LOG NO:	DEU	20	1991	RD.	
ACTION:					
AND A PLANE AND					
FILE NO:					

Diamond Drilling Assessment Report on the Mt. Mahon Property

SUB-RECORDER RECEIVED DEC 1 8 1991	Fort Stee	ele Mining	Division
M.R. # \$		NTS 82G/4	
VANCOUVER, B.C.			

Lat. 49°08'N Long. 115°55'W

<u>Owners</u>: Chevron Minerals Ltd. St. Eugene Mining Corporation Limited

> Operator: Minnova Inc. ASSESSMENT REPORT

Vancouver, B.C. December 17, 1991

Colin Burge Minnova Inc.

Table of Contents

	page
INTRODUCTION	1
Location and Access Physiography Property and Ownership History	1 1 2 2
1991 WORK PROGRAM	2
GEOLOGY	3
Regional Geology Property Geology	3 4
DIAMOND DRILLING	4
Results Lithogeochemistry	5 5

CONCLUSIONS AND RECOMMENDATIONS

LIST OF APPENDICES

Appendix	I	Itemized Cost Statement										
Appendix	II	Statement of Qualifications										
Appendix	III	MM-91-01 Drill Log										
Appendix	VI	Geochemical Analytical Procedures										
Appendix	V	Geochem Results										

LIST OF FIGURES

Figure	1	Claim Configuration	after p	. 1
Figure	2	Mt. Mahon Location Map	after p	. 2
Figure	3	Geology and Drill Location	in pocl	ket

LIST OF TABLES

Table 1

Claim Status

2

6

The Mt. Mahon South claim group consists of six claims totalling 100 units. The claims comprise the southern half of the Mt. Mahon property located 10 km east of Yahk, B.C.

The Mt. Mahon property is underlain by Proterozoic-age Aldridge formation sediments and intrusions which host the giant Sullivan Pb-Zn massive sulphide deposit 65 km to the north.

The Sullivan deposit occurs at the contact between the Lower and Middle Aldridge formations and this contact represents the principal target in the belt. The Mt. Mahon property covers some six kilometres of strike of "Sullivan time" and the 1991 drill program explored this stratigraphy.

Location and Access

The Mt. Mahon property is located on the south and east facing slopes of Mt. Mahon in the Purcell Mountains of southeastern B.C. The claims can be reached by proceeding east from the north end of Yahk, B.C. on the Hawkins Creek (Yahk Meadows) forestry road. At about the 12 km point the Cold Creek access road branches north and provides access along the eastern portion of the Mt. Mahon property. A number of other 4WD old logging roads exist on the property in various states of decay.

Physiography

The property is situated in the Purcell Mountains and elevations range from 1150 m in the Cold Creek valley to over 1900 metres at the Mt. Mahon summit. Relief is quite gentle over much of the claim block.

The forest cover consists of immature stands of fir and spruce as well as stands of alder. A large recent clearcut exists in the central and eastern portions of the property.

The climate is cool and dry without snow in the upper reaches between June and October



Property and Ownership

The Mt. Mahon South group consists of six claims comprising the southern portion of the Mt. Mahon property. Minnova Inc. has an option to earn an interest in the claims from owners, Chevron Minerals Ltd. and St. Eugene Mining Corporation Limited.

The following table lists the current status of claims in the Mt. Mahon South group.

<u>Claim Name</u>	Record No.	<u>Units</u>	<u>Area</u>	<u>Expiry_Date</u>
				•
Chev	1941	20	500 ha	Sep 23/1991
Stan	1942	20	500 ha	Sep 23/1991
Тор	952	10	250 ha	Jun 20/1992
Yahk	721	18	450 ha	Aug 1/1992
Alder	753	20	500 ha	Sep 7/1992
Pine	754	12	300 ha	Sep 7/1992

Table 1. Claim Status

<u>History</u>

The Mt. Mahon property has undergone exploration most recently by Chevron Minerals Ltd. 1984-1985 and Falconbridge Ltd. 1980-1981. Eleven drill holes have been drilled on the property and a number of soil and geophysical surveys have been conducted. The reader is referred to Assessment Report #14,240 for a comprehensive report on surface exploration at Mt. Mahon.

1991 WORK PROGRAM

A total of three holes were drilled to probe the Lower-Middle Aldridge formation contact zone on 1 kilometre centres. The



from Hoy 1989

Washington State Information Circular 86

Fig. 2 MT. MAHON LOCATION MAP

holes were collared in the hangingwall of tourmalinite showings exposed on the south flank of Mt. Mahon. This report is concerned with the upper portion of hole MM-91-01 which consisted of 300.0 m of NQ diamond drilling, ten whole rock assays and five geochem assays.

<u>GEOLOGY</u>

Regional Geology

The Proterozoic-age Aldridge Formation covers a large part of southeast B.C. and the southwest corner of Alberta. The Aldridge consists of upper greenschist facies sediments and conformable gabbroic sills known as the Moyie intrusions. The package forms three main structural blocks in southern B.C. divided by the northeast trending Cranbrook and Moyie Faults. Each structural block forms a broad open northeast plunging anticlines and it is the anticlinal axis of the northernmost structural block that the Sullivan deposit is situated. The Sullivan deposit is a 160 million ton >10% Pb-Zn, 68 g/t Ag massive sulphide sheet underlain by tourmalinization and overlain by an albite-chlorite alteration halo.

The Mt. Mahon claims are within the Moyie structural block, the southernmost block. The Sullivan time horizon (Lower -Middle Aldridge contact) is believed to be present on Mt. Mahon and extends, with shallow dips, north across the property.

