	76	± 7
Rb, µg/g	19.5	± 1.5
Sb, µg/g	2.0	± 0.4
Sc, µg/g	44	± 4
Sm, µg/g	2.8	± 0.3
Sr, µg/g	118	± 9
Tb, µg/g	0.5	± 0.1
Th, µg/g	1.0	± 0.1
U, µg/g	0.75	± 0.1
V, µg/g	222	± 17
Y, µg/g	14.6	± 2.7
Yb, µg/g	1.42	± 0.18
Zn, µg/g	31.5	± 8.5
Zr, µg/g	44	± 16

Informational ranges

(these are not certified values - they are intended to be used as a guide only)

Informational Ranges	
H_2O, %	0.16 - 0.21
LOI, %	3.6 - 4.0
S total, %	0.01 - 0.03
Ag, µg/g	0.1 - 1
As, µg/g	1.5 - 5
B, µg/g	250 - 280
Be, µg/g	0.2 - 0.8
Bi, µg/g	0.1 - 2
Cd, µg/g	0.1 - 0.4
Ce, µg/g	14 - 20
Dy, µg/g	2.5 - 3.5
Er, µg/g	1.2. - 1.8
Ga, µg/g	11 - 13

Informational Ranges	
Gd, µg/g	2.5 - 3.5
Ge, µg/g	0.2 - 7
Hg, µg/g	0.01
Li, µg/g	43 - 51
Lu, µg/g	0.20 - 0.36
Pb, µg/g	4 - 14
Pr, µg/g	2.3 - 2.6
Se, µg/g	0.1 - 0.8
Sn, µg/g	4.2 - 5.2
Ta, µg/g	0.3 - 1
Th, µg/g	1.0 - 1.6
Tm, µg/g	0.15 - 0.30
W, µg/g	1 - 3.5

CCRMP
Canadian Certified Reference Materials Project

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Projet canadien de matériaux de référence certifiés

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Certificate of Analysis

First issued: December 2007 Version: December 2007

WMS-1a

Certified Reference Material for Massive Sulphide with Gold and Platinum Group Elements

Table 1 – WMS-1a Certified Values

Element	Units	Mean	Within-lab Standard Deviation	Between-labs Standard Deviation	95% Confidence Interval of Mean
Al	%	1.350	0.021	0.084	0.051
As	µg/g	30.9	2.9	4.8	2.9
Au	µg/g	0.300	0.043	0.040	0.018
Ca*	%	3.09	0.05	0.17	0.11
Cu**	%	1.396	0.014	0.045	0.021
Fe	%	45.4	0.5	1.2	0.6
Ni	%	3.02	0.05	0.15	0.07
Pd	µg/g	1.45	0.05	0.11	0.05
Pt	µg/g	1.91	0.07	0.10	0.05
Rh	µg/g	0.222	0.015	0.052	0.038
S	%	28.17	0.27	0.96	0.69

* Certified value with digestions by two acids excluded as statistical outliers.
** Certified value with digestions by two acids excluded as method outliers based on statistical tests.

Table 2 – WMS-1a Provisional Values

Element	Units	Mean	Within-lab Standard Deviation	Between-labs Standard Deviation	95% Confidence Interval of Mean
Ag	µg/g	3.7	0.2	1.3	0.5
Co	%	0.145	0.002	0.017	0.008
Cr	µg/g	68	3	15	10
K	%	0.0991	0.0034	0.0094	0.0073
Ir*	µg/g	0.322	0.010	0.018	0.019
Mg	%	0.331	0.007	0.035	0.022
Mn	µg/g	600	10	120	70
Na	%	0.0329	0.0034	0.0074	0.0065
Ru*	µg/g	0.145	0.007	0.013	0.015
Sb	µg/g	6.92	1.01	0.98	0.96
Sr	µg/g	31.3	0.7	5.2	4.3
Ti	µg/g	840	20	120	80
V	µg/g	140	6	25	21
Zn	µg/g	130	4	19	8

*Statistical analysis of the results for these elements warrants classification as Provisional, despite only 6 sets for ruthenium and 7 sets for iridium. Ruthenium value is based on nickel sulphide fire assay only.

Table 3 – WMS-1a Informational Values

Analyte	Units	Mean	Number of accepted laboratories / values
Ba	µg/g	70	7 / 35
Bi	µg/g	1.2	3 /15
C	%	0.1	2 / 10
Cd	µg/g	1.4	4 / 20
Ce	µg/g	7.9	4 / 20
Cu (AD2)*	%	1.34	6 / 30
Cs	µg/g	0.6	4 / 20
Dy	µg/g	0.8	3 / 15
Er	µg/g	0.4	3 / 15
Eu	µg/g	0.2	4 / 20
Ga	µg/g	4	3 / 15
Gd	µg/g	0.8	3 /15

Hf	µg/g	0.5	4 / 20
Ho	µg/g	0.2	3 / 15
In	µg/g	0.2	3 / 15
La	µg/g	4.3	5 / 30
Li	µg/g	3	4 / 20
H_2O (105 – 110°C)	%	0.2	2 / 10
LOI **	%	11	2 / 10
Lu	µg/g	0.08	3 / 15
Mo	µg/g	3.0	7 / 35
Nb	µg/g	2.0	3 / 15
Nd	µg/g	4	3 / 15
Os	µg/g	0.15	3 / 12
P	%	0.018	7 / 35
Pb	µg/g	33	18 / 88
Pr	µg/g	1.0	3 / 15
Rb	µg/g	3	3 / 15
Sc	µg/g	3	4 / 25
Se	µg/g	87	7 / 40
Si	%	4.7	6/ 30
Sm	µg/g	0.8	4 / 25
Sn	µg/g	2.3	4 / 20
Ta	µg/g	0.1	3 / 15
Tb	µg/g	0.1	3 / 15
Th	µg/g	1.2	3 / 15
Tm	µg/g	0.08	3 / 15
U	µg/g	0.5	4 / 20
Y	µg/g	4	4 / 20
Yb	µg/g	0.5	4 / 20
Zr	µg/g	20	4 / 20

* Copper by two acid digestion (AD2) only
** Loss on ignition at 1000 – 1050°C

SOURCE
The raw material used to prepare WMS-1a was obtained from the Wellgreen property, near Whitehorse, Yukon. The mine is owned by Northern Platinum Limited. WMS-1a was obtained from the same mine as its predecessor, WMS-1, which is no longer available.

DESCRIPTION
Major species include pyrrhotite (59.7%), clinochlore (11.2%), mainly actinolite plus traces of sepiolite (9.1%), pentlandite (8.8%), clinopyroxene (6.0%), and chalcopyrite (4.1%). Minor species include mica (0.8%), magnetite (0.2%) and galena (0.1%).

INTENDED USE

WMS-1a is suitable for the analysis of gold, platinum group elements and various other elements at major, minor and trace levels in minerals. Examples of intended use include quality control, method development, environmental assessment and the calibration of equipment.

INSTRUCTIONS FOR USE

WMS-1a should be used "as is", without drying. The contents of the bottle should be thoroughly mixed before taking samples. The contents of the bottle should be exposed to air for the shortest time possible. Unused material should be stored under an inert gas in a desiccator, or in a new, heat-sealed laminated foil pouch. The values herein pertain to the date when issued. CANMET-MMSL is not responsible for changes occurring after shipment.

HANDLING INSTRUCTIONS

Normal safety precautions for handling fine particulate matter are suggested, such as the use of safety glasses, breathing protection, gloves and a laboratory coat.

METHOD OF PREPARATION

The raw material was crushed, ground, and sieved to remove the plus 74 µm fraction. The product was blended, then bottled in 200-gram units. The yield was 83%. Each bottle was sealed under nitrogen in a laminated aluminum foil-mylar pouch to prevent oxidation.

HOMOGENEITY

The homogeneity of the stock was investigated using twenty-two bottles chosen according to a stratified random sampling scheme. Two splits were analysed from each bottle. Lead fire assay pre-concentration was performed on 10 gram-samples, followed by determination of gold, platinum and palladium by both inductively coupled plasma - optical emission spectrometry and mass spectrometry. Additionally, samples of 0.25–gram were digested with hydrochloric, nitric, perchloric and hydrofluoric acids. Analyses for silver, copper and nickel were performed using inductively coupled plasma - optical emission spectrometry. Inductively coupled plasma - mass spectrometry was used for the determination of lead and zinc. In a third investigation, samples of 0.15-gram were used for the determination of sulphur by combustion.

Use of a smaller sub-sample than specified above will invalidate the use of the certified values and associated parameters. A one–way analysis of variance technique (ANOVA) was used to assess the homogeneity of these elements[1]. The ratio of the between-bottles to within-bottle mean squares was compared to the F statistic at the 95% level of probability. No evidence of inhomogeneity was observed for these elements.

CERTIFIED VALUES

Thirty-three industrial, commercial, and government laboratories participated in an interlaboratory measurement program using methods of their own choosing. Fire assay, multi-acid digestions, combustion and fusions were used for the concentration step. Inductively coupled plasma – optical emission spectrometry, inductively coupled plasma - mass spectrometry, atomic absorption spectrometry, instrumental neutron activation, x-ray fluorescence, hydride generation, visible and ultraviolet spectrometry and gravimetric analysis were used for the determination step.

ANOVA was used to calculate the consensus values and other statistical parameters[1] from the interlaboratory measurement program. Values are deemed to be Certified if derived from 10 or more sets of data that meet CCRMP statistical criterion regarding the agreement of the results. Eleven elements were certified (see Table 1).

Full details of all work, including the statistical analyses, the methods and the names of the participating laboratories are contained in the Certification Report. For more details on how to use reference material data to assess laboratory results, users are directed to ISO Guide 33:2000, pages 14-17, and the document, “Assessment of laboratory proficiency using CCRMP reference materials”, at www.ccrmp.ca under Publications, which is based on Guide 33:2000.

UNCERTIFIED VALUES

Fourteen provisional values (Table 2) were derived from 8 or 9 sets of data that fulfill the CCRMP statistical criterion regarding agreement; or alternatively**,** more than 8 sets of data that do not fulfill the CCRMP statistical criteria required for certification. Informational values for 41 elements, shown in Table 3, were derived from the means of a minimum of 2 sets.

TRACEABILITY

The values quoted herein are based on the consensus values derived from the statistical analysis of the data from the interlaboratory measurement program.

CERTIFICATION HISTORY

WMS-1a is a new material.

PERIOD OF VALIDITY

The certified values are valid until December 31, 2030. The stability of the material will be monitored every two years for the duration of the inventory. Updates will be made via the CCRMP web site.

LEGAL NOTICE

CANMET-MMSL has prepared this reference material and statistically evaluated the analytical data of the interlaboratory measurement program to the best of its ability. The purchaser, by receipt hereof, releases and indemnifies CANMET-MMSL from and against all liability and costs arising out of the use of this material and information.

CERTIFYING OFFICERS

Maureen E. Leaver – CCRMP Coordinator

Joseph Salley - Project Leader

FOR FURTHER INFORMATION

The WMS-1a Certification Report is available free of charge upon request to:

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REFERENCES

1. Brownlee, K.A., Statistical Theory and Methodology in Science and Engineering; John-Wiley and Sons, Inc.; New York; 1960.

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Canadian Certified Reference Materials Project

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PCMRC
Projet canadien de matériaux de référence certifiés

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Certificate of Analysis

First issued: January 1994 Version: January 2010

WPR-1

Certified Reference Material for an Altered Peridotite with Gold and Platinum Group Elements

Table 1 – Certified Values

Constituent	Unit	Mean	Within-Lab Standard Deviation	Between-Labs Standard Deviation	95% Confidence Limit
Au	ng/g	42.2	6.4	6.2	± 2.8
Cu	%	0.164	0.005	0.013	± 0.008
Fe_2O_3	%	14.6	0.4	0.5	± 0.3
Ir	ng/g	13.5	1.3	3.2	± 1.8
K_2O	%	0.12	0.03	0.04	± 0.03
MnO	%	0.166	0.004	0.010	± 0.006
Pd	ng/g	235	21	21	± 9
Pt	ng/g	285	24	29	± 12
Rh	ng/g	13.4	1.6	1.5	± 0.9
Ru	ng/g	21.6	3.3	6.8	± 4.3
TiO_2	%	0.29	0.02	0.03	± 0.02

Table 2 – Provisional Values

Constituent	Unit	Mean	Within-Lab Standard Deviation	Between-Labs Standard Deviation	95% Confidence Limit
Ag	ug/g	0.7	0.05	0.2	± 0.2
Al_2O_3	%	2.95	0.09	0.22	± 0.15
As	ug/g	1.4	0.5	0.9	± 0.8
Ba	ug/g	22	2	7	± 4
Bi	ug/g	0.19	0.05	0.05	± 0.09
CaO	%	2.07	0.07	0.16	± 0.11
Cd	ug/g	0.43	0.16	0.13	± 0.17
Ce	ug/g	6	0.4	1	± 1
Co	ug/g	180	5	15	± 9
Cr	%	0.33	0.02	0.09	± 0.05
Cs	ug/g	0.73	0.09	0.06	± 0.06
Dy	ug/g	1.1	0.1	0.3	± 0.3
Er	ug/g	0.5	0.05	0.1	± 0.2
Eu	ug/g	0.31	0.04	0.06	± 0.06
Ga	ug/g	4.5	0.5	0.8	± 0.9
CaO	%	2.07	0.07	0.16	± 0.11
Gd	ug/g	0.9	0.1	0.3	± 0.4
Hf	ug/g	0.61	0.05	0.15	± 0.15
Ho	ug/g	0.18	0.03	0.05	± 0.09
La	ug/g	2.2	0.1	0.3	± 0.2
Li	ug/g	4.2	0.2	1.0	± 1.6
Lu	ug/g	0.07	0.008	0.03	± 0.03
MgO	%	31	1	3	± 2
LOI	%	10.2	0.1	0.2	± 0.3
Mo	ug/g	0.9	0.2	0.3	± 0.3
Na_2O	%	0.041	0.008	0.023	± 0.016
Nb	ug/g	2.4	0.2	0.6	± 0.8

Table 2 – Provisional Values (cont'd)

Constituent	Unit	Mean	Within-Lab Standard Deviation	Between-Labs Standard Deviation	95% Confidence Limit
Nd	ug/g	3.5	0.3	0.7	± 0.7
Ni	%	0.29	0.01	0.04	± 0.02
Os	ng/g	13.3	1.6	1.6	± 2.1
P_2O_5	%	0.037	0.002	0.011	± 0.012
Pb	ug/g	6	1	3	± 3
Pr	ug/g	0.7	0.05	0.2	± 0.3
Rb	ug/g	5	0.4	2	± 2
S	%	0.94	0.04	0.04	± 0.06
Sb	ug/g	0.9	0.08	0.48	± 0.35
Sc	ug/g	12	0.4	1	± 1
Se	ug/g	4	0.6	1	± 1
SiO_2	%	36.2	0.9	0.1	± 0.4
Sm	ug/g	0.9	0.06	0.21	± 0.2
Sn	ug/g	1.1	0.2	0.2	± 0.3
Sr	ug/g	7	1.0	2.0	± 2
Th	ug/g	0.4	0.06	0.2	± 0.2
Tm	ug/g	0.09	0.02	0.02	± 0.03
U	ug/g	0.2	0.05	0.10	± 0.1
V	ug/g	65	3	37	± 26
Y	ug/g	5	0.3	1	± 1
Yb	ug/g	0.48	0.05	0.13	± 0.14
Zn	ug/g	95	6	19	± 11
Zr	ug/g	18	3	3	± 3

Table 3 - Informational Values

Constituent	Unit	Range
B	ug/g	35-130
Be	ug/g	0.1-0.3
Cl	ug/g	100-300
Ge	ug/g	1-5
H_2O^-	%	0.4-0.6
SO_3	%	0.5-2.5
Ta	ug/g	0.1-0.3
Tb	ug/g	0.1-0.2
Te	ug/g	0.1-0.7
Tl	ug/g	0.2-0.5
W	ug/g	0.1-3

DESCRIPTION

The raw material for WPR-1 was obtained from the Wellgreen Complex, Yukon Territory, Canada. WPR-1 was prepared and certified in cooperation with the Geological Survey of Canada (GSC).

WPR-1 is an altered peridotite which contains essentially antigorite with small amounts of chlorite and accessory magnetite and chromite. The peridotite contains pyrrhotite, pentlandite and chalcopyrite all either enclosed, penetrated or intergrown with magnetite. Violarite occurs as inclusions in the pyrrhotite. Tellurides were observed which have been tentatively identified as platinum group element complexes.

The raw material was dried, crushed, grounded, sieved, and blended to obtain a minus 74 micron (200 mesh) product. The yield was 80%. The material comes in glass bottles containing 400g each. This is the only size available.

INTENDED USE

WPR-1 is suitable for the analysis of gold, elements from the platinum group and other elements at major, minor and trace levels. Examples of intended use are for quality control in the analysis of samples of a similar type, method development, arbitration and the calibration of equipment.

INSTRUCTIONS FOR USE

The assigned values pertain to the date when issued. WPR-1 should be used “as is”, without drying. The contents of the bottle should be thoroughly mixed before taking samples. The material can be stored at room temperature and pressure with no special precautions.

HAZARDOUS SITUATION

Normal safety precautions such as the use of safety glasses, breathing protection for fine particulate matter, gloves and a laboratory coat are suggested.

LEVEL OF HOMOGENEITY

The homogeneity of the stock with respect to its gold, platinum and palladium was investigated using twenty-two bottles chosen according to the bottling sequence and a stratified random sampling scheme. Two splits were analyzed from each bottle. The analyses for gold, platinum and palladium were performed by GSC on 10g-samples using fire assay pre-concentration and followed by inductively coupled plasma mass spectrometry.

A one–way analysis of variance technique (ANOVA) was used to assess the homogeneity of these elements (1). The ratio of the between-bottles to within-bottle mean squares is compared to the F statistic at the 95% level of probability. No evidence of inhomogeneity was observed for all three elements. Use of a smaller mass than indicated will invalidate the use of the certified value and associated parameters.

CERTIFIED VALUES

The first interlaboratory measurement program was held in 1992 for the certification of gold and the platinum group elements. Twelve university, government, industrial and commercial laboratories submitted results. In 1994, thirty-three individual laboratories participated in the interlaboratory measurement program in an attempt to certify other elements. Up to 80 elements were analyzed by methods of each laboratory's choice. For gold and the platinum group elements, fire assay, multi-acid digestion followed by solvent extraction, gravimetric, inductively coupled plasma –optical emission spectroscopy, inductively coupled plasma – mass spectroscopy, graphite furnace atomic absorption spectroscopy, direct current plasma spectroscopy, and neutron activation analysis were used. For the other elements, various acid digestions, fusions, gravimetric, combustion, x-ray fluorescence, hydride generation, inductively coupled plasma – optical emission spectroscopy, inductively coupled plasma – mass spectroscopy, graphite furnace atomic absorption spectroscopy, direct current plasma spectroscopy, and neutron activation analysis were used.

A one-way analysis of variance technique (ANOVA) was used to estimate the consensus value and other statistical parameters (1). The two criteria for certification involve the agreement of within- and between-laboratories standard deviations and the number of sets with acceptable agreement. Table 1 contains the means and associated statistical parameters for the fifteen certified elements. Full details of all phases of the work, including statistical analysis, the methods and the names of the participants are contained in certification report.

UNCERTIFIED VALUES

Table 2 contains the provisional elements which did not meet either one or both of the two criteria for certification. Table 3 contains the informational values calculated from the mean of two or more sets of results which were considered to be in good agreement.

TRACEABILITY

The certified values quoted herein are based on the consensus value derived from the statistical analysis of the data from the interlaboratory measurement program.

DATE OF CERTIFICATION

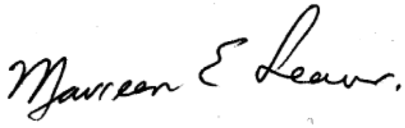
WPR-1 was released in 1994. The 2004 version of this certificate was written in order to release new or upgraded values. The 2004 version of the certificate included five new certified values, forty-nine new provisional values and eleven new informational values. The 2004 version of the certificate was re-issued in January 2010 with no changes due to the expiration of the former.

PERIOD OF VALIDITY

These certified values are valid until January 31, 2032. The stability of the material will be monitored every two years. Updates will be published on the CCRMP web site.

LEGAL NOTICE

CERTIFYING OFFICER



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REFERENCE

1. Brownlee, K.A., Statistical Theory and Methodology in Science and Engineering; John-Wiley and Sons, Inc.; New York; 1960.

APPENDIX C

SGS REPORT

An Investigation into

METALLURGICAL TESTWORK OF
CU/NI/PGE SAMPLES FROM THE WELLGREEN PROPERTY

prepared for

PROPHECY PLATINUM CORPORATION

Project 50149-001 – Final Report
July 31, 2012

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Executive Summary

A test program was completed by developing a flowsheet suitable for a single master composite and confirming through a high Ni composite sample from the Wellgreen property in Yukon Territory, Canada. The Wellgreen deposit is a part of the Kluane Ultramafic Nickel belt located in the Yukon Territory, Canada.

SGS Vancouver Metallurgy office received multiple shipments; a total of 300 kg to prepare the master composite, and later on a third shipment of 120 kg to prepare the high Ni composite. The samples originated from the Wellgreen deposit and submitted by Prophecy Platinum Corporation. The material shipped was originally three sub-composites (massive sulphide, gabbro, and peridotite) and were used to prepare a Master Composite and a High Ni Composite for metallurgical testing.

The head assays of the sub-composites as well as the Master Composite are shown in Table 1.

Table 1: Head Assay Results for Sub-Composites and Master Composite Samples

Sample	Cu	Ni	Ni(s)	Co	Fe	S	C(t)	MgO	Pt	Pd	Au	Rh
	%	%	%	%	%	%	%	%	g/t	g/t	g/t	g/t
Massive Sulphide	1.57	2.59	2.45	0.150	44.0	28.8	0.06	0.56	1.01	0.69	0.08	0.39
Gabbro	0.43	0.19	0.17	0.015	9.77	2.38	0.08	12.7	0.53	0.27	0.12	<0.02
Peridotite	0.25	0.36	0.30	0.017	11.0	1.47	0.06	25.9	0.25	0.35	0.02	0.03
Master Composite	0.33	0.42	0.37	0.018	11.9	2.53	0.06	22.8	0.41	0.45	0.04	0.04

Later on in the program a High Nickel Composite was prepared. The head assays of the ores as received and the High Nickel Composite are presented in Table 2.

Table 2: Head Assay Results for Sub-Composites and High Nickel Composite Samples

Sample	Cu	Ni	Ni(s)	Co	Fe	S	C(t)	MgO	Pt	Pd	Au	Rh
	%	%	%	%	%	%	%	%	g/t	g/t	g/t	g/t
Massive Sulphide	1.40	3.12	2.70	0.170	47.8	29.7	0.08	0.41	1.29	0.86	0.09	0.17
Gabbro	0.51	0.27	0.24	0.024	12.1	3.02	0.07	14.3	0.64	0.33	0.04	0.03
Peridotite	0.30	0.40	0.33	0.020	11.0	1.79	0.06	25.5	0.41	0.60	0.05	0.03
High Ni Composite	0.52	0.83	0.69	0.044	18.1	6.45	0.04	19.8	0.57	0.61	0.10	0.10

The scope of the program involved sample preparation, mineralogy and flotation testing. The flotation testwork investigated reagent and flowsheet options for the recovery of a bulk Copper-Nickel-PGM concentrate and a Ni concentrate. Scoping copper nickel separation tests were also conducted on the bulk copper-nickel concentrate. Batch rougher kinetics, batch cleaner and locked cycle flotation testing were conducted on each of the two composites.

Mineralogy investigations on feed sample were conducted. Detailed feed mineralogy was completed by QEMSCAN™ (quantitative mineralogy) on the master composite to identify mineral liberations and associations to develop grade recovery relationships for the sample. The mineralogy study provides indications of primary target grind based on mineral liberation information. This information identifies independent primary and regrind target estimations which will allow adequate mineral liberation to achieve target final concentrate grade.

Standard Bond grindability test (BWI) and abrasion index test were conducted. The BWI was determined to be 19.7 kWh/t for the Wellgreen master composite ore. This is considered to be a hard ore in the context of the SGS BWI database. The abrasion index fell in the soft range of abrasiveness with a Bond abrasion index of 0.088.

A preliminary flotation testwork was conducted on the master composite. The key variables tested were the effect of grind, collector, talc pre-float and CMC on rougher kinetics. Open circuit cleaner testing was conducted to test the effect of the regrind and dispersants/depressants on circuit recovery and bulk Cu/Ni concentrate grade. The preliminary cleaner flotation test results showed a 18% Cu+Ni concentrate grade at the average Cu and Ni recoveries of 79% and 50%, respectively would be expected. At the same test conditions the combined Pt, Pd and Au grade of 14 g/t at 22%, 53% and 53% recoveries, respectively is achieved.

Following the preliminary testing, split flowsheet optimization testwork to optimize the flowsheet through a more detailed program was started. The proposed split flowsheet recommends taking advantage of the parallel cleaner lines. The viability of the flowsheet was confirmed by means of locked cycle testing through re-circulation of middling streams. The average locked cycle test results over the last three cycles showed that the master composite produced copper, nickel and final bulk concentrates projections as shown in Table 3.

Table 3: Cu and Ni Metallurgical Predictions for Master Composite

LCT-3	**Weight**	**Assays, (Cu, Ni, S, Fe, MgO %) (Pt, Pd, Au g/t)**								**% Distribution**					
Product	**%**	**Cu**	**Ni**	**S**	**Pt**	**Pd**	**Au**	**Fe**	**MgO**	**Cu**	**Ni**	**S**	**Pt**	**Pd**	**Au**
Bulk Clnr 2 Conc.	2.78	11.0	9.28	27.2	3.39	10.3	0.80	31.6	4.13	83.5	57.6	25.9	22.7	62.9	50.3
Ni 3rd Clnr Conc.	2.36	0.59	1.78	12.8	3.55	1.45	0.11	22.4	17.9	3.8	9.4	10.3	20.2	7.5	6.1
Ni 1st Clnr Tail	15.7	0.10	0.34	4.41	0.66	0.41	0.03	–	–	4.3	12.1	23.8	24.9	14.1	12.1
Ni Scav Tail	69.9	0.04	0.11	1.06	0.14	0.06	0.02	–	–	7.6	16.6	25.4	24.1	9.5	25.4
Magnetic Clnr Conc.	0.21	0.85	1.22	8.93	6.19	5.41	0.52	24.4	18.4	0.5	0.6	0.7	3.2	2.5	2.5
Magnetic Rghr Tail	9.00	0.01	0.19	4.50	0.23	0.18	0.02	–	–	0.2	3.7	13.8	4.9	3.5	3.6
Combined Concentrates	**5.36**	**6.01**	**5.66**	**20.1**	**3.57**	**6.22**	**0.48**	**27.3**	**10.8**	**87.8**	**67.6**	**36.9**	**46.0**	**72.9**	**58.9**
Head (calc.)		0.37	0.45	2.92	0.42	0.46	0.04								

The results for High Ni Composite indicate the production of a combine concentrate with 14.5% Cu+Ni grade at the average Cu and Ni recoveries of 88% and 73%, respectively. At the same test conditions the combined Pt, Pd and Au grade of 9 g/t at 38%, 73% and 62% recoveries, respectively would be expected.

Introduction

A metallurgical test program was initiated by Mr. Danniel Oosterman on behalf of Prophecy Platinum Corporation. Mr. Oosterman requested a mineralogical and metallurgical study of one master composite on material from Wellgreen deposit.

The present scoping study was intended to investigate the flotation conditions and to improve mineral recoveries to advance the understanding of mineral recoveries for Cu, Ni, and PGM by flotation.

The scope of the program included sample preparation, mineralogy, grindability and flotation tests on a Master Composite and a High Ni Composite sample prepared from several areas of the mine which would establish a flowsheet capable of producing copper and nickel concentrates. Copper/nickel separation testwork was conducted on the master composite bulk concentrate.

While it is recognized that the different areas in the mine vary to some degree with regard to Cu-Ni-PGM ratios, the detailed testwork was completed on the Master Composite.

Mr. Danniel Oosterman and Mr. Mike Ounpuu represented the client and the results were forwarded to them as they became available. Mr Gary Johnson from Strategic Metallurgy Pty Ltd, Perth, Australia also provided recommendation to the testwork program. The optimization test program was conducted under the direction of consulting metallurgist Mr. Ounpuu, regular meetings and email communications were held over the duration of the project.

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Report preparation by: Jalal Tajadod
Reviewed by: Jake Lang

Testwork Summary

1. Sample Receipt and Preparation

Two shipments containing a total of three sub-composite samples, originated from the Wellgreen deposit in Yukon Territory, Canada were received by SGS Vancouver through Prophecy Platinum Corporation. The three sub-composites (massive sulphide, gabbro, and peridotite) were used to prepare one master composite for metallurgical testing.

Initially the three sub-composites representing different zones in the mine plan were stage crushed to ¾". Splits samples were taken as back-up and stored for future testwork. The remaining three sub-composites were combined based on the instruction from the client. The ratio of the sub-composites used to prepare the master composite were 80%, 15%, and 5% for peridotite, gabbro, and massive sulphide. This master composite sample was then processed further for sample characterization and metallurgical testing.

The master composite was first riffled to prepare material for Bond ball mill work index test and Abrasion index test. All remaining master composite material was crushed to minus 10 mesh and split into 2 kg test charges. A portion of one of the 2 kg test charges was removed for composite characterization.

Later in the program, 120 kg material was received and a High Nickel Composite was prepared. The ratio of the sub-composites used to prepare the High Nickel Composite were 70%, 13%, and 17% for peridotite, gabbro, and massive sulphide. The high nickel composite material was then crushed to minus 10 mesh and split into 2 kg test charges.

The complete sample list and sample preparation plan are provided in Appendix A.

2. Material Characterization

2.1. *Chemical Analysis*

A sub-sample from each composite was submitted for assay of Cu, Ni, NiS, Co, Fe, S, C(t), S, Pt, Pd, Au, Rh and MgO, as well as complete multi-element ICP Scan. The results are summarized in Tables 4 and 5 and presented in Appendix B.

It is important to note from the Ni and NiS assays; the Ni assay represents the total amount of Ni that is present, and the sulphide Ni (NiS) is an analytical indicator for the amount of Ni that can actually be recovered by flotation. Assay results indicate that for the master composite nickel is mainly present as the sulphide form (88%). A portion of the nickel (about 12%), however, is non-sulphide and most likely in solid solution with amphiboles, serpentine & amphiboles (substitution in crystal structure). It has been reported that the nickel content of the silicate minerals is about 0.1 to 0.3% Ni. This portion of nickel cannot be recovered during sulphide flotation. As a result, maximum achievable nickel recovery in flotation is reduced accordingly. In the case of the present ore sample, it is speculated that the maximum nickel recovery during rougher flotation process will be about 85% of total nickel. Platinum and palladium contents of head sample are also fairly significant. Gold assay in this sample seems to be low at 0.04 g/t.

The other compound of note is the high MgO content ranging from 0.6% to 26% in the composites.

Table 4: Head Sample Analysis and ICP-Scan for Master Composite

Sample	Masive Sulphide	Gabbro	Peridotite	Master Composite
Element	Assay			
Cu %	1.57	0.43	0.25	0.33
Ni %	2.59	0.19	0.36	0.42
NiS %	2.45	0.17	0.30	0.37
Co %	0.15	0.015	0.017	0.018
Fe %	44.0	9.77	11.0	11.9
S %	28.8	2.38	1.47	2.53
C(t) %	0.06	0.08	0.06	0.06
Pt g/t	1.01	0.53	0.25	0.41
Pd g/t	0.69	0.27	0.35	0.45
Au g/t	0.08	0.12	0.02	0.04
Rh g/t	0.39	< 0.02	0.03	0.04
MgO %	0.56	12.7	25.9	22.8
Ag g/t	5	3	< 2	< 2
Al g/t	16200	47800	30800	27900
As g/t	< 30	< 30	< 30	< 30
Ba g/t	134	1740	51.4	521
Be g/t	0.30	0.36	0.20	0.22
Bi g/t	< 20	< 20	< 20	< 20
Ca g/t	32100	110000	24800	29800
Cd g/t	< 2	< 2	< 2	< 2
Cr g/t	128	573	2227	1915
K g/t	2860	953	1650	1750
Li g/t	< 20	< 33	< 20	21
Mn g/t	322	1400	1300	1300
Mo g/t	< 5	< 5	< 5	< 5
Na g/t	1590	1670	425	1390
P g/t	< 200	539	310	313
Pb g/t	82	112	< 20	< 20
Sb g/t	< 10	< 10	< 10	< 10
Se g/t	66	< 30	< 30	< 30
Sn g/t	< 20	< 20	< 20	< 20
Sr g/t	45.9	40.0	21.6	19.2
Ti g/t	1110	4960	3460	3650
Tl g/t	< 30	< 30	< 30	< 30
U g/t	79	26	< 20	< 20
V g/t	118	169	114	126
Y g/t	4.8	14	7.6	8.5
Zn g/t	72	106	90	91

Table 5: Head Sample Analysis and ICP-Scan for High Nickel Composite

Sample	Masive Sulphide	Gabbro	Peridotite	High Nickel Composite
Element	Assay			
Cu %	1.40	0.51	0.3	0.52
Ni %	3.12	0.27	0.40	0.83
NiS %	2.70	0.24	0.33	0.69
Co %	0.17	0.024	0.02	0.044
Fe %	47.8	12.1	11.0	18.1
S %	29.7	3.02	1.79	6.45
C(t) %	0.08	0.07	0.06	0.04
Pt g/t	1.29	0.64	0.41	0.57
Pd g/t	0.86	0.33	0.60	0.61
Au g/t	0.09	0.04	0.05	0.10
Rh g/t	0.17	0.03	0.03	0.61
MgO %	0.41	14.3	25.5	19.8
Ag g/t	< 2	2	< 2	< 2
Al g/t	12400	39200	24500	30000
As g/t	< 30	< 30	< 30	< 30
Ba g/t	106	165	61.3	70.7
Be g/t	0.20	0.34	0.18	0.20
Bi g/t	< 20	< 20	< 20	< 20
Ca g/t	25800	28900	23600	33500
Cd g/t	< 2	< 2	< 2	< 2
Cr g/t	130	909	3070	1530
K g/t	1790	882	1560	1280
Li g/t	< 5	29	14	10
Mn g/t	290	1220	1220	1050
Mo g/t	< 5	< 5	< 5	< 5
Na g/t	582	100	533	434
P g/t	< 200	455	266	< 285
Pb g/t	< 200	< 200	< 200	< 60
Sb g/t	< 10	< 10	< 10	< 10
Se g/t	79	< 30	< 30	< 30
Sn g/t	< 20	< 20	< 20	< 20
Sr g/t	27	29.3	13.4	17.7
Ti g/t	744	3910	3200	2760
Tl g/t	< 30	< 30	< 30	< 30
U g/t	< 80	< 80	< 80	< 30
V g/t	92	146	104	107
Y g/t	3	10.7	6.5	6.5
Zn g/t	105	96	90	87

2.2. *Mineralogy Study*

QEMSCAN^{TM} analysis used for quantitative mineralogical ore characterization is an acronym for Quantitative Evaluation of Materials by Scanning Electron Microscopy. In order to accurately quantify the mineral constituents of the master composite and generate detailed information on grain sizes and liberation, the master composite was analysed using QEMSCAN. Particle Mineral Analyses (PMA) and

Specific Mineral Search (SMS) analyses were performed on each of the submitted polished sections. Particle Mineral Analysis (PMA) is a two-dimensional mapping analysis aimed at resolving liberation and locking characteristics of a generic set of particles. A pre-defined number of particles are mapped at a point spacing selected in order to spatially resolve and describe mineral textures and associations. Specific Mineral Search is a modified particle mapping routine aimed at resolving liberation and locking characteristics of a set of particles, specifically a phase that reports as a low-grade constituent. The results of the QEMSCAN analyses are presented in Appendix G.

2.2.1. Sample Receipt and Description

A ground sample of the overall master composite with an average K_{80} of 100 µm was submitted for mineralogy. The sample was screened to form three size fractions; +75, -75/+25, and -25 µm. A portion of each fraction was submitted for Cu, Ni, S and WRA analyses for data validation. Polished epoxy grain mounts were prepared for each size fraction and were submitted for analyses using QEMSCAN technology. These results are further discussed in the assay reconciliation portion of this section.

2.2.2. Analytical Quality Control

Analytical quality control is conducted by comparing the chemical analysis determined mineralogically by QEMSCAN with the chemical analyses obtained from standard assaying techniques.

Key QEMSCAN elemental assays, calculated from the mineral composition have been regressed with the chemical assays and this is presented in Figure 1. The overall correlation, as measured by R-squared criteria, was 0.99 and is considered acceptable.

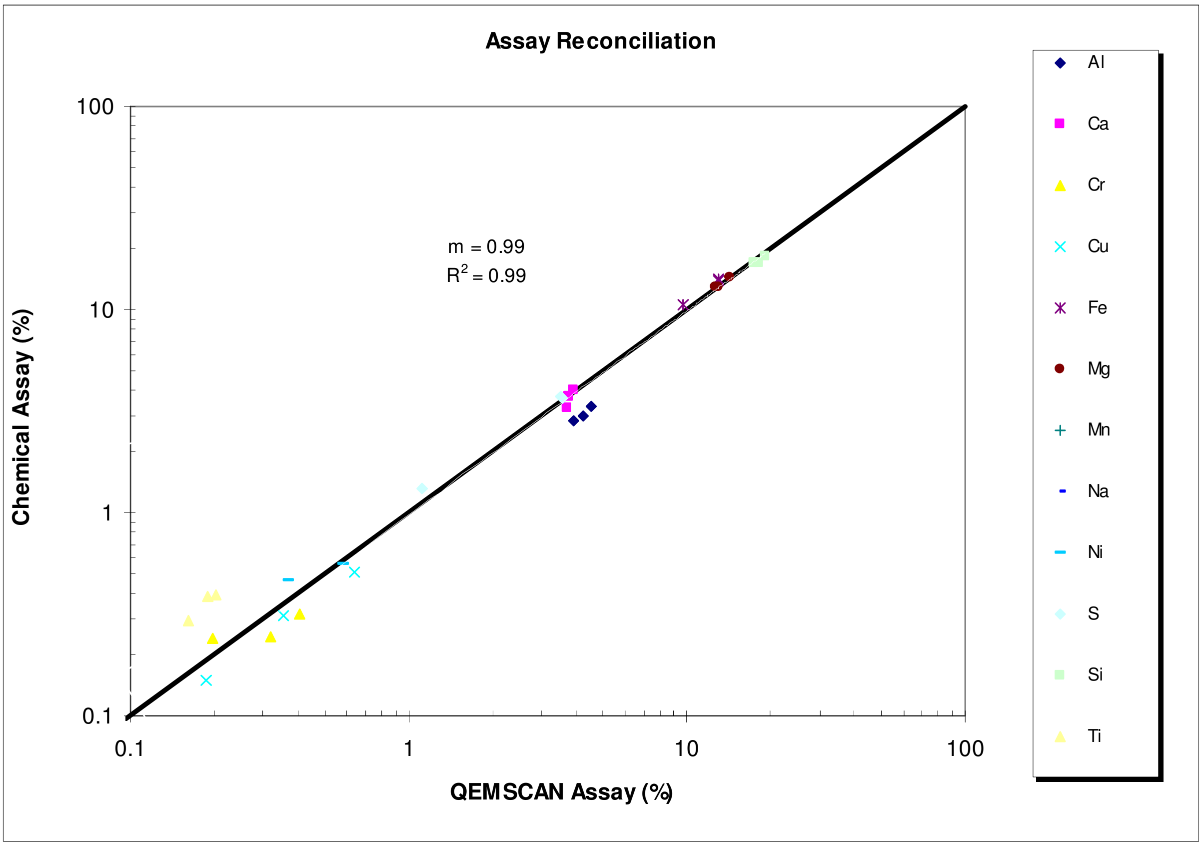


Figure 1: QEMSCAN Calculated Assays Compared to Chemical Assays

2.2.3. Modal Analysis and Grain Size Distribution

Mineral modal analysis of the overall composite, illustrating mineral distributions by both sample and fraction, is presented in Table 6. The major sulphide minerals are chalcopyrite, pentlandite and pyrrhotite, while the major floatable gangue minerals are orthopyroxene, clinopyroxene, chlorite/serpentine and talc.

The value minerals of this ore are chalcopyrite, accounting for 1.2% of the overall mineral mass, and pentlandite accounting for 1.1% of the overall mineral mass. The distributions of chalcopyrite and pentlandite increase in the finer fractions. The main constituent of sulphide gangue is pyrrhotite at 5.8% of the sample. Pyrite is present in only a few grains mainly liberated with a couple of attached grains. Chlorite, serpentine, amphiboles, pyroxene, talc, mica, and iron oxides account for a significant portion of the non-sulphide gangue. A high proportion of the gangue is potentially floatable.

Table 6: Bulk Modal Analysis of the Overall Composite

Sample		**Master Comp**						
Fraction		**Combined**	**+75 um**		**-75/+25 um**		**-25 um**	
Mass Size Distribution (%)			23.7		39.0		37.2	
Calculated ESD Particle Size		15	75		32		7	
		Sample	**Sample**	**Fraction**	**Sample**	**Fraction**	**Sample**	**Fraction**
Mineral Mass (%)	Chalcopyrite	1.2	0.1	0.5	0.4	1.0	0.7	1.8
	Pyrrhotite	5.8	0.5	2.2	2.9	7.5	2.3	6.2
	Pentlandite	1.1	0.1	0.3	0.4	1.1	0.6	1.7
	Other Sulphides	0.1	0.0	0.0	0.0	0.0	0.1	0.2
	Feldspar	3.4	0.6	2.4	1.3	3.2	1.5	4.2
	Orthopyroxene	7.7	2.8	11.8	4.1	10.4	0.9	2.3
	Clinopyroxene	12.9	3.4	14.5	5.7	14.7	3.8	10.1
	Amphibole	13.0	2.7	11.5	4.4	11.2	5.9	15.8
	Mica	1.6	0.8	3.6	0.5	1.3	0.3	0.7
	Chlorite/Serpentine	45.7	11.2	47.1	16.5	42.2	18.1	48.5
	Talc	3.0	0.6	2.4	1.1	2.8	1.4	3.7
	Other Silicates	0.5	0.1	0.4	0.2	0.5	0.2	0.5
	Fe Oxides	2.4	0.4	1.8	0.9	2.4	1.0	2.7
	Other Oxides	1.1	0.3	1.1	0.5	1.3	0.3	0.9
	Carbonates	0.3	0.0	0.2	0.1	0.3	0.1	0.4
	Others	0.2	0.0	0.1	0.1	0.2	0.1	0.3
	Total	100	23.7	100	39.0	100	37.2	100

The LCT-1 Ni cleaner concentrate as well as the rougher tails were submitted for the microprobe work. The primary focus of the probe work focused on Ni in major gangue minerals however pentlandite and pyrrhotite were also included to check their contents. The probe results showed there is Ni in the serpentine and chlorite and some Ni in the pyroxene and amphiboles. The mineral chemistry is provided in Appendix G.

The cumulative grain size distributions of the main minerals are presented in Figure 2. Pyrrhotite is the coarsest minerals present. Chalcopyrite and pentlandite are approximately in the same size range. Since the overall size distribution is coarser than the sulphides, the sulphides are preferentially ground finer than the silicates.

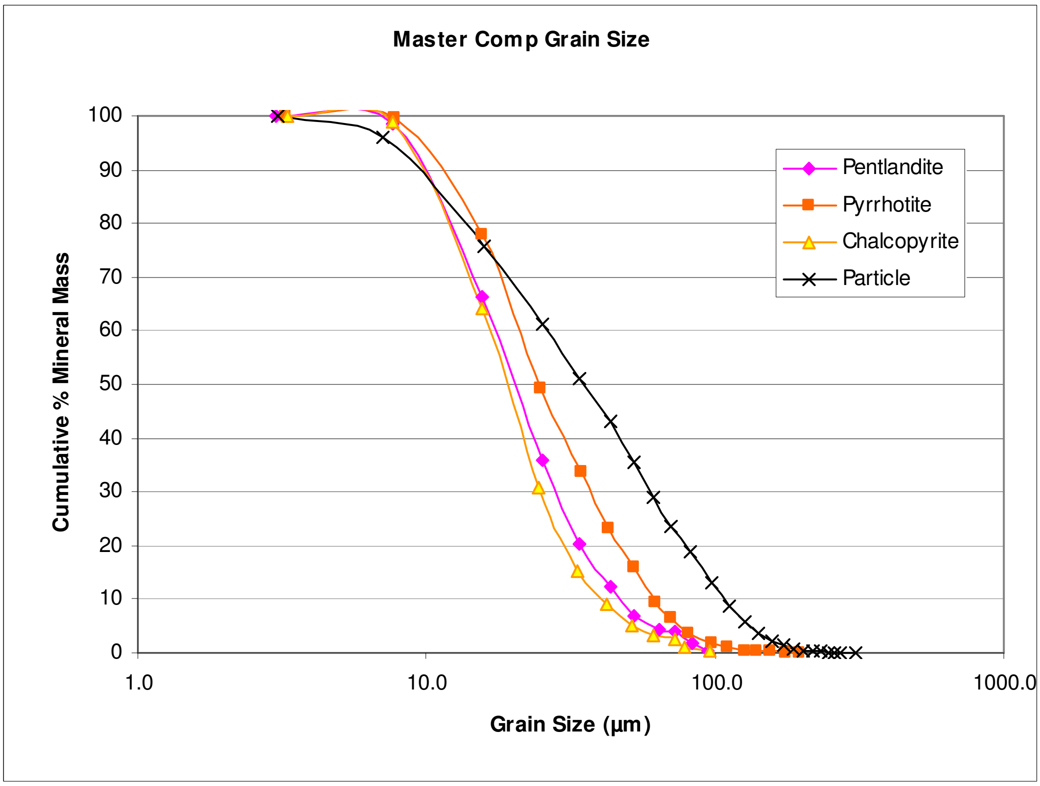
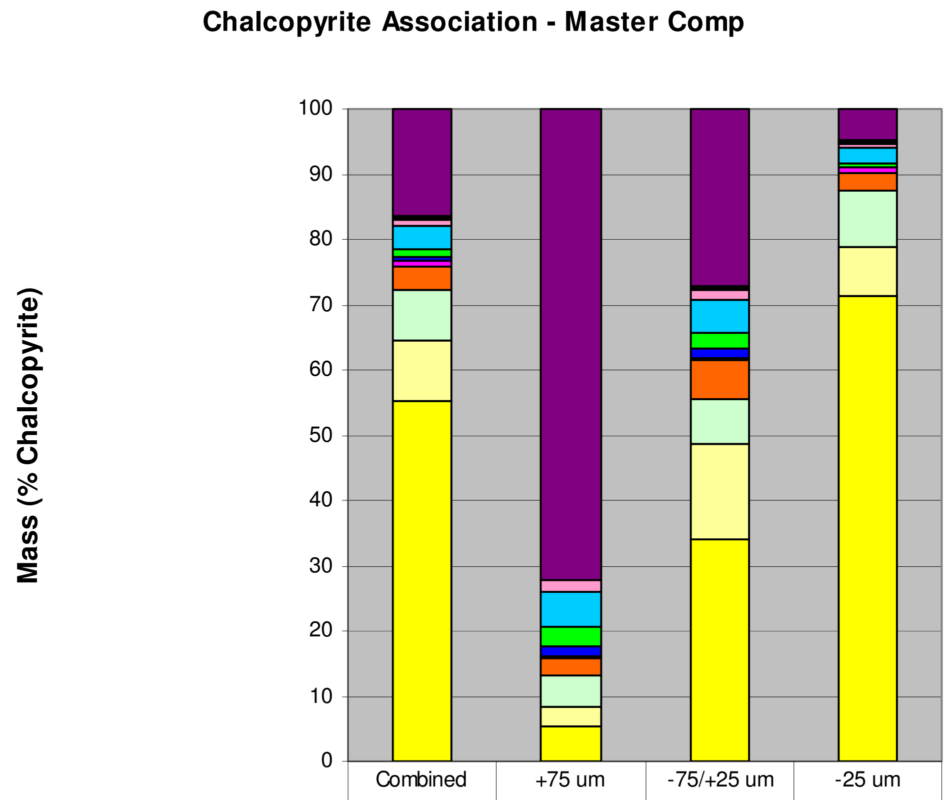


Figure 2: Mineral Cumulative Grain Size Distribution

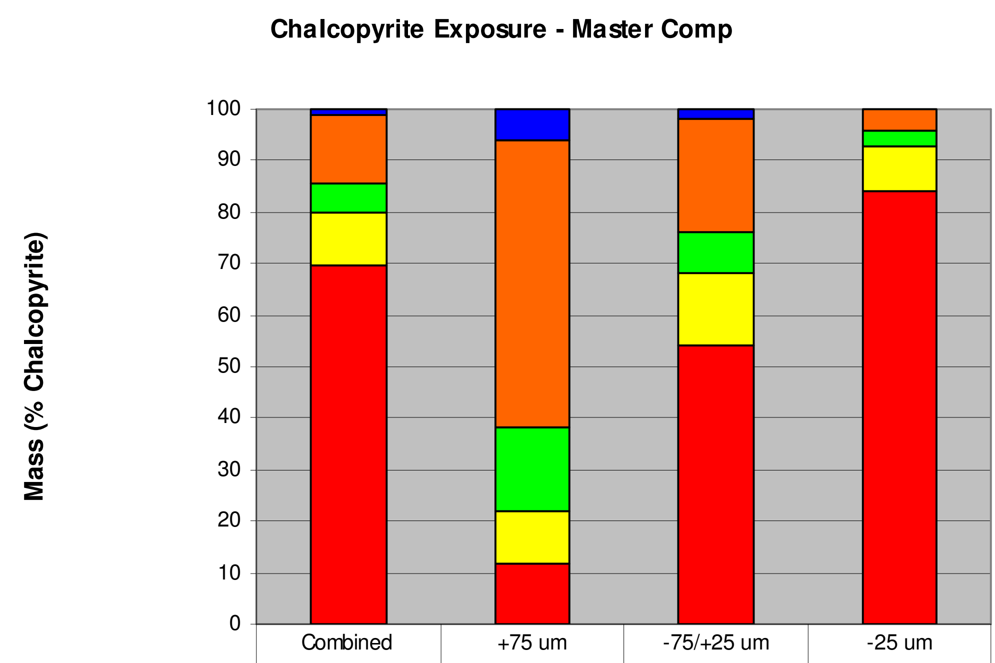
2.2.4. Liberation and Association

Global exposure, associations, and liberations of chalcopyrite, pentlandite, and pyrrhotite in the each fraction and overall composite are shown in Figures 3-8 and presented in Appendix G.



	Combined	+75 um	-75/+25 um	-25 um
Complex	16.5	72.2	27.1	4.9
Chalcopyrite:Other	0.2	0.0	0.0	0.2
Chalcopyrite:Oxides	0.3	0.1	0.7	0.2
Chalcopyrite:Other Silicates	1.1	1.7	1.4	0.8
Chalcopyrite:Serp/Chlorite	3.4	5.2	5.0	2.3
Chalcopyrite:Pyx/Amph	1.3	3.2	2.4	0.5
Chalcopyrite:Po:Pn	0.7	1.5	1.6	0.1
Chalcopyrite:Pentlandite	0.7	0.1	0.4	0.9
Chalcopyrite:Pyrrhotite	3.6	2.7	5.9	2.5
Lib Chalcopyrite	7.8	5.0	6.8	8.6
Free Chalcopyrite	9.4	2.8	14.7	7.6
Pure Chalcopyrite	55.2	5.4	34.1	71.3

Figure 3: Chalcopyrite Mineral Association



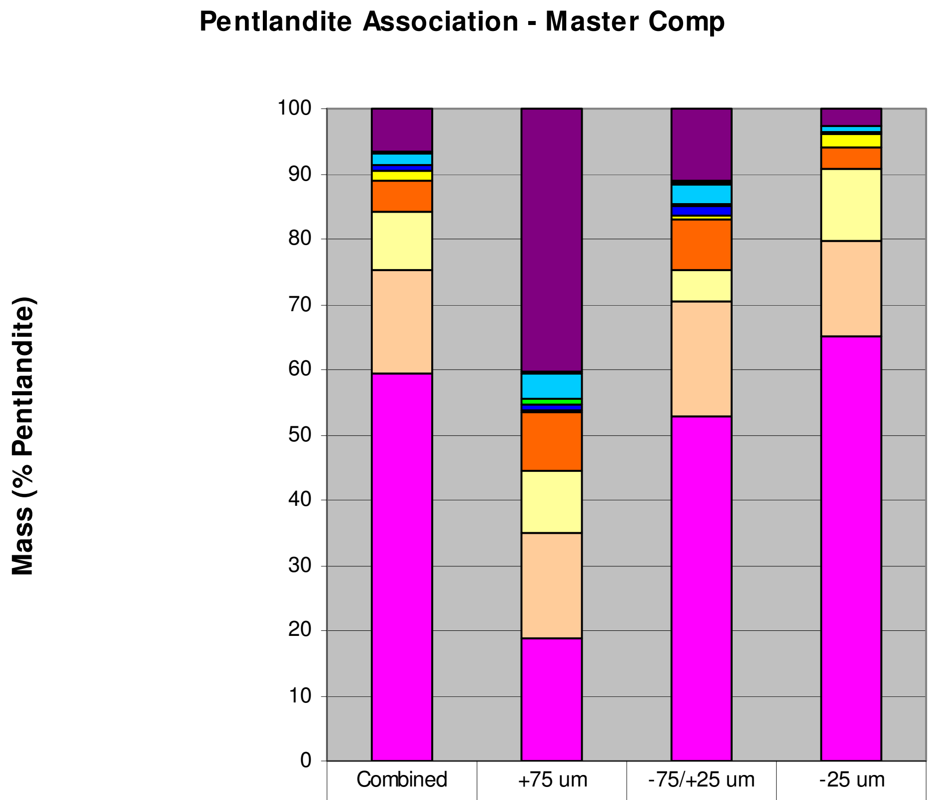
	Combined	+75 um	-75/+25 um	-25 um
Locked	1.1	6.1	1.8	0.2
0-30% Exposed	13.3	55.5	21.9	4.2
30-50% Exposed	5.5	16.3	8.1	3.0
50-80% Exposed	10.3	10.2	14.1	8.4
Exposed	69.8	11.8	54.0	84.3

Figure 4: Chalcopyrite Exposure

Chalcopyrite liberation in the sample is reasonably good at a grind size of ~80 µm. The pure, free, and liberated chalcopyrite accounts for 72% of the mineral mass overall. In the coarsest size fraction, this decreases to 13% of the Cu being liberated, with the expected increase in liberation in the finer fractions. Visual representations of these particles grouped by liberation class are shown in Appendix G.

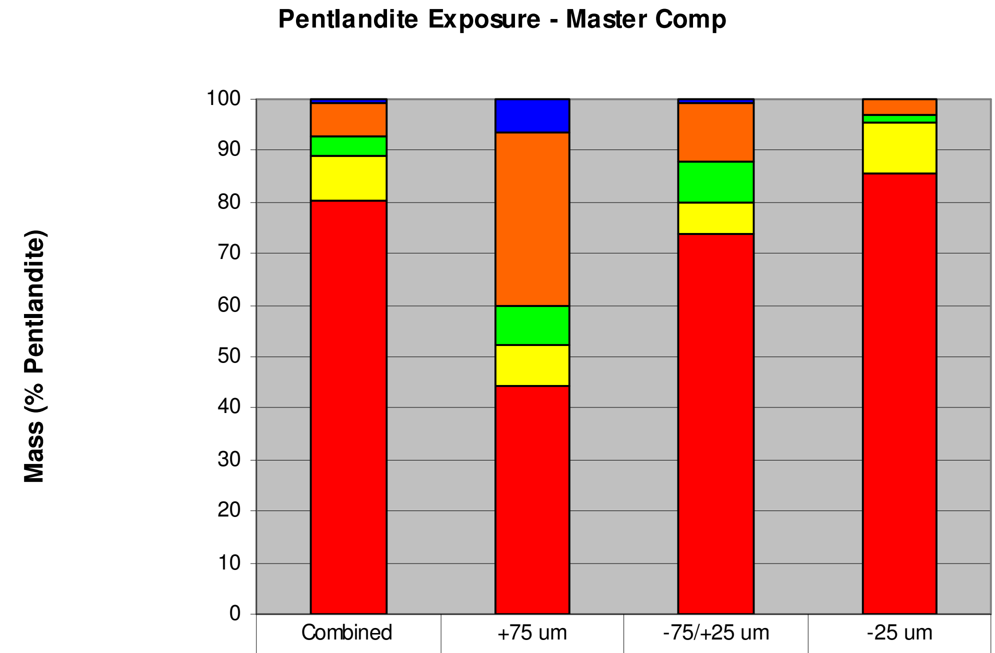
Most of the chalcopyrite exists as liberated minerals but there are associations with other sulphides and complex gangue particles in all size fractions. A regrind will be necessary in order to fully liberate the copper minerals. Minor amounts of chalcopyrite are associated with nickel sulphides.

Examining the exposure data, 70% of the chalcopyrite in the sample is totally exposed; the best exposure is seen in the -25 microns fraction. Locked chalcopyrite is 6% in the +75 microns fraction dropping to less than 1% in the -25 microns. Less than 1.1% of the overall chalcopyrite was locked.



	Combined	+75 um	-75/+25 um	-25 um
Complex	6.6	40.4	11.2	2.5
Pentlandite:Other	0.0	0.0	0.0	0.0
Pentlandite:Oxides	0.1	0.2	0.2	0.1
Pentlandite:Other Silicates	0.1	0.0	0.3	0.1
Pentlandite:Serp/Chlorite	1.7	3.9	3.1	1.0
Pentlandite:Pyx/Amph	0.1	0.9	0.2	0.0
Pentlandite:Cpy:Pn	0.7	0.7	1.7	0.2
Pentlandite:Chalcopyrite	1.5	0.3	0.3	2.1
Pentlandite:Pyrrhotite	4.9	8.8	8.0	3.2
Lib Pentlandite	9.0	9.8	4.6	11.1
Free Pentlandite	15.6	16.1	17.7	14.6
Pure Pentlandite	59.5	18.8	52.8	65.1

Figure 5: Pentlandite Mineral Association

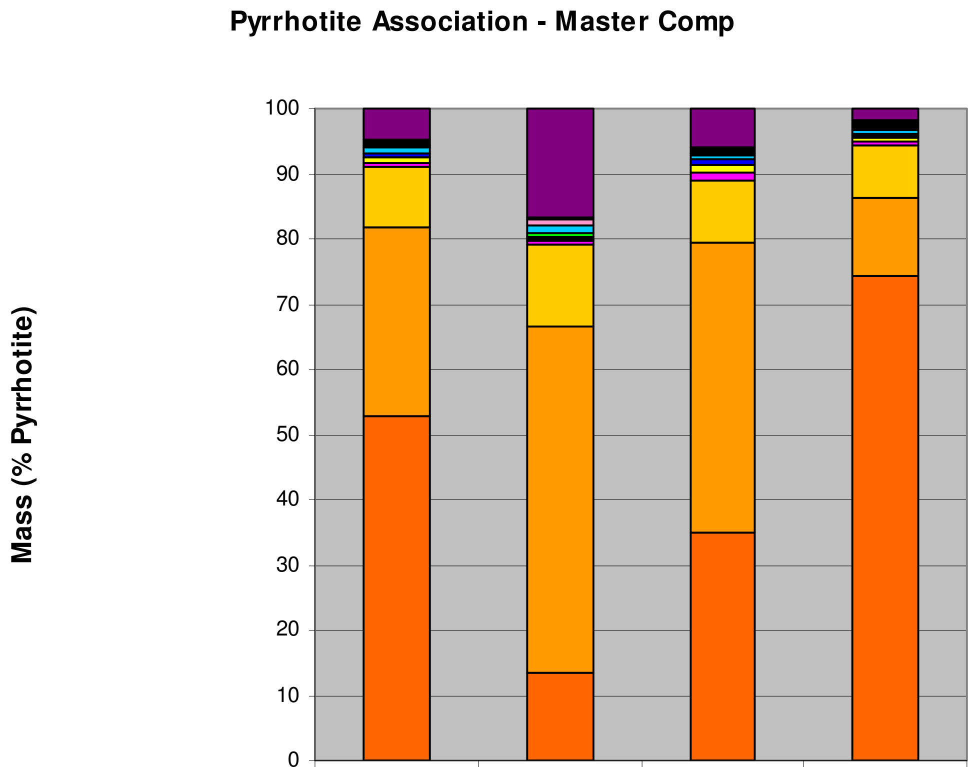


	Combined	+75 um	-75/+25 um	-25 um
Locked	0.6	6.6	0.8	0.2
0-30% Exposed	6.6	33.7	11.4	2.7
30-50% Exposed	3.8	7.3	7.7	1.7
50-80% Exposed	8.6	8.2	6.1	9.9
Exposed	80.4	44.2	73.9	85.5

Figure 6: Pentlandite Exposure

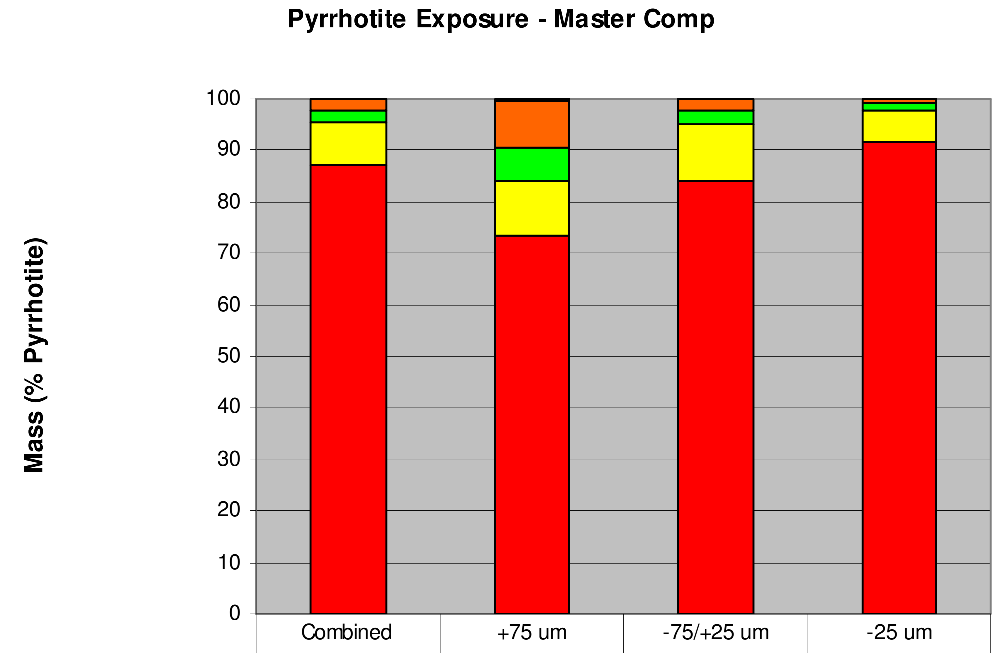
Pentlandite is reasonably well liberated at this grind (K_{80} ~80 µm). Overall, 84% of the pentlandite is pure, free, or liberated, with the best liberation observed in the -25 microns fraction at 91%. This is identified by the pentlandite exposure data where 80% of the pentlandite is exposed and the best exposure is in the -25 microns fraction to 86%. Locked pentlandite is present in trace amounts in all size fractions. The amount of locked sulphide Ni decreased with the successively finer size fractions to 0.2% locked in the -25 µm fraction. In the coarsest size fraction, 44% of the Ni-S was exposed. A visual representation of these particles grouped by liberation class is also presented in Appendix G.

As with the chalcopyrite, much of the pentlandite is liberated and is chiefly associated with pyrrhotite or other complex particles. Regrinding will likely be necessary in order to fully liberate the nickel. In the coarser fractions, there is also some association with sulphide complexes and serpentine and chlorite gangue.



	Combined	+75 um	-75/+25 um	-25 um
Complex	4.8	16.7	6.0	1.9
Pyrrhotite:Other	0.1	0.1	0.2	0.0
Pyrrhotite:Oxides	1.0	0.3	0.8	1.2
Pyrrhotite:Other Silicates	0.2	0.6	0.3	0.1
Pyrrhotite:Serp/Chlorite	0.7	1.4	0.6	0.7
Pyrrhotite:Pyx/Amph	0.3	0.4	0.1	0.3
Pyrrhotite:Cpy:Pn	0.4	0.3	0.8	0.1
Pyrrhotite:Chalcopyrite	0.9	0.5	1.3	0.6
Pyrrhotite:Pentlandite	0.7	0.5	0.9	0.6
Lib Pyrrhotite	9.3	12.7	9.8	8.3
Free Pyrrhotite	28.8	53.1	44.3	11.9
Pure Pyrrhotite	52.9	13.4	35.0	74.3

Figure 7: Pyrhotite Mineral Association



	Combined	+75 um	-75/+25 um	-25 um
Locked	0.1	0.3	0.1	0.0
0-30% Exposed	2.0	9.1	2.2	0.8
30-50% Exposed	2.3	6.3	2.8	1.3
50-80% Exposed	8.6	10.7	10.9	6.2
Exposed	87.0	73.6	84.0	91.6

Figure 8: Pyrrhotite Exposure

Pyrrhotite liberation (pure, free and liberated combined) in the sample is very good and accounts for 91% of the mineral mass overall with the best liberation seen in the -25 micron fraction at 94%. This is also noted in pyrrhotite exposure data where 87% of the pyrrhotite is exposed. In the coarsest size fraction this decreases to 74% with the expected increase in exposure in the finer fractions to 92%. Less than 0.1% of the overall pyrrhotite was locked.

Pyrrhotite associations exist with other sulphides and chiefly with complex gangue particles in all size fractions.

2.2.5. Process Mineralogy

Figure 9 illustrates the mineralogically limiting copper grade-recovery curves for the master composite by sample and by size fraction. This analysis provides an indication of the maximum achievable Cu grade and recovery based on individual particle liberation and grade. These curves do not reflect gangue activation and entrainment or other factors that could occur in the actual metallurgical process. Full grade-recovery data for each sample can be found in Appendix G.

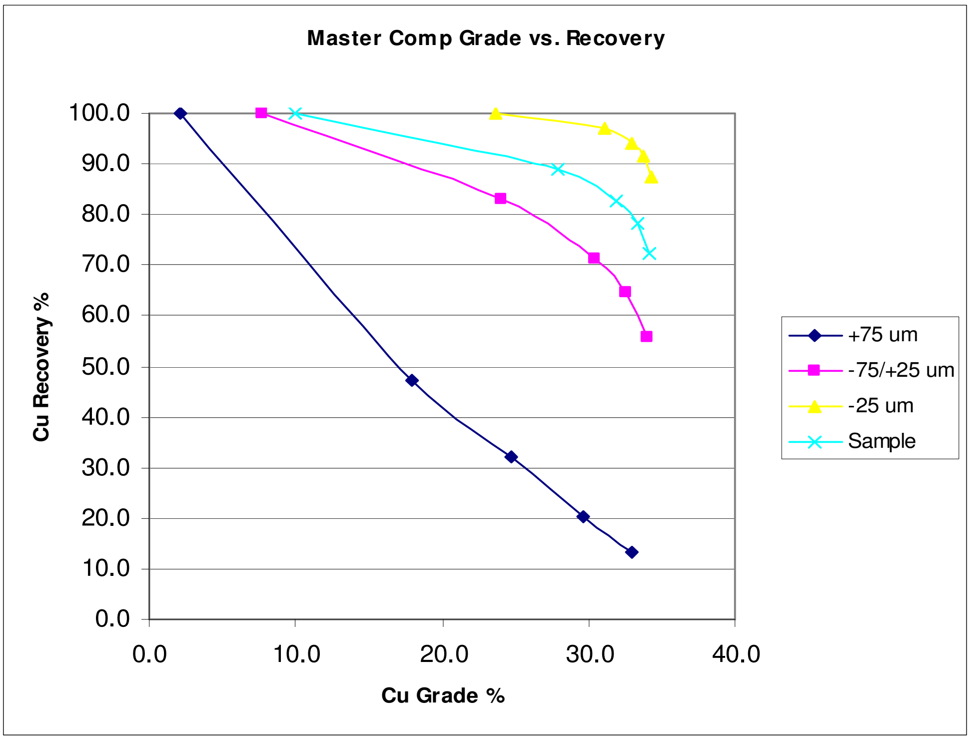


Figure 9: Mineralogically Limiting Copper Grade-Recovery Curves

It can be seen that there is a significant improvement in Cu recovery when particles are reduced to sizes finer than 75 µm. Grade recovery for Cu shows that for the sample, Cu grades of 34% and 28% can be achieved at recoveries of 72% and 89%, respectively.

Figure 10 illustrates the mineralogically limiting nickel grade-recovery curves for the master composite on each size fraction.

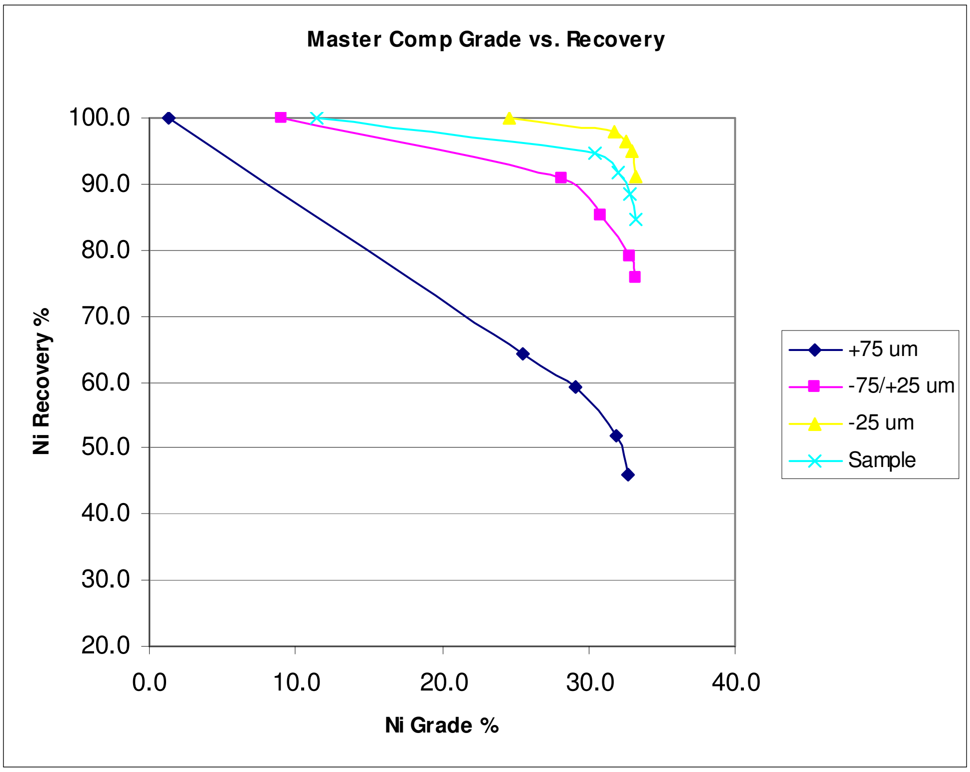


Figure 10: Mineralogically Limiting Nickel Grade-Recovery Curves

Grade recovery for Ni shows that for the sample, Ni grades of 33% and 30% can be achieved at Ni recoveries of 85% and 95% respectively.

Grade recovery for pyrrhotite shows that grades of 98% and 91% can be achieved at recoveries of 91% and 99%, respectively as shown in Figure 11.

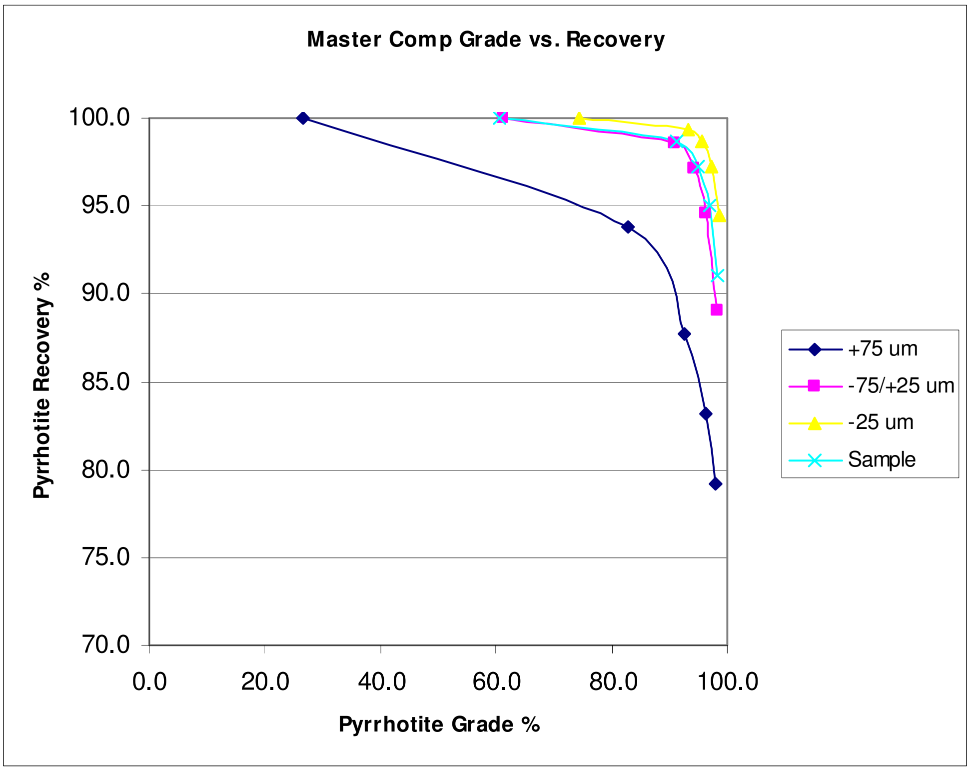


Figure 11: Mineralogically Limiting Pyrrhotite Grade -Recovery Curves

Care should be taken in the interpretation of these grade-recovery curves. They are better indicators of how the liberation changes with particle size than they are predictors of actual flotation grade-recovery potential. The mineralogical limiting grade-recovery curves do not take into account that most sulphides will float at the same time and that some of the floatable gangue is very difficult to depress, unless some of the Cu and Ni is sacrificed as well.

The mineral release curves for chalcopyrite, pentlandite and pyrrhotite are presented in Figure 12. The mineral release curve is used to predict the amount of liberated mineral of interest at varying size distributions. This can be an indicator of optimum grind targets for metallurgical processes to achieve the most liberation for the least amount of grind energy. The variation between value and gangue mineral release curves may sometimes be used to enhance separation.

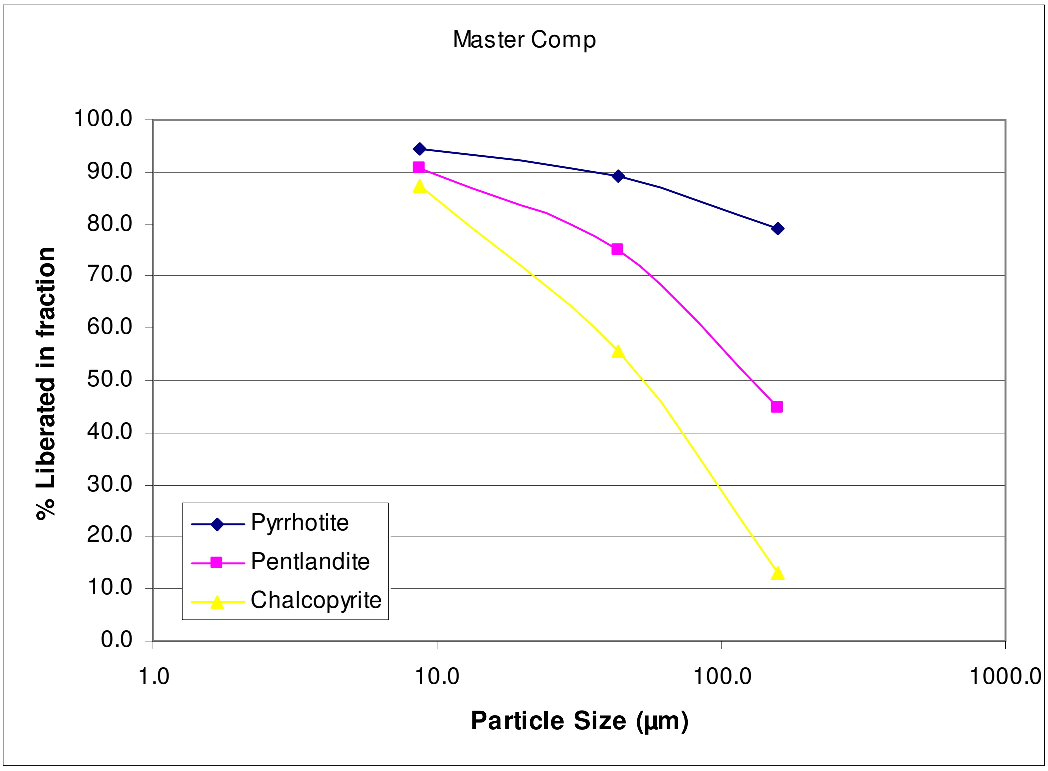


Figure 12: Mineral Release Curves

In the master composite, a significant increase in chalcopyrite liberation occurs between 75 and 10 µm. Both pyrrhotite and pentlandite show a more gradual increase between these two sizes. The mineral release curves indicate that the Cu circuit will require a regrind to 20 µm in order to liberate 80% of the chalcopyrite.

In order to liberate the sulphide nickel, regrind sizes will need to target sizes of 30 µm or finer.

Pyrrhotite liberated at a coarser size than the value minerals. However, reagent schemes aimed at gangue depression are more likely to target talc, chlorites, and serpentine as potential diluents.

2.2.6. Conclusions

The QEMSCAN mineralogical study of the master composite sample identified the following sample characteristics:

- Copper and nickel are the major value metals in this ore and occur almost exclusively as chalcopyrite, and pentlandite, respectively. The non-sulphide minerals are mainly chlorites, amphiboles, pyroxene, talc, and feldspar.
- There are a high proportion of chlorites/serpentine, pyroxene and talc in the ore which may require depressants to avoid recovery in the concentrate.

- In the ground sample, an average of 72% of the chalcopyrite occurs as liberated or free particles. Based on these analyses, a regrind to ~20 µm should be sufficient. The nickel sulphide is slightly coarser, but will require regrinding to ~30 µm to achieve greater liberation. This will also be sufficient to liberate any pyrrhotite reporting to the Cu circuit
- Of the non-liberated chalcopyrite-bearing particles, there is an association between pyrrhotite and chalcopyrite, and also association with complex gangue particles. Sulphide nickel also occurs as binary particles with pyrrhotite, as well as with non-sulphide gangue and complex particles.

3. Comminution Testwork

Standard Bond grindability test (BWI) for ball mill grinding and abrasion index test were conducted. Figures 13 and 14 place the values on histogram plots of the SGS grindability test database. The Bond ball mill grindability test is performed according to the original Bond procedure. It requires 8 kg of minus 6 mesh material that is preferably prepared at the testing facility. The Bond ball mill work index (BWI) has been widely used for mill sizing, but is also utilized in computer simulation and variability testing. The BWI was determined to be 19.7 kWh/t (metric) for the Wellgreen master composite ore. This is considered to be a hard ore in the context of the SGS BWI database.

The abrasion index fell in the soft range of abrasiveness with a Bond abrasion index of 0.088. Abrasion Index can be used to determine steel media and liner wear in crushers, rod mills, and ball mills.

Details on grindability testing data and calculations can be found in Appendix C.

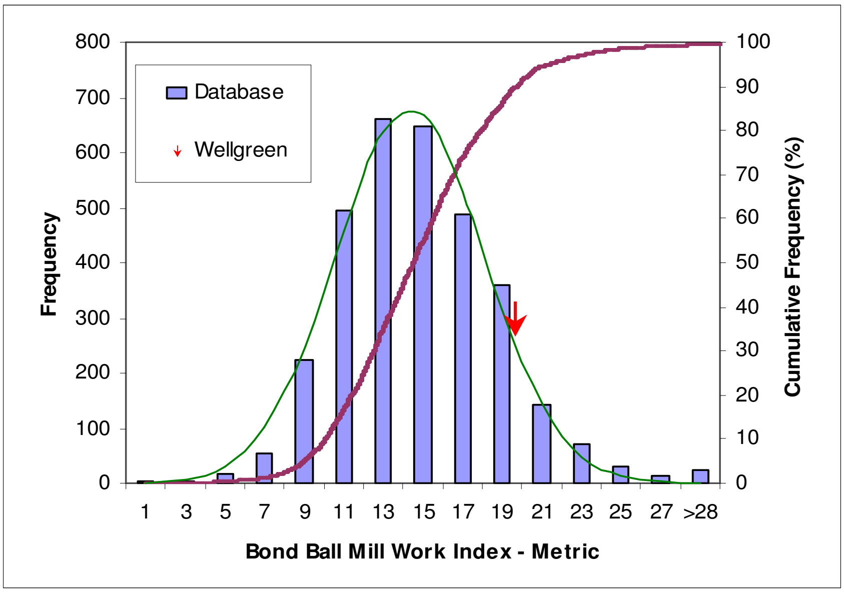


Figure 13: Histogram of Bond Ball Mill Work Index Distribution

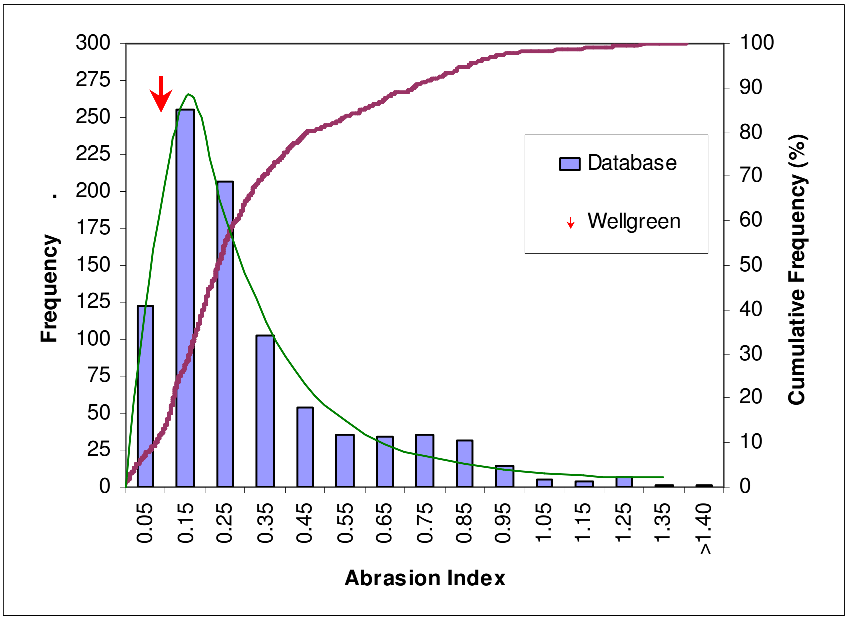


Figure 14: Master Composite Abrasion Index Relative to SGS Database

4. Master Composite Flotation Testwork

Development of a flotation flowsheet was undertaken through a series of rougher kinetics and cleaner flotation tests using 2 kg master composite test charges. The objective of these tests was to maximize recovery of valuable minerals into saleable concentrates whilst also limiting the amount of MgO recovered to the concentrates. The Ni and PGM values in the ore are deemed to be crucial for the profitability and project economics. The complete results are located in Appendix D.

4.1. Preliminary Flotation Testwork

Preliminary flotation testwork was conducted on the master composite. The key variables tested were the effect of grind, collector, talc pre-float and CMC on rougher kinetics. Open circuit cleaner testing was conducted to test the effect of the regrind and dispersants/depressants on circuit recovery and bulk Cu/Ni concentrate grade. A copper/nickel separation test and a split flotation test were also conducted in the preliminary testwork. One locked cycle test was conducted to assess the effect of re-circulating products on metallurgical performance.

In each test, pyrrhotite (Po), chalcopyrite (Cp), pentlandite (Pn) and non-sulphide gangue (NSG) grades were calculated from stoichiometric relationship assumptions based on actual assays of copper, nickel, and sulphur. It was assumed the major copper bearing mineral as chalcopyrite, nickel bearing mineral as pentlandite and the remaining S content is associated with pyrrhotite.

Determining the non-sulphide nickel of tails was also undertaken for the selected tests.

The following sections capture the bench-scale flotation testing component of the master composite in the preliminary testwork.

4.1.1. Rougher Flotation Tests

A series of 12 rougher kinetics tests were conducted. Rougher kinetics tests can establish preliminary grade and recovery relationships as well as flotation kinetics. This was accomplished by collecting concentrates over incremental time periods. The effects of operational variables (primary grind, collector, pH, talc pre-float and carboxy methyl cellulose (CMC)) on recovery were studied.

The initial test was conducted as a sighter test. Subsequent tests modified test conditions in attempts to improve metallurgy. Further tests avoided too much collector to collapse the copper froth, but added sufficient to recover the slower floating PGE minerals.

The final three rougher tests included additional collectors added at different points, dosages and a selective collector versus SIPX. In test F-24 enough dosage of SIPX was added in the grind to get a good copper recovery however the Ni recovery was low. Test F-26 replaced the SIPX in the grind with Cytec Aero 4037 promoter to float copper more selectively than SIPX. Test F-27 was conducted with 20 g/t SIPX in the first rougher instead of the grind to see if the pentlandite is more floatable at the start of the rougher. Finally, test F-28 was conducted with 5 minutes aeration between grinding and the first rougher to investigate if the pentlandite needs some aeration to get floating better. The results show aeration is not required. Adding collector into the grind really only floats copper. Using a selective collector shows more selective at floating copper from nickel and pyrrhotite however needs more investigation.

Table 7 summarizes the results of the rougher flotation testwork and Table 8 shows the rougher flotation test results. Complete test details can be found in Appendix E.

Table 7: Summary of the Rougher Flotation Test Condition and Results

	Grade, %	Rec. %	Grade %	Rec. %	Grade g/	Rec. %	Grade g/t	Rec. %	Grade g/t	Rec. %	Mass Re	Prim. Grind	Float	SIPX	PAX	pH	CMC	Option
Test	**Cu**		**Ni**		**Pt**		**Pd**		**Au**		**%**	**Microns**	**min**	**g/t**	**g/t**		**g/t**	
F1	1.20	92.2	1.40	84.7	1.20	77.1	1.58	88.7	0.17	87.9	28.3	90	18	100	–	Nat	–	
F2	1.29	89.5	1.50	80.6	1.11	68.4	1.33	81.2	0.10	69.8	24.9	90	18	–	80	Nat	–	
F3	1.82	92.8	2.03	78.8	1.65	66.8	2.04	81.7	0.15	62.8	18.0	90	20	70	–	Nat	–	
F4	1.63	93.1	1.82	82.4	1.58	78.7	1.93	89.2	0.16	67.5	20.4	90	20	70	–	9.5	–	
F5	1.54	95.7	1.74	81.9	1.49	70.3	1.79	82.3	0.10	59.2	22.2	50	20	70	–	Nat	–	
F6	1.49	90.6	1.68	81.3	1.36	73.4	1.60	85.0	0.11	61.8	22.1	144	20	70	–	Nat	–	
F7	1.37	82.2	1.68	79.3	1.37	67.6	1.64	73.7	0.11	57.5	21.5	90	20	70	–	Nat	–	Talc Pre-float
F8	1.70	91.7	1.86	80.5	1.53	67.6	2.00	83.0	0.16	65.7	19.7	90	20	70	–	Nat	60	CMC
F24	1.74	90.3	1.92	75.1	1.52	63.0	2.50	82.0	0.17	62.7	16.9	90	20	60	–	Nat	–	
F26	2.30	87.8	2.36	73.6	1.66	51.0	2.50	73.0	0.18	60.0	14.2	90	20	40	–	Nat	–	4037 20 g/t
F27	1.79	85.8	1.93	71.9	1.40	49.0	2.30	74.0	0.14	55.5	15.6	90	20	60	–	Nat	–	
F28	2.08	86.1	2.30	71.3	1.63	47.0	2.70	74.0	0.18	57.4	13.3	90	20	60	–	Nat	–	Aeration

Table 8: Rougher Flotation Test Results

Test	Product	Weight	Assays, (Pt, Pd, Au g/t), (Cu, Ni, S %)						% Distribution					
		%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
	Ro Conc 1	11.1	2.81	3.00	11.3	1.78	3.33	0.35	84.7	70.8	39.7	44.8	73.1	72.5
F1	Ro Conc 1-2	19.6	1.68	1.91	9.84	1.49	2.15	0.23	90.1	79.9	61.2	66.5	83.7	82.8
SIPX 100 g/t	**Ro Conc 1-3**	**28.3**	**1.20**	**1.40**	**8.60**	**1.20**	**1.58**	**0.17**	**92.2**	**84.7**	**77.0**	**77.1**	**88.7**	**87.9**
K80 90 um	Ro Tail	71.7	0.04	0.10	1.01	0.14	0.08	0.01	7.8	15.3	23.0	22.9	11.3	12.1
	Head (calc.)		0.37	0.47	3.15	0.44	0.50	0.05						
	Ro Conc 1	9.1	3.10	2.73	8.92	1.16	2.56	0.19	79.0	53.7	26.3	26.2	57.2	47.3
F2	Ro Conc 1-2	18.4	1.69	1.89	8.50	1.23	1.65	0.13	86.8	75.0	50.6	55.9	74.3	63.0
PAX 80 g/t	**Ro Conc 1-3**	**24.9**	**1.29**	**1.50**	**8.00**	**1.11**	**1.33**	**0.10**	**89.5**	**80.6**	**64.3**	**68.4**	**81.2**	**69.8**
K80 90 um	Ro Tail	75.1	0.05	0.12	1.47	0.17	0.10	0.02	10.5	19.4	35.7	31.6	18.8	30.2
	Head (calc.)		0.36	0.46	3.10	0.40	0.41	0.04						
	Ro Conc 1	3.5	2.26	0.38	3.81	0.50	2.55	0.14	22.1	2.8	4.4	3.9	19.7	11.0
	Ro Conc 1-2	8.2	3.57	2.89	8.81	1.39	3.34	0.25	82.3	51.0	24.0	25.4	60.7	46.2
F3	Ro Conc 1-3	12.5	2.54	2.67	9.04	1.67	2.67	0.20	89.8	72.2	37.7	47.0	74.4	56.1
SIPX 70 g/t	Ro Conc 1-4	14.6	2.22	2.39	9.08	1.70	2.39	0.18	91.4	75.2	44.1	55.8	77.7	58.9
K80 90 um	**Ro Conc 1-5**	**18.0**	**1.82**	**2.03**	**9.52**	**1.65**	**2.04**	**0.15**	**92.8**	**78.8**	**57.2**	**66.8**	**81.7**	**62.8**
	Ro Tail	82.0	0.03	0.12	1.57	0.18	0.10	0.02	7.2	21.2	42.8	33.2	18.3	37.2
	Head (calc.)		0.35	0.46	3.00	0.44	0.45	0.04						
	Ro Conc 1	3.0	1.86	0.38	3.55	0.61	3.73	0.14	15.7	2.5	3.4	4.5	25.4	8.6
	Ro Conc 1-2	7.7	3.77	3.35	10.6	1.60	3.80	0.32	81.8	57.4	25.7	30.2	66.4	50.2
F4	Ro Conc 1-3	14.0	2.30	2.46	10.3	1.76	2.59	0.22	90.2	76.2	45.2	60.1	81.8	61.7
Higher pH	Ro Conc 1-4	16.4	1.99	2.16	9.92	1.71	2.29	0.19	91.7	78.7	51.1	68.6	85.1	64.2
K80 90 um	**Ro Conc 1-5**	**20.4**	**1.63**	**1.82**	**10.4**	**1.58**	**1.93**	**0.16**	**93.1**	**82.4**	**66.8**	**78.7**	**89.2**	**67.5**
	Ro Tail	79.6	0.03	0.10	1.33	0.11	0.06	0.02	6.9	17.6	33.2	21.3	10.8	32.5
	Head (calc.)		0.36	0.45	3.19	0.41	0.44	0.05						
	Ro Conc 1	3.6	0.32	0.37	1.94	1.70	5.38	0.28	3.2	2.8	2.4	13.1	40.4	26.7
	Ro Conc 1-2	8.0	3.38	1.06	5.58	1.84	3.70	0.19	75.3	18.0	15.1	31.2	61.0	39.3
F5	Ro Conc 1-3	13.5	2.43	2.56	7.06	1.79	2.64	0.14	91.5	73.3	32.3	51.4	73.8	49.5
Repeat F3	Ro Conc 1-4	17.1	1.97	2.16	7.23	1.69	2.22	0.12	94.0	78.3	41.8	61.4	78.3	55.1
K80 50 um	**Ro Conc 1-5**	**22.2**	**1.54**	**1.74**	**7.15**	**1.49**	**1.79**	**0.10**	**95.7**	**81.9**	**53.7**	**70.3**	**82.3**	**59.2**
	Ro Tail	77.8	0.02	0.11	1.76	0.18	0.11	0.02	4.3	18.1	46.3	29.7	17.7	40.8
	Head (calc.)		0.36	0.47	2.96	0.47	0.48	0.04						
	Ro Conc 1	4.4	5.59	2.75	10.7	0.33	1.01	0.09	67.1	26.2	15.5	3.5	10.6	9.6
	Ro Conc 1-2	7.8	3.71	3.57	11.1	0.81	2.67	0.19	79.4	60.7	28.8	15.5	49.9	35.6
F6	Ro Conc 1-3	12.7	2.47	2.62	10.0	1.24	2.45	0.16	86.6	72.9	42.3	38.7	74.7	50.2
Repeat F3	Ro Conc 1-4	16.5	1.96	2.14	9.61	1.41	2.02	0.14	89.0	77.2	52.8	56.9	80.2	54.9
K80 144 um	**Ro Conc 1-5**	**22.1**	**1.49**	**1.68**	**9.01**	**1.36**	**1.60**	**0.11**	**90.6**	**81.3**	**66.3**	**73.4**	**85.0**	**61.8**
	Ro Tail	77.9	0.04	0.11	1.30	0.14	0.08	0.02	9.4	18.7	33.7	26.6	15.0	38.2
	Head (calc.)		0.36	0.46	3.01	0.41	0.42	0.04						
	Talc Conc 1-2	**5.3**	**1.73**	**0.55**	**3.20**	**0.66**	**2.36**	**0.10**	**11.7**	**3.1**	**2.5**	**3.7**	**12.6**	**6.5**
	Ro Conc 1	3.4	7.82	4.05	14.8	2.27	6.41	0.46	73.0	29.9	16.2	17.5	44.9	38.0
F7	Ro Conc 1-2	5.8	4.84	4.95	13.3	2.09	4.83	0.31	77.5	62.7	24.9	27.7	58.0	44.6
Repeat F3	Ro Conc 1-3	9.1	3.18	3.54	11.4	2.09	3.48	0.22	80.2	70.8	33.7	43.7	65.9	49.5
Talc Pre-float	Ro Conc 1-4	13.0	2.26	2.63	11.8	1.88	2.59	0.17	81.3	74.7	49.9	56.0	69.9	53.3
K80 90 um	**Ro Conc 1-5**	**21.5**	**1.37**	**1.68**	**9.93**	**1.37**	**1.64**	**0.11**	**82.2**	**79.3**	**69.8**	**67.6**	**73.7**	**57.5**
	Ro Tail	73.2	0.03	0.11	1.16	0.17	0.09	0.02	6.1	17.7	27.7	28.6	13.7	36.0
	Head (calc.)		0.36	0.46	3.07	0.43	0.48	0.04						
	Ro Conc 1	4.5	5.93	0.90	8.92	1.44	4.80	0.43	72.9	8.9	13.0	14.5	45.6	41.3
	Ro Conc 1-2	8.4	3.71	3.55	11.2	1.78	3.84	0.30	85.2	65.7	30.6	33.5	68.1	52.9
F8	Ro Conc 1-3	12.3	2.66	2.76	10.2	1.84	2.97	0.23	89.5	74.8	40.6	50.7	77.0	60.4
Repeat F3	Ro Conc 1-4	15.3	2.17	2.31	10.0	1.74	2.49	0.19	90.8	77.9	49.9	59.7	80.4	62.9
CMC 60 g/t	**Ro Conc 1-5**	**19.7**	**1.70**	**1.86**	**9.38**	**1.53**	**2.00**	**0.16**	**91.7**	**80.5**	**60.1**	**67.6**	**83.0**	**65.7**
K80 90 um	Ro Tail	80.3	0.04	0.11	1.53	0.18	0.10	0.02	8.3	19.5	39.9	32.4	17.0	34.3
	Head (calc.)		0.37	0.45	3.08	0.45	0.47	0.05						
	Ro Conc 1	6.5	3.93	0.97	6.64	1.54	4.40	0.25	77.7	14.4	18.1	24.4	56.0	36.3
	Ro Conc 1-2	10.3	2.75	2.78	8.31	1.69	3.63	0.24	86.8	66.2	36.1	42.8	73.9	54.5
F24	Ro Conc 1-3	13.1	2.21	2.37	7.95	1.67	3.04	0.20	89.0	71.7	44.0	53.8	78.8	58.9
SIPX 60 g/t	Ro Conc 1-4	15.3	1.91	2.08	7.55	1.58	2.67	0.18	89.9	73.8	48.8	59.4	80.8	60.9
(20 in grind)	**Ro Conc 1-5**	**16.9**	**1.74**	**1.92**	**7.34**	**1.52**	**2.45**	**0.16**	**90.3**	**75.1**	**52.4**	**63.3**	**82.0**	**62.7**
K80 90 um	Ro Tail	83.1	0.04	0.13	1.36	0.18	0.11	0.02	9.7	24.9	47.6	36.7	18.0	37.3
	Head (calc.)		0.33	0.43	2.37	0.41	0.51	0.04						
	Ro Conc 1	4.1	6.32	0.53	8.21	1.65	4.89	0.40	71.4	4.8	11.7	14.9	41.9	38.7
	Ro Conc 1-2	7.3	4.11	2.94	9.24	1.80	3.93	0.28	81.5	47.0	23.0	28.5	59.1	48.1
F26	Ro Conc 1-3	10.1	3.09	2.95	8.98	1.77	3.22	0.23	85.0	65.6	31.1	39.0	67.3	54.1
SIPX 60 g/t	Ro Conc 1-4	12.5	2.55	2.58	8.55	1.71	2.75	0.20	86.9	71.0	36.7	46.6	71.0	58.0
4037 20 g/t	**Ro Conc 1-5**	**14.2**	**2.27**	**2.36**	**8.33**	**1.66**	**2.50**	**0.18**	**87.8**	**73.6**	**40.5**	**51.4**	**73.4**	**60.0**
K80 90 um	Ro Tail	85.8	0.05	0.14	2.02	0.26	0.15	0.02	12.2	26.4	59.5	48.6	26.6	40.0
	Head (calc.)		0.37	0.45	2.91	0.46	0.48	0.04						
	Ro Conc 1	5.6	4.32	2.63	8.99	1.50	4.42	0.27	74.3	35.3	21.2	18.9	50.7	40.1
	Ro Conc 1-2	9.7	2.72	2.52	7.60	1.45	3.24	0.19	80.8	58.5	31.0	31.6	64.1	47.6
F27	Ro Conc 1-3	12.2	2.24	2.27	7.12	1.44	2.78	0.16	83.4	66.0	36.5	39.2	69.2	50.9
Repeat F24	Ro Conc 1-4	14.2	1.96	2.07	6.85	1.42	2.51	0.14	84.9	69.9	40.7	45.0	72.3	54.0
(20 in first rghr)	**Ro Conc 1-5**	**15.6**	**1.80**	**1.93**	**6.68**	**1.40**	**2.34**	**0.13**	**85.8**	**71.9**	**43.8**	**49.0**	**74.3**	**55.5**
K80 90 um	Ro Tail	84.4	0.06	0.14	1.59	0.27	0.15	0.02	14.2	28.1	56.2	51.0	25.7	44.5
	Head (calc.)		0.33	0.42	2.39	0.45	0.49	0.04						
	Ro Conc 1	4.5	5.29	2.76	9.97	1.63	5.24	0.38	73.6	29.3	19.1	15.9	47.8	42.0
	Ro Conc 1-2	6.8	3.74	3.16	9.07	1.72	4.31	0.29	79.3	51.1	26.5	25.5	59.8	48.3
F28	Ro Conc 1-3	9.6	2.80	2.81	8.02	1.67	3.45	0.22	82.9	63.7	32.8	34.9	67.1	52.4
Repeat F27	Ro Conc 1-4	11.5	2.38	2.51	7.44	1.66	3.03	0.19	84.8	68.5	36.6	41.5	70.8	54.8
Aeration	**Ro Conc 1-5**	**13.3**	**2.08**	**2.26**	**7.04**	**1.63**	**2.72**	**0.18**	**86.1**	**71.3**	**40.1**	**47.2**	**73.6**	**57.4**
K80 90 um	Ro Tail	86.7	0.05	0.14	1.62	0.28	0.15	0.02	13.9	28.7	59.9	52.8	26.4	42.6
	Head (calc.)		0.32	0.42	2.34	0.46	0.49	0.04						

Figures 15 and 16 provide a general overview of the kinetic responses and the influence of mass recovery in each test for Cu, Ni, and PGM. The results show that after 8 minutes the Cu and Ni, and Pd recoveries do not appreciably improve; whereas the Pt and Au recoveries improves beyond 8 minutes. Pd is usually associated with copper, while Pt and Au will be at least partially associated with pyrrhotite and gangue minerals.

Figure 15 shows copper, nickel, and palladium rougher flotation has a fast flotation rate at the start. In the first 4 minutes close to 80% of the copper and 60% of the nickel and palladium can be recovered. The slower floating minerals, Pt and Au, will take another 10-15 minutes of laboratory flotation time to be recovered.

Figure 16 shows that copper and nickel recoveries are least influenced by mass recovery above 15%, while for Pt a 10% additional mass recovery will increase rougher recovery by 20%, from 50% to 70%. The same was observed for Pd and Au; thus, higher than 15% mass recovery is recommended.

Overall, the rougher flotation test results show the rougher flotation performance looks to be fairly robust with good recovery of the metal values to the rougher concentrate.

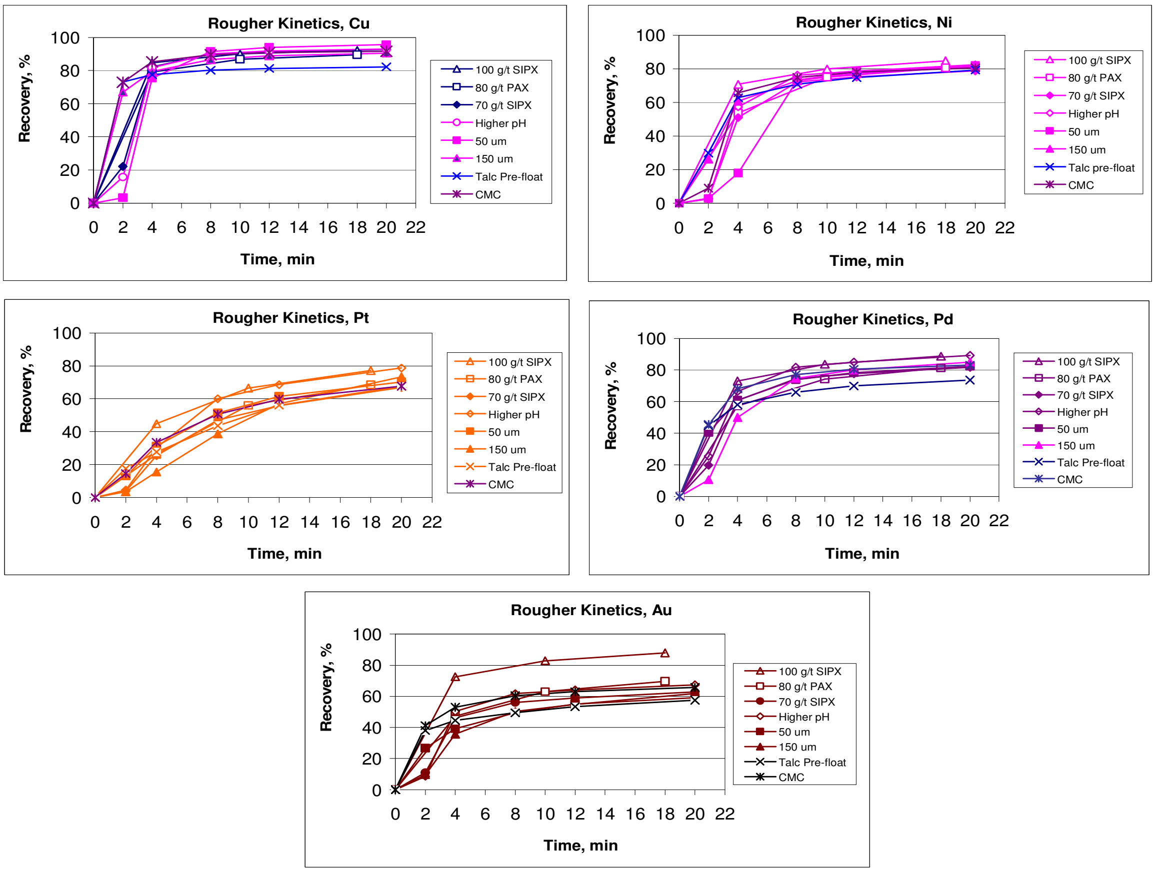


Figure 15: Rougher flotation Kinetics Results

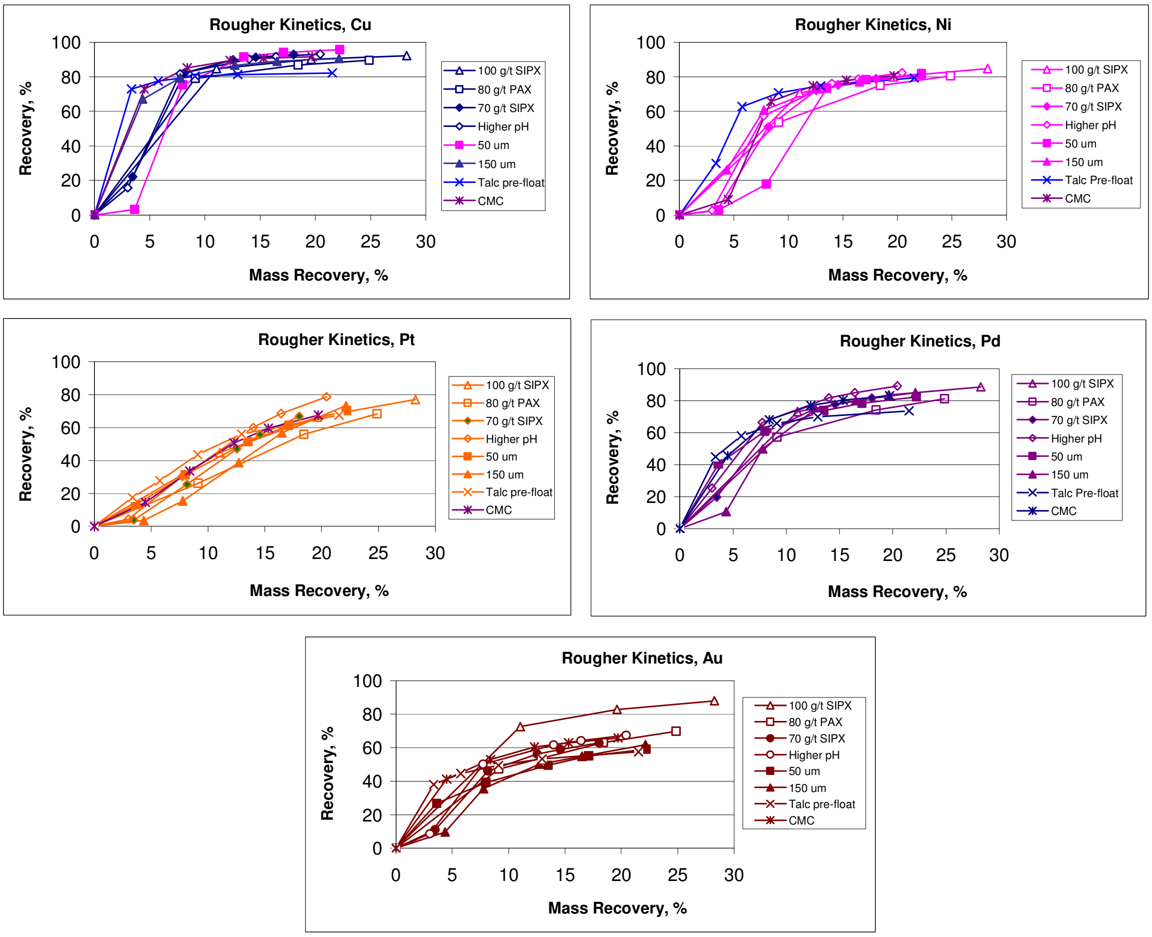


Figure 16: Effect of Mass Recovery on Cu, Ni and PGE Recovery

4.1.1.1. Effect of Primary Grinding

Preliminary rougher kinetics tests were conducted on the composite sample to determine the effects of grind size. Tests F3, F5, and F6 varied the primary grind, at 90, 50, and 144 microns respectively, while the SIPX dosage remained constant at 70 g/t at natural pH. In test F8 CMC was used as talc depressant. The results are shown in Figures 17 and 18.

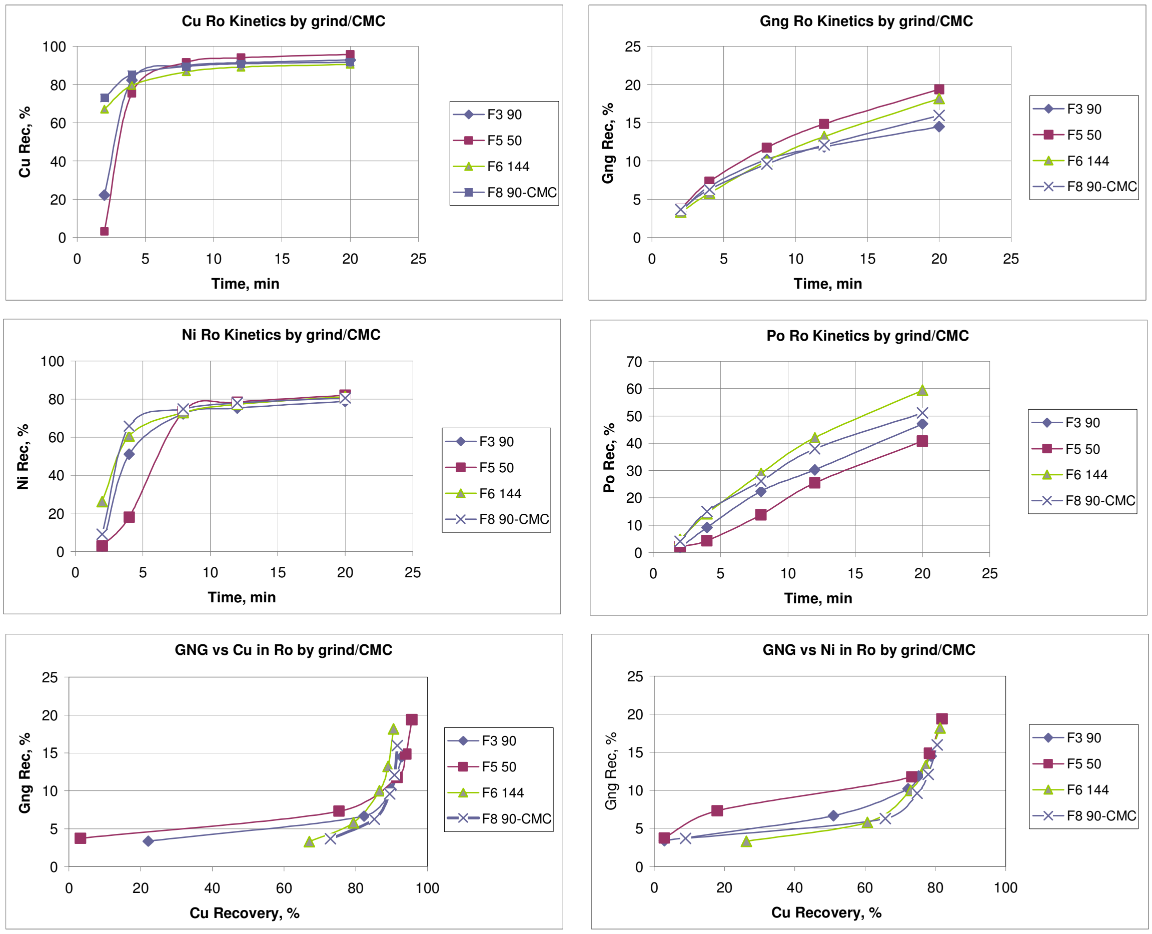


Figure 17: Effect of Primary Grinding on Rougher Recovery

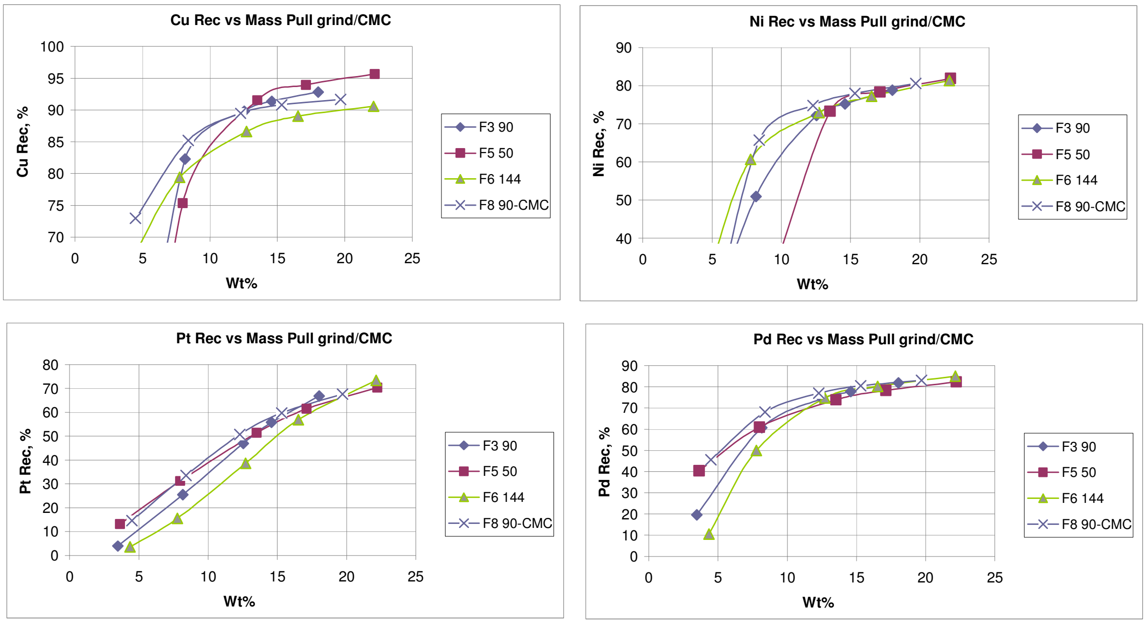


Figure 18: Recovery Grind Relationship

The following conclusions can be made from the test results:

- Copper recovery slightly increased with finer grind size over the range tested. The response was as expected with respect to copper metallurgy in Figure 2, with the grade/recovery relationship generally improving with finer grind. A maximum rougher recovery of 96% was reached with K_{80} of 50 µm. A plausible explanation is that at the finer grind, the chalcopyrite is better liberated, resulting in faster kinetics at the finer grind.
- Effect of grinding on nickel recovery is not similar to copper and finer grinding does not appear to improve recovery or selectivity, but may even be detrimental to Ni recovery over the range tested. Nickel metallurgy is shown in Figure 17 where the finer grind resulted in almost the same recovery as the coarser grind.
- Referring to Table 8 a common trend is noticed, which is not limited to the effect of grind test series but to all rougher kinetics tests completed, that a final rougher tailings Ni assay value of ~0.11% Ni is often reached. This is because there is some Ni in the silicates as well as some pentlandite texture/associations which can not be recovered. It also shows that the Pt losses tend to be highest. The mineralogy by Terra shows that Pt is primarily associated with pyrrhotite.
- Nickel rougher recovery barely reached more than 82%. This is expected since as it was stated previously, about some of the nickel is expected to be associated with silicate minerals and is not expected to float. The copper and nickel rougher concentrate grade ranged from 1.5%-1.8% and

1.7%-2%, respectively. Thus, the rougher flotation upgrading index for copper is between 4.5 and 5.5 and that of nickel is between 4 and 4.8, this is a reflection of the high mass pull used.

