MINNOVA

MEMORANDUM

DATE: September 21, 1990

A: A. J. Davidson

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COPIES TO: I. D. Pirie, D. H. Watkins, A. F. Reeve

DE
FROM: J. D. Kapusta, G. S. Wells

SUJET
SUBJECT: Lara Drill Proposal - Fall 1990

827441

1. Introduction

A 29 hole, 5160 meter diamond drill program is proposed to test massive sulphide targets on the Lara property this fall. Twenty-five holes (4480 m) will test the 262 felsic volcanic sequence, three holes (480 m) will test IP and VLF anomalies in the Sicker volcanics located north of the Coronation Zone and one hole (200 m) will test a strong IP anomaly located south of the Fulford fault in an area underlain by volcaniclastic sediments of the Fourth Lake group. Specific target areas are discussed below.

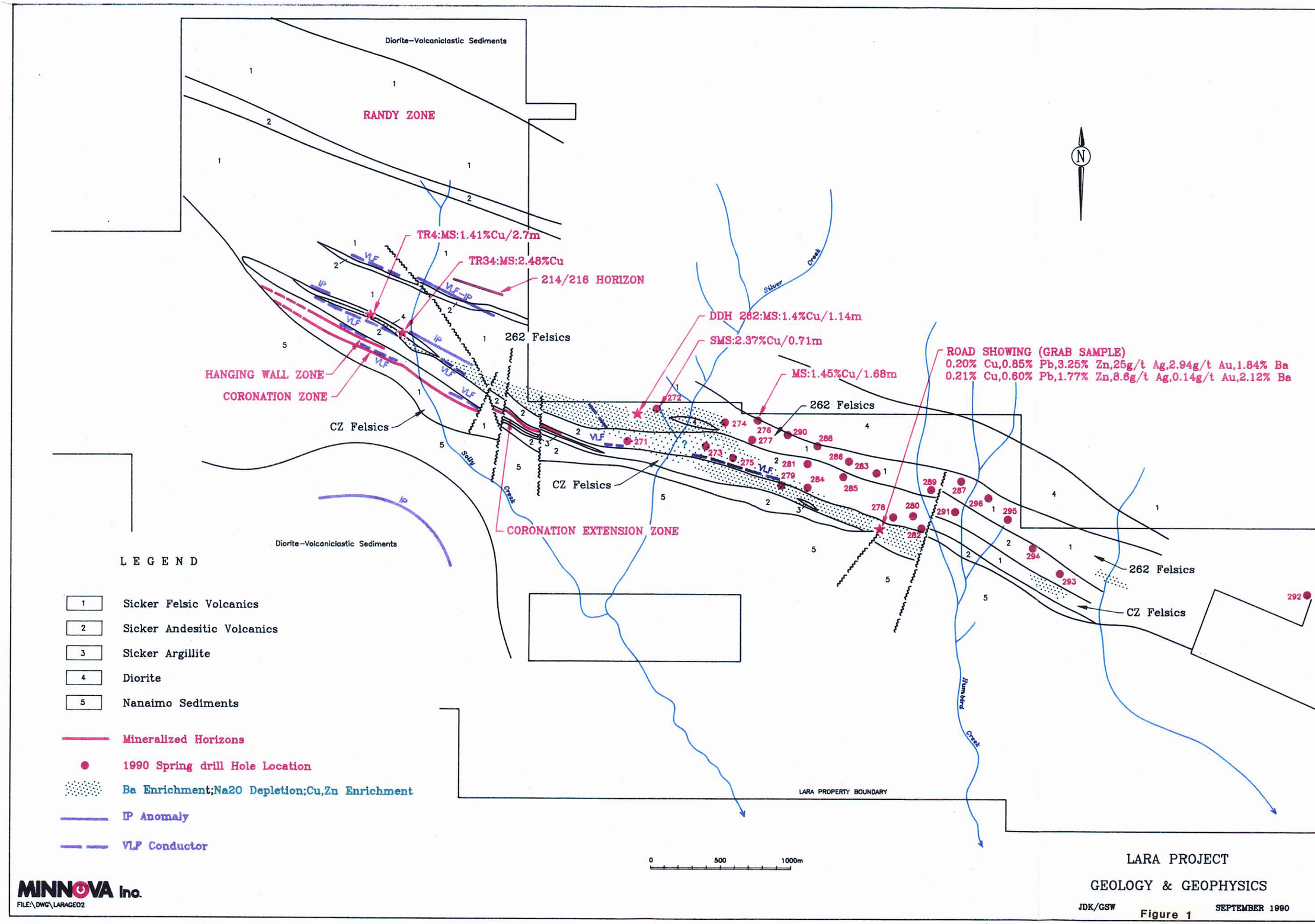
2. 262 Felsics

The spring drill program identified the 262 felsic sequence as a favourable unit to host volcanogenic massive sulphides. The crystal tuffs and ashes that comprise the unit are locally hydrothermally altered to sericitic schists and commonly host sulphide (py-cp-sph) stringer zones. The alteration zones are reflected chemically by Na_2O depletion and Cu, Zn and Ba enrichment. Pyritic cherts and ashes comprise a minor but very important part of the 262 felsic sequence. These units are interpreted as distal exhalites which mark a period during which sulphide deposition has occurred. Trenching and diamond drilling on the Lara property has traced these pyritic horizons over a strike length of 5 km. Thin, copper-rich massive pyrite zones are associated with this unit over a 3 km strike length (Figure 1). Significant assays from these massive sulphide zones are as follows:

Lara Fall Drilling.

hole #	location	Azimuth	Dip	Final Depth	mineralization.
90-297 (P-13)	97+80W. 105+12N (north of Coronation Extension).	208	-75°	288m	145.6 - 147.8 - 1-2% cpy - sph stringers in F Tuffs. 152.0 - 157.6 - 1-2% py - sph stringers 193.2 - 205.1 - py - cp stringer zone in F Tuff 2-3% stringers + 5-10% f.gr. diss py. 205.1 - 205.75* - py, cp ash/chert - 5-10% py, tr cp. - horizon occurs at contact between altered felsics and chloritic andesite tuffs.
90-298 (P-1)	74+00W; 112+19N (east of Silver Cr.)	208	-75	218.5m	121.3 - 122.8 - 5-7% py, tr, cp, 1-2% sph as stringers in andesite ash. 124.3 - 125.0 - 7-10% py associated with fine ash and chert layers.. 199.2 - 206.5 - 7-8% f.gr. py with Tash/chert = 262 Horizon.
90-299 (P-15).	98+80W; 104+37N	208	-80	215.5m	77.45 - 79.3 - 1-2% sph in FP Tuff. - diss and stringers. 84.4 - 97.9 - 2-3% py, tr sph, cp as stringers in F Lap T. 134.55 - 151.6 - 3-7% py, tr. sph, cp as stringers in F Lap T.
90-300 (P-3)	78+36W; 111+21N	208	-75	still drilling.	

hole #	location	Azimuth	Dip	Final Depth	mineralization.
90-301 (P-14).	98+80W, 105+52N	208	-77°	185.0	102.7 - 111.0 - 2-7% f.gr. diss py. in F Tuff. 111.0 - 112.2 - 3 - 10% v.f.gr. py in chert, siliceous ash. = 262 Horizon.
90-302. (P-16).	101+00W; 104+94N	208	-74	still	drilling.