The only significant producer apart from the Sullivan in the Aldridge Formation is the former St. Eugene Mine. The St. Eugene produced 1 million tons of 14% Pb, 5% Zn and 240 g/t Ag from a steep dipping massive sulphide vein. The St. Eugene is about 15 km northeast of the Mt. Mahon property.

3.

Property Geology

The Mt. Mahon claims are underlain by Middle Aldridge formation sediments and Moyie sills and dikes. The bedded rocks form an open NNE shallow plunging anticline. Dips range from 15° to 25° northeast.

The clastic assemblage is made up of predominantly medium bedded quartz-rich greywackes intercalated with thin bedded siltstones and mudstones. The finer material occasionally displays graded bedding, ripple marks and cross bedding. The package probably represents a turbidite sequence of considerable thickness. The intrusive rocks range from diorite to gabbro and are medium to coarse grained.

Exposures on the south flank of the Mt. Mahon summit consist of tourmaline rich argillites. The tourmalinite occurs as a massive, very hard black rock consisting mainly of very fine felted tourmaline needles. Tourmalinite float has been discovered on the Erik claim 2 km north of the Mt. Mahon summit. A thin 1 metre bed of intraformational conglomerate occurs on Mt. Mahon and has been traced several hundred metres north and east of the summit.

The target stratigraphy dips below a large gabbro sill which underlies much of the Alder claim.

Please refer to Assessment Report #14,240 for a detailed description of geology, geochemistry and geophysical surveys conducted on the property.

DIAMOND DRILLING

MM-91-01 was collared on the Cold Creek forestry access road a few hundred metres south of the Ryan Creek road junction. The hole was designed to test Lower-Middle Aldridge contact stratigraphy 1 km east and 1.6 km downdip from a massive sulphide intersection in YA-6.

<u>Results</u>

MM-91-01 collared in a sequence of thin to medium bedded massive quartzites intercalated with siltstone, argillite and cherty bands. The argillaceous laminae are typically biotite rich and finer siltstone bands often cherty. The bedding is at 75° to the core axis (Hole dip is -80°) and only traces of pyrrhotite were observed.

A gabbro intrusive was intersected between 26.5 m and 254.3 metres. The sill is massive, equigranular and becomes finer grained towards its contacts. Traces of magnetite, chalcopyrite and pyrrhotite occur throughout the unit.

Below the sill a 30 metre zone of thin bedded to laminated siltstones and argillites occur. These units are well preserved and very well sorted. Numerous sedimentary structures indicated tops uphole.

The bottom of the hole intersected alternating thin beds of argillaceous mudstone, wacke and quartz wackes.

Sediments at the bottom of the hole contain 10-30 cm bands of garnet (remnant) concentrations. These zones are often siliceous. Only very weak sericite alteration was observed in the hole.

Lithogeochemistry

Ten lithogeochemical and five geochemical samples were taken from the core. All were analyzed at Min-En Labs, North Vancouver. Litho samples were analyzed for SiO_2 , TiO_2 , CaO, MgO, Na_2O , K_2O , MnO_2 , Fe_2O_3 , (total iron), Al_2O_3 , Sr, Zn, and Ba by ICP analysis of a crushed and digested bead formed by fusion with lithium borate. Ag, Cu, Pb, Zn, B, Sb and As were analyzed by standard ICP techniques using an aqua-regia digestion. F and B-Tot were analyzed by fusion methods with their respective specific ion electrode and ICP finish. Geochem samples were analyzed for Cu, Pb, Zn, Ag, Au by standard ICP techniques.

Lithogeochemical samples were taken routinely approximately every 30 m down the hole. Lithogeochemistry does not show any marked deviation from fresh Middle Aldridge sediment. The gabbro sills are typically high in calcium, iron and magnesium and are enriched in copper. The sediments are calcium poor and are high in potassium and silica. Sample 36134 (255.1-258.1) show slightly elevated barium and soda values possibly as a result of sill intrusion.

CONCLUSIONS AND RECOMMENDATIONS

MM-91-01 cored 300.0 metres of Middle Aldridge turbidites and intrusive rock. No transition or Lower Aldridge stratigraphy was recognized in the hole. No tourmalinization or coarse clastic rocks were encountered.

Sulphide mineralization is limited to trace to 2% disseminations of pyrrhotite typical of the Aldridge formation. No base metal concentrations of any significance occur in the hole.

It is doubtful that the Cold Creek fault controls base metal mineralization and no further work is recommended in this area of the claim group.

6

Appendix I <u>Itemized Cost Statement</u>

Mt. Mahon Property

Itemized Cost Statement

Drilling Leclerc Drilling Ltd., Beaverdell 300 m @ \$59.18/m \$17,753.00 C. Burge 5 days @ \$350/day 1,050.00 5 days @ \$150/day 600.00 S. McCallum 20,370.56 Geochemistry Whole rock analyses 10 @ \$33.50 335.00 Geochems 5 @ 17.25 86.25 421.25 Transportation Air Travel C. Burge 500.71 4 WD Truck 5 days @ \$50 250.00 Fuel 150.00 900.71 Room and Board Hotel and Meal, Fiddlers, Yahk 5 days @ \$100 500.00 Field Equipment 79.81 579.81 Report Preparation

с.	Burge	4 days (§ \$350/day	1400.00
тур	ping, I	Drafting,	Computer	350.00

\$24,022.33

Appendix II Statement of Qualifications

Statement of Qualifications

I, Colin Michael Burge hereby certify that:

- 1. I have worked as an exploration geologist since graduation from the University of Waterloo, Waterloo, Ontario with a BSc. in Earth Sciences (1981).
- 2. I am currently employed as a Project Geologist for Minnova Inc., 3rd Floor - 311 Water St., Vancouver, B.C. and have been with this company for five years.
- 3. I personally carried out or supervised the work reported herein.

