DOMINION EXPLORERS

STURGEON LAKE MINE PROPERTY JOINT VENTURE

NOVEMBER 1987 - JUNE 1988 INTERIM REPORT

INTRODUCTION

As part of the Sturgeon Lake Mine joint venture agreement between Minnova and Dominion Explorers exploration diamond drilling was conducted on the mine property during the months of March thru May, 1988. A total of 17,935 feet. (5468m) was drilled on the southern portion of the claim block within the lower section of the stratigraphy. These holes were targetted at sectioning the alteration down-stratigraphy of the Sturgeon Lake Mine through the favourable Mattabi - F-Group horizons. Drill holes cut the expected stratigraphic horizons and intersected significant alteration however no economic sulphides were encountered.

1988 PROGRAM

Work carried out thus far in 1988 included:

1. 17,935 feet (5468m) of diamond drilling in eight holes. (SLM 252-259). (locations on the attached plan).

2. 70 geochem/assay samples and 235 geochemical samples sent for analysis.

3. Directional down-hole PEM on 7 of the 8 holes.

4. 12km of CSAMT (Controlled Source Audio-Frequency Magneto-Tellurics) geophysical test survey to outline paleo-synvolcanic structures.

5. 48 miles of line cutting.

RESULTS

Diamond drilling encountered significant alteration in every drill hole and minor zones of Zn-Cu stringers. No economic sulphides were encountered. Full interpretations of the data is underway.

Downhole PEM completed to date indicates a single problematic offhole anomaly in SLM-252. This data is being reviewed. A preliminary interpretation of the CSAMT test data defines a significant feature consistent with an interpreted caldera ring fracture system. These structures can help focus the hydrothermal discharge and form massive sulphide deposits. Further work on this structure is merited. See attached maps and summary logs.

FURTHER WORK

Work to be completed at this point:

1. 48 miles of DEEPEM

2. Detailed mapping on eastern section of property.

3. Full integration of all data (new and old) for interpretation.

Jamieson S. Walker

JW:sv

SUMMARY LOG SLM-252

TARGET: Sturgeon Lake Property AZIMUTH:
NORTHING: 81 + 10 N DIP: -88°
EASTING: 84 + 00 E LENGTH TO DATE: 1567.0 feet
PURPOSE: Evaluated stratigrapy and alteration underneath foowall intrusion of Sturgeon Lake deposit.

FROM-TO	ROCK TYPE	REMARKS
0.0- 37.0	CASING	
37.0-580.0	QTZ PORPHYRITE RHYOLITE / RHYOLITE TUFF	5-8% Bluish Qtz Xtals scattered in matrix. In situ brecciation produced by Chlorite injection (20-40% chlorite clots, names and veins). Late chlorite and Na amphibole + garnet alteration restricted to small patches (30-50cm). 473-546: stringer zone in silicified section. Avg: 10-15% po, 3% py < 1% cp
580.0-620.0	DEBRIS FLOW	Unsorted Heterolithic debris flow with 60% fragments in chlorite and garnet alteration groundmass.
620.0-776.5	RHYOLITE TUFF	In situ brecciated Rhyolite tuff with several moderately to strongly silicified zones: 646.2 - 662.0 690.0 - 705.0 745.2 - 776.5
776.5-1223.8	QTZ PORPHYRITIC RHYOLITE TUFF	5% resorbed bluish Qtz Xtals. Extensive late chlorite and Na amphibole and garnets alteration.

	892.2-937.6 QTZ PORPHYRITIC RHYOLITE TUFF	15% bluish Qtz-Xtals in sericite groundmass.
1000.0-1283.0	MAFIC DYKE	Fine - grained chlorite and biotite dyke.
1283.0-	RHYOLITE TUFF	Same as 452-1000. 1458-1471: Pyritic zone with/15% blotchy pyrite in fine grained siliceous tuff.

Both holes SLM-252 and SLM-253 are currently drilled to determine stratigraphy and the alteration beneath the footwall intrusion of the Sturgeon Lake deposit. Although a late chlorite and sodic amphibole and garnet alteration overprint earlier features several strongly silicified zones were intersected. Sillimanite needles are well developed in some of these bleached zones.

A well defined stringer zone was intersected in SLM-252 at 473-546, it averaged 10-15% po, 3% py, < 1% cp scattered in masses and stringers. This mineralized zone appears related with the late chlorite and garnet alteration. In SLM-253 a pyritic zone was intersected at 1458 1471, in which 15% blotchy pyrite occurs in silicified weakly banded fine rhyolite tuff.

SUMMARY LOG SLM-253

TARGET: Sturgeon Lake Property **AZIMUTH:**
NORTHING: 84 + 00 N **DIP:** -88°
EASTING: 100 + 20 E **LENGTH TO DATE:** 1480 feet
PURPOSE:

FROM-TO	ROCK TYPE	REMARKS
0.0- 16.0	CASING	
16.0-452.0	QTZ PORPHYRITIC RHYOLITE TUFF	8-10% bluish Qtz Xtals. 30% chlorite - mottled texture 296.0-301.0: 3% po, 1% cp, strg. 335.3-335.8: 25% po 8% cp, strg. 383.5-384.0: 3% po, 5% cp mineralization associated late chlorite and garnet alteration.
452.0-1000.0	RHYOLITE TUFF	30% chlorite clots,masses and veins - in situ brecciation. Numerous silicified zones(50 cm to 1.5 m). 628-858: variable sericite and silica ateration,restricted chlorite and Na amphibole and garnet alteration. 733-745: 10-15% pyrite masses and clots. 805-825: 5% diss. pyrite blebs. 858-1000:pervasive sericite and silica fish scale texture.

1223.8-1382.0 MAFIC DYKE	Fine grained chlorite and biotite dyke.

SUMMARY LOG SLM-254

TARGET: L7800E,80+OON AT -77S **AZIMUTH:**
NORTHING: **DIP:**
EASTING: **LENGTH TO DATE:2303 FEET**
PURPOSE:TEST STRATIGRAPHY AND ALTERATION BENEATH FOOTWALL INTRUSIVE OF STURGEON LAKE MINE.

FROM-TO	ROCK TYPE	REMARKS
0.0 - 34.8	CASING	
34.8 -145.0	RHYOLITE LAPILLI TUFF	-8-10% loose lapillis in wkly sericitic groundmass.
145.0 -315.0	RHYOLITE TUFF	-10% chlorite clots
315.0 -1031.0	RHYOLITIC LAPILLI TUFF	-315-490: 35% chlorite clots 397-417:blocky/fragmented texture 489-628:15% chlorite clots 628-714 RHYOLITE TUFF -occasional in situ brecciated. -8-10% chlorite clots. 827-859:late akl. alteration/chlorite patches and garnets. 859-907 RHYOLITE TUFF 867-897:stringer zone associated with late alk alteration. 881.6-881.8:15% sph 3-5% cp stringer and blebs. 883.3:2cm wide semi massive sph. stringer, < 1% py, tr cp.

		844.7-855.4:scattered 5% cp, 2% po, < 1% sph
		891.3:6-8mm wide semi massive sph. stringer
		892:5mm wide semi massive sph, stringer, po bleb.
	907.0 -1031.0	40-50% felsic lapillis/ cherts
		952.0 -965.7:silic zone
1031.0-1753.0	RHYOLITE ASH TUFF/FLOW	fine grained massive homogeneous
		1069-1347:siliceous zone with 20-25% chl clots 8% biotite clots -late alk. alteration overprint
		1350.9-1351.4: 3-5% po masses < 1% cp blebs associated with chlorite infilling.
		1347-1547: 20% chlorite, 5-8% biotite clots.
		1642-1746: andesite dyke swarm - 15% dykes.
1753.0-2063.0	QTZ PORPHYRITC RHYOLITE TUFF/ CLASTIC TUFF	Pervasive motted/blotchy texture 25-30% chlorite intercolated fine tuff and felsic clastic tuff.
		2045 & 2063: chlorite cherts, 5-8% biotite flecks.
2063.0-2302.0		Biotite rich calcite andesite dyke.
E.O.H.		

SUMMARY LOG SLM-255

TARGET: L11200E 85+15N -79S **AZIMUTH:**
NORTHING: **DIP:**
EASTING: **LENGTH TO DATE:2458 FEET**
PURPOSE:TEST STRATIGRAPHY AND ALTERATION BENEATH FOOTWALL INTRUSIVE OF STURGEON LAKE MINE.

FROM-TO	ROCK TYPE	REMARKS
0.0 - 20.00	CASING	
20.0 - 95.3	MAFIC INTRUSIVE GABBRO	
95.3 -812.4	QTZ PORPHYRITIC RHYOLITE TUFF	3-5% bluish Qtz Xtals (< 2mm)
	223.7-276.6 Andesite dyke swarm, 15% dykes late alk. alteration in QP tuff between dykes.	
	363.5-394.0 Qtz porphyritic lapilli tuff 20% distinct cherts.	
	394.0-403.0 Silicified zone invaded with 40% ser wips.	
	430-504 Weakly silicified zone -late alk. alteration overprint.	
		443-448: 2% po+py < 1% cp wips ass. with silic.
		473-474.8: 3% cp, 3% po massive blebs ass. with alk. alteration.
		498.5-501.0: 3% cp, 3% po massive blebs ass. with alk. alteration.

498.5-501.0: 3% po wips
1% cp ass. with alk alt.

501.2-503.2: 5-8% sph
1-2% cp, 3% po stringers
ass. with alk alteration
decrease in QP downhole.
(Mattabi ?)

719.5-747
Wkly silicif zone,
large chlorite +
ser patches <2% po
1% py scattered masses.

766.9-779
Stg silicitic 3-5%
stringers - 5% po,
1% cp, tr. sph.

779-812.4
Motted texture ?
5% lapillis

812.4 -1194.9 RHYOLITE TUFF — Similar to above but with no QP's.

812.4-871.1
Stringer zone-unevenly
distributed stringer
and masses in
silicified zone.

812.4-814: 10% po, 10% py
2% cp, tr sph

817.7-822.7: 1% py, 3-5%
po, tr cp sph

848.5-851.5: 3-5% po,
< 1% sph tr cp

867.5-870.5: 3% po, 1-2%
sph, < 1% cp

871.1-994.9 — Numerous restricted silic zone invaded with chlorite occasionally po, py trace cp.

	994.9-1087.6	Mottled chaotic texture 20-25% chl masses + clots
1194.6-1605	CLASTIC RHYOLITE TUFF	Closely packed > 50% siliceous clerts unaltered to weak silicified.
		1391-1569.8: Rhyolite tuff, no distinct cherts.
1605-2467.1	QTZ PORPHYRITIC RHYOLITE TUFF	5-8% bluish QP's (<2mm) close to unaltered but often weak chloritic.
	1827-1912 20-25% chlorite fractures.	
		1878-1912: broken core
		1888-1900: fault zone graphite coating on fractures.
	1912-1955.7 Late alk. alterat. chlorite + garnets.	
	1955.7-2467.1 Biotite/minor chlorite clots peppered throughout.	
		2058.0-2136: late alk. alteration.
		2218.0-2236: late alk. alteration.
		2446.5-2467.1: late alk. alteration.
2467.1-2468	ANDESITE DYKE	
E.O.H.		

SUMMARY LOG SIM-256

TARGET: L10000E 79+00N **AZIMUTH:**
NORTHING: **DIP:**
EASTING: **LENGTH TO DATE:**
PURPOSE: TEST STRATIGRAPHY AND ALTERATION BENEATH FOOTWALL INTRUSIVE OF STURGEON LAKE MINE.

FROM-TO	ROCK TYPE	REMARKS
0.0 - 21.2	CASING	
21.2 -730.5	QTZ PORPHYRITIC RHYOLITE TUFF	5-8% bluish QPs in chlorite clotted tuff
	152-204 Sericitic zones (patches + fractures) numerous QV's	
	267-394 Close to unaltered.	
	576.6-615.3 Rhyolite tuff no QP's 5-8% biotite clots.	
730.5-772.3	QTZ PORPHYRITIC CLASTIC TUFF/TUFF	Fault contact-chaotic zone at 730.5-732.1 wk blocky/fragmentary texture.
772.3-865.2	RHYOLITE TUFF	Molted texture 10% chl, No QP's.
	806-842 Weak bleaching, less chlorite.	
865.2-997.0	865.2-922	Chaotic fragmentary unit 40-50% mixed frag + clasts with chlorite fractures.
		886.5-904.0 Stg. pervasive silic.

	922-997.0	Fragmentary tuff mainly fragments-Homogeneous chl molted texture.
997.0-1083	QTZ PORPHYRITIC CLASTIC TUFF	Chlorite alteration fragmentary clastic tuff (molted texture) 10% cherts (3% mafic ?)
	1065-1083 Transit zone motled text to close to unaltered ash tuff.	
1083.0-1470.0	ASH TUFF	Fine grained.
1839.3-1897.0		Homogeneous close to unaltered peppered with 5-8% biotite clots.
	1097.8-1116.7 Weakly bleached zone.	
		1100.8: isolated thin (< 2mm) semi massive cp sph stringer
	1207-1397 15% biotite clots, weak alk. alterat.	
	1338-1342.2 alk. alter. / chlorite + garnets	
	1397-1556.5 mixed, biotite clotted/ non clotted ash tuff	
	1556.6-1673 Stg. chlorite alter. 35% fractures and veins. Weak to moderate silic. ash tuff - crude banding from chlorite infilling silic zone at: 1590.9-1593.7 1650.7-1657.0	

1740-1839.3	QTZ PORPHYRITIC ASH TUFF	
1897-2177		Similar to above with 10% bluish QP's.
	1782.1-1787.0 Brecciated zone and weak associated bleaching.	
	1897.0-1927 Late alk. alteration.	
E.O.H.		

SUMMARY LOG SLM-257

TARGET: Mattabi Rhyolite **AZIMUTH:** 180° Grid 195° Astr.

NORTHING: 76+00N **DIP:** -85° S

EASTING: 111+50E **LENGTH:** 2088m

PURPOSE: TEST STRATIGRAPHY AND ALTERATION WITHIN MATTABI RHYOLITE BELOW FOOTWALL INTRUSIVE OF THE STURGEON LAKE MINE.

FROM-TO	ROCK TYPE	REMARKS
0.0- 17.5	OVERBURDEN	
17.5- 33.0	ANDESITE DIKE	
33.0-418.0	QP TUFF (Mattabi Rhyolite)	Silicified +/- biotite - chlorite alteration. Scattered cp, and minor sph assoc. with chloritic alt'n.
418.0-1082	RH TUFF (Mattabi Rhyolite)	Upper section has carbonate-chlorite alt'n, lower has chloritic alt'n.
1082 - 1485	GABBRO	Po-cp in qtz-tourmaline veins. Intrusive not expected in this section.
1485 - 1935.5	RH TUFF (Mattabi Rhyolite)	Typical bedded Mattabi ash. Generally silicified with variable chlorite-biotite alt'n +/- garnet. Tr sulphides.

1935.5- 2088 GABBRO Po +/- cp in fractures.
(EOH) (South Intrusive)

Drill hole cuts abundant and intense alteration especially lower rhyolite tuff (1485-1935.5).

SUMMARY LOG SLM-258

TARGET: Mattabi Rhyolite
AZIMUTH: 180° Grid 195° Astr.
NORTHING: 80+00N
DIP: -85° S
EASTING: 91+75E
LENGTH: 2267m
PURPOSE: TEST STRATIGRAPHY AND ALTERATION WITHIN MATTABI RHYOLITE BELOW FOOTWALL INTRUSIVE OF THE STURGEON LAKE MINE.

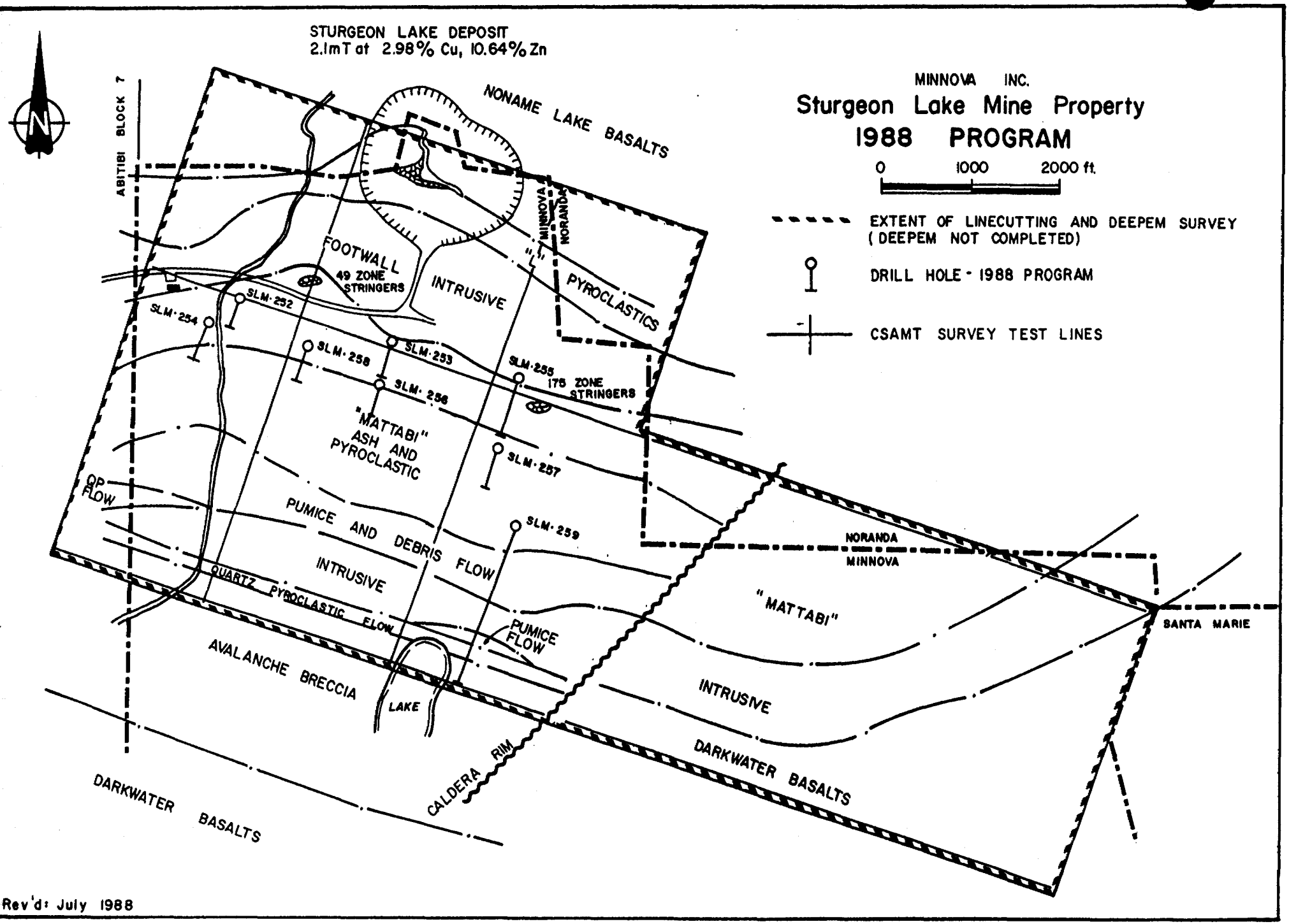
FROM-TO	ROCK TYPE	REMARKS
0.0- 65.5	OVERBURDEN	
65.5-2173.5	RH TUFF/QP TUFF (Mattabi Rhyolite)	Typical Mattabi Rhyolite with variable alteration. Generally silicified with several zones of intense chlorite or chlorite/ biotite and cordierite. Minor mineralization.
2173.5-2267	GABBRO	Marker Andesite - sill Southern intrusive.

SUMMARY LOG SLM-259

TARGET: MesoBx
AZIMUTH: 180° (Grid)
NORTHING: 66+00N
DIP: -65°
EASTING: 118+00E
LENGTH: 1877m
PURPOSE: TEST STRATIGRAPHY AND ALTERATION WITHIN LOWER SECTION OF MATTABI RHYOLITE AND UPYF/QPYF NORTH AND SOUTH OF SOUTHERN INTRUSIVE.

FROM-TO	ROCK TYPE	REMARKS
0.0- 21.0	OVERBURDEN	
21.0-506.7	QP TUFF/LAP TUFF	Mattabi rhyolite qtz-ash sets. Biotite-chlorite +/- carb alteration. 54-87 STRINGER ZONE po-cp-sph striner mineralization associated with chlorite-biotite cutting carbonate alteration. Possibly up to 2-3% Zn, 1-2% Cu- waiting on assays. 181-184 STRINGER ZONE po-sph-cp as above up to 4% Zn - waiting on assays.
506.7-559.5	HET TUFF/UPYF	Heterolithic debris flows with chlorite biotite alt'n and tr cp, po mineralization.

559.5-1013.3	GABBRO	Southern intrusive.
1013.3-1030.2	QP TUFF	Extensively silicified ash + qtz. xtals with biotite alteration. 1023.8-1024.2 <u>CHERTY EXHALITE</u> Dark grey siliceous with 5% pyrite, possibly sphalerite waiting on assays.
1030.2-1273	CHLORITE HET TUFF/ UPYF	Heterolithic debris flow with intense chlorite.
1273 - 1443	INTERMEDIATE INTRUSIVE	Fine grained "dacitic" intrusive similar to H.W. Intrusive @ Mattabi.
1443 - 1470	HET TUFF/UPYF (as above)	Heterolithic debris flows with chlorite-biotite alteration.
1470 - 1590.5	QP TUFF/QPYF	Light grey felsic 0-30% qtz xtls with chlorite-biotite alteration.
1590.5 - 1788	COARSE HET. BX/ MESOBX	Chaotic extremely unsorted heterolithic with block-sized fragments/Biotite-chlorite alteration.


STURGEON LAKE DEPOSIT
2.1mT at 2.98% Cu, 10.64% Zn
MINNOVA INC.
Sturgeon Lake Mine Property
1988 PROGRAM
0 1000 2000 ft.
EXTENT OF LINECUTTING AND DEEPEM SURVEY (DEEPEM NOT COMPLETED)
DRILL HOLE - 1988 PROGRAM
CSAMT SURVEY TEST LINES
N
ABITIBI BLOCK 7
NONAME LAKE BASALTS
MINNOVA
NORANDA
FOOTWALL
49 ZONE STRINGERS
INTRUSIVE
"I"
PYROCLASTICS
SLM-252
SLM-254
SLM-258
SLM-253
SLM-255
175 ZONE STRINGERS
SLM-256
"MATTABI" ASH AND PYROCLASTIC
SLM-257
QP FLOW
PUMICE AND DEBRIS FLOW
SLM-259
INTRUSIVE
QUARTZ PYROCLASTIC FLOW
PUMICE FLOW
AVALANCHE BRECCIA
LAKE
NORANDA
MINNOVA
"MATTABI"
SANTA MARIE
INTRUSIVE
CALDERA RIM
DARKWATER BASALTS
DARKWATER BASALTS
Rev'd: July 1988

HOLE NUMBER: SLM-252

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: X METRIC UNITS:

PROJECT NAME: SLM
PROJECT NUMBER: PN359
CLAIM NUMBER:
LOCATION: STURGEON LAKE MINE

PLOTTING COORDS GRID: MINE
NORTH: 8380.00N
EAST: 8100.00E
ELEV: 9975.00

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -88° 0' 0"
LENGTH OF THE HOLE: 2380.00f
START DEPTH: 0.00f
FINAL DEPTH: 2380.00f

COLLAR GRID AZIMUTH: 180° 0' 0"

COLLAR ASTRONOMIC AZIMUTH: 195° 0' 0"

DATE STARTED: March 20, 1988
DATE COMPLETED: April 3, 1988
DATE LOGGED: 0, 0

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: CONNORS DRILLING RIG 11
CASING: 37 FEET
CORE STORAGE: STURGEON LAKE MINE

PURPOSE: TEST ALTERATION AND STRATIGRAPHY BENEATH FOOTWALL INTRUSIVE OF THE STURGEON LAKE MINE.

DIRECTIONAL DATA:

Depth (f)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
607.00	198° 0'	-87° 0'	MULTISHOT	OK	
707.00	196° 0'	-86°30'	MULTISHOT	OK	
807.00	195° 0'	-86° 0'	MULTISHOT	OK	
907.00	192° 0'	-86° 0'	MULTISHOT	OK	
1007.00	191° 0'	-86° 0'	MULTISHOT	OK	
1107.00	190° 0'	-85°30'	MULTISHOT	OK	
1207.00	187° 0'	-85° 0'	MULTISHOT	OK	
1307.00	190° 0'	-85° 0'	MULTISHOT	OK	
1407.00	190° 0'	-85° 0'	MULTISHOT	OK	
1507.00	190° 0'	-85° 0'	MULTISHOT	OK	
1607.00	186° 0'	-84°30'	MULTISHOT	OK	
1707.00	185° 0'	-84°30'	MULTISHOT	OK	
1807.00	185° 0'	-84°30'	MULTISHOT	OK	
1907.00	180° 0'	-84° 0'	MULTISHOT	OK	
2007.00	178° 0'	-83°30'	MULTISHOT	OK	
50.00	-	-88° 0'	ROTODIP	OK	
200.00	-	-87° 0'	ROTODIP	OK	
350.00	-	-86° 0'	ROTODIP	OK	
500.00	-	-86° 0'	ROTODIP	OK	
650.00	-	-86° 0'	ROTODIP		
800.00	-	-85° 0'	ROTODIP		
950.00	-	-84° 0'	ROTODIP		
1100.00	-	-84° 0'	ROTODIP		
1250.00	-	-83° 0'	ROTODIP		
1400.00	-	-83° 0'	ROTODIP		
1550.00	-	-84° 0'	ROTODIP		
1650.00	-	-83° 0'	ROTODIP		
1750.00	-	-83° 0'	ROTODIP		
1800.00	-	-83° 0'	ROTODIP		
1900.00	-	-82° 0'	ROTODIP		
1950.00	-	-82° 0'	ROTODIP		
2000.00	-	-82° 0'	ROTODIP		
2050.00	-	-82° 0'	ROTODIP		
2100.00	-	-82° 0'	ROTODIP		
2150.00	-	-82° 0'	ROTODIP		
2200.00	-	-82° 0'	ROTODIP		
2250.00	-	-82° 0'	ROTODIP		
2300.00	-	-81°30'	ROTODIP		
150.00	172° 0'	86° 0'	TROPARI	OK	
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HOLE NUMBER: SLM-252

MINNOVA INC.
DRILL HOLE RECORD

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CLAIM NUMBER:
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NORTH: 8380.00N
EAST: 8100.00E
ELEV: 9975.00

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -88° 0' 0"
LENGTH OF THE HOLE: 2380.00f
START DEPTH: 0.00f
FINAL DEPTH: 2380.00f

COLLAR GRID AZIMUTH: 180° 0' 0"

COLLAR ASTRONOMIC AZIMUTH: 195° 0' 0"

DATE STARTED: March 20, 1988
DATE COMPLETED: April 3, 1988
DATE LOGGED: 0, 0

COLLAR SURVEY: NO
MULTISHOT SURVEY: NO
RQD LOG: NO

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: CONNORS DRILLING RIG 11
CASING: 37 FEET
CORE STORAGE: STURGEON LAKE MINE

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1507.00	190° 0'	-85° 0'	MULTISHOT	OK	
1607.00	186° 0'	-84°30'	MULTISHOT	OK	
1707.00	185° 0'	-84°30'	MULTISHOT	OK	
1807.00	185° 0'	-84°30'	MULTISHOT	OK	
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2007.00	178° 0'	-83°30'	MULTISHOT	OK	
50.00	-	-88° 0'	ROTODIP	OK	
200.00	-	-87° 0'	ROTODIP	OK	
350.00	-	-86° 0'	ROTODIP	OK	
500.00	-	-86° 0'	ROTODIP	OK	
650.00	-	-86° 0'	ROTODIP		
800.00	-	-85° 0'	ROTODIP		
950.00	-	-84° 0'	ROTODIP		
1100.00	-	-84° 0'	ROTODIP		
1250.00	-	-83° 0'	ROTODIP		
1400.00	-	-83° 0'	ROTODIP		
1550.00	-	-84° 0'	ROTODIP		
1650.00	-	-83° 0'	ROTODIP		
1750.00	-	-83° 0'	ROTODIP		
1800.00	-	-83° 0'	ROTODIP		
1900.00	-	-82° 0'	ROTODIP		
1950.00	-	-82° 0'	ROTODIP		
2000.00	-	-82° 0'	ROTODIP		
2050.00	-	-82° 0'	ROTODIP		
2100.00	-	-82° 0'	ROTODIP		
2150.00	-	-82° 0'	ROTODIP		
2200.00	-	-82° 0'	ROTODIP		
2250.00	-	-82° 0'	ROTODIP		
2300.00	-	-81°30'	ROTODIP		
150.00	172° 0'	86° 0'	TROPARI	OK	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 37.00	CASING «CASING»					
37.00 TO 417.00	QTZ PORPHYRITIC RHYOLITE TUFF «QP RH TUFF»	Qtz porphyritic Rhyolite tuff with up to 5% small (< 2mm) bluish, sub rounded qtz xtals scattered in siliceous medium grey sericitic matrix. Matrix is composed of fine grained Qtz + sericitic feldspar and minor biotite. Homogeneous Rhyolite tuff is invaded by chlorite clots, masses and fractures. Erratic 1-3 inch wide milky QV's cut through Rhyolite. 112.50-114.0 intrms dy ┤122.0-134.0├ «ma dyke» Medium - grained magnetic and calcitic equigranular mafic intrusive - containing up to 25% biotite and 15% chlorite associated with mixed calcite and Qtz. ┤134.0-144.0├ «RH clotted» Clotted Rhyolite with up to 15% chloritic clots. ┤139.0-155.0├ «ma dykes» Section containing up to 70% mafic intrusive sweats. Contacts are sharp irregular (broken or sinuous) contacts at low angles. Rh tuff often strongly calcitic near dyke margins		┤37-155.0├ «chl» Unevenly distributed up to 15% chlorite masses throughout matrix with occasional large chlorite patches (up to 15cm). Rhyolite tuft is weakly calcitic due to erratic disseminated calcite and small calcitic veinlets. Occasional Hematite xtals associated with large chlorite masses and calcite veinlets. mgnt carb «mgnt carb» Minute disseminated magnetite grains throughout extensive development of calcite in moderatively chloritic groundmass. «carb mgnt» 155.0-278.0 Decreese in chlorite masses and fractures. Chlorite rather occurs as diffused spread throughout rhyolite groundmass. Overall chlorite 10-15%, occasionally up to 40% obscuring primary textures. 173.70-178.8 «192.0-224.3├ «carb chl» Sections with strong carbonate development outlined by equigranular and or clotted textures. 30-40% calcite associated with chlorite and small	< 1% erratic sub-euhedral pyrite masses (< 3mm) randomly scattered throughout intrusive dykes. A 2 inch milky Qtz vein at 127 feet contains specks of chalco near its lower contact. Erratic specks also visible in vein selvage over 6 inch.	Litho 2154. Litho 2155.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				biotite flakes.		
				⟦225.0-278.0⟧ «stg chl» Strong chlorite development, commonly obscuring textures over 10-20cm. Chlorite occurs in fractures, as massive masses, and disseminated throughout groundmass.	226.0-228.0 < 1% scattered pyrrhotite specks and small blebs with occasional pyrite and chalcopyrite.	
		228.0-233.0 Isolated fragmental zone with up to 15% qtz xtals clustered in vague ag-gregales or along margins of chloritic masses. Fragments are the result of the in situ brecciation due to chlorite infilling.				
		242.5-264.0 Scattered < 2% milky Qtz vein with irregular outlines. Noticeable increase in chlorite in veins proximity (over 50cm) avg. QV's 5-8cm wide.			242.5-264.0 Erratic pyrite and pyrrhotite with minor chalcopyrite specks associated with some QV's. Overall trace.	
				255.5-256 Strongly silicified zone with blocky textures developed in the Rhyolite tuft strong chlorite development at both ends of the zone over 50cm.		Litho 2156. 2157
				⟦278.0-417.0⟧ «ser chl» Increase in sericite associated with chlorite throughout groundmass. Chlorite masses and clots are more diffused and ill defined.		Litho 2156 2157
		⟦370-450⟧ «qv's tourm» Section with several 3-5cm wide mikly Qtz veins. Vein selvages are brecciated on each side over 5-8cm, and filled with mixed chlorite and with tourmaline xtals and broken needles. Major veins at: 374.0-374.5 383.3-384.2 413.7-414.6 427.0-427.8 448.3-448.8		Chlorite increased in veins proximity.	Erratic < 1% pyrite masses occasionally found in some QV's. Pyrite rather in brecciated selvage or in the veins.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
417.00 TO 580.00	CLOTTED RHYOLITE TUFF «RH TUFF-CLOT»	Strongly altered and fragmented Rhyolite tuff with 40% distinct fragments and knots (avg 2cm) resulting from in situ brecciation. Resorbed bluish Qtz porphyrites are rare (< 2%) and occasionally occur clustered near chloritic fractures.		«chl» Weak pervasive silicification throughout with moderate to strong late chlorite development in masses, clots, and along fractures enveloping fragments. 5% garnets aggregates (avg size 5-15mm) occur chlorite patches. Late alk. alteration.	1-2% erratically distribured pyrite + pyrrhotite blebs and stringer, occasional trace to chalcopyrite. Mineralization associated with strong chlorite development.	Litho 2158.
					┤454.0-462.0├ «3% diss po py» 3% mixed pyrite and pyrrhotite stringers and wisps with erratic < 1% chalcopyrite blebs associated with chlorite and alumino-silicate aggregates.	Geochem 0341. 0342.
				┤473-546├ «alk alter» 3% small garnet aggregates and clusters associated with larger chlorite patches. Occasionally py + po found in contact with the garnets. Erratic magnetite grains scattered throughout zone.	┤473-546├ «stngr zone» Strongly silicified and chloritic zone invaded with 15% mixed pyrrhotite and pyrite +/or chalcopyrite masses and stringers.	Litho 2159.
					┤473.0-478.0├ «30% po, 8% py and 1-2% cp.»	Geochem 0343, conductor.
					┤478.0-483.0├ «5-8% po, 2-3% py and trace cp.»	Geochem 0344, 0345 conductor.
					┤518.0-523.0├ «8% po, 3% py and < 1% cp.»	Geochem 0346, conductor.
					┤523-528.0├ «3-5% po, 1% py, 1-2% cp»	Geochem 0347.
					┤528-533.0├ «8% po, 4% py, < 1% cp»	Geochem 0348.
					┤533.0-538.0├ «8-10% po, 5-8% py, trace cp.»	Geochem 0349 Geochem end of zone: 0350, 0351.
				┤544-556.7├ «sil» Lighter grey blocky silicified zone with diffuse chlorite throughout.		
		┤556.7-560.0├ «ma dy» Fine to medium grained equigranular mafic dyke strongly calcitic cut altered Rhyolite tuff.	30	chl carb Pervasive chlorite and calcite development throughout.		