- The distribution of pyrrhotite, which is the main iron sulphide mineral in the ore, appears to have a close correlation with nickel recovery. The pyrrhotite content of the bulk concentrate reached a maximum level at 18.8%. Contrary to both copper and nickel, pyrrhotite grade continuously increased as the flotation time increased.
- The pulp pH was at a natural level of about 9 in the primary flotation tests. This pH is not high enough to depress pyrrhotite. Pentlandite flotation is also expected not to be negatively affected at this pH. Sodium Isopropyl Xanthate was used as the main collector and it was stage added to the flotation cell with the total addition of 70 g/t. Details are shown in Appendix E.
- Pt and Pd recoveries were slightly higher at coarser primary grind size of 144 microns.
- While Cu and Ni kinetics were seen to be quicker in the test F6, the final recoveries were ultimately the same.

4.1.1.2. Effect of Pulp Chemistry

In addition to SIPX, collector PAX was tested. PAX is particularly effective for a stronger collector and it is non-selective collector which also renders Mg minerals to float. SIPX has the potential to improve the selectivity of nickel sulphide flotation therefore increase the nickel recovery.

The effects of this collector on copper, nickel, and PGM recoveries are shown in Figure 19.

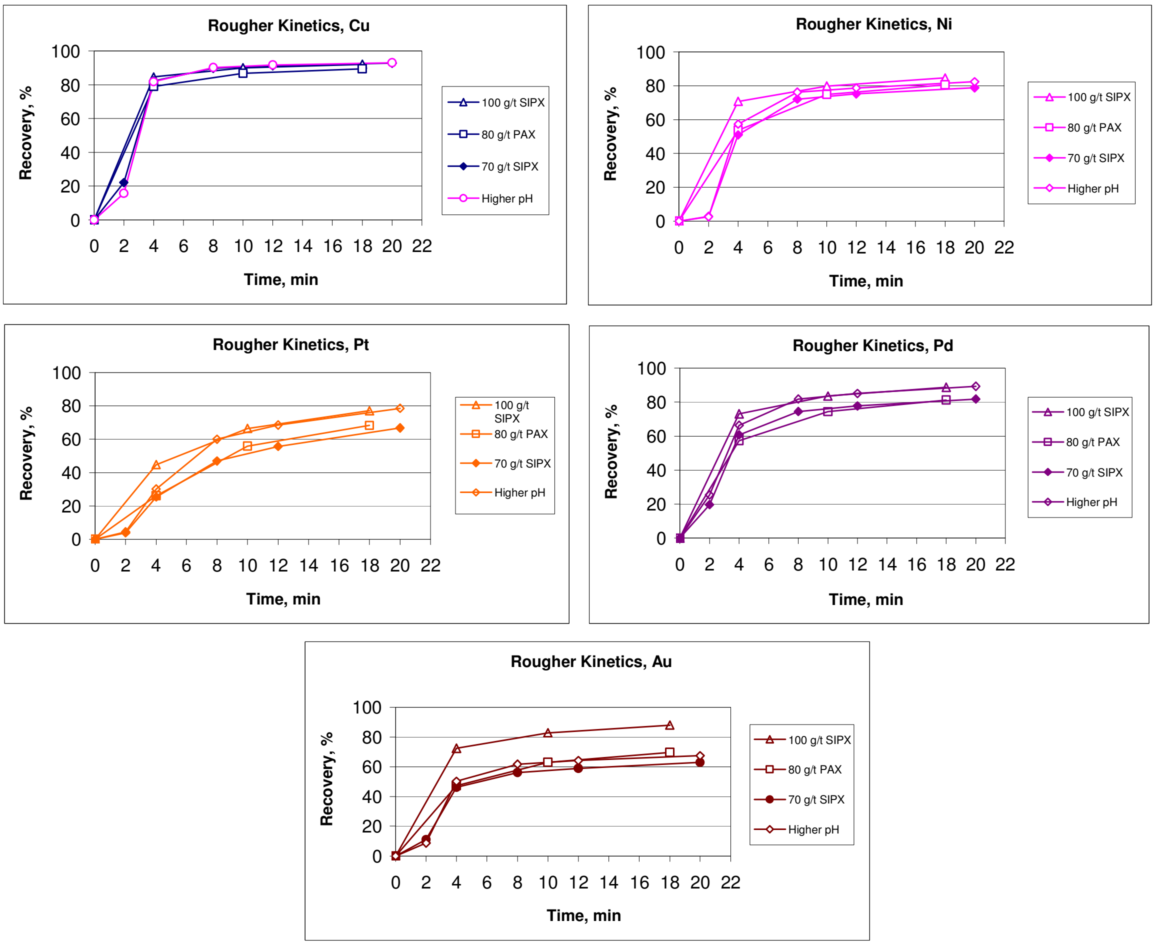


Figure 19: Effect of Pulp Chemistry on Rougher Flotation

The following results can be extracted from the test results:

- SIPX provided the same copper recovery as PAX.
- With SIPX, nickel recovery was higher within the first 10 minutes of the flotation; however the final recoveries were ultimately the same.
- Pyrrhotite distribution in the bulk concentrate decreased to 57% when PAX was used in comparison with SIPX which pyrrhotite recovery was 73%.
- Higher pH did not show any better results than the natural pH.
- SIPX provided better overall recoveries of sulphides and was used in further tests.

4.1.1.3. Effect of Talc Pre-float and CMC as Silicate Depressant

As the flotation testwork continued it was noticed that talc and floatable silicate material in the ore was causing problems during flotation and the dilution of concentrate was possible. In order to improve copper and nickel recoveries and enhance concentrate grade in the bulk concentrate, the effect of talc pre-flotation and CMC as silicate depressant were examined. In one test talc was floated ahead of the bulk copper and nickel flotation with frother. The results are shown in Figure 20.

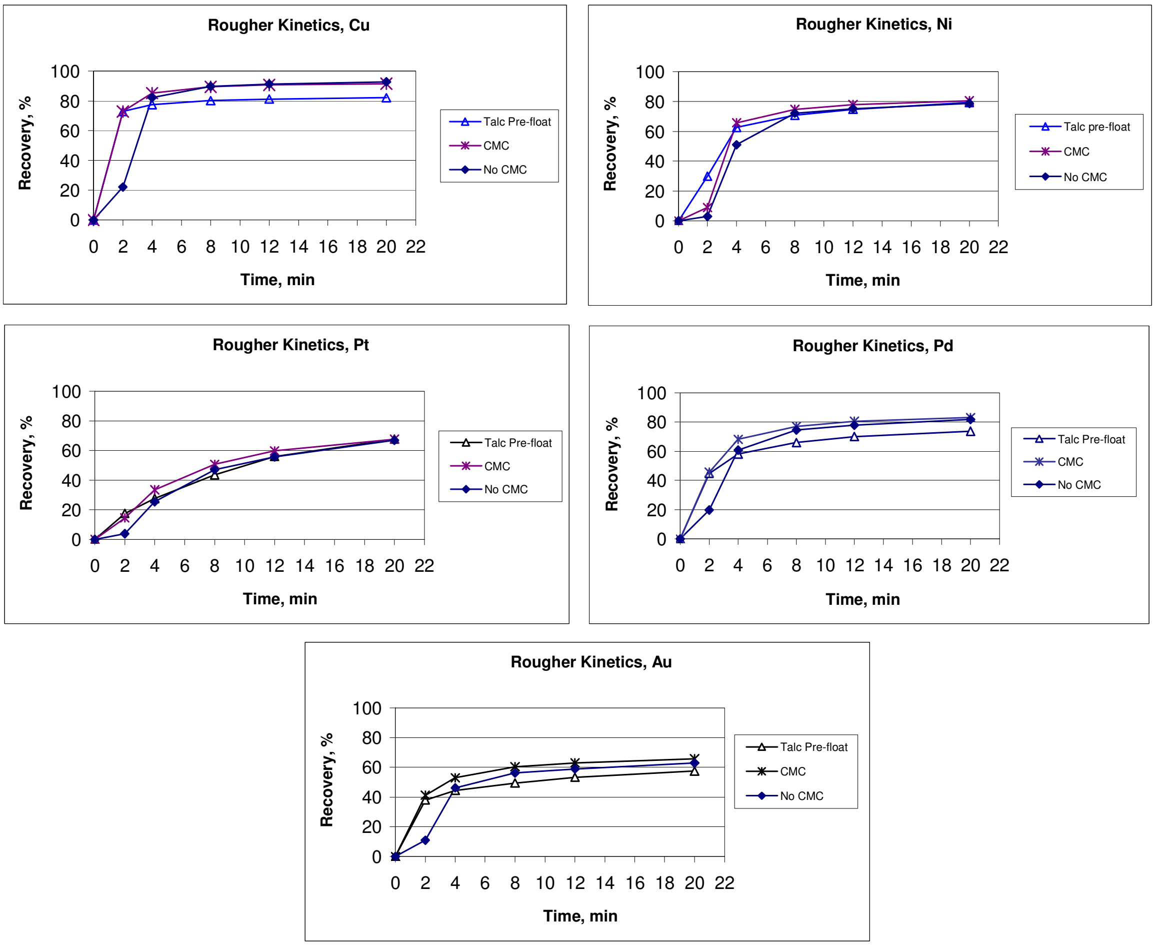


Figure 20: Effect of Talc Pre-flotation and CMC on Rougher Flotation

It can be concluded that:

- Effect of CMC: CMC was applied to depress silicates. It was stage added to the first three rougher stages at 60 g/t. CMC had minimal overall impact on Cu, Ni and PGM recoveries. The slight increase in Au recovery is likely due to inherent process variation.
- Effect of talc pre-float: Before collection of a first rougher concentrate, talc was floated using the addition of frother. It can be clearly observed in Table 8 that there was significant loss of Cu, Ni and PGM in the talc pre-float concentrate.

Due to the lack of any positive effect of talc pre-float and CMC addition, the base case (Test F3) was shown to be the preferred one. Thus, further cleaner flotation tests were followed based on the rougher flotation conditions of the base case.

4.1.2. Cleaner Flotation Tests

To further assess grades and recoveries of minerals into a final saleable concentrate a series of 15 batch cleaner flotation tests was conducted, allowing grade-recovery relationships to be developed. Grade-recovery relationships assist in understanding the extent of cleaning stages required to reach target concentrate grade and identify stage recovery losses within the circuit. In each test, mineral assays were estimated using the metal and sulphur assays of the products and the nominal contents of the preceding elements in each mineral, i.e. chalcopyrite, pentlandite and pyrrhotite. As MgO is critical to concentrate quality, tracking its deportment through particularly the cleaners, is crucial. The target is less than 5% MgO. The ratio of Fe:MgO greater than 4.5:1 in the final concentrate would be another critical parameter.

The key flotation circuit conditions and the main results are summarized in Table 9 and Table 10 for the batch cleaner tests and details are provided in Appendix E.

A bulk rougher concentrate was floated under conditions similar to those utilized in the rougher kinetics testwork. The bulk rougher concentrate was then subjected to a bulk cleaner flotation, with further additions of collector and/or depressants as required.

Tests F9-F25 attempted to establish a grade-recovery relationship for the master composite in a three stage cleaner test. A typical flowsheet for a conventional cleaner circuit is displayed in Figure 21. The rougher flotation scheme and reagent suite used followed that of F3. While maximum copper recovery of 88.6% was achieved in test F14, the Ni recovery was 64%. A low quality concentrate with Cu+Ni grade of 8% and 17.5% MgO was achieved in this test. Test F10 recovered the maximum Ni recovery of 65.5%, again the grade was low and MgO high. The results are shown in Table 10.

Many of the PGM ores have a floatable silicate gangue component which is rich in MgO. The MgO is a deleterious component in the smelting of concentrates and must be removed in the mineral processing stage. Not all silicates that float into the concentrate are naturally floatable. Non-floatable silicates are also recovered when they are still locked with sulphides. The distinction between the floatable silicates and the middling-silicates is an important one and is an important issue during flotation.

The main focus of the cleaner tests was on silicates depressant effects in the cleaner circuit. Both CMC depressant and guar gum were examined. The effect of Calgon, which has been a proven effective dispersant on low-grade Cu/Ni ores, was also investigated. The purpose of using dispersant is to eliminate the heterocoagulation between two different mineral particles via increasing the repulsive interactions between them. The most commonly used dispersants are sodium hexametaphosphate (Calgon), carboxymethyl cellulose (CMC), and gums. When added to the slurry, the dispersant adsorbs onto the particles surfaces and leads to a very high repulsive potential energy barrier to prevent the particles attaching to each other, making the ore slurry a well dispersed suspension of individual particles. At the same time, the dispersant also plays the role as a depressant, which is supposed to make gangue minerals more hydrophilic and difficult to attach to the air bubbles.

An analysis of the Cu, Ni, and S values in the Cu/Ni cleaner concentrate suggests that the primary diluents are non-sulphide gangue (NSG) minerals. It was unknown if these NSG minerals reported to the concentrate is in the form of middlings or by direct flotation. A mineralogical analysis of selected concentrates helped to answer this question and form the basis of the optimization program to improve the concentrate grade.

Table 9: Summary of Cleaner Flotation Tests Conditions and Results

	Grade, %	Rec. %	Grade %	Rec. %	Grade g/t	Rec. %	Grade g/t	Rec. %	Grade g/t	Rec. %	Mass Rec	Re-grind	Float	SIPX	pH	Fe	MgO	Option
Test	Cu		Ni		Pt		Pd		Au		%	Microns	min	g/t		%	%	
F9	5.88	82.0	4.40	46.8	2.17	24.2	6.45	62.7	0.56	51.2	4.9	No	22	15	Nat	–	14.7	
F10	4.49	86.9	4.36	65.5	2.52	37.9	5.23	72.4	0.31	47.0	7.0	No	22	15	Nat	–	15.7	CMC=35 g/t
F11	11.3	83.6	2.84	15.8	2.88	16.1	13.7	60.3	0.98	48.6	2.3	25	22	15	Nat	–	14.2	CMC=35 g/t
F12	10.2	79.2	8.02	48.5	3.62	22.1	9.14	52.8	0.99	52.7	3.1	No	22	15	Nat	–	4.1	CMC=200 g/t
F13	20.7	50.9	4.23	7.7	2.78	4.9	10.0	15.0	1.60	26.1	0.8	No	22	15	Nat	–	3.5	CMC=150, Guar gum=375 g/t
F14	3.88	88.6	4.16	63.9	2.51	39.2	5.00	68.1	0.26	42.1	6.9	No	22	15	Nat	–	17.5	Calgon=300g/t
F15	15.4	76.9	3.68	13.6	3.29	12.9	11.4	37.9	0.89	31.7	1.6	No	22	15	Nat	–	6.2	CMC=75, Guar gum=113 g/t
F16	11.9	79.7	6.58	33.0	2.69	15.0	8.55	45.1	0.85	43.4	2.4	No	22	15	Nat	–	5.1	CMC=65 Guar gum=85 g/t
F17	11.2	74.1	7.85	40.7	3.21	18.2	8.70	46.0	0.59	31.5	2.4	No	22	15	Nat	30.0	3.7	CMC=120 g/t
F19	23.6	68.5	3.51	8.0	3.26	7.6	15.0	32.0	1.51	34.7	1.0	23	22	15	Nat	30.1	2.5	CMC=200 g/t, Pri-grind 150 um
F20	15.8	77.2	8.47	32.6	3.47	12.9	12.4	46.0	0.90	36.8	1.7	34	22	15	Nat	33.0	2.3	CMC=200 g/t, Pri-grind 150 um
F21	8.99	69.5	8.78	47.0	3.60	19.3	11.2	52.0	0.59	29.2	2.3	72	22	15	Nat	31.7	6.6	CMC=200 g/t, Pri-grind 150 um
F22	10.1	76.9	7.82	42.6	3.90	21.2	11.2	52.0	0.78	35.5	2.4	51	22	15	Nat	30.0	5.9	CMC=200 g/t, Regrind 1st clnr conc
F23	5.60	79.2	6.50	64.0	4.00	46.8	6.78	66.0	0.43	45.4	4.7	No	22	15	Nat	39.5	5.2	CMC=200 g/t, CuSO4=245 g/t
F25	16.0	65.6	7.98	24.6	4.57	18.0	12.9	38.4	1.00	28.0	1.4	No	19	15	Nat	33.9	2.6	CMC=160 g/t

Table 10: Cleaner Flotation Test Results

Test	Product	Weight	Assays, (Pt, Pd, Au g/t), (Cu, Ni %)						% Distribution					
		%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
	3rd Clnr Conc	**4.9**	**5.88**	**4.40**	**15.5**	**2.17**	**6.45**	**0.56**	**82.0**	**46.8**	**25.3**	**24.2**	**62.7**	**51.2**
F9	2nd Clnr Conc	8.0	3.81	3.73	12.9	2.03	4.59	0.39	87.0	64.9	34.4	37.0	73.1	58.8
No Regrind	1st Clnr Conc	11.4	2.75	2.94	12.1	1.92	3.51	0.30	89.9	73.4	46.1	50.1	80.1	65.2
No CMC	1st Cl & ClScv Conc	13.0	2.43	2.66	12.0	1.88	3.17	0.28	90.7	75.6	52.3	55.9	82.5	67.3
	Rghr Conc	**20.3**	**1.58**	**1.78**	**9.00**	**1.41**	**2.11**	**0.18**	**92.0**	**79.1**	**61.3**	**65.4**	**85.7**	**70.1**
	1st Clnr Scv Tls	7.3	0.06	0.22	3.66	0.57	0.22	0.02	1.3	3.5	9.0	9.5	3.2	2.7
	Rougher Tails	79.7	0.04	0.12	1.45	0.19	0.09	0.02	8.0	20.9	38.7	34.6	14.3	29.9
	Head (calc.)		0.35	0.46	2.99	0.44	0.50	0.05						
	3rd Clnr Conc	**7.0**	**4.49**	**4.36**	**14.3**	**2.52**	**5.23**	**0.31**	**86.9**	**65.5**	**34.9**	**37.9**	**72.4**	**47.0**
F10	2nd Clnr Conc	9.8	3.30	3.41	12.0	2.22	3.99	0.24	89.1	71.3	40.8	46.6	77.1	50.6
No Regrind	1st Clnr Conc	13.8	2.40	2.59	10.5	1.91	3.00	0.18	90.7	76.0	50.3	56.3	81.3	54.8
CMC=35 g/t	1st Cl & ClScv Conc	15.3	2.16	2.37	10.3	1.83	2.74	0.19	91.1	77.4	55.0	59.8	82.6	63.6
	Rghr Conc	**22.8**	**1.47**	**1.65**	**7.89**	**1.35**	**1.90**	**0.14**	**92.1**	**80.2**	**62.2**	**65.4**	**84.8**	**66.7**
	1st Clnr Scv Tls	7.4	0.05	0.18	2.82	0.35	0.15	0.02	1.0	2.8	7.3	5.5	2.2	3.2
	Rougher Tails	77.2	0.04	0.12	1.41	0.21	0.10	0.02	7.9	19.8	37.8	34.6	15.2	33.3
	Head (calc.)		0.36	0.47	2.88	0.47	0.51	0.05						
	3rd Clnr Conc	**2.3**	**11.3**	**2.84**	**16.5**	**2.88**	**13.7**	**0.98**	**83.6**	**15.8**	**16.4**	**16.1**	**60.3**	**48.6**
F11	2nd Clnr Conc	5.1	5.16	2.29	9.23	1.98	6.73	0.47	86.6	29.0	20.8	25.2	67.3	53.0
Regrind	1st Clnr Conc	8.3	3.23	2.63	8.15	1.80	4.58	0.31	88.6	54.3	30.0	37.3	74.7	57.3
K80 = 25 um	1st Cl & ClScv Conc	9.9	2.75	2.65	8.18	1.67	3.97	0.27	89.4	64.8	35.7	40.9	76.7	58.3
CMC=35 g/t	**Rghr Conc**	**18.9**	**1.46**	**1.62**	**6.91**	**1.27**	**2.23**	**0.15**	**90.7**	**75.9**	**57.7**	**59.7**	**82.6**	**64.3**
	1st Clnr Scv Tls	9.0	0.04	0.50	5.52	0.84	0.33	0.03	1.3	11.2	22.0	18.8	5.8	6.0
	Rougher Tails	81.1	0.04	0.12	1.18	0.20	0.11	0.02	9.3	24.1	42.3	40.3	17.4	35.7
	Head (calc.)		0.30	0.40	2.26	0.40	0.51	0.05						
	3rd Clnr Conc	**3.1**	**10.2**	**8.02**	**26.2**	**3.62**	**9.14**	**0.99**	**79.2**	**48.5**	**23.0**	**22.1**	**52.8**	**52.7**
F12	2nd Clnr Conc	8.2	4.31	4.55	18.8	2.83	4.76	0.46	89.0	73.2	43.8	46.1	73.3	65.1
No Regrind	1st Clnr Conc	15.3	2.39	2.66	12.8	1.95	2.81	0.26	92.4	80.2	55.9	59.3	80.9	70.1
CMC=200 g/t	1st Cl & ClScv Conc	17.0	2.16	2.43	12.3	1.84	2.57	0.24	92.9	81.5	59.5	62.4	82.3	71.2
	Rghr Conc	**22.6**	**1.64**	**1.87**	**9.85**	**1.47**	**1.97**	**0.19**	**93.6**	**83.3**	**63.6**	**66.2**	**84.0**	**73.2**
	1st Clnr Scv Tls	5.6	0.04	0.16	2.54	0.34	0.16	0.02	0.6	1.8	4.1	3.8	1.7	1.9
	Rougher Tails	77.4	0.03	0.11	1.65	0.22	0.11	0.02	6.4	16.7	36.4	33.8	16.0	26.8
	Head (calc.)		0.40	0.51	3.51	0.50	0.53	0.06						
	3rd Clnr Conc	**0.7**	**20.7**	**4.23**	**27.9**	**2.78**	**10.0**	**1.60**	**50.9**	**7.7**	**9.1**	**4.9**	**15.0**	**26.1**
F13	2nd Clnr Conc	2.1	10.4	4.19	18.8	3.47	8.86	0.90	70.6	21.0	17.0	17.0	36.8	40.8
No Regrind	1st Clnr Conc	9.1	2.90	3.30	12.4	2.54	4.27	0.30	86.7	72.9	49.3	54.9	77.9	59.1
CMC=150 g/t	1st Cl & ClScv Conc	11.7	2.28	2.63	10.9	2.14	3.42	0.24	87.7	74.9	55.7	59.6	80.3	61.4
Guar=375 g/t	**Rghr Conc**	**21.5**	**1.26**	**1.51**	**7.02**	**1.33**	**1.95**	**0.14**	**89.1**	**79.0**	**66.3**	**68.2**	**84.2**	**65.7**
	1st Clnr Scv Tls	9.8	0.05	0.17	2.45	0.37	0.20	0.02	1.5	4.1	10.6	8.7	4.0	4.3
	Rougher Tails	78.5	0.04	0.11	0.98	0.17	0.10	0.02	10.9	21.0	33.7	31.8	15.8	34.3
	Head (calc.)		0.30	0.41	2.28	0.42	0.50	0.05						
	3rd Clnr Conc	**6.9**	**3.88**	**4.16**	**13.4**	**2.51**	**4.96**	**0.26**	**88.6**	**63.9**	**39.6**	**39.2**	**68.1**	**42.1**
F14	2nd Clnr Conc	9.0	3.07	3.43	11.5	2.29	4.08	0.25	91.2	68.5	44.4	46.5	72.7	52.3
No Regrind	1st Clnr Conc	11.1	2.51	2.89	10.2	2.08	3.41	0.21	92.7	71.6	48.9	52.5	75.5	55.3
Calgon=300g/t	1st Cl & ClScv Conc	12.9	2.19	2.56	9.87	1.96	3.03	0.19	94.0	73.9	54.9	57.6	78.1	57.5
	Rghr Conc	**19.8**	**1.45**	**1.74**	**7.31**	**1.42**	**2.05**	**0.13**	**94.9**	**76.7**	**62.1**	**63.6**	**80.8**	**62.3**
	1st Clnr Scv Tls	6.8	0.04	0.19	2.44	0.39	0.20	0.03	1.0	2.9	7.1	6.0	2.7	4.8
	Rougher Tails	80.2	0.02	0.13	1.10	0.20	0.12	0.02	5.1	23.3	37.9	36.4	19.2	37.7
	Head (calc.)		0.30	0.45	2.33	0.44	0.50	0.04						
	3rd Clnr Conc	**1.6**	**15.4**	**3.68**	**23.3**	**3.29**	**11.4**	**0.89**	**76.9**	**13.6**	**16.2**	**12.9**	**37.9**	**31.7**
F15	2nd Clnr Conc	3.1	8.67	5.90	19.4	3.15	8.83	0.75	83.2	42.1	25.9	23.7	56.5	51.5
No Regrind	1st Clnr Conc	7.2	3.86	4.03	13.4	2.41	4.95	0.36	86.8	67.4	41.9	42.5	74.1	57.9
CMC=75 g/t	1st Cl & ClScv Conc	10.2	2.75	3.00	11.4	1.97	3.63	0.26	88.1	71.2	50.8	49.5	77.3	59.9
Guar=113 g/t	**Rghr Conc**	**17.5**	**1.64**	**1.85**	**7.79**	**1.39**	**2.23**	**0.16**	**89.7**	**75.1**	**59.3**	**59.5**	**81.1**	**63.1**
	1st Clnr Scv Tls	7.2	0.07	0.23	2.70	0.56	0.25	0.02	1.6	3.9	8.5	9.9	3.8	3.2
	Rougher Tails	82.5	0.04	0.13	1.13	0.20	0.11	0.02	10.3	24.9	40.7	40.5	18.9	36.9
	Head (calc.)		0.32	0.43	2.29	0.41	0.48	0.04						
	3rd Clnr Conc	**2.4**	**11.9**	**6.58**	**24.0**	**2.69**	**8.55**	**0.85**	**79.7**	**33.0**	**18.3**	**15.0**	**45.1**	**43.4**
F16	2nd Clnr Conc	4.3	7.26	6.40	19.8	2.53	6.34	0.56	86.0	56.7	26.8	24.9	59.0	50.8
No Regrind	1st Clnr Conc	8.0	4.03	4.26	14.9	2.17	4.13	0.35	89.4	70.6	37.6	40.1	72.0	58.7
CMC=65	1st Cl & ClScv Conc	11.2	2.95	3.27	14.1	1.93	3.18	0.27	90.7	75.3	49.6	49.5	76.9	62.7
Guar=85 g/t	**Rghr Conc**	**20.7**	**1.62**	**1.88**	**9.28**	**1.26**	**1.80**	**0.15**	**92.3**	**80.4**	**60.4**	**59.8**	**81.1**	**66.7**
	1st Clnr Scv Tls	9.5	0.06	0.26	3.58	0.47	0.20	0.02	1.7	5.1	10.7	10.3	4.1	4.0
	Rougher Tails	79.3	0.04	0.12	1.59	0.22	0.11	0.02	7.7	19.6	39.6	40.2	18.9	33.3
	Head (calc.)		0.36	0.49	3.18	0.43	0.46	0.05						

Table 11: Cleaner Flotation Test Results (Continued)

Test	Product	Weight	Assays, (Pt, Pd, Au g/t), (Cu, Ni, Fe, MgO %)								% Distribution							
		%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
	3rd Clnr Conc	**2.4**	**11.2**	**7.85**	**26.3**	**3.21**	**8.70**	**0.59**	**30.0**	**3.70**	**74.1**	**40.7**	**20.0**	**18.2**	**46.0**	**31.5**	**5.8**	**0.4**
F17	2nd Clnr Conc	4.8	6.37	6.06	21.1	2.96	6.03	0.43	27.3	7.86	83.6	62.4	31.8	33.3	63.3	45.7	10.4	1.8
No Regrind	1st Clnr Conc	11.0	3.00	3.18	13.0	1.98	3.16	0.24	20.9	15.0	89.2	74.1	44.3	50.4	75.1	57.7	18.1	7.7
CMC=120 g/t	1st Cl & ClScv Conc	12.9	2.58	2.78	12.8	1.85	2.78	0.21	21.3	15.3	90.1	76.3	51.2	55.5	77.8	60.3	21.6	9.2
	Rghr Conc	**20.4**	**1.65**	**1.84**	**9.51**	**1.33**	**1.83**	**0.15**	**18.5**	**17.5**	**91.2**	**79.7**	**60.4**	**63.0**	**81.0**	**65.2**	**29.7**	**16.6**
	1st Clnr Scv Tls	7.5	0.05	0.21	3.94	0.43	0.20	0.03	13.7	21.2	1.0	3.4	9.2	7.5	3.3	4.9	8.1	7.4
	Rougher Tails	79.6	0.04	0.12	1.60	0.20	0.11	0.02	11.2	22.5	8.8	20.3	39.6	37.0	19.0	34.8	70.3	83.4
	Head (calc.)		0.37	0.47	3.22	0.43	0.46	0.05	12.7	21.5								
	3rd Clnr Conc	**1.0**	**23.6**	**3.51**	**31.6**	**3.26**	**15.0**	**1.51**	**30.7**	**2.52**	**68.5**	**8.0**	**10.4**	**7.6**	**31.9**	**34.7**	**2.5**	**0.1**
F19	2nd Clnr Conc	2.0	13.6	5.96	23.9	3.62	12.0	1.02	27.4	7.17	74.4	25.6	14.9	15.9	48.1	44.2	4.3	0.6
CMC=200 g/t	1st Clnr Conc	5.7	4.93	4.31	13.4	2.43	5.30	0.42	20.0	15.8	78.5	53.8	24.4	31.0	61.9	53.3	9.1	3.9
Grind 150 um	1st Cl & ClScv Conc	6.9	4.10	4.00	12.9	2.37	4.56	0.36	20.2	16.2	79.2	60.5	28.3	36.6	64.5	55.2	11.1	4.8
Regrind 23 um	**Rghr Conc**	**15.5**	**1.87**	**2.14**	**9.56**	**1.47**	**2.23**	**0.18**	**19.4**	**18.2**	**80.7**	**72.3**	**46.9**	**51.0**	**70.6**	**62.7**	**23.9**	**12.2**
	1st Clnr Scv Tls	8.6	0.06	0.63	6.85	0.75	0.35	0.04	18.7	19.8	1.5	11.8	18.6	14.3	6.1	7.5	12.8	7.3
	Rougher Tails	84.5	0.08	0.15	1.98	0.26	0.17	0.02	11.3	24.1	19.3	27.7	53.1	49.0	29.4	37.3	76.1	87.8
	Head (calc.)		0.36	0.46	3.15	0.45	0.49	0.05	12.5	23.2								
	3rd Clnr Conc	**1.7**	**15.8**	**8.47**	**27.8**	**3.47**	**12.4**	**0.90**	**33.0**	**2.32**	**77.2**	**32.6**	**17.3**	**12.9**	**46.2**	**36.8**	**4.7**	**0.2**
F20	2nd Clnr Conc	2.9	9.70	7.90	22.6	3.53	9.00	0.61	29.9	6.81	80.1	51.4	23.8	22.2	56.7	42.5	7.2	0.9
CMC=200 g/t	1st Clnr Conc	6.0	4.72	4.61	13.5	2.58	4.82	0.33	22.7	14.8	82.3	63.3	29.9	34.2	64.1	47.8	11.6	4.0
Grind 150 um	1st Cl & ClScv Conc	6.6	4.31	4.32	13.0	2.55	4.46	0.31	22.6	15.1	82.6	65.4	31.7	37.1	65.2	49.3	12.7	4.5
Regrind 34 um	**Rghr Conc**	**14.0**	**2.09**	**2.33**	**9.65**	**1.65**	**2.32**	**0.17**	**19.9**	**17.5**	**84.5**	**74.5**	**49.8**	**50.7**	**71.5**	**58.2**	**23.5**	**11.0**
	1st Clnr Scv Tls	7.4	0.09	0.54	6.66	0.84	0.39	0.05	17.4	19.6	1.9	9.1	18.1	13.6	6.3	8.9	10.8	6.5
	Rougher Tails	86.0	0.06	0.13	1.58	0.26	0.15	0.02	10.5	22.9	15.5	25.5	50.2	49.3	28.5	41.8	76.5	89.0
	Head (calc.)		0.35	0.44	2.71	0.45	0.45	0.04	11.8	22.1								
	3rd Clnr Conc	**2.3**	**8.99**	**8.78**	**23.6**	**3.60**	**11.2**	**0.59**	**31.7**	**6.57**	**69.5**	**47.0**	**23.9**	**19.3**	**52.0**	**29.2**	**6.1**	**0.6**
F21	2nd Clnr Conc	4.4	4.99	5.61	15.7	2.94	6.95	0.37	24.5	14.0	72.7	56.5	29.9	29.6	60.8	34.4	8.9	2.5
CMC=200 g/t	1st Clnr Conc	8.9	2.52	3.05	9.42	1.90	3.69	0.20	18.5	20.4	74.6	62.4	36.5	38.9	65.6	38.3	13.7	7.3
Grind 150 um	1st Cl & ClScv Conc	10.6	2.15	2.70	9.06	1.78	3.21	0.18	18.7	20.5	75.4	65.5	41.7	43.4	67.8	40.4	16.3	8.7
Regrind 72 um	**Rghr Conc**	**17.4**	**1.35**	**1.79**	**7.35**	**1.37**	**2.13**	**0.13**	**17.9**	**21.6**	**78.2**	**71.6**	**55.6**	**54.6**	**73.8**	**47.6**	**25.8**	**15.0**
	1st Clnr Scv Tls	6.8	0.12	0.39	4.7	0.72	0.44	0.05	16.8	23.2	2.7	6.1	13.9	11.3	6.0	7.2	9.5	6.3
	Rougher Tails	82.6	0.08	0.15	1.24	0.24	0.16	0.03	10.9	25.8	21.8	28.4	44.4	45.4	26.2	52.4	74.2	85.0
	Head (calc.)		0.30	0.44	2.31	0.44	0.50	0.05	12.1	25.1								
	3rd Clnr Conc	**2.4**	**10.1**	**7.82**	**25.7**	**3.90**	**11.2**	**0.78**	**30.0**	**5.86**	**76.9**	**42.6**	**25.5**	**21.2**	**52.3**	**35.5**	**5.3**	**0.7**
F22	2nd Clnr Conc	4.9	5.28	5.32	18.0	3.21	6.83	0.47	25.7	11.9	81.2	58.6	36.1	35.3	64.5	43.0	9.1	2.7
CMC=200 g/t	1st Clnr Conc	11.0	2.45	2.88	11.5	2.10	3.47	0.25	20.6	17.2	84.3	70.6	51.8	51.5	73.1	52.1	16.3	8.7
Regrind	1st Cl & ClScv Conc	12.3	2.20	2.61	11.0	1.98	3.14	0.23	20.3	17.6	84.6	71.8	55.4	54.5	74.2	53.3	18.0	10.0
1st Clnr 51um	**Rghr Conc**	**17.5**	**1.55**	**1.89**	**8.48**	**1.51**	**2.26**	**0.21**	**18.1**	**19.1**	**85.3**	**74.1**	**60.9**	**59.4**	**76.2**	**69.1**	**23.0**	**15.5**
	1st Clnr Scv Tls	5.2	0.04	0.20	2.53	0.42	0.20	0.16	13.1	22.8	0.6	2.4	5.4	4.9	2.0	15.7	5.0	5.5
	Rougher Tails	82.5	0.06	0.14	1.16	0.22	0.15	0.02	12.9	22.1	14.7	25.9	39.1	40.6	23.8	30.9	77.0	84.5
	Head (calc.)		0.32	0.45	2.44	0.45	0.52	0.05	13.8	21.6								
	3rd Clnr Conc	**4.7**	**5.61**	**6.50**	**18.8**	**4.00**	**6.78**	**0.43**	**39.5**	**5.17**	**79.2**	**64.0**	**40.4**	**46.8**	**66.0**	**45.4**	**15.5**	**1.0**
F23	2nd Clnr Conc	7.3	3.76	4.52	14.5	2.98	4.73	0.30	31.1	11.4	82.6	69.3	48.6	54.2	71.5	50.1	18.9	3.3
No Regrind	1st Clnr Conc	12.9	2.22	2.76	9.60	1.94	2.87	0.19	22.8	17.8	85.8	74.4	56.5	62.0	76.4	56.3	24.5	9.2
CMC=200 g/t	1st Cl & ClScv Conc	15.8	1.84	2.33	8.57	1.69	2.42	0.17	21.2	19.1	87.2	76.7	61.7	66.1	78.7	60.8	27.8	12.0
CuSO4	**Rghr Conc**	**22.2**	**1.33**	**1.70**	**6.41**	**1.26**	**1.76**	**0.13**	**18.2**	**21.2**	**88.3**	**78.9**	**64.8**	**69.1**	**80.7**	**65.1**	**33.5**	**18.8**
	1st Clnr Scv Tls	6.4	0.06	0.16	1.07	0.19	0.15	0.03	10.7	26.6	1.1	2.1	3.1	3.0	2.0	4.3	5.7	6.8
	Rougher Tails	77.8	0.05	0.13	0.99	0.16	0.12	0.02	10.3	26.2	11.7	21.1	35.2	30.9	19.3	34.9	66.5	81.2
	Head (calc.)		0.33	0.48	2.19	0.40	0.48	0.04	12.0	25.1								
	3rd Clnr Conc	**1.4**	**16.0**	**7.98**	**28.0**	**4.57**	**12.9**	**0.97**	**33.9**	**2.63**	**65.6**	**24.6**	**16.0**	**18.0**	**38.4**	**28.3**	**3.6**	**0.2**
F25	2nd Clnr Conc	2.8	9.12	7.54	22.6	4.22	10.0	0.77	30.9	6.05	77.4	48.1	26.7	34.4	61.6	46.4	6.8	0.8
Repeat F12	1st Clnr Conc	7.3	3.89	4.08	13.1	2.63	5.01	0.38	22.4	13.6	85.5	67.5	40.2	55.5	80.0	59.0	12.7	4.5
Optimize CMC	1st Cl & ClScv Conc	8.9	3.24	3.48	11.9	2.43	4.28	0.32	21.3	15.4	86.5	70.0	44.1	62.2	82.9	61.0	14.8	6.2
	Rghr Conc	**14.5**	**2.00**	**2.22**	**8.18**	**1.62**	**2.69**	**0.20**	**17.7**	**18.7**	**87.4**	**72.9**	**49.6**	**67.9**	**85.1**	**63.4**	**20.1**	**12.3**
	1st Clnr Scv Tls	5.6	0.05	0.23	2.34	0.35	0.18	0.02	12.1	23.9	0.9	2.9	5.5	5.7	2.2	2.4	5.3	6.1
	Rougher Tails	85.5	0.05	0.14	1.41	0.13	0.08	0.02	12.0	22.7	12.6	27.1	50.4	32.1	14.9	36.6	79.9	87.7
	Head (calc.)		0.33	0.44	2.39	0.35	0.46	0.05	12.8	22.1								

Test F9 was conducted as a baseline cleaner flotation test without using any depressants or regrind. To improve Cu and Ni metallurgy, test F10 investigated the effect of 35 g/t silicate depressant CMC. Copper and nickel recoveries improved to 87% and 65.5%, respectively. PGE recoveries were also higher. Due to high recovery of non-sulphide gangue (60%) copper grade in this test decreased to 4.5%.

Test F11 explored the effect of regrinding. Regrinding is an avenue to liberate the sulphides from the silicates, but the re-grind needs to grind fine. Fine sulphides (and PGM) will exhibit a slower flotation rate and losses can increase as a result. In addition, the re-grind can re-grind talc component as well, which will then become more difficult to depress. The results show that regrinding the rougher concentrate to 30 microns decreased the recovery of Ni and Pt dramatically. Cu recovery was less affected and copper grade increased to 11%.

Regrinding of already liberated particles is not ideal and particularly in Ni ores with floatable gangue. Typically, the grind is applied on streams with abundant middling particles, not on well liberated streams. Furthermore, the benefit of a re-grind mill cannot be tested in a batch test, as the effect of re-grinding the floatable silicates cannot be assessed without recycling these particles. It is especially the build-up of floatable gangue in the cleaning circuit that plague the ability to control floatation and attain an acceptable concentrate grade and recovery

Test F12 examined the effect of higher CMC and no regrind which resulted in better selectivity. Ni grade and recovery increased to 8% and 48%, however copper recovery decreased to 79%.

The effect of guar gum as a possible floatable silicate depressant was tested in test F13. While the copper grade increased to 21%, Ni recovery was the worst at 8%. PGE recoveries were also very low in this test.

Calgon was tried in test F14. Very low copper grade was achieved in this test. A combined 8% Cu/Ni, 8 g/t PGE, and 17.5% MgO were achieved in this test

To reduce Ni and PGE losses, CMC and guar gum dosages in the 2nd and 3rd cleaners were decreased in tests F15 and F16. The results show the improvement of the recovery of Ni and PGE.

Tests F10 to F17 were conducted to investigate the effect of silicate depressants and optimize their dosages by balancing these depressant to obtain good flotation performance. Mineralogy data indicated the presence of free floating silicates which was countered with CMC as a depressant. The addition of high dosage of CMC proved detrimental to both copper, and especially nickel recoveries.

Flotation tests F19-F21 tested the effect of a coarse primary grind at different re-grind sizes. Loss of Cu, Ni and PGE in the rougher tailings resulted in lower recoveries.

The position of the regrind mill after the first cleaner was investigated based on the results obtained with this configuration and with rougher concentrate re-grind. First cleaner concentrate was re-ground in test F22 which resulted loss of Ni in the second cleaner tails.

In order to improve Ni recovery and enhance pyrrhotite distribution in the bulk concentrate, the effect of $CuSO_4$ was examined in flotation test F23. It was added after the collection of two rougher concentrates at 175 g/t in the rougher and 70 g/t in the cleaner stages. Copper sulphate had no positive effect on Ni and pyrrhotite recovery in this test.

Test F25 was conducted to adjust CMC dosages in the cleaner stages with no success due to high dosages. The CMC dosages worked out to be ~600, 600, 800 g/t stage which were too high. Ni recovery was very low in this test. At the start of the cleaners in this test a heavy froth was noticed which is a sign of too much collector. In the roughers gangue is floated with the sulphides and the gangue helps support the froth, however when CMC is added it depresses the gangue and the gangue no longer helps support the froth. The heavy froth is likely from the Cu which suggests floating the Cu ahead of most of the Ni and deal with Ni in separate cleaners, a split-stream flowsheet circuit.

Finally test F40 was conducted to repeat test F17. Rougher tailing from this test was directed to a magnetic separation stage. No improvement in the Ni recovery was observed in this test.

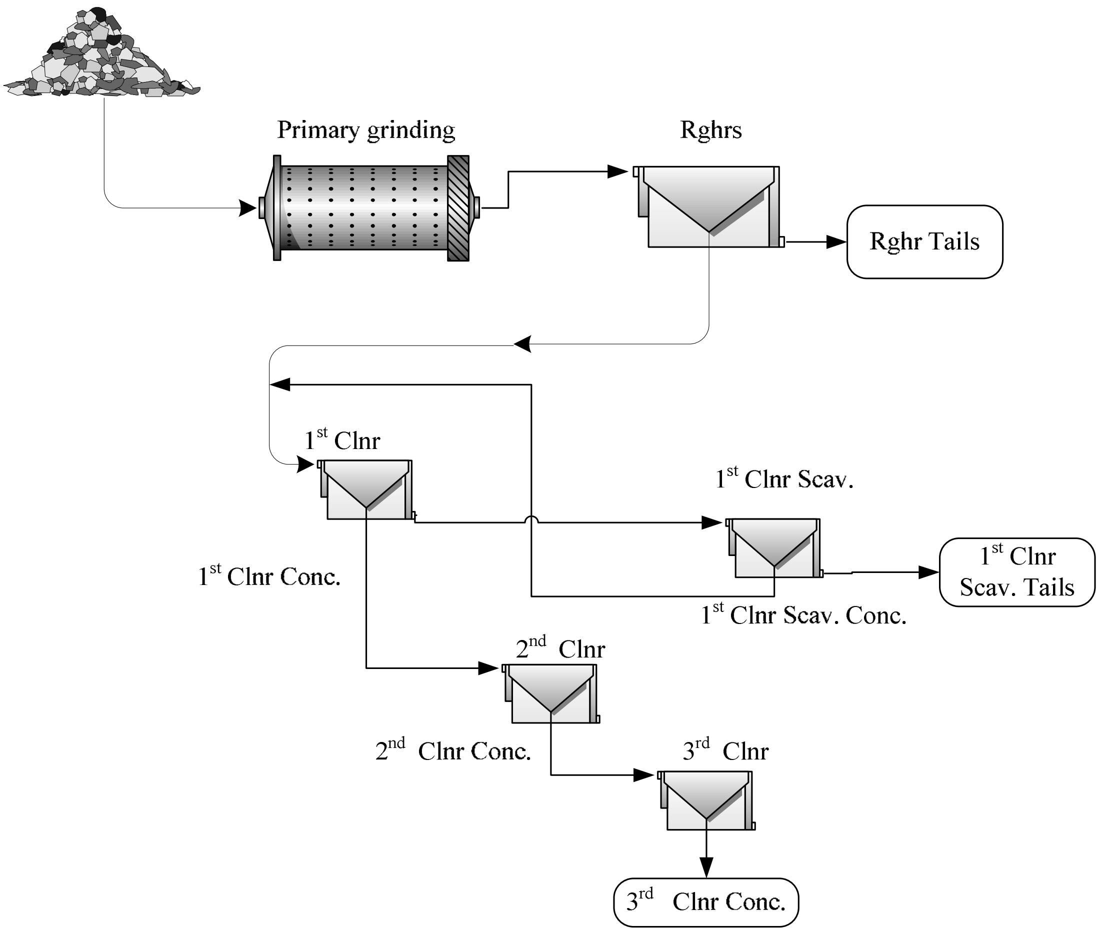


Figure 21: Cleaner Flotation Tests Flowsheet

Figure 22 shows the copper grade-recovery relationships for the cleaner tests and Figure 23 compares the recovery of each of the pay-metals; Cu and Ni as well as Pt, Pd, and Au as a function of combined Cu+Ni and PGE grades, respectively.

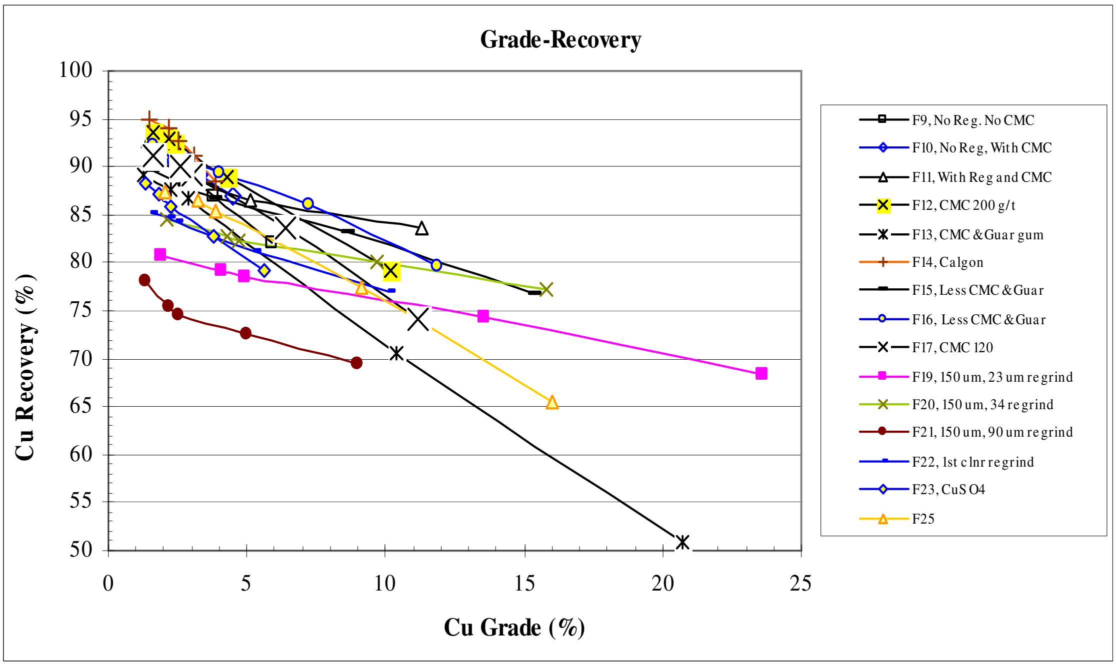


Figure 22: Copper Grade-Recovery Relationship

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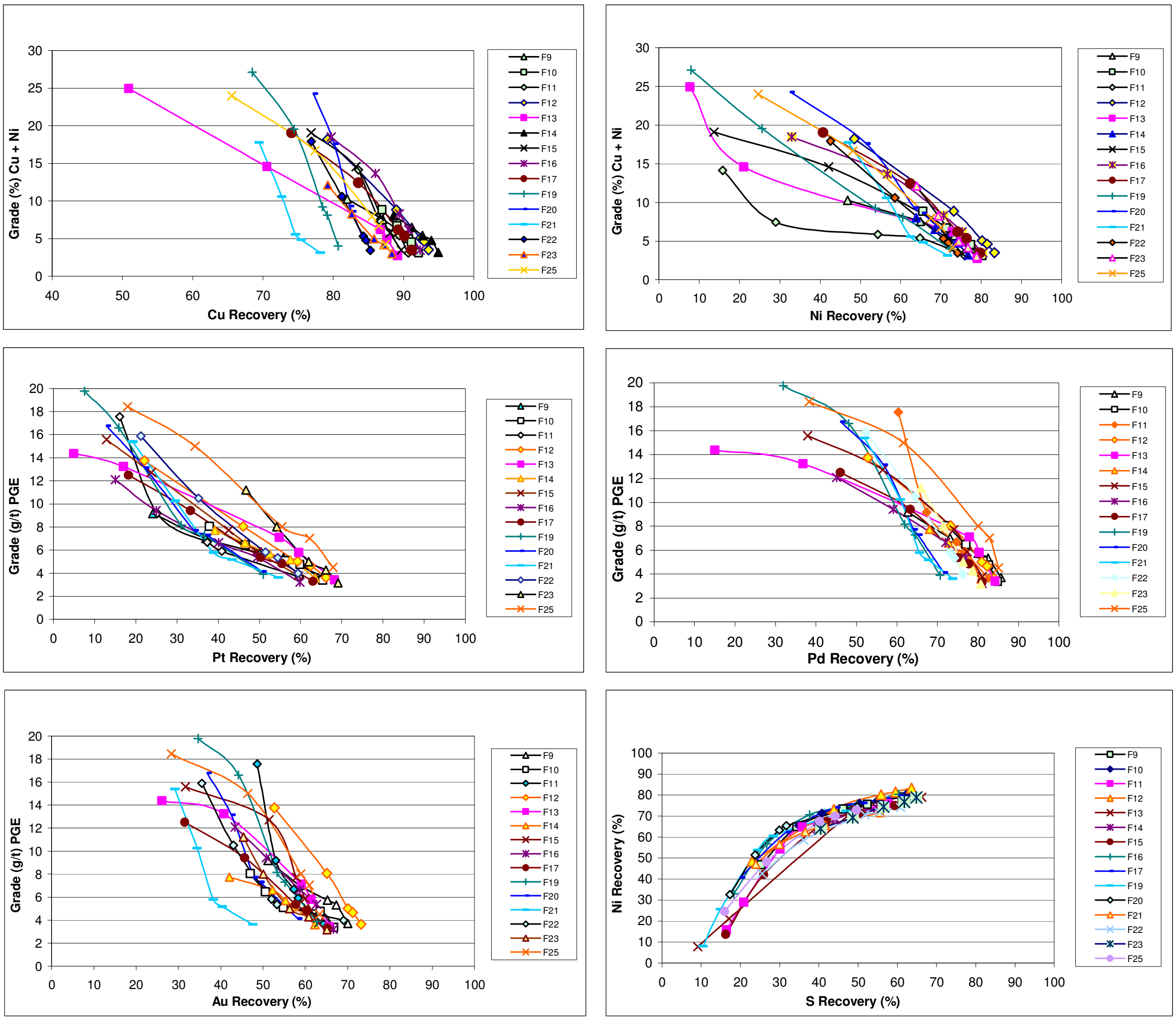


Figure 23: Recovery vs. Cu+Ni and PGE grade

Based on the results of test F12, if an 18% Cu+Ni concentrate grade is acceptable, the average Cu and Ni recovery is expected to be approximately 79% and 50%, respectively. At higher Cu+Ni concentrate grades, Cu and Ni recoveries are expected to decrease. The recoveries quoted are for open-circuit batch tests and are expected to be slightly higher in a closed circuit.

The combined Au, Pt, and Pd grade of the test F12 is 14 g/t. The Pt, Pd and Au recoveries are 22%, 53% and 53%, respectively.

4.1.3. Copper Nickel Separation

In addition to standard cleaning, one test (Sep-F1) investigated the feasibility of copper nickel separation. The intention was to draw attention to a possible method for producing separate copper and nickel concentrates while minimizing nickel losses into the copper concentrate. The flowsheet for this separation testwork is outlined in Figure 24.

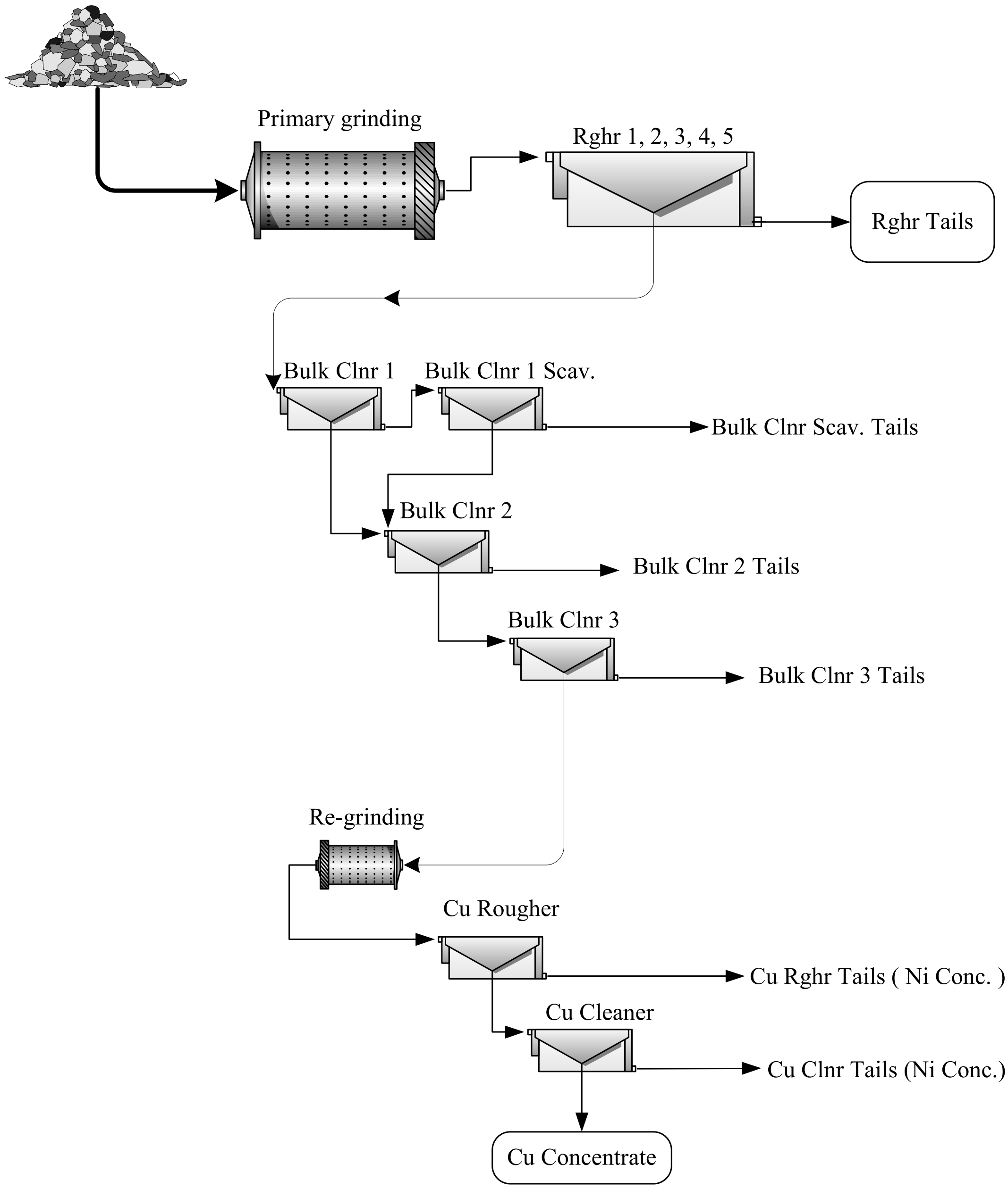


Figure 24: Cu/Ni Separation Flowsheet used in Test Sep-F1

The most notable results observed in test Sep-F1 show the rougher stage produced a copper concentrate assaying 18% Cu at 60% recovery. This test featured a copper rougher tail producing a final Ni concentrate of 7.5% Ni at 51.5% recovery. Bulk cleaner in this test observed recoveries of 76% and 52% for copper and nickel respectively into the final 3rd cleaner concentrate at a grade of 15% Cu+Ni. Cu/Ni separation test results are presented in Table 12. Detailed test results are attached in the Appendix E.

Table 12: Cu/Ni Separation Test (Sep-F1) Results

Product	Weight	Assays, (Pt, Pd, Au g/t), (Cu, Ni, S, fe, MgO %)								% Distribution							
	%	Cu	Ni	Pt	Pd	Au	S	Fe	MgO	Cu	Ni	Pt	Pd	Au	S	Fe	MgO
Cu Cleaner 1 Conc.	**0.2**	**31.3**	**0.38**	**1.50**	**6.04**	**0.83**	**31.4**	**30.4**	**0.70**	**19.1**	**0.2**	**0.8**	**2.4**	**3.8**	**2.6**	**0.5**	**0.0**
Cu Rghr Conc.	1.1	17.9	**1.72**	2.22	9.14	0.73	22.5	21.3	1.68	60.2	**4.4**	**6.2**	**20.1**	**18.4**	**10.4**	**1.9**	**0.1**
Cu Cleaner 1 Tails (Ni Conc.)	0.9	14.9	**2.01**	2.38	9.83	0.71	0.71	19.3	1.90	41.1	**4.2**	**5.4**	**17.7**	**14.6**	**7.8**	**1.4**	**0.1**
(Cu Rghr Tails (Ni Conc.)	**2.0**	**2.51**	**9.75**	**4.52**	**9.47**	**0.33**	**22.3**	**31.9**	**5.70**	**16.2**	**47.4**	**24.0**	**39.7**	**15.9**	**19.8**	**5.3**	**0.5**
Total Ni Conc.	**2.9**	**6.23**	**7.43**	**3.88**	**9.58**	**0.44**	**21.8**	**28.1**	**4.56**	**57.3**	**51.6**	**29.4**	**57.4**	**30.5**	**27.6**	**6.7**	**0.6**
Bulk 3rd Clnr Conc	3.1	7.79	6.99	3.73	9.36	0.47	22.4	28.3	4.32	76.4	51.8	30.2	59.8	34.3	30.2	7.2	0.6
Bulk 2nd Clnr Conc	5.0	5.06	5.19	3.29	6.67	0.36	18.1	26.6	9.20	81.9	63.4	43.9	70.3	43.8	40.4	11.2	2.0
Bulk 1st Clnr + Clnr Scav Conc	11.5	2.36	2.63	1.99	3.33	0.21	11.1	20.4	16.9	86.9	73.1	60.5	80.0	57.7	56.3	19.5	8.3
Bulk Rghr Conc	**19.4**	**1.42**	**1.63**	**1.33**	**2.06**	**0.13**	**7.49**	**17.1**	**19.7**	**88.1**	**76.6**	**68.0**	**83.2**	**61.4**	**64.0**	**27.5**	**16.2**
Bulk Rghr Tail	80.6	0.05	0.12	0.15	0.10	0.02	1.01	10.8	24.5	11.9	23.4	32.0	16.8	38.6	36.0	72.5	83.8

4.1.4. Split-Stream Flowsheet

A split-stream flow sheet was also tested and initial fast-floating copper minerals were cleaned separately from slower floating nickel minerals. Test F18 was performed with the objective of producing a copper concentrate that could be marketed to a smelter and a bulk copper-nickel concentrate to be processed in a hydrometallurgy process. Since the first and second timed rougher concentrates were high grade in copper, combined and was cleaned separately to produce a copper concentrate. The remainder of the rougher concentrate (rougher concentrates 3-5) was cleaned separately in three stages. The results are shown in Table 13. Detailed test results are presented in the Appendix E. It can be concluded that the copper grade in the final Cu concentrate reached 28% Cu with a low recovery of about 27%. While the grade of copper into the Cu concentrate was high, the nickel content in the copper concentrate was 0.5%. With two cleaning stages a lower copper grade of 20% Cu concentrate with 65% recovery was achieved.

Nickel did not upgrade to any significant level in the bulk concentrate. In this concentrate, nickel grade and recovery were 4% Ni and 7%, respectively. The other main portions of nickel were in the copper cleaner tails and bulk rougher tails. Pyrrhotite deports mainly to the low-nickel grade concentrate.

Table 13: The Split-Stream Test (F18) Results

Product	Weight	Assays, (Pt, Pd, Au g/t), (Cu, Ni, S, Fe, MgO %)								% Distribution							
	%	Cu	Ni	Pt	Pd	Au	S	Fe	MgO	Cu	Ni	Pt	Pd	Au	S	Fe	MgO
Bulk Clnr 3 Conc	**0.8**	**1.34**	**4.02**	**7.10**	**2.68**	**0.33**	**19.7**	**29.2**	**2.74**	**2.9**	**6.8**	**13.5**	**4.7**	**5.2**	**5.1**	**1.7**	**0.1**
Bulk Clnr 2 Conc	1.6	0.95	3.07	5.34	2.24	0.23	20.2	34.2	5.98	4.4	11.0	21.5	8.3	7.7	11.0	4.2	0.4
Bulk Clnr 1 + Clnr 1 Scav Conc	6.0	0.44	1.39	2.51	1.18	0.11	12.9	25.8	14.5	7.5	18.2	36.8	16.0	14.0	25.6	11.6	4.0
Bulk Rghr 3-5 Conc	**12.2**	**0.26**	**0.80**	**1.45**	**0.70**	**0.07**	**8.46**	**19.9**	**18.6**	**8.9**	**21.3**	**43.4**	**19.3**	**16.5**	**34.3**	**18.3**	**10.3**
Bulk Rghr Tail	78.4	0.04	0.11	0.14	0.07	0.02	1.51	12.0	22.7	8.0	18.9	27.0	12.5	32.3	39.5	70.8	81.2
Ro1-2 Cu Clnr 3 Conc.(High Cu Conc	**0.3**	**28.4**	**0.46**	**1.82**	**13.2**	**1.72**	**29.5**	**28.4**	**2.79**	**26.9**	**0.3**	**1.5**	**10.0**	**11.8**	**3.3**	**0.7**	**0.0**
Ro1-2 Cu Clnr 2 Conc.	1.1	19.7	1.32	2.31	11.4	1.51	22.5	25.1	7.27	64.5	3.3	6.5	29.7	35.9	8.6	2.2	0.4
Ro1-2 Cu Clnr 1 Conc.	3.0	8.94	3.61	1.87	7.40	0.70	14.3	19.3	14.2	76.5	23.8	13.8	50.7	43.2	14.3	4.4	2.0
Rghr 1-2 Conc	**9.5**	**3.09**	**2.88**	**1.27**	**3.16**	**0.26**	**8.29**	**15.3**	**19.6**	**83.1**	**59.8**	**29.6**	**68.2**	**51.2**	**26.2**	**10.9**	**8.5**
Rghr 1-5 Conc	**21.6**	**1.50**	**1.71**	**1.37**	**1.78**	**0.15**	**8.38**	**17.9**	**19.0**	**92.0**	**81.1**	**73.0**	**87.5**	**67.7**	**60.5**	**29.2**	**18.8**

4.1.5. Locked Cycle Testing

Based on the metallurgical performance and expectation from the mineralogical information, one locked cycle test was conducted to provide more definitive performance information by re-circulation of middling streams and the projection of concentrate grades and recoveries that would be realized from a continuous process. The conditions for the locked cycle test were kept the same as the batch test F12. Aero 3477 was added to the grind and guar gum and CMC were used in the cleaner stages. The 1st cleaner scavenger stage was dropped in this test since not enough gangue material is rejected to ever make concentrate by keeping the cleaner scavenger. Table 14 presents the locked cycle test (LCT-2) results, and detailed results are attached in the Appendix F.

The calculated mass balances and LCT stability are presented in Appendix F. It should be noted that the mass balance is calculated from the locked cycle test end cycle products (last three cycles) along with the projected concentrate grades and recoveries. Cycle test stability is measured by comparing the mass and metal units into and out of the circuit from each cycle. Figure 25 shows LCT-2 circuit stability.

Table 14: Locked Cycle Test 2 Results

Product	Weight	Assays, (Pt, Pd, Au g/t), (Cu, Ni, Fe, MgO %)								% Distribution					
	%	Cu	Ni	S	Pt	Pd	Au	Fe	Mgo	Cu	Ni	S	Pt	Pd	Au
3rd Clnr Concentrate	4.36	6.99	7.13	19.4	2.44	6.80	0.54	25.4	9.82	84.9	63.4	29.2	26.4	64.4	62.9
Cleaner Tail	12.8	0.11	0.44	3.59	0.70	0.41	0.03	—	—	3.9	11.3	15.8	22.2	11.5	9.3
Rougher Tail	82.9	0.05	0.15	1.93	0.25	0.13	0.01	—	—	11.2	25.3	55.0	51.4	24.1	27.8
1st Cleaner Regrind Conc F	0.23	0.51	1.40	4.55	2.17	1.73	0.20	—	—	0.3	0.7	0.4	1.2	0.9	1.2
Magnetic Conc F	0.32	0.28	0.45	3.33	1.40	1.38	0.21	—	—	0.2	0.3	0.4	1.1	1.0	1.8
Head (calc.)	100.0	0.36	0.49	2.90	0.40	0.46	0.04	—	—	100.0	100.0	100.0	100.0	100.0	100.0
(direct)		0.33	0.42	2.53	0.41	0.45	0.04	11.9	22.8						

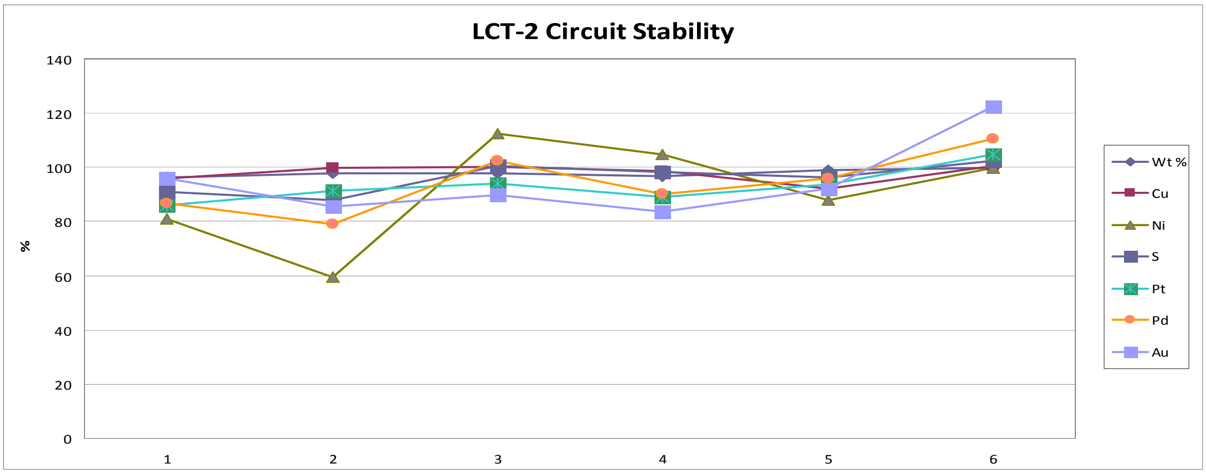


Figure 25: Locked Cycle Test 2 Circuit Stability

Test F-40 to some extent suggested a lot of the PGE is with pyrrhotite and/ or magnetite. A small test was added to the LCT-2 by conducting a magnetic separation on the cycle F rougher tail. The magnetic concentrate was reground for 20 minutes with 20 g/t Aero 4037 and then floated for recovery of Cu, Ni, and PGE.

Also in this the 1st cleaner tail F was reground for 20 minutes with Aero 4037 and floated for recovery of Cu, Ni, and PGE. The added reground and magnetic separations were promising in this test. The results are presented in Appendix F.

Based on the test LCT-2, a 14% Cu+Ni concentrate grade was achieved; the Cu and Ni recoveries were 85% and 63%, respectively. The combined Au, Pt, and Pd grade of this test was 10 g/t. The Pt, Pd and

Au recoveries were 26%, 64% and 33%, respectively. The Fe/MgO ratio and MgO content of the final concentrate were above the accepted limits in this test.

4.2. Optimization Flotation Testwork

4.2.1. Split-Stream Flowsheet

Following the preliminary testing, the next step of the flotation testwork to optimize the split flowsheet through a more detailed program was started. The proposed split flowsheet recommends taking advantage of the parallel cleaner lines presently used by most Cu/Ni commercial operations. The strategy would be to direct a rougher concentrate, rich in copper and nickel minerals to one of the lines and to direct a scavenger concentrate, rich in pyrrhotite to the other line. The advantages of decoupling the cleaners would be that the collector and CMC conditions could be customized to the floatability of each mineral class. Specifically, the copper and nickel minerals are known to be responsive to very low collector conditions. This low amount of collector is anticipated to result in significant improvements to the flotation separation of copper from nickel. Also the rougher circuit can be focused on recovery of the liberated minerals and avoid regrind here. The pyrrhotite rich products would likely have most of the middling particles and this is where r regrind is applied. On the other hand, the pyrrhotite is known to require high amounts of collector to recover acceptable levels of sulphides. It is predicted that the proposed flowsheet will result in the production of better quality copper concentrates and better process control in the commercial operation.

The proposed flowsheet is presented in Figure 26 and the tests results are presented in Tables 15 and 16. As the testwork progressed modifications to the flowsheet were applied for each individual test as presented in the Appendix E.

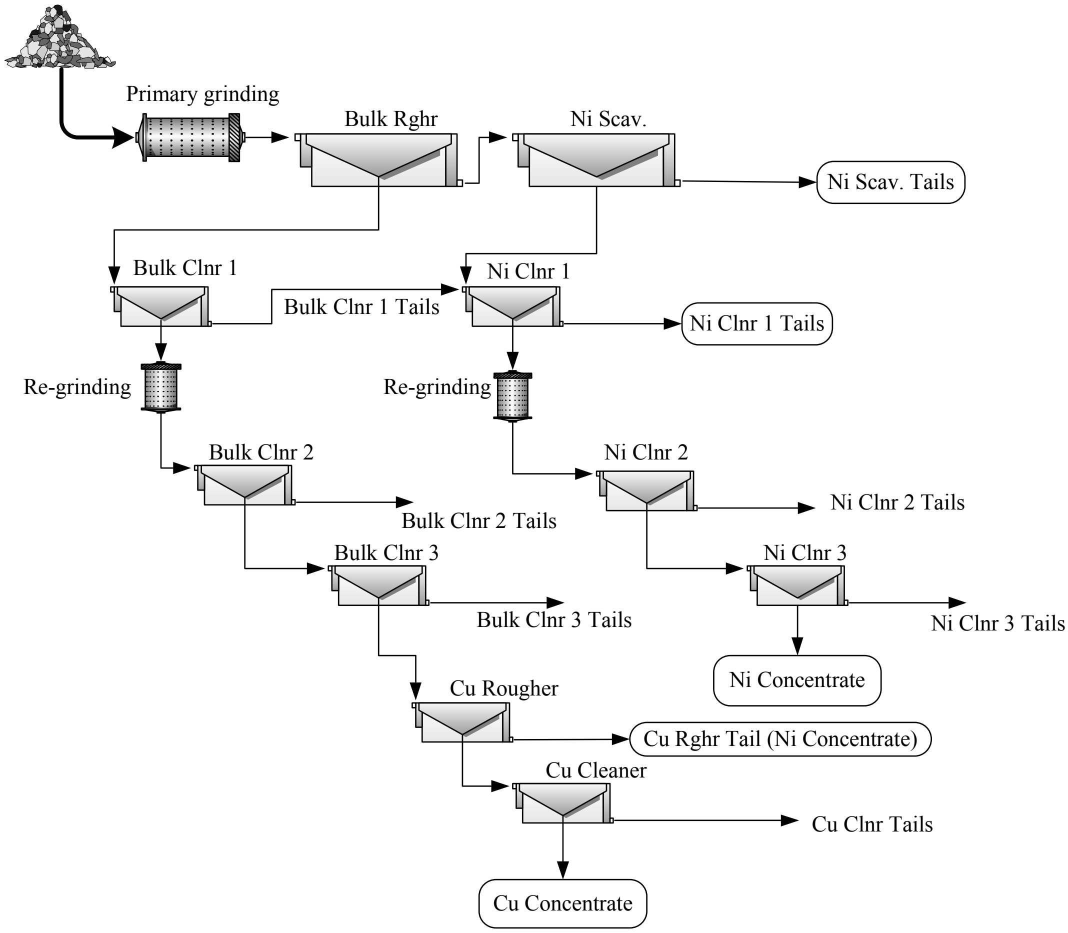


Figure 26: Split Flowsheet

Ten flotation tests were conducted to optimize the split-stream test conditions. Test F29 was intended to scope appropriate bulk cleaner conditions for the bulk cleaner circuits (rougher and scavenger) as well as attempted a preliminary Cu-Ni separation of the bulk cleaner concentrate. The objective of the bulk circuit was to recover most of the copper and most of the liberated pentlandite. The Ni scavenger used a high dosage of SIPX to get a high recovery of PGE. The bulk 2nd cleaner concentrate contained in excess of 37% non-sulphide gangue (NSG), which was considered very high. A high content of NSG was present in the scavenger cleaner as well and pyrrhotite was noted to have poor kinetics. Cu-Ni separation showed promise with a Cu concentrate grade of 29% Cu and 0.4% Ni at a copper recovery of 40%.

Test F30 was conducted with no re-grind in the bulk circuit and coarser regrind for Ni circuit. CMC was used in the rougher and scavenger stages. In Test F31 Ni scavenger time was extended and CuSo4 was added in the third scavenger stage.

Test F32 used copper sulphate in the Ni scavenger and Aero 5100 was used in the copper circuit. This test gave the best Ni cleaner performance and this is notable for the addition of CuSO4 with no apparent impact on making concentrate grade. Test F34 used Aero 5100 and 3477 in the final stage of the Ni cleaner circuit.

Test F35 used CMC and guar with a 50:50 mix. The results were encouraging and gave the best 1st bulk cleaner performance. This test is notable for blended CMC/guar and higher SIPX in the bulk rougher. CMC is very good at depressing talc but also tends to collapse the froth when the dosage is high. Guar is often used to depress chlorite which was identified by mineralogy as the primary gangue mineral in the high grade concentrates. Guar also has the benefit of not collapsing the froth.

Test F36 was a repeat of F35 but more aggressive for recovery with more time in bulk rougher and Ni scavenger as well as CuSo4 in Ni scavenger. No bulk reground was conducted in this test with only two stages of cleaning. Copper sulphate was added after Ni regrind in this test to keep the Ni and PGE floating. Test F37 was a repeat of F36 with no CMC/guar in the roughers. This had no effect on the mass recovery in rougher/scavenger. CMC/guar was eliminated in this test and yet had no effect on the mass recovery in rougher/scavenger.

Test F36 was repeated as the test F38 with no CMC/guar in the rougher stages with a re-grind before 1st Ni cleaner stage. And finally F41 was conducted at a finer primary grind of 70 microns.

Overall, the results for these tests show there is no need for CMC/guar in the rougher. The results for bulk cleaners are good however more CMC/guar might be needed in the bulk cleaners. Ni scavenger results are good and use of copper sulphate is recommended for master composite. As for the Ni cleaner, it is needed to drop copper sulphate after regrind. Also SIPX additions need to stay high for recovery presumably to float the middling Cu/Ni material and for pyrrhotite recovery which has been shown to have abundant PGE minerals associated with it.

Table 15: Split Flowsheet Cleaner Flotation Test Results

Test	Product	Weight	Assays, %			% Distribution		
		%	Cu	Ni	S	Cu	Ni	S
F29	Cu 1st Clnr Conc	0.40	29.3	0.40	30.7	40.3	0.4	5.1
	Cu Rougher Conc	0.62	24.3	1.20	28.2	51.6	1.82	7.29
	Bulk 3rd Clnr Conc	1.40	13.6	6.61	23.8	65.6	22.7	14.0
	Bulk Rougher Conc	5.49	3.86	3.45	10.0	72.9	46.5	23.1
	Ni 4th Clnr Conc	0.20	7.29	9.33	28.7	5.08	4.63	2.44
	Ni Scav Conc	8.68	0.36	1.23	7.69	10.8	26.1	28.0
	Ni Scav Tail	85.8	0.06	0.13	1.36	16.3	27.4	48.9
	Head (calc.)		0.29	0.41	2.39			
F30	Bulk 3rd Clnr Conc	1.62	14.2	4.79	22.4	75.3	19.7	14.9
	Bulk Rougher Conc	5.65	4.41	3.57	10.9	81.6	51.3	25.4
	Ni 3rd Clnr Conc	0.44	2.64	6.08	13.2	3.80	6.79	2.40
	Ni Scav Conc	7.68	0.39	1.14	9.22	9.90	22.3	29.2
	Ni Scav Tail	86.7	0.03	0.12	1.27	8.52	26.5	45.4
	Head (calc.)		0.31	0.39	2.43			
F31	Bulk 3rd Clnr Conc	1.19	16.4	3.70	24.4	63.8	10.8	12.3
	Bulk Rougher Conc	6.03	3.85	3.74	11.2	75.9	55.5	28.7
	Ni 3rd Clnr Conc	0.14	4.65	6.76	30.3	2.09	2.28	1.80
	Ni Scav Conc	6.32	0.34	1.00	9.70	7.12	15.51	26.0
	Ni Scav Tail	86.2	0.06	0.13	1.07	16.4	27.6	39.1
	Head (calc.)		0.31	0.41	2.36			
F38	Bulk 2nd Clnr Conc	3.18	9.34	7.20	24.2	79.4	47.5	23.3
	Bulk Rougher Conc	9.17	3.45	3.60	13.0	84.7	68.5	36.0
	Ni 3rd Clnr Conc	1.36	0.69	1.50	30.0	2.50	4.2	12.3
	Ni Scav Conc	11.7	0.22	0.62	13.5	6.86	15.05	47.7
	Ni Scav Tail	79.2	0.04	0.10	0.68	8.48	16.45	16.3
	Head (calc.)		0.37	0.48	3.30			
F41	Bulk 2nd Clnr Conc	3.20	11.2	8.26	25.8	86.6	52.0	24.1
	Bulk Rougher Conc	10.6	3.55	3.49	12.3	90.8	72.7	38.1
	Ni 2nd Clnr Conc	0.61	0.91	1.66	25.9	1.35	2.00	4.64
	Ni Scav Conc	7.03	0.19	0.57	11.2	3.26	7.87	22.9
	Ni Scav Tail	82.4	0.03	0.12	1.62	5.98	19.44	39.0
	Head (calc.)		0.41	0.51	3.43			

Table 16; Split Flowsheet Cleaner Test Results (Continued)

Test	Product	Weight	Assays, %								% Distribution							
		%	Cu	Ni	Pt	Pd	Au	S	Fe	MgO	Cu	Ni	Pt	Pd	Au	S	Fe	MgO
F32	**Cu 1st Clnr Conc**	**0.4**	**30.3**	**0.47**	**1.71**	**6.17**	**1.27**	**30.1**	**31.5**	**1.15**	**37.6**	**0.4**	**1.6**	**5.0**	**11.5**	**4.6**	**0.9**	**0.02**
4Kg	Cu Rougher Conc	0.4	28.3	0.93	2.06	8.69	1.353	29.5	31.6	1.60	43.7	1.0	2.4	8.71	15.2	5.7	1.2	0.03
	Bulk 2nd Clnr Conc	**0.8**	**20.1**	**6.68**	**2.52**	**14.2**	**1.127**	**28.3**	**31.0**	**2.82**	**55.5**	**12.8**	**5.3**	**25.3**	**22.7**	**9.67**	**2.0**	**0.09**
	Bulk Rougher Conc	3.1	6.08	3.53	1.44	5.87	0.365	11.7	18.1	17.7	64.8	26.2	11.7	40.6	28.4	15.4	4.5	2.22
	Ni 3rd Clnr Conc	**1.2**	**3.14**	**9.32**	**7.10**	**7.80**	**0.44**	**30.5**	**44.1**	**2.24**	**13.0**	**26.8**	**22.3**	**20.9**	**13.2**	**15.6**	**4.3**	**0.11**
	Ni Scav Conc	8.8	0.64	2.20	2.14	1.82	0.125	11.4	22.5	18.3	19.5	46.4	49.2	35.8	27.5	42.9	16.1	6.54
	Ni Scav Tail	88.1	0.05	0.13	0.17	0.12	0.02	1.11	11.1	25.6	15.7	27.4	39.1	23.6	44.1	41.7	79.4	91.2
	Head (calc.)		0.29	0.42	0.38	0.45	0.04	2.35	12.3	24.7								
F34	**Bulk 3rd Clnr Conc**	**0.82**	**23.2**	**3.65**	**2.51**	**12.0**	**1.41**	**29.2**	**30.2**	**2.3**	**60.4**	**6.8**	**4.7**	**20.3**	**25.2**	**8.9**	**1.9**	**0.08**
4Kg	Bulk Rougher Conc	5.42	4.60	4.44	1.96	5.25	0.36	12.5	19.7	16.1	79.6	55.2	24.5	58.9	42.4	25.3	8.4	3.87
	Ni 2nd Clnr Conc	**0.41**	**3.11**	**7.05**	**9.33**	**7.69**	**1.12**	**29.6**	**42.3**	**3.7**	**4.0**	**6.6**	**8.8**	**6.5**	**10.0**	**4.5**	**1.36**	**0.07**
	Ni Scav Conc	5.85	0.42	1.22	1.95	1.27	0.15	9.86	21.0	18.4	7.9	16.3	26.4	15.3	18.7	21.5	9.7	4.78
	Ni Scav Tail	88.7	0.04	0.14	0.24	0.14	0.02	1.61	11.7	23.2	12.5	28.5	49.1	25.7	38.9	53.2	81.9	91.4
	Head (calc.)		0.31	0.44	0.43	0.48	0.05	2.68	12.7	22.5								
F35	**Bulk 3rd Clnr Conc**	**1.26**	**18.5**	**7.53**	**3.10**	**15.5**	**1.57**	**30.3**	**31.3**	**2.11**	**70.2**	**21.6**	**8.8**	**34.9**	**37.7**	**13.2**	**3.0**	**0.1**
4Kg	Bulk Rougher Conc	5.93	4.66	4.49	2.17	5.41	0.43	14.0	20.9	15.9	82.9	60.5	28.8	57.2	48.6	28.5	9.5	4.0
	Ni 3rd Clnr Conc	**0.31**	**3.00**	**4.13**	**5.51**	**6.00**	**1.60**	**32.9**	**48.0**	**2.32**	**2.8**	**2.9**	**3.8**	**3.3**	**9.4**	**3.5**	**1.1**	**0.0**
	Ni Scav Conc	5.49	0.42	1.07	1.91	1.15	0.17	11.5	23.8	17.7	7.0	13.3	23.5	11.3	17.8	21.8	10.1	4.2
	Ni Scav Tail	88.6	0.04	0.13	0.24	0.20	0.02	1.6	11.8	24.2	10.1	26.2	47.7	31.5	33.6	49.7	80.4	91.8
	Head (calc.)		0.33	0.44	0.45	0.56	0.05	2.9	13.0	23.3								
F36	**Bulk 2nd Clnr Conc**	**3.22**	**8.85**	**8.94**	**2.22**	**6.79**	**0.72**	**26.6**	**32.1**	**4.8**	**80.1**	**59.3**	**20.9**	**55.3**	**29.6**	**28.7**	**8.4**	**0.7**
4Kg	Bulk Rougher Conc	7.60	3.88	4.29	1.54	3.40	0.36	13.9	20.7	14.9	83.0	67.2	34.3	65.2	34.8	35.3	12.7	5.2
	Ni 3rd Clnr Conc	**2.83**	**0.41**	**1.32**	**1.30**	**0.78**	**0.17**	**30.8**	**47.3**	**5.2**	**3.3**	**7.7**	**10.8**	**5.6**	**6.1**	**29.2**	**10.8**	**0.7**
	Ni Scav Conc	10.2	0.27	0.67	0.99	0.56	0.11	14.2	27.2	15.4	7.8	14.1	29.6	14.4	14.8	48.4	22.4	7.2
	Ni Scav Tail	82.2	0.04	0.11	0.15	0.10	0.05	0.6	9.8	23.2	9.2	18.6	36.1	20.4	50.4	16.2	64.9	87.6
	Head (calc.)		0.36	0.49	0.34	0.40	0.08	3.0	12.4	21.8								
F37	**Bulk 2nd Clnr Conc**	**3.01**	**10.8**	**8.56**	**1.88**	**6.27**	**0.94**	**29.2**	**30.9**	**4.3**	**81.5**	**53.3**	**13.9**	**51.7**	**11.9**	**24.2**	**7.3**	**0.6**
4Kg	Bulk Rougher Conc	7.97	4.22	3.85	1.35	2.98	0.45	14.3	19.3	15.3	84.2	63.3	26.5	65.1	15.2	31.3	12.0	5.8
	Ni 3rd Clnr Conc	**3.46**	**0.44**	**1.69**	**3.02**	**0.31**	**0.37**	**32.1**	**46.7**	**5.4**	**3.8**	**12.1**	**25.7**	**2.9**	**5.3**	**30.5**	**12.6**	**0.9**
	Ni Scav Conc	9.35	0.32	0.92	1.61	0.40	0.23	18.4	30.6	13.2	7.5	17.9	37.0	10.3	9.1	47.3	22.3	5.9
	Ni Scav Tail	82.7	0.04	0.11	0.18	0.11	0.02	0.9	10.2	22.4	8.3	18.8	36.5	24.7	19.5	21.4	65.7	88.3
	Head (calc.)		0.40	0.48	0.41	0.37	0.07	3.6	12.8	21.0								

4.2.2. MF2 Flowsheet

Tests F-33 and F-39 were conducted using grind-float-grind-float philosophy (An MF2 style flowsheet). This type of flowsheet has been successfully used in the South African platinum industry to deal with bimodal distributions of PGM. Coarse minerals were recovered before regrinding the tails to liberate very fine material. MF2 flowsheet is shown in Figure 27 and the results are presented in Tables 17 and 18. Detailed test results are presented in the Appendix F

Based on the test F-33, a 16.5% Cu+Ni concentrate grade was achieved; the Cu and Ni recoveries were 67% and 25%, respectively. The combined Au, Pt, and Pd grade of this test was 14.5 g/t. The Pt, Pd and Au recoveries were 16%, 36% and 37%, respectively.

As for the test F-39, a 13% Cu+Ni concentrate grade was achieved; the Cu and Ni recoveries were 79% and 38%, respectively. The MF2 tests did not show much promise but there are merits to including flash flotation as this will recover easy to float liberated Cu/Ni from a de-slimed feed. It is difficult to test the lash flotation in the lab.

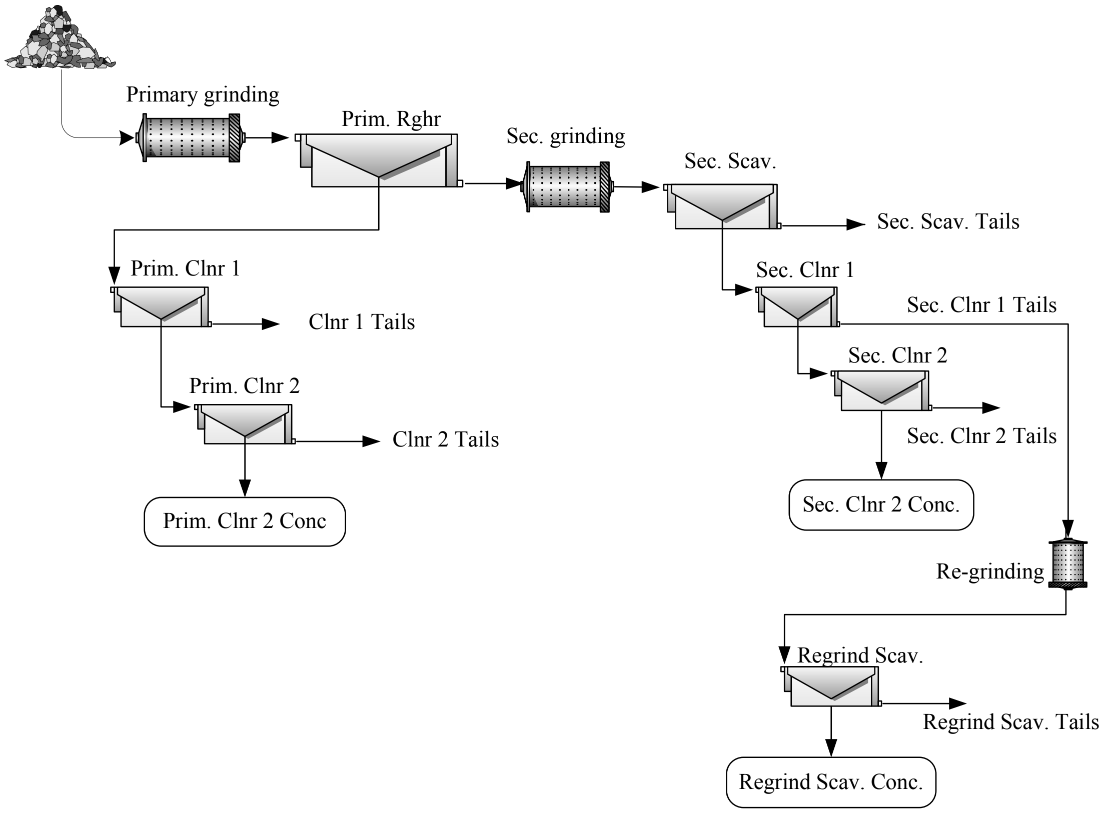


Figure 27: MF2 Flowsheet

Table 17: Test F-33 Results Using MF2 Flowsheet

Product	Weight	Assays, (Pt, Pd, Au g/t), (Cu, Ni, S, Fe, MgO %)								% Distribution							
	%	Cu	Ni	Pt	Pd	Au	S	Fe	MgO	Cu	Ni	Pt	Pd	Au	S	Fe	MgO
Prim 2nd Clnr Conc	0.4	22.4	2.64	2.47	10.1	1.60	29.2	31.8	2.9	29.4	2.4	2.3	8.0	13.7	4.8	1.0	0.05
Prim 1st Clnr Conc	1.0	11.1	8.99	2.57	10.8	0.90	26.0	30.9	4.5	36.5	20.6	5.9	21.4	19.4	10.6	2.5	0.2
Prim Rougher Conc	2.7	4.32	4.64	1.42	4.73	0.37	12.5	19.3	13.0	38.6	28.8	8.9	25.4	21.6	13.8	4.2	1.5
Sec 3rd Clnr Conc	1.5	7.53	6.61	3.82	9.44	0.72	23.7	29.9	4.75	37.2	22.7	13.2	28.1	23.2	14.5	3.6	0.3
Sec 2nd Clnr Conc	4.2	3.29	3.92	3.57	5.49	0.38	14.3	23.0	14.2	44.9	37.3	34.1	45.1	34.0	24.2	7.6	2.5
Sec 1st Clnr Conc	4.7	2.94	3.63	3.39	5.00	0.35	13.6	22.5	14.9	45.6	39.2	36.7	46.7	35.1	26.1	8.4	3.0
Sec Scav Conc	9.7	1.50	1.97	2.04	2.65	0.20	8.51	17.8	18.4	47.4	43.3	45.0	50.4	41.0	33.3	13.6	7.4
Regrind Scav Conc	0.2	0.70	1.23	2.92	2.03	0.37	6.88	15.9	20.5	0.5	0.7	1.6	0.9	1.8	0.7	0.3	0.2
Regrind Scav Feed	4.9	0.11	0.36	0.74	0.38	0.06	3.60	13.2	21.7	1.7	4.1	8.3	3.7	5.8	7.2	5.1	4.5
Regrind Scav Tail	4.7	0.08	0.32	0.63	0.30	0.04	3.44	13.1	21.8	1.2	3.4	6.7	2.8	4.0	6.5	4.8	4.3
Sec Scav Tail	87.6	0.05	0.14	0.23	0.14	0.02	1.49	11.9	24.8	14.0	27.9	46.1	24.2	37.4	52.9	82.3	91.1
Comb Clnr Conc	1.9	10.7	5.78	3.54	9.58	0.90	24.9	30.3	4.36	66.7	25.1	15.5	36.1	37.0	19.3	4.6	0.3
Comb Ro & Scav Conc	12.4	2.12	2.56	1.90	3.11	0.24	9.39	18.1	17.2	86.0	72.1	54	76	63	47.1	17.7	8.9

Table 18: Test F-39 Results Using MF2 Flowsheet

Product	Weight	Assays, %			% Distribution		
	%	Cu	Ni	S	Cu	Ni	S
Prim Clnr 2 Conc	1.0	15.5	7.28	29.7	40.9	14.9	8.57
Prim Clnr 1 Conc	1.3	11.6	7.95	28.1	42.9	22.8	11.4
Prim Rougher Conc	4.8	3.75	4.56	16.1	49.1	46.4	23.1
Sec Clnr 2 Conc	2.6	5.31	4.20	20.7	37.6	23.1	16.1
Sec Clnr 1 Conc	4.5	3.19	2.82	16.4	39.8	27.3	22.5
Sec Scav Conc	9.9	1.53	1.51	11.1	41.5	31.8	33.0
Regrind Scav Conc	0.2	0.65	0.98	7.80	0.38	0.45	0.50
Regrind Scav Feed	5.3	0.11	0.39	6.55	1.65	4.50	10.5
Regrind Scav Tail	5.1	0.09	0.37	6.50	1.27	4.05	10.0
Sec Scav Tail	85.3	0.04	0.12	1.71	9.38	21.8	43.9
Comb Clnr Conc	3.5	8.07	5.04	23.1	78.5	38.0	24.6
Comb Ro & Scav Conc	14.7	2.25	2.50	12.7	90.6	78.2	56.1

4.2.3. Locked Cycle Tests – Split Stream

Locked cycle testing helps to establish plant predicted grade-recovery relationships since it includes circulating loads in a simulated continuous environment. Based on the results and analysis of metallurgical performance from the split flowsheet batch tests three locked cycle tests, LCT-1, LCT-3, and LCT-5 were conducted using this flowsheet (Figure 26) by re-circulating the intermediate products.

LCT-1 was conducted with Cu-Ni separation on the last three cycles. In this test 4-kg charges were used for each cycle. A copper concentrate with a grade of 23% Cu at a recovery of 68% was achieved in this test. The Fe/MgO ratio and MgO content of the final concentrate were within the accepted limits in this test.

Table 19 presents the locked cycle test (LCT-1) results, and detailed results are presented in Appendix F.

Table 19: LCT-1 Test Results

LCT-1 Product	Weight %	Assays													% Distribution				
		Cu	Ni	S	Pt	Pd	Au	Rh	Ru	Ir	Os	Co	Fe	MgO	Cu	Ni	S	Fe	MgO
		%	%	%	g/t	g/t	g/t	ppb	ppb	ppb	ppb	%	%	%					
Cu Conc	1.00	23.2	0.88	28.3	2.16	4.83	1.44	177	192	150	140	0.045	28.5	2.83	68.2	1.8	9.5	2.3	0.1
Cu Rougher Tail (Ni Conc.)	1.78	2.55	14.4	26.7	3.34	10.9	0.32	323	455	329	270	0.870	32.5	4.55	13.4	53.9	16.1	4.7	0.4
Ni 3rd Clnr Conc	0.48	3.24	7.03	27.2	5.72	5.9	0.43	311	430	338	290	0.360	41.8	5.04	4.6	7.0	4.4	1.6	0.1
Ni 1st Clnr Tail	15.0	0.13	0.48	7.48	1.02	0.61	0.05	90	112	106	72	0.023	18.5	20.4	5.8	15.0	38.0	22.5	13.5
Ni Scav Tail	81.7	0.03	0.13	1.15	0.22	0.09	0.02	<20	<50	23	19	<0.01	10.4	23.8	8.0	22.2	31.9	68.9	85.9
Total Ni Conc.	2.26	2.69	12.9	26.8	–	–	–	–	–	–	–	–	34.5	4.66	18.0	60.9	20.5	6.3	0.5
Head (calc.)		0.34	0.48	2.95	–	–	–	–	–	–	–	–	12.3	22.7					

LCT-3 was conducted to repeat LCT-1 with magnetic separation stage and Aero 4037 was added into the regrind. No Cu-Ni separation was tried in this test. Based on the results of test LCT-3, a 12% Cu+Ni concentrate grade was achieved; the Cu and Ni recoveries were 88% and 68%, respectively. The combined Au, Pt, and Pd grade of this test was 10.5 g/t. The Pt, Pd and Au recoveries were 46%, 73% and 59%, respectively. The Fe/MgO ratio and MgO content of the combined concentrate were above the accepted limits in this test.

Table 20 shows the locked cycle test (LCT-3) results. Detailed results are presented in Appendix F.

Table 20: LCT-3 Test Results

LCT-3	Weight	Assays, (Cu, Ni, S, Fe, MgO %) (Pt, Pd, Au g/t)								% Distribution					
Product	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au
Bulk Clnr 2 Conc.	2.78	11.0	9.28	27.2	3.39	10.3	0.80	31.6	4.13	83.5	57.6	25.9	22.7	62.9	50.3
Ni 3rd Clnr Conc.	2.36	0.59	1.78	12.8	3.55	1.45	0.11	22.4	17.9	3.8	9.4	10.3	20.2	7.5	6.1
Ni 1st Clnr Tail	15.7	0.10	0.34	4.41	0.66	0.41	0.03	–	–	4.3	12.1	23.8	24.9	14.1	12.1
Ni Scav Tail	69.9	0.04	0.11	1.06	0.14	0.06	0.02	–	–	7.6	16.6	25.4	24.1	9.5	25.4
Magnetic Clnr Conc.	0.21	0.85	1.22	8.93	6.19	5.41	0.52	24.4	18.4	0.5	0.6	0.7	3.2	2.5	2.5
Magnetic Rghr Tail	9.00	0.01	0.19	4.50	0.23	0.18	0.02	–	–	0.2	3.7	13.8	4.9	3.5	3.6
Combined Concentrates	**5.36**	**6.01**	**5.66**	**20.1**	**3.57**	**6.22**	**0.48**	**27.3**	**10.8**	**87.8**	**67.6**	**36.9**	**46.0**	**72.9**	**58.9**
Head (calc.)		0.37	0.45	2.92	0.42	0.46	0.04								

Finally, LCT-5 was conducted using the same bulk circuit conditions as the LCT-3. Lime was added for copper separation and SIPX was added to copper rougher. Aero 4037 was added into the regrind as this worked good in the magnetic separation circuit and was okay in LCT-2 on the first cleaner tails. CuSo4 was added in the Ni cleaners. Ni scavenger concentrate was reground in this test. A copper concentrate with a grade of 19% Cu at a recovery of 75.5% was achieved. A total Ni concentrate of 8.75% Ni at 65% recovery was produced in this test. The Fe/MgO ratio and MgO content of the final concentrate were within the accepted limits however, the copper concentrate contained higher than 1% Ni which does not meet the saleable copper concentrate quality.

Table 21 presents the locked cycle test (LCT-5) results. The metallurgical results of LCT-5 are shown in Appendix F.

Table 21: LCT-5 Test Results

LCT-5	Weight	Assays, (Cu, Ni, S, Fe, MgO %) (Pt, Pd, Au g/t)								Distribution, %					
Product	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au
Cu Clnr 1 Conc	1.52	19.1	1.37	25.5	2.51	6.06	1.41	28.8	4.75	75.5	4.5	14.6	9.5	19.5	47.0
Cu Rougher Tail (Ni Conc.)	1.85	1.66	14.3	25.0	3.63	12.0	0.45	30.8	5.58	8.0	56.9	17.4	16.7	47.2	18.3
Ni 3rd Clnr Conc	1.44	0.88	2.44	17.2	5.76	2.32	0.19	28.2	14.4	3.3	7.6	9.3	20.7	7.1	5.9
Ni 1st Clnr Tail	16.2	0.12	0.36	4.21	0.59	0.43	0.03	–	–	4.9	12.4	25.7	23.7	14.8	11.5
Ni Scav Tail	79.0	0.04	0.11	1.11	0.15	0.07	0.01	–	–	8.2	18.7	33.0	29.5	11.4	17.4
Magnetic Cleaner Con	0.2	1.68	1.88	11.6	8.04	8.58	7.46	26.5	15.9	0.7	0.7	0.7	3.4	3.1	27.7
Magnetic Cleaner Tail	3.7	0.06	0.25	4.82	0.68	0.45	0.16	–	–	0.6	2.0	6.7	6.2	3.5	13.0
Magnetic Rougher Tail	7.6	0.03	0.20	4.20	0.26	0.22	0.05	–	–	0.6	3.3	12.1	4.9	3.5	8.2
Total Ni Conc.	3.46	1.34	8.75	21.1	4.73	7.81	0.68	29.5	9.77	12.0	65.1	27.5	40.7	57.3	51.9
Head (calc.)		0.38	0.46	2.65	0.40	0.47	0.05	–	–						

5. High Nickel Composite Flotation Testwork

As mentioned earlier a High Ni Composite was prepared from the third shipment of the samples to SGS Vancouver Metallurgy. The grades for this composite were higher but contained lower MgO (19.8%) as compared with the master composite. Flotation tests HNI-F1 to HNI-F5 were conducted using the high nickel composite.

Rougher flotation test HNI-F1 was conducted using the same conditions as the rougher flotation test F3 for the Master Composite. Mass recovery and Cu and Ni recoveries were higher for high Ni composite.

The results for HNI-F1 are shown in Table 22. Detailed test conditions and results and are presented in Appendix E.

Table 22: Rougher Flotation Test HNI-F1 Results

Test	Product	Weight	Assays, (Pt, Pd, Au g/t), (Cu, Ni, S %)						% Distribution					
		%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
	Ro Conc 1	2.3	1.10	0.44	3.00	0.58	4.02	0.23	4.8	1.2	1.0	2.3	16.9	8.5
HNI-F1	Ro Conc 1-2	6.4	6.32	1.77	11.2	1.46	4.14	0.50	75.8	13.6	10.8	16.2	48.0	51.4
SIPX 70 g/t	Ro Conc 1-3	13.2	3.59	4.69	15.0	1.60	3.02	0.32	88.7	74.3	29.8	36.7	72.1	66.6
K80 90 um	Ro Conc 1-4	18.4	2.67	3.69	15.9	1.67	2.37	0.24	91.9	81.3	43.9	53.0	78.6	71.5
	Ro Conc 1-5	**26.2**	**1.92**	**2.77**	**17.1**	**1.50**	**1.77**	**0.18**	**94.1**	**86.7**	**67.4**	**68.1**	**84.0**	**76.5**
	Ro Tail	73.8	0.04	0.15	2.94	0.25	0.12	0.02	5.9	13.3	32.6	31.9	16.0	23.5
	Head (calc.)		0.53	0.83	6.66	0.58	0.55	0.06						

Cleaner flotation test HNI-F2 was conducted using the same test conditions as the master composite cleaner flotation test F12. High Ni composite has a higher sulphide content which would result in a proportionally higher mass flow to the cleaning circuit. Ni recovery was high at 66.5% for this composite as compared to 48.5% for Master Composite. Based on the test HNI-F2, a 15% Cu+Ni concentrate grade was achieved; the Cu and Ni recoveries were 85% and 66.5%, respectively. The combined Au, Pt, and Pd grade of this test was 9 g/t. The Pt, Pd and Au recoveries were 29%, 66% and 61%, respectively. The Fe/MgO ratio and MgO content of the final concentrate were within the accepted limits in this test.

The results for test HNI-F2 are shown in Table 23. Detailed test conditions and results and are presented in Appendix E.

Table 23; Cleaner Flotation Test HNI-F2 results

Test	Product	Weight	Assays, (Pt, Pd, Au g/t), (Cu, Ni, Fe, MgO %)								% Distribution							
		%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
	3rd Clnr Conc	**6.8**	**6.53**	**8.21**	**25.0**	**2.53**	**5.54**	**0.68**	**36.0**	**3.02**	**85.2**	**66.5**	**27.1**	**29.1**	**65.6**	**61.5**	**13.4**	**1.0**
HNI-F2	2nd Clnr Conc	10.2	4.54	6.24	23.7	2.36	4.18	0.51	36.6	5.18	88.9	75.7	38.5	40.7	74.2	69.2	20.4	2.5
No Regrind	1st Clnr Conc	15.7	3.01	4.30	19.7	1.89	2.87	0.36	32.9	9.84	90.6	80.2	49.1	50.0	78.2	75.8	28.2	7.4
CMC=200 g/t	1st Cl & ClScv Conc	17.0	2.79	4.02	19.3	1.84	2.68	0.34	32.9	10.2	91.0	81.3	52.2	52.8	79.2	77.2	30.5	8.3
	Rghr Conc	**22.2**	**2.15**	**3.15**	**16.1**	**1.54**	**2.10**	**0.27**	**29.4**	**12.8**	**91.6**	**83.3**	**57.1**	**57.9**	**81.0**	**79.3**	**35.7**	**13.6**
	1st Clnr Scv Tls	5.2	0.07	0.33	5.88	0.58	0.20	0.03	18.3	21	0.7	2.1	4.9	5.1	1.8	2.1	5.2	5.3
	Rougher Tails	77.8	0.06	0.18	3.46	0.32	0.14	0.02	15.1	23.2	8.4	16.7	42.9	42.1	19.0	20.7	64.3	86.4
	Head (calc.)		0.52	0.84	6.27	0.59	0.57	0.08	18.3	20.9								

Flotation tests HNI-F3 to HNI-F5 tested the split flowsheet for this composite.

Test HNI-F3 was conducted as per the master composite flotation test F-35. Higher Ni grade and recovery at 11% and 42% respectively, were achieved in this test.

HNI-F4 was conducted with longer rougher and scavenger flotation time with no bulk cleaner re-grind. Almost the same Cu and Ni grade-recovery relationships were achieved in this test. The Fe/MgO ratio and MgO content of the final concentrates were within the accepted limits in both tests.

The results for HNI-F3 and HNI-F4 are shown in Table 24. Detailed test conditions and results and are presented in Appendix E.

Table 24: High Ni Composite Split Flowsheet Flotation Tests HNI-F3 & F4 Results

Test	Product	Weight	Assays, (Pt, Pd, Au g/t), (Cu, Ni, S %)								% Distribution							
		%	Cu	Ni	Pt	Pd	Au	S	Fe	MgO	Cu	Ni	Pt	Pd	Au	S	Fe	MgO
	Bulk 3rd Clnr Conc	3.1	10.3	11.0	2.32	8.11	0.94	28.8	33.9	1.82	67.6	41.8	12.6	44.9	40.2	13.9	5.9	0.3
	Bulk 2nd Clnr Conc	4.2	7.95	10.3	2.18	6.68	0.74	27.6	34.1	3.32	70.1	52.6	15.9	49.7	42.5	17.9	7.9	0.7
	Bulk 1st Clnr Conc	6.2	5.95	8.32	2.23	5.38	0.54	24.9	33.2	5.39	77.3	62.6	23.9	58.9	45.8	23.8	11.4	1.7
HNI-F3	Bulk Rougher Conc	10.6	3.64	5.65	1.93	3.58	0.36	21.0	31.4	9.06	81.0	72.8	35.5	67.1	51.8	34.4	18.4	5.0
4 kg	Ni 3rd Clnr Conc	1.1	1.50	1.80	2.64	1.54	0.31	34.1	53.8	0.98	3.4	2.4	4.9	2.9	4.6	5.7	3.2	0.1
	Ni 2nd Clnr Conc	1.9	1.06	1.63	2.36	1.24	0.23	32.1	52.1	2.17	4.3	3.8	7.8	4.2	6.0	9.4	5.5	0.2
	Ni 1st Clnr Conc	4.2	0.67	1.26	1.91	0.92	0.16	28.7	46.9	4.08	6.0	6.5	14.1	6.9	9.6	18.8	11.0	0.9
	Ni Scav Conc	9.5	0.46	0.92	1.55	0.77	0.12	18.7	34.2	11.1	9.2	10.6	25.6	13.0	15.3	27.5	18.1	5.5
	Ni Scav Tail	79.9	0.06	0.17	0.28	0.14	0.03	3.08	14.3	21.4	9.8	16.6	38.9	19.9	32.9	38.1	63.5	89.5
	Head (calc.)		0.47	0.82	0.58	0.56	0.07	6.46	18.0	19.1								
	Bulk 2nd Clnr Conc	4.0	9.68	9.07	2.35	7.46	0.81	28.0	35.3	2.51	77.0	43.3	17.3	52.1	32.9	16.6	7.7	0.5
HNI-F4	Bulk Rougher Conc	10.2	4.08	5.61	1.75	3.78	0.37	18.7	27.8	10.9	82.6	68.1	32.7	67.2	38.5	28.2	15.5	5.8
	Ni 3rd Clnr Conc	1.6	1.62	2.80	3.15	2.00	1.46	30.2	47.2	4.31	5.1	5.2	9.1	5.5	23.3	7.0	4.1	0.4
	Ni 2nd Clnr Conc	2.4	1.21	2.48	2.77	1.66	1.04	29.1	46.2	5.06	5.8	7.2	12.4	7.0	25.5	10.4	6.1	0.6
	Ni 1st Clnr Conc	4.6	0.79	1.94	2.30	1.26	0.64	25.3	41.7	7.63	7.2	10.6	19.5	10.1	30.0	17.2	10.5	1.8
	Ni Scav Conc	12.4	0.38	1.04	1.38	0.70	0.30	17.8	31.8	11.8	9.3	15.3	31.6	15.2	37.9	32.6	21.6	7.6
	Ni Scav Tail	77.4	0.05	0.18	0.25	0.13	0.03	3.42	14.8	21.4	8.2	16.6	35.7	17.6	23.6	39.2	62.9	86.6
	Head (calc.)		0.50	0.84	0.54	0.57	0.10	6.76	18.2	19.1								

Test HNI-F5 was conducted with less SIPX in the scavenger and longer scavenger re-grind. While Ni recovery improved in this test, Ni grade was lower.

Overall, the results for high Ni composite show the bulk circuit is pretty good without CMC/guar in rougher. It seems more SIPX is needed in the bulk rougher 2 in order to get higher recovery. It is needed to make better concentrate on Ni side. The issue is pyrrhotite flotation here. Copper sulphate was not used for this composite. It is suggested to use less SIPX in scavenger and cleaner stages.

The results for this test are shown in Table 25 and are presented in detail in Appendix E.

Table 25: High Ni Composite Split Flotation Test HNI-F5 Results

Test	Product	Weight	Assays, (Cu, Ni, S %)			% Distribution		
		%	Cu	Ni	S	Cu	Ni	S
	Bulk 2nd Clnr Conc	5.2	7.91	8.75	28.5	79.2	55.3	21.3
	Bulk 1st Clnr Conc	7.6	5.44	6.28	24.7	80.3	58.5	27.3
HNI-F5	Bulk Rougher Conc	15.9	2.67	3.26	18.7	81.8	63.1	42.8
	Ni 3rd Clnr Conc	0.8	4.04	3.73	24.0	5.9	3.4	2.6
	Ni 2nd Clnr Conc	1.5	2.25	2.81	22.0	6.5	5.2	4.8
	Ni 1st Clnr Conc	3.1	1.37	2.54	15.8	8.3	9.7	7.1
	Ni Scav Conc	8.2	0.69	2.12	14.4	10.9	21.2	17.1
	Ni Scav Tail	75.9	0.05	0.17	3.67	7.3	15.7	40.1
	Head (calc.)		0.52	0.82	6.94			

Finally, one locked cycle test (LCT-4) was conducted on High Ni Composite sample using the same test conditions as master composite LCT-3. Reagents were adjusted accordingly and no $CuSO_4$ was used in this test.

The results for this test are shown in Table 26 and detailed test conditions and results are presented in Appendix F.

Table 26: LCT-4 Test Results

LCT-4 Product	Weight %	Assays, (Cu, Ni, S, Fe, MgO %) (Pt, Pd, Au g/t)								% Distribution					
		Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au
Bulk Clnr 2 Conc.	6.0	7.57	9.27	30.2	2.51	6.15	0.71	36.6	2.03	82.8	66.9	26.9	26.3	64.4	55.6
Ni 3rd Clnr Conc.	1.2	2.07	3.83	18.8	4.10	2.77	0.32	28.1	12.6	4.7	5.7	3.4	8.9	6.0	5.2
Ni 1st Clnr Tail	16.5	0.18	0.64	12.7	1.06	0.45	0.05	–	–	5.3	12.7	31.3	30.8	13.1	9.9
Ni Scav Tail	68.0	0.05	0.15	3.06	0.22	0.08	0.03	–	–	6.2	12.3	31.0	26.3	10.0	25.2
Magnetic Clnr Conc.	0.2	1.26	1.22	10.9	6.94	6.39	0.55	26.5	16.4	0.5	0.3	0.3	2.5	2.3	1.5
Magnetic Rghr Tail	8.0	0.03	0.22	5.96	0.37	0.30	0.03	–	–	0.5	2.1	7.1	5.2	4.2	2.8
Combined Conc.	**7.4**	**6.48**	**8.15**	**27.8**	**2.89**	**5.59**	**0.64**	**34.9**	**4.18**	**88.0**	**72.9**	**30.7**	**37.7**	**72.6**	**62.2**
Head (calc.)		0.55	0.83	6.73	0.57	0.57	0.08	–	–						

Based on the test LCT-4, a bulk 14.5% Cu+Ni concentrate grade was achieved; the Cu and Ni recoveries were 88% and 73%, respectively. The combined Au, Pt, and Pd grade of this test was 9 g/t. The Pt, Pd and Au recoveries were 38%, 73% and 62%, respectively. The Fe/MgO ratio and MgO content of the final concentrate were within the accepted limits in this test.

6. Mineralogy of Flotation Products

In order to quantify the degree of liberation of Cu and Ni minerals and describe mineral textures and associations, the bulk Cu/Ni 1st cleaner concentrate and the final products of test LCT-1 were submitted to the mineralogy department for QEMSCAN analysis.

The first study focused on the mineralogy of the first cleaning stage for test F12 to investigate the loss of Ni in the cleaner tails. The second mineralogy study evaluated the closed circuit by assessing the LCT-1 products. The objective for these studies was to better understand and identify nickel losses to improve overall nickel recovery and define a recovery limit for nickel.

The results of the QEMSCAN™ analyses for flotation products are presented in Appendix G.

F12 1st Cleaner Concentrate and Tails

The results of the F12 1st cleaner concentrate analysis show only ~25% of the gangue is "free" and 75% is with notable association with other minerals, notably sulphides. Pentlandite is only 71% free and pyrrhotite is 46% free. The QEMSCAN data suggests it is not possible to reject ~70% of the gangue minerals without losses of the sulphides. This was confirmed by metallurgical tests. The analysis of metallurgical results had assumed low upgrading of Ni was related to pyrrhotite, however QEMSCAN data shows there is also issues with gangue middlings as well. As the flotation test results show, there is no difference in Ni-pyrrhotite selectivity between roughing and cleaning. It is not possible to get good Ni recovery without floating pyrrhotite. The concentrate can likely tolerate a maximum of 20% pyrrhotite recovery to meet the quality objectives. Although there is not a great degree of liberation at 90 microns primary grind, but the degree of liberation is high enough for a reasonable rougher recovery and there would be needed to add a re-grind stage to the circuit. The rougher tails results provide an examination into the main reason for losses in test F12. There were minimal losses to the 1st cleaner tails.

Mineral modal analysis of the F12 1st cleaner concentrate and tails, illustrating the mineral distributions, unsized, are presented in Table 27. Modal analysis and pentlandite, pyrrhotite, chalcopyrite, chlorite/serpentine, and talc associations as well as grain size results are presented in Appendix G.

Table 27: Bulk Modal Analysis of F12 1st Cleaner Concentrate and Tails

Sample		F12R Clnl Conc	Ro Tails
Mass Size Distribution (%)		100.0	100.0
Calculated ESD Particle Size		10.8	20
		Sample	Sample
Mineral Mass (%)	Chalcopyrite	8.4	0.1
	Pyrrhotite	8.5	4.8
	Pentlandite	10.7	0.1
	Other Sulphides	0.1	0.0
	Feldspar	0.7	3.0
	Orthopyroxene	2.2	9.3
	Clinopyroxene	2.6	14.0
	Amphibole	6.0	12.5
	Mica	0.2	2.5
	Chlorite/Serpentine	32.0	46.9
	Talc	25.7	2.1
	Other Silicates	0.2	0.3
	Fe Oxides	2.2	2.4
	Other Oxides	0.3	1.2
	Carbonates	0.1	0.5
	Others	0.1	0.3
	Total	100	100

The QEMSCAN results supports split type of flowsheet in which primary roughing is to focus on recovery of the reasonably liberated material, ~85% Cu and ~70% Ni. This does not require a high collector addition or high pyrrhotite recovery. This will need a short re-grind and three aggressive cleaners to reject gangue and have high recovery of sulphides. Cleaner collector will have to be added part way through the cleaner stages to keep the pentlandite and associated pyrrhotite floating. The concentrate from this circuit will/may go to Cu-Ni separation to produce a saleable copper concentrate. The copper separation tail would be Ni concentrate.