Colin M.

17/12/91

Appendix III <u>Drill Log - MM-91-01</u>

HOLE NUMBER: MM 91-01		IMPERIAL UNITS:	METRI	C UNITS: X			
PROJECT NAME: MT. MAHON Project number: 674 Claim number: Alder Location: Yahk	PLOTTING COORDS GRID: NORTH: EAST: ELEV:	2010.00N 900.00E 1245.00	ALTERNATE COORDS GRID: NORTH: EAST: ELEV:	12+70N 17+80E 1245.00	LENGTH O S F	COLLAR DIP: F THE HOLE: TART DEPTH: INAL DEPTH:	-80°0'0" 425.81m 0.00m 425.81m
DATE STARIED: September 20, 1991 DATE COMPLETED: September 25, 1991 DATE LOGGED: September 25, 1991	COLLAR SURVEY: NO MULTISHOT SURVEY: NO RQD LOG: NO	170- 0- 0-	COLLAR ASTRONOMIC AZIMUTH: PULSE EM SURVEY: NO PLUGGED: NO HOLE S12E: NQ	230° 0' 0"	CONTRACTOR: LECLERC DR: CASING: 18.3M CORE STORAGE: FIDDLERS, 1	ILLING LTD. YAHK	

PURPOSE: TO TEST YA-6 MS HORIZON 1KM DOWNDIP

DIRECTIONAL DATA:

Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (m)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
38.71	-	-79° 0'	ACID	0K	·····						
78.33	-	-79° 0'	ACID	DK		1.	-	-	-	-	
148.44	•	-78° 0'	ACID	OK		-	-	-	-	-	
212.45	-	-78° 0'	ACID	OK		- 1	-	•	-	•	
270.36	-	-78° 0'	ACID	OK		-	-	-	-	-	
322.17	-	-76° 0†	ACID	OK			-	-	-	-	
370.94	-	-73° 0'	ACID	OK		- 1	+	-	-		
419.71	-	-72* 0'	ACID	OK		-	-	-		-	
-	-	-	-	-		- 1	-	-	-	-	
-	-	-	-	-			-	-	-		
-	-	-	-	-			-	-	-		
-	+	•	-	-		· ·	-	-		_	
-	-	•	-	-			-	-	_	_	
-	-	-	-	-				-	_		
-	-	-	۰.	-		-	-	-	-	-	
-	-	-	-	-		1 -	-	_		-	
-	÷	-	-	-			_	_	-	-	
• .	-	-	•	-		· · ·	_	-		-	
•	-	-	-	-				-	-	-	
-	-	-	-	-			_		-	-	
-		-	-				-	-	•	-	
-	•	-	-	-			-	-	-	-	
-		-		. ·			•	• .	-	-	
-	*	-				1 -	-		-	•	
		-	-	-			-	•	-	-	
-		-	-	-			-	-	•	-	
•		-	-	-			•	•	-	•	
		-	-	-			-	•	-	-	

.

HOLE NUMBER	R: MM 91-01			MINNOVA INC. Drill Hole Record		DATE: 17-December-1991
FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	WINERALIZATION	REMARKS
0,00 « то 18,30	«CASING»					
18.30 Q TO W 26.50 «	Quartz Jacke MACKE/SLTS I»	Grey to white with occasional black bands. Very fine to fine grained. Massive 10-60cm quartzite beds intercalated with fine grain laminated silt- stone/argillite/cherty bands, contact sharp and distinct. Finer siltier beds often cherty and argillaceous laminae biotite rich. 20-20.4m: Finely laminated siltstone/argillite intervals rusty stain. 22.9-23.1m: Cherty laminae. 25.5-25.8m: Bedding biotite rich lenses + vague siliceous clasts.	75	Nil.	Trace po.	Typical turbidite sequence of middle aldridge. 36126 20.5-23.5m. 36301 19.4-20.4m. 36302 22.9-23.1m. Disturbed due to sill intrusion.
26.50 C TO 254.34	Gabbro «GAB»	Black and speckled very dark green and grey. Medium to coarse grained. Faulted contact 5cm gouge. Massive equigranular. Homogeneous. Hornblende, quartz feldspar crystals. Finer grained towards contact. 461-61.3] «Flt» 25cm gouge zone. 72.75m: Quartz vein, transluscent 1-2cm, -barren. 77m: Fine grain size and becomes a more mafic phase. Below 100m becomes a fine to medium grained diorite. Below 100m becomes a fine to medium grained diorite. Below 186-195m minor quartz veinlets <1cm in width. 4195-195.8] «Flt» 25cm gouge. 216.5-218.05m: 3-5cm quartz biotite vein at 10 degrees to core axis.		Níl.	<pre>Nil. Trace magnetite, pyrrhotite, and trace of chalcopyrite. 449-546 «Tr Po, Cp» 664-771 «2% Sp» 164-771 «2% Sp» 123.951 «Tr Cp» 1cm quartz veinlet carring 5% chalcopy- rite. Vein at 15 degrees to core axis. 126.8-127.4m: 1-2% po. 1134.31 «Tr Cp» 182.65m: Quartz veinlet 1cm, 2% cp. 188.351 «Tr Cp» 192m: Tracé galena in minor 1-2cm al- bite veinlet.</pre>	Weakly magnetic. Geochem 36303 46.25-46.57m. 36127: 50.9-53.9m. 36128: 74-77m. 36129: 108.8-111.8m: More mafic phase. 36130: 136.2-139.2m. 36131: 169.8-172.8m. Lost core 30cm at fault. 36132: 206.3-209.3m.