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				┤560.6-745.20├ «alk alter» Up to 30% chlorite masses and wisps mixed with minor sericite, often containing up to 8% garnet containing up to 8% garnet aggregates (avg. size < 3mm) clusters over 8-10cm wide zones.	« < 1% po» Erratic small irregular pyrrhotite masses and stringers overall < 1%.	Litho 2160.
580.00 TO 637.00	DEBRIS FLOW «HET DEBRIS »	Chaotic debris flow containing up to 60% unsorted sub-angular Heterolithic fragments in a medium grained chloritic groundmass. Fragment size range between 1cm to 6cm, averaging 1-2cm. Occasional QV's cut throughout debris flow containing erratic specks of chalcopyrite.		«stg alk alter» Strong pervasive chlorite throughout groundmass. More than half of the fragments are chloritic and sericitic. Resorbed sub-rounded garnets aggregates are peppered throughout debris flow. Section between 600.0 and 614.0 contains up to 20% small (< 5mm) garnets. ┤632.0-637.0├ «sil ser» Isolated silicified zone marked by decrease in chlorite and increase in sericite wisps (up to 10%) fragments outlines slightly obscured by silicification.	634.5-636.0 Mixed chalcopyrite and pyrrhotite stringer following a chloritic fracture and erratic blebs located in the fracture proximity - 5% mixed po, cp over 50cm.	Geochem 0352.
637.00 TO 776.50	FELSIC LAPILLI TUFF «LAP TUFF»	Medium grained chloritic lapilli tuff containing fragments resulting from in situ brecciation (similar to 417.0-580.0) but also faint but distinct 5-8% scattered lapillis (avg size < 15mm)		«alk alt» Late alk. alteration throughout - similar to 417.0-580.0. ┤646.2-662├ «sil ser» ┤690-705├ «sil ser» Lighter grey silicified zones similar to 632.0-637.0. ┤745.2-776.5├ «stg ser, sil» Moderate alk. alter. over a strongly sericitic silicified zone resulting in a clotted texture consisting of 5-10% irregular chlorite +/- garnets patches randomly distributed over the silicified and strongly sericitic groundmass. Sericite occur mainly mixed with silica in groundmass and as wisps along	No mineralization appears associated with the strong sericite development. Erratic pyrrhotite masses occur in the chloritic patches.	Litho 2161. Litho 2162.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				fractures enveloping silica knots. (silica + seric. alt. preceeds alk. alt.).		
776.50 TO 1223.80	QTZ PORPHYRITIC RHYOLITE TUFF «QP TUFF»	Qtz porphyritic rhyolite tuff containing up to 5% distinct resorbed bluish QP's (avg. size < 2mm) throughout strongly altered (chlorite + sericite + garnet) to situ brecciated tuffaceous groundmass. Most primary textures obscured by alteration.		┤776.5-890├ «ser, chl, grnt» Up to 8% sericitic patches, fractures and wisps visible throughout the late alk alteration (chlorite + garnets). Sericite altered zones varies from 30cm to 1.5m long and contains in average 25 to 30% sericite in it. Weak calcite development along sericitic fractures.	Occasional < 1% pyrrhotite and minor chalcopyrite stringers and irregular masses associated with chloritic zone. Minute chalcopyrite specks scattered throughout mainly associated with garnets and/or chlorite.	Litho 2163.
					┤794.0-804├ «3% po, 2% cp» 3% pyrrhotite and < 2% chalcopyrite mixed in irregular stringers and masses along chloritic fractures and chlorite and garnet patches.	Geochem 0353. 0354.
		890-1187.0 Less altered QP Rhyolite tuff with no distinct fragments containing up to 8-10% small (< 2mm) scattered bluish QP's in a medium to fine grained Qtz + sericitic Feldspar with minor magnetite weakly banded groundmass - banding @	25 30	┤890.0-1087├ «chl, grnt» Chlorite + garnet alteration still ubiquitous but it is less pervasive. Chlorite alteration is restricted to isolated elongated patches (ill defined band, common length: 0.3 to 1.0m) in the weakly silicified Rhyolitic tuff. Garnets aggregates associated with chlorite in this section are commonly up to 10mm in diameter and are weakly aligned along faint banding at 30 degrees. 15-20% garnet aggregation in a chloritic elongated patch (or band) is common. Fine magnetite grains and calcite seems often found associated with garnets.	1% pyrrhotite and chalcopyrite wisps and specks usually present in minor amount in chlorite and garnet batches minor pyrite. Occur mixed with pyrrhotite. Occasionally pyrrhotite and chalcopyrite blebs are found in QV's	Litho 2164. 2165.
		Section cut by few small QV's and numerous minute seems of calcite +/or Fe-carbonate.				
		915.5-918.5 mafic dyke Fine grained massive equigranular, weakly magnetic and strongly calcitic. Development of weak bleaching over 1.0m in the Rhyolite tuff beneath the dyke.		Pervasive chlorite and calcopyrite throughout		
		┤1013.7-1013.9├ «flt»			942.0-945.0 2% mixed pyrrhotite, pyrite and minor chalcopyrite in irregular clusters.	Geochem 0355.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Small 3cm fault with development of day gouge material.		1084.5-1187.0 sil ser Siliceous tuffaceous groundmass with weak to moderate sericite and minor chlorite throughout. Faint banding or preferential fractures plane around 10-20 degrees to C.A. - sericite and chlorite wisps commonly well developed near fractures. Chloritoid clusters developed near small QV's ??	1084.5-1187.0 1-2% fine disseminated pyrite 10 minute fractures and seems and in larger blebs and masses (< 4mm) associated with chloritic fractures or small QV's. 1115-1125 Isolated small chloritic zone with 1% mixed pyrite and pyrrhotite stringers and wisps. Trace of chalcopyrite specks.	Litho 2166.
		┤1131-1135├ «flt» Probable fault zone outlined by highly broken core.		┤1187.0-1223.8├ «chl ser sil» Altered zone with chlorite and sericite and silica development associated with mafic intrusive (at 1223.8). Chlorite and sericite (overall 15-20%) occurs as wisps throughout matrix along fractures and in broken bands. Silica knots and silicified fragments are common. Micro garnets occasionally occur with chlorite - noticeable increase in garnets toward intrusive.	1187.0-1223.8 py Up to 3% pyrite clots and masses scattered throughout altered zone.	Litho 2167.
1223.80 TO 1289.00	ANDESITE DYKE «AND DY»	1223.8-1289.0 Fine grained massive equigranular biotite rich andesite dyke. Numerous fine calcite seems, irregular pods and occasional small QV's are scattered in the intrusive contact with altered zone @	25	Pervasive chlorite throughout hard siliceous groundmass.		Litho 2168.
1289.00 TO 1380.00	DYKES IN QP TUFF «DYKES QP TUFF»	┤1289.0-1380├ Section contains several andesite dykes cutting at low angle within the highly silicified QP rhyolitic tuff. Repetitive intersection of andesite dyke at low angle probably indicate presence of a major sinuous sub parallel to C.A. andesite contact dykes: 1320.6-1324.20		┤1289.0-1429.4├ «sil chl» Strongly altered zone. Intense silicification with local stringer chlorite development in intrusive's margins and in 2% erratic < 2% patches. Pale green and light brown sericite occur mixed with fine grained chlorite	5-8% scattered disseminated pyrite. Pyrite mostly occurs in sericitic groundmass between silica knots.	Litho 2169. 2170.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		1325.5-1334.0 1363.4-1370.0 1375.0-1379.0 Contacts @	 20	in groundmass enveloping silica knots and fragments. 8-10% mixed sericite and Fe-carbonate wisps are erratically scattered throughout, often occuring along small fractures.		
1380.00 TO 1429.40	QP TUFF «QP TUFF»	Silicified portion contains up to 15% sub-rounded weakly preserved, bluish and grey white QP's tuffaceous groundmass is strongly altered, primary textures are mostly obscured. 1425.3-1429.4 mafic dyke Light greenish grey, fine to medium grained, massive, equigranular.	 10	 10% qtz-carb veining.		
1429.40 TO 1578.60	QTZ PORPHYRITIC RH TUFF «RH TUFF»	Similar to 776.5-1223.8 Auto brecciated, pale grey, aphanitic to weakly qtz-phyric (< 1% blue qtz-eyes). Coarse blocky fragments (70-90%) in a chloritic, lesser sericitic (patchy) minor biotite siliceous qtz-phyric (5% qc) groundmass Weak planer fabric defined by chlorite. 1471.0 1" healed (silicified) fualt zone with pyritic halo. 1502.0 4" irregular amph band. 1504.0-1505.0 Irregular amph band. 1562.4-1564.5 Mafic (amph?) band. 1576.0-1577.5 Mafic (amph?) band.	 10 20	«chl» Pervasive stringer chloritic altered inter fragmental groundmass. Occasional hairline cream coloured calcite veining. Occasional small patch and stringers of green amphibole - po alteration (alkali overprint?) 1560.7 1" sil zone 1569.5 1" sil zone.	Trace disseminated Py overall with occasional small patches of pyrite ie. 1438.0-1442.3, 1451.0 1521.0 1/2" qtz-py vein. 1562.4-1564.5 2% disseminated py. 1576.0-1577.5 2% disseminated py.	 Geochem: 0356. Geochem: 0357.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
1578.60 TO 1614.80	RHYOLITE LAPILLI TUFF «QP LAP TUFF»	Angular Rhyolitic clasts up to 1" daimeter occasionally showing "hot" reaction rim zonation. Groundmass siliceous with 1-5% blue qtz eyes. Weakly developed banding/fabric @	16	«weak chl» Pervasive weak chlorite alteration. 1581.0 2" sil band. 1591.2 1/2" qtz-carb ? Al silicate ? vein.	Pervasive trace disseminated pyrite. 1601.2-1602.0 2% Py.	Geochem 0358.
1614.80 TO 1690.20	RHYOLITE CRYSTAL TUFF/ LAPILLI TUFF «RH LAP TUFF»	Interlayered fine grained, light grey quartz-phyric (< 1% qtz eyes) rhyolite tuff and rhyolite lapilli tuff. Overall gradually becoming nore fine grained downhole. Crude banding / layering @ ..... 1636.0-1637.2 Groundcore. 1651.5-1652.5 2" qtz stringer low CA 1655-1657 Contorted layering/banding (tectonic). 1655-1669 fault zone ? 1656.5-1657 qtz (-chl) vein 1659.5-1662.6 qtz (-chl) vein 1668.1-1669 qtz (-chl) vein	22	«? unalt'd»	Trace fine grained disseminated py, po and py blebs.	
1690.20 TO 2044.40	ANDESITE DYKE «AND DY»	Medium grey, fine grained, equigranular, massive, uniform texture. Contacts abrupt but not sharp. 1691.0 2" qtz vein 1698.3 4" qtz vein 1700.8 2" qtz vein		Unaltered exc. Occasional narrow qtz(-carb-chl-py) veinlet.	Minor po stringers at uphole contact.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		1799.5-1800.5 felsic xeno 1816.0-1817.0 felsic xeno 1836.4 1" qtz-amph-py vein 1870.2 stringer carb.	19	1870.2-1817.9 Stringer carb. altered zone.		
2044.40 TO 2103.30	MIXED LAPILLI TUFF «LAP TUFF»	10-30% pale grey aphanitic, angular, aphyric rhyolite clasts (< 1cm diameter) in a fine grained intermediate biotitic groundmass (mafic tuff component?). No quartz eyes. 2069.2 1" qtz-tourm vein 2092.2 2" qtz-tourm vein (tourmalinization of wallrock). 2100.5 4" qtz-tourm vein (tourmalinization of wallrock).		«weak chl» Weak chloritic alteration.	Trace disseminated po.	
2103.30 TO 2143.40	ANDESITE DYKE «AND DY»	Medium to fine grained, massive, dark green. Minor qtz veins. Occasional large siliceous, angular, blocky inclusions/alterations patches? both sharp and diffuse contacts. 2118.4-2119.0 qtz vein 2125.6-2125.8 qtz vein 2126.3 patchy garnetiferous zone.		Minor silicification. Weak chloritic.	Nil py, po.	
2143.40 TO 2150.00	BLOCKY RHYOLITE «BLOCKY RH TUFF»	Large blocks of light grey to buff, aphyric, aphanitic rhyolite with fine grained, dark siliceous interfragmental material.		«weak chl» Weak chloritic alteration.	1% po as stringers, disseminated blebs in both clasts and matrix and as massive clasts.	Geochem: 0359-0360.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
2150.00 TO 2380.00	ANDESITE DYKE «AND DY» E.O.H.	Fine to medium grained, dark green, massive equigranular, minor fracturing. 2167.0 3" qtz vein Occasional large siliceous, angular, blocky inclusions/alteration batches? 2262-2287 Silica and calcite development associated with fracturing (up to 20% irregular fractures). 2323.2 Small (approximately 15cm) brecciated zone. 2324.5-2329 Highly broken core fault zone ? End of Hole.		Minor calcite alteration associated with fracturing.	Nil.	

Sample	From (f)	To (f)	Length (f)	ESTIMATES Cu %	Zn %	Py %	Po %	Mt %	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Ag oz/ton	Au oz/ton	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	Ag ppm	Au ppb	Ni ppm	As ppm	Sb ppm	COMMENTS
MSD-0341	454.00	457.00	3.00	TR		3	2									36	74		0.6	10				PY,PO STRINGERS,CPY BLEBS
MSD-0342	457.00	462.00	5.00	< 1		TR	3									30	116		0.6	8				PY, PO, CPY STRINGERS
MSD-0343	473.00	478.00	5.00	1-2		8	30									269	96		1.8	20				PY, PO, CPY STRINGERS
MSD-0344	478.00	483.00	5.00	< 1		3	5-8									163	63		0.9	15				PY, PO, CPY STRINGERS
MSD-0345	483.00	488.00	5.00			1	2									202	84		1.5	9				PY, PO, CPY STRINGERS
MSD-0346	518.00	523.00	5.00	< 1		3	8									54	90		1.6	7				PY, PO, CPY STRINGERS
MSD-0347	523.00	528.00	5.00	1-2		1	3-5									36	121		0.9	7				PY, PO, CPY STRINGERS
MSD-0348	528.00	533.00	5.00	< 1		4	8									53	74		0.9	15				PY, PO, CPY STRINGERS
MSD-0349	533.00	538.00	5.00	< 1		5-8	8-10									63	87		1.3	11				PY, PO, CPY STRINGERS
MSD-0350	538.00	543.00	5.00			1-2	3									71	104		1.0	20				PY, PO, CPY STRINGERS
MSD-0351	543.00	546.00	3.00			1	1									45	77		0.4	8				PY, PO, CPY STRINGERS
MSD-0352	634.50	636.50	2.00	2			3									4910	85		7.1	64				CPY, + PO STRINGERS
MSD-0353	794.00	799.00	5.00	< 1			3									1360	40		3.2	23				CPY + PO STRINGERS
MSD-0354	799.00	804.00	5.00	< 1		1	3									897	36		1.4	9				CPY + PO STRINGERS
MSD-0355	942.00	945.00	3.00	1		1	3									478	76		1.1	26				PY, PO CLUSTERS MINOR CPY
MSD-0356	1562.40	1564.50	2.10			2										87	132		0.6	5				DISSEMINATED PY
MSD-0357	1576.00	1577.50	1.50			2										128	114		0.7	7				DISSEMINATED PY
MSD-0358	1600.20	1602.10	1.90			1										9	90		0.4	4				
MSD-0359	2143.40	2146.70	3.30				2-5									32	35		0.8	5				PO STRINGER BLEBS
MSD-0360	2146.70	2150.00	3.30				TR - 1									36	49		0.7	5				PO STRINGER BLEBS

Sample	From (f)	To (f)	Length (f)	SiO2 %	TiO2 %	Al2O3 %	FeO %	MgO %	MnO %	K2O %	CaO %	Na2O %	LOI %	Cu ppm	Zn ppm	Ni ppm	Ag ppm	Au ppb	TOTAL %	Pb ppm	Mn ppm	As ppm
MSD-2154	87.00	97.00	10.00	77.30	0.43	11.96	2.67	1.36	0.07	2.50	0.87	0.47	2.25	13	121	3	0.3	5	99.88			
MSD-2155	200.00	210.00	10.00	46.20	0.33	13.52	6.18	6.40	0.11	0.74	11.46	0.79	14.19	6	74	12	1.3	4	99.92			
MSD-2156	278.00	288.00	10.00	74.00	0.42	12.19	4.09	2.32	0.11	0.57	3.37	0.53	2.16	4	64	5	0.6	6	99.76			
MSD-2157	348.00	358.00	10.00	67.80	0.51	13.94	5.44	3.25	0.11	0.41	3.30	1.01	3.83	3	65	4	0.5	5	99.60			
MSD-2158	417.00	427.00	10.00	62.00	0.52	12.99	5.68	4.56	0.18	0.95	5.22	0.99	6.61	3	73	6	0.7	5	99.70			
MSD-2160	467.00	477.00	10.00	72.50	0.77	12.71	6.06	1.42	0.12	2.66	0.50	0.30	2.58	33	74	9	0.5	4	99.62			
MSD-2159	497.00	507.00	10.00	76.20	0.43	13.12	3.44	0.84	0.09	2.39	0.17	0.45	2.19	3	45	2	0.4	4	99.32			
MSD-2161	647.00	657.00	10.00	81.20	0.27	9.19	3.96	0.76	0.06	2.21	0.14	0.19	1.90	37	21	4	0.2	5	99.88			
MSD-2162	747.00	757.00	10.00	74.70	0.27	9.81	5.56	0.94	0.14	2.66	0.28	0.16	4.78	44	16	5	0.4	5	99.30			
MSD-2163	817.00	827.00	10.00	76.70	0.26	9.46	4.86	1.47	0.15	2.08	1.12	0.31	3.02	32	18	4	0.4	6	99.43			
MSD-2164	920.00	930.00	10.00	77.50	0.31	11.48	4.29	0.88	0.06	2.23	0.16	0.30	2.13	5	43	3	0.2	4	99.34			
MSD-2165	1017.00	1037.00	20.00	76.40	0.29	10.75	5.76	1.33	0.18	1.39	0.56	0.31	2.51	19	55	4	0.4	5	99.48			
MSD-2166	1097.00	1107.00	10.00	78.90	0.30	9.79	3.03	1.61	0.06	1.93	0.92	0.41	2.67	13	69	3	0.3	5	99.62			
MSD-2167	1197.00	1207.00	10.00	69.40	0.39	8.92	5.69	3.91	0.11	0.58	5.23	0.41	5.25	28	54	23	0.8	7	99.89			
MSD-2168	1257.00	1267.00	10.00	57.30	1.16	18.20	6.90	4.45	0.15	1.87	5.14	0.92	3.53	25	75	29	1.1	5	99.62			
MSD-2169	1347.00	1357.00	10.00	76.30	0.33	12.36	2.93	2.00	0.06	1.91	0.93	0.41	2.64	17	76	4	0.3	5	99.87			
MSD-2170	1412.00	1424.00	12.00	72.80	0.31	12.93	3.52	2.80	0.08	1.11	2.01	0.98	2.98	3	68	4	0.4	4	99.52			
MSD-2171	1507.00	1517.00	10.00	77.00	0.32	11.40	3.53	2.30	0.07	1.43	0.83	0.26	2.62	7	105	2	0.3	4	99.76			
MSD-2174	1587.00	1597.00	10.00	75.20	0.36	13.01	3.54	2.42	0.06	1.60	0.59	0.32	2.40	4	67	3	0.2	4	99.50			
MSD-2172	1677.00	1687.00	10.00	77.30	0.30	10.93	3.66	2.28	0.06	1.76	0.50	0.28	2.37	11	50	5	0.2	4	99.44			
MSD-2173	1787.00	1797.00	10.00	58.30	1.14	17.04	8.39	4.61	0.17	1.01	4.30	0.61	4.08	65	63	35	0.8	6	99.65			
MSD-2175	1877.00	1887.00	10.00	60.60	1.17	16.91	6.51	4.19	0.11	2.46	5.17	0.55	2.13	37	64	31	1.3	5	99.80			
MSD-2176	1977.00	1987.00	10.00	53.00	1.16	17.60	7.77	5.59	0.20	1.98	7.49	0.56	4.02	77	61	34	1.5	4	99.37			
MSD-2177	2067.00	2077.00	10.00	70.10	0.90	14.53	6.85	2.14	0.13	1.23	0.87	0.29	2.79	21	45	17	0.2	4	99.83			

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: X METRIC UNITS:

PROJECT NAME: SLM
PROJECT NUMBER: PN059
CLAIM NUMBER:
LOCATION: STURGEON LAKE MINE

PLOTTING COORDS GRID: MINE GEOL.
NORTH: 8500.00N
EAST: 10010.00E
ELEV:

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -88° 5' 0"
LENGTH OF THE HOLE: 2398.00f
START DEPTH: 0.00f
FINAL DEPTH: 2398.00f

COLLAR GRID AZIMUTH: ° ' "

COLLAR ASTRONOMIC AZIMUTH: ° ' "

DATE STARTED: March 20, 1988
DATE COMPLETED: April 4, 1988
DATE LOGGED: 0, 0

COLLAR SURVEY: YES
MULTISHOT SURVEY: NO
RQD LOG: YES

PULSE EM SURVEY: NO
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: CONNOR'S DRILLING RIG 12
CASING:
CORE STORAGE: STURGEON LAKE MINE

PURPOSE:

DIRECTIONAL DATA:

Depth (f)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments	Depth (f)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
950.00	-	-85° 0'	ACID	OK	DIP	-	-	-	-	-	
1200.00	-	-83° 0'	ACID	OK		-	-	-	-	-	
1400.00	-	-83° 0'	ACID	OK		-	-	-	-	-	
1600.00	-	-83° 0'	ACID	OK		-	-	-	-	-	
100.00	-	-89° 0'	ROTODIP	OK		-	-	-	-	-	
100.01	-	0° 0'	ROTODIP	OK		-	-	-	-	-	
250.00	-	-88° 0'	ROTODIP	OK		-	-	-	-	-	
400.00	-	-86° 0'	ROTODIP	OK		-	-	-	-	-	
600.00	-	-87° 0'	ROTODIP	OK		-	-	-	-	-	
750.00	-	-85° 0'	ROTODIP	OK		-	-	-	-	-	
900.00	-	-84° 0'	ROTODIP	OK	PROBLEM WITH ROTO	-	-	-	-	-	
1800.00	-	-84° 0'	ROTODIP	OK		-	-	-	-	-	
1900.00	-	-84° 0'	ROTODIP	OK		-	-	-	-	-	
2000.00	-	-84° 0'	ROTODIP	OK		-	-	-	-	-	
2100.00	-	-84° 0'	ROTODIP	OK		-	-	-	-	-	
2200.00	-	-84° 0'	ROTODIP	OK		-	-	-	-	-	
2300.00	-	-84° 0'	ROTODIP	OK		-	-	-	-	-	
2350.00	-	-84° 0'	ROTODIP	OK		-	-	-	-	-	
230.00	189° 0'	-87° 0'	TRO-PARI	OK		-	-	-	-	-	
230.01	0° 0'	0° 0'	TRO-PARI	OK		-	-	-	-	-	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 16.00	CASING «CASING»	Overburden / large boulders and gravel.				
16.00 TO 94.80	MAFIC INTRUSIVE	Medium-grained, weakly magnetic, equigranular mafic intrusive. Composed of 50% chlorite, 10-15% biotite 30% mixed Qtz and feldspar and 5% calcite. Erratic zones with up to 30% calcite grains.			1% fine pyrite specks disseminated throughout intrusive.	Litho 2623.
94.80 TO 892.20	QTZ PORPHYRITIC RHYOLITE TUFF «RH QP»	Light to medium grey Qtz porphyritic Rhyolite tuff containing 8-10% unevenly distributed small (< 2mm) sub-rounded bluish Qtz porphyries in a fine grained siliceous slightly sericitic matrix. Faint original banding @ ..... QP rhyolite tuff unit is strongly altered; primary textures are commonly obscured. Lapillitic section probably masked by fragmentation due to in situ brecciation.	40	«ser, alk. alt» Diffuse < 8% sericite and chlorite masses and wisps unevenly scattered throughout matrix. Numerous highly silicified zones (cherty appearance) of variable length often late larger chlorite masses (up to 30cm) contains 1-3% sub rounded garnets aggregates.	Scattered < 1% small pyrrhotite blebs and faint stringers with occasional chalcopyrite. Unit contains several zones with up to 10% pyrrhotite stringers (description in the following).	Litho 2624, 2625.
		119.8-126.7 «intrus. dyke» 137.5-140.2 «intrus. dyke» Fine grained calcitic dykes of weakly magnetic mafic intrusive fine grained equigranular of intrusive at 16-94.8. Increase in chlorite in Rhyolite near dykes. Margins.		Up to 50-60% chlorite throughout intrusive.	127.5-128 3% pyrrhotite, < 2% chalcopyrite masses and blebs disseminated throughout chloritic Rhyolite Tuff. 139.0-139.6 3% pyrite masses and blebs associated with calcite and sericite near small fractures.	
				194.5-203.0 «stg sil ser hem» Strong silica flooding - development of up to 10% sericite wisps along fractures. Local pinkish tinge due to diffuse Hematite associated with sericite. Occasional minute disseminated Hematite Xtals along fractures and/or clustered in small nests.	«po sph» Mixed pyrrhotite and sphalerite knots and masses and ill defined stringers close to fractures. Overall < 1%.	Litho 2636.
				203.0-216.0 «sil chl ser» Patchy silicified zone, silica flooding less intense and less widespread as above. Mixed sericite and	«po, cp» Scattered numerous pyrrhotite and chalcopyrite masses and stringers associated either with silica flood	Geochem 9390, 9391, 9392.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				chlorite wisps abundant (up to 25%) between silica rich patches.	zones or with chlorite and sericite wisps rich zone. Overall < 3% pyrrhotite 1% chalcopyrite - rare pyrite.	
		┤251.0-452.0├ «clotted rh qp» Fine grained Rhyolite tuff clotted with chlorite. Homogeneous unit composed of 70% well defined, slightly resorbed silicified tuffaceous knots enveloped by clots and veins of mixed fine chlorite and sericite scattered 3-5% bluish QP's occur throughout unit.		«chl sil» Mottled weakly silicified section clotted with 30% chlorite masses (avg. < 2cm) and veins. Erratic 3% large chlorite patches inprenated the Rhyolite and totally obscure textures over 10 to 40cm.	Scattered 2% small pyrrhotite stringers and wisps with < 1% chalcopyrite occuring throughout unit associated with chlorite.	Litho 2625, 2627.
					261.8-262.3 Isolated chalcopyrite (up to 5%) and pyrrhotite (3%) stringers associated with fractures in siliceous zone.	Geochem 9393.
				┤296.0-301.0├ «alk. alt.» Silicified section with up to 30% fine-grained, late chlorite masses and patches small garnets aggregates (10-15mm) are associated with occasional amphibole mixed with chlorite.	┤296.0-301.0├ «3% po, 1% cp» Scattered < 5% irregular pyrrhotite stringers and masses (up to one inch wide). Pyrrhotite occasional mixed with minor pyrite and mainly associated with chlorite development in silicified zone. 1% chalcopyrite blebs and wisps randomly associated with pyrrhotite (chalco often located near the edges or margins of masses and/or stringers.	Weak conductor at 297.0. Geochem 9394.
				┤320.5-322.0├ «alk alt» Chlorite patche with 1-2% weakly resorbed garnets aggregates (avg.<5mm).	«po cp» 2% pyrrhotite + < 1% chalcopyrite wisps scattered throughout chlorite. Occasionally chalcopyrite found in fine garnets aggregates.	Geochem 9395.
					┤395.3-335.8├ «25% po, 8% cp» Isolated zone with 25% semi-massive pyrrhotite irregular masses mixed with 8-10 chalcopyrite blebs and masses. Mineralization directly associated with chlorite and alumino-silicate aggregates.	Geochem 9396.
					┤383.5-384.0├ «3% po, 5% cp» Similar to 335.3-335.8 isolated semi massive chalcopyrite and pyrrhotite	Geochem 9397.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
					irregular masses (3% po-5% cp) associated with chlorite and alumino-silicate aggregates.	
		┤452.0-858.0├ «blocky rh tuff» Blocky rhyolite tuff, containing numerous (0.3 to 1.5mm long) chlorite clotted zones. Occasional, < 1%, resorbed QP's still visible. Brecciated textures occasionally well developed but restricted and commonly less than 8cm wide.		«chl sil» Up to 25% chlorite in fractures and in masses or large clots between silicified tuffaceous fragments. Numerous strongly silicified zone (silica flooding over 15-30cm) randomly distributed throughout.	Scattered chalcopyrite blebs associated with strong chlorite development along fractures, occasionally blebs of chalcopyrite are clustered in nests (avg. size 3-5cm) chalcopyrite nests are erratic and randomly distributed but mainly associated with strong chlorite. Overall chalcopyrite < 1%.	Litho 2629.
					459.0-461.0 3% semi-massive pyrrhotite stringers with some < 1% chalcopyrite sweats associated with chloritic fractures near small QV's.	Geochem 9398.
				┤467.5-469.0├ «stg sil» ┤470.1-475.7├ «stg sil»		
		Contact of silicified zones sharp @	70	Light grey strongly bleached zone. Silica flooding associated with < 5% sericite and Fe-carb wisps irregularly scattered throughout. Margins of these zones are strongly brecciated over 1.0 to 3.0cm.		Litho 2637.
				┤555.9-556.5├ «stg sil» Aphanitic greenish grey mixed silica and fine chlorite over 20cm. Sharp contact with blocky Rhyolite at 40 degrees.		
				┤574.0-580├ «sil silman» Strongly bleached (silicified) zone with sharp decrease in chlorite contact. Silimanite needles well developed near fractures and in erratic 1-3cm patches.		Litho 2638.
		628.0-858.0 Light grey silicified blocky Rhyolite tuff with 10% mixed chlorite and sericite wisps and faint		┤628.0-858.0├ «ser sil» Overall decrease in late chlorite and garnet alk. alteration.	Fewer pyrrhotite and chalcopyrite stringer and blebs scattered	Litho 2637. Siliceous brittle core.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		patches throughout groundmass. Sericite wisps enveloped fragments and blocks resulting from in situ brecciation. The Rhyolite tuff is brittle; strongly sericitic zones are fissile.		Remaining chlorite masses are more diffuse and smaller, chloritic fractures are less extensive - overall chlorite 5-8% under the late alteration section appear weakly silicified and calcite with local strong pervasive sericite development.	throughout. Pyritic zone and scattered pyrite masses appear associated with silicified section.	
				┤661.0-675├ «stg sil» Strongly bleached zone bordered on both ends by 30-50cm chlorite development in the less silicified Rhyolite tuff. Small siliminate needles in aggregates developed near small veins.	Chloritic margin of bleached zone contains up to 2% chalcopyrite blebs associated with ill defined 3% pyrrhotite stringers.	
				┤696.2-700.0├ «alk. alt.» Chaotic strongly chloritic zone containing Qtz and calcite pods and small veins and 5-8% Hematite stained calcite aggregates and minor garnets. Calcite and garnets are commonly clustered in elongated 3-5cm patches Hematite staining mostly restricted to calcite aggregates and pods. Smaller similar chlorite and calcite and garnet zones (< 15cm) occur erratically throughout the silicified tuff (overall < 1%).	┤696.2-700├ «py tr sph» Randomly scattered 2-3% pyrite masses and blebs pyrite appears associated with strongly chloritic patches. Occasionally, mainly at 699-200, honey-coloured sphalerite xtals are associated with pyrite and calcite. Overall sphalerite - trace.	Geochem 9399.
		┤715.0-715.5├ «flt» Small well developed fault with clay gouge. Fault @	15			
					┤733-745.0├ «py» Silicified zone containing up to 15% scattered pyrite blebs (avg size <5mm).	Weak conductor at 738.5-739.5. Litho 2639.
					┤805-825├ «py» Zone with 5-8% disseminated pyrite and small pyrite stringers erratically distributed throughout. Rare pyrrhotite masses.	
				┤858.0-892.2├ «ser chl» Pervasive sericite mixed with minor chlorite in groundmass producing		Litho 2633, 2635.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				homogeneous fish scale textures. 3-5% calcite seems and small disseminated grains occur erratically throughout.		
892.20 TO 980.00	QTZ PORPHYRITIC RHYOLITE TUFF «QP RH TUFF»	Qtz porphyritic Rhyolite tuff. Contact of this zone marked by sudden appearance of up to 10% subrounded bluish QP's scattered throughout. Coarse (up to 4mm) Qtz and feldspar porphyries are visible. Between 892.2-900. Contacts with non-porphyritic tuff is sharp.		«ser sil» Siliceous + sericitic matrix (sericite probably replacing Feldspar) with 3-5% sericite and Hematite wisps occuring randomly throughout. Radiating pyrrhollite knots occurs near upper contact of zone, associated with chlorite.		Broken core at 903-905 possible fault. Litho 2634.
980.00 TO 983.20	DEBRIS FLOW «DEBRIS FLOW»	⌊980-982.3⌋ «debris flow» Chaotic debris flow containing up to 60% angular and sub-angular fragments (avg.) size 1cm) in a medium grained mixed chlorite and sericite groundmass. Low angle contact @	10 15	«chl ser» Mixed medium grained chlorite and sericite throughout groundmass.		Probable unit DPFY.
983.20 TO 1038.00	RHYOLITE BRECCIA «RH BX»	Pale grey-green, fine grained aphyric wo weakly qtz phyric Variable mottled 'chaotic' texture. Predominantly auto brecciated - flow bx? hydrothermal bx? Occasional zones of coarse clastics (lapilli tuff?) and fine grained massive (tuffaceous?) 1004.0 1/2" qtz-pyrophyllite vein. 1035.0 Possible mafic clasts.		Pervasive weak to moderate chloritic alteration gradually increasing downhole. Minor patchy sericite diminishing downhole.	Occasional bleb, wisp of py, po - trace overall.	
1038.00 TO 1088.50	RHYOLITE TUFF/ LAPILLI TUFF «RH LAP TUFF»	Gradational contact with rhyolite bx unit - more pyroclastic in appearance - predominantly lapilli sized felsic clastic with minor interlayered fine grained tuff - aphyric to weakly qtz-phyric - pale greenish grey.	10 to 20	Crude planes fabric defined by chlorite.	Occasional bleb, wisp py, po trace overall.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		1038.0-1051.5 Fine grained tuffaceous zone, occasionally lapilli.				
		1051.5-1068.6 Lapilli tuff.				
		1053.8-1054.1 Amygdules?				
		1058.2-1058.7 Amygdules?		1058.0-1071.0 Moderate to strong chloritic zone - possible mafic tuff component (mafic clasts?)		
		1060.0-1061.5 Coarse blocky rhyolite.				
		1072.5-1073.5 Coarse blocky rhyolite.			1087.2-1088.5 MSV po stringer approximately 1" wide.	Geochem 9400.
1088.50 TO 1284.00	ANDESITE DYKE «AND DY»	Light greenish grey, medium grained massive, equigranular. Upper contact close to parallel C.A.		Biotite rich.		
		1094.0-1097.7 Blocky rhyolite xeno weakly qtz phyric, buff colour.		1097.7-1155.0 Strong chlorite (carb) alteration. Chlorite pervasive and as irregular veins/stringers. Carb as pathces, spots.	Trace disseminated py.	Narrow zones ie 1098.0-1099.5, 1104.8-1105.2, 1105.5-1106.0 Containing amygdule - like or lapilli like inclusive possibly the result of chloritization.
		1114.8-1116.0 Blocky rhyolite xeno.		111.8-1128 Patcht carb alteration.		
				1144-1148 Patchy carb alteration.		
		1153.6-1156.1 Blocky rhyolite xeno.				
		1173.0-1173.8 Blocky rhyolite xeno - downhole contact.	45			
		[1204.4-1212.3] «rh bx» Buff coloured clasts, weak chloritic fabric @ ... Lower contact 20 degrees marked by a 2" wide	20	-		Xeno?