There will be a scavenger circuit where the collector dosage would be high to get a good recovery of the remaining valuable, Ni, PGE and some Cu. There would be more notable re-grind here to get some liberation and finally, likely three stages of cleaning to reject gangue and pyrrhotite.

The other choice is a finer primary grind, but the ore is hard and the tonnage is high, so there would be no economical justification for this.

LCT-1 Products

Six products from LCT-1, namely; copper cleaner 1 concentrate, copper rougher tail, bulk cleaner 1 tail, Ni cleaner 3 concentrate, Ni cleaner 1 tail and Ni scavenger tail products were submitted for QEMSCAN analysis. Mineral modal analysis of the LCT-1 products illustrating the mineral distributions is presented in Table 28. Modal analysis and pentlandite, pyrrhotite, chalcopyrite, chlorite/serpentine, talc and Fe Ox associations results are presented in Appendix G.

Table 28: Bulk Modal Analysis of LCT-1 Products

Sample		Cu Cl 1 Con G	Cu Ro. Tail G	Bulk Cl. 1 Tail G	Ni Cl. 3 Con G	Ni Cl. 1 Tail G	Ni Scav Tail G
Fraction		-106um	-106um	-106um	-106um	-106um	-106um
Mass Size Distribution (%)		100.0	100.0	100.0	100.0	100.0	100.0
Calculated ESD Particle Size		16	16	11	15	11	10
Mineral Mass (%)	Chalcopyrite	75.7	9.7	1.0	13.5	0.5	0.1
	Pyrrhotite	8.4	26.6	13.7	38.8	24.1	3.8
	Pentlandite	1.7	41.8	4.8	26.5	1.8	0.1
	Other Sulphides	0.2	0.2	0.04	0.2	0.04	0.004
	Feldspar	3.0	2.9	1.0	2.7	1.9	3.5
	Orthopyroxene	1.6	2.2	2.9	2.0	3.4	6.3
	Clinopyroxene	0.5	0.8	2.3	0.6	4.8	9.1
	Amphibole	1.9	3.1	8.4	3.5	10.1	14.2
	Mica	0.1	0.2	0.2	0.2	0.4	1.7
	Chlorite/Serpentine	4.0	7.8	42.8	7.8	40.2	56.8
	Talc	0.5	1.7	20.0	2.0	9.1	1.5
	Other Silicates	0.4	0.4	0.4	0.3	0.2	0.1
	Fe Oxides	1.7	2.3	1.4	1.8	2.6	1.3
	Other Oxides	0.1	0.2	0.7	0.1	0.5	0.6
	Carbonates	0.1	0.1	0.2	0.0	0.3	0.5
	Others	0.1	0.1	0.1	0.1	0.2	0.2
	Total	100	100	100	100	100	100

The scavenger tail and 1st cleaner tail of the LCT-1 were submitted to Terra mineralogical services Inc. for PGE mineralogy. PGE minerals predominately occur as liberated particles in the Ni 1st cleaner tail. In contrast, only minor amounts of liberated grains (all of them sperrylite) are deported to the Ni scavenger tail, whereas the bulk of PGE minerals reports to this sample as inclusions or intergrown with gangue minerals. Most of the non-liberated PGE minerals occurring in the Ni 1st Cleaner Tail are intergrown with pyrrhotite and only minor amounts are associated with magnetite or silicate gangue. In the Nickel scavenger tail, two-thirds of the PGE minerals are also intergrown with sulphide (chiefly pyrrhotite), yet approximately 21% are also associated with silicate gangue. It is note worthy that almost half of the Pt losses (mineral sperrylite) is as small liberated particles. PGE mineralogy results are presented in Appendix G.

7. Concentrate Analysis

The potential for the deposit is known to contain various impurity elements which may result in penalties or bonus payments at the smelter. In order to complete the study, full multi-element analysis was conducted on concentrates produced from each locked cycle test. 7e and Co ICP-Scan for the LCT-1 products were also conducted. Tables 29-32 list the results. The concentration of various elements in locked cycle test concentrates from master composite feed material are presented, mainly as ICP results, in Appendix B.

Generally, there were no significant differences in the grades of minor elements in the concentrates. Deleterious elements do not appear to be present in sufficient quantities to create marketing issues with these concentrates.

Table 29: Multi-element Analysis Results for LCT-2

ANALYTE	**As**	**Se**	**Te**	**Hg**	**F**	**Cl**	**Al**	**As**	**Ba**	**Be**
UNITS	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm
LCT 2 CLNR 3 CON D/E/F	16	61	12.6	0.77	60	<50	1.25	<30	30	<5
ANALYTE	**Ca**	**Cd**	**Cr**	**Co**	**Cu**	**Fe**	**K**	**La**	**Li**	**Mg**
UNITS	%	ppm	ppm	ppm	ppm	%	%	ppm	ppm	%
LCT 2 CLNR 3 CON D/E/F	1.5	10	900	3660	67800	24.8	<0.1	<10	10	6.53
ANALYTE	**Mn**	**Mo**	**Ni**	**P**	**Pb**	**Sb**	**Sc**	**Sn**	**Sr**	**Ti**
UNITS	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%
LCT 2 CLNR 3 CON D/E/F	560	<10	62400	<0.01	310	<50	5	<50	20	0.12
ANALYTE	**V**	**W**	**Y**	**Zn**	**Si**	**SiO2**	–	–	–	–
UNITS	ppm	ppm	ppm	ppm	%	%	–	–	–	–
LCT 2 CLNR 3 CON D/E/F	70	320	<5	470	10	21.4	–	–	–	–

Table 30: Multi-element Analysis Results for LCT-3

ANALYTE	**As**	**Se**	**Te**	**Hg**	**F**	**Cl**	**Al**	**As**	**Ba**	**Be**
UNITS	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm
LCT 3 BULK CLNR 2 CON D/E/F Combined	18	75	16.6	1.15	40	<50	0.84	40	20	<5
LCT 3 NI CLNR CON D/E/F Combined	16	40	3.42	0.30	70	<50	1.14	40	<10	<5
LCT 3 MAG CLNR CON D/E/F Combined	24	27	6.42	0.28	80	<50	1.51	30	<10	<5
Combined Conc.	17	58	10.4	0.74	55		1.00	39.6		
ANALYTE	**Ba**	**Be**	**Ca**	**Cd**	**Cr**	**Co**	**Cu**	**Fe**	**K**	**La**
UNITS	ppm	ppm	%	ppm	ppm	ppm	ppm	%	%	ppm
LCT 3 BULK CLNR 2 CON D/E/F Combined	20	<5	1.2	10	360	5230	1E+05	31.1	<0.1	<10
LCT 3 NI CLNR CON D/E/F Combined	<10	<5	0.6	10	1020	980	6660	22.0	<0.1	<10
LCT 3 MAG CLNR CON D/E/F Combined	<10	<5	1.1	<10	5370	620	9030	24.9	<0.1	<10
Combined Conc.			0.9		850	3174	58367	26.8		
ANALYTE	**Li**	**Mg**	**Mn**	**Mo**	**Ni**	**P**	**Pb**	**Sb**	**Sc**	**Sn**
UNITS	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
LCT 3 BULK CLNR 2 CON D/E/F Combined	<10	2.54	300	<10	89300	<0.01	490	<50	<5	<50
LCT 3 NI CLNR CON D/E/F Combined	<10	11	600	<10	18200	<0.01	40	<50	6	<50
LCT 3 MAG CLNR CON D/E/F Combined	<10	11.1	1170	<10	12400	<0.01	20	<50	10	<50
Combined Conc.		6.6	467		54912		273			
ANALYTE	**Sr**	**Ti**	**V**	**W**	**Y**	**Zn**	**Si**	**SiO2**	–	–
UNITS	ppm	%	ppm	ppm	ppm	ppm	%	%	–	–
LCT 3 BULK CLNR 2 CON D/E/F Combined	10	0.07	50	410	<5	560	4.65	9.95	–	–
LCT 3 NI CLNR CON D/E/F Combined	<10	0.12	50	300	<5	260	15.5	33.1	–	–
LCT 3 MAG CLNR CON D/E/F Combined	<10	0.28	180	340	<5	420	13.4	28.6	–	–
Combined Conc.		0.1	55	359		422	9.78	20.9		

Table 31: Multi-element Analysis Results for LCT-4

ANALYTE	Au	Pt	Pd	As	Se	Te	F	Al	As	Ba
UNITS	ppb	ppb	ppb	ppm	ppm	ppm	ppm	%	ppm	ppm
LCT-4 Bulk Cln 2 Con D, E, F Combined	65	1480	637	22	74	9.54	70	0.7	<30	10
LCT-4 Ni Cln 3 Con D, E, F Combined	151	1790	1580	33	60	14.9	80	0.84	40	<10
LCT-4Mag Cln Con D, E, F Combined	390	5650	4550	21	35	9.42	90	1.43	40	10
Combined Conc.	88	1647	902	24	71	10.4	72	0.74		
ANALYTE	**Be**	**Ca**	**Cd**	**Cr**	**Co**	**Cu**	**Fe**	**K**	**La**	**Li**
UNITS	ppm	%	ppm	ppm	ppm	ppm	%	%	ppm	ppm
LCT-4 Bulk Cln 2 Con D, E, F Combined	<5	1.3	<10	180	5690	78400	>30	<0.1	<10	<10
LCT-4 Ni Cln 3 Con D, E, F Combined	<5	0.7	<10	560	2330	18300	28.1	<0.1	<10	<10
LCT-4 Mag Cln Con D, E, F Combined	<5	1.3	<10	5590	560	9840	26.2	<0.1	<10	<10
Combined Conc.		1.2		393	4990	66522				
ANALYTE	**Mg**	**Mn**	**Mo**	**Ni**	**P**	**Pb**	**Sb**	**Sc**	**Sn**	**Sr**
UNITS	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm
LCT-4 Bulk Cln 2 Con D, E, F Combined	1.24	220	<10	90800	<0.01	70	<50	<5	<50	20
LCT-4 Ni Cln 3 Con D, E, F Combined	7.64	400	<10	39400	<0.01	<20	<50	<5	<50	<10
LCT-4 Mag Cln Con D, E, F Combined	9.89	1120	<10	12000	<0.01	<20	<50	9	<50	10
Combined Conc.	2.5	275		80085						
ANALYTE	**Ti**	**V**	**W**	**Y**	**Zn**	**Si**	**SiO2**	—	—	—
UNITS	%	ppm	ppm	ppm	ppm	%	%	—	—	—
LCT-4 Bulk Cln 2 Con D, E, F Combined	0.05	50	410	<5	320	3.35	7.16	—	—	—
LCT-4 Ni Cln 3 Con D, E, F Combined	0.07	40	340	<5	190	11.0	23.6	—	—	—
LCT-4 Mag Cln Con D, E, F Combined	0.26	180	320	<5	270	11.9	25.4	—	—	—
Combined Conc.	0.06	52	396		297	4.86	10.4			

Table 32: Co and 7e ICP-Scan Results for Locked Cycle Test 1 Products

Sample ID	Rh ppb	Ru ppb	Ir ppb	Os ppb	Co %	Au g/t	Pt g/t	Pd g/t
LCT 1 Cu Clnr 1 Con E,F,G combined	177	192	150	140	0.045	1.44	2.16	4.83
LCT 1 Cu Ro Tail E,F,G Combined	323	455	329	270	0.87	0.32	3.34	10.9
LCT 1 Ni 3rd Clnr Con E,F,G Combined	311	430	338	290	0.36	0.43	5.72	5.90
LCT 1 Ni 1st Clnr Tail E,F,G Combined	90	112	106	72	0.023	0.05	1.02	0.61
LCT 1 Ni Scav Tail E,F,G Combined	< 20	< 50	23	19	< 0.01	0.02	0.22	0.09

Conclusions and Recommendations

A test program was completed on a master composite and a high Ni composite sample from the Wellgreen property in Yukon Territory, Canada. SGS Vancouver Metallurgy received multiple shipments, a total of 300 kg to prepare the master composite, and later on a third shipment of 120 kg to prepare the high Ni composite. The material shipped was originally three sub-composites (massive sulphide, gabbro, and peridotite) and was used to prepare a Master Composite and a High Ni Composite for metallurgical testing.

A mineralogy investigation on feed sample was completed by QEMSCAN (quantitative mineralogy) on the master composite to identify mineral liberations and associations and develop grade limiting/recovery relationships for the sample. The results showed that the sulphide minerals dominated by chalcopyrite, pentlandite, and pyrrhotite. Copper and nickel contents combined approximately 2% of the sample mass. Chalcopyrite and pentlandite accounted for most of the Cu and Ni in the sample, respectively. The master composite is non pyritic and contains high levels of chlorite/serpentine. It also contains pyroxene, amphibole, mica and talc. Main copper sulphide (chalcopyrite) mineral association for the overall sample exist with complex gangue minerals (16.5%), pentlandrite (0.7%), and pyrrhotite (3.6%). Nickel sulphide association for the overall sample shows complex gangue minerals (6.6%), chalcopyrite (1.5%) and pyrrhotite (5%). Pyrhotite association for the overall sample shows complex gangue minerals (4.8%), chalcopyrite (0.9%) and pentlandite (0.7%). Overall, the liberations of chalcopyrite, pentlandite, and pyrrhotite were adequate to produce good metallurgical performance in a bulk rougher circuit. Regrinding of rougher concentrates is recommended to improve liberation of chalcopyrite and pentlandite in order to produce optimum cleaner circuit performance.

Standard Bond grindability test (BWI) for ball mill grinding and abrasion index test were conducted. The BWI was determined to be 19.7 kWh/t for the Wellgreen master composite ore. This is considered to be a hard ore in the context of the SGS BWI database. The abrasion index fell in the soft range of abrasiveness with a Bond abrasion index of 0.088.

A preliminary flotation testwork was conducted on the master composite. The key variables tested were the effect of grind, collector, talc pre-float and CMC on rougher kinetics. Due to the lack of any positive effect of talc pre-float and CMC addition, the base case (70 g/t SIPX) was shown to be the preferred one. A primary grind size of 90 microns was identified as optimum.

Further cleaner flotation tests were followed based on the rougher flotation conditions of the base case. Open circuit cleaner testing was conducted to test the effect of the regrind and dispersants/depressants on circuit recovery and bulk Cu/Ni concentrate grade. Overall, the preliminary cleaner flotation test results showed a 18% Cu+Ni concentrate grade at the average Cu and Ni recoveries of 79% and 50%, respectively would be expected. At the same test conditions the combined Pt, Pd and Au grade of 14 g/t at 22%, 53% and 53% recoveries respectively, is achieved.

In order to quantify the degree of liberation of Cu and Ni minerals and describe mineral textures and associations, the bulk cleaner concentrate and the final products of locked cycle test were also submitted for QEMSCAN analysis. The QEMSCAN results supports split type of flowsheet in which primary roughing is to focus on recovery of the reasonably liberated material.

Following the preliminary testing, split flowsheet optimization testwork to optimize the flowsheet through a more detailed program was started. The proposed split flowsheet recommends taking advantage of the parallel cleaner lines presently used in the commercial operations. The strategy would be to direct a rougher concentrate, rich in copper and nickel minerals to one of the lines and to direct a scavenger concentrate, rich in pyrrhotite to the other line. The advantages of decoupling the cleaners would be that collector and CMC conditions could be customized to the floatability of each mineral class. Specifically, the copper and nickel minerals are known to be responsive to very low collector conditions. This low amount of collector is anticipated to result in significant improvements to the flotation separation of copper from nickel. On the other hand, the pyrrhotite is known to require high amounts of collector to recover acceptable levels of sulphides. It is predicted that the proposed flowsheet will result in the production of better quality copper concentrates and better process control in the commercial operation.

The viability of the split flowsheet was confirmed by means of locked cycle testing through re-circulation of middling streams. The results indicate production of a bulk concentrate with 12% Cu+Ni grade at the average Cu and Ni recoveries of 88% and 67%, respectively. At the same test conditions the combined Pt, Pd and Au grade of 10.5 g/t at 46%, 73% and 59% recoveries, respectively would be expected.

In summary, within the limits imposed by its mineralogy, the ore sample responded very well to the split flowsheet with a basic reagent regime. The Fe/MgO ratio and MgO content of the final concentrate were within the accepted limits in this circuit.

The testwork completed thus far on the High Ni Composite show the production of a bulk concentrate with 14.5% Cu+Ni grade at the average Cu and Ni recoveries of 88% and 73%, respectively. At the same test conditions the combined Pt, Pd and Au grade of 9 g/t at 38%, 73% and 62% recoveries respectively, was produced.

Based on the results and observations of this test program, a number of recommendations are made for future testing. These additional tests would help to increase the confidence in the metallurgical predictions and to further the development of this material.

- It is anticipated that improved performance is possible in terms of Ni and PGE grade and recoveries through better combinations of reagent selection and optimization.
- Variability testing extended to:
    - Production composites, lithology composites, special location and grade variance. Point samples should be used to confirm the developed flowsheet from a geometallurgical perspective.

  - Design comminution testing should be considered for proper mill sizing and production forecasting. Selection of specific samples for SAG mill design (including and not limited to JK DWT, SMC, SPI, CWI) and ball mill sizing (BWI).

- The collection of additional variability information is recommended through a variability test programme on the samples from various geological origin and grades.

- Conduct further grinding tests on more variability composites.

Appendix A – Sample Preparation

Appendix B – Chemical Analysis

Appendix C – Comminution Testing

Appendix D – Grind Calibration Tests

Appendix E – Flotation Tests

Appendix F – Locke Cycle Tests

Appendix G – QEMSCAN Analysis

An Investigation into

METALLURGICAL TESTWORK OF
CU/NI/PGE SAMPLES FROM THE WELLGREEN PROPERTY

prepared for

PROPHECY PLATINUM CORPORATION

Project 50149-001 – Final Report

Appendix A, B, C, D, E, F, G
July 31, 2012

SGS Canada Inc. | 50-655 West Kent Avenue North, Vancouver, BC, V6P 6T7
Tel: (604) 324-1166 Fax: (604) 324-1177 www.met.sgs.com www.ca.sgs.com
Member of the SGS Group (SGS SA)

Appendix A – Sample Preparation

50149-001
Prophecy

First shipment

Pail	Contents	Weight
1	large pieces, cut edges	25.2
2	large pieces, cut edges	25.1
3	large chunks upto 8", rough rocks	25.6
4	large chunks upto 8", rough rocks	25.7
5	large chunks upto 8", rough rocks	26.9
6	large chunks upto 8", rough rocks	26.9
		155.4

Second shipment

There were 5 pails and 1 tote. Labeled as 2-7 of 13.

2 of 13 is the tote and weighs 25.9 kg	25.9
3 of 13 is a pail and weighs 23.75 kg	24.0
4 of 13 is a pail and weighs 24.95 kg	25.0
5 of 13 is a pail and weighs 26.4 kg	26.0
6 of 13 is a pail and weighs 23.1 kg	23.0
7 of 13 is a pail and weighs 25.4 kg	25.0
	148.9

Total, first and second **304**

Third Shipment

09-Nov-11

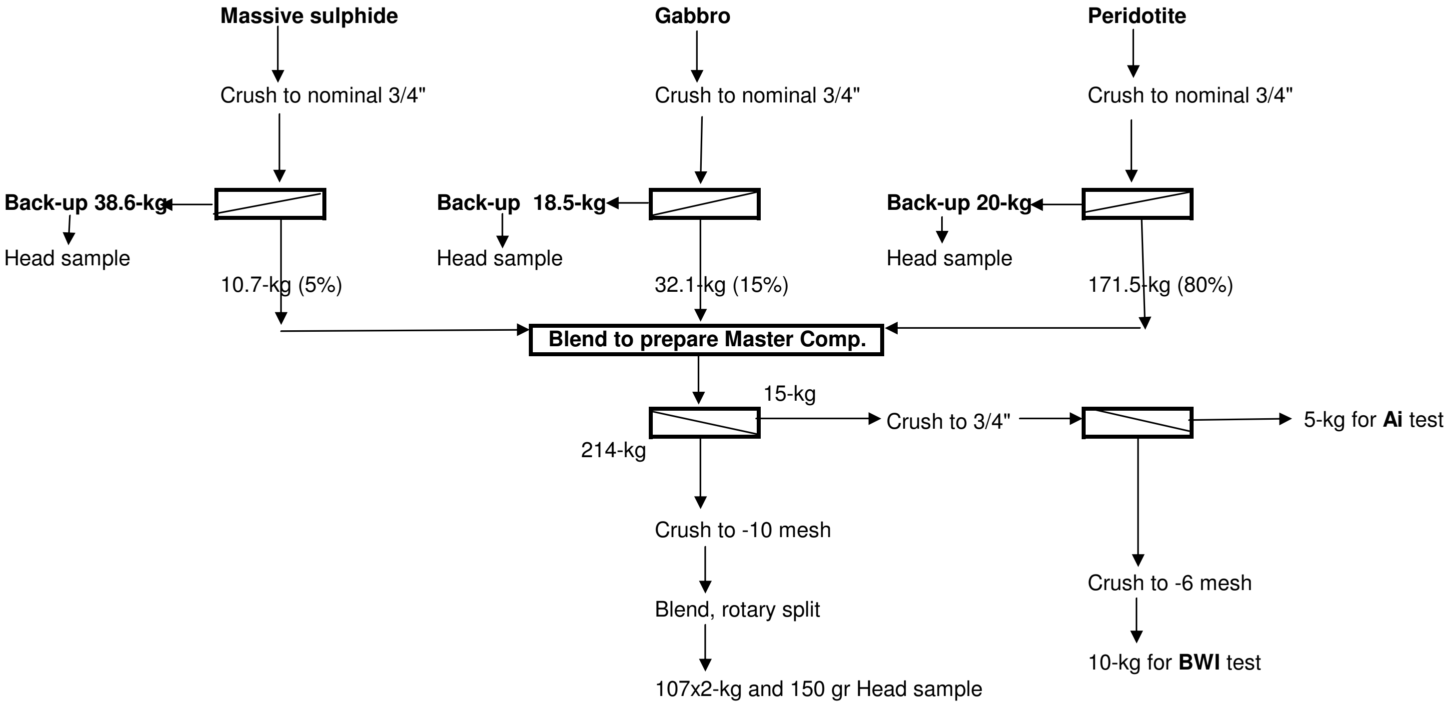
Tag: Van329		**Total, kg**
Gabbro, 1 rice bag		23.0
Peridotite 3 rice bags	17.2	
	16.7	
	20.6	
		54.5
Massive Sulphide		41.6
		119

Prophecy, Wellgreen samples **50149-001**

A-Sample receipt, Log-in and Inventory

Massive sulphide: **50 kg**
Gabbro: **51 kg**
Peridotite: **203 kg**

1-Massive sulphide comp. (Combine pails 1+2)
2-Gabbro comp. (Combine pails 3+4)
3-Peridotite comp. (Combine pails 5+6 and second shipment sample)



Appendix B – Chemical Analysis

Client	(8117) Jalal Tajadod	Received	16-Sep-11 15:53
Reference	Head Assays	Requested	21-Sep-11 15:53
Project	CAVM-50149-001	Created	16-Sep-11 15:53
Batch	0283-sep11	Finished	06-Oct-11 08:36
Supervisor	wattt	Samples	4,0,0 - 45

Notes:
Reporting limits for Li,P raised due to interference.Sep30.slm

Tag	Type	Sample ID	Cu %	Ni %	Co %	Fe %	Ni Sulfide/Metallic	S %
1	SMP	Massive sulphide	1.57	2.59	0.15	44.0	2.45	28.8
2	SMP	Gabbro	0.43	0.19	0.015	9.77	0.17	2.38
3	SMP	Peridotite	0.25	0.36	0.017	11.0	0.30	1.47
4	SMP	Master Comp	0.33	0.42	0.018	11.9	0.37	2.53

Tag	C(t) %	Pt g/t	Pd g/t	Au g/t	Rh g/t	MgO %	Ag g/t	Al g/t
1	0.06	1.01	0.69	0.08	0.39	0.56	5	16200
2	0.08	0.53	0.27	0.12	< 0.02	12.7	3	47800
3	0.06	0.25	0.35	0.02	0.03	25.9	< 2	30800
4	0.06	0.41	0.45	0.04	0.04	22.8	< 2	27900

Tag	As g/t	Ba g/t	Be g/t	Bi g/t	Ca g/t	Cd g/t	Cr g/t	K g/t
1	< 30	134	0.30	< 20	32100	< 2	128	2860
2	< 30	1740	0.36	< 20	110000	< 2	573	953
3	< 30	51.4	0.20	< 20	24800	< 2	2227	1650
4	< 30	521	0.22	< 20	29800	< 2	1915	1750

Tag	Li g/t	Mn g/t	Mo g/t	Na g/t	P g/t	Pb g/t	Sb g/t	Se g/t
1	< 20	322	< 5	1590	< 200	82	< 10	66
2	33	1400	< 5	1670	539	112	< 10	< 30
3	< 20	1300	< 5	425	310	< 20	< 10	< 30
4	21	1300	< 5	1390	313	< 20	< 10	< 30

Tag	Sn g/t	Sr g/t	Ti g/t	Tl g/t	U g/t	V g/t	Y g/t	Zn g/t
1	< 20	45.9	1110	< 30	79	118	4.8	72
2	< 20	40.0	4960	< 30	26	169	14.0	106

Tag	Sn g/t	Sr g/t	Ti g/t	Tl g/t	U g/t	V g/t	Y g/t	Zn g/t
3	< 20	21.6	3460	< 30	< 20	114	7.6	90
4	< 20	19.2	3650	< 30	< 20	126	8.5	91

Tag	Buck wt. g
1	155
2	155
3	175
4	180

Client	(8117) Jesse Ding	Received	02-Dec-11 15:39
Reference	Head Assays	Requested	05-Dec-11 15:39
Project	CAVM-50149-001	Created	02-Dec-11 15:39
Batch	0042-DEC11	Finished	12-Jan-12 09:35
Supervisor	wattt	Samples	3,0,0 - 44

Notes:
ICP9440.LBR - Strong Acid Digest for Highly Mineralized Samples with FUSION

Tag	Type	Sample ID	Ag g/t	Al g/t	As g/t	Ba g/t	Be g/t	Bi g/t
1	SMP	Massive Sulphide	< 2	12400	< 30	106	0.20	< 20
2	SMP	Gabbro	2	39200	< 30	165	0.34	< 20
3	SMP	peridotite	< 2	24500	< 30	61.3	0.18	< 20

Tag	Ca g/t	Cd g/t	Cr g/t	K g/t	Li g/t	Mn g/t	Mo g/t	Na g/t
1	25800	< 2	130	1790	< 5	290	< 5	582
2	78900	< 2	909	882	29	1220	< 5	1000
3	23600	< 2	3070	1560	14	1220	< 5	533

Tag	P g/t	Pb g/t	Sb g/t	Se g/t	Sn g/t	Sr g/t	Ti g/t	Tl g/t
1	< 200	< 200	< 10	79	< 20	27.0	744	< 30
2	455	< 200	< 10	< 30	< 20	29.3	3910	< 30
3	266	< 200	< 10	< 30	< 20	13.4	3200	< 30

Tag	U g/t	V g/t	Y g/t	Zn g/t	Cu %	Ni %	Co %	Fe %
1	< 80	92	3.0	105	1.40	3.12	0.17	47.8
2	< 80	146	10.7	96	0.51	0.27	0.024	12.1
3	< 80	104	6.5	90	0.30	0.40	0.020	11.0

Tag	Ni Sulfide/Metallic	S %	C(t) %	Au g/t	Pt g/t	Pd g/t	Rh g/t	MgO %
1	2.70	29.7	0.08	0.09	1.29	0.86	0.17	0.41
2	0.24	3.02	0.07	0.04	0.64	0.33	0.03	14.3
3	0.33	1.79	0.06	0.05	0.41	0.60	0.03	25.5

Client	**(8117) Jalal Tajadod**	Received	**09-Dec-11 13:15**
Reference	**Head Assays**	Requested	**14-Dec-11 13:15**
Project	**CAVM-50149-001**	Created	**09-Dec-11 13:15**
Batch	**0138-DEC11**	Finished	**12-Jan-12 09:34**
Supervisor	**wattt**	Samples	**1,0,2 - 44**

Notes:
ICP9440.LBR - Strong Acid Digest for Highly Mineralized
Samples with FUSION

Tag	Type	Sample ID	Ag g/t	Al g/t	As g/t	Ba g/t	Be g/t	Bi g/t
1	SMP	High Ni Comp	< 2	30000	< 30	70.7	0.20	< 20

Tag	Ca g/t	Cd g/t	Cr g/t	K g/t	Li g/t	Mn g/t	Mo g/t	Na g/t
1	33500	< 2	1530	1280	10	1050	< 5	434

Tag	P g/t	Pb g/t	Sb g/t	Se g/t	Sn g/t	Sr g/t	Ti g/t	Tl g/t
1	285	< 60	< 10	< 30	< 20	17.7	2760	< 30

Tag	U g/t	V g/t	Y g/t	Zn g/t	Cu %	Ni %	Co %	Fe %
1	< 30	107	6.5	87	0.52	0.83	0.044	18.1

Tag	Ni Sulfide/Metallic	S %	C(t) %	Au g/t	Pt g/t	Pd g/t	Rh g/t	MgO %
1	0.69	6.45	0.04	0.10	0.57	0.61	0.10	19.8

Certificate of Analysis

Work Order: VC120756

To: **Met - Jalal Tajadod**
F400101 SGS CANADA INC
50-655 WEST KENT AVE NORTH
VANCOUVER BC V6P 6T7

Date: May 11, 2012

P.O. No.	:	PO: 50149-001 / TEST:LCT 2&3 additional
Project No.	:	-
No. Of Samples	:	4
Date Submitted	:	May 09, 2012
Report Comprises	:	Pages 1 to 5 (Inclusive of Cover Sheet)

Distribution of unused material:
Active files - upstairs:

Certified By : ______________________
Satpaul Gill
QAQC Chemist

SGS Minerals Services Geochemistry, Vancouver, BC is ISO 9001:2008 certified.

Report Footer:

L.N.R.	= Listed not received	I.S.	= Insufficient Sample
n.a.	= Not applicable	--	= No result

*INF = Composition of this sample makes detection impossible by this method

M after a result denotes ppb to ppm conversion, % denotes ppm to % conversion

Methods marked with an asterisk (e.g. *NAA08V) were subcontracted
Methods marked with the **@** symbol (e.g. @AAS21E) denote accredited tests

Final : VC120756 Revision REVISED Order: PO: 50149-001 / TEST:LCT 2&3

Element	As	Se	Te	Hg	F	Cl	Al	As	Ba	Be
Method	ICM14B	ICM14B	ICM14B	ICM14B	ISE07A	ISE08B	ICP90A	ICP90A	ICP90A	ICP90A
Det.Lim.	1	1	0.05	0.01	20	50	0.01	30	10	5
Units	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm
LCT 2 CLNR 3 CON D/E/F	16	61	12.6	0.77	60	<50	1.25	<30	30	<5
LCT 3 BULK CLNR 2 CON D/E/F	18	75	16.6	1.15	40	<50	0.84	40	20	<5
LCT 3 NI CLNR CON D/E/F	16	40	3.42	0.30	70	<50	1.14	40	<10	<5
LCT 3 MAG CLNR CON D/E/F	24	27	6.42	0.28	80	<50	1.51	30	<10	<5

Element	Ca	Cd	Cr	Co	Cu	Fe	K	La	Li	Mg
Method	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A
Det.Lim.	0.1	10	10	10	10	0.01	0.1	10	10	0.01
Units	%	ppm	ppm	ppm	ppm	%	%	ppm	ppm	%
LCT 2 CLNR 3 CON D/E/F	1.5	10	900	3660	67800	24.8	<0.1	<10	10	6.53
LCT 3 BULK CLNR 2 CON D/E/F	1.2	10	360	5230	105995	31.1	<0.1	<10	<10	2.54
LCT 3 NI CLNR CON D/E/F	0.6	10	1020	980	6660	22.0	<0.1	<10	<10	11.0
LCT 3 MAG CLNR CON D/E/F	1.1	<10	5370	620	9030	24.9	<0.1	<10	<10	11.1

SGS

Element	Mn	Mo	Ni	P	Pb	Sb	Sc	Sn	Sr	Ti
Method	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A
Det.Lim.	10	10	10	0.01	20	50	5	50	10	0.01
Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%
LCT 2 CLNR 3 CON D/E/F	560	<10	62400	<0.01	310	<50	5	<50	20	0.12
LCT 3 BULK CLNR 2 CON D/E/F	300	<10	89300	<0.01	490	<50	<5	<50	10	0.07
LCT 3 NI CLNR CON D/E/F	600	<10	18200	<0.01	40	<50	6	<50	<10	0.12
LCT 3 MAG CLNR CON D/E/F	1170	<10	12400	<0.01	20	<50	10	<50	<10	0.28

Final : VC120756 Revision REVISED Order: PO: 50149-001 / TEST:LCT 2&3

Element	V	W	Y	Zn	Si	SiO2
Method	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A
Det.Lim.	10	50	5	10	0.01	0.01
Units	ppm	ppm	ppm	ppm	%	%
LCT 2 CLNR 3 CON D/E/F	70	320	<5	470	10.0	21.4
LCT 3 BULK CLNR 2 CON D/E/F	50	410	<5	560	4.65	9.95
LCT 3 NI CLNR CON D/E/F	50	300	<5	260	15.5	33.1
LCT 3 MAG CLNR CON D/E/F	180	340	<5	420	13.4	28.6

Certificate of Analysis

Work Order: VC120590A

To: Met - Jalal Tajadod Date: Apr 19, 2012

F400101 SGS CANADA INC
50-655 WEST KENT AVE NORTH
VANCOUVER BC V6P 6T7

P.O. No.	:	PO: 50149-001/ TEST: LCT 2
Project No.	:	-
No. Of Samples	:	23
Date Submitted	:	Apr 17, 2012
Report Comprises	:	Pages 1 to 2 (Inclusive of Cover Sheet)

Certified By : ______________________
Satpaul Gill
QAQC Chemist

SGS Minerals Services Geochemistry, Vancouver, BC is ISO 9001:2008 certified.

Report Footer:	L.N.R.	= Listed not received	I.S.	= Insufficient Sample
	n.a.	= Not applicable	--	= No result

*INF = Composition of this sample makes detection impossible by this method

M after a result denotes ppb to ppm conversion, % denotes ppm to % conversion

Methods marked with an asterisk (e.g. *NAA08V) were subcontracted
Methods marked with the @ symbol (e.g. @AAS21E) denote accredited tests

Final : VC120590A Revision REVISED Order: PO: 50149-001/ TEST: LCT 2

Element	Se	Te
Method	ICM14B	ICM14B
Det.Lim.	1	0.05
Units	ppm	ppm
3RD CLEANER CON. A	N.A.	N.A.
3RD CLEANER CON. B	N.A.	N.A.
3RD CLEANER CON. C	N.A.	N.A.
3RD CLEANER CON. D	N.A.	N.A.
3RD CLEANER CON. E	N.A.	N.A.
3RD CLEANER CON. F	59	12.6
3RD CLEANER TAIL. F	N.A.	N.A.
2ND CLEANER TAIL. F	N.A.	N.A.
1ST CLEANER TAILS A	N.A.	N.A.
1ST CLEANER TAILS B	N.A.	N.A.
1ST CLEANER TAILS C	N.A.	N.A.
1ST CLEANER TAILS D	N.A.	N.A.
1ST CLEANER TAILS E	N.A.	N.A.
1ST CLEANER REGRIND CON F	N.A.	N.A.
1ST CLEANER REGRIND TAIL F	N.A.	N.A.
ROUGHER TAILS A	N.A.	N.A.
ROUGHER TAILS B	N.A.	N.A.
ROUGHER TAILS C	N.A.	N.A.
ROUGHER TAILS D	N.A.	N.A.
ROUGHER TAILS E	N.A.	N.A.
ROUGHER TAILS F	N.A.	N.A.
MAGNETIC CON F	N.A.	N.A.
MAGNETIC TAIL F	N.A.	N.A.

Certificate of Analysis

Work Order: VC120590

To: **Met - Jalal Tajadod**
F400101 SGS CANADA INC
50-655 WEST KENT AVE NORTH
VANCOUVER BC V6P 6T7

Date: Apr 13, 2012

P.O. No.	:	PO: 50149-001/ TEST: LCT 2
Project No.	:	-
No. Of Samples	:	23
Date Submitted	:	Apr 10, 2012
Report Comprises	:	Pages 1 to 6 (Inclusive of Cover Sheet)

Distribution of unused material:
Active files - upstairs:

Certified By : ____________________
Satpaul Gill
QAQC Chemist

SGS Minerals Services Geochemistry, Vancouver, BC is ISO 9001:2008 certified.

Report Footer:

L.N.R.	= Listed not received	I.S.	= Insufficient Sample
n.a.	= Not applicable	--	= No result

*INF = Composition of this sample makes detection impossible by this method

M after a result denotes ppb to ppm conversion, % denotes ppm to % conversion

Methods marked with an asterisk (e.g. *NAA08V) were subcontracted
Methods marked with the **@** symbol (e.g. @AAS21E) denote accredited tests

Final : VC120590 Revision REVISED Order: PO: 50149-001/ TEST: LCT 2

Element	S	Au	Pt	Pd	Al	As	Ba	Be	Ca	Cd
Method	CSA06V	FAI313	FAI313	FAI313	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A
Det.Lim.	0.01	1	10	5	0.01	30	10	5	0.1	10
Units	%	ppb	ppb	ppb	%	ppm	ppm	ppm	%	ppm
3RD CLEANER CON. A	23.2	813	2740	8300	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
3RD CLEANER CON. B	21.2	849	2820	8030	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
3RD CLEANER CON. C	24.0	620	2660	7990	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
3RD CLEANER CON. D	20.3	405	2180	5940	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
3RD CLEANER CON. E	19.6	606	2540	7280	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
3RD CLEANER CON. F	15.5	543	2430	6360	1.26	<30	30	7	1.5	<10
3RD CLEANER TAIL. F	7.50	142	2080	2290	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
2ND CLEANER TAIL. F	4.26	67	1040	824	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1ST CLEANER TAILS A	3.04	27	690	389	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1ST CLEANER TAILS B	3.13	23	720	447	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1ST CLEANER TAILS C	3.57	28	750	546	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1ST CLEANER TAILS D	3.11	21	630	335	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1ST CLEANER TAILS E	3.38	20	640	346	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1ST CLEANER REGRIND CON F	4.55	195	2170	1730	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1ST CLEANER REGRIND TAIL F	4.20	21	620	280	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
ROUGHER TAILS A	1.96	12	250	136	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
ROUGHER TAILS B	1.98	12	270	143	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
ROUGHER TAILS C	1.94	10	250	135	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
ROUGHER TAILS D	1.95	14	250	135	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
ROUGHER TAILS E	1.90	11	250	134	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
ROUGHER TAILS F	1.42	9	190	70	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
MAGNETIC CON F	3.33	214	1400	1380	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
MAGNETIC TAIL F	4.49	18	410	275	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

Element	Cr	Co	Cu	Fe	K	La	Li	Mg	Mn	Mo
Method	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A
Det.Lim.	10	10	10	0.01	0.1	10	10	0.01	10	10
Units	ppm	ppm	ppm	%	%	ppm	ppm	%	ppm	ppm
3RD CLEANER CON. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
3RD CLEANER CON. B	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
3RD CLEANER CON. C	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
3RD CLEANER CON. D	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
3RD CLEANER CON. E	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
3RD CLEANER CON. F	1080	3320	60400	22.3	<0.1	<10	10	8.07	590	<10
3RD CLEANER TAIL. F	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
2ND CLEANER TAIL. F	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1ST CLEANER TAILS A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1ST CLEANER TAILS B	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1ST CLEANER TAILS C	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1ST CLEANER TAILS D	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1ST CLEANER TAILS E	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1ST CLEANER REGRIND CON F	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1ST CLEANER REGRIND TAIL F	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
ROUGHER TAILS A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
ROUGHER TAILS B	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
ROUGHER TAILS C	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
ROUGHER TAILS D	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
ROUGHER TAILS E	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
ROUGHER TAILS F	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
MAGNETIC CON F	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
MAGNETIC TAIL F	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

Element	Ni	P	Pb	Sb	Sc	Sn	Sr	Ti	V	W
Method	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A	ICP90A
Det.Lim.	10	0.01	20	50	5	50	10	0.01	10	50
Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm
3RD CLEANER CON. A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
3RD CLEANER CON. B	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
3RD CLEANER CON. C	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
3RD CLEANER CON. D	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
3RD CLEANER CON. E	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
3RD CLEANER CON. F	57200	<0.01	210	<50	9	<50	30	0.12	70	<50
3RD CLEANER TAIL. F	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
2ND CLEANER TAIL. F	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1ST CLEANER TAILS A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1ST CLEANER TAILS B	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1ST CLEANER TAILS C	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1ST CLEANER TAILS D	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1ST CLEANER TAILS E	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1ST CLEANER REGRIND CON F	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1ST CLEANER REGRIND TAIL F	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
ROUGHER TAILS A	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
ROUGHER TAILS B	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
ROUGHER TAILS C	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
ROUGHER TAILS D	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
ROUGHER TAILS E	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
ROUGHER TAILS F	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
MAGNETIC CON F	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
MAGNETIC TAIL F	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

Final : VC120590 Revision REVISED Order: PO: 50149-001/ TEST: LCT 2

Element	Y	Zn	Cl	F	As	Cu	Fe	MgO	Ni	SiO2
Method	ICP90A	ICP90A	ISE08B	ISE07A	ICP90Q	ICP90Q	ICP90Q	ICP90Q	ICP90Q	ICP90Q
Det.Lim.	5	10	50	20	0.01	0.01	0.01	0.01	0.01	0.01
Units	ppm	ppm	ppm	ppm	%	%	%	%	%	%
3RD CLEANER CON. A	N.A.	N.A.	N.A.	N.A.	N.A.	10.1	28.4	5.73	8.02	N.A.
3RD CLEANER CON. B	N.A.	N.A.	N.A.	N.A.	N.A.	13.1	26.9	6.81	3.83	N.A.
3RD CLEANER CON. C	N.A.	N.A.	N.A.	N.A.	N.A.	8.39	29.7	5.93	9.82	N.A.
3RD CLEANER CON. D	N.A.	N.A.	N.A.	N.A.	N.A.	6.91	27.1	8.47	7.72	N.A.
3RD CLEANER CON. E	N.A.	N.A.	N.A.	N.A.	N.A.	7.28	25.0	9.92	6.48	N.A.
3RD CLEANER CON. F	7	400	<50	110	<0.01	5.90	21.4	13.5	5.28	25.7
3RD CLEANER TAIL. F	N.A.	N.A.	N.A.	N.A.	N.A.	0.68	N.A.	N.A.	3.46	N.A.
2ND CLEANER TAIL. F	N.A.	N.A.	N.A.	N.A.	N.A.	0.25	N.A.	N.A.	1.46	N.A.
1ST CLEANER TAILS A	N.A.	N.A.	N.A.	N.A.	N.A.	0.11	N.A.	N.A.	0.37	N.A.
1ST CLEANER TAILS B	N.A.	N.A.	N.A.	N.A.	N.A.	0.14	N.A.	N.A.	0.50	N.A.
1ST CLEANER TAILS C	N.A.	N.A.	N.A.	N.A.	N.A.	0.14	N.A.	N.A.	0.49	N.A.
1ST CLEANER TAILS D	N.A.	N.A.	N.A.	N.A.	N.A.	0.10	N.A.	N.A.	0.33	N.A.
1ST CLEANER TAILS E	N.A.	N.A.	N.A.	N.A.	N.A.	0.10	N.A.	N.A.	0.36	N.A.
1ST CLEANER REGRIND CON F	N.A.	N.A.	N.A.	N.A.	N.A.	0.51	N.A.	N.A.	1.40	N.A.
1ST CLEANER REGRIND TAIL F	N.A.	N.A.	N.A.	N.A.	N.A.	0.05	N.A.	N.A.	0.46	N.A.
ROUGHER TAILS A	N.A.	N.A.	N.A.	N.A.	N.A.	0.05	N.A.	N.A.	0.14	N.A.
ROUGHER TAILS B	N.A.	N.A.	N.A.	N.A.	N.A.	0.05	N.A.	N.A.	0.16	N.A.
ROUGHER TAILS C	N.A.	N.A.	N.A.	N.A.	N.A.	0.05	N.A.	N.A.	0.15	N.A.
ROUGHER TAILS D	N.A.	N.A.	N.A.	N.A.	N.A.	0.05	N.A.	N.A.	0.15	N.A.
ROUGHER TAILS E	N.A.	N.A.	N.A.	N.A.	N.A.	0.05	N.A.	N.A.	0.15	N.A.
ROUGHER TAILS F	N.A.	N.A.	N.A.	N.A.	N.A.	0.04	N.A.	N.A.	0.13	N.A.
MAGNETIC CON F	N.A.	N.A.	N.A.	N.A.	N.A.	0.28	N.A.	N.A.	0.45	N.A.
MAGNETIC TAIL F	N.A.	N.A.	N.A.	N.A.	N.A.	0.03	N.A.	N.A.	0.21	N.A.

SGS

Final : VC120590 Revision REVISED Order: PO: 50149-001/ TEST: LCT 2

Element	Hg
Method	ICM14B
Det.Lim.	0.01
Units	ppm
3RD CLEANER CON. A	N.A.
3RD CLEANER CON. B	N.A.
3RD CLEANER CON. C	N.A.
3RD CLEANER CON. D	N.A.
3RD CLEANER CON. E	N.A.
3RD CLEANER CON. F	0.71
3RD CLEANER TAIL. F	N.A.
2ND CLEANER TAIL. F	N.A.
1ST CLEANER TAILS A	N.A.
1ST CLEANER TAILS B	N.A.
1ST CLEANER TAILS C	N.A.
1ST CLEANER TAILS D	N.A.
1ST CLEANER TAILS E	N.A.
1ST CLEANER REGRIND CON F	N.A.
1ST CLEANER REGRIND TAIL F	N.A.
ROUGHER TAILS A	N.A.
ROUGHER TAILS B	N.A.
ROUGHER TAILS C	N.A.
ROUGHER TAILS D	N.A.
ROUGHER TAILS E	N.A.
ROUGHER TAILS F	N.A.
MAGNETIC CON F	N.A.
MAGNETIC TAIL F	N.A.

Client	**(8117) Jalal Tajadod**	Received	**02-Apr-12 13:48**
Reference	**LCT 1 continued**	Requested	**04-Apr-12 13:48**
Project	**CAVM-50149-001**	Created	**02-Apr-12 13:48**
Batch	**0013-APR12**	Finished	**15-May-12 12:43**
Supervisor	**ricea**	Samples	**5,0,0 - 6**

Tag	Type	Sample ID	Rh ppb	Ru ppb	Ir ppb	Os ppb
1	SMP	LCT 1 Cu Clnr 1 Con E,F,G combined	177	192	150	140
2	SMP	LCT 1 Cu Ro Tail E,F,G Combined	323	455	329	270
3	SMP	LCT 1 Ni 3rd Clnr Con E,F,G Combine	311	430	338	290
4	SMP	LCT 1 Ni 1st Clnr Tail E,F,G Combine	90	112	106	72
5	SMP	LCT 1 Ni Scav Tail E,F,G Combined	< 20	< 50	23	19

Tag	Buck wt. g
1	15
2	14
3	15
4	15.5
5	15.5

Client	**(8117) Jalal Tajadod**	Received	**22-Mar-12 08:43**
Reference	**LCT 1**	Requested	**26-Mar-12 08:43**
Project	**CAVM-50149-001**	Created	**22-Mar-12 08:43**
Batch	**0288-MAR12**	Finished	**04-Apr-12 11:21**
Supervisor	**wattt**	Samples	**5,1,0 - 7**

Notes:
Samples received Mar20 instructions recieved
Mar22/12-nb
Cancelled Rh, Ru, Ir and Os. Client will send more sample
and log under a new Lims. Mar 30/12 Tom Watt

Tag	Type	Sample ID	Co %	Au g/t	Pt g/t	Pd g/t
1	SMP	LCT 1 Cu Clnr 1 Con E,F,G Combined	0.045	1.44	2.16	4.83
2	SMP	LCT 1 Cu Ro Tail E,F,G, Combined	0.87	0.32	3.34	10.9
3	SMP	LCT 1 Ni 3rd Clnr Con E,F,G Combine	0.36	0.43	5.72	5.90
4	SMP	LCT 1 Ni 1st Clnr Tail E,F,G Combine	0.023	0.05	1.02	0.61
5	SMP	LCT 1 Ni Scav Tail E,F,G Combined	< 0.01	0.02	0.22	0.09

Tag	Buck wt. g
1	21
2	16.1
3	5.4
4	17.1
5	39.7

Appendix C – Comminution Testing

SGS Minerals Services

Standard Bond Ball Mill Grindability Test

Project No.:	50149-001 Product: Minus 6 Mesh Date: SEPT 13,2011
Sample.:	MC Comp
Purpose:	To determine the ball mill grindability of the sample in terms of a Bond work index number.
Procedure:	The equipment and procedure duplicate the Bond method for determining ball mill work indices.

Test Conditions:	Mesh of grind:	150	mesh
	Test feed weight (700 mL):	1431.1	grams
	Equivalent to : 2044 kg/m³ at Minus 6 mesh		
	Weight % of the undersize material in the ball mill feed:	4.2	%
	Weight of undersize product for 250% circulating load:	409	grams
Results:	Average for Last Three Stages = **0.91g.**	**246%**	Circulation load

CALCULATION OF A BOND WORK INDEX

$$BWI = \frac{44.5}{P1^{0.23} \times Grp^{0.82} \times \left\{ \frac{10}{\sqrt{P}} - \frac{10}{\sqrt{F}} \right\}}$$

P1 = 100% passing size of the product	106	microns
Grp = Grams per revolution	0.91	grams
P80 = 80% passing size of product	80	microns
F80 = 80% passing size of the feed	2621	microns

BWI = **17.9** (imperial)

BWI = **19.7** (metric)

Grindability Test Data Project No.: 50149-001 Test No.: MC Comp

Stage No.	Revs	New Feed (grams)	Undersize In Feed (grams)	Undersize To Be Ground (grams)	U'Size In Product (grams)	Undersize Product Total (grams)	Undersize Product Per Mill Rev (grams)
1	150	1,431	60	349	229	169	1.13
2	354	229	10	399	302	292	0.83
3	480	302	13	396	411	399	0.83
4	472	411	17	392	437	419	0.89
5	440	437	18	391	415	396	0.90
6	435	415	17	392	408	390	0.90
7	437	408	17	392	420	403	0.92

Average for Last Three Stages = 414g. 0.91g.

Feed K80

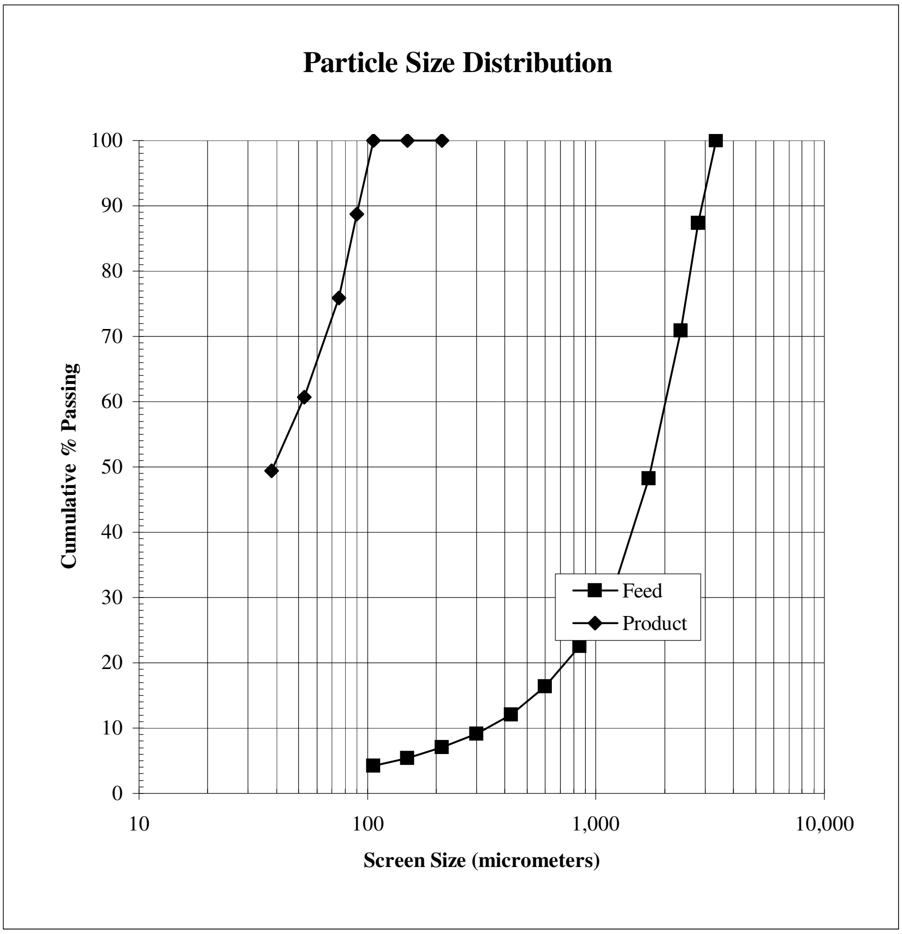
Size Mesh	Size µm	Weight grams	% Retained Individual	% Retained Cumulative	% Passing Cumulative
6	3,360	0.0	0.0	0.0	100.0
7	2,800	31.2	12.6	12.6	87.4
8	2,360	40.8	16.5	29.1	70.9
10	1,700	55.8	22.6	51.7	48.3
14	1,180	43.4	17.6	69.3	30.7
20	850	20.2	8.2	77.5	22.5
28	600	15.1	6.1	83.6	16.4
35	425	10.8	4.4	88.0	12.0
48	300	7.2	2.9	90.9	9.1
65	212	5.0	2.0	92.9	7.1
100	150	4.2	1.7	94.6	5.4
150	106	3.0	1.2	95.8	4.2
Pan	-106	10.3	4.2	100.0	0.0
Total	**-**	**247.0**	**100.0**	**-**	**-**

K80 **2,621**

Product K80

Size Mesh	Size µm	Weight grams	% Retained Individual	% Retained Cumulative	% Passing Cumulative
65	212	0.0	0.0	0.0	100.0
100	150	0.0	0.0	0.0	100.0
150	106	0.0	0.0	0.0	100.0
170	90	17.2	11.2	11.2	88.8
200	75	19.7	12.9	24.1	75.9
270	53	23.4	15.3	39.4	60.6
400	38	17.2	11.2	50.6	49.4
Pan	-38	75.7	49.4	100.0	0.0
Total	**-**	153.2	**100.0**	**-**	**-**

K80 **80**


Particle Size Distribution
Cumulative % Passing
Screen Size (micrometers)
Feed
Product
0
10
20
30
40
50
60
70
80
90
100
10
100
1,000
10,000

SGS Minerals Services

STANDARD BOND ABRASION TEST

Project No.:	50149-001	Date (mm/dd/yy):	21-Sep-11
Sample:	MASTER COMP		

Purpose: To determine the Abrasion Index of the sample

Procedure: The equipment and procedure duplicate the Bond method for determining an abrasion index.

Feed: 1,600 grams minus 3/4 inch plus 1/2 inch fraction

Results:	Original paddle weight, grams:	94.4255
	Final paddle weight, grams:	94.3375
	Abrasion Index, Ai:	**0.088**

Predicted Wear Rates:

		lb/kwh	kg/kwh
Wet rod mill, rods:	0.35*(Ai-0.020)^0.20	0.20	0.09
Wet rod mill, liners:	0.035*(Ai-0.015)^0.30	0.016	0.007
Ball Mill (overflow and grate discharge types)			
Wet ball mill, balls:	0.35*(Ai-0.015)^0.33	0.15	0.067
Wet ball mill, liners:	0.026*(Ai-0.015)^0.30	0.012	0.0054
Ball Mill (grate discharge type)			
Dry ball mill, balls:	0.05*(Ai)^0.5	0.015	0.007
Dry ball mill, liners:	0.005*(Ai)^0.5	0.0015	0.0007
Crushers (gyratory, jaw, cone)			
Crusher, liners:	(Ai+0.22)/11	0.028	0.013
Roll crusher, shells:	(Ai/10)^0.67	0.042	0.019

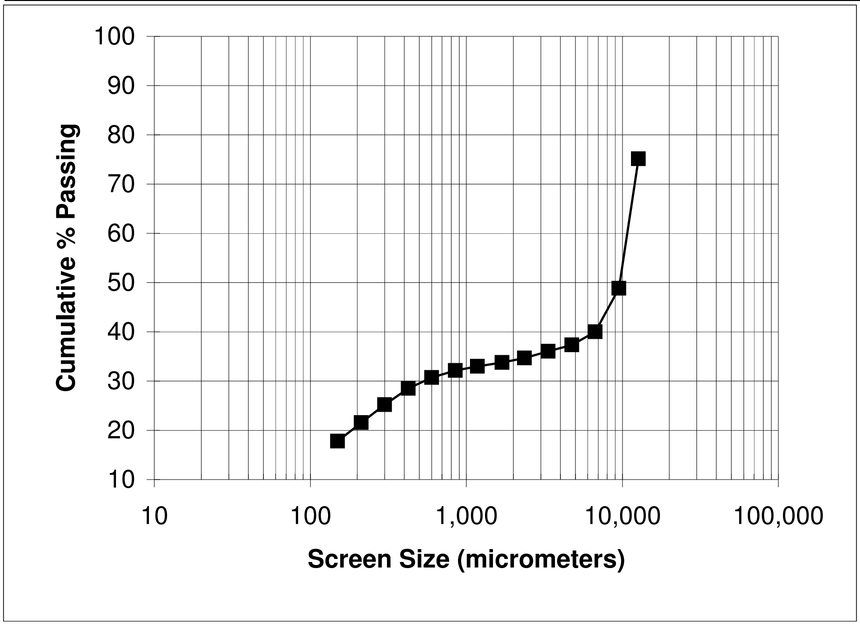
SGS Minerals Services

STANDARD BOND ABRASION TEST

Project No.: 50149-001 Date: 21-Sep-11
Sample: MASTER COMP

Product Particle Size Analysis

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
1/2 in	12,700	199.3	24.8	24.8	75.2
3/8 in	9,500	211.4	26.3	51.2	48.8
3	6,700	70.9	8.84	60.0	40.0
4	4,750	21.0	2.62	62.6	37.4
6	3,350	10.6	1.32	64.0	36.0
8	2,360	10.9	1.36	65.3	34.7
10	1,700	7.10	0.88	66.2	33.8
14	1,180	6.30	0.79	67.0	33.0
20	850	6.80	0.85	67.8	32.2
28	600	11.6	1.45	69.3	30.7
35	425	17.8	2.22	71.5	28.5
48	300	26.4	3.29	74.8	25.2
65	212	29.1	3.63	78.4	21.6
100	150	30.4	3.79	82.2	17.8
-100	-150	142.8	17.8	100.0	-
	Total	802.4	100.0	**K80**	**13,868**



Appendix D – Grind Calibration Tests

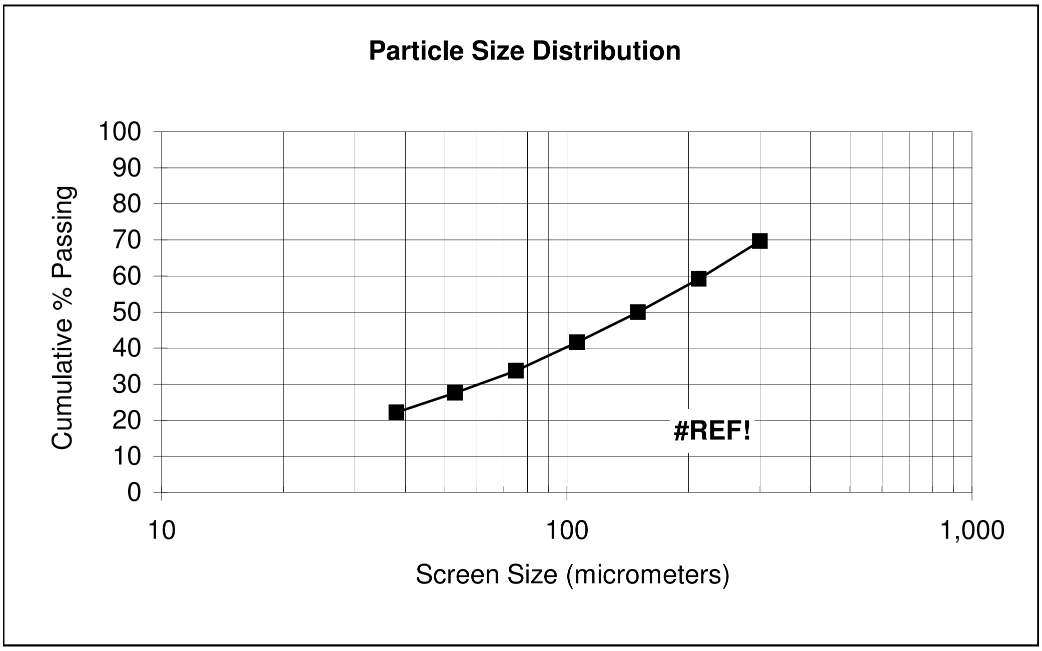
SGS Minerals Services
Size Distribution Analysis

Date:Sept. 14, 2011

Project No. **50149-001**

Sample: **MC (2Kg)** Test No.: **20minutes**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	77.9	30.4	30.4	69.6
65	212	26.7	10.4	40.8	59.2
100	150	23.7	9.2	50.0	50.0
150	106	21.5	8.4	58.4	41.6
200	75	20.3	7.9	66.3	33.7
270	53	15.6	6.1	72.4	27.6
400	38	14.0	5.5	77.9	22.1
Pan	-38	56.8	22.1	100.0	0.0
Total	**-**	**256.5**	100.0	**-**	**-**
K80	**#REF!**				



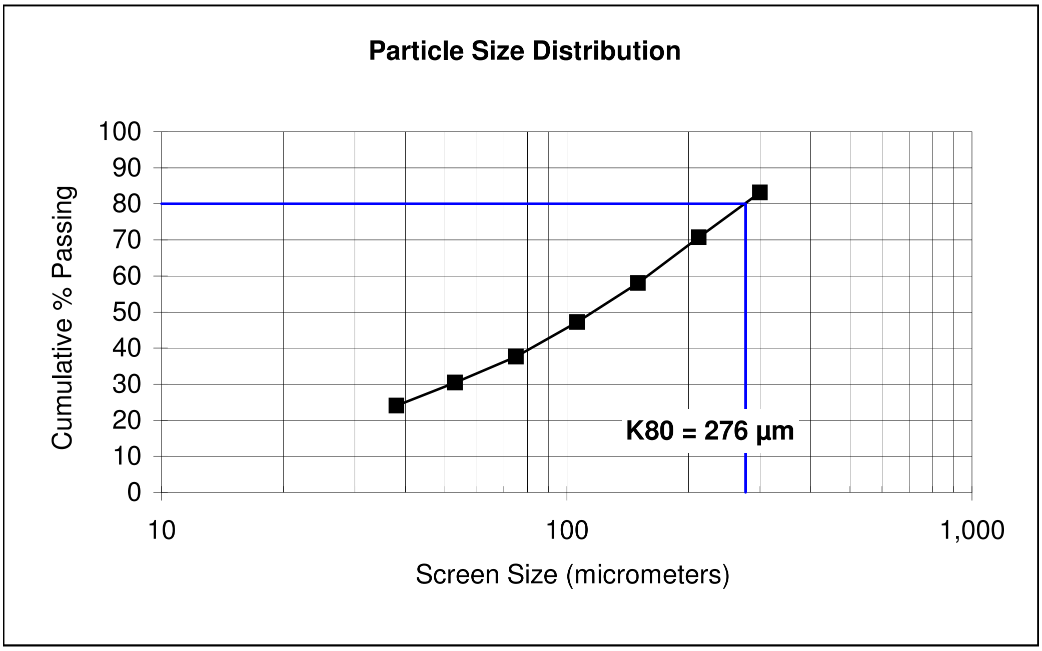
SGS Minerals Services

Date:Sept. 14, 2011 **Size Distribution Analysis**

Project No. **50149-001**

Sample: **MC (2Kg)** Test No.: **30minutes**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	45.2	16.9	16.9	83.1
65	212	33.3	12.4	29.3	70.7
100	150	33.9	12.6	41.9	58.1
150	106	29.1	10.9	52.8	47.2
200	75	25.7	9.6	62.4	37.6
270	53	19.2	7.2	69.6	30.4
400	38	17.2	6.4	76.0	24.0
Pan	-38	64.4	24.0	100.0	0.0
Total	**-**	**268.0**	100.0	**-**	**-**
K80	**276**				



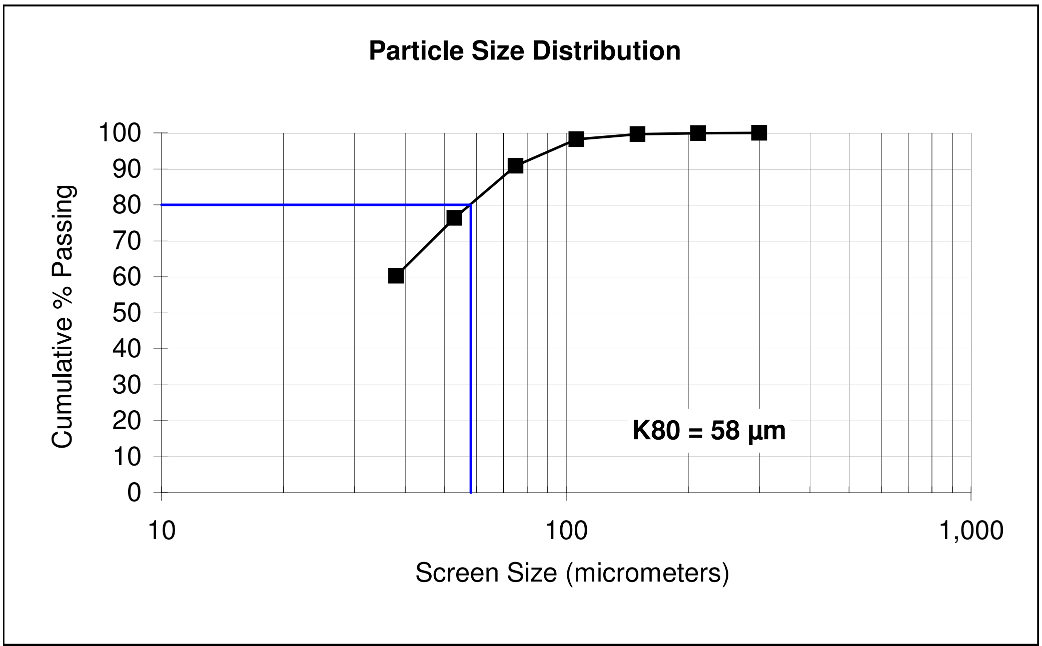
SGS Minerals Services
Size Distribution Analysis

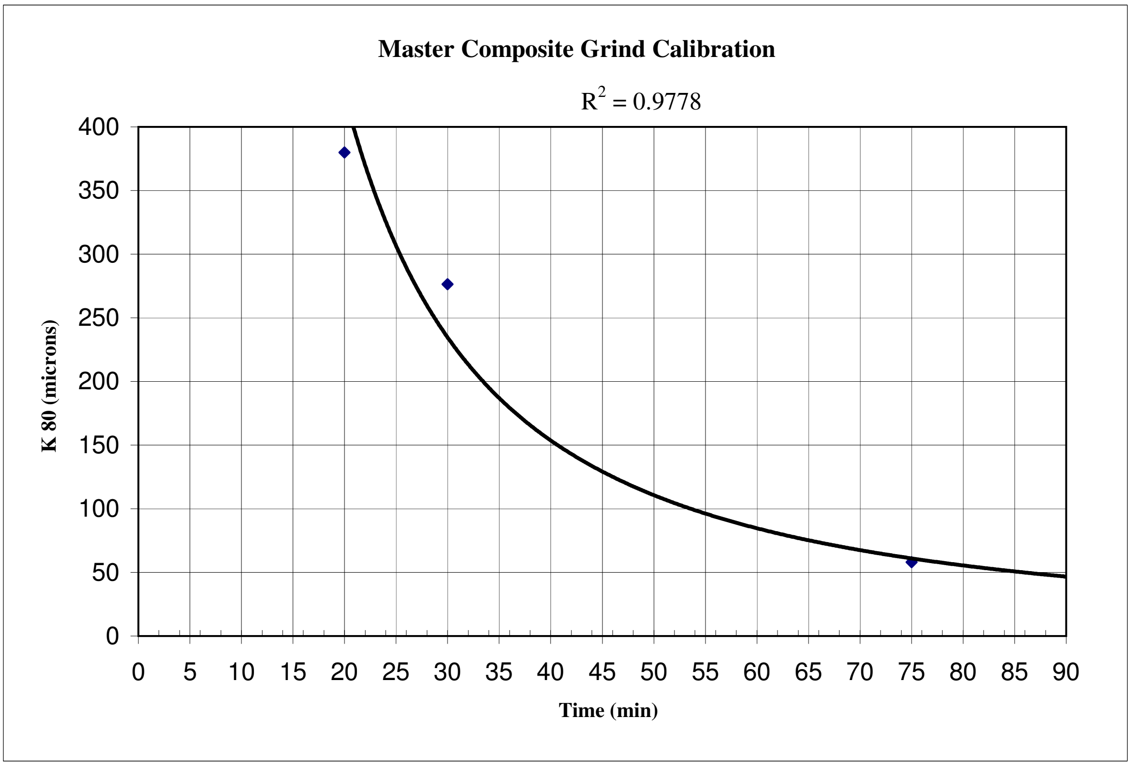
Date:Sept. 14, 2011

Project No. **50149-001**

Sample: **MC (2Kg)** Test No.: **75minutes**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	0.1	0.0	0.0	100.0
65	212	0.2	0.1	0.1	99.9
100	150	0.5	0.2	0.3	99.7
150	106	3.7	1.4	1.8	98.2
200	75	19.0	7.4	9.2	90.8
270	53	36.8	14.4	23.6	76.4
400	38	41.3	16.2	39.8	60.2
Pan	-38	153.9	60.2	100.0	0.0
Total	**-**	**255.5**	100.0	**-**	**-**
K80	**58**				



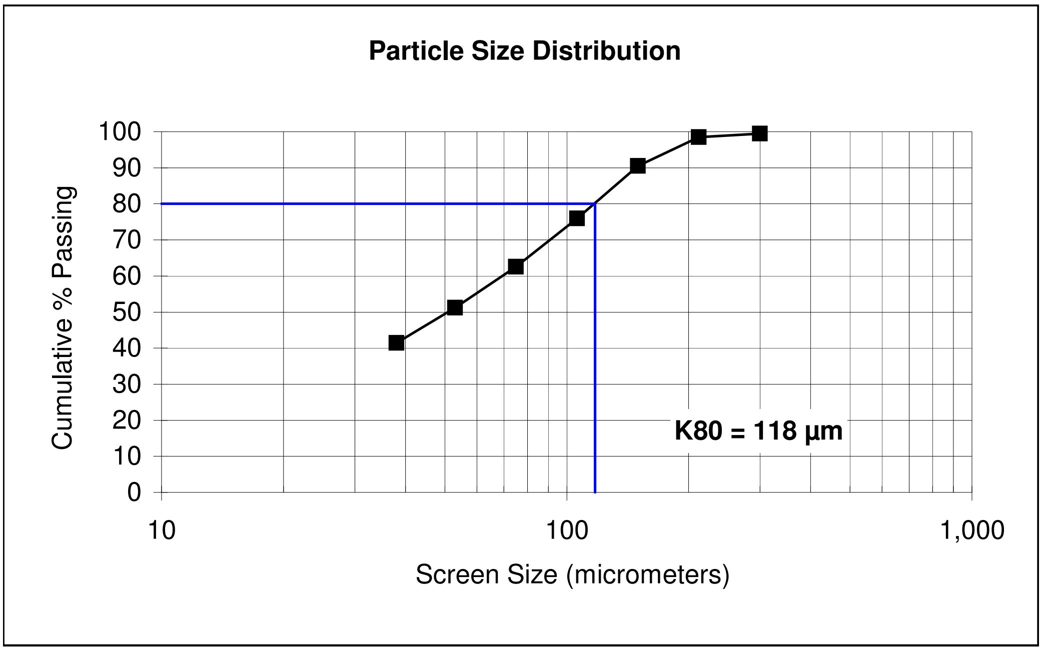


Master Composite Grind Calibration
$R^2 = 0.9778$
K 80 (microns)
400
350
300
250
200
150
100
50
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90
Time (min)

	SGS Minerals Services	Project No.
Date:Sept. 14, 2011	**Size Distribution Analysis**	**50149-001**

Sample: **High Ni Composite** Test No.: **2kg-50 minutes**

Size		Weight	% Retained		% Passing
Mesh	µm	grams	Individual	Cumulative	Cumulative
48	300	1.3	0.5	0.5	99.5
65	212	2.3	1.0	1.5	98.5
100	150	19.3	8.0	9.5	90.5
150	106	35.3	14.6	24.1	75.9
200	75	32.4	13.4	37.5	62.5
270	53	27.4	11.3	48.8	51.2
400	38	23.7	9.8	58.6	41.4
Pan	-38	100.1	41.4	100.0	0.0
Total	**-**	**241.8**	100.0	**-**	**-**
K80	**118**				



Appendix E – Flotation Tests

Test No.: F1 **Project No.:** 50149-001 **Operator:** YW **Date:** September 15 2011

Purpose: Rougher flotation sighter test
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 57 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Feed K_{80} :90 µm

Conditions:

Stage	Reagents added, grams per tonne							Time, minutes			pH
	245	SIPX	3477	PAX	CMC	Lime	MIBC*	Grind	Cond.	Froth	
Grind								57			
Condition		40					10		1		9.0
Rougher 1										4	
Condition		30					5		1		8.8
Rougher 2										6	
Condition		30					5		1		8.9
Rougher 3										8	
Total	0	100	0	0	0	0	20	57	3	18	

* As required

Stage	Rougher
Flotation Cell	1000-D12
Speed: rpm	1800

Assay for: Cu, Ni, S, Pt, Pd, Au
PSA on tail

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
Ro Conc 1	191.6	11.1	2.81	3.00	11.3	1.78	3.33	0.351	84.7	70.8	39.7	44.8	73.1	72.5
Ro Conc 2	148.5	8.57	0.23	0.50	7.91	1.11	0.62	0.064	5.4	9.1	21.5	21.7	10.5	10.2
Ro Conc 3	150.0	8.65	0.09	0.26	5.77	0.54	0.30	0.032	2.1	4.8	15.8	10.6	5.1	5.2
Ro Tail	1244	71.7	0.04	0.10	1.01	0.14	0.08	0.009	7.8	15.3	23.0	22.9	11.3	12.1
Head (calc.)	1734	100	0.37	0.47	3.15	0.44	0.50	0.053	100	100	100	100	100	100
Head (direct)			0.33	0.42	2.53	0.41	0.45	0.040						

Combined Prod	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
Ro Conc 1	191.6	11.1	2.81	3.00	11.3	1.78	3.33	0.35	84.7	70.8	39.7	44.8	73.1	72.5
Ro Conc 1-2	340.1	19.6	1.68	1.91	9.84	1.49	2.15	0.23	90.1	79.9	61.2	66.5	83.7	82.8
Ro Conc 1-3	**490.1**	**28.3**	**1.20**	**1.40**	**8.60**	**1.20**	**1.58**	**0.17**	**92.2**	**84.7**	**77.0**	**77.1**	**88.7**	**87.9**

Product	Weight		Assays, %				% Distribution			
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue
Rougher 1	191.6	11.1	8.14	8.40	15.0	68.4	84.7	73.2	26.7	8.3
Rougher 2	148.5	8.57	0.67	1.21	19.2	79.0	5.4	8.2	26.4	7.4
Rougher 3	150.0	8.65	0.26	0.58	14.4	84.7	2.1	3.9	20.1	8.0
Rougher Tail	1244	71.7	0.12	0.26	2.33	97.3	7.8	14.7	26.8	76.3
Head (calc.)	1734	100	1.06	1.27	6.22	91.4	100	100	100	100
Combined Products										
Ro Conc 1		11.1	8.14	8.40	15.0	68.4	84.7	73.2	26.7	8.3
Ro Conc 1-2		19.6	4.88	5.26	16.8	73.0	90.1	81.4	53.1	15.7
Ro Conc 1-3		28.3	3.47	3.83	16.1	76.6	92.2	85.3	73.2	23.7
Ro Tail		71.7	0.12	0.26	2.33	97.3	7.82	14.7	26.8	76.3

Test No.: F2 **Project No.**: 50149-001 **Operator**: YW **Date**: September 15 2011

Purpose: Rougher flotation sighter test
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 57 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Feed K_{80} :92 µm

Conditions:

Stage	Reagents added, grams per tonne							Time, minutes			pH
	245	SIPX	3477	PAX	CMC	Lime	MIBC*	Grind	Cond.	Froth	
Grind								57			
Condition				30			10		1		9.1
Rougher 1										4	
Condition				30			5		1		8.9
Rougher 2										6	
Condition				20			5		1		8.9
Rougher 3										8	
Total	0	0	0	80	0	0	20	57	3	18	

* As required

Stage	Rougher
Flotation Cell	1000-D12
Speed: rpm	1800

Assay for: Cu, Ni, S, Pt, Pd, Au
PSA on tail

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
Ro Conc 1	180.8	9.12	3.10	2.73	8.92	1.16	2.56	0.193	79.0	53.7	26.3	26.2	57.2	47.3
Ro Conc 2	184.5	9.31	0.30	1.06	8.08	1.29	0.75	0.063	7.80	21.3	24.3	29.7	17.1	15.7
Ro Conc 3	127.7	6.44	0.15	0.40	6.60	0.78	0.44	0.039	2.70	5.56	13.7	12.4	6.96	6.75
Ro Tail	1489	75.1	0.05	0.12	1.47	0.17	0.10	0.015	10.5	19.4	35.7	31.6	18.8	30.2
Head (calc.)	1982	100	0.36	0.46	3.10	0.40	0.41	0.037	100	100	100	100	100	100
Head (direct)			0.33	0.42	2.53	0.41	0.45	0.040						

Combined Prod	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
Ro Conc 1	180.8	9.12	3.10	2.73	8.92	1.16	2.56	0.19	79.0	53.7	26.3	26.2	57.2	47.3
Ro Conc 1-2	365.3	18.4	1.69	1.89	8.50	1.23	1.65	0.13	86.8	75.0	50.6	55.9	74.3	63.0
Ro Conc 1-3	**493.0**	**24.9**	**1.29**	**1.50**	**8.00**	**1.11**	**1.33**	**0.10**	**89.5**	**80.6**	**64.3**	**68.4**	**81.2**	**69.8**

Product	Weight		Assays, %				% Distribution			
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue
Rougher 1	180.8	9.12	8.99	7.70	8.51	74.8	79.0	56.0	12.7	7.45
Rougher 2	184.5	9.31	0.87	2.82	18.0	78.3	7.80	20.9	27.5	7.96
Rougher 3	127.7	6.44	0.43	0.96	16.1	82.5	2.70	4.92	17.0	5.80
Rougher Tail	1489	75.1	0.14	0.30	3.47	96.1	10.5	18.1	42.7	78.8
Head (calc.)	1982	100.0	1.04	1.26	6.1	91.6	100	100	100	100
Combined Products										
Ro Conc 1		9.12	8.99	7.70	8.51	74.8	79.0	56.0	12.7	7.45
Ro Conc 1-2		18.4	4.89	5.24	13.3	76.6	86.8	76.9	40.2	15.4
Ro Conc 1-3		24.9	3.73	4.13	14.0	78.1	89.5	81.9	57.3	21.2
Ro Tail		75.1	0.14	0.30	3.47	96.1	10.5	18.1	42.7	78.8

Test No.: F3 **Project No.**: 50149-001 **Operator**: YW **Date**: September 23 2011

Purpose: Rougher Flotation test, Decrease SIPX
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 57minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Target Feed K_{80} :90 µm

Conditions:

Stage	Reagents added, grams per tonne							Time, minutes			pH	Eh
	245	SIPX	3477	PAX	CMC	MIBC*	DF 250	Grind	Cond.	Froth		
Grind		5						57				
Condition									1			
Rougher 1						10			1	2	8.8	53
Rougher 2		5				5			1	2	8.7	42
Rougher 3		10				5			1	4	8.7	22
Rougher 4		20				5			1	4	8.8	0.6
Rougher 5		30							1	8	8.7	23
Total	0	70	0	0	0	25	0	57	6	20		

* As required

Stage	Rougher
Flotation Cell	1000-D12
Speed: rpm	1800

Assay for: Cu, Ni, S, Pt, Pd, Au

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
Ro Conc 1	68.8	3.47	2.26	0.38	3.81	0.50	2.55	0.14	22.1	2.84	4.40	3.90	19.7	11.0
Ro Conc 2	93.2	4.70	4.53	4.75	12.5	2.04	3.92	0.33	60.1	48.1	19.6	21.6	41.0	35.2
Ro Conc 3	86.7	4.37	0.61	2.25	9.47	2.19	1.41	0.10	7.53	21.2	13.8	21.5	13.7	9.92
Ro Conc 4	40.6	2.05	0.27	0.69	9.34	1.91	0.71	0.06	1.56	3.05	6.36	8.79	3.24	2.79
Ro Conc 5	68.3	3.44	0.15	0.48	11.4	1.43	0.53	0.05	1.46	3.56	13.1	11.1	4.06	3.91
Ro Tail	1626	82.0	0.03	0.12	1.57	0.18	0.10	0.02	7.18	21.2	42.8	33.2	18.3	37.2
			Ro Tails Ni(s)=0.061											
Head (calc.)	1983	100	0.35	0.46	3.00	0.44	0.45	0.04	100	100	100	100	100	100
Head (direct)			0.33	0.42	2.53	0.41	0.45	0.04						

Combined Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
Ro Conc 1	68.8	3.47	2.26	0.38	3.81	0.50	2.55	0.14	22.1	2.84	4.40	3.90	19.7	11.0
Ro Conc 1-2	162.0	8.17	3.57	2.89	8.81	1.39	3.34	0.25	82.3	51.0	24.0	25.4	60.7	46.2
Ro Conc 1-3	248.7	12.5	2.54	2.67	9.04	1.67	2.67	0.20	89.8	72.2	37.7	47.0	74.4	56.1
Ro Conc 1-4	289.3	14.6	2.22	2.39	9.08	1.70	2.39	0.18	91.4	75.2	44.1	55.8	77.7	58.9
Ro Conc 1-5	**357.6**	**18.0**	**1.82**	**2.03**	**9.52**	**1.65**	**2.04**	**0.15**	**92.8**	**78.8**	**57.2**	**66.8**	**81.7**	**62.8**

Product	Weight		Assays, %				% Distribution			
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue
Rougher 1	68.8	3.47	6.55	1.05	3.08	89.3	22.1	2.90	1.82	3.37
Rougher 2	93.2	4.70	13.1	13.5	9.11	64.3	60.1	50.3	7.29	3.29
Rougher 3	86.7	4.37	1.77	6.22	17.9	74.1	7.53	21.6	13.3	3.53
Rougher 4	40.6	2.05	0.78	1.72	22.4	75.1	1.56	2.79	7.80	1.67
Rougher 5	68.3	3.44	0.43	1.04	28.7	69.8	1.46	2.86	16.8	2.62
Rougher Tail	1626	82.0	0.09	0.30	3.79	95.8	7.18	19.5	52.9	85.5
Head (calc.)	1983	100	1.03	1.26	5.87	91.8	100	100	100	100
Combined Products										
Ro Conc 1		3.47	6.55	1.05	3.08	89.3	22.1	2.90	1.82	3.37
Ro Conc 1-2		8.17	10.3	8.19	6.55	74.9	82.3	53.2	9.11	6.66
Ro Conc 1-3		12.5	7.35	7.51	10.5	74.6	89.8	74.8	22.4	10.2
Ro Conc 1-4		14.6	6.43	6.69	12.2	74.7	91.4	77.6	30.2	11.9
Ro Conc 1-5		18.0	5.28	5.62	15.3	73.8	92.8	80.5	47.1	14.5
Ro Tail		82.0	0.09	0.30	3.79	95.8	7.18	19.5	52.9	85.5

Test No.: F4 **Project No.**: 50149-001 **Operator**: YW **Date**: September 23 2011

Purpose: Rougher Flotation test, Increase pH using Soda ash
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 57minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Target Feed K_{80} : :90 µm

Conditions:

Stage	Reagents added, grams per tonne							Time, minutes			pH	Eh
	Soda ash	SIPX	3477	PAX	CMC	MIBC*	DF 250	Grind	Cond.	Froth		
Grind	400	5						57				
Condition									1			
Rougher 1	654					10			1	2	9.8	-11
Rougher 2		5				5			1	2	9.6	15
Rougher 3		10				5			1	4	9.5	-0.6
Rougher 4		20				5			1	4	9.5	-11
Rougher 5		30							1	8	9.5	-21
Total	1054	70	0	0	0	25	0	57	6	20		

* As required

Stage	Rougher
Flotation Cell	1000-D12
Speed: rpm	1800

Assay for: Cu, Ni, S, Pt, Pd, Au

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
Ro Conc 1	59.9	3.02	1.86	0.38	3.55	0.61	3.73	0.14	15.7	2.54	3.36	4.48	25.4	8.64
Ro Conc 2	93.8	4.72	4.99	5.24	15.1	2.24	3.84	0.43	66.0	54.8	22.4	25.8	41.0	41.5
Ro Conc 3	124	6.25	0.48	1.36	9.94	1.96	1.09	0.09	8.41	18.8	19.5	29.8	15.4	11.5
Ro Conc 4	48.5	2.44	0.23	0.47	7.70	1.43	0.59	0.05	1.57	2.54	5.90	8.50	3.26	2.50
Ro Conc 5	79.4	4.00	0.12	0.41	12.5	1.04	0.46	0.04	1.34	3.63	15.7	10.1	4.16	3.27
Ro Tail	1580	79.6	0.03	0.10	1.33	0.11	0.06	0.02	6.91	17.6	33.2	21.3	10.8	32.5
Head (calc.)	1985.9	100	0.36	0.45	3.19	0.41	0.44	0.049	100	100	100	100	100	100
Head (direct)			0.33	0.42	2.53	0.41	0.45	0.040						

Combined Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
Ro Conc 1	59.90	3.02	1.86	0.38	3.55	0.61	3.73	0.14	15.7	2.54	3.36	4.48	25.4	8.64
Ro Conc 1-2	153.7	7.74	3.77	3.35	10.6	1.60	3.80	0.32	81.8	57.4	25.7	30.2	66.4	50.2
Ro Conc 1-3	277.8	14.0	2.30	2.46	10.3	1.76	2.59	0.22	90.2	76.2	45.2	60.1	81.8	61.7
Ro Conc 1-4	326.3	16.4	1.99	2.16	9.92	1.71	2.29	0.19	91.7	78.7	51.1	68.6	85.1	64.2
Ro Conc 1-5	**405.7**	**20.4**	**1.63**	**1.82**	**10.4**	**1.58**	**1.93**	**0.16**	**93.1**	**82.4**	**66.8**	**78.7**	**89.2**	**67.5**

Product	Weight		Assays, %				% Distribution			
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue
Rougher 1	59.9	3.02	5.39	1.05	3.47	90.1	15.7	2.59	1.64	2.97
Rougher 2	93.8	4.72	14.5	14.8	13.5	57.2	66.0	57.5	10.0	2.96
Rougher 3	124	6.25	1.39	3.64	21.7	73.3	8.41	18.7	21.3	5.01
Rougher 4	48.5	2.44	0.67	1.13	18.7	79.5	1.57	2.27	7.15	2.13
Rougher 5	79.4	4.00	0.35	0.81	31.9	67.0	1.34	2.65	20.0	2.93
Rougher Tail	1580	79.6	0.09	0.25	3.20	96.5	6.91	16.3	39.9	84.0
Head (calc.)	1985.9	100.0	1.03	1.22	6.38	91.4	100	100	100	100
Combined Products										
Ro Conc 1		3.02	5.4	1.05	3.47	90.1	15.7	2.59	1.64	3.0
Ro Conc 1-2		7.74	10.9	9.45	9.62	70.0	81.8	60.1	11.7	5.9
Ro Conc 1-3		14.0	6.7	6.85	15.0	71.5	90.2	78.8	32.9	10.9
Ro Conc 1-4		16.4	5.8	6.00	15.6	72.7	91.7	81.1	40.1	13.1
Ro Conc 1-5		20.4	4.7	4.99	18.8	71.5	93.1	83.7	60.1	16.0
Ro Tail		79.6	0.09	0.25	3.20	96.5	6.91	16.3	39.93	84.0

Test No.: F5 **Project No.**: 50149-001 **Operator**: YW **Date**: September 29 2011

Purpose: Rougher Flotation test, Repeat F3, finer primary grind
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 88 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Feed K_{80} :50 µm

Conditions:

Stage	Reagents added, grams per tonne							Time, minutes			pH	Eh
	245	SIPX	3477	PAX	CMC	MIBC*	DF 250	Grind	Cond.	Froth		
Grind		5						88				
Condition									1			
Rougher 1						10			1	2	9.0	-42.0
Rougher 2		5				5			1	2	8.9	20.4
Rougher 3		10				5			1	4	8.9	15.2
Rougher 4		20				5			1	4	8.9	14.1
Rougher 5		30							1	8	8.9	4.8
Total	0	70	0	0	0	25	0	88	6	20		

* As required

Stage	Rougher
Flotation Cell	1000-D12
Speed: rpm	1800

Assay for: Cu, Ni, S, Pt, Pd, Au
PSA on tail
Assays to Lakefield

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
Ro Conc 1	72.0	3.63	0.32	0.37	1.94	1.70	5.38	0.28	3.25	2.85	2.38	13.1	40.4	26.7
Ro Conc 2	86.3	4.36	5.93	1.64	8.62	1.96	2.29	0.11	72.1	15.1	12.7	18.1	20.6	12.6
Ro Conc 3	110	5.53	1.05	4.72	9.20	1.72	1.12	0.07	16.2	55.3	17.2	20.2	12.8	10.2
Ro Conc 4	71.2	3.59	0.24	0.66	7.85	1.32	0.61	0.06	2.41	5.02	9.54	10.1	4.53	5.66
Ro Conc 5	101	5.10	0.12	0.33	6.89	0.82	0.38	0.03	1.71	3.56	11.9	8.86	4.00	4.02
Ro Tail	1541	77.8	0.02	0.11	1.76	0.18	0.11	< 0.02	4.34	18.1	46.3	29.7	17.7	40.8
Head (calc.)	1981.1	100	0.358	0.47	2.96	0.47	0.484	0.038	100	100	100	100	100	100
Head (direct)			0.330	0.42	2.53	0.41	0.450	0.040						

Combined Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
Ro Conc 1	72.00	3.63	0.32	0.37	1.94	1.70	5.38	0.28	3.25	2.85	2.38	13.1	40.4	26.7
Ro Conc 1-2	158.3	7.99	3.38	1.06	5.58	1.84	3.70	0.19	75.3	18.0	15.1	31.2	61.0	39.3
Ro Conc 1-3	267.9	13.5	2.43	2.56	7.06	1.79	2.64	0.14	91.5	73.3	32.3	51.4	73.8	49.5
Ro Conc 1-4	339.1	17.1	1.97	2.16	7.23	1.69	2.22	0.12	94.0	78.3	41.8	61.4	78.3	55.1
Ro Conc 1-5	**440.1**	**22.2**	**1.54**	**1.74**	**7.15**	**1.49**	**1.79**	**0.10**	**95.7**	**81.9**	**53.7**	**70.3**	**82.3**	**59.2**

Product	Weight		Assays, %				% Distribution			
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue
Rougher 1	72.0	3.63	0.93	1.02	3.37	94.7	3.25	2.88	2.14	3.74
Rougher 2	86.3	4.36	17.2	4.65	2.81	75.3	72.1	15.8	2.14	3.57
Rougher 3	110	5.53	3.04	13.4	9.79	73.8	16.2	57.6	9.49	4.44
Rougher 4	71.2	3.59	0.70	1.67	18.6	79.1	2.41	4.69	11.7	3.09
Rougher 5	101	5.10	0.35	0.75	17.2	81.7	1.71	2.97	15.3	4.53
Rougher Tail	1541	77.8	0.06	0.26	4.35	95.3	4.34	16.0	59.2	80.6
Head (calc.)	1981	100	1.04	1.28	5.71	92	100	100	100	100
Combined Products										
Ro Conc 1		3.63	0.93	1.02	3.37	94.7	3.25	2.88	2.14	3.74
Ro Conc 1-2		7.99	9.79	3.00	3.06	84.1	75.3	18.7	4.29	7.31
Ro Conc 1-3		13.5	7.03	7.24	5.82	79.9	91.5	76.3	13.8	11.7
Ro Conc 1-4		17.1	5.70	6.07	8.49	79.7	94.0	81.0	25.5	14.8
Ro Conc 1-5		22.2	4.47	4.85	10.5	80.2	95.7	84.0	40.8	19.4
Ro Tail		77.8	0.06	0.26	4.35	95.3	4.34	16.0	59.2	80.6

Test No.: F6 **Project No.**: 50149-001 **Operator**: YW **Date**: September 29 2011

Purpose: Rougher Flotation test, Repeat F3, coarser primary grind
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 43 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Feed K_{80} :144 µm

Conditions:

Stage	Reagents added, grams per tonne							Time, minutes			pH	Eh
	245	SIPX	3477	PAX	CMC	MIBC*	DF 250	Grind	Cond.	Froth		
Grind		5						43				
Condition									1			
Rougher 1						10			1	2	8.9	11.5
Rougher 2		5				5			1	2	9.0	22.4
Rougher 3		10				5			1	4	8.9	21.4
Rougher 4		20				5			1	4	8.8	-5.0
Rougher 5		30							1	8	8.7	-12.3
Total	0	70	0	0	0	25	0	43	6	20		

* As required

Stage	Rougher
Flotation Cell	1000-D12
Speed: rpm	1800

Assay for: Cu, Ni, S, Pt, Pd, Au
PSA on tail
Assays to Lakefield

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
Ro Conc 1	86.4	4.36	5.59	2.75	10.7	0.33	1.01	0.09	67.1	26.2	15.5	3.51	10.6	9.63
Ro Conc 2	67.8	3.42	1.31	4.61	11.7	1.43	4.79	0.31	12.3	34.5	13.3	12.0	39.3	26.0
Ro Conc 3	98.0	4.94	0.53	1.13	8.21	1.92	2.09	0.12	7.21	12.2	13.5	23.2	24.8	14.6
Ro Conc 4	75.4	3.80	0.23	0.52	8.31	1.96	0.60	0.05	2.41	4.32	10.5	18.2	5.48	4.67
Ro Conc 5	111	5.62	0.10	0.33	7.24	1.20	0.36	0.05	1.55	4.05	13.5	16.5	4.86	6.90
Ro Tail	1544	77.9	0.044	0.11	1.30	0.14	0.08	< 0.02	9.43	18.7	33.7	26.6	15.0	38.2
Head (calc.)	1983.0	100	0.363	0.46	3.01	0.41	0.416	0.041	100	100	100	100	100	100
Head (direct)			0.330	0.42	2.53	0.41	0.450	0.040						

Combined Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
Ro Conc 1	86.40	4.36	5.59	2.75	10.7	0.33	1.01	0.09	67.1	26.2	15.5	3.51	10.6	9.63
Ro Conc 1-2	154.2	7.78	3.71	3.57	11.1	0.81	2.67	0.19	79.4	60.7	28.8	15.5	49.9	35.6
Ro Conc 1-3	252.2	12.7	2.47	2.62	10.0	1.24	2.45	0.16	86.6	72.9	42.3	38.7	74.7	50.2
Ro Conc 1-4	327.6	16.5	1.96	2.14	9.61	1.41	2.02	0.14	89.0	77.2	52.8	56.9	80.2	54.9
Ro Conc 1-5	**439.0**	**22.1**	**1.49**	**1.68**	**9.01**	**1.36**	**1.60**	**0.11**	**90.6**	**81.3**	**66.3**	**73.4**	**85.0**	**61.8**

Product	Weight		Assays, %				% Distribution			
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue
Rougher 1	86.4	4.36	16.2	7.78	6.48	69.5	67.1	27.4	4.81	3.30
Rougher 2	67.8	3.42	3.80	13.0	16.0	67.2	12.3	35.8	9.33	2.50
Rougher 3	98.0	4.94	1.54	3.03	17.6	77.9	7.21	12.1	14.8	4.19
Rougher 4	75.4	3.80	0.67	1.26	20.2	77.9	2.41	3.85	13.1	3.23
Rougher 5	111	5.62	0.29	0.74	18.1	80.8	1.55	3.33	17.4	4.94
Rougher Tail	1544	77.9	0.13	0.28	3.06	96.5	9.43	17.5	40.6	81.8
Head (calc.)	1983	100	1.05	1.24	5.87	91.8	100	100	100	100
Combined Products										
Ro Conc 1		4.36	16.2	7.78	6.48	69.5	67.1	27.4	4.81	3.30
Ro Conc 1-2		7.78	10.7	10.1	10.7	68.5	79.4	63.2	14.1	5.80
Ro Conc 1-3		12.7	7.17	7.33	13.3	72.1	86.6	75.3	28.9	10.0
Ro Conc 1-4		16.5	5.67	5.94	14.9	73.5	89.0	79.1	42.0	13.2
Ro Conc 1-5		22.1	4.31	4.62	15.7	75.3	90.6	82.5	59.4	18.2
Ro Tail		77.9	0.13	0.28	3.06	96.5	9.43	17.5	40.6	81.8

Test No.: F7 **Project No.**: 50149-001 **Operator**: YW **Date**: October 6 2011

Purpose: Rougher Flotation test, repeat F3 talc pre-float
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 57 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Target Feed K_{80} :90 µm

Conditions:

Stage	Reagents added, grams per tonne							Time, minutes			pH	Eh
	245	SIPX	3477	PAX	CMC	MIBC*	DF 250	Grind	Cond.	Froth		
Grind								57				
Talc Pre-Float 1						20			1	2	8.8	62.9
Talc Pre-Float 2						10			1	2		
Condition									1			
Rougher 1		5							1	2	8.6	34.4
Rougher 2		5				5			1	2	8.6	29.8
Rougher 3		10				5			1	4	8.6	20.4
Rougher 4		20							1	4	8.6	28.2
Rougher 5		30							1	8	8.7	22.8
Total	0	70	0	0	0	40	0	57	8	24		

* As required

Stage	Rougher
Flotation Cell	1000-D12
Speed: rpm	1800

Assay for: Cu, Ni, S, Pt, Pd, Au
To Lakefield

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
Talc Conc 1	67.1	3.40	0.65	0.24	1.19	0.26	1.09	0.05	6.14	1.79	1.32	2.03	7.72	4.18
Talc Conc 2	36.6	1.85	1.08	0.31	2.01	0.40	1.27	0.05	5.56	1.26	1.22	1.71	4.90	2.28
Ro Conc 1	66.3	3.36	7.82	4.05	14.8	2.27	6.41	0.46	73.0	29.9	16.22	17.5	44.9	38.0
Ro Conc 2	47.5	2.41	0.67	6.21	11.1	1.84	2.63	0.11	4.48	32.8	8.7	10.2	13.2	6.5
Ro Conc 3	65.7	3.33	0.30	1.10	8.07	2.08	1.13	0.06	2.78	8.04	8.8	15.9	7.8	4.92
Ro Conc 4	76.3	3.87	0.10	0.47	12.8	1.39	0.50	0.04	1.03	3.99	16.14	12.4	4.03	3.81
Ro Conc 5	169	8.57	0.04	0.24	7.12	0.59	0.21	0.02	0.93	4.52	19.9	11.6	3.75	4.22
Ro Tail	1444	73.2	0.03	0.11	1.16	0.17	0.09	< 0.02	6.10	17.7	27.7	28.6	13.7	36.0
Head (calc.)	1973	100	0.360	0.46	3.07	0.43	0.48	0.041	100	100	100	100	100	100
Head (direct)			0.330	0.42	2.53	0.41	0.45	0.040						

Combined Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
Talc Conc 1-2	**103.7**	**5.25**	**1.73**	**0.55**	**3.20**	**0.66**	**2.36**	**0.10**	**11.7**	**3.05**	**2.5**	**3.74**	**12.6**	**6.47**
Ro Conc 1	66.29	3.36	7.82	4.05	14.8	2.27	6.41	0.46	73.0	29.9	16.22	17.5	44.9	38.0
Ro Conc 1-2	113.8	5.77	4.84	4.95	13.3	2.09	4.83	0.31	77.5	62.7	24.9	27.7	58.0	44.6
Ro Conc 1-3	179.5	9.10	3.18	3.54	11.4	2.09	3.48	0.22	80.2	70.8	33.7	43.7	65.9	49.5
Ro Conc 1-4	255.8	13.0	2.26	2.63	11.8	1.88	2.59	0.17	81.3	74.7	49.9	56.0	69.9	53.3
Ro Conc 1-5	**424.9**	**21.5**	**1.37**	**1.68**	**9.93**	**1.37**	**1.64**	**0.11**	**82.2**	**79.3**	**69.8**	**67.6**	**73.7**	**57.5**

Product	Weight		Assays, %				% Distribution			
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue
Rougher 1	66.3	3.55	22.7	11.5	8.10	57.8	82.7	32.3	4.55	2.24
Rougher 2	47.5	2.54	1.94	17.6	12.1	68.3	5.07	35.5	4.89	1.90
Rougher 3	65.7	3.52	0.87	2.94	17.9	78.3	3.14	8.20	9.97	3.01
Rougher 4	76.3	4.08	0.28	0.97	32.6	66.2	1.17	3.14	21.1	2.95
Rougher 5	169	9.05	0.11	0.48	18.2	81.2	1.05	3.43	26.1	8.03
Rougher Tail	1444	77.3	0.09	0.28	2.73	96.9	6.91	17.4	33.4	81.9
Head (calc.)	1869.1	100	0.97	1.26	6.31	91.5	100	100	100	100
Combined Products										
Ro Conc 1		3.55	22.67	11.5	8.10	57.8	82.7	32.3	4.55	2.24
Ro Conc 1-2		6.09	14.0	14.0	9.78	62.2	87.7	67.9	9.44	4.14
Ro Conc 1-3		9.60	9.20	9.97	12.7	68.1	90.9	76.1	19.4	7.1
Ro Conc 1-4		13.7	6.54	7.29	18.7	67.5	92.0	79.2	40.5	10.1
Ro Conc 1-5		22.7	3.98	4.58	18.5	73.0	93.1	82.6	66.6	18.1
Ro Tail		77.3	0.09	0.28	2.73	96.9	6.91	17.4	33.4	81.9

Test No.: F8 **Project No.**: 50149-001 **Operator**: YW **Date**: October 6 2011

Purpose: Rougher Flotation test, repeat F3 add CMC in the rougher
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 57 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Target Feed K_{80} :90 µm

Conditions:

Stage	Reagents added, grams per tonne							Time, minutes			pH	Eh
	245	SIPX	3477	PAX	CMC	MIBC*	DF 250	Grind	Cond.	Froth		
Grind		5						57				
Condition									1			
Rougher 1					40	20			1	2	9.1	26.8
Rougher 2		5			10	5			1	2	9.1	14.8
Rougher 3		10			10				1	4	8.9	46.6
Rougher 4		20							1	4	8.9	-14.4
Rougher 5		30							1	8	8.9	-12.3
Total	0	70	0	0	60	25	0	57	6	20		

* As required

Stage	Rougher
Flotation Cell	1000-D12
Speed: rpm	1800

Assay for: Cu, Ni, S, Pt, Pd, Au
To Lakefield

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
Ro Conc 1	89.1	4.50	5.93	0.90	8.92	1.44	4.80	0.43	72.9	8.92	13.05	14.5	45.6	41.3
Ro Conc 2	77.3	3.90	1.15	6.61	13.8	2.18	2.73	0.14	12.3	56.8	17.5	19.0	22.5	11.7
Ro Conc 3	76.9	3.88	0.40	1.06	7.93	1.97	1.08	0.09	4.25	9.06	10.0	17.1	8.86	7.45
Ro Conc 4	60.1	3.03	0.16	0.47	9.44	1.33	0.54	0.04	1.33	3.14	9.31	9.03	3.46	2.59
Ro Conc 5	86.8	4.38	0.07	0.27	7.14	0.81	0.28	0.03	0.86	2.61	10.2	7.95	2.59	2.80
Ro Tail	1591	80.3	0.04	0.11	1.53	0.18	0.10	< 0.02	8.34	19.5	39.9	32.4	17.0	34.3
Head (calc.)	1981	100	0.366	0.45	3.08	0.45	0.47	0.047	100	100	100	100	100	100
Head (direct)			0.330	0.42	2.53	0.41	0.45	0.040						

Combined Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
Ro Conc 1	89.1	4.50	5.93	0.90	8.92	1.44	4.80	0.43	72.9	8.92	13.05	14.5	45.6	41.3
Ro Conc 1-2	166.4	8.40	3.71	3.55	11.2	1.78	3.84	0.30	85.2	65.7	30.6	33.5	68.1	52.9
Ro Conc 1-3	243.3	12.3	2.66	2.76	10.2	1.84	2.97	0.23	89.5	74.8	40.6	50.7	77.0	60.4
Ro Conc 1-4	303.4	15.3	2.17	2.31	10.0	1.74	2.49	0.19	90.8	77.9	49.9	59.7	80.4	62.9
Ro Conc 1-5	**390.2**	**19.7**	**1.70**	**1.86**	**9.38**	**1.53**	**2.00**	**0.16**	**91.7**	**80.5**	**60.1**	**67.6**	**83.0**	**65.7**

Product	Weight		Assays, %				% Distribution			
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue
Rougher 1	89.1	4.50	17.2	2.51	5.46	74.8	72.9	9.19	4.06	3.67
Rougher 2	77.3	3.90	3.33	18.7	17.0	61.0	12.3	59.4	11.0	2.60
Rougher 3	76.9	3.88	1.16	2.83	17.3	78.7	4.25	8.95	11.1	3.33
Rougher 4	60.1	3.03	0.46	1.07	23.5	75.0	1.33	2.65	11.8	2.48
Rougher 5	86.8	4.38	0.21	0.56	18.1	81.1	0.86	2.01	13.1	3.88
Rougher Tail	1591	80.3	0.11	0.27	3.69	95.9	8.34	17.8	48.9	84.0
Head (calc.)	1981	100	1.06	1.23	6.05	91.7	100	100	100	100
Combined Products										
Ro Conc 1		4.50	17.2	2.51	5.46	74.8	72.9	9.19	4.06	3.67
Ro Conc 1-2		8.40	10.8	10.0	10.8	68.4	85.2	68.6	15.0	6.27
Ro Conc 1-3		12.3	7.72	7.75	12.9	71.6	89.5	77.5	26.2	9.60
Ro Conc 1-4		15.3	6.28	6.43	15.0	72.3	90.8	80.2	37.9	12.1
Ro Conc 1-5		19.7	4.93	5.12	15.7	74.3	91.7	82.2	51.1	16.0
Ro Tail		80.3	0.11	0.27	3.69	95.9	8.34	17.8	48.9	84.0

Test No.: F9 **Project No.**: 50149-001 **Operator**: YW **Date**: 17-Oct-11

Purpose: Baseline cleaner flotation test,
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 57 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Target K_{80} :90 µm

Conditions:

Stage	Reagents added, g/t							Time, minutes			pH	Eh
	Lime	SIPX	MIBC*	CMC	DF250	PAX	3477	Grind	Cond.	Froth		
Grind		5						57				
Condition									1			
Rougher 1			10						1	2	8.8	42.8
Rougher 2		5	5						1	2	8.8	17.5
Rougher 3		10	5						1	4	8.8	34.4
Rougher 4		20	5						1	6	8.8	29.2
Regrind (PM)								0				
1st Cleaner		5							1	8	8.9	10.2
1st Cleaner Scav		10							1	4	8.6	50.1
2nd Cleaner									1	6	8.7	37.5
3rd Cleaner									1	4	8.7	53.4
Total	0	55	25	0			0	57	9	36	.	.

* As required

Stage	Roughers	1stClnr and Scav.	2nd, 3rd Cleaner
Flotation Cell	1000g-D12	500-g D12	250-g D12
Speed: rpm	1800	1600	1100

Assay for: Cu, Ni,S, Pt, Pd, Au
MgO assay for 3rd Clnr Conc.
Sulphide sulphur assay for Rougher tail
Malvern on combined products

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
3rd Clnr Conc	96.5	4.9	5.88	4.40	15.5	2.17	6.45	0.56	82.0	46.8	25.3	24.2	62.7	51.2
3rd Clnr Tls	61.5	3.1	0.57	2.67	8.82	1.81	1.68	0.13	5.1	18.1	9.2	12.8	10.4	7.6
2nd Clnr Tls	68.4	3.5	0.29	1.12	10.1	1.66	1.02	0.10	2.9	8.4	11.7	13.1	7.0	6.5
1st Clnr Scv Conc	31.6	1.6	0.18	0.64	11.7	1.58	0.74	0.07	0.8	2.2	6.2	5.8	2.4	2.1
1st Clnr Scv Tls	145	7.3	0.06	0.22	3.66	0.57	0.22	0.02	1.3	3.5	9.0	9.5	3.2	2.7
Rougher Tails	1579	79.7	0.04	0.12	1.45	0.19	0.09	0.02	8.0	20.9	38.7	34.6	14.3	29.9
					S" = 1.41									
Head (calc.)	1982	100	0.35	0.46	2.99	0.44	0.50	0.05	100	100	100	100	100	100
(direct)			0.33	0.42	2.53	0.41	0.45	0.04						

Combined Products

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
3rd Clnr Conc	**96.5**	**4.87**	**5.88**	**4.40**	**15.5**	**2.17**	**6.45**	**0.56**	**82.0**	**46.8**	**25.3**	**24.2**	**62.7**	**51.2**
2nd Clnr Conc	158	7.97	3.81	3.73	12.9	2.03	4.59	0.39	87.0	64.9	34.4	37.0	73.1	58.8
1st Clnr Conc	226	11.4	2.75	2.94	12.1	1.92	3.51	0.30	89.9	73.4	46.1	50.1	80.1	65.2
1st Cl & ClScv Conc	258	13.0	2.43	2.66	12.0	1.88	3.17	0.28	90.7	75.6	52.3	55.9	82.5	67.3
Rghr Conc	**403**	**20.3**	**1.58**	**1.78**	**9.00**	**1.41**	**2.11**	**0.18**	**92.0**	**79.1**	**61.3**	**65.4**	**85.7**	**70.1**

Cleaner Circuit Unit Performance	Mass rec	Upgrade						Unit Recovery					
	24%	3.72	2.47	1.72	1.54	3.06	3.05	90%	64%	56%	52%	77%	77%

Product	Weight		Assays, %				% Distribution					
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue		
3rd Cleaner Conc	96.5	4.9	17.0	12.4	14.3	56.2	82.0	48.7	11.9	3.0		
3rd Cleaner Tail	61.5	3.1	1.65	7.45	15.2	75.7	5.1	18.6	8.1	2.6		
2nd Cleaner Tail	68.4	3.5	0.84	2.93	23.3	73.0	2.9	8.2	13.7	2.7		
1st Cleaner Scav Co	31.6	1.6	0.52	1.50	29.0	69.0	0.8	1.9	7.9	1.2		
1st Cleaner Scav Tai	145	7.3	0.18	0.53	9.01	90.3	1.3	3.1	11.3	7.2		
Rougher Tail	1579	79.7	0.10	0.30	3.46	96.1	8.0	19.5	47.1	83.3		
Head (calc.)	1982.3	100	1.01	1.24	5.85	91.9	100	100	100	100		
Combined Products											Cu+Ni	PGE
3rd Cleaner Conc		4.9	17.0	12.4	14.3	56.2	82.0	48.7	11.9	3.0	10.3	9.2
2nd Cleaner Conc		8.0	11.1	10.5	14.7	63.8	87.0	67.3	20.0	5.5	7.5	7.0
1st Cleaner Conc		11.4	7.97	8.20	17.3	66.6	89.9	75.5	33.7	8.3	5.7	5.7
1st Cl + Sc Conc		13.0	7.06	7.38	18.7	66.9	90.7	77.4	41.6	9.5	5.1	5.3
Rougher Conc		20.3	4.58	4.91	15.2	75.3	92.0	80.5	52.9	16.7	3.4	3.7
Rougher Tail'		79.7	0.10	0.30	3.46	96.1	8.0	19.5	47.1	83.3		

Test No.: F10 **Project No.:** 50149-001 **Operator:** YW **Date:** 18-Oct-11

Purpose: Cleaner flotation test, repeat F9 CMC in the cleaner
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 57 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Target K_{80} :90 µm

Conditions:

Stage	Reagents added, g/t							Time, minutes			pH	Eh
	Lime	SIPX	MIBC*	CMC	DF250	PAX	3477	Grind	Cond.	Froth		
Grind		5						57				
Condition									1			
Rougher 1			10						1	2	8.9	56.9
Rougher 2		5	5						1	2	8.8	14.0
Rougher 3		10	5						1	4	8.8	41.2
Rougher 4		20	5						1	6	8.8	30.4
Regrind (PM)								0				
1st Cleaner		5		20					1	8	8.9	14.3
1st Cleaner Scav		10							1	4	8.5	40.7
2nd Cleaner				10					1	6	8.8	43.5
3rd Cleaner			7	5					1	4	8.7	77.2
Total	0	55	32	35			0	57	9	36	.	.

* As required

Stage	Roughers	1stClnr and Scav.	2nd, 3rd Cleaner
Flotation Cell	1000g-D12	500-g D12	250-g D12
Speed: rpm	1800	1600	1100

Assay for: Cu, Ni,S, Pt, Pd, Au
MgO assay for 3rd Clnr Conc.

Metallurgical Balance

Malvern on combined products

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
3rd Clnr Conc	140.2	7.0	4.49	4.36	14.3	2.52	5.23	0.31	86.9	65.5	34.9	37.9	72.4	47.0
3rd Clnr Tls	55.2	2.8	0.28	0.98	6.10	1.47	0.85	0.06	2.1	5.8	5.9	8.7	4.6	3.6
2nd Clnr Tls	78.8	4.0	0.15	0.56	6.93	1.15	0.55	0.05	1.6	4.7	9.5	9.7	4.3	4.3
1st Clnr Scv Conc	31.0	1.6	0.10	0.41	8.67	1.07	0.42	0.26	0.4	1.4	4.7	3.6	1.3	8.7
1st Clnr Scv Tls	147.7	7.4	0.05	0.18	2.82	0.35	0.15	0.02	1.0	2.8	7.3	5.5	2.2	3.2
Rougher Tails	1538	77.2	0.04	0.12	1.41	0.21	0.10	0.02	7.9	19.8	37.8	34.6	15.2	33.3
Head (calc.)	1991	100	0.36	0.47	2.88	0.47	0.51	0.05	100	100	100	100	100	100
(direct)			0.33	0.42	2.53	0.41	0.45	0.04						

Combined Products

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
3rd Clnr Conc	**140.2**	**7.04**	**4.49**	**4.36**	**14.3**	**2.52**	**5.23**	**0.31**	**86.9**	**65.5**	**34.9**	**37.9**	**72.4**	**47.0**
2nd Clnr Conc	195	9.82	3.30	3.41	12.0	2.22	3.99	0.24	89.1	71.3	40.8	46.6	77.1	50.6
1st Clnr Conc	274	13.8	2.40	2.59	10.5	1.91	3.00	0.18	90.7	76.0	50.3	56.3	81.3	54.8
1st Cl & ClScv Conc	305	15.3	2.16	2.37	10.3	1.83	2.74	0.19	91.1	77.4	55.0	59.8	82.6	63.6
Rghr Conc	**453**	**22.8**	**1.47**	**1.65**	**7.89**	**1.35**	**1.90**	**0.14**	**92.1**	**80.2**	**62.2**	**65.4**	**84.8**	**66.7**

	Mass rec	Upgrade						Unit Recovery					
Cleaner Circuit Unit Performance	31%	3.05	2.64	1.81	1.87	2.76	2.27	95%	85%	68%	66%	88%	75%

Product	Weight		Assays, %				% Distribution					
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue	Cu+Ni	PGE
3rd Cleaner Conc	140.2	7.0	13.0	12.3	15.0	59.7	86.9	67.8	19.1	4.6		
3rd Cleaner Tail	55.2	2.8	0.81	2.65	13.0	83.5	2.1	5.8	6.5	2.5		
2nd Cleaner Tail	78.8	4.0	0.43	1.41	16.6	81.5	1.6	4.4	11.9	3.5		
1st Cleaner Scav Co	31.0	1.6	0.28	0.92	21.8	77.0	0.4	1.1	6.2	1.3		
1st Cleaner Scav Tai	147.7	7.4	0.14	0.44	6.91	92.5	1.0	2.5	9.3	7.4		
Rougher Tail	1538	77.2	0.11	0.30	3.35	96.2	7.9	18.4	46.9	80.7		
Head (calc.)	1990.5	100	1.05	1.28	5.51	92.2	100	100	100	100		
Combined Products												
3rd Cleaner Conc		7.0	13.0	12.3	15.0	59.7	86.9	67.8	19.1	4.6	8.9	8.1
2nd Cleaner Conc		9.8	9.57	9.56	14.4	66.5	89.1	73.5	25.7	7.1	6.7	6.5
1st Cleaner Conc		13.8	6.94	7.22	15.0	70.8	90.7	77.9	37.6	10.6	5.0	5.1
1st Cl + Sc Conc		15.3	6.27	6.58	15.7	71.4	91.1	79.0	43.8	11.9	4.5	4.8
Rougher Conc		22.8	4.27	4.58	12.9	78.3	92.1	81.6	53.1	19.3	3.1	3.4
Rougher Tail'		77.2	0.11	0.30	3.35	96.2	7.9	18.4	46.9	80.7		

Test No.: F11 **Project No.**: 50149-001 **Operator**: YW **Date**: 19-Oct-11

Purpose: Cleaner flotation test, Repeat F10 with regrind
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 57 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind: 25 minutes

Target K_{80} :90 µm
Regind K_{80} :28 µm

Conditions:

Stage	Reagents added, g/t							Time, minutes			pH	Eh
	Lime	SIPX	MIBC*	CMC	DF250	PAX	3477	Grind	Cond.	Froth		
Grind		5						57				
Condition									1			
Rougher 1			10						1	2	9.0	50.1
Rougher 2		5	5						1	2	8.9	15.5
Rougher 3		10	5						1	4	8.9	40.0
Rougher 4		20	5						1	6	8.8	21.4
Regrind (PM)								25				
1st Cleaner		5		20					1	8	8.9	44.5
1st Cleaner Scav		10							1	4	8.5	31.1
2nd Cleaner				10					1	6	8.7	53.9
3rd Cleaner			7	5					1	4	8.6	46.2
Total	0	55	32	35			0	82	9	36	.	.

* As required

Stage	Roughers	1stClnr and Scav.	2nd, 3rd Cleaner
Flotation Cell	1000g-D12	500-g D12	250-g D12
Speed: rpm	1800	1600	1100

Assay for: Cu, Ni,S, Pt, Pd, Au
MgO assay for 3rd Clnr Conc.

Metallurgical Balance

Malvern on combined products

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
3rd Clnr Conc	44.7	2.3	11.3	2.84	16.5	2.88	13.7	0.98	83.6	15.8	16.4	16.1	60.3	48.6
3rd Clnr Tls	56.8	2.9	0.32	1.86	3.51	1.28	1.25	0.07	3.0	13.2	4.4	9.1	7.0	4.4
2nd Clnr Tls	64.2	3.2	0.19	3.17	6.44	1.51	1.17	0.06	2.0	25.3	9.2	12.1	7.4	4.3
1st Clnr Scv Conc	30.6	1.5	0.15	2.75	8.37	0.93	0.66	0.03	0.8	10.5	5.7	3.6	2.0	1.0
1st Clnr Scv Tls	179.1	9.0	0.04	0.50	5.52	0.84	0.33	0.03	1.3	11.2	22.0	18.8	5.8	6.0
Rougher Tails	1610	81.1	0.04	0.12	1.18	0.20	0.11	< 0.02	9.3	24.1	42.3	40.3	17.4	35.7
Head (calc.)	1985	100	0.30	0.40	2.26	0.40	0.51	0.05	100	100	100	100	100	100
(direct)			0.33	0.42	2.53	0.41	0.45	0.04						

Combined Products

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
3rd Clnr Conc	**44.7**	**2.25**	**11.3**	**2.84**	**16.5**	**2.88**	**13.7**	**0.98**	**83.6**	**15.8**	**16.4**	**16.1**	**60.3**	**48.6**
2nd Clnr Conc	102	5.11	5.16	2.29	9.23	1.98	6.73	0.47	86.6	29.0	20.8	25.2	67.3	53.0
1st Clnr Conc	166	8.35	3.23	2.63	8.15	1.80	4.58	0.31	88.6	54.3	30.0	37.3	74.7	57.3
1st Cl & ClScv Conc	196	9.89	2.75	2.65	8.18	1.67	3.97	0.27	89.4	64.8	35.7	40.9	76.7	58.3
Rghr Conc	**375**	**18.9**	**1.46**	**1.62**	**6.91**	**1.27**	**2.23**	**0.15**	**90.7**	**75.9**	**57.7**	**59.7**	**82.6**	**64.3**

	Mass rec	Upgrade						Unit Recovery					
Cleaner Circuit Unit Performance	12%	7.74	1.75	2.39	2.27	6.14	6.35	94%	36%	67%	58%	80%	85%

Product	Weight		Assays, %				% Distribution					
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue	Cu+Ni	PGE
3rd Cleaner Conc	44.7	2.3	32.8	8.04	6.27	52.9	83.6	16.3	3.4	1.3		
3rd Cleaner Tail	56.8	2.9	0.93	5.27	3.81	90.0	3.0	13.6	2.6	2.7		
2nd Cleaner Tail	64.2	3.2	0.55	8.96	8.66	81.8	2.0	26.2	6.7	2.8		
1st Cleaner Scav Co	30.6	1.5	0.43	7.69	15.0	76.9	0.8	10.7	5.5	1.3		
1st Cleaner Scav Tai	179.1	9.0	0.13	1.28	13.3	85.3	1.3	10.4	28.7	8.2		
Rougher Tail	1610	81.1	0.10	0.31	2.74	96.8	9.3	22.8	53.1	83.7		
Head (calc.)	1985.0	100	0.88	1.11	4.2	93.8	100	100	100	100		
Combined Products											Cu+Ni	PGE
3rd Cleaner Conc		2.3	32.8	8.04	6.27	52.9	83.6	16.3	3.4	1.3	14.1	17.6
2nd Cleaner Conc		5.1	14.9	6.49	4.89	73.7	86.6	30.0	6.0	4.0	7.4	9.2
1st Cleaner Conc		8.3	9.37	7.45	6.35	76.8	88.6	56.1	12.7	6.8	5.9	6.7
1st Cl + Sc Conc		9.9	7.97	7.48	7.69	76.8	89.4	66.8	18.2	8.1	5.4	5.9
Rougher Conc		18.9	4.23	4.52	10.4	80.9	90.7	77.2	46.9	16.3	3.1	3.7
Rougher Tail'		81.1	0.10	0.31	2.74	96.8	9.3	22.8	53.1	83.7		

Test No.: F12 **Project No.**: 50149-001 **Operator**: YW **Date**: 01-Nov-11

Purpose: Cleaner flotation test, Repeat F10 with higher CMC in the clnrs
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 57 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Target K_{80} :90 µm

Conditions:

Stage	Reagents added, g/t							Time, minutes			pH	Eh
	Lime	SIPX	MIBC*	CMC	DF250	PAX	3477	Grind	Cond.	Froth		
Grind		5						57				
Condition												
Rougher 1			10						1	2	8.9	25.3
Rougher 2		5	5						1	2	8.8	-9.1
Rougher 3		10	5						1	4	8.8	-9.5
Rougher 4		20	5						1	6	8.8	-27.8
Regrind (PM)								0				
1st Cleaner		5		75					1	8	8.8	19.3
1st Cleaner Scav		10							1	4	8.5	-9.2
2nd Cleaner			5	75					1	6	8.7	29.0
3rd Cleaner			5	50					1	4	8.6	39.2
Total	0	55	35	200			0	57	8	36	.	.

* As required

Stage	Roughers	1stClnr and Scav	2nd, 3rd Cleaner
Flotation Cell	1000g-D12	500-g D12	250-g D12
Speed: rpm	1800	1600	1100

Assay for: Cu, Ni,S, Pt, Pd, Au
MgO assay for 3rd Clnr Conc.

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, Fe, MgO %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
3rd Clnr Conc	61.5	3.1	10.2	8.02	26.2	3.62	9.14	0.99	79.2	48.5	23.0	22.1	52.8	52.7
3rd Clnr Tls	102.2	5.1	0.76	2.46	14.3	2.36	2.13	0.14	9.8	24.7	20.8	23.9	20.4	12.4
2nd Clnr Tls	143.1	7.2	0.19	0.50	5.92	0.93	0.57	0.04	3.4	7.0	12.1	13	7.7	5.0
1st Clnr Scv Conc	33.9	1.7	0.12	0.39	7.57	0.93	0.44	0.04	0.5	1.3	3.7	3.1	1.4	1.2
1st Clnr Scv Tls	112.4	5.6	0.04	0.16	2.54	0.34	0.16	0.02	0.6	1.8	4.1	3.8	1.7	1.9
Rougher Tails	1548	77.4	0.03	0.11	1.65	0.22	0.11	0.02	6.4	16.7	36.4	33.8	16.0	26.8
			Ni(S)=	0.07										
Head (calc.)	2001	100	0.40	0.51	3.51	0.50	0.53	0.06	100	100	100	100	100	100
(direct)			0.33	0.42	2.53	0.41	0.45	0.04						

1st Clnr Scv Tls Ni(S)=0.12

Combined Products

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, fe, MgO %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
3rd Clnr Conc	**61.5**	**3.07**	**10.2**	**8.02**	**26.2**	**3.62**	**9.1**	**0.99**	**79.2**	**48.5**	**23.0**	**22.1**	**52.8**	**52.7**
2nd Clnr Conc	164	8.18	4.31	4.55	18.8	2.83	4.76	0.46	89.0	73.2	43.8	46.1	73.3	65.1
1st Clnr Conc	307	15.3	2.39	2.66	12.8	1.95	2.81	0.26	92.4	80.2	55.9	59.3	80.9	70.1
1st Cl & ClScv Conc	341	17.0	2.16	2.43	12.3	1.84	2.57	0.24	92.9	81.5	59.5	62.4	82.3	71.2
Rghr Conc	**453**	**22.6**	**1.64**	**1.87**	**9.85**	**1.47**	**1.97**	**0.19**	**93.6**	**83.3**	**63.6**	**66.2**	**84.0**	**73.2**

Cleaner Circuit Unit Performance	Mass rec	Upgrade						Unit Recovery					
	14%	6.24	4.29	2.66	2.46	4.63	5.31	85%	60%	43%	39%	65%	75%

Product	Weight		Assays, %				% Distribution					
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue		
3rd Cleaner Conc	61.5	3.1	29.6	22.7	22.0	25.7	79.2	50.7	9.7	0.9		
3rd Cleaner Tail	102.2	5.1	2.20	6.69	29.8	61.3	9.8	24.9	21.8	3.5		
2nd Cleaner Tail	143.1	7.2	0.55	1.27	14.0	84.2	3.4	6.6	14.3	6.7		
1st Cleaner Scav Conc	33.9	1.7	0.35	0.90	18.8	79.9	0.5	1.1	4.6	1.5		
1st Cleaner Scav Tail	112.4	5.6	0.13	0.39	6.2	93.3	0.6	1.6	5.0	5.8		
Rougher Tail	1548	77.4	0.10	0.27	4.0	95.6	6.4	15.1	44.6	81.7		
Head (calc.)	2001	100	1.15	1.37	7.0	90.5	100	100	100	100		
Combined Products											Cu+Ni	PGE
3rd Cleaner Conc		3.1	29.6	22.7	22.0	25.7	79.2	50.7	9.7	0.9	18.2	13.8
2nd Cleaner Conc		8.2	12.5	12.7	26.9	47.9	89.0	75.6	31.5	4.3	8.9	8.1
1st Cleaner Conc		15.3	6.92	7.36	20.9	64.9	92.4	82.2	45.8	11.0	5.0	5.0
1st Cl + Sc Conc		17.0	6.26	6.72	20.7	66.4	92.9	83.3	50.4	12.5	4.6	4.7
Rougher Conc		22.6	4.74	5.15	17.1	73.0	93.6	84.9	55.4	18.3	3.5	3.6
Rougher Tail'		77.4	0.10	0.27	4.02	95.6	6.4	15.1	44.6	81.7		

Test No.: F13 **Project No.**: 50149-001 **Operator**: YW **Date**: 01-Nov-11

Purpose: Cleaner flotation test, Repeat F12 with guar gum in the clnrs
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 57 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Target K_{80} :90 µm

Conditions:

Stage	Reagents added, g/t							Time, minutes			pH	Eh
	Lime	SIPX	MIBC*	CMC	DF250	PAX	Guar Gum	Grind	Cond.	Froth		
Grind		5						57				
Condition									1			
Rougher 1			10						1	2	9.1	24.8
Rougher 2		5	5						1	2	9.0	-17.5
Rougher 3		10	5						1	4	9.0	-47.0
Rougher 4		20	5						1	6	8.9	-86.6
Regrind (PM)								0				
1st Cleaner		5		50			75		1	8	9.0	19.2
1st Cleaner Scav		10							1	4	8.6	-21.1
2nd Cleaner			5	50			150		1	6	8.8	40.2
3rd Cleaner			5	50			150		1	4	8.6	53.8
Total	0	55	35	150			375	57	9	36	.	.

* As required

Stage	Roughers	1stClnr and Scav.	2nd, 3rd Cleaner
Flotation Cell	1000g-D12	500-g D12	250-g D12
Speed: rpm	1800	1600	1100

Assay for: Cu, Ni,S, Pt, Pd, Au
MgO assay for 3rd Clnr Conc.

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
3rd Clnr Conc	14.3	0.7	20.7	4.23	27.9	2.78	10.0	1.60	50.9	7.7	9.1	4.9	15.0	26.1
3rd Clnr Tls	25.2	1.3	4.54	4.17	13.7	3.86	8.22	0.51	19.7	13.4	7.9	12.1	21.8	14.7
2nd Clnr Tls	134	7.0	0.70	3.04	10.5	2.27	2.92	0.12	16.1	51.8	32.2	38	41.1	18.4
1st Clnr Scv Conc	50.2	2.6	0.11	0.32	5.59	0.76	0.45	0.04	0.9	2.0	6.4	4.7	2.4	2.3
1st Clnr Scv Tls	188	9.8	0.05	0.17	2.45	0.37	0.20	0.02	1.5	4.1	10.6	8.7	4.0	4.3
Rougher Tails	1503	78.5	0.04	0.11	0.98	0.17	0.10	< 0.02	10.9	21.0	33.7	31.8	15.8	34.3
Head (calc.)	1915	100	0.30	0.41	2.28	0.42	0.50	0.05	100	100	100	100	100	100
(direct)			0.33	0.42	2.53	0.41	0.45	0.04						

Combined Products

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
3rd Clnr Conc	**14.3**	**0.75**	**20.7**	**4.23**	**27.9**	**2.78**	**10.0**	**1.60**	**50.9**	**7.7**	**9.1**	**4.9**	**15.0**	**26.1**
2nd Clnr Conc	39.5	2.06	10.4	4.19	18.8	3.47	8.86	0.90	70.6	21.0	17.0	17.0	36.8	40.8
1st Clnr Conc	173.6	9.06	2.90	3.30	12.4	2.54	4.27	0.30	86.7	72.9	49.3	54.9	77.9	59.1
1st Cl & ClScv Conc	223.8	11.7	2.28	2.63	10.9	2.14	3.42	0.24	87.7	74.9	55.7	59.6	80.3	61.4
Rghr Conc	**412.0**	**21.5**	**1.26**	**1.51**	**7.02**	**1.33**	**1.95**	**0.14**	**89.1**	**79.0**	**66.3**	**68.2**	**84.2**	**65.7**

Cleaner Circuit Unit Performance	**Mass rec**	**Upgrade**						**Unit Recovery**					
	3%	16.4	2.81	3.97	2.09	5.14	11.45	59%	15%	30%	20%	23%	46%

Product	Weight		Assays, %				% Distribution					
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue		
3rd Cleaner Conc	14.3	0.7	60.0	12.0	7.74	20.3	50.9	8.0	1.4	0.2		
3rd Cleaner Tail	25.2	1.3	13.2	11.8	13.7	61.4	19.7	13.7	4.3	0.9		
2nd Cleaner Tail	134	7.0	2.03	8.48	18.4	71.1	16.1	52.7	30.6	5.3		
1st Cleaner Scav Co	50.2	2.6	0.32	0.76	13.8	85.2	0.9	1.8	8.6	2.4		
1st Cleaner Scav Tai	188	9.8	0.13	0.42	6.0	93.5	1.5	3.6	13.9	9.8		
Rougher Tail	1503	78.5	0.12	0.29	2.22	97.4	10.9	20.2	41.3	81.5		
Head (calc.)	1915.2	100	0.88	1.13	4.2	93.8	100	100	100	100		
Combined Products											Cu+Ni	PGE
3rd Cleaner Conc		0.7	60.0	12.0	7.74	20.3	50.9	8.0	1.4	0.2	24.9	14.4
2nd Cleaner Conc		2.1	30.1	11.8	11.6	46.5	70.6	21.7	5.7	1.0	14.6	13.2
1st Cleaner Conc		9.1	8.42	9.24	16.8	65.5	86.7	74.4	36.2	6.3	6.2	7.1
1st Cl + Sc Conc		11.7	6.60	7.34	16.2	69.9	87.7	76.2	44.8	8.7	4.9	5.8
Rougher Conc		21.5	3.65	4.18	11.5	80.7	89.1	79.8	58.7	18.5	2.8	3.4
Rougher Tail'		78.5	0.12	0.29	2.22	97.4	10.9	20.2	41.3	81.5		

Test No.: F14 **Project No.**: 50149-001 **Operator**: YW **Date**: 28-Oct-11

Purpose: Cleaner flotation test, Repeat F12 with disperssant in the clnrs
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 57 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Target K_{80} :90 µm

Conditions:

Stage	Reagents added, g/t							Time, minutes			pH	Eh
	Lime	SIPX	MIBC*	CMC	DF250	PAX	Calgon	Grind	Cond.	Froth		
Grind		5						57				
Condition									1			
Rougher 1			10						1	2	8.8	62.1
Rougher 2		5	5						1	2	8.8	59.8
Rougher 3		10	5						1	4	8.8	28.4
Rougher 4		20	5						1	6	8.8	46.7
Regrind (PM)								0				
1st Cleaner		5					150		1	8	8.9	59.1
1st Cleaner Scav		10							1	4	8.5	63.1
2nd Cleaner			5				75		1	6	8.7	63.5
3rd Cleaner			5				75		1	4	8.5	74.4
Total	0	55	35	0			300	57	9	36	.	.

* As required

Stage	Roughers	1stClnr and Scav.	2nd, 3rd Cleaner
Flotation Cell	1000g-D12	500-g D12	250-g D12
Speed: rpm	1800	1600	1100

Assay for: Cu, Ni,S, Pt, Pd, Au
MgO assay for 3rd Clnr Conc.

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
3rd Clnr Conc	136.5	6.9	3.88	4.16	13.4	2.51	4.96	0.26	88.6	63.9	39.6	39.2	68.1	42.1
3rd Clnr Tls	41.0	2.1	0.38	1.01	5.30	1.56	1.13	0.21	2.6	4.7	4.7	7.3	4.7	10.2
2nd Clnr Tls	42.9	2.2	0.21	0.64	4.89	1.22	0.64	0.06	1.5	3.1	4.5	6	2.8	3.1
1st Clnr Scv Conc	36.3	1.8	0.21	0.55	7.65	1.21	0.72	0.05	1.3	2.2	6.0	5.0	2.6	2.2
1st Clnr Scv Tls	135.1	6.8	0.04	0.19	2.44	0.39	0.20	0.03	1.0	2.9	7.1	6	2.7	4.8
Rougher Tails	1591	80.2	0.02	0.13	1.10	0.20	0.12	0.02	5.1	23.3	37.9	36.4	19.2	37.7
Head (calc.)	1983	100	0.30	0.45	2.33	0.44	0.50	0.04	100	100	100	100	100	100
(direct)			0.33	0.42	2.53	0.41	0.45	0.04						

Combined Products

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
3rd Clnr Conc		**6.88**	**3.88**	**4.16**	**13.4**	**2.51**	**5.0**	**0.26**	**88.6**	**63.9**	**39.6**	**39.2**	**68.1**	**42.1**
2nd Clnr Conc		8.95	3.07	3.43	11.5	2.29	4.08	0.25	91.2	68.5	44.4	46.5	72.7	52.3
1st Clnr Conc		11.1	2.51	2.89	10.2	2.08	3.41	0.21	92.7	71.6	48.9	52.5	75.5	55.3
1st Cl & ClScv Conc		12.9	2.19	2.56	9.87	1.96	3.03	0.19	94.0	73.9	54.9	57.6	78.1	57.5
Rghr Conc		**19.8**	**1.45**	**1.74**	**7.31**	**1.42**	**2.05**	**0.13**	**94.9**	**76.7**	**62.1**	**63.6**	**80.8**	**62.3**

Cleaner Circuit Unit Performance	Mass rec	Upgrade						Unit Recovery					
	35%	2.68	2.39	1.83	1.77	2.42	1.94	94%	87%	75%	71%	88%	75%

Product	Weight		Assays, %				% Distribution			
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue
3rd Cleaner Conc	136.5	6.9	11.2	11.7	14.7	62.3	88.6	65.4	23.9	4.6
3rd Cleaner Tail	41.0	2.1	1.10	2.77	10.5	85.6	2.6	4.6	5.1	1.9
2nd Cleaner Tail	42.9	2.2	0.61	1.70	10.8	86.9	1.5	3.0	5.5	2.0
1st Cleaner Scav Co	36.3	1.8	0.61	1.36	18.4	79.6	1.3	2.0	7.9	1.6
1st Cleaner Scav Tai	135.1	6.8	0.12	0.48	5.9	93.5	1.0	2.6	9.5	6.8
Rougher Tail	1591	80.2	0.06	0.34	2.55	97.1	5.1	22.3	48.1	83.2
Head (calc.)	1982.8	100	0.87	1.23	4.2	93.6	100	100	100	100

Combined Products	Weight %	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue	Cu+Ni	PGE
3rd Cleaner Conc	6.9	11.2	11.7	14.7	62.3	88.6	65.4	23.9	4.6	8.0	7.7
2nd Cleaner Conc	9.0	8.9	9.65	13.8	67.7	91.2	70.1	29.0	6.5	6.5	6.6
1st Cleaner Conc	11.1	7.29	8.10	13.2	71.4	92.7	73.1	34.5	8.5	5.4	5.7
1st Cl + Sc Conc	12.9	6.34	7.15	13.9	72.6	94.0	75.1	42.4	10.0	4.7	5.2
Rougher Conc	19.8	4.20	4.85	11.2	79.8	94.9	77.7	51.9	16.8	3.2	3.6
Rougher Tail'	80.2	0.06	0.34	2.55	97.1	5.1	22.3	48.1	83.2		

Test No.: F15 **Project No.**: 50149-001 **Operator**: YW **Date**: 08-Nov-11

Purpose: Cleaner flotation test, Repeat F13 adjust CMC and Guar gum dosages
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 57 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Target K_{80} :90 µm

Conditions:

Stage	Reagents added, g/t							Time, minutes			pH	Eh
	Lime	SIPX	MIBC*	CMC	DF250	PAX	Guar Gum	Grind	Cond.	Froth		
Grind		5						57				
Condition									1			
Rougher 1			10						1	2	8.3	33.8
Rougher 2		5	5						1	2	8.5	7.9
Rougher 3		10	5						1	4	8.5	-2.1
Rougher 4		20	5						1	6	8.6	-18.5
Regrind (PM)								0				
1st Cleaner		5		50			75		1	8	8.7	4.0
1st Cleaner Scav		10	5						1	4	8.8	0.3
2nd Cleaner			10	20			30		1	6	8.9	-22.4
3rd Cleaner			10	5			7.5		1	4	8.7	49.3
Total	0	55	50	75			113	57	9	36	.	.

* As required

Stage	Roughers	1stClnr and Scav.	2nd, 3rd Cleaner
Flotation Cell	1000g-D12	500-g D12	250-g D12
Speed: rpm	1800	1600	1100

Assay for: Cu, Ni,S, Pt, Pd, Au
MgO assay for 3rd Clnr Conc.

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
3rd Clnr Conc	31.6	1.6	15.4	3.68	23.3	3.29	11.4	0.89	76.9	13.6	16.2	12.9	37.9	31.7
3rd Clnr Tls	29.2	1.5	1.38	8.31	15.1	3.00	6.04	0.60	6.4	28.5	9.7	10.9	18.6	19.8
2nd Clnr Tls	81.5	4.1	0.28	2.64	8.89	1.86	2.05	0.07	3.6	25.3	16.0	18.8	17.6	6.4
1st Clnr Scv Conc	60.1	3.0	0.13	0.54	6.73	0.94	0.51	0.03	1.2	3.8	8.9	7.0	3.2	2.0
1st Clnr Scv Tls	143	7.2	0.07	0.23	2.70	0.56	0.25	0.02	1.6	3.9	8.5	9.9	3.8	3.2
Rougher Tails	1635	82.5	0.04	0.13	1.13	0.20	0.11	< 0.02	10.3	24.9	40.7	40.5	18.9	36.9
Head (calc.)	1980	100	0.32	0.43	2.29	0.41	0.48	0.04	100	100	100	100	100	100
(direct)			0.33	0.42	2.53	0.41	0.45	0.04						

Combined Products

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
3rd Clnr Conc	**31.6**	**1.60**	**15.4**	**3.68**	**23.3**	**3.29**	**11.4**	**0.89**	**76.9**	**13.6**	**16.2**	**12.9**	**37.9**	**31.7**
2nd Clnr Conc	60.8	3.07	8.67	5.90	19.4	3.15	8.83	0.75	83.2	42.1	25.9	23.7	56.5	51.5
1st Clnr Conc	142.3	7.19	3.86	4.03	13.4	2.41	4.95	0.36	86.8	67.4	41.9	42.5	74.1	57.9
1st Cl & ClScv Conc	202.4	10.2	2.75	3.00	11.4	1.97	3.63	0.26	88.1	71.2	50.8	49.5	77.3	59.9
Rghr Conc	**345.7**	**17.5**	**1.64**	**1.85**	**7.79**	**1.39**	**2.23**	**0.16**	**89.7**	**75.1**	**59.3**	**59.5**	**81.1**	**63.1**

Cleaner Circuit Unit Performance	Mass rec	Upgrade						Unit Recovery					
	9%	9.38	1.99	2.99	2.37	5.12	5.49	88%	23%	42%	38%	51%	55%

Product	Weight		Assays, %				% Distribution				Cu+Ni	PGE
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue		
3rd Cleaner Conc	44.7	2.3	44.6	10.4	11.2	33.8	79.5	15.6	6.1	0.8		
3rd Cleaner Tail	56.8	2.9	4.00	23.6	15.6	56.8	9.1	45.0	10.8	1.7		
2nd Cleaner Tail	64.2	3.2	0.81	7.36	16.3	75.6	2.1	15.9	12.7	2.6		
1st Cleaner Scav Co	30.6	1.5	0.38	1.36	16.2	82.1	0.5	1.4	6.0	1.4		
1st Cleaner Scav Tai	179.1	9.0	0.21	0.58	6.4	92.8	1.5	3.5	14.0	9.0		
Rougher Tail	1610	81.1	0.12	0.34	2.57	97.0	7.4	18.5	50.4	84.5		
Head (calc.)	1985.0	100	1.26	1.50	4.1	93.1	100	100	100	100		
Combined Products												
3rd Cleaner Conc		2.3	44.6	10.4	11.2	33.8	79.5	15.6	6.1	0.8	19.1	15.6
2nd Cleaner Conc		5.1	21.9	17.8	13.6	46.7	88.6	60.7	16.9	2.6	14.6	12.7
1st Cleaner Conc		8.3	13.7	13.7	14.7	57.9	90.6	76.6	29.6	5.2	7.9	7.7
1st Cl + Sc Conc		9.9	11.6	11.8	14.9	61.7	91.1	78.0	35.6	6.5	5.8	5.9
Rougher Conc		18.9	6.19	6.45	10.8	76.5	92.6	81.5	49.6	15.5	3.5	3.8
Rougher Tail'		81.1	0.12	0.34	2.57	97.0	7.4	18.5	50.4	84.5		

Test No.: F16 **Project No.**: 50149-001 **Operator**: YW **Date**: Nov 15 2011

Purpose: Cleaner flotation test, Repeat F15 adjust CMC and Guar gum dosages
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 57 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Target K_{80} :90 µm

Conditions:

Stage	Reagents added, g/t							Time, minutes			pH	Eh
	Lime	SIPX	MIBC*	CMC	DF250	PAX	Guar Gum	Grind	Cond.	Froth		
Grind		5						57				
Condition									1			
Rougher 1			10						1	2	8.9	41.4
Rougher 2		5	5						1	2	8.4	41.3
Rougher 3		10	5						1	4	8.4	33.4
Rougher 4		20	5						1	6	8.2	27.1
Regrind (PM)								0				
1st Cleaner		5		50			75		1	8	8.9	40.3
1st Cleaner Scav		10	5						1	4	8.8	-24.3
2nd Cleaner			10	10			7.5		1	6	9.2	57.5
3rd Cleaner			10	5			2.5		1	4	8.8	56.1
Total	0	55	50	65			85	57	9	36	.	.

* As required

Stage	Roughers	1stClnr and Scav.	2nd, 3rd Cleaner
Flotation Cell	1000g-D12	500-g D12	250-g D12
Speed: rpm	1800	1600	1100

target mass pull including paper 73 gr Actual 81 gr

Assay for: Cu, Ni,S, Pt, Pd, Au
MgO assay for 3rd Clnr Conc.

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
3rd Clnr Conc	48.1	2.4	11.9	6.58	24.0	2.69	8.55	0.85	79.7	33.0	18.3	15.0	45.1	43.4
3rd Clnr Tls	36.9	1.9	1.22	6.17	14.4	2.31	3.45	0.19	6.3	23.7	8.4	9.9	14.0	7.4
2nd Clnr Tls	74.1	3.7	0.33	1.81	9.23	1.76	1.60	0.10	3.4	14.0	10.9	15.2	13.0	7.9
1st Clnr Scv Conc	61.9	3.1	0.15	0.72	12.2	1.31	0.72	0.06	1.3	4.6	12.0	9.4	4.9	3.9
1st Clnr Scv Tls	189	9.5	0.06	0.26	3.58	0.47	0.20	0.02	1.7	5.1	10.7	10.3	4.1	4.0
Rougher Tails	1570	79.3	0.04	0.12	1.59	0.22	0.11	0.02	7.7	19.6	39.6	40.2	18.9	33.3
Head (calc.)	1980	100	0.36	0.49	3.18	0.43	0.46	0.05	100	100	100	100	100	100
(direct)			0.33	0.42	2.53	0.41	0.45	0.04						

Combined Products

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
3rd Clnr Conc	**48.1**	**2.4**	**11.9**	**6.58**	**24.0**	**2.69**	**8.55**	**0.85**	**79.7**	**33.0**	**18.3**	**15.0**	**45.1**	**43.4**
2nd Clnr Conc	85.0	4.3	7.26	6.40	19.8	2.53	6.34	0.56	86.0	56.7	26.8	24.9	59.0	50.8
1st Clnr Conc	159	8.0	4.03	4.26	14.9	2.17	4.13	0.35	89.4	70.6	37.6	40.1	72.0	58.7
1st Cl & ClScv Conc	221	11.2	2.95	3.27	14.1	1.93	3.18	0.27	90.7	75.3	49.6	49.5	76.9	62.7
Rghr Conc	**410**	**20.7**	**1.62**	**1.88**	**9.28**	**1.26**	**1.80**	**0.15**	**92.3**	**80.4**	**60.4**	**59.8**	**81.1**	**66.7**

Cleaner Circuit Unit Performance	Mass rec	Upgrade						Unit Recovery					
	12%	7.35	3.49	2.59	2.14	4.74	5.55	88%	47%	48%	42%	61%	71%

Product	Weight		Assays, %				% Distribution					
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue		
3rd Cleaner Conc	48.1	2.4	34.5	18.6	15.2	31.7	79.7	34.4	5.9	0.8		
3rd Cleaner Tail	36.9	1.9	3.54	17.4	19.5	59.5	6.3	24.7	5.8	1.2		
2nd Cleaner Tail	74.1	3.7	0.96	4.95	19.1	75.0	3.4	14.1	11.4	3.1		
1st Cleaner Scav Co	61.9	3.1	0.43	1.71	30.2	67.6	1.3	4.1	15.1	2.3		
1st Cleaner Scav Tai	188.7	9.5	0.18	0.64	8.7	90.5	1.7	4.7	13.2	9.4		
Rougher Tail	1570	79.3	0.10	0.30	3.83	95.8	7.7	18.0	48.5	83.1		
Head (calc.)	1979.9	100	1.05	1.31	6.3	91.4	100	100	100	100		
Combined Products											Cu+Ni	PGE
3rd Cleaner Conc		2.4	34.5	18.6	15.2	31.7	79.7	34.4	5.9	0.8	18.5	12.1
2nd Cleaner Conc		4.3	21.1	18.1	17.1	43.8	86.0	59.1	11.7	2.1	13.7	9.4
1st Cleaner Conc		8.0	11.69	12.0	18.0	58.3	89.4	73.2	23.1	5.1	8.3	6.6
1st Cl + Sc Conc		11.2	8.54	9.10	21.4	60.9	90.7	77.3	38.2	7.4	6.2	5.4
Rougher Conc		20.7	4.69	5.21	15.6	74.5	92.3	82.0	51.5	16.9	3.5	3.2
Rougher Tail'		79.3	0.10	0.30	3.83	95.8	7.7	18.0	48.5	83.1		

Test No.: F17 **Project No.**: 50149-001 **Operator**: YW **Date**: Nov 22 2011

Purpose: Cleaner flotation test, Repeat F12 with lower CMC in the second and third clnrs
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 57 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Target K_{80} :90 µm

Conditions:

Stage	Reagents added, g/t							Time, minutes			pH	Eh
	Lime	SIPX	MIBC*	CMC	DF250	PAX	3501	Grind	Cond.	Froth		
Grind		5						57				
Condition									1			
Rougher 1			10						1	2	8.9	11.0
Rougher 2		5	5						1	2	8.8	20.0
Rougher 3		10	5						1	4	8.8	-0.7
Rougher 4		20	5						1	6	8.9	-2.0
Regrind (PM)								0				
1st Cleaner		5		75					1	8	8.9	25.5
1st Cleaner Scav		10							1	4	8.6	57.6
2nd Cleaner			5	35					1	6	8.8	54.3
3rd Cleaner			5	10					1	4	8.6	63.2
Total	0	55	35	120			0	57	9	36	.	.

* As required

Stage	Roughers	1stClnr and Scav.	2nd, 3rd Cleaner
Flotation Cell	1000g-D12	500-g D12	250-g D12
Speed: rpm	1800	1600	1100

Assay for: Cu, Ni,S, Pt, Pd, Au
MgO assay for 3rd Clnr Conc.

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, Fe, MgO %)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
3rd Clnr Conc	48.3	2.4	11.2	7.85	26.3	3.21	8.70	0.59	30.0	3.70	74.1	40.7	20.0	18.2	46.0	31.5	5.8	0.4
3rd Clnr Tls	47.5	2.4	1.46	4.24	15.8	2.70	3.32	0.27	24.6	12.1	9.5	21.6	11.8	15.1	17.3	14.2	4.7	1.4
2nd Clnr Tls	121	6.1	0.34	0.90	6.60	1.20	0.89	0.09	15.8	20.6	5.7	11.7	12.6	17.1	11.8	12.1	7.6	5.9
1st Clnr Scv Conc	38.3	1.9	0.17	0.54	11.4	1.13	0.63	0.06	23.4	17.2	0.9	2.2	6.9	5.1	2.6	2.5	3.6	1.6
1st Clnr Scv Tls	149	7.5	0.05	0.21	3.94	0.43	0.20	0.03	13.7	21.2	1.0	3.4	9.2	7.5	3.3	4.9	8.1	7.4
Rougher Tails	1575	79.6	0.04	0.12	1.60	0.20	0.11	< 0.02	11.2	22.5	8.8	20.3	39.6	37.0	19.0	34.8	70.3	83.4
Head (calc.)	1979	100	0.37	0.47	3.22	0.43	0.46	0.05	12.7	21.5	100	100	100	100	100	100	100	100
(direct)			0.33	0.42	2.53	0.41	0.45	0.04	11.9	22.8								

Combined Products

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, Fe, MgO %)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
3rd Clnr Conc	**48.3**	**2.44**	**11.2**	**7.85**	**26.3**	**3.21**	**8.70**	**0.59**	**30.0**	**3.70**	**74.1**	**40.7**	**20.0**	**18.2**	**46.0**	**31.5**	**5.8**	**0.4**
2nd Clnr Conc	95.8	4.84	6.37	6.06	21.1	2.96	6.03	0.43	27.3	7.86	83.6	62.4	31.8	33.3	63.3	45.7	10.4	1.8
1st Clnr Conc	217	11.0	3.00	3.18	13.0	1.98	3.16	0.24	20.9	15.0	89.2	74.1	44.3	50.4	75.1	57.7	18.1	7.7
1st Cl & ClScv Conc	256	12.9	2.58	2.78	12.8	1.85	2.78	0.21	21.3	15.3	90.1	76.3	51.2	55.5	77.8	60.3	21.6	9.2
Rghr Conc	**404**	**20.4**	**1.65**	**1.84**	**9.51**	**1.33**	**1.83**	**0.15**	**18.5**	**17.5**	**91.2**	**79.7**	**60.4**	**63.0**	**81.0**	**65.2**	**29.7**	**16.6**

Cleaner Circuit Unit Performance	Mass red	Upgrade								Unit Recovery							
	12%	6.80	4.28	2.76	2.42	4.75	4.04	1.62	0.21	82%	55%	48%	41%	61%	56%	47%	47%

Product	Weight		Assays, %				% Distribution					
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue		
3rd Cleaner Conc	48.3	2.4	32.5	22.2	20.0	25.3	74.1	42.6	7.7	0.7		
3rd Cleaner Tail	47.5	2.4	4.23	11.8	27.4	56.5	9.5	22.3	10.3	1.5		
2nd Cleaner Tail	121.4	6.1	0.99	2.41	14.4	82.2	5.7	11.6	13.8	5.5		
1st Cleaner Scav Co	38.3	1.9	0.49	1.22	28.5	69.8	0.9	1.9	8.7	1.5		
1st Cleaner Scav Tai	148.6	7.5	0.15	0.49	9.81	89.6	1.0	2.9	11.6	7.4		
Rougher Tail	1575	79.6	0.12	0.30	3.84	95.7	8.8	18.7	48.0	83.5		
Head (calc.)	1978.7	100	1.07	1.27	6.37	91.3	100	100	100	100		
Combined Products											Cu+Ni	PGE
3rd Cleaner Conc		2.4	32.5	22.2	20.0	25.3	74.1	42.6	7.7	0.7	19.1	12.5
2nd Cleaner Conc		4.8	18.5	17.0	23.7	40.8	83.6	64.9	18.0	2.2	12.4	9.4
1st Cleaner Conc		11.0	8.70	8.86	18.5	64.0	89.2	76.5	31.8	7.7	6.2	5.4
1st Cl + Sc Conc		12.9	7.47	7.72	20.0	64.8	90.1	78.4	40.5	9.2	5.4	4.8
Rougher Conc		20.4	4.77	5.06	16.2	73.9	91.2	81.3	52.0	16.5	3.5	3.3
Rougher Tail'		79.6	0.12	0.30	3.84	95.7	8.8	18.7	48.0	83.5		

Test No.: F18 **Project No.**: 50149-001 **Operator**: YW **Date**: Dec 10 2011

Purpose: To try split flowsheet
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 88 minutes / 2 kg @ 65% solids in laboratory Ball Mill — Target Primary grind: K_{80} = 50 µm.
Regrind:
Conditions:

Stage		Lime	SIPX	MIBC*	CMC*	DF250	PAX	3501	Grind	Cond.	Froth	pH	Eh
		Reagents added, g/t							Time, minutes				
Grind			5						88				
Rougher 1(High Cu Pre-float)				10						1	2	8.9	63.7
Rougher 2			5	5						1	2	8.9	24.2
Keep Rghr I,2 Conc. Separate for Cleaning													
Rougher 3			10	5						1	4	8.8	24.5
Rougher 4			20	5						1	4	8.8	-15.5
Rougher 5			30							1	8	8.7	17.5
Combine Bulk Rghrs 3-5													
Bulk cleaner 1			3		30					1	3	8.8	38.7
			2		25					1	3	8.7	43.0
			2		10					1	2	8.5	64.3
Bulk cleaner 1 scavanger			10							1	4	8.5	-24.1
Combine Bulk Clnr 1 conc. & Bulk Clnr 1 scave conc.													
Bulk cleaner 2				5	60						6	8.7	43.5
Bulk cleaner 3				5	10						4	8.4	74.3
Clean Rougher 1 (Cu Pre-float)													
Ro1-2 Cu Clnr 1			4		5					1	2	8.7	84.4
Ro1-2 Cu Clnr 2		140								1	1.5	10.8	-64.5
Ro1-2 Cu Clnr 3 (High Cu Conc.)		985								1	1	11.5	-108.3
Total		1125	91	35	140		0	0	88	12	46.5		

Stage	Roughers	1stClnr and Scav	2nd, 3rd Cleaner
Flotation Cell	1000g-D12	500-g D12	250-g D12
Speed: rpm	1800	1600	1100

*As needed

Assay for: Cu, Ni, Pt, Pd, Au, S, Fe, MgO
Assay for: Ni(S) for Bulk rougher tail

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S, Fe, MgO %)								% Distribution							
	g	%	Cu	Ni	Pt	Pd	Au	S	Fe	MgO	Cu	Ni	Pt	Pd	Au	S	Fe	MgO
Bulk Clnr 3 Conc.	15.3	0.8	1.34	4.02	7.10	2.68	0.33	19.7	29.2	2.74	2.9	6.8	13.5	4.7	5.2	5.1	1.7	0.1
Bulk Clnr 3 Tail	17.2	0.9	0.61	2.22	3.77	1.84	0.14	20.6	38.6	8.86	1.5	4.2	8.0	3.6	2.5	6.0	2.5	0.4
Bulk Clnr 2 Tail	85.6	4.3	0.25	0.76	1.44	0.78	0.07	10.1	22.6	17.8	3.1	7.2	15.3	7.7	6.2	14.5	7.3	3.5
Bulk Clnr 1 Scav.Tail	123	6.2	0.08	0.23	0.43	0.23	0.02	4.23	14.3	22.5	1.4	3.1	6.6	3.3	2.6	8.8	6.7	6.4
Bulk Rougher Tail	1554	78.4	0.04	0.11	0.14	0.07	0.02	1.51	12.0	22.7	8.0	18.9	27.0	12.5	32.3	39.5	70.8	81.2
Ro1-2 Cu Clnr 3 Conc.	6.6	0.3	28.4	0.46	1.82	13.20	1.72	29.5	28.4	2.79	26.9	0.3	1.5	10.0	11.8	3.3	0.7	0.0
Ro1-2 Cu Clnr 3 Tail	16.2	0.8	16.2	1.67	2.51	10.60	1.43	19.6	23.7	9.09	37.6	3.0	5.0	19.7	24.1	5.3	1.5	0.3
Ro1-2 Cu Clnr 2 Tail	36.9	1.9	2.27	5.03	1.59	4.96	0.19	9.21	15.7	18.5	12.0	20.5	7.3	21.0	7.3	5.7	2.2	1.6
Ro1-2 Cu Clnr 1 Tail	128	6.5	0.36	2.54	0.99	1.19	0.06	5.50	13.5	22.1	6.6	36.0	15.8	17.5	8.0	11.9	6.6	6.5
Head (calc.)	1984	100	0.35	0.46	0.41	0.44	0.05	3.00	13.3	21.9	100.0	100	100	100	100.0	100	100	100
(direct)			0.33	0.42	0.41	0.45	0.04	2.53	11.9	22.8								

Bulk Rghr Tail Ni(S)= 0.06
Ro1-2 Cu Clnr 1 Tail Ni(S)= 2.36

Combined Products

Product	Weight	Assays, (Pt, Pd, Au g/t), (Cu, Ni, S, Fe, MgO %)								% Distribution							
	%	Cu	Ni	Pt	Pd	Au	S	Fe	MgO	Cu	Ni	Pt	Pd	Au	S	Fe	MgO
Bulk Clnr 3 Conc	**0.8**	**1.34**	**4.02**	**7.10**	**2.68**	**0.33**	**19.7**	**29.2**	**2.74**	**2.9**	**6.8**	**13.5**	**4.7**	**5.2**	**5.1**	**1.7**	**0.1**
Bulk Clnr 2 Conc	1.6	0.95	3.07	5.34	2.24	0.23	20.2	34.2	5.98	4.4	11.0	21.5	8.3	7.7	11.0	4.2	0.4
Bulk Clnr 1 + Clnr 1 Scav Conc	6.0	0.44	1.39	2.51	1.18	0.11	12.9	25.8	14.5	7.5	18.2	36.8	16.0	14.0	25.6	11.6	4.0
Bulk Rghr 3-5 Conc	**12.2**	**0.26**	**0.80**	**1.45**	**0.70**	**0.07**	**8.46**	**19.9**	**18.6**	**8.9**	**21.3**	**43.4**	**19.3**	**16.5**	**34.3**	**18.3**	**10.3**
Bulk Rghr Tail	78.4	0.04	0.11	0.14	0.07	0.02	1.51	12.0	22.7	8.0	18.9	27.0	12.5	32.3	39.5	70.8	81.2
Ro1-2 Cu Clnr 3 Conc.(High Cu Con	**0.3**	**28.4**	**0.46**	**1.82**	**13.2**	**1.72**	**29.5**	**28.4**	**2.79**	**26.9**	**0.3**	**1.5**	**10.0**	**11.8**	**3.3**	**0.7**	**0.0**
Ro1-2 Cu Clnr 2 Conc.	1.1	19.7	1.32	2.31	11.4	1.51	22.5	25.1	7.27	64.5	3.3	6.5	29.7	35.9	8.6	2.2	0.4
Ro1-2 Cu Clnr 1 Conc.	3.0	8.94	3.61	1.87	7.40	0.70	14.3	19.3	14.2	76.5	23.8	13.8	50.7	43.2	14.3	4.4	2.0
Rghr 1-2 Conc	**9.5**	**3.09**	**2.88**	**1.27**	**3.16**	**0.26**	**8.29**	**15.3**	**19.6**	**83.1**	**59.8**	**29.6**	**68.2**	**51.2**	**26.2**	**10.9**	**8.5**
Rghr 1-5 Conc	**21.6**	**1.50**	**1.71**	**1.37**	**1.78**	**0.15**	**8.38**	**17.9**	**19.0**	**92.0**	**81.1**	**73.0**	**87.5**	**67.7**	**60.5**	**29.2**	**18.8**

Test No.: Sep-F1 **Project No.**: 50149-001 **Operator**: **Date**: Dec 7 2011

Purpose:

Procedure: To conduct Cu/Ni separation test based on F12

Feed: As outlined below.

Grind: 2 kg of minus 10 mesh of Master Composite — Target Primary grind: K_{80} = 90 µm.

Regrind: 57 minutes / 2 kg @ 65% solids in laboratory Ball Mill

Conditions:

Stage	Reagents added, g/t								Time, minutes			pH	Eh
		Lime	SIPX	MIBC*	CMC	DF250	PAX	3501	Grind	Cond.	Froth		
Grind			5						57				
Condition										1			
Rougher 1				10						1	2	8.9	38.9
Rougher 2			5	5						1	2	8.8	41.0
Rougher 3			10	5						1	4	8.8	11.4
Rougher 4			20	5						1	4	8.7	-3.5
Rougher 5			30							1	8	8.7	-35.2
Cleaner													
Regrind													
1st cleaner			5		75					1	8	8.6	43.6
1st cleaner scavanger			10							1	4	8.5	12.6
Combine 1st Clnr conc. & 1st Clnr scave conc.													
2nd cleaner				5	75					1	6	8.6	74.1
3rd cleaner				5	50					1	4	8.5	60.0
Separation													
Regrind		100							5				
Cu Rougher		2380	5							1	2	11.5	-97.0
Cu Cleaner 1		3745								1	1.5	12.0	-89.2
Total		6225	90	35	200		0	0	62	12	45.5		

Stage	Roughers	1stClnr and Sca	2nd, 3rd Cleaner & Sep.
Flotation Cell	1000g-D12	500-g D12	250-g D12
Speed: rpm	1800	1600	1100

Malvern on Cu/Ni separation circuit

Assay for: Cu, Ni, Pt, Pd, Au, S, Fe, MgO

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S, Fe, MgO %)								% Distribution							
	g	%	Cu	Ni	Pt	Pd	Au	S	Fe	MgO	Cu	Ni	Pt	Pd	Au	S	Fe	MgO
Cu Cleaner 1 Conc.	3.8	0.2	31.3	0.38	1.50	6.04	0.83	31.4	30.4	0.70	19.1	0.2	0.8	2.4	3.8	2.6	0.5	0.01
Cu Cleaner 1 Tails	17.2	0.9	14.9	2.01	2.38	9.83	0.71	20.5	19.3	1.90	41.1	4.2	5.4	17.7	14.6	7.8	1.4	0.07
Cu Rghr Tails(Ni Conc.)	40.1	2.0	2.51	9.75	4.52	9.47	0.33	22.3	31.9	5.70	16.2	47.4	24.0	39.7	15.9	19.8	5.3	0.49
Bulk 3rd Clnr Tail	39.7	2.0	0.87	2.42	2.61	2.54	0.20	11.6	24.0	16.7	5.5	11.7	13.7	10.5	9.5	10.2	4.0	1.41
Bulk 2nd Clnr Tail	129	6.5	0.24	0.62	0.97	0.72	0.09	5.56	15.5	23.0	5.0	9.7	16.6	9.7	13.9	15.9	8.3	6.30
Bulk 1st Clnr Scav.Tail	157	7.9	0.05	0.18	0.36	0.19	0.02	2.24	12.3	23.7	1.2	3.4	7.5	3.1	3.8	7.8	8.0	7.91
Bulk Rougher Tail	1610	80.6	0.05	0.12	0.15	0.10	< 0.02	1.01	10.8	24.5	11.9	23.4	32.0	16.8	38.6	36.0	72.5	83.8
			Ni(S)=	0.06														
Head (calc.)	1997	100	0.31	0.41	0.38	0.48	0.04	2.26	12.0	23.6	100	100	100	100	100	100	100	100
(direct)			0.33	0.42	0.41	0.45	0.04	2.53	11.9	22.8								

Combined Products

Product	Weight	Assays, (Pt, Pd, Au g/t), (Cu, Ni, S, fe, MgO %)								% Distribution							
	%	Cu	Ni	Pt	Pd	Au	S	Fe	MgO	Cu	Ni	Pt	Pd	Au	S	Fe	MgO
Cu Cleaner 1 Conc.	**0.2**	**31.3**	**0.38**	**1.50**	**6.04**	**0.83**	**31.4**	**30.4**	**0.70**	**19.1**	**0.2**	**0.8**	**2.4**	**3.8**	**2.6**	**0.5**	**0.0**
Cu Rghr Conc.	1.1	17.9	**1.72**	2.22	9.14	0.73	22.5	21.3	1.68	60.2	**4.4**	**6.2**	**20.1**	**18.4**	**10.4**	**1.9**	**0.1**
Ni Conc.	**2.0**	**2.51**	**9.75**	**4.52**	**9.47**	**0.33**	**22.3**	**31.9**	**5.70**	**16.2**	**47.4**	**24.0**	**39.7**	**15.9**	**19.8**	**5.3**	**0.5**
Bulk 3rd Clnr Conc	3.1	7.79	6.99	3.73	9.36	0.47	22.4	28.3	4.32	76.4	51.8	30.2	59.8	34.3	30.2	7.2	0.6
Bulk 2nd Clnr Conc	5.0	5.06	5.19	3.29	6.67	0.36	18.1	26.6	9.20	81.9	63.4	43.9	70.3	43.8	40.4	11.2	2.0
Bulk 1st Clnr + Clnr Scav Conc	11.5	2.36	2.63	1.99	3.33	0.21	11.1	20.4	16.9	86.9	73.1	60.5	80.0	57.7	56.3	19.5	8.3
Bulk Rghr Conc	**19.4**	**1.42**	**1.63**	**1.33**	**2.06**	**0.13**	**7.49**	**17.1**	**19.7**	**88.1**	**76.6**	**68.0**	**83.2**	**61.4**	**64.0**	**27.5**	**16.2**
Bulk Rghr Tail	80.6	0.05	0.12	0.15	0.10	0.02	1.01	10.8	24.5	11.9	23.4	32.0	16.8	38.6	36.0	72.5	83.8

Test No.: F19 **Project No.**: 50149-001 **Operator**: YW **Date**: December 8 2011

Purpose: Cleaner flotation test, coarse grind
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 40 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Target K_{80}: 150 µm
Regind K_{80}: 23 µm

Conditions:

Stage	Reagents added, g/t							Time, minutes			pH	Eh
	Lime	SIPX	MIBC*	CMC	DF250	PAX	3477	Grind	Cond.	Froth		
Grind		5						40				
Condition												
Rougher 1			10						1	2	8.8	19.6
Rougher 2		5	5						1	2	8.8	50.4
Rougher 3		10	5						1	4	8.8	31.8
Rougher 4		20	5						1	6	8.7	54.7
Regrind (PM)								16				
1st Cleaner		5		75					1	8	8.7	74.6
1st Cleaner Scav		10							1	4	8.4	96.5
2nd Cleaner			5	75					1	6	8.5	80.7
3rd Cleaner			5	50					1	4	8.3	99.1
Total	0	55	35	200			0	56	8	36	.	.

* As required

Stage	Roughers	1stClnr and Scav	2nd, 3rd Cleaner
Flotation Cell	1000g-D12	500-g D12	250-g D12
Speed: rpm	1800	1600	1100

Assay for: Cu, Ni,S, Pt, Pd, Au, Fe, MgO
Ni(S) for Roghr tail
Malvern on regrind

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, Fe, MgO %)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
3rd Clnr Conc	20.6	1.0	23.6	3.51	31.6	3.26	15.0	1.51	30.7	2.52	68.5	8.0	10.4	7.6	31.9	34.7	2.5	0.1
3rd Clnr Tls	18.3	0.9	2.31	8.72	15.3	4.02	8.55	0.47	23.6	12.4	6.0	17.6	4.5	8.3	16.2	9.6	1.7	0.5
2nd Clnr Tls	74.2	3.7	0.39	3.44	7.94	1.81	1.81	0.11	16.2	20.3	4.1	28.2	9.4	15	13.9	9.1	4.8	3.3
1st Clnr Scv Conc	23.9	1.2	0.20	2.57	10.4	2.08	1.05	0.07	20.8	18.3	0.7	6.8	4.0	5.6	2.6	1.9	2.0	1.0
1st Clnr Scv Tls	169.3	8.6	0.06	0.63	6.85	0.75	0.35	0.04	18.7	19.8	1.5	11.8	18.6	14.3	6.1	7.5	12.8	7.3
Rougher Tails	1672	84.5	0.08	0.15	1.98	0.26	0.17	0.02	11.3	24.1	19.3	27.7	53.1	49.0	29.4	37.3	76.1	87.8
			Ni(S)=	0.10														
Head (calc.)	1979	100	0.36	0.46	3.15	0.45	0.49	0.05	12.5	23.2	100	100	100	100	100	100	100	100
(direct)			0.33	0.42	2.53	0.41	0.45	0.04	11.9	22.8								

Combined Products

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni %)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
3rd Clnr Conc	**20.6**	**1.04**	**23.6**	**3.51**	**31.6**	**3.26**	**15.0**	**1.51**	**30.7**	**2.52**	**68.5**	**8.0**	**10.4**	**7.6**	**31.9**	**34.7**	**2.5**	**0.1**
2nd Clnr Conc	38.9	1.97	13.6	5.96	23.9	3.62	12.0	1.02	27.4	7.17	74.4	25.6	14.9	15.9	48.1	44.2	4.3	0.6
1st Clnr Conc	113.1	5.72	4.93	4.31	13.4	2.43	5.30	0.42	20.0	15.78	78.5	53.8	24.4	31.0	61.9	53.3	9.1	3.9
1st Cl & ClScv Conc	137.0	6.92	4.10	4.00	12.9	2.37	4.56	0.36	20.2	16.22	79.2	60.5	28.3	36.6	64.5	55.2	11.1	4.8
Rghr Conc	**306.3**	**15.5**	**1.87**	**2.14**	**9.56**	**1.47**	**2.23**	**0.18**	**19.4**	**18.20**	**80.7**	**72.3**	**46.9**	**51.0**	**70.6**	**62.7**	**23.9**	**12.2**

	Mass red	Upgrade								Unit Recovery							
Cleaner Circuit Unit Performance	7%	12.62	1.64	3.31	2.21	6.72	8.21	1.59	0.14	87%	27%	62%	43%	54%	67%	64%	61%

Product	Weight		Assays, %				% Distribution					
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue		
3rd Cleaner Conc	20.6	1.0	68.4	9.9	11.6	10.1	68.5	8.3	1.9	0.1		
3rd Cleaner Tail	18.3	0.9	6.70	24.8	12.6	55.9	6.0	18.5	1.9	0.6		
2nd Cleaner Tail	74.2	3.7	1.13	9.70	11.4	77.7	4.1	29.4	6.8	3.2		
1st Cleaner Scav Co	23.9	1.2	0.58	7.11	20.7	71.7	0.7	6.9	4.0	0.9		
1st Cleaner Scav Tai	169.3	8.6	0.19	1.61	16.5	81.7	1.5	11.2	22.5	7.6		
Rougher Tail	1672	84.5	0.24	0.38	4.67	94.7	19.3	25.6	62.9	87.5		
Head (calc.)	1978.7	100	1.04	1.24	6.3	91.5	100	100	100	100		
Combined Products											Cu+Ni	PGE
3rd Cleaner Conc		1.0	68.4	9.9	11.6	10.1	68.5	8.3	1.9	0.1	27.1	19.8
2nd Cleaner Conc		2.0	39.4	16.9	12.0	31.7	74.4	26.9	3.8	0.7	19.5	16.6
1st Cleaner Conc		5.7	14.3	12.2	11.6	61.9	78.5	56.3	10.6	3.9	9.2	8.2
1st Cl + Sc Conc		6.9	11.9	11.3	13.2	63.6	79.2	63.2	14.6	4.8	8.1	7.3
Rougher Conc		15.5	5.42	5.94	15.0	73.6	80.7	74.4	37.1	12.5	4.0	3.9
Rougher Tail'		84.5	0.24	0.38	4.67	94.7	19.3	25.6	62.9	87.5		

Test No.: F20 **Project No.**: 50149-001 **Operator**: YW **Date**: Dec 13 2011

Purpose: Cleaner flotation test, coarse grind
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 40 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Target K_{80}: 150 µm
Regind K_{80}: 34 µm

Conditions:

Stage	Reagents added, g/t							Time, minutes			pH	Eh
	Lime	SIPX	MIBC*	CMC	DF250	PAX	3477	Grind	Cond.	Froth		
Grind		5						40				
Condition												
Rougher 1			10						1	2	8.7	37.8
Rougher 2		5	5						1	2	8.7	-11.6
Rougher 3		10	5						1	4	8.6	34.9
Rougher 4		20	5						1	6	8.6	34.4
Regrind (PM)								10				
1st Cleaner		5		75					1	8	8.6	41.3
1st Cleaner Scav		10							1	4	8.5	44.8
2nd Cleaner			5	75					1	6	8.5	57.4
3rd Cleaner			5	50					1	4	7.3	
Total	0	55	35	200			0	50	8	36	.	.

* As required

Stage	Roughers	1stClnr and Scav.	2nd, 3rd Cleaner
Flotation Cell	1000g-D12	500-g D12	250-g D12
Speed: rpm	1800	1600	1100

Assay for: Cu, Ni,S, Pt, Pd, Au, Fe, MgO
Ni(S) for Roghr tail

PSA on regrind

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, Fe, MgO %)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
3rd Clnr Conc	33.3	1.7	15.8	8.47	27.8	3.47	12.4	0.90	33.0	2.32	77.2	32.6	17.3	12.9	46.2	36.8	4.7	0.2
3rd Clnr Tls	23.0	1.2	0.87	7.07	15.0	3.62	4.08	0.20	25.4	13.3	2.9	18.8	6.5	9.3	10.5	5.7	2.5	0.7
2nd Clnr Tls	62.5	3.2	0.24	1.65	5.25	1.72	1.06	0.07	16.2	22.0	2.2	11.9	6.1	12	7.4	5.4	4.3	3.1
1st Clnr Scv Conc	12.0	0.6	0.19	1.47	8.13	2.23	0.83	0.10	22.0	17.8	0.3	2.0	1.8	3.0	1.1	1.5	1.1	0.5
1st Clnr Scv Tls	145.2	7.4	0.09	0.54	6.66	0.84	0.39	0.05	17.4	19.6	1.9	9.1	18.1	13.6	6.3	8.9	10.8	6.5
Rougher Tails	1699	86.0	0.06	0.13	1.58	0.26	0.15	0.02	10.5	22.9	15.5	25.5	50.2	49.3	28.5	41.8	76.5	89.0
				Ni(S)=0.09														
Head (calc.)	1975	100	0.35	0.44	2.71	0.45	0.45	0.04	11.81	22.1	100	100	100	100	100	100	100	100
(direct)			0.33	0.42	2.53	0.41	0.45	0.04	11.9	22.8								

Combined Products

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni %)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
3rd Clnr Conc	**33.3**	**1.69**	**15.8**	**8.47**	**27.8**	**3.47**	**12.4**	**0.90**	**33.0**	**2.32**	**77.2**	**32.6**	**17.3**	**12.9**	**46.2**	**36.8**	**4.7**	**0.2**
2nd Clnr Conc	56.3	2.85	9.70	7.90	22.6	3.53	9.00	0.61	29.9	6.81	80.1	51.4	23.8	22.2	56.7	42.5	7.2	0.9
1st Clnr Conc	118.8	6.01	4.72	4.61	13.5	2.58	4.82	0.33	22.7	14.8	82.3	63.3	29.9	34.2	64.1	47.8	11.6	4.0
1st Cl & ClScv Conc	130.8	6.62	4.31	4.32	13.0	2.55	4.46	0.31	22.6	15.1	82.6	65.4	31.7	37.1	65.2	49.3	12.7	4.5
Rghr Conc	**276.0**	**14.0**	**2.09**	**2.33**	**9.65**	**1.65**	**2.32**	**0.17**	**19.9**	**17.5**	**84.5**	**74.5**	**49.8**	**50.7**	**71.5**	**58.2**	**23.5**	**11.0**

Cleaner Circuit Unit Performance	Mass red	Upgrade								Unit Recovery							
	12%	7.57	3.63	2.88	2.10	5.35	5.24	1.66	0.13	94%	56%	71%	52%	73%	79%	66%	61%

Product	Weight		Assays, %				% Distribution					
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue		
3rd Cleaner Conc	33.3	1.7	45.8	24.1	10.1	20.1	77.2	34.1	3.3	0.4		
3rd Cleaner Tail	23.0	1.2	2.52	20.0	19.8	57.7	2.9	19.5	4.5	0.7		
2nd Cleaner Tail	62.5	3.2	0.70	4.61	9.2	85.5	2.2	12.2	5.6	2.9		
1st Cleaner Scav Co	12.0	0.6	0.55	4.00	17.4	78.0	0.3	2.0	2.0	0.5		
1st Cleaner Scav Tai	145.2	7.4	0.26	1.36	16.1	82.3	1.9	8.4	22.9	6.5		
Rougher Tail	1699	86.0	0.18	0.33	3.71	95.8	15.5	23.8	61.7	88.9		
Head (calc.)	1975.3	100	1.00	1.19	5.2	92.6	100	100	100	100		
Combined Products											Cu+Ni	PGE
3rd Cleaner Conc		1.7	45.8	24.1	10.1	20.1	77.2	34.1	3.3	0.4	24.3	16.8
2nd Cleaner Conc		2.9	28.1	22.4	14.0	35.4	80.1	53.6	7.7	1.1	17.6	13.1
1st Cleaner Conc		6.0	13.69	13.04	11.5	61.8	82.3	65.8	13.4	4.0	9.3	7.7
1st Cl + Sc Conc		6.6	12.49	12.21	12.0	63.3	82.6	67.9	15.4	4.5	8.6	7.3
Rougher Conc		14.0	6.05	6.50	14.2	73.3	84.5	76.2	38.3	11.1	4.4	4.1
Rougher Tail'		86.0	0.18	0.33	3.71	95.8	15.5	23.8	61.7	88.9		

Test No.: F21 **Project No.**: 50149-001 **Operator**: YW **Date**: Dec 22 2011

Purpose: Cleaner flotation test, coarse grind
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 40 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Target K_{80}: 150 µm
Regind K_{80}: 72 µm

Conditions:

Stage	Reagents added, g/t							Time, minutes			pH	Eh
	Lime	SIPX	MIBC*	CMC	DF250	PAX	3477	Grind	Cond.	Froth		
Grind		5						40				
Condition												
Rougher 1			10						1	2	8.8	73.8
Rougher 2		5	5						1	2	8.8	44.0
Rougher 3		10	5						1	4	8.8	24.1
Rougher 4		20	5						1	6	8.7	-28.8
Regrind (PM)								5				
1st Cleaner		5		75					1	8	8.7	82.2
1st Cleaner Scav		10							1	4	8.5	40.0
2nd Cleaner			5	75					1	6	8.7	60.9
3rd Cleaner			5	50					1	4	8.5	83.7
Total	0	55	35	200			0	45	8	36	.	.

* As required

Stage	Roughers	1stClnr and Scav.	2nd, 3rd Cleaner
Flotation Cell	1000g-D12	500-g D12	250-g D12
Speed: rpm	1800	1600	1100

Assay for: Cu, Ni,S, Pt, Pd, Au, Fe, MgO
Ni(S) for Roghr tail
Malvern on regrind

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, Fe, MgO %)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
3rd Clnr Conc	46.0	2.3	8.99	8.78	23.6	3.60	11.2	0.59	31.7	6.57	69.5	47.0	23.9	19.3	52.0	29.2	6.1	0.6
3rd Clnr Tls	40.7	2.1	0.47	2.02	6.75	2.19	2.15	0.12	16.3	22.5	3.2	9.6	6.0	10.4	8.8	5.2	2.8	1.9
2nd Clnr Tls	89.4	4.5	0.13	0.57	3.33	0.89	0.53	0.04	12.8	26.5	2.0	5.9	6.6	9	4.8	3.8	4.8	4.8
1st Clnr Scv Conc	32.9	1.7	0.15	0.81	7.18	1.17	0.66	0.06	19.3	21.5	0.8	3.1	5.2	4.5	2.2	2.1	2.7	1.4
1st Clnr Scv Tls	134.5	6.8	0.12	0.39	4.70	0.72	0.44	0.05	16.8	23.2	2.7	6.1	13.9	11.3	6.0	7.2	9.5	6.3
Rougher Tails	1626	82.6	0.08	0.15	1.24	0.24	0.16	0.03	10.9	25.8	21.8	28.4	44.4	45.4	26.2	52.4	74.2	85.0
			Ni(S)=	0.08														
Head (calc.)	1969	100	0.30	0.44	2.31	0.44	0.50	0.05	12.1	25.1	100	100	100	100	100	100	100	100
(direct)			0.33	0.42	2.53	0.41	0.45	0.04	11.9	22.8								

Combined Products

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni %)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
3rd Clnr Conc	**46.0**	**2.34**	**8.99**	**8.78**	**23.6**	**3.60**	**11.2**	**0.59**	**31.7**	**6.57**	**69.5**	**47.0**	**23.9**	**19.3**	**52.0**	**29.2**	**6.1**	**0.6**
2nd Clnr Conc	86.7	4.40	4.99	5.61	15.7	2.94	6.95	0.37	24.5	14.0	72.7	56.5	29.9	29.6	60.8	34.4	8.9	2.5
1st Clnr Conc	176.1	8.9	2.52	3.05	9.4	1.90	3.69	0.20	18.5	20.4	74.6	62.4	36.5	38.9	65.6	38.3	13.7	7.3
1st Cl & ClScv Conc	209.0	10.6	2.15	2.70	9.1	1.78	3.21	0.18	18.7	20.5	75.4	65.5	41.7	43.4	67.8	40.4	16.3	8.7
Rghr Conc	**343.5**	**17.4**	**1.35**	**1.79**	**7.35**	**1.37**	**2.13**	**0.13**	**17.9**	**21.6**	**78.2**	**71.6**	**55.6**	**54.6**	**73.8**	**47.6**	**25.8**	**15.0**

	Mass red	Upgrade								Unit Recovery							
Cleaner Circuit Unit Performance	13%	6.64	4.89	3.21	2.63	5.26	4.57	1.77	0.30	92%	74%	68%	56%	79%	76%	60%	46%

Product	Weight		Assays, %				% Distribution					
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue		
3rd Cleaner Conc	46.0	2.3	26.1	24.9	16.5	32.6	69.5	48.5	9.1	0.8		
3rd Cleaner Tail	40.7	2.1	1.36	5.64	11.6	81.4	3.2	9.7	5.7	1.8		
2nd Cleaner Tail	89.4	4.5	0.38	1.55	7.1	91.0	2.0	5.9	7.6	4.4		
1st Cleaner Scav Co	32.9	1.7	0.43	2.12	16.6	80.8	0.8	3.0	6.6	1.4		
1st Cleaner Scav Tai	134.5	6.8	0.35	0.99	11.2	87.5	2.7	5.6	18.1	6.4		
Rougher Tail	1626	82.6	0.23	0.40	2.70	96.7	21.8	27.4	52.9	85.2		
Head (calc.)	1969.1	100	0.88	1.20	4.2	93.7	100	100	100	100		
Combined Products											Cu+Ni	PGE
3rd Cleaner Conc		2.3	26.1	24.9	16.5	32.6	69.5	48.5	9.1	0.8	17.8	15.4
2nd Cleaner Conc		4.4	14.5	15.9	14.2	55.5	72.7	58.2	14.8	2.6	10.6	10.3
1st Cleaner Conc		8.9	7.31	8.59	10.6	73.5	74.6	64.1	22.4	7.0	5.6	5.8
1st Cl + Sc Conc		10.6	6.23	7.57	11.5	74.7	75.4	67.0	29.0	8.5	4.8	5.2
Rougher Conc		17.4	3.93	4.99	11.4	79.7	78.2	72.6	47.1	14.8	3.1	3.6
Rougher Tail'		82.6	0.23	0.40	2.70	96.7	21.8	27.4	52.9	85.2		

Test No.: F22 **Project No.**: 50149-001 **Operator**: YW **Date**: December 21 2011

Purpose: Cleaner flotation test, Repeat F12, Regrind 1st cleaner concentrate
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 57 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Target K_{80} : 90 µm
Regrind K_{80}: 51 µm

Conditions:

Stage	Reagents added, g/t							Time, minutes			pH	Eh
	Lime	SIPX	MIBC*	CMC	DF250	PAX	$CuSO_4$	Grind	Cond.	Froth		
Grind		5						57				
Condition												
Rougher 1			10						1	2	9.2	70.3
Rougher 2		5	5						1	2	9.2	43.3
Rougher 3		10	5						1	4	9.1	17.9
Rougher 4		20	5						1	6	9.1	-17.1
1st Cleaner		5		75					1	8	9.1	50.3
1st Cleaner Scav		10							1	4	8.7	-4.0
Regrind (PM)								3				
2nd Cleaner			5	75					1	6	8.9	-84.4
3rd Cleaner			5	50					1	4	8.8	77.7
Total	0	55	35	200			0	60	8	36	.	.

* As required

Stage	Roughers	1stClnr and Scav.	2nd, 3rd Cleaner
Flotation Cell	1000g-D12	500-g D12	250-g D12
Speed: rpm	1800	1600	1100

Assay for: Cu, Ni,S, Pt, Pd, Au, Fe, MgO
Ni(S) for Roghr tail
Malvern on regrind

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, Fe, MgO %)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
3rd Clnr Conc	48.1	2.4	10.1	7.82	25.7	3.90	11.2	0.78	30.0	5.86	76.9	42.6	25.5	21.2	52.3	35.5	5.3	0.7
3rd Clnr Tls	49.2	2.5	0.56	2.87	10.4	2.53	2.55	0.16	21.5	17.9	4.4	16.0	10.6	14.1	12.2	7.5	3.9	2.1
2nd Clnr Tls	120	6.0	0.16	0.89	6.32	1.20	0.74	0.08	16.4	21.4	3.0	12.1	15.6	16.2	8.6	9.1	7.2	6.0
1st Clnr Scv Conc	26.3	1.3	0.09	0.39	6.74	0.99	0.45	0.05	17.7	20.8	0.4	1.2	3.7	2.9	1.1	1.2	1.7	1.3
1st Clnr Scv Tls	104	5.2	0.04	0.20	2.53	0.42	0.20	0.16	13.1	22.8	0.6	2.4	5.4	4.9	2.0	15.7	5.0	5.5
Rougher Tails	1633	82.5	0.06	0.14	1.16	0.22	0.15	0.02	12.9	22.1	14.7	25.9	39.1	40.6	23.8	30.9	77.0	84.5
Head (calc.)	1980	100	0.32	0.45	2.44	0.45	0.52	0.05	13.8	21.6	100	100	100	100	100	100	100	100
(direct)			0.33	0.42	2.53	0.41	0.45	0.04	11.9	22.8								

Combined Products

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni %)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
3rd Clnr Conc	**48.1**	**2.43**	**10.1**	**7.82**	**25.7**	**3.90**	**11.2**	**0.78**	**30.0**	**5.86**	**76.9**	**42.6**	**25.5**	**21.2**	**52.3**	**35.5**	**5.3**	**0.7**
2nd Clnr Conc	97.3	4.91	5.28	5.32	18.0	3.21	6.83	0.47	25.7	11.9	81.2	58.6	36.1	35.3	64.5	43.0	9.1	2.7
1st Clnr Conc	217.0	11.0	2.45	2.88	11.5	2.10	3.47	0.25	20.6	17.2	84.3	70.6	51.8	51.5	73.1	52.1	16.3	8.7
1st Cl & ClScv Conc	243.3	12.3	2.20	2.61	11.0	1.98	3.14	0.23	20.3	17.6	84.6	71.8	55.4	54.5	74.2	53.3	18.0	10.0
Rghr Conc	**347.2**	**17.5**	**1.55**	**1.89**	**8.48**	**1.51**	**2.26**	**0.21**	**18.1**	**19.1**	**85.3**	**74.1**	**60.9**	**59.4**	**76.2**	**69.1**	**23.0**	**15.5**

	Mass rec	Upgrade								Unit Recovery							
Cleaner Circuit Unit Performance	14%	6.51	4.15	3.03	2.58	4.95	3.71	1.66	0.31	91%	61%	51%	44%	71%	74%	45%	40%

Product	Weight		Assays, %				% Distribution					
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue		
3rd Cleaner Conc	48.1	2.4	29.3	22.1	21.5	27.1	76.9	43.9	11.6	0.7		
3rd Cleaner Tail	49.2	2.5	1.62	7.98	18.9	71.5	4.4	16.2	10.4	1.9		
2nd Cleaner Tail	119.7	6.0	0.46	2.38	14.1	83.0	3.0	11.8	18.9	5.4		
1st Cleaner Scav Conc	26.3	1.3	0.26	0.92	16.7	82.1	0.4	1.0	4.9	1.2		
1st Cleaner Scav Tail	103.9	5.2	0.11	0.50	6.1	93.3	0.6	2.2	7.1	5.2		
Rougher Tail	1633	82.5	0.17	0.37	2.58	96.9	14.7	25.0	47.1	85.6		
Head (calc.)	1980.3	100	0.92	1.22	4.5	93.3	100	100	100	100		
Combined Products											Cu+Ni	PGE
3rd Cleaner Conc		2.4	29.3	22.1	21.5	27.1	76.9	43.9	11.6	0.7	17.9	15.9
2nd Cleaner Conc		4.9	15.3	15.0	20.2	49.6	81.2	60.1	22.0	2.6	10.6	10.5
1st Cleaner Conc		11.0	7.11	8.02	16.9	68.0	84.3	71.9	40.9	8.0	5.3	5.8
1st Cl + Sc Conc		12.3	6.37	7.25	16.8	69.5	84.6	72.9	45.8	9.2	4.8	5.4
Rougher Conc		17.5	4.50	5.23	13.6	76.6	85.3	75.0	52.9	14.4	3.4	4.0
Rougher Tail'		82.5	0.17	0.37	2.58	96.9	14.7	25.0	47.1	85.6		

Test No.: F23 **Project No.**: 50149-001 **Operator**: YW **Date**: Dec 22 2011

Purpose: Cleaner flotation test, Repeat F12, Use CuSO4
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 57 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Target K_{80} :90 µm

Conditions:

Stage	Reagents added, g/t							Time, minutes			pH	Eh
	Lime	SIPX	MIBC*	CMC	DF250	PAX	$CuSO_4$	Grind	Cond.	Froth		
Grind		5						57				
Condition												
Rougher 1			10						1	2	9.0	51.7
Rougher 2		5	5						1	2	8.9	46.7
Rougher 3		10	5				125		1	4	8.7	33.3
Rougher 4		20	5				50		1	6	8.7	35.2
Regrind (PM)								0				
1st Cleaner		5		75			20		1	8	9.0	52.2
1st Cleaner Scav		10					20		1	4	8.6	-41.6
2nd Cleaner			5	75			20		1	6	8.5	54.0
3rd Cleaner			5	50			10		1	4	8.6	49.0
Total	0	55	35	200			245	57	8	36	.	.

* As required

Stage	Roughers	1stClnr and Scav.	2nd, 3rd Cleaner
Flotation Cell	1000g-D12	500-g D12	250-g D12
Speed: rpm	1800	1600	1100

Assay for: Cu, Ni,S, Pt, Pd, Au, Fe, MgO
Ni(S) for Roghr tail

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, Fe, MgO %)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
3rd Clnr Conc	93.2	4.7	5.61	6.50	18.8	4.00	6.78	0.43	39.5	5.17	79.2	64.0	40.4	46.8	66.0	45.4	15.5	1.0
3rd Clnr Tls	51.8	2.6	0.44	0.97	6.86	1.15	1.03	0.08	15.9	22.5	3.5	5.3	8.2	7.5	5.6	4.7	3.5	2.3
2nd Clnr Tls	110.1	5.6	0.19	0.44	3.09	0.56	0.42	0.05	12.0	26.3	3.2	5.1	7.8	8	4.8	6.2	5.5	5.8
1st Clnr Scv Conc	57.1	2.9	0.16	0.38	4.00	0.58	0.40	0.07	14.0	24.8	1.4	2.3	5.3	4.2	2.4	4.5	3.4	2.9
1st Clnr Scv Tls	126.0	6.4	0.06	0.16	1.07	0.19	0.15	0.03	10.7	26.6	1.1	2.1	3.1	3.0	2.0	4.3	5.7	6.8
Rougher Tails	1539	77.8	0.05	0.13	0.99	0.16	0.12	0.02	10.3	26.2	11.7	21.1	35.2	30.9	19.3	34.9	66.5	81.2
				Ni(S)=	0.06													
Head (calc.)	1977	100	0.33	0.48	2.19	0.40	0.48	0.04	12.0	25.1	100	100	100	100	100	100	100	100
(direct)			0.33	0.42	2.53	0.41	0.45	0.04	11.9	22.8								

Combined Products

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni %)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
3rd Clnr Conc	**93.2**	**4.71**	**5.61**	**6.50**	**18.8**	**4.00**	**6.8**	**0.43**	**39.5**	**5.17**	**79.2**	**64.0**	**40.4**	**46.8**	**66.0**	**45.4**	**15.5**	**1.0**
2nd Clnr Conc	145.0	7.33	3.76	4.52	14.5	2.98	4.73	0.30	31.1	11.4	82.6	69.3	48.6	54.2	71.5	50.1	18.9	3.3
1st Clnr Conc	255.1	12.9	2.22	2.76	9.6	1.94	2.87	0.19	22.8	17.8	85.8	74.4	56.5	62.0	76.4	56.3	24.5	9.2
1st Cl & ClScv Conc	312.2	15.8	1.84	2.33	8.6	1.69	2.42	0.17	21.2	19.1	87.2	76.7	61.7	66.1	78.7	60.8	27.8	12.0
Rghr Conc	**438.2**	**22.2**	**1.33**	**1.70**	**6.41**	**1.26**	**1.76**	**0.13**	**18.2**	**21.2**	**88.3**	**78.9**	**64.8**	**69.1**	**80.7**	**65.1**	**33.5**	**18.8**

	Mass rec	Upgrade								Unit Recovery							
Cleaner Circuit Unit Performance	21%	4.21	3.82	2.93	3.18	3.84	3.28	2.17	0.24	91%	84%	67%	72%	84%	76%	63%	41%

Product	Weight		Assays, %				% Distribution			
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue
3rd Cleaner Conc	93.2	4.7	16.3	18.4	18.6	46.8	79.2	65.3	23.5	2.3
3rd Cleaner Tail	51.8	2.6	1.28	2.60	14.6	81.5	3.5	5.1	10.3	2.3
2nd Cleaner Tail	110.1	5.6	0.55	1.18	6.6	91.7	3.2	5.0	9.9	5.4
1st Cleaner Scav Conc	57.1	2.9	0.46	0.98	9.2	89.3	1.4	2.1	7.2	2.7
1st Cleaner Scav Tail	126.0	6.4	0.17	0.43	2.3	97.1	1.1	2.1	3.9	6.6
Rougher Tail	1539	77.8	0.14	0.35	2.17	97.3	11.7	20.4	45.3	80.6
Head (calc.)	1977.4	100	0.97	1.32	3.7	94.0	100	100	100	100
Combined Products										
3rd Cleaner Conc		4.7	16.3	18.4	18.6	46.8	79.2	65.3	23.5	2.3
2nd Cleaner Conc		7.3	10.9	12.7	17.1	59.2	82.6	70.5	33.7	4.6
1st Cleaner Conc		12.9	6.44	7.75	12.6	73.2	85.8	75.4	43.6	10.1
1st Cl + Sc Conc		15.8	5.34	6.51	12.0	76.2	87.2	77.6	50.8	12.8
Rougher Conc		22.2	3.86	4.76	9.2	82.2	88.3	79.6	54.7	19.4
Rougher Tail'		77.8	0.14	0.35	2.17	97.3	11.7	20.4	45.3	80.6

Cu+Ni	PGE
12.1	11.2
8.3	8.0
5.0	5.0
4.2	4.3
3.0	3.2

Test No.: F24 **Project No.**: 50149-001 **Operator**: YW **Date**: January 12 2012

Purpose: Rougher Flotation test, 20 g/t SIPX in the grind
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 57 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Feed K_{80} :90 µm

Conditions:

Stage	Reagents added, grams per tonne							Time, minutes			pH	Eh
	245	SIPX	3477	PAX	CMC	MIBC*	DF 250	Grind	Cond.	Froth		
Grind		20						57				
Condition									1			
Rougher 1						12			1	4	8.8	67.1
Rougher 2		10							1	4	8.8	21.4
Rougher 3		10							1	4	8.6	12.9
Rougher 4		10							1	4	8.7	32.8
Rougher 5		10							1	4	8.6	26.9
Total	0	60	0	0	0	12	0	57	6	20		

* As required

Stage	Rougher
Flotation Cell	1000-D12
Speed: rpm	1800

Assay for: Cu, Ni, S, Pt, Pd, Au
Ro tails Ni(S)

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S, Fe, MgO %)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
Ro Conc 1	128.5	6.46	3.93	0.97	6.64	1.54	4.40	0.25	13.5	20.0	77.7	14.4	18.1	24.43	56.0	36.3	7.0	5.1
Ro Conc 2	76.9	3.86	0.77	5.81	11.1	1.94	2.35	0.21	20.4	17.7	9.1	51.8	18.1	18.4	17.9	18.2	6.3	2.7
Ro Conc 3	56	2.81	0.26	0.85	6.62	1.58	0.87	0.07	18.3	22.9	2.24	5.5	7.9	10.9	4.8	4.42	4.1	2.57
Ro Conc 4	44	2.21	0.13	0.4	5.16	1.04	0.47	0.04	16.6	23.6	0.88	2.04	4.8	5.65	2.05	1.99	2.95	2.08
Ro Conc 5	31.8	1.60	0.09	0.36	5.32	0.98	0.37	0.05	17.8	22.7	0.44	1.33	3.6	3.8	1.17	1.79	2.28	1.45
Ro Tail	1653	83.1	0.04	0.13	1.36	0.18	0.11	< 0.02	11.6	26.0	9.66	24.9	47.6	36.7	18.0	37.3	77.3	86.0
			Ro Tails Ni(s)=0.06															
Head (calc.)	1990	100	0.33	0.43	2.37	0.41	0.51	0.04	12.5	25.1	100	100	100	100	100	100	100	100
Head (direct)			0.33	0.42	2.53	0.41	0.45	0.04	11.9	22.8								

Combined Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S %)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
Ro Conc 1	128.5	6.46	3.93	0.97	6.64	1.54	4.40	0.25	13.5	20.0	77.7	14.4	18.1	24.43	56.0	36.3	7.0	5.1
Ro Conc 1-2	205.4	10.3	2.75	2.78	8.31	1.69	3.63	0.24	16.1	19.1	86.8	66.2	36.1	42.8	73.9	54.5	13.3	7.9
Ro Conc 1-3	261.4	13.1	2.21	2.37	7.95	1.67	3.04	0.20	16.6	19.9	89.0	71.7	44.0	53.8	78.8	58.9	17.5	10.4
Ro Conc 1-4	305.4	15.3	1.91	2.08	7.55	1.58	2.67	0.18	16.6	20.5	89.9	73.8	48.8	59.4	80.8	60.9	20.4	12.5
Ro Conc 1-5	**337.2**	**16.9**	**1.74**	**1.92**	**7.34**	**1.52**	**2.45**	**0.16**	**16.7**	**20.7**	**90.3**	**75.1**	**52.4**	**63.3**	**82.0**	**62.7**	**22.7**	**14.0**

Product	Weight		Assays, %				% Distribution			
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue
Rougher 1	128.5	6.46	11.4	2.72	4.62	81.3	77.7	14.8	6.9	5.6
Rougher 2	76.9	3.86	2.23	16.5	12.9	68.4	9.1	53.5	11.5	2.8
Rougher 3	56.0	2.81	0.75	2.26	14.8	82.2	2.2	5.3	9.6	2.5
Rougher 4	44.0	2.21	0.38	1.00	12.4	86.3	0.9	1.9	6.3	2.0
Rougher 5	31.8	1.60	0.26	0.88	13.0	85.9	0.4	1.2	4.8	1.5
Rougher Tail	1653	83.1	0.11	0.34	3.19	96.4	9.7	23.4	61.0	85.6
Head (calc.)	1990	100	0.95	1.19	4.34	93.5	100	100	100	100
Combined Products										
Ro Conc 1		6.46	11.39	2.72	4.62	81.3	77.7	14.8	6.88	5.61
Ro Conc 1-2		10.32	8.0	7.86	7.71	76.5	86.8	68.2	18.3	8.44
Ro Conc 1-3		13.1	6.42	6.66	9.2	77.7	89.0	73.6	27.9	10.9
Ro Conc 1-4		15.3	5.55	5.85	9.7	78.9	89.9	75.4	34.2	13.0
Ro Conc 1-5		16.9	5.05	5.38	10.0	79.6	90.3	76.6	39.0	14.4
Ro Tail		83.1	0.11	0.34	3.19	96.4	9.66	23.4	61.0	85.6

Test No.: F25 **Project No.**: 50149-001 **Operator**: YW **Date**: January 12 2012

Purpose: Cleaner flotation test, Repeat F12 with 90, 45, 25 g/t CMC in the clnrs
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 57 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Target K_{80} :90 µm

Conditions:

	Reagents added, g/t							Time, minutes				
Stage	**Lime**	**SIPX**	**MIBC***	**CMC**	**DF250**	**PAX**	**3477**	**Grind**	**Cond.**	**Froth**	**pH**	**Eh**
Grind		20						57				
Condition												
Rougher 1									1	4	9.0	63.1
Rougher 2		10	12						1	4	9.0	13.2
Rougher 3		10							1	4	8.9	13.5
Regrind (PM)								0				
1st Cleaner		5		90					1	6	8.9	56.8
1st Cleaner Scav		5							1	4	8.5	19.1
2nd Cleaner		2.5	15	45					1	5	8.6	63.7
3rd Cleaner		2.5	20	25					1	4	8.6	19.7
Total	0	55	47	160			0	57	7	31	.	.

* As required

Stage	Roughers	lstClnr and Scav	2nd, 3rd Cleaner
Flotation Cell	1000g-D12	500-g D12	250-g D12
Speed: rpm	1800	1600	1100

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, Fe, MgO %)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
3rd Clnr Conc	27.1	1.4	16.0	7.98	28.0	4.57	12.9	0.97	33.9	2.63	65.6	24.6	16.0	18.0	38.4	28.3	3.6	0.2
3rd Clnr Tls	29.0	1.5	2.70	7.12	17.6	3.89	7.31	0.58	28.1	9.24	11.8	23.5	10.7	16.4	23.3	18.1	3.2	0.6
2nd Clnr Tls	89.4	4.5	0.60	1.91	7.19	1.63	1.88	0.13	17.0	18.4	8.1	19.4	13.5	21	18.4	12.5	6.0	3.7
1st Clnr Scv Conc	31.0	1.6	0.21	0.69	5.98	1.48	0.83	0.06	16.5	23.4	1.0	2.4	3.9	6.7	2.8	2.0	2.0	1.6
1st Clnr Scv Tls	112.1	5.6	0.05	0.23	2.34	0.35	0.18	< 0.02	12.1	23.9	0.9	2.9	5.5	5.7	2.2	2.4	5.3	6.1
Rougher Tails	1700	85.5	0.05	0.14	1.41	0.13	0.08	< 0.02	12.0	22.7	12.6	27.1	50.4	32.1	14.9	36.6	79.9	87.7
Head (calc.)	1989	100	0.33	0.44	2.39	0.35	0.46	0.05	12.8	22.1	100	100	100	100	100	100	100	100
(direct)			0.33	0.42	2.53	0.41	0.45	0.04	11.9	22.8								

Combined Products

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni %)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
3rd Clnr Conc	**27.1**	**1.4**	**16.0**	**7.98**	**28.0**	**4.57**	**12.9**	**0.97**	**33.9**	**2.63**	**65.6**	**24.6**	**16.0**	**18.0**	**38.4**	**28.3**	**3.6**	**0.2**
2nd Clnr Conc	56.1	2.8	9.12	7.54	22.6	4.22	10.01	0.77	30.9	6.05	77.4	48.1	26.7	34.4	61.6	46.4	6.8	0.8
1st Clnr Conc	146	7.3	3.89	4.08	13.1	2.63	5.01	0.38	22.4	13.6	85.5	67.5	40.2	55.5	80.0	59.0	12.7	4.5
1st Cl & ClScv Conc	177	8.9	3.24	3.48	11.9	2.43	4.28	0.32	21.3	15.4	86.5	70.0	44.1	62.2	82.9	61.0	14.8	6.2
Rghr Conc	**289**	**14.5**	**2.00**	**2.22**	**8.18**	**1.62**	**2.69**	**0.20**	**17.7**	**18.7**	**87.4**	**72.9**	**49.6**	**67.9**	**85.1**	**63.4**	**20.1**	**12.3**

Cleaner Circuit Unit Performance	**Mass rec**	**Upgrade**								**Unit Recovery**							
	9%	7.99	3.59	3.42	2.82	4.80	4.76	1.91	0.14	76%	38%	43%	35%	48%	48%	44%	51%

Product	Weight		Assays, %				% Distribution			
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue
3rd Cleaner Conc	27.1	1.4	46.4	22.7	11.3	19.7	65.6	25.5	3.5	0.3
3rd Cleaner Tail	29.0	1.5	7.83	20.1	21.7	50.4	11.8	24.2	7.3	0.8
2nd Cleaner Tail	89.4	4.5	1.74	5.31	12.7	80.2	8.1	19.7	13.1	3.9
1st Cleaner Scav Conc	31.0	1.6	0.61	1.82	13.6	84.0	1.0	2.3	4.9	1.4
1st Cleaner Scav Tail	112.1	5.6	0.16	0.59	5.5	93.8	0.9	2.8	7.1	5.7
Rougher Tail	1700	85.5	0.14	0.36	3.3	96.2	12.6	25.6	64.1	88.0
Head (calc.)	1989	100	0.96	1.21	4.4	93.5	100	100	100	100
Combined Products										
3rd Cleaner Conc		1.4	46.4	22.7	11.3	19.7	65.6	25.5	3.5	0.3
2nd Cleaner Conc		2.8	26.4	21.3	16.6	35.6	77.4	49.6	10.8	1.1
1st Cleaner Conc		7.3	11.27	11.49	14.2	63.0	85.5	69.3	23.9	4.9
1st Cl + Sc Conc		8.9	9.39	9.79	14.1	66.7	86.5	71.7	28.8	6.3
Rougher Conc		14.5	5.81	6.22	10.8	77.2	87.4	74.4	35.9	12.0
Rougher Tail'		85.5	0.14	0.36	3.26	96.2	12.6	25.6	64.1	88.0

Test No.: F26 **Project No.**: 50149-001 **Operator**: YW **Date**: Jan 23 2012

Purpose: Rougher Flotation test,repeat F24, 20 g/t 4037 in the grind
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 57 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Feed K_{80} :90 µm

Conditions:

Stage	Reagents added, grams per tonne							Time, minutes			pH	Eh
	245	4037	3477	PAX	CMC	MIBC*	DF 250	Grind	Cond.	Froth		
Grind		20						57				
Condition									1			
Rougher 1									1	4	8.8	36.1
		SIPX										
Rougher 2		10				3			1	4	8.7	26.6
Rougher 3		10							1	4	8.6	59.9
Rougher 4		10							1	4	8.5	45.7
Rougher 5		10							1	4	8.6	20.6
Total	0	60	0	0	0	3	0	57	6	20		

* As required

Stage	Rougher
Flotation Cell	1000-D12
Speed: rpm	1800

Assay for: Cu, Ni, S, Pt, Pd, Au, Fe, MgO
Ro tails Ni(S)

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S, Fe, MgO %)								% Distribution							
		%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
Ro Conc 1	82.3	4.15	6.32	0.53	8.21	1.65	4.89	0.40	15.4	19.6	71.4	4.8	11.7	14.91	41.9	38.7	5.0	3.8
Ro Conc 2	62	3.12	1.18	6.14	10.6	2.00	2.65	0.13	18.6	16.4	10.0	42.2	11.4	13.6	17.1	9.5	4.5	2.4
Ro Conc 3	56.1	2.83	0.46	2.99	8.31	1.70	1.40	0.09	18.2	17.8	3.5	18.6	8.1	10.5	8.2	5.9	4.0	2.34
Ro Conc 4	47.9	2.41	0.28	1.03	6.78	1.45	0.76	0.07	17.7	20.3	1.8	5.5	5.6	7.6	3.8	3.9	3.3	2.28
Ro Conc 5	33.3	1.68	0.21	0.69	6.65	1.30	0.67	0.05	18.5	17.9	1.0	2.5	3.8	4.8	2.3	2.0	2.4	1.40
Ro Tail	1703.5	85.8	0.05	0.14	2.02	0.26	0.15	0.02	12.0	22.0	12.2	26.4	59.5	48.6	26.6	40.0	80.6	87.8
			Ni(S)=	0.08														
Head (calc.)	1985	100	0.37	0.45	2.91	0.46	0.48	0.04	12.8	21.5	100	100	100	100	100	100	100	100
Head (direct)			0.33	0.42	2.53	0.41	0.45	0.04	11.9	22.8								

Combined Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S %)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
Ro Conc 1	82.3	4.15	6.32	0.53	8.21	1.65	4.89	0.40	15.4	19.6	71.4	4.8	11.7	14.9	41.9	38.7	5.0	3.8
Ro Conc 1-2	144.3	7.3	4.11	2.94	9.24	1.80	3.93	0.28	16.8	18.2	81.5	47.0	23.0	28.5	59.1	48.1	9.5	6.2
Ro Conc 1-3	200.4	10.1	3.09	2.95	8.98	1.77	3.22	0.23	17.2	18.1	85.0	65.6	31.1	39.0	67.3	54.1	13.6	8.5
Ro Conc 1-4	248.3	12.5	2.55	2.58	8.55	1.71	2.75	0.20	17.3	18.5	86.9	71.0	36.7	46.6	71.0	58.0	16.9	10.8
Ro Conc 1-5	**281.6**	**14.2**	**2.27**	**2.36**	**8.33**	**1.66**	**2.50**	**0.18**	**17.4**	**18.5**	**87.8**	**73.6**	**40.5**	**51.4**	**73.4**	**60.0**	**19.4**	**12.2**

Product	Weight		Assays, %				% Distribution			
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue
Rougher 1	82.3	4.15	18.32	1.47	3.45	76.8	71.4	5.0	2.5	3.5
Rougher 2	62.0	3.12	3.4	17.4	9.61	69.5	10.0	44.1	5.3	2.4
Rougher 3	56.1	2.83	1.33	8.39	13.4	76.9	3.54	19.2	6.7	2.4
Rougher 4	47.9	2.41	0.81	2.78	14.7	81.7	1.84	5.4	6.3	2.1
Rougher 5	33.3	1.68	0.61	1.80	15.4	82.2	0.96	2.4	4.6	1.5
Rougher Tail	1704	85.8	0.15	0.34	4.88	94.6	12.2	23.9	74.5	88.2
Head (calc.)	1985	100	1.06	1.24	5.62	92.1	100	100	100	100
Combined Products										
Ro Conc 1		4.15	18.32	1.47	3.45	76.8	71.4	4.95	2.55	3.46
Ro Conc 1-2		7.27	11.9	8.33	6.10	73.7	81.5	49.0	7.89	5.81
Ro Conc 1-3		10.1	8.95	8.35	8.1	74.6	85.0	68.2	14.6	8.2
Ro Conc 1-4		12.5	7.38	7.27	9.4	76.0	86.9	73.6	20.9	10.3
Ro Conc 1-5		14.2	6.58	6.63	10.1	76.7	87.8	76.1	25.5	11.8
Ro Tail		85.8	0.15	0.34	4.88	94.6	12.17	23.9	74.5	88.2

Test No.: F27 **Project No.**: 50149-001 **Operator**: YW **Date**: Jan 23 2012

Purpose: Rougher Flotation test, Repeat F24, 20 g/t SIPX in the 1st rougher
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 57 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Feed K_{80} :90 µm

Conditions:

Stage	Reagents added, grams per tonne							Time, minutes			pH	Eh
	245	SIPX	3477	PAX	CMC	MIBC*	DF 250	Grind	Cond.	Froth		
Grind								57				
Condition									1			
Rougher 1		20				12			1	4	8.9	40.6
Rougher 2		10							1	4	8.9	42.2
Rougher 3		10							1	4	8.9	13.3
Rougher 4		10							1	4	8.8	2.7
Rougher 5		10							1	4	8.7	18.7
Total	0	60	0	0	0	12	0	57	6	20		

* As required

Stage	Rougher
Flotation Cell	1000-D12
Speed: rpm	1800

Assay for: Cu, Ni, S, Pt, Pd, Au, Fe, MgO
Ro tails Ni(S)

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S, Fe, MgO %)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
Ro Conc 1	111.7	5.64	4.32	2.63	8.99	1.50	4.42	0.27	16.0	17.0	74.3	35.3	21.2	18.92	50.7	40.1	7.5	4.4
Ro Conc 2	81.2	4.10	0.52	2.38	5.69	1.38	1.61	0.07	14.6	20.8	6.5	23.2	9.8	12.7	13.4	7.6	5.0	3.9
Ro Conc 3	49.2	2.48	0.34	1.27	5.23	1.38	1.01	0.05	15.1	21.0	2.6	7.5	5.4	7.7	5.1	3.3	3.1	2.4
Ro Conc 4	38.8	1.96	0.26	0.82	5.15	1.32	0.78	0.06	15.7	20.4	1.6	3.8	4.2	5.8	3.1	3.1	2.6	1.8
Ro Conc 5	28.9	1.46	0.20	0.58	5.04	1.22	0.66	0.04	15.7	20.9	0.89	2.0	3.1	4.0	2.0	1.5	1.9	1.4
Ro Tail	1672.4	84.4	0.06	0.14	1.59	0.27	0.15	< 0.02	11.3	22.3	14.2	28.1	56.2	51.0	25.7	44.5	79.8	86.1
			Ni(S)=	0.08														
Head (calc.)	1982	100	0.33	0.42	2.39	0.45	0.49	0.04	11.9	21.9	100	100	100	100	100	100	100	100
Head (direct)			0.33	0.42	2.53	0.41	0.45	0.04	11.9	22.8								

Combined Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S %)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
Ro Conc 1	111.7	5.64	4.32	2.63	8.99	1.50	4.42	0.27	16.0	17.0	74.3	35.3	21.2	18.92	50.7	40.1	7.5	4.4
Ro Conc 1-2	192.9	9.7	2.72	2.52	7.60	1.45	3.24	0.19	15.4	18.6	80.8	58.5	31.0	31.6	64.1	47.6	12.6	8.3
Ro Conc 1-3	242.1	12.2	2.24	2.27	7.12	1.44	2.78	0.16	15.3	19.1	83.4	66.0	36.5	39.2	69.2	50.9	15.7	10.7
Ro Conc 1-4	280.9	14.2	1.96	2.07	6.85	1.42	2.51	0.14	15.4	19.3	84.9	69.9	40.7	45.0	72.3	54.0	18.3	12.5
Ro Conc 1-5	**309.8**	**15.6**	**1.80**	**1.93**	**6.68**	**1.40**	**2.34**	**0.13**	**15.4**	**19.4**	**85.8**	**71.9**	**43.8**	**49.0**	**74.3**	**55.5**	**20.2**	**13.9**

Product	Weight		Assays, %				% Distribution			
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue
Rougher 1	111.7	5.64	12.5	7.45	5.66	74.4	74.3	36.5	7.2	4.5
Rougher 2	81.2	4.10	1.51	6.71	7.76	84.0	6.5	23.9	7.2	3.7
Rougher 3	49.2	2.48	0.99	3.52	9.80	85.7	2.6	7.6	5.5	2.3
Rougher 4	38.8	1.96	0.75	2.22	10.9	86.1	1.6	3.8	4.9	1.8
Rougher 5	28.9	1.46	0.58	1.53	11.4	86.5	0.9	1.9	3.8	1.3
Rougher Tail	1672	84.4	0.16	0.36	3.73	95.8	14.2	26.2	71.4	86.4
Head (calc.)	1982	100	0.95	1.15	4.40	93.5	100	100	100	100
Combined Products										
Ro Conc 1		5.64	12.52	7.45	5.66	74.4	74.3	36.53	7.24	4.48
Ro Conc 1-2		9.73	7.9	7.14	6.54	78.4	80.8	60.5	14.45	8.16
Ro Conc 1-3		12.2	6.48	6.40	7.20	79.9	83.4	68.0	20.0	10.4
Ro Conc 1-4		14.2	5.69	5.82	7.72	80.8	84.9	71.8	24.8	12.2
Ro Conc 1-5		15.6	5.21	5.42	8.06	81.3	85.8	73.8	28.6	13.6
Ro Tail		84.4	0.16	0.36	3.73	95.8	14.17	26.2	71.4	86.4

Test No.: F28 **Project No.**: 50149-001 **Operator**: YW **Date**: Jan 23 2012

Purpose: Rougher Flotation test, Repeat F27 with 5 min aeration
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 57 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Feed K_{80} :90 µm

Conditions:

Stage	Reagents added, grams per tonne							Time, minutes			pH	Eh
	245	SIPX	3477	PAX	CMC	MIBC*	DF 250	Grind	Cond.	Froth		
Grind								57				
Aeration									5			
Rougher 1		20				12			1	4	9.0	25.8
Rougher 2		10							1	4	8.8	24.0
Rougher 3		10							1	4	8.8	20.0
Rougher 4		10							1	4	8.7	16.0
Rougher 5		10							1	4	8.7	23.2
Total	0	60	0	0	0	12	0	57	10	20		

* As required

Stage	Rougher
Flotation Cell	1000-D12
Speed: rpm	1800

Assay for: Cu, Ni, S, Pt, Pd, Au, Fe, MgO
Ro tails Ni(S)

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S, Fe, MgO %)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
Ro Conc 1	89.4	4.50	5.29	2.76	9.97	1.63	5.24	0.38	16.6	19.2	73.6	29.3	19.1	15.94	47.8	42.0	6.2	3.6
Ro Conc 2	46.7	2.35	0.78	3.93	7.36	1.88	2.52	0.11	15.6	21.1	5.7	21.8	7.4	9.6	12.0	6.3	3.1	2.0
Ro Conc 3	54.4	2.74	0.43	1.94	5.38	1.57	1.32	0.06	15.2	23.1	3.6	12.5	6.3	9.3	7.3	4.0	3.5	2.6
Ro Conc 4	38.8	1.95	0.31	1.04	4.60	1.57	0.92	0.05	15.1	23.1	1.9	4.8	3.8	6.7	3.6	2.4	2.5	1.9
Ro Conc 5	36.1	1.82	0.23	0.67	4.46	1.44	0.78	0.06	15.1	23.2	1.3	2.9	3.5	5.7	2.9	2.7	2.3	1.7
Ro Tail	1722.8	86.7	0.05	0.14	1.62	0.28	0.15	< 0.02	11.4	24.6	13.9	28.7	59.9	52.8	26.4	42.6	82.5	88.2
			Ni(S)=	0.08														
Head (calc.)	1988	100	0.32	0.42	2.34	0.46	0.49	0.04	12.0	24.18	100	100	100	100	100	100	100	100
Head (direct)			0.33	0.42	2.53	0.41	0.45	0.04	11.9	22.8								

Combined Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S %)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
Ro Conc 1	89.4	4.50	5.29	2.76	9.97	1.63	5.24	0.38	16.6	19.2	73.6	29.3	19.1	15.94	47.8	42.0	6.2	3.6
Ro Conc 1-2	136.1	6.8	3.74	3.16	9.07	1.72	4.31	0.29	16.3	19.9	79.3	51.1	26.5	25.5	59.8	48.3	9.3	5.6
Ro Conc 1-3	190.5	9.6	2.80	2.81	8.02	1.67	3.45	0.22	16.0	20.8	82.9	63.7	32.8	34.9	67.1	52.4	12.8	8.2
Ro Conc 1-4	229.3	11.5	2.38	2.51	7.44	1.66	3.03	0.19	15.8	21.2	84.8	68.5	36.6	41.5	70.8	54.8	15.2	10.1
Ro Conc 1-5	**265.4**	**13.3**	**2.08**	**2.26**	**7.04**	**1.63**	**2.72**	**0.18**	**15.7**	**21.4**	**86.1**	**71.3**	**40.1**	**47.2**	**73.6**	**57.4**	**17.5**	**11.8**

Product	Weight		Assays, %				% Distribution			
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue
Rougher 1	89.4	4.50	15.33	7.82	5.32	71.5	73.6	30.3	5.6	3.4
Rougher 2	46.7	2.35	2.3	11.1	7.61	79.0	5.7	22.6	4.2	2.0
Rougher 3	54.4	2.74	1.25	5.45	8.3	85.0	3.6	12.8	5.3	2.5
Rougher 4	38.8	1.95	0.90	2.87	8.8	87.4	1.9	4.8	4.0	1.8
Rougher 5	36.1	1.82	0.67	1.81	9.6	88.0	1.3	2.8	4.0	1.7
Rougher Tail	1723	86.7	0.15	0.36	3.81	95.7	13.9	26.6	77.0	88.6
Head (calc.)	1988	100	0.94	1.16	4.29	93.6	100	100	100	100
Combined Products										
Ro Conc 1		4.50	15.33	7.82	5.32	71.5	73.6	30.33	5.57	3.44
Ro Conc 1-2		6.85	10.8	8.96	6.11	74.1	79.3	52.9	9.73	5.42
Ro Conc 1-3		9.6	8.11	7.96	6.7	77.2	82.9	65.7	15.0	7.9
Ro Conc 1-4		11.5	6.89	7.10	7.1	78.9	84.8	70.6	19.0	9.7
Ro Conc 1-5		13.3	6.04	6.38	7.4	80.2	86.1	73.4	23.0	11.4
Ro Tail		86.7	0.15	0.36	3.81	95.7	13.94	26.6	77.0	88.6

Test: F29 | **Project: 150149-001** | **Date:** 08-Feb-12 | **Operator:** YW

Purpose: Split flowsheet including Cu separation
Procedure: As below.
Feed: 2 kg of -10 mesh Master Composite
Grind: 57 minutes/2 kg at 65% solids in a lab mill
Regrind 2 minutes in the pebble mill (bulk clnr 1 concentrate)
Regrind 6 minutes in the pebble mill (Ni clnr 1 concentrate)

Feed K_{80} :90 µm
Cu regrind K80: 31 µm
Ni regrind K80: 26 µm

Conditions:

Stage	Reagents added, grams per tonne						Time, minutes				
	Lime	SIPX	4037	CMC		MIBC*	Grind	Cond.	Froth	pH	Eh
Grind		20					57				
Bulk Rougher 1						10		1	2	8.7	124.6
Bulk Rougher 2		10						1	2	8.7	48.2
Ni Scav 1		30							6	8.7	85.3
Ni Scav 2		30							6	8.6	29.2
Combine Ro Conc 1-2											
Bulk 1st Cleaner		0+5+2		20+20+0		5		2	3+2+1	8.7	101.2
Regrind (PM)							2				
Bulk 2nd Cleaner		0+2		0+5		10		2	2+2	8.1	143.4
Bulk 3rd Cleaner				10		10		2	6	7.7	174.4
Condition								5			
Cu Rougher	600							1	2	11.3	-2.9
Cu 1st Cleaner	95							1	1	11.0	16.9
Combine Scav Conc 1-2											
Ni 1st Cleaner		10+5		50+20				2	3+3	8.6	98.7
Regrind (PM)	100						6				
Ni 2nd Cleaner		5+2		10+10		5		2	2.5	10.0	49.9
Ni 3rd Cleaner				5		8		2	1.5	9.1	101.4
Ni 4th Cleaner								2	1	8.0	144.3
Total	795	90	0	15	0	48	65	21	29		

*As needed

Stage	Rougher	1st cleaners	2nd & 3rd clnr & sep	
Flotation Cell	1000 g D-12	500 g D-12	250 g D-12	
Speed: r.p.m.	1800	1600	1200	

PSA On Bulk Regrind
PSA On Ni Regrind
Assay for Cu, Ni, S

Metallurgical Balance

Product	Weight		Assays, %			% Distribution		
	g	%	Cu	Ni	S	Cu	Ni	S
Cu 1st Cl Conc	7.9	0.40	29.3	0.40	30.7	40.3	0.4	5.1
Cu 1st Cl Tail	4.3	0.22	15.0	2.67	23.5	11.2	1.4	2.1
Cu Ro Tail	15.4	0.78	**5.22**	**10.9**	20.4	14.0	20.8	6.7
Bulk 3rd Clnr Tail	9.1	0.46	2.06	9.53	15.9	3.3	10.8	3.1
Bulk 2nd Clnr Tail	18.9	0.96	0.90	4.37	10.1	3.0	10.3	4.0
Bulk 1st Clnr Tail	52.9	2.68	0.12	0.43	1.80	1.1	2.8	2.0
Ni 4th Clnr Conc	4.0	0.20	7.29	9.33	28.7	5.1	4.6	2.4
Ni 4th Clnr Tail	1.6	0.08	1.95	6.54	23.4	0.5	1.3	0.8
Ni 3rd Clnr Tail	7.9	0.40	0.82	4.40	17.6	1.1	4.3	2.9
Ni 2nd Clnr Tail	46.8	2.37	0.26	2.07	13.9	2.1	12.0	13.8
Ni 1st Clnr Tail	111	5.63	0.10	0.28	3.39	1.9	3.9	8.0
Ni Scav Tail	1696	85.8	0.06	0.13	1.36	16.3	27.4	48.9
Head (calc.)	1976	100.0	0.29	0.41	2.39	100.0	100.0	100.0
(direct)			0.33	0.42	2.53			
Combined Products								
Cu 1st Clnr Conc	7.9	0.40	**29.3**	**0.40**	30.7	**40.3**	**0.39**	5.15
Cu Rougher Conc	12.2	0.62	24.3	1.20	28.2	51.6	1.82	7.29
Bulk 3rd Clnr Conc	27.6	1.40	**13.6**	**6.61**	23.8	**65.6**	**22.7**	14.0
Bulk 2nd Clnr Conc	36.7	1.86	10.8	7.34	21.9	68.9	33.4	17.0
Bulk 1st Clnr Conc	55.6	2.81	7.41	6.33	17.9	71.8	43.7	21.1
Bulk Rougher Conc	**109**	**5.49**	**3.86**	**3.45**	**10.0**	**72.9**	**46.5**	**23.1**
Ni 4th Clnr Conc	4.0	0.20	**7.29**	**9.33**	28.7	**5.1**	**4.6**	2.4
Ni 3rd Clnr Conc	5.6	0.28	5.76	8.53	27.2	5.6	5.9	3.2
Ni 2nd Clnr Conc	13.5	0.68	2.87	6.11	21.6	6.8	10.2	6.2
Ni 1st Clnr Conc	60.3	3.05	0.84	2.98	15.6	8.9	22.3	20.0
Ni Scav Conc	172	8.68	0.36	1.23	7.69	10.8	26.1	28.0
Bulk Rghr+Scav Conc	280	**14.2**	1.72	2.09	8.60	83.7	72.6	51.1

Metallurgical Balance

Product	Weight		Assays, %								% Distribution						
	g	%	Cu	Ni	S	other	Cp	Pn	Po	Ga	Cu	Ni	S	Cp	Pn	Po	Ga
Cu 1st Cl Conc	7.9	0.40	**29.3**	**0.40**	30.7	39.6	84.7	1.13	1.79	12.4	40.3	0.4	5.1	40.3	0.5	0.2	0.1
Cu 1st Cl Tail	4.3	0.22	15.0	2.67	23.5	58.8	43.4	7.54	15.1	34.0	11.2	1.4	2.1	11.2	1.7	0.7	0.1
Cu Ro Tail (Ni Conc.)	15.4	0.78	**5.22**	**10.9**	20.4	63.5	15.1	31.8	12.0	41.1	14.0	20.8	6.7	14.0	25.3	2.0	0.3
Bulk 3rd Clnr Tail	9.1	0.46	2.06	9.53	15.9	72.5	5.95	27.7	12.1	54.2	3.3	10.8	3.1	3.3	13.0	1.2	0.3
Bulk 2nd Clnr Tail	18.9	0.96	0.90	4.37	10.1	84.6	2.60	12.5	13.1	71.8	3.0	10.3	4.0	3.0	12.2	2.7	0.7
Bulk 1st Clnr Tail	52.9	2.68	0.12	0.43	1.80	97.7	0.35	1.06	3.44	95.2	1.1	2.8	2.0	1.1	2.9	2.0	2.7
Ni 4th Clnr Conc	4.0	0.20	**7.29**	**9.33**	28.7	54.7	21.1	26.8	32.3	19.8	5.1	4.6	2.4	5.1	5.5	1.4	0.0
Ni 4th Clnr Tail	1.6	0.08	1.95	6.54	23.4	68.1	5.64	18.5	39.7	36.2	0.5	1.3	0.8	0.5	1.5	0.7	0.0
Ni 3rd Clnr Tail	7.9	0.40	0.82	4.40	17.6	77.2	2.37	12.3	32.9	52.4	1.1	4.3	2.9	1.1	5.0	2.9	0.2
Ni 2nd Clnr Tail	46.8	2.37	0.26	2.07	13.9	83.8	0.75	5.45	30.7	63.1	2.1	12.0	13.8	2.1	13.2	15.9	1.6
Ni 1st Clnr Tail	111	5.63	0.10	0.28	3.39	96.2	0.29	0.55	8.05	91.1	1.9	3.9	8.0	1.9	3.1	9.9	5.5
Ni Scav Tail	1696	85.8	0.06	0.13	1.36	98.5	0.16	0.18	3.22	96.4	16.3	27.4	48.9	16.3	16.1	60.4	88.4
Head (calc.)	1976	100.0	0.29	0.41	2.39	96.9	0.84	0.98	4.58	93.6	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.33	0.42	2.53												
Combined Products																	
Cu 1st Clnr Conc	7.9	0.40	29.3	0.40	30.7	39.6	84.7	1.13	1.79	12.4	40.3	0.4	5.1	40.3	0.5	0.2	0.1
Cu Rougher Conc	12.2	0.62	24.3	1.20	28.2	46.4	70.1	3.39	6.49	20.0	51.6	1.8	7.3	51.6	2.1	0.9	0.1
Bulk 3rd Clnr Conc	27.6	1.40	13.6	6.61	23.8	55.9	39.4	19.2	9.56	31.8	65.6	22.7	14.0	65.6	27.4	2.9	0.5
Bulk 2nd Clnr Conc	36.7	1.86	10.8	7.34	21.9	60.0	31.1	21.3	10.2	37.4	68.9	33.4	17.0	68.9	40.4	4.1	0.7
Bulk 1st Clnr Conc	55.6	2.81	7.41	6.33	17.9	68.4	21.4	18.3	11.2	49.1	71.8	43.7	21.1	71.8	52.6	6.9	1.5
Bulk Rougher Conc	109	5.49	3.86	3.45	10.0	82.7	11.1	9.92	7.41	71.5	72.9	46.5	23.1	72.9	55.5	8.9	4.2
Ni 4th Clnr Conc	4.0	0.20	7.29	9.33	28.7	54.7	21.1	26.8	32.3	19.8	5.1	4.6	2.4	5.1	5.5	1.4	0.0
Ni 3rd Clnr Conc	5.6	0.28	5.76	8.53	27.2	58.5	16.7	24.5	34.4	24.5	5.6	5.9	3.2	5.6	7.1	2.1	0.1
Ni 2nd Clnr Conc	13.5	0.68	2.87	6.11	21.6	69.4	8.30	17.3	33.6	40.8	6.8	10.2	6.2	6.8	12.1	5.0	0.3
Ni 1st Clnr Conc	60.3	3.05	0.84	2.98	15.6	80.6	2.44	8.11	31.3	58.1	8.9	22.3	20.0	8.9	25.2	20.9	1.9
Ni Scav Conc	172	8.68	0.36	1.23	7.69	90.7	1.05	3.21	16.2	79.5	10.8	26.1	28.0	10.8	28.4	30.8	7.4
Bulk Rghr+Scav Conc	280	14.2	1.72	2.09	8.60	87.6	4.96	5.81	12.8	76.4	83.7	72.6	51.1	83.7	83.9	39.6	11.6