-

HOLE NUMBER: MM 91-01

.

MINNOVA INC. DRILL HOLE RECORD

DATE: 17-December-1991

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
						36133: 239.9-242.9m.
		Lower contact sharp at	82			Absolutely no indication of approaching contact until the last 1.5m where grain size becomes very fine.
254.34 TO 286.90	Quartzite, Quartz Wacke and Laminated Siltstone «WACKE/SLTS T»	White and light to dark grey bands. Very fine to fine grained. Up to 1.5m wack beds fining upward interbedded with rhythmically bedded siltstone. Very well sorted, sharp contacts. Well preserved sedimentary structures indicating tops up hole - flames, lode casts, remnant cut and fill. Occasional cherty laminae.	75	Nil. Traces of sericite forming laminations.	Nil.	No disturbance of sediments due to dyke /sill intrusion. 36134: 255.1-258.1m.
		<pre>4264.3-265 (Cht) 264.3-265m: Siliceous zone, possible chert hori- zon. Zones of coelescing/lapilli 1-2mm size (accretionary lapilli2). Rare aroillaceous worke</pre>			4264.3-264.94 «Ir Gn» Traces of galena as disseminated flecks.	Units are now siliceous with biotite rich horizons due to metamorphic grade.
		beds toward base.				36304 geochem: 264.3-264.9m. 36308 geochem: 285.6-286.8m.
286.90 TO 411.40	Argilla- ceous Wacke Quartz Wacke «ARG WACKE»	Light grey to grey-black. Very fine to medium grained. Contact gradational over 5-10m. [277.27] «flt» 3cm sericite gouge. 290-290.4m: Contacts normal to bedding and paral- lel to core axis.		Weak to moderate sericite throughout.	Trace 3% pyrrhotite throughout. [287-288.5] «2% Po» Pyrrhotite as veinlet and as ellipsoid flat Lenses 3-4mm. Possible fragments mantled by biotite.	36135: 285.6-288.6m. Evidence of syn-sedimentary tectonic activity.
		Argillaceous component seems to increase downhole. 298-298.7m: Interbeds of clean chert 1-2cm thick.				36136: 316.1-319.1m. 36305: 317.67-318.17m.
		314.15m: Laminations	82		316-425.81m; Trace pyrchotite	
		Below 304m: thin beds and laminae becoming less distinct - less sharp and more gradational.		Weak to moderate sericite alteration.	317.67-318.17 «2% Po»	320.25m: Concretions occasional 1-2cm size foreign clast usually of fine
		4317.3-326.54 «Qtz Vnlts» Minor quartz veinlets, barren, 3-4mm wide. Occa- sionally pyygmatically folded. Some carry biotite crystals. No sulphides.		Some banded siltstone/mudstone and argillaceous mudstone moderate to strongly sericite altered.	Pyrrhotite common on fracture surfaces. 354m: Very fine grained icm pyrrhotite beds.	grain, sub rounded material below 325m. 331.32m: Pink aggregates 2-3mm in size -remnant garnets?. 36137: 332.5-335.5m. 36138: 355.7-358.7m.
		330.4-331.32m: Argillaceous mudstone. 2% po. Argillaceous component of both medium to thin bedded quartz wackes and siltstone laminae consi-		332-337m: Strong sericite. ' 368.35-369 «Cord»	367.5-367.7m: Wispy po bands <1cm in thickness. Possible beds.	Below 360m: Pink aggregates common over 10cm zones. Often occur near po con- centrations. Alteration phenomena?

HOLE NUMBER: MM 91-01

ASSAY SHEET

DATE: 17-December-1991

					ASS	AYS								GEOCHEM	ICAL						COMMENTS
Sample	From (m)	To (m)	Length (ጠ)	Cu %	Pb' %	Zn %	Ag g∕t	Au g/t	Ag ppm	As ppm	Ва ррп	Cd ppm	Cu ppm	Pb ppm	sp ppm	Zn ppm	Au ppb	8 ppm	8aT ppm	F ppm	
36301 36302 36303 36304 36308	19.90 22.90 46.25 264.30 285.60	20.40 23.10 46.57 264.90 286.80	0.50 0.20 0.32 0.60 1.20						0.8 0.6 1.3 0.4 0.6	2		0.1 0.1 0.1 0.1	53 8 385 4 40	7 12 11 3 13	1.	49 32 63 4 29	5 5 3 10 5	78.3 52.8 48.9 131.9	1920 2650 215 1030	395 205 160 505	 Gabbro
36306 36305 36307	314.20 317.67 395.30	314.70 318.17 395.70	0.50 0.50 0.40						0.9 0.8 0.9			0.1 0.2 0.1	69 105 102	17 21 38		32 80 35	5 5 5	127.7 183.5 172.9	750 1100 800	485 450 610	