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		fault breccia chas by angular clasts with reaction rims in milled groundmass.				
1284.00 TO 1417.00	ALTERED RHYOLITE/ RHYOLITE BRECCIA	Light greenish grey, fine grained strong foliation (low C.A.). Primary features obliterated, brecciated. 1320-1320.8 mafic dyke 1321.6-1322.0 mafic dyke 1328.0-1417.0 Gradational contact as primary textures become better preserved as alteration decreases. Intermixed rhyolite, minor rhyolite breccia, lapilli tuff and tuff. Aphyric to weakly qtz-phyric. 1361.9-1362.5 mafic dyke 1378.3-1378.9 mafic dyke 1379.9-1382.6 mafic dyke		Strongly chloritized, sericitized, weakly carbonated. Alteration diminishing to weak to moderate chlorite moderate sericite. 1364-1368 Moderate chl, ser. 1368 Transition to weak chlorite, weak ser downhole. 1383.0-1387.4 Highly chloritic zone.	Trace blebws of py. Trace pyrite except as noted. 1351-1366 1/2-1% stringer and bleb pyrite. 1389.4-1391.0 5% stringer pyrite 1395.0-1395.5 10% stringer py 1397.0-1498.0 10% stringer py 1401.8-1402.7 5% bleb py	Core highly incompetent, breaks easily in hands. Geochem 2201-2203. Geochem 2204.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
1417.00 TO 1591.00	RHYOLITE TUFF/ LAPILLI TUFF «RH LAP TUFF»	Interlayered fine grained massive to weakly layered rhyolite tuff with lapilli tuff. 1417.0-1427.3 Msv - layered tuff aphanitic, aphyric.	5	1417.0-1427.3 Weak to moderate sericite moderate silicified.	1417.0-1427.3 1-2% stringer pyrite.	
		1427.3-1441.2 lapilli tuff				
		1441.2-1449.5 Tuff - undulating low core angles.			1441.2-1449.5 5% bleb and subparallel vein pyrite.	True width of tuff approximately 1 ft. Geochem: 2205-2206.
		1449.5-1460.6 lapilli tuff.		1449.5-1460.6 weak ser.	1449.5-1460.6 3% stringer pyrite.	Geochem 2207-2208.
		1460.6-1472.0 Tuff (minor lapilli zones) layering, lower contact.	5	1460.6-1470.0 Weak sericite.	1460.6-1472.0 5-10% stringer pyrite.	Geochem 2209-2210.
		1472.0-1512.6 lapilli tuff		1472.0-1512.6 Weak chlorite.	1472.0-1512.6 Tr-1% bleb pyrite.	Geochem 2211.
		1512.6-1591.0 Tuff (minor lapilli zones) lower contact @	0 8	1512.6-1591.0 Unalterd (weak carb).	1512.6-1554.0 1-2% (-5%) stringer pyrite.	Geochem 2212-2214.
1591.00 TO 1645.50	ANDESITE DYKE «AND DY»	Brownish green, fine to medium grained, massive, equigranular biotite-rich. Occasional narrow qtz-carb vein. Lower contact @	60	Minor patchy carb alteration.	Trace py - fine grained disseminated and veinlets.	
1645.50 TO 1715.10	RHYOLITE TUFF/ LAPILLI TUFF	Light to medium grey, mottled to uniform textured, numerous fragmental zones clasts angular.		Pervasive weak to moderate carb. alteration, weakly chloritic.	Pervasive 1-2% stringer pyrite.	
1715.10 TO 2398.00	ANDESITE DYKE «AND DY»	Medium to dark grey, fine to medium grained massive, equigranular, biotite-rich.		Unaltered except for zones of crosscutting stringer alkali metasomatism char. by green amphibole-calcite-po (-qtz) (-garnet).	Minor stringer po zones near uphole contact.	Geochem: 2215.
	E.O.H.	1749.5-1750.4 Qtz (carb) py vein @	62 28			

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		1888-1892 Calcite veining.		1888-1892 Carb. alteration.		
		1903.8 1" qtz-carb-chl-py vein,				
		1910.8 2" qtz-carb-chl-py vein				
		1910.7-1911.1 Qtz-carb vein (irreg)				
		1920.8 1" qtz-carb-chl-py vein.				
		2006.0 2" qtz-carb-chl-py vein.				
		2028.0-2030.3 Carb'd fracture zone.				
		2086.0-2087.0 Ground core.		2089.5-2111.5 alk. metasom		
				2120.5-2122.5 alk. metasom		
				2128 -2143 alk. metasom		
				2167-2180 alk. metasom		
				2210-2216 alk. metasom		
				2223-2233 alk. metasom		
				2236-2240 alk. metasom		
				2260.5-2270 alk. metasom		
		2275.8 2" qtz vein				
				2350-2353 alk. metasom		
				2358.5-2361 alk. metasom		
		2374-2375 6" calcite-chl vein @	35			

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		2388.6 2" calcite-chl vein @	25			
		End of Hole.		2390-2398 alk. metasom (bx'd stringer zone).		

Sample	From (f)	To (f)	Length (f)	ESTIMATES Cu %	Zn %	Py %	Po %	Mt %	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Ag oz/ton	Au oz/ton	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	Ag ppm	Au ppb	Ni ppm	As ppm	Sb ppm	COMMENTS
TBD-9390	203.00	206.00	3.00	< 1			2									579	325		0.8	7				SCATTERED MASSES + STRGS
TBD-9391	206.00	211.00	5.00	1		TR	3									748	282		1.5	15				SCATTERED MASSES + STRGS
TBD-9392	211.00	216.00	5.00	< 1			2									480	254		1.2	6				SCATTERED MASSES + STRGS
TBD-9393	260.50	263.50	3.00	< 2		< 1	2									1057	114		1.4	10				CPY + PO STRINGERS
TBD-9394	296.00	301.00	5.00	1		< 2	5									2060	168		2.6	19				PO STRINGERS, CPY BLEBS
TBD-9395	320.50	322.00	1.50	< 1			2									1185	412		2.8	39				PO + CPY WISPS
TBD-9396	335.30	335.80	0.50	8-10			25									26200	503		40.	138				SM PO, CPY MASSES
TBD-9397	382.50	384.50	2.00	3			3									2760	261		3.1	43				SM PO + CPY
TBD-9398	459.00	461.00	2.00	< 1			3									422	68		1.1	6				SM PO STRGS, MINOR CPY+PY
TBD-9399	696.00	700.00	4.00		< 1	1	3									377	4240		2.4	6				PY MASSES, TRACE SPH
TBD-9400	1087.00	1089.00	2.00													1440	1191		3.7	72				SM PO STRINGERS
MSD-2201	1351.00	1356.00	5.00			1/2-1										74	49		0.4	4				PY BLEBS + STRINGERS
MSD-2202	1356.00	1361.00	5.00			1/2-1										17	44		0.3	5				PY BLEBS + STRINGERS
MSD-2203	1361.00	1366.00	5.00			1/2-1										9	51		0.3	4				PY BLEBS + STRINGERS
MSD-2204	1389.40	1391.00	1.60			5										32	47		0.8	6				PY STRINGERS
MSD-2205	1441.20	1445.40	4.20			5										17	45		0.4	4				PY BLEBS+SUBPARALLEL VEIN
MSD-2206	1445.40	1449.50	4.10			5										21	33		0.4	6				PY BLEBS+SUBPARALLEL VEIN
MSD-2207	1449.50	1455.00	5.50			3										28	66		0.5	8				PY STRINGERS
MSD-2208	1455.00	1460.60	5.60			3										6	79		0.7	4				PY STRINGERS
MSD-2209	1460.60	1466.30	5.70			5-10										47	71		0.4	5				PY STRINGERS
MSD-2210	1466.30	1472.00	5.70			5-10										52	50		0.4	7				PY BLEBS
MSD-2211	1512.60	1522.60	10.00			5										42	54		0.7	5				COMPOSITE
MSD-2212	1522.60	1532.60	10.00			1										83	47		0.6	4				COMPOSITE
MSD-2213	1532.60	1542.60	10.00			2										110	16		0.5	4				COMPOSITE
MSD-2214	1542.60	1554.00	11.40			1-2										36	32		0.7	6				COMPOSITE
MSD-2215	2225.10	2228.60	3.50			1	1									285	65		1.0	5				

Sample	From (f)	To (f)	Length (f)	SiO2 %	TiO2 %	Al2O3 %	FeO %	MgO %	MnO %	K2O %	CaO %	Na2O %	LOI %	Cu ppm	Zn ppm	Ni ppm	Ag ppm	Au ppb	TOTAL %	Pb ppm	Mn ppm	As ppm
MSD-2623	38.00	48.00	10.00	53.10	0.85	14.96	9.04	7.55	0.18	0.67	8.86	2.59	1.80	65	31	25	0.3	7	99.60			
MSD-2624	140.00	150.00	10.00	78.10	0.34	12.34	1.64	1.69	0.03	2.62	0.17	0.35	2.19	3	31	3	0.1	5	99.47			
MSD-2636	193.00	203.00	10.00	84.30	0.25	9.20	1.10	0.58	0.03	2.09	0.08	0.25	1.43	72	251	2	0.1	8	99.31			
MSD-2625	216.00	226.00	10.00	75.60	0.34	12.59	3.45	2.01	0.06	2.52	0.15	0.30	2.50	29	132	3	0.3	5	99.52			
MSD-2626	286.00	296.00	10.00	78.00	0.38	10.58	4.24	2.17	0.08	1.71	0.10	0.24	2.24	9	60	3	0.3	4	99.74			
MSD-2627	358.00	368.00	10.00	76.10	0.40	11.93	4.90	1.77	0.11	2.10	0.08	0.25	2.25	12	82	3	0.2	6	99.89			
MSD-2628	428.00	438.00	10.00	78.00	0.38	10.71	4.90	1.36	0.10	1.92	0.16	0.20	1.99	10	39	4	0.3	5	99.72			
MSD-2637	470.00	475.00	5.00	84.80	0.42	9.26	0.80	0.25	0.03	2.24	0.11	0.31	1.51	64	6	3	0.1	6	99.73			
MSD-2629	518.00	528.00	10.00	76.40	0.35	10.94	4.84	2.86	0.06	1.58	0.11	0.21	2.52	5	49	4	0.4	5	99.87			
MSD-2638	574.00	580.00	6.00	82.50	0.41	10.39	1.34	0.72	0.03	2.06	0.12	0.32	1.53	7	13	6	0.1	5	99.42			
MSD-2630	598.00	608.00	10.00	76.50	0.33	9.83	4.92	3.17	0.08	1.21	0.43	0.44	2.68	23	69	5	0.4	7	99.59			
MSD-2631	678.00	688.00	10.00	76.50	0.33	10.97	4.23	3.21	0.05	1.32	0.14	0.30	2.55	25	230	5	0.4	4	99.60			
MSD-2639	733.00	743.00	10.00	71.70	0.30	8.00	7.50	5.62	0.04	0.18	0.45	0.10	5.51	197	115	50	1.6	12	99.40			
MSD-2632	788.00	798.00	10.00	63.60	1.00	16.15	5.01	6.30	0.04	1.88	0.54	0.42	4.32	38	49	22	0.4	5	99.26			
MSD-2633	868.00	878.00	10.00	70.30	0.63	12.68	4.13	5.32	0.04	0.80	1.40	0.92	3.66	18	69	16	0.5	4	99.88			
MSD-2634	918.00	928.00	10.00	77.30	0.32	10.84	2.63	4.19	0.03	0.70	0.76	0.26	2.69	5	38	8	0.3	4	99.72			
MSD-2635	1018.00	1028.00	10.00	58.80	1.08	16.86	6.84	8.03	0.06	1.31	0.61	0.56	5.21	32	70	29	0.7	6	99.36			
MSD-2640	1118.00	1128.00	10.00	56.90	0.65	12.09	7.62	9.98	0.12	0.30	4.28	0.23	7.36	30	81	24	0.8	5	99.53			
MSD-2641	1238.00	1248.00	10.00	61.30	1.01	15.16	6.68	5.48	0.11	2.07	2.77	0.34	4.84	47	127	27	0.7	4	99.76			
MSD-2642	1298.00	1308.00	10.00	73.50	0.47	12.13	3.30	3.28	0.05	2.62	0.59	0.19	3.21	18	43	9	0.3	4	99.34			
MSD-2643	1398.00	1408.00	10.00	63.00	1.07	14.79	7.43	5.56	0.04	2.03	0.34	0.28	4.96	43	60	25	0.7	4	99.50			
MSD-2644	1498.00	1508.00	10.00	64.50	1.07	16.58	4.44	2.73	0.03	1.97	3.04	0.73	4.61	29	41	34	0.5	5	99.70			
MSD-2645	1608.00	1618.00	10.00	59.50	1.08	16.57	5.76	4.90	0.09	1.65	3.87	1.16	4.84	51	73	30	1.1	4	99.42			
MSD-2646	1668.00	1678.00	10.00	60.60	1.07	16.17	5.88	2.97	0.05	2.16	3.40	1.11	6.07	45	34	38	0.6	4	99.48			
MSD-2647	1788.00	1799.00	11.00	58.30	1.13	16.89	8.25	5.32	0.14	1.79	4.35	0.60	2.93	119	69	29	1.0	4	99.70			
MSD-2648	1898.00	1908.00	10.00	60.80	1.18	17.43	6.52	3.82	0.14	2.55	3.87	0.58	2.64	37	55	34	0.7	4	99.53			
MSD-2649	2103.00	2113.00	10.00	51.60	0.93	14.39	8.56	8.95	0.24	1.36	9.17	0.95	3.64	7	928	23	0.9	4	99.79			
MSD-2650	2298.00	2308.00	10.00	60.30	1.33	16.22	6.63	3.48	0.10	2.76	6.01	1.67	1.08	28	67	34	1.1	5	99.58			

HOLE NUMBER: SLM-254

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: X METRIC UNITS:

PROJECT NAME: SLM
PROJECT NUMBER: PN359
CLAIM NUMBER:
LOCATION: STURGEON LAKE MINE

PLOTTING COORDS GRID: MINE GEOLOGY
NORTH: 8000.00N
EAST: 7800.00E
ELEV: 9970.00

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -77° 0' 0"
LENGTH OF THE HOLE: 2302.00f
START DEPTH: 0.00f
FINAL DEPTH: 2302.00f

COLLAR GRID AZIMUTH: 180° 0' 0"

COLLAR ASTRONOMIC AZIMUTH: 195° 0' 0"

DATE STARTED: April 4, 1988
DATE COMPLETED: April 14, 1988
DATE LOGGED: April 10, 1988

COLLAR SURVEY: NO
MULTISHOT SURVEY: YES
RQD LOG: NO

PULSE EM SURVEY: YES
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: CONNORS DRILLING RIG 11
CASING: 34.8 FEET
CORE STORAGE: STURGEON LAKE MINE

PURPOSE: TEST ALTERATION & STRATIGRAPHY WITHIN MATTABI RHYOBELOW FOOTWALL INTRUSIVE OF THE STURGEON LAKE MINE

DIRECTIONAL DATA:

Depth (f)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
144.00	199° 0'	-80° 0'	MULTISHOT	OK	
244.00	198° 0'	-79°30'	MULTISHOT	OK	
344.00	198° 0'	-79° 0'	MULTISHOT	OK	
444.00	196° 0'	-79°30'	MULTISHOT	OK	
544.00	190° 0'	-78°30'	MULTISHOT	OK	
644.00	192° 0'	-78°30'	MULTISHOT	OK	
744.00	191° 0'	-78° 0'	MULTISHOT	OK	
844.00	191° 0'	-78° 0'	MULTISHOT	OK	
944.00	191° 0'	-77°30'	MULTISHOT	OK	
1044.00	191° 0'	-77°30'	MULTISHOT	OK	
1144.00	191° 0'	-77° 0'	MULTISHOT	OK	
1244.00	191° 0'	-77° 0'	MULTISHOT	OK	
1344.00	191° 0'	-76°30'	MULTISHOT	OK	
1444.00	191° 0'	0° 0'	MULTISHOT	OK	
1544.00	191° 0'	-75°30'	MULTISHOT	OK	
1644.00	192° 0'	-75° 0'	MULTISHOT	OK	
1650.00	191° 0'	-76° 0'	MULTISHOT	OK	
1750.00	191° 0'	-76° 0'	MULTISHOT	OK	
1850.00	191° 0'	-75° 0'	MULTISHOT	OK	
1950.00	192° 0'	-74° 0'	MULTISHOT	OK	
2050.00	192° 0'	-74° 0'	MULTISHOT	OK	
2150.00	195° 0'	-74° 0'	MULTISHOT	OK	
2250.00	195° 0'	-73° 0'	MULTISHOT	OK	
250.00	-	-77° 0'	ROTODIP		
400.00	-	-77° 0'	ROTODIP		
550.00	-	-77° 0'	ROTODIP		
700.00	-	-76° 0'	ROTODIP		
850.00	-	-76° 0'	ROTODIP		
1000.00	-	-76° 0'	ROTODIP		
1250.00	-	-76° 0'	ROTODIP		
1400.00	-	-75° 0'	ROTODIP		
1550.00	-	-74° 0'	ROTODIP		
1700.00	-	-73° 0'	ROTODIP		
1850.00	-	-71° 0'	ROTODIP		
2000.00	-	-71° 0'	ROTODIP		
2150.00	-	-71° 0'	ROTODIP		
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 34.80	CASING «CASING»					
34.80 TO 145.00	RHYOLITE LAPILLI TUFF «RH LAP TUFF»	8-10% mixed lapillis loosely packed in a fine grained light grey Rhyolite groundmass. Unsorted lapillis (size ranged between < 0.5cm to 2cm) are sub-angular to sub-rounded, often corroded and sericitic. 2% of the lapillis are chloritic (mafics?) lapillis distribution is irregular and occasionally fine grained tuffaceous zone occurs (up to 2m long). Weak preferential lapilli alignment @ ..... 18 Occasionally < 1cm calcite and Qtz veinlets. 22		⟦34.8-145⟧ «sil, ser» Siliceous groundmass weakly sericitized with 2-3% small chlorite clots (< 0.5cm) scattered throughout. 34.8-36 Isolated alkaline altered patch with 5% garnets aggregates in chlorite and amphibole groundmass.		Litho 2178.
145.00 TO 315.00	RHYOLITE TUFF «RH TUFF/ CLOT»	Medium grained clotted Rhyolite tuff. 10% chloritic clots (avg. size 0.5cm) in a light grey siliceous tuffaceous groundmass gradational contact with lapilli tuff. 155.6-156 Chaotic calcite and Qtz veinelts. ⟦189.2-194.6⟧ «dy» 199.0-202.0 dy 203.3-204 dy Medium grained equigranular mafic dykes strongly calcitic and moderate magnetic. Contacts are sharp with well developed chilled rims. Contacts @ ..... 40 Occasional magnetite grains developed in tuff adjacent to dykes. 253-315 Slightly more altered Rhyolite tuff containing 1-2% randomly distributed isolated lapillis +/or lapilli clusters. Weak preferential alignment. 25		⟦145-253⟧ «10% chl clots» 10% chlorite clots scattered in moderate sericitic groundmass. Pervasive calcite throughout chloritic groundmass. ⟦253-297⟧ «chl» Progressive increase in chloritic clots (up to 15-20%) in the sericitic groundmass - occasionally longer clots (up to 3cm). ⟦297-315⟧ «calc, ser» Calcite and sericite development		Litho 2179. Litho 2080. Litho 2081.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				associated with fracturing - up to 30% irregular, small fractures filled with calcite and sericite wisps.		
315.00 TO 1031.00	RHYOLITE LAPILLI TUFF «RH LAP TUFF»	Medium grained lapilli tuff containing isolated siliceous blocky sections. 15% lapillis (avg. size < 1cm) with faint but distant outlines in chloritic tuffaceous groundmass. ** Mattabi unit. 363.2-364.0 Small QV's (< 5mm) associated with a large broken calcite patch. ┤389.4-391.2├ «QV's» Section invaded by 25-30% irregular and broken small Qtz veinlets and pods. Small 5% chlorite and biotite patches develope near veins.		┤315-397├ «35% chl clots» 35% chlorite clots and masses throughout lapilli tuff - sharp decrease in chlorite in the more siliceous blocky Rhyolite zones increase in chlorite disseminated grandmass downhole. ┤397-417├ «blocky sil» Fine grained blocky silicified zone. ┤417-441├ «chl clots» ┤442-454.5├ «wk sil» Weak pervasive silicification throughout. ┤454.5-489.5├ «ser calc» Moderate to strong patchy sericitic development. Section laced with fine calcitic fractures invaded with up to 35% sericite wisps and large patches (up to 5cm wide).	Erratic pyrite and pyrrhotite masses associated with small QV's (overall trace). ┤389.4-391.2├ «2% py, po» 2% pyrite and pyrrhotite isolated sub-rounded masses (avg. 3mm). Erratic pyrite and pyrrhotite masses and fracture coating scattered throughout and occasionally associated with small QV's (overall trace).	Litho 2182. Litho 2183.
		489.5-628.0 Homogeneous closely packed lapilli tuff with locally up to 50% ill defined corroded small felsic clasts (avg. size < 8mm) in a chloritic groundmass. Erratic < 1% rounded bluish QP's (< 1mm). 1-2% randomly distributed calcite pods (? replaced fragments and patches. Weak preferential alignment @ 40 555.5		┤489.5-628.0├ «15% chl clots» Moderate pervasive chlorite throughout groundmass enveloping small clasts. 15% well defined < 5mm chlorite clots randomly scattered throughout.		Litho 2184, 2185. Altered mafic intrusive ?? Check geochem results.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		5cm milky, Qtz vein.				
		489.5-492.2 Aphanitic tuffaceous darker zone.			⟦489.5-492.2⟧ «2% diss py» Dark aphanitic zone peppered with < 2% fine (< 1mm) disseminated pyrite grains.	
		⟦628-714⟧ «rh tuff» Gradational contact with a finer grained tuff (? flow ?). No distinct clasts throughout blocky groundmass. Occassional fragments resulting from weak in situ brecciateion no bluish QP's.		⟦628-714⟧ «8-10% chl clots» 8-10% chlorite clots (avg. size <10mm, up to 3cm scattered throughout weakly chloritic groundmass. Fine fractures are filled with chlorite. Calcite patches and pods common (3-5%). Occasional creamy white silicified zone (2-8cm) are strongly calcitic.	1% fine disseminated pyrite grains and blebs scattered throughout. Often associated with small QV's or chlorite clots. Erratic pyrrhotite masses associated with chlorite clots (overall trace).	
				⟦700-708⟧ «sil carb» Creamy white silicified zone with moderate sericite development. Occasional strong calcite throughout groundmass, numerous small calcitic fractures.		Litho 2186.
		⟦714-806.5⟧ «frag tuff» Gradational contact with unsorted fragmental Rhyolite tuff - composed of 5-8% larger fragments (> 1cm) mixed with up to 40% smaller ones (< 1cm) in a fine grained clotted groundmass. Rare bluish QP's occasionally occur. Fragments are angular to sub rounded-larger fragments exhibit chilled rims and are commonly calcitic.		⟦714-806.5⟧ «8-10% chl clots» Well defined sub-angular 8-10% chlorite clots evenly scattered throughout. 15% of larger fragments are pervasively replaced by calcite. 1-2% small chlorite filled fractures.	714-806.5 < 1% small pyrite +/or pyrrhotite blebs (< 5mm) associated with chlorite clots. 2-3% large calcitic fragments are filled or partly filled with fine-grained disseminated pyrite.	Litho 2187.
		Weak preferential alignment of smaller fragments large calcitic fragments often cross-cut alignment.	25			
		⟦810.8-812.2⟧ «and dy» Medium grained equigranular strongly calcitic andesite dyke. Sharp chiled contacts @ ..... Irregular QV's over 5cm near dyke lower margin.	75	Chlorite and biotite groundmass with a 5cm weakly silicified strongly sericitic patch near the middle of dyke associated with small (< 1cm) QV.		
		806.5-859.5 Homogeneous closely packed clastic tuff same as		⟦806.5-827⟧ «chl clots» ⟦827-859.5⟧ «alk alt»		

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		489.5-628.0.		< 2% erratic small garnet aggregates (sub-rounded avg. size 3-5mm) scattered in chloritic groundmass.		
		┤859.5-907├ «rh tuff» Fine to medium grained Rhyolite tuff with homogeneous fish scale texture with rare isolated clasts. Occasional in situ brecciateion due to 10-15% late chlorite infilling. Contact @	20	┤859.5-907├ «alk alter.» Weak to moderate alk. alteration character by weak pervasive chlorite over sericite in groundmass and by 15% well defined strong chlorite patches (up to 5cm wide) 2-3% randomly distributed garnets (avg. size < 3mm)/.		Litho 2188.
		861.3-862.5 Equigranular medium grained andesite dyke.		Chloritic and strongly calcitic.	┤867-897├ «strgr zone» «3% sph» Mineralized stringer zone directly associated with chlorite patches and occasionally with small (< 5mm) QV's. Overall sulphides in the zone: 3% semi-massive to massive brown sphalerite stringers and occasional isolated disseminated sphalerite mixed with 1% pyrrhotite masses and small stringers chalcopyrite specks and small blebs (overall 1-2%) associated with sphalerite +/or pyrrhotite. Stringer distribution throughout zone is random - best sphalerite at: 881.-881.8 15% disseminated sphalerite mixed with 3-5% chalcopyrite blebs. 883.3 Irregular semi-massive to massive 2cm wide sphalerite stringer with < 1% pyrite and trace chalcopyrite. 844.7-855.4 Irregularly scattered 5% chalcopyrite 2% pyrrhotite and < 1% sphalerite small masses (< 3mm) and wisps. 891.3 6-8mm wide semi-massive (up to 70%) brown sphalerite stringer.	Geochem 0361-0366.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
					892 5mm wide brown sphalerite stringer containing on e 1cm long pyrrhotite masse in its central part.	
		907-1031 Homogeneous closely packed lapilli tuff similar to 489.5-628.0 but slightly more siliceous. 40-50% distinct clasts (avg. size < 8mm).		Chlorite in groundmass between clasts produced clotted texture. 2-3% small garnets peppered throughout - chlorite and garnet probably late alk. alt.	1% erratic small sphalerite and pyrrhotite masses associated with chlrotic fractures and patches.	
				⟦907-952⟧ «chl clots» ⟦952-965.7⟧ «sil knots» Silicified zone locally calcitic with 50% silica clots and knots distributed throughout sericitic and chloritic slightly siliceous groundmass. 1-2% small garnets erratically distributed throughout. Downhole to 1031. 5% silica clots (or silica replaced lapilli) is common.	915-917 Isolated zone with 2-3% mineralized masses and small stringers occasionally chalcopyrite blebs.	Geochem 0367. Litho 2189.
		⟦1028.6-1031⟧ «QV's» Section cut by 5% irregular and broken milky Qtz veins.		⟦965-1031⟧ «chl clots»	Trace of pyrrhotite and chalcopyrite associated with QV's.	
1031.00 TO 1753.10	RHYOLITE ASH FLOW «CLOTTED ASH FLOW»	Clear transition (but no distinct contact) from lapilli tuff into medium grey, fine grained to aphanitic ash flow. Homeogeneous massive unit with local and restricted auto-brecciated zones - appear slightly more intermediate in composition than above unit - ? fine grained intrusive ? ⟦1042-1046⟧ «flt» Broken core - probably fault zone no clay gouge development. 1047-1057.5		⟦1031-1347⟧ «alk alt» Pervasive moderate alkaline alteration outlined by diffuse chlorite in ground-mass and development of 2-3% small garnets (< 3mm) commonly clustered in 5-8 cm patches randomly distributed throughout.	Rare.	Litho 2190. Check chemistry ? can it be an intrusive.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Blocky texture weakly brecciated zone with fine chlorite fractures (< 1mm).				
		┤1077-1087├ «and dy» Fine grained strongly calcitic, equigranular andesite dyke. Ill defined contact - mainly marked by appearance and dissappearance of calcite. Five qtz veins cut dyke at high angle 75-80 degrees (avg. vein size 2cm).		Pervasive calcite throughout dyke. Vein selvage in dyke are silicified, massive chlorite blebs occasionally associated with QV's.	< 1% pyrite blebs with trace of chalcopyrite occur in veins often associated with chlorite.	
		1096.6-1097 Two, 2cm wide, milky qtz veins biotite and chlorite development in vein selvage.				
				In several sections the alk alteration is less pervasive and ash flow appears more siliceous with well developed clotted texture. 20-25% scattered chlorite masses, and clots mixed with 8% biotite flecks (occasionally chloritoid?)		
				Clotted siliceous sections at: ┤1068.8-1077.0├ «sil» ┤1097.5-1123.5├ «sil» ┤1137.0-1161.0├ «sil» ┤1167-1176.8├ «sil»		Litho 2191.
				Auto brecciation - small fragments (< 5mm). ┤1180.9-1183├ «sil»	1183-1193.8 1% pyrrhotite masses with trace of chalcopyrite associated with large garnets (approximately 8mm) in strongly chlorite (occasionally calcitic patches and veins).	
				┤1193.8-1205.7├ «sil» 1224-1225.3 auto-brecciated zone.		Litho 2192.
				┤1255.9-1269.3├ «sil» Homogeneous zone not clotted, weak alkaline alteration.		
			30	┤1287.8-1291.6├ «sil» Weak preferential chlorite clots alignment at 30 degrees - no biotite.		