Test: F30 **Project:** 150149-001 **Date:** 09-Feb-12 **Operator:** YW
Purpose: Split flowsheet
Procedure: As below.
Feed: 2 kg of -10 mesh Master Composite
Grind: 57 minutes/2 kg at 65% solids in a lab mill
Regrind 4 minutes in the pebble mill (Ni clnr 1 concentrate)
Regrind

Feed K_{80} :90 µm
Cu regrind K80: 74 µm
Ni regrind K80: 30 µm

Conditions:

Stage	Reagents added, grams per tonne						Time, minutes				
	Lime	SIPX	4037	CMC	Calgon	MIBC*	Grind	Cond.	Froth	pH	Eh
Grind							57				
Bulk Rougher 1		10		40		10		1	2	8.8	124.4
Bulk Rougher 2		5		40		5		1	2	8.7	66.7
Ni Scav 1		30		40					6	8.7	53.4
Ni Scav 2		30		40					6	8.7	47.8
Combine Ro Conc 1-2											
Bulk 1st Cleaner		0+0+2		10+10+0		0+2+0			3+2+1	8.6	92.2
Regrind (PM)							0				
Bulk 2nd Cleaner				5					2+2	8.4	109.6
Bulk 3rd Cleaner									2		
Combine Scav Conc 1-2											
Ni 1st Cleaner		10+10		30+0					2+2	8.7	79.5
Regrind (PM)							4				
Ni 2nd Cleaner		5+5		5+0					2	8.5	59.0
Ni 3rd Cleaner					10				2	7.5	165.8
Total	0	75	0	165	10	15	61	2	22		

*As needed

Stage	Rougher	1st cleaners	2nd & 3rd clnr & sep
Flotation Cell	1000 g D-12	500 g D-12	250 g D-12
Speed: r.p.m.	1800	1600	1200

PSA On Ni Regrind
Assay for Cu, Ni, S

Metallurgical Balance

Product	Weight		Assays, %			% Distribution		
	g	%	Cu	Ni	S	Cu	Ni	S
Bulk 3rd Clnr Conc.	31.7	1.62	14.2	4.79	22.4	75.3	19.7	14.9
Bulk 3rd Clnr Tail	1.6	0.08	1.12	4.24	21.1	0.3	0.9	0.7
Bulk 2nd Clnr Tail	28.7	1.47	0.95	5.83	9.51	4.6	21.7	5.7
Bulk 1st Clnr Tail	48.6	2.48	0.17	1.41	3.93	1.4	8.9	4.0
Ni 3rd Clnr Conc	8.6	0.44	2.64	6.08	13.2	3.8	6.8	2.4
Ni 3rd Clnr Tail	2.8	0.14	2.68	6.18	26.4	1.3	2.2	1.6
Ni 2nd Clnr Tail	24.3	1.24	0.34	1.97	14.4	1.4	6.2	7.4
Ni 1st Clnr Tail	114.8	5.86	0.18	0.47	7.40	3.5	7.0	17.9
Ni Scav Tail	1697	86.7	0.03	0.12	1.27	8.5	26.5	45.4
Head (calc.)	1959	100.0	0.31	0.39	2.43	100.0	100.0	100.0
(direct)			0.33	0.42	2.53			
Combined Products								
Bulk 3rd Clnr Conc	31.7	1.62	**14.2**	**4.79**	22.4	**75.3**	**19.7**	14.9
Bulk 2nd Clnr Conc	33.3	1.70	13.6	4.76	22.3	75.6	20.6	15.7
Bulk 1st Clnr Conc	62.0	3.17	7.73	5.26	16.4	80.2	42.4	21.4
Bulk Rougher Conc	**111**	**5.65**	**4.41**	**3.57**	**10.9**	**81.6**	**51.3**	**25.4**
Ni 3rd Clnr Conc	8.6	0.44	**2.64**	**6.08**	13.2	3.8	6.8	2.4
Ni 2nd Clnr Conc	11.4	0.58	2.65	6.10	16.4	5.1	9.0	3.9
Ni 1st Clnr Conc	35.7	1.82	1.08	3.29	15.1	6.4	15.3	11.3
Ni Scav Conc	151	7.68	0.39	1.14	9.22	9.9	22.3	29.2
Bulk Rghr+Scav Conc	261	**13.3**	2.09	2.17	9.94	91.5	73.5	54.62

Metallurgical Balance

Product	Weight		Assays, %								% Distribution						
	g	%	Cu	Ni	S	other	Cp	Pn	Po	Ga	Cu	Ni	S	Cp	Pn	Po	Ga
Bulk 3rd Clnr Conc.	31.7	1.62	**14.2**	**4.79**	22.4	58.6	41.0	13.9	8.95	36.1	75.3	19.7	14.9	75.3	24.0	3.1	0.6
Bulk 3rd Clnr Tail	1.6	0.08	1.12	4.24	21.1	73.5	3.24	11.7	41.8	43.3	0.3	0.9	0.7	0.3	1.0	0.7	0.04
Bulk 2nd Clnr Tail	28.7	1.47	0.95	5.83	9.51	83.7	2.75	16.9	7.70	72.7	4.6	21.7	5.7	4.6	26.5	2.4	1.1
Bulk 1st Clnr Tail	48.6	2.48	0.17	1.41	3.93	94.5	0.49	3.90	6.40	89.2	1.4	8.9	4.0	1.4	10.4	3.4	2.4
Ni 3rd Clnr Conc	8.6	0.44	**2.64**	**6.08**	13.2	78.1	7.63	17.6	12.3	62.5	3.8	6.8	2.4	3.8	8.2	1.1	0.3
Ni 3rd Clnr Tail	2.8	0.14	2.68	6.18	26.4	64.7	7.75	17.3	46.6	28.4	1.3	2.2	1.6	1.3	2.6	1.4	0.0
Ni 2nd Clnr Tail	24.3	1.24	0.34	1.97	14.4	83.3	0.98	5.14	32.0	61.9	1.4	6.2	7.4	1.4	6.8	8.5	0.8
Ni 1st Clnr Tail	114.8	5.86	0.18	0.47	7.40	92.0	0.52	0.95	17.9	80.6	3.5	7.0	17.9	3.5	5.9	22.4	5.1
Ni Scav Tail	1697	86.7	0.03	0.12	1.27	98.6	0.09	0.16	3.08	96.7	8.5	26.5	45.4	8.5	14.5	56.9	89.6
Head (calc.)	1959	100.0	0.31	0.39	2.43	96.9	0.88	0.94	4.68	93.5	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.33	0.42	2.53												
Combined Products																	
Bulk 3rd Clnr Conc	31.7	1.62	14.2	4.79	22.4	58.6	41.0	13.9	8.95	36.1	75.3	19.7	14.9	75.3	24.0	3.1	0.6
Bulk 2nd Clnr Conc	33.3	1.70	13.6	4.76	22.3	59.3	39.2	13.8	10.5	36.5	75.6	20.6	15.7	75.6	25.0	3.8	0.7
Bulk 1st Clnr Conc	62.0	3.17	7.73	5.26	16.4	70.6	22.3	15.2	9.22	53.2	80.2	42.4	21.4	80.2	51.5	6.2	1.8
Bulk Rougher Conc	111	5.65	4.41	3.57	10.9	81.1	12.7	10.2	7.98	69.0	81.6	51.3	25.4	81.6	61.9	9.6	4.2
Ni 3rd Clnr Conc	8.6	0.44	2.64	6.08	13.2	78.1	7.63	17.6	12.3	62.5	3.8	6.8	2.4	3.8	8.2	1.1	0.3
Ni 3rd Clnr Conc	11.4	0.58	2.65	6.10	16.4	74.8	7.66	17.5	20.7	54.1	5.1	9.0	3.9	5.1	10.9	2.6	0.3
Ni 1st Clnr Conc	35.7	1.82	1.08	3.29	15.1	80.6	3.11	9.09	28.4	59.4	6.4	15.3	11.3	6.4	17.7	11.1	1.2
Ni Scav Conc	151	7.68	0.39	1.14	9.22	89.3	1.14	2.88	20.4	75.6	9.9	22.3	29.2	9.9	23.6	33.4	6.2
Bulk Rghr+Scav Conc	261	13.3	2.09	2.17	9.94	85.8	6.05	6.00	15.1	72.8	91.5	73.5	54.6	91.5	85.5	43.1	10.4

Test: F31 | **Project: 150149-001** | **Date:** 09-Feb-12 | **Operator:** YW

Purpose: Split flowsheet
Procedure: As below.
Feed: 2 kg of -10 mesh Master Composite
Grind: 57 minutes/2 kg at 65% solids in a lab mill
Regrind 4 minutes in the pebble mill (Ni clnr 1 concentrate)
Regrind

Feed K_{80} :90 µm
Cu regrind K80: 75 µm
Ni regrind K80: 51 µm

Conditions:

Stage	Reagents added, grams per tonne						Time, minutes				
	Lime	SIPX	CuSO4	CMC	Guar Gum	MIBC*	Grind	Cond.	Froth	pH	Eh
Grind							57				
Bulk Rougher 1		10		40		10		1	2	9.0	-133.1
Bulk Rougher 2		5		40		5		1	2	9.0	83.5
Ni Scav 1		30		40				1	6	9.0	70.0
Ni Scav 2		30		40				1	6	8.8	70.5
Ni Scav 3		30	200						2		
Combine Ro Conc 1-2											
Bulk 1st Cleaner		0+2		15					3+1		
Regrind (PM)							0				
Bulk 2nd Cleaner		0+2			10				4		
Bulk 3rd Cleaner									2	7.9	135.9
Combine Scav Conc 1-2											
Ni 1st Cleaner		20		30					4	8.7	115.7
Regrind (PM)							4				
Ni 2nd Cleaner		10			10	10			2	8.4	130.1
Ni 3rd Cleaner									2	7.7	144.7
Total	0	135	200	205	20	25	61	4	32		

*As needed

Stage	Rougher	1st cleaners	2nd & 3rd clnr & sep	
Flotation Cell	1000 g D-12	500 g D-12	250 g D-12	
Speed: r.p.m.	1800	1600	1200	

Assay for Cu, Ni, S

Metallurgical Balance

Product	Weight		Assays, %			% Distribution		
	g	%	Cu	Ni	S	Cu	Ni	S
Bulk 3rd Clnr Conc.	23.4	1.19	**16.4**	**3.70**	24.4	63.8	10.8	12.3
Bulk 3rd Clnr Tail	11.2	0.57	3.51	7.90	17.4	6.5	11.1	4.2
Bulk 2nd Clnr Tail	38.8	1.97	0.76	6.17	11.4	4.9	29.9	9.5
Bulk 1st Clnr Tail	45.3	2.30	0.09	0.66	2.79	0.7	3.7	2.7
Ni 3rd Clnr Conc	2.7	0.14	**4.65**	**6.76**	30.3	2.1	2.3	1.8
Ni 3rd Clnr Tail	1.9	0.10	1.45	4.53	26.0	0.5	1.1	1.1
Ni 2nd Clnr Tail	28.3	1.44	0.39	1.98	20.9	1.8	7.0	12.7
Ni 1st Clnr Tail	91.6	4.65	0.18	0.45	5.30	2.7	5.2	10.4
Ni Scav 3	27.9	1.42	0.12	0.39	10.4	0.6	1.4	6.2
Ni Scav Tail	1699	86.2	0.06	0.13	1.07	16.4	27.6	39.1
Head (calc.)	1970	100.0	0.31	0.41	2.36	100.0	100.0	100.0
(direct)			0.33	0.42	2.53			
Combined Products								
Bulk 3rd Clnr Conc	23.4	1.19	**16.4**	**3.70**	24.4	63.8	10.8	12.3
Bulk 2nd Clnr Conc	34.6	1.76	12.2	5.06	22.1	70.3	21.9	16.5
Bulk 1st Clnr Conc	73.4	3.73	6.17	5.65	16.5	75.3	51.8	26.0
Bulk Rougher Conc	**119**	**6.03**	**3.85**	**3.74**	**11.2**	**75.9**	**55.5**	**28.7**
Ni 3rd Clnr Conc	2.7	0.14	**4.65**	**6.76**	30.3	**2.1**	**2.3**	1.8
Ni 2nd Clnr Conc	4.6	0.23	3.33	5.84	28.5	2.5	3.4	2.8
Ni 1st Clnr Conc	32.9	1.67	0.80	2.52	22.0	4.4	10.4	15.5
Ni Scav 1 & 2 Conc	125	6.32	0.34	1.00	9.70	7.1	15.5	26.0
Bulk Rghr+Scav Conc	271	**13.8**	1.85	2.14	10.4	83.6	72.4	60.9

Metallurgical Balance

Product	Weight		Assays, %								% Distribution						
	g	%	Cu	Ni	S	other	Cp	Pn	Po	Ga	Cu	Ni	S	Cp	Pn	Po	Ga
Bulk 3rd Clnr Conc.	23.4	1.19	**16.4**	**3.70**	24.4	55.5	47.4	10.6	11.1	30.8	63.8	10.8	12.3	65.2	14.1	3.1	0.4
Bulk 3rd Clnr Tail	11.2	0.57	3.51	7.90	17.4	71.2	10.1	22.9	16.3	50.7	6.5	11.1	4.2	6.7	14.5	2.2	0.3
Bulk 2nd Clnr Tail	38.8	1.97	0.76	6.17	11.4	81.7	2.2	17.8	12.3	67.7	4.9	29.9	9.5	5.0	39.1	5.7	1.4
Bulk 1st Clnr Tail	45.3	2.30	0.09	0.66	2.79	96.5	0.3	1.71	5.53	92.5	0.7	3.7	2.7	0.7	4.4	3.0	2.3
Ni 3rd Clnr Conc	2.7	0.14	**4.65**	**6.76**	30.3	58.3	13.4	19.0	50.1	17.5	2.1	2.3	1.8	2.1	2.9	1.6	0.0
Ni 3rd Clnr Tail	1.9	0.10	1.45	4.53	26.0	68.0	4.2	12.3	53.0	30.5	0.5	1.1	1.1	0.5	1.3	1.2	0.0
Ni 2nd Clnr Tail	28.3	1.44	0.39	1.98	20.9	76.7	0.5	0.98	12.4	86.1	1.8	7.0	12.7	0.9	1.6	4.2	1.3
Ni 1st Clnr Tail	91.6	4.65	0.18	0.45	5.30	94.1	0.3	0.58	26.1	72.9	2.7	5.2	10.4	1.9	3.0	28.5	3.6
Ni Scav 3	27.9	1.42	0.12	0.39	10.4	89.1	0.2	0.20	2.45	97.2	0.6	1.4	6.2	0.3	0.3	0.8	1.5
Ni Scav Tail	1698.9	86.2	0.06	0.13	1.07	98.7	0.2	0.20	2.45	97.2	16.4	27.6	39.1	16.8	18.8	49.7	89.2
Head (calc.)	1970.0	100.0	0.31	0.41	2.36	96.9	0.86	0.90	4.26	94.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.33	0.42	2.53												
Combined Products																	
Bulk 3rd Clnr Conc	23.4	1.19	**16.4**	**3.70**	24.4	55.5	47.4	10.6	11.1	30.8	63.8	10.8	12.3	65.2	14.1	3.1	0.4
Bulk 2nd Clnr Conc	34.6	1.76	12.2	5.06	22.1	60.6	35.3	14.6	12.8	37.2	70.3	21.9	16.5	71.9	28.6	5.3	0.7
Bulk 1st Clnr Conc	73.4	3.73	6.17	5.65	16.5	71.7	17.8	16.3	12.5	53.3	75.3	51.8	26.0	76.9	67.7	11.0	2.1
Bulk Rougher Conc	**118.7**	**6.03**	**3.85**	**3.74**	**11.2**	**81.2**	**11.1**	**10.7**	**9.9**	**68.3**	**75.9**	**55.5**	**28.7**	**77.6**	**72.1**	**14.0**	**4.4**
Ni 3rd Clnr Conc	2.7	0.14	**4.65**	**6.76**	30.3	58.3	13.4	19.0	50.1	17.5	2.1	2.3	1.8	2.1	2.9	1.6	0.0
Ni 3rd Clnr Conc	4.6	0.23	3.33	5.84	28.5	62.3	9.62	16.2	51.3	22.9	2.5	3.4	2.8	2.6	4.2	2.8	0.1
Ni 1st Clnr Conc	32.9	1.67	0.80	2.52	22.0	74.7	1.79	3.11	17.9	77.2	4.4	10.4	15.5	3.5	5.8	7.0	1.4
Ni Scav 1 & 2 Conc	124.5	6.32	0.34	1.00	9.70	89.0	0.73	1.25	23.9	74.1	7.1	15.5	26.0	5.3	8.8	35.5	5.0
Bulk Rghr+Scav Conc	271.1	13.76	1.84	2.10	9.38	86.7	5.20	5.27	15.3	63.9	83.6	72.4	60.9	83.2	81.2	50.3	10.8

Test: F32 | **Project: 150149-001** | **Date:** 09-Feb-12 | **Operator:** YW

Purpose: Split flowsheet including Cu separation
Procedure: As below.
Feed: 2x2 kg of -10 mesh Master Composite
Grind: 57 minutes/2 kg at 65% solids in a lab mill
Regrind 4 minutes in the pebble mill (bulk clnr 1 concentrate)
Regrind 8 minutes in the pebble mill (Ni clnr 1 concentrate)

Feed K_{80} : 90 µm
Cu regrind K80: 44 µm
Ni regrind K80: 53 µm

Conditions:

Stage	Reagents added, grams per tonne						Time, minutes				
	Lime	SIPX	4037	CMC		MIBC*	Grind	Cond.	Froth	pH	Eh
Grind							57				
Bulk Rougher 1		10		40		24		1	2	8.5	150.7
Bulk Rougher 2		5		40				1	2	8.5	97.8
Ni Scav 1		30		40		10			6		
Ni Scav 2		30+30		40	CuSO4: 200 g/t	12			6+2	8.5	100.0
Combine Ro Conc 1-2											
Bulk 1st Cleaner		0+2		15+0					3+1	8.6	115.4
Regrind (PM)							4				
Bulk 2nd Cleaner		0+2+2			Guar gum: 10 g/t					8.2	97.8
Condition	700							5		11.3	-31.9
Cu Rougher					5100: 1.25 g/t	4+4			2	11.1	-16.3
Cu 1st Cleaner	116.5								1		
Combine Scav Conc 1-2											
Ni 1st Cleaner		20+10		30					4+2	8.7	64.3
Regrind (PM)					Guar Gum		8				
Ni 2nd Cleaner		5			10				3+2	8.4	113.2
Ni 3rd Cleaner					10				2		
Total	816.5	50	0	190	20	46	69	7	15		

*As needed

Stage	Rougher	2nd clnr	3rd clnr & sep
Flotation Cell	2000 g D-12	500 g D-12	250 g D-12
Speed: r.p.m.	1500	1600	1200

PSA On Bulk Regrind
PSA On Ni Regrind

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S, Fe, MgO %)								% Distribution							
	g	%	Cu	Ni	Pt	Pd	Au	S	Fe	MgO	Cu	Ni	Pt	Pd	Au	S	Fe	MgO
Cu 1st Cl Conc	14.3	0.36	30.3	0.47	1.71	6.17	1.27	30.1	31.5	1.15	37.6	0.4	1.6	5.0	11.5	4.6	0.9	0.02
Cu 1st Cl Tail	3.5	0.09	20.3	2.80	3.47	19.0	1.69	27.3	31.8	3.43	6.2	0.6	0.8	3.7	3.7	1.0	0.2	0.01
Cu Ro Tail	14.0	0.35	9.65	14.0	3.10	21.1	0.84	26.6	30.2	4.37	11.7	11.8	2.9	16.6	7.4	4.0	0.9	0.1
Bulk 2nd Clnr Tail	31.4	0.79	3.16	6.23	2.08	7.82	0.23	13.2	20.3	16.2	8.6	11.8	4.3	13.8	4.6	4.5	1.3	0.5
Bulk 1st Clnr Tail	59.7	1.51	0.14	0.43	0.53	0.44	0.03	2.05	10.0	26.4	0.7	1.6	2.1	1.5	1.1	1.3	1.2	1.6
Ni 3rd Clnr Conc	47.6	1.20	3.14	9.32	7.10	7.80	0.44	30.5	44.1	2.2	13.0	26.8	22.3	20.9	13.2	15.6	4.3	0.1
Ni 3rd Clnr Tail	50.3	1.27	0.47	2.87	3.19	1.92	0.17	17.1	29.6	14.7	2.1	8.7	10.6	5.4	5.4	9.3	3.1	0.8
Ni 2nd Clnr Tail	80.0	2.02	0.26	1.37	1.40	0.94	0.09	13.6	24.8	16.0	1.8	6.6	7.4	4.2	4.6	11.7	4.1	1.3
Ni 1st Clnr Tail	171	4.32	0.18	0.41	0.80	0.54	0.04	3.40	13.3	25.0	2.7	4.2	9.0	5.2	4.3	6.3	4.7	4.4
Ni Scav Tail	3490	88.1	0.05	0.13	0.17	0.12	<0.02	1.11	11.1	25.6	15.7	27.4	39.1	23.6	44.1	41.7	79.4	91.2
Head (calc.)	3962	100.0	0.29	0.42	0.38	0.45	0.04	2.35	12.3	24.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.33	0.42	0.41	0.45	0.04	2.53	11.9	22.8								
Combined Products																		
Cu 1st Clnr Conc	14.3	0.36	30.3	0.47	1.7	6.2	1.27	30.1	31.5	1.2	37.6	0.41	1.61	4.97	11.5	4.63	0.92	0.02
Cu Rougher Conc	17.8	0.45	28.3	0.93	2.1	8.7	1.35	29.5	31.6	1.6	43.7	1.00	2.41	8.71	15.2	5.66	1.15	0.03
Bulk 2nd Clnr Conc	31.8	0.80	20.1	6.68	2.5	14.2	1.13	28.3	31.0	2.8	55.5	12.8	5.27	25.3	22.7	9.67	2.02	0.09
Bulk 1st Clnr Conc	63.2	1.60	11.7	6.46	2.3	11.0	0.68	20.8	25.7	9.5	64.1	24.7	9.58	39.2	27.2	14.1	3.32	0.61
Bulk Rougher Conc	122.9	3.10	6.08	3.53	1.44	5.87	0.36	11.7	18.1	17.7	64.8	26.2	11.7	40.6	28.4	15.4	4.55	2.22
Ni 3rd Clnr Conc	47.6	1.20	3.14	9.32	7.1	7.80	0.44	30.5	44.1	2.2	13.0	26.8	22.3	20.9	13.2	15.6	4.30	0.11
Ni 2nd Clnr Conc	97.9	2.47	1.77	6.01	5.1	4.78	0.30	23.6	36.7	8.6	15.0	35.5	32.8	26.3	18.6	24.9	7.35	0.86
Ni 1st Clnr Conc	177.9	4.49	1.09	3.92	3.4	3.05	0.21	19.1	31.3	12.0	16.8	42.1	40.2	30.6	23.2	36.6	11.4	2.17
Ni Scav Conc	348.9	8.81	0.64	2.20	2.14	1.82	0.12	11.4	22.5	18.35	19.5	46.4	49.2	35.8	27.5	42.9	16.1	6.54
Bulk Rghr+Scav Conc	471.8	11.91	2.06	2.55	1.96	2.88	0.187	11.5	21.3	18.18	84.3	72.6	60.9	76.4	55.9	58.3	20.6	8.76

Metallurgical Balance

Product	Weight		Assays, %								% Distribution						
	g	%	Cu	Ni	S	other	Cp	Pn	Po	Ga	Cu	Ni	S	Cp	Pn	Po	Ga
Cu 1st Cl Conc	14.3	0.36	30.3	0.47	30.1	39.1	87.6	1.41	-2.63	13.6	37.6	0.4	4.6	37.6	0.5	-0.2	0.1
Cu 1st Cl Tail	3.5	0.09	20.3	2.80	27.3	49.6	58.7	8.01	10.7	22.6	6.2	0.6	1.0	6.2	0.7	0.2	0.0
Cu Ro Tail (Ni Conc.)	14.0	0.35	9.65	14.0	26.6	49.8	27.9	41.0	8.58	22.5	11.7	11.8	4.0	11.7	14.3	0.7	0.1
Bulk 2nd Clnr Tail	31.4	0.79	3.16	6.23	13.2	77.4	9.13	18.0	10.5	62.3	8.6	11.8	4.5	8.6	14.1	1.9	0.5
Bulk 1st Clnr Tail	59.7	1.51	0.14	0.43	2.05	97.4	0.40	1.05	4.04	94.5	0.7	1.6	1.3	0.7	1.6	1.4	1.5
Ni 3rd Clnr Conc	47.6	1.20	3.14	9.32	30.5	57.0	9.08	26.5	48.1	16.3	13.0	26.8	15.6	13.0	31.5	13.0	0.2
Ni 3rd Clnr Tail	50.3	1.27	0.47	2.87	17.1	79.6	1.36	7.72	36.5	54.5	2.1	8.7	9.3	2.05	9.7	10.4	0.7
Ni 2nd Clnr Tail	80.0	2.02	0.26	1.37	13.6	84.8	0.75	3.38	31.7	64.2	1.8	6.6	11.7	1.80	6.7	14.4	1.4
Ni 1st Clnr Tail	171	4.32	0.18	0.41	3.40	96.0	0.52	0.94	7.53	91.0	2.7	4.2	6.3	2.67	4.0	7.3	4.2
Ni Scav Tail	3490	88.1	0.05	0.13	1.11	98.7	0.15	0.19	2.57	97.1	15.7	27.4	41.7	15.7	16.9	51.0	91.3
Head (calc.)	3962	100.0	0.29	0.42	2.35	96.9	0.84	1.01	4.45	93.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.33	0.42	2.53												
Combined Products																	
Cu 1st Clnr Conc	14.3	0.36	30.3	0.47	30.1	39.1	87.6	1.41	-2.63	13.6	37.6	0.4	4.6	37.6	0.5	-0.21	0.1
Cu Rougher Conc	17.8	0.45	28.3	0.93	29.5	41.2	81.9	2.71	-0.01	15.4	43.7	1.0	5.7	43.7	1.2	0.0	0.1
Bulk 2nd Clnr Conc	31.8	0.80	20.1	6.68	28.3	45.0	58.1	19.6	3.77	18.6	55.5	12.8	9.7	55.5	15.5	0.7	0.2
Bulk 1st Clnr Conc	63.2	1.60	11.7	6.46	20.8	61.1	33.8	18.8	7.11	40.3	64.1	24.7	14.1	64.1	29.6	2.5	0.7
Bulk Rougher Conc	122.9	3.10	6.08	3.53	11.7	78.7	17.6	10.18	5.62	66.6	64.8	26.2	15.4	64.8	31.2	3.9	2.2
Ni 3rd Clnr Conc	47.6	1.20	3.14	9.32	30.5	57.0	9.08	26.5	48.1	16.3	13.0	26.8	15.6	13.0	31.5	13.0	0.2
Ni 2nd Clnr Conc	97.9	2.47	1.77	6.01	23.6	68.6	5.11	16.9	42.1	35.9	15.0	35.5	24.9	15.0	41.2	23.4	0.9
Ni 1st Clnr Conc	177.9	4.49	1.09	3.92	19.1	75.9	3.15	10.8	37.4	48.6	16.8	42.1	36.6	16.8	47.9	37.8	2.3
Ni Scav Conc	348.9	8.81	0.64	2.20	11.41	85.7	1.86	5.97	22.8	69.4	19.5	46.4	42.9	19.5	51.9	45.1	6.5
Bulk Rghr+Scav Conc	471.8	11.91	2.06	2.55	11.48	83.9	5.95	7.07	18.30	68.7	84.3	72.6	58.3	84.3	83.1	49.0	8.7

Test: F33-MF2 **Project:** 50149-001 **Date:** 10-Feb-12 **Operato** YW

Purpose: Test MF2 flowsheet as recommended by Wardrop in Draft PEA
Procedure: As below, adapted by Mike Ounpuu
Feed: 2 kg of -10 mesh Master Composite
Prim Grind: 19 minutes/2 kg at 65% solids in a lab mill Target ~ 300 micron
Sec Grind: 38 minutes/2 kg at ~65% solids in a lab mill Target 90 micron
Regrind 8 min in Pebble Mill

Prim Clnrs K_{80} : 52 µm
Sec Clnrs K_{80} : 71 µm
Scav. Reg. K_{80} : 30 µm

Conditions:

Stage	Reagents added, grams per tonne						Time, minutes				
	Lime	SIPX	4037	CMC	Guar	MIBC*	Grind	Cond.	Froth	pH	Eh
Prim Grind							19				
Prim Rougher		10		40		10		1	2	8.6	165.0
Prim 1st Cleaner				10		5		1	1.5	8.4	91.4
Prim 2nd Cleaner					5	6		1	1	7.8	143.3
Prim Ro Tail to Sec Grind											
Sec Grind							38				
Sec Scav 1		30		40		6			6	8.8	109.2
Sec Scav 2		30		40					6	8.8	40.7
Combine Scav Conc 1-2											
Sec 1st Cleaner		0+2		30		5		2	2+2	8.8	62.9
Sec 2nd Cleaner					10	15		2	4	8.5	114.3
Sec 3rd Cleaner					5			2	3	8.1	130.7
Sec 1st Cl Tail to Regrind											
Regrind							4				
Regrind Scav		10			10				2	8.6	84.0
Total	0	70	0	160	20	47	57	9	23.5		

*As needed

Stage	Rougher	1st cleaners	2nd & 3rd clnr & sep
Flotation Cell	1000 g D-12	500 g D-12	250 g D-12
Speed: r.p.m.	1800	1600	1200

PSA on Sec Scav tail
PSA on Pri Clnr
PSA on Sec Clnr
PSA on Regrind

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S, Fe, MgO %)								% Distribution							
	g	%	Cu	Ni	Pt	Pd	Au	S	Fe	MgO	Cu	Ni	Pt	Pd	Au	S	Fe	MgO
Prim Cl 2 Conc	7.9	0.40	**22.4**	**2.64**	2.47	10.1	1.60	29.2	31.8	2.89	29.4	2.4	2.3	8.0	13.7	4.8	1.0	0.0
Prim Cl 2 Tail	11.9	0.61	3.54	13.2	2.63	11.2	0.44	23.9	30.3	5.58	7.0	18.2	3.6	13.4	5.7	5.9	1.4	0.1
Prim Cl 1 Tail	33.9	1.73	0.38	2.10	0.75	1.20	0.06	4.60	12.6	18.0	2.1	8.2	3.0	4.1	2.2	3.2	1.7	1.3
Sec Cl 3 Conc	29.7	1.51	**7.53**	**6.61**	3.82	9.44	0.72	23.7	29.9	4.75	37.2	22.7	13.2	28.1	23.2	14.5	3.6	0.3
Sec Cl 3 Tail	52.3	2.66	0.88	2.40	3.43	3.24	0.19	8.95	19.1	19.5	7.7	14.5	20.9	17.0	10.8	9.7	4.0	2.2
Sec Cl 3 Tail	11.2	0.57	0.40	1.51	2.03	1.47	0.09	8.37	18.8	20.7	0.7	2.0	2.6	1.6	1.1	1.9	0.8	0.5
Regrind Scav Conc	4.6	0.23	0.70	1.23	2.92	2.03	0.37	6.88	15.9	20.5	0.5	0.7	1.6	0.9	1.8	0.7	0.3	0.2
Regrind Scav Tail	91.9	4.68	**0.08**	**0.32**	0.63	0.30	0.04	3.44	13.1	21.8	1.2	3.4	6.7	2.8	4.0	6.5	4.8	4.3
Sec Scav Tail	1722	87.6	0.05	0.14	0.23	0.14	0.02	1.49	11.9	24.8	14.0	27.9	46.1	24.2	37.4	52.9	82.3	91.1
Head (calc.)	1965	100.0	0.31	0.44	0.44	0.51	0.05	2.47	12.7	23.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.33	0.42	0.41	0.45	0.04	2.53	11.9	22.8								
Combined Products																		
Prim 2nd Clnr Conc	7.9	0.4	**22.4**	**2.64**	2.47	10.1	1.60	29.2	31.8	2.9	29.4	2.4	2.3	8.0	13.7	4.8	1.0	0.0
Prim 1st Clnr Conc	19.8	1.0	11.1	8.99	2.57	10.8	0.90	26.0	30.9	4.5	36.5	20.6	5.9	21.4	19.4	10.6	2.5	0.2
Prim Rougher Conc	53.7	2.7	4.32	4.64	1.42	4.73	0.37	12.5	19.3	13.0	38.6	28.8	8.9	25.4	21.6	13.8	4.2	1.5
Sec 3rd Clnr Conc	29.7	1.5	**7.53**	**6.61**	3.82	9.44	0.72	23.7	29.9	4.75	37.2	22.7	13.2	28.1	23.2	14.5	3.6	0.3
Sec 2nd Clnr Conc	82.0	4.2	3.29	3.92	3.57	5.49	0.38	14.3	23.0	14.2	44.9	37.3	34.1	45.1	34.0	24.2	7.6	2.5
Sec 1st Clnr Conc	93.2	4.7	2.94	3.63	3.39	5.00	0.35	13.6	22.5	14.9	45.6	39.2	36.7	46.7	35.1	26.1	8.4	3.0
Sec Scav Conc	190	9.7	1.50	1.97	2.04	2.65	0.20	8.51	17.8	18.4	47.4	43.3	45.0	50.4	41.0	33.3	13.6	7.4
Regrind Scav Conc	4.6	0.2	0.70	1.23	2.92	2.03	0.37	6.88	15.9	20.5	0.5	0.7	1.6	0.9	1.8	0.7	0.3	0.2
Regrind Scav Feed	96.5	4.9	0.11	0.36	0.74	0.38	0.06	3.60	13.2	21.7	1.7	4.1	8.3	3.7	5.8	7.2	5.1	4.5
Comb Clnr Conc	37.6	1.9	10.7	5.78	3.54	9.58	0.90	24.9	30.3	4.36	66.7	25.1	15.5	36.1	37.0	19.3	4.6	0.3
Comb Ro & Scav Cor	243	12.4	2.12	2.56	1.90	3.11	0.24	9.39	18.1	17.2	86.0	72.1	54	76	63	47.1	17.7	9

Metallurgical Balance

Product	Weight		Assays, %								% Distribution						
	g	%	Cu	Ni	S	other	Cp	Pn	Po	Ga	Cu	Ni	S	Cp	Pn	Po	Ga
Prim Cl 2 Conc	7.90	0.40	**22.4**	**2.64**	29.2	45.8	64.7	7.55	10.5	17.2	29.4	2.4	4.8	29.4	2.83	0.9	0.1
Prim Cl 2 Tail	11.9	0.61	3.54	13.2	23.9	59.4	10.2	38.4	19.8	31.6	7.0	18.2	5.9	7.0	21.7	2.6	0.2
Prim Cl 1 Tail	33.9	1.73	0.38	2.10	4.60	92.9	1.10	5.95	5.84	87.1	2.1	8.2	3.2	2.1	9.6	2.2	1.6
Sec Cl 3 Conc	29.7	1.51	**7.53**	**6.61**	23.7	62.2	21.8	18.9	25.5	33.8	37.2	22.7	14.5	37.2	26.7	8.2	0.5
Sec Cl 3 Tail	52.3	2.66	0.88	2.40	8.95	87.8	2.54	6.68	15.2	75.6	7.7	14.5	9.7	7.7	16.6	8.6	2.2
Sec Cl 3 Tail	11.2	0.57	0.40	1.51	8.37	89.7	1.16	4.02	17.2	77.6	0.7	2.0	1.9	0.7	2.1	2.1	0.5
Regrind Scav Conc	4.60	0.23	0.70	1.23	6.88	91.2	2.02	3.26	13.2	81.5	0.5	0.7	0.7	0.5	0.7	0.7	0.2
Regrind Scav Tail	91.9	4.68	**0.08**	**0.32**	3.44	96.2	0.23	0.66	8.14	91.0	1.2	3.4	6.5	1.2	2.9	8.1	4.6
Sec Scav Tail	1722	87.6	0.05	0.14	1.49	98.3	0.14	0.21	3.55	96.1	14.0	27.9	52.9	14.0	17.0	66.6	90.2
Head (calc.)	1965	100.0	0.31	0.44	2.47	96.8	0.88	1.07	4.67	93.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.33	0.42	2.53												
Combined Products																	
Prim 2nd Clnr Conc	7.90	0.4	**22.4**	**2.64**	29.2	45.8	64.7	7.55	10.5	17.2	29.4	2.4	4.8	29.4	2.8	0.9	0.1
Prim 1st Clnr Conc	19.8	1.0	11.1	8.99	26.0	53.9	32.0	26.1	16.1	25.8	36.5	20.6	10.6	36.5	24.5	3.5	0.3
Prim Rougher Conc	53.7	2.7	4.32	4.64	12.5	78.5	12.5	13.4	9.6	64.5	38.6	28.8	13.8	38.6	34.1	5.6	1.9
Sec 3rd Clnr Conc	29.7	1.5	**7.53**	**6.61**	23.7	62.2	21.8	18.9	25.5	33.8	37.2	22.7	14.5	37.2	26.7	8.2	0.5
Sec 2nd Clnr Conc	82.0	4.2	3.29	3.92	14.3	78.5	9.50	11.1	18.9	60.5	44.9	37.3	24.2	44.9	43.2	16.9	2.7
Sec 1st Clnr Conc	93.2	4.7	2.94	3.63	13.6	79.8	8.50	10.3	18.7	62.5	45.6	39.2	26.1	45.6	45.4	19.0	3.2
Sec Scav Conc	190	9.7	1.50	1.97	8.51	88.0	4.34	5.45	13.4	76.8	47.4	43.3	33.3	47.4	49.0	27.8	7.9
Regrind Scav Conc	4.60	0.2	0.70	1.23	6.88	91.2	2.02	3.26	13.2	81.5	0.5	0.7	0.7	0.5	0.7	0.7	0.2
Regrind Scav Feed	96.5	4.9	0.11	0.36	3.60	95.9	0.31	0.79	8.38	90.5	1.7	4.1	7.2	1.7	3.6	8.8	4.8
Comb Conc	37.6	1.9	10.7	5.78	24.9	58.7	30.8	16.5	22.3	30.3	66.7	25.1	19.3	66.7	29.5	9.1	0.6

Test: F34 **Project:** 150149-001 **Date:** 10-Feb-12 **Operator:** YW

Purpose: Split flowsheet
Procedure: As below.
Feed: 2x2 kg of -10 mesh Master Composite
Grind: 57 minutes/2 kg at 65% solids in a lab mill
Regrind 4 minutes in the pebble mill (bulk clnr 1 concentrate)
Regrind 6 minutes in the pebble mill (Ni clnr 1 concentrate)

Feed K_{80} :90 µm
Cu regrind K80: 38 µm
Ni regrind K80: 36 µm

Conditions:

Stage	Reagents added, grams per tonne: Lime	SIPX	4037	CMC	Guar gum	MIBC*	Time, minutes: Grind	Cond.	Froth	pH	Eh
Grind							57				
Bulk Rougher 1		20		40		12		1	2	8.9	98.2
Bulk Rougher 2		5		40					2	8.9	39.4
Ni Scav 1		30		40					4	8.8	39.7
Ni Scav 2		30							4	8.8	-42.1
Ni Scav 3		30							4		
Combine Ro Conc 1-2											
Bulk 1st Cleaner		0+0+2.5		10+5		5			2+1	8.8	72.9
Regrind (PM)							4				
Bulk 2nd Cleaner		2			10	2			2.5	8.4	87.2
Bulk 3rd Cleaner		0+2			5	2.5			3	8.1	114.5
Combine Scav Conc 1-2											
Ni 1st Cleaner		20+5		30	10	5			3	8.8	72.7
Regrind (PM)							6				
Ni 2nd Cleaner		10+10			10	5			2+2	8.7	86.4
Ni 2nd Cleaner Scav					5100: 5 g/t	3477: 5 g/t			2		
Total	0	117	0	150	35	31.5	67	1	26.5		

*As needed

Stage	Rougher	2nd clnr	3rd clnr
Flotation Cell	2000 g D-12	500 g D-12	250 g D-12
Speed: r.p.m.	1500	1600	1200

PSA On Bulk Regrind
PSA On Ni Regrind

Metallurgical Balance

Product	Weight g	%	Assays, (Pt, Pd, Au g/t), (Cu, Ni, S, Fe, MgO %) Cu	Ni	Pt	Pd	Au	S	Fe	MgO	% Distribution Cu	Ni	Pt	Pd	Au	S	Fe	MgO
Bulk 3rd Clnr conc	32.1	0.82	23.2	3.65	2.51	12.0	1.41	29.2	30.2	2.34	60.4	6.8	4.7	20.3	25.2	8.9	1.9	0.1
Bulk 3rd Clnr Tail	16.2	0.41	4.80	11.0	3.21	13.4	0.49	19.6	24.9	9.92	6.3	10.4	3.0	11.4	4.4	3.0	0.8	0.2
Bulk 2nd Clnr Tail	96.0	2.44	1.59	6.48	2.41	5.14	0.21	12.8	21.6	15.8	12.4	36.3	13.6	26.0	11.2	11.6	4.2	1.7
Bulk 1st Clnr Tail	69.0	1.75	0.10	0.43	0.79	0.34	0.04	2.65	11.1	24.3	0.6	1.7	3.2	1.2	1.5	1.7	1.5	1.9
Ni 2nd Clnr Conc	16.0	0.41	**3.11**	**7.05**	9.33	**7.69**	**1.12**	29.6	**42.3**	3.69	4.0	6.6	8.8	6.5	10.0	4.5	1.4	0.1
Ni 2nd Clnr Scav.Conc	13.8	0.35	**0.44**	**2.19**	3.81	**1.86**	**0.20**	23.8	**37.3**	8.30	0.5	1.8	3.1	1.4	1.5	3.1	1.0	0.1
Ni 2nd Clnr Scav. Tail	35.8	0.91	0.29	1.44	2.14	1.09	0.13	16.7	31.2	12.4	0.8	3.0	4.5	2.1	2.6	5.7	2.2	0.5
Ni 1st Clnr Tail	164.3	4.18	0.19	0.52	1.04	0.63	0.05	5.27	15.3	22.0	2.5	5.0	10.0	5.5	4.6	8.2	5.0	4.1
Ni Scav Tail	3489	88.7	0.04	0.14	0.24	0.14	0.02	1.61	11.7	23.2	12.5	28.5	49.1	25.7	38.9	53.2	81.9	91.4
Head (calc.)	3932	100.0	0.31	0.44	0.43	0.48	0.05	2.68	12.7	22.5	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.33	0.42	0.41	0.45	0.04	2.53	11.9	22.8								
Combined Products																		
Bulk 3rd Clnr Conc	32.1	0.82	**23.2**	**3.65**	2.51	12.0	1.41	29.2	30.2	2.3	60.4	6.83	4.73	20.3	25.2	8.9	1.9	0.08
Bulk 2nd Clnr Conc	48.3	1.23	17.0	6.12	2.74	12.47	1.10	26.0	28.4	4.9	66.7	17.2	7.77	31.7	29.6	11.9	2.8	0.27
Bulk 1st Clnr Conc	144	3.67	6.76	6.36	2.52	7.59	0.51	17.2	23.9	12.1	79.1	53.5	21.3	57.7	40.9	23.5	6.9	1.98
Bulk Rougher Conc	**213**	**5.42**	**4.60**	**4.44**	**1.96**	**5.25**	**0.36**	**12.5**	**19.7**	**16.1**	**79.6**	**55.2**	**24.5**	**58.9**	**42.4**	**25.3**	**8.4**	**3.87**
Ni 2nd Clnr Conc	16.0	0.41	**3.11**	**7.05**	9.33	7.69	1.12	29.6	42.3	3.7	4.0	6.6	8.75	6.48	9.99	4.49	1.36	0.07
Ni 2nd Clnr + Scav. Conc	29.8	0.76	1.87	4.80	6.77	4.99	0.69	26.9	40.0	5.8	4.5	8.3	11.8	7.83	11.5	7.60	2.39	0.20
Ni 1st Clnr Conc	65.6	1.67	1.01	2.97	4.24	2.86	0.39	21.3	35.2	9.4	5.4	11.3	16.3	9.89	14.1	13.3	4.63	0.70
Ni Scav Conc	230	5.85	0.42	1.22	1.95	1.27	0.15	9.86	21.0	18.4	7.9	16.3	26.4	15.3	18.7	21.5	9.7	4.78
Bulk Rghr+Scav Conc	443	11.3	2.44	2.77	1.96	3.18	0.25	11.1	20.4	17.3	87.5	71.5	50.9	74.3	61.1	46.8	18.1	8.65

Metallurgical Balance

Product	Weight g	%	Assays, % Cu	Ni	S	other	Cp	Pn	Po	Ga	% Distribution Cu	Ni	S	Cp	Pn	Po	Ga
Bulk 3rd Clnr Conc	32.1	0.82	23.2	3.65	29.2	44.0	67.1	10.6	5.78	16.6	60.4	6.8	8.9	40.1	3.7	0.3	0.2
Bulk 3rd Clnr Tail	16.2	0.41	4.80	11.0	19.6	64.6	13.9	32.1	10.8	43.3	6.3	10.4	3.0	4.2	5.7	0.3	0.2
Bulk 2nd Clnr Tail	96.0	2.44	1.59	6.5	12.8	79.1	4.60	18.7	13.0	63.7	12.4	36.3	11.6	8.2	19.7	2.3	1.9
Bulk 1st Clnr Tail	69.0	1.75	0.10	0.43	2.65	96.8	4.60	18.7	13.0	63.7	0.6	1.7	1.7	5.9	14.1	1.7	1.4
Ni 2nd Clnr Conc	16.0	0.41	**3.11**	**7.05**	29.6	60.2	0.29	1.03	5.73	93.0	4.0	6.6	4.5	0.1	0.2	0.2	0.5
Ni 2nd Clnr Scav.Conc	13.8	0.35	0.44	2.19	23.8	73.6	8.99	19.8	51.6	19.6	0.5	1.8	3.1	2.3	3.0	1.3	0.1
Ni 2nd Clnr Scav. Tail	35.8	0.91	0.29	1.44	16.7	81.6	1.27	5.40	55.9	37.4	0.8	3.0	5.7	0.8	2.1	3.7	0.4
Ni 1st Clnr Tail	164.3	4.18	0.19	0.52	5.27	94.0	0.84	3.45	39.6	56.2	2.5	5.0	8.2	2.6	6.2	12.0	2.8
Ni Scav Tail	3489	88.7	0.04	0.14	1.61	98.2	0.55	1.19	12.1	86.1	12.5	28.5	53.2	35.7	45.3	78.2	92.6
Head (calc.)	3932	100.0	0.31	0.44	2.68	96.6	1.36	2.33	13.8	82.5	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.33	0.42	2.53												
Combined Products																	
Bulk 3rd Clnr Conc	32.1	0.82	23.2	3.65	29.2	44.0	67.1	10.6	5.78	16.6	60.4	6.8	8.9	40.1	3.7	0.3	0.2
Bulk 2nd Clnr Conc	48.3	1.23	17.0	6.12	26.0	50.9	49.2	17.8	7.45	25.5	66.7	17.2	11.9	44.3	9.4	0.7	0.4
Bulk 1st Clnr Conc	144.3	3.67	6.76	6.36	17.2	69.7	19.5	18.4	11.1	50.9	79.1	53.5	23.5	52.5	29.1	3.0	2.3
Bulk Rougher Conc	213	5.42	4.60	4.44	12.5	78.5	14.7	18.5	11.7	55.0	79.6	55.2	25.3	58.5	43.2	4.6	3.6
Ni 2nd Clnr Conc	16.0	0.41	3.11	7.05	29.6	60.2	0.29	1.03	5.73	93.0	4.0	6.6	4.5	0.1	0.2	0.2	0.5
Ni 2nd Clnr + Scav. Conc	29.8	0.76	1.87	4.80	26.9	66.4	4.32	9.72	27.0	59.0	4.5	8.3	7.6	2.4	3.2	1.5	0.5
Ni 1st Clnr Conc	65.6	1.67	1.01	2.97	21.3	74.7	2.66	7.36	42.8	47.2	5.4	11.3	13.3	3.2	5.3	5.2	1.0
Ni Scav Conc	230	5.85	0.42	1.22	9.86	88.5	1.36	4.57	40.5	53.6	7.9	16.3	21.5	5.8	11.5	17.2	3.8
Bulk Rghr+Scav Conc	443	11.27	2.44	2.77	11.1	83.7	7.78	11.3	26.6	54.3	87.5	71.5	46.8	64.3	54.7	21.8	7.4

Test: F35 **Project: 150149-001** **Date:** 14-Feb-12 **Operator:** YW

Purpose: Split flowsheet, CMC and Guar 50:50 mix
Procedure: As below.
Feed: 2x2 kg of -10 mesh Master Composite
Grind: 57 minutes/2 kg at 65% solids in a lab mill
Regrind 4 minutes in the pebble mill (bulk clnr 1 concentrate)
Regrind 8 minutes in the pebble mill (Ni clnr 1 concentrate)

Feed K_{80} : 90 µm
Cu regrind K80: 41 µm
Ni regrind K80: 35 µm

Conditions:

Stage	Lime	SIPX	4037	CMC	Guar	MIBC*	Grind	Cond.	Froth	pH	Eh
	Reagents added, grams per tonne						Time, minutes				
Grind							57				
Bulk Rougher 1		15		30	30			1	2	8.8	26.9
Bulk Rougher 2		10		20	20			1	2	8.7	19.4
Ni Scav 1		30		20	20				4	8.7	25.9
Ni Scav 2		30							4	8.7	13.9
Ni Scav 3		30							4	8.7	-59.6
Combine Ro Conc 1-2											
Bulk 1st Cleaner A				10	10				2	8.7	64.0
B		2							2		
Regrind (PM)							4				
Bulk 2nd Cleaner		0		5	5				2		
		5							2		
Bulk 3rd Cleaner A (this may not be needed)		0		2.5	2.5				2	7.9	105.0
B		2							2		
Combine Scav Conc 1-3											
Ni 1st Cleaner		20		15	15				3	8.8	53.4
		10							3	8.7	-44.0
Regrind (PM)							8				
Ni 2nd Cleaner		5		5	5				4	8.6	54.1
Ni 3rd Cleaner		5		2.5	2.5				3	8.4	87.8
Total	0	164	0	110	110	0	69	2	41		

*As needed

Stage	Rougher	2nd clnr	3rd clnr
Flotation Cell	2000 g D-12	500 g D-12	250 g D-12
Speed: r.p.m.	1500	1600	1200

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S, Fe, MgO %)								% Distribution							
	g	%	Cu	Ni	Pt	Pd	Au	S	Fe	MgO	Cu	Ni	Pt	Pd	Au	S	Fe	MgO
Bulk 3rd Clnr Conc.	50.0	1.26	18.5	7.53	3.10	15.5	1.57	30.3	31.3	2.11	70.2	21.6	8.8	34.9	37.7	13.2	3.0	0.1
Bulk 3rd Clnr Tail	8.2	0.21	3.18	11.6	4.19	7.87	0.42	21.6	29.1	7.91	2.0	5.5	1.9	2.9	1.7	1.5	0.5	0.1
Bulk 2nd Clnr Tail	70.1	1.77	1.68	7.01	2.92	4.69	0.20	16.3	25.6	12.1	8.9	28.2	11.6	14.8	6.7	9.9	3.5	0.9
Bulk 1st Clnr Tail	106	2.69	0.22	0.85	1.08	0.96	0.05	4.12	12.2	25.4	1.8	5.2	6.5	4.6	2.5	3.8	2.5	2.9
Ni 3rd Clnr Conc	12.2	0.31	**3.00**	**4.13**	5.51	**6.00**	**1.60**	32.9	**48.0**	2.32	2.8	2.9	3.8	3.3	9.4	3.5	1.1	0.0
Ni 3rd Clnr Tail	13.5	0.34	0.75	2.61	4.52	2.25	0.23	26.5	42.3	6.61	0.8	2.0	3.5	1.4	1.5	3.1	1.1	0.1
Ni 2nd Clnr Tail	70.3	1.78	0.33	1.30	2.29	1.16	0.12	17.2	32.0	12.7	1.8	5.3	9.1	3.7	4.0	10.5	4.4	1.0
Ni 1st Clnr Tail	121	3.07	0.18	0.45	1.03	0.54	0.05	4.40	14.6	23.3	1.7	3.1	7.1	3.0	2.9	4.6	3.4	3.1
Ni Scav Tail	3504	88.6	0.04	0.13	0.24	0.20	<0.02	1.63	11.8	24.2	10.1	26.2	47.7	31.5	33.6	49.7	80.4	91.8
Head (calc.)	3956	100.0	0.33	0.44	0.45	0.56	0.05	2.90	13.0	23.3	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.33	0.42	0.41	0.45	0.04	2.53	11.9	22.8								
Combined Products																		
Bulk 3rd Clnr Conc	50.0	1.26	**18.5**	**7.53**	3.10	15.5	1.57	30.3	31.3	2.11	**70.2**	**21.6**	8.79	34.9	37.7	13.2	3.0	0.1
Bulk 2nd Clnr Conc	58.2	1.47	16.3	8.10	3.25	14.4	1.41	29.1	31.0	2.93	72.2	27.1	10.7	37.8	39.3	14.7	3.5	0.2
Bulk 1st Clnr Conc	128	3.24	8.33	7.51	3.07	9.11	0.75	22.1	28.0	7.94	81.1	55.3	22.3	52.6	46.0	24.7	7.0	1.1
Bulk Rougher Conc	**235**	**5.93**	**4.66**	**4.49**	**2.17**	**5.41**	**0.43**	**14.0**	**20.9**	**15.9**	**82.9**	**60.5**	**28.8**	**57.2**	**48.6**	**28.5**	**9.5**	**4.0**
Ni 3rd Clnr Conc	12.2	0.31	**3.00**	**4.13**	5.51	6.00	1.60	32.9	48.0	2.32	2.8	2.9	3.8	3.3	9.4	3.5	1.1	0.0
Ni 2nd Clnr Conc	25.7	0.65	1.82	3.33	4.99	4.03	0.88	29.5	45.0	4.57	3.5	4.9	7.3	4.7	10.9	6.6	2.2	0.1
Ni 1st Clnr Conc	96.0	2.43	0.73	1.84	3.01	1.93	0.32	20.5	35.5	10.5	5.3	10.2	16.4	8.3	14.9	17.1	6.6	1.1
Ni Scav Conc	217	5.49	0.42	1.07	1.91	1.15	0.17	11.5	23.8	17.7	7.0	13.3	23.5	11.3	17.8	21.8	10.1	4.2
Bulk Rghr+Scav Conc	452	11.4	2.62	2.84	2.04	3.37	0.31	12.8	22.3	16.7	89.9	73.8	52.3	68.5	66.4	50.3	19.6	8.2

Metallurgical Balance

Product	Weight		Assays, %								% Distribution						
	g	%	Cu	Ni	S	other	Cp	Pn	Po	Ga	Cu	Ni	S	Cp	Pn	Po	Ga
Bulk 3rd Clnr Conc.	50.0	1.26	18.5	7.53	30.3	43.7	53.5	21.9	11.3	13.3	70.2	21.6	13.2	70.2	26.2	2.5	0.18
Bulk 3rd Clnr Tail	8.2	0.21	3.18	11.6	21.6	63.6	9.2	33.7	18.8	38.3	2.0	5.5	1.5	2.0	6.6	0.7	0.09
Bulk 2nd Clnr Tail	70.1	1.77	1.68	7.01	16.3	75.0	4.9	20.2	20.6	54.4	8.94	28.2	9.9	8.9	33.8	6.3	1.0
Bulk 1st Clnr Tail	106	2.69	0.22	0.85	4.12	94.8	0.6	2.22	8.20	88.9	1.8	5.2	3.8	1.8	5.7	3.8	2.6
Ni 3rd Clnr Conc	12.2	0.31	**3.00**	**4.13**	32.9	60.0	8.7	10.9	68.0	12.4	2.8	2.9	3.5	2.8	3.2	3.7	0.0
Ni 3rd Clnr Tail	13.5	0.34	0.75	2.61	26.5	70.1	2.2	6.55	61.1	30.2	0.8	2.0	3.1	0.8	2.1	3.6	0.1
Ni 2nd Clnr Tail	70.3	1.78	0.33	1.30	17.2	81.2	1.0	3.02	41.1	54.9	1.8	5.3	10.5	1.8	5.1	12.7	1.1
Ni 1st Clnr Tail	121	3.07	0.18	0.45	4.40	95.0	0.5	1.02	10.1	88.4	1.66	3.1	4.6	1.66	2.9	5.4	2.9
Ni Scav Tail	3504	88.6	0.04	0.13	1.63	98.2	0.1	0.17	3.98	95.7	10.1	26.2	49.7	10.1	14.4	61.3	91.9
Head (calc.)	3956	100.0	0.33	0.44	2.90	96.3	0.96	1.06	5.75	92.2	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.33	0.42	2.53												
Combined Products																	
Bulk 3rd Clnr Conc	50.0	1.26	**18.5**	**7.53**	30.3	43.7	53.5	21.9	11.3	13.3	70.2	21.6	13.2	70.2	26.2	2.5	0.2
Bulk 2nd Clnr Conc	58.2	1.47	16.3	8.10	29.1	46.5	47.2	23.6	12.3	16.9	72.2	27.1	14.7	72.2	32.8	3.2	0.3
Bulk 1st Clnr Conc	128.3	3.24	8.33	7.51	22.1	62.1	24.1	21.7	16.8	37.4	81.1	55.3	24.7	81.1	66.7	9.5	1.3
Bulk Rougher Conc	**234.6**	**5.93**	**4.66**	**4.49**	**14.0**	**76.9**	**13.5**	**12.9**	**12.9**	**60.7**	**82.9**	**60.5**	**28.5**	**82.9**	**72.3**	**13.3**	**3.9**
Ni 3rd Clnr Conc	12.2	0.31	**3.00**	**4.13**	32.9	60.0	8.67	10.9	68.0	12.4	2.8	2.9	3.5	2.8	3.2	3.7	0.0
Ni 2nd Clnr Conc	25.7	0.65	1.82	3.33	29.5	65.3	5.25	8.63	64.4	21.7	3.5	4.9	6.6	3.5	5.3	7.3	0.2
Ni 1st Clnr Conc	96.0	2.43	0.73	1.84	20.5	76.9	2.11	4.52	47.3	46.0	5.3	10.2	17.1	5.3	10.4	20.0	1.2
Ni Scav Conc	217.4	5.49	0.42	1.07	11.51	87.0	1.22	2.56	26.5	69.7	7.0	13.3	21.8	7.0	13.3	25.4	4.2
Bulk Rghr+Scav Conc	452.0	11.4	2.62	2.84	12.78	81.8	7.57	7.92	19.5	65.0	89.9	73.8	50.3	89.9	85.6	38.7	8.1

Test: F36 **Project:** 50149-001 **Date:** Feb 23 2012 **Operator:** YW

Purpose: Split flowsheet, CMC and Guar 50:50 mix similar to F-35, but more aggressive for recovery
Procedure: As below.
Feed: 2x2 kg of -10 mesh Master Composite
Grind: 57 minutes/2 kg at 65% solids in a lab mill
Regrind
Regrind 8 minutes in the pebble mill (Ni clnr 1 concentrate)

Feed K_{80} : 90 µm
Ni regrind K80: µm

Conditions:

Stage	Lime	SIPX	CuSO4	CMC	Guar	MIBC*	Grind	Cond.	Froth	pH	Eh
	Reagents added, grams per tonne						Time, minutes				
Grind							57				
Bulk Rougher 1		15		30	30	12		1	3	8.3	110.7
Bulk Rougher 2		20		20	20			1	3	8.4	55.2
Ni Scav 1		30	200						6	8.2	137.2
Ni Scav 2		30							6		
Ni Scav 3		30							6	8.2	16.4
Combine Ro Conc 1-2											
Bulk 1st Cleaner A				10	10				2	8.4	70.9
B		10							2		
Bulk 2nd Cleaner A		0		5	5				2	8.2	101.1
B		5							2		
Combine Scav Conc 1-3											
Ni 1st Cleaner		20		15	15				3	8.3	81.3
		10							3		
Regrind (PM)							8				
Ni 2nd Cleaner		20	50	5	5				4	8.4	67.5
Ni 3rd Cleaner		10		2.5	2.5				3	7.8	44.2
Total	0	200	250	87.5	87.5	12	65	2	45		

*As needed

Stage	Rougher	2nd clnr	3rd clnr	
Flotation Cell	2000 g D-12	500 g D-12	250 g D-12	
Speed: r.p.m.	1500	1600	1200	

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S, Fe, MgO %)								% Distribution							
	g	%	Cu	Ni	Pt	Pd	Au	S	Fe	MgO	Cu	Ni	Pt	Pd	Au	S	Fe	MgO
Bulk 2nd Clnr Conc.	126.5	3.22	8.85	8.94	2.22	6.79	0.72	26.6	32.1	4.77	**80.1**	**59.3**	20.9	55.3	29.6	28.7	8.4	0.7
Bulk 2nd Clnr Tail	46.1	1.17	0.38	1.67	1.50	1.52	0.18	6.55	14.0	21.4	1.3	4.0	5.2	4.5	2.74	2.6	1.3	1.2
Bulk 1st Clnr Tail	126	3.21	0.18	0.59	0.87	0.67	0.06	3.81	11.6	22.8	1.6	3.9	8.2	5.5	2.46	4.1	3.0	3.4
Ni 3rd Clnr Conc	111.1	2.83	0.41	1.32	1.30	0.78	0.17	30.8	47.3	5.23	3.3	7.7	10.8	5.6	6.06	29.2	10.8	0.7
Ni 3rd Clnr Tail	52.7	1.34	0.32	0.75	1.42	0.75	0.14	16.0	29.9	14.9	1.2	2.1	5.6	2.6	2.40	7.2	3.2	0.9
Ni 2nd Clnr Tail	85.1	2.17	0.28	0.50	0.94	0.39	0.08	12.3	26.4	16.3	1.7	2.2	6.0	2.1	2.21	8.9	4.6	1.6
Ni 1st Clnr Tail	150	3.82	0.15	0.27	0.65	0.43	0.09	2.48	11.9	22.7	1.6	2.1	7.3	4.1	4.14	3.2	3.7	4.0
Ni Scav Tail	3232	82.2	0.04	0.11	0.15	0.10	0.05	0.59	9.75	23.2	9.2	18.6	36.1	20.4	50.4	16.2	64.9	87.6
Head (calc.)	3929	100.0	0.36	0.49	0.34	0.40	0.08	2.99	12.4	21.8	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.33	0.42	0.41	0.45	0.04	2.53	11.9	22.8								
Combined Products																		
Bulk 2nd Clnr Conc	126.5	3.22	**8.85**	**8.94**	2.2	6.79	0.72	26.6	32.1	4.8	80.1	59.3	20.9	55.3	29.6	28.7	8.4	0.7
Bulk 1st Clnr Conc	172.6	4.39	6.59	7.00	2.0	5.38	0.58	21.2	27.3	9.2	81.3	63.3	26.1	59.8	32.3	31.2	9.7	1.9
Bulk Rougher Conc	**298.6**	**7.60**	**3.88**	**4.29**	**1.54**	**3.40**	**0.36**	**13.9**	**20.7**	**14.9**	**83.0**	**67.2**	**34.3**	**65.2**	**34.8**	**35.3**	**12.7**	**5.2**
Ni 3rd Clnr Conc	111.1	2.83	**0.41**	**1.32**	1.3	0.78	0.17	30.8	47.3	5.2	3.3	7.7	10.8	5.58	6.06	29.2	10.8	0.7
Ni 2nd Clnr Conc	163.8	4.17	0.38	1.14	1.3	0.77	0.16	26.0	41.7	8.3	4.5	9.8	16.3	8.13	8.46	36.3	14.1	1.6
Ni 1st Clnr Conc	248.9	6.33	0.35	0.92	1.2	0.64	0.13	21.3	36.5	11.1	6.2	12.0	22.3	10.3	10.7	45.3	18.7	3.2
Ni Scav Conc	398.9	10.2	0.27	0.67	0.99	0.56	0.11	14.2	27.2	15.4	7.8	14.1	29.6	14.4	14.8	48.4	22.4	7.2
Bulk Rghr+Scav Conc	697.5	17.8	1.82	2.22	1.23	1.77	0.22	14.1	24.4	15.2	90.8	81.4	63.9	79.6	49.6	83.8	35.1	12.4

Metallurgical Balance

Product	Weight		Assays, %								% Distribution						
	g	%	Cu	Ni	S	other	Cp	Pn	Po	Ga	Cu	Ni	S	Cp	Pn	Po	Ga
Bulk 2nd Clnr Conc.	126.5	3.22	**8.85**	**8.94**	26.6	55.6	25.6	25.8	23.6	25.0	80.1	59.3	28.7	80.1	69.9	13.1	0.87
Bulk 2nd Clnr Tail	46.1	1.17	0.38	1.67	6.55	91.4	1.10	4.58	12.1	82.3	1.3	4.0	2.6	1.3	4.5	2.4	1.05
Bulk 1st Clnr Tail	126	3.21	0.18	0.59	3.81	95.4	0.52	1.46	8.15	89.9	1.6	3.9	4.1	1.6	3.9	4.5	3.1
Ni 3rd Clnr Conc	111.1	2.83	**0.41**	**1.32**	30.8	67.5	1.18	2.50	76.6	19.7	3.3	7.7	29.2	3.3	5.9	37.4	0.6
Ni 3rd Clnr Tail	52.7	1.34	0.32	0.75	16.0	82.9	0.92	1.43	39.4	58.3	1.2	2.1	7.2	1.2	1.6	9.1	0.8
Ni 2nd Clnr Tail	85.1	2.17	0.28	0.50	12.3	86.9	0.81	0.83	30.4	67.9	1.7	2.2	8.9	1.7	1.5	11.4	1.6
Ni 1st Clnr Tail	150	3.82	0.15	0.27	2.48	97.1	0.43	0.56	5.55	93.5	1.6	2.1	3.2	1.6	1.8	3.7	3.9
Ni Scav Tail	3232	82.2	0.04	0.11	0.59	99.3	0.12	0.16	1.29	98.4	9.2	18.6	16.2	9.2	10.8	18.3	88.0
Head (calc.)	3929	100.0	0.36	0.49	2.99	96.2	1.03	1.19	5.79	92.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.33	0.42	2.53												
Combined Products																	
Bulk 2nd Clnr Conc	127	3.22	**8.85**	**8.94**	26.6	55.6	25.6	25.8	23.6	25.0	80.1	59.3	28.7	80.1	69.9	13.1	0.9
Bulk 1st Clnr Conc	173	4.39	6.59	7.00	21.2	65.2	19.0	20.2	20.5	40.3	81.3	63.3	31.2	81.3	74.4	15.6	1.9
Bulk Rougher Conc	**299**	**7.60**	**3.88**	**4.29**	**13.9**	**77.9**	**11.2**	**12.3**	**15.3**	**61.2**	**83.0**	**67.2**	**35.3**	**83.0**	**78.4**	**20.1**	**5.1**
Ni 3rd Clnr Conc	111	2.83	**0.41**	**1.32**	30.8	67.5	1.18	2.50	76.6	19.7	3.3	7.7	29.2	3.3	5.9	37.4	0.6
Ni 2nd Clnr Conc	164	4.17	0.38	1.14	26.0	72.4	1.10	2.16	64.6	32.1	4.5	9.8	36.3	4.5	7.6	46.5	1.5
Ni 1st Clnr Conc	249	6.33	0.35	0.92	21.3	77.4	1.00	1.70	52.9	44.4	6.2	12.0	45.3	6.2	9.1	57.9	3.1
Ni Scav Conc	399	10.2	0.27	0.67	14.2	84.8	0.79	1.27	35.1	62.8	7.8	14.1	48.4	7.8	10.9	61.6	6.9
Bulk Rghr+Scav Conc	698	17.8	1.82	2.22	14.1	81.9	5.26	5.98	26.6	62.1	90.8	81.4	83.8	90.8	89.2	81.7	12.0

Test: F37 **Project:** 150149-001 **Date:** Feb 23 2012 **Operator:** YW

Purpose: Split flowsheet, CMC and Guar 50:50 mix similar to F-36, no CMC or Guar in the roughers
Procedure: As below.
Feed: 2x2 kg of -10 mesh Master Composite
Grind: 57 minutes/2 kg at 65% solids in a lab mill
Regrind
Regrind 8 minutes in the pebble mill (Ni clnr 1 concentrate)

Feed K_{80} : 90 µm
Ni regrind K80: µm

Conditions:

	Reagents added, grams per tonne						Time, minutes				
Stage	Lime	SIPX	CuSO4	CMC	Guar	MIBC*	Grind	Cond.	Froth	pH	Eh
Grind							57				
Bulk Rougher 1		15				12		1	3	8.8	76.3
Bulk Rougher 2		20				6		1	3	8.8	8.9
Ni Scav 1		30	200			6			6	8.7	32.5
Ni Scav 2		30							6	8.5	38.9
Ni Scav 3		30							6	8.3	11.2
Combine Ro Conc 1-2											
Bulk 1st Cleaner A				10	10				2		
B		10							2	8.4	74.0
Bulk 2nd Cleaner A		0		5	5				2	8.3	71.5
B		5							2		
Combine Scav Conc 1-3											
Ni 1st Cleaner		20		15	15				3	8.5	74.1
		10							3	8.4	21.4
Regrind (PM)							8				
Ni 2nd Cleaner		20	50	5	5				4		
Ni 3rd Cleaner		10		2.5	2.5				3	7.9	87.6
Total	0	200	250	37.5	37.5	24	65	2	45		

*As needed

Stage	Rougher	2nd clnr	3rd clnr	
Flotation Cell	2000 g D-12	500 g D-12	250 g D-12	
Speed: r.p.m.	1500	1600	1200	

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S, Fe, MgO %)								% Distribution							
	g	%	Cu	Ni	Pt	Pd	Au	S	Fe	MgO	Cu	Ni	Pt	Pd	Au	S	Fe	MgO
Bulk 2nd Clnr Conc.	119.7	3.01	10.8	8.56	1.88	6.27	0.94	29.2	30.9	4.30	81.5	53.3	13.9	51.7	39.4	24.2	7.3	0.6
Bulk 2nd Clnr Tail	52.1	1.31	0.37	1.97	1.58	2.00	0.21	7.34	13.9	21.4	1.2	5.3	5.1	7.2	3.7	2.6	1.4	1.3
Bulk 1st Clnr Tail	145	3.64	0.16	0.63	0.84	0.62	0.14	4.45	11.7	22.2	1.5	4.7	7.5	6.2	7.1	4.5	3.3	3.9
Ni 3rd Clnr Conc	137.5	3.46	**0.44**	**1.69**	3.02	**0.31**	**0.37**	32.1	**46.7**	5.36	3.8	12.1	25.7	2.9	17.7	30.5	12.6	0.9
Ni 3rd Clnr Tail	43.4	1.09	0.41	0.83	1.71	0.91	0.15	18.1	30.4	14.3	1.1	1.9	4.6	2.7	2.3	5.4	2.6	0.7
Ni 2nd Clnr Tail	79.8	2.01	0.28	0.54	0.39	0.26	0.17	17.4	30.3	13.5	1.4	2.2	1.9	1.4	4.7	9.6	4.7	1.3
Ni 1st Clnr Tail	111	2.79	0.17	0.29	0.70	0.41	0.14	2.27	10.9	22.4	1.2	1.7	4.8	3.2	5.6	1.7	2.4	3.0
Ni Scav Tail	3286	82.7	0.04	0.11	0.18	0.11	0.02	0.94	10.2	22.4	8.3	18.8	36.5	24.7	19.5	21.4	65.7	88.3
Head (calc.)	3974	100.0	0.40	0.48	0.41	0.37	0.07	3.64	12.8	21.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.33	0.42	0.41	0.45	0.04	2.53	11.9	22.8								
Combined Products																		
Bulk 2nd Clnr Conc	119.7	3.01	**10.8**	**8.56**	1.9	6.27	0.94	29.2	30.9	4.3	81.5	53.3	13.9	51.7	39.4	24.2	7.3	0.6
Bulk 1st Clnr Conc	171.8	4.32	7.64	6.56	1.8	4.98	0.72	22.6	25.7	9.5	82.7	58.6	19.0	58.9	43.2	26.8	8.7	2.0
Bulk Rougher Conc	**316.6**	**7.97**	**4.22**	**3.85**	**1.35**	**2.98**	**0.45**	**14.3**	**19.3**	**15.3**	**84.2**	**63.3**	**26.5**	**65.1**	**50.3**	**31.3**	**12.0**	**5.8**
Ni 3rd Clnr Conc	137.5	3.46	**0.44**	**1.69**	3.0	0.31	0.37	32.1	46.7	5.4	3.8	12.1	25.7	2.9	17.7	30.5	12.6	0.9
Ni 2nd Clnr Conc	180.9	4.55	0.43	1.48	2.7	0.45	0.32	28.7	42.8	7.5	4.9	14.0	30.2	5.7	20.0	36.0	15.2	1.6
Ni 1st Clnr Conc	260.7	6.56	0.39	1.19	2.0	0.40	0.27	25.3	39.0	9.3	6.3	16.2	32.2	7.1	24.6	45.6	19.9	2.9
Ni Scav Conc	371.6	9.35	0.32	0.92	1.61	0.40	0.23	18.4	30.6	13.2	7.5	17.9	37.0	10.3	30.2	47.3	22.3	5.9
Bulk Rghr+Scav Conc	688.2	17.3	2.11	2.27	1.49	1.59	0.34	16.5	25.4	14.2	91.7	81.2	63.5	75.3	80.5	78.6	34.3	11.7

Metallurgical Balance

Product	Weight		Assays, %								% Distribution						
	g	%	Cu	Ni	S	other	Cp	Pn	Po	Ga	Cu	Ni	S	Cp	Pn	Po	Ga
Bulk 2nd Clnr Conc.	119.7	3.01	10.8	8.56	29.2	51.4	31.2	24.7	26.2	17.9	81.5	53.3	24.2	81.5	64.1	10.7	0.60
Bulk 2nd Clnr Tail	52.1	1.31	0.37	1.97	7.34	90.3	1.07	5.44	13.4	80.1	1.2	5.3	2.6	1.2	6.1	2.38	1.16
Bulk 1st Clnr Tail	145	3.64	0.16	0.63	4.45	94.8	0.46	1.55	9.8	88.2	1.5	4.7	4.5	1.5	4.9	4.8	3.6
Ni 3rd Clnr Conc	137.5	3.46	0.44	1.69	32.1	65.8	1.27	3.55	79.0	16.2	3.8	12.1	30.5	3.8	10.6	37.0	0.6
Ni 3rd Clnr Tail	43.4	1.09	0.41	0.83	18.1	80.7	1.18	1.58	44.5	52.8	1.1	1.9	5.4	1.1	1.5	6.6	0.6
Ni 2nd Clnr Tail	79.8	2.01	0.28	0.54	17.4	81.8	0.81	0.74	43.7	54.7	1.4	2.2	9.6	1.4	1.3	11.9	1.2
Ni 1st Clnr Tail	111	2.79	0.17	0.29	2.27	97.3	0.49	0.63	4.90	94.0	1.2	1.7	1.7	1.2	1.5	1.9	2.9
Ni Scav Tail	3286	82.7	0.04	0.11	0.94	98.9	0.12	0.14	2.21	97.5	8.3	18.8	21.4	8.3	10.1	24.8	89.3
Head (calc.)	3974	100.0	0.40	0.48	3.64	95.5	1.15	1.16	7.38	90.3	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.33	0.42	2.53												
Combined Products																	
Bulk 2nd Clnr Conc	119.7	3.01	**10.8**	**8.56**	29.2	51.4	31.2	24.7	26.2	17.9	**81.5**	**53.3**	24.2	81.5	64.1	10.7	0.6
Bulk 1st Clnr Conc	171.8	4.32	7.64	6.56	22.6	63.2	22.1	18.9	22.3	36.7	82.7	58.6	26.8	82.7	70.2	13.1	1.8
Bulk Rougher Conc	**316.6**	**7.97**	**4.22**	**3.85**	14.3	77.7	12.2	10.9	16.6	60.3	**84.2**	**63.3**	**31.3**	**84.2**	**75.1**	**17.9**	**5.3**
Ni 3rd Clnr Conc	137.5	3.46	**0.44**	**1.69**	32.1	65.8	1.27	3.55	79.0	16.2	3.8	12.1	30.5	3.8	10.6	37.0	0.6
Ni 2nd Clnr Conc	180.9	4.55	0.43	1.48	28.7	69.3	1.25	3.08	70.7	25.0	4.9	14.0	36.0	4.9	12.1	43.6	1.3
Ni 1st Clnr Conc	260.7	6.56	0.39	1.19	25.3	73.1	1.12	2.36	62.4	34.1	6.3	16.2	45.6	6.3	13.4	55.5	2.5
Ni Scav Conc	371.6	9.35	0.32	0.92	18.4	80.3	0.93	1.84	45.3	52.0	7.5	17.9	47.3	7.5	14.9	57.3	5.4
Bulk Rghr+Scav Conc	688.2	17.3	2.11	2.27	16.5	79.1	6.11	6.03	32.1	55.8	91.7	81.2	78.6	91.7	89.9	75.2	10.7

Test: F38 | **Project: 150149-001** | **Date:** 06-Mar-12 | **Operator:** YW

Purpose: Split flowsheet, CMC and Guar 50:50 mix similar to F-36, no CMC or Guar in the roughers
Procedure: As below.
Feed: 2 kg of -10 mesh Master Composite
Grind: 57 minutes/2 kg at 65% solids in a lab mill
Regrind 15 minutes in the pebble mill

Feed K_{80} : 90 µm
Ni regrind K80: 41 µm

Conditions:

Stage	Reagents added, grams per tonne						Time, minutes				
	Lime	SIPX	CuSO4	CMC	Guar	MIBC*	Grind	Cond.	Froth	pH	Eh
Grind							57				
Bulk Rougher 1		15				12		1	3	8.5	81.9
Bulk Rougher 2		20				6		1	3	8.5	49.8
Ni Scav 1		30	200			6			6	8.2	121.9
Ni Scav 2		30							6	8.3	57.6
Ni Scav 3		30							6	8.2	18.2
Combine Ro Conc 1-2											
Bulk 1st Cleaner A				10	10				2	8.5	53.5
B		10							2		
Bulk 2nd Cleaner A		0		5	5				2	8.3	65.3
B		5							2		
Combine Scav Conc 1-3											
Regrind (PM)							15				
Ni 1st Cleaner		20		15	15				3	8.5	79.0
		10							3		
Ni 2nd Cleaner		5		5	5				4	8.4	29.6
Ni 3rd Cleaner		1		2.5	2.5				3	8.2	6.5
Total	0	176	200	37.5	37.5	24	72	2	45		

*As needed

Stage	Rougher	1st cleaners	2nd & 3rd clnr & sep
Flotation Cell	1000 g D-12	500 g D-12	250 g D-12
Speed: r.p.m.	1800	1600	1200

Assay for Cu, Ni, S
PSA on regrind
Send to sherbrooke

Metallurgical Balance

Product	Weight		Assays, %			% Distribution		
	g	%	Cu	Ni	S	Cu	Ni	S
Bulk 2nd Clnr Conc.	62.8	3.18	9.34	7.20	24.2	79.4	47.5	23.3
Bulk 2nd Clnr Tail	55.3	2.80	0.55	2.85	9.60	4.1	16.6	8.1
Bulk 1st Clnr Tail	63	3.19	0.13	0.66	4.73	1.1	4.4	4.6
Ni 3rd Clnr Conc	26.8	1.36	**0.69**	**1.50**	30.0	2.5	4.2	12.3
Ni 3rd Clnr Tail	26.7	1.35	0.27	1.07	23.8	1.0	3.0	9.7
Ni 2nd Clnr Tail	39.1	1.98	0.25	0.81	14.7	1.3	3.3	8.8
Ni 1st Clnr Tail	138	6.97	0.11	0.31	7.95	2.1	4.5	16.8
Ni Scav Tail	1565	79.2	0.04	0.10	0.68	8.5	16.5	16.3
Head (calc.)	1976	100.0	0.37	0.48	3.30	100.0	100.0	100.0
(direct)			0.33	0.42	2.53			
Combined Products								
Bulk 2nd Clnr Conc	62.8	3.18	**9.34**	**7.20**	24.2	79.4	47.5	23.3
Bulk 1st Clnr Conc	118.1	5.98	5.22	5.16	17.4	83.6	64.1	31.4
Bulk Rougher Conc	**181.1**	**9.17**	**3.45**	**3.60**	**13.0**	**84.7**	**68.5**	**36.0**
Ni 3rd Clnr Conc	26.8	1.36	**0.69**	**1.50**	30.0	2.5	4.2	12.3
Ni 2nd Clnr Conc	53.5	2.71	0.48	1.29	26.9	3.5	7.2	22.1
Ni 1st Clnr Conc	92.6	4.69	0.38	1.08	21.8	4.8	10.6	30.9
Ni Scav Conc	230.3	11.7	0.22	0.62	13.5	6.9	15.1	47.7
Bulk Rghr+Scav Conc	411.4	20.8	1.64	1.93	13.3	91.5	83.5	83.7

Cu	Ni
95.1	74.2
98.7	93.6

Metallurgical Balance

Product	Weight		Assays, %								% Distribution						
	g	%	Cu	Ni	S	other	Cp	Pn	Po	Ga	Cu	Ni	S	Cp	Pn	Po	Ga
Bulk 2nd Clnr Conc.	62.8	3.18	9.34	7.20	24.2	59.3	27.0	20.8	20.5	31.8	79.4	47.5	23.3	79.4	56.6	9.89	1.11
Bulk 2nd Clnr Tail	55.3	2.80	0.55	2.85	9.60	87.0	1.59	7.98	16.6	73.8	4.1	16.6	8.1	4.1	19.2	7.07	2.27
Bulk 1st Clnr Tail	63	3.19	0.13	0.66	4.73	94.5	0.38	1.63	10.5	87.5	1.1	4.4	4.6	1.1	4.5	5.1	3.1
Ni 3rd Clnr Conc	26.8	1.36	0.69	1.50	30.0	67.8	1.99	3.09	73.3	21.6	2.5	4.2	12.3	2.5	3.6	15.1	0.3
Ni 3rd Clnr Tail	26.7	1.35	0.27	1.07	23.8	74.9	0.78	2.05	59.2	38.0	1.0	3.0	9.7	1.0	2.4	12.2	0.6
Ni 2nd Clnr Tail	39.1	1.98	0.25	0.81	14.7	84.2	0.72	1.66	36.0	61.6	1.3	3.3	8.8	1.3	2.8	10.8	1.3
Ni 1st Clnr Tail	138	6.97	0.11	0.31	7.95	91.6	0.32	0.44	19.9	79.3	2.1	4.5	16.8	2.1	2.7	21.1	6.1
Ni Scav Tail	1565	79.2	0.04	0.10	0.68	99.2	0.12	0.12	1.55	98.2	8.5	16.5	16.3	8.5	8.3	18.7	85.3
Head (calc.)	1976	100.0	0.37	0.48	3.30	95.8	1.08	1.17	6.57	91.2	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.33	0.42	2.53												
Combined Products																	
Bulk 2nd Clnr Conc	62.8	3.18	**9.34**	**7.20**	24.2	59.3	27.0	20.8	20.5	31.8	**79.4**	**47.5**	23.3	79.4	56.6	9.9	1.1
Bulk 1st Clnr Conc	118.1	5.98	5.22	5.16	17.4	72.2	15.1	14.8	18.7	51.5	83.6	64.1	31.4	83.6	75.8	17.0	3.4
Bulk Rougher Conc	**181.1**	**9.17**	**3.45**	**3.60**	13.0	80.0	10.0	10.2	15.8	64.0	**84.7**	**68.5**	**36.0**	**84.7**	**80.3**	**22.1**	**6.4**
Ni 3rd Clnr Conc	26.8	1.36	**0.69**	**1.50**	30.0	67.8	1.99	3.09	73.3	21.6	2.5	4.2	12.3	2.5	3.6	15.1	0.3
Ni 2nd Clnr Conc	53.5	2.71	0.48	1.29	26.9	71.3	1.39	2.57	66.3	29.8	3.5	7.2	22.1	3.5	6.0	27.3	0.9
Ni 1st Clnr Conc	92.6	4.69	0.38	1.08	21.8	76.8	1.11	2.18	53.5	43.2	4.8	10.6	30.9	4.8	8.8	38.1	2.2
Ni Scav Conc	230.3	11.66	0.22	0.62	13.5	85.7	0.64	1.14	33.4	64.8	6.9	15.1	47.7	6.9	11.4	59.2	8.3
Bulk Rghr+Scav Conc	411.4	20.8	1.64	1.93	13.3	83.2	4.75	5.13	25.7	64.4	91.5	83.5	83.7	91.5	91.7	81.3	14.7

Test: F39-MF2 | **Project: 50149-001** | **Date:** 15-Mar-12 | **Operator:** YW

Purpose: Test MF2 flowsheet as recommended by Wardrop in Draft PEA
Procedure: As below, adapted by Mike Ounpuu
Feed: 2 kg of -10 mesh Master Composite
Prim Grind: 18 minutes/2 kg at 65% solids in a lab mill — Target ~ 300 micron
Sec Grind: 36 minutes/2 kg at ~65% solids in a lab mill — Target 90 micron
Regrind 8 min in Pebble Mill

Prim Clnrs K_{80} : 102 µm
Sec Clnrs K_{80} : 100 µm
Scav. Reg. K_{80} : 30 µm

Conditions:

Stage	Reagents added, grams per tonne						Time, minutes				
	Lime	SIPX	4037	CMC	Guar	MIBC*	Grind	Cond.	Froth	pH	Eh
Prim Grind							18				
Prim Rougher		10				10		1	2	8.5	
Prim Rougher		20				5			2	8.4	
Prim 1st Cleaner				10	10	5		1	1	8.1	
Prim 1st Cleaner		5				2			1		
Prim 1st Cleaner Scavenger 1	4037: 15 g/t								1		
Prim 1st Cleaner Scavenger 2		20							1		
Prim 2nd Cleaner				5	5	5		1	1	7.6	320.8
Prim 2nd Cleaner		5				3			1		
Prim Ro Tail to Sec Grind											
Sec Grind							36				
Sec Scav 1		30				10			4	8.7	21.9
Sec Scav 2		30				5			4	8.7	-24.9
Sec Scav 3		30				5			4	8.7	27.2
Combine Scav Conc 1-3											
Sec 1st Cleaner				15	15	5		1	2	8.7	20.7
		5							2		
		5							2		
Sec 2nd Cleaner					5	10		1	2	8.3	64.9
		10							2		
Sec 1st Cl Tail to Regrind											
Regrind							8				
Regrind Scav		20		2.5	2.5				2		
Total	0	170	0	30	35	65	54	5	32		430.6

*As needed

Stage	Rougher	1st cleaners	2nd & 3rd clnr & sep
Flotation Cell	1000 g D-12	500 g D-12	250 g D-12
Speed: r.p.m.	1800	1600	1200

Assay only Cu, Ni, S

PSA on Sec Scav tail
PSA on Pri Clnr
PSA on Sec Clnr
PSA on Regrind

Metallurgical Balance

Product	Weight		Assays, %			% Distribution		
	g	%	Cu	Ni	S	Cu	Ni	S
Prim Clnr 2 Conc	18.9	0.96	15.5	7.28	29.7	40.9	14.9	8.6
Prim Clnr 2 Tail	7.6	0.39	1.96	9.61	24.0	2.1	7.9	2.8
Prim Clnr 1 Scav Tail	12.0	0.61	1.98	8.66	23.6	3.3	11.2	4.3
Prim 1st Clnr Scav 1Conc	9.2	0.47	0.97	6.36	20.9	1.2	6.3	2.9
Prim 1st Clnr Scav 2 Conc	46.3	2.35	0.25	1.20	6.35	1.6	6.0	4.5
Sec Clnr 2 Conc	50.8	2.58	5.31	4.20	20.7	37.6	23.1	16.1
Sec Clnr 2 Tail	38.8	1.97	0.41	1.01	10.8	2.2	4.2	6.4
Regrind Scav Conc	4.2	0.21	0.65	0.98	7.80	0.4	0.4	0.5
Regrind Scav Tail	101.2	5.14	0.09	0.37	6.50	1.3	4.1	10.0
Sec Scav Tail	1682	85.3	0.04	0.12	1.71	9.4	21.8	43.9
Head (calc.)	1971	100.0	0.36	0.47	3.32	100.0	100.0	100.0
(direct)			0.33	0.42	2.53			

Combined Products

Prim Clnr 2 Conc	18.9	1.0	15.5	7.28	29.7	40.9	14.9	8.6
Prim Clnr 1 Conc	26.5	1.3	11.6	7.95	28.1	42.9	22.8	11.4
Prim Rougher Conc	94.0	4.8	3.75	4.56	16.1	49.1	46.4	23.1
Sec Clnr 2 Conc	50.8	2.6	5.31	4.20	20.7	37.6	23.1	16.1
Sec Clnr 1 Conc	89.6	4.5	3.19	2.82	16.4	39.8	27.3	22.5
Sec Scav Conc	195.0	9.9	1.53	1.51	11.1	41.5	31.8	33.0
Regrind Scav Conc	4.2	0.2	0.65	0.98	7.80	0.4	0.4	0.5
Regrind Scav Feed	105.4	5.3	0.11	0.39	6.55	1.7	4.5	10.5
Comb Clnr Conc	69.7	3.5	8.07	5.04	23.1	78.5	38.0	24.6
Comb Ro & Scav Conc	289.0	14.7	2.25	2.50	12.7	90.6	78.2	56.1

Metallurgical Balance

Product	Weight		Assays, %								% Distribution						
	g	%	Cu	Ni	S	other	Cp	Pn	Po	Ga	Cu	Ni	S	Cp	Pn	Po	Ga
Prim Clnr 2 Conc	18.9	0.96	15.5	7.28	29.7	47.5	44.8	21.1	18.3	15.8	40.9	14.9	8.6	35.2	9.96	1.0	0.2
Prim Clnr 2 Tail	7.60	0.39	1.96	9.61	24.0	64.4	5.66	27.6	33.4	33.3	2.1	7.9	2.8	1.8	5.3	0.8	0.2
Prim Clnr 1 Scav Tail	12.0	0.61	1.98	8.66	23.6	65.8	5.72	24.8	34.7	34.7	3.3	11.2	4.3	2.9	7.5	1.2	0.3
Prim 1st Clnr Scav 1Conc	9.20	0.47	0.97	6.36	20.9	71.8	5.72	24.8	34.7	34.7	1.2	6.3	2.9	2.2	5.7	1.0	0.2
Prim 1st Clnr Scav 2 Conc	46.3	2.35	0.25	1.20	6.35	92.2	2.80	18.0	36.2	43.0	1.6	6.0	4.5	5.4	20.9	5.0	1.3
Sec Clnr 2 Conc	50.8	2.58	5.31	4.20	20.7	69.8	0.72	3.18	13.1	83.0	37.6	23.1	16.1	1.5	4.0	2.0	2.7
Sec Clnr 2 Tail	38.8	1.97	0.41	1.01	10.8	87.8	15.3	11.8	29.7	43.2	2.2	4.2	6.4	24.8	11.4	3.4	1.1
Regrind Scav Conc	4.20	0.21	0.65	0.98	7.80	90.6	1.18	2.43	24.8	71.6	0.4	0.4	0.5	0.2	0.3	0.3	0.2
Regrind Scav Tail	101	5.14	0.09	0.37	6.50	93.0	1.88	2.48	16.4	79.3	1.3	4.1	10.0	7.9	6.3	4.9	5.1
Sec Scav Tail	1682	85.3	0.04	0.12	1.71	98.1	0.26	0.68	16.0	83.0	9.4	21.8	43.9	18.2	28.8	80.3	88.9
Head (calc.)	1971	100.0	0.36	0.47	3.32	95.8	1.22	2.03	17.0	79.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.33	0.42	2.53												

Combined Products

Prim Clnr 2 Conc	18.9	0.96	15.5	7.28	29.7	47.5	44.8	21.1	18.3	15.8	40.9	14.9	8.6	35.2	10.0	1.0	0.2
Prim Clnr 1 Conc	26.5	1.34	11.6	7.95	28.1	52.4	33.6	22.9	22.6	20.8	42.9	22.8	11.4	37.0	15.2	1.8	0.4
Prim Rougher Conc	94.0	4.77	3.75	4.56	16.1	75.6	12.1	20.9	32.1	34.9	47.5	40.4	18.6	42.0	28.4	4.0	0.8
Sec Clnr 2 Conc	50.8	2.58	5.31	4.20	20.7	69.8	0.7	3.2	13.1	83.0	1.6	6.0	4.5	5.4	20.9	5.0	1.3
Sec Clnr 1 Conc	89.6	4.55	3.19	2.82	16.4	77.6	7.06	6.9	20.3	65.8	39.2	29.1	20.5	6.9	24.9	7.0	4.0
Sec Scav Conc	195	9.90	1.53	1.51	11.1	85.9	4.24	4.5	18.3	72.9	41.5	33.3	26.9	31.7	36.3	10.4	5.0
Regrind Scav Conc	4.20	0.21	0.65	0.98	7.80	90.6	1.18	2.43	24.8	71.6	43.1	37.8	37.5	39.8	42.9	15.7	10.3
Regrind Scav Feed	105	5.35	0.11	0.39	6.55	92.9	1.85	2.47	16.7	79.0	0.4	0.4	0.5	0.2	0.3	0.3	0.2
Comb Clnr Conc	69.7	3.54	8.07	5.04	23.14	63.8	12.7	8.03	14.50	64.8	1.7	4.5	10.5	8.1	6.5	5.3	5.3
Comb Ro & Scav Conc	289	14.7	2.25	2.50	12.71	82.5	6.81	9.85	22.81	60.5	11.0	26.3	54.4	26.3	35.3	85.6	94.2

Test No.: F40 **Project No.:** 50149-001 **Operator**: YW **Date**: March 16 2012

Purpose: Cleaner flotation test, Repeat F17
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 57 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Target K_{80} :90 µm

Conditions:

Stage	Reagents added, g/t							Time, minutes			pH	Eh
	Lime	SIPX	MIBC*	CMC	DF250	PAX	3501	Grind	Cond.	Froth		
Grind		5						57				
Condition									1			
Rougher 1			10						1	2	8.6	43.9
Rougher 2		5	5						1	2	8.6	36.5
Rougher 3		10	5						1	4	8.5	21.6
Rougher 4		20	5						1	6	8.5	-14.7
Rougher tails to Magnetic separation												
Regrind (PM)								0				
1st Cleaner		5		75					1	8	8.5	89.2
1st Cleaner Scav		10							1	4	8.0	12.0
2nd Cleaner			10	35					1	6	8.2	79.0
3rd Cleaner			5	10					1	4		
Total	0	55	40	120			0	57	9	36	.	.

* As required

Stage	Roughers	1stClnr and Scav.	2nd, 3rd Cleaner
Flotation Cell	1000g-D12	500-g D12	250-g D12
Speed: rpm	1800	1600	1100

Assay for: Cu, Ni,S,
Magnetic Conc. Extra assays for Pt, Pd, Au

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S, %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
3rd Clnr Conc	33.4	1.7	16.0	9.06	30.3	–	–	–	71.6	32.1	15.2	–	–	–
3rd Clnr Tls	20.8	1.1	2.96	7.89	22.0	–	–	–	8.3	17.4	6.9	–	–	–
2nd Clnr Tls	58.7	3.0	1.09	3.47	19.0	–	–	–	8.6	21.6	16.7	–	–	–
1st Clnr Scv Conc	24.9	1.3	0.17	0.53	10.7	–	–	–	0.6	1.4	4.0	–	–	–
1st Clnr Scv Tls	114	5.8	0.06	0.23	3.60	–	–	–	0.9	2.8	6.2	–	–	–
Magnetic Conc.	122	6.2	0.09	0.34	7.70	0.94	0.81	0.04	1.5	4.4	14.1	–	–	–
Rougher Tails	1605	81.1	0.04	0.12	1.53	–	–	–	8.6	20.4	36.9	–	–	–
Head (calc.)	1979	100	0.38	0.48	3.37	–	–	–	100	100	100	0.0	0.0	0.0
(direct)			0.33	0.42	2.53	0.41	0.45	0.04						

Combined Products

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S, %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
3rd Clnr Conc	**33.4**	**1.69**	**16.0**	**9.06**	**30.3**	–	–	–	**71.6**	**32.1**	**15.2**	–	–	–
2nd Clnr Conc	54.2	2.74	11.0	8.61	27.1	–	–	–	79.9	49.4	22.1	–	–	–
1st Clnr Conc	113	5.70	5.85	5.94	22.9	–	–	–	88.4	71.0	38.8	–	–	–
1st Cl & ClScv Conc	138	6.96	4.82	4.96	20.7	–	–	–	89.0	72.4	42.8	–	–	–
Magnetic Conc.	122	6.18	0.09	0.34	7.70	0.94	0.81	0.04	1.5	4.4	14.1	–	–	–
Rghr Conc	**252**	**12.7**	**2.66**	**2.82**	**12.9**	–	–	–	**89.9**	**75.2**	**49.0**	**0.0**	**0.0**	**0.0**

Cleaner Circuit Unit Performance	Mass rec	Upgrade						Unit Recovery					
	13%	6.01	3.22	2.34	–	–	–	81%	46%	44%	######	######	######

Product	Weight		Assays, %				% Distribution				Cu+Ni	PGE
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue		
3rd Cleaner Conc	33.4	1.7	46.4	25.7	14.7	13.2	71.6	33.8	3.7	0.2		
3rd Cleaner Tail	20.8	1.1	8.58	22.2	30.7	38.5	8.3	18.1	4.8	0.4		
2nd Cleaner Tail	58.7	3.0	3.16	9.47	38.9	48.5	8.6	21.8	17.1	1.6		
1st Cleaner Scav Co	24.9	1.3	0.49	1.21	26.7	71.6	0.6	1.2	5.0	1.0		
1st Cleaner Scav Tai	114.3	5.8	0.17	0.56	8.8	90.4	0.9	2.5	7.6	5.7		
Magnetic Conc.	122.3	6.2	0.26	0.75	19.4	79.6	1.5	3.6	17.8	5.4		
Rougher Tail	1605	81.1	0.12	0.30	3.66	95.9	8.6	19.0	44.1	85.6		
Head (calc.)	1979	100	1.09	1.29	6.7	90.9	100	100	100	100		
Combined Products												
3rd Cleaner Conc		1.7	46.4	25.72	14.69	13.2	71.6	33.8	3.7	0.2	25.1	######
2nd Cleaner Conc		2.7	31.9	24.36	20.84	22.9	79.9	51.9	8.5	0.7	19.6	######
1st Cleaner Conc		5.7	16.94	16.62	30.21	36.2	88.4	73.7	25.6	2.3	11.8	######
1st Cl + Sc Conc		7.0	13.97	13.84	29.57	42.6	89.0	74.9	30.6	3.3	9.8	######
Rougher Conc		12.7	7.72	7.81	20.2	64.3	89.9	77.4	38.2	9.0	5.5	######
Rougher Tail'		81.1	0.12	0.30	3.66	95.9	8.6	19.0	44.1	85.6		

Test: F41 **Project:** 150149-001 **Date:** YW **Operator:** 19-Mar-12

Purpose: Split flowsheet , Finer primary grind
Procedure: As below.
Feed: 2 kg of -10 mesh Master Composite
Grind: 73 minutes/2 kg at 65% solids in a lab mill
Regrind 2 minutes in the pebble mill

Feed K_{80} : 71 µm
Ni regrind K80: 43 µm

Conditions:

	Reagents added, grams per tonne						Time, minutes				
Stage	Lime	SIPX	CuSO4	CMC	Guar	MIBC*	Grind	Cond.	Froth	pH	Eh
Grind							73				
Bulk Rougher 1		15				12		1	3	8.3	125.5
Bulk Rougher 2		20				6		1	3	8.3	27.2
Ni Scav 1		30		20	20			1	4	8.3	23.0
Ni Scav 2		30						1	4	8.2	-39.1
Ni Scav 3		30						1	4	8.2	-67.1
Combine Ro Conc 1-2											
Bulk 1st Cleaner A				12	12				2	8.3	55.1
B		10							2		
Bulk 2nd Cleaner A				7	7				2		
B		5							2		
Combine Scav Conc 1-3											
Ni 1st Cleaner A		20		15	15	10		1	3	8.4	19.1
B		10				5		1	3	8.2	-33.1
Regrind (PM)							2				
Ni 2nd Cleaner		5		2+2	2+2			1	2+2		
Total	0	175	0	54	54	33	75	8	32		

*As needed

Stage	Roughers	1stClnr and Scav.	2nd, 3rd Cleaner
Flotation Cell	1000g-D12	500-g D12	250-g D12
Speed: rpm	1800	1600	1100

PSA on Ni Scav tails
PSA On Ni Regrind
Assay only Cu, Ni, S

Metallurgical Balance

Product	Weight		Assays, %			% Distribution		
	g	%	Cu	Ni	S	Cu	Ni	S
Bulk 2nd Clnr Conc.	63.1	3.20	11.2	8.26	25.8	**86.6**	**52.0**	24.1
Bulk 2nd Clnr Tail	47.4	2.40	0.42	3.02	9.43	2.4	14.3	6.6
Bulk 1st Clnr Tail	98.2	4.98	0.14	0.66	5.10	1.7	6.5	7.4
Ni 2nd Clnr Conc	12.1	0.61	0.91	1.66	25.9	1.3	2.0	4.6
Ni 2nd Clnr Tail	33.7	1.71	0.16	0.70	17.8	0.7	2.4	8.9
Ni 1st Clnr Tail	92.9	4.71	0.11	0.38	6.82	1.3	3.5	9.4
Ni Scav Tail	1625	82.4	0.03	0.12	1.62	6.0	19.4	39.0
Head (calc.)	1972	100.0	0.41	0.51	3.43	100.0	100.0	100.0
(direct)			0.33	0.42	2.53			
Combined Products								
Bulk 2nd Clnr Conc	63.1	3.20	**11.2**	**8.26**	25.8	86.6	52.0	24.1
Bulk 1st Clnr Conc	111	5.60	6.58	6.01	18.8	89.1	66.2	30.7
Bulk Rougher Conc	**209**	**10.6**	**3.55**	**3.49**	**12.3**	**90.8**	**72.7**	**38.1**
Ni 2nd Clnr Conc	12.1	0.61	**0.91**	**1.66**	25.9	1.3	2.0	4.6
Ni 1st Clnr Conc	45.8	2.32	0.36	0.95	19.9	2.0	4.4	13.5
Ni Scav Conc	139	7.03	0.19	0.57	11.2	3.3	7.9	22.9
Bulk Rghr+Scav Conc	347	17.6	2.21	2.33	11.9	94.0	80.6	61.0

Metallurgical Balance

Product	Weight		Assays, %								% Distribution						
	g	%	Cu	Ni	S	other	Cp	Pn	Po	Ga	Cu	Ni	S	Cp	Pn	Po	Ga
Bulk 2nd Clnr Conc.	63.1	3.20	**11.2**	**8.26**	25.8	54.7	32.4	23.4	17.8	26.4	86.6	52.0	24.1	86.6	56.8	8.4	0.93
Bulk 2nd Clnr Tail	47.4	2.40	0.42	3.02	9.43	87.1	1.2	8.4	16.4	74.0	2.4	14.3	6.6	2.4	15.3	5.8	1.96
Bulk 1st Clnr Tail	98	4.98	0.14	0.66	5.10	94.1	0.4	1.7	11.6	86.3	1.7	6.5	7.4	1.7	6.4	8.5	4.7
Ni 2nd Clnr Conc	12.1	0.61	**0.91**	**1.66**	25.9	71.5	2.6	4.0	62.3	31.0	1.3	2.0	4.6	1.3	1.9	5.6	0.2
Ni 2nd Clnr Tail	33.7	1.71	0.16	0.70	17.8	81.3	0.5	1.4	45.2	52.8	0.7	2.4	8.9	0.7	1.9	11.4	1.0
Ni 1st Clnr Tail	93	4.71	0.11	0.38	6.82	92.7	0.3	0.8	16.9	81.9	1.3	3.5	9.4	1.3	3.0	11.8	4.3
Ni Scav Tail	1625	82.4	0.03	0.12	1.62	98.2	0.1	0.2	4.0	95.7	6.0	19.4	39.0	6.0	14.7	48.5	86.9
Head (calc.)	1972	100.0	0.41	0.51	3.43	95.7	1.20	1.32	6.77	90.7	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.33	0.42	2.53												
Combined Products																	
Bulk 2nd Clnr Conc	63	3.20	**11.20**	**8.26**	25.8	54.7	32.4	23.4	17.8	26.4	86.6	52.0	24.1	86.6	56.8	8.4	0.9
Bulk 1st Clnr Conc	111	5.60	6.58	6.01	18.8	68.6	19.0	17.0	17.2	46.8	89.1	66.2	30.7	89.1	72.2	14.2	2.9
Bulk Rougher Conc	**209**	**10.6**	**3.55**	**3.49**	**12.3**	**80.6**	**10.3**	**9.8**	**14.5**	**65.4**	**90.8**	**72.7**	**38.1**	**90.8**	**78.6**	**22.7**	**7.6**
Ni 2nd Clnr Conc	12	0.61	**0.91**	**1.66**	25.9	71.5	2.63	4.01	62.3	31.0	1.3	2.0	4.6	1.3	1.9	5.6	0.2
Ni 1st Clnr Conc	46	2.32	0.36	0.95	19.9	78.7	1.04	2.13	49.7	47.1	2.0	4.4	13.5	2.0	3.8	17.0	1.2
Ni Scav Conc	139	7.03	0.19	0.57	11.2	88.1	0.55	1.26	27.7	70.4	3.3	7.9	22.9	3.3	6.8	28.8	5.5
Bulk Rghr+Scav Conc	347	17.6	2.21	2.33	11.9	83.6	6.38	6.38	19.8	67.4	94.0	80.6	61.0	94.0	85.3	51.5	13.1

Test No.: HNI-F1 **Project No.**: 50149-001 **Operator**: YW **Date**: Dec 15 2011

Purpose: Rougher Flotation test
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of Master Composite
Grind: 57 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

Target Feed K_{80}: 90 µm

Conditions:

Stage	Reagents added, grams per tonne							Time, minutes			pH	Eh
	245	SIPX	3477	PAX	CMC	MIBC*	DF 250	Grind	Cond.	Froth		
Grind		5						57				
Condition									1			
Rougher 1						10			1	2	8.8	22.7
Rougher 2		5				5			1	2	8.6	56.7
Rougher 3		10				5			1	4	8.7	32.8
Rougher 4		20				5			1	4	8.6	36.5
Rougher 5		30							1	8	8.1	-29.4
Total	0	70	0	0	0	25	0	57	6	20		

* As required

Stage	Rougher
Flotation Cell	1000-D12
Speed: rpm	1800

Assay for: Cu, Ni, S, Pt, Pd, Au
Extra assay:Ro Tails assay for Ni(s)

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
Ro Conc 1	45.9	2.33	1.10	0.44	3.00	0.58	4.02	0.23	4.8	1.2	1.0	2.3	16.9	8.5
Ro Conc 2	80.5	4.08	9.30	2.53	15.9	1.96	4.21	0.66	71.0	12.4	9.8	13.9	31.1	42.9
Ro Conc 3	134	6.80	1.01	7.45	18.6	1.74	1.96	0.14	12.8	60.7	19.0	20.5	24.1	15.2
Ro Conc 4	102	5.16	0.33	1.14	18.2	1.83	0.70	0.06	3.2	7.1	14.1	16.4	6.5	4.9
Ro Conc 5	154	7.82	0.15	0.58	20.0	1.11	0.38	0.04	2.2	5.4	23.5	15.0	5.4	5.0
Ro Tail	1455	73.8	0.04	0.15	2.94	0.25	0.12	0.02	5.94	13.3	32.6	31.9	16.0	23.5
		Ro Tails Ni(s)=		0.09										
Head (calc.)	1972	100	0.53	0.83	6.66	0.58	0.55	0.06	100	100	100	100	100	100
Head (direct)			0.52	0.83	6.45	0.57	0.61	0.10						

Combined Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, S %)						% Distribution					
	g	%	Cu	Ni	S	Pt	Pd	Au	Cu	Ni	S	Pt	Pd	Au
Ro Conc 1	45.9	2.3	1.10	0.44	3.00	0.58	4.02	0.23	4.8	1.2	1.0	2.3	16.9	8.5
Ro Conc 1-2	126	6.4	6.32	1.77	11.2	1.46	4.14	0.50	75.8	13.6	10.8	16.2	48.0	51.4
Ro Conc 1-3	260	13.2	3.59	4.69	15.0	1.60	3.02	0.32	88.7	74.3	29.8	36.7	72.1	66.6
Ro Conc 1-4	362	18.4	2.67	3.69	15.9	1.67	2.37	0.24	91.9	81.3	43.9	53.0	78.6	71.5
Ro Conc 1-5	**516**	**26.2**	**1.92**	**2.77**	**17.1**	**1.50**	**1.77**	**0.18**	**94.1**	**86.7**	**67.4**	**68.1**	**84.0**	**76.5**

Product	Weight		Assays, %				% Distribution			
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue
Rougher 1	45.9	2.33	3.19	1.21	3.91	91.7	4.8	1.27	0.6	2.6
Rougher 2	80.5	4.08	27.0	7.10	10.8	55.1	71.0	13.0	3.1	2.7
Rougher 3	134	6.80	2.93	21.0	28.0	48.1	12.8	64.1	13.5	4.0
Rougher 4	102	5.16	0.96	2.75	44.6	51.7	3.2	6.4	16.3	3.3
Rougher 5	154	7.82	0.43	1.07	51.3	47.2	2.2	3.76	28.3	4.5
Rougher Tail	1455	73.8	0.12	0.34	7.32	92.2	5.9	11.4	38.2	82.9
Head (calc.)	1972	100	1.55	2.22	14.16	82.1	100	100	100	100

Combined Products

Product	Weight	Assays, %				% Distribution			
	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue
Ro Conc 1	2.33	3.19	1.21	3.91	91.7	4.8	1.3	0.6	2.6
Ro Conc 1-2	6.41	18.3	4.97	8.32	68.4	75.8	14.3	3.8	5.3
Ro Conc 1-3	13.2	10.4	13.2	18.5	57.9	88.7	78.4	17.2	9.3
Ro Conc 1-4	18.4	7.75	10.3	25.8	56.2	91.9	84.8	33.5	12.6
Ro Conc 1-5	26.2	5.56	7.52	33.4	53.5	94.1	88.6	61.8	17.1
Ro Tail	73.8	0.12	0.34	7.32	92.2	5.94	11.4	38.2	82.9

Test No.: NHI-F2 **Project No.:** 50149-001 **Operator:** YW **Date:** Jan 6 2012

Purpose: Cleaner flotation test, based on Master Composite flotation test F12
Procedure: As outlined below.
Feed: 2 kg of minus 10 mesh of **High Ni Composite**
Grind: 57 minutes / 2 kg @ 65% solids in laboratory Ball Mill
Regrind:

$K_{80:}$ 103 µm
Clnr $K_{80:}$ 58 µm

Conditions:

Stage	Reagents added, g/t							Time, minutes			pH	Eh
	Lime	SIPX	MIBC*	CMC	DF250	PAX	3477	Grind	Cond.	Froth		
Grind		5						57				
Condition									1			
Rougher 1			10						1	2	8.7	34.5
Rougher 2		5	5						1	2	8.6	30.8
Rougher 3		10	5						1	4	8.6	9.3
Rougher 4		20	5						1	6	8.5	-3.0
Regrind (PM)								0				
1st Cleaner		5		75					1	8	8.5	75.9
1st Cleaner Scav		10							1	3	8.3	13.5
2nd Cleaner			5	75					1	7	8.5	41.1
3rd Cleaner			5	50					1	6	8.4	50.0
Total	0	55	35	200			0	57	9	38	.	.