PAGE: 5

GEOCHEM, SHEET DATE: 17-December-1991 Sample From Τo Length AL203 Ba CaO Fe203 K20 MgO MnO2 Na2O P205 Si02 T102 TOT S Ag As ₿a Cu Рb (m) Sb Zn Au LOI 8 (m) F (m) % % * % % % % % % * % % X ppm ppm ppm ppm ppm ppm ppm ppb % ppm ppm 36126 20.50 23.50 3.00 13.05 0.065 3.91 4.96 2.85 1.57 0.11 3.03 0.01 67.91 0.57 0.06 98.08 1.1 264 28 11 17 14 36127 50.90 2 39 5 .9 51.5 315 53.90 3.00 11.46 0.005 7.8 16.86 0.46 2.92 0.25 1.73 0.11 54.81 2.08 0.17 98.65 1.2 2 163 77 9 36128 1 69 5 .4 .2 74.00 77.00 3.00 19.4 11.81 0.005 6.69 1.32 3.09 0.27 1.1 0.08 52.27 2.67 0.18 98.88 0.7 1 166 7 74 1 5 36129 108.80 111.80 3.00 12.32 0.005 9.18 19.36 0.42 4.79 0.22 1.43 0.03 48.45 2.11 0.22 98.53 13 1.4 1 552 36130 136.20 139.20 6 1 46 5 .9 3.00 14.53 0.005 8.87 12.63 0.38 5.06 0.19 2.57 0.02 52.89 1.16 0.13 98.43 1 23 213 1 10 8 1 28 .7 36131 169.80 172.80 3.00 14.66 0.005 9.39 11.88 0.4 5.55 0.18 2.46 0.01 52.44 1.06 0.13 98.17 1.3 25 164 1 6 1 20 5 1.0 36132 206.30 209.30 3.00 15.2 0.005 9.37 11.05 0.49 6.29 0.18 2.35 0.01 52,15 0.95 0.18 98.21 23 0.8 21 132 36133 11 2 18 5 1.2 239.90 242.90 3.00 14.17 0.005 9.21 11.67 0.41 6.63 0.18 2.35 0.01 52.12 0.98 0.12 97.85 0.8 5 18 156 20 9 1 5 36134 255.10 258.10 1.3 3.00 14.16 0.205 2.54 1.15 3.66 1.14 0.03 4.95 0.01 69.91 0.57 0.02 98.35 0.8 158 9 6 8 1 22 5 36135 285.60 288.60 .6 64.9 295 3.00 15.16 0.05 1.05 3.34 3.72 1.15 0.04 3.02 0.01 68.95 0.58 0.28 97.34 0.8 11 167 39 9 1 27 5 2.3 149.0 565 36136 316.10 319.10 3.00 15.54 0.03 1.23 5.51 4.26 1.35 0.07 1.53 0.01 66.72 0.57 0.31 97.13 0.8 9 256 84 16 42 36137 1 5 2.2 61.6 590 332.50 335.50 3.00 18.52 0.06 0.22 4.69 5.32 1.03 0.05 1.17 0.01 64.54 0.66 0.07 96.34 0.6 5 140 22 9 36 1 5 2.8 155.6 36138 355.70 358.70 490 3.00 19.64 0.065 0.39 5.58 5.53 1.32 0.08 1.29 0.01 62.23 0.73 0.11 96.96 0.7 184 15 1 10 1 60 5 2.4 148.6 600 36139 380.10 383.10 3.00 14.83 0.005 1.13 4.47 3.53 1.22 0.06 1.89 0.01 69.19 0.55 0.32 97.2 0.7 7 126 36 17 2 73 36140 5 2.2 81.0 570 402.00 405.00 3.00 15.59 0.01 1.16 4.27 3.93 1.04 0.07 1.9 0.01 68.58 0.57 0.08 97.19 25 0.7 7 171 13 1 50 5 1.9 77.6 485 36141 422.80 425.80 3.00 20.1 0.045 0.86 4.13 5.17 0.96 0.06 1.59 0.01 63.63 0.03 97.35 0.76 0.9 5 136 4 10 2 44 5 1.8 104.2 515

HOLE NUMBER: MM 91-01

PAGE:

Appendix IV <u>Geochemical Analytical Procedures</u>

ı.

Division of Assayers Corp. Ltd.



ANALYTICAL PROCEDURE REPORT FOR ASSESSMENT WORK: PROCEDURE FOR TRACE ELEMENT ICP

> Ag, Al, As, B, Ba, Be, Bi, Ca, Cd, Co, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Sb, Sr, Th, U, V, Zn, Ga, Sn, W, Cr

Samples are processed by Min-En Laboratories, at 705 West 15th Street, North Vancouver, employing the following procedures.

After drying the samples at 95 C, soil and stream sediment samples are screened by 80 mesh sieve to obtain the minus 80 mesh fraction for analysis. The rock samples are crushed by a jaw crusher and pulverized on a ring mill pulverizer.

0.50 gram of the sample is digested for 2 hours with an aqua regia mixture. After cooling samples are diluted to standard volume.

The solutions are analyzed by computer operated Jarrall Ash 9000 ICAP or Jobin Yvon 70 Type II Inductively Coupled Plasma Spectrometers.

Division of Assayers Corp. Ltd.



ANALYTICAL PRECEDURE REPORT FOR ASSESSMENT WORK: PROCEDURE FOR WET GOLD GEOCHEMICAL ANALYSIS

Samples are processed by Min-En Laboratories, at 705 West 15th Street, North Vancouver, employing the following procedures.

After drying the samples at 95 C, soil and stream sediment samples are screened by 80 mesh sieve to obtain the minus 80 mesh fraction for analysis. The rock samples are crushed by a jaw crusher and pulverized on a ring mill pulverizer.

5.00 grams of sample is weighed into porcelain crucibles and cindered @ 800 C for 3 hours. Samples are then transferred to beakers and digested using aqua regia, diluted to volume and mixed.