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		1292-1292.6 Brecciated Qtz vein in chloritic section. 1293.6-1297 Broken core.		⟦1313.2-1325.8⟧ «sil» No biotite/chltd, larger and more diffused chlorite clots (avg. size < 8mm). 1334-1337 sil ⟦1347-1547⟧ «chl biot sil» Overall decrease in alkaline alteration ash flow clotted with up to 20% chlorite clots (aligned at 40 degrees) and peppered with 5-8% biotite (chltd?) clots and flakes. Chlorite throughout groundmass is weaker, garnets are smaller (< 2mm) and more widely scattered. 1350.9-1351.4 3-5% pyrrhotite masses (< 5mm) and <1% chalcopyrite blebs associated with fracturing and weak chlorite infilling.		Litho 2193. Litho 2194 2195.
		1402-1450 Several (1 per 1.5mmm) small Qtz veins scattered throughout with 1-2cm weakly silicified selvage - not mineralized. 1500.4-1500.7 1500.8-1502.3 ma dy Medium grained amygdular (60% small calcitic amygdules) mafic dykes. ⟦1502.3-1513.2⟧ «blocky» Blocky texture resulting from chlorite infilling 5-8% chlorite fractures (< 2mm). 1545-1547 ma dy Calcite mafic dyke similar to 1500.8-1502.3. Sharp chilled contact @	40	1507-1678 Slightly more siliceous zone chlorite clots are more diffused and down to		Litho 2195, 2196 - intrusive texture - appears too fine grained and siliceous to be intrusive

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				< 5%. Increased in biotite content downward to 15-20% well developed peppered texture.		but check chemistry.
		1606-1606.3 Milky Qtz vein with 10% chloritic fragments, contact @	40			
		1339.9-1340.0 Milky Qtz vein contact @	5			
		┤1641.6-1745.7├ «dy swarm» 15% sharp fine grained equigranular strongly calcitic andesite dykes cut throughough the biotite peppered ash flow - avg. contacts at	40			
		dykes at 1641.6-1644 1690.6-1692.6 1661.4-1662.7 1714.3-1716.0 1671.8-1673.9 1745.6-1745.7 1674.8-1678.0				
		1678-1753.1 Finer grained massive homogeneous zone - Sharp decrease in biotite flakes and clots downhole from the dyke swarm transition zone between peppered unit and clastic tuff underneath.				1742.8-1743.6 Broken core - ? fault ?
1753.10 TO 2063.00	QTZ PORPHYRITIC RHYOLITE TUFF/ CLASTIC TUFF «QP TUFF»	Irregular brecciated contact into a chloritic brecciated Qtz porphyritic tuff intercolated with clastic horizons. Up to 15% small bluish QP's (< 2mm) scattered in groundmass but often clustered near brecciated zone.		«chl» Strong mottled/blotchy texture produced by chlorite infilling fractures and 25-30% chloritic masses.		Litho 2198.
		1759-1761 «fine tuff» Fine grained homogeneous tuffaceous zone with no Qp's. Gradational contact between clastics and tuff.				
		┤1808.5-1874.7├ «clastic tuff»		┤1753.1-1808.5├ «chl bx» 8-10% chloritic brecciated zones (3-10cm wide). Associated with brecciation are large siliciceous fragments (up top 2cm) and clusters of bluish Qtz porphyries (3cm wide clusters contained up to 50%. QP's surrounded by a silica halo - ? QP's in small clasts ? No distinct QP's in larger siliceous fragments and far less abundant QP's scattered in non brecciated zones. Few rare garnets developed in large chlorite (< 3cm) masses.		

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Less brecciated, homogeneous clastic zone with 30% (locally up to 55%) sub-rounded siliceous clasts (< 5mm) commonly clustered with a bluish Qtz Xtal in a fine grained strongly chloritic matrix. No preferential alignment of clasts. ┤1874.7-1948.5├ «rh tuff» Gradational contact into a more fine grained siliceous tuffaceous horizon - chaotic zone alkaline alteration overprint blocky texture associated with chlorite infilling and local brecciation. Auto clastic fragments are large (up to 3cm) and often silicified. No QP's. 1948.5-1994.3 Occasional visible felsic and siliceous sub-rounded clasts - transition zone between altered tuffaceous horizons and clasts.		┤1842-1986├ «alk alt.» Alkaline alteration - at 1842. Occasional chlorite and garnet patches with progressive increase downhole. Downward from 1850.5 10% corroded garnet aggregates are scattered over 0.5 to 2m. pervasively chloritized zones. Calcite and magnetite occasionally associated with chlorite and garnets. Isolated and restricted (< 15cm) zone with cluster of bluish QP's. ┤1899-1912├ «sil» Blocky silicified zone visible throughout weaker alkaline alteration. 1917-1922 mgnt Weak to moderate desseminated in strongly alkaline altered zone with 3-5% (2-3mm) massive masse aligned along ill-defined banding at 60 degrees . 3 ashanitic massive elongated magnetite pods (one dislocated pod)). Pod sizes: 5.5cm x 3.5cm, 4cm x 1.5cm and 2cm x 0.8 cm. 1919.9-1921 alk alt. QV Chaotic zone cut by 2-3 small (< 3mm wide) QV's sillimate needle occasionally developed near QV's. 1956.8-1961.5 sil calc Weakly silicified tuffaceous zone cut by irregular granular calcitic pods and fractures (Fe-carb?) Isolated zone with no chlorite and garnet alteration. 1960-1960.4 Milky QV with calcitic and chloritic rims.	Erratic irregular pyrrhotite masses (< 1cm) associated with garnet or replacing fragments and occasional fine disseminated pyrrhotite in chloritic fractures - overall trace. Erratic pyrrhotite and chalcopyrite blebs (< 3mm) associated with QV's.	Litho 2199. Silicified zone.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				┤1961.5-1971.7├ «calc» Strongly calcitic zone invaded with fine calcite seems and fractures and sub-rounded pods (3-5cm across). Zone is less siliceous than 1956.8.		
		1985.7-1989.1 and dy 1990.7-1992.0 and dy 2015.8-2016.2 and dy Medium to fine grained equigranular strongly calcitic andesite dykes (biotite-chlorite). Sharp chilled contacts at high angles > 75 degrees.				
		┤1994.3-2063├ «clastic» 10-15% distinct sub angular to sub-rounded felsic clasts (size ranged between 3-5mm to 15mm - unsorted clasts) in a fine grained dark grey biotite clotted siliceous groundmass. No preferent alignment in clastic tuff - gradational decrease in clasts downhole from 2017.		Siliceous matrix is clotted by 5-8% irregular biotite flecks. Calcite is disseminated throughout groundmass. 3% calcite replaced clasts weak patchy alkaline alteration.	Rare disseminated pyrrhotite +/or pyrite - overall trace.	Litho 2701.
				┤2017.0-2063├ «10-15% chl clots» Progressive increase in chlorite clots, and chlorite masses peppered with small corroded garnets (< 3mm) overall 10-15% chlorite. < 1% local and restricted brecciated zone associated with calcite veins and fractures.		
		┤2045.4-2063├ «chl clasts» Gradational increase in chloritic clasts. Chlorite clots have well defined outlines and are probably replaced clasts - 15-20% small clasts. Overall 20-25% clasts (avg. size (5mm-10mm).		Well developed brecciated calcite vein at 2028.1 (6 cm) broken QV's with calcite fractures at 2039.6 (3cm) and 2 040.8 (10cm).		Litho 2702.
		2058.6-2059.2 10% large sub-rounded chloritic clasts (up to 2cm across) floating in fine grained dark siliceous groundmass faint clasts elongation @ ..... No siliceous clasts.	25			
2063.00 TO 2302.00	BIOTITE RICH ANDESITE DYKE «MAFIC	Sharp high angle contact into fine grained equigranular strongly calcitic andesite dyke. Overall dyke is homogeneous with only local zone where biotite is slightly coarser 1% randomly	85			Litho 2703.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
	INTRU»	distributed calcite +/- chlorite veinlets.			Occasional pyrite blebs in small veinlets associated with chlorite and biotite books.	
	E.O.H.	2064.6-2067.0 Zone laced with 10% fine regular calcite seems. Well developed alignment of seams @	15			
		2067-2067.4 Mixed calcite and chlorite veinlets and bands at high angle to C.A.				
		2069-2072.9 Sub parallel to CA chlorite and calcite fracture (avg. 5mm wide - up to 15mm) run through andesite dyke.			And pyrite masse associated with chloritic fracture - overall trace.	
		2127.8-2129.2 Section invaded with 20% small siliceous and sericitic seams and fractures.				
		2129.2-2175 Section with 1-2% Qtz and/or calcite and chlorite veins. Occasional blood red Hematite ? grains along QV's rims. Occasional veins filled with biotite books with erratic pyrite +/or chalcopyrite specks.				
		End of Hole.				

Sample	From (f)	To (f)	Length (f)	ESTIMATES Cu %	Zn %	Py %	Po %	Mt %	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Ag oz/ton	Au oz/ton	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	Ag ppm	Au ppb	Ni ppm	As ppm	Sb ppm	COMMENTS
MSD-0361	877.00	880.00	3.00	1	1-2											819	3000		1.9	8				STG ZONE OVERALL 3% SPH
MSD-0362	880.00	883.00	3.00	1-2	3-5											5500	15610		12.5	58				STG ASS. W/CHL PATCHES
MSD-0363	883.00	886.00	3.00	2-3	5											7240	11060		11.4	127				STG ASS. W/CHL PATCHES
MSD-0364	886.00	891.00	5.00	TR	TR											74	515		0.4	4				STG ASS. W/CHL PATCHES
MSD-0365	891.00	894.00	3.00	< 1	< 2											176	6480		0.7	5				STG ASS. W/CHL PATCHES
MSD-0366	894.00	897.00	3.00	TR	< 1											13	702		0.4	4				STG ASS. W/CHL PATCHES
MSD-0367	915.00	917.00	2.00	< 1	1-2											150	605		0.6	4				STG ASS. W/CHL PATCHES

Sample	From (f)	To (f)	Length (f)	SiO2 %	TiO2 %	Al2O3 %	FeO %	MgO %	MnO %	K2O %	CaO %	Na2O %	LOI %	Cu ppm	Zn ppm	Ni ppm	Ag ppm	Au ppb	TOTAL %	Pb ppm	Mn ppm	As ppm
MSD-2178	87.00	97.00	10.00	73.20	0.43	11.23	3.76	2.31	0.06	2.50	3.56	0.51	2.21	49	74	5	0.9	4	99.77			
MSD-2179	167.00	177.00	10.00	74.60	0.44	13.13	3.48	1.38	0.05	3.02	0.77	0.56	2.08	5	73	4	0.2	5	99.51			
MSD-2180	247.00	257.00	10.00	71.30	0.46	12.41	3.91	2.32	0.08	2.71	3.02	0.48	2.95	13	74	5	0.4	4	99.64			
MSD-2181	297.00	307.00	10.00	68.80	0.45	11.53	3.54	2.27	0.06	2.31	4.68	0.29	5.46	16	52	10	0.6	4	99.39			
MSD-2182	397.00	407.00	10.00	77.30	0.41	11.82	2.89	1.28	0.05	2.82	0.64	0.33	2.01	9	47	3	0.2	4	99.55			
MSD-2183	467.00	477.00	10.00	64.70	0.39	10.67	5.45	4.06	0.15	1.98	5.27	0.52	6.49	7	101	7	0.7	6	99.68			
MSD-2184	547.00	557.00	10.00	71.20	0.51	11.90	4.49	3.53	0.10	2.31	4.07	0.57	0.97	15	91	8	0.9	4	99.65			
MSD-2185	617.00	627.00	10.00	76.30	0.35	11.01	2.87	1.97	0.06	2.46	3.13	0.37	1.14	11	70	7	0.6	4	99.66			
MSD-2186	700.00	708.00	8.00	75.00	0.36	11.33	2.53	1.35	0.04	3.08	2.89	0.25	2.92	6	46	4	0.3	4	99.75			
MSD-2187	777.00	787.00	10.00	75.00	0.34	11.02	3.18	1.84	0.13	2.98	2.38	0.36	2.26	23	107	5	0.4	4	99.49			
MSD-2188	867.00	877.00	10.00	73.30	0.43	12.76	4.22	2.70	0.15	2.91	0.22	0.34	2.65	31	291	4	0.3	5	99.68			
MSD-2189	954.00	964.00	10.00	76.00	0.38	11.63	3.39	2.24	0.11	3.18	0.53	0.28	1.90	48	498	5	0.5	4	99.64			
MSD-2190	1032.00	1042.00	10.00	76.10	0.39	10.96	4.76	2.85	0.09	1.70	0.07	0.22	2.52	5	135	4	0.3	4	99.66			
MSD-2191	1113.50	1123.50	10.00	75.00	0.43	12.27	3.73	1.89	0.12	2.77	0.57	0.55	2.16	74	362	3	0.4	6	99.49			
MSD-2192	1207.00	1217.00	10.00																			
MSD-2193	1315.00	1325.00	10.00	74.60	0.48	12.70	4.14	1.44	0.13	2.93	0.55	0.51	1.93	167	128	2	0.6	5	99.41			
MSD-2194	1417.00	1427.00	10.00	74.40	0.50	12.04	4.41	2.36	0.13	3.42	0.43	0.37	1.74	3	101	2	0.5	4	99.80			
MSD-2195	1547.00	1557.00	10.00	73.00	0.52	12.40	3.48	1.97	0.11	3.14	2.97	0.70	1.37	6	87	3	0.6	4	99.66			
MSD-2196	1627.00	1637.00	10.00	73.80	0.49	12.15	3.89	2.26	0.11	3.30	1.39	0.70	1.34	26	105	3	0.7	4	99.43			
MSD-2197	1727.00	1737.00	10.00	73.40	0.47	11.64	4.63	3.46	0.09	2.51	0.34	0.45	2.34	3	59	3	0.5	4	99.33			
MSD-2198	1817.00	1827.00	10.00	76.70	0.32	9.93	4.76	2.81	0.06	2.70	0.10	0.46	1.66	1	42	3	0.5	4	99.50			
MSD-2199	1902.00	1912.00	10.00	76.80	0.32	11.19	4.42	1.69	0.06	2.99	0.09	0.42	1.51	4	38	3	0.5	4	99.49			
MSD-2200	1957.00	1961.50	4.50	72.00	0.51	10.98	4.10	2.64	0.12	2.26	3.93	0.51	2.46	12	48	6	0.9	5	99.51			
MSD-2701	2007.00	2017.00	10.00	55.40	0.87	14.31	6.62	4.81	0.31	2.59	7.85	0.86	6.15	6	100	34	1.4	4	99.77			
MSD-2702	2047.00	2057.00	10.00	61.10	1.17	14.54	7.90	5.01	0.24	2.17	4.77	1.20	1.73	18	130	16	1.0	4	99.83			

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: X METRIC UNITS:

PROJECT NAME: SLM
PROJECT NUMBER: PN359
CLAIM NUMBER:
LOCATION: STURGEON LAKE MINE

PLOTTING COORDS GRID: MINE GEOLOGY
NORTH: 8515.00N
EAST: 11200.00E
ELEV: 10025.00

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -79° 0' 0"
LENGTH OF THE HOLE: 2468.00f
START DEPTH: 0.00f
FINAL DEPTH: 2468.00f

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 195° 0' 0"

DATE STARTED: April 5, 1988
DATE COMPLETED: April 18, 1988
DATE LOGGED: April 6, 1988

COLLAR SURVEY: NO
MULTISHOT SURVEY: YES
RQD LOG: NO

PULSE EM SURVEY: YES
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: CONNORS DRILLING RIG 12
CASING: 20 FEET
CORE STORAGE: STURGEON LAKE MINE

PURPOSE: TEST ALTERATION & STRATIGRAPHY WITHIN MATTABI RHYOBELOW FOOTWALL INTRUSIVE OF THE STURGEON LAKE MINE

DIRECTIONAL DATA:

Depth (f)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
104.00	191° 0'	-78° 0'	MULTISHOT	OK	
204.00	189° 0'	-77° 0'	MULTISHOT	OK	
304.00	190° 0'	-77° 0'	MULTISHOT	OK	
404.00	189° 0'	-77° 0'	MULTISHOT	OK	
504.00	189° 0'	-76° 0'	MULTISHOT	OK	
604.00	189° 0'	-75° 0'	MULTISHOT	OK	
704.00	190° 0'	-74° 0'	MULTISHOT	OK	
804.00	190° 0'	-73° 0'	MULTISHOT	OK	
865.00	192° 0'	-72° 0'	MULTISHOT	OK	
965.00	193° 0'	-72° 0'	MULTISHOT	OK	
1065.00	192° 0'	-71° 0'	MULTISHOT	OK	
1265.00	193° 0'	-71° 0'	MULTISHOT	OK	
1365.00	195° 0'	-70° 0'	MULTISHOT	OK	
1465.00	195° 0'	-69° 0'	MULTISHOT	OK	
1546.00	192° 0'	-68° 0'	MULTISHOT	OK	
1565.00	194° 0'	-69° 0'	MULTISHOT	OK	
1646.00	192° 0'	-67° 0'	MULTISHOT	OK	
1746.00	193° 0'	-66° 0'	MULTISHOT	OK	
1846.00	194° 0'	-66° 0'	MULTISHOT	OK	
1946.00	195° 0'	-66° 0'	MULTISHOT	OK	
2046.00	195° 0'	-66° 0'	MULTISHOT	OK	
2146.00	195° 0'	-65° 0'	MULTISHOT	OK	
2246.00	198° 0'	-65° 0'	MULTISHOT	OK	
2346.00	199° 0'	-64° 0'	MULTISHOT	OK	
2446.00	199° 0'	-64° 0'	MULTISHOT	OK	
100.00	-	-79° 0'	ROTODIP		
250.00	-	-77° 0'	ROTODIP		
400.00	-	-76° 0'	ROTODIP		
550.00	-	-75° 0'	ROTODIP		
700.00	-	-75° 0'	ROTODIP		
800.00	-	-72° 0'	ROTODIP		
950.00	-	-72° 0'	ROTODIP		
1100.00	-	-72° 0'	ROTODIP		
1250.00	-	-71° 0'	ROTODIP		
1400.00	-	-70° 0'	ROTODIP		
1550.00	-	-70° 0'	ROTODIP		
1700.00	-	-66° 0'	ROTODIP		
1850.00	-	-64° 0'	ROTODIP		
2000.00	-	-63° 0'	ROTODIP		
2150.00	-	-61° 0'	ROTODIP		
2300.00	-	-61° 0'	ROTODIP		
2450.00	-	-61° 0'	ROTODIP		
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 20.00	CASING «CASING»					
20.00 TO 95.30	MAFIC INTRUSIVE «GABBRO»	Medium grained equigranular mafic intrusive strongly calcitic, locally peppered with 8% magnetite grains (< 2mm) 15-20% biotite nest and flakes (2-3mm) in chloritic groundmass. Intrusive laced with 3-5% calcite fractures small veinlets and occasional pods. 88-95.3 Fine grained to aphanitic intrusive margin.		Strong calcite developement throughout chloritic groundmass.	Erratic pyrite blebs - overall trace.	29.5-30 47-48 Broken weathered core.
95.30 TO 223.70	QP RHYOLITE TUFF «QP RH TUFF »	Fine to medium grained Rhyolite tuff with 3-5% rounded bluish QP's (< 1mm) scattered in the sericitic often silicified groundmass. Up to 5% small distinct clasts (< 8mm) occur locally. Occasionally in situ brecciation due to silicification or late alkaline alteration.		⌊95.3-137⌋ «chl sil» Zone near intrusive contact is strongly chloritic with 30-35% silica clots and knots and with 5% chlorite patches (up to 5cm wide) with garnet aggregates - late alkaline alteration. ⌊137-169.9⌋ «weak sil, ser, chl» Weak pervasive silicification throughout sericitic and weakly chloritic groundmass. 10-15% sericite wisps occasionally aligned along faint banding at approximately 40 degrees. Alkaline alteration restricted to isolated patches. (< 2%). ⌊169.9-177.5⌋ «sil ser» Moderate to strongly silicified zone with 30% sericite development (pale green and brownish sericite) associated with fracturing. Trace of Hematite.	Erratic pyrite blebs - overall trace. 1% pyrite blebs and small masses (< 5mm) and trace of disseminated chalcopyrite - often associated with minute Qtz veinlets or pods.	Litho 2651. Litho 2653. Litho 2652.
223.70 TO 276.40	ANDESITE DYKE SWARM «AND DY SWARM/QP TUFF»	QP Rhyolite tuff cut by numerous (15%) fine to medium grained strongly calcitic andesite dykes, dykes contacts are sharp with 2/cm chilled margins. Dykes cut through at various angles (20 to 80				

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		degrees). Dykes at: 168.1-169.9 248.0-250.3 187.2-188.0 258.7-261.5 223.7-224.2 263.1-266.5 244.6-245.4 275.2-276.4 246.5-247.0		┤238.5-307.5├ «alk alt» Section invaded by 30% chlorite clots, large patches and fractures. Avg. patches size: 2-3cm; occasional zones (10-25 wide) covered with up to 70% chlorite. Garnet aggregates locally well developed in larger chloritic zones. In situ brecciation developed in the QP Rhyolite tuff due to chlorite infilling.	< 1% pyrrhotite and pyrite blebs with trace of chalcopyrite occur associated with chlorite. Large chloritic zones occasionally contains trace of brown sphalerite associated with pyrite and pyrrhotitic.	Litho 2654.
276.40 TO 504.00	QTZ PORPHYRITIC RHYOLITE TUFF «QP RH TUFF »	Same as 95.3-168.1 - coarse granular QP rhyolite tuff with 3% small commonly resorbed bluish QP's QP's content progressively decrease downhole from 500. Sub-rounded silicified clasts (< 8mm) are locally present (restricted to local zones). Blocky and brecciated textures common-resulting from chlorite infilling.		Same as 137-168.1. «weak sil, ser, chl»	Throughout all unit pyrrhotite and/or pyrite (occasional chalcopyrite and sphalerite) masses and stringer occur associted with chlorite - overall 1%. 281.0-282.0 Large chlorite patche with 1% chalcopyrite blebs, 1% disseminated fine grained sphalerite mixed with 2-3% pyrrhotite and pyrite.	Geochem 2216.
				┤331-342.0├ «sil ser» Moderately silicified zone similar to 169.9-177.5 Diffused gradational contact with surrounding Rhyolite tuff.		Litho 2655.
		┤363.5-394.0├ «qp lap tuff» Coarser grained QP Rhyolite tuff with 20% small distinct visible clasts (< 5mm) in tuffaceous matrix.			363.5-394.0 1% mixed small pyrrhotite and pyrite blebs and wisps with trace chalcopyrite scattered through groundmass.	
		383.7-387.0 and dy Fine grained equigranular strongly calcitic andesite dyke chilled contacts @	85	357.0-359.6 ┤394.0-403.3├ «sil ser» 418.0-420 Moderately to strongly silicified zone invaded by up to 40% yellow-green sericite wisps.		Litho 2656.
				┤430.0-504├ «alk alt» Altered QP rhyolite tuff - weak pervasive silicification outlined by blocky and occasional brecciated	┤430.0-504├ 1-2% po, < 1% sph, tr cp» «strg-chl» Section containing overall 1-2% pyrrhotite < 1% sphalerite, tr cp clear	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				textures (in situ brecciation) overprint by 8% large massive chlorite patches (avg 3-5cm occasionally up to 15cm long) containind 1-3% garnet aggregates (< 15mm).	association between mineralization and chlorite alteration. Occasionally pyrrhotite masses (< 2cm) with trace of chalcopyrite occur in silicified QP tuff but larger pyrrhotite and chalcopyrite masses and blebs, as well as sphalerite disseminations and semi-massive stringers occur in chlorite patches.	
				Strongly silicified zones at:	Well mineralized chloritic zones at:	
				┤443.0-448.0├ «stg sil, alk alt» Aphanitic silicified zone invaded with 35% chlorite masses and veins.	┤443.0-448.0├ «po py» 2% pyrrhotite +/or pyrite blebs with < 1% chalcopyrite wisps scattered in chlorite.	Geochem 2217.
					┤473.0-474.8├ «3% po cp» 3% massive chalcopyrite and 3% massive pyrrhotite blebs (up to 15mm wide) and occasional fine wisps associated with 2% garnet in a 60% chloritic interval.	Geochem 2218.
				┤495.4-497.0├ «sil» Silicified zone with only , 5% late chlorite infilling (silicification window throughout alkaline alteration).		Litho 2657.
					┤498.5-501.0├ «po cp» 3% disseminated pyrrhotite wisps and occasional stringers 9, 2mm) with 1% scattered chalcopyrite blebs and specks 25-30% chlorite 2% large garnets (up to 10mm) in interval.	Geochem 2219.
					┤501.2-503.2├ «5% sph, 1% cp» 60% chlorite masses and stringers overall 5-8% sphalerite 1-2% chalcopyrite wisps 3% pyrrhotite. A large well defined 8cm long chlorite fracture is laced by 45% semi-massive brown sphalerite.	Geochem 2220.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
504.00 TO 812.40	RHYOLITE TUFF «RH TUFF»	Similar to above but with progressive decrease in QP's downhole to 812.4.		At: 504.0 Sharp disappearance of the large chloritic patches. Substantial decrease in late alkaline alteration. QP tuff exhibit blocky textures (fractures and veins commonly at low angle with C.A. 10-20%).	504.0-540.0 Gradational decrease in pyrrhotite masses and small stringers (with occasional trace chalcopyrite) associated with decrease in chlorite overall po < 2%.	Litho 2658 * Cu Zn values.
		529.9-530.1 and dy 568.7-569.0 and dy Sharp fine grained strongly calcitic andesite dyke.			Erratic < 1% disseimated pyrite grains in dyke - QP tuff near dykes margins.	
				⟦540-562.5⟧ «sil» ⟦603-611.5⟧ «sil» Moderate pervasive silicification throughout blocky QP tuff with 5-8% sericite wisps enveloping large sub-angular fragments - these zones appear clastic.		Litho 2659.
		⟦562.5-570⟧ «QV's chl» Chaotic zone laced with 8-10% irregular Qtz veins (up to 2cm wide) and silica knots (< 8mm). Fractures near QV's filled with chlorite and sericite wisps - occassional strong brecciated associated with silica infilling.				
				⟦638.0-660.0⟧ «sil» Lighter grey weakly to moderately silicified section - blotchy textures.		Litho 2660.
		611.5-614 ma dy 666.8-669.2 ma dy Medium grained slightly calcitic mafic dyke. Contacts are sharp @	30		Isolated massive pyrite stringer (3mm) near dyke. Upper contact.	
				⟦669.2-671.9⟧ «chl» Diffuse chlorite development in QP tuff adjacent to dyke lower contact.	1% fine pyrite blebs in irregular stringers.	
				⟦671.9-679.8⟧ «sil» Silicified zone similar to 638.0-660.0 Contact between the chlorite and silicified zone well defined at 20 degrees.	Contact filled with fine pyrite +/or pyrrhotite seams overall 2% mixed pyrite pyrrhotite.	
		694-695.8 dy 697.7-700 dy Medium grained mafic dykes, same as 666.8-669.2.		692.5-702 Diffuse rhyolite throughout QP tuff in		

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Chilled contacts (1-2cm wide) @	25 30	the dykes surrounding.		
				┤719.5-747├ «sil ser» Weakly to moderately silicified zone similar to 638.0-660.0 containing large patches (up to 50cm wide) of 70% mixed coarse sericite and chlorite flakes and wisps. The sericite and chlorite patches are well defined often rimmed with a fine massive chlorite band. Chlroite also rimmed and occasionally replaced small clasts within the QP tuff. Sericite and chlorite patches at: 719.0-721.6 738.7-741.4 743.8-745.4	2% pyrrhotite 1% pyrite in masses and stringers and < 1% chalcopyrite clots (< 3mm) occur randomly throughout. In the more siliceous zone (at 733.0) trace of sphalerite is associated with pyrrhotite and pyrite in a fine (< 2mm) stringer.	Contact here rather than at 812.4. Litho 2661 Cu Zn.
				┤766.9-779├ «stg sil» Light grey fine grained to aphanitic strongly silicified zone. Primary textures partly obscured.	┤766.9-779├ «5% po, 1% cp, tr sph» 3-5% mineralized stringers and blebs (variable in size < 2mm-3cm) associated with silica flooding. Pyrrhotite is the main stringer component (overall 5% pyrrhotite) 1% chalcopyrite occur blebs and wisps associated with pyrrhotite and occasionally as large blobs (up to 2 cm wide). Sphalerite often found in minute amount mixed with pyrrhotite occasionly in small masses, overall < 1%.	Litho 2662. Geochem 2221 to 2224.
		┤779-812.4├ «qp lap tuff» Tuffaceous section with 5% lapillis and 2-3% small reserved bluish QP's. Chlorite alteration outlined small sub-rounded clasts (< 5mm) in the tuff - Chlorite occasionally rimmed +/or partly filled 2% of the sub-rounded larger clasts (< 1cm)		┤279-812.4├ «chl» 30% medium to coarse grained chlorite mixed with < 5% sericite diffusing throughout groundmass and filling small fractures over printing weak silicification in QP tuff-mottled textures with local in situ brecciation (angular fragments).	1% pyrite blebs and small stringers scattered through commonly associated wtih chlorite.	
812.40 TO 1194.90	RHYOLITIC TUFF «RH TUFF»	Unit similar to 276.4-812,4 but without bluish QP's		┤812.4-822.7├ «sil» ┤826.5-871.1├ «sil» Moderate to strong pervasive silicification with 5-8% chloritic	┤812.4-871.1├ «strngr» Unevenly distributed 3% pyrrhotite stringers and semi-massive masses throughout silicified zone - 1%	Contact might be better located at 719.5. Litho 2663.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				fractures - fractures often mineralized	chalcopyrite blebs and < 1% disseminated sphalerite associated with pyrrhotite. Pyrite restricted to local zones. Best mineralized zones at:	
					⟨812.4-814.0⟩ «10% po py» 10% pyrite, 10% pyrrhotite, 2% chalcopyrite, trace sphalerite.	Geochem 2225.
					⟨817.7-822.7⟩ «3-5% po,1% py,tr sp cp» 1% pyrite associated with 3-5% pyrrhotite stringers. Scattered < 1% chalcopyrite blebs (< 3mm). Isolated < 1% sphalerite in pyrrhotite stringer at 821.2. Minute trace of sphalerite also occur locally mixed with pyrrhotite.	Geochem 2226.
					⟨848.5-851.5⟩ «3-5% po tr sp cp» 3-5% pyrrhotite, < 1% sphalerite trace chalcopyrite clustered in semi massive patches (5cm wide) and disseminated throughout in small stringers and blebs.	Geochem 2227.
					⟨851.5-854.5⟩ «3% py tr sph cp» Similar to above but sphalerite and chalcopyrite associated with pyrite rather than pyrrhotite 3% pyrite, < 1% sph. trace chalcopyrite.	Geochem 2228.
					⟨867.5-870.5⟩ «3% po, 1-2% sph» 3% pyrrhotite stringers with 1-2% sphalerite dissem. in pyrrhotite stringer and occasional masses (< 4mm) < 1% chalcopyrite wisps in po stringers	Geochem 2229.
				⟨871.1-904.5⟩ «chl» Silicified zone invaded by chlorite. 871.1-888 60% diffused chlorite throughout groundmass (similar to 779-812.4). 888-904.5 20-25% chlorite masses (< 3cm), clots	Random < 2% pyrrhotite masses (5mm to 2cm) with 1% pyrite and < 1% chalcopyrite scattered in chlorite altered zone.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				and veins - no garnets. Occasional rounded / weakly elongated chlorite - chloritic clasts?		
					906-908 Chloritic zone with 5-8% pyrrhotite 3% pyrite masses and stringers with 1% chalcopyrite specks and blebs.	Geochem 230. Litho 2464.
				904.5-906 ┤908-919.6├ «sil» Silicified zone similar to 826.5-871.1 with 5-8% chlorite clots and fractures.	Occasional massive pyrrhotite and pyrite stringers in chloritic fractures in the silicified zone.	
				┤919.6-994.9├ «chl» Same chloritic alteration as 871.1-904.5.		
				919.6-926.5 25% chlorite masses and fractures.		
				926.5-994.9 Up to 70% diffuse chlorite in groundmass.		
					┤960-962├ «3% po py» 3% disseminated pyrrhotite wisps and blebs with 2% chalcopyrite masses (~5mm) associated with pervasive chlorite.	Geochem 2231.
		┤994.9-1087.6├ «clot RH Tuff» Clotted rhyolite tuff with scattered ill defined lapillitic zones. Often well defined chlorite clots resemble replaced lapillis or clasts (< 5%). Alteration obscured most primary features. Several Qtz veins (-1 or 2 per 1.5m avg size 1cm, up to 3.5cm) cut through at high angles 60-80 degrees with sharp contacts.		┤994.9-1086├ «clotted» Mottled texture - chaotic clotted zone with 20-25% diffuse chlorite masses (0.5-2cm) and well defined chlorite clots (< 10mm). Fracturing -2% chloritic fractures - produced local fragmentation. Progressive decrease in alteration downhole.		Litho 2665.
				1079.4-1082 sil 1086-1087.6 sil Restricted silicified zone with sharp contact. Pervasive bleaching obscured textures.		Litho 2666.
		┤1087.6-1194.9├ «clastic» Locally distinct 10-15% rounded siliceous clasts (or Qtz Xtals) avg size - 2-8mm.		1087.6-1194.9 Close to unaltered, weak diffuse		Contact at 1087.6 rather than at