* As required

Stage	Roughers	1stClnr and Scav.	2nd, 3rd Cleaner
Flotation Cell	1000g-D12	500-g D12	250-g D12
Speed: rpm	1800	1600	1100

PSA on rougher tail
Extra assay:Ro Tails assay for Ni(s)

Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, Fe, MgO %)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
3rd Clnr Conc	134.4	6.8	6.53	8.21	25.0	2.53	5.54	0.68	36.0	3.02	85.2	66.5	27.1	29.1	65.6	61.5	13.4	1.0
3rd Clnr Tls	67.1	3.4	0.56	2.28	21.1	2.03	1.47	0.17	37.8	9.51	3.6	9.2	11.4	11.6	8.7	7.7	7.0	1.5
2nd Clnr Tls	108.3	5.5	0.16	0.69	12.2	1.00	0.41	0.09	26.0	18.5	1.7	4.5	10.6	9	3.9	6.6	7.8	4.9
1st Clnr Scv Conc	25.7	1.3	0.16	0.69	14.7	1.27	0.46	0.08	32.6	14.6	0.4	1.1	3.0	2.8	1.0	1.4	2.3	0.9
1st Clnr Scv Tls	103.7	5.2	0.07	0.33	5.88	0.58	0.20	0.03	18.3	21.0	0.7	2.1	4.9	5.1	1.8	2.1	5.2	5.3
Rougher Tails	1539	77.8	0.06	0.18	3.46	0.32	0.14	0.02	15.1	23.2	8.4	16.7	42.9	42.1	19.0	20.7	64.3	86.4
			Ni(S)=	0.11														
Head (calc.)	1978	100	0.52	0.84	6.27	0.59	0.57	0.08	18.3	20.9	100	100	100	100	100	100	100	100
(direct)			0.52	0.83	6.45	0.57	0.61	0.10	18.1	19.8								

Combined Products

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni %)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
3rd Clnr Conc	**134.4**	**6.79**	**6.53**	**8.21**	**25.0**	**2.53**	**5.5**	**0.68**	**36.0**	**3.02**	**85.2**	**66.5**	**27.1**	**29.1**	**65.6**	**61.5**	**13.4**	**1.0**
2nd Clnr Conc	201.5	10.2	4.54	6.24	23.7	2.36	4.18	0.51	36.6	5.18	88.9	75.7	38.5	40.7	74.2	69.2	20.4	2.5
1st Clnr Conc	309.8	15.7	3.01	4.30	19.7	1.89	2.87	0.36	32.9	9.84	90.6	80.2	49.1	50.0	78.2	75.8	28.2	7.4
1st Cl & ClScv Conc	335.5	17.0	2.79	4.02	19.3	1.84	2.68	0.34	32.9	10.2	91.0	81.3	52.2	52.8	79.2	77.2	30.5	8.3
Rghr Conc	**439.2**	**22.2**	**2.15**	**3.15**	**16.1**	**1.54**	**2.10**	**0.27**	**29.4**	**12.8**	**91.6**	**83.3**	**57.1**	**57.9**	**81.0**	**79.3**	**35.7**	**13.6**

	Mass rec	Upgrade								Unit Recovery							
Cleaner Circuit Unit Performance	31%	3.04	2.61	1.55	1.64	2.64	2.54	1.22	0.24	94%	82%	56%	59%	83%	80%	52%	46%

Product	Weight		Assays, %				% Distribution					
	g	%	Cp	Pn	Po	Gangue	Cp	Pn	Po	Gangue		
3rd Cleaner Conc	134.4	6.8	18.9	23.1	28.3	29.7	85.2	69.9	14.6	2.4		
3rd Cleaner Tail	67.1	3.4	1.62	5.96	48.9	43.6	3.6	9.0	12.6	1.8		
2nd Cleaner Tail	108.3	5.5	0.46	1.63	30.3	67.6	1.7	4.0	12.6	4.5		
1st Cleaner Scav Co	25.7	1.3	0.46	1.55	36.9	61.1	0.4	0.9	3.6	1.0		
1st Cleaner Scav Tai	103.7	5.2	0.19	0.78	14.6	84.4	0.7	1.8	5.8	5.3		
Rougher Tail	1539	77.8	0.16	0.42	8.59	90.8	8.4	14.4	50.8	85.1		
Head (calc.)	1978.4	100	1.51	2.25	13.2	83.1	100	100	100	100		
Combined Products											Cu+Ni	PGE
3rd Cleaner Conc		6.8	18.9	23.1	28.3	29.7	85.2	69.9	14.6	2.4	14.7	8.8
2nd Cleaner Conc		10.2	13.2	17.4	35.1	34.3	88.9	78.9	27.2	4.2	10.8	7.1
1st Cleaner Conc		15.7	8.72	11.89	33.4	46.0	90.6	82.9	39.8	8.7	7.3	5.1
1st Cl + Sc Conc		17.0	8.09	11.10	33.7	47.1	91.0	83.8	43.4	9.6	6.8	4.9
Rougher Conc		22.2	6.23	8.66	29.2	55.9	91.6	85.6	49.2	14.9	5.3	3.9
Rougher Tail'		77.8	0.16	0.42	8.59	90.8	8.4	14.4	50.8	85.1		

Test: **HNI-F3** **Project:** **50149-001** **Date:** 15-Feb-12 **Operator:** YW

Purpose: Split flowsheet, CMC and Guar 50:50 mix
Procedure: As below.
Feed: 2x2 kg of -10 mesh **High Ni Composite**
Grind: 57 minutes/2 kg at 65% solids in a lab mill
Regrind 4 minutes in the pebble mill (bulk clnr 1 concentrate)
Regrind 8 minutes in the pebble mill (Ni clnr 1 concentrate)

Target Feed K_{80} : 90 µm
Cu regrind K80: 42 µm

Conditions:

Stage	Reagents added, grams per tonne						Time, minutes				
	Lime	SIPX	CuSO4	CMC	Guar	MIBC*	Grind	Cond.	Froth	pH	Eh
Grind							57				
Bulk Rougher 1		15		30	30			1	2	8.6	45.0
Bulk Rougher 2		10		20	20			1	2	8.6	73.4
Ni Scav 1		30		20	20				4	8.5	57.0
Ni Scav 2		30							4	8.6	4.3
Ni Scav 3		30							4	8.5	-4.9
Combine Ro Conc 1-2											
Bulk 1st Cleaner A				10	10				2	8.6	78.5
B		2							2		
Regrind (PM)							4				
Bulk 2nd Cleaner		0		5	5				2	8.1	123.2
		5							2		
Bulk 3rd Cleaner A (this may not be needed)		0		2.5	2.5				2	8.0	118.7
B		2							2		
Combine Scav Conc 1-3											
Ni 1st Cleaner		20		15	15				3	8.6	48.1
		10							3		
Regrind (PM)							8				
Ni 2nd Cleaner		5		5	5				4	8.4	42.3
Ni 3rd Cleaner		5		2.5	2.5				3	8.1	108.0
Total	0	164	0	110	110	0	69	2	41		

*As needed

Stage	Rougher	2nd clnr	3rd clnr & sep
Flotation Cell	2000 g D-12	500 g D-12	250 g D-12
Speed: r.p.m.	1500	1600	1200

PSA on Bulk regrind
PSA on Ni Regrind

Metallurgical Balance

Product	Weight		Assays, %								% Distribution							
	g	%	Cu	Ni	Pt	Pd	Au	S	Fe	MgO	Cu	Ni	Pt	Pd	Au	S	Fe	MgO
Bulk 3rd Clnr Conc.	124	3.12	10.3	11.0	2.32	8.11	0.94	28.8	33.9	1.82	67.6	41.8	12.6	44.9	40.2	13.9	5.9	0.3
Bulk 3rd Clnr Tail	42.8	1.07	1.12	8.25	1.77	2.54	0.16	24.2	34.8	7.68	2.5	10.8	3.3	4.8	2.4	4.0	2.1	0.4
Bulk 2nd Clnr Tail	78.9	1.98	1.71	4.13	2.34	2.63	0.12	19.2	31.2	9.78	7.1	10.0	8.0	9.2	3.3	5.9	3.4	1.0
Bulk 1st Clnr Tail	175	4.40	0.41	1.91	1.52	1.05	0.10	15.6	29.0	14.2	3.8	10.2	11.6	8.2	6.0	10.6	7.1	3.3
Ni 3rd Clnr Conc	43	1.08	**1.50**	**1.80**	2.64	**1.54**	**0.31**	34.1	**53.8**	0.98	3.4	2.4	4.9	2.9	4.6	5.7	3.2	0.1
Ni 3rd Clnr Tail	32.8	0.82	0.49	1.40	1.99	0.84	0.13	29.5	49.9	3.73	0.8	1.4	2.8	1.2	1.5	3.8	2.3	0.2
Ni 2nd Clnr Tail	93.2	2.34	0.35	0.97	1.55	0.67	0.11	25.9	42.7	5.63	1.7	2.8	6.3	2.8	3.5	9.4	5.5	0.7
Ni 1st Clnr Tail	211	5.28	0.29	0.64	1.26	0.650	0.08	10.7	24.0	16.7	3.2	4.1	11.5	6.1	5.8	8.7	7.0	4.6
Ni Scav Tail	3190	79.9	0.06	0.17	0.28	0.140	0.03	3.08	14.3	21.4	9.8	16.6	38.9	19.9	32.9	38.1	63.5	89.5
Head (calc.)	3991	100.0	0.47	0.82	0.58	0.56	0.07	6.46	18.0	19.1	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.52	0.83	0.57	0.61	0.10	6.45	18.1	19.8								
Combined Products																		
Bulk 3rd Clnr Conc	124	3.12	**10.3**	**11.0**	2.32	8.11	0.94	28.8	33.9	1.82	**67.6**	**41.8**	12.6	44.9	40.2	13.9	5.87	0.30
Bulk 2nd Clnr Conc	167	4.19	7.95	10.3	2.18	6.68	0.74	27.6	34.1	3.32	70.1	52.6	15.9	49.7	42.5	17.9	7.94	0.73
Bulk 1st Clnr Conc	246	6.17	5.95	8.32	2.23	5.38	0.54	24.9	33.2	5.39	77.3	62.6	23.9	58.9	45.8	23.8	11.4	1.74
Bulk Rougher Conc	**422**	**10.6**	**3.64**	**5.65**	**1.93**	**3.58**	**0.36**	**21.0**	**31.4**	**9.06**	**81.0**	**72.8**	**35.5**	**67.1**	**51.8**	**34.4**	**18.4**	**5.00**
Ni 3rd Clnr Conc	43	1.08	**1.50**	**1.80**	2.64	1.54	0.31	34.1	53.8	0.98	**3.4**	**2.4**	4.94	2.94	4.58	5.68	3.22	0.06
Ni 2nd Clnr Conc	76	1.90	1.06	1.63	2.36	1.24	0.23	32.1	52.1	2.17	4.3	3.8	7.78	4.17	6.04	9.44	5.50	0.22
Ni 1st Clnr Conc	169	4.24	0.67	1.26	1.9	0.92	0.16	28.7	46.9	4.08	6.0	6.5	14.1	6.95	9.56	18.8	11.0	0.90
Ni Scav Conc	380	9.51	0.46	0.92	1.55	0.77	0.12	18.7	34.2	11.1	9.2	10.6	25.6	13.0	15.3	27.5	18.1	5.51
Bulk Rghr+Scav Conc	801	**20.1**	**2.14**	**3.41**	1.75	2.25	0.24	19.9	32.8	10.0	**90.2**	**83.4**	61.1	80.1	67.1	61.9	36.5	10.5

Metallurgical Balance

Product	Weight		Assays, %								% Distribution						
	g	%	Cu	Ni	S	other	Cp	Pn	Po	Ga	Cu	Ni	S	Cp	Pn	Po	Ga
Bulk 3rd Clnr Conc.	124.4	3.12	10.3	11.0	28.8	49.9	29.8	32.0	20.3	18.0	67.6	41.8	13.9	67.6	48.7	4.6	0.7
Bulk 3rd Clnr Tail	42.8	1.07	1.12	8.25	24.2	66.4	3.24	23.5	39.7	33.6	2.5	10.8	4.0	2.5	12.3	3.1	0.4
Bulk 2nd Clnr Tail	78.9	1.98	1.71	4.13	19.2	75.0	4.94	11.5	35.5	48.1	7.1	10.0	5.9	7.1	11.1	5.1	1.1
Bulk 1st Clnr Tail	175.4	4.40	0.41	1.91	15.6	82.1	1.18	4.91	35.1	58.8	3.8	10.2	10.6	3.8	10.5	11.2	3.1
Ni 3rd Clnr Conc	43.0	1.08	**1.50**	**1.80**	34.1	62.6	4.34	3.85	81.1	10.7	3.4	2.4	5.7	3.4	2.0	6.4	0.1
Ni 3rd Clnr Tail	32.8	0.82	0.49	1.40	29.5	68.6	1.42	2.80	72.7	23.0	0.8	1.4	3.8	0.8	1.1	4.3	0.2
Ni 2nd Clnr Tail	93.2	2.34	0.35	0.97	25.9	72.8	1.01	1.66	64.8	32.6	1.7	2.8	9.4	1.7	1.9	11.0	0.9
Ni 1st Clnr Tail	210.5	5.28	0.29	0.64	10.7	88.4	0.84	1.32	25.8	72.0	3.2	4.1	8.7	3.2	3.4	9.9	4.6
Ni Scav Tail	3190	79.9	0.06	0.17	3.08	96.7	0.17	0.23	7.63	92.0	9.8	16.6	38.1	9.8	9.0	44.4	88.7
Head (calc.)	3991	100.0	0.47	0.82	6.46	92.2	1.37	2.05	13.7	82.8	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.52	0.83	6.45												
Combined Products																	
Bulk 3rd Clnr Conc	124	3.12	10.3	11.0	28.8	49.9	29.8	32.0	20.3	18.0	67.6	41.8	13.9	67.6	48.7	4.6	0.7
Bulk 2nd Clnr Conc	167	4.19	7.95	10.3	27.6	54.1	23.0	29.8	25.2	22.0	70.1	52.6	17.9	70.1	61.0	7.7	1.1
Bulk 1st Clnr Conc	246	6.17	5.95	8.32	24.9	60.8	17.2	23.9	28.5	30.4	77.3	62.6	23.8	77.3	72.0	12.8	2.3
Bulk Rougher Conc	422	10.6	3.64	5.65	21.0	69.7	10.5	16.0	31.3	42.2	81.0	72.8	34.4	81.0	82.6	24.0	5.4
Ni 3rd Clnr Conc	43.0	1.08	1.50	1.80	34.1	62.6	4.34	3.85	81.1	10.7	3.4	2.4	5.7	3.4	2.0	6.4	0.1
Ni 2nd Clnr Conc	75.8	1.90	1.06	1.63	32.1	65.2	3.07	3.39	77.5	16.0	4.3	3.8	9.4	4.3	3.1	10.7	0.4
Ni 1st Clnr Conc	169	4.24	0.67	1.26	28.7	69.4	1.94	2.44	70.5	25.2	6.0	6.5	18.8	6.0	5.0	21.7	1.3
Ni Scav Conc	380	9.51	0.46	0.92	18.7	79.9	1.33	1.82	45.7	51.1	9.2	10.6	27.5	9.2	8.4	31.6	5.9
Bulk Rghr+Scav Conc	801	**20.1**	**2.14**	**3.41**	19.9	74.5	6.17	9.29	38.1	46.4	**90.2**	**83.4**	61.9	90.2	91.0	55.6	11.3

Test: HNI-F4 **Project:** 150149-001 **Date:** March 1 2012 **Operator:** YW

Purpose: Split flowsheet, CMC and Guar 50:50 mix
Procedure: As below.
Feed: 2 kg of -10 mesh **High Ni Composite**
Grind: 57 minutes/2 kg at 65% solids in a lab mill
Regrind 8 minutes in the pebble mill (Ni scav concentrate)

Target Feed K_{80} : 90 µm

Conditions:

Stage	Reagents added, grams per tonne						Time, minutes				
Stage	Lime	SIPX	CuSO4	CMC	Guar	MIBC*	Grind	Cond.	Froth	pH	Eh
Grind							57				
Bulk Rougher 1		15				12		1	3	8.4	94.1
Bulk Rougher 2		10						1	3	8.4	24.6
Ni Scav 1		30							6	8.4	-8.8
Ni Scav 2		30							6	8.3	-7.2
Ni Scav 3		30							6	8.2	-55.4
Combine Ro Conc 1-2											
Bulk 1st Cleaner A				10	10				2	8.3	74.3
B		2							2		
Bulk 2nd Cleaner		0		5	5				2	8.0	82.5
		5							2		
Combine Scav Conc 1-3											
Regrind (PM)							8				
Ni 1st Cleaner		7.5		10	10				3	8.5	61.1
		5							3		
Ni 2nd Cleaner		2		1	1				4	7.6	113.3
Ni 3rd Cleaner									3		
Total	0	136.5	0	26	26	12	65	2	45		

*As needed

Stage	Roughers	1stClnr and Scav.	2nd, 3rd Cleaner
Flotation Cell	1000g-D12	500-g D12	250-g D12
Speed: rpm	1800	1600	1100

Metallurgical Balance

Product	Weight		Assays, %								% Distribution							
	g	%	Cu	Ni	Pt	Pd	Au	S	Fe	MgO	Cu	Ni	Pt	Pd	Au	S	Fe	MgO
Bulk 2nd Clnr Conc.	79.0	4.00	9.68	9.07	2.35	7.46	0.81	28.0	35.3	2.51	77.0	43.3	17.3	52.1	32.94	16.6	7.7	0.5
Bulk 2nd Clnr Tail	44.0	2.23	0.78	5.55	1.80	2.59	0.14	16.5	27.3	12.9	3.5	14.8	7.4	10.1	3.17	5.4	3.3	1.5
Bulk 1st Clnr Tail	77.8	3.94	0.27	2.13	1.10	0.72	0.06	10.6	20.5	18.2	2.1	10.0	8.0	5.0	2.40	6.2	4.4	3.7
Ni 3rd Clnr Conc	31.0	1.57	**1.62**	**2.80**	3.2	**2.00**	**1.46**	30.2	**47.2**	4.31	5.1	5.2	9.1	5.5	23.30	7.0	4.1	0.4
Ni 3rd Clnr Tail	16.8	0.85	0.45	1.88	2.06	1.02	0.26	27.2	44.3	6.44	0.8	1.9	3.2	1.5	2.25	3.4	2.1	0.3
Ni 2nd Clnr Tail	42.8	2.17	0.33	1.35	1.78	0.81	0.20	21.0	36.8	10.5	1.4	3.5	7.1	3.1	4.41	6.7	4.4	1.2
Ni 1st Clnr Tail	154	7.80	0.13	0.50	0.84	0.38	0.10	13.4	26.0	14.2	2.0	4.7	12.1	5.2	7.93	15.5	11.1	5.8
Ni Scav Tail	1529	77.4	0.05	0.18	0.25	0.13	0.03	3.42	14.8	21.4	8.2	16.6	35.7	17.6	23.61	39.2	62.9	86.6
Head (calc.)	1974	100.0	0.50	0.84	0.54	0.57	0.10	6.76	18.2	19.1	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.52	0.83	0.57	0.61	0.10	6.45	18.1	19.8								
Combined Products																		
Bulk 2nd Clnr Conc	79	4.00	**9.68**	**9.07**	2.4	7.46	0.81	28.0	35.3	2.51	**77.0**	**43.3**	17.34	52.14	32.94	16.57	7.75	0.52
Bulk 1st Clnr Conc	123	6.23	6.50	7.81	2.2	5.72	0.57	23.9	32.4	6.23	80.5	58.1	24.74	62.22	36.11	22.01	11.1	2.03
Bulk Rougher Conc	**201**	**10.2**	**4.08**	**5.61**	**1.75**	**3.78**	**0.37**	**18.7**	**27.8**	**10.9**	**82.6**	**68.1**	**32.74**	**67.17**	**38.51**	**28.19**	**15.5**	**5.78**
Ni 3rd Clnr Conc	31	1.57	**1.62**	**2.80**	3.2	2.00	1.46	30.2	47.2	4.31	**5.1**	**5.2**	9.12	5.48	23.30	7.01	4.06	0.35
Ni 2nd Clnr Conc	48	2.42	1.21	2.48	2.8	1.66	1.04	29.1	46.2	5.06	5.8	7.2	12.35	7.00	25.55	10.44	6.13	0.64
Ni 1st Clnr Conc	91	4.59	0.79	1.94	2.3	1.26	0.64	25.3	41.7	7.63	7.2	10.6	19.47	10.07	29.95	17.17	10.5	1.83
Ni Scav Conc	245	12.4	0.38	1.04	1.38	0.70	0.30	17.8	31.8	11.8	9.3	15.3	31.56	15.24	37.88	32.63	21.6	7.62
Bulk Rghr+Scav Conc	445	**22.6**	**2.05**	**3.10**	1.55	2.09	0.33	18.2	30.0	11.4	**91.8**	**83.4**	64.29	82.42	76.39	60.82	37.1	13.39

Metallurgical Balance

Product	Weight		Assays, %								% Distribution						
	g	%	Cu	Ni	S	other	Cp	Pn	Po	Ga	Cu	Ni	S	Cp	Pn	Po	Ga
Bulk 2nd Clnr Conc.	79.0	4.00	9.68	9.07	28.0	53.3	28.0	26.2	24.8	21.0	77.0	43.3	16.6	77.0	50.2	6.9	1.0
Bulk 2nd Clnr Tail	44.0	2.23	0.78	5.55	16.5	77.2	2.3	15.8	27.2	54.8	3.5	14.8	5.4	3.5	16.8	4.2	1.5
Bulk 1st Clnr Tail	77.8	3.94	0.27	2.13	10.6	87.0	0.8	5.8	21.8	71.6	2.1	10.0	6.2	2.1	10.9	6.0	3.4
Ni 3rd Clnr Conc	31.0	1.57	**1.62**	**2.80**	30.2	65.4	4.7	7.0	68.0	20.3	5.1	5.2	7.0	5.1	5.3	7.4	0.4
Ni 3rd Clnr Tail	16.8	0.85	0.45	1.88	27.2	70.5	1.3	4.3	65.6	28.8	0.8	1.9	3.4	0.8	1.8	3.9	0.3
Ni 2nd Clnr Tail	42.8	2.17	0.33	1.35	21.0	77.3	1.0	3.0	51.0	45.1	1.4	3.5	6.7	1.4	3.1	7.7	1.2
Ni 1st Clnr Tail	154.0	7.80	0.13	0.50	13.4	86.0	0.4	0.8	33.7	65.1	2.0	4.7	15.5	2.0	2.9	18.2	6.2
Ni Scav Tail	1529	77.4	0.05	0.18	3.42	96.3	0.2	0.2	8.5	91.1	8.2	16.6	39.2	8.2	9.1	45.7	86.0
Head (calc.)	1974	100.0	0.50	0.84	6.76	91.9	1.45	2.09	14.4	82.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.52	0.83	6.45												
Combined Products																	
Bulk 2nd Clnr Conc	79	4.00	9.68	9.07	28.0	53.3	28.0	26.2	24.8	21.0	77.0	43.3	16.6	77.0	50.2	6.9	1.0
Bulk 1st Clnr Conc	123	6.23	6.50	7.81	23.9	61.8	18.8	22.5	25.6	33.1	80.5	58.1	22.0	80.5	67.0	11.1	2.5
Bulk Rougher Conc	201	10.2	4.08	5.61	18.7	71.6	11.8	16.0	24.2	48.0	82.6	68.1	28.2	82.6	77.9	17.1	6.0
Ni 3rd Clnr Conc	31.0	1.57	1.62	2.80	30.2	65.4	4.68	7.01	68.0	20.3	5.1	5.2	7.0	5.1	5.3	7.4	0.4
Ni 2nd Clnr Conc	47.8	2.42	1.21	2.48	29.1	67.2	3.49	6.06	67.2	23.3	5.8	7.2	10.4	5.8	7.0	11.3	0.7
Ni 1st Clnr Conc	91	4.59	0.79	1.94	25.3	72.0	2.29	4.62	59.5	33.6	7.2	10.6	17.2	7.2	10.1	19.0	1.9
Ni Scav Conc	245	12.4	0.38	1.04	17.8	80.8	1.09	2.20	43.3	53.4	9.3	15.3	32.6	9.3	13.1	37.2	8.1
Bulk Rghr+Scav Conc	445	**22.6**	**2.05**	**3.10**	18.2	76.6	5.92	8.42	34.7	51.0	**91.8**	**83.4**	60.8	91.8	90.9	54.3	14.0

Test: HNI-F5 **Project: 150149-001** **Date:** 06-Mar-12 **Operator:** YW

Purpose: Split flowsheet, CMC and Guar 50:50 mix
Procedure: As below.
Feed: 2 kg of -10 mesh **High Ni Composite**
Grind: 57 minutes/2 kg at 65% solids in a lab mill
Regrind 15 minutes in the pebble mill (Ni scav concentrate)

Target Feed K_{80} : 90 µm
Ni regrind K80: 37 µm

Conditions:

Stage	Reagents added, grams per tonne						Time, minutes				
	Lime	SIPX	CuSO4	CMC	Guar	MIBC*	Grind	Cond.	Froth	pH	Eh
Grind							57				
Bulk Rougher 1		15				12		1	3	8.6	3.7
Bulk Rougher 2		15						1	3	8.6	-71.1
Ni Scav 1		20							6	8.6	-8.3
Ni Scav 2		20							6	8.5	-2.2
Ni Scav 3		20							6	8.5	-1.3
Combine Ro Conc 1-2											
Bulk 1st Cleaner A				10	10				2	8.5	64.7
B		2							2		
Bulk 2nd Cleaner		0		5	5				2	8.3	63.7
		5							2		
Combine Scav Conc 1-3											
Regrind (PM)							15				
Ni 1st Cleaner		5		5	5				3	8.6	53.6
		2							3		
Ni 2nd Cleaner		2		2	2				4	8.5	66.3
Ni 3rd Cleaner									3	8.2	22.6
Total	0	106	0	22	22	12	72	2	45		

*As needed

Stage	Roughers	1stClnr and Scav.	2nd, 3rd Cleaner
Flotation Cell	1000g-D12	500-g D12	250-g D12
Speed: rpm	1800	1600	1100

PSA on Ni regrind
Assay for Cu, Ni, S
To Sherbrooke

Metallurgical Balance

Product	Weight		Assays, %			% Distribution		
	g	%	Cu	Ni	S	Cu	Ni	S
Bulk 2nd Clnr Conc.	102	5.19	7.91	8.75	28.5	79.2	55.3	21.3
Bulk 2nd Clnr Tail	48.6	2.46	0.23	1.07	16.8	1.1	3.2	6.0
Bulk 1st Clnr Tail	162	8.23	0.09	0.45	13.1	1.4	4.5	15.5
Ni 3rd Clnr Conc	14.8	0.75	**4.04**	**3.73**	24.0	5.9	3.4	2.6
Ni 3rd Clnr Tail	14.9	0.76	0.47	1.90	20.1	0.7	1.7	2.2
Ni 2nd Clnr Tail	32.2	1.63	0.55	2.29	9.96	1.7	4.6	2.3
Ni 1st Clnr Tail	100	5.07	0.27	1.86	13.6	2.6	11.5	9.9
Ni Scav Tail	1498	75.9	0.05	0.17	3.67	7.3	15.7	40.1
Head (calc.)	1973	100.0	0.52	0.82	6.94	100.0	100.0	100.0
(direct)			0.52	0.83	6.45			
Combined Products								
Bulk 2nd Clnr Conc	102	5.19	**7.91**	**8.75**	28.5	**79.2**	**55.3**	21.3
Bulk 1st Clnr Conc	151	7.65	5.44	6.28	24.7	80.3	58.5	27.3
Bulk Rougher Conc	**313**	**15.9**	**2.67**	**3.26**	**18.7**	**81.8**	**63.1**	**42.8**
Ni 3rd Clnr Conc	15	0.75	**4.04**	**3.73**	24.0	**5.9**	**3.4**	2.59
Ni 2nd Clnr Conc	30	1.51	2.25	2.81	22.0	6.5	5.2	4.78
Ni 1st Clnr Conc	62	3.14	1.37	2.54	15.8	8.3	9.7	7.13
Ni Scav Conc	162	8.21	0.69	2.12	14.4	10.9	21.2	17.1
Bulk Rghr+Scav Conc	475	**24.1**	**1.99**	**2.87**	17.25	**92.7**	**84.3**	59.9

Metallurgical Balance

Product	Weight		Assays, %								% Distribution						
	g	%	Cu	Ni	S	other	Cp	Pn	Po	Ga	Cu	Ni	S	Cp	Pn	Po	Ga
Bulk 2nd Clnr Conc.	102.3	5.19	7.91	8.75	28.5	54.8	22.9	25.1	31.6	20.4	79.2	55.3	21.3	79.2	64.3	11.0	1.3
Bulk 2nd Clnr Tail	48.6	2.46	0.23	1.07	16.8	81.9	0.7	2.3	40.9	56.1	1.1	3.2	6.0	1.1	2.8	6.8	1.7
Bulk 1st Clnr Tail	162.3	8.23	0.09	0.45	13.1	86.4	0.3	0.6	33.2	65.9	1.4	4.5	15.5	1.4	2.6	18.3	6.7
Ni 3rd Clnr Conc	14.8	0.75	**4.04**	**3.73**	24.0	68.2	11.7	10.2	42.9	35.3	5.9	3.4	2.6	5.9	3.8	2.2	0.3
Ni 3rd Clnr Tail	14.9	0.76	0.47	1.90	20.1	77.5	1.4	4.7	46.8	47.1	0.7	1.7	2.2	0.7	1.7	2.4	0.4
Ni 2nd Clnr Tail	32.2	1.63	0.55	2.29	10.0	87.2	1.6	6.3	19.0	73.1	1.7	4.6	2.3	1.7	5.1	2.1	1.5
Ni 1st Clnr Tail	100.0	5.07	0.27	1.86	13.6	84.3	0.8	4.8	30.4	64.0	2.6	11.5	9.9	2.6	12.1	10.3	4.0
Ni Scav Tail	1498	75.9	0.05	0.17	3.67	96.1	0.1	0.2	9.2	90.4	7.3	15.7	40.1	7.3	7.7	46.9	84.2
Head (calc.)	1973	100.0	0.52	0.82	6.94	91.7	1.50	2.03	14.9	81.6	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.52	0.83	6.45												
Combined Products																	
Bulk 2nd Clnr Conc	102	5.19	7.9	8.8	28.5	54.8	22.9	25.1	31.6	20.4	79.2	55.3	21.3	79.2	64.3	11.0	1.3
Bulk 1st Clnr Conc	151	7.65	5.44	6.28	24.7	63.6	15.7	17.8	34.6	31.9	80.3	58.5	27.3	80.3	67.1	17.8	3.0
Bulk Rougher Conc	313	15.9	2.67	3.26	18.7	75.4	7.7	8.9	33.9	49.5	81.8	63.1	42.8	81.8	69.7	36.1	9.6
Ni 3rd Clnr Conc	14.8	0.75	4.04	3.73	24.0	68.2	11.7	10.2	42.9	35.3	5.9	3.4	2.6	5.9	3.8	2.2	0.3
Ni 2nd Clnr Conc	29.7	1.51	2.25	2.81	22.0	72.9	6.50	7.42	44.9	41.2	6.5	5.2	4.8	6.5	5.5	4.5	0.8
Ni 1st Clnr Conc	62	3.14	1.37	2.54	15.8	80.3	3.95	6.83	31.4	57.8	8.3	9.7	7.1	8.3	10.6	6.6	2.2
Ni Scav Conc	162	8.2	0.69	2.12	14.4	82.8	1.99	5.60	30.8	61.6	10.9	21.2	17.1	10.9	22.7	17.0	6.2
Bulk Rghr+Scav Conc	475	**24.1**	**1.99**	**2.87**	17.2	77.9	5.76	7.78	32.8	53.7	**92.7**	**84.3**	59.9	92.7	92.3	53.1	15.8

Appendix F – Locke Cycle Tests

Test: LCT-1 **Project:** 50149-001 **Date:** March 14 2012 **Operator:** YW/Wei

Purpose: Split flowsheet including Cu separation
Procedure: As below.
Feed: 7 x (2x2)-kg of -10 mesh Master Composite
Grind: 58 minutes /2 kg at 65% solids in the lab ball mill
Regrind (Ni Ro Sc) 8 minutes in the pebble mill

Ni Scav Tail G K_{80} : 118 µm
Ni regrind K80: 35 µm

Conditions:

Stage	Reagents added, grams per tonne						Time, minutes					
	Lime	**SIPX**	**CuSO4**	**CMC**	**Guar**	**MIBC***	**Grind**	**Cond.**	**Froth**	**pH**	**Eh**	
Grind	-	-	-	-	-	-	58					
Bulk Rougher 1	-	15	-	-	-	12		1	3	8.4	89.3	
Bulk Rougher 2	-	20	-	-	-	6		1	3	8.4	37.8	
Ni Scav 1	-	30	-	-	-	2		1	4	8.4	37.0	
Ni Scav 2	-	30	-	-	-	2		1	4	8.4	39.0	
Ni Scav 3	-	30	-	-	-	1		1	4	8.3	11.0	
Bulk Cleaner *(Combine Ro Conc 1-2)*												
Bulk 1st Cleaner 1	-	-	-	12	12	-			2	8.8	89.1	
Bulk 1st Cleaner 2	-	10	-	-	-	-			2			
Bulk 2nd Cleaner 1	-	-		7	7	-			2	8.9	82.7	
Bulk 2nd Cleaner 2	-	5	-	-	-	-			2			
Cu / Ni Separation												
Conditioner 1	375	-	-	-	-	-		5				
Cu Rougher	-	-	-	-	-	-		1	2	12.0		
Cu Cleaner 1	50	-	-	-	-	-		1	2	12.0		
Ni Cleaner *(Combine Scav Conc 1-3)*												
Ni 1st Cleaner 1	-	20		20	20	-		1	3	8.5	74.0	1st cycle: 15; from 2nd cycle: 20g/t
Ni 1st Cleaner 2	-	10	-	-	-	-		1	3	8.4	21.0	
			-	-	-	-						
Regrind (PM)	-	-	-	-	-	-	8					
Ni 2nd Cleaner	-	5	-	7.5	7.5	-		1	4	8.4	68.0	1st cycle: 5; from 2nd cycle: 7.5g/t
Ni 3rd Cleaner	-	1	-	5	5	-		1	3	7.9	88.0	1st cycle: 2.5; from 2nd cycle: 5g/t
Total	425	176	0	51.5	51.5	23	66	16	43			

*As needed

Stage	Rougher	2nd clnr	3rd clnr & sep
Flotation Cell	2000 g D-12	500 g D-12	250 g D-12
Speed: r.p.m.	1500	1600	1200

PSA On Ni Regrind
PSA Tails F
PSA Tails G

Test: LCT-1

Metallurgical Prediction (Using Cycles E,F,G)

Product	Weight		Assays, (Cu, Ni, S, Fe, MgO %)					% Distribution				
	g	%	Cu	Ni	S	Fe	MgO	Cu	Ni	S	Fe	MgO
Cu Conc	39.2	1.00	23.2	0.88	28.3	28.5	2.83	68.2	1.8	9.5	2.3	0.1
Cu Rougher Tail (Ni Conc.)	70.3	1.78	2.55	14.4	26.7	32.5	4.55	13.4	53.9	16.1	4.7	0.4
Ni 3rd Clnr Conc	18.9	0.48	3.24	7.03	27.2	41.8	5.04	4.6	7.0	4.4	1.6	0.1
Ni 1st Clnr Tail	592.3	15.0	0.13	0.48	7.48	18.5	20.4	5.8	15.0	38.0	22.5	13.5
Ni Scav Tail	3221	81.7	0.03	0.13	1.15	10.4	23.8	8.0	22.2	31.9	68.9	85.9
Total Ni Conc.	89.2	2.26	2.69	12.9	26.8	34.5	4.66	18.0	60.9	20.5	6.3	0.5
Head (calc.)	3941.7	100	0.34	0.48	2.95	12.3	22.7	100	100	100	100	100

Metallurgical Balance

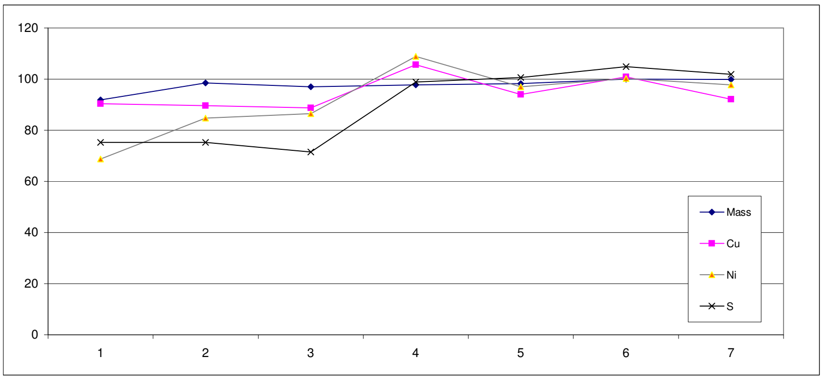
Product	Weight		Assays, (Cu, Ni, S, Fe, MgO %)					% Distribution				
	g	%	Cu	Ni	S	Fe	MgO	Cu	Ni	S	Fe	MgO
Bulk Clnr 2 Conc A	62.5	0.23	15.5	7.75	29.0	–	–	9.9	3.6	2.3		
Bulk Clnr 2 Conc B	59.0	0.21	15.4	8.04	29.1	–	–	9.3	3.5	2.2		
Bulk Clnr 2 Conc C	83.6	0.30	11.7	9.46	27.6	–	–	10.0	5.9	2.9		
Bulk Clnr 2 Conc D	129.8	0.47	9.21	8.64	27.1	–	–	12.2	8.4	4.4		
Cu Clnr 1 Conc E	37.4	0.13	23.1	0.85	27.8	28.9	2.98	8.8	0.2	1.3		
Cu Clnr 1 Conc F	45.9	0.17	21.3	1.03	27.5	28.2	3.27	10.0	0.4	1.6		
Cu Clnr 1 Conc G	34.4	0.12	25.9	0.71	30.0	28.5	2.09	9.1	0.2	1.3		
Cu Clnr 1 Tail G	46.8	0.17	8.05	3.78	19.6			3.9	1.3	1.2		
Cu Rghr Tail E	75.5	0.27	2.69	12.9	26.4	32.8	4.91	2.1	7.3	2.5		
Cu Rghr Tail F	66.8	0.24	2.55	15.5	27.1	32.6	4.18	1.7	7.7	2.3		
Cu Rghr Tail G	68.6	0.25	2.39	15.1	26.5	32.2	4.52	1.7	7.7	2.3		
Bulk 2nd Clnr Tail G	46.8	0.17	0.59	3.56	11.4	–	–	0.3	1.2	0.7		
Bulk 1st Clnr Tail G	203.3	0.73	0.23	1.04	6.16	–	–	0.5	1.6	1.6		
Ni 3rd Clnr Conc A	19.5	0.07	5.28	14.9	28.8	–	–	1.1	2.2	0.7		
Ni 3rd Clnr Conc B	35.4	0.13	3.72	13.8	26.9	–	–	1.3	3.6	1.2		
Ni 3rd Clnr Conc C	16.7	0.06	4.76	11.6	26.6	–	–	0.8	1.4	0.6		
Ni 3rd Clnr Conc D	23.9	0.09	3.27	10.7	27.7	–	–	0.8	1.9	0.8		
Ni 3rd Clnr Conc E	22.8	0.08	3.37	8.05	27.2	45.7	5.49	0.8	1.4	0.8		
Ni 3rd Clnr Conc F	22.5	0.08	2.52	6.24	27.8	40.7	4.45	0.6	1.0	0.8		
Ni 3rd Clnr Conc G	11.3	0.04	4.41	6.53	26.2	36.2	5.32	0.5	0.6	0.4		
Ni 3rd Clnr Tail G	86.0	0.31	0.45	3.41	22.0	–	–	0.4	2.2	2.4		
Ni 2nd Clnr Tail G	277.1	1.00	0.18	0.82	12.9	–	–	0.5	1.7	4.5		
Ni 1st Clnr Tail A	370	1.33	0.17	0.43	6.34	–	–	0.6	1.2	2.9		
Ni 1st Clnr Tail B	533	1.92	0.15	0.44	4.95	–	–	0.8	1.8	3.3		
Ni 1st Clnr Tail C	577	2.08	0.15	0.45	5.25	–	–	0.9	1.9	3.8		
Ni 1st Clnr Tail D	571	2.06	0.13	0.41	6.29	–	–	0.8	1.7	4.5		
Ni 1st Clnr Tail E	558	2.01	0.13	0.45	7.51	18.3	19.7	0.7	1.9	5.3		
Ni 1st Clnr Tail F	625	2.25	0.12	0.45	6.99	18.5	21.4	0.8	2.1	5.5		
Ni 1st Clnr Tail G	594	2.14	0.14	0.53	7.96	18.7	20.0	0.9	2.3	5.9		
Ni Scav Tail A	3192	11.50	0.04	0.12	1.20	–	–	1.3	2.9	4.8		
Ni Scav Tail B	3282	11.82	0.04	0.13	0.99	–	–	1.3	3.2	4.1		
Ni Scav Tail C	3171	11.42	0.03	0.13	0.74	–	–	1.0	3.1	2.9		
Ni Scav Tail D	3154	11.36	0.04	0.15	1.10	–	–	1.3	3.5	4.4		
Ni Scav Tail E	3205	11.54	0.03	0.13	1.12	10.3	23.5	1.0	3.1	4.5		
Ni Scav Tail F	3206	11.55	0.04	0.13	1.20	10.5	24.1	1.3	3.1	4.8		
Ni Scav Tail G	3252	11.71	0.03	0.13	1.14	10.4	23.9	1.0	3.2	4.7		
Head (calc.)	27765	100.0	0.35	0.48	2.87			100.0	100.0	100.0		
(direct)			0.33	0.42	2.53	11.9	22.8					

Test: LCT-1

Overall Stability

Total Products Out Per Cycle		Weight Wt %	Units out as a % of Units in/Cycle Cu	Ni	S
Cycle A	1	91.9	90.4	68.8	75.2
Cycle B	2	98.6	89.6	84.8	75.3
Cycle C	3	97.0	88.8	86.5	71.5
Cycle D	4	97.8	105.6	108.8	98.9
Cycle E	5	98.3	94.0	97.0	100.6
Cycle F	6	100.0	100.8	100.3	104.8
Cycle G	7	99.8	92.1	97.7	101.9

	Wt %	Cu	Ni	S	
Average of F - G	99.9	96.5	99.0	103.3	
Average of E - G*	99.4	95.6	98.3	102.4	* *chosen for prediction*
Average of D - G	99.0	98.1	101.0	101.5	



Metallurgical Balance

Product	Weight g	%	Assays, % Cu	Ni	S	other	Cp	Pn	Po	Ga	% Distribution Cu	Ni	S	Cp	Pn	Po	Ga
Cu Conc	274.6	1.00	**23.2**	**0.88**	28.3	47.6	67.1	2.4	10.5	20.0	57.8	1.1	7.9	57.8	1.2	1.6	0.2
Cu Rougher Tail (Ni Conc.)	492.1	1.78	2.55	14.4	26.7	56.4	7.4	42.0	26.5	24.2	11.4	33.5	13.4	11.4	37.2	7.3	0.5
Ni 3rd Clnr Conc	132.1	0.48	**3.24**	**7.03**	27.2	62.5	9.4	19.8	45.1	25.7	3.9	4.4	3.7	3.9	4.7	3.3	0.1
Ni 1st Clnr Tail	4146	15.0	0.13	0.48	7.48	91.9	0.4	1.0	18.2	80.5	4.9	9.3	31.6	4.9	7.2	42.4	13.0
Ni Scav Tail	22547	81.7	0.03	0.13	1.15	98.7	0.1	0.2	2.74	97.0	6.8	13.8	26.5	6.8	7.8	34.7	85.5
Total Ni Conc.	624.2	2.26	**2.69**	**12.9**	26.8	57.7	7.8	37.3	30.4	24.5	15.2	37.9	17.0	15.2	41.9	10.7	0.6
Head (calc.)	27592	100.0	0.40	0.77	3.56	95.3	1.2	2.0	6.45	92.6	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.33	0.42	2.53												

Test: LCT-2 **Project No.**:50149-001 **Operator**: YW & Max **Date**: 05-Apr-12

Purpose: To conduct a Locked Cycle Test on **Master composite**

Procedure: As outlined below.

Feed: 6 x 2 kg of minus 10 mesh master composite.

Grind: 57 minutes / 2 kg @ 65% solids in laboratory Ball Mill — Rghr Tail F K_{80} = 114 µm

Regrind: N/A — Cln 1 Tail K_{80} = 38 µm

Conditions: Cycle A and B:

	Reagents added, g/t						Time, minutes					
Stage	**3477**	**SIPX**	**MIBC***	**CMC**	**Guar Gum**	**DF 250**	**4037**	**Grind**	**Cond.**	**Froth**	**pH**	**Eh**
Grind	10	-	-	-	-	-		57				
Condition	-	-	-	-	-	-			1		9.3	190.0
Rougher 1	-	-	10	-	-	-			1	2	9.3	182.0
Rougher 2	-	5	5	-	-	-			1	2	9.2	158.0
Rougher 3	-	10	5	-	-	-			1	4	9.2	150.0
Rougher 4	-	20	5	-	-	-			1	6	9.1	134.0
Use Rghr Tail F												
Magnetic separation(Cycle F)												
Regrind Mag. Conc.							20	20				
Mag. Rougher float									1	4		
1st Cleaner	-	5		24	24				1	8	8.8	68.2
2nd Cleaner	-	-	5	12	12				1	6	8.6	85.1
3rd Cleaner	-	-	5	2.5	2.5				1	4	8.4	89.2
Use 1st Clnr Tail (CycleF)												
Regrind							20	20				
1st Clnr Regrind Float									1	4		
Total	10	40	35	39	39		40	97	10	40	.	.
		240	210	231	231							

Stage	Roughers	1stClnr and Scav.	2nd, 3rd Cleaner
Flotation Cell	1000g-D12	500-g D12	250-g D12
Speed: rpm	1800	1600	1100

Assay for: Cu, Ni,S, Pt, Pd, Au, Fe, MgO

PSA Tails F

Test: LCT-2

Metallurgical Prediction (Using Cycles C, D, E, F)

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, Fe, MgO %)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	Mgo	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
3rd Clnr Concentrate	85.25	4.36	6.99	7.13	19.4	2.44	6.80	0.54	25.4	9.82	84.9	63.4	29.2	26.4	64.4	62.9	–	–
Cleaner Tail	249.5	12.8	0.11	0.44	3.59	0.70	0.41	0.03	–	–	3.9	11.3	15.8	22.2	11.5	9.3	–	–
Rougher Tail	1619.6	82.9	0.05	0.15	1.93	0.25	0.13	0.01	–	–	11.2	25.3	55.0	51.4	24.1	27.8	–	–
1st Cleaner Regrind Con F	27.4	0.23	0.51	1.40	4.55	2.17	1.73	0.20	–	–	0.3	0.7	0.4	1.2	0.9	1.2	–	–
Magnetic Con F	37.6	0.32	0.28	0.45	3.33	1.40	1.38	0.21	–	–	0.2	0.3	0.4	1.1	1.0	1.8	–	–
Head (calc.)	1954.3	100.0	0.36	0.49	2.90	0.40	0.46	0.04	–	–	100	100	100	100	100	100	–	–
(direct)			0.33	0.42	2.53	0.41	0.45	0.04	11.9	22.8								

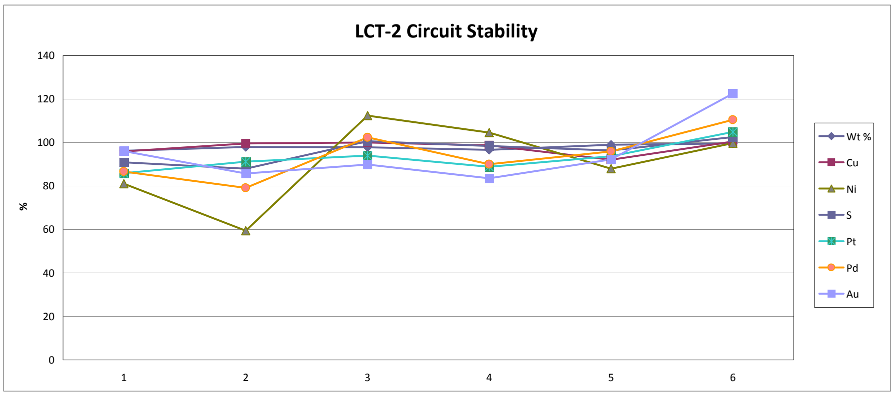
Metallurgical Balance

Product	Weight		Assays, (Pt, Pd, Au g/t), (Cu, Ni, Fe, MgO %)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	Mgo	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
3rd Cleaner Conc. A	57.7	0.48	10.1	8.02	23.2	2.74	8.30	0.81	28.4	5.73	13.5	8.1	3.9	3.2	8.8	10.4	14.2	8.3
3rd Cleaner Conc. B	45.6	0.38	13.1	3.83	21.2	2.82	8.03	0.85	26.9	6.81	13.9	3.1	2.8	2.6	6.8	8.6	10.6	7.8
3rd Cleaner Conc. C	71.8	0.60	8.39	9.82	24.0	2.66	7.99	0.62	29.7	5.93	14.0	12.4	5.0	3.9	10.6	9.9	18.5	10.7
3rd Cleaner Conc. D	87.6	0.73	6.91	7.72	20.3	2.18	5.94	0.41	27.1	8.47	14.1	11.9	5.2	3.8	9.6	7.9	20.6	18.6
3rd Cleaner Conc. E	75.9	0.64	7.28	6.48	19.6	2.54	7.28	0.61	25.0	9.92	12.8	8.6	4.3	3.9	10.2	10.2	16.5	18.9
3rd Cleaner Conc. F	105.7	0.89	5.90	5.28	15.5	2.43	6.36	0.54	21.4	13.5	14.5	9.8	4.8	5.2	12.4	12.7	19.6	35.8
3rd Cleaner Tail F	74.0	0.62	0.68	3.46	7.50	2.08	2.29	0.14			1.2	4.5	1.6	3.1	3.1	2.3	0.0	0.0
2nd Cleaner Tail F	183.1	1.53	0.25	1.46	4.26	1.04	0.82	0.07			1.1	4.7	2.3	3.8	2.8	2.7	0.0	0.0
1st Cleanr Tails A	199.6	1.67	0.11	0.37	3.04	0.69	0.39	0.03			0.5	1.3	1.8	2.8	1.4	1.2	0.0	0.0
1st Cleanr Tails B	248.8	2.08	0.14	0.50	3.13	0.72	0.45	0.02			0.8	2.2	2.3	3.6	2.1	1.3	0.0	0.0
1st Cleanr Tails C	235.3	1.97	0.14	0.49	3.57	0.75	0.55	0.03			0.8	2.0	2.5	3.6	2.4	1.5	0.0	0.0
1st Cleanr Tails D	222.9	1.87	0.10	0.33	3.11	0.63	0.34	0.02			0.5	1.3	2.0	2.8	1.4	1.0	0.0	0.0
1st Cleanr Tails E	278.0	2.33	0.10	0.36	3.38	0.64	0.35	0.02			0.6	1.8	2.7	3.6	1.8	1.2	0.0	0.0
1st Cleanr Tails F (Calc)	261.8	2.19	0.10	0.56	4.24	0.78	0.43	0.04			0.6	2.6	3.2	4.1	2.1	2.3	0.0	0.0
1st Cleaner Regrind Con F	27.4	0.23	0.51	1.40	4.55	2.17	1.73	0.20			0.3	0.7	0.4	1.2	0.9	1.2	0.0	0.0
1st Cleaner Regrind Tail F	234.4	1.96	0.05	0.46	4.20	0.62	0.28	0.02			0.3	1.9	2.9	2.9	1.2	1.1	0.0	0.0
Rougher Tails A	1655.5	13.9	0.05	0.14	1.96	0.25	0.14	0.01			1.9	4.1	9.5	8.3	4.2	4.4	0.0	0.0
Rougher Tails B	1652.9	13.8	0.05	0.16	1.98	0.27	0.14	0.01			1.9	4.6	9.6	9.0	4.4	4.4	0.0	0.0
Rougher Tails C	1637.8	13.7	0.05	0.15	1.94	0.25	0.14	0.01			1.9	4.3	9.3	8.3	4.1	3.6	0.0	0.0
Rougher Tails D	1612.3	13.5	0.05	0.15	1.95	0.25	0.14	0.01			1.9	4.2	9.2	8.1	4.0	5.0	0.0	0.0
Rougher Tails E	1614.9	13.5	0.05	0.15	1.90	0.25	0.13	0.01			1.9	4.3	9.0	8.1	4.0	3.9	0.0	0.0
Rougher Tails F(Calc)	1613.2	13.5	0.04	0.15	1.92	0.25	0.13	0.02			1.7	4.2	9.1	8.2	3.9	5.4	0.0	0.0
Magnetic Con F	37.6	0.32	0.28	0.45	3.33	1.40	1.38	0.21			0.2	0.3	0.4	1.1	1.0	1.8	0.0	0.0
Magnetic Tail F	241.6	2.02	0.03	0.21	4.49	0.41	0.28	0.02			0.2	0.9	3.2	2.0	1.2	1.0	0.0	0.0
Rougher Tails F	1334.0	11.2	0.04	0.13	1.42	0.19	0.07	0.01			1.2	3.0	5.5	5.1	1.7	2.7	0.0	0.0
Head (calc.)	11934	100.0	0.36	0.48	2.87	0.42	0.45	0.04			100	100	100	100	100	100	100	100
(direct)			0.33	0.42	2.53	0.41	0.45	0.04	11.9	22.8								

Overall Stability

Total Products Out Per Cycle	Weight		Units out as a % of Units in/Cycle							
		Wt %	Cu	Ni	S	Pt	Pd	Au	Fe	Mgo
Cycle A	1	96.2	95.8	81.0	90.9	85.8	86.6	96.0	85.3	49.7
Cycle B	2	97.9	99.6	59.4	87.9	91.2	79.1	85.7	63.8	46.7
Cycle C	3	97.8	100.0	112.4	100.6	94.0	102.3	89.8	111.0	64.0
Cycle D	4	96.7	98.7	104.5	98.4	88.8	90.1	83.5	123.5	111.6
Cycle E	5	99.0	92.1	87.9	96.3	93.7	95.9	92.2	98.7	113.3
Cycle F	6	99.6	100.4	99.6	102.5	104.8	110.5	122.5	117.7	214.6
Average of E - F		99.3	96.3	93.8	99.4	99.3	103.2	107.4	108.2	164.0
Average of D - F		98.4	97.1	97.4	99.1	95.8	98.8	99.4	113.3	146.5
Average of C - F*		98.3	97.8	101.1	99.4	95.3	99.7	97.0	112.7	125.9

** chosen for prediction*



Test: LCT-3 **Project:** 50149-001 **Date:** 17-Apr-12 **Operator:** YW/Wei

Purpose: Split flowsheet -Repeat LCT-1, No Cu/Ni Separation

Procedure: As below.

Feed: 6 x 2-kg of -10 mesh **Master Composite**

Grind: 69 minutes /2 kg at 65% solids in the lab ball mill

Regrind 10 minutes in the pebble mill

Ni Scav Tail C K_{80} : 83 µm
Ni Scav Tail D K_{80} : 80 µm
Ni regrind K80: 29 µm

Conditions:

Stage	*Reagents added, grams per tonne*						Time, minutes					
Stage	**Lime**	**SIPX**	**CuSO4**	**CMC**	**Guar**	**MIBC***	**Grind**	**Cond.**	**Froth**	**pH**	**Eh**	
Grind	-	-	-	-	-	-	69					
Bulk Rougher 1	-	15	-	-	-	12		1	3	8.6	107.8	
Bulk Rougher 2	-	20	-	-	-	6		1	3	8.6	76.4	
Ni Scav 1	-	30	-	-	-	2		1	4	8.7	75.0	
Ni Scav 2	-	30	-	-	-	2		1	4	8.7	30.0	
Ni Scav 3	-	30	-	-	-	1		1	4	8.7	25.0	
		4037										
Magnetic Separation on Ni Scav Tail												
Regrind Magnetic Concentrate		20		2	2		20					
Rougher - Magnetic		20		2	2			1	3			
Cleaner - Magnetic									2			
Bulk Cleaner *(Combine Ro Conc 1-2)*		**SIPX**										
Bulk 1st Cleaner 1	-	-	-	12	12	-			2	8.5	78.1	
Bulk 1st Cleaner 2	-	10	-	-	-	-			2	8.4	9.8	
Bulk 2nd Cleaner 1	-	-		7	7	-			2	8.4	44.0	
Bulk 2nd Cleaner 2	-	5	-	-	-	-			2	8.4	50.0	
Ni Cleaner *(Combine Scav Conc 1-3)*			CuSO4									
Ni 1st Cleaner 1	-	20		15	15	-		1	3	8.7	85.0	1st cycle: 20 CMC / 20 Guar
Ni 1st Cleaner 2	-	10	-	-	-	-		1	3	8.7	55.0	
			-	-	-	-						
Regrind (PM)	-	-	-	-	-	-	10					1st cycle: 20min
Ni 2nd Cleaner	-	40+20	100	5	5	-		1	2+2	8.1	150.0	1st cycle: 50 SIPX / 40 A4037
Ni 3rd Cleaner	-	20+40	0+100	2	2	2		1	3+2	8.3	125.0	1st cycle: 20 SIPX / 50 CuSO4; 2nd cycle: 20 SIPX / 2 CMC / 2 Guar .
Total	0	4247	100	45	45	25	99	10	37			

*As needed

Stage	Rougher	2nd clnr	3rd clnr
Flotation Cell	2000 g D-12	500 g D-12	250 g D-12
Speed: r.p.m.	1500	1600	1200

PSA On Ni Regrind
PSA Tails E
PSA Tails F

Test: LCT-3

Metallurgical Prediction (Using Cycles D, E, F)

Product	Weight		Assays, (Cu, Ni, S, Fe, MgO %) (Pt, Pd, Au g/t)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
Bulk Clnr 2 Conc.	55.3	2.78	11.0	9.28	27.2	3.39	10.3	0.80	31.6	4.13	83.5	57.6	25.9	22.7	62.9	50.3	–	–
Ni 3rd Clnr Conc.	46.9	2.36	0.59	1.78	12.8	3.55	1.45	0.11	22.4	17.9	3.8	9.4	10.3	20.2	7.5	6.1	–	–
Ni 1st Clnr Tail	312.4	15.7	0.10	0.34	4.41	0.66	0.41	0.03	–	–	4.3	12.1	23.8	24.9	14.1	12.1	–	–
Ni Scav Tail	1388.1	69.9	0.04	0.11	1.06	0.14	0.06	0.02	–	–	7.6	16.6	25.4	24.1	9.5	25.4	–	–
Magnetic Clnr Conc.	4.2	0.21	0.85	1.22	8.93	6.19	5.41	0.52	24.4	18.4	0.5	0.6	0.7	3.2	2.5	2.5	–	–
Magnetic Rghr Tail	178.6	9.00	0.01	0.19	4.50	0.23	0.18	0.02	–	–	0.2	3.7	13.8	4.9	3.5	3.6	–	–
Combined Conc.	106.4	5.36	6.01	5.66	20.1	3.57	6.22	0.48	–	–	87.8	67.6	36.9	46.0	72.9	58.9	–	–
Head (calc.)	1985.5	100	0.37	0.45	2.92	0.42	0.46	0.04	–	–	100	100	100	100	100	100	–	–

Metallurgical Balance

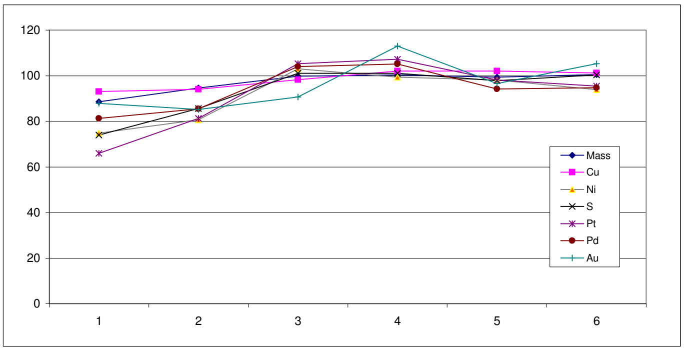
Product	Weight		Assays, (Cu, Ni, S, Fe, MgO %) (Pt, Pd, Au g/t)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
Bulk Clnr 2 Conc A	54.5	0.46	10.8	8.54	25.9	3.26	10.6	0.80	30.4	4.89	13.7	8.5	4.0	3.6	10.4	8.8	10.9	5.15
Bulk Clnr 2 Conc B	51.6	0.43	11.3	8.56	27.2	3.40	10.6	0.74	31.5	4.11	13.6	8.0	4.0	3.6	9.8	7.6	10.7	4.10
Bulk Clnr 2 Conc C	61.3	0.51	9.54	9.55	26.6	3.30	10.3	0.60	31.4	4.63	13.6	10.6	4.7	4.1	11.4	7.3	12.7	5.49
Bulk Clnr 2 Conc D	56.5	0.47	10.7	9.50	27.4	3.65	10.9	0.80	31.9	4.03	14.1	9.8	4.4	4.2	11.1	9.0	11.9	4.40
Bulk Clnr 2 Conc E	56.6	0.48	10.9	9.30	27.2	3.25	9.69	0.72	31.7	4.39	14.4	9.6	4.4	3.7	9.9	8.1	11.8	4.80
Bulk Clnr 2 Conc F	52.7	0.44	11.4	9.03	27.1	3.25	10.4	0.88	31.2	3.95	14.0	8.6	4.1	3.5	9.9	9.3	10.8	4.02
Bulk 2nd Clnr Tail F	49.1	0.41	0.45	5.47	12.2	2.36	2.99	0.11			0.5	4.9	1.7	2.3	2.6	1.1	0.0	0.00
Bulk 1st Clnr Tail F	126	1.06	0.14	0.94	4.21	1.22	0.81	0.05			0.4	2.1	1.5	3.1	1.8	1.1	0.0	0.00
Ni 3rd Clnr Conc A	3.0	0.03	1.50	1.70	14.2	4.06	2.44	0.40	24.6	15.6	0.1	0.1	0.1	0.2	0.1	0.2	0.5	0.90
Ni 3rd Clnr Conc B	7.4	0.06	1.52	3.27	16.1	6.38	3.09	0.35	25.3	15.5	0.3	0.4	0.3	1.0	0.4	0.5	1.2	2.22
Ni 3rd Clnr Conc C	36.5	0.31	0.68	1.98	12.4	4.41	1.67	0.16	21.2	18.9	0.6	1.3	1.3	3.3	1.1	1.1	5.1	13.33
Ni 3rd Clnr Conc D	45.7	0.38	0.58	1.69	12.7	3.54	1.42	0.10	22.4	17.6	0.6	1.4	1.7	3.3	1.2	0.9	6.8	15.55
Ni 3rd Clnr Conc E	48.9	0.41	0.55	1.78	13.1	3.50	1.43	0.12	22.7	18.0	0.6	1.6	1.8	3.5	1.3	1.2	7.3	17.01
Ni 3rd Clnr Conc F	46.0	0.39	0.65	1.88	12.6	3.61	1.51	0.12	22.1	18.2	0.7	1.6	1.7	3.4	1.3	1.1	6.7	16.18
Ni 3rd Clnr Tail F	10.5	0.09	0.40	0.57	9.58	1.05	0.61	0.07			0.1	0.1	0.3	0.2	0.1	0.1	0.0	0.00
Ni 2nd Clnr Tail F	83.3	0.70	0.24	0.60	9.49	0.85	0.59	0.05			0.5	0.9	2.3	1.4	0.9	0.8	0.0	0.00
Ni 1st Clnr Tail A	188	1.58	0.08	0.27	4.57	0.70	0.32	0.03			0.4	0.9	2.5	2.7	1.1	1.2	0.0	0.00
Ni 1st Clnr Tail B	253	2.13	0.07	0.33	5.00	0.71	0.34	0.03			0.4	1.5	3.6	3.6	1.5	1.6	0.0	0.00
Ni 1st Clnr Tail C	336	2.82	0.10	0.34	4.46	0.70	0.40	0.03			0.8	2.1	4.3	4.8	2.4	2.1	0.0	0.00
Ni 1st Clnr Tail D	338	2.84	0.11	0.36	4.48	0.70	0.44	0.04			0.9	2.2	4.3	4.8	2.7	2.6	0.0	0.00
Ni 1st Clnr Tail E	287	2.41	0.09	0.33	4.14	0.66	0.41	0.03			0.6	1.7	3.4	3.8	2.1	1.7	0.0	0.00
Ni 1st Clnr Tail F	313	2.63	0.10	0.34	4.59	0.61	0.38	0.03			0.7	1.9	4.1	3.9	2.1	2.0	0.0	0.00
Ni Scav Tail A	1374	11.5	0.04	0.10	0.98	0.14	0.06	0.01			1.3	2.5	3.9	3.9	1.5	3.0	0.0	0.00
Ni Scav Tail B	1387	11.6	0.04	0.11	1.00	0.15	0.06	0.01			1.3	2.8	4.0	4.2	1.5	2.8	0.0	0.00
Ni Scav Tail C	1372	11.5	0.04	0.10	1.07	0.15	0.06	0.01			1.3	2.5	4.2	4.2	1.5	3.3	0.0	0.00
Ni Scav Tail D	1381	11.6	0.04	0.10	1.04	0.15	0.06	0.02			1.3	2.5	4.1	4.2	1.6	5.0	0.0	0.00
Ni Scav Tail E	1377	11.6	0.04	0.11	1.04	0.14	0.06	0.02			1.3	2.8	4.1	3.9	1.4	4.1	0.0	0.00
Ni Scav Tail F	1406	11.8	0.04	0.11	1.11	0.14	0.07	0.02			1.3	2.8	4.5	4.0	1.6	4.2	0.0	0.00
Magnetic Clnr Conc. A	1.1	0.01	0.74	1.24	11.1	4.63	5.14	2.92	30.4	14.8	0.0	0.0	0.0	0.1	0.1	0.6	0.2	0.31
Magnetic Clnr Conc. B	2.0	0.02	0.78	1.28	10.3	5.46	5.11	1.22	29.1	15.5	0.0	0.0	0.1	0.2	0.2	0.5	0.4	0.60
Magnetic Clnr Conc. C	4.4	0.04	0.72	1.18	9.43	5.60	4.80	0.65	27.8	16.8	0.1	0.1	0.1	0.5	0.4	0.6	0.8	1.43
Magnetic Clnr Conc. D	3.6	0.03	1.10	1.48	10.5	7.92	7.03	0.80	26.8	17.1	0.1	0.1	0.1	0.6	0.5	0.6	0.6	1.19
Magnetic Clnr Conc. E	4.3	0.04	0.78	1.22	8.91	6.08	5.17	0.46	23.2	18.9	0.1	0.1	0.1	0.5	0.4	0.4	0.7	1.57
Magnetic Clnr Conc. F	4.8	0.04	0.73	1.03	7.77	4.98	4.42	0.37	23.8	18.8	0.1	0.1	0.1	0.5	0.4	0.4	0.8	1.74
Magnetic Clnr Tail F	68	0.57	0.04	0.26	4.66	0.50	0.34	0.03			0.1	0.3	0.9	0.7	0.4	0.4	0.0	0.00
Magnetic Rghr Tail A	135	1.13	<0.01	0.19	4.69	0.18	0.15	0.03			0.0	0.5	1.8	0.5	0.4	0.8	0.0	0.00
Magnetic Rghr Tail B	175	1.47	0.02	0.20	4.49	0.27	0.23	0.04			0.1	0.6	2.2	1.0	0.7	1.2	0.0	0.00
Magnetic Rghr Tail C	169	1.42	<0.01	0.18	4.65	0.22	0.19	0.02			0.0	0.6	2.3	0.8	0.6	0.6	0.0	0.00
Magnetic Rghr Tail D	167	1.41	0.01	0.19	4.58	0.25	0.19	0.02			0.0	0.6	2.2	0.8	0.6	0.7	0.0	0.00
Magnetic Rghr Tail E	197	1.66	<0.01	0.18	4.31	0.22	0.18	0.02			0.0	0.6	2.4	0.9	0.6	0.6	0.0	0.00
Magnetic Rghr Tail F	171	1.44	<0.01	0.19	4.63	0.21	0.17	0.02			0.0	0.6	2.3	0.7	0.5	0.7	0.0	0.00
Head (calc.)	11904	100.0	0.36	0.46	2.93	0.41	0.47	0.04	1.27	0.43	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.33	0.42	2.53	0.41	0.45	0.04	11.9	22.8								

Test: LCT-3

Overall Stability

Total Products Out Per Cycle	Weight	Wt %	Cu	Ni	S	Pt	Pd	Au
			Units out as a % of Units in/Cycle					
Cycle A	1	88.5	93.0	74.8	74.0	66.0	81.2	87.9
Cycle B	2	94.5	94.1	80.6	85.6	81.2	85.5	85.2
Cycle C	3	99.8	98.3	103.0	101.0	105.2	104.0	90.7
Cycle D	4	100.4	102.0	99.3	101.1	107.2	105.1	113.0
Cycle E	5	99.3	102.1	98.2	97.8	98.0	94.2	96.5
Cycle F	6	100.5	101.2	93.9	100.3	95.4	94.8	105.3

	Wt %	Cu	Ni	S	Pt	Pd	Au	
Average of E - F	99.9	101.6	96.0	99.0	96.7	94.5	100.9	
Average of D - F*	100.1	101.8	97.1	99.7	100.2	98.0	104.9	* *chosen for prediction*
Average of C - F	100.0	100.9	98.6	100.0	101.5	99.5	101.4	



Metallurgical Balance

Product	Weight g	Weight %	Assays, % Cu	Ni	S	other	Cp	Pn	Po	Ga	% Distribution Cu	Ni	S	Cp	Pn	Po	Ga
Bulk Clnr 2 Conc.	55.3	2.78	**11.0**	**9.3**	**27.2**	52.5	31.8	26.9	18.7	22.6	84.1	60.2	30.3	84.1	70.9	11.3	0.7
Ni 3rd Clnr Conc.	46.9	2.36	**0.6**	**1.8**	**12.8**	84.8	1.7	4.7	27.6	66.0	3.8	9.8	12.1	3.8	10.4	14.1	1.9
Ni 1st Clnr Tail	312.4	15.7	**0.1**	**0.3**	**4.4**	95.1	0.3	0.7	10.6	88.4	4.4	12.6	27.8	4.4	10.4	36.0	16.6
Ni Scav Tail	1388	69.9	**0.0**	**0.1**	**1.1**	98.8	0.1	0.1	2.5	97.2	7.7	17.4	29.8	7.7	8.3	38.5	80.8
Magnetic Clnr Conc.	4	0.2	**0.9**	**1.2**	**8.9**	89.0	2.5	3.2	18.2	76.2	0.5	0.6	0.8	0.5	0.6	0.8	0.2
Magnetic Rghr Tail	179	9.0	**0.0**	**0.2**	**4.5**	95.3	0.0	0.2	11.4	88.3	0.2	3.9	16.2	0.2	1.8	22.3	9.4
Head (calc.)	1986	100.0	0.36	0.43	2.50	96.7	1.1	1.1	4.62	84.1	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.33	0.42	2.53												

Test: LCT-4 **Project:** 50149-001 **Date:** April 18.2012 **Operator:** Yonika\Wei

Purpose: Split flowsheet

Procedure: As below.

Feed: 6 x2kg of -10 mesh **HNI Composite**

Grind: 64 minutes /2 kg at 65% solids in the lab ball mill

Regrind (Ni Ro Sc) 10 minutes in the pebble mill

Ni Scav Tail E K_{80} : 75 µm

Ni Scav Tail F K_{80} : 75 µm

Ni regrind K80: 32 µm

Conditions:

	Reagents added, grams per tonne						Time, minutes				
Stage	**Lime**	**SIPX**	**CuSO4**	**CMC**	**Guar**	**MIBC***	**Grind**	**Cond.**	**Froth**	**pH**	**Eh**
Grind	-	-	-	-	-	-	64				
Bulk Rougher 1	-	15	-	-	-	18		1	3	8.5	3.0
Bulk Rougher 2	-	20	-	-	-	6		1	3	8.5	0.9
Ni Scav 1	-	20	-	-	-	2		1	4	8.6	30.0
Ni Scav 2	-	20	-	-	-	2		1	4	8.6	50.0
Ni Scav 3	-	20	-	-	-	1		1	4	8.6	50.0
		4037									
Magnetic Separation on Ni Scav Tail									12		
Regrind Magnetic Concentrate		20					20				
Rougher - Magnetic		10		5	5			1	3		
Cleaner - Magnetic									2		
Bulk Cleaner *(Combine Ro Conc 1-2)*		**SIPX**									
Bulk 1st Cleaner 1	-	-	-	15	15	2			2	8.4	-15.0
Bulk 1st Cleaner 2	-	5	-	-	-	2			3	8.2	12.4
Bulk 2nd Cleaner 1	-			7	7	4			2	8.2	61.7
Bulk 2nd Cleaner 2	-	5	-	-	-	4			3	8.2	-24.1
Ni Cleaner *(Combine Scav Conc 1-3)*											
Ni 1st Cleaner 1	-	10		10	10	-		1	3	8.6	100.0
Ni 1st Cleaner 2	-	10	-	-	-	-		1	3	8.6	75.0
			-	-	-	-					
Regrind (PM)	-	-	-	-	-	-	10				
Ni 2nd Cleaner	-	5+5	-	2	2	2		1	2+2	8.7	200.0
Ni 3rd Cleaner	-		-			-		1	3	8.2	180.0
Total	0	4192	0	39	39	43	94	10	54		

*As needed

Cycle E and F: 10 g/t SIPX

1st cycle: 15 CMC / 15 Guar

Stage	Rougher	2nd clnr	3rd clnr	
Flotation Cell	2000 g D-12	500 g D-12	250 g D-12	
Speed: r.p.m.	1500	1600	1200	

PSA On Ni Regrind

PSA Tails E

PSA Tails F

Test: LCT-4

Metallurgical Prediction (Using Cycles D, E, F)

Product	Weight		Assays, (Cu, Ni, S, Fe, MgO %) (Pt, Pd, Au g/t)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
Bulk Clnr 2 Conc.	117.8	5.99	7.57	9.27	30.2	2.51	6.15	0.71	36.6	2.03	82.8	66.9	26.9	26.3	64.4	55.6	–	–
Ni 3rd Clnr Conc.	24.3	1.23	2.07	3.83	18.8	4.10	2.77	0.32	28.1	12.6	4.7	5.7	3.4	8.9	6.0	5.2	–	–
Ni 1st Clnr Tail	325.0	16.5	0.18	0.64	12.7	1.06	0.45	0.05	–	–	5.3	12.7	31.3	30.8	13.1	9.9	–	–
Ni Scav Tail	1338.6	68.0	0.05	0.15	3.06	0.22	0.08	0.03	–	–	6.2	12.3	31.0	26.3	10.0	25.2	–	–
Magnetic Clnr Conc.	4.0	0.2	1.26	1.22	10.9	6.94	6.39	0.55	26.5	16.4	0.5	0.3	0.3	2.5	2.3	1.5	–	–
Magnetic Rghr Tail	157.8	8.0	0.03	0.22	5.96	0.37	0.30	0.03	–	–	0.5	2.1	7.1	5.2	4.2	2.8	–	–
Combined Conc.	146.1	7.42	6.48	8.15	27.8	2.89	5.59	0.64	–	–	88.0	72.9	30.7	37.7	72.6	62.2	–	–
Head (calc.)	1967.6	100	0.55	0.83	6.73	0.57	0.57	0.08	–	–	100	100	100	100	100	100	–	–

Metallurgical Balance

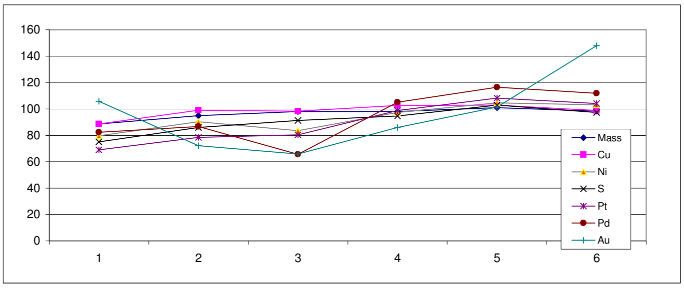
Product	Weight		Assays, (Cu, Ni, S, Fe, MgO %) (Pt, Pd, Au g/t)								% Distribution							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
Bulk Clnr 2 Conc A	106.6	0.90	7.73	9.17	29.0	2.11	5.47	0.96	36.4	2.35	12.9	10.2	3.8	3.5	9.6	12.6	13.1	5.96
Bulk Clnr 2 Conc B	126.2	1.06	7.06	8.49	29.4	2.19	4.64	0.45	36.6	2.85	14.0	11.1	4.6	4.3	9.6	7.0	15.6	8.56
Bulk Clnr 2 Conc C	93.8	0.79	9.01	8.97	29.1	1.12	2.94	0.37	36.0	2.17	13.3	8.7	3.4	1.6	4.5	4.3	11.4	4.85
Bulk Clnr 2 Conc D	112.4	0.94	8.07	9.19	29.8	2.38	5.90	0.50	36.3	2.18	14.2	10.7	4.1	4.1	10.9	7.0	13.8	5.83
Bulk Clnr 2 Conc E	122.0	1.02	7.43	9.12	30.6	2.59	6.26	0.67	36.5	2.04	14.2	11.6	4.6	4.9	12.6	10.1	15.1	5.93
Bulk Clnr 2 Conc F	118.9	1.00	7.24	9.51	30.2	2.54	6.27	0.95	37.1	1.88	13.5	11.7	4.4	4.7	12.3	14.0	14.9	5.32
Bulk 2nd Clnr Tail F	61.4	0.52	0.38	3.42	22.2	2.00	1.32	0.10			0.4	2.2	1.7	1.9	1.3	0.7	0.0	0.00
Bulk 1st Clnr Tail F	118	0.99	0.26	1.29	12.3	1.31	0.66	0.06			0.5	1.6	1.8	2.4	1.3	0.8	0.0	0.00
Ni 3rd Clnr Conc A	1.0	0.01	9.16	1.56	25.1	5.66	8.23	1.13	25.3	19.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.45
Ni 3rd Clnr Conc B	8.6	0.07	4.28	2.68	17.5	5.22	3.88	0.52	25.4	13.7	0.6	0.2	0.2	0.7	0.5	0.6	0.7	2.81
Ni 3rd Clnr Conc C	19.0	0.16	2.79	3.74	18.5	4.10	2.94	0.34	27.5	12.7	0.8	0.7	0.4	1.2	0.9	0.8	1.8	5.75
Ni 3rd Clnr Conc D	24.2	0.20	2.03	3.72	19.0	4.31	2.87	0.32	28.3	12.4	0.8	0.9	0.6	1.6	1.1	1.0	2.3	7.15
Ni 3rd Clnr Conc E	24.4	0.20	1.91	4.07	19.6	3.81	2.70	0.35	29.5	12.1	0.7	1.0	0.6	1.4	1.1	1.0	2.4	7.03
Ni 3rd Clnr Conc F	24.2	0.20	2.28	3.70	17.7	4.17	2.73	0.30	26.6	13.3	0.9	0.9	0.5	1.6	1.1	0.9	2.2	7.66
Ni 3rd Clnr Tail F	49.3	0.41	0.42	2.49	17.7	2.55	1.10	0.10			0.3	1.3	1.1	1.9	0.9	0.6	0.0	0.00
Ni 2nd Clnr Tail F	146.8	1.23	0.19	1.14	18.2	1.44	0.56	0.06			0.4	1.7	3.3	3.3	1.3	1.1	0.0	0.00
Ni 1st Clnr Tail A	165.1	1.39	0.18	0.46	10.6	0.90	0.36	0.05			0.5	0.8	2.2	2.3	1.0	1.0	0.0	0.00
Ni 1st Clnr Tail B	248.0	2.08	0.18	0.52	11.2	0.62	0.26	0.03			0.7	1.3	3.4	2.4	1.1	0.8	0.0	0.00
Ni 1st Clnr Tail C	333.5	2.80	0.20	0.62	12.0	0.99	0.47	0.05			1.0	2.1	5.0	5.1	2.6	2.1	0.0	0.00
Ni 1st Clnr Tail D	303.8	2.55	0.18	0.65	12.8	1.08	0.47	0.05			0.9	2.1	4.8	5.1	2.4	1.8	0.0	0.00
Ni 1st Clnr Tail E	335.5	2.82	0.18	0.66	12.9	1.10	0.47	0.05			0.9	2.3	5.4	5.7	2.6	1.9	0.0	0.00
Ni 1st Clnr Tail F	335.8	2.82	0.17	0.60	12.5	1.01	0.43	0.04			0.9	2.1	5.2	5.2	2.4	1.8	0.0	0.00
Ni Scav Tail A	1324.8	11.1	0.05	0.14	3.17	0.21	0.08	0.02			1.0	1.9	5.2	4.3	1.8	3.1	0.0	0.00
Ni Scav Tail B	1330.3	11.2	0.05	0.14	2.94	0.21	0.08	0.02			1.0	1.9	4.8	4.3	1.8	2.8	0.0	0.00
Ni Scav Tail C	1354.0	11.4	0.05	0.14	3.16	0.21	0.08	0.02			1.1	2.0	5.3	4.4	1.9	3.2	0.0	0.00
Ni Scav Tail D	1347.1	11.3	0.05	0.15	3.05	0.21	0.08	0.02			1.1	2.1	5.1	4.4	1.8	3.8	0.0	0.00
Ni Scav Tail E	1345.3	11.3	0.05	0.15	3.15	0.22	0.09	0.02			1.1	2.1	5.2	4.6	1.9	3.0	0.0	0.00
Ni Scav Tail F	1323.5	11.1	0.05	0.15	2.99	0.23	0.08	0.04			1.0	2.1	4.9	4.7	1.8	7.2	0.0	0.00
Magnetic Clnr Conc. A	12.3	0.10	0.46	0.58	7.14	2.99	2.67	0.25	24.3	17.6	0.1	0.1	0.1	0.6	0.5	0.4	1.0	5.15
Magnetic Clnr Conc. B	7.4	0.06	0.76	0.69	7.73	4.21	3.96	0.29	24.3	17.5	0.1	0.1	0.1	0.5	0.5	0.3	0.6	3.08
Magnetic Clnr Conc. C	2.5	0.02	2.02	1.78	12.3	8.62	8.48	0.71	27.8	15.8	0.1	0.0	0.0	0.3	0.3	0.2	0.2	0.94
Magnetic Clnr Conc. D	3.1	0.03	1.41	1.14	11.2	6.63	7.16	0.65	26.9	15.6	0.1	0.0	0.0	0.3	0.4	0.2	0.3	1.15
Magnetic Clnr Conc. E	5.0	0.04	1.26	1.33	11.1	7.53	6.09	0.46	26.7	16.3	0.1	0.1	0.1	0.6	0.5	0.3	0.5	1.94
Magnetic Clnr Conc. F	4.0	0.03	1.13	1.14	10.5	6.44	6.17	0.59	26.0	17.2	0.1	0.0	0.1	0.4	0.4	0.3	0.4	1.64
Magnetic Clnr Tail F	43.6	0.37	0.10	0.30	18.1	1.00	0.75	0.06	24.7	18.1	0.1	0.1	1.0	0.7	0.5	0.3	3.6	18.79
Magnetic Rghr Tail A	146.7	1.23	0.03	0.21	6.39	0.35	0.28	0.02			0.1	0.3	1.2	0.8	0.7	0.3	0.0	0.00
Magnetic Rghr Tail B	162.6	1.37	0.04	0.20	5.91	0.38	0.32	0.03			0.1	0.3	1.2	1.0	0.9	0.5	0.0	0.00
Magnetic Rghr Tail C	143.5	1.21	0.03	0.20	6.24	0.34	0.29	0.02			0.1	0.3	1.1	0.8	0.7	0.4	0.0	0.00
Magnetic Rghr Tail D	157.0	1.32	0.04	0.22	5.85	0.41	0.34	0.03			0.1	0.4	1.1	1.0	0.9	0.5	0.0	0.00
Magnetic Rghr Tail E	170.3	1.43	0.03	0.22	5.96	0.34	0.28	0.03			0.1	0.4	1.3	0.9	0.8	0.6	0.0	0.00
Magnetic Rghr Tail F	146.2	1.23	0.03	0.21	6.07	0.36	0.29	0.03			0.1	0.3	1.1	0.8	0.7	0.5	0.0	0.00
Head (calc.)	11908	100.0	0.53	0.81	6.79	0.54	0.51	0.07			100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.52	0.83	6.45	0.57	0.61	0.10	18.1	19.8								

Test: LCT-4

Overall Stability

Total Products Out Per Cycle	Weight	Wt %	Cu	Ni	S	Pt	Pd	Au
			Units out as a % of Units in/Cycle					
Cycle A	1	88.5	88.5	79.7	74.9	69.0	82.2	105.8
Cycle B	2	94.9	99.0	90.2	85.9	78.4	86.6	72.0
Cycle C	3	98.1	98.2	83.6	91.2	80.3	65.6	65.9
Cycle D	4	98.1	102.6	97.2	94.7	98.8	105.0	85.8
Cycle E	5	100.9	102.9	104.6	102.8	108.3	116.5	101.3
Cycle F	6	98.4	98.8	103.2	97.3	104.1	111.7	147.9

	Wt %	Cu	Ni	S	Pt	Pd	Au	
Average of E - F	99.6	100.8	103.9	100.1	106.2	114.1	124.6	
Average of D - F*	99.1	101.4	101.7	98.3	103.7	111.1	111.7	** chosen for prediction*
Average of C - F	98.9	100.6	97.2	96.5	97.9	99.7	100.3	



Metallurgical Balance

Product	Weight g	Weight %	Assays, % Cu	Ni	S	other	Cp	Pn	Po	Ga	% Distribution Cu	Ni	S	Cp	Pn	Po	Ga
Bulk Clnr 2 Conc.	117.8	5.99	**7.57**	**9.27**	29.9	53.2	21.9	26.6	34.9	16.5	83.6	68.6	28.8	83.6	78.1	16.2	1.3
Ni 3rd Clnr Conc.	24.3	1.23	2.07	3.83	18.8	75.3	6.0	10.6	34.1	49.3	4.7	5.8	3.7	4.7	6.4	3.3	0.8
Ni 1st Clnr Tail	325.0	16.5	**0.18**	**0.64**	12.7	86.5	0.5	1.2	31.5	66.8	5.4	13.0	33.9	5.4	9.8	40.2	14.7
Ni Scav Tail	1339	68.0	0.05	0.15	3.06	96.7	0.1	0.2	7.7	92.0	6.3	12.6	33.6	6.3	5.7	40.3	83.2
Magnetic Clnr Conc.	4	0.2	1.26	1.22	10.9	86.6	3.6	3.1	22.4	70.9	0.5	0.3	0.4	0.5	0.3	0.4	0.2
Magnetic Rghr Tail	158	8.0	0.03	0.22	5.96	93.8	0.1	0.2	15.1	84.5	0.5	2.1	7.7	0.5	1.0	9.4	9.0
Head (calc.)	1968	100.0	0.54	0.81	6.21	92.4	1.6	2.0	12.92	75.2	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.52	0.83	6.45												

Test: LCT-5 **Project:** 50149-001 **Date:** May 1 2012 **Operator:** YW/Wei

Purpose: Split flowsheet including Cu separation and Magnetic separation

Procedure: As below.

Feed: 6 x 2-kg of -10 mesh Master Composite

Grind: 69 minutes /2 kg at 65% solids in the lab ball mill

Regrind: 8 minutes in pebble mill

Ni Scav Tail F K_{80} : 87 µm

Ni regrind K80: 35 µm

Conditions:

	Reagents added, grams per tonne						Time, minutes					
Stage	**Lime**	**SIPX**	**CuSO4**	**CMC**	**Guar**	**MIBC***	**Grind**	**Cond.**	**Froth**	**pH**	**Eh**	
Grind	-	-	-	-	-	-	69					
Bulk Rougher 1	-	15	-	-	-	12		1	3	8.7	2.4	
Bulk Rougher 2	-	20	-	-	-	6		1	3	8.7	2.7	
Ni Scav 1	-	30	-	-	-	2		1	4	8.7	50.0	
Ni Scav 2	-	30	-	-	-	2		1	4	8.7	100.0	
Ni Scav 3	-	30	-	-	-	1		1	4	8.7	100.0	
	4037											
Magnetic Separation on Ni Scav Tail												
Regrind Magnetic Concentrate	20			2	2		20					
Rougher - Magnetic	5			2	2			1	3			
Cleaner - Magnetic									2			
Bulk Cleaner *(Combine Ro Conc 1-2)*												
Bulk 1st Cleaner 1	-	-	-	12	12	-			2	8.6	78.9	
Bulk 1st Cleaner 2	-	10	-	-	-	-			2			
Bulk 2nd Cleaner 1	-	-		7	7	-			2	8.4	84.4	
Bulk 2nd Cleaner 2	-	5	-	-	-	-			2			
Cu / Ni Separation												
Conditioner 1	450	-	-	-	-	-		5		10.5	-58.3	
Cu Rougher		5	-	-	-	-		1	2	11.0	-94.3	
Cu Cleaner 1	50	0	-	-	-	-		1	2	11.0	-89.7	Cycle 1 to 4: 2 g/t SIPX; Cycle 5 to 6: 0 g/t SIPX
Ni Cleaner *(Combine Scav Conc 1-3)*	**4037**											
Regrind (PM)	20	-	-	-	-	-	18					
Ni 1st Cleaner 1	-	20		18	18	-		1	4	8.8	100.0	1st/2nd: 15 CMC / 15 Guar; from 3rd: 18 CMC / 18 Guar
Ni 1st Cleaner 2	-	10	-	-	-	-		1	4	8.8	100.0	
			-	-	-	-						
Ni 2nd Cleaner	-	40+20	100	6	6	-		1	4+2	7.8	200.0	1st/2nd: 5 CMC / 5 Guar; from 3rd: 6 CMC / 6 Guar
Ni 3rd Cleaner	-	10		2	2			1	2	8.1	175.0	1st/2nd: 20 SIPX; from 3rd: 10 SIPX
Total	8619	185	100	49	49	23	107	17	45			

*As needed

Stage	Rougher	2nd clnr	3rd clnr & sep
Flotation Cell	2000 g D-12	500 g D-12	250 g D-12
Speed: r.p.m.	1500	1600	1200

PSA On Ni Regrind

PSA Tails F

Test: LCT-5

Metallurgical Prediction (Using Cycles E,F,G)

Product	Weight		Assays, (Cu, Ni, S, Fe, MgO %) (Pt, Pd, Au g/t)								Distribution, %							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
Cu Clnr 1 Conc	27.0	1.52	19.1	1.37	25.5	2.51	6.06	1.41	28.8	4.75	75.5	4.5	14.6	9.5	19.5	47.0	–	–
Cu Rougher Tail (Ni Conc.)	32.8	1.85	1.66	14.3	25.0	3.63	12.0	0.45	30.8	5.58	8.0	56.9	17.4	16.7	47.2	18.3	–	–
Ni 3rd Clnr Conc	25.6	1.44	0.88	2.44	17.2	5.76	2.32	0.19	28.2	14.4	3.3	7.6	9.3	20.7	7.1	5.9	–	–
Ni 1st Clnr Tail	287.2	16.2	0.12	0.36	4.21	0.59	0.43	0.03	–	–	4.9	12.4	25.7	23.7	14.8	11.5	–	–
Ni Scav Tail	1403	79.0	0.04	0.11	1.11	0.15	0.07	0.01	–	–	8.2	18.7	33.0	29.5	11.4	17.4	–	–
Magnetic Cleaner Con	3	0.2	1.68	1.88	11.6	8.04	8.58	7.46	26.5	15.9	0.7	0.7	0.7	3.4	3.1	27.7	–	–
Magnetic Cleaner Tail	65	3.7	0.06	0.25	4.82	0.68	0.45	0.16	–	–	0.6	2.0	6.7	6.2	3.5	13.0	–	–
Magnetic Rougher Tail	136	7.6	0.03	0.20	4.20	0.26	0.22	0.05	–	–	0.6	3.3	12.1	4.9	3.5	8.2	–	–
Total Ni Conc.	61.4	3.46	1.34	8.75	21.1	4.73	7.81	0.68	29.5	9.77	12.0	65.1	27.5	40.7	57.3	51.9	–	–
Head (calc.)	1775.2	100	0.38	0.46	2.65	0.40	0.47	0.05	–	–	100	100	100	100	100	100	–	–

Metallurgical Balance

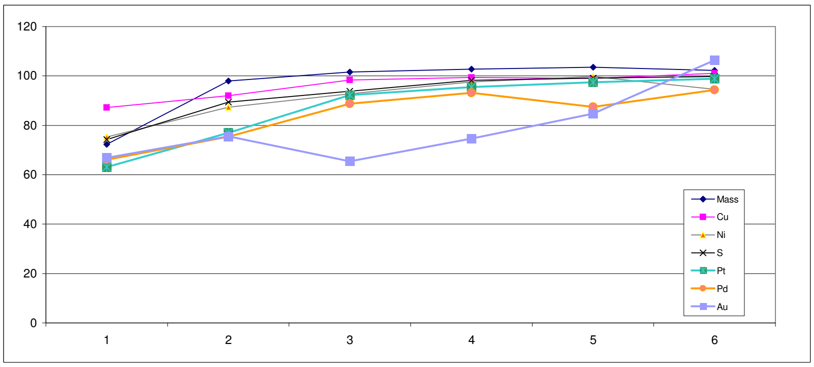
Product	Weight		Assays, (Cu, Ni, S, Fe, MgO %) (Pt, Pd, Au g/t)								Distribution, %							
	g	%	Cu	Ni	S	Pt	Pd	Au	Fe	MgO	Cu	Ni	S	Pt	Pd	Au	Fe	MgO
Cu Clnr 1 Conc A	25.5	0.22	19.1	1.15	24.8	2.59	6.62	1.61	28.0	5.30	11.7	0.5	1.9	1.3	2.8	6.1	5.1	3.29
Cu Clnr 1 Conc B	27.4	0.24	19.2	1.02	25.3	2.90	7.57	1.57	28.3	4.83	12.7	0.5	2.0	1.5	3.4	6.4	5.5	3.22
Cu Clnr 1 Conc C	28.9	0.25	18.2	1.27	23.0	2.82	6.39	1.07	28.1	4.96	12.7	0.7	2.0	1.6	3.1	4.6	5.8	3.49
Cu Clnr 1 Conc D	29.1	0.25	18.4	1.20	25.0	2.51	6.10	1.39	28.7	4.83	12.9	0.6	2.1	1.4	2.9	6.0	5.9	3.42
Cu Clnr 1 Conc E	26.4	0.23	19.0	1.25	25.3	2.38	6.25	1.29	28.5	4.55	12.1	0.6	2.0	1.2	2.7	5.0	5.4	2.93
Cu Clnr 1 Conc F	25.4	0.22	19.9	1.70	26.2	2.63	5.83	1.55	29.3	4.87	12.2	0.8	2.0	1.3	2.5	5.8	5.3	3.01
Cu Clnr 1 Tail F	11.0	0.10	5.71	3.86	17.6	3.96	10.2	0.71			1.5	0.8	0.6	0.8	1.9	1.1	0.0	0.00
Cu Rghr Tail A	28.2	0.24	1.11	14.5	24.9	3.30	10.4	0.27	28.8	6.63	0.8	7.6	2.1	1.8	4.9	1.1	5.8	4.55
Cu Rghr Tail B	30.4	0.26	0.94	15.2	25.7	2.97	9.48	0.20	30.6	5.99	0.7	8.6	2.3	1.8	4.8	0.9	6.6	4.44
Cu Rghr Tail C	30.3	0.26	1.24	15.4	25.9	3.83	12.7	0.25	31.1	5.55	0.9	8.7	2.3	2.3	6.4	1.1	6.7	4.10
Cu Rghr Tail D	32.4	0.28	1.19	15.5	26.2	3.98	13.1	0.30	31.5	4.98	0.9	9.3	2.5	2.5	7.0	1.4	7.3	3.93
Cu Rghr Tail E	33.3	0.29	1.76	14.2	24.6	3.15	10.1	0.71	30.6	6.19	1.4	8.8	2.4	2.0	5.6	3.5	7.2	5.02
Cu Rghr Tail F	32.8	0.28	2.02	13.2	24.2	3.77	12.9	0.34	30.3	5.54	1.6	8.0	2.3	2.4	7.0	1.6	7.1	4.43
Bulk 2nd Clnr Tail F	63.0	0.54	0.35	2.66	7.18	1.83	2.39	0.09			0.5	3.1	1.3	2.2	2.5	0.8	0.0	0.00
Bulk 1st Clnr Tail F	121.1	1.05	0.14	0.60	2.79	1.93	4.53	0.97			0.4	1.3	1.0	4.5	9.1	17.3	0.0	0.00
Ni 3rd Clnr Conc A	18.6	0.16	0.85	1.35	12.4	2.85	1.63	0.19	22.7	17.6	0.4	0.5	0.7	1.0	0.5	0.5	3.0	7.97
Ni 3rd Clnr Conc B	20.1	0.17	0.75	1.89	14.0	4.36	1.92	0.16	23.9	16.7	0.4	0.7	0.8	1.7	0.6	0.5	3.4	8.18
Ni 3rd Clnr Conc C	23.7	0.20	0.97	2.47	14.0	5.06	2.03	0.14	23.8	17.1	0.6	1.1	1.0	2.3	0.8	0.5	4.0	9.87
Ni 3rd Clnr Conc D	24.0	0.21	0.69	2.06	16.6	4.90	2.00	0.15	28.1	14.8	0.4	0.9	1.2	2.3	0.8	0.5	4.8	8.65
Ni 3rd Clnr Conc E	27.2	0.24	0.97	2.88	16.9	6.06	2.37	0.17	28.0	14.9	0.6	1.5	1.4	3.2	1.1	0.7	5.4	9.87
Ni 3rd Clnr Conc F	25.5	0.22	0.96	2.34	18.0	6.26	2.56	0.24	28.5	13.6	0.6	1.1	1.3	3.1	1.1	0.9	5.2	8.45
Ni 3rd Clnr Tail F	92.3	0.80	0.36	1.46	11.3	1.92	0.96	0.08			0.8	2.5	3.1	3.4	1.5	1.1	0.0	0.00
Ni 2nd Clnr Tail F	88.4	0.76	0.27	0.62	6.08	0.89	0.61	0.05			0.6	1.0	1.6	1.5	0.9	0.6	0.0	0.00
Ni 1st Clnr Tail A	161.1	1.39	0.07	0.31	5.76	0.60	0.27	0.03			0.3	0.9	2.7	1.9	0.7	0.7	0.0	0.00
Ni 1st Clnr Tail B	253.0	2.19	0.08	0.27	4.29	0.48	0.26	0.03			0.5	1.3	3.2	2.4	1.1	1.2	0.0	0.00
Ni 1st Clnr Tail C	266.3	2.30	0.11	0.29	3.75	0.51	0.32	0.03			0.7	1.4	2.9	2.6	1.4	1.1	0.0	0.00
Ni 1st Clnr Tail D	304.2	2.63	0.11	0.32	3.90	0.54	0.38	0.03			0.8	1.8	3.5	3.2	1.9	1.4	0.0	0.00
Ni 1st Clnr Tail E	276.0	2.39	0.12	0.36	4.27	0.58	0.44	0.03			0.8	1.8	3.5	3.1	2.0	1.3	0.0	0.00
Ni 1st Clnr Tail F	281.5	2.43	0.12	0.39	4.48	0.65	0.48	0.03			0.8	2.0	3.7	3.6	2.2	1.4	0.0	0.00
Ni Scav Tail A	1160.6	10.0	0.05	0.14	1.48	0.20	0.11	0.02			1.4	3.0	5.1	4.5	2.2	2.8	0.0	0.00
Ni Scav Tail B	1557.7	13.5	0.03	0.12	1.43	0.18	0.10	0.02			1.1	3.5	6.5	5.5	2.6	3.7	0.0	0.00
Ni Scav Tail C	1608.1	13.9	0.04	0.12	1.58	0.21	0.12	0.02			1.5	3.6	7.5	6.6	3.1	3.6	0.0	0.00
Ni Scav Tail D	1592.2	13.8	0.04	0.12	1.51	0.21	0.11	0.01			1.5	3.5	7.1	6.5	2.8	3.1	0.0	0.00
Ni Scav Tail E	1632.2	14.1	0.04	0.13	1.53	0.21	0.12	0.02			1.6	3.9	7.3	6.7	3.2	3.6	0.0	0.00
Ni Scav Tail F (calc.)	1606.6	13.9	0.04	0.13	1.54	0.20	0.11	0.03			1.7	3.8	7.3	6.1	3.0	7.9	0.6	1.16
Ni Scav Tail F (after magsep)	1402.6	12.1	0.04	0.11	1.11	0.15	0.07	0.01			1.4	2.9	4.6	4.1	1.6	2.1	0.0	0.00
Magnetic Clnr Conc. F	3.0	0.03	1.68	1.88	11.6	8.04	8.58	7.46	26.2	15.9	0.1	0.1	0.1	0.5	0.4	3.3	0.6	1.16
Magnetic Clnr Tail F	65.4	0.57	0.06	0.25	4.82	0.68	0.45	0.16			0.1	0.3	0.9	0.9	0.5	1.6	0.0	0.00
Magnetic Rghr Tail F	135.6	1.17	0.03	0.20	4.20	0.26	0.22	0.05			0.1	0.5	1.7	0.7	0.5	1.0	0.0	0.00
Head (calc.)	11565	100.0	0.36	0.47	2.94	0.44	0.52	0.06			100	100	100	100	100	100	100	100
(direct)			0.33	0.42	2.53	0.41	0.45	0.04	11.9	22.8								

Test: LCT-5

Overall Stability

Total Products Out Per Cycle	Weight		Units out as % of Units in/Cycle					
		Wt %	Cu	Ni	S	Pt	Pd	Au
Cycle A	1	72.3	87.2	75.3	74.3	63.1	66.1	66.9
Cycle B	2	98.0	92.0	87.3	89.4	76.9	75.4	75.6
Cycle C	3	101.6	98.3	92.7	93.9	92.3	88.7	65.5
Cycle D	4	102.8	99.4	97.5	98.2	95.5	93.1	74.6
Cycle E	5	103.5	99.0	99.8	99.2	97.5	87.4	84.8
Cycle F	6	102.3	101.1	94.6	99.8	98.9	94.4	106.3
Average of E - F		102.9	100.0	97.2	99.5	98.2	90.9	95.6
Average of D - F*		102.9	99.8	97.3	99.1	97.3	91.7	88.6
Average of C - F		102.5	99.4	96.2	97.8	96.1	90.9	82.8

** chosen for prediction*



Metallurgical Balance

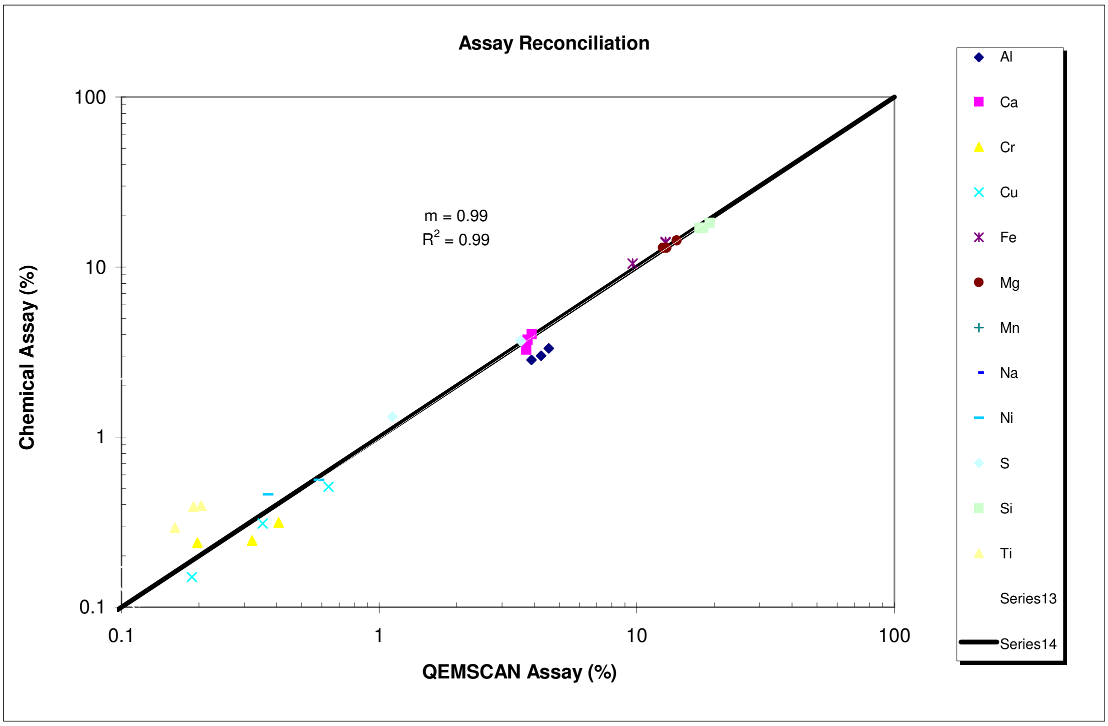
Product	Weight		Assays, %								% Distribution						
	g	%	Cu	Ni	S	other	Cp	Pn	Po	Ga	Cu	Ni	S	Cp	Pn	Po	Ga
Cu Clnr 1 Conc	27.0	1.36	**19.1**	**1.37**	25.5	54.1	55.1	3.8	12.8	28.3	74.5	4.2	12.2	74.5	4.8	3.2	0.4
Cu Rougher Tail (Ni Conc.)	32.8	1.66	1.66	14.3	25.0	59.1	4.8	41.6	24.9	28.8	7.9	53.7	14.6	7.9	64.8	7.5	0.5
Ni 3rd Clnr Conc	25.6	1.29	**0.88**	**2.44**	17.2	79.5	2.5	6.5	36.7	54.3	3.3	7.2	7.8	3.3	7.8	8.6	0.8
Ni 1st Clnr Tail	287	14.5	0.12	0.36	4.21	95.3	0.3	0.7	10.0	89.0	4.8	11.7	21.5	4.8	10.1	26.2	13.9
Ni Scav Tail	1610	81.2	0.04	0.13	1.53	98.3	0.1	0.2	3.71	96.0	9.6	23.2	43.8	9.6	12.4	54.6	84.4
Total Ni Conc.	58.4	2.95	**1.32**	**9.1**	21.6	68.0	3.8	26.2	30.0	40.0	11.1	60.9	22.4	11.1	72.6	16.0	1.3
Head (calc.)	1983	100.0	0.35	0.44	2.83	96.4	1.0	1.1	5.51	92.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(direct)			0.33	0.42	2.53												

Appendix G – QEMSCAN Analysis

Prophecy Platinum Corp
50149-101
MI7013-SEP11

High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Assay Reconciliation



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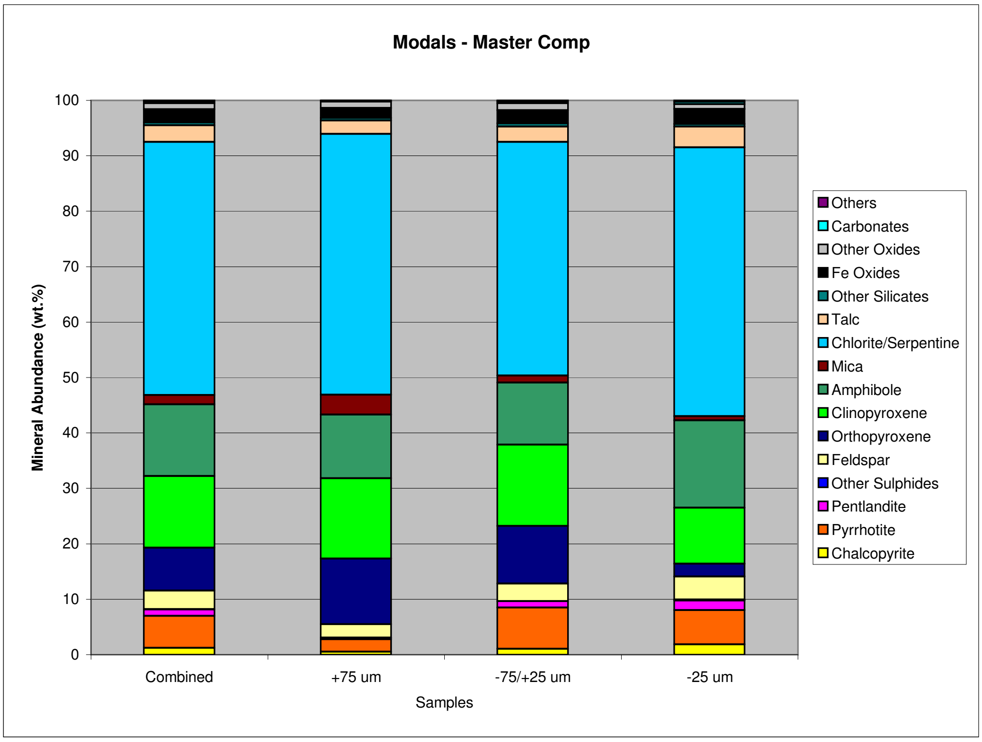
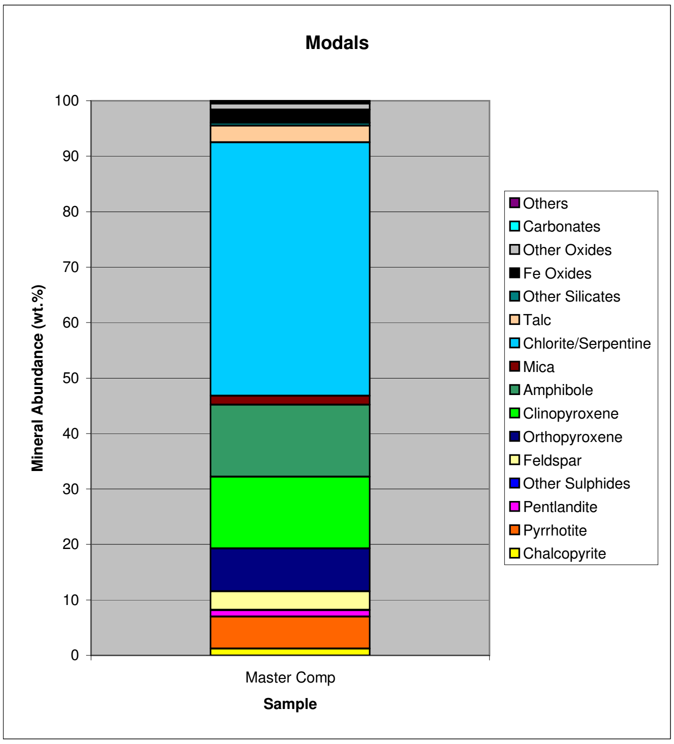
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Modals

Survey		**Prophecy Platinum Corp**						
Project		**50149-101 / MI7013-SEP11**						
Sample		**Master Comp**						
Fraction		**Combined**	**+75 um**		**-75/+25 um**		**-25 um**	
Mass Size Distribution (%)			23.7		39.0		37.2	
Calculated ESD Particle Size		15	75		32		7	
		Sample	**Sample**	**Fraction**	**Sample**	**Fraction**	**Sample**	**Fraction**
Mineral Mass (%)	Chalcopyrite	1.2	0.1	0.5	0.4	1.0	0.7	1.8
	Pyrrhotite	5.8	0.5	2.2	2.9	7.5	2.3	6.2
	Pentlandite	1.1	0.1	0.3	0.4	1.1	0.6	1.7
	Other Sulphides	0.1	0.0	0.0	0.0	0.0	0.1	0.2
	Feldspar	3.4	0.6	2.4	1.3	3.2	1.5	4.2
	Orthopyroxene	7.7	2.8	11.8	4.1	10.4	0.9	2.3
	Clinopyroxene	12.9	3.4	14.5	5.7	14.7	3.8	10.1
	Amphibole	13.0	2.7	11.5	4.4	11.2	5.9	15.8
	Mica	1.6	0.8	3.6	0.5	1.3	0.3	0.7
	Chlorite/Serpentine	45.7	11.2	47.1	16.5	42.2	18.1	48.5
	Talc	3.0	0.6	2.4	1.1	2.8	1.4	3.7
	Other Silicates	0.5	0.1	0.4	0.2	0.5	0.2	0.5
	Fe Oxides	2.4	0.4	1.8	0.9	2.4	1.0	2.7
	Other Oxides	1.1	0.3	1.1	0.5	1.3	0.3	0.9
	Carbonates	0.3	0.0	0.2	0.1	0.3	0.1	0.4
	Others	0.2	0.0	0.1	0.1	0.2	0.1	0.3
	Total	100.0	23.7	100.0	39.0	100.0	37.2	100.0
Mean Grain Size by Frequency (μm)	Chalcopyrite	8	17		16		6	
	Pyrrhotite	11	39		26		7	
	Pentlandite	10	19		20		8	
	Other Sulphides	9	15		6		9	
	Feldspar	8	28		18		5	
	Orthopyroxene	13	23		13		5	
	Clinopyroxene	18	51		26		9	
	Amphibole	10	29		17		6	
	Mica	13	28		12		5	
	Chlorite/Serpentine	12	39		20		7	
	Talc	8	19		11		5	
	Other Silicates	12	16		14		10	
	Fe Oxides	9	19		13		6	
	Other Oxides	12	26		20		7	
	Carbonates	13	42		26		8	
	Others	8	21		16		5	


Modals - Master Comp
Mineral Abundance (wt.%)
100
90
80
70
60
50
40
30
20
10
0
Combined
+75 um
-75/+25 um
-25 um
Samples
Others
Carbonates
Other Oxides
Fe Oxides
Other Silicates
Talc
Chlorite/Serpentine
Mica
Amphibole
Clinopyroxene
Orthopyroxene
Feldspar
Other Sulphides
Pentlandite
Pyrrhotite
Chalcopyrite


Modals
Mineral Abundance (wt.%)
100
90
80
70
60
50
40
30
20
10
0
Master Comp
Sample
Others
Carbonates
Other Oxides
Fe Oxides
Other Silicates
Talc
Chlorite/Serpentine
Mica
Amphibole
Clinopyroxene
Orthopyroxene
Feldspar
Other Sulphides
Pentlandite
Pyrrhotite
Chalcopyrite

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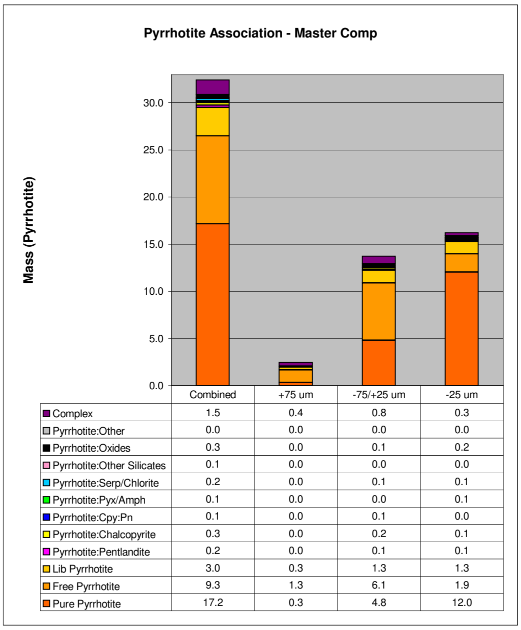
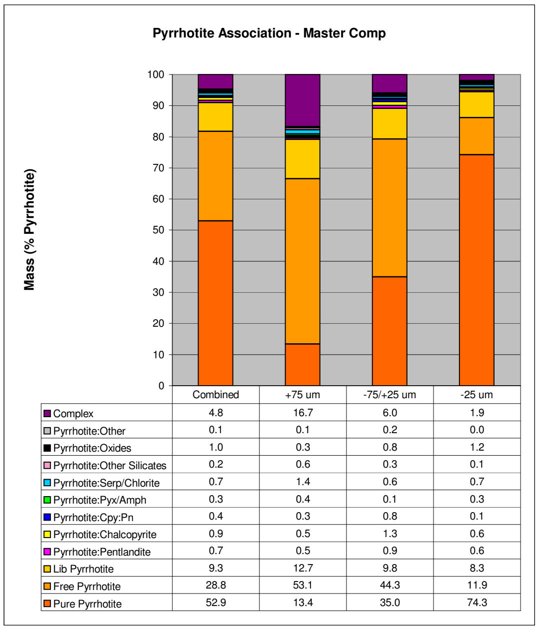
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Pyrrhotite Association





Absolute Mass of Pyrrhotite Across Fraction Master Comp

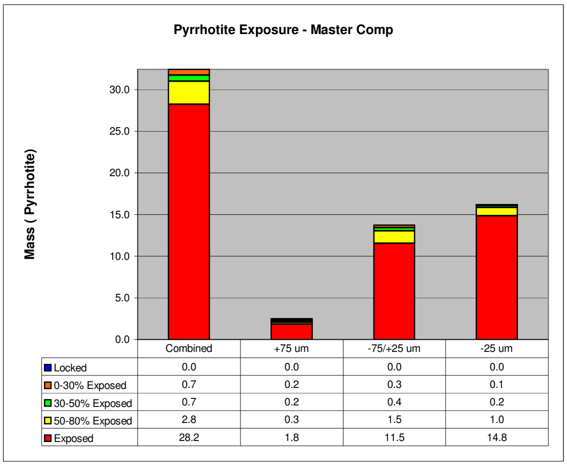
Mineral Name	Combined	+75 um	-75/+25 um	-25 um
Pure Pyrrhotite	17.2	0.3	4.8	12.0
Free Pyrrhotite	9.3	1.3	6.1	1.9
Lib Pyrrhotite	3.0	0.3	1.3	1.3
Pyrrhotite:Pentlandite	0.2	0.0	0.1	0.1
Pyrrhotite:Chalcopyrite	0.3	0.0	0.2	0.1
Pyrrhotite:Cpy:Pn	0.1	0.0	0.1	0.0
Pyrrhotite:Pyx/Amph	0.1	0.0	0.0	0.1
Pyrrhotite:Serp/Chlorite	0.2	0.0	0.1	0.1
Pyrrhotite:Other Silicates	0.1	0.0	0.0	0.0
Pyrrhotite:Oxides	0.3	0.0	0.1	0.2
Pyrrhotite:Other	0.0	0.0	0.0	0.0
Complex	1.5	0.4	0.8	0.3
Total	32.4	2.5	13.7	16.2
Total (% in fraction)	100.0	7.7	42.4	50.0

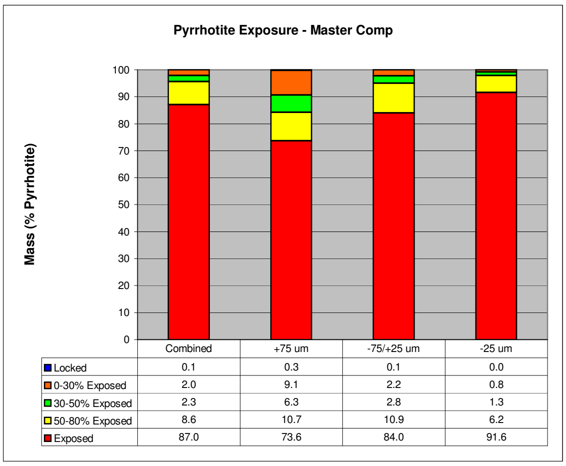
Normalized Mass of Pyrrhotite Across Fraction Master Comp

Mineral Name	Combined	+75 um	-75/+25 um	-25 um
Pure Pyrrhotite	52.9	13.4	35.0	74.3
Free Pyrrhotite	28.8	53.1	44.3	11.9
Lib Pyrrhotite	9.3	12.7	9.8	8.3
Pyrrhotite:Pentlandite	0.7	0.5	0.9	0.6
Pyrrhotite:Chalcopyrite	0.9	0.5	1.3	0.6
Pyrrhotite:Cpy:Pn	0.4	0.3	0.8	0.1
Pyrrhotite:Pyx/Amph	0.3	0.4	0.1	0.3
Pyrrhotite:Serp/Chlorite	0.7	1.4	0.6	0.7
Pyrrhotite:Other Silicates	0.2	0.6	0.3	0.1
Pyrrhotite:Oxides	1.0	0.3	0.8	1.2
Pyrrhotite:Other	0.1	0.1	0.2	0.0
Complex	4.8	16.7	6.0	1.9
Total	100.0	100.0	100.0	100.0
Liberated	91.0	79.1	89.1	94.4