Further oxidation and treatment of 75% of the above solution is then extracted for gold by Methy'l Iso-butyl Ketone.

The MIBK solutions are analyzed on an atomic absorption spectrometer using a suitable standard set.

PHONE: (604) 980-5814 (604) 988-4524 TELEX: VIA USA 7601067 FAX: (604) 980-9621

.....



ANALYTICAL PROCEDURE FOR ASSESSMENT WORK WHOLE ROCK ANALYSIS

Samples are processed by Min-En Laboratories at 705 West 15th Street, North Vancouver, employing the following procedures.

After drying the samples at 95 C, soil and stream sediment samples are screened to -80 mesh for analysis. Rock samples are crushed by a jaw crusher and pulverized to 90% -120 mesh.

A 0.200 gram subsample is fused using lithium metaborate, dissolved and diluted to standard volume.

The solutions are analyzed by computer operated Jarrall Ash 9000 ICAP or Jobin Yvon Type II Inductively Coupled Plasma Spectrometers.

ICE AND LABORATORIES: WEST FIFTEENTH STREET, NORTH VANCOUVER, B.C. NADA V7M 1T2 PHONE: (604) 980-5814 (604) 988-4524 TELEX: VIA USA 7601067 FAX: (604) 980-9621

AND IN COMPANY OF THE OWNER.

•••



ANALYTICAL PROCEDURE FOR ASSESSMENT WORK

Boron Geochem

Samples are processed by Min-En Laboratories at 705 West 15th Street, North Vancouver, employing the following procedures:

After drying the samples at 95 degrees celsius, soil and stream sediment samples are screened to -80 mesh for analysis. Rock samples are crushed by a jaw crusher and then pulverized to 90% -120 mesh.

A 0.500 gram sub-sample is fused using KOH, leached overnight and then dissolved using HCL. The solution is diluted to volume and mixed.

The solutions are analyzed by computer operated Jarell Ash 9000 ICAP or Jobin Yvon Type II Inductively Coupled Plasma Spectrometers. The results are compared to certified natural standards.



e



ANALYTICAL PROCEDURE FOR ASSESSMENT WORK

Fluorine Geochem

Samples are processed by Min-En Laboratories at 705 West 15th Street, North Vancouver, employing the following procedures:

After drying the samples at 95 degrees celsius, soil and stream sediment samples are screened to -80 mesh for analysis. Rock imples are crushed by a jaw crusher and then pulverized to 90% -120 mesh.

A 0.200 gram sub-sample is fused using NaOH, leached overnight with water and then dissolved using H2SO4. A buffer is added and the sample is adjusted to pH 7.0 using NaOH.

The solutions are analyzed using specific ion electrodes and compared to known certified natural standards.

FICE AND LABORATORIES: 5 WEST FIFTEENTH STREET, NORTH VANCOUVER, B.C. ANADA V7M 1T2

PHONE: (604) 980-5814 (604) 988-4524 TELEX: VIA USA 7601067 FAX: (604) 980-0624

والتقاديمة ففا فإمنيه مستشكله مبروه وعامد مسادكات وسيقو والطراب كالمراج

Appendix V <u>Geochemical Results</u>





DRILLING

FALL /91

705 WEST 15TH STREET NORTH VANCOUVER, B.C. CANADA V7M 1T2 TELEPHONE (604) 980-5814 OR (604) 988-4524 FAX (604) 980-9621

SMITHERS LAB.: 3176 TATLOW ROAD SMITHERS, B.C. CANADA VOJ 2NO TELEPHONE (604) 847-3004 FAX (604) 847-3005

SPECIALISTS IN MINERAL ENVIRONMENTS CHEMISTS + ASSAYERS + ANALYSTS + GEOCHEMISTS

1V-1186-RG1

Company: MINNOVA INC. Project: 674 Attn: COLIN BURGE

Date: OCT-22-91 Copy 1. MINNOVA INC., VANCOUVER, B.C.

He hereby certify the following Geochemical Analysis of 12 CORE samples submitted SEP-30-91 by COLIN BURGE.

Sample	AU-WET	AG	B BA	-TOTAL	CD	CU	2B	ZN	F	
Number	PPB	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	
				**	****					,=*=#==================================

36301	5	.8	78.3	1920	<u>, 1</u>	53	7	49	395	\sim
36302	5	.6	52.8	2650	.1	8	12	32	205	
36304	10	.4	48.9	215	.1	4	3	4	160	-
36305	5	.8	183.5	1100	.2	105	21	80	450	
36306	5	.9	127.7	750	.1	69	17	32	485	- VARA-91-01
36307	5	.9	172.9	800	1	102	38	35	 610	
36308	2 2	۰Ó	131.9	1030	.1	40	13	29	505	

Certified by

MIN-EN LABORATORIES

COMP: MINNOVA INC.