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Clastic zones occur randomly throughout and their contacts are ill-defined. 1158.7-1161.6 ┤1173.2-1178.4├ «chl clasts» 1181.3-1181.4 Irregular isolated zones containing up to 40% weakly elongated well rounded ? chloritic clasts?/ size range 4-15mm across) in a fine to medium grained chloritic groundmass. Occasional biotite flakes developed in the clasts centre clasts elongation to C.A. Contacts of these zones are sharp marked by appearance of spherulite but highly irregular. 1193.7-1194.9	42	chlorite in groundmass.	< 1% chalcopyrite blebs (< 3mm) in small QV at 1178.3.	1194.6 ?? Litho 2667.
1194.90 TO 1605.00	CLASTIC TUFF «CLAST TUFF»	Light grey. Clastic tuff composed of up to 75% closely packed sub-rounded to rounded siliceous clasts (2-10mm) in a medium grained weakly chloritic and sericitic groundmass. Upper part of unit (up to 1263.5) is slightly more heterogeneous - fewer and less distinct clasts than the lower part of the unit. Occasional faint alignment of clastic @ ..... ┤1280-1284├ «and dy» Fine grained equigranular strongly calcitic andesite dyke. 1275-1284.5 Height small milky Qtz veins cut at high angles (< 75 degrees) in the clastic tuff and dyke. Veins in dyke are slightly calcitic. 1309.7-1311.9 and dy 1316.7-1318.5 and dy Fine grained andesite dyke same as 1280-1284. Dyke laced with minute calcite seems blocky/ fragmented texture developed in upper dyke margin (1308-1309.7).	58	«weak sil, ser» Unaltered to weakly silicified with weak sericite in groundmass - local weakl chlorite in fractures and associated 2-3% clots. ┤1318.5-1322├ «sil» Silicified lower dyke margin with	Rare disseminated pyrite and small blebs associated with some QV's - overall trace.	Contact better at 1087.6 ? Litho 2668. 2669.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				10-15% fine sericite wisps and occasinal Hematite seams. 1318.5-1319 5% small calcitic fractures. ┤1322-1335├ «Hem wisps» Erratically distributed minute hematite wisps and seams commonly associated with fine low angle (20-30 degrees) chloritic fractures.	
		┤1365-1367├ «flt» Highly broken core, probable fault zone. 1362.5-1365 Occasional Xtallized Hematite on fractured surfaces. 1390.0-1390.1 Small fracture filled with clay material small fault? @	18			
		┤1391-1569.8├ «rh tuff» Gradational contact into coarse to medium grained light grey rhyolite tuff with no distinct clasts (or ? tightly compacted) local blocky texture due to chlorite infilling fractures - thin hematite coating is common on fractured surfaces. Faint fabric alignment @	20	Weakly bleached - close to unaltered. Homogeneous fish scale texture with occasional chlorite fine fractures and 2-3% chlorite clots.		Litho 2670. 2671.
		1410.7-1412 Broken Qtz veins with chlorite and calcite fractures. Blood red Hematite grains and biotite books associated with QV's and chlorite. 1446.5-1446.8 Small fracture filled with clay and calcite and graphite seams. ┤1462.3-1471.1├ «flt» Broken core - fault zone with weak clay and calcite and Hematite development. In this section 3% chlorite clots resemble clast with well defined outlines - fractures @	22 22	1471.1-1476.5		

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				1471.1-1473.6 Pervasive weak bleaching with similar chlorite clots as in 1462.3-1471.1. 1473.6-1476.5 Zone locally invaded with minute calcite and Hematite seams - broken Qtz veinlets and pods occasionally filled fractures.		
		1476.5-1481.6 Restricted finer grained and darker grey zone. 1486.9-1487 Contorted and broken Qtz vein (< 2cm wide).				
				┤1518-1530.1├ «wk sil» Weakly silicified zone lighter grey - finer grained.		Litho 2672.
		1562-1562.1 1564.6-1564.7 Small fractures in core (< 3mm) coated with graphite. Small faults @	24 18	Weak bleaching assoicated with faults.		
		1568-1569.8 Gradational contact between tuff and underlying clastic tuff (same as described) at 1194.9). Faint fabric elongation in clastics @	34			
1605.00 TO 2467.10	QTZ PORPHYRITIC RHYOLITE TUFF «QP TUFF» E.O.H.	Medium to dark grey medium grained Qtz. porphyritic Rhyolite tuff with 5-8% small (< 2mm) rounded distinct bluish QP's scattered throughout sericite, often chloritic groundmass - locally QP tuff appear finer grained (ash tuff) homogeneous, and QP's are occasionally undistinct or faint zone bordered on both sides by a 3-5cm wide milky Qtz vein. Up to 25% minute chloritic fractures developed in QP tuff (low angle to C.A.).		«weak ser, chl» Weak sericite and chlorite in groundmass - Network of minute fractures filled with chlorite locally produced strong chloritic aspect. ┤1646.6-1653├ «chl» 1724-1724.2 1728.4-1728.6 Isolated chlorite patches with corroded garnet aggregates.	1646.6-1653 Pyrite masses and chalcopyrite and pyrrhotite blebs respectively associated with the 2 QV's. Disseminated < 1% chalcopyrite and pyrrhotite wisps at 1651.7-1653.	Litho 2673. 2674, 2675.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		1810-1812 Local zone with 1-2% large chloritic pseudo - lapillis.		┤1827-1912├ «chl« Altered zone - core is more broken in this section - invaded with 20-25% closely space chloritic fractures and seams. Common fragmentation is QP tuff (in situ brecciated) resulting from chloritic infilling. Weak pervasive sericite development throughout and occasional pale-green sericite in fractures. Sericitic zones (with up to 25% sericite fractures @ 1843.9-1845.1 and in dyke altered margins over 30cm. Erratic garnets locally associated with chlorite - overall trace - chlorite alteration increase downward to fault zone.	Occasional pyrite masses and chalcopyrite blebs associated with rare QV's overall trace.	
		1855.8-1856.4 1860.3-1861.5 and dy Fine grained equigranular calcitic andesite dykes.				
		┤1870.5-1878├ «graph fract» Upper margin of underneath fault zone with graphite developed in small fractures - 1878-1888. Broken core (avg piece size 3-8cm) occassional graphite coating on fractured surfaces.				Litho 2676.
		┤1888-1900├ «fault» Fault zone - highly broken core (avg. pieces size < 4cm) with occasional graphite coating on fractured surfaces. Preferent fracturing @ ..... No change in unit - same QP tuff as above fault.	 40 45			
		1900-1912 Broken core (avg. piece size 3-8cm) occasionally graphite coating on fractured surfaces.		┤1912-1955.7├ «alk alt.- chl» Grey green QP tuff with moderate pervasive chlorite throughout groundmass. Progressive increase in alkaline alteration larger and more extensive chloritic zones with corroded garnet aggregates. 5-8% garnets in chloritic zones at: 1923-1924, 1933-1935, 1937.8-1946.4, 1958-1959.6, 1964.9-1965.5.	Occasional pyrrhotite wisps associated with alkaline altered zones - overall trace.	
		┤1948-1981.4├ «chl clasts»				

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Chlorite clots in groundmass (< 5mm) resemble small clast - local mafic component to QP tuff?				
		1935.5-1955.7 and dy Fine grained equigranular calcitic andesite dyke, invaded with irregular calcite fractures, seams and occasional pods. Near upper dyke margin alkaline alteration QP tuff is laced with seams and veinlets. Dyke contacts @	70	No alkaline alteration in dyke.		
				┤1955.7-2058.0├ «chl biot clots» Lighter grey clotted QP tuff with locally up to 25% small chlorite and biotite clots (< 3mm) aligned along a 50 degrees fabric alkaline alteration is less extensive and more patchy but still ubiquitous.		Litho 2677.
				┤2058-2136├ «alk alt chl» Alkaline alteration similar to 1912-1993.5.		Litho 2678.
		2104.9-2104.5 Small broken and contorded QV's.				
		2112.4-2114.9 qv's Zone invaded with Qtz veins and chloritic fractures (low angles to sub parallel to C.A. Biotite masses associated with QV's and chlorite.			Erratic masses of pyrite associated with QV's - overall trace.	
				┤2136-2348├ «chl/biot clots» Lighter grey clotted QP tuff - biotite chlorite clots, similar to 1955.7-2028.0. Weak alkaline alteration still visible overall decreasing downhole.		Litho 2679.
		2140.6-2140.9 Broken core (high angle fractures) at 2141 - sericite development 2140.6-2141.				
		┤2175.8-2180.5├ «and dy» Fine grained equigranular strongly calcitic andesite dyke.				
		2180.5-2237 Coarser grained texture in QP tuff - biotite/ chlorite clots distribution produced a pseudo equigranular texture.				
				┤2218-2236├ «alk alt»		

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				Local moderate to strong alkaline alteration.		
				┤2230.5-2242├ «sil ser» Weakly silicified zone laced with 3-5% fine (< 3mm) sericitic fractures going in all directions.		Litho 2680.
		2309.5-2328 Finer grained zone with decrease in chlorite and biotite clots.				
				┤2348-2468├ «10% biot clots» Clotted QP tuff similar to 2136-2348 but in this section biotite clots are progressively larger (up to 0.8mm) and in greater amount than chlorite.		Litho 2681.
				2446.5-2467.1 Increase in alkaline alteration - weak pervasive chlorite throughout groundmass with a strong massive chlorite patch at 2466-2467.1 with 3% large (up to 10mm) garnets.		Litho 2682.
		2467.1-2468 Fine grained strongly calcitic andesite dyke. Sharp contact between dyke and chlorite patch a..	85			
		End of Hole.				

Sample	From (f)	To (f)	Length (f)	ESTIMATES Cu %	Zn %	Py %	Po %	Mt %	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Ag oz/ton	Au oz/ton	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	Ag ppm	Au ppb	Ni ppm	As ppm	Sb ppm	COMMENTS
MSD-2216	281.00	282.00	1.00	1	< 1	2-3										6200	6470		8.6	235				
MSD-2217	443.00	448.00	5.00	< 1		2										456	159		0.9	18				
MSD-2218	473.00	474.80	1.80	3			3									2650	390		5.4	36				
MSD-2219	498.50	501.00	2.50	1	TR	TR	3									710	1476		2.5	20				
MSD-2220	501.00	503.20	2.20	1-2	5		3									1310	70250		3.4	125				
MSD-2221	769.30	771.80	2.50	TR	1		1-2									667	1516		1.2	39				
MSD-2222	771.80	773.80	2.00	< 2	TR		10									1492	1401		3.8	46				
MSD-2223	773.80	776.80	3.00	TR-1	?		5									160	52		0.3	6				
MSD-2224	776.80	778.80	2.00	1	TR		5									1590	518		2.9	104				
MSD-2225	812.40	814.00	1.60	< 2	TR	10	10									1139	492		4.0	7				
MSD-2226	817.70	822.70	5.00	< 1	< 1		3-5									473	1365		0.8	4				
MSD-2227	848.50	851.50	3.00	TR	< 1	3										420	3780		1.4	23				
MSD-2228	851.50	854.50	3.00	TR	< 1	3-5										2850	725		6.1	30				
MSD-2229	867.50	870.50	3.00	< 1	1-2		1									885	1820		2.0	6				
MSD-2230	906.00	908.00	2.00	< 1	?	3	5-8									1083	67		2.0	25				chl alt zone strg mass
MSD-2231	960.00	962.00	2.00	2			3									1210	269		2.6	6				chl atl sil zone strg mas

Sample	From (f)	To (f)	Length (f)	SiO2 %	TiO2 %	Al2O3 %	FeO %	MgO %	MnO %	K2O %	CaO %	Na2O %	LOI %	Cu ppm	Zn ppm	Ni ppm	Ag ppm	Au ppb	TOTAL %	Pb ppm	Mn ppm	As ppm
MSD-2651	118.00	128.00	10.00	75.70	0.29	9.52	5.21	2.57	0.18	1.27	1.45	1.39	2.24	23	55	10	0.4	4	99.82			
MSD-2652	170.00	177.00	7.00	78.20	0.27	11.98	2.51	1.15	0.04	2.94	0.18	0.36	1.98	41	60	4	0.1	5	99.61			
MSD-2653	208.00	218.00	10.00	77.90	0.28	11.71	2.83	1.48	0.05	2.65	0.17	0.47	2.09	3	51	3	0.1	4	99.63			
MSD-2654	268.00	278.00	10.00	75.80	0.27	9.90	6.87	2.01	0.10	1.62	0.32	0.36	2.25	135	162	8	0.5	4	99.50			
MSD-2655	331.00	341.00	10.00	79.40	0.30	11.70	2.02	0.85	0.04	2.98	0.04	0.36	1.91	2	13	3	0.1	4	99.60			
MSD-2656	395.00	403.00	8.00	67.80	0.47	12.98	5.93	1.69	0.32	2.72	0.76	0.36	6.77	2310	116	5	3.3	41	99.80			
MSD-2657	495.40	397.00	-98.40	84.80	0.24	9.26	1.09	0.25	0.02	2.16	0.03	0.41	1.37	31	25	3	0.1	5	99.63			
MSD-2658	518.00	528.00	10.00	76.50	0.29	11.98	4.14	1.41	0.09	2.31	0.35	0.45	2.28	131	132	6	0.2	4	99.80			
MSD-2659	548.00	558.00	10.00	77.90	0.31	12.04	3.06	0.99	0.06	2.52	0.08	0.55	2.20	22	98	4	0.1	5	99.71			
MSD-2660	638.00	648.00	10.00	81.60	0.30	10.35	2.03	0.88	0.05	2.21	0.20	0.41	1.65	12	21	3	0.1	4	99.68			
MSD-2661	728.00	738.00	10.00	84.50	0.33	8.64	1.51	0.51	0.02	1.93	0.05	0.39	1.45	39	21	4	0.2	4	99.33			
MSD-2662	766.80	769.80	3.00	88.70	0.20	6.93	0.54	0.15	0.01	1.50	0.01	0.39	0.92	12	4	4	0.1	4	99.35			
MSD-2663	826.50	836.50	10.00	83.60	0.30	8.50	2.70	0.46	0.03	1.84	0.04	0.43	1.78	106	32	5	0.1	4	99.68			
MSD-2664	908.00	918.00	10.00	84.20	0.32	9.92	1.04	0.23	0.03	1.97	0.01	0.64	1.35	9	3	3	0.1	4	99.71			
MSD-2665	1002.00	1012.00	10.00	78.50	0.44	11.81	2.03	1.21	0.04	2.43	0.08	0.66	2.13	10	25	1	0.4	5	99.33			
MSD-2666	1079.40	1082.00	2.60	82.30	0.43	10.91	0.59	0.26	0.03	2.83	0.11	0.41	1.52	4	6	1	0.1	4	99.39			
MSD-2667	1178.00	1188.00	10.00	78.20	0.39	10.65	3.07	2.27	0.04	2.14	0.08	0.45	2.20	4	49	3	0.3	4	99.49			
MSD-2668	1208.00	1218.00	10.00	74.30	0.43	11.99	3.90	3.14	0.09	2.28	0.57	0.59	2.47	3	68	3	0.7	4	99.76			
MSD-2669	1292.00	1302.00	10.00	75.20	0.45	12.47	3.22	2.52	0.05	2.77	0.14	0.49	2.50	2	40	2	0.3	5	99.81			
MSD-2670	1398.00	1408.00	10.00	80.00	0.39	10.23	2.76	1.90	0.04	2.09	0.05	0.33	1.93	12	45	2	0.3	4	99.72			
MSD-2671	1488.00	1498.00	10.00	72.70	0.57	12.32	5.39	3.24	0.08	1.99	0.13	0.31	2.85	2	50	3	0.5	4	99.58			
MSD-2672	1518.00	1528.00	10.00	77.70	0.41	11.61	2.92	2.10	0.05	2.50	0.08	0.31	2.09	1	43	2	0.2	5	99.77			
MSD-2673	1618.00	1628.00	10.00	76.90	0.36	12.62	2.69	1.74	0.04	2.88	0.07	0.36	2.16	3	21	2	0.3	4	99.82			
MSD-2674	1708.00	1718.00	10.00	76.90	0.47	12.61	2.86	1.44	0.06	2.91	0.11	0.29	2.02	8	36	2	0.2	4	99.67			
MSD-2675	1788.00	1798.00	10.00	76.80	0.47	11.59	3.88	1.89	0.08	2.58	0.12	0.29	2.07	118	78	3	0.4	4	99.77			
MSD-2676	1868.00	1878.00	10.00	75.10	0.44	11.15	5.27	2.34	0.08	2.53	0.25	0.31	2.27	5	36	3	0.7	4	99.74			
MSD-2677	1998.00	2008.00	10.00	75.60	0.44	11.82	4.70	1.90	0.15	2.55	0.11	0.31	2.20	10	135	3	0.4	4	99.78			
MSD-2678	2078.00	2088.00	10.00	74.00	0.48	12.22	5.75	2.00	0.14	2.63	0.17	0.38	1.88	22	24	3	0.4	4	99.65			
MSD-2679	2158.00	2168.00	10.00	76.30	0.44	11.36	3.93	2.19	0.10	1.61	1.28	0.55	1.69	2	20	4	0.5	4	99.45			
MSD-2680	2231.00	2241.00	10.00	75.50	0.45	10.20	5.48	1.88	0.15	1.72	1.01	0.22	2.88	8	17	3	0.4	5	99.49			
MSD-2681	2378.00	2388.00	10.00	74.10	0.50	11.41	4.19	2.43	0.10	1.99	2.95	0.57	1.23	2	13	4	0.7	4	99.47			
MSD-2682	2448.00	2458.00	10.00	77.00	0.52	9.43	4.78	3.07	0.09	2.36	0.21	0.38	1.56	2	23	4	0.5	4	99.40			

HOLE NUMBER: SLM-256

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: X METRIC UNITS:

PROJECT NAME: SLM
PROJECT NUMBER: PN359
CLAIM NUMBER:
LOCATION: STURGEON LAKE MINE

PLOTTING COORDS GRID: MINE GEOLOGY
NORTH: 7900.00N
EAST: 10000.00E
ELEV: 99960.00

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -78° 5' 0"
LENGTH OF THE HOLE: 2177.00f
START DEPTH: 0.00f
FINAL DEPTH: 2177.00f

COLLAR GRID AZIMUTH: 180° 0' 0"

COLLAR ASTRONOMIC AZIMUTH: 195° 0' 0"

DATE STARTED: April 15, 1988
DATE COMPLETED: April 25, 1988
DATE LOGGED: April 20, 1988

COLLAR SURVEY: NO
MULTISHOT SURVEY: YES
RQD LOG: NO

PULSE EM SURVEY: YES
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: CONNORS DRILLING RIG 11
CASING: 21 FEET
CORE STORAGE: STURGEON LAKE MINE

PURPOSE: TEST ALTERATION & STRATIGRAPHY WITHIN MATTABI RHYOBELOW FOOTWALL INTRUSIVE OF THE STURGEON LAKE MINE

DIRECTIONAL DATA:

Depth (f)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
127.00	189° 0'	-78° 0'	MULTISHOT	OK	
227.00	189° 0'	-78° 0'	MULTISHOT	OK	
327.00	190° 0'	-78° 0'	MULTISHOT	OK	
427.00	190° 0'	-78° 0'	MULTISHOT	OK	
527.00	191° 0'	-77° 0'	MULTISHOT	OK	
627.00	192° 0'	-77° 0'	MULTISHOT	OK	
727.00	192° 0'	-77° 0'	MULTISHOT	OK	
827.00	195° 0'	-77° 0'	MULTISHOT	OK	
927.00	197° 0'	-77° 0'	MULTISHOT	OK	
1027.00	199° 0'	-77° 0'	MULTISHOT	OK	
1127.00	199° 0'	-77° 0'	MULTISHOT	OK	
1227.00	200° 0'	-76° 0'	MULTISHOT	OK	
1327.00	201° 0'	-76° 0'	MULTISHOT	OK	
1427.00	201° 0'	-76° 0'	MULTISHOT	OK	
1527.00	201° 0'	-76° 0'	MULTISHOT	OK	
1857.00	202° 0'	-76° 0'	MULTISHOT	OK	
1957.00	202° 0'	-75° 0'	MULTISHOT	OK	
2057.00	202° 0'	-74° 0'	MULTISHOT	OK	
2157.00	204° 0'	-73° 0'	MULTISHOT	OK	
100.00	-	-78° 0'	ROTODIP	OK	
250.00	-	-78° 0'	ROTODIP	OK	
400.00	-	-77° 0'	ROTODIP	OK	
550.00	-	-77° 0'	ROTODIP	OK	
700.00	-	-76° 0'	ROTODIP	OK	
850.00	-	-76° 0'	ROTODIP	OK	
1000.00	-	-76° 0'	ROTODIP	OK	
1150.00	-	-76° 0'	ROTODIP	OK	
1300.00	-	-76° 0'	ROTODIP	OK	
1450.00	-	-75° 0'	ROTODIP	OK	
1600.00	-	-75° 0'	ROTODIP	OK	
1750.00	-	-74° 0'	ROTODIP	OK	
1900.00	-	-72° 0'	ROTODIP	OK	
2050.00	-	-71° 0'	ROTODIP	OK	
2150.00	-	-71° 0'	ROTODIP	OK	
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 21.20	CASING «CASING»	Overburden /boulder gravel.				
21.20 TO 730.50	QTZ PORPHYRITIC RHYOLITE TUFF «QP TUFF»	Medium grey, fine to medium grained Qtz porphyritic rhyolite tuff up eto 8% small (< 3mm) rounded bluish QP's scattered through weakly sericitc, occasional chloritic groundmass. Commonly in chloritic zone QP's are less distinct.		⟦21.2-100.8⟧ «wk chl, 5-8% chl clots» Weak pervasive chlorite down to 100.8 associated with fine chlorite fractures and 5-8% irregular clots (< 8mm).		
				⟦76.5-91.2⟧ «chl» In situ brecciated zone associated with chlorite infilling fractures and seams. Occasional weak sericite development near fractures.		60-67 Broken core/blocky zone.
				78.3 Small QV's (< 5mm) associated with chloritic fractures.		
		91.2-91.6 Small strongly calcitic dyke. Sharp sinnous contacts at high angles @	75			
				⟦108.0-209.0⟧ «ser, chl»		
				⟦108.0-209.0⟧ «ser, chl» Weakly bleached QP tuff-with randomly		Litho 2704.
				Weakly bleached QP tuff-with randomly distributed 2% sericitic patches (up to distinct 2% sericitic patches (up to 5cm wide) 5cm wide).		Litho 2704.
				More extensive sericitic zone at 129-133 above andesite dyke.		
		133.0-135.0 141.2-143.0 Fine grained equigranular strongly calcitic andesite @	45 50			
				⟦152.0-204.0⟧ «ser»		
		⟦156.0-157.2⟧ «QV» Zone invaded with 25% irregular Qtz veins and swells. Contorted calcite and sericite and chlorite seams and wisps associated with QV's.		Pale green pervasive to patchy sericite development in section cut by several QV's. 75% of section is weakly to moderate sericitic.		Litho 2705.
		185.0-186.0 QV				

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		200.0-217.2 QV 215.7-217.2 QV 223.5-223.8 QV 230.1 230.4 QV 238.1-238.4 QV 243.9-244.1 259.1-258.3 Sharp massive milky Qtz veins cutting through at various high angles average > 50 degrees.		┤209-267├ «wk chl, clots» Chlorite fractures and clots, similar to 21.2-108.0. Well developed blocky texture at 231.5-237.0. Erratic silicified and broken vein - like features.	259.1-259.3 1-2% pyrite in fractures in QV - trace of pyrrhotite in chloritic fracture at 259.4.	Litho 2706.
				┤267.0-394.9├ «least alt'd» Close to unaltered to weakly bleached (or just siliceous QP tuff) zone. Section which appears slightly more slicified and/or sericitic: 281.5-284.8 288.0-291, 302.0-307.0. Occasional weak hematite wisps associated with sericite. 321.0-342.0, 352.1-355.1, 361.5-369.3, 389.7-392.9.		Litho 2707, 2708.
		317.5 Fine fracture (< 3mm) filled with clay material, fracture @	24			
		394.9-395.5 Small strongly calcitic dyke.				
		┤395.5-489.0├ «10% QP tuff, mottled tex» Substantial increase in scattered QP's avg. 10% with occasional zone up to 15%. Mottled texture outlined siliceous fragments. Mainly due to auto-fragmentation but occasional fragments appear clastic (mainly between 465-479.4).		344.6-352.1 ┤395.5-689.0├ «ser chl» Well developed mottled texture: broken QP tuff with medium to fine grained wispy sericite and chlorite (occasional biotite) masses and fractures surrounding tuffaceous fragments.	Rare erratic irreular pyrite masses (< 5mm) associated with fractures overall trace. ┤479.0-479├ «sulpy strg» 5-6mm semi-massive pyrite stringer bordering the contact.	Litho 2709.
		467.9-468.3 Small andesite dyke.		483-389 Weakly bleached zone.	483.5-484 2% disseminated pyrite blebs and small masse - isolated zone.	
		┤489-576.6├ «3% QP tuff» Sharp low angle contact at 489.0 @ ..... between mottled QP tuff and finer grained less altered tuff (ash tuff (ash flow?). QP's down to < 3%, and progressively decrease down-hole to 576.6.	18	489.0-490.6 Strongly calcitic with weak pervasive chloritic and 2% erratic garnets. Broken core at 490.6-491.5 ?? calcitic dyke between chlorite mottled tuff and finer grained QP ash flow.		Check chemistry - litho 2710.
		┤509-512.8├ «and dy»		┤512.8-531.7├ «sil ser»	512.8-531.7	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		┤531.7-538.9├ and dy» Fine grained equigranular strongly calcitic andesite dykes. Sinuous and irregular contact at 5317, other contacts sharp @	85	┤538.9-541.5├ «sil ser» Zones beneath dykes are moderate to strongly silicified with erratic sericitic patches and wisps. Occasional small irregular QV's. 558.3-559.5 Weak silicified associated with irregular QV's at 558.5-558.8.	538.9-541.5 Randomly distributed < 1% disseminated pyrite blebs and small masses - pyrite blebs also associated with QV's.	
		┤576.6-615.3├ «rh tuff» «biot clots» Homogeneous clotted Rhyolite tuff with no distinct blue QP's. 5-8% small (< 5mm) biotite clots peppered throughout. Upper contact marked by a fracture @ ..... Lower contact abrupt but ill defined.	44	┤576.6-687.0├ «weak chl-grnt» Weak alkaline alteration - weak chlorite in groundmass and 1-2% erratic corroded small garnets aggres (< 3mm).	Occasional trace to < 1% pyrrhotite and pyrite wisps and replaced biotite clots.	Litho 2711.
		┤615.3-618.9├ «frag zone» Chaotic zone with 40-50% small fragments, clast? (avg size 2-10mm) in a fine to medium grained wispy weakly chloritic and sericitic groundmass.				
		618.9-772.3 Gradational contact into a homogeneous medium grained Qtz porphyritic rhyolite tuff with 10% (locally up to 15%) scattered rounded bluish QP's (up to 2mm) in a weakly chloritic and sericitic groundmass.				Litho 2712.
				┤687.0-708.5├ «weak silic» Weak pervasive silicitic throughout.	Rare chalcopyrite specks.	
		Indistinct QP's in strongly silicified zone.		┤708.5-730.5├ «sil» Blocky, in situ fragmental silicified zone - strongly silicified fragments (cherty appearance) enveloped by 25% wispy chloritic fractures and seams. Occasional fragments appear clastic (at 721.5). Broken ore throughout the whole zone.	Erratic rare chalcopyrite specks and blebs (< 3mm) associated with small fractures - overall trace.	Litho 2713.
730.50 TO 772.30	QTZ PORPHYRITIC CLASTIC TUFF/TUFF «QP TUFF/ CLASTIC TUF F»	┤730.5-732.1├ «flt» Fault contact (marked by clay gouge along fracture at between silicified and blocky QP tuff and a definite chaotic clastic zone with unsorted sub-rounded and sub-angular clasts loosely packed in a greenish sericitic groundmass. Ill-defined	62			

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		lower contact ? along fractured surface @	51			
		⌊739-772.3⌋ «QP tuff/clastic» Weakly blocky a fragmentary QP tuff intercolated with clastic zones. Clasts are small (< 5mm) sub angular angular to sub rounded. Ill defined (gradational) contact between clastic zones and tuff. "Elastic" features best exhibit between: 739-746.5 and 765.5-772.3 - occasional small calcitic seams.				
772.30 TO 865.20	RHYOLITE TUFF «RH TUFF»	Pseudo-contact @ ..... Between QP tuff and non QP rhyolite tuff - texture on both sides of the contact is very similar (weakly blocky/mottled texture) but disappearance of QP's is abrupt.	68	⌊772.3-806⌋ «mottled/chl» Weak to moderate pervasive mottled and occasionally blocky texture produced by < 10% chlorite and sericite infilling. Errotic large chlorite masse extending from fractures (up to 2cm wide).	Erratic and rare small (< 3mm) pyrite blebs scattered in tuff and occasional thin pyritic coating on fractured surfaces (overall trace).	Litho 2714.
		798-806 Darker grey, homogeneous fine grained tuff with no mottled texture - upper contact marked by a QV's @ ..... Lower contact is gradational in silicified zone.	58	⌊806-842⌋ «sil» Pervasive moderate silicification - weaker, more diffuse and less prominent mottled texture.	807.5 Isolated 10cm zone with 5% disseminated fine pyrrhotite grains and 1% small pyrite blebs (< 3mm).	Litho 2715.
		820.9 4cm clay gouge filled fracture @	50	837-842 Progressive decrease in silicification.		
		836.5 1cm clay gouge filled fracture @	44			
		Occasional other, thinner, fractures contains seams of clay material.				
		⌊847-865.2⌋ «bx» Zone of progressive increase in fragmentation and brecciation from blocky RH tuff into a brecciated strongly "broken zone" at 865.2.				Broken core between 864-887.
865.20 TO 997.00	FRAGMENTAL RHYOLITE TUFF/ CLASTIC TUFF	⌊865.2-922.0⌋ «bx clastics» Chaotic and brecciated clastic unit marked by a 3cm wide clay gouge filled fracture @ ..... With 45-50% unsorted fragments (mixed in situ	58	⌊865.2-922⌋ «chl» Strong chlorite and sericite development in groundmass and fractures. Deep-red hematite commonly		

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
	«RH FRAG»	fragments and sub angular to sub rounded siliceous clasts < 5mm to 15mm - mo mafic clasts) enveloped by mixed wispy chloritic sericitic and occasional hematite fractures and groundmass.		found coating fractured surfaces - all fragments and clast strongly siliceous. Erratic and rare garnets scattered throughout.		
				⟦886.5-904.0⟧ «stg sil hem» Strong pervasive silicification with diffuse hematite development (red-orange tinge) associated with sericite wisps and fractures.	Erratic (< 1%) pyrite stringers and small masses associated with Hem and sericite fracture. Rare pyrite replaced fragment.	Litho.
		887.2 2cm wide clay gouge filled fracture @	85			
		⟦922-997⟧ «bx tuff/clast» Fragmental light grey siliceous rhyolitic tuff/ clastic tuff made of up to 70% broken fragments (in situ fragmentation) enveloped by chloritic fractures. Fragment's size is highly variable (and overall larger than 865.2-922.0) from 0.5mm to 25mm, avg. 10-15mm with local larger ones up to 5-6cm wide. Often fragments resemble clasts with weak defined outlines. Clasts and fragments composition is very homogeneous - no mafic fragments or clasts. Rare erratic blue QP's toward 997.0 ?? larger fragements? pumice?		⟦922.0-997.0⟧ «chl sil» Homogeneous brecciated/mottled texture with dark massive chlorite filling fractures surrounding silicitic fragments. Erratic chlorite patches with garnets- overall < 1% .		Litho 2718 ?? in situ fragments only or fragmented clastic unit?
997.00 TO 1083.00	QTZ PORPHYRITIC CLASTIC TUFF «QP CLASTIC TUFF»	⟦997.0-1065.5⟧ «qp clastic tuff» Altered chaotic and fragmentary clastic tuff composed of up to 65% broken tuff fragments and felsic clasts mixed with < 3% more chloritic (mafic) clasts. Original clasts in tuff < 10% Clasts and fragments enveloped by fine dark chloritic fractures and swells 1-2% minute (< 1mm) bluish QP's scattered throughout. Fragments and clasts size highly variable.		⟦997.0-1065.5⟧ «sil mottled chl» Well developed pervasive mottled/ blocky texture throughout with 25% chloritic and locally sericite, fractures ans swells enveloping strongly siliceous often corroded fragments and clasts. Randomly distributed 3% (locally up to 5%) garnets aggeg. downhole from 1045 - 1045 - mottled/broken texture progressively decreased rock appear more siliceous due to decrease in chloritic fractures.	Erratic specks (trace) of chalcopyrite and wisps of pyrrhotite scattered.	Litho 2718.
		1015.6-1016.1 1025.9-1026.5 Fine grained equigranular calcitic andesite dyke. Sharp contacts @	50 60		1025-1025.9 1027-1028 Local concentration of 2% pyrrhotite	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		1062.4-1063 10cm zone invaded by irregular QV's followed by strong developed in lower selvage. Sericitic clay in small fracture bordered QV's irregular contact.			masses and fine broken stringers associated with chloritic fractures.	
				1065.5-1083 Transition zone between strongly altered (mottled) clastic unit and homogeneous fine grained close to unaltered ash tuff.	Erratic fine chalco pyrite scattered in chlorite fractures (overall < trace).	
				1074-1083 Chlorite and garnets (2-3%) altered zone. Progressive decrease in chloritic fractures and associated mottled texture.	1080 Small irregular QV's (< 1cm) with chalcopyrite blebs in fractures.	
				1082.5-1083 Last fragmental zone broken zone filled with Qtz veins and pods. At 1083 - sinuous irregular contact.	1082.5-1083 1% pyhotite specks and small blebs and trace of chalcopyrite associated with fractures in the QV rich broken zone.	
1083.00 TO 1740.00	ASH TUFF «ASH TUFF»	Medium grey fine grained massive ash tuff Homogeneous unit commonly peppered with 5-8% irregular biotite +/or chlorite clots (clots size 3mm). No bluish QP's.		┤1083.0-1556.6├ «5-8% biot clots» 5-8% biotite clots peppered on close to unaltered ash tuff. Small corroded 1-2% garnets randomly scattered throughout locally weakly more chloritic groundmass.		Litho 2720 ? first part to 1565 ? intrusive ?
				1085.5-1086.4 1093-1094 Silicified sericite fractured zone (fine seams 2-5mm wide).		
				┤1097.8-1116.7├ «sil» Pervasive moderate silicified zone lighter grey locally fragmented. Downhole from 1116.7-5-8% biotite clots peppered throughout.	1100.8 Thin (< 2mm) semi-massive mixed sphalerite and chalcopyrite stringer cutting at 85 degrees - fractured surface is coated with sph and chalcopyrite.	Litho 2719.
		┤1207-1397.0├ «15% biot. clots» Biotite clots are slightly larger (up to 8mm) and		2-3% corroded garnets randomly		Litho 2721.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		commonly up to 15-20%.		distributed in clusters through unit - weak chlorite in groundmass.		2722 ? intrusive ?
				1297-1298 ┤1311-1338├ «sil» Silicified zone similar to 1097.8-1116.7. Sharp desappearance of biotite clots in this zone.	Erratic rare chalcopyrite flecks.	Litho 2722.
				┤1338-1342.2├ «alk alt» Large extensive chloritic patches developed with 3% large garnet aggregates (avg. size 8mm) scattered throughout. Contact of this zone marked by a sericitic fracture at 26 degrees. Isolated smaller patch at 1345.0-1345.2		
		1347-1556.5 Mixed zone with intercolated fine grained dark grey silceous ash tuff (with no biotite clots) and biotite clotted zones. Biotite clotted zones at: 1419.9-1421.4, 1423.3-1435, 1452.5-1453.8, 1492-1498, 1535.5-1546.5 - gradational contacts between various zones.		Zones with < 3% biotite clots appears slightly silicified and often contains irregular small siliceous knots (< 8mm) mainly around 1537.		Litho 2723, 2724. Check chemistry - biotite clotted intrusive?
		1413.`-1414 Irregular and sinuous Qtz vein Qtz with development of chloritic fractures and veins and of occasional calcitic pods.		Occasionally fragmentated zone due to chlorite infilling (of 1470). Minimum alkaline alteration.		
		1421.4-1423.3 and dy Fine grained calcitic andesite dyke. Sharp contact @	58			
		1436.4-1437.2 dy 1459.1-1459.9 dy 1484.5-1486.9 dy Medium grained greenish intermediate dyke. Weakly to non calcite, common. Sharp contacts @ ..... Occasional small QV's near contacts.	40			
		1520.8-1523.3├ and dy				

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Strongly calcitic fine grained andesite dyke, upper contact at: lower contact obscured by chloritic fractures.				
		⟦1556.6-1673.0⟧ «alt'd ash tuff» Strongly altered fine grained rhyolitic ash tuff/ flow. Commonly silcified ash tuff is invaded by up to 35% chloritic veins and fractures.		«chl sil» Chlorite veins are large (2-3cm) and extensive, often large chlorite masse (up to 10cm) extended from veins and fractures. Several veins cut at 45 degrees and locally produced a crude banding but overall texture is chaotic ("gateau marbre"). Garnets rarely occurs in chloritic masses. Occasionally pale green fine sericitic fractures.	Specks of chalcopyrite associated with QV's near upper contact. Overall trace.	Litho 2725.
		Upper contact is ill-defined, outlined by increase in small Qtz and chlorite veinlets and by the abrupt difference between biotite clotted zone and chlorite-altered zone.		Strongly silicified zones at: ⟦1590.9-1593.7⟧ «stg sil» ⟦1650.5-1657.0⟧ «stg sil»		Litho 2726. Litho 2727.
				⟦1673-1740⟧ «chl, 10% biot clots» Abrupt change in alteration style more pervasive chlorite development throughout groundmass leaving 10-15% irregular clusters creamy-white silicified spots-section is peppered with 8-10% biotite clots (< 8mm).		Litho 2728 Check chemistry biotite clotted intrusive ??
1740.00 TO 1839.30	RHYOLITE QTZ PORPHYRITIC ASH TUFF «QP ASH TUFF»	Unit very similar to 1556.5-1740 but with up to 10% bluish QP's scattered throughout. Contact between 2 units is only marked by sharp appearance of bluish QP's.		«sil, chl» Pervasive chlorite throughout siliceous groundmass (similar to 1673-1740). 1-2% small sharp fractures filled with pale green sericite.		Litho 2729.
				1767-1782.1 Progressive decrease in chlorite downhole toward brecciated zone - lighter grey QP ash tuff weakly silicified.		Litho 2730.
		⟦1782.1-1784.5⟧ «breccia» Well developed typical breccia zone with mixed		«calc chl ser» QP tuff fragments are chloritized and		

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Qtz and calcite enveloping subangular to angular QP tuff fragmnets (variable in size with overall decrease in fragment size downhole). Zone cut by an unbroken Qtz vein (6-7cm) at 1783. |1831.0-1833.9| «and dy» |1834.6-1839.3| «and dy» Medium to fine grained equigranular, calcite andesite dyke. Lower dyke contact @ ..... 1835.5-1835.8 Milky Qtz vein with tourmaline needles.	70	commonly sericitic. |1784.5-1787| «sil» Light grey to medium grey weakly silicified zone with less chlorite than overall - similar to 1767-1782.1. 1825.4-1831.0 Weakly bleached zone (upper dyke margin).	1835.7-1835.8 Semi massive bleb of pyrite associated with tourmaline in QV.	
1839.30 TO 1897.00	ASH TUFF «ASH TUFF»	Medium to dark grey massive ash tuff similar to 1083.0-1740. Sharp disappearance of bluish QP's contact between 2 units obscurred by andesite dyke. |1867.4-1869.6| «and dy» Equigranular strongly calcitic andesite dyke. 1867.4 Small parallel to C.A. Qtz and calcite and minor tourmaline veinlet.			1853.9-1854 Isolated and restricted cluster of small pyrrhotite blebs 1 or 2 specks of chalcopyrite.	Litho 2731.
1897.00 TO 2177.00	QTZ PORPHYRITIC TUFF «QP ASH TUFF»	Fine grained homogenous ash tuff with 5% bluish Qtz porphyrite (< 3mm) scattered throughout. Unit similar to 1740-1839.3.		|1897.0-1927| «alk alt» Late alkaline alteration with 35% chlorite spots and masses (< 4cm) homogeneous distributed throughout. 5-8% corroded small (< 5mm) garnets aggregates randomly clustered in larger chloritic masses. Occasional sericitic fractures.		Litho 2732.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				1984-1934.7 Local silicification associated with chlorite fracturing. Downhole from 1927-1953.3 late alk. alt. is rare, chlorite is weakly to moderate pervasive in groundmass and locally chloritic fractures are well developed at 1938.5-1952.3.		
		1952.3-1953.3 «and dy» 1954.2-1955, 1961.7-1961.9 Equigranular calcitic andesite dyke.				
		1983.9-1984.5 Sinuous milky Qtz vein (4-6cm wide) and several small Qtz veinlets (< 4cm) cut through QP ash tuff.		1953.3-2173 Homogeneous zone with only occasionally fine (< 5mm) sericitic fractures and chloritic zones (< 1.5mm) and with lighter grey diffused zones (2099.5-2102, 2136-2152) (2160.5-2166).		Litho 2733.
		2152-2157.5 Isolated zone cut by 8-10 small (< 2cm) sharp milky Qtz veins.		2008-2046.5 Weakly sericitic zone with < 5% fine sericitic fractures, irregular masses and wisps.		
	E.O.H.	End of Hole.				

Sample	From (f)	To (f)	Length (f)	ESTIMATES Cu %	Zn %	Py %	Po %	Mt %	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Ag oz/ton	Au oz/ton	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	Ag ppm	Au ppb	Ni ppm	As ppm	Sb ppm	COMMENTS
	0.00	0.00	0.00																					

Sample	From (f)	To (f)	Length (f)	SiO2 %	TiO2 %	Al2O3 %	FeO %	MgO %	MnO %	K2O %	CaO %	Na2O %	LOI %	Cu ppm	Zn ppm	Ni ppm	Ag ppm	Au ppb	TOTAL %	Pb ppm	Mn ppm	As ppm
MSD-2704	111.00	121.00	10.00	78.40	0.29	11.96	1.30	1.68	0.01	2.93	0.42	0.54	2.36	31	66	1	0.5	5				
MSD-2705	187.00	197.00	10.00	80.90	0.28	10.63	1.27	1.42	0.01	2.61	0.15	0.35	2.16	6	18	2	0.1	4				
MSD-2706	247.00	257.00	10.00	74.50	0.31	12.29	2.46	3.65	0.04	2.42	0.67	0.67	2.62	14	30	3	0.5	4				
MSD-2707	297.00	307.00	10.00	82.40	0.24	8.31	1.41	2.64	0.03	1.65	0.37	0.33	2.13	8	20	3	0.5	4				
MSD-2708	381.00	391.00	10.00	75.00	0.33	10.98	2.53	4.51	0.04	2.08	0.22	0.59	3.04	4	39	3	0.2	9				
MSD-2709	467.00	477.00	10.00	72.40	0.51	11.72	4.54	3.80	0.11	2.99	0.40	0.51	2.40	23	102	5	0.7	4				
MSD-2710	489.00	499.00	10.00	71.50	0.51	11.70	5.19	4.35	0.17	2.60	0.83	0.59	2.46	6	115	4	0.6	4				
MSD-2711	587.00	597.00	10.00	74.90	0.48	12.17	3.09	2.57	0.11	3.36	0.35	0.61	2.18	9	83	3	0.9	4				
MSD-2712	667.00	677.00	10.00	78.30	0.30	10.23	2.60	2.66	0.11	2.43	0.45	0.42	2.27	9	120	5	0.6	7				
MSD-2713	720.00	738.00	18.00	75.00	0.48	11.37	3.37	3.19	0.08	2.34	0.45	0.43	3.07	36	296	5	0.4	4				
MSD-2714	787.00	797.00	10.00	70.80	0.51	12.88	4.14	4.55	0.12	3.31	0.50	0.38	2.66	12	93	4	0.6	4				
MSD-2715	807.00	817.00	10.00	74.70	0.43	12.52	3.13	2.08	0.05	3.17	0.33	0.45	2.79	58	222	5	0.6	5				
MSD-2716	887.00	897.00	10.00	75.30	0.37	11.27	2.40	1.33	0.07	2.92	1.76	0.25	3.67	46	119	5	0.4	4				
MSD-2717	977.00	987.00	10.00	75.70	0.40	11.38	3.69	2.74	0.10	2.65	0.12	0.52	2.06	20	115	3	0.7	4				
MSD-2718	1037.00	1047.00	10.00	74.70	0.51	10.87	5.06	2.77	0.15	2.66	0.11	0.28	2.21	28	287	4	0.7	5				
MSD-2719	1107.00	1117.00	10.00	67.80	0.42	12.26	4.48	3.90	0.24	1.06	3.82	0.58	5.16	83	120	4	0.7	4				
MSD-2720	1187.00	1197.00	10.00	72.20	0.46	13.01	3.87	2.14	0.14	2.08	3.12	0.43	2.11	2	49	5	0.9	4				
MSD-2721	1257.00	1267.00	10.00	73.50	0.48	12.86	4.00	2.16	0.13	2.46	1.32	0.64	2.12	2	74	4	0.7	4				
MSD-2722	1317.00	1327.00	10.00	74.30	0.47	12.38	4.98	1.93	0.10	2.39	0.31	0.52	2.25	24	36	4	0.3	5				
MSD-2723	1397.00	1407.00	10.00	78.00	0.46	11.38	3.87	1.39	0.10	1.75	0.66	0.27	1.62	5	12	3	0.5	4				
MSD-2724	1497.00	1507.00	10.00	77.00	0.47	10.02	3.84	2.09	0.10	1.42	2.23	0.47	1.89	6	34	5	0.6	4				
MSD-2725	1567.00	1577.00	10.00	74.30	0.46	11.77	5.38	1.94	0.11	2.20	0.75	0.39	2.13	2	25	4	0.5	4				
MSD-2726	1591.00	1592.50	1.50	80.40	0.33	10.78	2.74	1.11	0.04	2.68	0.07	0.35	1.36	2	10	3	0.5	4				
MSD-2727	1651.00	1656.00	5.00	75.70	0.50	11.33	5.34	1.87	0.06	2.78	0.09	0.35	1.68	2	17	5	0.8	4				
MSD-2728	1707.00	1717.00	10.00	71.80	0.53	11.69	6.12	3.79	0.14	2.75	0.13	0.33	2.22	3	58	5	0.9	4				
MSD-2729	1747.00	1757.00	10.00	79.80	0.27	10.41	2.86	1.72	0.05	2.68	0.09	0.33	1.57	2	17	3	0.4	4				
MSD-2730	1771.00	1781.00	10.00	80.20	0.26	9.82	2.57	1.66	0.04	2.65	0.15	0.27	1.72	2	32	5	0.3	4				
MSD-2731	1847.00	1857.00	10.00	76.70	0.41	10.35	3.96	3.16	0.06	2.11	0.19	0.41	2.36	3	129	4	0.9	4				
MSD-2732	1907.00	1917.00	10.00	74.50	0.36	11.38	4.87	2.85	0.11	2.34	1.11	0.45	1.86	8	54	4	0.8	4				
MSD-2733	1977.00	1987.00	10.00	76.70	0.27	10.28	4.30	2.66	0.06	1.99	0.13	0.41	2.64	2	49	3	0.5	5				
MSD-2734	2017.00	2027.00	10.00	71.40	0.32	10.96	7.46	3.59	0.13	1.87	0.10	0.45	3.10	2	52	5	0.5	4				

HOLE NUMBER: SLM-257

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: X METRIC UNITS:

PROJECT NAME: SLM
PROJECT NUMBER: PM359
CLAIM NUMBER:
LOCATION: STURGEON LAKE MINE

PLOTTING COORDS GRID: MINE GEOLOGY
NORTH: 7600.00N
EAST: 11150.00E
ELEV: 9960.00

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -85° 0' 0"
LENGTH OF THE HOLE: 2089.00f
START DEPTH: 0.00f
FINAL DEPTH: 2089.00f

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 195° 0' 0"

DATE STARTED: April 22, 1988
DATE COMPLETED: May 2, 1988
DATE LOGGED: 0, 0

COLLAR SURVEY: NO
MULTISHOT SURVEY: YES
RQD LOG: NO

PULSE EM SURVEY: YES
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: CONNORS DRILLING RIG 12
CASING: 20 FEET
CORE STORAGE: STURGEON LAKE MINE

PURPOSE: TEST STRATIGRAPHY AND ALTERATION BELOW FOOTWALL INTRUSIVE WITHIN MATTABI RHYOLITE.

DIRECTIONAL DATA:

Depth (f)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
138.00	180° 0'	-84° 0'	MULTISHOT	OK	
278.00	178° 0'	-84° 0'	MULTISHOT	OK	
418.00	178° 0'	-83° 0'	MULTISHOT	OK	
558.00	177° 0'	-82° 0'	MULTISHOT	OK	
698.00	177° 0'	-82° 0'	MULTISHOT	OK	
838.00	177° 0'	-82° 0'	MULTISHOT	OK	
978.00	177° 0'	-81° 0'	MULTISHOT	OK	
1078.00	175° 0'	-81° 0'	MULTISHOT	OK	
1178.00	175° 0'	-81° 0'	MULTISHOT	OK	
1278.00	175° 0'	-82° 0'	MULTISHOT	OK	
1368.00	173° 0'	-81°30'	MULTISHOT		BAD
1378.00	175° 0'	-82° 0'	MULTISHOT	OK	
1388.00	175° 0'	-82° 0'	MULTISHOT	OK	
1508.00	176° 0'	-81°30'	MULTISHOT	OK	
1648.00	177° 0'	-81° 0'	MULTISHOT	OK	
1788.00	176° 0'	-81° 0'	MULTISHOT	OK	
1928.00	178° 0'	-81° 0'	MULTISHOT	OK	
2068.00	178° 0'	-80°30'	MULTISHOT	OK	
100.00	-	-85° 0'	ROTODIP		
250.00	-	-84° 0'	ROTODIP		
400.00	-	-83° 0'	ROTODIP		
550.00	-	-81° 0'	ROTODIP		
700.00	-	-80° 0'	ROTODIP		
850.00	-	-78° 0'	ROTODIP		
1000.00	-	-78° 0'	ROTODIP		
1150.00	-	-78° 0'	ROTODIP		
1300.00	-	-78° 0'	ROTODIP		
1450.00	-	-78° 0'	ROTODIP		
1600.00	-	-78° 0'	ROTODIP		
1750.00	-	-78° 0'	ROTODIP		
1900.00	-	-77° 0'	ROTODIP		
2050.00	-	-76° 0'	ROTODIP		
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 17.50	CASING «CASING»	Gravel / boulders.				
17.50 TO 33.00	ANDESITE INTRUSIVE, (DYKE ?) «AND DYKE»	Mixed fine and medium grained strongly calcitic andesite intrusive (dyke) laced with calcite veinlets and pods. Coarser zones are equigranular with 25-30% chlorite and biotite flecks - occasional blue QP's - finer zones at: 17.5-21.5, 25-27.				
33.00 TO 418.00	QTZ PORPHYRITIC CLASTIC TUFF «QP CLAST TUFF»	33-37.8 Chaotic zone - fragmental QP Clastic tuff - (10-15%, < 8mm clasts) intrusive contact margin - numerous chloritic fractures, clasts and fragments commonly calcitic.		«weak sil, chl» Weak silicific associated with intrusive margin.		
		Light to medium grey Qtz porphyritic clastic tuff with 2% small (< 2mm) bluish QP's and 3-5% distinct to ill defined felsic (siliceous) clast loose in a medium grained tuffaceous matrix < 1% small high angle Qtz and minor calcite veins (< 4cm). Occasional weak fabric alignment @	40 50	Weak chloritic fracturing.		Litho 2683.
		79.81.1 and dy Fine grained equigranular, strongly calcitic andesite dyke.				
		108-341.3 Coarse grained zone with gradational increase in distinct siliceous corroded clasts ? pumice ? (up to 40% < 8mm, occasionally up to 15mm) and in tuffaceous fragments resulting from invading fine and sinuous chloritic and sericitic fractures. Occasionally larger chloritic clasts (mafic ?) bluish QP's unevenly distributed, locally absent to 3%.		10-15% mixed granular and wispy chlorite and biotite flecks as masses and fine serious fractures enveloping clasts and fragments, homogeneous tight "mouchete" texture.	Minute erratic specks of pyrite +/or chalcopyrite occasionally associated with chlorite - overall trace.	Litho 2684 2685 2686.
		166.2-166.8 Series of small elongated Qtz and chlorite veins and fractures @	18			

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		281.9-282.5 Sharp contact into a finer grained homogeneous zone - 7 non calc. dyke. 288.9-291.2 and dy 227.3-228.5 Grey - brownish fine grained equigranular and locally porphyritic calcitic andesite dyke. Occasional small fractures with weak granular hematite development. Lower contact - sharp fracture @ ..... Coated with graphitic clay gouge. 324.8-325.2 Small Qtz vein (4cm wide) surrounded by fine weakly contorted chlorite Qtz parallel veinlets and seams. ┤341.3-418├ «frags» Gradational contact into more loosely packed clastic tuff with 20-25% siliceous clasts ? and pumice ? of various size (1 to 3cm across) in a medium grained wispy to granular mixed chlorite and biotite groundmass. Occasional fine Qtz seams filled with biotite flakes. 383-383.5 ┤384.4-387.5├ «and dy» Fine grained to amygdular strongly calcitic andesite dykes. Sharp contact @ ..... At 406 Fine (< 5mm) low angle Qtz veinlet filled with biotite books and flecks.	34 30 40	«chl biotite» Mixed granular and wisps biotite and chlorite in fractures and groundmass. 341-368 Local zone with up to 60% mixed chlorite and biotite. ┤394-416.3├ «alk alt» Local increase in alkaline alteration with 2-3% scattered garnet aggregates in chloritic fractures and masses.	Erratic chalcopyrite specks associated with QV (trace). 355-363.5 Fine specks and small blebs (< 3mm) of chalcopyrite scattered in groundmass (overall 1%). ┤394-405├ «sph cp» 1-2% randomly scattered fine grained irregular sphalerite masses (< 5mm to 20mm across) and small chalcopyrite specks. Minute sphalerite grains also disseminated in chloritic groundmass.	Litho 2687. Geochem 2232. Geochem 2233 2234 2235 Litho 2688.
418.00 TO 1082.00	RHYOLITE TUFF «RH TUFF»	Fragmented fine siliceous rhyolite tuff with only few rare definite clasts invaded with 15-20% (< 5mm) fracturs, long seams and occasionally extending masses. Locally fractures are parallel to C.A. but more		15-20% fine granular and wispy mixed chlorite and biotite fractures, seams and clots. ┤435-441.5├ «calc Fe-carb»	418-438 Occasionally ? sphalerite clots ? or hematite ?	Litho 2689. Check Zn.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		commonly chaotic.		Fine stringers and seams filled with calcite and rusty colour Fe-carbonate. Associated with silica pods and chlorite patch.		
		463.7-465.8 Local contorted zone near small Qtz veinlets with fracture alignment a	32			
		446.6-447 and dy				
		487.7-487 and dy				
		522.9-525.6 and dy Fine grained strongly calcitic equigranular (with occasional calcite porphyries) andesite.		⟨513-515.6⟩ qv chl bio» ⟨583.4-585⟩ qv chl bio» Chlorite masses and fractures developed associated with Qtz vein, broken calcite veinlets and pods. Large biotite flakes developed near Qtz veins. Occasional brown-yellow Fe-carbonate grains and wisps. Similar smaller and more restricted zone occasionally occur downhole.		
		585.1-1082 Gradational contact into a fine grained medium grey tuff/ash tuff. Occasionally 1-2% bluish QP's erratically scattered throughout. Occasionally 1-2% loose well defined clasts: < 5% to 10mm siliceous ("cherty") clasts and larger (occasionally ill defined) up to 2cm chloritic (mafic ?) clasts.		Massive tuff with less than 5% chloritci fractures.		Litho 2691.
		⟨607.5-609.3⟩ «sm fault» Small fault - chloritic fracture (8mm) with graphitic gouge - fracture a ..... Numerous chloritic fractures, broken calcite pods and hematite clots in zone adjacent to small fault.	40			
		652.4-652.8 Isolated zone invaded with sub parallel weakly contorted fine Qtz, calcite and chlorite fractures and veinlets.		⟨666.1-752⟩ «chl»		

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				666.1-672.6 Blotchy chlorite development, gradational contact into 75-80% chlorite zone with large fracture and veins filled with chlorite commonly extending into pervasive chlorite over 30-80cm.		
		Common preferential fracture alignmnet , 1%, small (< 5cm) sharp and sinuous sinuous Qtz vein randomly scattered in chloritic zone.	32			Litho 2692.
		674.3-679.9 Large milky Qtz vein with < 2% isolated chlorite inclusions. Sharp lower contact @	80	Occasionally fine biotite stringers and clots. Occasionally fine hematite seams (best developed at 699.5-706). Chlorite obscured fine tuff primary features.	No visible sulphides.	Geochem 2236. Composite sample.
		1001.5-1010 Broken core blocky ground - ? fault ?				
				1024 Slight increase in garnet aggregates in chloritic patches.		
		1049.5-1082 Pseudo - chlorite clasts - chlorite clots resemble clasts in zone adjacent - to a series of chlorite and sericite fractures and small broken Qtz veinlets @ ..... Occasional minute Hematite and Fe-carb wisps and grains. ? contact?	80			
		1064.9-1066.8 1070.7-1071.8 Medium grained chlorite and biotite gabbro dykes -weakly to moderately calcitic both cut by Qtz and tourmaline vein. Sharp contacts occasionally rimmed with Qtz veinlet or fine tourmaline fracture. Fine biotite development in adjacent tuff infilled with sub angular calcite fragments.				
				⟨752-909⟩ «35-40% chl» Chlorite altertion still ubiquitous but exhibit a more blotchy texture - chlorote patches and clots are variable in size / 3cm to 25cm and covered 35-40% of the surface. Clasts in fine tuff, and erratic bluish QP's (1-2%) occasional distinct throughout chlorite alteration. Occasional Hematite development in fine seams and along fractured surface.		768-783 808-813 Core sharply split parallel to C.A. Fractured surface commonly coated with Hematite. Litho 2693, 2694. Check Zn value - Hematite or minute sphalerite at 760.5. (2693).

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				┤909-1082├ «15-20% chl» Decrease in chlorite - 15-20% chlorite patches (avg. size 3-5cm) and masses (< 3cm). Occasional erratic garnet aggregates associated with chlorite patches - downhole from 960 slight increase in small Qtz veins and veinlets calcite pods and seams.	Occasional fine fractures with pyrrhotite and chalcopyrite coating (overall trace).	Litho 2695. 2696.
1082.00 TO 1485.00	GABBRO «GB»	Medium grained equigranular gabbro speckled appearance due to large biotite flecks. Gabbro is commonly calcitic and cut by numerous Qtz + calcite and tourmaline veins.		Chlorite carbonate.	Generally 0-1% diss po + py +/- cp throughout. Qtz - tourmaline veins with po +/- py in vein and selvage. 1392.2 1cm bleb of po in qtz - tour vein. 1420.3 10% po in 2cm wide qtz tour vein @ 60 degrees to C.A. 1428.3 40% po, 3% cp in 2cm tourmaline - qtz vein. 1436-1439 Disseminated 3% po + cp in matrix. 1442.5 40% po in 8mm wide qtz vein. 1484 Po in qtz - tourmaline vein.	Litho 2697 1418-1428
1485.00 TO 1935.50	FELSIC ASH TUFF-MATTABI «FEL ASH TUFF»	Altered felsic very fine grained ash tuff. Primary features strongly overprinted by biotite - chlorite - +/- garnet alteration. Remnants of primary rock? are light grey and aphanitic.		1485-1488.5 bio h.r fls Medium graine biotite - rich baked felsic rock - hornfels. ┤1488.5-1499.6├ «sil ser» Light grey - green silicified felsic ash with abundant sericite.		Probably Mattabi Ash.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				┤1499.6-1542├ «chl-bio» Pervasive to vein type chloritic alteration of light grey felsic ash. Rock is generally medium green in colour with masses (0.2 to 30cm) of chlorite-rich material and veins (0.2 to 2cm) of chlorite at various angles to core axis. 1-3mm garnets up to 2-3% associated with strong chloritic alteration. Biotite in 1-5mm veinlets overprint chloritic alteration.	Trace disseminated py. ┤1531-1531.4├ «sph in qtz» 9cm quartz vein at 60 degrees to C.A. contains 5% blebs up to 1cm of sph, py. Qtz vein appear multi phased with biotitic margins.	Litho 2698. 1518-1528
		1504.2-1505.7 and dyke Medium grained dark grey, carbonated biotite rich intrusive with contacts at 70 degrees to C.A. same as foliation.				
		1546.7-1547.3 and dy Fine grained dark grey-green carbonated with biotite. Contacts @ 85 degrees to C.A.		┤1542-1603├ «bio-chl» Biotite fracture veinlets (1-8mm) wide anastomizing through light grey silicified matrix. Lessor chloritic clots and veins. Beyong 1580 alteration forms pseudo breccia with fragments (2-30mm) of silicified ash surrounded by biotite-chlorite veinlets.		Litho 2699 1588-1598.
		┤1550-1550.8├ «bedded felsic ash» Fine light grey silicified bedded ash with biotite +/- chlorite along 2-8mm thick bedding planes @ 25-35 degrees to C.A. Foliation controlled by biotite +/- chlorite veinlets.	25 35	┤1603-1757├ «bio in bedding» Fine veinlets of bio +/- chl in bedding planes of silicified ash. Veinlets 1-4mm wide separated by 2-8mm, beds of silicified ash. Beyond 1685' minor zone of crosscutting intense chlorite-garnet veins.		Typical Mattabi bedded ash - MTA. Similar to chloritoid alteration at Mattabi. Litho 2700. 1628-1638.
		Bedding less distinct beyond 1720.		┤1757-1793├ «chl-gnt veins» Silicified felsic ash with early biotite veinlets as above cut by extensive chlorite and garnet veining, 10-50% of rock mass. Chlorite veins are light to dark green (0.5 to 5cm wide) and contain 10-40% pink 1-6mm subhedral garnets. Host rock is medium to dark grey and contains 0-5% anhedral 1-4mm garnets. Late dolomite associated with chlorite veins 1788-1793.		Litho 2851 1708-1718. Litho 2852 1758-1768.
		┤1773.7-1775├ «and dyke» Fine grained dark grey carbonated intermediate dyke with contacts @ 70 degrees to C.A.				
		Grey silicified bedded ? Ash throughout, no quartz xtals, no apparent lapilli.		┤1793-1934.5├ «silic + bio» Light grey silicified ash with biotite veinlets 1-5mm wide erratically		

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				distributed 5-30% of rock mass. 1-5% chlorite development proximal to biotite veinlets. 0.4 1-3mm anhedral garnets scattered through section. 1-20cm chlorite-garnet veins cut earlier alteration at: 1834 - 1cm chl-gnt vein @ 30 degrees 1853 - 6cm chl-gnt vein @ 50 degrees 1868.8 - 1.5cm chl-gnt vein @ 45 degree 1872-1872.5 - 15cm weak chlorite - garnet vein with up to 4% py. 1875.5-1876 - 10cm gnt-chl vein at 45 degrees. 1880 - 2cm chl-gnt vein at 40 degrees. 1885-1885.5 10cm chl-gnt vein @ 35 degrees.	4% py over 10cm associated with chlorite @ 1872.	Litho 2853 1838-1848 Litho 2854 1898-1908
1935.50 TO 2088.00	GABBRO INTRUSIVE «GB» E.O.H.	Fine to medium grained ? porphyritic - altered gabbroic intrusion. Medium grey-green to medium green with common biotite and chlorite porphyroblasts. Shows excellent chill contact with upper 20' containing either 2-6mm chlorite clots or 1-4mm biotite clots. Cut by numerous calcite veinlets up to 6mm wide with biotitic reaction rims. Chloritic +/- garnet veining similar to 1753-1773 contains po +/- cp. End of Hole.		Calcite veinlets with biotite rims. Chlorite and biotite clots up to 30%. Chlorite veining with po +/- cp with minor garnet development.	Po as blebs and dissemination + po and cp in fracture planes. Disseminated po + po blebs +/- cp. 2018.5-2021 5% po + 1% cp. 2021.7-2022 10% po blebs in carbonate - chlorite vein. 2068-2070 4% po + 1% cp Po +/- cp on fracture planes at: 2016 2036.2 2041.1, 2041.5 2044.9, 2045.3, 2045.9 2049.8 2051.3 2052.3 2052.7	Litho 2855 1938-1948 Fine grained.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
					2054, 2054.8 2075, 2083	

Sample	From (f)	To (f)	Length (f)	ESTIMATES Cu %	Zn %	Py %	Po %	Mt %	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Ag oz/ton	Au oz/ton	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	Ag ppm	Au ppb	Ni ppm	As ppm	Sb ppm	COMMENTS
MSD-2232	358.50	363.50	5.00	< 1	?											1700	367		2.6	6				
MSD-2233	394.00	397.00	3.00	< 1	1-3											1890	7280		1.5	39				
MSD-2234	397.00	402.00	5.00	TR	1-2											352	3340		0.7	7				
MSD-2235	402.00	405.00	3.00	TR	1											187	1720		0.4	5				

Sample	From (f)	To (f)	Length (f)	SiO2 %	TiO2 %	Al2O3 %	FeO %	MgO %	MnO %	K2O %	CaO %	Na2O %	LOI %	Cu ppm	Zn ppm	Ni ppm	Ag ppm	Au ppb	TOTAL %	Pb ppm	Mn ppm	As ppm
MSD-2683	98.00	108.00	10.00	71.30	0.47	13.24	4.38	4.36	0.06	2.46	0.14	0.34	3.08	5	53	3	0.3	4	99.83			
MSD-2684	168.00	178.00	10.00	72.00	0.44	12.05	4.35	5.29	0.10	1.69	0.43	0.39	3.00	2	69	3	0.4	6	99.74			
MSD-2685	258.00	268.00	10.00	72.80	0.44	11.92	4.12	4.83	0.10	1.98	0.54	0.42	2.37	2	62	5	0.3	4	99.52			
MSD-2686	308.00	318.00	10.00	71.40	0.50	12.76	4.65	4.26	0.16	2.52	0.12	0.33	3.00	2	73	4	0.3	4	99.70			
MSD-2687	368.00	378.00	10.00	66.60	0.60	12.36	10.20	4.44	0.23	1.58	0.12	0.29	3.19	408	504	5	0.7	6	99.61			
MSD-2688	405.00	415.00	10.00	68.50	0.67	14.22	7.67	4.05	0.23	2.35	0.14	0.26	1.46	205	3085	5	0.5	4	99.55			
MSD-2689	418.00	428.00	10.00	75.20	0.42	11.21	4.18	3.33	0.12	2.14	0.13	0.26	2.53	40	168	3	0.3	4	99.52			
MSD-2690	498.00	508.00	10.00	71.30	0.48	12.31	4.70	4.58	0.14	2.38	0.28	0.31	2.94	4	101	4	0.4	4	99.42			
MSD-2691	588.00	598.00	10.00	71.10	0.46	12.38	4.60	5.43	0.13	2.14	0.17	0.28	3.10	2	72	3	0.5	4	99.79			
MSD-2692	688.00	698.00	10.00	68.90	0.67	13.34	6.22	4.49	0.16	2.33	0.16	0.21	3.19	3	68	10	0.3	4	99.67			
MSD-2693	758.00	768.00	10.00	75.00	0.35	10.81	5.86	2.70	0.10	2.04	0.09	0.14	2.41	19	44	4	0.3	4	99.50			
MSD-2694	858.00	868.00	10.00	74.30	0.37	10.54	6.44	2.81	0.12	1.98	0.58	0.30	2.24	3	64	5	0.3	4	99.68			
MSD-2695	918.00	928.00	10.00	77.10	0.35	11.39	4.38	1.44	0.09	2.46	0.11	0.21	2.21	2	69	3	0.1	4	99.74			
MSD-2696	1018.00	1028.00	10.00	80.20	0.34	10.22	3.73	0.78	0.05	2.06	0.22	0.31	1.71	7	18	4	0.1	4	99.62			
MSD-2697	1418.00	1428.00	10.00	51.70	1.26	14.57	12.77	6.56	0.25	0.50	8.23	2.16	1.44	86	33	26	0.3	4	99.44			
MSD-2698	1518.00	1528.00	10.00	74.90	0.41	11.00	5.49	3.22	0.11	2.01	0.34	0.18	2.02	3	59	4	0.3	4	99.68			
MSD-2699	1588.00	1598.00	10.00	75.30	0.38	10.50	4.77	3.07	0.10	1.87	0.99	0.31	2.41	30	63	4	0.3	5	99.70			
MSD-2700	1628.00	1638.00	10.00	75.90	0.39	11.29	4.16	2.11	0.09	2.71	0.48	0.32	2.04	2	41	3	0.2	4	99.49			
MSD-2851	1708.00	1718.00	10.00	76.90	0.38	11.08	3.96	1.87	0.09	2.43	0.62	0.31	1.86	1	43	6	0.3	4	99.50			
MSD-2852	1758.00	1768.00	10.00	61.60	0.26	7.65	19.93	5.56	0.69	0.95	1.70	0.37	0.99	94	41	20	0.4	4	99.70			
MSD-2853	1838.00	1848.00	10.00	77.70	0.37	11.58	3.58	1.20	0.07	2.57	0.83	0.39	1.53	8	25	4	0.1	5	99.82			
MSD-2854	1898.00	1908.00	10.00	77.80	0.37	11.08	3.32	1.60	0.06	2.05	1.17	0.60	1.53	2	30	4	0.2	4	99.58			
MSD-2855	1938.00	1948.00	10.00	57.00	1.41	15.62	10.15	3.74	0.15	1.82	7.23	1.57	1.21	25	42	19	0.5	5	99.90			

HOLE NUMBER: SLM-258

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: X METRIC UNITS:

PROJECT NAME: SLM
PROJECT NUMBER: PN359
CLAIM NUMBER:
LOCATION: STURGEON LAKE MINE

PLOTTING COORDS GRID: MINE GRID
NORTH: 8000.00N
EAST: 9175.00E
ELEV: 9975.00

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -85° 0' 0"
LENGTH OF THE HOLE: 2267.00f
START DEPTH: 0.00f
FINAL DEPTH: 2267.00f

COLLAR GRID AZIMUTH: 180° 0' 0"

COLLAR ASTRONOMIC AZIMUTH: 195° 0' 0"

DATE STARTED: April 26, 1988
DATE COMPLETED: May 5, 1988
DATE LOGGED: June 10, 1988

COLLAR SURVEY: NO
MULTISHOT SURVEY: YES
RQD LOG: NO

PULSE EM SURVEY: YES
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: CONNOR'S DRILLING RIG 11
CASING: 66 FEET
CORE STORAGE: STURGEON LAKE MINE

PURPOSE: TEST STRATIGRAPHY AND ALTERATION BELOW FOOTWALL INTRUSIVE WITH MATTABI RHYOLITE.

DIRECTIONAL DATA:

Depth (f)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
90.00	186° 0'	-81° 0'	MULTISHOT	OK	
190.00	186° 0'	-80°30'	MULTISHOT	OK	
330.00	184° 0'	-80°30'	MULTISHOT	OK	
476.00	182° 0'	-80° 0'	MULTISHOT	OK	
610.00	183° 0'	-79° 0'	MULTISHOT	OK	
750.00	181° 0'	-78° 0'	MULTISHOT	OK	
890.00	181° 0'	-78° 0'	MULTISHOT	OK	
1030.00	182° 0'	-77° 0'	MULTISHOT	OK	
1170.00	183° 0'	-76°30'	MULTISHOT	OK	
1253.00	183° 0'	-75° 0'	MULTISHOT	OK	
1310.00	182° 0'	-76° 0'	MULTISHOT	OK	
1353.00	184° 0'	-74° 0'	MULTISHOT	OK	
1453.00	184° 0'	-73°30'	MULTISHOT	OK	
1543.00	183° 0'	-73° 0'	MULTISHOT	OK	
1653.00	183° 0'	-73° 0'	MULTISHOT	OK	
1753.00	184° 0'	-72°30'	MULTISHOT	OK	
1853.00	184° 0'	-73° 0'	MULTISHOT	OK	
1953.00	186° 0'	-72°30'	MULTISHOT	OK	
2053.00	184° 0'	-72°30'	MULTISHOT	OK	
2153.00	186° 0'	-72° 0'	MULTISHOT	OK	
2253.00	184° 0'	-71°30'	MULTISHOT	OK	
100.00	-	-78° 0'	ROTODIP		
250.00	-	-78° 0'	ROTODIP		
400.00	-	-76° 0'	ROTODIP		
550.00	-	-76° 0'	ROTODIP		
700.00	-	-76° 0'	ROTODIP		
950.00	-	-74° 0'	ROTODIP		
1100.00	-	-74° 0'	ROTODIP		
1250.00	-	-74° 0'	ROTODIP		
1400.00	-	-73° 0'	ROTODIP		
1550.00	-	-73° 0'	ROTODIP		
1600.00	-	-72° 0'	ROTODIP		
1650.00	-	-72° 0'	ROTODIP		
1700.00	-	-72° 0'	ROTODIP		
1750.00	-	-72° 0'	ROTODIP		
1800.00	-	-72° 0'	ROTODIP		
1850.00	-	-72° 0'	ROTODIP		
1900.00	-	-72° 0'	ROTODIP		
1950.00	-	-72° 0'	ROTODIP		
2000.00	-	-72° 0'	ROTODIP		
2050.00	-	-72° 0'	ROTODIP		
2100.00	-	-72° 0'	ROTODIP		
2150.00	-	-72° 0'	ROTODIP		
2200.00	-	-71° 0'	ROTODIP		
2250.00	-	-71° 0'	ROTODIP		
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FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 65.50	CASING «CASING»	Overburden and broken rocks from old mill site.				
65.50 TO 1749.70	RHYOLITE TUFF/ASH TUFF «RH TUFF/ ASH»	Fine grained homogeneous rhyolite tuff/ash tuff containing sections < 5%, 0.5-2mm blue QP's tuff is moderate siliceous and chloritic. Occasional small chlorite clots (< 5%, < 10mm across) associated with silicified and sericitic patches. 120-121.5 Broken core. 124-128.1 Broken core probable fault with strongly weathered dyke at 126.5-128.1. 154.5-159.3 7cm wide milky QV's. ┤185-242├ «fractured zone» Fractured zone - broken core with several highly broken zones at 185.5-190, 199-200, 203-203.5, 221.3-222, 223-224, - occasional silicified developed near highly fractured zones. ┤236.5-237.2├ «flt» ┤239-240├ «flt» 265.5-267 fracture 271-271.7 fracture ┤282-287├ «flt» ┤290.5-294.2├ «flt» Broken zone with local chaotic development of clay material and sericite banding just below lower fault @ ..... 30 274.1-275.9 Sharp Hematite and calcitic andesite dyke contacts @ ..... 42 Increase in hematite in tuff near dyke - Qtz		65.5-87 Broken core, weathered zone with sericite and/or hematite development in fractures and seams. ┤87-235├ «ser hem» Randomly distributed 10-15% silicified and sericitic sections (15cm-1m long) throughout siliceous and weak chloritic tuff. 3-5% blood red Hematite developed in fractures, seams and disseminated in irregular patches - 197-112 section with up to 20% hematite. Occasional calcite associated with hematite. 213.2-223 Moderate to strong pervasive silicified with 3% hematite seams. ┤235-365├ «chl» Increase in pervasive chlorite throughout tuff - patchy chlorite 235-249 in fractured zone - chlorite development exhibit banding at 42 degrees. Weak and erratic Hematite in fractures and on fractured surface - substantial decrease in hematite downhole from lower fault zone at 290.5-294.2. 1-10mm patches of ameboid chlortic material surrounded light grey material 0.5% biotite associated with chlorite.		Mattabi - similar to ash tuff in SLM-254. Litho 2735 2736 Litho 2737. Litho 2738. Possibly cordierite rich alteration.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		crystals consistant 1-3%, 0.5 to 1.5mm. Minor felsic lapilli < 1% up to 1cm.				
		┤352-354├ «flt» Broken and fractured ground with strong foliation Chloritic gouge with foliation @ 20 degrees to C.A.		┤365-378├ «sil» Dark grey-green silicified section, fine massive alteration texture.		Litho 2739 385-395
		┤417.5-420├ «and dy» Intermediate feldspar porphyritic dyke with 2-15%. 5 to 2mm feldspar xtals in green fine-grained matrix. Upper contact @ 20 degrees lower contact fractured. 1% subhedral pyrite grains 1-2mm		┤378-417.5├ «sil + chl» Grey-green silicified section with chloritic veining 5-15% @ 30-45 degrees to C.A.		
		426.5-427 Dykelet as above.		┤420-430.8├ «chl» Green chloritized section pervading rock-lesser veining.		
		430.8-433 and dy Fine grained intermediate dyke with 25% biotite in feldspar matrix.		┤433-461├ «intense chl» Intense chloritized zone beginning at contact with dyke. Brecciated with open space qtz filling for two feet. 5% quartz and pink? feldspar veining. Strong variable foliation from 20-60 degrees to C.A.		Litho 2740 445-455
		447-448 and dy Fine grained with biotite as above. Quartz crystals consistant through section 2-4%.		┤461-473├ «chl» Light grey-green with lesser chlorite (10-20%) and minor biotite.		
				┤473-498├ «silic» Mottled silicification and 3-5% biotite in patches and veining - Rock is light grey.		
		Fine altered ash with 2-4% , 5-1.5 mm quartz crystals.		┤498-533├ «chl» 20-30% pervasive chlorite, giving rock medium green colour. Occasional 2-5mm quartz vein with fiberous light coloured mineral - ? Kyanite.		
			45	┤533-541├ «chl + bio» Moderate chlorite alteration with 5% biotite and common 2-10mm white qtz veins, light green selvages and fiberous mineral ? Kyanite.		Litho 2741 534-540

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
				⟨541-543⟩ «sil» Light grey silicified ash with 2-5% rounded "spots" to 2mm, ? andulusite.		? Kyanite in qtz veins.
				⟨541-561⟩ «chl» Moderate chlorite alteration pervading matrix up to 10% biotite, common quartz veins with chloritic selvages.		? andulusite in matrix.
		562.5-563 qtz veins Contains 30% white mica.		⟨561-576.5⟩ «patchy chl» Interconnected patches 2-10mm of chlorite in light grey coarser matrix, minor biotite.		Possibly cordierite.
		563-563.5 felsic dyke Light grey sericitic dyke @ 20 degrees to C.A.				
		2-4% blue quartz crystals.		⟨576.5-591⟩ «chl» Patchy to pervasive chlorite alteration in light grey matrix, minor biotite < 5%.		
				⟨591-603⟩ «ser» Light yellowish grey, abundant sericite apparently cross-cutting. Appears to "concentrate" qtz. crystals up to 10%.		Litho 2742 592-602
		1-4% .5-1.5mm blue quartz crystals throughout.		⟨603-696⟩ «patchy chl-bio» Veins and patches of chlorite - biotite up to 30-40% in light grey matrix. Biotite less prevelent by 640'.		? Cordierite alteration. Litho 2743 620-630
				655-667 Band of yellowish sericite alteration. Beyond 650 sericite appears to replace biotite as secondary alteration mineral.		
				681-696 Occasional quartz vein with fiberous light blue mineral.		
		719-720.3 and dy Dark grey, fine-grained with up to 1mm feldspar grains, 10%. 1% euhedral pyrite grains up to 1mm.		⟨695-707⟩ «chl-ser» Dark pervasive chlorite cut by veins of yellow sericite up to 2cm wide, sericite veins 10-20% of rock. Cut axis		

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Calcite in matrix.				
		┤700-846├ «> 5% qp» General increase in quartz crystals to over 5%, lower "contact" relatively sharp.		┤707-769├ «chl-bio-cord» Medium green chloritic groundmass surrounding patches of light grey creamy alteration rimmed by biotite. Patches several mm's to pervasive 20cm blobs. Apparent cordierite crystals in light coloured patches up to 2mm. Lower section gradational.		Litho 2744 709-719 ? Increased Mg. Typical Mattabi Rhyolite.
				┤769-834├ «ser-chl» Creamy grey massive sericite-rich altered ash cut by 0.2 to 2cm veins of green chloritic material creating a "pseudo-breccia" texture with 0.5 to 5cm fragments of sericitic rock. No biotite. Very minor carbonate associated with sulphides.	┤770-830├ «1% py-po» Trace to 1% pyrite - pyrrhotite in late fine fractures associated with chlorite. Very fine grained, no apparent cp or sph.	Litho 2745 810-820
		┤846-950├ «1% QP» Scattered 0.5-1.5mm blue quartz xtals in altered matrix.		┤834-853├ «chl-bio» Pervasive chloritic alteration with minor (< 5%) associated biotite.		
		┤894.5-897├ «and dy» Intermediate feldspar porphyritic, medium grey coloured fine grained dyke with 10-20% 1-4mm feldspar phenocrysts. Contacts @ approximately 80 degrees to C.A. Possible lapilli from 897.5-905		┤853-894├ chl-bio gnt» Very similar to chl-bio alteration. Chlorite pervading and veins through light grey (? cordierite-rich) matrix, giving rock green-grey colour scattered 1-4%, 0.5 to 2mm pink anhedral garnets. Biotite up to 15% in veins with chlorite and as < 5mm clots.	Minor 1-3mm grains of chalcopyrite associated with calcite veinlets < 5mm wide @ 876'. Trace fine pyrite @ 897.	Litho 2746 875-885
		917.3-918.2 and dy Same as 894.5-897 except contacts and strong foliation @ 35 degrees to C.A.	45	┤894-919├ «chl-bio» Light blueish-grey matrix stringered by veinlets of chlorite-biotite up to 30% and occasional biotite clots.	┤915.3-915.4├ «qtz vein w sph\py-po» 1 inch qtz vein @ 70 degrees to C.A. with 2-3% fine brown sphalerite, 1% py, tr po. 2mm clot of cp @ 916.	Very minor not worth analysis. LATE. ? cordierite.
				┤919-931├ «ser-chl» Light creamy-grey sericite-rich matrix cut by 20% chlorite veins up to 1cm. Minor 1-5mm biotite clots.		
		┤950-1574├ «no qp» Fine felsic ash tuff - as above with no quartz		┤931-1051├ «chl-bio ? cord» Blueish-grey matrix surrounded by		

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		xtals.		"blebs" and veins of chlorite-biotite (20-40%). Occasional discrete 1-2mm square ? cordierite crystal in grey matrix. Matrix appears coarser than CHL-BIO zones. Biotite clots 2-10%, 1-5mm beyond 1000'.	Trace pyrite associated with chlorite-biotite veining.	Litho 2747 1000-1010
		┤958-985├ «and dy» Dark grey equigranular to slightly feldspar porphyritic. Groundmass carbonated and chloritic. Feldspar phenocrysts (0-10%) up to 1mm. Cut by 1-5mm calcite-quartz veinlets with associated green (? sericite) alteration up to 2cm wide. Late quartz veins up to 10cm, no alteration associated @ 963, 972 and 979. Dyke contacts to wall rocks at 20 degrees to C.A.				
		1020-1022 and dy Feldspar porphyritic grey-green intermediate dyke, upper contact at 45 degrees and lower contact at 25 degrees in opposite direction. Carbonate rich groundmass. Euhedral 1-3mm pyrite cubes (2-5%) near contacts @	45 60		2-5% pyrite near contacts.	
		┤1070-1079.5├ «and dy» Feldspar porphyritic fine grained intermediate intrusive with chloritic and carbonate-rich groundmass. 10-30% 1-3mm feldspar phenocrysts. Same as other dykes. Upper contact @ 30 degrees, lower @ 45 degrees.		┤1051-1082├ «bio-chl» Pervasive replacement of fine grained grey matrix with fine biotite (10-30%) and lesser chlorite (5-20%).		
		┤1082.5-1137├ «flt zone» Brecciated chloritic matrix cut by biotitic veinlets with abundant calcite. Biotite 2-30%. Foliation 0-10 to C.A.	0 10	┤1082.5-1137├ «chl-bio-calcite bx» Chloritic matrix cut by biotite veinlets with calcite enrichment. Form fault breccia. Apple green sericitic vein controlled alteration beyond 1105.		Intrusion invading fault zones - calcite alteration associated with intrusive.
		┤1137-1165├ «and dy» Same as 1070-1079.5 except 10-35% 1-4mm feldspar phenocrysts, 1-2% 2-6mm quartz-calcite amygdules and 10% biotite in matrix.	45 60	┤1165-1192├ «chl-bio» Light green chloritic foliated matrix cut by biotitic veining and minor associated calcite.	Trace pyrite. ┤1174-1174.3├ «py-po-sph-cp-strg» Fine grained py-po-sph-cp in chloritic biotite vein with calcite and quartz contained within 5cm vein - like zone.	Litho 2748 1090-1100 Non-foliated, post-dates fault. Geochem 0370. 1173-1175
		┤1168-1175├ «lapilli zone» Poorly defined 0-40% 2-8mm subround felsic lapilli in discrete beds. Bedding at	45	┤1192-1344├ «chl-bio» Light grey matrix, veined and replaced by chloritic material and cut finer veinlets of biotite. Some sections with chloritic clots up to 30% 3-8mm.		? cordierite
		┤1206.3-1210.5├ «mafic debris» Mafic debris flow-epiclastic 40-50% heterolithic lapilli, dominantly rounded chloritic mafic			Pyrite associated with chlorite and calcite.	Litho 2749 1193-1203

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		fragments 2-20mm, lesser felsic fragments 5-15mm. Matrix is extremely biotitic.				
		⟨1242-1243.8⟩ «ma dy» Dark green chloritic dyke with strong foliation at approximately 45 degrees to C.A. @ ..... Upper contact at 25 degrees, lower contact wave at approximately 45 degrees.	45		20% pyrite over 5cm @ 1296.5.	
		1277-1279.5 and dy As above.				
		⟨1344-1364⟩ «1-3% QP» 1-3%, 5 to 1mm quartz crystals in fine ash matrix.		⟨1344-1364⟩ «sil + chl» Dark grey green silicified massive very fine grained, cherty rock. Minor chlorite veining.		Litho 2750 1280-1290
				⟨1364-1387⟩ «ser - bio» Creamy grey silicified and sericitic matrix. Cut by chloritic veining and biotite as clots. Also minor scattered 1-2mm garnets.		Possible andulusite @ 1372.
				⟨1387-1405⟩ «patchy chl» Light grey granular matrix (slightly coarser grained possibly cordierite - rich), with disscontinuous irregular patches 2-30mm of chloritic material and minor veining. Some minor biotite clots and trace garnet. Some massive chloritic veins to 10cm.	Trace pyrite.	Litho 2751 1350-1360
				⟨1405-1427⟩ «chl-bio» Dark grey-green pervasive fine chlorite and biotite overprinting fine grey matrix.		
		⟨1429.8-1432.5⟩ «lapilli zone» 10-20% light coloured 4-30mm felsic lapilli in biotite-rich matrix. Py (5%) and garnet near lower contact. Upper contact approximately 45 degrees, lower 20 degrees. 2-3% 1mm quartz crystals.		⟨1427-1446⟩ «chl-bio-cal» As above except with abundant (10-20%) calcite in matrix. Minor calcite veining with sericitic margins.	1% < 0.5mm euhedral pyrite. Cp in 15cm quartz vein at 1443.	Litho 2752 1435-1445
				⟨1446-1515⟩ «chl-bio» Pervasive fine-grained chlorite	Py-po in quartz-calcite vein at 1512.	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		┤1432.5-1506├ «< 1% QP» Scattered .5 to 1mm blue quartz crystals < 1%.		(20-30%) and biotite (10-20%). Some zones with patchy chlorite overprint. Also minor garnet.		
		┤1506.3-1508├ «lapilli zone» 10% felsic lapilli up to 20mm in biotite-rich matrix. Contacts at approximately 45 degrees.		┤1515-1574.5├ »bio-chl-gnt» Biotite as patcy to pervasive alteration approximately 10-35% fine grained cp-giving rock dark grey colour associated with cut by chloritic "bands" chlorite alteration band up to several cm's wide at 1524'. Garnet 2-10%, 1-8mm scattered throughout.		? Biotite alteration in coarse bed.
		┤1508-1530├ «qp < 1%» Scattered 0.5-1mm blue quartz crystals.				Litho 2753 1545-1555
		┤1530-1574.5├ «qp 1-5%. lapilli» Abundant (1-5%) .5 to 1.5mm blue quartz crystals. Apparent felsic lapilli concentrated near bottom to 10% 2-30mm.				
		┤1574.5-1740├ «bedded ash» Very fine grained, light grey banded tuffaceous planes (sl chloritized). Minor scattered quartz xtal << 1%. Texture is preserved in patches throughout chloritic alteration.		┤1574.5-1665├ «chl» Massive dense chlorite alteration surrounding remnants of light blue-grey biotite rimmed bedded ash? remnants (1-50cm) commonly with wavy outlines. Fine < 2mm garnets in chlorite-rich zones. Chloritic alteration becomes very massive beyond 1630 totally replacing all texture.		Remnants possibly cordierite rich.
						Litho 2754 1640-1650
				┤1665-1749.7├ «silic + chl-gnt strg» Massive silicified blue-grey altered brecciated and stringered by chlorite and associated garnet. Veining is very irregtular and varises from 2-30mm wide and comprises 5-30% of rock. 2-8mm anhedral garnets (1-4%) are found throughout chlorite veins. Rock has weak vein controlled foliation. 1-4% biotite rims chlorite veins.		
						Litho 2755 1730-1740
		┤1740-1749├ «lapilli» 5-10% felsic lapilli 4-15mm. No quartz crystals. Matrix slightly enriched in biotite felsic to ash.				

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
1749.70 TO 2173.50	BEDDED AHS/ RH TUFF «BEDDED ASH»	Felsic light grey bedded ash (MATTABI). Where preserved (1794-1797) bedding is fine 1-5mm banding at 28 degrees to C.A. Rock is silicified and very fine grained. 1-2% quartz xtals 1819-1824 Trace quartz xtals elsewhere. Bedding @	28	┤1749.7-1837├ «chl-bio strg» Light grey silicified ash cut by anastomizing stringers of chlorite with associated biotite. Chlorite up to 30% and biotite up to 20%. Minor garnet with chlorite. Occasional biotite clot 2-5mm in silicified ash.		Litho 2756 1840-1850
		1945-1960 Possible mafic (chloritic) 5-20mm fragments, or brecciated chloritic veins.		1837-1862 Sericite associated with chlorite.		
			30 35	┤1862-1955├ «chl-bio» Pervasive to stringer type chlorite with lesser biotite replacing silicified ash. Minor 2-15cm sections with remnants of silicified ash. Biotite tends to form 2-10mm rims through massive chloritic sections. Trace garnet.		Litho 2757 1920-1930
		2019-2020.4 and dy Carbonated dark grey fine grained intermediate intrusive with aphanitic chilled margins. 10cm massive chloritic wallrock margins.		┤1955-2119.5├ «bio chlot + chl strg» Silicified ash? with biotite clots +/- biotite - chlorite clots 2-5%, 2-5mm cut by massive chlorite +/- biotite veins with 2-8mm subhedral pink garnets. Also broken chloritic pseudo-gragments. Chloritic veins generally 2-15cm wide with anastomizing contacts at various angles to C.A. Late ? fine biotite-rich veinlets cut through silicified ash sections.		Litho 2758 2000-2010 ? Cordierite.
		2028.2-2028.5 As above.				
		2030.8-2031.8 and dy Green-grey feldspar porphyritic and carbonate intermediate dyke. Upper contact @ 45 degrees, lower at 35 degrees with sericitic margins.				Litho 2759 2090-2100
		┤2114.7-2119.5├ and dy As above.		2027-2050 Common fine (2mm) fractures with sericitic "bleached" margins up to 2cm wide. Minor white fiberous mineral within fine qtz filled fractures.		
		2131.7-2134 and dy As above.				
		┤2151.6-2173.2├ «qp < 4%» 0.5 to 1.5mm blue qtz xtals in fine felsic ash tuff.		┤2119.5-2173.2├ «blotchy chl» 0.2 to 4cm blotches of chloritic matereial in light grey silicified ash. Lessor veining of chlorite +/- biotite. Chlorite 20-30%.		Litho 2760 2155-2165

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		2162.4-2164.3 and dy As above. 2168.8-2170.5 and dy As above.				
2173.50 TO 2267.00	ANDESITE DYKE/ INTRUSIVE «GB INTRS» E.O.H.	Green grey aphanitic to fine grained chloritic and locally biotitic intrusive rock with aphanitic chilled contact. Zones with chloritic and biotite clots up to 2mm, 0-30%. Minor quartz - calcite veins generally at < 40 degrees to C.A. and less than 10mm wide. Also fine 2mm calcite filled fractures. Very little carbonate in matrix. End of Hole.				Marker andesite of old INTRUSIVE of Morton et. al. H.W. Dacite at Mattabi. Litho 2761 2200-2210

Sample	From (f)	To (f)	Length (f)	ESTIMATES Cu %	Zn %	Py %	Po %	Mt %	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Ag oz/ton	Au oz/ton	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	Ag ppm	Au ppb	Ni ppm	As ppm	Sb ppm	COMMENTS
MSD-0368	1173.00	1175.00	2.00													287	4380		2.7	13				

Sample	From (f)	To (f)	Length (f)	SiO2 %	TiO2 %	Al2O3 %	FeO %	MgO %	MnO %	K2O %	CaO %	Na2O %	LOI %	Cu ppm	Zn ppm	Ni ppm	Ag ppm	Au ppb	TOTAL %	Pb ppm	Mn ppm	As ppm
MSD-2735	107.00	117.00	10.00	73.50	0.45	11.53	3.86	4.98	0.02	1.41	0.13	0.30	3.61	37	44	3	0.6	4	99.79			
MSD-2736	157.00	167.00	10.00	76.00	0.45	11.05	2.79	4.54	0.02	1.31	0.15	0.38	3.11	12	28	2	0.1	4	99.80			
MSD-2737	214.50	220.50	6.00	74.00	0.47	13.52	2.20	3.21	0.02	2.68	0.27	0.29	3.13	16	20	2	0.3	4	99.79			
MSD-2738	295.00	305.00	10.00	70.00	0.51	12.14	4.83	5.90	0.04	2.19	0.30	0.20	3.77	3	68	4	0.4	4	99.88			
MSD-2739	385.00	395.00	10.00	70.70	0.51	12.41	3.92	5.37	0.02	2.41	0.17	0.33	3.51	7	60	4	0.4	4	99.35			
MSD-2740	445.00	455.00	10.00	65.30	0.46	11.07	6.08	8.62	0.05	1.13	1.27	0.43	5.11	4	68	5	0.3	5	99.52			
MSD-2741	534.00	540.00	6.00	71.60	0.47	12.93	3.65	4.86	0.05	1.88	0.25	0.50	3.50	2	44	4	0.2	4	99.69			
MSD-2742	592.00	602.00	10.00	75.10	0.34	12.78	2.34	2.99	0.02	2.60	0.36	0.44	2.43	32	36	5	0.2	4	99.40			
MSD-2743	620.00	630.00	10.00	72.90	0.46	12.03	4.16	4.26	0.06	2.15	0.21	0.31	2.79	4	59	12	0.4	4	99.33			
MSD-2744	709.00	719.00	10.00	74.60	0.43	10.87	4.07	4.61	0.05	1.52	0.24	0.23	2.92	2	50	3	0.2	4	99.54			
MSD-2745	810.00	820.00	10.00	76.70	0.31	12.12	2.38	2.82	0.02	2.61	0.03	0.28	2.49	3	36	2	0.2	4	99.76			
MSD-2746	875.00	885.00	10.00	74.00	0.50	12.21	3.30	2.73	0.17	2.98	1.06	0.40	2.33	130	489	4	0.4	5	99.68			
MSD-2747	1000.00	1010.00	10.00	75.60	0.46	12.06	3.14	2.76	0.07	2.60	0.18	0.32	2.60	24	85	3	0.2	4	99.79			
MSD-2748	1090.00	1100.00	10.00	66.70	0.61	10.53	4.61	5.94	0.14	1.62	3.48	0.16	5.81	33	100	40	0.6	4	99.60			
MSD-2749	1193.00	1203.00	10.00	74.40	0.45	11.75	4.00	3.22	0.08	2.46	0.22	0.20	2.72	2	71	3	0.2	4	99.50			
MSD-2750	1280.00	1290.00	10.00	74.60	0.46	10.93	4.41	3.58	0.08	2.09	0.44	0.20	3.03	5	79	16	0.3	5	99.82			
MSD-2751	1350.00	1360.00	10.00	60.30	1.21	14.43	10.45	6.33	0.24	1.95	0.36	0.21	4.19	2	148	8	0.5	4	99.67			
MSD-2752	1435.00	1445.00	10.00	57.60	1.84	10.62	8.70	12.01	0.18	3.67	0.11	0.48	4.63	71	106	246	1.2	4	99.84			
MSD-2753	1545.00	1555.00	10.00	64.20	1.12	13.51	7.38	4.37	0.29	2.11	3.82	0.57	2.34	163	124	18	0.9	4	99.71			
MSD-2754	1640.00	1650.00	10.00	56.90	1.54	13.37	14.80	6.73	0.24	1.28	0.44	0.27	3.82	3	89	29	0.8	4	99.39			
MSD-2755	1730.00	1740.00	10.00	77.60	0.38	9.18	4.90	2.84	0.15	2.64	0.27	0.14	1.28	2	47	6	0.4	4	99.38			
MSD-2756	1840.00	1850.00	10.00	68.90	0.40	11.19	8.25	5.24	0.19	1.63	0.26	0.21	3.62	5	100	8	0.7	4	99.89			
MSD-2757	1920.00	1930.00	10.00	76.30	0.49	10.45	4.70	2.83	0.10	2.50	0.14	0.20	1.86	3	21	4	0.3	5	99.57			
MSD-2758	2000.00	2010.00	10.00	76.00	0.48	10.31	5.89	2.42	0.10	2.15	0.10	0.20	2.02	3	15	31	0.3	4	99.67			
MSD-2759	2090.00	2100.00	10.00	73.00	0.60	11.90	6.04	3.00	0.14	2.36	0.13	0.32	2.26	47	18	4	0.6	4	99.75			
MSD-2760	2155.00	2165.00	10.00	74.90	0.31	10.99	5.07	2.85	0.06	1.63	0.51	0.80	2.32	4	39	4	0.3	4	99.44			
MSD-2761	2200.00	2210.00	10.00	56.90	1.29	15.40	9.73	3.58	0.13	0.84	6.32	3.44	2.26	91	50	18	0.5	4	99.89			

MINNOVA INC.
DRILL HOLE RECORD

IMPERIAL UNITS: X METRIC UNITS:

PROJECT NAME: SLM
PROJECT NUMBER: PN359
CLAIM NUMBER:
LOCATION: STURGEON LAKE MINE

PLOTTING COORDS GRID: MINE GRID
NORTH: 6600.00N
EAST: 11800.00E
ELEV: 9950.00

ALTERNATE COORDS GRID:
NORTH: 0+ 0
EAST: 0+ 0
ELEV: 0.00

COLLAR DIP: -65° 0' 0"
LENGTH OF THE HOLE: 1877.00f
START DEPTH: 0.00f
FINAL DEPTH: 1877.00f

COLLAR GRID AZIMUTH: 180° 0' 0"
COLLAR ASTRONOMIC AZIMUTH: 195° 0' 0"

DATE STARTED: May 7, 1988
DATE COMPLETED: May 17, 1988
DATE LOGGED: May 25, 1988

COLLAR SURVEY: NO
MULTISHOT SURVEY: YES
RQD LOG: NO

PULSE EM SURVEY: YES
PLUGGED: YES
HOLE SIZE: NQ

CONTRACTOR: CONNORS DRILLING RIG 11
CASING: 20 FEET
CORE STORAGE: STURGEON LAKE MINE

PURPOSE: TEST STRATIGRAPHY AND ALTERATION OF LOWER MATTABI RHYOLITE AND UPYF/QPYF BELOW SOUTH INTRUSIVE.

DIRECTIONAL DATA:

Depth (f)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
166.00	198° 0'	-65° 0'	MULTISHOT	OK	No rotodip - results
226.00	199° 0'	-64°30'	MULTISHOT	OK	inconsistant from drillers.
366.00	198° 0'	-64°30'	MULTISHOT	OK	
506.00	200° 0'	-64° 0'	MULTISHOT	OK	
786.00	200° 0'	-63°30'	MULTISHOT	OK	
1346.00	202° 0'	-64° 0'	MULTISHOT	OK	
1486.00	203° 0'	-64° 0'	MULTISHOT	OK	
1626.00	205° 0'	-63°30'	MULTISHOT	OK	

Depth (f)	Astronomic Azimuth	Dip degrees	Type of Test	FLAG	Comments
-	-	-	-	-	

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
0.00 TO 21.00	CASING «CASING»					
21.00 TO 506.70	QUARTZ-PORPHYRITIC RHYOLITE PYROCLASTIC BEDDED ASH «QP TUFF/ LAP TUFF»	Light to dark grey, very fine grained silicified ash-rich rhyolite pyroclastic flow deposits. Unit consists of quartz-rich basal beds with up to 15% .5-1.5mm subrounded to squarish quartz crystals and minor dense lapill, separated by thicker beds of very fine silicified ash. Basal bed (Qtz-rich) vary in thickness from 1cm to several metres. Overlying ash beds very in thickness from 30cm to 10's of metres. Basal quartz-lapilli beds generally show a sharp contact on ash bed of lower qtz-ash set and shows evidence of rip-up clasts. Upper ash beds tend to be gradational from qtz-rich section. Some ash sections are composed completely of lapilli to block size ashy fragments with < 20% qtz-rich matrix, possibly a slump feature. Bedding measurments can be obtained from lower qtz-bed contact and varies from 30-45 degrees to C.A. Foliation variable and due to chlorite-biotite veining. Quartz crystals commonly have light coloured rim approximately 2mm wide. Beyond 130', lapilli zones dominant and bedded ash-qtz zones less definable. Rock is generally Qtz-porphyritic lapilli tuff. 151.5-152.5 «flt gouge»	30 45	⟦21-190⟧ «sil + chl - bio - carb» Generally silicified (typical for Mattabi Rhyolite) light to dark grey matrix with 1-10cm zones of carbonate-rich alteration (dolomite +/- calcite) carbonate alteration is sporadic and accounts for < 2% of unit. Silicification and carbonitization is inturn cut by fracture-controlled chlorite-biotite alteration, which consists of amastomizing 2-10mm veinlets of chlorite biotite (10-30%). This alteration is more intense in fragmental sections (ie. qtz-lapilli beds) than in massive ash sections. Trace to 2% 1-3mm pink subhedral garnets are found proximal to more intense chlorite - biotite viening. Sphalerite mineralization is probably associated with this veining. Minor zones of late overprinting sericite alteration.	«54-87» «strg zone» Stringer type po-cp-sph mineralization. Sporadic fine veinlets with dominantly pyrrhotite and lessor amounts of chalcopyrite, sphalerite and trace pyrite. Veinlets are associated with chlorite - biotite alteration and bright green chlorite often rims mineralization. Sphalerite deposition is generally proximal to dolomite-calcite masses but not within. Veinlets are usually 1-5mm wide and discontinuous. ⟦54=55⟧ «sph-po strg» Fine veinlets 1-3mm with fine grained sphalerite and pyrrhotite, trace pyrite Sphalerite is reddish brown. 3% sph, 3% po, 5% garnet. ⟦60.5-60.8⟧ «sph-po strg» Bleb of sphalerite (2 X 8mm) with veinelts of Po 4% sph, 3% po. ⟦72.4-72.6⟧ «sph-po strg» Disseminated 4% sph in chloritic groundmass, 3% Po garnet ⟦77.8-78.0⟧ «po-cp strg» 3% po, 2% cp in blebs approximately 3mm with chlorite, no garnet, no carbonate. ⟦84.5-85.0⟧ «sph-po strg» 3% sph, 2% po in veinlet at 25 degrees to C.A. parallel to carbonate mass. Veinlet .5 to 3mm wide, no garnet. ⟦132.5-134⟧ «po-cp strg» Bleb and fine veinlets of Po (4%), cp	Typical Mattabi quartz-ash bedded sequences very similar to Mattabi orebody host rocks. Litho 2762 27-37 Dominantely qtz-rich rock. Geochem 0369. 53.5-55.5 Geochem 0374. 55.5-59.5 Geochem 0370. 59.5-61.5 Geochem 0375. 61.5-71.5 Geochem 0371. 71.5-73.5 Geochem 0377 73.5-77 Geochem 0372. 77.79 Note: assoc. of sph with carbonate in wall rock and garnet in stringer Geochem 0376 85-87 Geochem 0373. 131.5-134.5

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		Weathered talcose gouge zone @ 90 degrees to C.A.			(2%). No garnets, no carbonates tr py. Trace to 1% po as scattered blebs, very minor cp 134-181.	Litho 2763 107-117 Dominantly ash, few qtz xtals.
				┤190-350├ «bio-chl» Early pervasive chloritic enrichment as fine chlorite throughout matrix and cut by fine veinlets of biotite.	┤181-184├ «strg zones» Po-sph-cp mineralization in chlorite veining proximal to carbonate alteration. Mineralization generally confined to veinlets with up to 8% sph. 183-184. Very similar to STR ZONE 54-87.	Geochem 0378. 177-181 Geochem 0379. 181-183 Geochem 0380. 183-184 Geochem 0381. 184-187
		Consistant 5% rimmed qtz xtals through section. Small < 1cm lapilli approximately 10%.		Chloritic clots - 5% 3-10mm, 310-355. Carbonate zones with up to 30% calcite 327.2-327.4 335.3-337.	┤328.2-329├ «massive po in QV» Massive to semi-massive po with tr. cp in quartz vein and rock matrix.	Litho 2765 237-247 Litho 2766 297-307
		338.3-339 and dyke Intermediate, fine grained, carbonated dyke. Fine carbonated feldspar in chlorite-biotite matrix. Trace po near contacts.			Trace po.	Geochem 0382 328-329
		Barren white quartz veins with chlorite and biotite: 305.9-306.2 310-310.6		┤350-417├ «silic + bio +/- carb» Light to medium grey silicified ash and minor lapilli. Shows common in-situ brecciation with biotite veining, lesser chlorite. Minor carbonate rich zones (early). Biotite commonly in 2mm plates possibly after chloritoid.		Litho 2767 377-378 Similar to chloritoid alteration @ MATTABI.
		┤417-422├ «no qp» Massive light grey silicified ash with carbonate and biotite alteration.		┤417-422├ «carb + bio» Massive silicified ash (no qtz xtals) cut by 2-20cm veins of carbonate with lessor chlorite. Carbonate in turn brecciated and veined with 10-20% 1-5mm coarse biotite-rich vienlets.		Litho 2768. 417-422
				┤422-468.5├ «silic + bio-chl» Silicified light grey ash +/- lapilli and 2-3% qtz xtals. Early < 5% chlorite is cut by 5-30% coarse biotite in 2-5mm veinlets.		Litho 2769. 457-467
		505.5-506.7 and dy Fine-grained, grey, carbonated intermediate intrusive, as above. Intrusive fills major		┤468.5-506.7├ «chl-bio» Medium green-grey chaotic veined and brecciated ash and qtz xtals. Chlorotic		Litho 2770. 487-497

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		contact.		veinlets up to 30% with minor associated biotite. Late fine biotitic veinlets 5-10% cut earlier alteration.		
506.70 TO 559.50	HETERO-LITHIC DEBRIS FLOW LAPILLI TUFF «HET TUFF/ UPYF»	Inhomogeneous intermediate ash-rich debris flow/ lapilli tuff. Light grey to medium green with several unique beds from 2 to 15 ft. thick. Lower most bed shows good bedding with 4-12mm oblong chlorite-biotite fragments (25%) in light grey silicified? fine ash matrix (554.9-559.5). More commonly matrix is biotite-chlorite rich with < 5% 2-5mm felsic fragments and approxiamtely 10% chlorite-biotite +/- carbonate 2-8mm mafic fragments. Some beds are normally graded. No quartz xtals. Felsic fine light grey silicified 549-552.5. ┤543-544.8├ «and dy» Dark grey aphanitic carbonate intrusive, as above.	45	┤506.7-559.9├ «chl-bio» Early pervasive chloritic alteration throughout matrix cut by fine biotitic veinlets.	Trace cp and py associated with chloritic alteration.	Litho 2771. 527-537 Litho 2772. 549-552.5
559.50 TO 1013.30	GABBROIC INTRUSIVE «GB INT»	Fine to medium grained, grey-green intermediate-mafic intrusive with 5-30% 1-5mm chlorite or chlorite/biotite clots. Shows good chilled contact. Fine grained dykes 683-684.5 695-696.5 701-702		Fine calcite-ankerite +/- quartz veinlets 2-8mm at various angles to C.A. 5% 2-6mm garnet 630-665. Rare massive chlorite-garnet vein up to 10cm wide. Scattered 2-10% 2-6mm subhedral garnet beyond 750 ft. Sericitic blocky ground at 733'. Strong chlorite development proximal to calcite veining.	Trace po on fracture planes.	Marker andesite of old. Litho 2773 560-570
1013.30 TO 1030.20	FINE FELSIC QUARTZ PORPHYRITIC TUFF «QP TUFF»	Very fine grained, light-grey silicified felsic tuff with 0.5% < 1mm quartz. Unit consists of two beds: the upper contains colourless fine quartz in very siliceous fine matrix (1013.3-1026), the second (1026-1030.2) is darker, more biotitic and the upper 2' contains 10% < 2mm blue quartz. Section 1023.8-1024.2 appears to be cherty exhalite with 5% fine pyrite.		┤1013.3-1030.2├ «silic +/- bio» Light to dark grey cherty silicified.	┤1023.8-1024.2├ «? exhalite» Dark grey, very siliceous ? exhalite or silicified ash with 5% stratiform fine pyrite over 10cm. Also yellow hematite approximately 10% finely disseminated. Trace cp associated with	Litho 2774. 1015-1023 Geochem 1023.5-1024.5 Possibly "E" horizon.

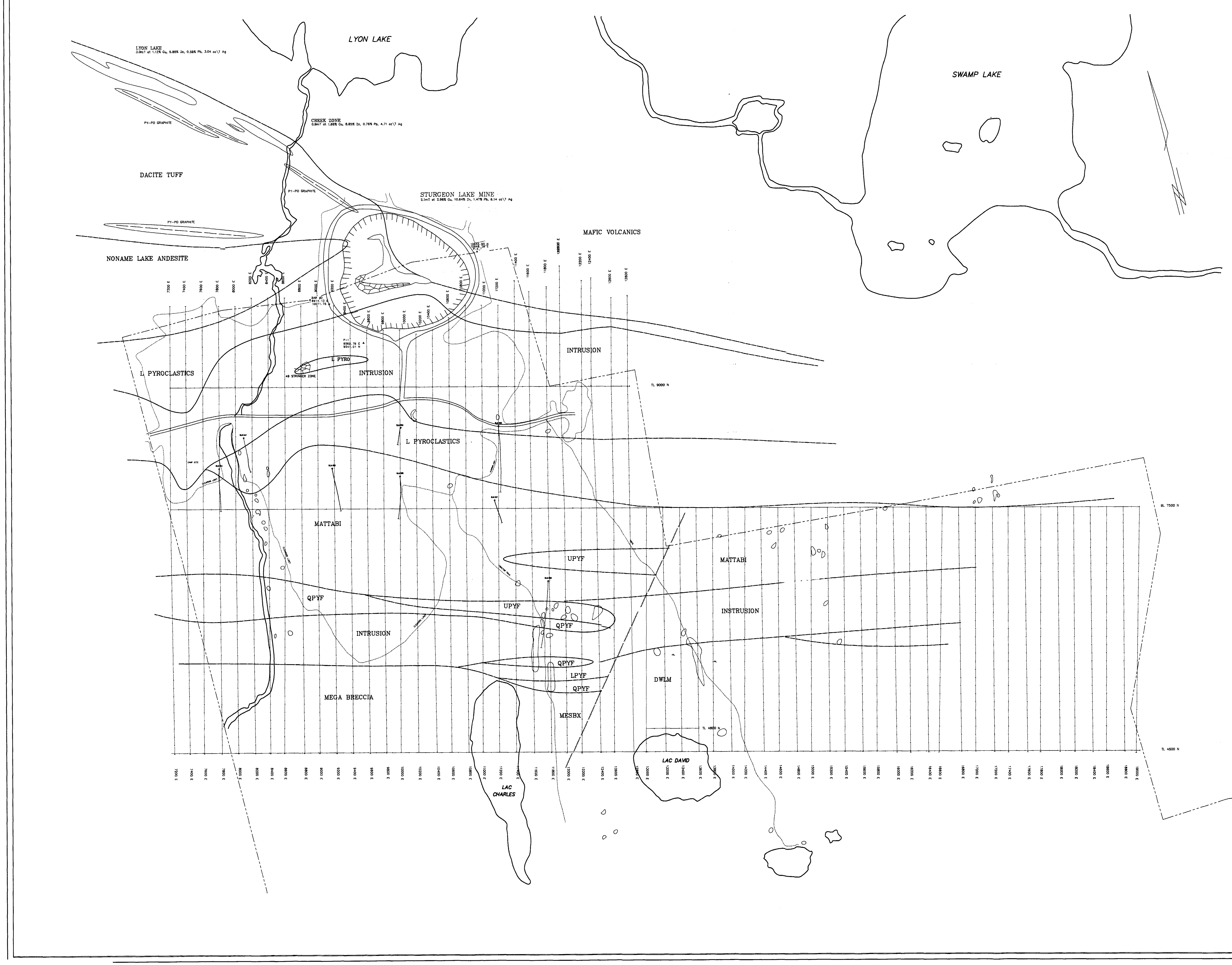
FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
					quartz vein @ 1027.	
1030.20 TO 1273.00	CHLORITIC HETERO-LITHIC DEBRIS FLOW TUFF «HET TUFF/UPYF»	Dark green chloritic in homogeneous debris/tuff with 5-10% 2-8mm felsic frags and 5-15% angular 2-15mm chloritic mafic frag. Unit is very unsorted. Beyond 1100', alteration less intense, shows 10-40% subangular 2-10mm, 0-10% 4-20mm felsic lithic fragment. Unit is very unsorted with some 2-10' containing packed mafic fragments. Andesite dykes: 1191.5-1192 1193.2-1195.5 1192.6-1193.2 1198.0-1198.5 ┤1207-1212.5├ «sealed fault» Brecciated debris flow recemented. Fault gouge on contact with intrusive. ┤1212.5-1239.5├ «intermediate intrusive» Fractured fine grained grey carbonated intrusive with common 1-3mm calcite filled fractures. Very blocky, poor core recovery 1230-1239.5. ┤1239.5-1247├ «sealed fault» Brecciated and sealed with chlorite-biotite, as above 1207-1212.5.		┤1032.2-1102.5├ «intense chlorite» Pervasive strong chloritic alteration destroying rock texture, giving rock dark green colour, cut by approximately 10% late biotitic veining. Minor sections with garnet. ┤1102.5-1212.5├ «silic + chl» Matrix of unit is light grey, silicified and cut by 2-8mm veins of chlorite. Minor calcite and garnet. Generally no foliation. ┤1239.5-1273├ «silic + chl-bio» Light grey early silicification cut by chloritic vein to pervasive alteration and late biotite veinlet esp. 1239.5-1247.	Minor py, po and trace cp associated with chlorite alteration.	Litho 2775. 1057-1067 Litho 2776. 1137-1147 MAJOR FAULT SYSTEM-LATE Litho 2777. 1217-1227 Litho 2778. 1257-1267
1273.00 TO 1443.00	INTER-MEDIATE INTRUSIVE «INTERMED INTRUSIVE»	Fine grained to aphanitic medium grey-green, non carbonated. "Dacitic intrusive. Chloritic near contacts. Upper contact at 70 degrees, lower contact brecciated and biotitic.		Chlorite development near contacts, fine calcite veinlets minor. 1350-1364 Brecciated bleached section with chlorite and biotite.	Scattered minor subhederal pyrite 1-3mm.	Unique intrusive. Litho 2779 1297-1307 ? Possibly 1ML flows.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
1443.00 TO 1470.00	HETERO-LITHIC DEBRIS FLOW DEPOSITS/ TUFF OR UPYF «HET TUFF/ UPYF»	Strongly overprinted heterolithic biotitic debris with fine felsic frags (5-15%) 2-6mm, and very indistinct mafic fragments. Matrix is very biotitic and chloritic. Similar to 1030.2-1273.		⟨1443-1470⟩ «bio-chl» Strong pervasive biotite and chlorite throughout matrix. Possible chloritoid alteration replaced by biotite as 1 x 2mm plates 1465-1470.		Litho 2780. 1447-1457
1470.00 TO 1590.50	QTZ PORPHYRITIC TUFF «QP TUFF/ QPYF»	Light green-grey felsic qtz-porphyritic, sl. fragmental pyroclastic flow deposits/tuff. Generally light grey fine ash matrix with 0-30% < 1mm qtz. xtals. Occasional 2-5mm felsic fragment (< 2%). Quartz-rich 1475-1490.		⟨1470-1712⟩ «chl +/- bio» Moderate pervasive light green chloritic alteration with biotite in zones with quartz xtals. Within Mesobx chlorite and biotite stringer throughout matrix.		Litho 2781. 1477-1487 Qtz-eye-rich.
1590.50 TO 1877.00	COARSE HETERO-LITHIC BRECCIA/ DEBRIS «HET BX/ MESO BX» E.O.H.	Coarse chaotic heterolithic fragment-rich/debris. Extremely unsorted with large felsic fragments from 4mm to several cm possible metres, 20-60%. Mafic fragments less abundant, 0-50%, 4-70mm. Matrix is chaotic chlorite-biotite and generally < 30%. Unit contains several amygdaloidal intermediate flows. ⟨1614.3-1635.8⟩ «amy intermediate flow» Grey-green amygdaloidal, 0-10%, 2-8mm qtz-filled in non-caarbonated matrix. Contacts are not sharp and amygdules are zoned toward contacts. Unit becomes chloritic toward contacts. ⟨1647-1665.5⟩ «amy inter flow» As above. ⟨1686-1705⟩ «amy inter flow» As above. ⟨1725-1734⟩ «abund mafic frags» Up to 70% amygdaloidal basalt fragments with 30% qtz-filled amygdules 2-5mm. 1858.7-1868 and dyke Dark grey fine grained, non-carbonated, sharp		Up to 5% garnet associated with more intense chlorite alteration. ⟨1712-1877⟩ «bio +/- chl» Early chloritic alteration left as patches in matrix and mafic frags cut by intense biotitic alteration as veining and pervasive texture up to 5% garnet in biotite-rich patches and mafic fragments 1722-1752.	Cp blebs in qtz vein cutting flows at 1664. Cp-Po blebs @ 1681 in chlorite-garnet vein. Cp-Po blebs @ 1724 in chlorite-garnet vein.	Litho 2782. 1547-1548 Ash-rich. Litho 2784. 1667-1677. Very similar to IML-dacitic flows @ Mattabi. Litho 2783. 1617-1627 Litho 2785. 1725-1735 (abund. mafic frags). Litho 2786. 1837-1847.

FROM TO	ROCK TYPE	TEXTURE AND STRUCTURE	ANGLE TO CA	ALTERATION	MINERALIZATION	REMARKS
		contacts at approximately 80 degrees. 1869-1871 and dyke As above. End of Hole.				

Sample	From (f)	To (f)	Length (f)	ESTIMATES Cu %	Zn %	Py %	Po %	Mt %	ASSAYS Cu %	Zn %	Pb %	Ag g/t	Au g/t	Ag oz/ton	Au oz/ton	GEOCHEMICAL Cu ppm	Zn ppm	Pb ppm	Ag ppm	Au ppb	Ni ppm	As ppm	Sb ppm	COMMENTS
MSD-0369	53.50	55.50	2.00	1	4											146	1160		0.6	5				
MSD-0374	55.50	59.50	4.00	2	1											11	78		0.5	6				
MSD-0370	59.50	61.50	2.00	TR	0.2											112	488		0.9	7				
MSD-0375	61.50	71.50	10.00	.5	TR											12	41		0.4	5				
MSD-0371	71.50	73.50	2.00	.7	TR											54	233		0.9	5				
MSD-0377	73.50	77.00	3.50	TR	TR											36	112		0.4	4				
MSD-0372	77.00	79.00	2.00	TR	TR											172	61		0.5	4				
MSD-0376	85.00	87.00	2.00	.5	TR											46	205		0.6	4				
MSD-0373	131.50	134.50	3.00	TR	0.1											26	45		0.7	4				
MSD-0378	177.00	181.00	4.00	TR	TR											45	62		0.6	13				
MSD-0379	181.00	183.00	2.00	TR	0.2											275	432		1.0	4				
MSD-0380	183.00	184.00	1.00	.5	4.0											1340	2760		2.8	4				
MSD-0381	184.00	187.00	3.00	.1	TR											69	98		0.5	4				
MSD-0382	328.00	329.00	1.00	.1	TR											204	38		1.9	21				
MSD-0383	1023.50	1024.50	1.00	TR	TR											188	53		0.6	5				POSSIB FM DISS SPH

Sample	From (f)	To (f)	Length (f)	SiO2 %	TiO2 %	Al2O3 %	FeO %	MgO %	MnO %	K2O %	CaO %	Na2O %	LOI %	Cu ppm	Zn ppm	Ni ppm	Ag ppm	Au ppb	TOTAL %	Pb ppm	Mn ppm	As ppm
MSD-2762	27.00	37.00	10.00	78.00	0.36	10.46	3.43	1.82	0.09	2.01	1.54	0.48	1.63	9	37	4	0.7	4	99.82			
MSD-2763	107.00	117.00	10.00	78.30	0.27	9.13	3.23	1.99	0.08	1.61	2.73	0.41	1.97	25	61	3	0.5	4	99.72			
MSD-2764	167.00	177.00	10.00	79.90	0.29	9.15	3.36	2.33	0.08	1.29	0.96	0.30	1.97	3	28	4	0.6	5	99.63			
MSD-2765	237.00	247.00	10.00	76.20	0.33	10.83	2.86	2.38	0.10	1.61	2.85	0.49	1.89	2	49	4	0.5	4	99.54			
MSD-2766	297.00	307.00	10.00	76.00	0.36	12.45	2.75	1.79	0.07	2.46	0.82	0.60	2.52	2	40	2	0.2	4	99.82			
MSD-2767	377.00	388.00	11.00	77.50	0.32	10.14	3.10	2.04	0.07	1.82	2.85	0.42	1.56	6	34	4	0.5	4	99.82			
MSD-2768	417.00	422.00	5.00	72.10	0.32	9.43	4.36	3.47	0.13	1.67	3.63	0.47	3.90	31	59	5	0.5	4	99.48			
MSD-2769	457.00	467.00	10.00	76.10	0.32	11.30	3.23	2.72	0.07	1.73	1.42	0.56	2.04	5	51	3	0.4	5	99.49			
MSD-2770	487.00	497.00	10.00	75.30	0.30	10.52	4.01	3.76	0.10	1.51	0.92	0.60	2.75	92	80	3	0.4	5	99.77			
MSD-2771	527.00	537.00	10.00	65.00	0.80	11.81	7.14	7.07	0.09	0.87	2.78	0.59	3.52	23	70	15	0.8	4	99.67			
MSD-2772	549.00	552.50	3.50	73.90	0.61	11.25	2.80	3.45	0.09	0.77	3.83	1.43	1.62	4	31	6	0.5	4	99.75			
MSD-2773	560.00	570.00	10.00	59.30	1.40	14.45	9.36	3.71	0.16	1.25	6.66	1.57	1.85	3	32	17	0.5	4	99.71			
MSD-2774	1015.00	1023.00	8.00	83.50	0.26	8.59	2.49	0.83	0.06	1.15	0.45	1.07	1.23	19	7	4	0.2	4	99.63			
MSD-2775	1057.00	1067.00	10.00	60.60	2.03	12.75	12.90	5.12	0.16	0.57	1.58	0.64	3.48	208	63	19	1.0	7	99.83			
MSD-2776	1137.00	1147.00	10.00	67.20	1.18	14.93	7.37	2.64	0.10	1.68	0.46	0.64	3.27	61	19	29	0.4	4	99.47			
MSD-2777	1217.00	1227.00	10.00	58.30	1.44	15.58	8.26	3.34	0.16	1.78	4.02	1.38	5.39	53	43	50	0.8	4	99.65			
MSD-2778	1257.00	1267.00	10.00	72.50	0.59	11.61	4.72	3.45	0.13	1.71	1.54	0.57	2.81	7	51	5	0.4	5	99.63			
MSD-2779	1297.00	1307.00	10.00	59.40	1.27	15.33	7.95	4.81	0.16	1.72	7.03	1.00	1.16	18	43	34	0.9	5	99.83			
MSD-2780	1447.00	1457.00	10.00	69.50	0.75	11.87	6.00	3.79	0.12	1.57	3.46	0.40	2.02	26	36	9	0.7	4	99.48			
MSD-2781	1477.00	1487.00	10.00	72.40	0.72	12.30	4.43	3.81	0.10	1.51	1.47	0.44	2.61	103	40	5	0.5	4	99.79			
MSD-2782	1547.00	1557.00	10.00	52.60	1.51	17.45	9.41	9.10	0.11	0.46	3.37	1.45	4.31	13	95	28	0.8	4	99.77			
MSD-2783	1617.00	1627.00	10.00	57.60	1.40	15.94	8.46	6.51	0.19	1.15	4.53	1.27	2.51	41	101	27	0.8	5	99.56			
MSD-2784	1667.00	1677.00	10.00	71.00	0.54	11.20	6.88	4.76	0.17	1.54	0.39	0.59	2.74	141	126	10	0.6	4	99.81			
MSD-2785	1725.00	1735.00	10.00	78.70	0.68	7.90	5.50	2.34	0.13	1.60	0.82	0.34	1.44	36	23	7	0.5	4	99.45			
MSD-2786	1837.00	1847.00	10.00	68.30	0.75	12.65	5.99	4.51	0.16	1.09	4.07	0.60	1.71	243	2440	18	1.0	7	99.83			



MINNOVA INC.
STURGEON LAKE MINE
1988 DRILLING

DRAWN BY	F.B., S.S.	DATE 08/01/88	1 inch = 400 feet
UPDATED:	L.W.	17/01/89	
GEOLOGY BY			
PLAN No: 88DLLSLM	APPROUVED BY		

Legend of Geological Units
Sturgeon Lake Caldera Complex

NO NAME LAKE SUCCESSION
- Massive to amygdaloidal flows and flow breccias — NNLM(massive), NNLA(amy), NNLBX(breccia)
- Pillow lavas and breccias, hyaloclastites — NNP(pillowed), NNPB(breccia), NNHY(hyaloclastite)
- Debris flow deposits — NNDF
- Sedimentary rocks(greywacke, shales, graphitic shales) — NNSED

"L" SUCCESSION
- Quartz+/-plagioclase(>2mm) crystal ash flow tuff — LBQBP
- Quartz+/-plagioclase(<2mm) crystal ash flow tuff — LQP, LP
- Ash units +/- plagioclase crystals(<1mm) — LA

BELL RIVER LAKE SUCCESSION
- Intermediate massive to amygdaloidal flows and flow breccias — IML, IMLA, IMLBX
- Volcaniclastic sedimentary rocks and debris flow deposits — RREPI

MATTABI SUCCESSION
- Quartz crystal ash flow tuff and bedded ash flow tuff — MTQ, MTQB(bedded), MTQC(cherty),MTQF(fragmental) MS(massive sulphides)
- Bedded ash deposits — MTA, MTAB(alteration breccia), MTAC(cherty), MTAS(quartz chips), MTAF(fragmental), MS(massive sulphides)

TAILINGS LAKE SUCCESSION
- Volcanic debris flow deposits, bedded epiclastic deposits, felsic ash tuffs — UPYF, UPYFB(bedded), UPYFA(ash), UPYMS(massive sulphides)

HIGH LEVEL LAKE SUCCESSION
- Pumice-rich ash flow tuffs — LPYF
- Quartz crystal ash flow tuffs — QPYF
- Mesobreccias(coarse heterolithic volcanic breccias) — MESBX, MESBF(megabreccia)
- Ash fall deposits(Pilinion) — PAF

DARKWATER CREEK SUCCESSION
- Bedded volcaniclastic scoria-bearing deposits — EPISC
- Scoria-rich lapilli and ash tuffs — SC, SCA(ash)

JACKPOT LAKE SUCCESSION
- Mafic volcaniclastic deposits — JLEPI
- Felsic ash flow tuffs — JLBQ(quartz>3mm), JLBP(plagioclase>3mm) JPFA(ash units)
- Felsic mafic to amygdaloidal flows and flow breccia — JLFLM, JLFLA, JLFLB
- Intermediate plagioclase-bearing debris flow deposits — JLIDF (DWLF)
- Welded tuff

DARKWATER LAKE SUCCESSION
- Massive to amygdaloidal basaltic flows, flow breccias, scoriaceous flows, interflow felsic ash fall tuff — DWLM, DWLA, DWLBX, DWLS, DWFA

INTRUSIVE ROCKS
- Fine grained microporphyritic quartz diorite +/- abundant carbonate — INTQP, INTR
- Feldspar +/- biotite prophyritic granodiorite — INTFP, INTQP(quartz prophyritic), INTG(gabbro),INTM(mine dike)
- Beidleman Bay Trondjhemite Complex — BBINT

SULPHIDES
- Massive Sulphides
- Stringer Sulphides