High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Pyrrhotite Exposure





Absolute Mass of Pyrrhotite Across Fraction Master Comp

Mineral Name	Combined	+75 um	-75/+25 um	-25 um
Exposed	28.2	1.8	11.5	14.8
50-80% Exposed	2.8	0.3	1.5	1.0
30-50% Exposed	0.7	0.2	0.4	0.2
0-30% Exposed	0.7	0.2	0.3	0.1
Locked	0.0	0.0	0.0	0.0
Total	32.4	2.5	13.7	16.2
Total (% in fraction)	100.0	7.7	42.4	50.0

Normalized Mass of Pyrrhotite Across Fraction Master Comp

Mineral Name	Combined	+75 um	-75/+25 um	-25 um
Exposed	87.0	73.6	84.0	91.6
50-80% Exposed	8.6	10.7	10.9	6.2
30-50% Exposed	2.3	6.3	2.8	1.3
0-30% Exposed	2.0	9.1	2.2	0.8
Locked	0.1	0.3	0.1	0.0
Total	100.0	100.0	100.0	100.0

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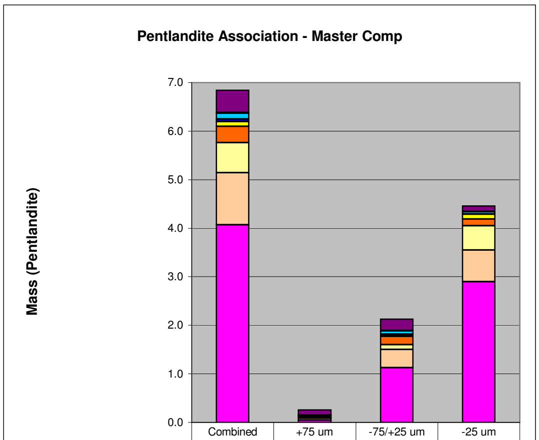
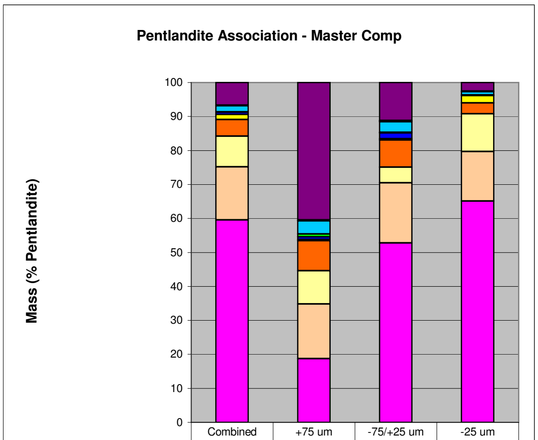
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Pentlandite Association



	Combined	+75 um	-75/+25 um	-25 um
Complex	0.5	0.1	0.2	0.1
Pentlandite:Other	0.0	0.0	0.0	0.0
Pentlandite:Oxides	0.0	0.0	0.0	0.0
Pentlandite:Other Silicates	0.0	0.0	0.0	0.0
Pentlandite:Serp/Chlorite	0.1	0.0	0.1	0.0
Pentlandite:Pyx/Amph	0.0	0.0	0.0	0.0
Pentlandite:Cpy:Pn	0.0	0.0	0.0	0.0
Pentlandite:Chalcopyrite	0.1	0.0	0.0	0.1
Pentlandite:Pyrrhotite	0.3	0.0	0.2	0.1
Lib Pentlandite	0.6	0.0	0.1	0.5
Free Pentlandite	1.1	0.0	0.4	0.7
Pure Pentlandite	4.1	0.0	1.1	2.9



	Combined	+75 um	-75/+25 um	-25 um
Complex	6.6	40.4	11.2	2.5
Pentlandite:Other	0.0	0.0	0.0	0.0
Pentlandite:Oxides	0.1	0.2	0.2	0.1
Pentlandite:Other Silicates	0.1	0.0	0.3	0.1
Pentlandite:Serp/Chlorite	1.7	3.9	3.1	1.0
Pentlandite:Pyx/Amph	0.1	0.9	0.2	0.0
Pentlandite:Cpy:Pn	0.7	0.7	1.7	0.2
Pentlandite:Chalcopyrite	1.5	0.3	0.3	2.1
Pentlandite:Pyrrhotite	4.9	8.8	8.0	3.2
Lib Pentlandite	9.0	9.8	4.6	11.1
Free Pentlandite	15.6	16.1	17.7	14.6
Pure Pentlandite	59.5	18.8	52.8	65.1

Absolute Mass of Pentlandite Across Fraction Master Comp

Mineral Name	Combined	+75 um	-75/+25 um	-25 um
Pure Pentlandite	4.1	0.0	1.1	2.9
Free Pentlandite	1.1	0.0	0.4	0.7
Lib Pentlandite	0.6	0.0	0.1	0.5
Pentlandite:Pyrrhotite	0.3	0.0	0.2	0.1
Pentlandite:Chalcopyrite	0.1	0.0	0.0	0.1
Pentlandite:Cpy:Pn	0.0	0.0	0.0	0.0
Pentlandite:Pyx/Amph	0.0	0.0	0.0	0.0
Pentlandite:Serp/Chlorite	0.1	0.0	0.1	0.0
Pentlandite:Other Silicates	0.0	0.0	0.0	0.0
Pentlandite:Oxides	0.0	0.0	0.0	0.0
Pentlandite:Other	0.0	0.0	0.0	0.0
Complex	0.5	0.1	0.2	0.1
Total	6.8	0.3	2.1	4.5
Total (% in fraction)	100.0	3.7	31.1	65.2

Normalized Mass of Pentlandite Across Fraction Master Comp

Mineral Name	Combined	+75 um	-75/+25 um	-25 um
Pure Pentlandite	59.5	18.8	52.8	65.1
Free Pentlandite	15.6	16.1	17.7	14.6
Lib Pentlandite	9.0	9.8	4.6	11.1
Pentlandite:Pyrrhotite	4.9	8.8	8.0	3.2
Pentlandite:Chalcopyrite	1.5	0.3	0.3	2.1
Pentlandite:Cpy:Pn	0.7	0.7	1.7	0.2
Pentlandite:Pyx/Amph	0.1	0.9	0.2	0.0
Pentlandite:Serp/Chlorite	1.7	3.9	3.1	1.0
Pentlandite:Other Silicates	0.1	0.0	0.3	0.1
Pentlandite:Oxides	0.1	0.2	0.2	0.1
Pentlandite:Other	0.0	0.0	0.0	0.0
Complex	6.6	40.4	11.2	2.5
Total	100.0	100.0	100.0	100.0
Liberated	84.2	44.6	75.1	90.8

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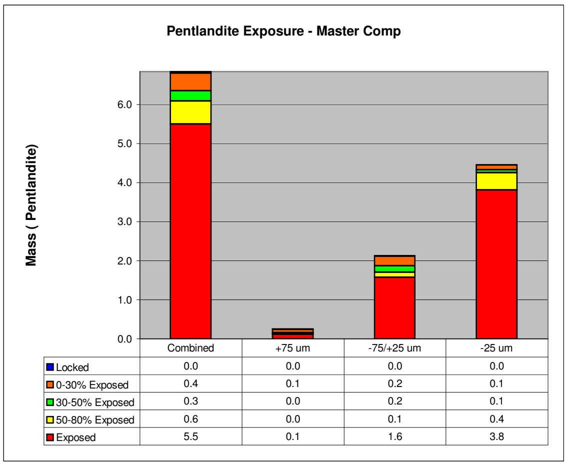
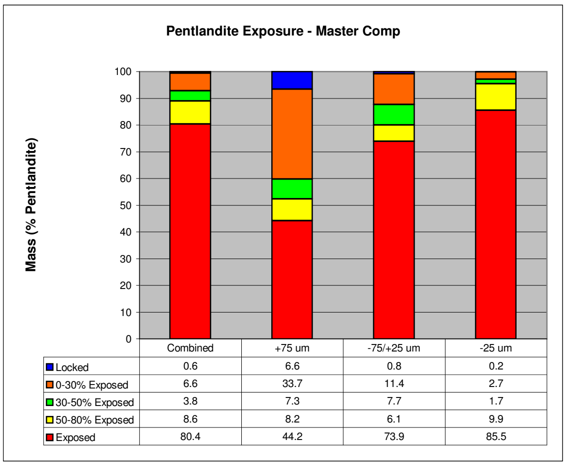
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Pentlandite Exposure





Absolute Mass of Pentlandite Across Fraction Master Comp

Mineral Name	Combined	+75 um	-75/+25 um	-25 um
Exposed	5.5	0.1	1.6	3.8
50-80% Exposed	0.6	0.0	0.1	0.4
30-50% Exposed	0.3	0.0	0.2	0.1
0-30% Exposed	0.4	0.1	0.2	0.1
Locked	0.0	0.0	0.0	0.0
Total	6.8	0.3	2.1	4.5
Total (% in fraction)	100.0	3.7	31.1	65.2

Normalized Mass of Pentlandite Across Fraction Master Comp

Mineral Name	Combined	+75 um	-75/+25 um	-25 um
Exposed	80.4	44.2	73.9	85.5
50-80% Exposed	8.6	8.2	6.1	9.9
30-50% Exposed	3.8	7.3	7.7	1.7
0-30% Exposed	6.6	33.7	11.4	2.7
Locked	0.6	6.6	0.8	0.2
Total	100.0	100.0	100.0	100.0

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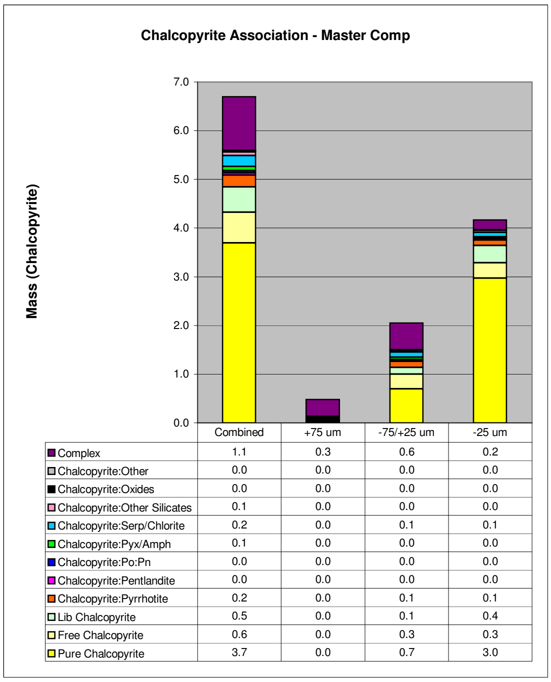
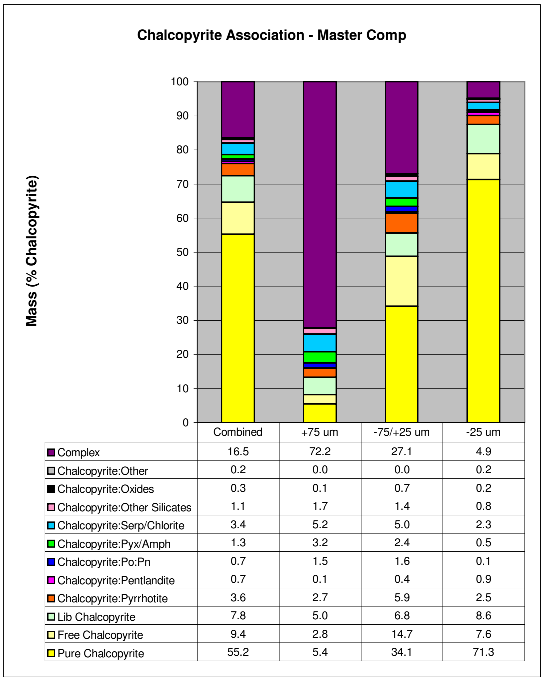
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Chalcopyrite Association





Absolute Mass of Chalcopyrite Across Fraction Master Comp

Mineral Name	Combined	+75 um	-75/+25 um	-25 um
Pure Chalcopyrite	3.7	0.0	0.7	3.0
Free Chalcopyrite	0.6	0.0	0.3	0.3
Lib Chalcopyrite	0.5	0.0	0.1	0.4
Chalcopyrite:Pyrrhotite	0.2	0.0	0.1	0.1
Chalcopyrite:Pentlandite	0.0	0.0	0.0	0.0
Chalcopyrite:Po:Pn	0.0	0.0	0.0	0.0
Chalcopyrite:Pyx/Amph	0.1	0.0	0.0	0.0
Chalcopyrite:Serp/Chlorite	0.2	0.0	0.1	0.1
Chalcopyrite:Other Silicates	0.1	0.0	0.0	0.0
Chalcopyrite:Oxides	0.0	0.0	0.0	0.0
Chalcopyrite:Other	0.0	0.0	0.0	0.0
Complex	1.1	0.3	0.6	0.2
Total	6.7	0.5	2.1	4.2
Total (% in fraction)	100.0	7.2	30.6	62.2

Normalized Mass of Chalcopyrite Across Fraction Master Comp

Mineral Name	Combined	+75 um	-75/+25 um	-25 um
Pure Chalcopyrite	55.2	5.4	34.1	71.3
Free Chalcopyrite	9.4	2.8	14.7	7.6
Lib Chalcopyrite	7.8	5.0	6.8	8.6
Chalcopyrite:Pyrrhotite	3.6	2.7	5.9	2.5
Chalcopyrite:Pentlandite	0.7	0.1	0.4	0.9
Chalcopyrite:Po:Pn	0.7	1.5	1.6	0.1
Chalcopyrite:Pyx/Amph	1.3	3.2	2.4	0.5
Chalcopyrite:Serp/Chlorite	3.4	5.2	5.0	2.3
Chalcopyrite:Other Silicates	1.1	1.7	1.4	0.8
Chalcopyrite:Oxides	0.3	0.1	0.7	0.2
Chalcopyrite:Other	0.2	0.0	0.0	0.2
Complex	16.5	72.2	27.1	4.9
Total	100.0	100.0	100.0	100.0
Liberated	72.4	13.2	55.5	87.5

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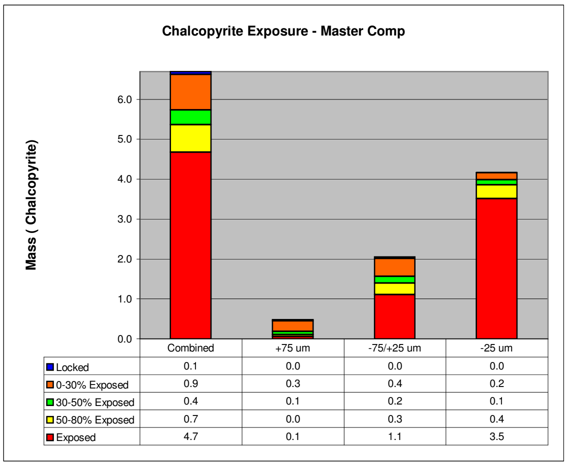
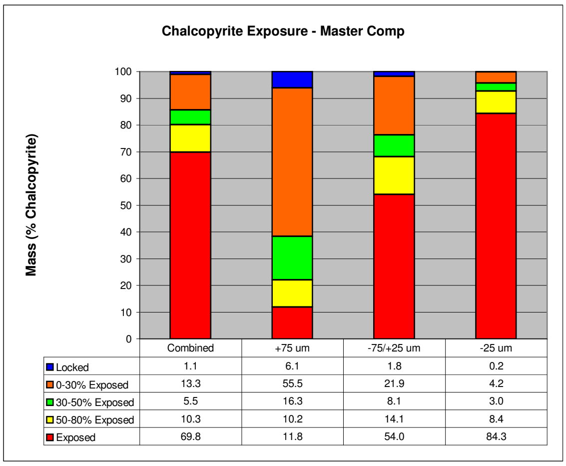
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Chalcopyrite Exposure





Absolute Mass of Chalcopyrite Across Fraction Master Comp

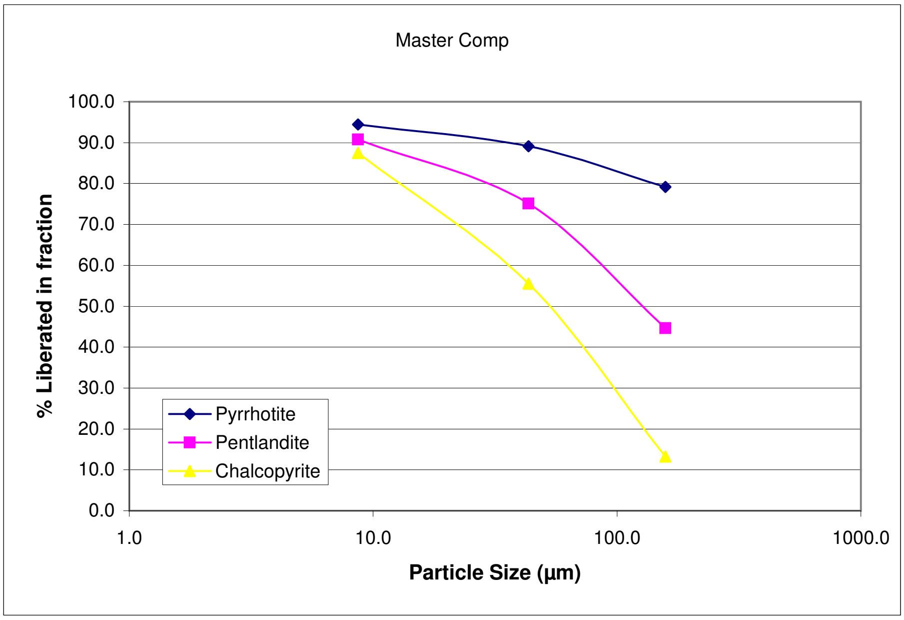
Mineral Name	Combined	+75 um	-75/+25 um	-25 um
Exposed	4.7	0.1	1.1	3.5
50-80% Exposed	0.7	0.0	0.3	0.4
30-50% Exposed	0.4	0.1	0.2	0.1
0-30% Exposed	0.9	0.3	0.4	0.2
Locked	0.1	0.0	0.0	0.0
Total	6.7	0.5	2.1	4.2
Total (% in fraction)	100.0	7.2	30.6	62.2

Normalized Mass of Chalcopyrite Across Fraction Master Comp

Mineral Name	Combined	+75 um	-75/+25 um	-25 um
Exposed	69.8	11.8	54.0	84.3
50-80% Exposed	10.3	10.2	14.1	8.4
30-50% Exposed	5.5	16.3	8.1	3.0
0-30% Exposed	13.3	55.5	21.9	4.2
Locked	1.1	6.1	1.8	0.2
Total	100.0	100.0	100.0	100.0

High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

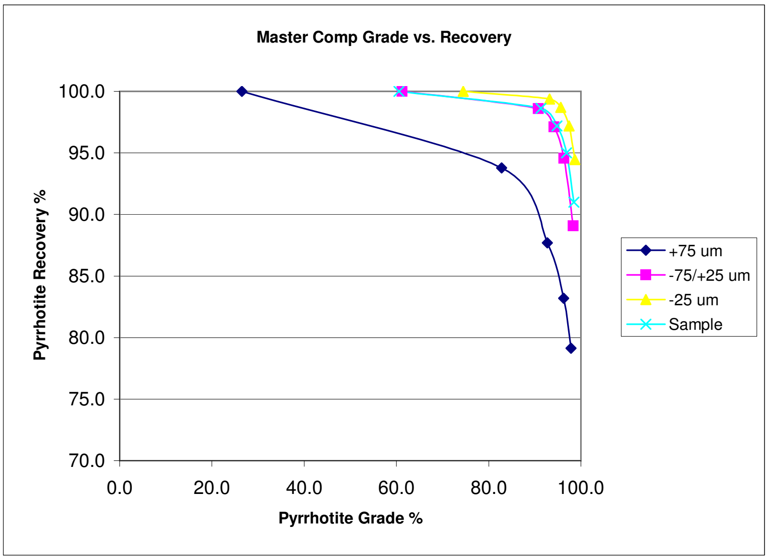
Mineral Release Curves



Sample	Master Comp		
Fraction			
Average Particle Size (µm)	158	43	9
Mineral Mass % 80% Lib			
Pyrrhotite	79.1	89.1	94.4
Pentlandite	44.6	75.1	90.8
Chalcopyrite	13.2	55.5	87.5

High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Pyrrhotite Grade vs. Recovery: Master Comp



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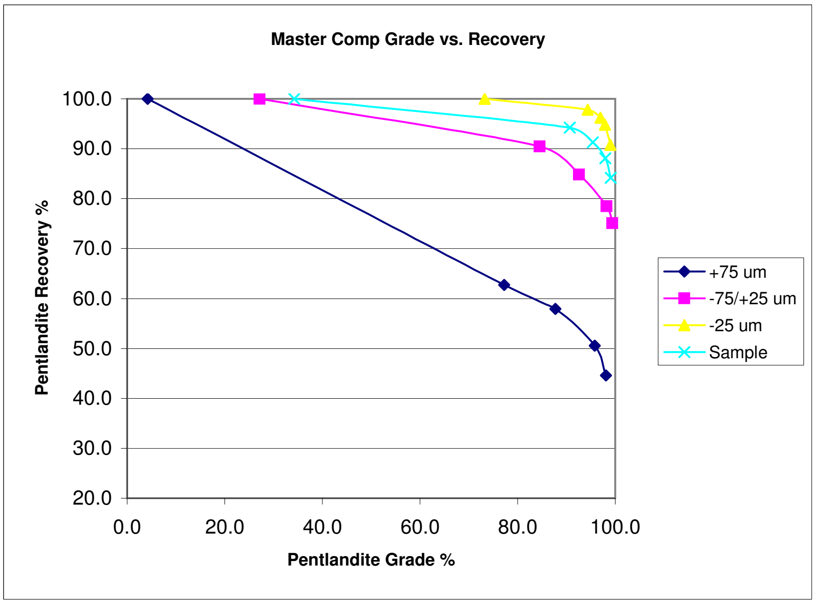
<u>Pentlandite Grade vs. Recovery: Master Comp</u>



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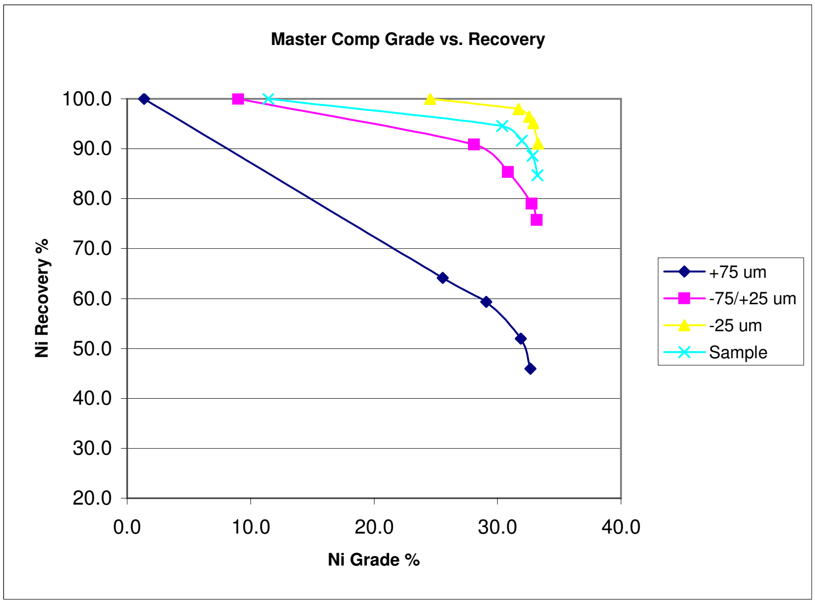
Ni Grade vs. Recovery: Master Comp



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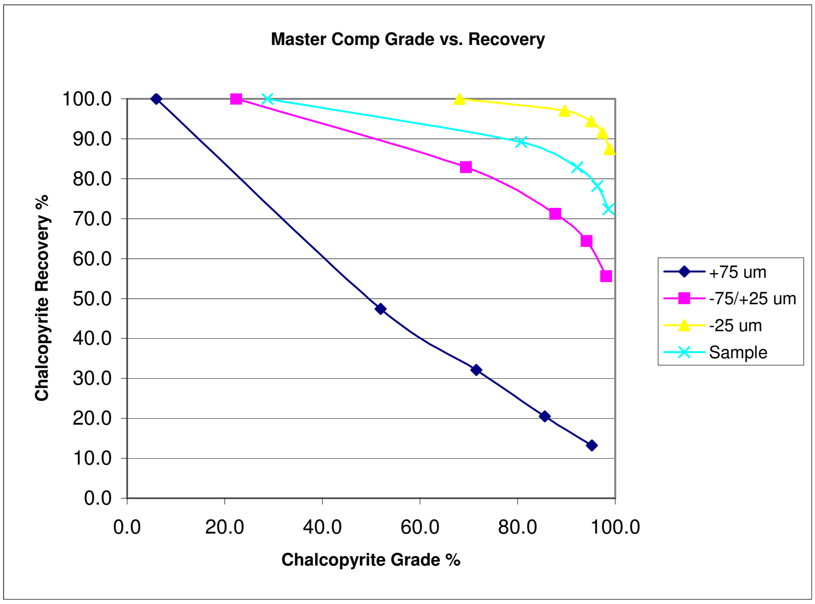
Chalcopyrite Grade vs. Recovery: Master Comp



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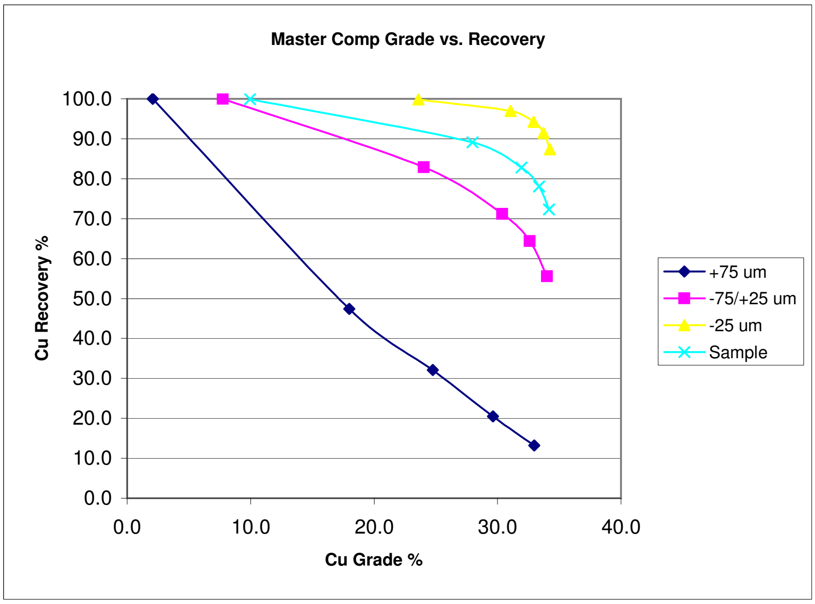
Cu Grade vs. Recovery: Master Comp



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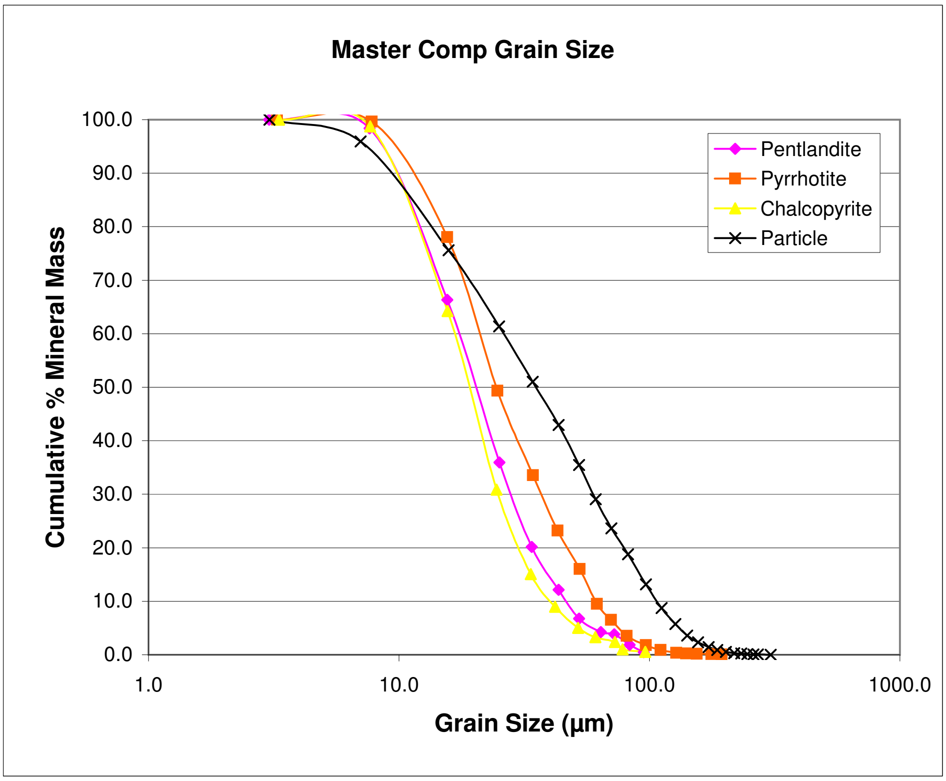
Cumulative Grain Size Distribution



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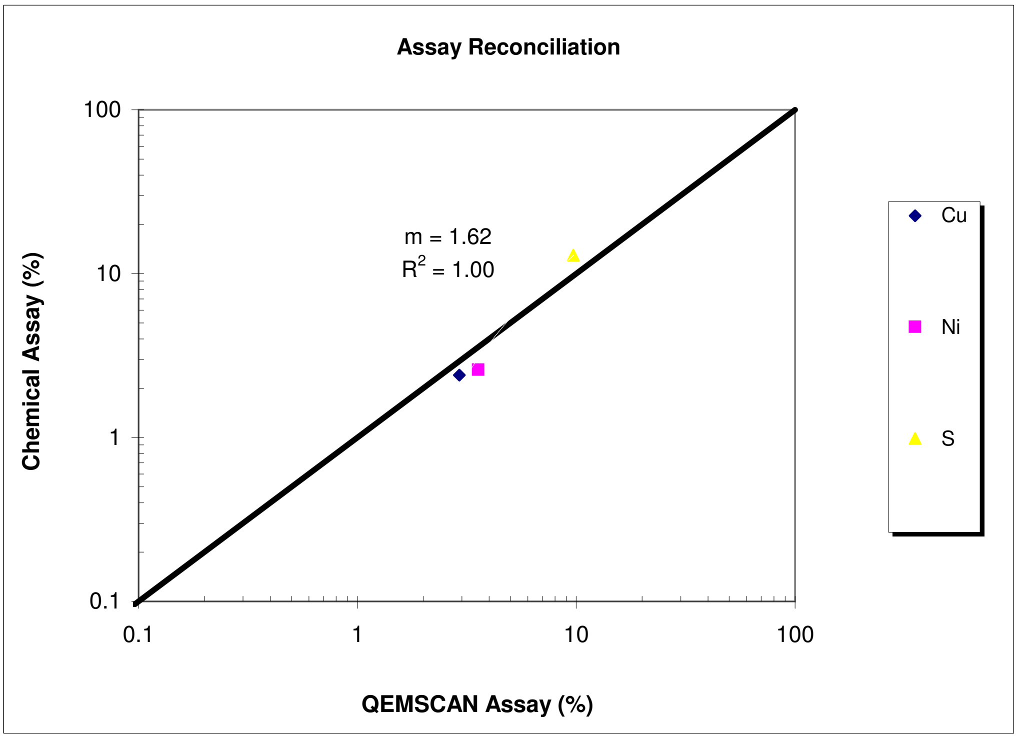
Assay Reconciliation



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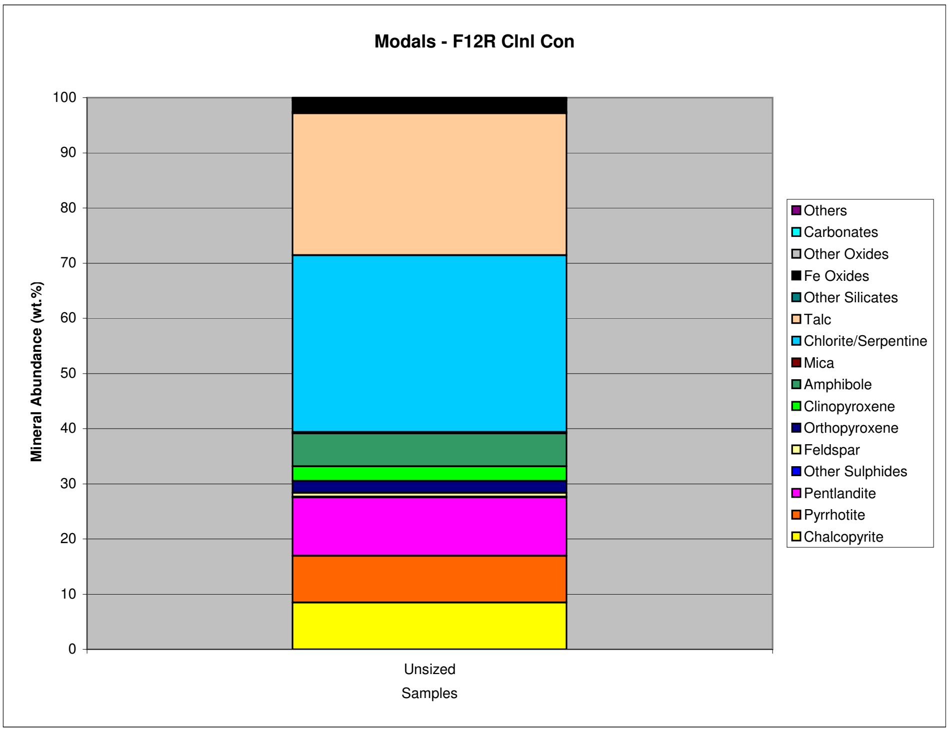
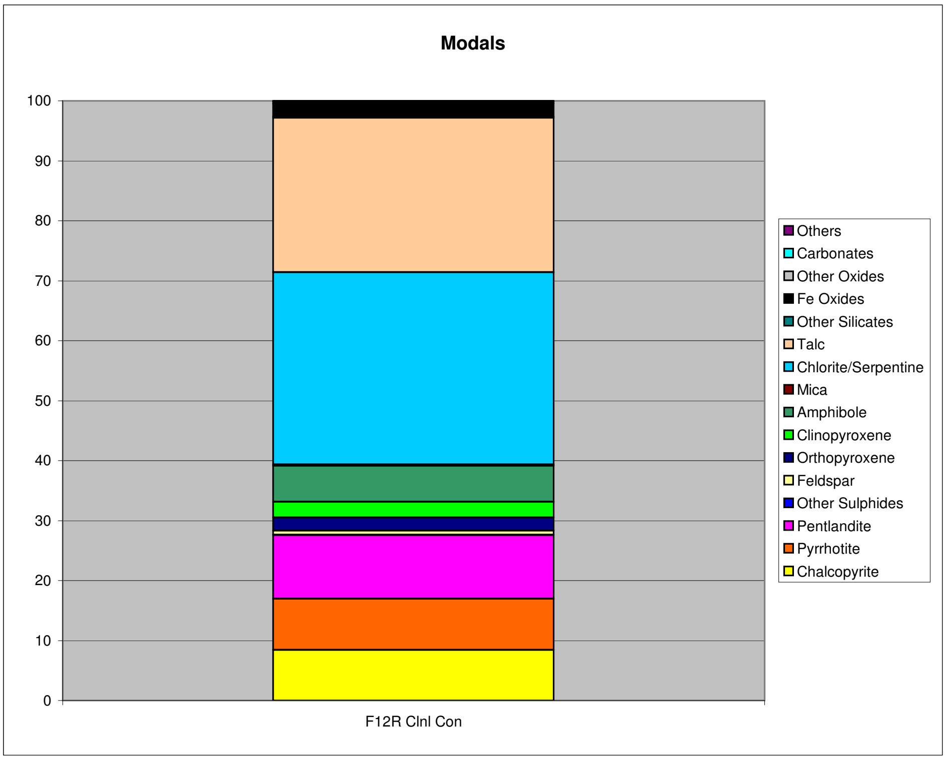
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Modals

Survey		**Prophecy Platinum Corp**
Project		**50149-101 / MI7003-JAN12**
Sample		**F12R Clnl Con**
Fraction		**Unsized**
Mass Size Distribution (%)		100.0
Calculated ESD Particle Size		10.8
		Sample
Mineral Mass (%)	Chalcopyrite	8.4
	Pyrrhotite	8.5
	Pentlandite	10.7
	Other Sulphides	0.1
	Feldspar	0.7
	Orthopyroxene	2.2
	Clinopyroxene	2.6
	Amphibole	6.0
	Mica	0.2
	Chlorite/Serpentine	32.0
	Talc	25.7
	Other Silicates	0.2
	Fe Oxides	2.2
	Other Oxides	0.3
	Carbonates	0.1
	Others	0.1
	Total	100.0
Mean Grain Size by Frequency (µm)	Chalcopyrite	8.3
	Pyrrhotite	9.9
	Pentlandite	10.5
	Other Sulphides	5.2
	Feldspar	6.4
	Orthopyroxene	5.3
	Clinopyroxene	10.5
	Amphibole	7.9
	Mica	7.1
	Chlorite/Serpentine	6.7
	Talc	7.0
	Other Silicates	9.6
	Fe Oxides	7.1
	Other Oxides	5.6
	Carbonates	6.6
	Others	4.8



Modals - F12R Clnl Con
Mineral Abundance (wt.%)
100
90
80
70
60
50
40
30
20
10
0
Unsized
Samples
Others
Carbonates
Other Oxides
Fe Oxides
Other Silicates
Talc
Chlorite/Serpentine
Mica
Amphibole
Clinopyroxene
Orthopyroxene
Feldspar
Other Sulphides
Pentlandite
Pyrrhotite
Chalcopyrite



Modals
100
90
80
70
60
50
40
30
20
10
0
F12R Clnl Con
Others
Carbonates
Other Oxides
Fe Oxides
Other Silicates
Talc
Chlorite/Serpentine
Mica
Amphibole
Clinopyroxene
Orthopyroxene
Feldspar
Other Sulphides
Pentlandite
Pyrrhotite
Chalcopyrite

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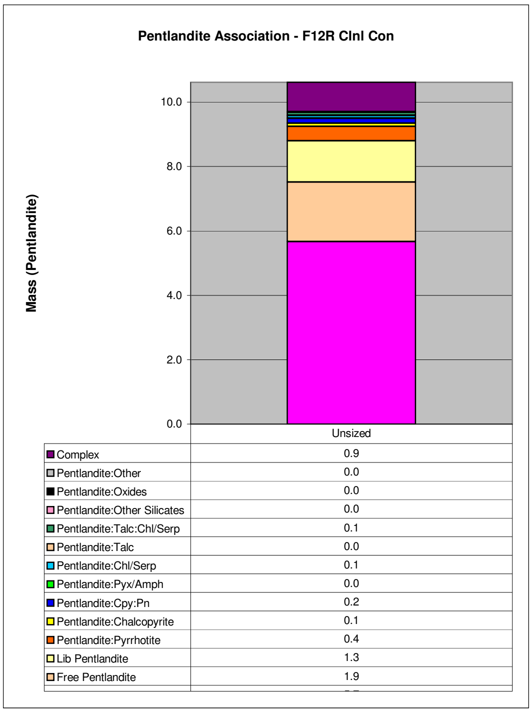
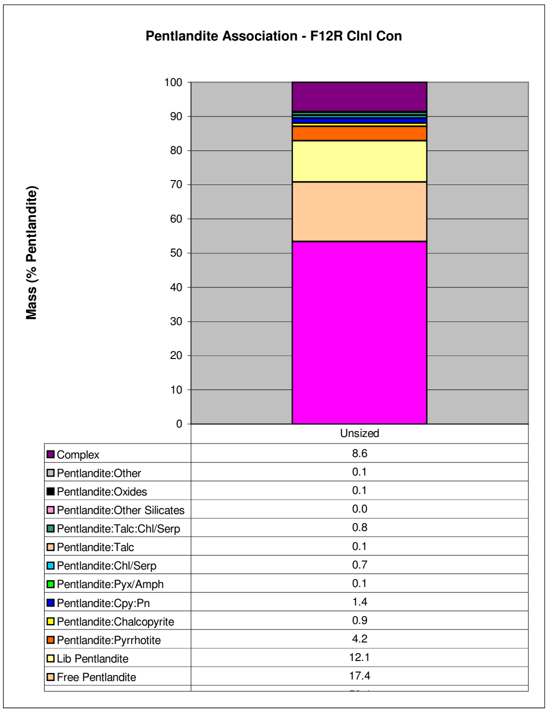
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Pentlandite Association





Absolute Mass of Pentlandite Across Fraction F12R Clnl Con

Mineral Name	Unsized
Pure Pentlandite	5.7
Free Pentlandite	1.9
Lib Pentlandite	1.3
Pentlandite:Pyrrhotite	0.4
Pentlandite:Chalcopyrite	0.1
Pentlandite:Cpy:Pn	0.2
Pentlandite:Pyx/Amph	0.0
Pentlandite:Chl/Serp	0.1
Pentlandite:Talc	0.0
Pentlandite:Talc:Chl/Serp	0.1
Pentlandite:Other Silicates	0.0
Pentlandite:Oxides	0.0
Pentlandite:Other	0.0
Complex	0.9
Total	10.6
Total (% in fraction)	100.0

Normalized Mass of Pentlandite Across Fraction F12R Clnl Con

Mineral Name	Unsized
Pure Pentlandite	53.4
Free Pentlandite	17.4
Lib Pentlandite	12.1
Pentlandite:Pyrrhotite	4.2
Pentlandite:Chalcopyrite	0.9
Pentlandite:Cpy:Pn	1.4
Pentlandite:Pyx/Amph	0.1
Pentlandite:Chl/Serp	0.7
Pentlandite:Talc	0.1
Pentlandite:Talc:Chl/Serp	0.8
Pentlandite:Other Silicates	0.0
Pentlandite:Oxides	0.1
Pentlandite:Other	0.1
Complex	8.6
Total	100.0
Liberated	**82.9**

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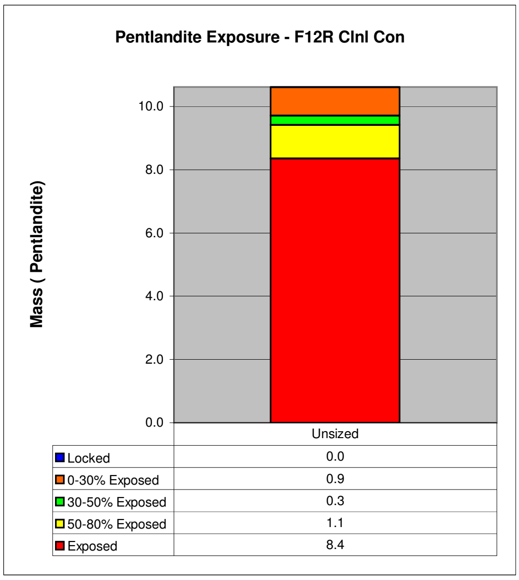
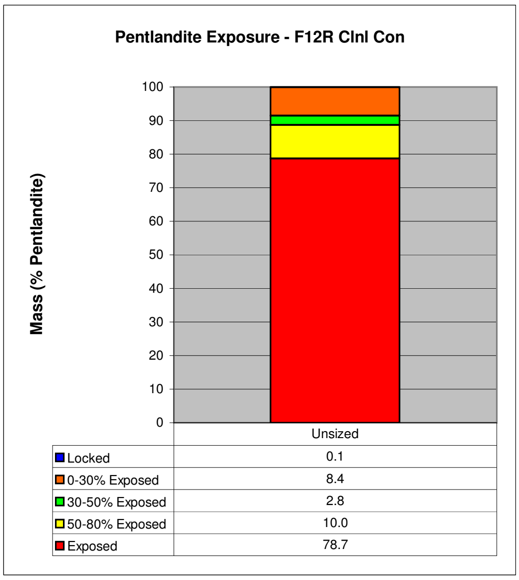
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Pentlandite Exposure





Absolute Mass of Pentlandite Across Fraction F12R Clnl Con

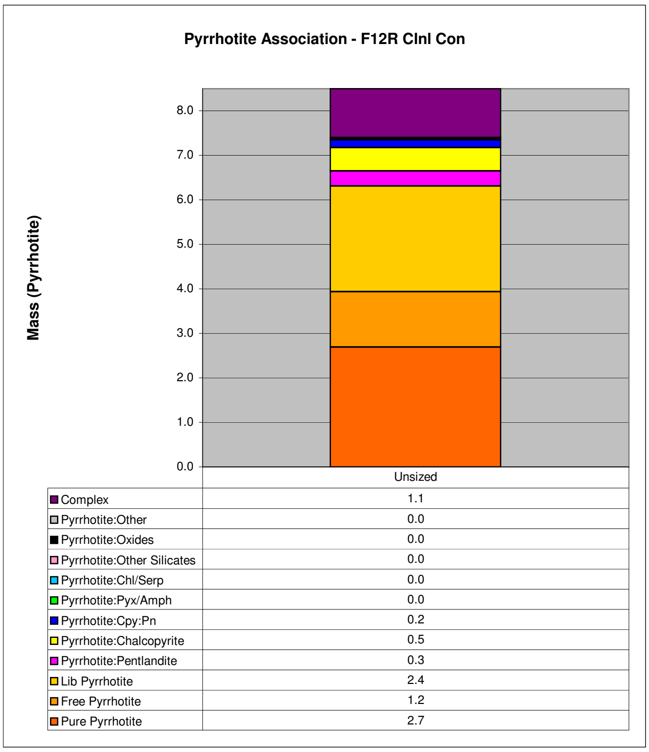
Mineral Name	Unsized
Exposed	8.4
50-80% Exposed	1.1
30-50% Exposed	0.3
0-30% Exposed	0.9
Locked	0.0
Total	10.6
Total (% in fraction)	100.0

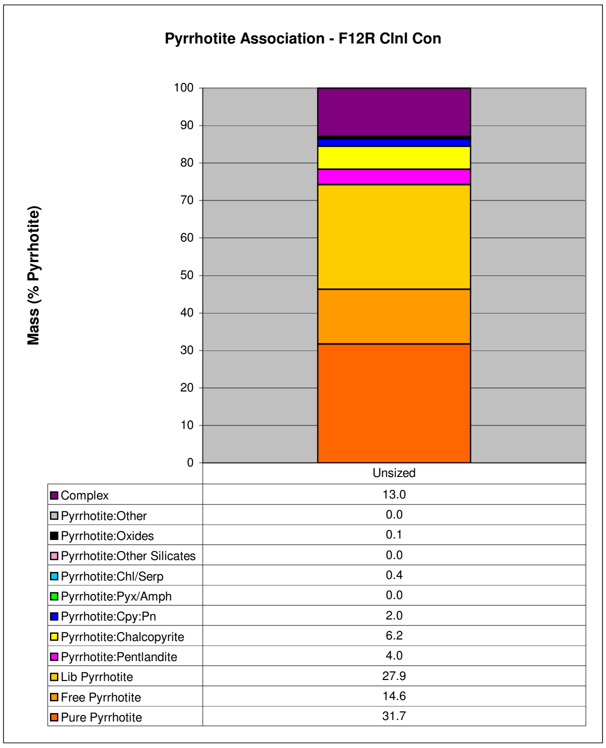
Normalized Mass of Pentlandite Across Fraction F12R Clnl Con

Mineral Name	Unsized
Exposed	78.7
50-80% Exposed	10.0
30-50% Exposed	2.8
0-30% Exposed	8.4
Locked	0.1
Total	100.0

High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Pyrrhotite Association





Absolute Mass of Pyrrhotite Across Fraction F12R Clnl Con

Mineral Name	Unsized
Pure Pyrrhotite	2.7
Free Pyrrhotite	1.2
Lib Pyrrhotite	2.4
Pyrrhotite:Pentlandite	0.3
Pyrrhotite:Chalcopyrite	0.5
Pyrrhotite:Cpy:Pn	0.2
Pyrrhotite:Pyx/Amph	0.0
Pyrrhotite:Chl/Serp	0.0
Pyrrhotite:Other Silicates	0.0
Pyrrhotite:Oxides	0.0
Pyrrhotite:Other	0.0
Complex	1.1
Total	8.5
Total (% in fraction)	100.0

Normalized Mass of Pyrrhotite Across Fraction F12R Clnl Con

Mineral Name	Unsized
Pure Pyrrhotite	31.7
Free Pyrrhotite	14.6
Lib Pyrrhotite	27.9
Pyrrhotite:Pentlandite	4.0
Pyrrhotite:Chalcopyrite	6.2
Pyrrhotite:Cpy:Pn	2.0
Pyrrhotite:Pyx/Amph	0.0
Pyrrhotite:Chl/Serp	0.4
Pyrrhotite:Other Silicates	0.0
Pyrrhotite:Oxides	0.1
Pyrrhotite:Other	0.0
Complex	13.0
Total	100.0
Liberated	74.2

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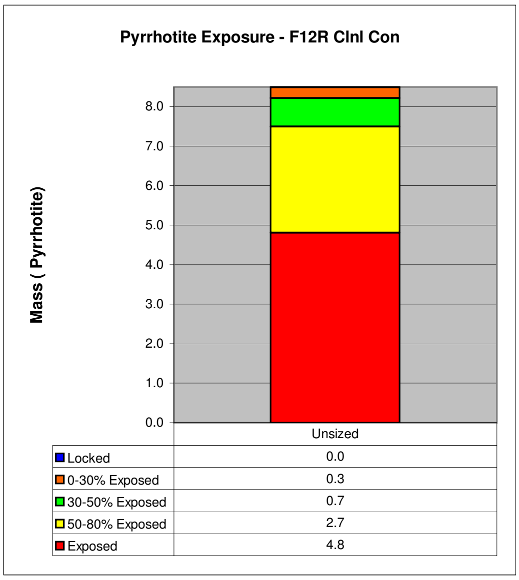
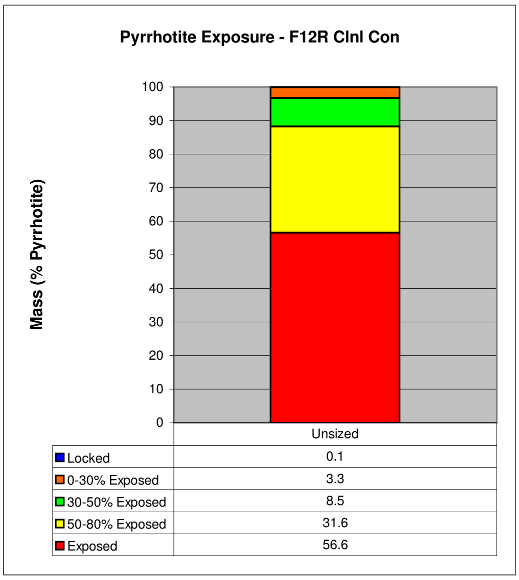
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Pyrrhotite Exposure





Absolute Mass of Pyrrhotite Across Fraction F12R Clnl Con

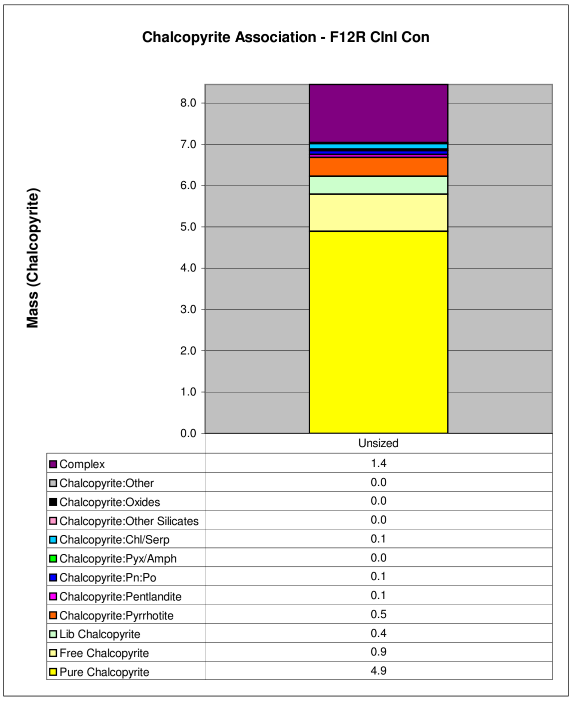
Mineral Name	Unsized
Exposed	4.8
50-80% Exposed	2.7
30-50% Exposed	0.7
0-30% Exposed	0.3
Locked	0.0
Total	8.5
Total (% in fraction)	100.0

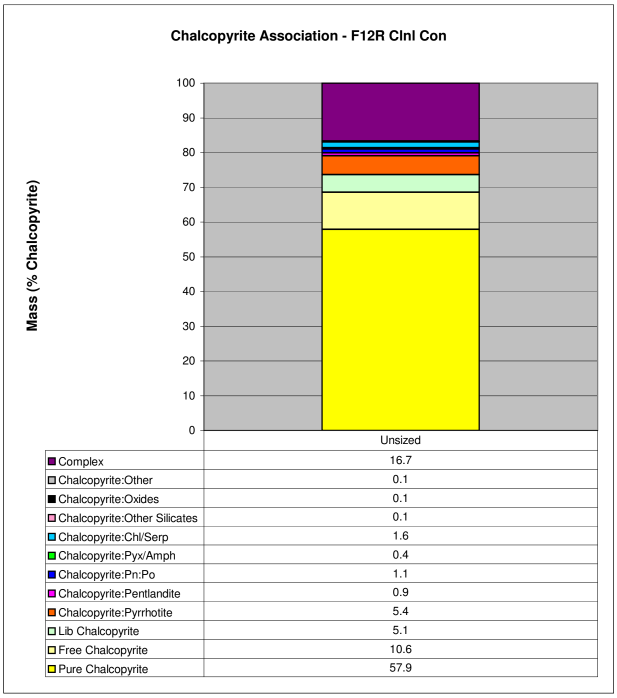
Normalized Mass of Pyrrhotite Across Fraction F12R Clnl Con

Mineral Name	Unsized
Exposed	56.6
50-80% Exposed	31.6
30-50% Exposed	8.5
0-30% Exposed	3.3
Locked	0.1
Total	100.0

High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Chalcopyrite Association





Absolute Mass of Chalcopyrite Across Fraction F12R Clnl Con

Mineral Name	Unsized
Pure Chalcopyrite	4.9
Free Chalcopyrite	0.9
Lib Chalcopyrite	0.4
Chalcopyrite:Pyrrhotite	0.5
Chalcopyrite:Pentlandite	0.1
Chalcopyrite:Pn:Po	0.1
Chalcopyrite:Pyx/Amph	0.0
Chalcopyrite:Chl/Serp	0.1
Chalcopyrite:Other Silicates	0.0
Chalcopyrite:Oxides	0.0
Chalcopyrite:Other	0.0
Complex	1.4
Total	8.4
Total (% in fraction)	100.0

Normalized Mass of Chalcopyrite Across Fraction F12R Clnl Con

Mineral Name	Unsized
Pure Chalcopyrite	57.9
Free Chalcopyrite	10.6
Lib Chalcopyrite	5.1
Chalcopyrite:Pyrrhotite	5.4
Chalcopyrite:Pentlandite	0.9
Chalcopyrite:Pn:Po	1.1
Chalcopyrite:Pyx/Amph	0.4
Chalcopyrite:Chl/Serp	1.6
Chalcopyrite:Other Silicates	0.1
Chalcopyrite:Oxides	0.1
Chalcopyrite:Other	0.1
Complex	16.7
Total	100.0
Liberated	73.7

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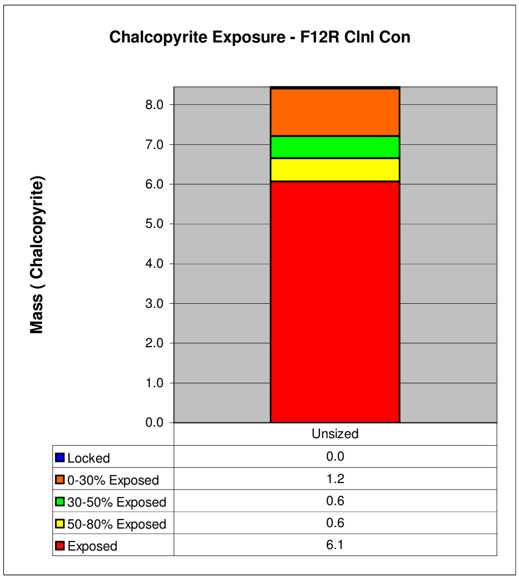
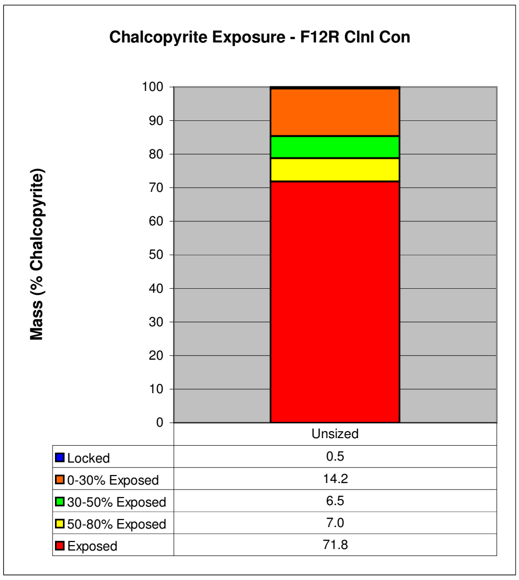
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Chalcopyrite Exposure





Absolute Mass of Chalcopyrite Across Fraction F12R Clnl Con

Mineral Name	Unsized
Exposed	6.1
50-80% Exposed	0.6
30-50% Exposed	0.6
0-30% Exposed	1.2
Locked	0.0
Total	8.4
Total (% in fraction)	100.0

Normalized Mass of Chalcopyrite Across Fraction F12R Clnl Con

Mineral Name	Unsized
Exposed	71.8
50-80% Exposed	7.0
30-50% Exposed	6.5
0-30% Exposed	14.2
Locked	0.5
Total	100.0

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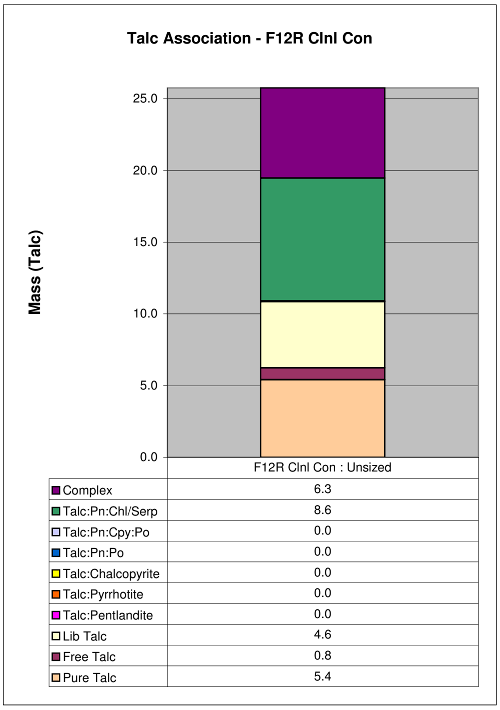
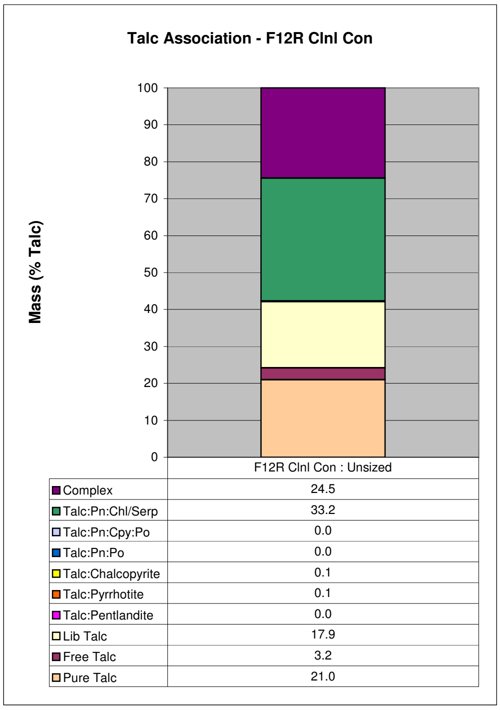
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Talc Association





Absolute Mass of Talc Across Fraction F12R Clnl Con

Mineral Name	Clnl Con : Unsized
Pure Talc	5.4
Free Talc	0.8
Lib Talc	4.6
Talc:Pentlandite	0.0
Talc:Pyrrhotite	0.0
Talc:Chalcopyrite	0.0
Talc:Pn:Po	0.0
Talc:Pn:Cpy:Po	0.0
Talc:Pn:Chl/Serp	8.6
Complex	6.3
Total	25.8
Total (% in fraction)	100.0

Normalized Mass of Talc Across Fraction F12R Clnl Con

Mineral Name	Clnl Con : Unsized
Pure Talc	21.0
Free Talc	3.2
Lib Talc	17.9
Talc:Pentlandite	0.0
Talc:Pyrrhotite	0.1
Talc:Chalcopyrite	0.1
Talc:Pn:Po	0.0
Talc:Pn:Cpy:Po	0.0
Talc:Pn:Chl/Serp	33.2
Complex	24.5
Total	100.0
Liberated	42.1

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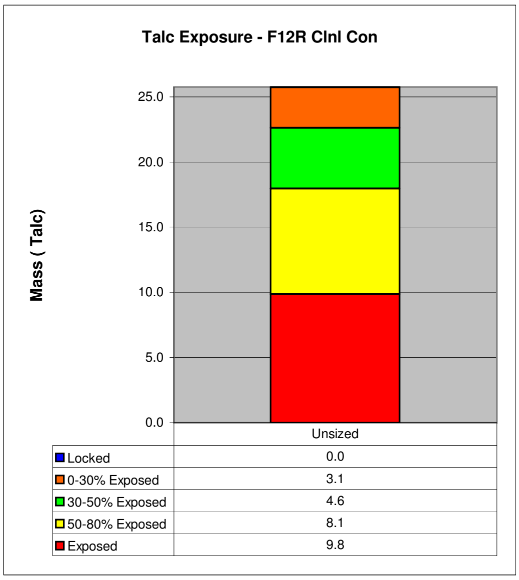
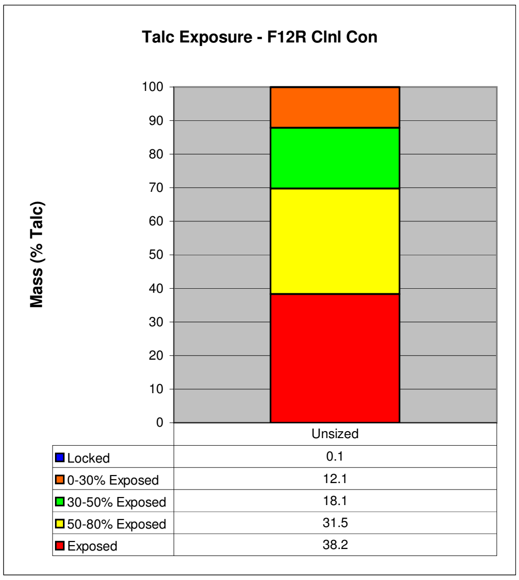
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Talc Exposure





Absolute Mass of Talc Across Fraction F12R Clnl Con

Mineral Name	Unsized
Exposed	9.8
50-80% Exposed	8.1
30-50% Exposed	4.6
0-30% Exposed	3.1
Locked	0.0
Total	25.8
Total (% in fraction)	100.0

Normalized Mass of Talc Across Fraction F12R Clnl Con

Mineral Name	Unsized
Exposed	38.2
50-80% Exposed	31.5
30-50% Exposed	18.1
0-30% Exposed	12.1
Locked	0.1
Total	100.0

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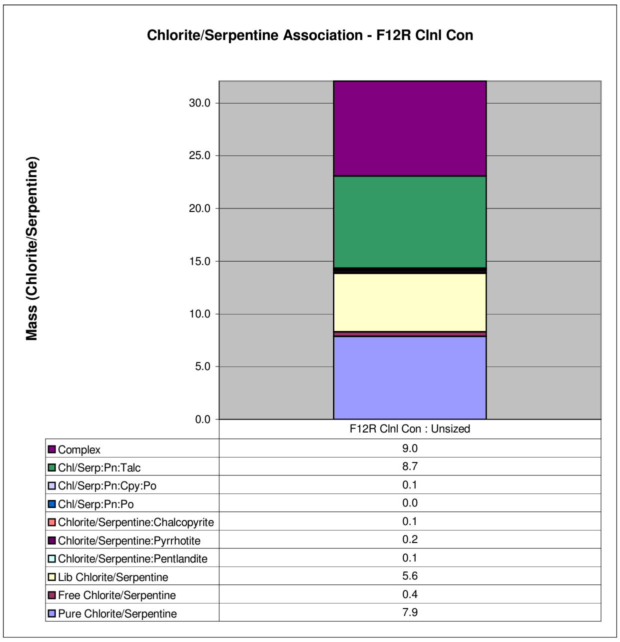
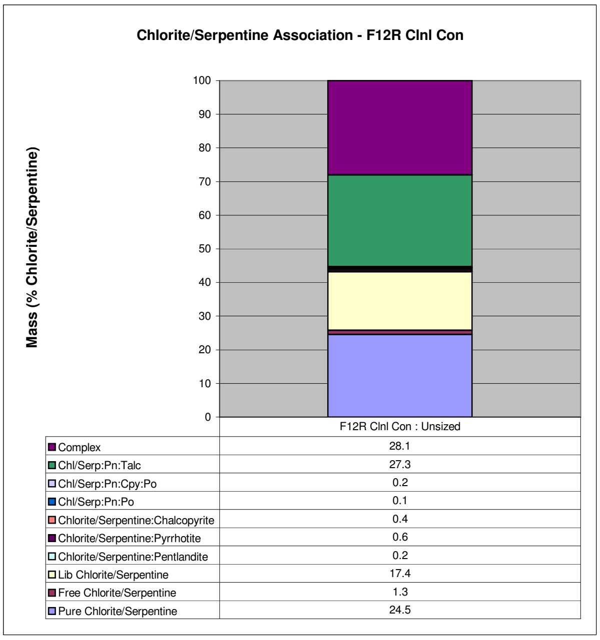
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Chlorite/Serpentine Association





Absolute Mass of Chlorite/Serpentine Across Fraction F12R Clnl Con

Mineral Name	Clnl Con : Unsized
Pure Chlorite/Serpentine	7.9
Free Chlorite/Serpentine	0.4
Lib Chlorite/Serpentine	5.6
Chlorite/Serpentine:Pentlandite	0.1
Chlorite/Serpentine:Pyrrhotite	0.2
Chlorite/Serpentine:Chalcopyrite	0.1
Chl/Serp:Pn:Po	0.0
Chl/Serp:Pn:Cpy:Po	0.1
Chl/Serp:Pn:Talc	8.7
Complex	9.0
Total	32.1
Total (% in fraction)	100.0

Normalized Mass of Chlorite/Serpentine Across Fraction F12R Clnl Con

Mineral Name	Clnl Con : Unsized
Pure Chlorite/Serpentine	24.5
Free Chlorite/Serpentine	1.3
Lib Chlorite/Serpentine	17.4
Chlorite/Serpentine:Pentlandite	0.2
Chlorite/Serpentine:Pyrrhotite	0.6
Chlorite/Serpentine:Chalcopyrite	0.4
Chl/Serp:Pn:Po	0.1
Chl/Serp:Pn:Cpy:Po	0.2
Chl/Serp:Pn:Talc	27.3
Complex	28.1
Total	100.0
Liberated	43.2

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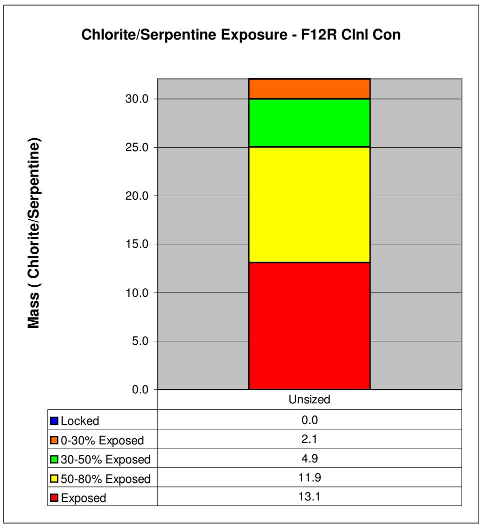
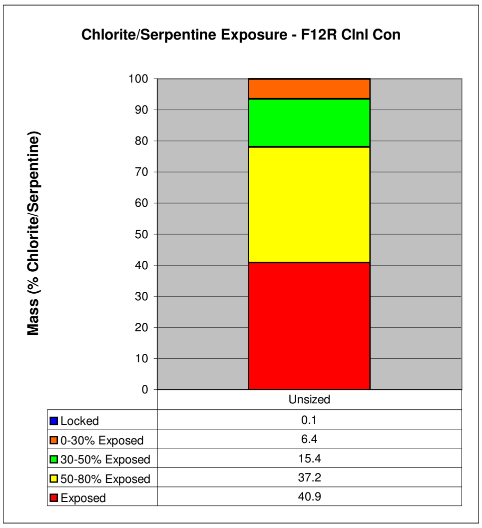
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Chlorite/Serpentine Exposure





Absolute Mass of Chlorite/Serpentine Across Fraction F12R Clnl Con

Mineral Name	Unsized
Exposed	13.1
50-80% Exposed	11.9
30-50% Exposed	4.9
0-30% Exposed	2.1
Locked	0.0
Total	32.1
Total (% in fraction)	

Normalized Mass of Chlorite/Serpentine Across Fraction F12R Clnl Con

Mineral Name	Unsized
Exposed	40.9
50-80% Exposed	37.2
30-50% Exposed	15.4
0-30% Exposed	6.4
Locked	0.1
Total	100.0

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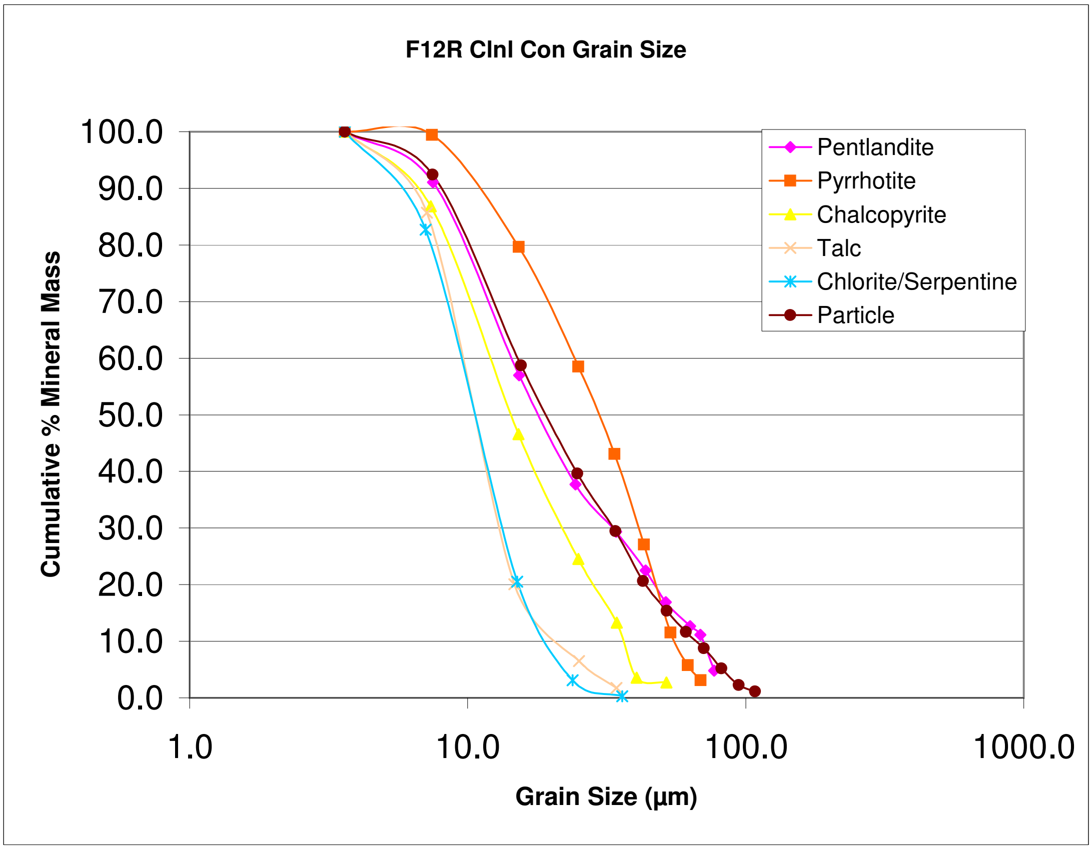
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Cumulative Grain Size Distribution



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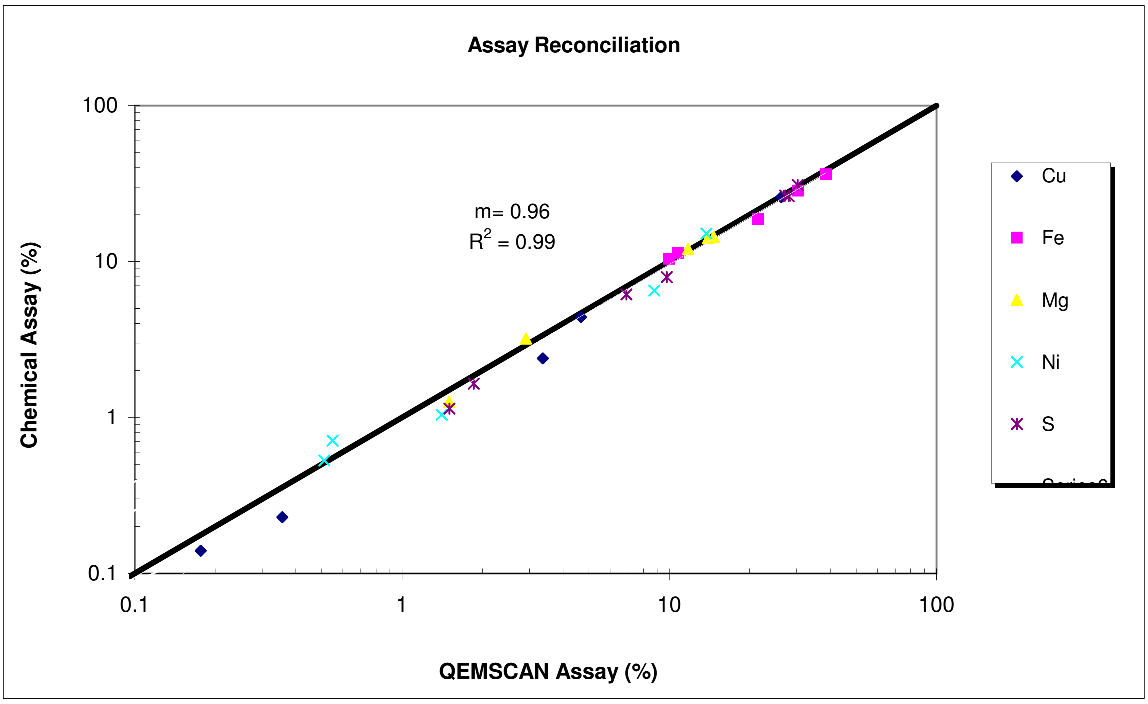
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Assay Reconciliation



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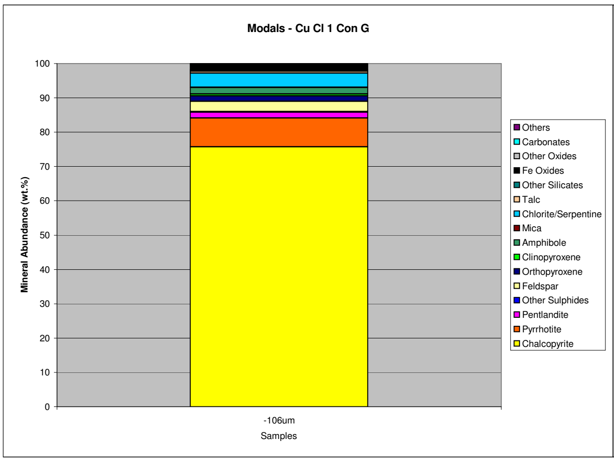
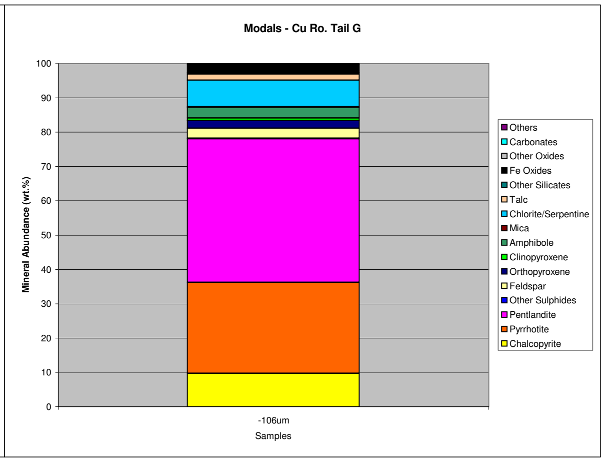
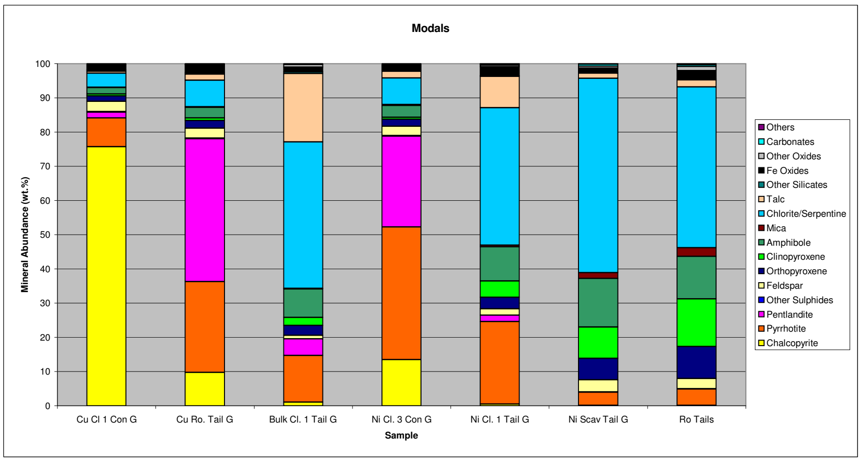
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

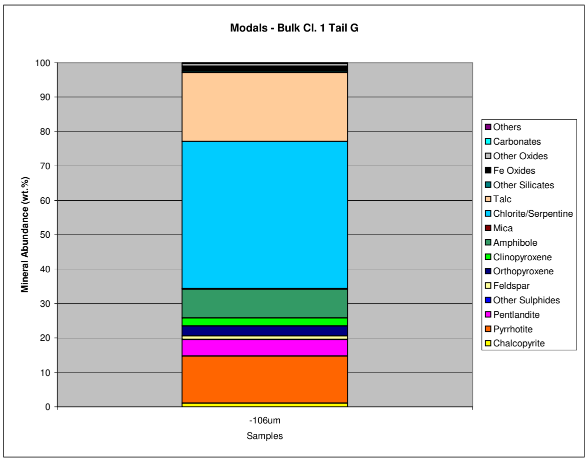
Modals

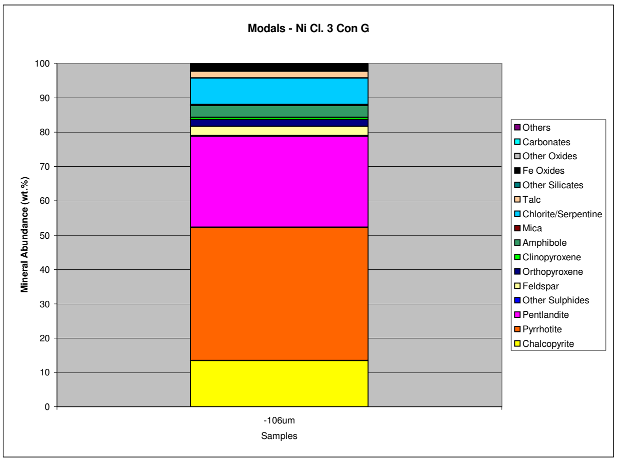
Survey		Prophecy Platinum Corp						
Project		50149-101 / MI7018-MAR12						
Sample		Cu Cl 1 Con G	Cu Ro. Tail G	Bulk Cl. 1 Tail G	Ni Cl. 3 Con G	Ni Cl. 1 Tail G	Ni Scav Tail G	Ro Tails
Fraction		-106um	-106um	-106um	-106um	-106um	-106um	-106um
Mass Size Distribution (%)		100.0	100.0	100.0	100.0	100.0	100.0	100.0
Calculated ESD Particle Size		16	16	11	15	11	10	20
		Sample	Sample	Sample	Sample	Sample	Sample	Sample
Mineral Mass (%)	Chalcopyrite	75.7	9.7	1.0	13.5	0.5	0.1	0.1
	Pyrrhotite	8.4	26.6	13.7	38.8	24.1	3.8	4.8
	Pentlandite	1.7	41.8	4.8	26.5	1.8	0.1	0.1
	Other Sulphides	0.2	0.2	0.0	0.2	0.0	0.0	0.0
	Feldspar	3.0	2.9	1.0	2.7	1.9	3.5	3.0
	Orthopyroxene	1.6	2.2	2.9	2.0	3.4	6.3	9.3
	Clinopyroxene	0.5	0.8	2.3	0.6	4.8	9.1	14.0
	Amphibole	1.9	3.1	8.4	3.5	10.1	14.2	12.5
	Mica	0.1	0.2	0.2	0.2	0.4	1.7	2.5
	Chlorite/Serpentine	4.0	7.8	42.8	7.8	40.2	56.8	46.9
	Talc	0.5	1.7	20.0	2.0	9.1	1.5	2.1
	Other Silicates	0.4	0.4	0.4	0.3	0.2	0.1	0.3
	Fe Oxides	1.7	2.3	1.4	1.8	2.6	1.3	2.4
	Other Oxides	0.1	0.2	0.7	0.1	0.5	0.6	1.2
	Carbonates	0.1	0.1	0.2	0.0	0.3	0.5	0.5
	Others	0.1	0.1	0.1	0.1	0.2	0.2	0.3
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Mean Grain Size by Frequency (μm)	Chalcopyrite	13	8	6	8	5	5	5
	Pyrrhotite	13	15	11	13	10	6	10
	Pentlandite	12	15	7	11	6	3	4
	Other Sulphides	9	5	5	7	5	4	4
	Feldspar	23	19	7	14	7	5	6
	Orthopyroxene	15	13	9	10	9	7	7
	Clinopyroxene	14	14	10	9	12	10	20
	Amphibole	16	14	8	13	8	6	9
	Mica	6	8	6	5	6	7	11
	Chlorite/Serpentine	15	11	8	9	8	8	11
	Talc	14	8	8	9	7	4	5
	Other Silicates	12	12	11	10	9	6	8
	Fe Oxides	11	9	7	6	7	5	7
	Other Oxides	9	10	8	8	7	6	12
	Carbonates	19	12	8	8	9	8	12
	Others	5	6	5	4	5	5	11

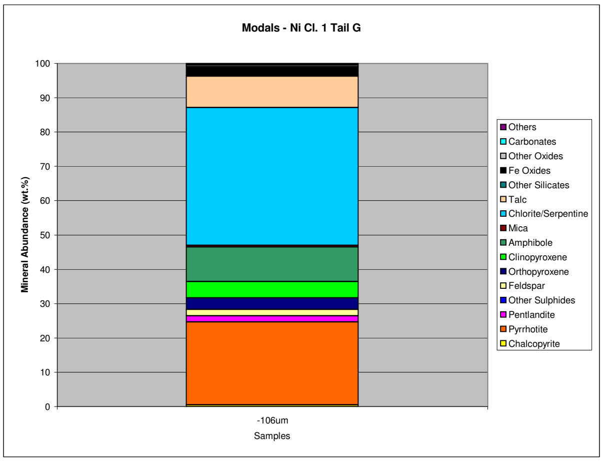

Modals - Cu Cl 1 Con G
Mineral Abundance (wt.%)
100
90
80
70
60
50
40
30
20
10
0
-106um
Samples
Others
Carbonates
Other Oxides
Fe Oxides
Other Silicates
Talc
Chlorite/Serpentine
Mica
Amphibole
Clinopyroxene
Orthopyroxene
Feldspar
Other Sulphides
Pentlandite
Pyrrhotite
Chalcopyrite

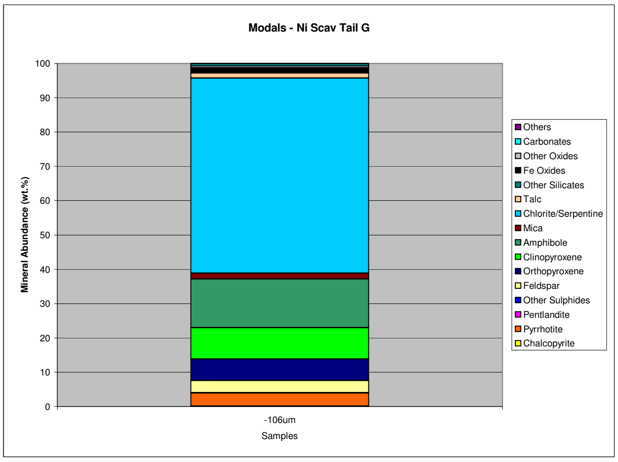

Modals - Cu Ro. Tail G
Mineral Abundance (wt.%)
100
90
80
70
60
50
40
30
20
10
0
-106um
Samples
Others
Carbonates
Other Oxides
Fe Oxides
Other Silicates
Talc
Chlorite/Serpentine
Mica
Amphibole
Clinopyroxene
Orthopyroxene
Feldspar
Other Sulphides
Pentlandite
Pyrrhotite
Chalcopyrite

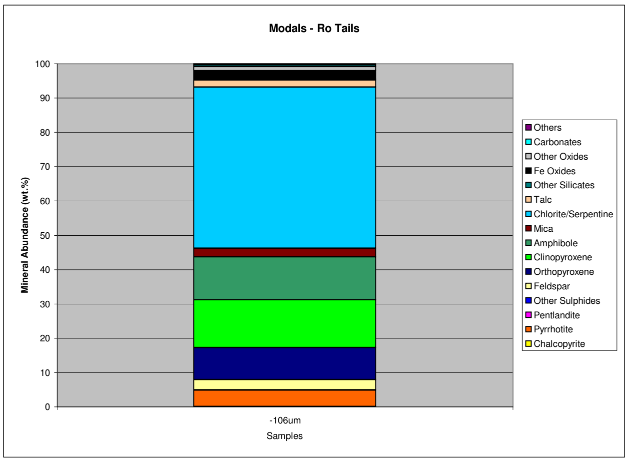

Modals
Mineral Abundance (wt.%)
100
90
80
70
60
50
40
30
20
10
0
Cu Cl 1 Con G
Cu Ro. Tail G
Bulk Cl. 1 Tail G
Ni Cl. 3 Con G
Ni Cl. 1 Tail G
Ni Scav Tail G
Ro Tails
Sample
Others
Carbonates
Other Oxides
Fe Oxides
Other Silicates
Talc
Chlorite/Serpentine
Mica
Amphibole
Clinopyroxene
Orthopyroxene
Feldspar
Other Sulphides
Pentlandite
Pyrrhotite
Chalcopyrite


Modals - Bulk Cl. 1 Tail G
Mineral Abundance (wt.%)
100
90
80
70
60
50
40
30
20
10
0
-106um
Samples
Others
Carbonates
Other Oxides
Fe Oxides
Other Silicates
Talc
Chlorite/Serpentine
Mica
Amphibole
Clinopyroxene
Orthopyroxene
Feldspar
Other Sulphides
Pentlandite
Pyrrhotite
Chalcopyrite


Modals - Ni Cl. 3 Con G
Mineral Abundance (wt.%)
100
90
80
70
60
50
40
30
20
10
0
-106um
Samples
Others
Carbonates
Other Oxides
Fe Oxides
Other Silicates
Talc
Chlorite/Serpentine
Mica
Amphibole
Clinopyroxene
Orthopyroxene
Feldspar
Other Sulphides
Pentlandite
Pyrrhotite
Chalcopyrite


Modals - Ni Cl. 1 Tail G
Mineral Abundance (wt.%)
100
90
80
70
60
50
40
30
20
10
0
-106um
Samples
Others
Carbonates
Other Oxides
Fe Oxides
Other Silicates
Talc
Chlorite/Serpentine
Mica
Amphibole
Clinopyroxene
Orthopyroxene
Feldspar
Other Sulphides
Pentlandite
Pyrrhotite
Chalcopyrite


Modals - Ni Scav Tail G
Mineral Abundance (wt.%)
100
90
80
70
60
50
40
30
20
10
0
-106um
Samples
Others
Carbonates
Other Oxides
Fe Oxides
Other Silicates
Talc
Chlorite/Serpentine
Mica
Amphibole
Clinopyroxene
Orthopyroxene
Feldspar
Other Sulphides
Pentlandite
Pyrrhotite
Chalcopyrite


Modals - Ro Tails
Mineral Abundance (wt.%)
100
90
80
70
60
50
40
30
20
10
0
-106um
Samples
Others
Carbonates
Other Oxides
Fe Oxides
Other Silicates
Talc
Chlorite/Serpentine
Mica
Amphibole
Clinopyroxene
Orthopyroxene
Feldspar
Other Sulphides
Pentlandite
Pyrrhotite
Chalcopyrite

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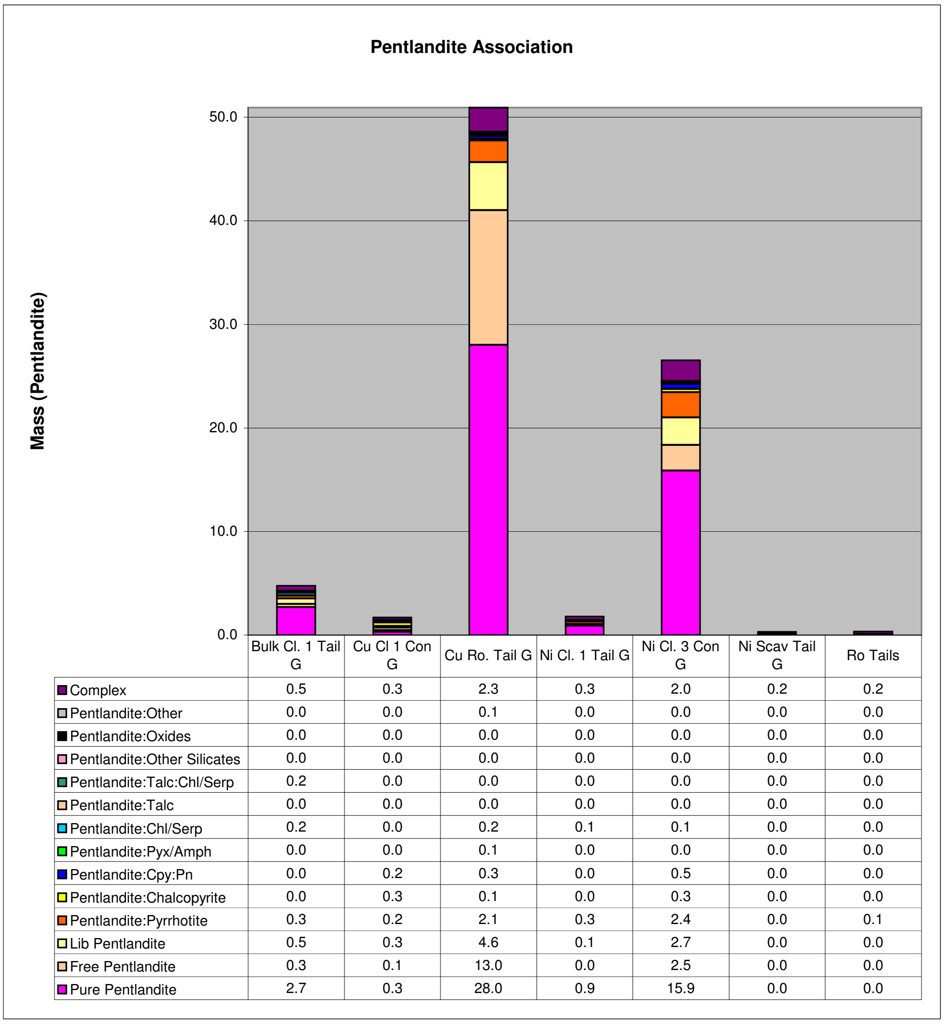
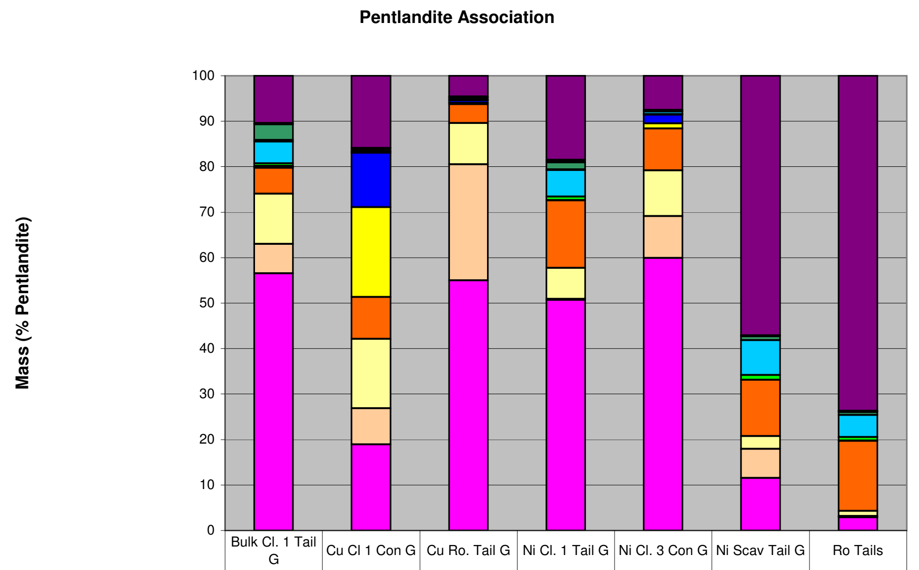
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Pentlandite Association



Absolute Mass of Pentlandite Across Samples

Mineral Name	Bulk Cl. 1 Tail G	Cu Cl 1 Con G	Cu Ro. Tail G	Ni Cl. 1 Tail G	Ni Cl. 3 Con G	Ni Scav Tail G	Ro Tails
Pure Pentlandite	2.7	0.3	28.0	0.9	15.9	0.0	0.0
Free Pentlandite	0.3	0.1	13.0	0.0	2.5	0.0	0.0
Lib Pentlandite	0.5	0.3	4.6	0.1	2.7	0.0	0.0
Pentlandite:Pyrrhotite	0.3	0.2	2.1	0.3	2.4	0.0	0.1
Pentlandite:Chalcopyrite	0.0	0.3	0.1	0.0	0.3	0.0	0.0
Pentlandite:Cpy:Pn	0.0	0.2	0.3	0.0	0.5	0.0	0.0
Pentlandite:Pyx/Amph	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Pentlandite:Chl/Serp	0.2	0.0	0.2	0.1	0.1	0.0	0.0
Pentlandite:Talc	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pentlandite:Talc:Chl/Serp	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Pentlandite:Other Silicates	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pentlandite:Oxides	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pentlandite:Other	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Complex	0.5	0.3	2.3	0.3	2.0	0.2	0.2
Total	4.8	1.7	50.9	1.8	26.5	0.3	0.3



	Bulk Cl. 1 Tail G	Cu Cl 1 Con G	Cu Ro. Tail G	Ni Cl. 1 Tail G	Ni Cl. 3 Con G	Ni Scav Tail G	Ro Tails
Complex	10.4	15.9	4.6	18.5	7.5	57.1	73.7
Pentlandite:Other	0.0	0.0	0.2	0.1	0.1	0.0	0.1
Pentlandite:Oxides	0.2	0.7	0.1	0.4	0.2	0.2	0.2
Pentlandite:Other Silicates	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Pentlandite:Talc:Chl/Serp	3.4	0.0	0.1	1.6	0.1	0.9	0.6
Pentlandite:Talc	0.4	0.0	0.0	0.1	0.0	0.0	0.0
Pentlandite:Chl/Serp	4.8	0.3	0.3	5.8	0.5	7.6	4.9
Pentlandite:Pyx/Amph	0.5	0.0	0.1	0.8	0.1	1.1	0.7
Pentlandite:Cpy:Pn	0.3	12.0	0.6	0.1	1.9	0.0	0.0
Pentlandite:Chalcopyrite	0.1	19.8	0.3	0.0	1.2	0.0	0.0
Pentlandite:Pyrrhotite	5.7	9.2	4.1	14.8	9.2	12.4	15.4
Lib Pentlandite	11.1	15.2	9.1	6.8	10.1	2.8	1.1
Free Pentlandite	6.5	8.0	25.5	0.2	9.2	6.4	0.3
Pure Pentlandite	56.5	18.9	55.0	50.7	59.9	11.5	2.9

Normalized Mass of Pentlandite Across Samples

Mineral Name	Bulk Cl. 1 Tail G	Cu Cl 1 Con G	Cu Ro. Tail G	Ni Cl. 1 Tail G	Ni Cl. 3 Con G	Ni Scav Tail G	Ro Tails
Pure Pentlandite	56.5	18.9	55.0	50.7	59.9	11.5	2.9
Free Pentlandite	6.5	8.0	25.5	0.2	9.2	6.4	0.3
Lib Pentlandite	11.1	15.2	9.1	6.8	10.1	2.8	1.1
Pentlandite:Pyrrhotite	5.7	9.2	4.1	14.8	9.2	12.4	15.4
Pentlandite:Chalcopyrite	0.1	19.8	0.3	0.0	1.2	0.0	0.0
Pentlandite:Cpy:Pn	0.3	12.0	0.6	0.1	1.9	0.0	0.0
Pentlandite:Pyx/Amph	0.5	0.0	0.1	0.8	0.1	1.1	0.7
Pentlandite:Chl/Serp	4.8	0.3	0.3	5.8	0.5	7.6	4.9
Pentlandite:Talc	0.4	0.0	0.0	0.1	0.0	0.0	0.0
Pentlandite:Talc:Chl/Serp	3.4	0.0	0.1	1.6	0.1	0.9	0.6
Pentlandite:Other Silicates	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Pentlandite:Oxides	0.2	0.7	0.1	0.4	0.2	0.2	0.2
Pentlandite:Other	0.0	0.0	0.2	0.1	0.1	0.0	0.1
Complex	10.4	15.9	4.6	18.5	7.5	57.1	73.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

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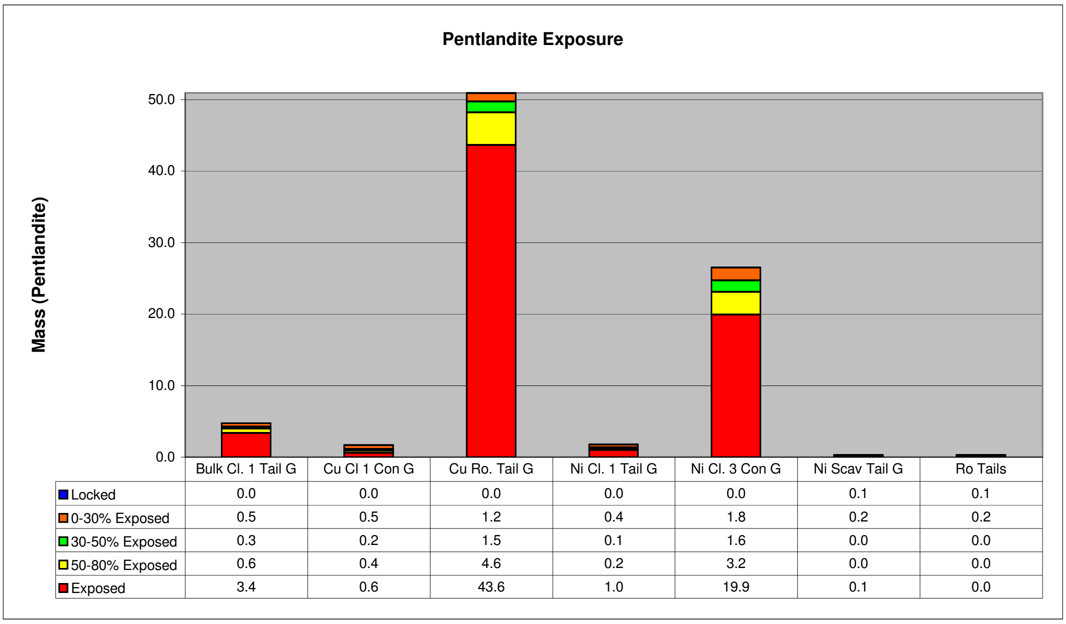
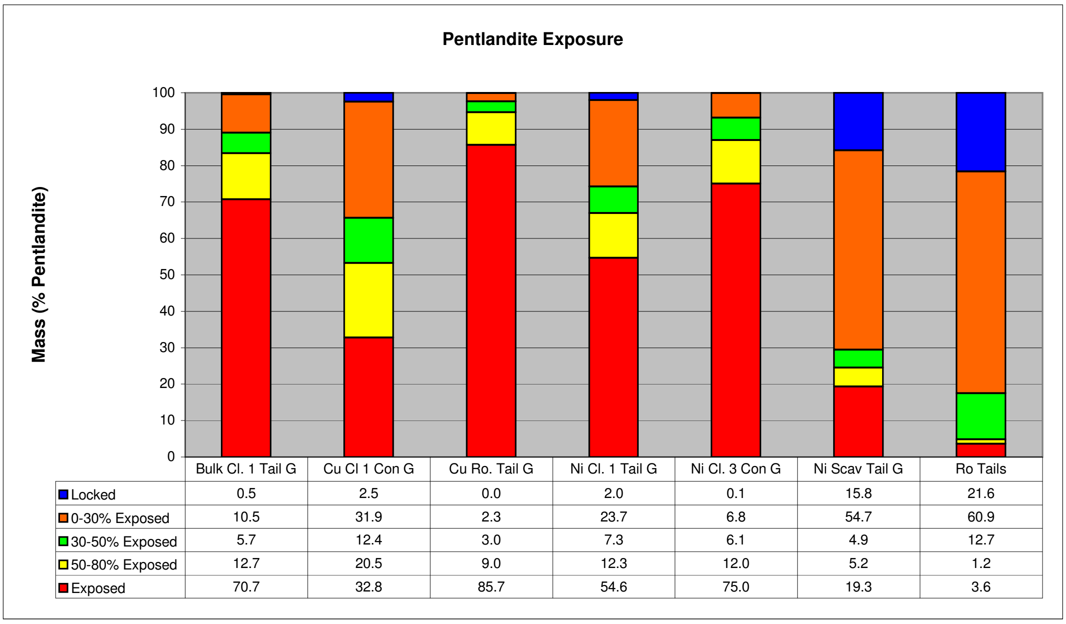
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

<u>Pentlandite Exposure</u>



<u>Absolute Mass of Pentlandite Across Samples</u>

Mineral Name	Bulk Cl. 1 Tail G	Cu Cl 1 Con G	Cu Ro. Tail G	Ni Cl. 1 Tail G	Ni Cl. 3 Con G	Ni Scav Tail G	Ro Tails
Exposed	3.4	0.6	43.6	1.0	19.9	0.1	0.0
50-80% Exposed	0.6	0.4	4.6	0.2	3.2	0.0	0.0
30-50% Exposed	0.3	0.2	1.5	0.1	1.6	0.0	0.0
0-30% Exposed	0.5	0.5	1.2	0.4	1.8	0.2	0.2
Locked	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Total	4.8	1.7	50.9	1.8	26.5	0.3	0.3



Normalized Mass of Pentlandite Across Samples

Mineral Name	Bulk Cl. 1 Tail G	Cu Cl 1 Con G	Cu Ro. Tail G	Ni Cl. 1 Tail G	Ni Cl. 3 Con G	Ni Scav Tail G	Ro Tails
Exposed	70.7	32.8	85.7	54.6	75.0	19.3	3.6
50-80% Exposed	12.7	20.5	9.0	12.3	12.0	5.2	1.2
30-50% Exposed	5.7	12.4	3.0	7.3	6.1	4.9	12.7
0-30% Exposed	10.5	31.9	2.3	23.7	6.8	54.7	60.9
Locked	0.5	2.5	0.0	2.0	0.1	15.8	21.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Prophecy Platinum Corp
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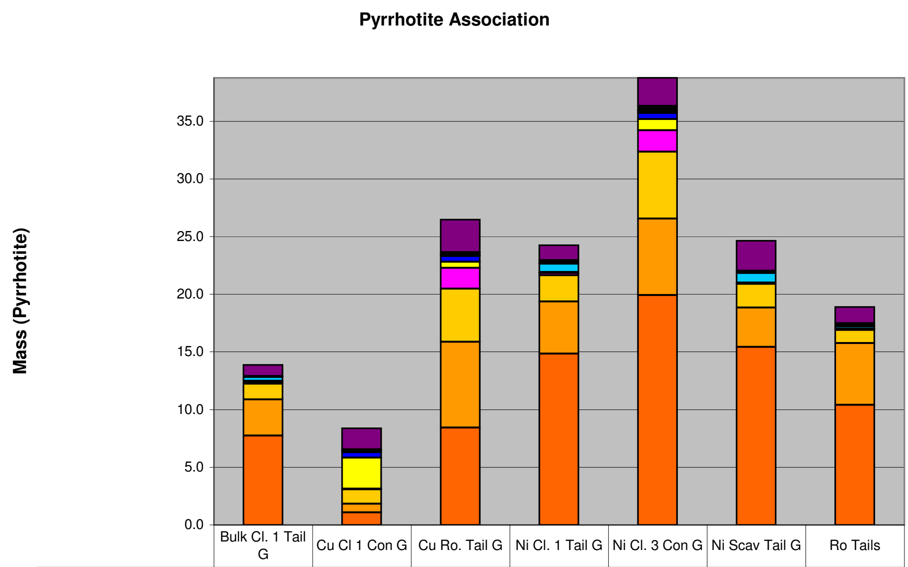
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

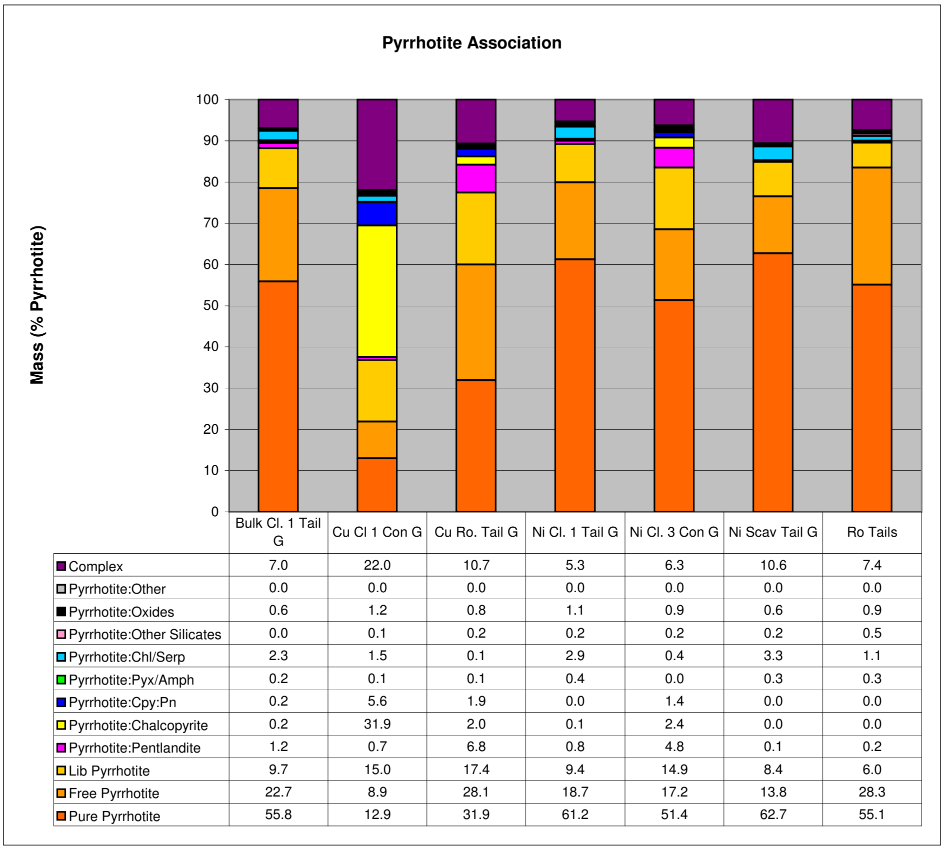
Pyrrhotite Association



	Bulk Cl. 1 Tail G	Cu Cl 1 Con G	Cu Ro. Tail G	Ni Cl. 1 Tail G	Ni Cl. 3 Con G	Ni Scav Tail G	Ro Tails
Complex	1.0	1.8	2.8	1.3	2.4	2.6	1.4
Pyrrhotite:Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pyrrhotite:Oxides	0.1	0.1	0.2	0.3	0.4	0.1	0.2
Pyrrhotite:Other Silicates	0.0	0.0	0.1	0.0	0.1	0.1	0.1
Pyrrhotite:Chl/Serp	0.3	0.1	0.0	0.7	0.2	0.8	0.2
Pyrrhotite:Pyx/Amph	0.0	0.0	0.0	0.1	0.0	0.1	0.1
Pyrrhotite:Cpy:Pn	0.0	0.5	0.5	0.0	0.5	0.0	0.0
Pyrrhotite:Chalcopyrite	0.0	2.7	0.5	0.0	0.9	0.0	0.0
Pyrrhotite:Pentlandite	0.2	0.1	1.8	0.2	1.9	0.0	0.0
Lib Pyrrhotite	1.3	1.3	4.6	2.3	5.8	2.1	1.1
Free Pyrrhotite	3.1	0.7	7.4	4.5	6.7	3.4	5.4
Pure Pyrrhotite	7.7	1.1	8.4	14.8	19.9	15.4	10.4

Absolute Mass of Pyrrhotite Across Samples

Mineral Name	Bulk Cl. 1 Tail G	Cu Cl 1 Con G	Cu Ro. Tail G	Ni Cl. 1 Tail G	Ni Cl. 3 Con G	Ni Scav Tail G	Ro Tails
Pure Pyrrhotite	7.7	1.1	8.4	14.8	19.9	15.4	10.4
Free Pyrrhotite	3.1	0.7	7.4	4.5	6.7	3.4	5.4
Lib Pyrrhotite	1.3	1.3	4.6	2.3	5.8	2.1	1.1
Pyrrhotite:Pentlandite	0.2	0.1	1.8	0.2	1.9	0.0	0.0
Pyrrhotite:Chalcopyrite	0.0	2.7	0.5	0.0	0.9	0.0	0.0
Pyrrhotite:Cpy:Pn	0.0	0.5	0.5	0.0	0.5	0.0	0.0
Pyrrhotite:Pyx/Amph	0.0	0.0	0.0	0.1	0.0	0.1	0.1
Pyrrhotite:Chl/Serp	0.3	0.1	0.0	0.7	0.2	0.8	0.2
Pyrrhotite:Other Silicates	0.0	0.0	0.1	0.0	0.1	0.1	0.1
Pyrrhotite:Oxides	0.1	0.1	0.2	0.3	0.4	0.1	0.2
Pyrrhotite:Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Complex	1.0	1.8	2.8	1.3	2.4	2.6	1.4
Total	13.9	8.4	26.5	24.2	38.8	24.6	18.9



Normalized Mass of Pyrrhotite Across Samples

Mineral Name	Bulk Cl. 1 Tail G	Cu Cl 1 Con G	Cu Ro. Tail G	Ni Cl. 1 Tail G	Ni Cl. 3 Con G	Ni Scav Tail G	Ro Tails
Pure Pyrrhotite	55.8	12.9	31.9	61.2	51.4	62.7	55.1
Free Pyrrhotite	22.7	8.9	28.1	18.7	17.2	13.8	28.3
Lib Pyrrhotite	9.7	15.0	17.4	9.4	14.9	8.4	6.0
Pyrrhotite:Pentlandite	1.2	0.7	6.8	0.8	4.8	0.1	0.2
Pyrrhotite:Chalcopyrite	0.2	31.9	2.0	0.1	2.4	0.0	0.0
Pyrrhotite:Cpy:Pn	0.2	5.6	1.9	0.0	1.4	0.0	0.0
Pyrrhotite:Pyx/Amph	0.2	0.1	0.1	0.4	0.0	0.3	0.3
Pyrrhotite:Chl/Serp	2.3	1.5	0.1	2.9	0.4	3.3	1.1
Pyrrhotite:Other Silicates	0.0	0.1	0.2	0.2	0.2	0.2	0.5
Pyrrhotite:Oxides	0.6	1.2	0.8	1.1	0.9	0.6	0.9
Pyrrhotite:Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Complex	7.0	22.0	10.7	5.3	6.3	10.6	7.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

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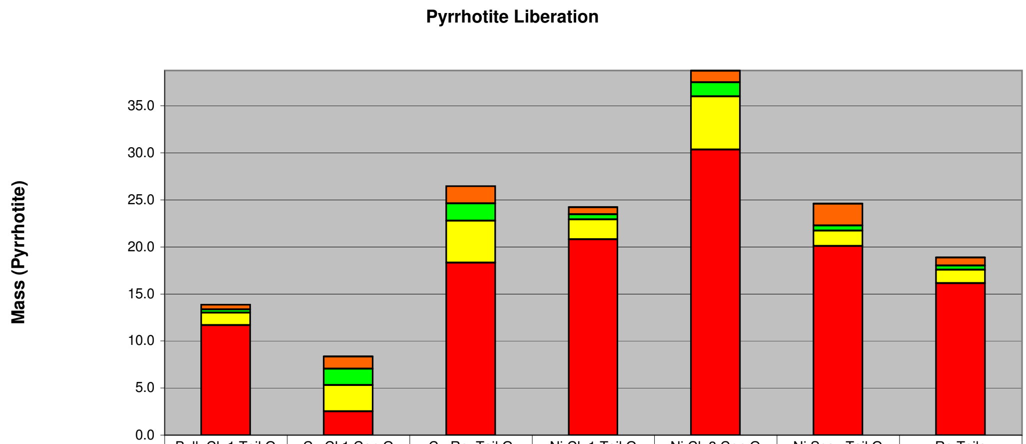
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

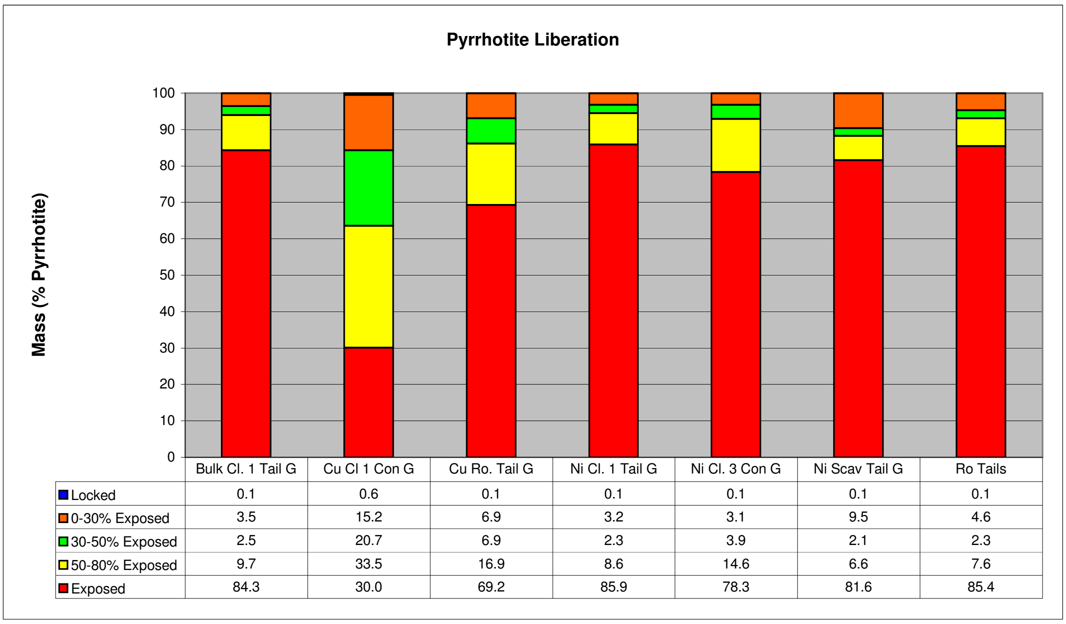
Pyrrhotite Exposure



	Bulk Cl. 1 Tail G	Cu Cl 1 Con G	Cu Ro. Tail G	Ni Cl. 1 Tail G	Ni Cl. 3 Con G	Ni Scav Tail G	Ro Tails
Locked	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0-30% Exposed	0.5	1.3	1.8	0.8	1.2	2.3	0.9
30-50% Exposed	0.3	1.7	1.8	0.6	1.5	0.5	0.4
50-80% Exposed	1.3	2.8	4.5	2.1	5.7	1.6	1.4
Exposed	11.7	2.5	18.3	20.8	30.3	20.1	16.1

Absolute Mass of Pyrrhotite Across Samples

Mineral Name	Bulk Cl. 1 Tail G	Cu Cl 1 Con G	Cu Ro. Tail G	Ni Cl. 1 Tail G	Ni Cl. 3 Con G	Ni Scav Tail G	Ro Tails
Exposed	11.7	2.5	18.3	20.8	30.3	20.1	16.1
50-80% Exposed	1.3	2.8	4.5	2.1	5.7	1.6	1.4
30-50% Exposed	0.3	1.7	1.8	0.6	1.5	0.5	0.4
0-30% Exposed	0.5	1.3	1.8	0.8	1.2	2.3	0.9
Locked	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	13.9	8.4	26.5	24.2	38.8	24.6	18.9



Normalized Mass of Pyrrhotite Across Samples

Mineral Name	Bulk Cl. 1 Tail G	Cu Cl 1 Con G	Cu Ro. Tail G	Ni Cl. 1 Tail G	Ni Cl. 3 Con G	Ni Scav Tail G	Ro Tails
Exposed	84.3	30.0	69.2	85.9	78.3	81.6	85.4
50-80% Exposed	9.7	33.5	16.9	8.6	14.6	6.6	7.6
30-50% Exposed	2.5	20.7	6.9	2.3	3.9	2.1	2.3
0-30% Exposed	3.5	15.2	6.9	3.2	3.1	9.5	4.6
Locked	0.1	0.6	0.1	0.1	0.1	0.1	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

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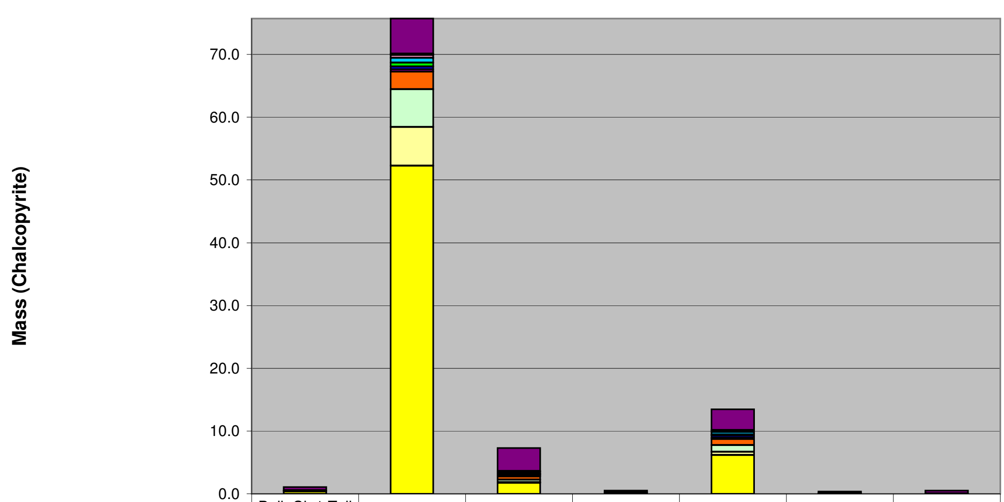
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

Chalcopyrite Association

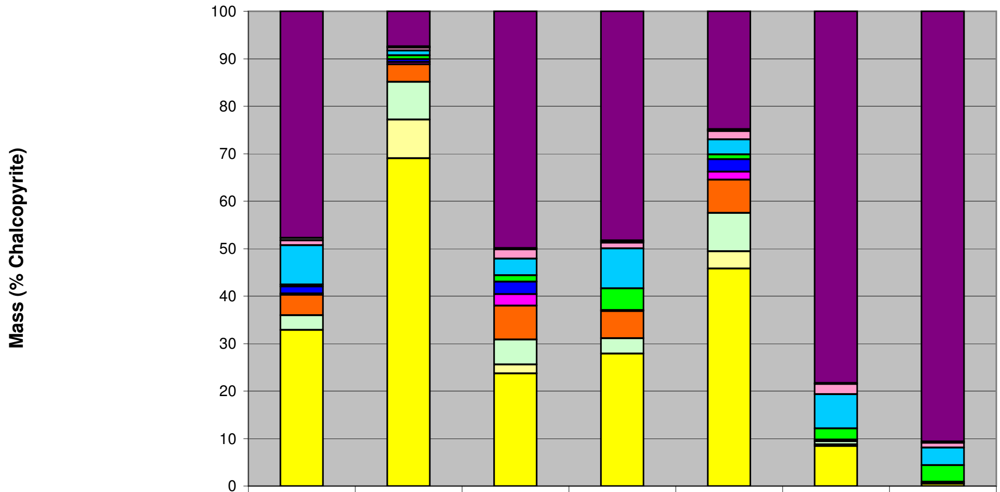


	Bulk Cl. 1 Tail G	Cu Cl 1 Con G	Cu Ro. Tail G	Ni Cl. 1 Tail G	Ni Cl. 3 Con G	Ni Scav Tail G	Ro Tails
Complex	0.5	5.6	3.6	0.2	3.4	0.3	0.5
Chalcopyrite:Other	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Chalcopyrite:Oxides	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Chalcopyrite:Other Silicates	0.0	0.5	0.1	0.0	0.2	0.0	0.0
Chalcopyrite:Chl/Serp	0.1	0.8	0.3	0.0	0.4	0.0	0.0
Chalcopyrite:Pyx/Amph	0.0	0.6	0.1	0.0	0.1	0.0	0.0
Chalcopyrite:Pn:Po	0.0	0.5	0.2	0.0	0.4	0.0	0.0
Chalcopyrite:Pentlandite	0.0	0.3	0.2	0.0	0.2	0.0	0.0
Chalcopyrite:Pyrrhotite	0.0	2.8	0.5	0.0	1.0	0.0	0.0
Lib Chalcopyrite	0.0	6.0	0.4	0.0	1.1	0.0	0.0
Free Chalcopyrite	0.0	6.2	0.1	0.0	0.5	0.0	0.0
Pure Chalcopyrite	0.3	52.3	1.7	0.1	6.2	0.0	0.0

Absolute Mass of Chalcopyrite Across Samples

Mineral Name	Bulk Cl. 1 Tail G	Cu Cl 1 Con G	Cu Ro. Tail G	Ni Cl. 1 Tail G	Ni Cl. 3 Con G	Ni Scav Tail G	Ro Tails
Pure Chalcopyrite	0.3	52.3	1.7	0.1	6.2	0.0	0.0
Free Chalcopyrite	0.0	6.2	0.1	0.0	0.5	0.0	0.0
Lib Chalcopyrite	0.0	6.0	0.4	0.0	1.1	0.0	0.0
Chalcopyrite:Pyrrhotite	0.0	2.8	0.5	0.0	1.0	0.0	0.0
Chalcopyrite:Pentlandite	0.0	0.3	0.2	0.0	0.2	0.0	0.0
Chalcopyrite:Pn:Po	0.0	0.5	0.2	0.0	0.4	0.0	0.0
Chalcopyrite:Pyx/Amph	0.0	0.6	0.1	0.0	0.1	0.0	0.0
Chalcopyrite:Chl/Serp	0.1	0.8	0.3	0.0	0.4	0.0	0.0
Chalcopyrite:Other Silicates	0.0	0.5	0.1	0.0	0.2	0.0	0.0
Chalcopyrite:Oxides	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Chalcopyrite:Other	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Complex	0.5	5.6	3.6	0.2	3.4	0.3	0.5
Total	1.0	75.7	7.3	0.5	13.5	0.4	0.5

Chalcopyrite Association



	Bulk Cl. 1 Tail G	Cu Cl 1 Con G	Cu Ro. Tail G	Ni Cl. 1 Tail G	Ni Cl. 3 Con G	Ni Scav Tail G	Ro Tails
Complex	47.7	7.4	49.9	48.3	24.9	78.3	90.6
Chalcopyrite:Other	0.5	0.1	0.2	0.2	0.2	0.1	0.0
Chalcopyrite:Oxides	0.1	0.1	0.1	0.2	0.2	0.1	0.3
Chalcopyrite:Other Silicates	1.0	0.6	1.9	1.2	1.8	2.2	1.0
Chalcopyrite:Chl/Serp	8.3	1.0	3.5	8.4	3.2	7.2	3.7
Chalcopyrite:Pyx/Amph	0.4	0.8	1.3	4.6	1.0	2.3	3.5
Chalcopyrite:Pn:Po	1.5	0.6	2.7	0.1	2.6	0.0	0.0
Chalcopyrite:Pentlandite	0.3	0.5	2.4	0.1	1.7	0.0	0.0
Chalcopyrite:Pyrrhotite	4.3	3.7	7.1	5.7	7.0	0.3	0.2
Lib Chalcopyrite	3.1	7.9	5.3	3.3	8.0	0.7	0.1
Free Chalcopyrite	0.0	8.1	1.8	0.0	3.7	0.3	0.0
Pure Chalcopyrite	32.9	69.1	23.7	27.9	45.8	8.4	0.5

Normalized Mass of Chalcopyrite Across Samples

Mineral Name	Bulk Cl. 1 Tail G	Cu Cl 1 Con G	Cu Ro. Tail G	Ni Cl. 1 Tail G	Ni Cl. 3 Con G	Ni Scav Tail G	Ro Tails
Pure Chalcopyrite	32.9	69.1	23.7	27.9	45.8	8.4	0.5
Free Chalcopyrite	0.0	8.1	1.8	0.0	3.7	0.3	0.0
Lib Chalcopyrite	3.1	7.9	5.3	3.3	8.0	0.7	0.1
Chalcopyrite:Pyrrhotite	4.3	3.7	7.1	5.7	7.0	0.3	0.2
Chalcopyrite:Pentlandite	0.3	0.5	2.4	0.1	1.7	0.0	0.0
Chalcopyrite:Pn:Po	1.5	0.6	2.7	0.1	2.6	0.0	0.0
Chalcopyrite:Pyx/Amph	0.4	0.8	1.3	4.6	1.0	2.3	3.5
Chalcopyrite:Chl/Serp	8.3	1.0	3.5	8.4	3.2	7.2	3.7
Chalcopyrite:Other Silicates	1.0	0.6	1.9	1.2	1.8	2.2	1.0
Chalcopyrite:Oxides	0.1	0.1	0.1	0.2	0.2	0.1	0.3
Chalcopyrite:Other	0.5	0.1	0.2	0.2	0.2	0.1	0.0
Complex	47.7	7.4	49.9	48.3	24.9	78.3	90.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

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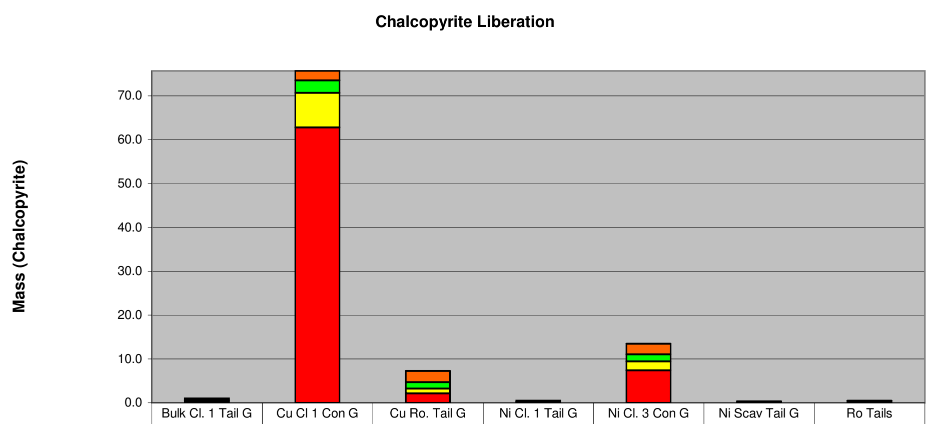
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

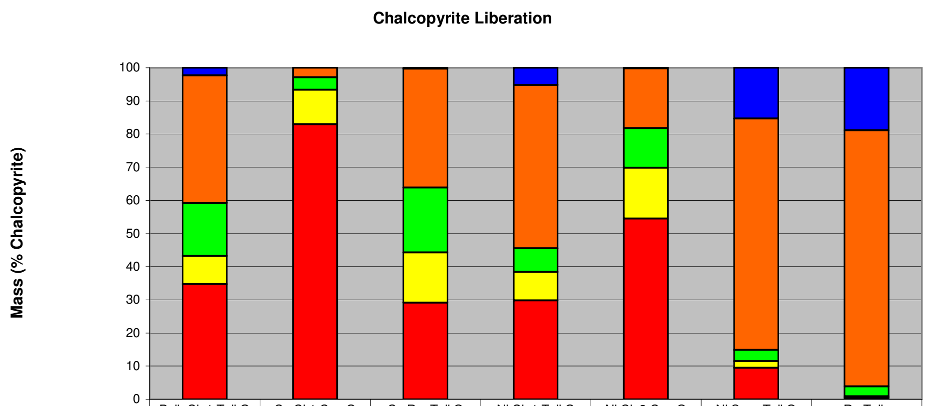
Chalcopyrite Liberation



	Bulk Cl. 1 Tail G	Cu Cl 1 Con G	Cu Ro. Tail G	Ni Cl. 1 Tail G	Ni Cl. 3 Con G	Ni Scav Tail G	Ro Tails
Locked	0.0	0.0	0.0	0.0	0.0	0.1	0.1
0-30% Exposed	0.4	2.2	2.6	0.3	2.4	0.3	0.4
30-50% Exposed	0.2	2.8	1.4	0.0	1.6	0.0	0.0
50-80% Exposed	0.1	7.9	1.1	0.0	2.1	0.0	0.0
Exposed	0.4	62.8	2.1	0.2	7.3	0.0	0.0

Absolute Mass of Chalcopyrite Across Samples

Mineral Name	Bulk Cl. 1 Tail G	Cu Cl 1 Con G	Cu Ro. Tail G	Ni Cl. 1 Tail G	Ni Cl. 3 Con G	Ni Scav Tail G	Ro Tails
Exposed	0.4	62.8	2.1	0.2	7.3	0.0	0.0
50-80% Exposed	0.1	7.9	1.1	0.0	2.1	0.0	0.0
30-50% Exposed	0.2	2.8	1.4	0.0	1.6	0.0	0.0
0-30% Exposed	0.4	2.2	2.6	0.3	2.4	0.3	0.4
Locked	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Total	1.0	75.7	7.3	0.5	13.5	0.4	0.5



	Bulk Cl. 1 Tail G	Cu Cl 1 Con G	Cu Ro. Tail G	Ni Cl. 1 Tail G	Ni Cl. 3 Con G	Ni Scav Tail G	Ro Tails
Locked	2.3	0.0	0.3	5.2	0.2	15.3	18.9
0-30% Exposed	38.6	2.9	35.8	49.3	18.0	69.8	77.2
30-50% Exposed	16.0	3.7	19.6	7.1	11.9	3.4	3.0
50-80% Exposed	8.5	10.4	15.1	8.5	15.4	2.0	0.4
Exposed	34.7	82.9	29.1	29.8	54.5	9.5	0.5

Normalized Mass of Chalcopyrite Across Samples

Mineral Name	Bulk Cl. 1 Tail G	Cu Cl 1 Con G	Cu Ro. Tail G	Ni Cl. 1 Tail G	Ni Cl. 3 Con G	Ni Scav Tail G	Ro Tails
Exposed	34.7	82.9	29.1	29.8	54.5	9.5	0.5
50-80% Exposed	8.5	10.4	15.1	8.5	15.4	2.0	0.4
30-50% Exposed	16.0	3.7	19.6	7.1	11.9	3.4	3.0
0-30% Exposed	38.6	2.9	35.8	49.3	18.0	69.8	77.2
Locked	2.3	0.0	0.3	5.2	0.2	15.3	18.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

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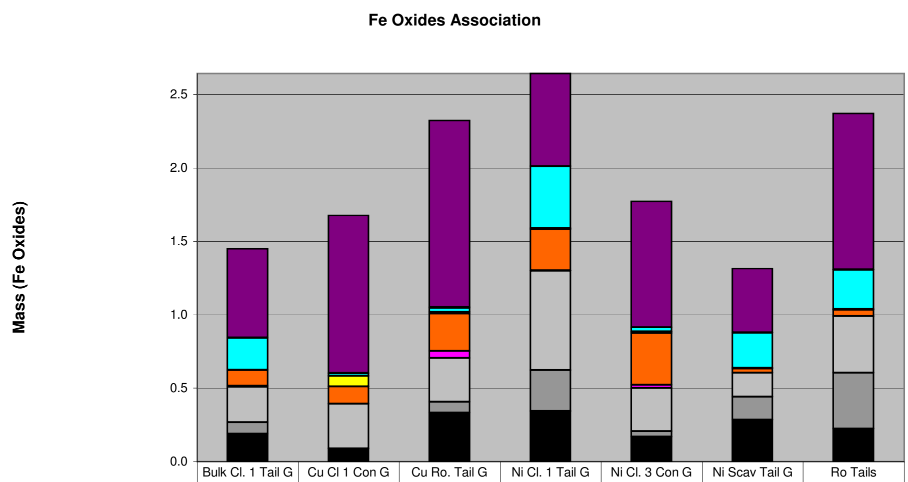
High Definition Mineralogical Analysis using QEMSCAN (Quantitative Evaluation of Materials by Scanning Electron Microscopy)

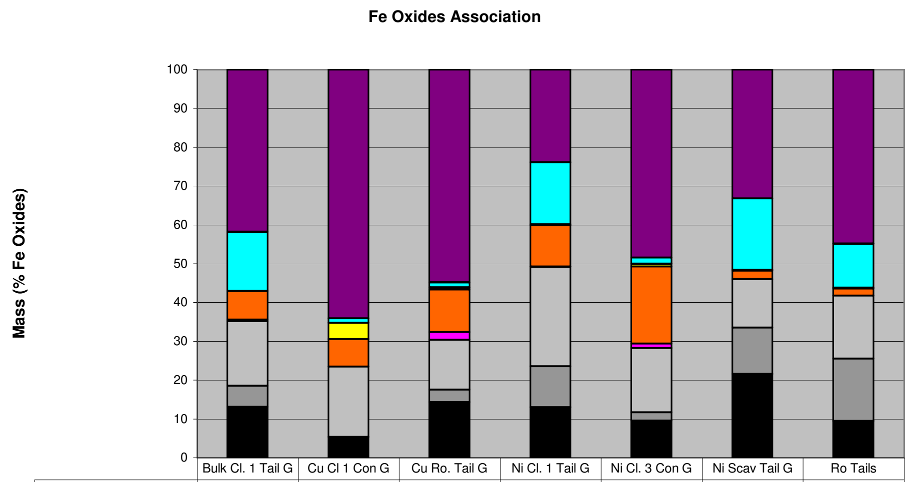
<u>Fe Oxides Association</u>



	Bulk Cl. 1 Tail G	Cu Cl 1 Con G	Cu Ro. Tail G	Ni Cl. 1 Tail G	Ni Cl. 3 Con G	Ni Scav Tail G	Ro Tails
Complex	0.6	1.1	1.3	0.6	0.9	0.4	1.1
Fe Oxides:Other Silicates	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fe Oxides:Talc	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fe Oxides:Serp/Chlorite	0.2	0.0	0.0	0.4	0.0	0.2	0.3
Fe Oxides:Pyx/Amph	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fe Oxides:Chalcopyrite	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Fe Oxides:Pyrrhotite	0.1	0.1	0.3	0.3	0.4	0.0	0.0
Fe Oxides:Pentlandite	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lib Fe Oxides	0.2	0.3	0.3	0.7	0.3	0.2	0.4
Free Fe Oxides	0.1	0.0	0.1	0.3	0.0	0.2	0.4
Pure Fe Oxides	0.2	0.1	0.3	0.3	0.2	0.3	0.2

<u>Absolute Mass of Fe Oxides Across Samples</u>

Mineral Name	Bulk Cl. 1 Tail G	Cu Cl 1 Con G	Cu Ro. Tail G	Ni Cl. 1 Tail G	Ni Cl. 3 Con G	Ni Scav Tail G	Ro Tails
Pure Fe Oxides	0.2	0.1	0.3	0.3	0.2	0.3	0.2
Free Fe Oxides	0.1	0.0	0.1	0.3	0.0	0.2	0.4
Lib Fe Oxides	0.2	0.3	0.3	0.7	0.3	0.2	0.4
Fe Oxides:Pentlandite	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fe Oxides:Pyrrhotite	0.1	0.1	0.3	0.3	0.4	0.0	0.0
Fe Oxides:Chalcopyrite	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Fe Oxides:Pyx/Amph	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fe Oxides:Serp/Chlorite	0.2	0.0	0.0	0.4	0.0	0.2	0.3
Fe Oxides:Talc	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fe Oxides:Other Silicates	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Complex	0.6	1.1	1.3	0.6	0.9	0.4	1.1
Total	1.5	1.7	2.3	2.6	1.8	1.3	2.4



	Bulk Cl. 1 Tail G	Cu Cl 1 Con G	Cu Ro. Tail G	Ni Cl. 1 Tail G	Ni Cl. 3 Con G	Ni Scav Tail G	Ro Tails
Complex	41.8	64.1	54.8	23.8	48.4	33.2	44.8
Fe Oxides:Other Silicates	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Fe Oxides:Talc	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Fe Oxides:Serp/Chlorite	15.1	1.1	1.2	16.0	1.6	18.3	11.3
Fe Oxides:Pyx/Amph	0.1	0.0	0.0	0.2	0.1	0.3	0.2
Fe Oxides:Chalcopyrite	0.0	4.2	0.5	0.0	0.6	0.0	0.0
Fe Oxides:Pyrrhotite	7.3	7.0	10.9	10.6	19.9	2.1	1.8
Fe Oxides:Pentlandite	0.4	0.0	2.0	0.1	1.2	0.1	0.0
Lib Fe Oxides	16.7	18.1	12.8	25.7	16.6	12.4	16.3
Free Fe Oxides	5.4	0.0	3.2	10.6	2.1	11.9	16.0
Pure Fe Oxides	13.1	5.4	14.3	13.0	9.5	21.6	9.5

Normalized Mass of Fe Oxides Across Samples

Mineral Name	Bulk Cl. 1 Tail G	Cu Cl 1 Con G	Cu Ro. Tail G	Ni Cl. 1 Tail G	Ni Cl. 3 Con G	Ni Scav Tail G	Ro Tails
Pure Fe Oxides	13.1	5.4	14.3	13.0	9.5	21.6	9.5
Free Fe Oxides	5.4	0.0	3.2	10.6	2.1	11.9	16.0
Lib Fe Oxides	16.7	18.1	12.8	25.7	16.6	12.4	16.3
Fe Oxides:Pentlandite	0.4	0.0	2.0	0.1	1.2	0.1	0.0
Fe Oxides:Pyrrhotite	7.3	7.0	10.9	10.6	19.9	2.1	1.8
Fe Oxides:Chalcopyrite	0.0	4.2	0.5	0.0	0.6	0.0	0.0
Fe Oxides:Pyx/Amph	0.1	0.0	0.0	0.2	0.1	0.3	0.2
Fe Oxides:Serp/Chlorite	15.1	1.1	1.2	16.0	1.6	18.3	11.3
Fe Oxides:Talc	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Fe Oxides:Other Silicates	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Complex	41.8	64.1	54.8	23.8	48.4	33.2	44.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

CAVM-50149-101
MI7018-MAR12
Sample Ni Cl. 3 Con G
Cameca Quantitative Analysis
Laboratoire de Microanalyse - Universite Laval
Label : asulSGS2
Wed Apr 11 08:50:31 2012
Weight %

mdl(%)	*0.027*	*0.138*	*0.109*	*0.116*	*0.121*	*0.063*	*0.044*	*0.038*	*0.032*	
Pyrrhotite	S	Pb	Co	Fe	Ni	Cu	Zn	As	Mn	Total
Conc po	39.404	0.104	0.053	58.890	0.592	0.000	0.013	0.005	0.000	99.061
Conc po	38.446	0.125	0.000	60.037	0.680	0.003	0.000	0.004	0.000	99.295
Conc po	38.301	0.090	0.046	59.759	0.631	0.242	0.007	0.034	0.000	99.110
Conc po	38.569	0.126	0.031	59.155	0.661	0.007	0.000	0.029	0.000	98.578
Conc po	38.525	0.132	0.001	59.995	0.430	0.092	0.000	0.000	0.000	99.175
Conc po	38.727	0.114	0.000	59.064	0.514	0.075	0.000	0.049	0.000	98.543
Conc po	38.203	0.123	0.026	59.683	0.510	0.116	0.068	0.036	0.000	98.765
Conc po	38.260	0.097	0.042	59.722	0.634	0.000	0.000	0.000	0.000	98.755
Conc po	38.596	0.017	0.004	60.093	0.546	0.000	0.000	0.022	0.006	99.284
Conc po	38.503	0.095	0.030	59.886	0.644	0.041	0.051	0.034	0.000	99.284
Ave	**38.553**	**0.102**	**0.023**	**59.628**	**0.584**	**0.058**	**0.014**	**0.021**	**0.001**	**98.985**
Min	**38.203**	**0.017**	**0.000**	**58.890**	**0.430**	**0.000**	**0.000**	**0.000**	**0.000**	**98.543**
Max	**39.404**	**0.132**	**0.053**	**60.093**	**0.680**	**0.242**	**0.068**	**0.049**	**0.006**	**99.295**
SD	**0.340**	**0.033**	**0.021**	**0.435**	**0.081**	**0.078**	**0.025**	**0.018**	**0.002**	**0.297**

Pentlandite	S	Pb	Co	Fe	Ni	Cu	Zn	As	Mn	Total
Conc pn	32.889	0.042	1.733	31.280	32.616	0.054	0.007	0.009	0.000	98.630
Conc pn	32.958	0.017	2.607	27.685	34.864	0.127	0.004	0.012	0.024	98.298
Conc pn	32.982	0.154	1.359	30.044	34.130	0.027	0.000	0.006	0.000	98.702
Conc pn	33.098	0.133	2.150	31.095	33.652	0.104	0.000	0.025	0.000	100.257
Conc pn	32.895	0.061	1.590	31.697	33.349	0.117	0.019	0.033	0.000	99.761
Conc pn	33.038	0.097	1.723	30.636	34.412	0.094	0.003	0.000	0.000	100.003
Conc pn	33.076	0.066	1.788	30.453	33.176	0.054	0.015	0.001	0.000	98.629
Conc pn	32.926	0.144	2.018	31.384	32.835	0.064	0.000	0.000	0.017	99.388
Conc pn	33.109	0.053	1.898	29.291	33.617	0.027	0.000	0.014	0.006	98.015
Conc pn	33.045	0.072	1.595	28.846	35.351	0.000	0.000	0.017	0.004	98.930
Conc pn	33.129	0.142	1.722	28.882	35.256	0.000	0.056	0.035	0.025	99.247
Conc pn	33.180	0.171	1.989	30.508	33.053	0.030	0.000	0.032	0.012	98.975
Conc pn	32.964	0.032	1.555	29.337	34.941	0.000	0.002	0.013	0.004	98.848
Ave	**33.022**	**0.091**	**1.825**	**30.088**	**33.942**	**0.054**	**0.008**	**0.015**	**0.007**	**99.053**
Min	**32.889**	**0.017**	**1.359**	**27.685**	**32.616**	**0.000**	**0.000**	**0.000**	**0.000**	**98.015**
Max	**33.180**	**0.171**	**2.607**	**31.697**	**35.351**	**0.127**	**0.056**	**0.035**	**0.025**	**100.257**
SD	**0.094**	**0.052**	**0.318**	**1.200**	**0.945**	**0.045**	**0.016**	**0.013**	**0.009**	**0.658**

Label : miscmc
Wed Apr 11 20:45:48 2012
Geo Analysis : miscellaneo. based on 1 Oxygens
Compound Percents

mdl(%)	*0.034*	*0.123*	*0.023*	*0.086*	*0.028*	*0.021*	*0.037*	*0.122*	*0.047*	*0.052*	*0.027*	*0.012*	
CPX-Augite	SiO2	TiO2	Al2O3	Cr2O3	MgO	CaO	MnO	FeO	CoO	NiO	Na2O	K2O	Total
Con cpx	53.582	0.053	0.826	0.071	13.995	17.634	0.169	10.456	0.035	0.111	0.253	0.036	97.221
Con cpx	51.429	0.544	2.392	0.537	15.940	20.261	0.219	7.125	0.000	0.038	0.381	0.000	98.866
Con cpx	51.065	0.690	2.295	0.662	15.683	20.934	0.218	6.652	0.004	0.048	0.360	0.000	98.611
Ave	**52.025**	**0.429**	**1.838**	**0.423**	**15.206**	**19.610**	**0.202**	**8.078**	**0.013**	**0.066**	**0.331**	**0.012**	**98.233**
Min	**51.065**	**0.053**	**0.826**	**0.071**	**13.995**	**17.634**	**0.169**	**6.652**	**0.000**	**0.038**	**0.253**	**0.000**	**97.221**
Max	**53.582**	**0.690**	**2.392**	**0.662**	**15.940**	**20.934**	**0.219**	**10.456**	**0.035**	**0.111**	**0.381**	**0.036**	**98.866**
SD	**1.360**	**0.334**	**0.877**	**0.311**	**1.057**	**1.744**	**0.029**	**2.073**	**0.019**	**0.040**	**0.069**	**0.021**	**0.885**

CPX-Hedenbergite	SiO2	TiO2	Al2O3	Cr2O3	MgO	CaO	MnO	FeO	CoO	NiO	Na2O	K2O	Total
Con cpx	51.352	0.011	2.254	0.000	7.589	21.299	0.374	14.747	0.012	0.078	1.063	0.000	98.779
Con cpx	51.291	0.000	1.017	0.000	7.283	18.901	0.407	17.982	0.030	0.074	0.514	0.027	97.526
Con cpx	51.197	0.053	0.947	0.044	7.248	20.646	0.237	17.543	0.006	0.083	0.350	0.014	98.368
Con cpx	51.098	0.021	1.015	0.003	7.851	23.026	0.212	14.593	0.000	0.038	0.503	0.006	98.366
Con cpx	50.759	0.000	1.408	0.066	7.502	19.096	0.176	19.198	0.000	0.046	0.497	0.045	98.793
Con cpx	49.529	0.000	1.143	0.031	3.711	22.191	0.501	20.722	0.015	0.003	0.514	0.000	98.360
Con cpx	49.423	0.000	0.909	0.003	3.856	22.148	0.164	21.244	0.000	0.086	0.415	0.000	98.248
Con cpx	49.408	0.000	1.276	0.028	2.860	21.877	0.091	21.930	0.000	0.000	0.584	0.000	98.054
Con cpx	47.989	0.000	0.402	0.000	0.396	22.290	0.401	26.048	0.000	0.080	0.204	0.010	97.820
Ave	**50.227**	**0.009**	**1.152**	**0.019**	**5.366**	**21.275**	**0.285**	**19.334**	**0.007**	**0.054**	**0.516**	**0.011**	**98.257**
Min	**47.989**	**0.000**	**0.402**	**0.000**	**0.396**	**18.901**	**0.091**	**14.593**	**0.000**	**0.000**	**0.204**	**0.000**	**97.526**
Max	**51.352**	**0.053**	**2.254**	**0.066**	**7.851**	**23.026**	**0.501**	**26.048**	**0.030**	**0.086**	**1.063**	**0.045**	**98.793**
SD	**1.183**	**0.018**	**0.499**	**0.024**	**2.713**	**1.451**	**0.139**	**3.639**	**0.010**	**0.034**	**0.234**	**0.016**	**0.412**

Chlorite	SiO2	TiO2	Al2O3	Cr2O3	MgO	CaO	MnO	FeO	CoO	NiO	Na2O	K2O	Total
Con chl	37.101	0.052	7.646	0.229	30.239	0.045	0.134	10.600	0.000	0.228	0.019	0.006	86.299
Con chl	36.363	0.021	8.290	0.000	30.601	0.025	0.177	10.597	0.000	0.078	0.001	0.012	86.165
Con chl	34.504	0.005	11.301	0.010	30.879	0.011	0.100	10.297	0.020	0.221	0.012	0.000	87.360
Con chl	33.810	0.000	12.061	0.000	30.129	0.007	0.093	10.356	0.009	0.140	0.011	0.000	86.616
Con chl	33.628	0.005	12.247	0.000	28.598	0.003	0.093	11.395	0.000	0.174	0.006	0.000	86.149
Con chl	28.688	0.000	18.691	0.034	20.016	0.003	0.100	18.748	0.014	0.165	0.009	0.004	86.472
Ave	**34.016**	**0.014**	**11.706**	**0.046**	**28.410**	**0.016**	**0.116**	**11.999**	**0.007**	**0.168**	**0.010**	**0.004**	**86.510**
Min	**28.688**	**0.000**	**7.646**	**0.000**	**20.016**	**0.003**	**0.093**	**10.297**	**0.000**	**0.078**	**0.001**	**0.000**	**86.149**
Max	**37.101**	**0.052**	**18.691**	**0.229**	**30.879**	**0.045**	**0.177**	**18.748**	**0.020**	**0.228**	**0.019**	**0.012**	**87.360**
SD	**2.961**	**0.020**	**3.938**	**0.091**	**4.188**	**0.017**	**0.034**	**3.330**	**0.009**	**0.055**	**0.006**	**0.005**	**0.454**

Amphibole (trem,Hnb)	SiO2	TiO2	Al2O3	Cr2O3	MgO	CaO	MnO	FeO	CoO	NiO	Na2O	K2O	Total
Con am	56.514	0.011	0.240	0.232	20.026	13.580	0.132	6.822	0.046	0.090	0.054	0.025	97.772
Con am	54.708	0.000	0.231	0.048	13.133	12.538	0.562	15.544	0.000	0.062	0.050	0.035	96.911
Con am	50.624	0.356	2.663	0.000	11.721	11.323	0.261	17.975	0.007	0.090	0.637	0.310	95.967
Ave	**53.949**	**0.122**	**1.045**	**0.093**	**14.960**	**12.480**	**0.318**	**13.447**	**0.018**	**0.081**	**0.247**	**0.123**	**96.883**
Min	**50.624**	**0.000**	**0.231**	**0.000**	**11.721**	**11.323**	**0.132**	**6.822**	**0.000**	**0.062**	**0.050**	**0.025**	**95.967**
Max	**56.514**	**0.356**	**2.663**	**0.232**	**20.026**	**13.580**	**0.562**	**17.975**	**0.046**	**0.090**	**0.637**	**0.310**	**97.772**
SD	**3.018**	**0.202**	**1.402**	**0.122**	**4.444**	**1.130**	**0.221**	**5.865**	**0.025**	**0.016**	**0.338**	**0.162**	**0.903**

Alteration phase	SiO2	TiO2	Al2O3	Cr2O3	MgO	CaO	MnO	FeO	CoO	NiO	Na2O	K2O	Total
Serpentine?	60.849	0.021	0.149	0.066	27.677	0.000	0.025	4.512	0.000	0.109	0.029	0.000	93.437
Con ser	44.401	0.048	1.453	0.000	33.953	0.025	0.113	8.293	0.000	0.226	0.005	0.001	88.518
Con ser	42.823	0.053	0.543	0.006	35.457	0.024	0.116	6.470	0.011	0.355	0.001	0.000	85.859
Con ser	42.762	0.032	0.522	0.000	36.714	0.052	0.081	6.235	0.002	0.337	0.018	0.000	86.755
Con ser	42.619	0.106	1.017	0.042	34.106	0.058	0.140	8.187	0.000	0.284	0.000	0.000	86.559
Con ser	42.501	0.000	1.129	0.052	36.449	0.019	0.135	7.345	0.012	0.359	0.011	0.003	88.015
Con ser	42.242	0.032	0.861	0.000	35.057	0.037	0.097	8.781	0.009	0.298	0.001	0.000	87.415
Con ser	42.218	0.000	1.312	0.058	33.748	0.065	0.133	8.692	0.012	0.336	0.007	0.003	86.584
Con ser	42.021	0.021	1.303	0.081	34.412	0.073	0.139	7.523	0.058	0.485	0.010	0.004	86.130
Con ser	41.939	0.000	0.993	0.000	30.036	0.016	0.276	12.730	0.017	0.341	0.016	0.000	86.364
Con ser	41.908	0.053	1.851	0.087	33.089	0.080	0.181	8.958	0.001	0.339	0.000	0.000	86.547
Con ser	41.891	0.016	3.522	0.470	27.857	1.324	0.274	11.459	0.000	0.111	0.001	0.014	86.939
Con ser	41.782	0.000	0.892	0.067	34.461	0.049	0.169	10.045	0.001	0.161	0.000	0.000	87.627
Con ser	41.767	0.042	0.919	0.010	35.713	0.047	0.112	8.891	0.024	0.111	0.011	0.000	87.647
Con ser	41.756	0.096	0.206	0.104	38.142	0.017	0.060	5.485	0.000	0.256	0.012	0.000	86.134
Con ser	41.727	0.032	1.092	0.071	35.183	0.022	0.116	8.384	0.024	0.174	0.015	0.000	86.840
Con ser	41.114	0.000	2.628	0.102	32.972	0.047	0.138	9.395	0.011	0.434	0.011	0.000	86.852
Con ser	40.290	0.053	2.923	0.000	31.640	0.044	0.151	10.208	0.010	0.409	0.008	0.005	85.741
Con ser	40.241	0.005	2.970	0.105	30.724	0.066	0.151	10.727	0.038	0.712	0.021	0.006	85.766
Ave	**42.992**	**0.032**	**1.383**	**0.070**	**33.547**	**0.109**	**0.137**	**8.543**	**0.012**	**0.307**	**0.009**	**0.002**	**87.144**
Min	**40.241**	**0.000**	**0.149**	**0.000**	**27.677**	**0.000**	**0.025**	**4.512**	**0.000**	**0.109**	**0.000**	**0.000**	**85.741**
Max	**60.849**	**0.106**	**3.522**	**0.470**	**38.142**	**1.324**	**0.276**	**12.730**	**0.058**	**0.712**	**0.029**	**0.014**	**93.437**
SD	**4.418**	**0.031**	**0.965**	**0.105**	**2.851**	**0.295**	**0.061**	**2.039**	**0.015**	**0.148**	**0.008**	**0.004**	**1.706**

CAVM-50149-101
MI7018-MAR12
Sample Ro Tails
Cameca Quantitative Analysis
Laboratoire de Microanalyse - Universite Laval
Label : asulSGS2
Wed Apr 11 08:50:31 2012
Weight %

mdl(%)	*0.027*	*0.138*	*0.109*	*0.116*	*0.121*	*0.063*	*0.044*	*0.038*	*0.032*	
Pyrrhotite	S	Pb	Co	Fe	Ni	Cu	Zn	As	Mn	Total
Tail po	38.794	0.079	0.073	59.746	0.641	0.000	0.001	0.000	0.029	99.363
Tail po	39.050	0.112	0.000	59.996	0.518	0.027	0.064	0.001	0.012	99.780
Tail po	38.968	0.044	0.012	60.167	0.510	0.014	0.000	0.035	0.010	99.760
Tail po	38.658	0.073	0.000	59.734	0.596	0.051	0.018	0.000	0.013	99.143
Tail po	38.862	0.161	0.018	60.472	0.535	0.072	0.000	0.013	0.000	100.133
Tail po	39.697	0.176	0.050	59.528	0.588	0.000	0.010	0.007	0.007	100.063
Tail po	39.821	0.077	0.000	59.636	0.772	0.075	0.000	0.016	0.000	100.397
Tail po	39.918	0.077	0.011	60.270	0.775	0.000	0.000	0.025	0.010	101.086
Tail po	39.639	0.125	0.047	60.244	0.702	0.195	0.007	0.043	0.006	101.008
Tail po	39.277	0.099	0.019	60.149	1.190	0.000	0.005	0.026	0.001	100.766
Tail po	39.111	0.183	0.000	60.632	0.655	0.000	0.000	0.040	0.000	100.621
Tail po	39.082	0.079	0.036	60.409	0.698	0.031	0.000	0.000	0.000	100.335
Tail po	39.039	0.187	0.005	60.448	0.580	0.051	0.008	0.026	0.000	100.344
Tail po	39.236	0.097	0.000	61.044	0.600	0.017	0.000	0.013	0.000	101.007
Ave	**39.225**	**0.112**	**0.019**	**60.177**	**0.669**	**0.038**	**0.008**	**0.018**	**0.006**	**100.272**
Min	**38.658**	**0.044**	**0.000**	**59.528**	**0.510**	**0.000**	**0.000**	**0.000**	**0.000**	**99.143**
Max	**39.918**	**0.187**	**0.073**	**61.044**	**1.190**	**0.195**	**0.064**	**0.043**	**0.029**	**101.086**
SD	**0.396**	**0.047**	**0.023**	**0.422**	**0.172**	**0.053**	**0.017**	**0.015**	**0.008**	**0.608**

Label : miscmc
Wed Apr 11 20:45:48 2012
Geo Analysis : miscellaneo. based on 1 Oxygens
Compound Percents

mdl(%)	*0.034*	*0.123*	*0.023*	*0.086*	*0.028*	*0.021*	*0.037*	*0.122*	*0.047*	*0.052*	*0.027*	*0.012*	
CPX	SiO2	TiO2	Al2O3	Cr2O3	MgO	CaO	MnO	FeO	CoO	NiO	Na2O	K2O	Total
Tail cpx	54.438	0.169	0.920	0.209	16.875	24.148	0.121	3.796	0.029	0.016	0.266	0.000	100.987
Tail cpx	54.248	0.022	0.323	0.200	15.261	23.488	0.268	6.505	0.002	0.007	0.228	0.000	100.552
Tail cpx	54.183	0.000	0.594	0.023	12.735	24.907	0.107	9.130	0.000	0.019	0.278	0.000	101.976
Tail cpx	53.622	0.065	2.494	0.152	15.268	24.065	0.092	4.569	0.011	0.000	0.417	0.000	100.755
Tail cpx	53.384	0.754	1.631	0.440	16.709	23.124	0.092	4.160	0.000	0.047	0.459	0.000	100.800
Tail cpx	53.247	0.022	1.042	0.000	11.417	24.551	0.100	9.869	0.006	0.000	0.367	0.009	100.630
Tail cpx	53.139	0.587	1.341	0.042	15.794	21.432	0.265	8.051	0.000	0.008	0.380	0.003	101.042
Tail cpx	52.796	0.432	3.040	0.912	17.227	21.319	0.179	5.181	0.000	0.006	0.198	0.000	101.290
Tail cpx	52.627	0.048	0.514	0.161	12.449	20.636	0.372	12.760	0.000	0.035	0.364	0.000	99.966
Tail cpx	52.595	0.389	3.046	0.880	17.298	21.451	0.165	5.015	0.006	0.017	0.207	0.003	101.072
Tail cpx	52.454	0.524	2.971	1.108	17.444	21.279	0.095	4.573	0.000	0.047	0.214	0.000	100.709
Tail cpx	52.431	0.492	2.944	1.147	17.560	21.333	0.106	4.624	0.012	0.029	0.180	0.000	100.858
Tail am	51.204	0.369	1.578	0.039	10.333	24.467	0.235	12.602	0.000	0.000	0.199	0.000	101.026
Tail cpx	50.416	0.931	4.182	0.226	14.944	21.454	0.182	7.619	0.000	0.031	0.343	0.000	100.328
Tail am	50.091	0.573	2.289	0.032	11.654	22.849	0.238	11.013	0.018	0.035	0.133	0.013	98.938
Ave	**52.603**	**0.372**	**1.999**	**0.383**	**14.721**	**22.597**	**0.178**	**7.548**	**0.004**	**0.020**	**0.283**	**0.002**	**100.710**
Min	**50.091**	**0.000**	**0.323**	**0.000**	**10.333**	**20.636**	**0.092**	**3.796**	**0.000**	**0.000**	**0.133**	**0.000**	**98.938**
Max	**54.438**	**0.931**	**4.182**	**1.147**	**17.560**	**24.907**	**0.372**	**12.760**	**0.029**	**0.047**	**0.459**	**0.013**	**101.976**
SD	**1.305**	**0.294**	**1.160**	**0.419**	**2.495**	**1.488**	**0.085**	**3.127**	**0.009**	**0.017**	**0.099**	**0.004**	**0.668**

Chlorite	SiO2	TiO2	Al2O3	Cr2O3	MgO	CaO	MnO	FeO	CoO	NiO	Na2O	K2O	Total
Tail chl	38.515	0.016	8.516	0.000	29.702	0.065	0.186	11.339	0.000	0.088	0.009	0.055	88.491
Tail chl	37.624	0.047	10.353	0.048	28.558	0.024	0.082	11.816	0.006	0.062	0.019	0.607	89.246
Tail chl	37.225	0.005	11.416	0.048	31.546	0.008	0.081	8.143	0.000	0.120	0.009	0.000	88.601
Tail chl	37.037	0.000	11.083	0.042	32.125	0.006	0.100	8.370	0.000	0.156	0.000	0.008	88.927
Tail chl	36.694	0.052	9.842	0.016	26.829	0.185	0.195	12.580	0.000	0.024	0.012	0.044	86.473
Tail chl	36.478	0.073	10.356	0.000	26.619	0.145	0.229	12.947	0.000	0.292	0.001	0.126	87.266
Tail chl	36.059	2.388	11.920	0.538	25.356	0.021	0.101	9.482	0.000	0.096	0.012	3.308	89.281
Tail chl	35.712	0.058	9.586	1.344	30.202	0.044	0.060	10.142	0.000	0.110	0.000	0.004	87.262
Tail chl	34.875	0.037	11.605	0.009	29.523	0.021	0.148	11.755	0.001	0.059	0.019	0.000	88.052
Tail chl	28.358	0.000	23.606	0.000	20.613	0.269	0.802	14.249	0.000	0.001	0.011	0.002	87.911
Ave	**35.858**	**0.268**	**11.828**	**0.205**	**28.107**	**0.079**	**0.198**	**11.082**	**0.001**	**0.101**	**0.009**	**0.415**	**88.151**
Min	**28.358**	**0.000**	**8.516**	**0.000**	**20.613**	**0.006**	**0.060**	**8.143**	**0.000**	**0.001**	**0.000**	**0.000**	**86.473**
Max	**38.515**	**2.388**	**23.606**	**1.344**	**32.125**	**0.269**	**0.802**	**14.249**	**0.006**	**0.292**	**0.019**	**3.308**	**89.281**
SD	**2.824**	**0.745**	**4.266**	**0.433**	**3.411**	**0.090**	**0.220**	**2.007**	**0.002**	**0.081**	**0.007**	**1.033**	**0.934**

Amphibole	SiO2	TiO2	Al2O3	Cr2O3	MgO	CaO	MnO	FeO	CoO	NiO	Na2O	K2O	Total
Trem	57.999	0.000	0.042	0.066	21.361	13.646	0.089	4.836	0.015	0.032	0.014	0.017	98.117
Trem	57.823	0.000	0.885	0.000	22.520	13.185	0.119	4.047	0.000	0.000	0.136	0.030	98.745
Trem	56.328	0.016	0.286	0.023	25.473	11.214	0.110	3.530	0.008	0.061	0.022	0.022	97.093
Hnb	51.536	0.032	2.719	0.173	16.118	11.828	0.149	12.550	0.000	0.048	0.127	0.101	95.381
Hnb	50.252	0.080	6.568	0.039	20.169	10.955	0.144	7.698	0.000	0.035	0.845	0.083	96.868
Hnb	49.669	0.123	7.956	0.000	18.438	12.234	0.120	8.216	0.006	0.040	1.136	0.086	98.024
Ave	**53.935**	**0.042**	**3.076**	**0.050**	**20.680**	**12.177**	**0.122**	**6.813**	**0.005**	**0.036**	**0.380**	**0.057**	**97.371**
Min	**49.669**	**0.000**	**0.042**	**0.000**	**16.118**	**10.955**	**0.089**	**3.530**	**0.000**	**0.000**	**0.014**	**0.017**	**95.381**
Max	**57.999**	**0.123**	**7.956**	**0.173**	**25.473**	**13.646**	**0.149**	**12.550**	**0.015**	**0.061**	**1.136**	**0.101**	**98.745**
SD	**3.870**	**0.050**	**3.404**	**0.065**	**3.253**	**1.070**	**0.022**	**3.406**	**0.006**	**0.020**	**0.484**	**0.037**	**1.197**

Alteration phase	SiO2	TiO2	Al2O3	Cr2O3	MgO	CaO	MnO	FeO	CoO	NiO	Na2O	K2O	Total
serpentine?	54.979	0.011	0.802	0.033	29.483	0.064	0.089	6.791	0.000	0.083	0.024	0.004	92.363
Tail ser	42.536	0.010	3.969	0.000	29.777	0.108	0.184	11.315	0.000	0.075	0.000	0.018	87.992
Tail ser	42.104	0.000	2.749	0.000	29.920	0.111	0.296	12.637	0.008	0.050	0.010	0.048	87.933
Tail ser	41.915	0.000	0.416	0.006	37.697	0.027	0.057	7.494	0.017	0.137	0.019	0.000	87.785
Tail ser	41.732	0.021	1.851	0.118	34.299	0.085	0.186	9.870	0.010	0.075	0.004	0.000	88.251
Tail ser	41.635	0.005	1.074	0.029	37.108	0.032	0.075	8.815	0.000	0.151	0.027	0.000	88.951
Tail ser	41.611	0.000	0.506	0.000	36.505	0.013	0.060	8.807	0.000	0.152	0.000	0.006	87.660
Tail ser	41.536	0.079	3.574	0.367	28.666	0.065	0.235	11.840	0.000	0.038	0.015	0.020	86.435
Tail ser	41.500	0.037	4.372	0.117	29.218	0.135	0.218	11.607	0.000	0.092	0.013	0.015	87.324
Tail ser	41.325	0.021	3.552	0.184	30.751	0.053	0.190	11.211	0.001	0.009	0.272	0.215	87.784
Tail ser	40.883	0.058	5.761	0.025	28.034	0.130	0.194	11.590	0.012	0.443	0.009	0.031	87.170
Tail ser	40.360	0.026	2.516	0.000	32.774	0.082	0.160	10.584	0.018	0.406	0.016	0.005	86.947
Tail ser	40.089	0.000	4.928	0.010	32.758	0.201	0.133	9.838	0.001	0.109	0.020	0.005	88.092
Tail chl	40.061	0.000	6.878	0.045	30.061	0.093	0.163	10.684	0.000	0.083	0.014	0.032	88.114
Ave	**42.305**	**0.019**	**3.068**	**0.067**	**31.932**	**0.086**	**0.160**	**10.220**	**0.005**	**0.136**	**0.032**	**0.029**	**88.057**
Min	**40.061**	**0.000**	**0.416**	**0.000**	**28.034**	**0.013**	**0.057**	**6.791**	**0.000**	**0.009**	**0.000**	**0.000**	**86.435**
Max	**54.979**	**0.079**	**6.878**	**0.367**	**37.697**	**0.201**	**0.296**	**12.637**	**0.018**	**0.443**	**0.272**	**0.215**	**92.363**
SD	**3.722**	**0.024**	**2.016**	**0.103**	**3.290**	**0.050**	**0.070**	**1.715**	**0.007**	**0.129**	**0.070**	**0.056**	**1.384**

Mineralogical Report

MINERALOGICAL INVESTIGATION OF THE DEPORTMENT OF PLATINUM AND PALLADIUM MINERALS IN TWO LOCKED CYCLE TEST TAILS FROM THE WELLGREEN METALLURGICAL TEST PROGRAM

Prepared for Mike Ounpuu and Danniel Oosterman
For:
Prophecy Platinum Corp.

By Giovanni Di Prisco

July 9, 2012

Project : TerraMS- 12JUL-001 – Wellgreen –LCT Tail Platinum-Palladium Minerals Deportment

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SUMMARY

The present document reports information concerning the deportment of Platinum- and Palladium-bearing particles encountered in two tail products (Test LCT-1) generated from the Wellgreen ore from the Prophecy Platinum Yukon project metallurgical test program. The main scope of the present mineralogy examination was to determine the PGE mineral mode of occurrence and gangue associations, with a secondary objective of outlining the broad PGE mineral families observed.

A total of ninety- four and nineteen PGE particles were identified in the Nickel 1st Cleaner tail and Nickel Scavenger Tail samples, respectively.

Two broad categories of PGE minerals were identified. Platinum was identified only in sperrylite ($PtAs_2$, abbreviation Pt-As), whereas Palladium was encountered in a series of Palladium-Antimonite and Palladium (+/- Sb, Ni) telluride. Finally one grain of auro-cuprite (?) was also observed in the Ni 1st Cleaner tail sample.

PGE minerals predominately occur as liberated particles in the Nickel 1st Cleaner tail. In contrast, only minor amounts of liberated grains (all of them sperrylite) are deported to the Nickel Scavenger tail, whereas the bulk of PGE minerals reports to this tail sample as inclusions or intergrown with gangue minerals.

Most of the non-liberated PGE minerals occurring in the Nickel 1st Cleaner Tail are intergrown with pyrrhotite and only minor amounts are associated with magnetite or silicate gangue. In the Nickel Scavenger tail, two-thirds of the PGE minerals are also intergrown with sulphide (chiefly pyrrhotite), yet approximately 21% are also associated with silicate gangue.

The entire group of identified PGE mineral grains present re-calculated diameters that can be best described as extremely fine grained. Most grains are less than 3 µm in diameter with an average diameter not exceeding 1.5 µm.

Terra Mineralogical Services Inc.
July 9, 2011

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Consulting Geologist – Mineralogist

INTRODUCTION

The present document reports information concerning the deportment of Platinum- and Palladium-bearing particles encountered in one 1st Cleaner Tail and one Scavenger Tail sample (Table 1). These tail samples were generated from Locked Cycle Test 1(LCT 01), performed March 14, 2012, to test ore mineralization originating from workings located in the East zone of the Wellgreen Copper-Nickel PGE deposit of Prophecy Platinum, located in Southwestern Yukon.

The main scope of the present mineralogy examination was to determine the PGE mineral mode of occurrence and gangue associations, with a secondary objective of outlining the broad PGE mineral families observed.

Table 1. Examined Tail Samples*							
	Assays, %				Assays g/ t		
	Cu	Ni	S	Fe	Pt	Pd	Au
Ni 1st Cleaner Tail (**)	0.13	0.48	7.48	18.5	1.02	0.61	0.05
Ni Scavenger Tail(**)	0.03	0.13	1.15	10.4	0.22	0.09	0.02

*: Analyses carried out at SGS geochemistry laboratories
(**): combined cycles E, F, G

Approximately 34.7% Platinum and 21.0% Palladium are deported to the Nickel 1st Cleaner Tail of LCT1; whereas 40.7% of the Platinum and 16.9%, of the Palladium report to the Nickel Scavenger tail of LCT1. Thus, considerable amounts of these two elements are lost to these tailings streams.

METHODOLOGY

A group of five polished sections was prepared for each tail sample. The entire surface of each section was scanned to identify PGE-bearing minerals and associated gangue phases.

The sections were scanned for PGE mineral occurrences using SEM-EDX. The SEM scans were performed using the ASPEX eXplorer Scanning Electron Microscope fitted with automatic stage movement and the Automatic Feature Analysis (AFA) software set to recognize precious metal grains. The SEM-EDX recognition software collected a series of physical parameters for each particle of interest, in particular the maximum width and length of PGE particles and the total area of each precious metal grain. In addition, standard ore microscopy scans and manual SEM-EDS scans were also performed on selected areas of some sections, and additional very fine grained particles might have been detected and measured. In these instances, a normalized width and length was collected for each grain. For irregularly shaped grains, a “best fit” width and length was attributed to calculate the area of the grains.

In addition to PGE mineral grain dimensions, other information recorded includes the mode of occurrence of PGE particles, and associated minerals. Information for each identified PGE grain was reported in data tables. Codes for the different modes of occurrence of PGE-bearing particles occurring in metallurgical products are presented in Table 2, and illustrated in Figure 1. A succinct list of mineral abbreviations that might have been used is presented in Table 3.

Table 2 - Precious Metal Grains - Mode of Occurrence	Code
inclusion in	1
at grain boundaries/included in	2
along fracture/ veinlets in	3
at mineral grain boundaries	4
attached to, or exposed	5
liberated	6

Figure 1. Mode of Occurrence of Precious Metal Grains

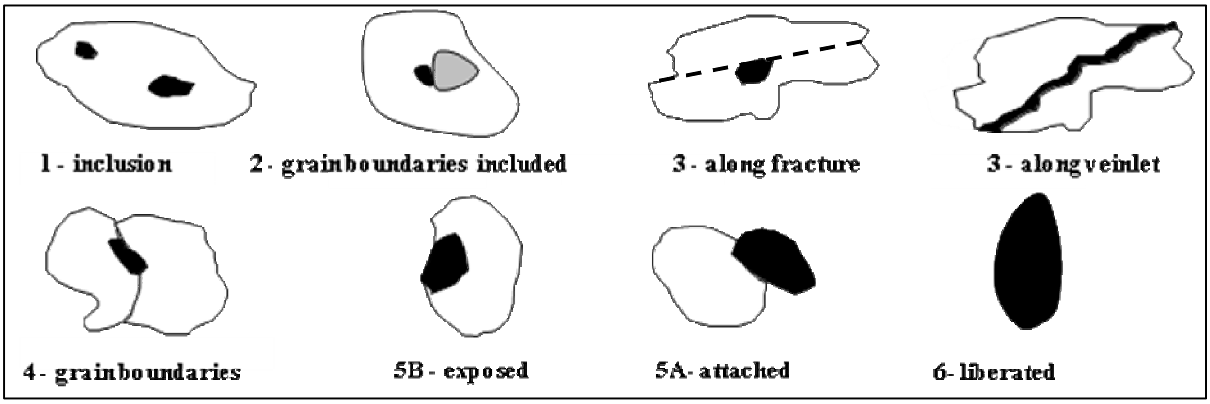


Table 3. List of Mineral Abbreviations

carbonate	:	crb	magnetite	:	mt
chalcopyrite	:	cp	pentlandite	:	ptn
chlorite	:	chl	Platinum Group Elements:		PGE
galena	:	ga	pyrite	:	py
Iron Oxide	:	Fe-Ox	pyrrhotite	:	po
Iron oxi-hydroxide	:	Fe-O-OH	quartz	:	qtz
hematite	:	hem	rutile	:	rut
non-opaque gangue	:	nop	sperrylite	:	spy
			sulphides	:	sul

SUMMARY OF OBSERVATIONS

Nickel 1st Cleaner Tail Cycle G – Locked Cycle Test 01 - Wellgreen deposit

	Assays, %				Assays g/ t		
	Cu	**Ni**	**S**	**Fe**	**Pt**	**Pd**	**Au**
Ni 1st Cleaner Tail	0.13	0.48	7.48	18.5	1.02	0.61	0.05

Data from the entire set of PGE minerals identified in the Nickel 1st Cleaner Tail-G sample are presented in Appendix 1, whereas a series of BSE images illustrating pertinent features are presented in Appendix 3. A summary of the types of PGE minerals and other precious metal particles is presented in Table 4, whereas the distribution of the mode of occurrence of these particles is presented in Table 5.

Table 4. Ni Cln 1st Tail- Type of PGE Minerals

Precious Metal	Code	Vol % Distribution
Auro-Cuprite	Au1	0.5
Paladium Antimonite	Pd-Sb	5.1
Palladium (+/-Sb+/-Ni)-Telluride	Pd-Sb(Ni)-Te	24.2
sperrylite	Pt-As	70.1

Table 5. Ni 1st Cln Tail- Mode of Occurrence of PGE Minerals

Precious Metal	Code	Vol % Distribution
inclusion	1	2.1
at grain boundaries	4	16.8
attached/ exposed	5	23.8
liberated	6	57.3

A total of ninety-four PGE particles and one gold particle were identified. Sperryllite (Pt-As) is the main PGE mineral in this tail sample (~ 70 vol %), whereas unclassified Pd phases (Pd Antimonite and Pd tellurides) account for approximately 30% of the PGE minerals observed. Finally, one occurrence of auro- cuprite (?) was also identified.

The majority of the identified PGE particles occur as minute liberated grains (~ 57 vol%), however the degree of liberation of sperrylite grains (~ 61% liberated) is markedly higher than the degree of liberation of Palladium-bearing particles (~ 48% liberated). In contrast, very few grains were entirely locked as minute inclusions. Most of the PGE minerals that are not liberated are chiefly intergrown with pyrrhotite, and a few with magnetite, or silicate gangue.

The entire group of identified particles possess a re-calculated grain size diameter of less than 4.6 µm; only five of the ninety-five identified particles present a diameter coarser than 3 µm. The overall average for these particles is 1.5 µm.

Nickel Scavenger Tail Cycle G – Locked Cycle Test 01 - Wellgreen deposit

	Assays, %				Assays g/ t		
	Cu	**Ni**	**S**	**Fe**	**Pt**	**Pd**	**Au**
Ni Scavenger Tail	0.03	0.13	1.15	10.4	0.22	0.09	0.02

Data from the entire set of PGE minerals identified in the Nickel Scavenger Tail-G sample are presented in Appendix 2, whereas a series of BSE images illustrating pertinent features are presented in Appendix 3. A summary of the types of PGE minerals and other precious metal particles is presented in Table 6, whereas the distribution of the mode of occurrence of these particles is presented in Table 7.

Table 6. Ni Scavenger Tail- Type of PGE Minerals

Precious Metal	Code	Vol % Distribution
Paladium Antimonite	Pd-Sb	0.3
Palladium (+/-Sb+/-Ni)-Telluride	Pd-Sb(Ni)-Te	56.0
sperrylite	Pt-As	43.7

Table 7. Ni Scavenger Tail- Mode of Occurrence of PGE Minerals

Precious Metal	Code	Vol % Distribution
inclusion	1	25.9
at grain boundaries	4	17.6
attached/ exposed	5	44.2
liberated	6	12.3

In this Scavenger Tail sample, a total of nineteen PGE particles were identified. Unclassified Pd phases (Pd Antimonite and Pd tellurides) account for approximately 56 vol% of the grains identified and sperryllite (Pt-As) the remaining 44 vol%.

A minor amount of particles occurs as liberated grains (~12 vol%), all of which sperrylite. In contrast, PGE minerals deported to this scavenger tail are chiefly intergrown with gangue minerals, and occur as inclusions (~ 26%), at grain boundaries (~ 17.5%), and attached to gangue minerals (~ 44%). Approximately two third of the non liberated particles (~ 66.4 vol %) are intergrown with sulphide minerals (by far mainly pyrrhotite), whereas approximately 17.2% occur intergrown with silicate gangue, and another 4.1% at silicate gangue sulphide mineral contacts.

The entire group of particles identified in this Scavenger Tail also possess re-calculated grain size diameters of less than 4 µm; only two particles present a diameter coarser than 3 µm. The overall average for these particles is 1.3 µm.

Appendix 1.

List of PGE Occurrences in Ni 1st Cleaner Tail G

Ni 1st Cleaner Tail G- LCT1

	Type	Mode Occu	Gangue	AREA	d
1	Au1	5	ptn	1.3	1.3
2	Pd-Sb	1	po	0.7	1.0
3	Pd-Sb	4	po	0.28	0.6
4	Pd-Sb	5	po	0.2	0.4
5	Pd-Sb	5	po	2.2	1.7
6	Pd-Sb	6		0.3	0.6
7	Pd-Sb	6		0.4	0.7
8	Pd-Sb	6		0.7	0.9
9	Pd-Sb	6		0.8	1.0
10	Pd-Sb	6		1.7	1.5
11	Pd-Sb	6		1.8	1.5
12	Pd-Sb	6		3	2.0
13	Pd-Sb(Ni)-Te	4	po	6.3	2.8
14	Pd-Sb(Ni)-Te	5	po	3.2	2.0
15	Pd-Sb(Ni)-Te	5	po	4.2	2.3
16	Pd-Sb(Ni)-Te	5	po	5.5	2.6
17	Pd-Sb(Ni)-Te	6		1.7	1.5
18	Pd-Sb(Ni)-Te	6		2.8	1.9
19	Pd-SbTe	1	po	4.1	2.3
20	Pd-Sb-Te	4	po	0.8	1.0
21	Pd-Sb-Te	4	po	6.2	2.8
22	Pd-Sb-Te	5	po	0.4	0.7
23	Pd-Sb-Te	5	po	0.8	1.0
24	Pd-Sb-Te	5	po	0.8	1.0
25	Pd-Sb-Te	6		0.3	0.6
26	Pd-Sb-Te	6		0.3	0.6
27	Pd-Sb-Te	6		0.4	0.7
28	Pd-Sb-Te	6		1.6	1.4
29	Pd-Sb-Te	6		2.4	1.8
30	Pd-Sb-Te	6		2.6	1.8
31	Pd-Sb-Te	6		3.2	2.0
32	Pd-Sb-Te	6		3.5	2.1
33	Pd-Sb-Te	6		5.8	2.7
34	Pt-As	4	po	0.6	0.9
35	Pt-As	4	sil, po	5.6	2.7
36	Pt-As	4	sil, po	9.2	3.4
37	Pt-As	4	sil, po	10.8	3.7
38	Pt-As	5	Fe-Ox	0.24	0.6
39	Pt-As	5	Fe-Ox	0.4	0.7
40	Pt-As	5	Fe-Ox	6.8	2.9
41	Pt-As	5	Fe-Ox	14.4	4.3
42	Pt-As	5	po	0.4	0.7
43	Pt-As	5	po	0.55	0.8
44	Pt-As	5	po	0.9	1.1
45	Pt-As	5	po	1.3	1.3
46	Pt-As	5	po	1.4	1.3
47	Pt-As	5	po	1.7	1.5
48	Pt-As	5	po	2.6	1.8

49	**Pt-As**	5	po	3.8	**2.2**
50	**Pt-As**	5	sil, po	3.1	**2.0**
51	**Pt-As**	6		0.2	**0.5**
52	**Pt-As**	6		0.2	**0.6**
53	**Pt-As**	6		0.2	**0.5**
54	**Pt-As**	6		0.2	**0.6**
55	**Pt-As**	6		0.3	**0.6**
56	**Pt-As**	6		0.3	**0.6**
57	**Pt-As**	6		0.3	**0.6**
58	**Pt-As**	6		0.3	**0.6**
59	**Pt-As**	6		0.4	**0.7**
60	**Pt-As**	6		0.5	**0.8**
61	**Pt-As**	6		0.6	**0.9**
62	**Pt-As**	6		0.6	**0.9**
63	**Pt-As**	6		0.6	**0.9**
64	**Pt-As**	6		0.7	**0.9**
65	**Pt-As**	6		0.8	**1.0**
66	**Pt-As**	6		0.8	**1.0**
67	**Pt-As**	6		0.9	**1.1**
68	**Pt-As**	6		0.9	**1.1**
69	**Pt-As**	6		1	**1.1**
70	**Pt-As**	6		1.1	**1.2**
71	**Pt-As**	6		1.2	**1.2**
72	**Pt-As**	6		1.2	**1.2**
73	**Pt-As**	6		1.2	**1.2**
74	**Pt-As**	6		1.3	**1.3**
75	**Pt-As**	6		1.3	**1.3**
76	**Pt-As**	6		1.4	**1.4**
77	**Pt-As**	6		1.5	**1.4**
78	**Pt-As**	6		1.7	**1.5**
79	**Pt-As**	6		1.9	**1.6**
80	**Pt-As**	6		1.9	**1.6**
81	**Pt-As**	6		2	**1.6**
82	**Pt-As**	6		2	**1.6**
83	**Pt-As**	6		2.3	**1.7**
84	**Pt-As**	6		2.4	**1.8**
85	**Pt-As**	6		2.6	**1.8**
86	**Pt-As**	6		3.5	**2.1**
87	**Pt-As**	6		3.7	**2.2**
88	**Pt-As**	6		4.6	**2.4**
89	**Pt-As**	6		4.9	**2.5**
90	**Pt-As**	6		5.4	**2.6**
91	**Pt-As**	6		5.7	**2.7**
92	**Pt-As**	6		6	**2.8**
93	**Pt-As**	6		6.2	**2.8**
94	**Pt-As**	6		8.4	**3.3**
95	**Pt-As**	6		16.2	**4.5**

Appendix2.

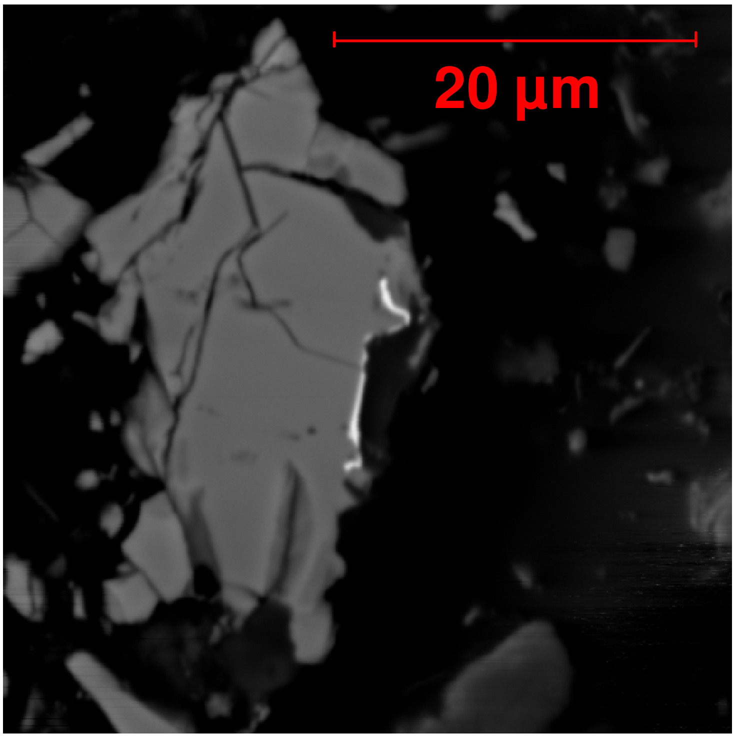
List of PGE Occurrences in Ni Scavenger Tail G

Ni Scavenger Tail G- LCT1

	Type	Mode Occu	Gangue	AREA	d
1	**Pd-Sb**	5	ptn, po, sil	0.1	**0.3**
2	**Pd-Sb(Ni)-Te**	1	po	0.4	**0.7**
3	**Pd-Sb(Ni)-Te**	1	po	7.4	**3.1**
4	**Pd-Sb(Ni)-Te**	4	sil	0.5	**0.8**
5	**Pd-Sb(Ni)-Te**	5	po	1.4	**1.3**
6	**Pd-Sb(Ni)-Te**	5	po	10.7	**3.7**
7	**Pt-As**	1	po	1.6	**1.4**
8	**Pt-As**	4	cp, po, sil	1.4	**1.3**
9	**Pt-As**	4	sil	0.1	**0.3**
10	**Pt-As**	4	sil	1	**1.1**
11	**Pt-As**	4	sil	1.4	**1.3**
12	**Pt-As**	4	sil	2	**1.6**
13	**Pt-As**	5	po	2.7	**1.9**
14	**Pt-As**	5	sil	1.3	**1.3**
15	**Pt-As**	6		0.5	**0.8**
16	**Pt-As**	6		0.8	**1**
17	**Pt-As**	6		0.9	**1.1**
18	**Pt-As**	6		1	**1.1**
19	**Pt-As**	6		1.3	**1.3**

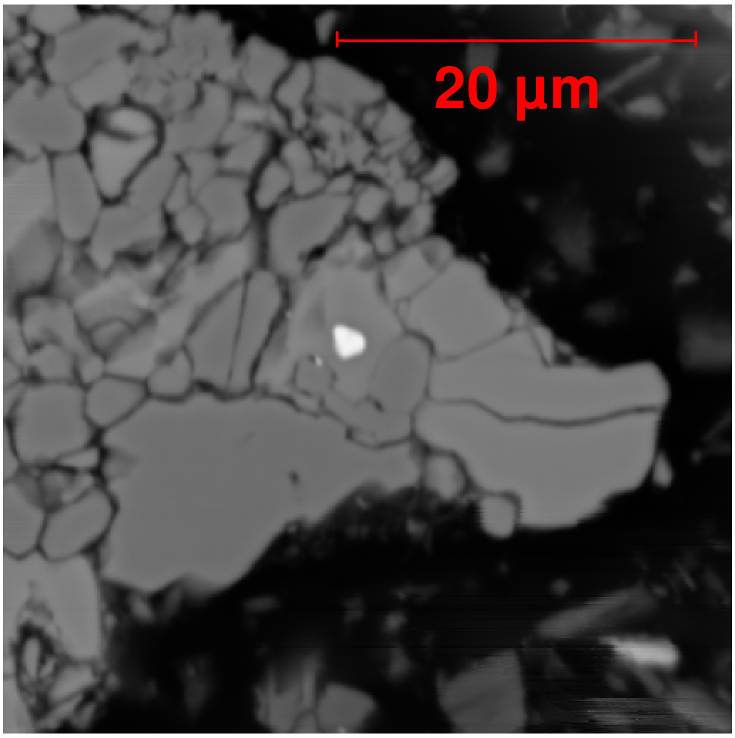
APPENDIX 3

Wellgreen Cleaner 1st Tail and Scavenger Tail
BSE Images
PGE Mineral Occurrences



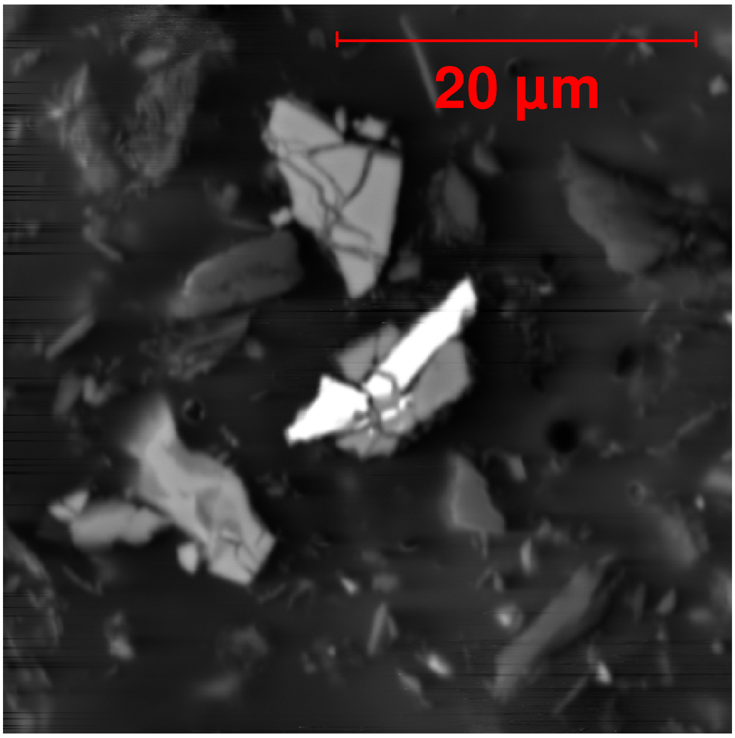
Ni Cln 1st Tail

Sperrylite (Pt-As) attached to pyrrhotite



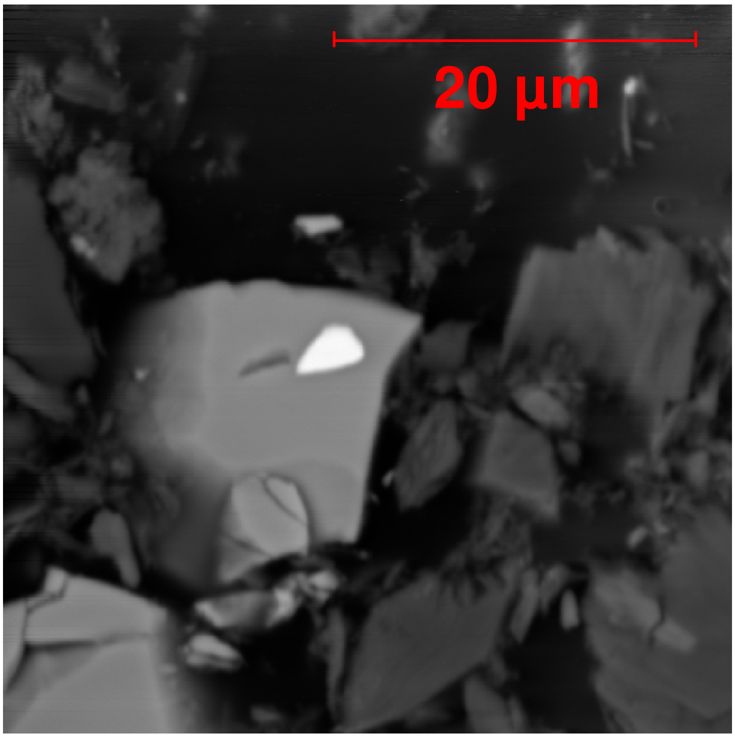
Ni Cln 1st Tail

Pd-Sb inclusion in pyrrhotite



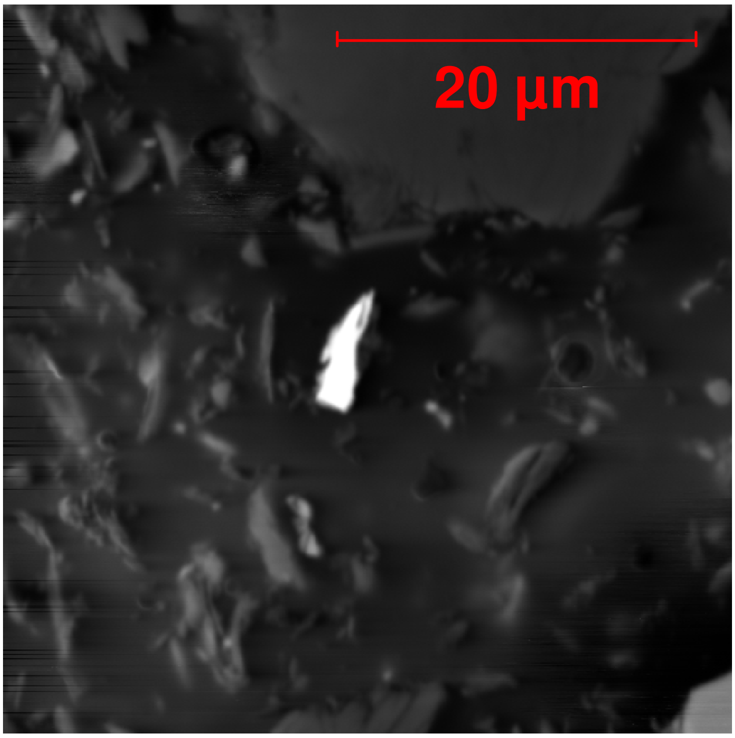
Ni Cln 1st Tail

Sperrylite (Pt-As) intergrown with magnetite



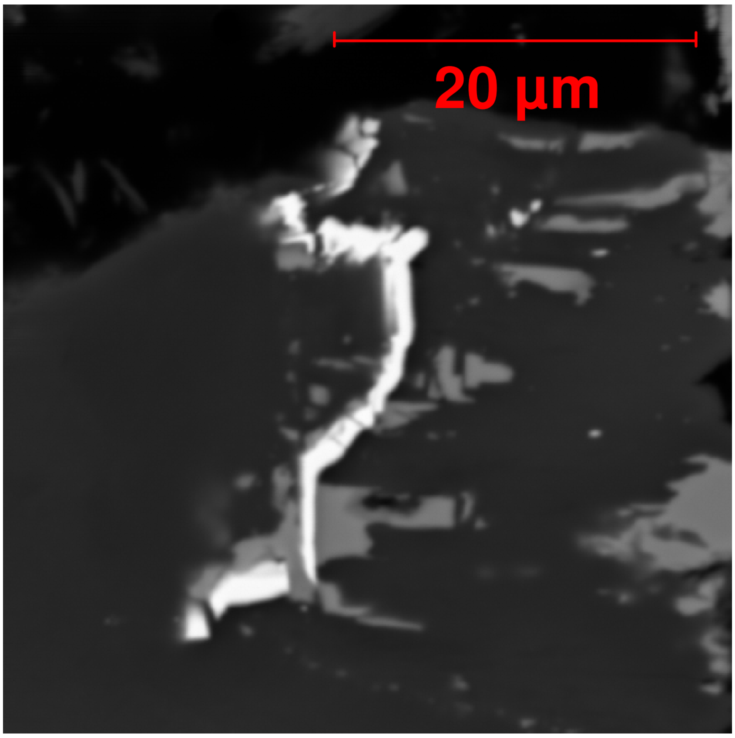
Ni Cln 1st Tail

Pd-Sb-Te inclusion in pyrrhotite



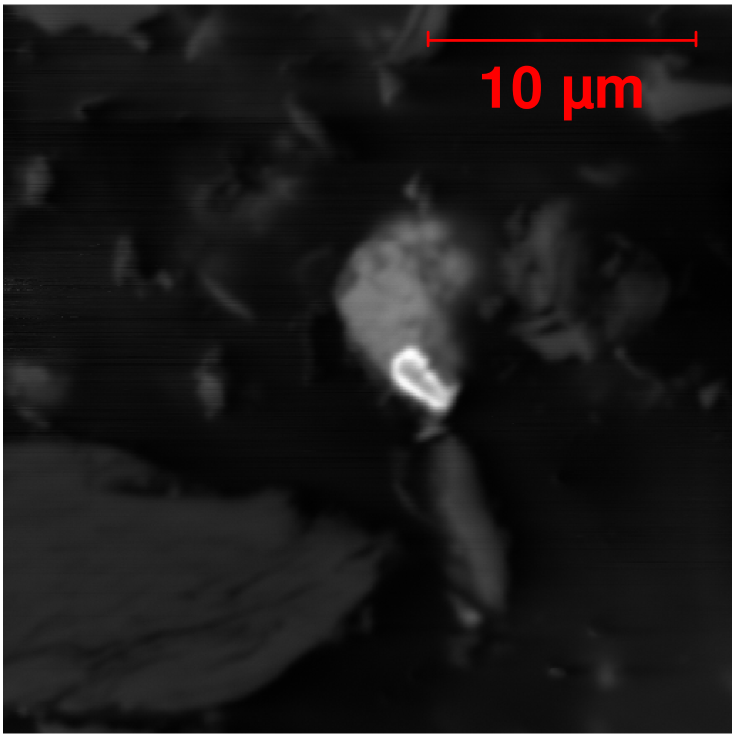
Ni Cln 1st Tail

Liberated particle of sperrylite (Pt-As)



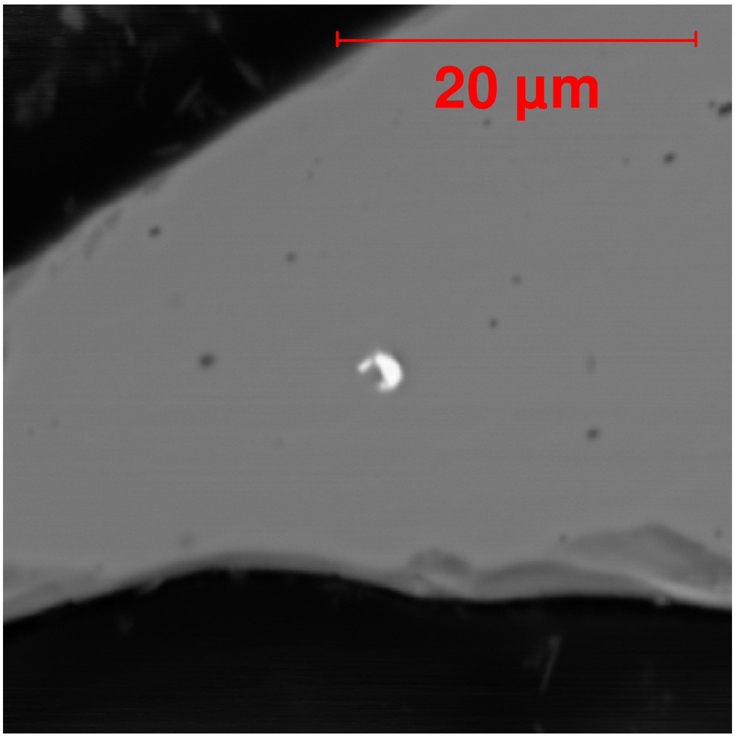
Ni Cln 1st Tail

Thin sperrylite (Pt-As) interstitial phase occurring at grain boundaries of quartz and pyrrhotite



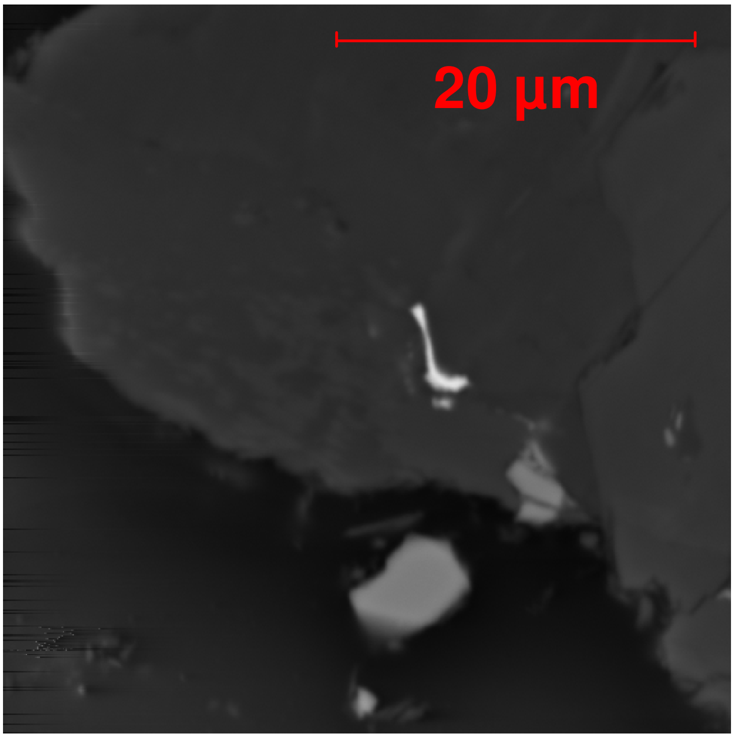
Ni Cln 1st Tail

Auro- cuprite (bright grain) attached to a particle of pentlandite



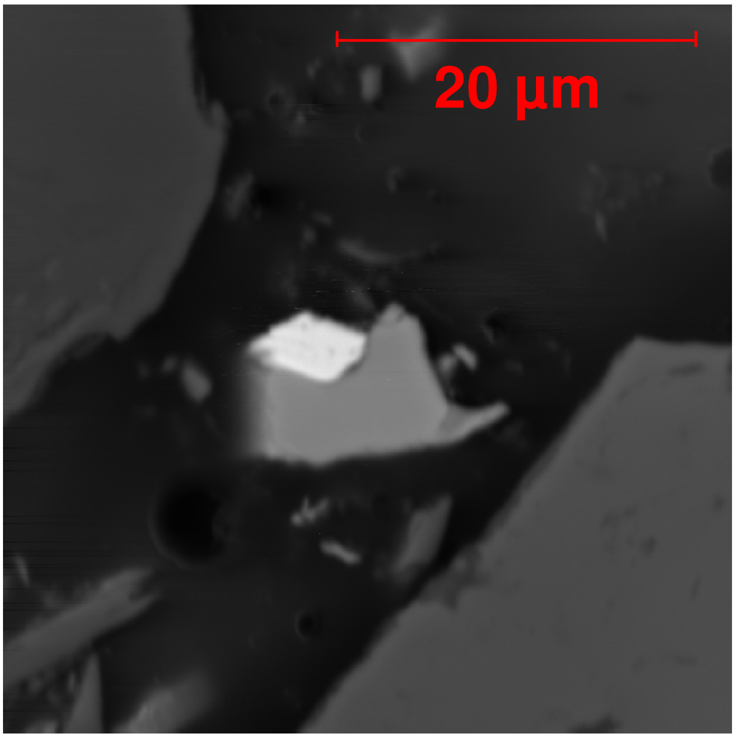
Ni Scavenger Tail G

Minute inclusion of sperrylite (Pt-As) in pyrrhotite



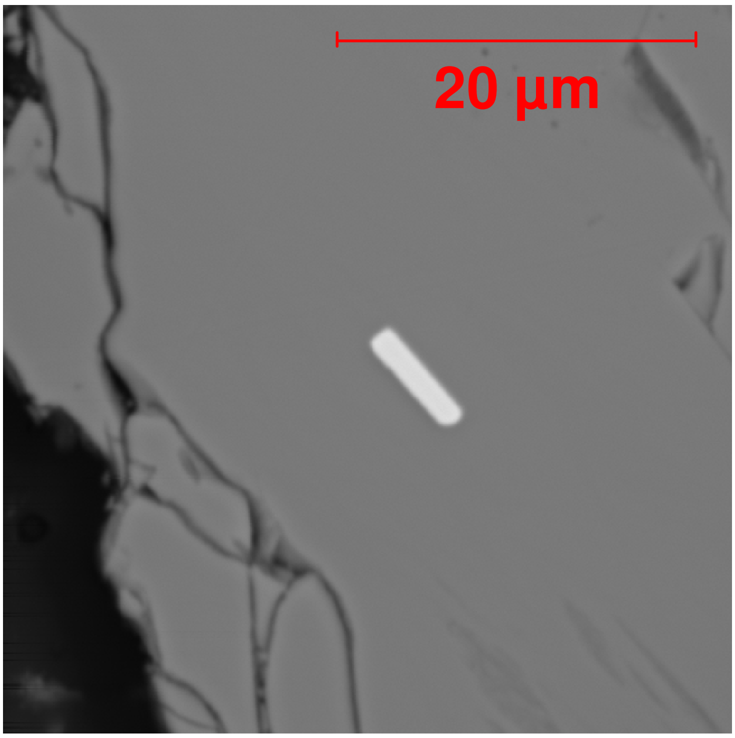
Ni Scavenger Tail G

Thin layer of interstitial sperrylite (Pt-As) at silicate grain boundaries



Ni Scavenger Tail G

Pt-Sb-Te attached to pentlandite



Ni Scavenger Tail G

Euhedral grain of Pt-Sb-Ni-Te occurring as inclusion in pyrrhotite

APPENDIX D

MINING

APPENDIX D: MINING

1.1 PIT OPTIMIZATION

Table 1 Optimization Results of Nested Pits

LG Phase	Revenue Factor (%)	Mineralized Material ('000 t)	Waste Rock ('000 t)	Strip Ratio (t:t)	Ni Grade (%)	Cu Grade (%)	Co Grade (%)	Au Grade (g/t)	Pt Grade (g/t)	Pd Grade (g/t)
Pit Shell 1	10	745	271	0.36	0.64	0.34	0.03	0.46	1.44	0.99
Pit Shell 2	12	1,936	430	0.22	0.52	0.29	0.02	0.40	0.99	0.77
Pit Shell 3	14	2,166	516	0.24	0.53	0.31	0.03	0.39	0.95	0.73
Pit Shell 4	16	4,166	1,369	0.33	0.50	0.31	0.03	0.34	0.74	0.59
Pit Shell 5	18	120,122	149,781	1.25	0.40	0.27	0.03	0.26	0.50	0.50
Pit Shell 6	20	131,624	171,328	1.30	0.41	0.28	0.03	0.26	0.49	0.49
Pit Shell 7	22	151,175	236,895	1.57	0.42	0.30	0.03	0.26	0.50	0.48
Pit Shell 8	24	216,051	363,019	1.68	0.39	0.31	0.03	0.24	0.50	0.44
Pit Shell 9	26	227,694	396,710	1.74	0.39	0.32	0.03	0.24	0.50	0.44
Pit Shell 10	28	244,311	478,384	1.96	0.39	0.33	0.03	0.24	0.50	0.43
Pit Shell 11	30	253,275	498,979	1.97	0.39	0.32	0.03	0.24	0.50	0.43
Pit Shell 12	32	262,749	546,521	2.08	0.39	0.33	0.03	0.24	0.50	0.43
Pit Shell 13	34	271,321	559,908	2.06	0.38	0.32	0.03	0.24	0.50	0.42
Pit Shell 14	36	278,226	575,757	2.07	0.38	0.32	0.03	0.23	0.50	0.42
Pit Shell 15	38	283,674	584,714	2.06	0.38	0.32	0.03	0.23	0.49	0.42
Pit Shell 16	40	299,182	629,343	2.10	0.37	0.31	0.03	0.23	0.48	0.41
Pit Shell 17	42	328,696	741,693	2.26	0.36	0.30	0.03	0.21	0.47	0.40
Pit Shell 18	44	367,796	853,852	2.32	0.35	0.29	0.03	0.20	0.45	0.38
Pit Shell 19	46	380,300	876,048	2.30	0.35	0.28	0.02	0.19	0.44	0.38
Pit Shell 20	48	393,773	904,784	2.30	0.34	0.28	0.02	0.19	0.43	0.37
Pit Shell 21	50	398,884	918,105	2.30	0.34	0.28	0.02	0.19	0.43	0.37
Pit Shell 22	52	408,572	950,182	2.33	0.34	0.27	0.02	0.18	0.43	0.36
Pit Shell 23	54	418,127	992,115	2.37	0.33	0.27	0.02	0.18	0.42	0.36
Pit Shell 24	56	422,142	1,002,273	2.37	0.33	0.27	0.02	0.18	0.42	0.36
Pit Shell 25	58	430,523	1,020,565	2.37	0.33	0.27	0.02	0.18	0.42	0.36
Pit Shell 26	60	438,234	1,047,803	2.39	0.33	0.26	0.02	0.18	0.41	0.35
Pit Shell 27	62	439,376	1,049,816	2.39	0.33	0.26	0.02	0.18	0.41	0.35
Pit Shell 28	64	452,485	1,080,922	2.39	0.32	0.26	0.02	0.17	0.41	0.35
Pit Shell 29	66	458,405	1,095,660	2.39	0.32	0.26	0.02	0.17	0.40	0.34

table continues…

LG Phase	Revenue Factor (%)	Mineralized Material ('000 t)	Waste Rock ('000 t)	Strip Ratio (t:t)	Ni Grade (%)	Cu Grade (%)	Co Grade (%)	Au Grade (g/t)	Pt Grade (g/t)	Pd Grade (g/t)
Pit Shell 30	68	467,364	1,137,398	2.43	0.32	0.25	0.02	0.17	0.40	0.34
Pit Shell 31	70	474,781	1,148,702	2.42	0.32	0.25	0.02	0.17	0.39	0.34
Pit Shell 32	72	478,428	1,168,895	2.44	0.32	0.25	0.02	0.17	0.39	0.33
Pit Shell 33	74	484,413	1,179,067	2.43	0.31	0.25	0.02	0.16	0.39	0.33
Pit Shell 34	76	486,026	1,187,315	2.44	0.31	0.25	0.02	0.16	0.39	0.33
Pit Shell 35	78	488,110	1,195,453	2.45	0.31	0.25	0.02	0.16	0.39	0.33
Pit Shell 36	80	492,359	1,214,952	2.47	0.31	0.25	0.02	0.16	0.39	0.33
Pit Shell 37	82	492,983	1,218,222	2.47	0.31	0.25	0.02	0.16	0.39	0.33
Pit Shell 38	84	494,889	1,232,120	2.49	0.31	0.24	0.02	0.16	0.38	0.33
Pit Shell 39	86	497,997	1,263,407	2.54	0.31	0.25	0.02	0.16	0.38	0.33
Pit Shell 40	88	498,471	1,265,335	2.54	0.31	0.24	0.02	0.16	0.38	0.33
Pit Shell 41	90	499,653	1,270,911	2.54	0.31	0.24	0.02	0.16	0.38	0.33
Pit Shell 42	92	501,192	1,288,429	2.57	0.31	0.24	0.02	0.16	0.38	0.33
Pit Shell 43	94	501,995	1,299,467	2.59	0.31	0.24	0.02	0.16	0.38	0.33
Pit Shell 44	96	502,750	1,308,127	2.60	0.31	0.24	0.02	0.16	0.38	0.33
Pit Shell 45	98	503,032	1,311,944	2.61	0.31	0.24	0.02	0.16	0.38	0.33
Pit Shell 46	100	504,375	1,336,980	2.65	0.31	0.24	0.02	0.16	0.38	0.33
Pit Shell 47	102	504,404	1,337,361	2.65	0.31	0.24	0.02	0.16	0.38	0.33
Pit Shell 48	104	505,279	1,344,494	2.66	0.31	0.24	0.02	0.16	0.38	0.33
Pit Shell 49	106	511,971	1,456,737	2.85	0.31	0.25	0.02	0.16	0.38	0.32
Pit Shell 50	108	513,152	1,469,841	2.86	0.31	0.25	0.02	0.16	0.38	0.32
Pit Shell 51	110	513,219	1,470,274	2.86	0.31	0.25	0.02	0.16	0.38	0.32
Pit Shell 52	112	514,006	1,487,558	2.89	0.31	0.25	0.02	0.16	0.38	0.32
Pit Shell 53	114	514,686	1,496,165	2.91	0.30	0.25	0.02	0.16	0.38	0.32
Pit Shell 54	118	515,191	1,506,523	2.92	0.30	0.25	0.02	0.16	0.38	0.32
Pit Shell 55	120	515,206	1,506,593	2.92	0.30	0.25	0.02	0.16	0.38	0.32
Pit Shell 56	122	515,580	1,511,463	2.93	0.30	0.25	0.02	0.16	0.38	0.32
Pit Shell 57	124	515,590	1,511,617	2.93	0.30	0.25	0.02	0.16	0.38	0.32
Pit Shell 58	126	517,124	1,545,160	2.99	0.30	0.25	0.02	0.16	0.38	0.32
Pit Shell 59	136	517,165	1,546,282	2.99	0.30	0.25	0.02	0.16	0.38	0.32
Pit Shell 60	138	517,178	1,546,423	2.99	0.30	0.25	0.02	0.16	0.38	0.32
Pit Shell 61	140	517,207	1,547,585	2.99	0.30	0.25	0.02	0.16	0.38	0.32
Pit Shell 62	142	517,341	1,548,764	2.99	0.30	0.25	0.02	0.16	0.38	0.32
Pit Shell 63	144	519,195	1,610,064	3.10	0.30	0.25	0.02	0.16	0.38	0.32
Pit Shell 64	146	519,899	1,621,949	3.12	0.30	0.25	0.02	0.16	0.38	0.32
Pit Shell 65	148	520,587	1,631,467	3.13	0.30	0.25	0.02	0.16	0.38	0.32
Pit Shell 66	150	520,599	1,631,943	3.13	0.30	0.25	0.02	0.16	0.38	0.32

1.2 MINE DESIGN AND SCHEDULING

Figure 1 Ramp Width Design – Concept

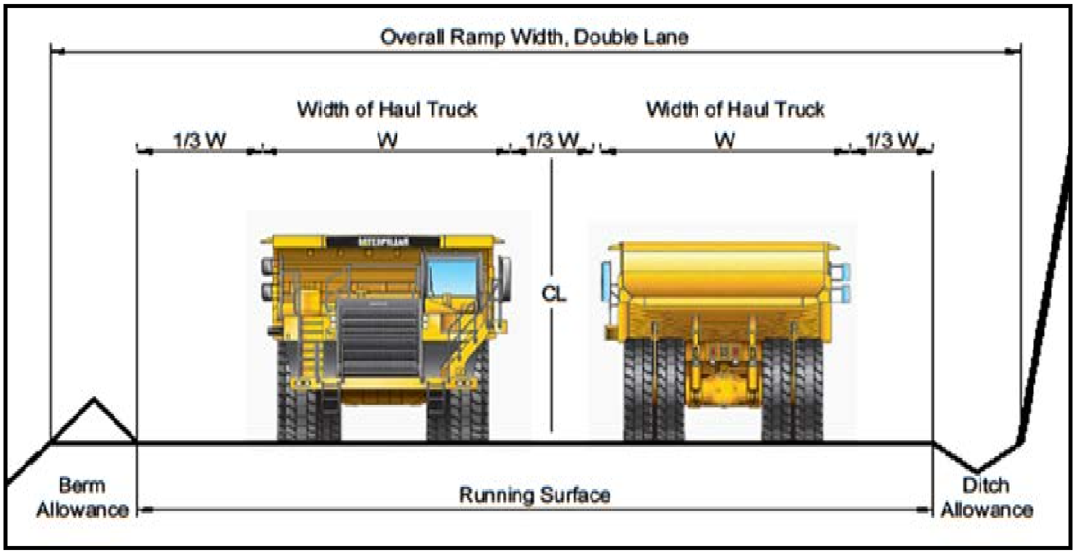


Figure 2 Minimum Pushback Width – Concept

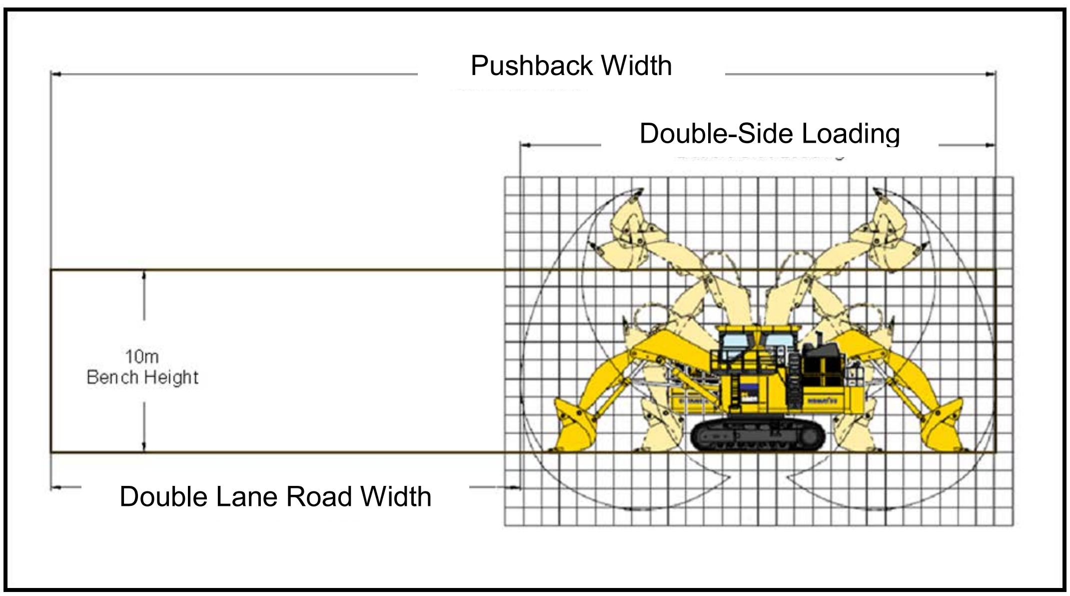


Figure 3 Overall Ultimate Pit Production Schedule

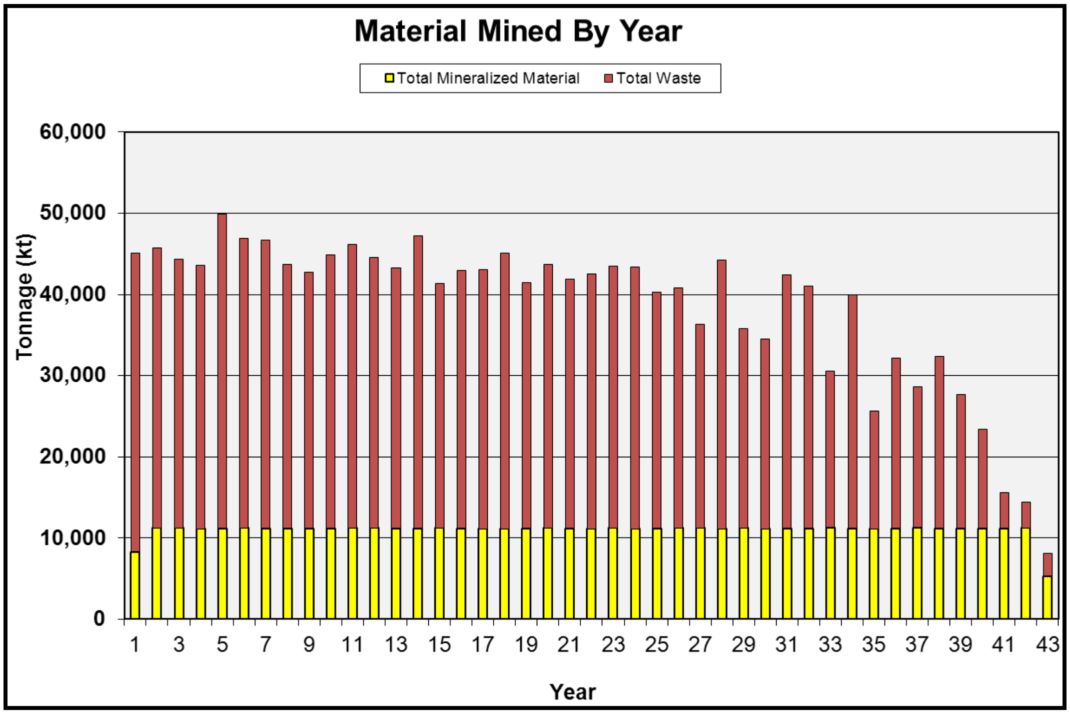
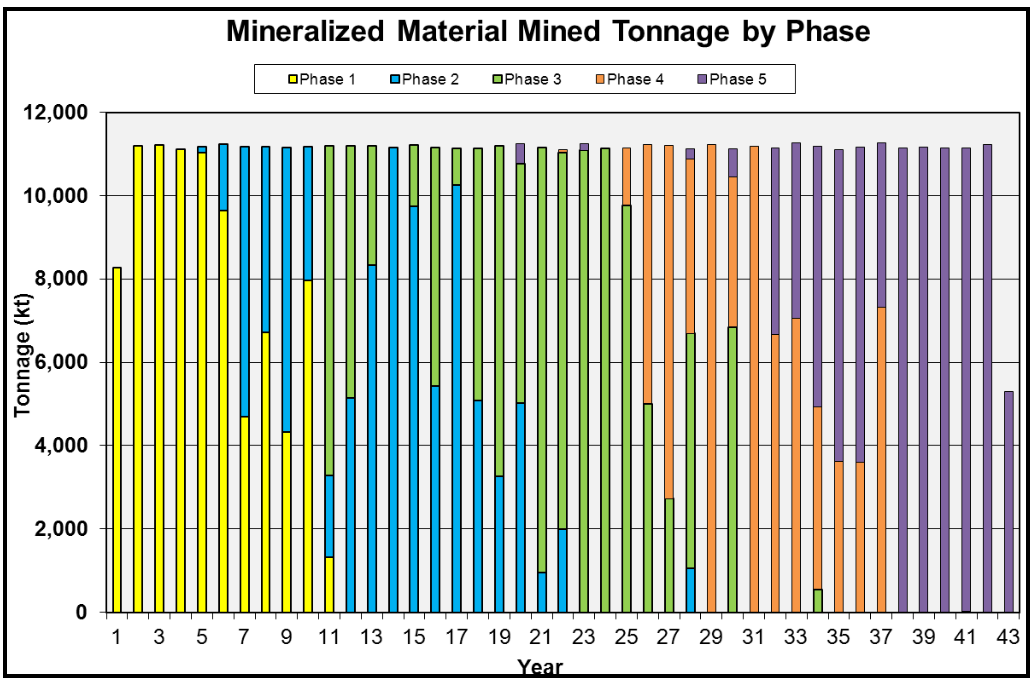


Figure 4 Mineralized Material Mined Tonnage by Phase by Year



1.3 Mine Equipment Selection

1.3.1 *Annual Equipment Production Hours*

Table 2 summarizes the typical available annual producing hours for each major equipment.

Table 2 Annual Equipment Producing Hours Available

	Unit	Typical
Total Hours	h/unit	8,400
Standby Time	h/unit	0
Operating Delays	h/unit	1,575
Available Hours	h/unit	6,825
Mechanical Availability	%	85
Net Operating Hours	h/unit	5,801
Operator Efficiency	%	90
Producing Hours	h/unit	5,221
Effective Utilization	%	62.2

1.3.2 *Drilling and Blasting Parameters*

Drilling Requirement

An 8.7 x 7.5 m blasting pattern was used in the evaluation for waste and mineralized materials. A 251 mm blasthole drill is selected as a primary drill. By applying careful blasting methods the preservation of rock mass integrity will allow for the development of the steepest wall slope. Implementation of pre-shear and buffer blasting practices adjacent to the final pit wall will minimize damage to the final pit walls due to blasting.

Drilling Productivity

Table 3 shows penetration and drilling rates for a set of drillhole parameters. A diesel-powered hydraulic percussion track drill might be used for secondary blasting of oversize material, sinking cut drilling, pre-shearing, etc. (not accounted for in the operating costs).

Table 3 Penetration and Drilling Rates

Parameters	Units	Waste	Mineralized Material
Hole Depth	m	12.3	12.3
Penetration Rate	cm/min	60.0	60.0
Grade Control Sampling Time	min	2.0	2.0
Move, Align, Collaring Time	min	3.0	3.0
Total Time per Hole	min	25.5	25.0
Holes per Hour	holes	2.4	2.4
Average Drilling Rate	m/h	28.9	29.5

BLASTING REQUIREMENT

Overall explosive consumption was based on using a 70% ammonium nitrate fuel oil (ANFO) and 30% emulsion mix product. Some blasting parameters are shown in Table 4. Drillhole liners are to be used in wet holes where practical.

The selected explosive supplier is to erect a plant and storage facility on site. Under the supervision of the drill/blast foreman, the supplier will be contracted to supply, deliver, and load explosives into the blastholes. The drill/blast foreman will also oversee the blasting crew who will prime, stem, and tie-in blastholes.

Table 4 Blasthole Drill Productivity and Blasting Parameters

Parameters	Units	Waste	Mineralized Material
Hole Diameter	cm	25.1	25.1
Bench Height	m	10	10
Sub-grade	m	2.3	2.3
Powder Factor	kg/t	0.27	0.21
Bank Density	t/m3	2.5	3.2
Rock Mass Per Hole	t	1,650	2,100
Spacing and Burden	m	8.7 x 7.5	8.7 x 7.5
Drilling Rate	m/h	28.9	29.5

1.3.3 LOADING AND HAULING

LOADING FLEET

The loading fleet will consist of 21 m^3 diesel hydraulic shovels and a 18 m^3 diesel hydraulic loader as back-up. The shovel requirements include four 21 m^3 shovels for both waste and mineralized material types from Year 1 to Year 14. From Year 15 to Year 28, the shovel requirements range between three and four. From Year 29 to

Year 39, the number of shovels required is three. In the final three years of the schedule, the shovel requirement decreases to two.

The shovel size has been matched with 225 t haul trucks to provide a swing cycle of 35 s and total truck load time of 4.0 min in six passes for waste material and 3.4 min in five passes for mineralized material. Suitable number of loading passes typically falls within the range of three to seven.

Shovel base productivities were calculated using the sample parameters in Table 5.

Table 5 Sample Shovel Productivity Calculation

	Units	Waste Shovel	Mineralized Material Shovel
Bucket Capacity (Heaped)	m^3	21.0	21.0
Material Weight	dmt/bank m^3	2.5	3.2
Bulk Factor		1.3	1.3
Material Weight	dmt/loose m^3	1.95	2.48
Moisture	%	3.0	3.0
Material Weight	wmt/lcm	2.01	2.55
Fill Factor	%	95	95
Effective Bucket Capacity	m^3	19.95	19.95
Tonnes/Pass	wmt	40.0	50.9
Truck Size Capacity	wmt	225	225
Average Number of Passes	passes	6	5
Truck Spot Time	s	32	32
First Bucket Cycle Time	s	30	30
Subsequent Bucket Cycle Time	s	35	35
Load Time Per Truck	min	3.9	3.4
Theoretical Maximum Productivity	trucks/h	15.2	17.8
	dmt/h	3,315	3,890
Truck Availability to Shovel	%	90	90
Producing Hours	h/a	5,221	5,221
Base Productivity	wmt/net operating hour	3,073	3,605

The material weights used in the sample calculation are 2.5 t/bank m^3 for waste and 3.2 t/bank m^3 for mineralized material. The base productivity was used under normal ideal loading conditions. Maximum productivities for both mineralized and waste materials for the shovel and loader were reduced to 90% due to truck availability.

Haulage

General Hauling Conditions

The 225 t hauler was selected to match the 21 m^3 diesel hydraulic shovel and 18 m^3 front end loaders in determining the number of trucks required for each operating year.

Cycle times are based on estimated haulage profiles from the ultimate pit design based on material types. It is assumed that the waste dump would be within 4,000 m of the pit entrances and primary crushing facilities, located at the mill, within 8,000 m.

Haul Truck Productivity

Truck productivities are based on expected operating conditions, haulage profiles, and production cycle times. Cycle times were calculated using Caterpillar FPC™ commercial software. A weighted average cycle time for each year was calculated according to its final destination (waste dump or crusher). Haulage analysis assumptions are outlined in Table 6.

Table 6 Assumptions Used for Cycle Time Calculations

	Units	Value
Maximum Speed on Dump and Around Shovel	km/h	20.0
Maximum Speed In-pit (and Ramps)	km/h	40.0
Maximum Speed on Downhill for Safety/Account for Corners	km/h	20.0
Loading Time (PC1250)	min	4.5
Dumping Time	min	0.5
Swell Factor	%	30.0
Waste Rock Density (in situ)	t/m^3	2.5
Mineralized Material Density (in situ)	t/m^3	3.2

All ramps were assigned a grade of 10% in the pit and on the dumps. The road grade for the road to the mill was assigned a grade of 5%.

Shovel and Truck Requirements

The haul truck requirement is initially 25 units of 225 t trucks and ramping up to a maximum of 32 units of 225 t trucks in Year 31 due to the estimated longer cycle times/increasing depth of pit. The truck requirements oscillate between the years due to the combination of the fluctuations in total material mined, the location within the pit that material in a year is being mined from (the effect of the different phases) and this impact on the estimated cycle times. The truck requirements begin to drop off in approximately Year 39 as the stripping ratio decreases. The yearly equipment requirements are shown in Table 7.

Table 7 Truck and Shovel Requirements by Year

Year	Equipment							
	Trucks				Shovels			
	Mechanical Availability (%)	Use of Availability (%)	Productivity (wmt/h)	Number Required	Mechanical Availability (%)	Use of Availability (%)	Productivity (wmt/h)	Number Required
1	85	76.8	351	25	85	76.8	3,067	4
2	85	76.8	317	28	85	76.8	3,096	4
3	85	76.8	313	28	85	76.8	3,099	4
4	85	76.8	312	27	85	76.8	3,100	4
5	85	76.8	314	31	85	76.8	3,086	4
6	85	76.8	296	31	85	76.8	3,093	4
7	85	76.8	290	31	85	76.8	3,093	4
8	85	76.8	299	28	85	76.8	3,101	4
9	85	76.8	328	25	85	76.8	3,103	3
10	85	76.8	335	26	85	76.8	3,098	4
11	85	76.8	336	27	85	76.8	3,094	4
12	85	76.8	335	26	85	76.8	3,099	4
13	85	76.8	334	25	85	76.8	3,102	4
14	85	76.8	336	27	85	76.8	3,092	4
15	85	76.8	289	28	85	76.8	3,108	3
16	85	76.8	289	29	85	76.8	3,103	3
17	85	76.8	289	29	85	76.8	3,102	3
18	85	76.8	289	30	85	76.8	3,096	4
19	85	76.8	289	28	85	76.8	3,107	3
20	85	76.8	277	31	85	76.8	3,102	4
21	85	76.8	277	29	85	76.8	2,431	4

table continues…

	Equipment							
	Trucks				Shovels			
Year	Mechanical Availability (%)	Use of Availability (%)	Productivity (wmt/h)	Number Required	Mechanical Availability (%)	Use of Availability (%)	Productivity (wmt/h)	Number Required
22	85	76.8	277	30	85	76.8	3,103	3
23	85	76.8	277	31	85	76.8	3,102	4
24	85	76.8	277	30	85	76.8	3,101	4
25	85	76.8	295	27	85	76.8	3,111	3
26	85	76.8	295	27	85	76.8	3,110	3
27	85	76.8	293	24	85	76.8	3,126	3
28	85	76.8	296	29	85	76.8	3,099	4
29	85	76.8	293	24	85	76.8	3,129	3
30	85	76.8	252	27	85	76.8	3,133	3
31	85	76.8	255	32	85	76.8	3,105	3
32	85	76.8	255	31	85	76.8	3,108	3
33	85	76.8	250	24	85	76.8	3,156	3
34	85	76.8	254	31	85	76.8	3,112	3
35	85	76.8	280	18	85	76.8	3,188	2
36	85	76.8	284	22	85	76.8	3,145	3
37	85	76.8	282	20	85	76.8	3,167	3
38	85	76.8	284	22	85	76.8	3,144	3
39	85	76.8	281	19	85	76.8	3,173	3
40	85	76.8	237	19	85	76.8	3,210	2
41	85	76.8	219	14	85	76.8	3,336	2
42	85	76.8	217	13	85	76.8	3,373	2
43	85	76.8	220	15	85	76.8	3,304	2