19

PROJ: 674

MIN-EN LABS --- ICP REPORT

705 WEST 15TH ST., NORTH VANCOUVER, B.C. V7M 1T2

FILE NO: 1V-1186-RJ2 DATE: 91/10/17

•

CANDI C	<u> </u>	·					~~						
SAMPLE NUMBER		AG PPM	AS PPM	CO PPM	CU PPM	NI PPM	PB PPM	SB PPM	ZN PPM	CR AU PPM	-FIRE PD PPB	-FIRE PPB	PT-FI P
36303		1.3	2	35	385	18	11	1	63	62	3	• 1	
				<u>_</u>					<u> </u>				
			. <u></u>					<u></u>					
		· <u> </u>	<u></u>										<u></u>
												<u>_, </u>	<u></u>
<u></u>			<u></u>			·		<u></u>		_ <u></u>			<u> . </u>
		<u></u>		. <u></u>									
<u>,</u>			. <u> </u>		<u> </u>					- <u></u>			<u></u>
<u>_</u>		·			. <u></u> ,	<u></u> ,		. <u></u>					



LABORATORIES (DIVISION OF ASSAYERS CORP.) SPECIALISTS IN MINERAL ENVIRONMENTS CHEMISTS • ASSAYERS • ANALYSTS • GEOCHEMISTS 705 WEST 15TH STREET NORTH VANCOUVER, B.C. CANADA V7M 1T2 TELEPHONE (604) 980-5814 OR (604) 988-4524 FAX (604) 980-9621

SMITHERS LAB.: 3176 TATLOW ROAD SMITHERS, B.C. CANADA VOJ 2NO TELEPHONE (604) 847-3004 FAX (604) 847-3005

<u>Geochemical Analysis Certificate</u>

1V-1185-RG1

Company: MINNOVA INC. Project: 674 Attn: COLIN BURGE Date: OCT-22-91 Copy 1. MINNOVA INC., VANCOUVER, B.C.

He hereby certify the following Geochemical Analysis of CORE samples submitted SEP-30-91 by COLIN BURGE.

LUHK

DRILLING

FAIL

Sample Number	B PPM	F PPM			
36126	51.5	315			
36134	64.9	295		•	
36135	149.0	565			
36136	61.6	590	:		
36137	185.4	490			
36138	148.6	600		 	
36139	81.0	570			
36140	77.6	485			
36141	104.2	515			

Certified by

MIN-EN LABORATORIES

COMP: MINNOVA INC. FROJ: 674 ATTN: COLIN BURGE

C

MIN-EN LABS - ICP REPORT

705 WEST 15TH ST., NORTH VANCOUVER, B.C. V7M 1T2 (604)980-5814 OR (604)988-4524

FILE NO: 1V-1185-RJ1 DATE: 91/10/16 * ROCK * (ACT:F31)

SAMPLE NUMBER	AG PPM	AS PPM	BA PPM	CU PPM	PB PPM	SB PPM	ZN PPM	AU-WET PPB		
36126 36134 36135 36136 36136 36137	1.1 -8 .8 .8 .8	11 9 11 9 5	264 158 167 256 140	17 6 39 84 22	14 8 9 16 9	2 1 1 1 1	39 22 27 42 36	5 5 5 5 5		
36138 36139 36140 36141	.7 .7 .7 .9	1 7 7 5	184 126 171 136	15 36 25 4	10 17 13 10	1 2 1 2	60 73 50 44	5 5 5 5		
		- u								
		<u></u>	,			<u></u>			<u></u>	 <u></u>
				<u></u>						
				<u></u>		t _{re} -				
\			<u></u>		. <u> </u>	<u></u>				
							···			
						····				
			<u> </u>	<u></u>			<u> </u>	<u> </u>		
	· · · · ·		- <u></u>					····· <u>, </u>		
		<u></u> ,								
L I										

COMP: MINNOVA INC.

PROJ: 674 ATTN: COLIN BURGE

.

MIN-EN LABS - ICP REPORT

705 WEST 15TH ST., NORTH VANCOUVER, B.C. V7M 1T2 (604)980-5814 OR (604)988-4524 FILE NO: 1V-1185-RL1 DATE: 91/10/16 * ROCK * (ACT:F26)

SAMPLE .	AL203 %	BA %	CAO X	FE203 X	к20 %	MGO X	MNOZ X	NA20 %	P205 X	\$102 X	۲102 %	S %	тот
36126 36134 36135 36136 36137	13.05 14.16 15.16 15.54 18.52	.065 .205 .050 .030 .060	3.91 1.15 1.05 1.23 .22	4.96 2.54 3.34 5.51 4.69	2.85 3.66 3.72 4.26 5.32	1.57 1.14 1.15 1.35 1.03	.11 .03 .04 .07 .05	3.03 4.95 3.02 1.53 1.17	.01 .01 .01 .01 .01	67.91 69.91 68.95 66.72 64.54	.57 .57 .58 .57 .66	.06 .02 .28 .31 .07	98 98 97 97 97
36138 36139 36140 36141	19.64 14.83 15.59 20.10	.065 .005 .010 .045	.39 1.13 1.16 .86	5.58 4.47 4.27 4.13	5.53 3.53 3.93 5.17	1.32 1.22 1.04 .96	.08 .06 .07 .06	1.29 1.89 1.90 1.59	.01 .01 .01 .01	62.23 69.19 68.58 63.63	.73 .55 .57 .76	.11 .32 .08 .03	96 97 97 97
												· · ·	
	,, ,,,,,,,,,_,,,,,,,,,,,					<u> </u>			<u>_</u>				
									<u> </u>				
		•											



SPECIALISTS IN MINERAL ENVIRONMENTS CHEMISTS • ASSAYERS • ANALYSTS • GEOCHEMISTS VANCOUVER OFFICE:

705 WEST 15TH STREET NORTH VANCOUVER, B.C. CANADÀ V7M 1T2 TELEPHONE (604) 980-5814 OR (604) 988-4524 FAX (604) 980-9621

SMITHERS LAB.: 3176 TATLOW ROAD SMITHERS, B.C. CANADA VOJ 2NO TELEPHONE (604) 847-3004 FAX (604) 847-3005

Assay Certificate

1V-1185-RA1

Company: MINNOVA INC. Project: 674 Attn: COLIN BURGE Date: OCT-16-91

Copy 1. MINNOVA INC., VANCOUVER, B.C.