Diorite–Volcaniclastic Sediments
RANDY ZONE
TR4:MS:1.41%Cu/2.7m
TR34:MS:2.48%Cu
214/216 HORIZON
HANGING WALL ZONE
CORONATION ZONE
CZ Felsics
262 Felsics
DDH 282:MS:1.4%Cu/1.14m
SMS:2.37%Cu/0.71m
MS:1.45%Cu/1.68m
ROAD SHOWING (GRAB SAMPLE)
0.20% Cu,0.85% Pb,3.25% Zn,25g/t Ag,2.94g/t Au,1.84% Ba
0.21% Cu,0.60% Pb,1.77% Zn,8.6g/t Ag,0.14g/t Au,2.12% Ba
CORONATION EXTENSION ZONE
Silver Creek
Stolly Creek
Humbird Creek
LARA PROPERTY BOUNDARY
0 500 1000m
N
LEGEND
1 Sicker Felsic Volcanics
2 Sicker Andesitic Volcanics
3 Sicker Argillite
4 Diorite
5 Nanaimo Sediments
Mineralized Horizons
1990 Spring drill Hole Location
Ba Enrichment;Na20 Depletion;Cu,Zn Enrichment
IP Anomaly
VLF Conductor
MINNOVA Inc.
FILE:\DWG\LARAGE02
LARA PROJECT
GEOLOGY & GEOPHYSICS
JDK/GSW
SEPTEMBER 1990
Figure 1

Trench 4:	1.34% Cu, 6.4 ppm Ag over 1.7 m (channel sample)
Trench 4a:	1.41% Cu, 7.1 ppm Ag over 2.7 m (channel sample)
Trench 34:	2.48% Cu (grab)
DDH 89-262:	1.42% Cu, 0.12% Zn, 5.9 g/T Ag over 1.14 m
DDH 90-272:	2.37% Cu, 158 ppm Zn, 6.4 ppm Ag over 0.71 m
DDH 90-276:	1.44% Cu, 378 ppm Zn, 4.3 g/T Ag over 1.68 m.

The 262 felsics are structurally complex due to a second phase folding event that is associated with the thrust fault that separates the 262 Andesites from the CZ Felsics. The overall dip of the 262 Felsics is 30-40° to the north, but contacts do steepen (60°+) away from the surface contact between the 262 andesites and felsics. Pierce points of the 262 Andesite-Felsic contact have been plotted on a plan longitudinal in Figure 2. The thickness of pyritic cherts and stringer zones and metal contents of both have been projected onto this plan to identify areas of metal enrichment and possible basins (Figure 2). Thicker accumulations of pyritic ash and chert occur in an east-west trending zone between 102W and 67W. These horizons are typically enriched in Cu and Zn. Sulphide stringer zones occur in the footwall and hanging wall to the pyritic ashes and appear to be most prevalent in this area between 102+50W and 97W. Stringer mineralization is not pronounced to the east of Silver Creek but this may be due to a lack of drill information rather than any real trends. To the west of 102W, a set of northerly dipping diorite dikes have dilated the 262 felsic sequence and locally covered the potential horizons. A thick zone of pyritic ash is present in hole 9 and massive sulphides are present in Trenches 4, 4a and 34. The down-dip potential of these zones is virtually unexplored.

3. Upper Solly VLF-IP

Re-examination of the data from the Lara property has indicated that a strong east-west trending VLF-IP anomaly that straddles the upper part of Solly Creek is untested (Figure 3). Hole 219 was collared in and near the eastern edge of the anomaly and intersected altered and pyritic andesite tuffs. Hole 223 which tested the western edge of the zone intersected unaltered felsic tuffs and failed to test the felsic-andesite contact. The geophysical anomaly is one of a series that occurs immediately north of the best part of the Coronation zone. It is an attractive target as it could be part of a stacked sulphide lens sequence.

4. Recce IP

Several reconnaissance IP lines were surveyed to the south of the Coronation zone to see if there are any additional slivers of Sicker volcanics to the south of the Fulford Fault. While most of the area appears to be covered by younger Nanaimo sediments, a well defined IP anomaly with a strike extent of 1200 meters was outlined approximately 800 meters south of the Coronation zone (Figure 1). Surface outcrops in the area consist of Fourth Lake volcaniclastic sediments with local disseminations of pyrrhotite and chalcopyrite.

5. Proposed Drilling

The bulk of the fall drilling program will test the VMS potential of the 262 Felsics. Other targets include IP-VLF anomalies to the north of the 262 sequence and an IP anomaly located 800 meters south of the Coronation Zone. Specific details for each hole are given in Table 1 and drill hole locations are shown in Figure 3. The projected pierce points of the 262 Andesite-Felsic contact and their relationship to previous drilling, the chert-pyritic ash basin, stringer zones and previous massive sulphide intersections are given in Figure 2.

6. Conclusions

A 29 hole, 5160 meter diamond drill program will test massive sulphide targets on the Lara property this fall. The majority of the holes will test the VMS potential for the 262 felsics in areas of hydrothermal alteration, stringer mineralization and thick pyritic chert basins. Other targets include untested VLF/IP anomalies that are exposed elsewhere on the property.

The all-inclusive cost of this program is estimated at $335,400 ($65/m). Drilling is scheduled to start on or around October 8.

Table 1: Proposed Drilling – Lara Property

Hole	Location	Collar			Depth	Target	Felsic Sequence
		Azimuth	Dip	Elevation			
1. 262 Felsics							
P-1	74+00W; 112+19N	208	-75	748 m	200 m	Downdip test of DDH90-286; that intersected a thick sequence of pyritic felsic ash and cherts	262 Felsics
~~P-2~~ P-3	78+36W; 111+21N	208	-75	762 m	200 m	Downdip test of DDH90-288; that intersected 330 ppm Zn, 880 ppm Cu over 7.30 m in pyritic ashes and cherts	262 Felsics
~~P-3~~ P-4	81+00W; 110+41N	208	-70	735 m	200 m	Downdip test of DDH90-290; that intersected minor chert over 4.80 m	262 Felsics
~~P-4~~ P-5	83+00W; 109+90N	208	-75	697 m	200 m	Downdip test of DDH90-276; that intersected 1.44% Cu, 373 ppm Pb, 378 ppm Zn, 4.28 ppm Ag and 141 ppm Au over 1.68 m	262 Felsics
~~P-5~~ P-2	76+00W; 111+76N	208	-75	752 m	200 m	Downdip test of DDH90-274, that intersected a thick sequence of pyritic felsic ash and cherts	262 Felsics
P-6	88+00W; 107+90N	208	-84	651 m	150 m	Test 89-262, 90-272 mineralized trend; downdip of 89-272	262 Felsics
P-7	88+85W; 106+74N	208	-78	665 m	165 m	Test 89-262, 90-272 mineralized trend	262 Felsics
P-8	89+68W; 107+10N	208	-75	684 m	200 m	Test 89-262, 90-272 mineralized trend; downdip of 89-262	262 Felsics
P-9	91+00W; 106+00N	208	-75	697 m	160 m	Test lateral extent of mineralization in DDH89-262	262 Felsics
P-10	93+00W; 105+10N	208	-80	717 m	230 m	Test 262 Felsic Package	262 Felsics
P-11	94+38W; 104+24N	208	-75	706 m	150 m	Test 262 Felsic Package	262 Felsics

Table 1: Proposed Drilling - Lara Property (cont.)

Hole	Location	Collar			Depth	Target	Felsic Sequence
		Azimuth	Dip	Elevation			
P-12	96+80W; 104+38N	208	-65	714 m	140 m	Test 262 Felsic Package and a strong coincident IP (+20 millisec) and soil anomaly in area of mineralization and thick py cherts	262 Felsics
P-13	97+80W; 105+12N	208	-75	723 m	220 m	Test 262 Felsic Package downdip of DDH86-101, 104 in area of stringer mineralization and thick py cherts	262 Felsics
P-14	98+80W; 105+52N	208	-75	731 m	210 m	Test 262 Felsic Package in area of stringer mineralization and thick py cherts	262 Felsics
P-15	98+80W; 104+37N	208	-80	703 m	180 m	Test the 262 Felsic Package and a +20 millisec. IP anomaly in area of stringers and thick py cherts	262 Felsics
P-16	101+00W; 104+94N	208	-75	703 m	190 m	Test 262 Felsic Package	262 Felsics
P-17	103+60W; 105+44N	208	-70	693 m	170 m	Test 262 Felsic Package	262 Felsics
P-18	105+00W; 105+96N	208	-70	787 m	210 m	Test 262 Felsic Package	262 Felsics
P-19	107+00W; 104+45N	208	-45	657 m	115 m	Test 262 Felsic Package with a strong IP anomaly (+20 millisec.) downdip of Trench 34	262 Felsics
P-20	107+00W; 105+25N	208	-70	664 m	180 m	Test 262 Felsic Package downdip of Trench 34	262 Felsics
P-21	108+00W; 104+42N	208	-75	669 m	170 m	Test 262 Felsic Package with a strong IP anomaly (+20 millisec.)	262 Felsics
P-22	109+00W; 103+59N	208	-56	684 m	110 m	Shallow test of a strong VLF(Fraser Filter +20) and IP anomaly down plunge of Tr. 4 & Tr. 4a	262 Felsics
P-23	109+00W; 105+79N	208	-75	705 m	200 m	Test 262 Felsic Package	262 Felsics

Table 1: Proposed Drilling – Lara Property (cont.)

Hole	Location	Collar			Depth	Target	Felsic Sequence
		Azimuth	Dip	Elevation			
P-24	112+00W; 105+10N	208	-80	743 m	180 m	Test 262 Felsic Package	262 Felsics
P-25	114+00W; 103+40N	208	-50	715 m	150 m	Test 262 Felsic Package with strong Cu humus anomaly	262 Felsics
				subtotal	4480 m	– 25 holes	
2. Upper Solly VLF/IP							
P-26	106+00W; 108+20N	208	-50	700 m	180 m	VLF/IP anomaly associated with altered andesite/ felsic contact	
P-27	108+00W; 107+50N	208	-60	708 m	150 m	VLF/IP anomaly associated with altered andesite/ felsic contact	
P-28	111+00W; 107+65N	208	-45	760 m	150 m	VLF anomaly – strike extent of holes P26, P27	
				subtotal	480 m	– 3 holes	
3. Recce IP							
P-29	96+00W; 93+00N	208	-45	590 m	200 m	IP chargeability high associated with Fourth Lake volcaniclastics and disseminated pyrrhotite, chalcopyrite	
				subtotal	200 m	– 1 hole	
				TOTAL	5160 m	– 29 holes	

Proposed Hole	Grid location
	from collar 90-286 (L74) go 108.00m on
P1 ✓	East Grid: ~74+00W : 028° Az ; to collar FS 208 ; BS 28° ; -75°
	from Collar 90-290 (L78) go 120.00m on 028°
P3 ✓	East Grid: ~78+00W: Az to collar ; FS 208 ; BS 28° ; -75°
	from Collar 90-276 (L81W) go 111.00m on 028°
P4 ✓	East Grid: ~81+00W; Az to Collar ; FS 208 ; BS 28° ; -70° (138)
	from Collar 90-274 (L83W) go 110.00m on 028°
P5 ✓	East Grid: ~83+00W; Az to Collar FS 208° ; BS 28° ; (130)
	West Grid
	Survey Grid: 97+80W ; 105+12N ; FS 208° ; BS 208° ; -75°
P13 ✓	West Grid:
	Survey Grid: 98+80W ; 104+37N ; FS 208° ; BS 208° ; -80°
P15 ✓	West Grid:
	Survey Grid: 98+80W ; 105+52N ; FS 208° ; BS, 208° ; -75°
P14 ✓	West Grid:
	Survey Grid: 101+00W ; 104+94N ; FS 208° ; BS 208° ; -75
P16 ✓	West Grid:
	Survey Grid: 103+60W ; 105+44N ; FS 208° ; BS 208° ; -70
P17 ✓	West Grid:
	Survey Grid: 105+00W ; 105+96N ; FS 208° ; BS 208° ; -70°
P18 ✓	West Grid:
P6	
P7	
P8	
P9	

Roy - changes on Oct 9/90

P-4 - 138m back of 276 in 111
P-5 - 130m " " 274 110

① 1st drill to start October 12 (Friday)

② Backhoe to start October 9 (Tuesday)

We will have to do P1, P3, P4, P5 first with the backhoe; then P13 - P15 - P14 - P16 - P17 - P18

1st drill hole will be on P13

When the second drill comes in on October 15 it will do P1, 3 4 + 5 if there's any water

Tuve Thickness Ash + Chert

P1	90-298	0.00m
P2	90-308	6.00m
P3	90-300	6.00m
P4	90-304	14.00m
P5	90-306	12.00m
P6		
P7	90-314	
P8	90-312	
P9	90-310	8.00m
P10	90-309	9.00m
P11	Scratch	
P12	Scratch	
P13	90-297	17m
P14	90-301	2m
P15	90-299	12m
P16	90-302	11m
P17	90-307	6m
P18	90-305	22m
P19	SCRATCH	
P20	90-313	
P21	SCRATCH	
P22	9-311	0m

P37/300

0.00-9.10	O.B.
9.10-35.25	Diorite (Pauls)
35.25-50.97	Heterolithic Breccia
50.97-133.10	Felsic Lapilli Tuff - Dome.
133.10-147.29	Andesite Lithic Tuff
147.29-196.15	Felsic Lapilli Tuff
196.15-209.00	Andesite Lithic Tuff
209.00-223.44	Felsic Tuff 1-2% disseminated pyrite
223.44-227.40	Intermediate Tuff 1-2% disseminated pyrite, trace chalcopyrite.
227.40-237.95	Intermediate Ash trace disseminated pyrite
237.95-243.85	Felsic-Intermediate Ash, minor interbedded chert; 2-3% very fine grained, syngenitic pyrite;
	233.35 - 233.77; 50% medium to coarse grained pyrite, 3% chalcopyrite.
243.85-260.38	Intermediate Lithic Tuff
	249.05 - 249.48; 45% medium to coarse grained pyrite, 1-2% chalcopyrite.
260.38-	Andesite Lithic to Crystal Lithic Tuff;

POWER LINE

LCP UGLY

LCP TL

LCP SOLLY

LCP JENNIE

LCP PLANT

FALCONBRIDGE

LARA

ANDESITE

262 FELSICS

262 ANDESITE

CZ FELSICS

DIORITE

ARGILLITE

NANAIMO SEDIMENTS

HANGING WALL ZONE

CORONATION ZONE

CORONATION EXTENSION ZONE

HIGH GRADE POD

TRENCH 4
MS(1.41%Cu /2.7m)

TRENCH 84
MS(0.48%Cu grab)

TR31

Bl. 100mW

115mW

110mW

105mW

100mW

95mW

90mW

P-28 P-27 P-26 P-25 P-24 P-23 P-22 P-21 P-20 P-19 P-18 P-17 P-16 P-15 P-14 P-13 P-12 P-11 P-10 P-9 P-8 P-7 P-6

CH-107 CH-117 CH-116 CH-119 CH-19

(MS:1.4%Cu/1.14m)

(MS:2.37%Cu/0.71m)

R151 Creek

N

inches
0 1 2
centimetres
0 1 2 3 4 5

BRITISH COLUMBIA GEOLOGICAL SURVEY

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

LEGEND

- VLF Anomaly
- HUMUS (Cu, Zn Anomaly)
- Diamond Drill Hole Horizontal Projection
- P-10 Proposed Diamond Drill Hole Location

MINNOVA Inc.

LARA PROPERTY

SOUTH SHEET

COMPILATION
GEOLOGY, GEOCHEMISTRY, GEOPHYSICS
262 ZONE

0 50 100 150 200 250m
SCALE: 1:5000

N.T.S.	92B/13W	SCALE: 1:5000	FIG. No. 3
DATE:	SEPTEMBER 1990	REVISED:	
DRAWN BY:	CDN/kg	FILE: LARSOUTH.DWG	