He hereby certify the following Assay of 9 ROCK samples submitted SEP-30-91 by COLIN BURGE.

Sample Number	LOI X	
36126	. 90	
36134	. 60	
36135	2.30	
36136	2.20	
36137	2.80	
36138	2,40	
6139	2,20	
6140	1,90	
6141	1,80	

Certified by

MIN-EN LABORATORIES

	LABORATORIES (DIVISION OF ASSAYERS CORP.) SPECIALISTS IN MINERAL CHEMISTS • ASSAYERS • ANALYS	ENVIRONMENTS	TELEPHONE (604) 980-5814 OR (604) 988-4524 FAX (604) 980-9621 SMITHERS LAB.: 3176 TATLOW ROAD SMITHERS, B.C. CANADA VOJ 2N0 TELEPHONE (604) 847-3004 FAX (604) 847-3005
\frown	<u>Assay Certi</u> ;	ficate	1V-1184-RA1
Company: Project: Attn:	MINNOVA INC. 674 COLIN BORGE	Ans'd Copy 1.	Date: OCT-11-91 MINNBVA INC., VANCOUVER, B.C.
He her	eby certify the follow	wing Assay of 7 CORE	samples
He her submit	eby certify the follow ted SEP-30-91 by COLIN	wing Assay of 7 CORE N BURGE.	samples
He her submit Sample Number	eby certify the follow ted SEP-30-91 by COLIN LOI %	wing Assay of 7 CORE N BURGE.	samples
We her submit Sample Number	eby certify the follow ted SEP-30-91 by COLIN LOI %	wing Assay of 7 CORE N BURGE.	samples
We her submit Sample Number 36127 36128	eby certify the follow ted SEP-30-91 by COLIN LOI % .40 .20	wing Assay of 7 CORE N BURGE.	samples
We her submit Sample Number 36127 36128 36129	eby certify the follow ted SEP-30-91 by COLIN LOI % .40 .20 .90	wing Assay of 7 CORE N BURGE.	samples
We her submit Sample Number 36127 36128 36129 36130	eby certify the follow ted SEP-30-91 by COLIN LOI % .40 .20 .90 .70	Wing Assay of 7 CORE N BURGE. MM-91-01	samples
<i>We her</i> submit Sample Number 36127 36128 36129 36130 36131	eby certify the follow ted SEP-30-91 by COLIN LDI % .40 .20 .70 .70 1.00	Wing Assay of 7 CORE N BURGE. MM-91-01	samples
<i>He her</i> submit Sample Number 36127 36128 36129 36130 36131 36132	<i>eby certify</i> the follow ted SEP-30-91 by COLIN LOI % .40 .20 .70 .70 1.00	Wing Assay of 7 CORE N BURGE. MM-91-01	samples

• .

Certified D	V
-------------	---

si print

· .

.

COMP: MINNOVA INC. PROJ: 674 ATTN: COLIN BURGE

÷

MIN-EN LABS - ICP REPORT

705 WEST 15TH ST., NORTH VANCOUVER, B.C. V7M 1T2 (604)980-5814 OR (604)988-4524

FILE NO: 1V-1184-RJ1 DATE: 91/10/11 * CORE * (ACT:F31)

SAMPLE NUMBER	AG PPM	AS PPM	BA PPM	CU PPM	PB PPM	SB PPM	ZN PPM	AU-WET PPB		
\$127 \$128 36129 36130 36131	1.2 .7 1.4 1.0 1.3	2 1 1 1 1	28 166 13 23 25	163 77 552 213 164	9 7 6 8 6	1 1 1 1 1	69 74 46 28 20	5 5 5 10 5		
36132 36133	.8 .8	23 5	21 18	132 156	11 9	2 1	18 20	5 5		
								, , <u>, , , , , , , , , , , , , , , , , </u>		
					<u> </u>					
		-						<u>, , , , , , , , , , , , , , , , , , , </u>	<u> </u>	
										

-

MIN-EN LABS - ICP REPORT COMP: MINNOVA INC. FILE NO: 1V-1184-RL1 DATE: 91/10/11 PROJ: 674 705 WEST 15TH ST., NORTH VANCOUVER, B.C. V7M 1T2 ATTN: COLIN BURGE (604)980-5814 OR (604)988-4524 * CORE * (ACT: F26) SAMPLE AL203 CAO FE203 K20 BA MGO MNO2 NA20 P205 \$102 T102 S TOT(%) NUMBER * X X * * * X % % X 7, * * 36127 11.46 .005 7.80 16.86 .46 2.92 .25 1.73 .11 54.81 2.08 .17 98.65 36128 .005 11.81 6.69 19.40 1.32 3.09 .27 98.88 1.10 -08 52.27 2.67 .18 1.43 2.57 36129 12.32 .005 9.18 19.36 .42 4.79 .22 .03 48.45 2.11 .22 98.53 36130 14.53 .005 8.87 . 19 98.43 12.63 .38 5.06 .13 .02 52.89 1.16 36131 14.66 .005 9.39 11.88 .40 5.55 . 18 2.46 -01 52.44 1.06 .13 98.17 36132 15.20 .005 9.37 11.05 6.29 2.35 .49 .18 .01 . 18 98.21 52.15 .95 .12 97.85 36133 14.17 .005 9.21 .41 2.35 11.67 6.63 -18 52,12 .98 .01

VANCOUVER OFFICE:

