DIAMOND DRILLING REPORT

ON THE

BLACKWATER-DAVIDSON PROPERTY

Omineca Mining Division

British Columbia

NTS: 93F/2

Latitude: 53° 11'N

Longitude: 124° 48'W

For

Granges Inc.

By

Gordon J. Allen, P. Geo.

January, 1993

Province of British Columbia | Ministry of Energy, Mines and Petroleum Resources

ASSESSMENT REPORT TITLE PAGE AND SUMMARY

TYPE OF REPORT/SURVEY(S)	TOTAL COST
DIAMOND DRILLING	$197,190

AUTHOR(S) GORDON J. ALLEN SIGNATURE(S) Gordon J. Allen

DATE STATEMENT OF EXPLORATION AND DEVELOPMENT FILED OCT. 15, 1992 YEAR OF WORK 1992

PROPERTY NAME(S) BLACKWATER - DAVIDSON

COMMODITIES PRESENT Au, Ag, Zn

B.C. MINERAL INVENTORY NUMBER(S), IF KNOWN 37 ON 93F

MINING DIVISION OMINECA NTS 93 F/2

LATITUDE 53° 11′ N LONGITUDE 124° 48′ W

NAMES and NUMBERS of all mineral tenures in good standing (when work was done) that form the property [Examples: TAX 1-4, FIRE 2 (12 units); PHOENIX (Lot 1706); Mineral Lease M 123; Mining or Certified Mining Lease ML 12 (claims involved)]:

DEB 1 (20 UNITS), MIRE (12 UNITS), MO (12 UNITS), GEORGE (6 UNITS), FAW 3(20), FAW 4 (20), FAW 11 (12), FAW 5 (20), FAW 1 (20), FAW 6 (18), FAW 12 (1), FAW 13-15 (@1 UNIT), FAW 2 (20), FAW 7 (16), FAW 8 (20), FAW 9 (12), FAW 10 (12), PEM (20 UNITS), NOODLE (20), KEN (20)

OWNER(S)

(1) GRANGES INC. (2)

MAILING ADDRESS

2300 - 885 W GEORGIA ST.
VANCOUVER, B.C. V6C 3E8

OPERATOR(S) (that is, Company paying for the work)

(1) GRANGES INC. (2)

MAILING ADDRESS

SUMMARY GEOLOGY (lithology, age, structure, alteration, mineralization, size, and attitude):

Intercalated andesite, rhyolite and sedimentary rocks possibly of the Upper Cretaceous to Eocene Ootsa Lake Group have been mineralized with disseminated sphalerite, pyrite, pyrrhotite, and minor galena, arsenopyrite and chalcopyrite. The mineralized zone has been cut by a series of closely-spaced northwest-trending faults.

REFERENCES TO PREVIOUS WORK ALLEN, 1992; TIPPER, 1962

TYPE OF WORK IN THIS REPORT	EXTENT OF WORK (IN METRIC UNITS)	ON WHICH CLAIMS	COST APPORTIONED
GEOLOGICAL (scale, area)			
Ground	3,035.25 hectares	All claims	46,722
Photo			
GEOPHYSICAL (line-kilometres)			
Ground			
Magnetic			
Electromagnetic			
Induced Polarization			
Radiometric			
Seismic			
Other			
Airborne			
GEOCHEMICAL (number of samples analysed for ....)			
Soil		PEM	
Silt	SLUDGE 90 - AU, ICP	"	1,395
Rock	CORE - 520 - AU & AG ASSAY, ICP	"	7,956
Other	CORE - WHOLE ROCK (24)	"	1,080
DRILLING (total metres; number of holes, size)	5 HOLES, 785.5m, NQ		
Core		PEM	37,082
Non-core		PEM	81,657
RELATED TECHNICAL			
Sampling/assaying			
Petrographic	29 POLISHED + REGULAR THIN SECTIONS	PEM	2,258
Mineralogic			
Metallurgic			
PROSPECTING (scale, area)			
PREPARATORY/PHYSICAL			
Legal surveys (scale, area)			
Topographic (scale, area)			
Photogrammetric (scale, area)			
Line/grid (kilometres)	25.6 Km	PEM, NOODLE, DEB	18,840
Road, local access (kilometres)			
Trench (metres)			
Underground (metres)			
		TOTAL COST	$127,190

FOR MINISTRY USE ONLY	NAME OF PAC ACCOUNT	DEBIT	CREDIT	REMARKS:
Value work done (from report)				
Value of work approved				
Value claimed (from statement)				
Value credited to PAC account				
Value debited to PAC account				
Accepted .... Date	Rept. No.			Information Class

SUMMARY

The primary purposes of this program were to drill-test chargeability anomalies on the Pem grid, and to expand the grid in areas with unclosed chargeable zones. Between November 5 and December 2, 1992, 758 m of NQ diamond drilling and 25.6 km of line cutting were completed.

Four of five priority-one drill targets were tested with five holes. These holes intersected sedimentary rocks in the westernmost site, and intermixed felsic and intermediate volcanic rocks closer to the previously defined gold zone. Most volcanic rocks close to the gold zone contained disseminated sulphides consisting of an average of 3-4% sphalerite, 1-3% pyrite and/or pyrrhotite, and traces of galena, arsenopyrite and chalcopyrite. Zones with elevated gold content occur both in felsic (0.63 g/t or 0.018 oz/t across 76 m; hole BD 92-33) and intermediate (0.72 g/t or 0.021 oz/t across 47.5 m; BD92-35) volcanic rock hosts. Mineralization and gold distribution do not appear to be lithologically controlled.

Drill hole DAV-11 was relogged and it appears that the highest-grade gold mineralization is shear-hosted. Mineralization intersected in this year's drilling was predominantly disseminated. It is possible that widespread disseminated sulphides occur peripheral to gold-bearing shear zones. These shears may not contain sufficient volume of sulphides to be clearly outlined in an IP survey.

The existence of northwest-trending faults in the mineralized zone as interpreted from magnetic and VLF data have been tentatively confirmed. They appear to dip steeply to the southwest. Units in the gold zone have been cut by closely-spaced faults which have juxtaposed alternating slices of felsic and intermediate volcanic rocks. These faults do not appear to be related to mineralization. They cut all noted mineralized rocks but show no signs of veining or of localization of mineralization.

Faulting has confused the stratigraphy such that bedding orientations are still unclear.

The zone with disseminated sulphide mineralization hosting the gold and silver zones is a significant feature, the limits of which are not defined. It is still possible that this zone contains ore-grade gold-bearing intervals, or that it is peripheral to a higher-grade shear-hosted deposit. The sulphide zone should be defined and better tested with a minimum of 1,500 m of diamond drilling.

TABLE OF CONTENTS

APPENDICES

LIST OF FIGURES

1.0 INTRODUCTION

1.1 Program Objectives

The main objective of this program was to drill-test the first priority targets as outlined in the Recommendations section of the Geology, Geochemistry and Geophysics Report on the Blackwater-Davidson Property (G. Allen, November 1992). These targets were primarily chosen to test chargeability anomalies, some with coincident soil geochemistry anomalies, as outlined in the previous programs.

1.2 Work Completed

Between November 5 and December 2, 1992, a total of 166 mandays (Granges employees only, including mobe and demobe) were spent in the field on this project.

1.2.1 Diamond Drilling

A total of 758.47 m (2,577') of drilling was completed in five holes, testing four of the five priority 1 targets.

1.2.2 Line Cutting

The Pem grid was expanded in areas with unclosed IP anomalies. This expansion consisted of:

- Lines 21, 22, 23, 24 and 25+00W on the Pem grid from 10+00S to 10+00N.
- Lines 2, 4, 6 and 8+00W on the Pem grid from the 10+00S tie line to 30+00S.
- Lines 1+00W, 1+00E and 3+00E on the Pem grid from the Pem 10+00S tie line to the Deb grid base line.
- Line 15+00W on the Deb grid (Pem Grid 0+00W) from the Deb 0+00 BL to the 30+00S Pem tieline (~750 m).

The linecutting outlined above including tie lines and baselines (Figure 10) totals 25.6 km. Approximately 22 km of crosslines have been chained and picketed, and are ready for geophysical surveying and soil sampling.

1.2.3 Surveying using a GPS Unit

To better define the claim locations and positions of the grids, several claim posts, grid points and all drill collars were surveyed using a Magellan 5000 GPS unit (Figure 9). The Magellan 5000 is a survey instrument which uses signals from satellites to calculate a position. Data are included in Appendix V.

1.2.4 Reclamation

Several debris piles from previous road-building and clearing activities were burned and levelled. The old camp was levelled and garbage buried. Felled and damaged trees along road sides in the vicinity of the drill sites were bucked and knocked down onto the ground as much as possible. All new roads, drill sites and the new camp were seeded with a 2:1 mixture of Timothy and Alsike clover.

This reclamation work covered an estimated 29,300m^2.

1.3 Location and Access

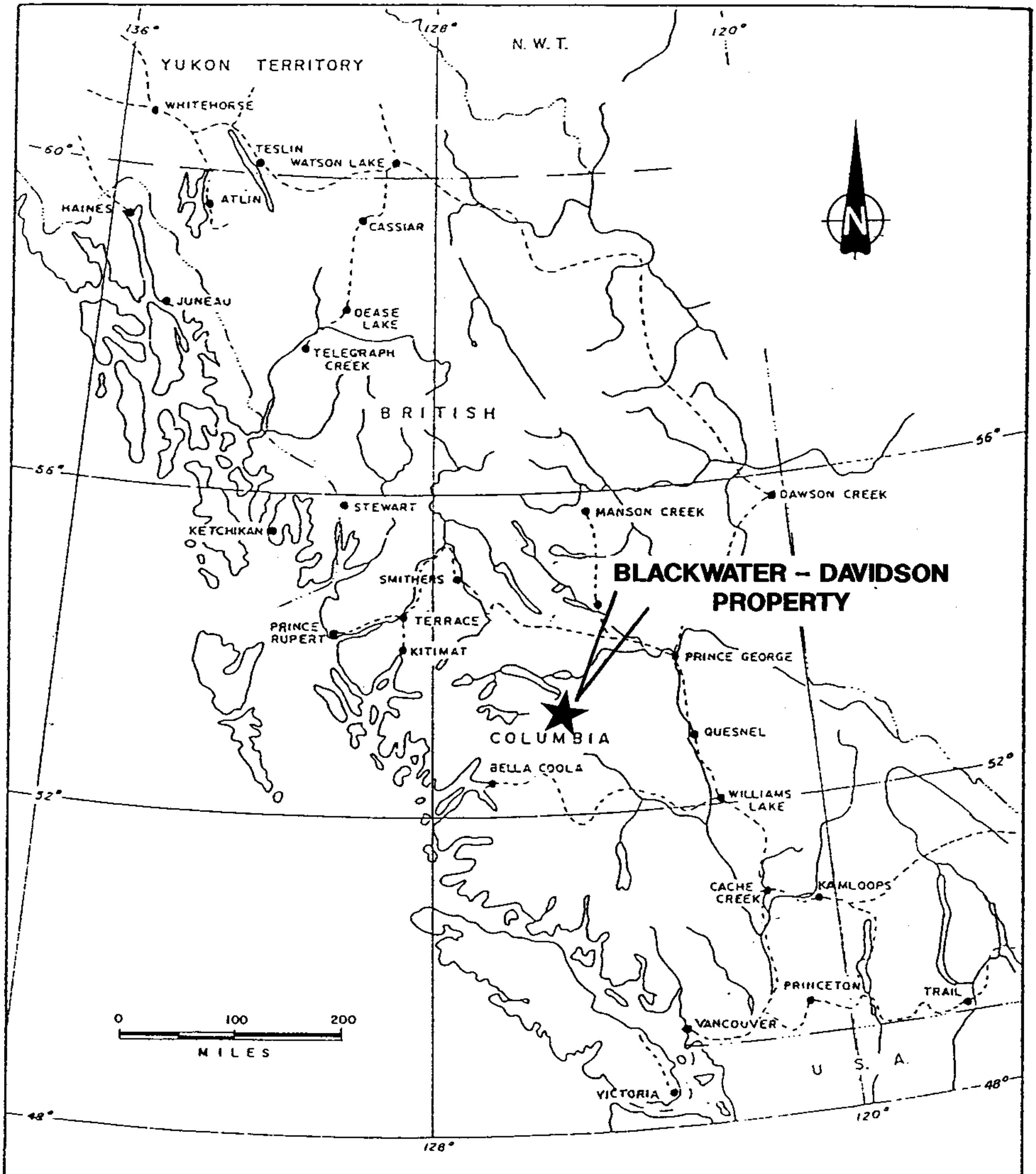
The property is accessed from Vanderhoof via the all-weather Kluskus main logging road (Figure 1a and 1b). At kilometre 146.5 on the Kluskus road a 4-wheel drive road heads off to the east for approximately 17 km to the camp. Driving time from Vanderhoof to the property is between 3 and 4 hours.

1.4 Property Ownership and Claim Information

The Blackwater-Davidson property is wholly-owned by Granges Inc. It consists of 22 claims totalling 304 units (Figure 2).

Claim information is summarized in the following table. Expiry dates shown do not include possible extensions as a result of assessment work covered by this report:

Claim No.	Claim Name	Claim Size Units	Due Date
238431	Deb No.1	20	June 19/95
239667	Mike	12	Aug. 31/95
239668	Mo	12	Aug. 31/95
239669	George	6	Aug. 31/95
306471	Faw 3	20	Nov. 18/95
306472	Faw 4	20	Nov. 18/95
306479	Faw 11	12	Nov. 19/95
306473	Faw 5	20	Nov. 21/95
306469	Faw 1	20	Nov. 22/95
306474	Faw 6	18	Nov. 22/95
306480	Faw 12	1	Nov. 23/95
306481	Faw 13	1	Nov. 23/95
306482	Faw 14	1	Nov. 23/95
306483	Faw 15	1	Nov. 23/95



BLACKWATER–DAVIDSON PROPERTY

LOCATION MAP

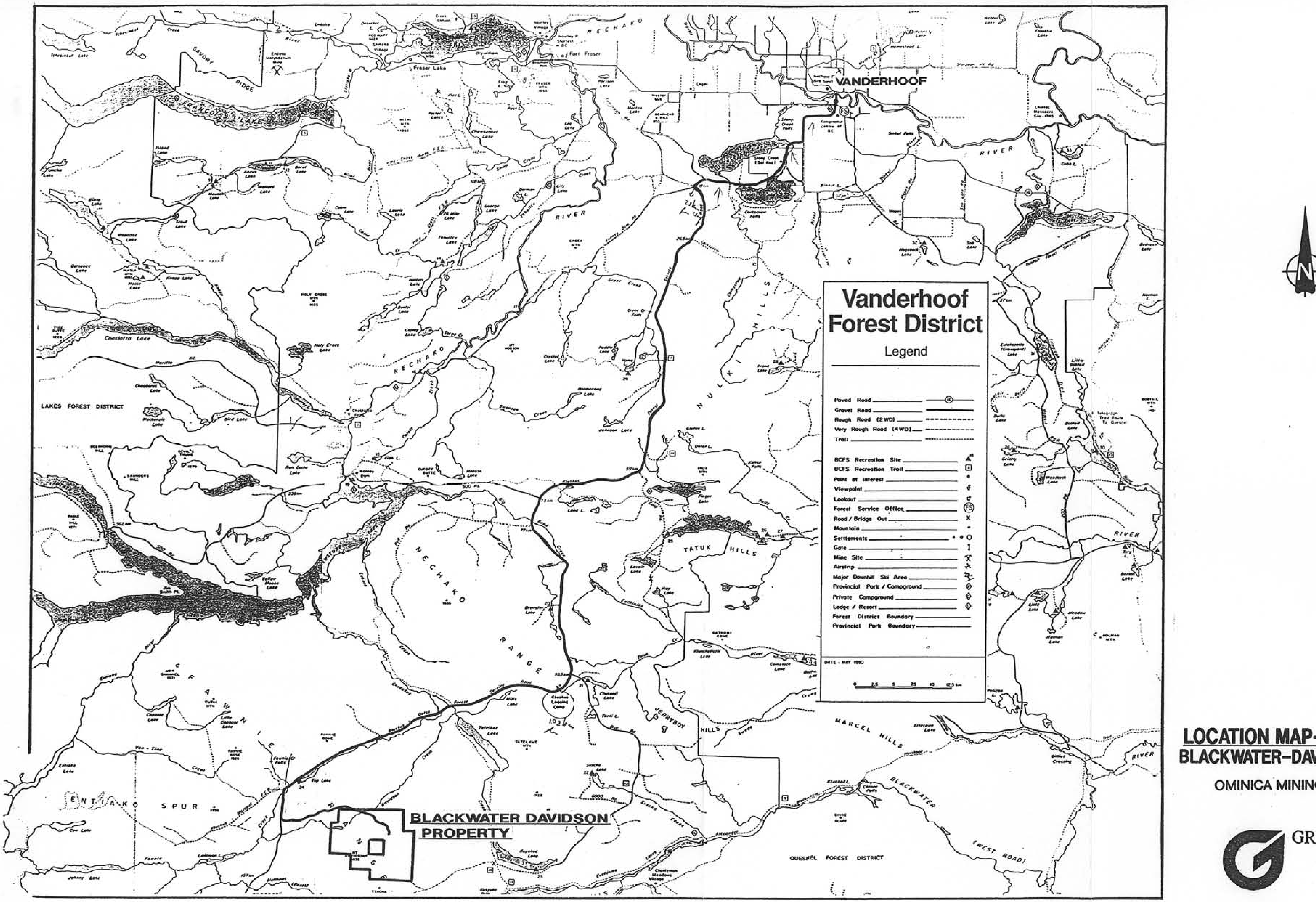
GRANGES INC.

N.T.S. 93 F/2

SCALE: as shown

DATE: JAN. 1993

FIGURE: 1 a

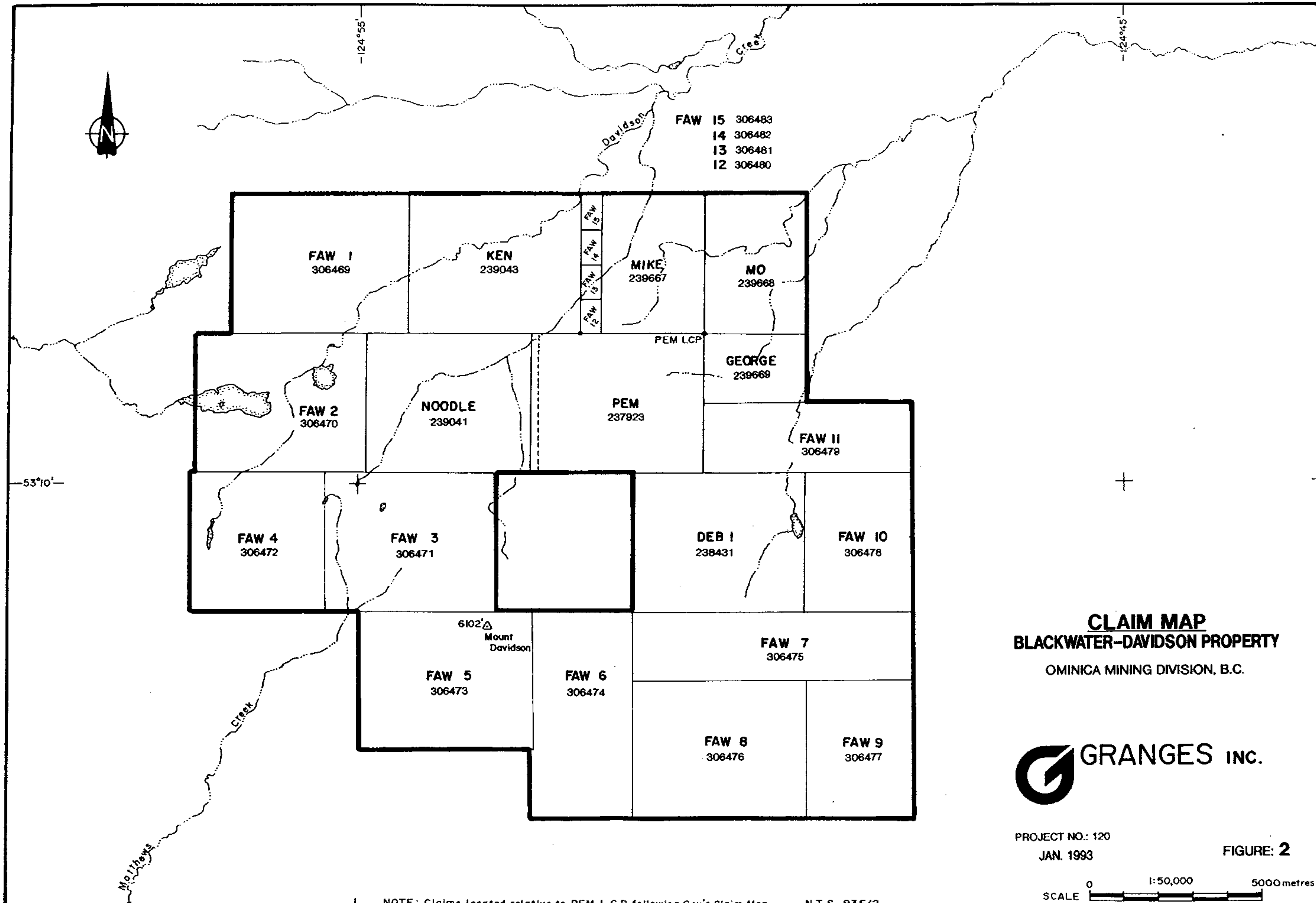


LOCATION MAP-ROAD ACCESS
BLACKWATER-DAVIDSON PROPERTY

OMINICA MINING DIVISION, B.C.

GRANGES INC.

JAN. 1993 FIGURE: **1b**


124°55'
124°45'
53°10'
N
Davidson
Creek
Matthews
Creek
FAW 15 306483
14 306482
13 306481
12 306480
FAW 1
306469
KEN
239043
FAW 15
FAW 14
FAW 13
FAW 12
MIKE
239667
MO
239668
PEM LCP
GEORGE
239669
FAW 2
306470
NOODLE
239041
PEM
237923
FAW 11
306479
FAW 4
306472
FAW 3
306471
DEB 1
238431
FAW 10
306478
6102'
Mount
Davidson
FAW 5
306473
FAW 6
306474
FAW 7
306475
FAW 8
306476
FAW 9
306477
CLAIM MAP
BLACKWATER-DAVIDSON PROPERTY
OMINICA MINING DIVISION, B.C.
GRANGES INC.
PROJECT NO.: 120
JAN. 1993
FIGURE: 2
SCALE 0 1:50,000 5000 metres
NOTE: Claims located relative to PEM L.C.P. following Gov't Claim Map.
N.T.S. 93F/2

Claim No.	Claim Name	Claim Size Units	Due Date
306470	Faw 2	20	Nov. 24/95
306475	Faw 7	16	Nov. 24/95
306476	Faw 8	20	Nov. 24/95
306477	Faw 9	12	Nov. 24/95
306478	Faw 10	12	Nov. 24/95
237923	Pem	20	Mar. 18/98
239041	Noodle	20	Oct. 23/98
239043	Ken	20	Oct. 31/98
	Total Units:	304	

1.5 Previous Work

A summary of previous work programs conducted on the property is given below. Descriptions of programs conducted between 1973 and August 1987 are extracted from a report by Haynes (1990):

1973	Results of the Tahtsa regional silt survey for porphyry copper mineralization, located anomalous silver, lead and zinc in the Mt. Davidson area. A wide spaced soil sample survey was carried out northeast of Mt. Davidson.
Sept. 1976	Soil sample and ground magnetometer surveys follow-up of 1973 soil results.
Mar. 1977	Staking of the Pem claim. Pulse EM survey on the Pem claim.
Nov.-Dec. 1979	Vector Pulse EM survey on the Pem claim.
Feb. 1981	Helicopter EM and magnetometer survey.
June 1981	Staking of the Deb #1 claim.
Aug. 1981	Horizontal Loop EM survey on the Deb #1 claim.
Nov. 1981	Reconnaissance mapping Mt. Davidson area.
July 1982	Soil sample and ground magnetometer surveys on the Pem claim.
July 1983	Hammer seismic survey.
Sept. 1984	Hand trenching and VLF survey on the Pem claim.

Aug. 1985	Winkie drilling (21.64 m) on the Pem claim. Holes Dav 1-2.
Sept. 1985	Diamond drilling (485.38 m) on the Pem claim. Holes Dav 3-8.
Oct. 1985	Staking of the Noodle and Ken claims.
July-Aug. 1986	Construction of access road.
Sept. 1986	Percussion drilling (1524 m) on the Pem claim. RC 1-34.
July-Nov. 1987	Diamond drilling (2724.61 m) on the Pem claim. Holes 9-31.
Aug. 1987	Staking of Mike, Mo and George claims.
Nov. 1987	Staking of Faw 1-15 claims (194 units) peripheral to older claim blocks.
July-Aug. 1992	Pem grid expanded and soil sampled. Deb grid soil sampled. Geological mapping was conducted on the property and surrounding area. IP, mag and VLF surveys conducted over the entire Pem grid and part of the Deb grid. Stream sediment samples were collected from every significant drainage on the property.

1.6 Logistics

This drilling program was conducted out of a camp constructed on the property in the vicinity of 6+00W, 3+00N. The camp was constructed and maintained by the drilling contractor (J.T. Thomas; subcontracted to Pellow Construction, Smithers). Camp consisted of:

- 5 14'x 16' sleeping tents (one doubling as an office) with a combined capacity of 18 persons.
- 1 kitchen/dining tent
- 1 dry
- 1 core shack
- 1 core cutting shack.

All tents have wooden frames, plywood floors, and 4' plywood walls. The frames have been left standing (without tents) on site and are Granges' property.

The access road to the property has been barricaded with large boulders at Davidson Creek to prevent vandalism of the camp. A cat would be needed to open the road prior to commencement of any future programs.

2.0 GEOLOGY

2.1 Regional Geology

The Blackwater-Davidson property is in Stikinia Terrane, an allochthonous oceanic arc within the Intermontane Belt (Andrew, 1985; Monger, et al, 1982).

Only limited regional government mapping has been conducted in the property area. This overview of the regional geology is based largely on a map compiled by Tipper, Campbell, Taylor and Stott (1974; Parsnip River, Map 1424A), data from which was subsequently used to construct a geological base for the mineral inventory map (Figure 3).

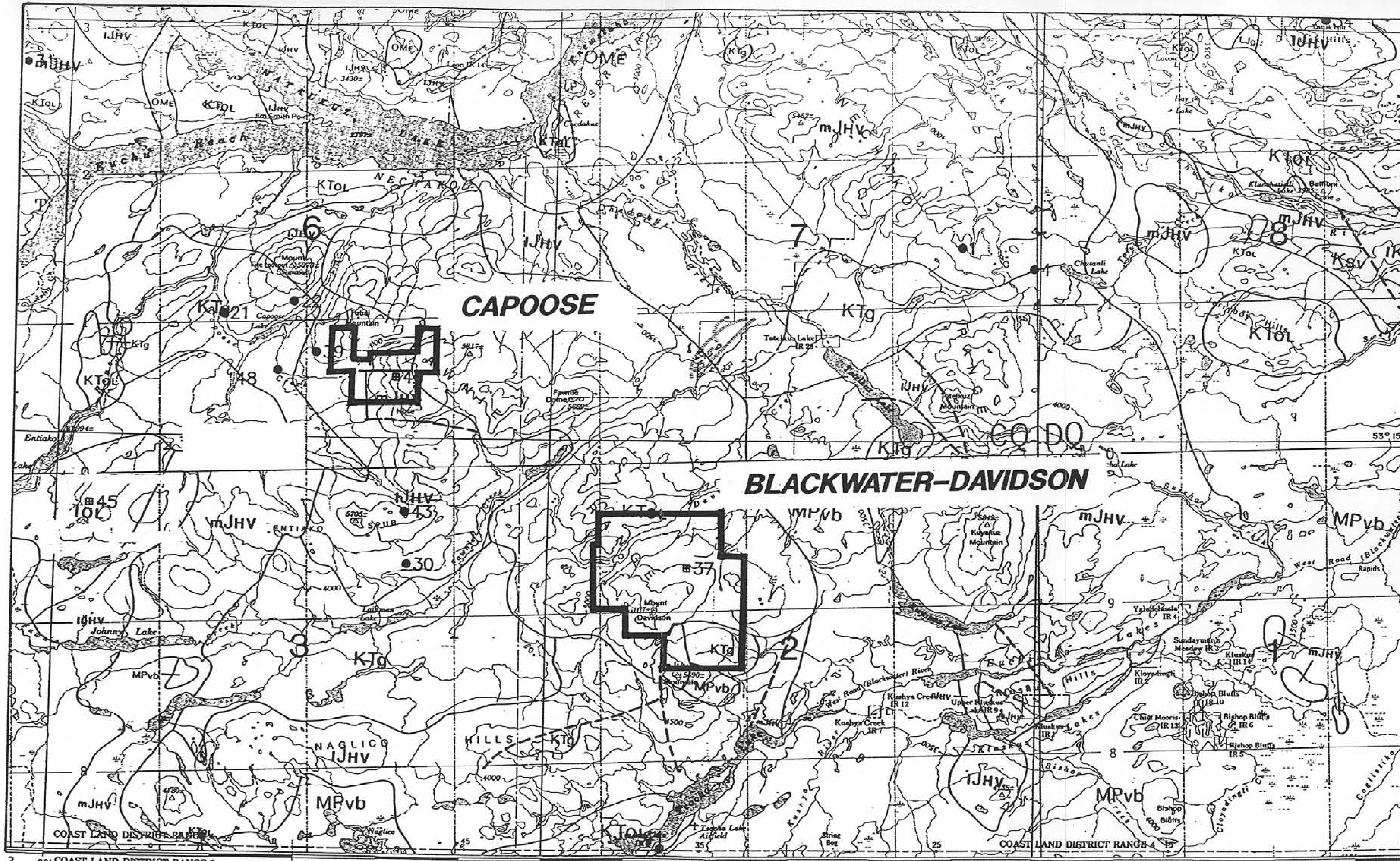
The region is largely underlain by rocks of the Lower to Middle Jurassic Hazelton Group. This group of rocks has been sub-divided into a lower sedimentary unit, a middle unit of andesitic to rhyolitic volcanic rocks, and an upper unit of intercalated mafic to intermediate volcanic and sedimentary rocks.

These rocks have been intruded by stocks of the Upper Cretaceous to Eocene (Tipper, et al, 1974) Quanchus Intrusions which range in composition from granite to diorite.

Overlying and probably in part crosscutting the Hazelton Group are rocks of the Upper Cretaceous to Tertiary Ootsa Lake Group. This group consists largely of felsic volcanic rocks intercalated with lesser amounts of intermediate volcanic and sedimentary rocks.

These rocks, which now appear to occur in isolated patches due to partial cover by younger overlying andesite flows and olivine plateau basalts, may have formed a relatively continuous cover along a northwest-trending belt over 300 km long. Volcanic rocks in the Ootsa Lake Group are probably coeval with the Quanchus Intrusions and may be their extrusive equivalents. It is felt that these volcanic rocks formed, at least in part, in caldera settings (Andrew, 1985).

Overlying all of the above mentioned rocks are andesitic to basaltic flows of the Oligocene and Miocene Endako Group.



0 5 10 15 20
KILOMETRES
SCALE: 1 : 250,000

For Legend see Figure: 3b

REGIONAL GEOLOGY
BLACKWATER-DAVIDSON PROPERTY

Province of British Columbia
Ministry of Energy, Mines and Petroleum Resources

MINFILE MAP 093F
NECHAKO RIVER
MINERAL OCCURRENCE MAP

FIGURE: 3a
JAN. 1993

GEOLOGICAL LEGEND

STRATIFIED ROCKS

TERTIARY

MIOCENE AND PLIOCENE

MPvb	*Olivine basalt flows, breccia, tuff*

OLIGOCENE AND MIOCENE

OME	**ENDAKO GROUP:** *Andesite, basalt, dacite*

UPPER CRETACEOUS AND LOWER TERTIARY

KToL	**OOTSA LAKE GROUP:** *Rhyolite, dacite, trachyte, sandstone, shale, conglomerate*

CRETACEOUS

Ksv	*Andesite, tuff, breccia, argillite, arkose, conglomerate*

LOWER CRETACEOUS

lKs	**SKEENA GROUP:** *Conglomerate, greywacke, shale, coal, volcanic breccia*

JURASSIC

MIDDLE JURASSIC

mJHV	**HAZELTON GROUP** *(part), undivided; basalt, andesite, tuff, breccia, greywacke, mudstone, conglomerate*

LOWER JURASSIC

lJHV	**HAZELTON GROUP** *(part): Andesitic to rhyolitic tuff, breccia, flows, sediments*
lJHS	**HAZELTON GROUP** *(part): Shale, conglomerate, greywacke*

UPPER TRIASSIC AND LOWER JURASSIC

TRJT	**TAKLA GROUP:** *Andesite, basalt, tuff, breccia, conglomerate, greywacke, shale, limestone*

TRIASSIC

UPPER TRIASSIC

uTRC	*Limestone*

PLUTONIC ROCKS

TERTIARY

Tg	*Granodiorite, quartz diorite, quartz monzonite*

CRETACEOUS AND/OR TERTIARY

KTg	**QUANCHUS INTRUSIONS:** *Granodiorite, quartz diorite, diorite, granite*

JURASSIC

LATE JURASSIC (in whole or in part)

LJg	*Granite, granodiorite, diorite*

Geological legend and base derived from:

Tipper, H.W., R.B. Campbell, G.C. Taylor and D.F. Stott (compilers)(1974): *Parsnip River, Sheet 93;* Geological Survey of Canada, Map 1424A, 1:1,000,000

Tipper, H.W. (1963): *Nechako River;* Geological Survey of Canada, Map 1131A (Memoir 324), 1:253,440

To accompany Figure: 3a

JAN. 1993

FIGURE: **3b**

The youngest rocks in the region are extensive flows of Miocene and Pliocene olivine basalt, possibly oceanic in origin.

No structural interpretation has been made on the map by Tipper, et al. From mapping done in the Blackwater-Davidson property area, air photo interpretation and from distribution of lithologic units, it appears that the area has been cut by a series of northeast-trending faults. Slickensided shear surfaces observed in the field suggest that they are strike slip faults.

These faults occur along prominent linear valleys and appear to be the most recent and prominent structural features in the region. They affect contacts with the youngest basalt flow rocks in the area, but it is unclear if the flows are following paleo-topography defined by faults, or if faults actually cuts these rocks as well.

The Blackwater-Davidson property area will be included in a regional mapping project currently being conducted by Dr. L. Diakow of the B.C.G.S. Understanding of the geology of the area will undoubtedly be greatly enhanced by this work.

2.2 Economic Setting

The Blackwater-Davidson property is located 15 km southwest of the Capoose prospect and 30 km east of the Wolf prospect (Figure 3). The Equity silver mine lies 145 km northwest of the property, within the same terrane.

Ages of these deposits or prospects fall within the range of ages of the Quanchus Intrusions. Much of the mineralization in the region, therefore, is probably genetically linked to this group of intrusions.

2.2.1 Capoose Prospect

The Capoose property covers a large low-grade silver prospect with an estimated reserve of 28.3 million tonnes grading 36.0 g/t silver and 0.30 g/t gold (Annual Report to the Securities Exchange Commission, Washington, D.C.; File number 1-9025, December 31, 1987. Also; Haynes, 1990). Mineralization in two of the three zones consists of disseminated pyrite, sphalerite, galena, chalcopyrite and arsenopyrite hosted in Late Cretaceous Maatrichtian rhyolite sills (dated at 68.4 to 70.3 ma) intruding Lower to Middle Jurassic Hazelton Group volcanic and sedimentary rocks (Andrew, 1985). The rhyolite sills are coeval with the Capoose batholith (part of the Quanchus Intrusions) which has been dated at 67.1 ma (Haynes, 1990).

K. Andrew (M.Sc. thesis, U.B.C., 1985) felt that sulphides were deposited as a result of circulating fluids caused by the emplacement of the rhyolite sills, giving the mineralization an age of roughly 68 ma. Tom Schroeter (B.C.G.S.), however, thought that dating of alteration minerals related to the mineralization at Capoose, gave an age of 49 ma (pers. comm.). This would suggest that mineralization at the Capoose and Wolf properties formed at approximately the same time.

2.2.2 Wolf Prospect

The Wolf prospect is a classic near-surface (100 m) epithermal system hosted in Eocene Lutitian (50-42.1 ma) rhyolites of the Ootsa Lake Group (Andrew, 1985). Host rocks have been hydrofractured and cemented with opaline chalcedony, cut by bladed quartz veins (pseudomorphs after calcite, apparently indicative of boiling), and flooded with dark blue-grey chalcedony. "Electrum, native silver and silver sulphosalts occur as inclusions *in and adjacent to pyrite*" (Andrew, 1985) although no metallic minerals are visible in hand specimen. Rocks from the Wolf property are visually similar to those from the McLaughlin mine in California. (G. Allen, personal observation).

2.2.3 Equity Silver Mine

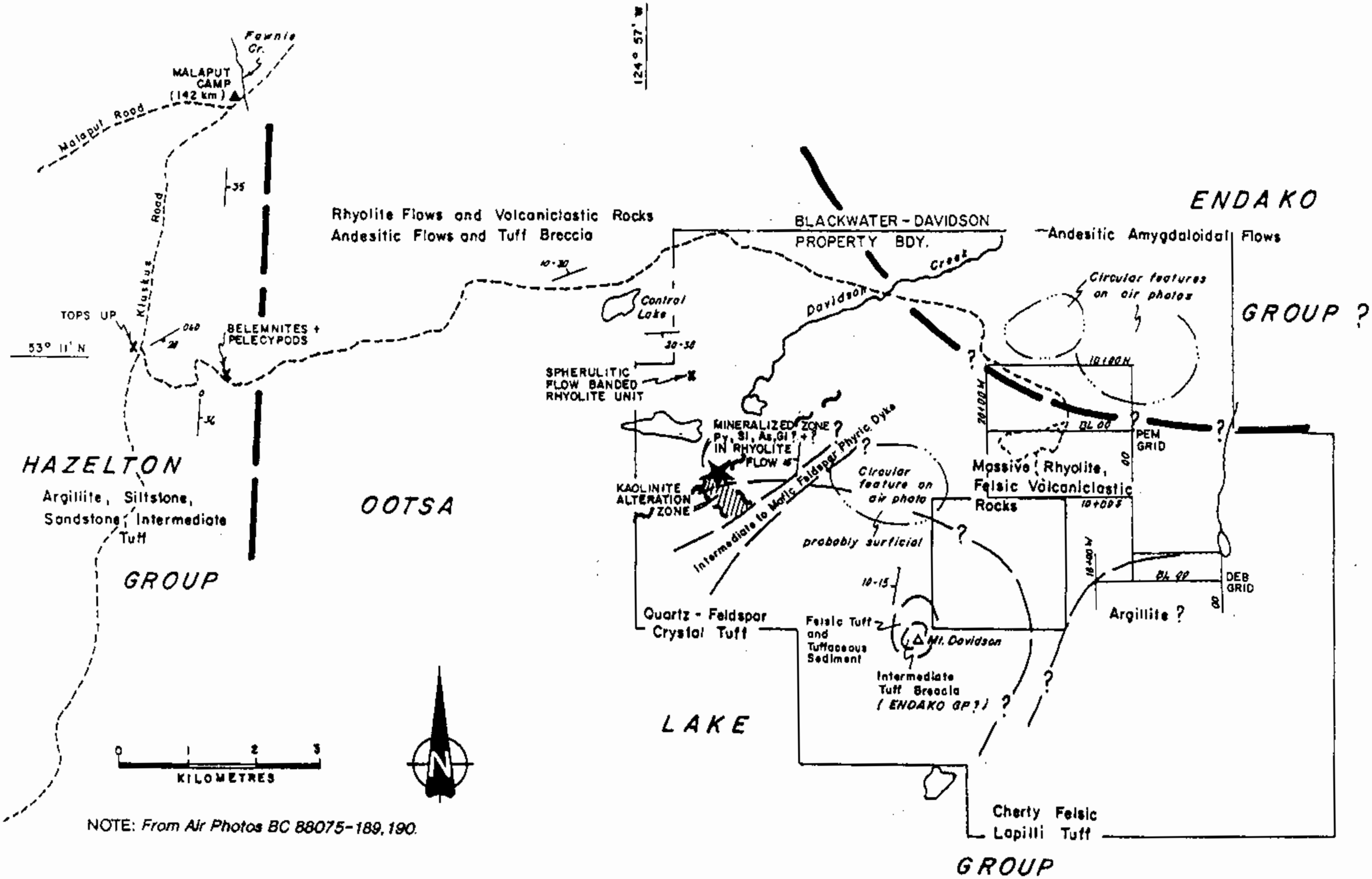
The Equity Silver deposit, which is discussed in detail by Cyr, Pease and Schroeter, 1984, occurred in three zones. The main ore zone was estimated to contain 21.6 million tonnes grading 109 g/t silver, 0.35% copper and 0.85 g/t gold.

Disseminated and fracture-related sulphides occur within an argillically altered dust tuff of the Upper Jurassic to Cretaceous Goosly sequence. Mineralization is thought to be related to emplacement of a quartz monzonite stock (dated at 58 ma) which caused fluid circulation within favourable permeable units.

Mineralization consists primarily of pyrite, chalcopyrite, tetrahedrite, pyrrhotite, arsenopyrite, sphalerite and galena, with minor native gold, bournonite, boulangerite and jamesonite.

2.3 Property Geology and Mineralization

The property is underlain by an intercalated sequence of felsic and intermediate volcaniclastic and flow rocks, and sedimentary rocks ranging from argillite to sandstone (Figure 4). These rocks have been described in the past as being part



GRANGES INC.

GENERAL GEOLOGY
BLACKWATER-DAVIDSON PROPERTY AND AREA

FIGURE: 4
G.A./OCT. 1993

of the Late Cretaceous to Tertiary Ootsa Lake Group. Dr. L. Diakow of the B.C.G.S. is currently mapping this area and he feels that they are post Callovian (ie. younger than 161my), possibly Cretaceous in age but probably not part of the Ootsa Lake Group (pers. comm). Rocks of the Ootsa Lake Group apparently typically contain 1% biotite, whereas the rocks in the Mt. Davidson area do not.

Bedding attitudes in these rocks are rare, but where observed are generally flat or dipping gently to the west.

The known mineralized zone on the property is hosted in a northeast-trending fault-bounded block roughly 5.75 km wide. Geophysical data from the previous program (Allen, 1992) suggest that the mineralized zone is cut by a closely spaced series of northwest-trending faults.

Mineralization consists of disseminated sphalerite, pyrite, ± pyrrhotite, galena, chalcopyrite, arsenopyrite and rarely tetrahedrite and boulangerite (the last two minerals identified in polished section only). Host rocks to the mineralization are phyllic (quartz, sericite) to potassic (quartz, biotite, sericite) altered felsic and intermediate volcanic rocks.

A more complete discussion of the geology of the property including lithology descriptions is presented in the Geology, Geochemistry and Geophysics report on the Blackwater-Davidson Property (Allen, 1992).

3.0 1992 DIAMOND DRILLING ON THE PEM GRID

A total of 785.47 m (2,577') of drilling was completed on the Pem Grid (Figure 5), producing 707.75 m (2,322') of NQ core. The drilling contractor was J.T. Thomas Diamond Drilling Ltd., of Smithers, B.C.

Acid tests were taken at approximately 30 m intervals. No tests were taken in holes BD92-32 and 33 due to lack of equipment.

All core was cut with a diamond saw and sampled in intervals generally less than two metres. Core was sampled in regular intervals unless distinct zones of mineralization or lithology were noted.

A total of 520 core samples were sent to CDN Resource Laboratories Ltd. of Burnaby where they were prepared and fire assayed for gold and silver. Pulps were forwarded to Acme Analytical Laboratories of Vancouver for 30-element ICP analysis. Sludge samples from return water were collected when possible (loss of return prevented collection of sludge samples in several holes). A total of 90 sludges were analyzed for gold (wet geochemistry) by CDN Labs and for 30 elements (ICP) by Acme Labs. Analyses are included in Appendix II.

Most volcanic units were sampled at least every 30 m (totalling 24 samples) and sent to X-Ray Assay Laboratories for whole rocks (major oxides and trace elements) analyses (Appendix III).

A total of 10 thin sections and 19 polished thin sections were sent to Dr. Craig Leitch for description and interpretation (Appendix IV).

Core recoveries were generally very good considering the extremely broken condition of some intervals. These good recoveries are probably due in a large part to the use of large quantities of drilling muds.

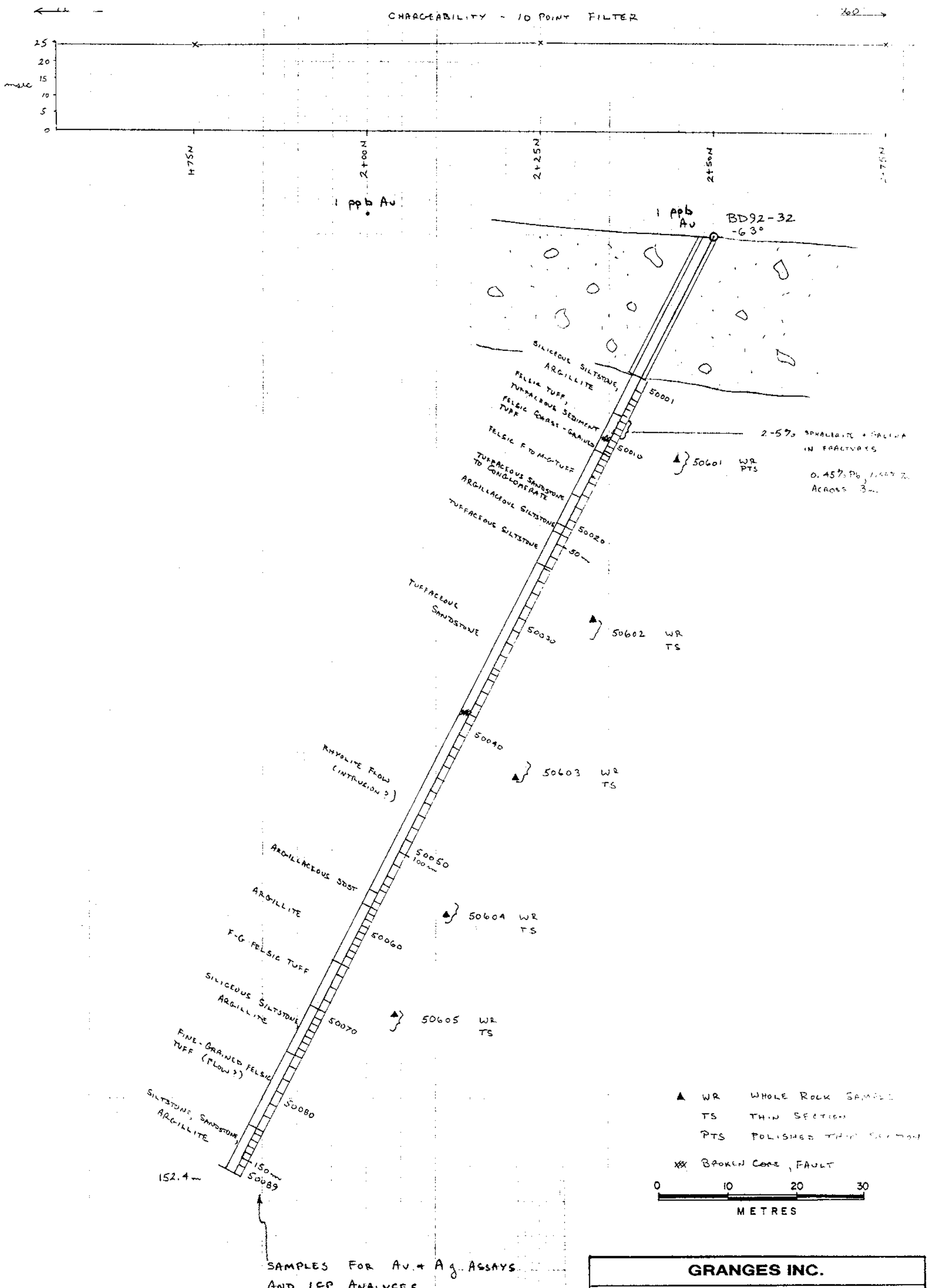
All holes were logged in detail on site and stacked on pallets for storage at the campsite (6+00W, 3+00N). In addition, drill holes DAV-11 and DAV-12 (1987) were relogged to put new drilling into perspective.

Hole locations are shown in Figure 5, and cross sections in Figures 6a-d. Drill logs are presented in Appendix I.

3.1 Discussion of Targets

Previous drilling programs on the Pem grid partially outlined two apparently discrete zones of mineralization; namely the Gold and Silver Zones. The Gold Zone is steeply dipping, up to 70 m across and contains sporadic intervals with greater than 1 g/t of gold. Drill hole DAV-11, intersected 14.28 g/t (0.416 oz/t) gold across 6.3 m, and 48.3 g/t (1.409 oz/t), gold across 1.3 m. The Silver Zone is interpreted to be a relatively flat-lying body up to 70 m thick containing an estimated 6 million tonnes grading 37 g/t silver and 0.05 g/t gold (Caelles, 1991). It is open at depth and to the north.

An IP survey conducted earlier in 1992 (Allen, 1992) outlined a rough bull's eye of high resistivity in the southwest part of the Pem grid (Figure 5). Chargeability highs occur peripheral to the core of this resistivity anomaly. It was postulated that collectively these anomalies may be defining a hydrothermal alteration zone with a silicified core, surrounded by a zone with disseminated sulphide mineralization. Both the gold and silver zones occur within this ring of chargeabilities. The best exploration targets were, therefore, thought to be the chargeable zones.



GRANGES INC.

BLACKWATER-DAVIDSON PROPERTY
PEM GRID

SECTION 20+00 W

BD 92-32

SCALE: 1 : 500	DATE: JAN. 1993
DATA BY: R. ZAWADA	
DRAWN BY: G.A.	FIGURE: 6a

Five zones of high chargeability, some with coincident high gold soil geochemistry, were chosen as first priority drill targets.

3.2 Drill Hole Summaries and Observations

Hole Number	Proposed Hole	Location	Dip	Azimuth	Depth (m)
BD92-32	A	Pem; 20+00W, 2+50N	-63	179	152.4
BD92-33	C	Pem; 11+02W, 4+29S	-50	178	183.8
BD92-34	B	Pem; 10+01W, 6+48S	-65	181	144.8
BD92-35	D	Pem; 11+99W, 5+73S	-52.5	181	171.3
BD92-36	J	Pem; 10+99W, 3+25S	-48	179	136.2
		Total			785.5

Hole BD92-32 (Proposed Hole BD92-A)

This hole was drilled to test a zone of high chargeability on line 20+00W between 0+00N and 3+50N (Figure 6a).

The hole intersected an interbedded (intercalated?) sequence of tuffaceous (?) argillaceous siltstone and sandstone, and felsic ash tuffs and flows. Contacts appear to be conformable. The sediments are commonly bedded, suggesting possible flat to moderate northerly dips (assuming bedding strikes perpendicular to the drilling direction). One possible graded sequence indicates tops up.

Sulphide content is generally low, consisting mostly of traces to 5% disseminated pyrrhotite. Sulphides are generally much more abundant in the sedimentary rocks than in the felsic volcanic units.

Between 29.28 and 32.0 m felsic tuff contains 2-5% red-brown sphalerite and minor galena in cross-cutting stringers up to 5mm wide. A 1 m wide sample (50008) within this interval contained 2.3% zinc and 0.6% lead (converted from ppm). Gold and silver values are weakly elevated in this interval.

Gold levels are generally at or near detection limit (0.002 oz/t). Arsenic levels are sporadic (up to 1,445 ppm), and at least 10 times higher in the sedimentary rocks than the felsic volcanic units.

The sulphide content appears to be too low to be the source of the IP anomaly and it may be related to graphitic sediments, although no graphite was noted.

Alteration in the rocks intersected is not strong and it appears that this area is outside of the zone affected by the mineralizing event to the southeast (ie. the Silver and Gold Zones).

Hole BD92-33 (Proposed Hole BD92-C)

This hole was proposed to test a coincident high gold-in-soil anomaly (up to 528 ppb Au at 4+50S, 11+00W) and a zone of high chargeability (later also tested by holes BD92-34 and BD92-35).

The hole intersected a short interval of intermediate lapilli tuff at the top, a massive felsic flow or intrusive unit, and felsic volcaniclastic units (Figure 6c). All units have undergone pervasive moderate phyllic (quartz-sericite) alteration and contain irregular patches up to 1 cm in diameter of soft fine-grained green sericite.

Between 13.72 m (bedrock surface) and 82.0 m the intermediate tuff and felsic flow (intrusion ?) units have been strongly sheared and broken at 20° to core axis, suggesting a possible steep south-dipping fault zone. The most distinct units in the hole are quite probably juxtaposed along fault contacts.

Total sulphide content ranges from 2-10%, averaging 5-6%. Sulphides occur in five distinct zones:

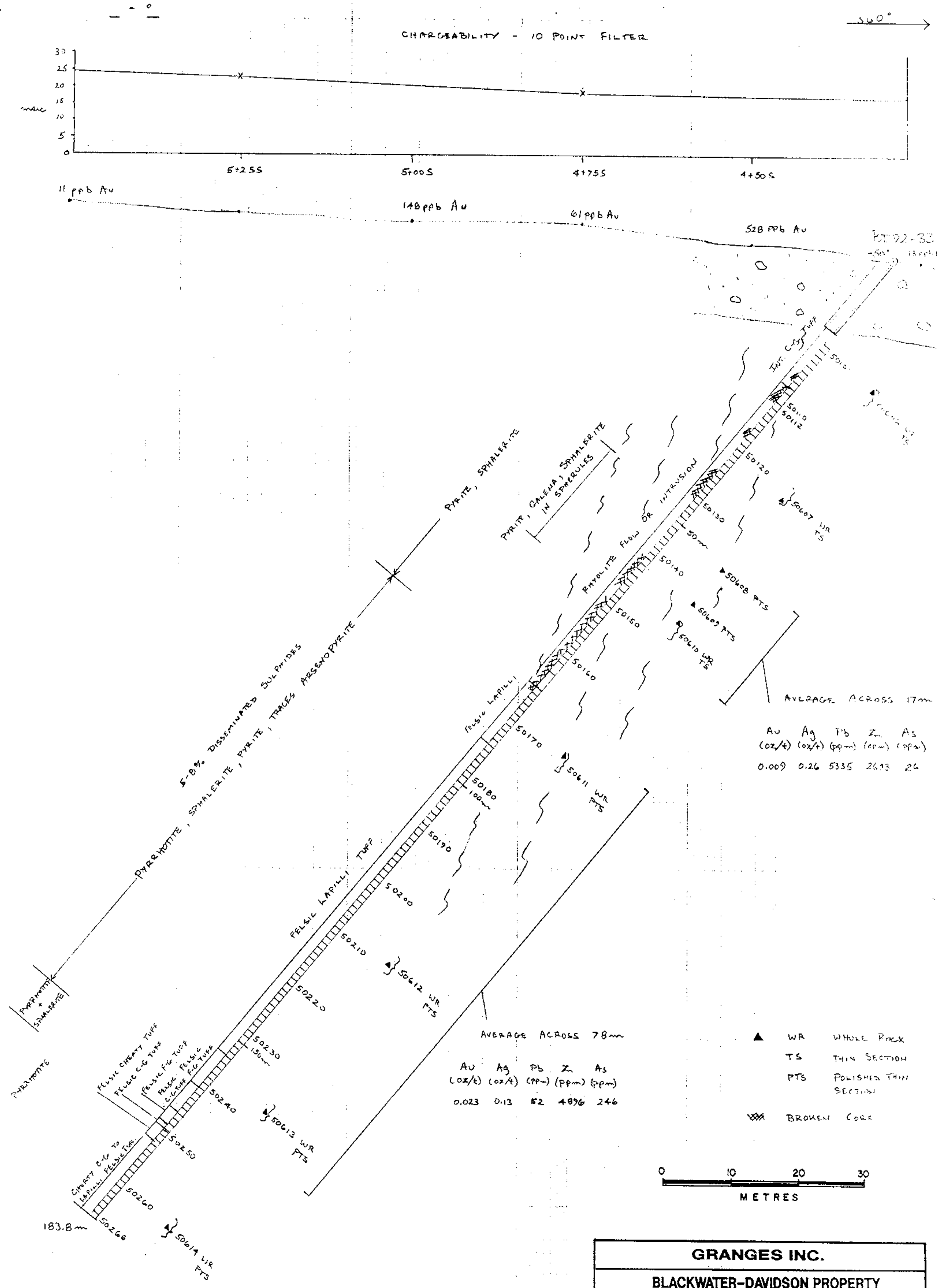
1: 24.2 m - 83 m

A felsic flow (intrusion ?) unit in this interval contains abundant (5% +) limonitic pits, probably after pyrite. Shearing has probably allowed penetration of groundwater into this unit, causing relatively deep weathering.

Gold content in most of this interval is quite low, averaging roughly 0.006 oz/t. It is, however, distinctly higher than in the overlying (?) intermediate tuff unit up hole. Lead content in this felsic unit is 50 to 100 times higher than in units above and below, suggesting that either the mineralizing fluids were strongly lithologically controlled, or that these rocks were originally in different parts of the mineralized zone and later juxtaposed by faulting.

2: 48.77 m - 65.5 m

Within the interval described above is a zone with nonlimonitic (unweathered) intervals which contain abundant (up to 20%) black spherules up to 8 mm in diameter, commonly with 1-2 mm pyrite ± dark sphalerite cores. Between spherules the rock contains 5-8% fine-grained disseminated sulphides



GRANGES INC.

BLACKWATER-DAVIDSON PROPERTY
PEM GRID

SECTION 11+00 W

BD 92-33

SCALE : 1 : 500	DATE : JAN. 1993
DATA BY: R. ZAWADA	
DRAWN BY: G.A.	FIGURE : 6c

including; 1-2% pyrite, traces to 4% galena, and up to 5% red-brown sphalerite. Sphalerite in the spherules is dark-coloured in contrast to the light red-brown colour in the matrix, suggesting that the rock may have undergone at least two phases of mineralization.

Gold content in the central part of this zone is slightly elevated, but silver values are near background levels. Arsenic levels are below background. Lead and zinc contents, however, are distinctly anomalous ranging up to 16,667 ppm and 9,096 ppm respectively across 1m.

Average metal content of the 17 m interval between 49 m and 66 m is summarized below:

Au oz/t	Ag oz/t	Pb ppm	Zn ppm	As ppm
0.009	0.26	5,335	2,693	26

3: 83 m - 161 m

This interval of predominantly felsic lapilli tuff contains 2-8% (average 4-6%) sulphides which occur disseminated in the matrix, as thin whisps probably paralleling foliation in sericite, and replacing fragments up to 1 cm in diameter. Sulphide content consists of 2-4% each of pyrrhotite and red-brown sphalerite, lesser amounts of pyrite, and traces of arsenopyrite and chalcopyrite.

It is interesting to note that at the first appearance of pyrrhotite in the hole there is a coincidental significant increase in gold content, ranging up to 0.296 oz/t across 1 m. Silver and lead contents do not appear to be significantly above background. Zinc values are elevated in the zone but there does not appear to be a direct relationship between zinc and gold. Arsenic content in the interval is above background, with the highest arsenic values occurring close to but not coincidental with the highest gold values.

The average metal content of the 78 m interval between 83 m and 161 m is shown below:

Au oz/t	Ag oz/t	Pb ppm	Zn ppm	As ppm
0.023 (0.79g/t)	0.13	52	4,896	246

If the two highest gold values of 0.100 and 0.296 oz/t are removed from the sample set, the average gold content across 76 m is reduced to 0.018 oz/t (0.63 g/t).

A re-analysis of sample 50219 (originally 0.296 oz/t Au) yielded 0.048 oz/t. This discrepancy suggests that free gold may be present, causing a nugget affect.

4: 161 m - 167.1 m

This interval of felsic ash to lapilli tuff contains 2-3% pyrrhotite and 1-2% sphalerite, but lacks significant pyrite content in contrast to the interval above. This 'disappearance' of pyrite is coincidental with an abrupt drop-off in gold content. It is probable therefore that the gold in the system is associated with pyrite, as suggested by data collected in the previous program.

5: 167.1 m - 183.8 m (E.O.H.)

Pyrrhotite content ranges from 1 to 5% in this interval, and sphalerite decreases to trace amounts. Gold content is not anomalous.

Hole BD92-34 (Proposed Hole BD92-B)

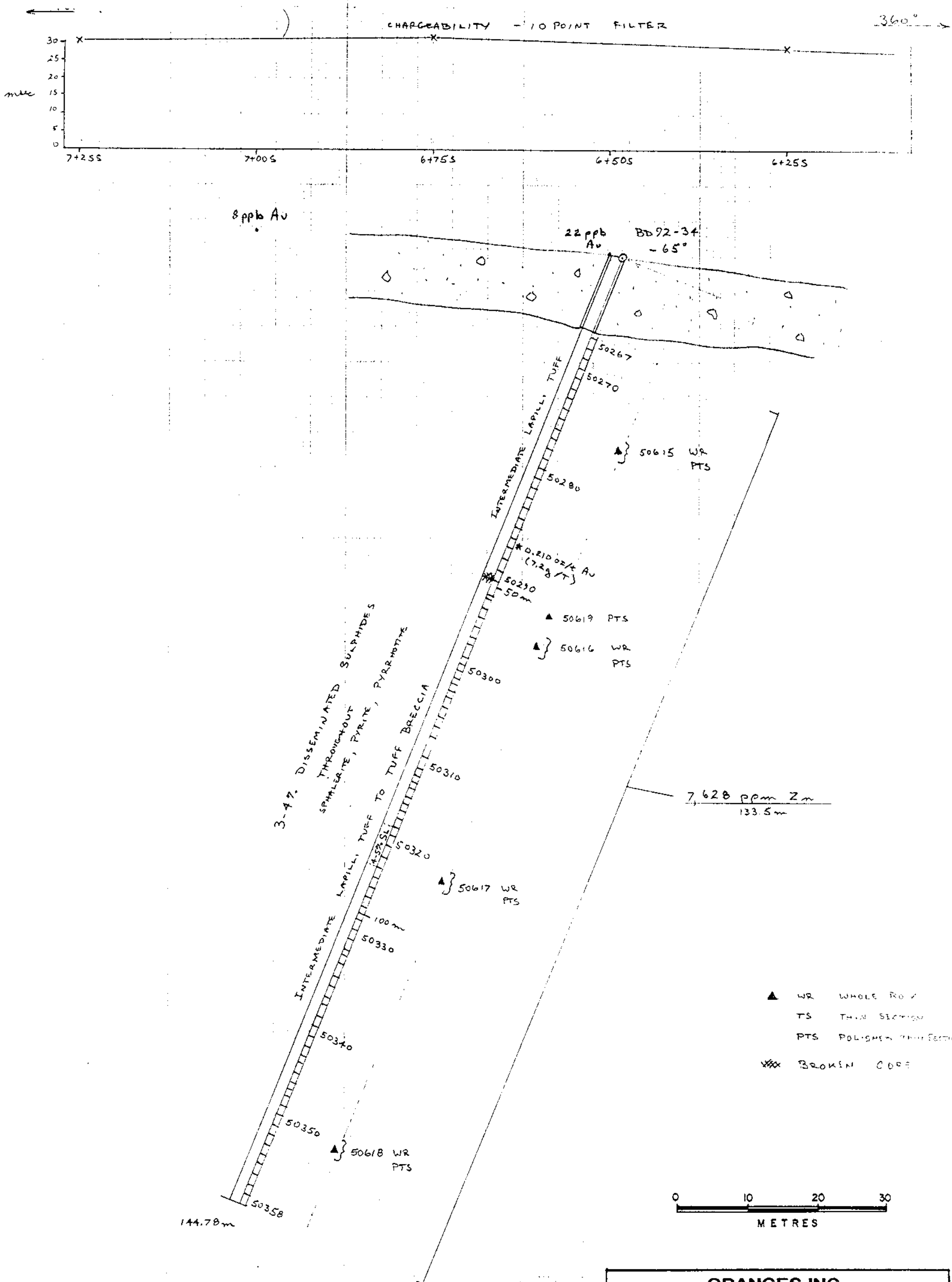
Hole BD92-34 targeted the centre of a large chargeability feature southwest of the gold zone. Resistivity in the target area and the gold zone are roughly comparable, but the chargeability in the target area is roughly 50% higher.

The hole intersected competent intermediate lapilli tuff to tuff breccia with amygdaloidal fragments along its entire length (Figure 6e). These rocks are andesitic to trachyandesitic in composition, and are chemically and visual similar to intermediate rocks intersected in hole DAV-11.

Sulphide content averages 3-4%, with sphalerite ranging from trace to 5%, pyrite from traces to 2%, and pyrrhotite occurring in only trace amounts. With this type of mineralization it is unclear what caused the chargeability anomaly which this hole was targeting.

Gold content ranges up to 0.210 oz/t (7.2 g/t) but is generally less than 0.01 oz/t (0.3 g/t). There is no clear correlation between the higher gold values and the silver, lead, zinc or arsenic contents.

The zinc content averages 7,628 ppm (0.76%) along the entire length of the hole (133.5 m in bedrock).



GRANGES INC.

BLACKWATER-DAVIDSON PROPERTY
PEM GRID

SECTION 10+00 W
BD 92-34

SCALE: 1:500	DATE: JAN. 1993
DATA BY: R. ZAWADA	
DRAWN BY: G.A.	FIGURE: **6e**

BD92-35 (Proposed Hole BD92-D)

Hole BD92-35 tested another part of the core of the chargeability feature tested in BD92-34. In this case the target area was a zone of coincident high resistivity and chargeability. It has a distinctly different geophysical signature than that of the gold zone.

Visually unaltered intermediate and minor amounts of felsic lapilli tuff were intersected in the top part of the hole to a depth of 122.8 m (Figure 6b). The intermediate volcaniclastic rock is similar to the units intersected in hole BD92-34. Between 122.8 m and 171.3 m (E.O.H.) the hole intersected an unaltered amygdaloidal intermediate flow (?) which is apparently chemically distinct from the overlying (?) fragmental unit (Figure 8b in Section 5.0).

Sulphide content is sporadic, ranging from 1-5% pyrite, traces to 8% sphalerite, up to 5% pyrrhotite, and traces of arsenopyrite and chalcopyrite. Sulphide content probably averages 3-5% throughout with sphalerite being most abundant. Pyrite and pyrrhotite content may average 2% and could be the source of the IP anomaly. Sulphides occur disseminated throughout and within amygdules.

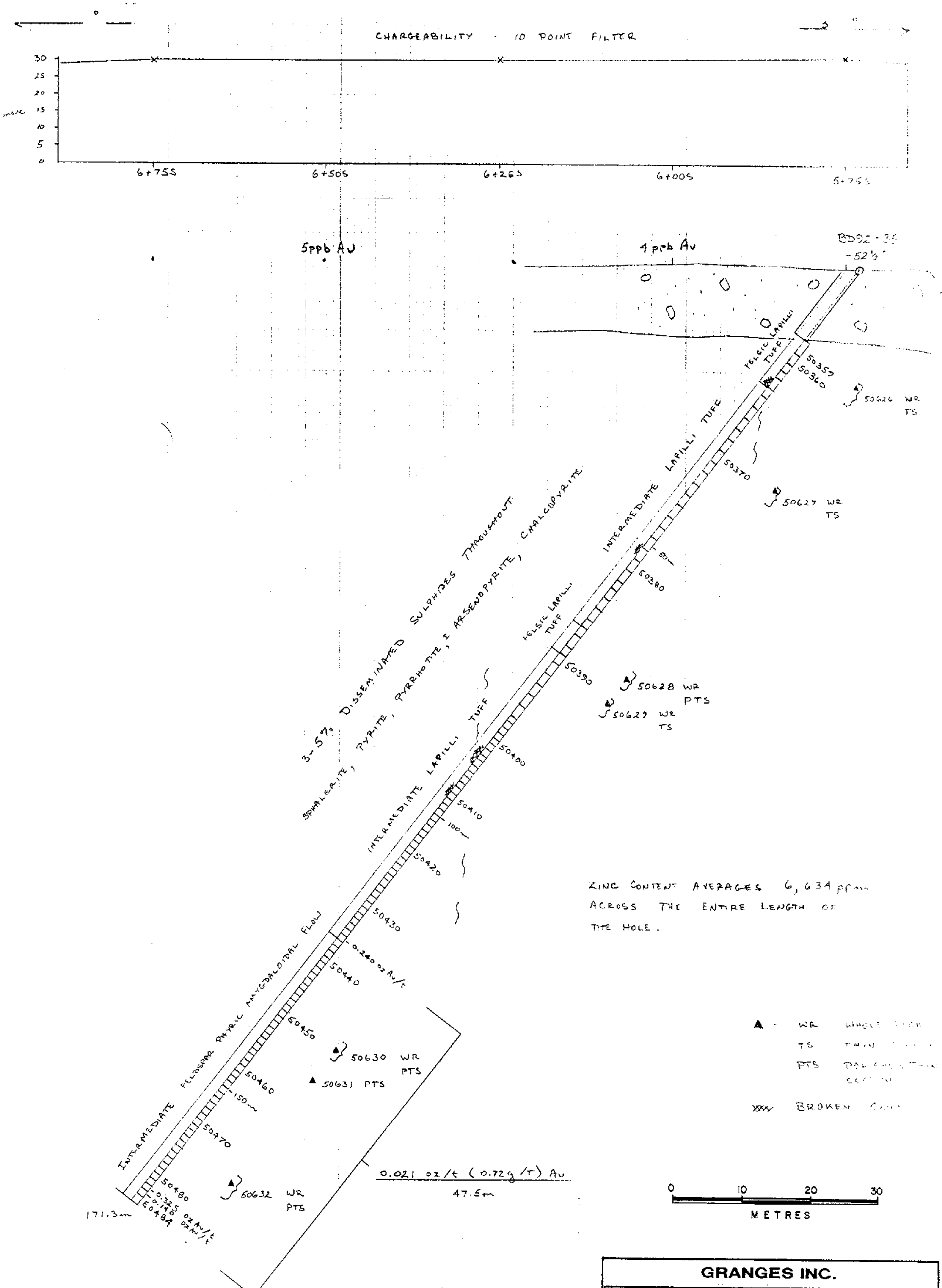
Gold content in the volcaniclastic rocks is generally low, near the detection limit of 0.002 oz/t. The flow unit between 122.8 m and 171.3 m has a higher gold content averaging 0.027 oz/t (0.93 g/t) across 48.5 m. Within this interval a 1 m sample (50482) contained 0.325 oz/t (11.14 g/t) gold. If this sample is removed from the data, the average grade is 0.021 oz/t (0.72 g/t) gold across 47.5 m.

Silver and lead values are low. Zinc content averages 6,634 ppm (0.66%) along the entire 158.5 m of rock intersected. Arsenic values are erratic, ranging up to 4,694 ppm.

There is no apparent correlation between gold and any of the other metals plotted.

BD92-36 (Proposed Hole BD92-J)

This hole was originally proposed to test a two line gold-in-soil anomaly (122 ppb Au on line 11+00W), a coincident VLF-EM indicated conductor, and a probable fault indicated by truncation and offset of magnetic features. Chargeabilities in this area are moderate, ranging up to 18 msec. The eastern part of the gold-in-soil anomaly (on line 9+00W) appears to correlate to the mineralized intersection in drill hole Dav 11.



GRANGES INC.

BLACKWATER–DAVIDSON PROPERTY
PEM GRID

SECTION 12+00 W

BD 92–35

SCALE: 1:500	DATE: JAN. 1993
DATA BY: R. ZAWADA	
DRAWN BY: G.A.	FIGURE: **6b**

The reason for drilling at this site during this program was to test for a continuation of mineralization intersected in BD92-33.

The hole intersected a fault zone along its entire length (Figure 6d). Shearing was generally at 20° to the axis. If this fault is the northwest-trending structure delineated by the magnetic data as interpreted in Figure 5, then it probably has a steep southwest dip.

Intermediate lapilli tuff was intersected for most of its length, with the exception of two narrow fault-bounded slices of felsic lapilli tuff. Lithologically and structurally it is very similar to hole DAV-11, suggesting that narrow units in that hole are not intercalated but fault slices as well.

The intermediate volcaniclastic units contain traces to 2% pyrrhotite and traces to 5% sphalerite throughout. Felsic intervals appear to be better mineralized with 3-4% sphalerite, 2-3% pyrite, traces to 1% galena and traces of chalcopyrite. Sulphides are generally disseminated. In the upper part of the hole sulphides are also associated with carbonate stringers.

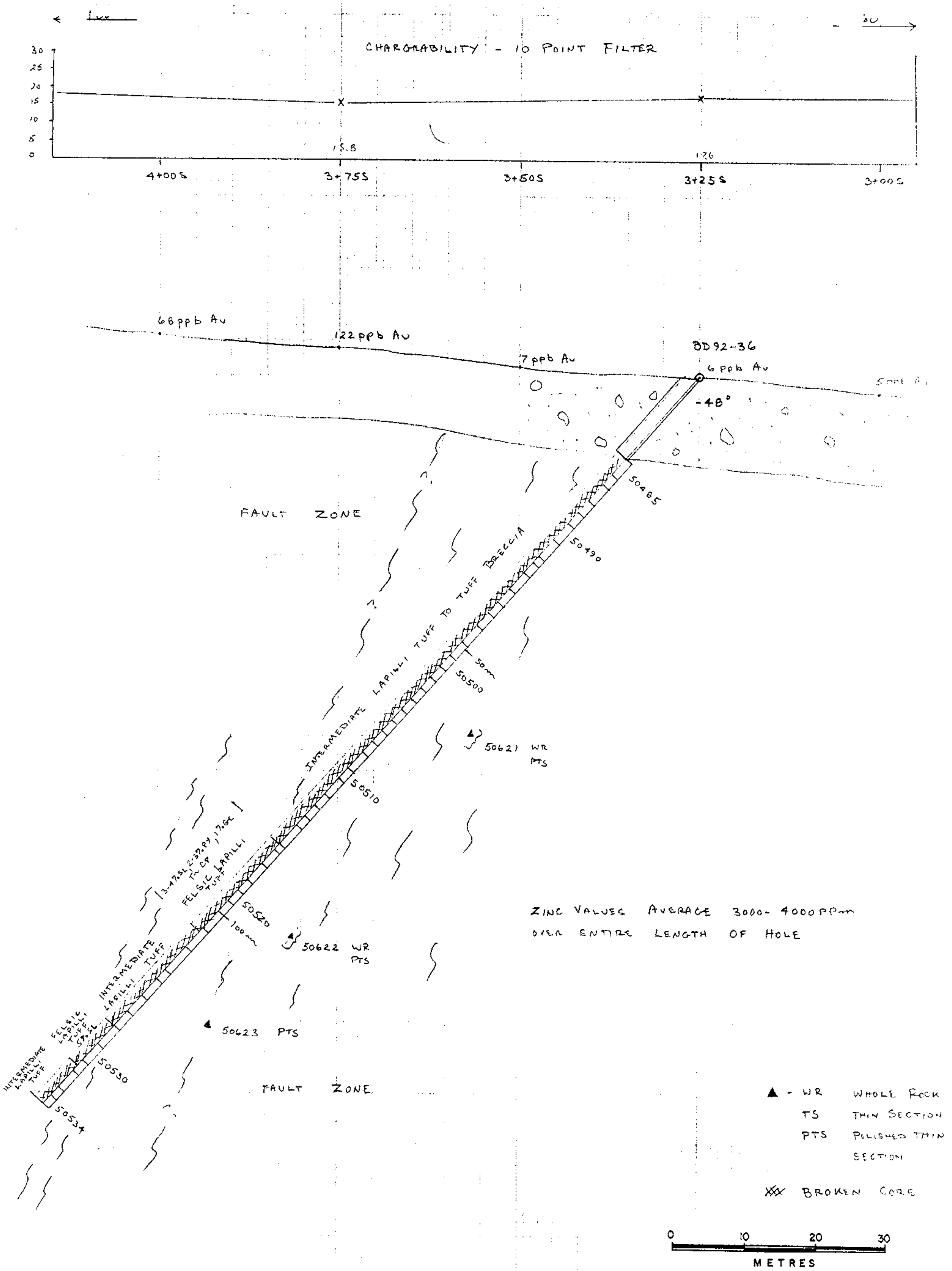
Gold and silver contents are generally low, near detection limit. Lead is sporadically anomalous with values up to 3,181 ppm across 1.21 m (sample 50516). Zinc values are consistently elevated, averaging 3,000 - 4,000 ppm along the entire length of the hole.

<u>DAV-11</u>

Drill hole DAV-11 was relogged after all new holes had been logged to see if there was anything distinct about the intervals with high gold content.

Lithologies are similar to those intersected in holes BD92-33, 34, 35 and 36. The rock has been strongly faulted at a low angle to the core axis and almost every lithologic contact occurs along a fault. It is probable, therefore, that the many units identified are fault slice repeats of the same two units as interpreted for BD92-36.

The gold-rich interval between 62.3 m and 68.6 m (6.3m) which averages 14.28 g/t gold (0.416 oz/t Au over 20.7') is a fault-bounded sheared felsic lapilli tuff with 2 intervals up to 0.7 m (+?) of massive sulphide. One interval between 62.6 m and 63.3 m consists of 20% fine-grained disseminated pyrrhotite and 30-40% coarse-grained massive pyrite. A second interval between 68.13 and 68.25 m consists of massive pyrite with traces of chalcopyrite. Outside of these intervals the rock



GRANGES INC.

BLACKWATER-DAVIDSON PROPERTY
PEM GRID

SECTION 11+00 W
BD 92-36

SCALE: 1:500	DATE: JAN. 1993
DATA BY: R. ZAWADA	
DRAWN BY: G.A.	FIGURE: 6d

is mineralized with 3-5% disseminated and fracture-related pyrite, commonly with a bladed habit (possibly marcasite), 2-5% disseminated sphalerite and traces of arsenopyrite and chalcopyrite.

The second gold zone between 108 m and 111 m assayed 48.3 g/t gold over 1.2 m (1.409 oz/t Au over 4.3') and is also a fault-bounded slice of felsic lapilli tuff. The interval is mineralized with 3-4% very fine-grained pyrite which occurs as coatings on fracture surfaces. Most of the high-grade interval is fault rubble.

Mineralization in the two gold-bearing intervals is distinctly different from the normal disseminated nature of the sulphides in most rocks in the area. It is probable that the gold-bearing mineralization is shear related and that these structures have been broken and sheared by later faulting.

3.3 <u>Results of Sludge Sampling Program</u>

Sludge samples from drilling return water were collected in 10' intervals when possible. It was hoped that if core loss occurred in fault zones a sludge sample would at least provide geochemical data for the interval.

A one quarter split of the return water was directed into a permeable 'Hubco' bag and hung to drain. Samples were subsequently sent to CDN Labs for wet geochemistry gold analyses and to Acme Labs for ICP analyses.

One of the main problems with the concept was that return water was commonly lost in the faulted intervals. Samples were collected from most of holes BD92-32 and 34. Only a few samples were collected from the tops of holes BD92-33 and 36 before return water was lost. No samples were recovered from hole BD92-35.

Correlations between gold content in core and sludge samples is poor to fair. In hole BD92-34 a core sample with 0.210 oz/t gold did not have a corresponding anomaly in the sludge samples. In the same hole, however, a core sample with 0.048 oz/t gold had a corresponding sludge sample with 1,400 ppb gold (0.041 oz/t Au). The nugget effect may be causing some problems with correlations.

Correlations between silver and arsenic contents in the two sample sets is fair. Lead and zinc correlations, however, are excellent.

The technique appears to be working, but in no case was a sludge sample collected in an interval with poor core recovery. It is recommended therefore that sludge samples not be collected in future programs.

4.0 PETROGRAPHIC STUDIES

A total of 10 thin sections and 19 polished thin sections were made from samples from this year's drilling program and sent to Dr. Craig Leitch for description and interpretation. The purpose of the study was to attempt to correlate lithologic units across faults both within and between holes, and to better understand the nature of the mineralization. Thin section descriptions are included in Appendix IV.

5.0 WHOLE ROCK GEOCHEMISTRY

A total of 24 samples were collected from the five holes drilled in this program and sent to X-Ray Labs for whole rock analysis (from pressed pellets). Analyses are presented in Appendix III.

Data from this suite and from a suite collected during the previous program on the Blackwater-Davidson and Capoose properties (collectively totalling 44 samples) are plotted in Figures 7a and 7b, and 8a and 8b. Figures 7a and 8a show data plotted with a corresponding ID number. These ID numbers are referenced to original sample numbers and locations in a table included in Appendix III. Figures 7b and 8b show an interpretation of the data.

These figures were plotted using QuottroPro 4.0. Data from this drilling program was added to a spreadsheet created by Hans Madeisky when he interpreted whole rock data from the July-August 1992 program.

Figure 7b is a plot of SiO_2 vs Na_2O + K_2O with an overlay of rock type fields. It shows that there are two basic rock types with relatively broad ranges of composition. The felsic suite ranges from dacite to rhyolite in composition. Alteration such as silicification and sodium depletion may account for some of the compositional scatter. The intermediate suite of rocks ranges in composition from andesite to trachyandesite.

6.0 DISCUSSION AND CONCLUSIONS

1. Disseminated sulphide mineralization, including sphalerite, pyrite, pyrrhotite and traces of galena, arsenopyrite and chalcopyrite is widespread in the Gold Zone area. Mineralization is hosted in both phyllic

BLACKWATER–DAVIDSON PROJECT
CHEMICAL CLASSIFICATION DIAGRAM

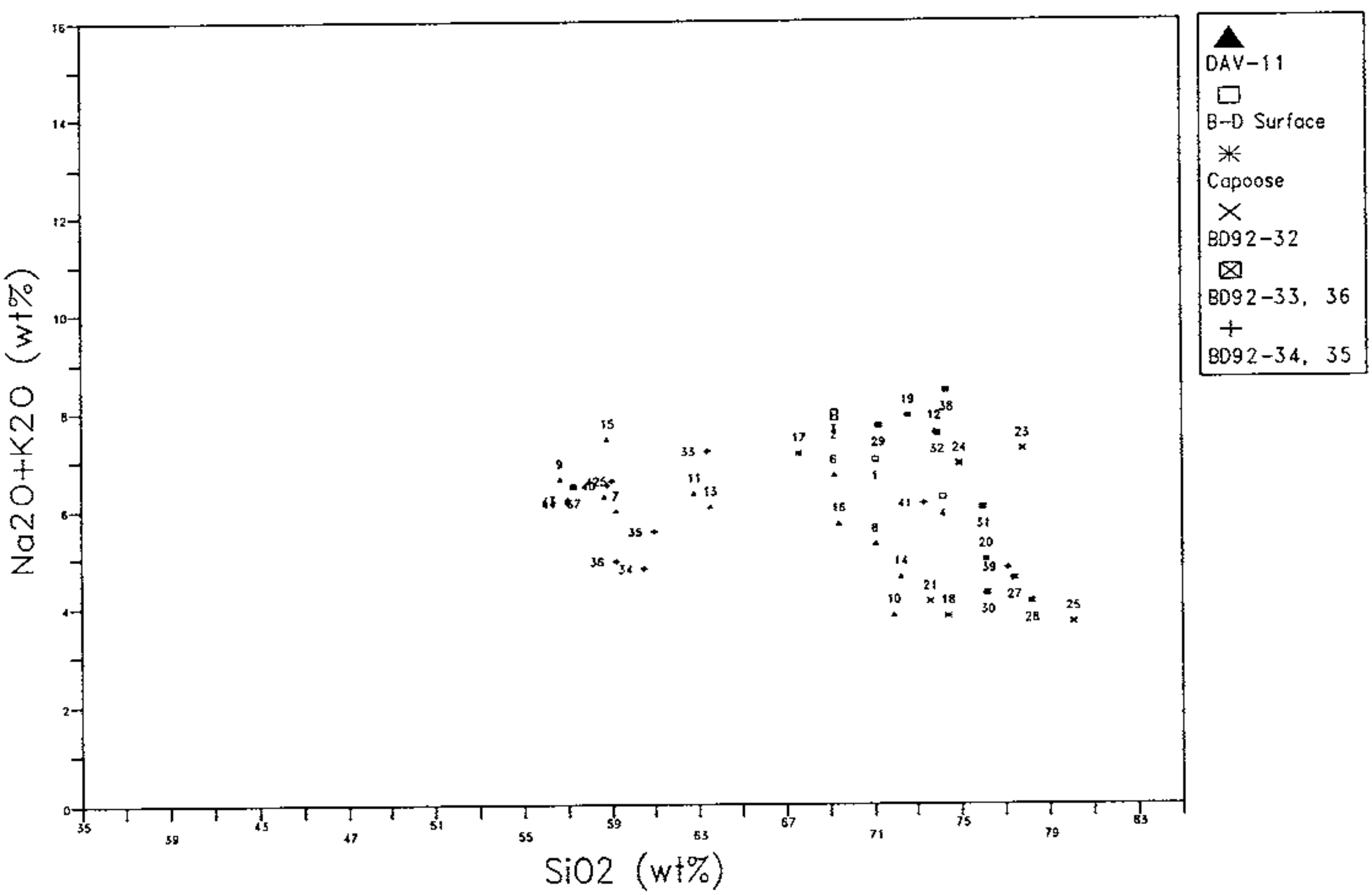


Figure 7a

G.A., 1993

BLACKWATER-DAVIDSON PROJECT
CHEMICAL CLASSIFICATION DIAGRAM

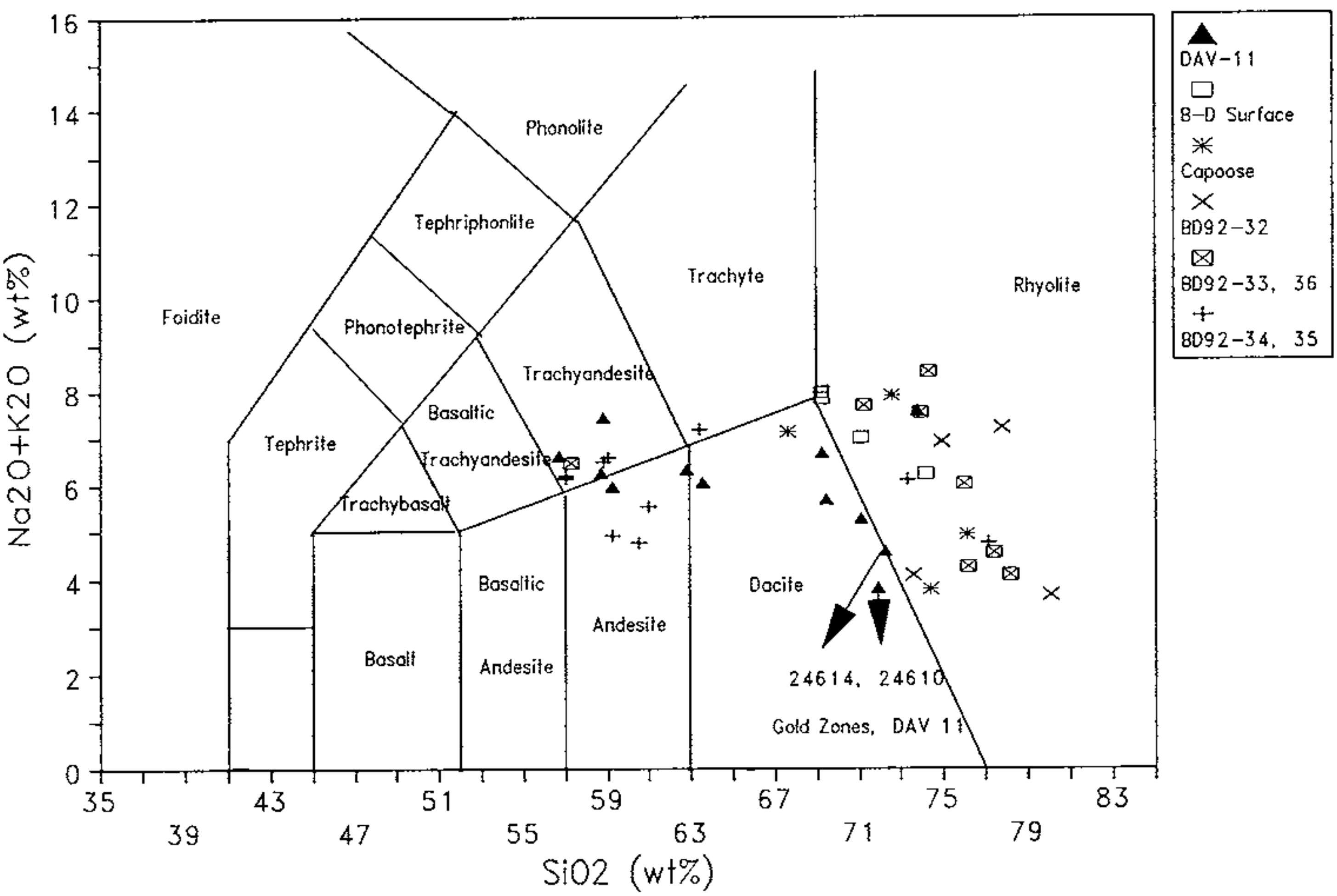


Figure 7b

G.A., 1993

BLACKWATER–DAVIDSON PROJECT
CONSERVED CONSTITUENT SCATTER PLOT

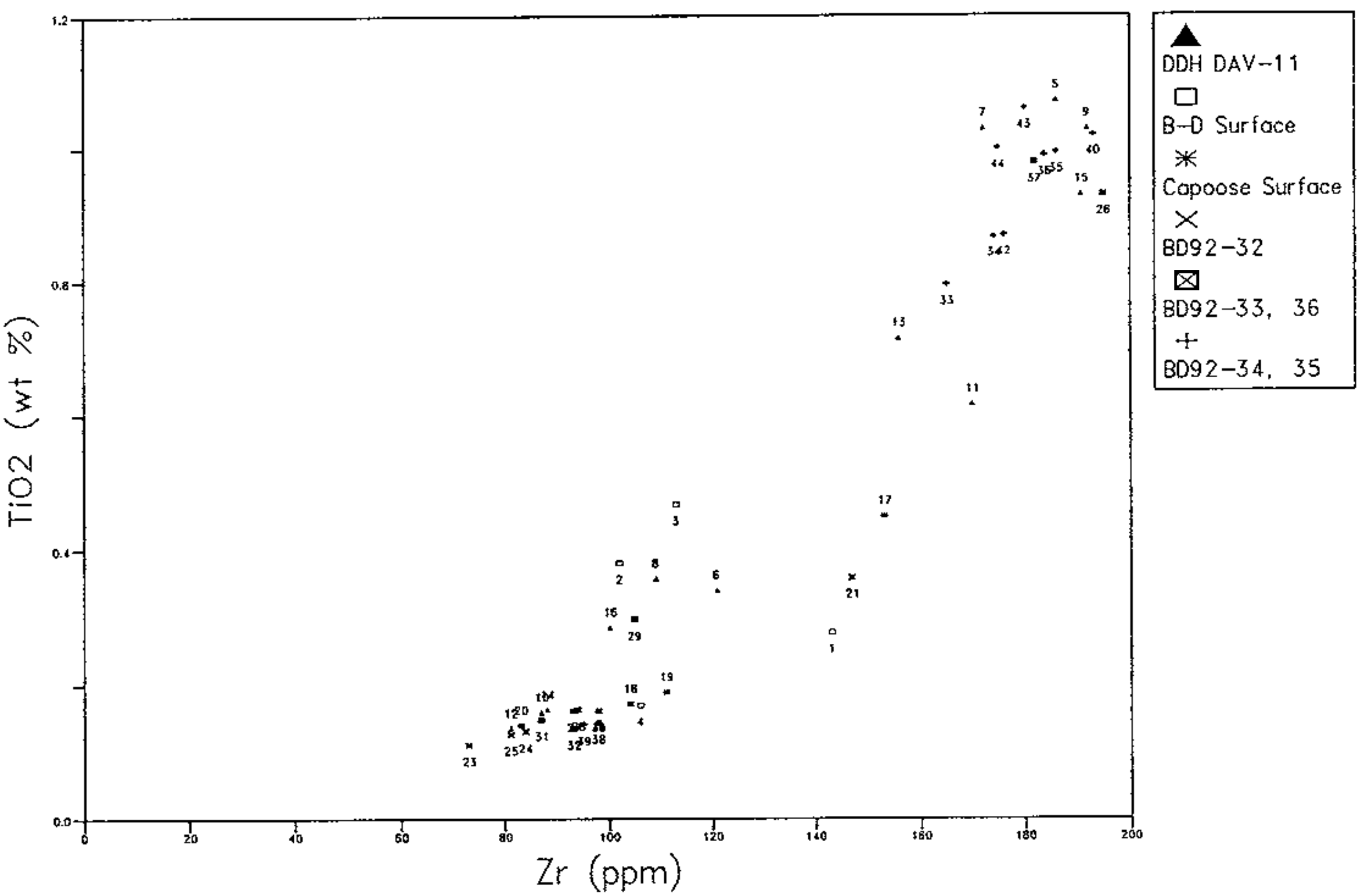


Figure 8a

G.A., 1993

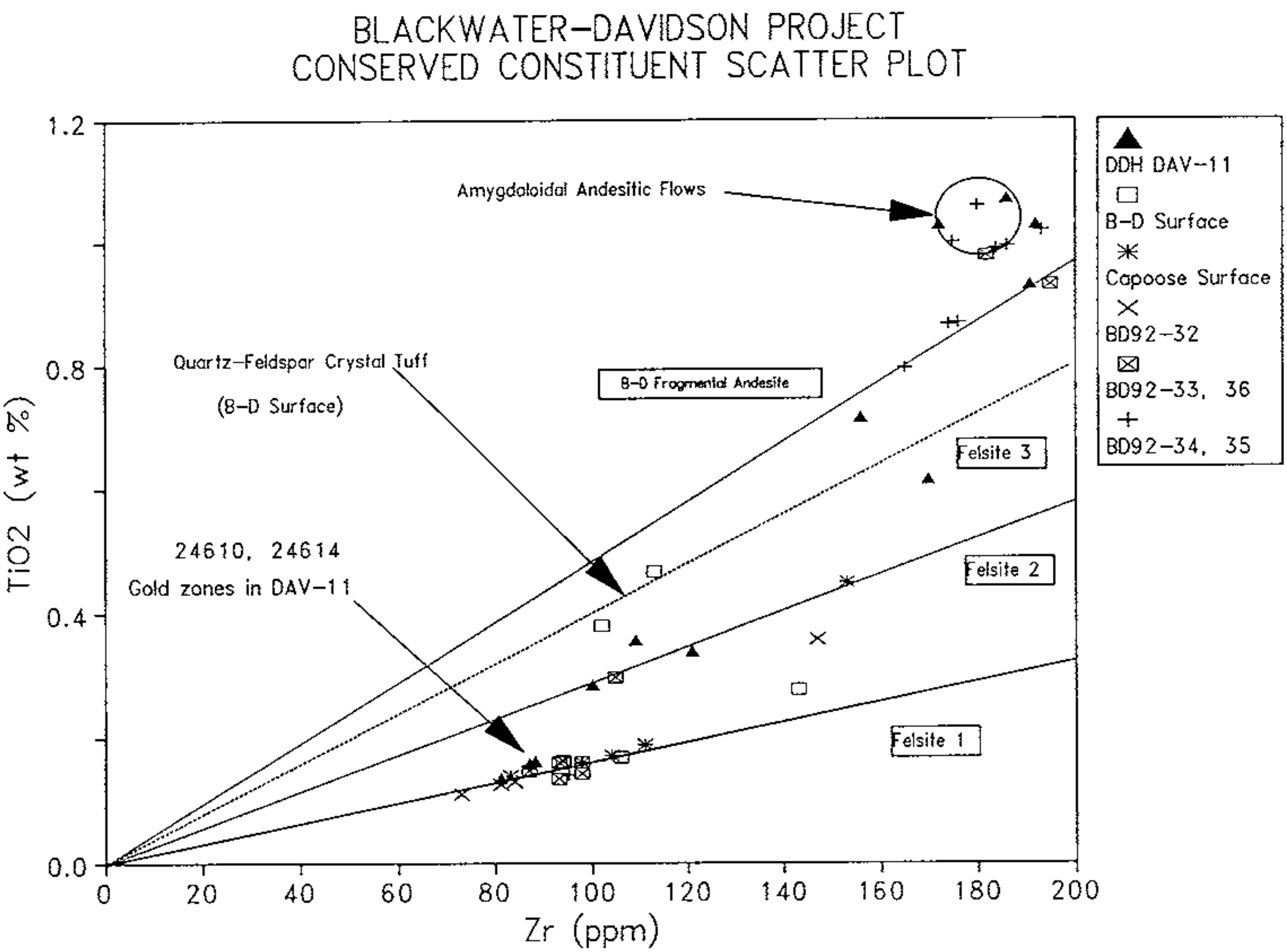


Figure 8b

G.A., 1993

± potassic altered felsic and intermediate volcanic rocks.

Zones with elevated gold occur both in felsic (0.63 g/t or 0.018 oz/t across 78 m; hole BD92-33) and intermediate (0.72g/t or 0.021 oz/t across 47.5 m; BD92-35) volcanic rock hosts.

Mineralization, therefore, is apparently not lithologically controlled.

2. Higher gold values are typically coincident with zones with higher pyrite contents.

3. Intervals with the highest gold content in DAV-11 have abundant fracture-related pyrite. It is probable, therefore, that the gold is shear-related, unlike mineralization intersected in the 1992 drilling.

4. Although there does not appear to be a one to one correlation between gold and zinc, all significant gold intersections occur within the zinc-rich disseminated sulphide zone. Disseminated sulphide mineralization may be genetically related to, and occur peripheral to higher-grade gold-bearing shear-hosted mineralization as intersected in DAV-11.

   Soil geochemistry has outlined a large discrete zinc anomaly which may define the limits of disseminated mineralization.

5. Chargeable zones which were drill-tested are apparently not related to gold mineralization as intersected in DAV-11. In some cases, however, they are coincident with zones of disseminated sulphides with elevated but subore-grade gold content.

6. The existence of faults as interpreted from magnetic and VLF data have been tentatively confirmed. In the gold zone they appear to form broad shear zones up to 200 m wide. If the faults have a northwest strike direction, shear to core axis angles suggest a steep southwest dip.

7. Bedding orientation is still unknown. Close-spaced faulting has made structural interpretations difficult.

8. The prominent northwest-trending faults do not appear to be related to mineralization. They cut all noted mineralized rocks but show no signs of veining or of localized mineralization.

8.0 BIBLIOGRAPHY

Allen, G.J. (1992) Geology, Geochemistry and Geophysics Report on the Blackwater-Davidson Property. Internal report for Granges Inc.

Andrew, K.P.E. (1985) Geology and Genesis of the Wolf Precious Metal Epithermal Prospect, and the Capoose Base and Precious Metal Porphyry-Style Prospect, Capoose Lake Area, Central British Columbia. Unpublished M.Sc. Thesis, U.B.C.

Blackwell, J.D. (1988) Davidson J.V.-Pem Summary. Unpublished Cominco Ltd. Report, 7 pp, 1 appendix, 8 plates.

Caelles, J. (1991) Report on the 1991 Re-logging of Diamond Drill Core and Review of Available Data on the Blackwater-Mt. Davidson Property. Unpublished internal report for Granges Inc.

Cyr, J.B.; Pease, R.B. and Schroeter, T.G. (1984) Geology and Mineralization at Equity Silver Mine. Economic Geology, 79, 947-968.

Harris, J.F. (1987) Petrographic Examination - Mt. Davidson drill core samples. Unpublished Granges Inc. report, 18 pp.

Haynes, L. (1990) Summary Report: Mt. Davidson Property. Unpublished Granges report, 19 pp, 6 figures.

Haynes, L. (1990) Summary Report: Capoose Property. Unpublished Granges Inc. report, 2 vols., 10 plates.

Leader, J.J. (1986) Technical Report on Blackwater-Davidson Property, Mount Davidson Area, Omineca Mining Division, B.C.

Lumley, W.E. (1981) Geophysical Report Horizontal Loop EM Survey Deb 1 claim, Mt. Davidson area, Omineca Mining Division, B.C.

Monger, J.W.H., Price R.A. and Tempelman-Kluit, D.J. (1982) Tectonic Accretion and the Origin of the two Major Metamorphic and Plutonic Belts in the Canadian Cordillera. Geology, Vol. 10, pp. 70-75.

Madeisky, H. (1992) Blackwater-Davidson Project, Pearce Element Ratio (PER) Analysis. Unpublished internal report for Granges Inc.

Sheldrake, R.F. (1981) Report on a Helicopter EM and Magnetometer Survey, Natalkuz Lake Projects, Omineca Mining Division, B..C.

Tipper, H.W. (1962) Map 1131A: Geology Nechako River, B.C. GSC Map.

Tipper, H.W. (1963) Nechako River Map-area. GSC Memoir 324, 59 pp, 5 plates, one map.

Tipper, H.W.; Campbell, R.B.; Taylor, G.C. and Stott, D.F. (compilers) (1974) Parsnip River, Sheet 93; Geological Survey of Canada, Map 1424A, 1:1,000,000.

Weekes, S. (1986) Mt. Davidson Project. Unpublished internal report for Granges Inc.

White, G.E. (1980) Geophysical Report on a Vector Electro-Magnetometer Survey, Mt. Davidson Area, Omineca Mining Division, B.C.

Wojdak, P.J. and Sinclair, A.J. (1984) Equity Silver Silver-Copper-Gold deposit: Alteration and Fluid Inclusion Studies. Economic Geology, 79, 969-990.

Zbitnoff, G.W. (1983) Geochemical, Geophysical Report Pem claim, Omineca Mining Division, B.C.; Granges Inc.

Zbitnoff, G.W. and Laite, A.L. (1988) Diamond Drilling Report on Pem Claim, Nechako Hills area, Omineca Mining Division, B.C.; Granges Inc.

Zbitnoff, G.W. and Williams, J.J. (1985) Work Report on Pem Claim, Omineca Mining Division, B.C.; Granges Inc.

9.0 STATEMENT OF EXPENDITURES

(November 5, 1992 - January 18, 1993)

Geological Survey	$ 22,145
Diamond Drilling (J.T. Thomas Diamond Drilling Ltd); including camp maintenance and accommodation	111,247
Linecutting	18,840
Analytical Costs (Acme Analytical Laboratories Ltd., X-Ray Assay Laboratories, Resource Laboratories Ltd.)	12,700
Field Supplies (Deakin Equipment Ltd., Neville Crosby Ltd., Vancouver Petrographics Ltd.)	4,203
Equipment Rental (trucks, chain saws, radios) (Redhawk Rentals Ltd., Lone Trail Prospecting Ltd.)	4,935
Miscellaneous (mobe-demobe, travel, field, maps, shipping)	5,194
Subtotal	$179,264
Office Overhead (10%)	17,926
Total Costs to January 18, 1993	$197,190

10.0 STATEMENT OF QUALIFICATIONS

I, Gordon J. Allen, do hereby certify;

1) I am a graduate in geology of the University of British Columbia (B.Sc. 1975)

2) I have practised as a geologist in mineral exploration for seventeen years.

3) I am a member in good standing of the Association of Professional Engineers and Geoscientists of British Columbia.

4) Opinions, conclusions and recommendations contained herein are based on fieldwork and research performed by or overseen by me between November 5, 1992 and January 18, 1993.

5) I own no direct, indirect, or contingent interests in the subject property, or shares or securities of Granges Inc.

Vancouver, B.C.

January 18, 1993

GORDON J. ALLEN, P. GEO.

APPENDIX I

DIAMOND DRILL LOGS

GRANGES INC.

DIAMOND DRILL LOG

BLACKWATER-DAVIDSON PROJECT (120)

Date Collared Nov. 12 / 92 Date Completed Nov. 14 / 92	HOLE NUMBER BD 92-32

Logged By: G. ALLEN

PURPOSE: TO TEST CHARGEABILITY ANOMALY ON LINE 20+00W

Location	Survey Data	Acid Dip Tests		
Claim: PEM	Collar Dip: -63	Depth	Reading	Dip
Grid: PEM	Azimuth: 179°	NONE	TAKEN	(NO TUBES)
Latitude: 2+50 N	Length: 152.40 m			
Departure: 20+00	Vert. Project. 135.79 m			
Elevation:	Hor. Project. 69.19 m			

Core Size: NQ	Reduced To: ______ at
Casing Depth: 22.86	Casing Left In: Yes ✓ No ______

COMMENTS:

PROPOSED HOLE BD 92-A

SAMPLE SERIES 50001 - 50031 } AU, AG, ICP
50033 - 50089 }
50601 - 50605 WR, T.S.

HOLE NUMBER BD92-32

SUMMARY LOG:

Interval	Code	Unit Description
0 - 22.86	CASING	CASING
22.86 - 29.28	7K, Jsb	SILICEOUS SILTSTONE, ARGILLITE
29.28 - 33.25	2-3BT	INTERMEDIATE TO FELSIC MEDIUM-GRAINED TUFF, TUFFACEOUS SED.
33.25 - 35.26	2-3CTSs	INTERMEDIATE TO FELSIC COARSE-GRAINED TUFF, "
35.26 - 42.45	2-3A-BT-Ss	TUFFACEOUS SEDIMENT, INTERMEDIATE FINE TO MEDIUM-GRAINED TUFF
42.45 - 47.14	7L-M/T	TUFFACEOUS SEDIMENT (SANDSTONE TO CONGLOMERATE)
47.14 - 48.50	7Kj	ARGILLACEOUS SILTSTONE
48.50 - 53.6	7KT	TUFFACEOUS SILTSTONE
53.6 - 77.67	7LT	TUFFACEOUS SANDSTONE
77.67 - 106.75	5Gf/10f	RHYOLITE FLOW (INTRUSION?)
106.75 - 109	7LjT. Bt	BIOTITE ALTERED ARGILLACEOUS (?) TUFFACEOUS SANDSTONE
109 - 118.24	7Kj / 7Jm	ARGILLACEOUS SILTSTONE / MASSIVE ARGILLITE
118.24 - 125.6	3Am	FINE-GRAINED FELSIC TUFF
125.6 - 133.10	7Ks, J	SILICEOUS SILTSTONE, ARGILLITE
133.10 - 145.2	3Am/G	FINE-GRAINED FELSIC TUFF (FLOW?)
145.2 - 152.4	7Ksb, J, LT	INTERBEDDED SILICEOUS SILTSTONE, ARGILLITE AND
E.O.H.		SANDSTONE (TUFFACEOUS?)

MINERALIZATION

Interval	Description	Interval	Description
29.28 - 32.0	2-5% sphalerite in fractures	145.2 - 152.4	2-5% dissem + frac pyrrhotite
106.75 - 113.3	3-5% dissem. + frac. pyrrhotite		
125.6 - 133.1	2-5% "		

Some syngenetic ?

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-32

Interval (m)	LITHOLOGY		L	S	M	A
0- 22.86	CASING		CASING			
22.86 - 29.28	SILICEOUS SILTSTONE, ARGILLITE (7KJ3b) Medium to dark grey siliceous siltstone to cherty argillite. Massive to thinly bedded 52°CA.	S0=52	7KJ3b			

5

10

15

20

25

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-32

Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
22.86- 29.28- minor fracture-related pyrite.	50001	22.86	24.83	1.97	0.006	0.03	37	433	115
	50002	24.83	26.30	1.47	0.006	0.03	89	410	96

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-32

Interval (m)	LITHOLOGY		L	S	M	A
			7K, J1b		PY	
29.28 - 33.25	INTERMEDIATE TO FELSIC MEDIUM-GRAINED TUFF (2-3BT), TUFFACEOUS SED. Medium blue-grey fine-grained sericitic groundmass with 20% ≤1 mm lighter grey grains. Unit is relatively soft. SL in stringers 20-30° CA. Tuffaceous sed?	So=34, So=50	2-3BT	40° FAULT GOUGE	2-5% SL; 1-2% SL	
33.25 - 35.26	INTERMEDIATE TO FELSIC COARSE-GRAINED TUFF (2-3C.Se), TUFFACEOUS SEDIMENT. Much as above. Slightly darker groundmass. light and dark fine-grained lithic frags to 2 cm, average 3-4 mm.		2-3C.Se		Tr SL	
35.26 - 42.45	TUFFACEOUS SEDIMENT INTERMEDIATE (TO FELSIC) FINE TO MEDIUM-GRAINED TUFF (2-3A-BT.Se). Medium to dark grey fine-grained sericitic groundmass with light and dark fragments. Tuffaceous sediment? Relatively soft. 35.26 - 36.40 - Coarse-grained; 36.40 - 42.45 - Fine-grained, massive	So/70	2-3A-BT.Se; 7L-MT			
42.45 - 47.14	TUFFACEOUS SEDIMENT, SANDSTONE TO CONGLOMERATE 7L-M/T		7K(J)			

Depth scale: 25, 30, 35, 40, 45, 50. • PTS (WR 5060) near 31–33.

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD 92-32

Mineralization and Alteration	Sample No.	From (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
	50003	26.30	27.20	0.90	0.004	0.03	134	215	125
	50004	27.20	28.0	0.80	0.008	0.03	89	144	137
	50005	28.0	29.0	1.0	0.006	0.03	32	186	142
	50006	29.0	30.0	1.0	0.006	0.09	3276	12270	69
* 29.28 – 32.0 – 2-5% dark red-brown sphalerite in fractures. Stringers to 5 mm. Trace galena?	50007	30.0	31.0	1.0	0.004	0.03	4045	14866	13
	50008	31.0	32.0	1.0	0.006	0.07	6286	23474	14
	50009	32.0	33.0	1.0	0.006	0.09	744	3330	10
32.0 – 35.26. 1-2% sphalerite in fractures and disseminated in masses to 1 mm.	50010	33.0	34.0	1.0	0.004	0.12	1145	3619	60
	50011	34.0	34.74	0.74	0.004	0.03	197	2400	11
	50012	34.74	35.26	0.52	0.002	0.01	109	935	561
35.26 – 38 Trace red-brown sphalerite; disseminated and along fractures.	50013	35.26	36.0	0.74	0.002	<0.01	30	188	136
	50014	36.0	37.0	1.0	0.002	0.03	59	222	9
	50015	37.0	38.0	1.0	0.004	<0.01	104	444	20
	50016	38.0	40.0	1.0	0.004	<0.01	83	344	18
	50017	40.0	42.0	2.0	0.004	<0.01	30	180	28
	50018	42.0	44.0	2.0	0.008	<0.01	27	84	78
	50019	44.0	46.0	2.0	0.002	<0.01	26	85	64
47.14 – 48.50 – Trace pyrrhotite along fractures.	50020	46.0	47.14	1.14	0.002	<0.01	18	97	69
	50021	47.14	48.5	1.36	<0.002	0.03	19	90	108
	50022	48.5	50.0	1.50	0.002	0.06	17	137	221

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD 92-32

Interval (m)	LITHOLOGY		L	S	M	A
	Dark blue-grey fine-grained sandy (tuffaceous?)		7KT			
	groundmass with light grey to black rounded sandstone			1cm calcite	Po w STG.	
	to argillite fragments to 15 cm, average 1-2 cm.				Po, CP 1cm	
47.14 - 48.50	ARGILLACEOUS SILTSTONE (7Ki)					
	Medium to dark blue-grey massive to		7LT (?)			
	poorly bedded. Gradational contacts					
48.50 -	TUFFACEOUS SILTSTONE (7KT)					
53.6	Dark blue-grey massive siltstone. Sericitic					
	fine-grained groundmass. Gradational contacts.					
53.6 - 77.67	TUFFACEOUS SANDSTONE ? (7LT)					
	Medium to dark bluish-grey f-g					
	aggregate of chlorite, sericite, biotite (?) + ?					
	Massive. Has an appearance of being intrusive but					
	probably an altered sediment or tuff. Some parts					
	with subhedral white feldspar crystals (fragments?)					
	to 1mm. Nonmagnetic except for pyrrhotite.					
					3% Po Tr CP	BLEACHED

Depth scale: 50, 55, 50602 • TS, 50.2 W1, 60, 65, 70, 75

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD 92-32

Depth	Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
50		50023	50.0	52.0	2.0	0.002	0.06	5	125	46
	53.7 - Band pyrrhotite + minor	50024	52.0	53.6	1.6	0.002	0.06	9	113	144
	chalcopyrite at ~ 30° CA. Shear?	50025	53.6	54.0	0.4	0.004	0.06	12	107	71
55	53.6 - 70.10 - Traces disseminated pyrrhotite.	50026	54.0	56.0	2.0	0.002	0.07	7	153	165
		50027	56.0	58.0	2.0	0.002	0.03	10	97	246
		50028	58.0	60.0	2.0	0.002	0.07	8	143	208
60		50029	60.0	62.0	2.0	0.002	0.09	11	188	193
		50030	62.0	64.0	2.0	0.004	0.18	11	189	86
65		50031	64.0	6 .0	.0	<0.002	0.06	9	167	257
		50032	66.0	68.0	2.0	<0.002	0.03	12	128	211
		50033	68.0	70.1	2.1	0.002	0.06	2	112	183
70	70.10 - 71.97 - 2-5% pyrrhotite in fractures. With calcite stringers 30° CA. Po to 1 cm wide. Minor chalcopyrite.	50034	70.1	71.0	0.9	0.002	0.03	5	68	79
		50035	71.0	72.0	1.0	<0.002	0.03	8	104	19
		50036	72.0	74.0	2.0	<0.002	0.03	19	113	23
75		50037	74.0	76.0	2.0	0.002	0.03	6	91	47

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-32

Interval (m)	LITHOLOGY
	(5Gf / 10f)
77.67 - 106.75	RHYOLITE FLOW (INTRUSION ?) A
	Medium to light bluish to greenish-grey massive f-grained groundmass composed probably mostly of quartz and sericite. Up to 15% white to dark green stubby subhedral feldspar phenocrysts to 1 mm. Some parts are distinctly banded & convoluted subparallel to core axis. Looks like flow banding but also looks fragmental (thin section 50603). Fragments probably bands of lighter grey material broken up during distortion of soft flow banding. The somewhat convoluted nature of banding suggests an intrusion. Flow banding becomes more consistent at depth (flow?).
	77.8 - 78.1 - Weak shearing 10° CA.
	95.78 - 106.75 - Flow banding less distinct.

Graphic log columns: L | S | M | A — annotations: 5Gf / 10f; FLOW BANDING; 45°; 38°; 38°; 5G(f)/10f; SHEAR; 5-8% APY Po.; BLEACHED; BLEACHED WHITE; depth marks 75, 80, 85, 90, 95, 100; 50603 • TS; 5c 3 WR

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-32

Depth	Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
75		50038	76.0	77.67	1.67	0.002	0.03	9	44	8[illegible]
	76.44 – 77.67 – Altered to a lighter blue-grey adjacent rhyolite. 5-8% fine-grained disseminated pyrrhotite.	50039	77.67	79.0	1.33	0.004	<0.01	7	5	1660
80	Pyrite in 10cm zone adjacent fracture 30° CA.	50040	79.0	81.0	2.0	0.002	0.01	7	6	62
		50041	81.0	83.02	2.02	0.002	0.03	8	5	17
	83.02 – 84.30 – Bleached white. Moderately soft (as surrounding rock).	50042	83.02	84.30	1.28	0.002	0.03	46	6	25
85		50043	84.30	86.0	1.70	0.002	0.03	5	4	18
		50044	86.0	88.0	2.0	0.004	0.01	13	26	58
90		50045	88.0	90.0	2.0	0.002	<0.01	4	4	12
		50046	90.0	92.0	2.0	0.002	0.01	5	5	6
		50047	92.0	94.0	2.0	0.002	0.01	7	9	5
95		50048	94.0	96.0	2.0	0.002	<0.01	7	8	45
		50049	96.0	98.0	2.0	0.002	0.01	3	6	5
100		50050	98.0	100.0	2.0	0.002	0.03	3	5	4

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-32

Interval (m)	LITHOLOGY		L	S	A	M
		30° Flow Banding	5G(+) / 10X(+)			
	Sheared lower contact 25°. Minor gouge.	18°	25°	25°		
106.75-109	BIOTITE ALTERED ARGILLACEOUS (?) TUFFACEOUS SANDSTONE (7LjT.Bt)		7LjT.Bt,Po			3-5% Po
	Dark blue-grey to black fine-grained groundmass with fine-grained brown biotite. 3-5% dissem. + fracture related Po. 20% ≤ 0.5mm white grains.	50/58	7Kj/7J			Po in bedding parallel bands
109-118.24	ARGILLACEOUS SILTSTONE / MASSIVE ARGILLITE					
	Dark blue-grey to black fine-grained generally massive medium hard argillaceous sediment.					1-2% Diss + Frac Po
118.24-125.6	FINE-GRAINED FELSIC TUFF (3Am)					
	Medium to light greenish-grey medium hard fine-grained felsic tuff. Appears to be massive but very fine-grained to (sandy) (ash) fragments in a quartz-sericite groundmass.	50?/35	3Am		Montmoril. veins; Mont.	Tr-2% Po

Depth scale: 100, 105, 110, 115, 120, 125

WR 50604 (approx. 103–106 m); TS at 105; WR 5060? (approx. 121–124 m); TS at ~121.5

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-32

Depth	Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
100		50051	100.0	102.0	2.0	0.002	0.03	6	17	9
	101.1 - 101.2 - 5% Po in fractures									
		50052	102.0	104.0	2.0	<0.002	0.03	10	11	16
		50053	104.0	105.27	1.27	0.002	0.03	19	22	12
105										
	106.75 - 113.3 - 3-5% disseminated,									
	fracture related + bedding parallel	50054	105.27	106.68	1.41	0.002	<0.01	14	18	17
	bands of pyrrhotite.	50055	106.28	108.0	1.72	<0.002	0.06	8	65	587
		50056	108.0	109.0	1.0	<0.002	0.09	7	77	664
		50057	109.0	110.0	1.0	0.002	0.03	8	72	243
110	111.2 - 5cm zone of banded (bedded?)	50058	110.0	111.0	1.0	<0.002	0.03	5	58	393
	pyrrhotite.	50059	111.0	112.0	1.0	0.002	0.01	5	57	284
	113.0 - 1cm wide stringer of pyrrhotite	50060	112.0	113.0	1.0	<0.002	0.04	10	163	402
	90°CA. Trace Sl, CP	50061	113.0	114.0	1.0	<0.002	0.03	5	154	291
	113.3 - 118.24 - 1-2% disseminated	50062	114.0	115.0	1.0	<0.002	0.03	8	275	1445
115	and fracture-related Po.	50063	115.0	116.0	1.0	0.002	0.03	8	184	882
		50064	116.0	117.0	1.0	<0.002	0.03	5	281	707
		50065	117.0	118.24	TRUE 1.67	<0.002	0.03	8	155	894
	118.24 - 125.6 Trace to 2% disseminated	50066	118.24	120.0	1.76	0.002	0.06	8	48	143
	pyrrhotite.	50067	120.0	122.0	2.0	<0.002	0.28	3	8	36
120	118.87 - 121 - 5% waxy green									
	stringers (montmorillonite?) up to	50068	122.0	124.0	2.0	<0.002	<0.01	2	3	29
	5cm wide at 45° CA.									
		50069	124.0	126.6	1.6	<0.002	0.01	9	13	62
125										

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-32

Interval (m)	LITHOLOGY		L	S	M	A
125.6 – 133.10	SILTSTONE, ARGILLITE (7Ks, J) Dark blue-grey to black siliceous siltstone with thin beds of argillite to 1cm. Bedded intervals common.	S0°/50 S0°/50 S0°/62	3A/ 7Ks, J		2-3% Po	
133.1 – 145.20	FINE-GRAINED FELSIC TUFF (FLOW?) (3An/G) Mottled light grey to medium greenish-grey siliceous (quartz-sericite) groundmass. Vague very fine-grained fragments (phenos?). Some parts with distinct clasts to 5mm; other parts more flow-like. Some parts with 10% stubby to subhedral prismatic greenish phenocrysts? to 1mm. Sharp lower contact at 60° CA	S0?/35° S0?/25 S0?/20	3An/G?		1-3% Po Sh, *CP ~1% Po	Rich MONTMORILLONITE
145.2 – 152.40 E.O.H.	INTERBEDDED SILICEOUS SILTSTONE, ARGILLITE AND SANDSTONE (TUFFACEOUS?) Well bedded sequence. Predominantly black f-g massive siliceous siltstone or argillite. 30% 1-10cm brownish-grey beds of medium-grained clastic (tuff?) with patches of secondary biotite. Possible graded bedding tops uphole.	S0=/70 S0=/68	7Ksb, J, LT		2-5% Po	

Depth scale (right margin): 125, 130, 135, 140, 145, 150

E.O.H.

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD 92-32

Mineralization and Alteration	Sample No.	From (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
125.6-133.1 – 2-5% fine-grained	50070	125.6	127.0	1.4	0.002	0.04	9	62	1343
pyrrhotite: disseminated, along fractures	71	127.0	128.0	1.0	0.002	0.03	6	40	264
and in bedding parallel bands (could	72	128.0	129.0	1.0	<0.002	0.03	6	49	133
be primary) to 1cm. Could be some	73	129.0	130.0	1.0	<0.002	0.03	6	79	124
soft sed deformation (bed breaking up)	74	130.0	131.0	1.0	<0.002	0.03	8	134	335
of sulphide bed. Syngenetic?	50075	131.0	132.0	1.0	<0.002	0.03	13	48	657
	76	132.0	133.1	1.1	<0.002	0.03	11	1193	543
133.1-135 - Waxy medium greenish-	50077	133.1	135.0	1.9	<0.002	0.03	11	758	175
grey f-g soft mineral (montmorillonite?)									
in bands & masses to 10cm. 1-3%	50078	135.0	137.0	2.0	<0.002	<0.01	8	19	85
sporadic diss. Po.									
134.5-134.65 - 10% red-brn	50079	137.0	139.0	2.0	<0.002	<0.01	6	8	25
sphalerite + trace chalcopyrite in									
fracture in a sediment fragment.	50080	139.0	141.0	2.0	<0.002	<0.01	5	12	28
135.0-145.2 - ~1% disseminated									
pyrrhotite. Sporadic.	50081	141.0	143.0	2.0	<0.002	<0.01	2	5	49
	50082	143.0	145.2	2.2	<0.002	<0.01	6	8	104
145.2-152.4 - 2-5% disseminated	50083	145.2	146.0	0.8	<0.002	0.06	10	376	322
and fracture-related pyrrhotite.	50084	146.0	147.0	1.0	<0.002	0.09	31	106	265
	50085	147.0	148.0	1.0	<0.002	0.03	11	49	405
	50086	148.0	149.0	1.0	<0.002	0.03	8	48	320
	50087	149.0	150.0	1.0	<0.002	0.06	5	65	172
	50088	150.0	151.0	1.0	0.002	0.03	7	57	234
	50089	151.0	152.4	1.4 E.O.H.	0.002	0.03	6	71	716

152.4 E.O.H.

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER ____________

Pg. _____ of _____

Interval (m)	LITHOLOGY		L	S	M	A

GRANGES INC.

DIAMOND DRILL LOG

BLACKWATER-DAVIDSON PROJECT (120)

Date Collared Nov. 14	HOLE NUMBER BD92-33
Date Completed Nov. 16	

Logged By: G. ALLEN

PURPOSE: (PROPOSED HOLE BD 92-C). TO TEST 528 ppb GOLD-IN-SOIL ANOMALY AT 4+50 S AND ZONE OF MODERATE CHARGEABILITY.

Location	Survey Data	Acid Dip Tests		
		Depth	Reading	Dip
Claim: PEM	Collar Dip: -50	NONE	TAKEN	
Grid: PEM	Azimuth: 178	(NO	TUBES	ON SITE)
Latitude: 4+28.7 S	Length: 183.8 m			
Departure: 11+02 W	Vert. Project. 140.80			
Elevation:	Hor. Project. 118.14			
Core Size: NQ	Reduced To: ______ at			
Casing Depth: 13.72 m	Casing Left In: Yes ✓ No ______			

COMMENTS:

NO RETURN WATER ∴ NO SLUDGES AFTER FIRST FEW METRES.

SAMPLE SERIES: 50100 - 50266 Au, Ag, ICP
50606 - 50614 WR, TS

SUMMARY LOG:

HOLE NUMBER BD92-33

Interval	Code	Unit Description
0-13.72		CASING
13.72-24.2	2Cw-Dw	INTERMEDIATE COARSE-GRAINED FELDSPAR CRYSTAL TO LAPILLI TUFF
24.2-82.0	5Gw/10Xw	RHYOLITE FLOW OR INTRUSION
82.0-93	2D/3D	INTERMEDIATE (TO FELSIC?) LAPILLI TUFF
93-152.8	3-2Ds.(fu)	FELSIC (TO INTERMEDIATE?) LAPILLI TUFF
152.8-159.1	3-2 A(b)s	FELSIC TO INTERMEDIATE FINE-GRAINED TUFF
159.1-163.8	3C-Ds.fu	FELSIC COARSE-GRAINED TO LAPILLI TUFF
163.8-166.3	3-2 Abs	FELSIC TO INTERMEDIATE FINE-GRAINED TUFF
166.3-167.1	3C-Ds	FELSIC COARSE-GRAINED TUFF
167.1-169.5	3Asb	CHERTY BEDDED FELSIC TUFF
169.5-183.8	3C-Ds	CHERTY FELSIC COARSE-GRAINED TO LAPILLI TUFF
E.O.H.		

MINERALIZATION

Interval	Description	Interval	Description
48.77-65.5	PY, SL, GL IN SPHERULES		
83.4	FIRST APPEARANCE OF PYRRHOTITE		
83.4-167.1	DISSEM. SPHALERITE (TO 5%), PYRITE + PYRRHOTITE (@ TO 5%). AVERAGE SULPHIDE CONTENT 4-7%. TRACES ARSENOPYRITE AND CHALCOPYRITE		

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-33

Interval (m)	LITHOLOGY		L	S	M	A
0 - 13.72	CASING		CASING			
13.72 - 24.2 ?	INTERMEDIATE COARSE-GRAINED, FELDSPAR CRYSTAL TO LAPILLI TUFF (2 C_u-Dw)		2 C_u Dw	SHEAR SET ~10° CA; BROKEN CORE; GOUGE	Bmm; FAULT	
	Fine-grained (aphanitic) medium to dark grey siliceous groundmass with 25-30% <1-2 mm subhedral to euhedral stubby to prism-shaped white feldspar crystal fragments. Some parts have feldspar phyric and dark grey aphyric lithic fragments to 1 cm.					
	22.8 - 27 FAULT ZONE - 40% recovery.					
	22.8 - 23.3 - Gouge zone. Orange mud					

5
10
15
TS
W 50606
20
25

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD 92-33

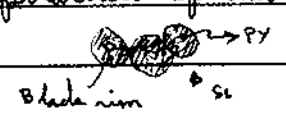
Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
CASING 0-13.72									
	50100	13.72	16.0	2.28					
	50101	16.0	17.0	1.0	<0.002	0.06	12	3336	13
	50102	17.0	18.0	1.0	<0.002	0.03	14	3018	13
	50103	18.0	19.0	1.0	<0.002	0.06	9	2164	11
	50104	19.0	20.0	1.0	<0.002	<0.01	16	2255	21
	50105	20.0	21.0	1.0	<0.002	0.03	13	1078	14
	50106	21.0	22.0	1.0	<0.002	0.03	16	935	14
	50107	22.0	23.0	1.0					
	50108	23.0	24.0	1.0	<0.002	0.09	151	2146	40
	50109	24.0	25.0	1.0	<0.002	0.23	1657	873	177
	50110	25.0	27.0	2.0	<0.002	0.38	1269	528	58

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-33

Interval (m)	LITHOLOGY		L	S	M	A
	23.3 - 24.2 - Broken blocky intermediate lapilli tuff. Shearing appears to be < 20° CA.		5Gw / 10Xw	FAULT; PY, SL	LIMONITE PITS AFTER SULFIDES ?	LIMONITE + MANGANESE STAINED FRACTURES
24.2 - 82.0	RHYOLITE FLOW (INTRUSION ?) (5Gw / 10Xw)					
	Light greenish to bluish - grey fine - grained medium hard groundmass probably composed mostly of quartz and sericite. ~10% stubby ≤ 1 mm white to green subhedral to euhedral feldspar phenocrysts. Unit is quite massive.			30°; GOUGE; 30° SHEAR; 25°; GOUGE		
	24.2 - Abundant limonite and manganese stained fractures 45-20° CA. Unit is pitted. Probably feldspar phenocrysts weathered out. Limonitic pits may indicate that sulphides replaced phenocrysts.			FRACTURES 20°; GOUGE; 25°; GOUGE		LIMONITE STAINED, Mn STAIN
	28.3 - 5cm zone with small (≤1mm) quartz-crystal lined vugs (part of silicification process?) commonly with pyrite filling core. Fine-grained black sulphide(?) in halos around vugs. Disseminated sphalerite spacially associated.		GOUGE, BANDED; GOUGE	20°; 0°; 20°		
	Vugs could be old feldspar phenocryst sites.				1% Py, 1% vug sulphides.	LESS LIMONITE



Depth scale: 25, 30, 35 (WR 5061, TS), 40, 45, 50

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-33

Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
24.2 - limonitic pits ~10%	50111	No	SAMPLE						7
may be sulphides replacing	50112	27.0	28.0	1.0	0.002	0.29	3425	449	72
feldspar + then weathering out	50113	28.0	29.0	1.0	0.008	0.18	1293	243	37
Generally sulphide deficient.	50114	29.0	30.0	1.0	0.008	0.23	1684	189	70
	50115	30.0	31.0	1.0	0.006	0.38	777	166	45
28.3 - 5cm zone with PY +	50116	31.0	32.0	1.0	0.008	0.93	998	228	73
sphalerite (@ <1%). See text for	50117	32.0	33.0	1.0	0.012	0.44	675	191	55
description.	118	33.0	34.0	1.0	0.004	0.38	546	227	49
* Zone with black rims around	119	34.0	35.0	1.0	0.004	0.70	1425	445	139
pyrite cores in zone with	50120	35.0	36.0	1.0	0.006	0.64	2004	339	177
less limonite staining, i.e. in	121	36.0	37.0	1.0	0.004	0.32	1282	326	WR 50607
unoxidized parts.	122	37.0	38.0	1.0	0.006	1.02	1606	373	111
	123	38.0	39.0	1.0	0.004	0.32	635	194	110
	124	39.0	40.0	1.0	0.004	0.18	1355	237	171
	50125	40.0	41.0	1.0	0.002	0.09	2208	421	154
	126	41.0	42.0	1.0	0.006	0.32	2219	585	91
	127	42.0	43.0	1.0	0.008	0.83	1004	426	83
	128	43.0	44.0	1.0	0.006	0.15	810	193	93
	129	44.0	45.0	1.0	0.004	0.15	634	229	36
	50130	45.0	46.0	1.0	<0.002	0.12	600	154	21
	COMBINED 131	46.0	47.0	1.0	0.004	0.20	623	227	17
48.77 - 51.3 - Zone with sporadic round	132	47.0	48.0	1.0	—				
black alteration rims around cores of	133	48.0	49.0	1.0	0.006	0.44	4580	788	38
± quartz, ± pyrite, ± grey sulphide.	134	49.0	50.0	1.0	0.002	0.18	5966	722	15
Some grey metallic could be hematite.	50135	50.0	51.0	1.0	0.006	0.29	10642	3125	29

Black halos up to 7mm, but average 3-5mm.

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-33

Interval (m)	LITHOLOGY		L	S	M	A
	Massive fine-grained rhyolite. Medium to light blue-grey aphanitic quartz - sericite aggregate. Feldspar phenocrysts not abundant. Altered & destroyed?		5 Gε / 10Xε		PY, Sl, Ef.	LIMONITE STAINING
	58.5 - 83 FAULT ZONE				PY, o Sl, oTr Gal, oCP	
	Zone of gouge, ~~and~~ crushed rock and broken core. Shearing appears to be subparallel to 20° to core axis. Faulting affects both ~~pyro~~ limonitic and non limonitic parts. Probably post-dates mineralization			20°, GOUGE, 20°, FAULT 0-20° CA	PY	LIMONITE
	68.7 - 69.2 - Negative of colour pattern observed above. Light grey spherules to 7mm with dark pyritic core.			GOUGE	PY, TR?	LIMONITE
				GOUGE, GOUGE AND CRUSHED ROCK 0° CA	2% Py, 3% Sl, Tr Py, Black mineral, 2% Py, 5% Sl	LIMONITE

Right margin: 50, P.T.S. 50608, 55, P.T.S. 50609, 60, 50610, 65, 70, 75

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-33

Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	AS ppm
Black haloes around pyrite core.	50136	51.0	52.0	1.0	0.006	0.23	1632	325	64
Could be sphalerite. Rarely a thin	137	52.0	53.0	1.0	0.006	0.35	5324	870	39
yellow stain occurs as a thin rim	138	53.0	54.0	1.0	0.004	0.12	1885	455	23
around the black 'spherules.' May	139	54.0	55.0	1.0	0.014	0.41	14810	7451	2
be greenockite (CdS) from weathered	50140	55.0	56.0	1.0	0.018	0.41	9031	9096	13
sphalerite. 1% PY, 5% SL ??	141	56.0	57.0	1.0	0.014	0.32	8003	7465	14
Trace galena? POLISHED T.S. 50608	142	57.0	58.0	1.0	0.013	0.48	9958	3340	38
AT 51.1m.	143	58.0	59.0	1.0	0.012	0.29	16,667	3410	7
- 54.0-57.6 - Much as above.	144	59.0	60.0	1.0	0.008	0.31	6590	1987	26
* 5% red brown dissem. sphalerite,	50145	60.0	61.0	1.0	0.004	0.18	1089	181	23
in masses to 2mm, 1-2% pyrite,	146	61.0	62.0	1.0	0.018	0.03	667	150	19
1% galena. Some parts also have	147	62.0	63.0	1.0	0.002	0.06	442	189	10
20% black spherules up to 7mm	148	63.0	64.0	1.0	0.006	0.09	668	250	41
in diameter (sphalerite?) some	149	64.0	65.0	1.0	0.006	0.31	5182	4503	16
greenockite ? rims. Trace chalcopyrite	50150	65.0	66.0	1.0	0.008	0.29	2141	2256	60
* Sulphides distinctly segregated	151	66.0	67.0	1.0	0.014	0.44	723	345	72
into non limonitic zones.	152	67.0	68.0	1.0	0.006	0.32	5169	5634	97
- 64.3-65.5 - ~2% fine-grained	153	68.0	69.0	1.0	0.022	0.29	1925	15693	278
dissem PY. 5-6% disseminated	154	69.0	70.0	1.0	0.036	0.32	1702	12117	464
* dark grey sulphide. Tetrahedrite?	50155	70.0	71.0	1.0	0.008	0.26	581	3642	513
- 67.0 - 70.7 Most of zone sheared to	156	71.0	72.0	1.0	0.008	0.15	949	782	724
gouge & crushed rock. Unsheared part	157	72.0	73.0	1.0	0.004	0.12	741	674	381
has f-g. dissem pyrite (~2-3%) +	158	73.0	74.0	1.0	0.004	0.06	382	7683	314
5% red-brown sphalerite.	159	74.0	75.0	1.0	0.008	0.10	1039	2041	321
- 73.0-74.0 - 2% py, 5% red-brn	50160	75.0	76.0	1.0	0.030	0.20	385	389	341

sphalerite.

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-33

Interval (m)	LITHOLOGY
	76.5 - 83.0 - FAULT ZONE
	Gouge and crushed rock. Sheared 20° on upper contact. Slickensides appear to parallel hole ∴ dip slip (?). Block faulting
	(TO FELSIC ?)
82.0 - 93	INTERMEDIATE, LAPILLI TUFF (2D)
	Medium grey aphanitic siliceous groundmass with 30-40% dark green aphyric aphanitic lithic fragments. Angular, to 5 cm. Some fragments appear to be flow-banded and composition may be more felsic than it looks.
	88.1 - Dark red-brown garnet in mass to 1 cm
	Unit becomes lighter grey and contains more flow-banded fragments with depth. More felsic? Gradational contact with unit below.
	(TO INTERMEDIATE ?)
93 - 152.8	FELSIC, LAPILLI TUFF 3-2Ds. (3Gfu)
	Probably same unit as above but more altered, silicified, lighter grey. More flow-banded fragments.
	Medium to light bluish to greenish-grey siliceous groundmass with 30-40%

<1-3 cm light green to dark grey aphanitic angular rock fragments. Flow-banded fragments common.
99.4 - Thinly bedded felsic tuff, ~10 cm interval.

L	S	M	A
5Ct/10Xt	20°; GOUGE; FAULT ZONE; RUBBLE; GOUGE	4-5% SL	
2D (-3D?)		3-5% SL Py, Po; 1-2% SL; 1-3% @ Po, SL	GARNET *
3D. (3Gfu) (-2D?)	50; 54°	2-4% @ Po, SL	Moderate silicification

Depth scale (m): 75, 80, 85, 90, 95, 100

1 m core loss

2 m core loss

PTS

W.F 50611

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-33

Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
76.5-77.5 - 4-5% fine-grained	50161	76.0	77.0	1.0	0.010	0.06	337	4324	427
disseminated red-brown sphalerite.	162	77.0	79.0	2.0	0.004	0.41	98	6051	794
Some irregular stringers & masses	163	79.0	82.0	3.0	0.006	0.03	22	4859	203
to 1cm.	164	82.0	83.0	1.0	0.006	0.04	30	4076	106
	50165	83.0	84.0	1.0	0.012	0.09	12	8148	181
	166	84.0	85.0	1.0	0.018	0.04	45	6425	920
	167	85.0	86.0	1.0	0.006	0.42	37	3370	74
* 83.0-84.3 - 3-5% fine-grained	168	86.0	87.0	1.0	0.006	0.06	35	1475	31
disseminated red-brown sphalerite.	169	87.0	88.0	1.0	0.008	0.06	40	2048	50
1-2 % @ pyrite and pyrrhotite.	50170	88.0	89.0	1.0	0.010	0.03	40	2389	68
* First appearance of Po in hole.	171	89.0	90.0	1.0	0.018	0.03	24	3561	118
84.3 - 85 1-2% sphalerite.	172	90.0	91.0	1.0	0.014	0.01	28	3313	69
85 - 94 1-3% @ sphalerite and	173	91.0	92.0	1.0	0.014	0.03	48	4029	271
pyrrhotite. Dissem. Trace PY	174	92.0	93.0	1.0	0.014	0.03	58	5712	224
Rare pyrrhotite fragments.	50175	93.0	94.0	1.0	0.014	0.03	64	4610	124
	176	94.0	95.0	1.0	0.010	0.15	57	3520	73
	177	95.0	96.0	1.0	0.006	0.06	30	2586	50
	178	96.0	97.0	1.0	0.008	0.03	39	4516	50
	179	97.0	98.0	1.0	0.008	0.38	39	4201	49
94 - 100 2-3% @ fine-grained	50180	98.0	99.0	1.0	0.010	0.06	43	4443	55
red-brown sphalerite and pyrrhotite	181	99.0	100.0	1.0	0.024	0.09	53	4745	103
	182	100.0	101.0	1.0	0.014	0.07	51	3846	84
	183	101.0	102.0	1.0	0.010	0.01	31	3997	114
	184	102.0	103.0	1.0	0.006	<0.01	26	3630	54
	50185	103.0	104.0	1.0	0.010	0.06	31	3169	100

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-33

Interval (m)	LITHOLOGY		L	S	M	A	
	100.9 - 101 - Thinly bedded felsic fine-grained tuff.	So 68°	3D	2-4% St 2-3% Po. Tr-1% Py			100
	114 - Some lithic fragments altered to a waxy green soft material (montmorillonite?) Siliceous groundmass.						105
				30°			110
					2-4% St *As, Cp 1-3% Py, Po Py>Po Tr As * Tr As *	SILICEOUS	115
					1-2% Py 2-4% St, Po		120
							125

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD 92-33

Depth	Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
100	100 - 112 2-4% fine-grained diss.	50186	104.0	105.0	1.0	0.010	0.35	28	4624	128
	red-brown sphalerite, 1-3%	187	105.0	106.0	1.0	0.012	0.23	35	5476	125
	pyrrhotite and trace to 1%	188	106.0	107.0	1.0	0.008	0.06	41	4298	131
	pyrite.	189	107.0	108.0	1.0	0.014	0.06	24	5409	407
		50190	108.0	109.0	1.0	0.008	0.13	25	5268	215
105	Sphalerite sporadic, but marginally	191	109.0	110.0	1.0	0.010	0.15	25	5399	594
	more abundant in fragments than	192	110.0	111.0	1.0	0.008	0.38	19	5989	331
	in groundmass.	193	111.0	112.0	1.0	0.016	0.12	32	6287	168
		194	112.0	113.0	1.0	0.014	0.09	23	4473	348
		50195	113.0	114.0	1.0	0.014	0.50	23	9082	368
110	112 - 119 2-4% SL, 1-2% @ Po, PY.	196	114.0	115.0	1.0	0.012	0.12	28	4657	612
*	Traces arsenopyrite. PY > Po	197	115.0	116.0	1.0	0.022	0.80	36	5276	749
	112.88 - Traces arsenopyrite and	198	116.0	117.0	1.0	0.040	0.32	150	10484	1317
	chalcopyrite rimming dark green	199	117.0	118.0	1.0	0.054	0.54	147	14598	1268
	lithic fragment.	50200	118.0	119.0	1.0	0.086	0.84	316	13612	830
115	sulphides predominantly in fragments	201	119.0	120.0	1.0	0.100	0.15	25	4463	600
		202	120.0	121.0	1.0	0.040	0.16	21	1118	567
		203	121.0	122.0	1.0	0.020	0.04	22	3129	631
	119 - 125 1-2% @ PY	204	122.0	123.0	1.0	0.080	0.50	87	13648	62
	2-4% Po, SL (red-brn)	50205	123.0	124.0	1.0	0.054	0.38	49	7520	131
120	Disseminated. Not as concentrated	206	124.0	125.0	1.0	0.014	0.53	15	3645	103
	in fragments as above.	207	125.0	126.0	1.0	0.022	0.01	13	1705	35
		208	126.0	127.0	1.0	0.018	0.03	7	2611	45
		209	127.0	128.0	1.0	0.036	0.03	14	7557	30
		50210	128.0	129.0	1.0	0.014	0.03	10	1819	32
125										

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD 92-33

Interval (m)	LITHOLOGY		L	S	M	A
	As above. Light grey siliceous groundmass with 25% soft green altered angular lithic fragments to 2cm (average <1cm). Up to 10% 1-2mm feldspar crystal fragments. Abundant sulphides.		WDS		4-5 Po, 3% SL, 2% Py, 2% Po, <1% SL, 2% Py, 1% SL, 5% Po, 1% SL, Py, Tr CS, 2% Py, 1% SL, As, 5% Po, 2-3 SL, 2-3% Po, 1-2% SL, 3-5 Py, 2-5 Po, 2-3 SL, 3-5% Py, 2-3 SL, 1-2 Py, 3-5% Po, SL, 3-5 SL, 2 Py, 1-2 Po, 2-3 Po, SL	PY; SILICEOUS, MONTMORILLONITE ALT. FRAGMENTS

S column annotations: 20°; CHLORITE GOUGE; As; As

Depth scale: 125, 130, 135, 140, 145, 150

WR 50612; P.T.S.

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD 92-33

Depth	Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
125										
	125-126.3 - 4-5% Po. Dissem.									
	126.3-128.2 - 3% Sl, 2% Py									
	Disseminated									
	128.2-13 - 2% Po <1% @ Sl Py	50211	129.0	130.0	1.0	0.012	0.18	25	1616	26
	132.7-133.5 - 5% Po, 1% @ Sl, Py, Tr Cp									
130	133.5-136.2 - 2% Py, 1% Sl.	212	130.0	131.0	1.0	0.012	0.03	50	2917	232
	*135.5 - Trace As	213	131.0	132.0	1.0	0.002	0.03	37	3289	60
	136.2-137.16 - 5% Po, 2-3% Sl	214	132.0	133.0	1.0	0.010	<0.01	21	3741	69
	Disseminated.	50 215	133.0	134.0	1.0	0.046	<0.01	12	1975	154
		216	134.0	135.0	1.0	0.008	0.03	15	2905	337
135		50217	135.0	136.0	1.0	0.018	<0.01	23	2034	719
		218	136.0	137.0	1.0	0.046	0.15	84	5372	698
	137.16-138.7 2-3% Po, 1-2% Sl	50219	137.0	138.0	1.0	0.296	0.12	35	3614	199
		50 220	138.0	139.0	1.0	0.074	0.15	250	6459	96
	138.7-142 - 3-5% Py, 2-5% Po,	221	139.0	140.0	1.0	0.024	0.07	175	5384	586
140	2-3% Sl, Trace As. Total sulphide	222	140.0	141.0	1.0	0.018	0.12	172	6491	239
	average 6-7%. Pyrite most	23	141.0	142.0	1.0	0.010	0.25	192	6858	308
	commonly in bladed habit.	50224	142.0	143.0	1.0	0.020	0.12	101	10165	243
	(marcasite?). Dissem. 1-2 mm.	50 225	143.0	144.0	1.0	0.016	0.48	93	8455	153
	142-144 - 3-5% Po, 2-3% Sl, 1-2%	226	144.0	145.0	1.0	0.014	0.20	27	10494	90
145	Py. Dissem. in <1-2mm	227	145.0	146.0	1.0	0.018	0.44	20	7164	106
	masses.	228	146.0	147.0	1.0	0.016	0.15	26	7123	414
	144-146 - 3-5% @ Sl, Po. Dissem.	50229	147.0	148.0	1.0	0.014	0.01	26	5500	245
	146-147.3 - 3-5% Sl, 2% Py, 1-2 Po	230	148.0	149.0	1.0	0.016	0.03	26	4927	293
	147.3-152 - 2-3% @ Sl, Po. Trace	231	149.0	150.0	1.0	0.012	0.03	24	6326	329
	As in small cubes at	232	150.0	151.0	1.0	0.042	<0.01	19	4113	156
150	148 m.									

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD 92-33

Interval (m)	LITHOLOGY		L	S	M	A	
			3D		2-3% Po, SL		150
152.8 -	FELSIC TO INTERMEDIATE FINE-						
159.1	GRAINED TUFF (3-2 A(b)s)				1-2 Po, SL		
	Medium greenish - grey fine-grained	So? 30°	3-2A(b)s		2-3 Po, 1-2 SL		
	hard (siliceous) mixture of quartz +	So 18°			3-4 SL, 1-2 Py		155 WR 5061
	sericite. Massive to poorly bedded.				1 Po	F.T.S.	
	1-2 mm bands commonly defined by	So 30°					
	sulphide distribution.			43°	1-2% Py, SL, Po	SILICIFIED	
	COARSE-GRAINED TO						
159.1 -	FELSIC LAPILLI TUFF (3C-Ds. fu)				1 Py, <1 Po		160
163.8	Medium greenish - grey aphanitic		3C-Ds		2-3 Po, 1-2 SL		
	siliceous groundmass composed of quartz						
	+ sericite (?) with 20-30% 1mm -						
	2cm angular light felsic lithic fragments.				1-2 Po + SL		
	Fragments commonly flow - banded.	So 60	3-2Abs		<1 Py		165
163.8 - 166.3	FELSIC TO INTERMEDIATE FINE-GRAINED		3C-Ds				
	TUFF (3-2 Abs)		3Asb		1-2% Po, Tr SL		
	Medium greenish - grey f-g siliceous						
	quartz - sericite groundmass with rare				2-3% Po		170
	white grains to 1mm. Poorly bedded		3C-Ds		Tr SL		
166.3 - 167.1	FELSIC COARSE - GRAINED TUFF (3C-Ds)	So? 60					
167.1 - 169.5	CHERTY BEDDED FELSIC TUFF (3Asb)						
	Medium to dark greenish - grey cherty						
	thinly laminated tuff (flow banding ??)						175

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD 92-33

Depth	Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
150		50233	151.0	152.0	1.0	0.012	0.03	20	4000	146
		34	152.0	153.0	1.0	0.010	0.06	36	4064	130
		50235	153.0	154.0	1.0	0.010	0.06	60	4724	39
		236	154.0	155.0	1.0	0.006	0.06	54	2265	71
155	154.5 - 157.6 - 3-4% SL, 1-2%	237	155.0	156.0	1.0	0.010	0.03	64	3587	57
	Py, 1% Po. Disseminated, blebs to	238	156.0	157.0	1.0	0.010	0.03	63	2696	89
	2mm.	239	157.0	158.0	1.0	0.006	0.03	74	3129	46
	157.6 - 159.7 1-2% @ SL, Py, Po.	50240	158.0	159.1	1.1	0.008	0.06	66	761	42
		241	159.1	160.0	0.9	0.018	0.03	87	1636	101
160	159.1 - 163.8 - fragments cut by	242	160.0	161.0	1.0	0.006	<0.01	23	2206	59
	abundant hairline quartz stringers	243	161.0	162.0	1.0	0.012	0.01	41	2796	36
	as extensions out of groundmass.	244	162.0	163.0	1.0	0.004	0.03	37	3349	69
	General silicification.	50245	163.0	164.0	1.0	0.004	<0.01	35	3702	164
	159.7 - 161.0 - 1% PY, <1% Po.	246	163.8	165.0	1.2	0.004	<0.01	31	2320	107
165	disseminated and along short fractures	247	165.0	166.0	1.0	0.006	<0.01	48	2527	37
	161.0 - 163.8 2-3% PO, 1-2% red-	248	166.0	167.0	1.0	0.006	0.34	45	2722	59
	brn sphalerite. Disseminated.	249	167.0	167.2	TRUE 1.4	0.004	0.03	41	2288	164
	163.8 - 167.1 1-2% PO & SL, <1% PY	50250	167.2	168.0	1.0	0.006	0.12	42	2444	233
		251	168.0	169.0	1.0	0.004	0.03	36	550	63
	167.1 - 169.5 - 1-2% PO, Tr SL	252	169.0	170.0	1.0	0.006	<0.01	39	501	22
170	169.5 - 183.8 - 2-5% PO, Tr SL, CP	253	170.0	171.0	1.0	0.004	0.12	46	573	83
	Disseminated in masses to 2mm,	254	171.0	172.0	1.0	0.006	0.01	25	853	79
	average <1 mm.	50255	172.0	173.0	1.0	0.012	<0.01	33	739	81
		50256	173.0	174.0	1.0	0.006	<0.01	50	709	27
		257	174.0	175.0	1.0	0.002	<0.01	28	429	37
		258	175.0	176.0	1.0	0.006	<0.01	30	770	90
175										

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-33

Interval (m)	LITHOLOGY		L	S	M	A
169.5 – 183.8 E.O.H.	CHERTY FELSIC COARSE-GRAINED TO LAPILLI TUFF (3c-Ds)	50?/70	3c-Ds		2-4 Po, Tr Sc, Py	
	Medium greenish-grey cherty coarse-grained to lapilli tuff. Indistinct angular to rounded lithic fragments, commonly flow banded. Some intervals thinly laminated (bedding?).					
	176.6 + 178.3 – 1cm masses of red-brown garnet.			183.8 E.O.H.		

175 — 50614 WR, P.T.S. ▲ — 180 — 185

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-33

Depth	Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
175										
		50259	176.0	177.0	1.0	0.004	<0.01	30	375	111
		50260	177.0	178.0	1.0	0.008	<0.01	41	366	150
		261	178.0	179.0	1.0	0.006	0.01	42	577	222
		262	179.0	180.0	1.0	0.004	0.35	45	346	76
180		263	180.0	181.0	1.0	0.004	<0.01	39	388	452
		264	181.0	182.0	1.0	0.008	<0.01	38	567	642
		50265	182.0	183.0	1.0	0.008	<0.01	44	1108	1223
		50266	183.0	183.8	0.8	0.012	<0.01	52	1774	86
185	183.8 E.O.H.									

BLACKWATER-DAVIDSON PROPERTY

BOX INTERVALS

HOLE NUMBER BD-92-33

Box	From	To	Box	From	To
1	13.72	19.3	25	149.4	154.0
2	19.3	28.2[illegible]	26	154.0	159.6
3	28.2[illegible]	33.18	27	159.6	[illegible]5.2
4	33.18	38.5	28	165.2	170.2
5	38.5	4[illegible]	29	170.2	175.9
6	43.6	50.9	30	175.9	181.5
7	5[illegible]	54.8	31	181.5	183.8 EOH
~~8~~ 9 / 9	~~54.8~~ / 59.92	~~59.92~~ / 65.4[illegible]	32		
10 ~~9~~	65.4	71.2	33		
11 ~~10~~	71.2	77.0	34		
12 ~~11~~	77.0	85.3	35		
13 ~~12~~	85.3	91.1	36		
14 ~~13~~	91.1	96.7	37		
15 ~~14~~	96.7	102.3	38		
16 ~~15~~	102.3	107.8	39		
17 ~~16~~	107.8	113.6	40		
~~17~~			41		
18	113.6	119.2	42		
19	119.2	124.9	43		
20	124.9	129.5	44		
21	129.5	134.1	45		
22	134.1	139.7	46		
23	139.7	144.8	47		
24	144.8	14[illegible].4	48		

CORE RECOVERY

HOLE NO. SD-92-33

RUN

FROM	TO	LENGTH	LENGTH OF CORE	RECOVERY (%)
13.72	15.24	1.52	.50	30.9
15.24	18.29	3.048	3.94	129.2
18.29	21.34	3.048	.73	23.9
21.34	24.38	3.048	2.72	90.5
24.38	27.43	3.048	1.32	43.3
27.43	30.48	3.048	3.34	109.6
30.48	33.53	3.048	2.99	98.1
33.53	36.58	3.048	3.14	103.0
36.58	39.62	3.048	3.01	98.7
39.62	42.67	3.048	3.34	109.6
42.67	45.72	3.048	2.34	76.8
45.72	48.77	3.048	2.74	89.9
48.77	51.82	3.048	2.92	95.8
51.82	54.86	3.048	3.26	106.9
54.86	57.91	3.048	3.11	102.0
57.91	60.96	3.048	3.63	119.1
60.96	64.00	3.048	3.30	108.2
64.00	67.05	3.048	3.45	113.2
67.05	70.10	3.048	2.70	88.6
70.10	73.15	3.048	2.27	74.5
73.15	76.20	3.048	3.42	112.2
76.20	79.25	3.048	2.04	66.9

CORE RECOVERY

HOLE NO. [illegible]

RUN

FROM	TO	LENGTH	LENGTH OF CORE	RECOVERY (%)
79.25	82.3	3.048	1.2	39.4
82.3[illegible]	[illegible]	3.048	3.21	105.3
85.35	88.39	3.048	3.22	105.6
88.39	91.44	3.048	3.15	103.3
91.44	94.49	3.048	3.30	108.2
94.49	97.54	3.048	3.10	101.7
97.54	100.58	3.048	3.11	102.0
100.58	103.63	3.048	3.04	100.0
103.63	106.68	3.048	3.34	109.6
106.68	109.73		3.20	105
109.73	112.78		2.95	97
112.78	115.82		3.28	108
115.82	118.87		3.05	100
118.87	121.92		3.2	105
121.92	124.97		3.3	108
124.97	128.02		3.4	111
128.02	131.06		3.0	98
131.06	134.11		3.4	111
134.11	137.16		3.25	107
137.16	140.21		3.15	103
140.21	143.26		3.4	111
[illegible]	146.30		3.2	105

CORE RECOVERY

HOLE NO. BD92-33

RUN

FROM	TO	LENGTH	LENGTH OF CORE	RECOVERY (%)
146.30	149.35	3.048	3.7	106
149.35	152.40		3.4	111
152.40	155.45		3.3	108
155.45	158.50		3.1	102
158.50	161.54		3.3	108
161.54	164.59		3.05	100
164.59	167.64		2.7	89
167.64	170.69		2.75	90
170.69	173.74		3.1	102
173.74	176.79		3.1	102
176.79	179.83		3.05	100
179.83	182.88		3.3	108
182.69	183.79		1.0	90 (100)
	E.O.H.			

GRANGES INC.

DIAMOND DRILL LOG

BLACKWATER-DAVIDSON PROJECT (120)

Date Collared Nov. 16/92	HOLE NUMBER BD92-34
Date Completed Nov.17/92	

Logged By: Ross Zawada

PURPOSE:

To test a geophyisical chargeability high.

Location	Survey Data	Acid Dip Tests		
Claim: Pem	Collar Dip: -65	Depth	Reading	Dip
Grid: Pem 10W 698S	Azimuth: 181° (G.A. 176°)	79.25m	75	70
Latitude: 6+48S	Length: 144.78m.	144.78	74.3	69
Departure: 10+01W	Vert. Project.			
Elevation:	Hor. Project.			

Core Size: NQ	Reduced To: ______ at
Casing Depth: ~ 11.19m	Casing Left In: Yes ✓ No ______

COMMENTS: PROPOSED HOLE BD92-B

SAMPLE SERIES : 50267 - 50358 Au, Ag, ICP
50615 - 50618 WR
50615 - 50619 POLISHED THIN SECTIONS

HOLE NUMBER BD92-34

SUMMARY LOG:

Interval	Code	Unit Description
0.0→11.28	—	CASING
11.28-49.10	2-3D	a whitish to greenish grey rock with matrix supported angular clasts. Clasts generally appear more chlorite altered. The rock is weakly to moderately oxidized to a down hole depth of 37.85 m and has a blocky, shattered nature with unbroken sections rarely exceeding 10 cm.
49.1→144.78	2D-Ea	- a greenish purple color with matrix supported angular clasts that are slightly darker than the surrounding groundmass. The contact with the overlying unit appears to be a fault. Lithology varies between tuff with lapilli sized frags and tuff with larger (≤10cm) amygdule rich fragments. Blocky, shattered core & gouge are common. 1-2% py, po & sl are found throughout the section with sl content increasing within the amygdule rich sections.

MINERALIZATION

Interval	Description	Interval	Description

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER B923-34

Interval (m)	LITHOLOGY		L	S	M	A
0.0m →						
11.28	CASING					
11.28 → 49.1	Felsic to Intermediate Lapilli Tuff a whitish grey to greenish grey rock with angular clasts ranging in size from ≤1 to >50mm across. Some clasts contain chlorite altered cores while others have feldspar laths ≤5mm along the long axis. Clasts are slighty lighter in color than the groundmass. - small randomly oriented & apparently discontinuous fractures are commonly chloritized and oxidized along fracture surfaces. These fractures commonly carry small amounts of pyrite.	2-3D WR		32° XX XX	Tr Py	MODERATELY OXIDIZED

5 10 15 20 24

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-34

Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
	50267	12.19	13.7	1.51	0.048	0.32	635	3728	57
	50268	13.7	15.24	1.54	0.008	0.06	557	6668	34
	50269	15.24	16.8	1.56	0.008	0.03	644	5600	25
	50270	16.8	18.29	1.49	0.004	0.44	2245	1292	35
	50271	18.29	19.8	1.51	0.006	0.85	820	1725	46
	50272	19.8	21.39	1.54	0.008	0.38	541	1841	91
	50273	21.34	22.8	1.46	0.004	0.10	1723	2465	31
	50274	22.8	24.4	1.60	0.006	0.48	2984	5177	53
	50275	24.4	25.9	1.50	0.008	0.04	209	1612	34

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-34

Interval (m)	LITHOLOGY		L	S	M	A
11.28 -> 49.10 (cont'd)	50615	PI WR				
	The core has a blocky + shattered nature with unbroken sections rarely exceeding 10 cm. Fault gouge is common.					Mod Oxi
	35.6 -> 49.2 - shattered core with ≈ 40% of recovered core being fault gouge - numerous fractures with 2-10 mm of fault gouge. Core angles range from 30-90° to CA.		6 3 D			
	Mineralisation - traces of pyrite are common throughout the interval. Some of the fault gouge carries as much as 2% pyrite. Also small chloritized fractures occassionaly carry small amounts of py.				Py 2% Py 1%	

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-34

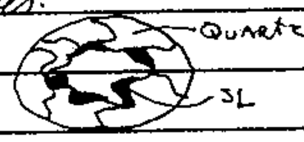
Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
	50276	25.9	27.43	1.53	0.016	0.44	783	3770	26
	50277	27.43	29.0	1.57	0.012	0.09	404	2783	96
	50278	29.0	30.5	1.5	0.012	0.26	466	1637	66
	50279	30.5	32.0	1.5	0.002	0.31	677	3290	70
	50280	32.0	33.5	1.5	0.004	0.26	840	5308	72
	50281	33.5	35.0	1.5	0.004	0.60	2252	5053	94
	50282	35.0	36.5	1.5	0.008	0.33	1192	4628	48
	50283	36.5	38.1	1.6	<0.002	0.22	869	1047	53
	50284	38.1	39.6	1.5	0.002	0.41	2426	3250	83
	50285	39.6	41.1	1.5	0.006	0.13	522	2770	64
	50286	41.1	42.6	1.5	0.076	0.99	951	8813	38
	50287	42.6	44.1	1.5	0.210	0.51	545	5122	59
	50288	44.1	45.72	1.62	0.010	0.16	46	10426	131
	50289	45.72	47.7	.98	0.010	0.16	111	6009	48
	50290	47.7	49.1	1.40	0.008	0.23	260	10018	56

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-34

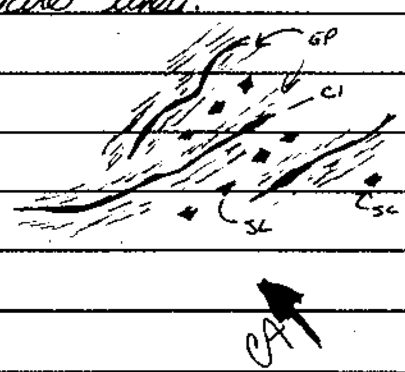
Interval (m)	LITHOLOGY		L	S	M	A
49.1 →					py SL	Cl-Ep
144.78	Intermediate Lapilli Tuff/Tuff Breccia	P.T.				Cl-Ep
	(2D-Ea)					
		50616				
	a greenish-purple coloured rock with	Whole Rock + P.T.				
	matrix supported clasts. Clasts fall					
	into 2 distinct types. First lapilli sized					
	angular clasts, darker than the matrix.					
	Secondly, larger clasts (±10cm across)		2Ea			SE
	angular, with abundant quartz filled					
	amygdules 1-5mm in diameter. These				Tr-1%	Cl
	larger clasts are slightly lighter in color					
	and have less distinctive boundaries.					
	These two clast types rarely occur				M+SL	SE
	together.					
	While the amygdules are most commonly					Cl
	quartz filled some are quartz lined			32°		
	forming a central vug that is					
	sometimes lined & other times filled with					
	sphalerite as well as equal or lesser					
	amounts of pyrite. Epidote (?) is also					
	common within amygdules.		2D			



50
60
70
75

Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
	50291	49.1	51.3	2.20	0.004	0.22	264	9353	15
1-2% sl w/ ≈2% py+po associated with cl and ep alt. along small discontinuous fractures ⊥ to CA.	50292	51.3	51.9	0.60	0.004	0.06	35	5158	22
	50293	51.9	53.9	1.50	0.008	0.16	88	7404	28
	50294	53.4	54.8	1.40	0.042	0.31	110	7820	4
	50295	54.8	56.3	1.50	<0.002	0.24	65	9288	10
	50296	56.3	57.9	1.60	<0.002	0.16	54	9034	8
	50297	57.9	59.0	1.10	0.004	0.13	110	5484	118
	50298	59.0	60.9	1.90	0.002	0.14	72	4002	87
	50299	60.9	62.0	1.10	0.002	0.12	92	4815	11
	50300	62.0	63.0	1.0	0.004	0.13	127	6036	36
	50301	63.0	64.0	1.0	0.004	0.16	408	10145	123
	50302	64.0	65.0	1.0	0.028	0.20	448	13629	37
	50303	65.0	66.0	1.0	0.020	0.19	303	7525	19
	50304	66.0	67.0	1.0	0.036	0.30	231	6341	84
	50305	67.0	68.5	1.5	0.008	0.17	68	8210	15
	50306	68.5	70.0	1.5	0.006	0.12	42	5169	54
	50307	70.0	71.5	1.5	0.008	0.16	604	8712	2
	50308	71.5	73.1	1.6	0.[illegible]0	0.22	1237	10250	3
	50309	73.1	76.2	2.9	<0.002	0.32	2665	8690	5

Interval (m)	LITHOLOGY		L	S	M	A
49.1 → 144.78 cont'd	The unit appears to be in fault contact with the overlying unit. A weak to moderate sericitic & chloritic alteration can be found virtually throughout the unit.		2D			
	51.5 - small apparently discontinuous fractures (mm across) ⊥ to CA with cl-ep alteration along fracture surfaces. - 2-4% red-brown sphalerite is found between fractures but rarely observed within the fractures. Occasionally these fractures are pyrite lined.	50617 Whole Rock P.T.	2Ev		SL 4% SL	
			2D		P4 P4 P1	



75
80
90
100

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-34

Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
	50310	76.2	78.0	1.8	0.002	0.10	492	7343	23
	50311	78.0	79.0	1.0	<0.002	0.05	132	1193	2
	50312	79.0	80.0	1.0	<0.002	0.16	1161	3655	9
	50313	80.0	81.0	1.0	0.002	0.16	288	10435	22
	50314	81.0	823	1.3	<0.002	0.06	59	7752	4
	50315	823	833	1.0	0.002	0.09	109	7171	16
	50316	83.3	84.4	1.1	<0.002	0.06	71	4984	26
	50317	84.4	85.6	1.2	<0.002	0.12	358	8166	26
	50318	856	869	1.3	<0.002	0.19	1560	6247	14
	50319	869	882	1.3	<0.002	0.08	257	6306	17
	50320	88.2	89.7	1.5	<0.002	0.15	262	8924	11
4-5%	50321	89.7	91.4	1.7	<0.002	0.08	117	12613	5
S<	50322	91.4	93.0	1.6	0.002	0.09	81	10598	9
	50323	93.0	94.5	1.5	0.004	0.07	95	11454	10
	50324	94.5	96.0	1.5	0.004	0.07	144	9170	16
	50325	96.0	97.5	1.5	0.004	0.16	178	16459	5
	50326	97.5	99.0	1.5	0.002	0.09	47	12752	20
	50327	99.0	1000	1.0	<0.002	0.07	40	10846	10

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-34

Interval (m)	LITHOLOGY
49.1 → 144.78 cont'd	70.0 → 87.3 · fragments no longer contain amygdules + the rock colour becomes much darker. Probably due to decrease in alteration. Angular fragments readily distinguishable. - clasts with 10-15% euhedral py aggregates present along with clasts contain propylitically altered fsp laths. - shattered core & abundant gouge continues down hole until 76.6. 87.3 → 90.3 - amygdaloidal fragments ≥ 10cm with 4-5% Red-Brown sphalerite 95.4 - 98.3 - fragments ≤ 4cm with 8% euhedral py. 1-3mm cubes.

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-34

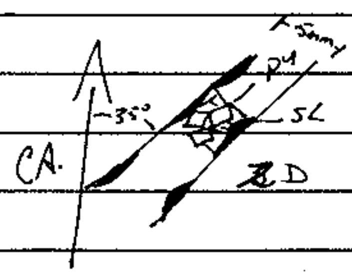
Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	A: pp
	50328	100.0	101.0	1.0	<0.002	0.06	19	9666	6
	50329	101.0	102.5	1.5	<0.002	0.07	29	11760	13
	50330	102.5	104.0	1.5	0.002	0.13	87	11338	13
	50331	104.0	105.5	1.5	0.002	0.11	101	11000	2
	50332	105.5	106.4	0.9	0.002	0.09	62	12651	[illegible]
MASSIVE py+sc along fractures	50333	106.4	107.7	1.3	0.056	0.58	441	11593	1
	50334	107.7	109.7	2.0	0.014	0.08	115	16949	1
	50335	109.7	111.2	1.5	0.006	0.14	75	13792	2
	50336	111.2	112.8	0.6	0.024	0.14	62	13670	21
TR.-1% sc, py+po	50337	112.8	114.0	1.2	0.006	0.07	39	10988	21
	50338	114.0	115.8	1.8	0.018	0.06	71	12842	5
	50339	115.8	117.3	1.5	0.008	0.15	48	10511	4
	50340	117.3	118.9	1.6	0.002	0.17	51	6845	4
	50341	118.9	120.3	1.4	0.014	0.25	65	3176	[illegible]
	50342	120.3	121.9	1.6	0.010	0.17	37	6390	7
	50343	121.9	122.9	1.0	0.002	0.07	55	9665	2
	50344	122.9	124.5	1.6	0.018	0.30	105	10892	[illegible]
	50345	124.5	126.0	1.5	0.018	0.21	69	8797	3

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-39

Interval (m)	LITHOLOGY		L	S	M	A
49.1 -> 144.78 cont'd	134.1 -> 144.78.					
	- Back into Lapilli tuff					
	143.0	Whole Rock P.T.				
	- fracture @ 35° to CA filled with blocky py + SL along fracture surface. 50618					
	EOH 144.78 m.					



GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-34

Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
	50346	126.0	127.0	1.0	0.012	0.12	28	10480	8
massive py in fracture ≤ 5mm across. Associated SL + PO	50347	127.0	128.0	1.0	0.052	0.14	43	5552	18
	50348	128.0	129.5	1.5	0.008	0.14	45	12133	10
	50349	129.5	131.0	1.5	0.034	1.08	191	2413	45
	50350	131.0	132.5	1.5	0.002	0.09	46	10248	4
TR - 1% py, PO + SL	50351	132.5	134.0	1.5	0.002	0.11	60	7605	13
	50352	134.0	135.5	1.5	0.030	0.37	106	8436	1[illegible]
	50353	135.5	137.1	1.6	0.006	0.12	80	10252	2
	50354	137.1	138.5	1.4	0.048	1.28	119	8787	[illegible]
	50355	138.5	140.1	1.6	0.006	0.05	50	9032	[illegible]
	50356	140.1	141.8	1.7	0.008	0.07	49	13434	34
	50357	141.8	143.3	1.5	0.002	0.06	28	10273	1[illegible]
	50358	143.3	144.78	1.48	0.014	0.07	39	7232	3

EOH

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER ____________

Pg. ____ of ____

Interval (m)	LITHOLOGY		L	S	M	A

CORE RECOVERY

HOLE NO. BD92-34

RUN

FROM (m)	TO (m)	LENGTH (m)	LENGTH OF CORE (m)	RECOVERY (%)
0.0	11.28	Casing	—	
	12.19	0.91	0.7	76
	15.24	3.05	2.06	68
	18.29	3.05	2.98	98
	21.34	3.05	3.03	99
	24.38	3.04	2.85	93
	27.43	3.05	2.98	98
	30.48	3.05	3.28	107
	33.53	3.05	2.97	98
	36.58	3.05	3.50	114
	39.62	3.05	1.70	58
	42.67	3.05	2.08	68
	4.72	3.05	2.40	79
	48.77	3.05	1.73	57
	51.81	3.04	2.99	98
	54.86	3.05	1.63	53
	57.91	3.05	2.20	72
	60.96	3.05	2.0	66
	64.01	3.05	2.10	69
	67.06	3.05	2.71	89
	70.10	3.04	1.61	53

CORE RECOVERY

HOLE NO. BD92-34

RUN

FROM	TO	LENGTH	LENGTH OF CORE	RECOVERY (%)
70.10	73.15	3.05	1.46	49
	76.20	3.05	1.65	54
	8230	6.10	4.28 No 260' Block (79.25)	70
	85.35	3.05	3.02	99
	88.4	3.05	3.20	103
	91.45	3.05	2.95	97
	94.50	3.05	3.01	99
	97.55	3.05	2.9	95
	100.6	3.05	3.20	103
	103.65	3.05	2.90	95
	106.70	3.05	3.0	98
	109.75	3.05	2.3	75
	112.80	3.05	2.57	84
	115.82	3.05	2.66	87
	118.87	3.05	2.08	68.
	121.92	3.05	3.05	100
	124.97	3.05	2.99	98
	128.02	3.05	2.68	87.
	131.07	3.05	3.05	100
	134.12	3.05	2.5	81
	137.16	3.05	2.4	79

(3)

CORE RECOVERY

HOLE NO. BD92-34

RUN

FROM	TO	LENGTH	LENGTH OF CORE	RECOVERY (%)
137.16	140.21	3.05	2.4	79
	143.26	3.05	2.9	95
	144.78	1.52	1.4	92
	EOH			

BLACKWATER-DAVIDSON PROPERTY

BOX INTERVALS

HOLE NUMBER BD92-34

Box	From	To	Box	From	To
1	0	17.3	25		
2	17.3	22.8	26		
3	22.8	28.4	27		
4	28.4	33.53	28		
5	33.53	39.5	29		
6	39.5	45.72	30		
7	45.72	51.9	31		
8	51.9	58.8	32		
9	58.8	64.2	33		
10	64.2	70.9	34		
11	70.9	78.0	35		
12	78.0	85.45	36		
13	85.45	89.8	37		
14	89.8	94.5	38		
15	94.5	99.7	39		
16	99.7	104.3	40		
17	104.3	108.25	41		
18	108.25	119.0	42		
19	119.0	120.0	43		
20	120.0	125.1	44		
21	125.1	130.3	45		
22	130.3	135.7	46		
23	135.7	141.2	47		
24	141.2	144.78 EOH	48		

GRANGES INC.

DIAMOND DRILL LOG

BLACKWATER-DAVIDSON PROJECT (120)

Date Collared: Nov. 17	HOLE NUMBER: BD92-35
Date Completed: Nov. 18	

Logged By: G. ALLEN Nov. 18-19 /92

PURPOSE: TO TEST COINCIDENT HIGH CHARGEABILITY AND RESISTIVITY ZONES

Location	Survey Data	Acid Dip Tests		
		Depth	Reading	Dip
Claim: PEM	Collar Dip: -52½	30.48 m	57.6	49
Grid: PEM	Azimuth: 181°	60.96	60	52
Latitude: 5+73 S	Length: 171.30 m	91.44	60	52
Departure: 18+99 W	Vert. Project. 135.90 m	121.92	CAN'T	READ
Elevation:	Hor. Project. 104.28	170.69	58.3	50

Core Size: NQ	Reduced To: ______ at
Casing Depth: 12.8 m	Casing Left In: Yes ✓ No ____

COMMENTS:

- INTERMEDIATE TUFF UNIT IN UPPER PART OF HOLE APPEARS TO BE THE SAME ROCK AS INTERSECTED IN HOLES BD92-34 and 36.

SAMPLE SERIES:	50359 - 50484	Au, Ag, ICP
	50626 - 50627	WR, TS
	50628	WR, P.T.S.
	50629	WR, TS
	50630	WR, PTS
	50631	PTS
	50632	WR, P.T.S.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-35

SUMMARY LOG:

Interval	Code	Unit Description
0-12.8		CASING
12.8-21.55	3D.fu	FELSIC LAPILLI TUFF
21.55-65.30	2D	INTERMEDIATE LAPILLI TUFF
65.30-70.30	3Ds.fu	FELSIC LAPILLI TUFF
70.30-122.8	2D	INTERMEDIATE LAPILLI TUFF
122.8-171.30	2-1 Gwa	INTERMEDIATE TO MAFIC FELDSPAR PHYRIC
		AMYGDALOIDAL FLOW

MINERALIZATION

Interval	Description	Interval	Description
83.7-91	2-4% SPHALERITE, <1% PYRITE		
114.1-118.7	7-8% SPHALERITE		
122.8-145	4-5% SL, TR-2% Po, <1-2% PY		

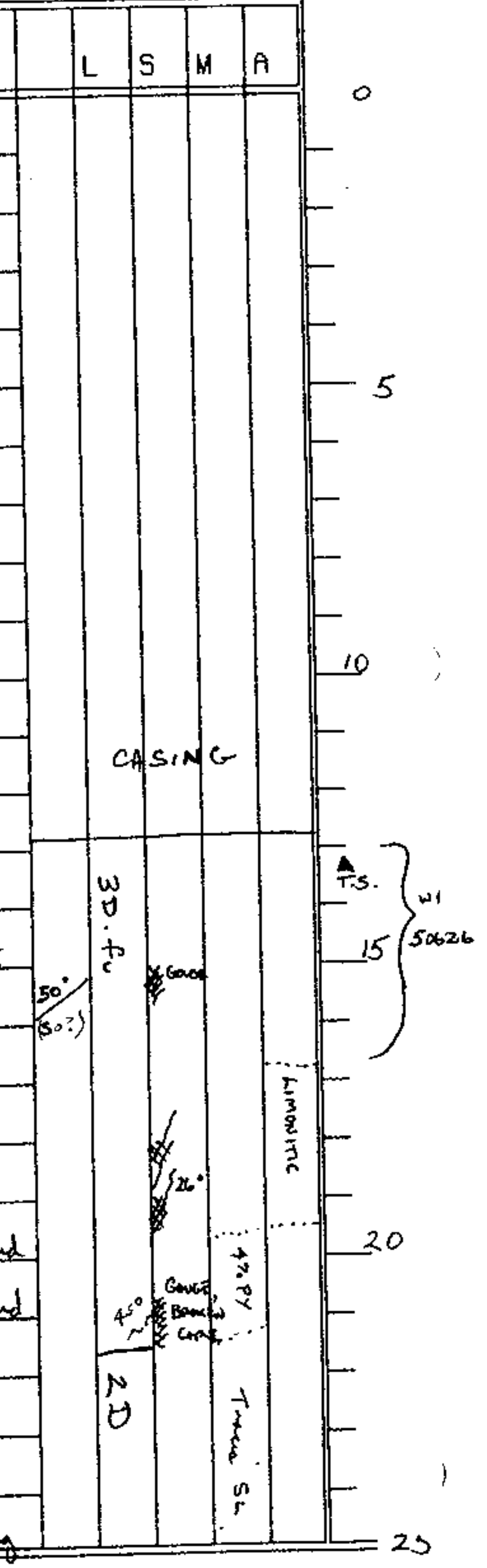
TRACES As.

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-35

Interval (m)	LITHOLOGY
0-12.80	CASING
12.80-21.55	FELSIC LAPILLI TUFF (3D.fv)
	Medium blue-grey fine-grained in part thinly laminated (bedding?) groundmass of quartz and sericite with 25-30% white to medium greenish-grey angular aphanitic fragments to 5cm (average <1cm). White fragments are kaolinite altered. Others composed of quartz + sericite; commonly flow-banded
21.55-65.30	INTERMEDIATE LAPILLI TUFF (2D)
	Medium to light grey fine-grained groundmass of quartz and sericite(?), hosting



GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-35

Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
	50359	12.8	15.24	2.44	<0.002	0.17	501	133	40
	50360	15.24	17.0	1.76	0.006	0.25	479	114	49
	50361	17.0	18.5	1.5	0.014	0.14	998	107	437
19.6 - 21.55 4% fine-grained pyrite in <1-2 mm masses disseminated throughout. Some clots look black.	50362	18.5	19.6	1.1	0.012	0.17	68	337	107
	50363	19.6	21.5	1.9	0.006	0.11	24	8192	211
	50364	21.5	23.0	1.5	0.002	0.06	27	13862	97
	50365	23.0	25.0	2.0	0.008	0.11	34	8749	93

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-35

Interval (m)	LITHOLOGY		L	S	M	A	
	20-30% medium to dark brownish-grey aphanitic angular volcanic fragments up to 20cm but averaging <1cm. Fragments commonly amygdaloidal (chlorite, to 2mm).	5°/20	2D, 5NT	45°, 20°	1-2% PY, Trace SL, TR PY, SL		25, 30
	28.8-29.1 - Dark grey amygdaloidal frag.						
	29.4-30.0 - Medium blue-grey cherty fine-grained tuff.						T.S., WR 50627
	Dark colour may be largely due to fine-grained secondary biotite. Possibly strong potassic alteration. Unit is relatively soft. Scratches to brown colour.		Cover	15°		LIMONITIC	35, 40
			2D	20°	2-3% PY / FRACR, 1-3% PY DISSEM		45, 50

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-35

Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
21.55-28.2 - Traces dissem. red-brn sphalerite. Clots of f.g pyrite up to 2mm ~ 2%, dissem.	50366	25.0	27.0	2.0	0.014	0.30	53	1041	152
	50367	27.0	29.0	2.0	0.022	0.40	42	1764	95
28.2 - ~43.7 Traces pyrite and sphalerite.	50368	29.0	31.0	2.0	0.002	0.12	27	5486	142
	50369	31.0	33.0	2.0	0.004	0.17	63	8461	50
	50370	33.0	35.0	2.0	<0.002	0.13	225	4882	38
	50371	35.0	37.0	2.0	<0.002	0.07	236	9192	17
	50372	37.0	39.0	2.0	<0.002	0.07	106	2838	32
	50373	39.0	41.0	2.0	0.010	0.33	245	2252	33
	50374	41.0	43.0	2.0	0.002	0.07	67	3912	40
	50375	43.0	45.0	2.0	0.006	0.32	919	10068	94
43.7-49 1-2% very fine-grained disseminated pyrite. Trace sphalerite.	50376	45.0	47.0	2.0	<0.002	0.08	131	10919	66
43.7-45 - 3-4% py dissem and along fracs.	50377	47.0	49.0	2.0	0.004	0.07	49	9677	59
	50378	49.0	51.0	2.0	0.006	0.07	75	9458	45

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-35

Interval (m)	LITHOLOGY	L	S	M	A	Depth	Samples
		2D	45°	3-4 PY	Bleached	50	
				Trace SL		55	
	58.3 - 60.2 - Bleached to light blue-grey. Silicified. More felsic tuff?			1-3% PY	Silicified, Bleached	60	
	60.2 - 65.30 - Intercalated + intermixed felsic and intermediate lapilli tuff. Some flow-banded fragments.	2D, 3D.fu		1-3% PY, Tr As, SL			
65.30 - 70.30	FELSIC LAPILLI TUFF (3Ds.fu) Medium blue-grey fine-grained siliceous groundmass composed of quartz + sericite. 30-40% <1-5cm light grey angular aphanitic flow-banded fragments	3Ds.fu	55°, 2cm GOUGE	1-3% PY + BLACK MIN. MnO?, Tr SL		65	P.T.S. ▲ WR 506 3
70.3 - 122.8	INTERMEDIATE LAPILLI TUFF (2D) As above felsic unit. Medium blue-grey f-g groundmass hosting 40-60% <1-3cm angular dark brn aphanitic volcanic lithic fragments. Abundant f-g biotite.	2D	50°	Tr PY		70, 75	▲ T.S. WR 50[illegible]

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-35

Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
	50379	51.0	53.0	2.0	0.002	0.05	17	7624	145
	50380	53.0	55.0	2.0	0.004	0.06	12	6205	143
	50381	55.0	57.0	2.0	<0.002	0.05	10	7966	107
	50382	57.0	58.3	1.3	0.010	0.07	11	5770	87
58.3-60.2 - 1-3% dissem PY. 1-2% black (metallic ?) mineral	50383	58.3	60.2	1.9	0.012	0.06	31	7800	133
dissem & along fracs. Could be manganese.	50384	60.2	62.0	1.8	0.004	0.17	35	8260	137
60.2-65.3 - 1-3% dissem PY, Trace As, SL.	50385	62.0	64.0	2.0	0.006	0.07	44	8413	625
65.3-70.3 - 1-3% dissem +	50386	64.0	65.3	1.3	0.004	0.06	13	9403	357
frac controlled PY. 3-4% fine-grained black mineral could be	50387	65.3	67.0	1.7	0.018	0.05	26	7830	110
manganese oxide; dissem in clots to 2 mm and along fractures.	50388	67.0	69.0	2.0	0.006	0.04	30	7198	355
Trace red-brown sphalerite. 70.3- Generally barren.	50389	69.0	70.3	1.3	0.006	0.03	16	5951	129
Minor PY along fractures. Trace sphalerite.	50390	70.3	72.0	1.7	0.002	0.05	13	8385	105
	50391	72.0	74.0	2.0	<0.002	0.05	16	10032	98

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-35

Interval (m)	LITHOLOGY		L	S	M	A
	75 - 78.1 - Mottled medium blue-grey to dark grey altered intermediate lapilli tuff. Amygdules in fragments ~ 15% up to 5 mm. White quartz rims with pyrite core (rarely dark sphalerite). Unit moderately soft.		2D(c)	15° Gouge	2-4% PY; ≤1% SL; 1% SL; 4% PY	Bleached & altered; MODERATE SILICIFICATION
	78.1 - 94.2 Dark brown volcaniclastic. Moderately silicified.			20°	2-4% SL; 1% PY; 2-5% PO, Tr SL, PY	
	94.2 - 98.0 - Medium to light blue-grey altered volcaniclastic. Alteration zone around fault zone. Some cherty fragments appear to be flow-banded ∴ could be felsic component to rock.		POSSIBLE 3D	25° Gouge; 40° Gouge	2-5 PY; Tr SL; 2-4% PY; Tr-1 SL	BLEACHED ZONE

Depth scale: 75, 80, 85, 90, 95, 100

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-35

Depth	Mineralization and Alteration	Sample No.	From (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
75	75-78.1 – 2-4% aspyrite in	50392	74.0	76.0	2.0	<0.002	0.04	30	7175	53
	cone of quartz rimmed amygdules									
	SL in amygdules and dissem.	50393	76.0	78.0	2.0	0.002	0.28	519	11071	37
	in matrix (~≤1%)									
80		50394	78.0	80.0	2.0	0.008	0.07	59	10283	55
		50395	80.0	82.0	2.0	0.002	0.07	39	9992	57
		50396	82.0	83.0	1.0	<0.002	0.18	453	9901	50
	START SPHALERITE ZONE	50397	83.0	84.0	1.0	0.002	0.15	369	7584	23
→*	~83.7-91 2-4% Fine-grained red-	50398	84.0	85.0	1.0	0.004	0.08	78	5866	66
85	brown sphalerite disseminated	50399	85.0	86.0	1.0	0.024	0.38	300	11279	98
	in matrix and in fragments.	50400	86.0	87.0	1.0	0.004	0.03	107	11637	33
	<1% pyrite.	50401	87.0	88.0	1.0	0.002	0.03	48	12271	52
		50402	88.0	89.0	1.0	<0.002	0.06	19	9723	67
		50403	89.0	90.0	1.0	<0.002	0.07	18	5763	36
90		50404	90.0	91.0	1.0	<0.002	0.21	361	6669	23
	91 - 94.2 - 2-5% pyrrhotite,	50405	91.0	92.0	1.0	<0.002	0.46	1064	13458	39
	traces SL, PY (disseminated)	50406	92.0	93.0	1.0	<0.002	0.07	24	12512	36
		50407	93.0	94.0	1.0	<0.002	0.07	18	6557	49
	94.2 - 98 - 2-5% f.g dissem. PY.	50408	94.0	95.0	1.0	<0.002	0.30	9	12577	80
95	≤1% (average <½%) red-brn	50409	95.0	96.0	1.0	0.002	0.02	20	1890	277
	sphalerite.	50410	96.0	97.0	1.0	0.002	0.02	10	4577	181
		50411	97.0	98.0	1.0	<0.002	0.03	10	4002	307
	98-100.2 - 2-4% f.g diss py.	50412	98.0	99.0	1.0	<0.002	0.05	10	8063	271
	Trace to 1.% dark red-brn	50413	99.0	100.0	1.0	0.002	0.06	10	8643	63
100	diss. SL.	50414	100.0	101.0	1.0	0.004	0.07	15	7396	370

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-35

Interval (m)	LITHOLOGY	L	S	M	A
	100.4 - 102 - Medium greenish-grey aphanitic siliceous rock with white 'spherules' to 4mm with dark sulphide (pyrite +/or sphalerite core up to 1mm).	2C-D (?)	* As	2-4% PY 1%S TR AS; TR-1% SL; TR PY, PO	SILICIFIED
	102 - 119 Black to dark brown fine-grained biotite-rich volcanic rock. Probably all volcaniclastic but lithic fragments obscure. Some parts feldspar phyric, and some amygdaloidal. Probably fragmental.	2cm gouge; FAULT ZONE	64°; 20°; 40	2-5% Tr PY; Tr-to 2% SL.	
	108.2 - ~111 - FAULT ZONE				
	119-121.5 - Clearly fragmental. Angular black to grey lithic fragments average 1cm.			7-8% SL	
			30°	1-2% @ PO, SL	
122.8 - 171.30 E.O.H.	INTERMEDIATE TO MAFIC FELDSPAR PHYRIC AMYGDALOIDAL FLOW (2-1Gwa)	2-1Gwa		4-5% SL	

100 105 110 115 120 125

Depth		Mineralization and Alteration	Sample No.	From (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
100		100.4 - 102 - 2-4% pyrite and 1-2%	50415	101.0	102.0	1.0	0.008	0.03	14	7515	251
		red brown sphalerite. Disseminated.	50416	102.0	103.0	1.0	0.004	0.06	11	10671	57
		Traces of <0.5mm euhedral	50417	103.0	104.0	1.0	0.002	0.05	11	8115	49
		arsenopyrite.	50418	104.0	105.0	1.0	0.002	0.07	19	6464	19
105		102-107 - Trace to 1% dissem.	50419	105.0	106.0	1.0	<0.002	0.08	31	7465	18
		red-brown sphalerite. Trace	50420	106.0	107.0	1.0	<0.002	0.05	18	4623	22
		pyrite.	421	107.0	108.0	1.0	<0.002	0.28	347	5545	13
			422	108.0	109.0	1.0	<0.002	0.08	102	4664	45
		107-108.2 - 2-5% f-g diss.	423	109.0	110.0	1.0	<0.002	0.08	28	6781	28
110		sphalerite.	424	110.0	111.0	1.0	<0.002	0.20	180	6584	34
		108.2 - 114.1 - Trace to 2%	50425	111.0	112.0	1.0	<0.002	0.08	53	4899	23
		disseminated sphalerite in fault	426	112.0	113.0	1.0	<0.002	0.07	38	6996	22
		zone.	427	113.0	114.0	1.0	<0.002	0.08	73	5829	29
	*	114.1 - 118.7 7-8% fine-grained	428	114.0	115.0	1.0	0.004	0.08	47	8167	16
115		red-brown sphalerite dissem.	429	115.0	116.0	1.0	0.004	0.03	53	9338	76
		in groundmass. Some parts up to 10%.	50430	116.0	117.0	1.0	0.002	0.03	44	9682	67
			431	117.0	118.0	1.0	0.002	0.03	62	7461	56
		118.7 - 122.8 1-2% @ fine-grained	432	118.0	119.0	1.0	0.003	0.03	100	6513	58
		disseminated pyrrhotite and sphalerite	433	119.0	120.0	1.0	0.001	0.05	48	5056	18
120			434	120.0	121.0	1.0	0.004	0.13	60	6968	30
	*	START MAIN SPHALERITE ZONE	50435	121.0	122.0	1.0	0.007	0.05	47	6280	46
		122.8 - 145 4-5% fine-grained	436	122.0	123.0	1.0	0.240	0.03	178	9444	84
		disseminated red-brown sphalerite.	437	123.0	124.0	1.0	0.012	0.07	76	7103	18
	*	Trace to 2% pyrrhotite. Traces	438	124.0	125.0	1.0	0.002	0.02	123	3281	54
125		of arsenopyrite. <1-2% Py	439	125.0	126.0	1.0	0.0006	0.01	298	6661	15

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-35

Interval (m)	LITHOLOGY		L	S	M	A	
	122.8-127.4 - Dark grey to black mottled aggregate of fine-grained chlorite, biotite +? with some parts with distinct feldspar phenocrysts to 3 mm and amygdules (quartz to 1 cm). Some parts look like a flow. Other parts look like a tuff. Could be same unit as above.		2/1 Gwe		4-5% SL <1-2% @PY,PO Tr As, CP * As		125, 130
	127.4 - 171.3 Fine-grained dark brown to black soft groundmass with 15-25% <1mm to >1cm white quartz amygdules. Some parts aphyric and other parts have up to 20% 1mm x up to 4mm feldspar prisms. Commonly trachytic.						135, ▲ P.T.S. } WR 50630, 140
	Some parts have a fragmental texture but most of the unit is clearly a flow.			0° 25°	As * 2-3% SL 1x@ PY,PO		▲ P.T.S. 5067, 145, 150

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-35

Depth (m)	Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
125	Sphalerite occurs most commonly	50440	126.0	127.0	1.0	0.001	0.04	195	6981	26
	as a fine-grained red-brown	441	127.0	128.0	1.0	0.010	0.09	17	8924	299
	dissemination or masses in	442	128.0	129.0	1.0	0.010	0.22	67	11236	234
	groundmass. Also occurs in the	443	129.0	130.0	1.0	0.006	0.03	13	7502	51
130	core of quartz amygdules with	444	130.0	131.0	1.0	0.006	0.04	7	4490	209
	pyrrhotite and rarely chalcopyrite.	50445	131.0	132.0	1.0	0.005	0.09	16	4626	124
	Arsenopyrite occurs as very	446	132.0	133.0	1.0	0.003	0.03	5	3260	83
	fine-grained (<0.5 mm) cubes.	447	133.0	134.0	1.0	0.010	0.07	9	6484	77
		448	134.0	135.0	1.0	0.009	0.02	3	7709	29
135		449	135.0	136.0	1.0	0.003	0.07	4	3553	44
		50450	136.0	137.0	1.0	0.006	0.05	2	3877	58
		451	137.0	138.0	1.0	0.008	0.07	7	7734	119
		452	138.0	139.0	1.0	0.010	0.08	9	3519	300
		453	139.0	140.0	1.0	0.011	0.04	10	4708	174
140		454	140.0	141.0	1.0	0.005	0.06	2	3316	470
	141.5 - Trace Arsenopyrite.	50455	141.0	142.0	1.0	0.012	0.03	12	10992	798
		456	142.0	143.0	1.0	0.010	0.09	44	10869	117
		457	143.0	144.0	1.0	0.001	0.03	2	4351	113
		458	144.0	145.0	1.0	0.001	0.04	2	8211	189
145	145-160 2-3% Sp, 1-2% Py, Po	459	145.0	146.0	1.0	0.022	0.01	17	17795	581
		50460	146.0	147.0	1.0	0.002	0.03	8	6346	106
		461	147.0	148.0	1.0	0.006	0.04	5	4892	75
		462	148.0	149.0	1.0	0.001	0.18	43	3571	62
		463	149.0	150.0	1.0	0.006	0.02	29	5937	56
		464	150.0	151.0	1.0	0.023	0.06	124	3883	19
150										

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-35

Interval (m)	LITHOLOGY		L	S	M	A
			2-1 Gw?		2-3% SL 1%@ PY, Po	
				26°	4-5% SL	
				Sun Gouge	2-3 Po 1-2PY	
				40° Gouge	3-4% PY	
					2-3% PY 1-2@ PO, SL	
					Tr Cp	
				E.O.H. 171.3m		

150

155

160

P.T.S. 50632

W.

165

170

175

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-35

Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
	50465	151.0	152.0	1.0	0.010	0.04	24	5773	2[illegible]
	466	152.0	153.0	1.0	0.018	0.02	7	3436	[illegible]
	467	153.0	154.0	1.0	0.029	0.02	20	3627	3[illegible]
	468	154.0	155.0	1.0	0.006	0.02	4	3731	3[illegible]
	469	155.0	156.0	1.0	0.007	0.02	4	4115	5[illegible]
	50470	156.0	157.0	1.0	0.012	0.02	11	5567	38
	471	157.0	158.0	1.0	0.005	0.03	5	6980	31[illegible]
	472	158.0	159.0	1.0	0.004	0.07	10	4415	43
	473	159.0	160.0	1.0	0.019	0.07	7	3262	469
160-162- 4-5% disseminated	474	160.0	161.0	1.0	0.006	0.05	26	4025	116
sphalerite, 2-3% Po in cores of	50475	161.0	162.0	1.0	0.062	0.06	97	3428	2[illegible]
quartz amygdules. 1-2% PY	476	162.0	163.0	1.0	0.013	0.06	37	3080	26[illegible]
mainly along fractures.	477	163.0	164.0	1.0	0.015	0.12	17	3381	292
162-165.5 - 3-4% pyrite in	478	164.0	165.0	1.0	0.021	0.06	103	1575	[illegible]
masses to 1 cm wide and as	479	165.0	166.0	1.0	0.010	0.06	16	4290	137
thin films on fracture surfaces	50480	166.0	167.0	1.0	0.009	0.10	12	4013	77
2-3% SL	481	167.0	168.0	1.0	0.098	0.07	32	5955	12[illegible]
	482	168.0	169.0	1.0	0.325	0.05	166	2805	59
165-171.3 - 2-3 pyrite	483	169.0	170.0	1.0	0.140	0.05	216	3988	55
on fracture surfaces and very	50484	170.0	171.3	1.3	0.041	0.03	31	4165	59
f-g dissem. 1-2% pyrrhotite									
+ sphalerite. Trace chalcopyrite.									
E.O.H. 171.30 m									

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER ____________

Pg. _____ of _____

Interval (m)	LITHOLOGY		L	S	M	A

BLACKWATER-DAVIDSON PROPERTY

BOX INTERVALS

HOLE NUMBER BD92-35

Box	From	To	Box	From	To	
1	12.80	20.0	25	138.4	143.5	
2	20.0	25.7	26	143.5	149.4	
3	25.7	30.7	27	149.4	154.6	
4	30.7	34.2	28	154.6	160.2	
5	34.2	39.~~65~~7	29	160.2	165.8	
6	39.7	44.7	30	165.8	171.3	E.O.H.
7	44.7	50.0	31			
8	50.0	54.~~86~~9	32			
9	54.9	60.3	33			
10	60.3	64.2	34			
11	64.2	69.3	35			
12	69.3	74.7	36			
13	74.7	79.2	37			
14	79.2	83.7	38			
15	83.7	89.3	39			
16	89.3	94.5	40			
17	94.5	100.0	41			
18	100.0	105.2	42			
19	105.2	110.8	43			
20	110.8	116.2	44			
21	116.2	122.1	45			
22	122.1	127.0	46			
23	127.0	132.6	47			
24	132.6	138.4	48			

CORE RECOVERY

HOLE NO. BD92-35

RUN FROM	TO	LENGTH	LENGTH OF CORE	RECOVERY (%)
12.80	15.24	2.44	0.7	
15.24	18.29	3.05	3.2	100
18.29	21.34		3.1	
21.34	24.38		3.2	
24.38	27.43		3.05	
27.43	30.48		3.5	
30.48	33.53		3.4	
33.53	36.58		3.5	
36.58	39.62		3.4	
39.62	42.67		3.2	
42.67	45.72		3.4	
45.72	48.77		3.4	
48.77	51.82		3.3	
51.82	54.86		3.4	
54.86	57.91		3.3	
57.91	60.96		3.9 ?	
60.96	64.01		3.6	
64.01	67.06		2.9	
67.06	70.10		3.8	
70.10	73.15		3.3	
73.15	76.20		3.5	
76.20	79.25		3.4	

Rec. 2

CORE RECOVERY

HOLE NO. BD 92-35

RUN FROM	TO	LENGTH	LENGTH OF CORE	RECOVERY (%)
79.25	82.30	3.05	3.4	100
82.30	85.34	↓	3.4	"
85.34	88.39		3.2	"
88.39	91.44		3.2	"
91.44	94.49		3.2	
94.49	97.54		* 2.8	
97.54	100.58		3.4	
100.58	103.63		3.3	
103.63	106.68		3.2	
106.68	109.73		2.8	
109.73	110.34	0.61	0.25	
110.34	112.78	2.44	2.3	
112.78	115.82	3.05	3.05	
115.82	118.87		2.95	
118.87	121.92			
121.92	124.97			
124.97	128.02		3.8 ?	
128.02	131.06		3.1	
131.06	134.11		3.1	
134.11	137.16		3.1	
137.16	140.21		~~[illegible]~~ 3.05	
140.21	143.26		3.4	
143.26	146.30	↓	* 2.6	

CORE RECOVERY

HOLE NO. BD 92-35

RUN FROM	TO	LENGTH	LENGTH OF CORE	RECOVERY (%)
146.30	149.35	3.05	3.3	100
149.35	152.40		3.3	"
152.40	155.45		3.05	"
155.45	158.50		3.25	"
158.50	161.54		3.2	"
161.54	164.59		3.25	"
164.59	167.64		* 2.9	
167.64	170.69		3.4	100
170.69	171.30	0.61	0.7	100

GRANGES INC.

DIAMOND DRILL LOG

BLACKWATER-DAVIDSON PROJECT (120)

Date Collared	Nov. 18/92	HOLE NUMBER	BD92-36
Date Completed	Nov. 21/92		

Logged By: Ross ZAWADA

PURPOSE: To test soil geochem Anomaly S of B92-33

Location	Survey Data	Acid Dip Tests		
		Depth	Reading	Dip
Claim: FEM.	Collar Dip: -48	30.48	57.75	49
Grid: 1099 W 325 S W	Azimuth: 179	79.25	57	48
Latitude: 3+25 S	Length: 136.2	133.20	55.7	47
Departure: 10+99 W	Vert. Project. 101.33 m			
Elevation:	Hor. Project. 91.01 m			
Core Size: NQ	Reduced To: ______ at			
Casing Depth: 15.24	Casing Left In: Yes ✓ No ____			

COMMENTS:

BD92-36 (proposed hole J) behind BD92-33 (proposed hole "C")

Tr quantities of po + sc are essentially ubiquitous throughout the hole. Structurally the entire hole is shattered rock, probably drilling oblique or down structure.

SAMPLE SERIES:	50485 - 50534	Au, Ag, ICP
	50621 - 50622	WR, PTS
	50623	PTS

HOLE NUMBER BD92-36

SUMMARY LOG:

Interval	Code	Unit Description
0-15.24		CASING
15.24-87.3	2DEa	Intermediate lapilli tuff w/ amygdaloidal breccia fragments
87.3-103.68	3D	Felsic Lapilli tuff
103.68-121.5	2DEa	
121.5-128.9	3D	
128.9-136.2	2DEa	
EOH		

MINERALIZATION

Interval	Description	Interval	Description
46.3-51.9	Traces of cp, sl, gl, se. alt	130.0-133.0	≤5% sl assc. w/ amygdules
80.0-82.0	1-2% sl assc. w/ amygdules		
110.2-112.8	sl, cp, po, gl (Tr) w/ ep alt.		

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER ______

Interval (m)	LITHOLOGY		L	S	M	A
0.0 → 15.24	CASING					
15.24 → 87.3	Intermediate Lapilli Tuff medium green-grey to greenish black in color with matrix supported angular clasts that are usually a slightly darker color than the matrix			2D		

0
5
15
5E
20
5E

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-36

Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
	50485	15.29	18.29	3.05	0.002	0.03	861	6008	13
	50486	18.29	20.2	1.91	0.008	0.03	1439	4896	1[illegible]
	50487	20.2	23.2	3.0	0.002	0.02	571	1769	2[illegible]
	50488	23.2	25.3	2.10	<0.001	0.03	1247	1245	17

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-36

Interval (m)	LITHOLOGY		L	S	M	A
~~15~~ 15.24 - 87.3 cont'd						
	42.1-> 75.0		2Da			
	carbonate veinlets up to 3mm wide predominantly at ±45° to CA but ranging from // to ⊥ to CA.					
	veining most intense between 61->70. m within small gouge zones of 10-20 cm.		2DCa			

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-36

Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
	50489	25.3	27.43	2.13	<0.001	0.03	428	425	21
Tr. po	50490	27.43	30.41	2.98	0.001	0.03	1191	3538	26
Tr. po	50491	30.48	33.53	3.12	0.001	0.03	1013	4731	13
Tr. po	50492	33.53	34.7	1.17	0.001	0.03	1158	3388	16
TR. po + SL w/ SE and EP alteration	50493	34.7	36.58	1.88	0.002	0.03	839	4193	22
Tr. po + SL	50494	36.58	39.62	3.04	0.001	0.04	360	1301	11
fault gouge, mod-str SE Alt.; MANG.(?)	50495	39.62	42.0	2.38	0.003	0.04	747	3179	21
	50496	42.0	44.0	2.0	0.002	0.03	219	1747	16
cb. VNS w/ SE Alt.	50497	44.0	46.3	2.30	0.001	0.03	416	446	21
Tr. of po, py, SL, CP + GN, SE Alt.	50498	46.3	49.5	3.20	0.002	0.12	1671	3606	11
TR po, cp, SL SE ALT.	50499	49.5	51.9	2.40	0.002	0.26	1677	9375	1[illegible]

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-36

Pg. 7 of 13

Interval (m)	LITHOLOGY		L	S	M	A
				55° 45°		CB
			2D		Po SL	CB
					1-2% Po Tr. cp	
					SL	
				45°	Po	CB CB CB CB
				35° 10°		CB CB CB CB CB CB CB CB CD CB
					Tr. SL	
					Tr. SL	
					Tr. SL	

50 55 60 65 70 72

PTS

WR 50

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-36

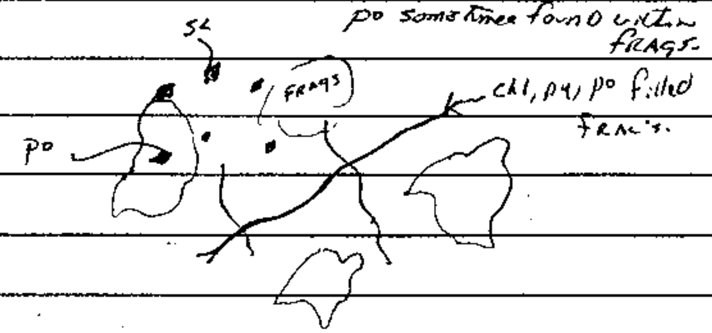
Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As pp-
Tr. sc + Po minor carbonate veinlets	50500	51.9	54.0	2.10	0.001	0.04	75	977	22
"	50501	54.0	56.0	2.0	0.059	0.02	50	1962	19
"	50502	56.0	58.0	2.0	0.015	0.02	91	5789	13
"	50503	58.0	60.0	2.0	0.092	0.04	316	989	17
"	50504	60.0	62.0	2.0	0.018	0.12	49	2977	25
"	50505	62.0	64.0	2.0	0.005	0.05	77	5288	15
"	50506	64.0	66.0	2.0	0.003	0.03	45	4025	15
CARB veining becomes more intense.	50507	66.0	68.0	2.0	0.002	0.04	28	478	26
"	50508	68.0	70.0	2.0	0.001	0.02	28	543	24
"	50509	70.0	73.0	3.0	0.001	0.03	41	2027	15
"	50510	73.0	75.0	2.0	<0.001	0.03	353	1823	2:

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-36.

Interval (m)	LITHOLOGY	L	S	M	A	
87.3 ->	- Felsic Lapilli Tuff. - olive green in color			sl		75
103.68	varies from clast to matrix supported. Most fragments					
	are flow banded. Fragment boundaries are often quite					
	obscure probably due to alt. Also some fsp xtals					
	appear to be flushed out + replaced with sulfide.					80
	Nature of upper + lower contacts obscured by fractured					
	nature of rk. Lower contact has minor amount of gouge.					
	91.0 -> 96.70			sl		
	- thin discontinuous fractures cross cutting @ ~45° to CA	3D				
	filled with chlorite minor py + greater amount of					
	non-magnetic po (?) with sl present within matrix.			sl py		85
	Fragment boundaries are visible but not well defined					



Interval (m)	LITHOLOGY	L	S	M	A	
						90
				sl po		
	99.8 -> 103.68.			sl py		
	- small discontinuous veinlets generally // to CA	3D		sl po		95
	but found to a lesser degree at all orientations					P.T.S. ▲
	cutting across fragment boundaries. Chlorite filled					
	with minor py + sl					
						100

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-36.

Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As pp-
Tr. of po+sl, lesser amt of CB vn/lts w/ minor epidote in minor gouge zones	50511	75.0	78.0	3.0	0.001	0.02	57	3237	1E
SE. Alt.	50512	78.0	80.0	2.0	0.003	0.02	86	5205	39
≤ 2% sl + tr. po in places.	50513	80.0	82.0	2.0	0.003	0.03	253	7022	18
Tr. po + sl	50514	82.0	83.7	1.7	<0.001	0.05	249	4695	15
py + sl	50515	83.7	87.17	3.48	0.002	0.02	216	3904	13
	50516	87.17	88.39	1.21	0.004	0.17	3181	5120	278
	50517	88.39	91.0	2.61	0.001	0.05	1063	2648	10
py + po + sl	50518	91.0	94.0	3.0	0.002	0.03	548	3706	8
	50519	94.0	96.0	2.0	0.003	0.01	83	2884	12
	50520	96.0	98.0	2.0	0.004	0.01	61	2981	6
	50521	98.0	100.0	2.0	0.001	<0.01	13	308	4

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-36

Interval (m)	LITHOLOGY	L	S	M	A
		3D		SL PO	SL Cl
103.68 – 121.5	Intermediate Lapilli Tuff	2D		SL PO; SL PO; 1% SL; Tr. SL CP PO GN PY	
121.5 – 128.9	Felsic Lapilli Tuff		3D		

100

P.T. 50623

120

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-36

Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm	As ppm
	50522	100.0	103.2	3.2	0.001	<0.01	38	3103	21
	50523	103.2	106.7	3.5	0.001	0.02	140	1930	21
Small zones w/ ≤2% sc in Amyg's.	50524	106.7	110.2	3.5	0.001	0.01	124	2685	2
Tr. sc, cp, po, gn (?) w/ Ep. Alt.	50525	110.2	112.8	2.6	0.002	0.03	357	580	4
	50526	112.8	115.8	3.0	<0.001	0.02	573	958	2
	50527	115.8	118.9	3.1	0.004	0.02	150	2830	2
	50528	118.9	121.5	2.6	0.003	0.03	152	6819	3
	50529	121.5	124.97	3.47	0.004	0.02	139	2227	26
	50530	124.97	128.0	3.03	0.009	0.01	84	965	15
	50531	128.0	130.0	2.0	0.002	0.02	101	3232	1
≤ 5% sc assc. w/ Amyg's	50532	130.0	133.0	3.0	<0.001	0.01	33	3688	[illegible]
	50533	133.0	134.5	1.5	0.001	0.01	8	2930	1
	50534	134.5	136.2	1.7	0.002	0.06	25	4081	[illegible]

EOH.

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER BD92-36

Interval (m)	LITHOLOGY		L	S	M	A
128.9-						
136.2						
EOH.	Intermediate Lapilli Tuff					
					5L	
			2D			
					5L	5E
						5E
					5L	
					5L	
		EOH				

125

136.2

CORE RECOVERY

HOLE NO. BD92-36.

RUN FROM	TO	LENGTH	LENGTH OF CORE	RECOVERY (%)
0	15.24	3.05	CASE	
	18.29		1.17	38
	21.34		2.80	92
	24.38		1.70	56
	27.43		1.80	59
	30.48		1.92	63
	33.53		1.13	37
	36.58		2.17	71
	39.62		2.33	76
	42.67		2.55	84
	45.72		2.95	98
	48.77	"	2.40	79
	51.82		2.82	92
	54.86		2.80	92
	57.91		2.62	86
	60.96		3.10	100
	64.01		2.76	90
	67.06		2.72	90
	70.10		2.82	92
	73.15		2.93	98
	76.20		2.69	88
	79.25	3.05	1.30	47

CORE RECOVERY

HOLE NO. BD92-36

RUN

FROM	TO	LENGTH	LENGTH OF CORE	RECOVERY (%)
79.25	82.30	3.05	2.77	38'
	85.34	3.05	2.24	73
	87.17	1.83	1.20	33
	88.39	3.05	1.58	52
	91.44		2.50	82
	94.49		1.90	62
	97.54		3.01	99
	100.59		2.25	74
	103.63		1.3	43
	106.68		1.8	59
	109.73		0.5	16
	112.78		2.65	87
	115.82	"	1.2	39
	118.87		1.4	46
	121.92		1.2	39
	124.97		1.39	46
	128.02		1.87	61
	131.06		2.3	75
	134.11		2.0	66
	136.20	3.05	2.3	75

BLACKWATER-DAVIDSON PROPERTY

BOX INTERVALS

HOLE NUMBER BD92-36

Box	From	To	Box	From	To
1	15.24	21.4	25		
2		30.2	26		
3		36.58	27		
4		42.2	28		
5		46.3	29		
6		51.9	30		
7		57.2	31		
8		62.6	32		
9		68.2	33		
10		73.6	34		
11		80.3	35		
12		85.5	36		
13		87.17 ✓	37		
14		91.44	38		
15		96.70	39		
16		103.2	40		
17		111.8	41		
18		119.0	42		
19		128.02	43		
20		133.0	44		
21		136.2 EOH	45		
22			46		
23			47		
24			48		

* Black mkr labels on boxes are out of wack after box 9. Label w/ dyno tags according to this sheet.

GRANGES INC.

DIAMOND DRILL LOG

BLACKWATER-DAVIDSON PROJECT (120)

Date Collared ________	HOLE NUMBER DAV-11
Date Completed ________	

Logged By: G. ALLEN Nov. 26, '92

PURPOSE:

Location	Survey Data	Acid Dip Tests		
Claim: PEM	Collar Dip:	Depth	Reading	Dip
Grid: PEM	Azimuth:			
Latitude:	Length: 139.25 m			
Departure:	Vert. Project.			
Elevation:	Hor. Project.			

Core Size: NQ	Reduced To: ________ at
Casing Depth: 23.2	Casing Left In: Yes ______ No ✓

COMMENTS:

- ABUNDANT FAULTS AT LOW ANGLES TO CORE AXIS. ALMOST ALL LITHOLOGIC CONTACTS ALONG FAULTS. UNITS COULD BE A SERIES OF FAULT SLICES AS SEEN IN BD92-36.

- LITHOLOGY SIMILAR (SOME IDENTICAL) TO THAT SEEN IN BD92-34, 35 + 36.

- GOLD-RICH INTERVALS HAVE HIGH PYRITE CONTENT (5% +). SOME MASSIVE. COMMONLY ALONG FRACTURES. PERHAPS DISSEMINATED SULPHIDES DON'T CARRY GOLD.

- NO EVIDENCE OF MINERALIZATION ASSOCIATED WITH FAULTING. NO APPARENT VEINING OR SULPHIDE DEVELOPMENT. SIMPLY SMASHED. FAULTING PROBABLY POST MINERALIZATION.

HOLE NUMBER DAV-11

SUMMARY LOG:

Interval	Code	Unit Description
0-23.2		CASING
23.2-27	2G/A-B	INTERMEDIATE FLOW (?) (TUFF ?)
27-34	3C-D	FELSIC COARSE-GRAINED TO LAPILLI TUFF
34-41	2Bw(-Dw)	INTERMEDIATE MEDIUM-GRAINED (TO LAPILLI ?) TUFF
41-48	3C-D	FELSIC COARSE-GRAINED TO LAPILLI TUFF
48-62.6	2C-Dw	INTERMEDIATE TO COARSE-GRAINED LAPILLI TUFF
* 62.6-69	3C-D(s)	FELSIC TUFF TO LAPILLI TUFF (GOLD ZONE) *
69-84	2D-3D	INTERMEDIATE TO FELSIC LAPILLI TUFF
84-104.7	3B-D.fb	FELSIC MEDIUM-GRAINED TO LAPILLI TUFF WITH FLOW BANDED FRAGMENTS
104.7-108	2(-3?)D	INTERMEDIATE (TO FELSIC?) LAPILLI TUFF
* 108-111	3C	FELSIC COARSE-GRAINED TUFF (GOLD ZONE) *
111-120.25	2C-D	INTERMEDIATE COARSE-GRAINED TO LAPILLI TUFF
120.25-139.29	3C-D	FELSIC COARSE-GRAINED TO LAPILLI TUFF
E.O.H.		

MINERALIZATION

Interval	Description	Interval	Description
44-48	3-4% SL, 1% @ PY, CL, Tr Po	68.13-68.25	MASSIVE PY, TR. CP (GOLD ZONE)
* 62.6-63.3(?)	20% F-G Po, 30-40% PY	68.25-69	1-4% SL, 1-2% PY (GOLD ZONE)
63.3-66.4	5% DISS + FRCR PY (BLADED) 1-2% SL	84-88	2-4% PY, <1-3% SL, Tr As *
66.4-68.13	3-5% DISS SL, 2-3% FRCR PY TR CP, As * (F-G, EUHEDRAL)	108-111	3-4% FRCR PY, TRACES SL * GOLD ZONE
		112-112.5	5% SL, 2% As, 1-2% PY

(Left margin bracket beside 62.6–68.13: GOLD ZONE)

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER DAV-11

Interval (m)	LITHOLOGY		L	S	M	A
0-23.2	CASING					

0
5
15
20

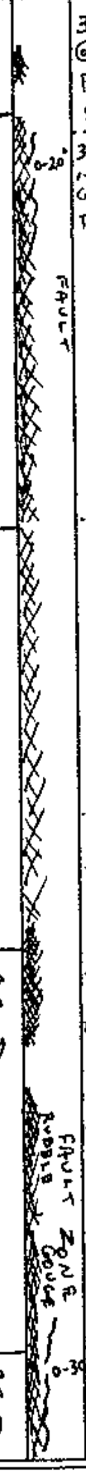
CASING

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER DAV-11

Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm

Interval (m)	LITHOLOGY (2G/A-B)	L	S	M	A
23.2 - -27	INTERMEDIATE FLOW (?) (TUFF?) Medium to dark greenish-grey fine-grained aggregate of sericite, chlorite and small clots of fine-grained biotite? Some feldspar crystals up to 1 mm altered to a dark waxy green. Some parts with a vague clastic texture. Moderately soft. (3C-D)	2G? / 3C-Ds		3-4% @ Po, SL / 3-4 SL 1-2% Gt, Py T-Cp	SILICIFIED
27- 34	FELSIC COARSE-GRAINED TO LAPILLI TUFF Medium grey aphanitic siliceous cherty groundmass with 30-40% ≤ 8 mm dark grey to medium green subangular lithic fragments. Greenish fragments are soft, montmorillonite (?) altered. Grey fragments are siliceous. Entire unit fractured to rubble or sand. FAULT ZONE. Sheared at shallow angle to core.	2B(-D)w / 3C-D		3-4% @ SL, Po / 2% Po 1% SL T-Py	
34-41	INTERMEDIATE MEDIUM-GRAINED (TO LAPILLI?) TUFF (2Bw-(Dw)) Fine-grained medium greenish-grey to dark grey moderately soft groundmass with 15-20% ≤1 mm subhedral feldspar crystals (prisms). Some parts with vague dark lithic fragments to 1 cm. Could be similar to intermediate tuff intersected in BD92-36.	2C-D		3-4% SL 1@ Gt Py T-Po	

25 30 35 40 45 50

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER DAV-11

Interval (m)	LITHOLOGY		L	S	M	A
			3C-Ds			
			2B(-D)w			
41-48	COARSE-GRAINED TO LAPILLI; FELSIC TUFF (3C-D)		3C-D			
	Medium greenish-grey fine-grained moderately soft groundmass of quartz and sericite with 30% subrounded white, dark grey to green aphanitic lithic fragments up to 1cm (av 5-8mm). Some frags siliceous & some altered to greenish clay. Most of interval ground to a sand or pebble-sized rubble.					
48-62.6	INTERMEDIATE TO COARSE-GRAINED LAPILLI TUFF (2C-Dw)		2C-Dw			

25
30
35
40
45
50

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER DAV-11

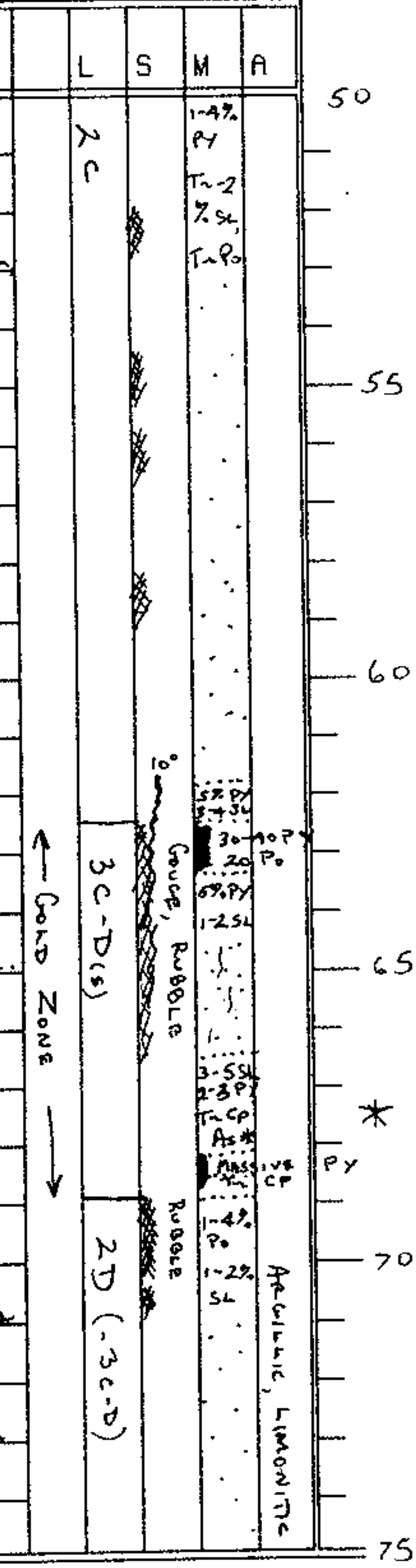
Depth	Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm
25	23.2-27 - 3-4% @ disseminated pyrrhotite and red-brown sphalerite.								
30	27-34 - Sporadic dissem sulphides, 3-4% red-brn sphalerite, 1-2% galena, 1-2% pyrite, trace chalcopyrite.								
*	SIMILAR TO FELSIC IN BD92-36. Some gougy parts contain up to 5% dissem. + frac. related pyrite.								
35	34-39 - Barren								
40	39-41 - 3-4% @ disseminated f-g. pyrrhotite and red-brown sphalerite								
	41-44 - 2% dissem. pyrrhotite, 1% sphalerite and trace pyrite.								
45	44-48 - 3-4% dissem red-brown sphalerite, up to 1% @ galena and pyrite a trace of pyrrhotite. Mostly dissem. but some fracture related.								
50									

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER DAV-11

Interval (m)	LITHOLOGY
	Medium greenish-grey to dark grey fine-grained medium hard groundmass. Some parts have distinct fragments up to 7mm but most of unit is fine-grained. Some parts obviously clastic. Some parts could be flow. 15-27% ≤1 mm subhedral prisms of chloritic mafic or feldspar phenocrysts or crystal fragments
62.6-69 *	FELSIC TUFF TO LAPILLI TUFF (GOLD ZONE) (3A-D(s))
	Medium greenish-grey to grey aphanitic sporadically hard groundmass probably composed of fine-grained quartz and sericite. Fragments commonly obscure.
	Contacts faulted. Most of unit gouge + sandy rubble
69-84	INTERMEDIATE TO FELSIC LAPILLI TUFF (2D-3)
	Dark grey aphanitic angular fragments up to 5cm in diameter ~ 30-50% of rock. Some fragments with 30% ≤1mm euhedral feldspar prisms. Groundmass of coarse-grained tuff with white quartz matrix and 30-40% 1-3mm black lithic fragments.



GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER DAV-11

Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm
48-62.0 - 1-4% disseminated and fracture-related pyrite. Trace-2% red-brown sphalerite, pyrrhotite								
62.0-62.6 - 5% dissem + fracture pyrite. 3-4% red-brown sphalerite.								
* 62.6-63.3 (?) - 20% fine-grained disseminated pyrrhotite and 30-40% coarse grained massive pyrite.		62.3	68.6	6.3	g 14.28	g 26.7		*
63.3-66.4 - 5% dissem + fracture-related pyrite. Pyrite commonly in bladed habit. 1-2% red-brown dissem. sphalerite.								
66.4-68.13 - 3-5% dissem & 5mm massive red-brown sphalerite, 2-3% dissem + frac pyrite, trace chalcopyrite + euhedral arsenopyrite (fine-grained). Arseno concentrated in fragments.								
68.13-68.25 - Massive pyrite. Trace chalcopyrite.								

68.25-69 - 1-4% dissem red-brn sphalerite, 1-2% pyrite. Dissem.

Interval (m)	LITHOLOGY	L	S	M	A
	Unit may have a partial felsic component.	2C-D	GOUGE RUBBLE	1-3% Po	
	Fragments are commonly light grey and			Tr SL	
	siliceous. With quartz-rich matrix rock				
	has significant silica content in some				
	parts.				
	Lower contact along fault.			* As	
	82.8 - Intermediate lapilli tuff. Black				
	aphanitic lithic fragments up to 1 cm				
	in dark grey g-m. As BD92-36.		SANDY (FAULT) RUBBLE	* As	
		3B-D.fv		2-4% Py	
84-104.7	FELSIC MEDIUM-GRAINED TO LAPILLI			4-3% SL	
	TUFF WITH FLOW BANDED FRAGMENTS			Tr As	
	(3B-D.fv)				
	Medium grey fine-grained groundmass			1-2% @ Py/SL	
	composed of sericite and quartz with 30%			Tr As	
	white to grey aphanitic commonly flow-			As *	
	banded fragments from <1mm - 2cm.				
	Unit appears to have been relatively				
	competent.				
	96-99 - Coarser-grained than average.	3D.fv			
	Lapilli tuff with 50%+ <1-5 cm				
	distinctly flow-banded fragments (avg ~2cm)				
	Fragments are white, relatively soft, sericitic				
	or kaolinitic. Groundmass grey aphanitic				

quartz. As seen on surface in silver zone.

Depth scale (right margin): 75, 80, 85, 90, 95, 100

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER DAV-11

Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm
75 ~72-80- limonitic.								
69-84- 1-3% PO, Trace-1% SL.								
80								
85 84-88 2-4% dissem + fine-white pyrite, <1-3% red-brown sphalerite in masses to 3mm. * Trace arsenopyrite.								
90 88-104 1-2% @ PY, SL, Trace arsenopyrite in f-g euhedral crystals. Sporadic.								
95								
100								

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER DA-V-11

Pg. 1a of 14

Interval (m)	LITHOLOGY		L	S	M	A
			3C-D	20-30° SHEAR	1-2% @ PY SL	
					As	
104.7-108(±)	INTERMEDIATE (TO FELSIC ?) LAPILLI TUFF (2(-3?)D)		2C-D		1-4% @ Po, SL	
	Medium to light grey aphanitic groundmass composed predom. of quartz (silicified ?) with 25%-35% angular aphanitic dark greenish-grey lithic fragments up to 5cm in diameter. As interval 69-84	GOLD ZONE	3C-D	GOUGE SANDY RUBBLE	3-4% PY IN FRACS SL	
	Gradational contact with unit below.		2C-D		SL, As, Py 2% SL	
108-~111	FELSIC COARSE-GRAINED TUFF (3C)			0° 40°		
* GOLD ZONE	Medium greenish-grey to light grey fine-grained aphanitic groundmass composed largely of quartz and sericite with up to 40% vague light-coloured lithic fragments up to 5mm. Could be altered part of unit above?		3C		3% PY	
			2C-D			
	Lower contact fault bounded. Gouge.		3C-D		1-2% @ SL, PY	

Depth scale (right margin): 100, 105, GOLD * ZONE 11, * As, 115, 120, 125

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER DAV-11

Interval (m)	LITHOLOGY		L	S	M	A
111-120.25	INTERMEDIATE COARSE-GRAINED TO LAPILLI TUFF (2C-D)					
*	Medium to dark grey fine grained groundmass with 30% dark greenish-grey subangular lithic fragments up to 1cm (average 5mm-1cm). Rock almost identical to units intersected in holes BD92-34, 35 + 36.					
	112-112.5 - Amygdaloidal black volcanic as intersected in lower part of BD92-35.					
	117.5-119 - Felsic interval adjacent small fault.					
120.25-139.29 E.O.H.	FELSIC COARSE-GRAINED TO LAPILLI TUFF (3C-D)					
	Medium greenish to brownish-grey aphanitic aggregate of quartz + sericite (?) with vague aphanitic angular lithic fragments average 2-5mm (rarely >1cm). Some fragments siliceous. Some soft, greenish clay alt.					
	127-139.29 FAULT ZONE. Pulverized					

sandy, gougy core.

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER DAV-11

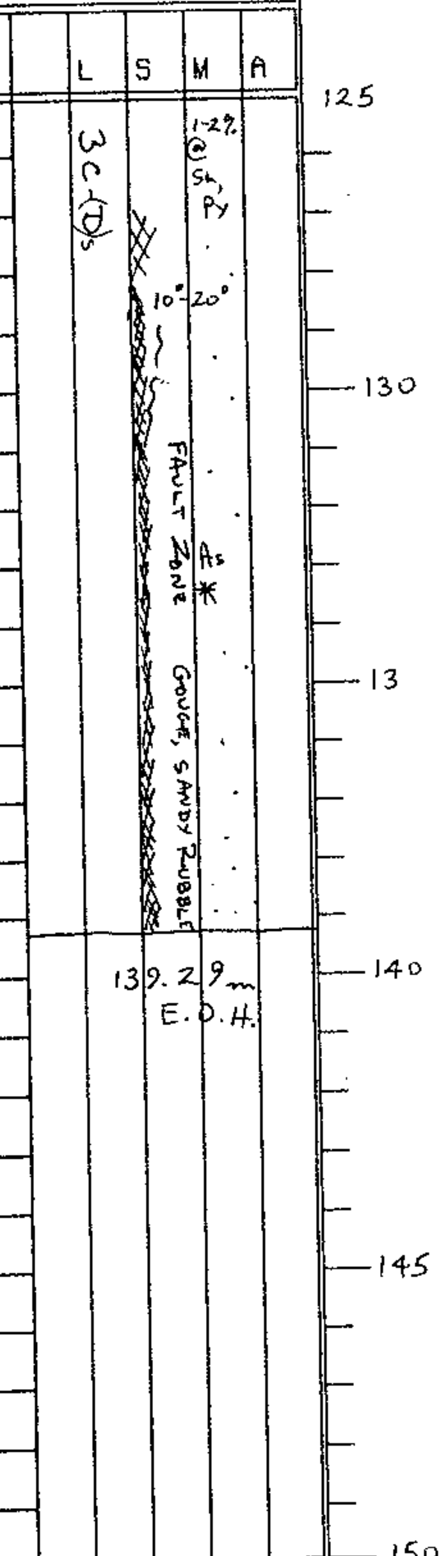
Depth	Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm
100									
105	104-108 - Sporadic 1-4% @								
	disseminated red-brown sphalerite								
	and pyrrhotite, predominantly in								
	fragments.								
			109.5	110.8	1.3	48.3g	19.6g		
110	108-111- 3-4% very fine-grained								
*	pyrite as coatings on hairline fractures.								
	Trace dissem sphalerite. Very								
	different style of mineralization from								
	norm. Fractures c̄ PY 10° & 70° CA.								
115	Fault related? Most of high-grade								
	interval is in fault rubble.								
*	112-112.5 5% sphalerite dissem + in								
	Cores of quartz amygdules. 2% As. 1-2%								
	PY in amygdules & fractures.								
120	112.5-120.25 - Trace to 2% (locally to								
	5%) red-brown dissem. SL. Predom in								
	groundmass. Some pyrrhotite.								
	120.25-139.29 - 1-2% @ PY, SL								
125	in clots to 5mm. Trace As.								

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER DAV-11

Interval (m)	LITHOLOGY



GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER DAV-11

Depth	Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm
125									
130									
135									
140									
145									
150									

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER ________

Pg. ____ of ____

Interval (m)	LITHOLOGY		L	S	M	A

GRANGES INC.

DIAMOND DRILL LOG

BLACKWATER-DAVIDSON PROJECT (120)

Date Collared	HOLE NUMBER DAV-12
Date Completed	

Logged By: G. ALLEN Nov. 29, '92

PURPOSE:

Location	Survey Data	Acid Dip Tests		
		Depth	Reading	Dip
Claim: PEM	Collar Dip:			
Grid: PEM	Azimuth:			
Latitude:	Length:			
Departure:	Vert. Project.			
Elevation:	Hor. Project.			

Core Size: NQ	Reduced To: ______ at
Casing Depth:	Casing Left In: Yes ____ No ✓

COMMENTS:

HOLE NUMBER DAV-12

SUMMARY LOG:

Interval	Code	Unit Description

MINERALIZATION

Interval	Description	Interval	Description

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER DAV-12

Interval (m)	LITHOLOGY		L	S	M	A
0-27	CASING					

0
5
10
15
20
25

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER DAV-12

Depth	Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm
0									
5									
10									
15									
20									
25									

Interval (m)	LITHOLOGY	L	S	M	A
			CASING		
27 - 39 (?)	INTERMEDIATE FELDSPAR PHYRIC FLOW (2Gw)	2Gw	FAULT; GOUGE, SANDY RUBBLE	Tr - 1% DISS SL	
	Medium bluish to greenish-grey moderately soft aphanitic groundmass (quartz and sericite?) with 20-25% anhedral subhedral to euhedral prism-shaped ≤ 1 mm feldspar phenocrysts, and 10% chlorite clots after mafic phenocrysts.				
	Some parts look tuffaceous. Could be all one tuff unit to 46 m				
	30 - 35 - FAULT. SANDY RUBBLE				
39 - 46 (±)	INTERMEDIATE FELDSPAR PHYRIC TUFF TO LAPILLI TUFF (2B-Dw)	? 2B-Dw	10° FAULT	55°	
	Could be same unit as above. Some parts clearly coarse-grained tuff matrix with dark grey fine-grained feldspar phyric fragments ≥ 10 cm. Fragments commonly trachytic.				
	Much of unit faulted to gouge or rubble. Shear orientation not clear. 0, 35, 55°.	3C-D	FAULT	2-4% Sn, Po; Tr As, Gn, Cp	

Depth scale: 25, 30, 3[5], 40, 45, 50

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER DAV-12

Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm
27-46- Trace to 2% dissem. red-brown fine-grained sphalerite.								
46-~60 - 2-4% @ dark red-brn sphalerite and pyrrhotite. Sphalerite in irregular masses up to 5mm across. Trace galena, arsenopyrite and chalcopyrite. Sulphides commonly concentrated in fragments.								

Interval (m)	LITHOLOGY	L	S	M	A
46- ~67	FELSIC COARSE-GRAINED TO LAPILLI TUFF (3C-D)	3C-D		2-4% @ Sh, Po Tr Gr, Cp, As	
	Medium greenish-grey aphanitic groundmass composed mostly of sericite & quartz. Generally soft. 40-50% <1mm to >1cm light grey (siliceous) to waxy green (clay-altered, sericitic) subrounded to angular aphanitic lithic fragments. Rarely flow-banded.				
	Some parts contain chloritic clots after mafic fragments up to 5mm in diameter. Could be more intermediate composition than indicated in unit name.		10° 35° FAULT ZONE; RUBBLE	2-4% Sh 1-3% Py	
67- 70	INTERMEDIATE COARSE-GRAINED TO LAPILLI TUFF (2C-D)	2C-D		Tr-1% @ Sh, Po	
	Medium grey moderately soft fine-grained groundmass with 30-40% dark green chloritic aphanitic to rarely porphyritic angular lithic fragments averaging 4-5mm. Same				
*	unit in BD92-34, 35 & 36 ?	3C	FAULT GOUGE	3-4% Fine Py	
70- 71.5	FELSIC COARSE-GRAINED TO LAPILLI TUFF	2B-C	10°	4-5% Sh Tr Gr, Py	
	Light grey quartz-sericite groundmass. Vague lithic fragments to 8mm. Fault bounded	3C		1-2% @ Sh	

50 55 60 65 70 75

GL

GRANGES INC.

BLACKWATER-DAVIDSON ROJECT

HOLE NUMBER DAV-12

Mineralization and Alt ation	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm
60-67								
2-4% sphalerite and 1-3% pyrite								
Sphalerite - PY zone below								
SL-Po Zone.								
70-71.5- 4% pyrite along fractures as in high-grade Au interval in DAV-11								
71.5-74- 4-5% dissem. f-g red-brn sphalerite. Tr PY, GL								
74-74.7- 1-2% @ sphalerite + galena in masses to 3 mm. Predom. in or peripheral to lithic fragments.								

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER DAV-12

Interval (m)	LITHOLOGY	L	S	M	A
71.5-74	INTERMEDIATE MEDIUM TO COARSE-GRAINED TUFF (2 B-C) Dark brownish-grey fine-grained moderately soft groundmass with vague more siliceous lithic fragments up to 4 mm.	2-3C-D 2Gu	FAULT	1-2% @ Sh, Gl; Tr Po	STAINS Mn STAIN
74-74.7	INTERMEDIATE TO FELSIC COARSE-GRAINED TO LAPILLI TUFF (2-3C-D) Light greenish-grey to white sporadically hard quartzose to sericitic groundmass with 30% dark green to brown aphanitic angular rock fragments up to 5 mm (average); some to 1.5 cm. Similar to rock seen in DAV-11. Lower contact faulted.	?	FAULT, GOUGE RUBBLE	Tr 2% Sh; Tr Po; Tr Gl	
74.7-~75?	INTERMEDIATE COARSE-GRAINED TUFF (2C) Dark grey fine-grained medium hard groundmass with 30% <1-5mm dark green aphanitic chloritic lithic fragments. Rare white lithic fragments.	2C-D 3D.fu		2-4% @ Sh, Po; Tr-4% Sh; 2-3% PY; Tr Gl	
75-77-	INTERMEDIATE TO FELSIC COARSE-GRAINED TO LAPILLI TUFF (2-3C-D) As 74-74.7. Lower contact faulted.	20°	BLOCKY, RUBBLE		

75
80
85
90
95
100

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER DAV-12

Pg. 9a of ___

Interval (m)	LITHOLOGY		L	S	M	A
77-82 (?)	INTERMEDIATE FELDSPAR PHYRIC FLOW (2Gw) Dark grey-brown aphanitic groundmass with 25% lath-shaped to stubby f-g (≤1 mm), euhedral white feldspar phenocrysts. Chloritic clots to 2mm could be mafic phenocrysts. Upper + lower contacts faulted.					
82 - 91.75	INTERMEDIATE COARSE-GRAINED TO LAPILLI TUFF (2C-D) Medium grey to greenish-grey aphanitic siliceous groundmass with 20-25% aphanitic dark greenish-grey (some feldspar phyric) lithic fragments to 1cm (average 4-5mm). Some parts of unit look more felsic as 74-74.7 + 75-77. Lower contact may not be faulted. (could be faulted!)					
91.75-100.28	FELSIC LAPILLI TUFF WITH FLOW-BANDED FRAGMENTS (3D.fu) Medium greenish-grey siliceous groundmass with 40-50% cream to greenish-grey flow-banded fragments to 3cm (average 5mm-1cm.					

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER DAV - 12

Depth	Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm
75									
	77-82- Trace Po.								
80									
	82-89- Trace to 2% red-brown								
	sphalerite, trace pyrrhotite.								
	Trace galena in intervals with								
85	lighter - coloured groundmass.								
	89-91.75- 2-4% @ dissem.								
90	sphalerite and pyrrhotite.								
	91.75- Trace to 4% dissem.								
	dark red-brown sphalerite.								
	2-3% very fine-grained pyrite								
95	along fractures. Looks black.								
	Trace GL. Some places 2%								
	galena.								
100									

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER DAV-12

Interval (m)	LITHOLOGY	L	S	M	A
100.28 - 115.52	INTERMEDIATE LAPILLI TUFF (2D) Medium purplish-grey fine-grained sericitic (?) groundmass with 35-40% angular dark green aphanitic lithic fragments to 2 cm (average 5 mm - 1 cm). Same unit as seen in BD92-34, 35, 36, and parts of DAV-11. Lower contact faulted.	2D	FAULT GOUGE	Tr-4% SL, Tr-2% Po } Average <1.	
115.52 - ~131	FELSIC COARSE-GRAINED TO LAPILLI TUFF WITH SOME FLOW BANDED FRAGMENTS 3C-D. (fv) Medium greenish to bluish-grey sporadically siliceous (bluish parts) quartz-sericite groundmass with 30% <1 mm to >1 cm aphanitic blue-grey lithic fragments. Flow banding relatively common. * Gradational lower contact.	3C-D. (fv)	5-10	2-4% SL, Tr-2% Py	

Depth scale (right margin): 100, 105, 1[10], 115, 120, 1[25]

BLACKWATER-DAVIDSON ROJECT

HOLE NUMBER DAV-12

Depth	Mineralization and Alte ation	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm
100	100.28 - 115.52 - Trace to 4% dissem fine-grained red-brown sphalerite. Trace - 2% diss. Po.								
105									
110									
115	115.52 - 131 - 2-4% dissem red-brown sphalerite in crystals to 2 mm. Commonly concentrated along alternating bands in flow-banded fragments. Trace to 2% Py								
120									
125									

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER DAV-12

Interval (m)	LITHOLOGY		L	S	M	A
	Chloritic fragments more common down hole. Fragments up to 5mm commonly almost totally replaced (?) by red-brown sphalerite.		3c-D.(fr)		2-4% SL, 1-2% PY	
		GRADATIONAL				
131 – 137.77 E.O.H. ?	INTERMEDIATE TUFF TO LAPILLI TUFF (2c-D) Dark grey f-g groundmass with 20% <1-2cm angular dark greenish-grey aphanitic lithic fragments. Some siliceous flow-banded fragments also. Gradational contact with unit above. Unit coarsens down hole. Near end (~137 m) amygdaloidal fragments up to 20cm. 20% 1-8mm quartz amygdules c̄ pyrite and sphalerite in some cores.		2c-D, 2E.a.v		2-4% SL, 2-3% SL, Tr-1% PY	
			137.77m E.O.H. ?			

125
130
140
145
150

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER DAV-12

	Mineralization and Alteration	Sample No.	Fro (m)	To (m)	W (m)	Au O/T	Ag O/T	Pb ppm	Zn ppm
125									
130									
	131 - 137 2-4% very fine-grained red-brown sphalerite disseminated in matrix.								
135									
	~~137.77~~ 137.77 2-4% sphalerite dissem. & in amygdules with pyrite.								
140									
145									
150									

GRANGES INC.

BLACKWATER-DAVIDSON PROJECT

HOLE NUMBER ________

Pg. ____ of ____

Interval (m)	LITHOLOGY		L	S	M	A

APPENDIX II

CERTIFICATES OF ANALYSIS

1992 PHASE II (DIAMOND DRILLING)

Shipment	Date Out	Sample Numbers	Core	WR	TS	PTS	Sludge	Lab	Report No.	Date
BD92II-1	Nov. 16	50142	1					CDN & Acme	92198	Nov. 18
									92-4046	Nov. 20
BD92II-2	Nov. 23	50001 - 50031	31					CDN & Acme	92203	Dec. 2
		50033 - 50089	57					"		
		50100 - 50110	11					"	92-4306	Dec.15
		50112 - 50141	30					"		
		50143 - 50277	135					"		
		50292 - 50293	2					"		
		50337 - 50338	2					"		
		50400 - 50401	2					"		
		50429 - 50431	3					"		
		50455 - 50456	2					"		
		50498 - 50499	2					"		
		50525	1					"		
		50534	1					"		
BD92II-3	Nov. 23	50602 - 50607			6			C. Leitch		
		50610			1			"		
		50626 - 50627			2			"		
		50629			1			"		
		50601				1		"		
		50608 - 50609				2		"		
		50611 - 50619				9		"		
		50621 - 50623				3		"		
		50628				1		"		
		50630 - 50632				3		"		
BD92II-4	Nov. 23	50601 - 50607		7				Xral	13942	Jan. 6, 1993
		50610 - 50618		9				"		
		50621 - 50622		2				"		
		50626 - 50630		5				"		
		50632		1				"		
BD92II-5	Nov. 25	50278 - 50291	14					CDN & Acme	92205	Dec. 4
		50294 - 50336	43					"		
		50339 - 50363	25					"	92-4306	Dec. 15
		50364 - 50399	36					"		
		50402 - 50428	27					"		
BD92II-6	Nov. 30	50432 - 50454	23					CDN & Acme	92207	Dec. 9
		50457 - 50497	41					"		
		50500 - 50524	25					"	92-4306	Dec. 15
		50526 - 50533	8					"		
BD92II-7	Dec. 8	See Requisition					90	CDN & Acme	92218	Dec. 15
									93-0020	Jan. 11, 1993
TOTALS			522	24	10	19	90			

CDN RESOURCE LABORATORIES LTD.

6329 BERESFORD STREET, BURNABY, B.C. V5E 1B3 / PH: 435-8376 / FAX: 435-9746

** ASSAY REPORT **

To: Granges Inc.
2300 - 885 West Georgia St.
Vancouver, B.C.
V6C 3E8

Number: 92198
Date: November 18, 1992
Proj.: 120

Attn: Bruce Downing cc. Gord Allen

	Au oz/ton	Ag oz/ton
50142	0.013	0.48

Licensed Assayer of British Columbia

..CME ... T..... LA.....TOR.... LTL. .... E. .....INGS ... V....OUVL.. ..C. ..A 1... ..IE(6 ,253- 8 . 4 .-17

GEOCHEMICAL ANALYSIS CERTIFICATE

Granges Inc. PROJECT 120 File # 92-4046

2300 - 885 W. Georgia St., Vancouver BC V6C 3E8

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
50142	11	120	9958	3340	16.5	10	4	64	1.59	38	5	ND	8	2	71.4	17	2	1	.03	.003	14	110	.01	16	.01	4	.28	.01	.23	3
RE 50142	11	120	10135	3361	16.6	10	4	61	1.58	39	7	ND	7	2	71.7	17	2	1	.02	.002	14	111	.01	19	.01	6	.28	.01	.23	3

ICP - .500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN FE SR CA P LA CR MG BA TI B W AND LIMITED FOR NA K AND AL. AU DETECTION LIMIT BY ICP IS 3 PPM.
ASSAY RECOMMENDED FOR ROCK AND CORE SAMPLES IF CU PB ZN AS > 1%, AG > 30 PPM & AU > 1000 PPB
- SAMPLE TYPE: ROCK PULP <u>Samples beginning 'RE' are duplicate samples.</u>

DATE RECEIVED: NOV 18 1992 **DATE REPORT MAILED:** Nov 20/92 **SIGNED BY**.......... D.TOYE, C.LEONG, J.WANG; CERTIFIED B.C. ASSAYERS

120.041 309

CDN RESOURCE LABORATORIES LTD.
6329 BERESFORD STREET, BURNABY, B.C. V5E 1B3 / PH: 435-8376 / FAX: 435-9746

** ASSAY REPORT **

To: Granges Inc.
2300 - 885 West Georgia St.
Vancouver, B.C.
V6C 3E8

Number: 92203
Date: December 2, 1992
Proj.: 120

Attn: Bruce Downing cc. Gord Allen

	Au oz/ton	Ag oz/ton
50010	0.004	0.12
50011	0.004	0.03
50012	0.002	0.01
50013	0.002	<0.01
50014	0.002	0.03
50015	0.004	<0.01
50016	0.004	<0.01
50017	0.004	<0.01
50018	0.008	<0.01
50019	0.002	<0.01
50020	0.002	<0.01
50021	<0.002	0.03
50022	0.002	0.06
50023	0.002	0.06
50024	0.002	0.06
50025	0.004	0.06
50026	0.002	0.07
50027	0.002	0.03
50028	0.002	0.07
50029	0.002	0.09
50030	0.004	0.18
50031	<0.002	0.06
50032	<0.002	0.03
50033	<0.002	0.06
50034	0.002	0.03
50035	<0.002	0.03
50036	<0.002	0.03
50037	0.002	0.03
50038	0.002	0.03
50039	0.004	<0.01
50040	0.002	0.01
50041	0.002	0.03
50042	0.002	0.03
50043	0.002	0.03
50044	0.004	0.01
50045	0.002	<0.01
50046	0.002	0.01
50047	0.002	0.01
50048	0.002	<0.01
50049	0.002	0.01

Duncan Sanderson
Licensed Assayer of British Columbia

CDN RESOURCE LABORATORIES LTD.
6329 BERESFORD STREET, BURNABY, B.C. V5E 1B3 / PH: 435-8376 / FAX: 435-9746

** ASSAY REPORT **

To: Granges Inc.
2300 - 885 West Georgia St.
Vancouver, B.C.
V6C 3E8

Number: 92203
Date: December 2, 1992
Proj.: 120

Attn: Bruce Downing cc. Gord Allen

	Au oz/ton	Ag oz/ton
50050	0.002	0.03
50051	0.002	0.03
50052	<0.002	0.03
50053	0.002	0.03
50054	0.002	<0.01
50055	<0.002	0.06
50056	<0.002	0.09
50057	0.002	0.03
50058	<0.002	0.03
50059	0.002	0.01
50060	<0.002	0.04
50061	<0.002	0.03
50062	<0.002	0.03
50063	0.002	0.03
50064	<0.002	0.03
50065	<0.002	0.03
50066	0.002	0.06
50067	<0.002	0.28
50068	<0.002	<0.01
50069	<0.002	0.01
50070	0.002	0.04
50071	0.002	0.03
50072	<0.002	0.03
50073	<0.002	0.03
50074	<0.002	0.03
50075	<0.002	0.03
50076	<0.002	0.03
50077	<0.002	0.03
50078	<0.002	<0.01
50079	<0.002	<0.01
50080	<0.002	<0.01
50081	<0.002	<0.01
50082	<0.002	<0.01
50083	<0.002	0.06
50084	<0.002	0.09
50085	<0.002	0.03
50086	<0.002	0.03
50087	<0.002	0.06
50088	0.002	0.03
50089	0.002	0.03

Duncan Sanderson
Licensed Assayer of British Columbia

CDN RESOURCE LABORATORIES LTD.
6329 BERESFORD STREET, BURNABY, B.C. V5E 1B3 / PH: 435-8376 / FAX: 435-9746

** ASSAY REPORT **

To: Granges Inc.
2300 - 885 West Georgia St.
Vancouver, B.C.
V6C 3E8

Number: 92203
Date: December 2, 1992
Proj.: 120

Attn: Bruce Downing cc. Gord Allen

	Au oz/ton	Ag oz/ton
50101	<0.002	0.06
50102	<0.002	0.03
50103	<0.002	0.06
50104	<0.002	<0.01
50105	<0.002	0.03
50106	<0.002	0.03
50108	<0.002	0.09
50109	<0.002	0.23
50110	0.002	0.38
50112	0.002	0.29
50113	0.008	0.18
50114	0.008	0.23
50115	0.006	0.38
50116	0.008	0.93
50117	0.012	0.44
50118	0.004	0.38
50119	0.004	0.70
50120	0.006	0.64
50121	0.004	0.32
50122	0.006	1.02
50123	0.004	0.32
50124	0.004	0.18
50125	0.002	0.09
50126	0.006	0.32
50127	0.008	0.83
50128	0.006	0.15
50129	0.004	0.15
50130	<0.002	0.12
50131/32	0.004	0.20
50133	0.006	0.44
50134	0.002	0.18
50135	0.006	0.29
50136	0.006	0.23
50137	0.006	0.35
50138	0.004	0.12
50139	0.014	0.41
50140	0.018	0.41
50141	0.014	0.32

Licensed Assayer of British Columbia

CDN RESOURCE LABORATORIES LTD.

6329 BERESFORD STREET, BURNABY, B.C. V5E 1B3 / PH: 435-8376 / FAX: 435-9746

** ASSAY REPORT **

To: Granges Inc.
2300 - 885 West Georgia St.
Vancouver, B.C.
V6C 3E8

Number: 92203
Date: December 2, 1992
Proj.: 120

Attn: Bruce Downing cc. Gord Allen

	Au oz/ton	Ag oz/ton
50143	0.012	0.29
50144	0.008	0.31
50145	0.004	0.18
50146	0.018	0.03
50147	0.002	0.06
50148	0.006	0.09
50149	0.006	0.31
50150	0.008	0.29
50151	0.014	0.44
50152	0.006	0.32
50153	0.022	0.29
50154	0.036	0.32
50155	0.008	0.26
50156	0.008	0.15
50157	0.004	0.12
50158	0.004	0.06
50159	0.008	0.10
50160	0.030	0.20
50161	0.010	0.06
50162	0.004	0.41
50163	0.006	0.03
50164	0.006	0.04
50165	0.012	0.09
50166	0.018	0.04
50167	0.006	0.42
50168	0.006	0.06
50169	0.008	0.06
50170	0.010	0.03
50171	0.018	0.03
50172	0.014	0.01
50173	0.014	0.03
50174	0.014	0.03
50175	0.014	0.03
50176	0.010	0.15
50177	0.006	0.06
50178	0.008	0.03
50179	0.008	0.38
50180	0.010	0.06
50181	0.024	0.09
50182	0.014	0.07

Duncan Sanderson
Licensed Assayer of British Columbia

CDN RESOURCE LABORATORIES LTD.
6329 BERESFORD STREET, BURNABY, B.C. V5E 1B3 / PH: 435-8376 / FAX: 435-9746

** ASSAY REPORT **

To: Grangex Inc.
2300 - 885 West Georgia St.
Vancouver, B.C.
V6C 3E8

Number: 92203
Date: December 2, 1992
Proj.: 120

Attn: Bruce Downing cc. Gord Allen

	Au oz/ton	Ag oz/ton
50183	0.010	0.01
50184	0.006	<0.01
50185	0.010	0.06
50186	0.010	0.35
50187	0.012	0.23
50188	0.008	0.06
50189	0.014	0.06
50190	0.008	0.13
50191	0.010	0.15
50192	0.008	0.38
50193	0.010	0.12
50194	0.014	0.09
50195	0.014	0.50
50196	0.012	0.12
50197	0.022	0.80
50198	0.040	0.32
50199	0.054	0.54
50200	0.086	0.84
50201	0.100	0.15
50202	0.040	0.16
50203	0.020	0.04
50204	0.080	0.50
50205	0.054	0.38
50206	0.014	0.53
50207	0.022	0.01
50208	0.018	0.03
50209	0.036	0.03
50210	0.014	0.03
50211	0.012	0.18
50212	0.012	0.03
50213	0.002	0.03
50214	0.010	<0.01
50215	0.046	<0.01
50216	0.008	0.03
50217	0.018	<0.01
50218	0.046	0.15
50219	0.296	0.12
50220	0.074	0.15
50221	0.024	0.07
50222	0.018	0.12

Duncan Sanderson
Licensed Assayer of British Columbia

CDN RESOURCE LABORATORIES LTD.
6329 BERESFORD STREET, BURNABY, B.C. V5E 1B3 / PH: 435-8376 / FAX: 435-9746

** ASSAY REPORT **

To: Granges Inc.
2300 - 885 West Georgia St.
Vancouver, B.C.
V6C 3E8

Number: 92203
Date: December 2, 1992
Proj.: 120

Attn: Bruce Downing cc. Gord Allen

	Au oz/ton	Ag oz/ton
50223	0.010	0.25
50224	0.020	0.12
50225	0.016	0.48
50226	0.014	0.20
50227	0.018	0.44
50228	0.016	0.15
50229	0.014	0.01
50230	0.016	0.03
50231	0.012	0.03
50232	0.042	<0.01
50233	0.012	0.03
50234	0.010	0.06
50235	0.010	0.06
50236	0.006	0.06
50237	0.010	0.03
50238	0.010	0.03
50239	0.006	0.03
50240	0.008	0.06
50241	0.018	0.03
50242	0.006	<0.01
50243	0.012	0.01
50244	0.004	0.03
50245	0.004	<0.01
50246	0.004	<0.01
50247	0.006	<0.01
50248	0.006	0.34
50249	0.004	0.03
50250	0.006	0.12
50251	0.004	0.03
50252	0.006	<0.01
50253	0.004	0.12
50254	0.006	0.01
50255	0.012	<0.01
50256	0.006	<0.01
50257	0.002	<0.01
50258	0.006	<0.01
50259	0.004	<0.01
50260	0.008	<0.01
50261	0.006	0.01
50262	0.004	0.35

Duncan Sanderson
Licensed Assayer of British Columbia

CDM RESOURCE LABORATORIES LTD.
6329 BERESFORD STREET, BURNABY, B.C. V5E 1B3 / PH: 435-8376 / FAX: 435-9746

** ASSAY REPORT **

To: Granges Inc.
2300 - 885 West Georgia St.
Vancouver, B.C.
V6C 3E8

Number: 92203
Date: December 2, 1992
Proj.: 120

Attn: Bruce Downing cc. Gord Allen

	Au oz/ton	Ag oz/ton
50263	0.004	<0.01
50264	0.008	<0.01
50265	0.008	<0.01
50266	0.012	<0.01
50267	0.048	0.32
50268	0.008	0.06
50269	0.008	0.03
50270	0.004	0.44
50271	0.006	0.85
50272	0.008	0.38
50273	0.004	0.10
50274	0.006	0.48
50275	0.008	0.04
50276	0.016	0.44
50277	0.012	0.09
50292	0.004	0.06
50293	0.008	0.16
50337	0.006	0.07
50338	0.018	0.06
50400	0.004	0.03
50401	0.002	0.03
50429	0.004	0.03
50430	0.002	0.03
50431	0.002	0.03
50455	0.012	0.03
50456	0.010	0.09
50498	0.002	0.12
50499	0.002	0.26
50525	0.002	0.03
50534	0.002	0.06
50001	0.006	0.03
50002	0.006	0.03
50003	0.004	0.03
50004	0.008	0.03
50005	0.006	0.03
50006	0.006	0.09
50007	0.004	0.03
50008	0.006	0.07
50009	0.006	0.09

Duncan Sanders
Licensed Assayer of British Columbia

..CME ... L LI ...ATO... LT. ... E. TIN T. :OUV 3.C 6A ... NE( )25: 58 (6^ 3-1

120.04C 9

GEOCHEMICAL ANALYSIS CERTIFICATE

Granges Inc. PROJECT BLACKWATER-DAVIDSON File # 92-4306 Page 1

2300 - 885 W. Georgia St., Vancouver BC V6C 3E8

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
50001	5	103	37	433	.7	314	19	447	4.83	115	5	ND	1	19	2.7	36	2	38	.20	.044	4	89	.68	115	.06	7	2.01	.02	.46	2
50002	3	45	89	410	1.0	227	18	3272	4.55	96	5	ND	1	103	1.7	20	2	66	1.38	.036	3	153	1.20	206	.11	3	4.75	.17	.74	2
50003	4	47	134	215	1.4	226	17	1392	4.83	125	5	ND	1	125	1.4	15	3	76	2.24	.040	3	155	1.43	153	.14	2	5.11	.19	.93	1
50004	4	56	89	144	1.1	275	25	2041	4.49	137	5	ND	1	185	.3	5	3	66	4.21	.038	3	215	1.63	327	.18	5	6.03	.23	1.17	1
50005	4	42	32	186	.4	232	23	1826	4.42	142	5	ND	1	169	.3	16	2	71	2.48	.069	3	171	1.04	342	.14	2	5.13	.26	.94	1
50006	5	54	3276	12270	16.8	102	19	2035	3.71	69	5	ND	5	47	118.9	33	2	31	.63	.035	6	66	.44	156	.09	2	2.58	.09	.68	1
50007	7	16	4045	14866	20.9	16	8	2524	2.00	13	5	ND	10	31	140.0	25	2	4	.30	.004	6	45	.17	117	.05	3	1.52	.06	.46	1
50008	7	16	6286	23474	32.4	12	7	2233	1.67	14	5	ND	10	43	217.5	29	3	3	.31	.005	6	35	.14	132	.04	3	1.37	.06	.41	1
50009	6	6	744	3330	3.5	11	6	2150	1.40	10	5	ND	10	45	25.7	12	2	5	.56	.004	7	43	.15	123	.08	6	1.51	.09	.48	1
50010	6	11	1145	3619	4.9	36	24	4076	2.18	60	5	ND	8	65	27.8	12	2	8	1.66	.006	7	34	.24	155	.08	8	2.24	.10	.72	1
50011	7	13	197	2400	1.0	16	9	2275	1.89	11	5	ND	8	48	18.5	12	2	9	.61	.010	6	41	.17	122	.08	5	1.76	.10	.54	1
50012	70	17	109	935	.6	254	141	3367	2.27	561	5	ND	6	59	5.6	60	2	12	.47	.031	5	53	.20	186	.07	8	1.66	.08	.50	1
50013	17	9	30	188	.3	71	34	4274	1.97	136	5	ND	7	70	.9	12	2	8	1.64	.006	7	48	.20	153	.08	4	2.15	.12	.62	1
50014	6	11	59	222	.5	9	6	3741	1.56	9	5	ND	11	33	1.1	8	2	3	.73	.004	7	56	.14	92	.05	4	1.32	.06	.43	1
50015	7	9	104	444	.5	12	10	3637	1.73	20	5	ND	10	35	3.4	16	2	3	.92	.004	7	58	.17	83	.06	4	1.22	.05	.37	1
50016	4	16	83	344	.4	9	6	1589	1.39	18	5	ND	10	21	2.7	14	2	4	.26	.006	7	42	.11	91	.07	8	1.04	.03	.37	1
50017	3	13	30	180	.1	11	6	1157	1.49	28	5	ND	10	34	1.2	13	2	6	.28	.006	8	19	.12	158	.07	9	1.23	.02	.48	1
50018	5	40	27	84	.4	53	15	1753	3.70	78	5	ND	3	148	.2	16	2	35	.66	.015	5	79	.37	271	.15	10	2.61	.11	.75	1
50019	4	17	26	85	.4	60	18	1497	3.98	64	5	ND	2	63	.2	21	2	36	.51	.018	3	65	.41	238	.16	6	2.53	.11	.69	1
50020	3	19	18	97	.4	54	17	1108	3.96	69	5	ND	2	63	.2	26	2	28	.47	.020	4	54	.39	235	.13	6	2.23	.10	.62	1
50021	3	55	19	90	.2	27	12	551	4.38	108	5	ND	1	54	.2	33	3	46	.55	.067	6	31	.28	235	.11	8	2.17	.06	.74	1
50022	4	142	17	137	.5	20	31	1481	6.25	221	5	ND	2	71	.2	30	2	103	.99	.198	18	40	.64	231	.17	10	3.20	.13	.99	1
50023	4	103	5	125	.4	13	27	1521	6.18	46	5	ND	2	83	.2	17	3	117	1.00	.196	17	30	.71	170	.19	4	3.14	.11	1.05	1
50024	5	178	9	113	.5	10	23	1416	6.42	144	5	ND	2	112	.2	35	3	97	1.02	.203	16	40	.66	171	.15	9	3.19	.09	1.18	1
50025	5	279	12	107	.8	10	23	1596	6.84	71	5	ND	3	158	.2	36	2	101	1.07	.215	15	46	.59	183	.16	7	3.13	.10	1.20	1
50026	7	142	7	153	.6	5	25	2101	7.25	165	5	ND	2	66	.2	29	2	107	.80	.190	15	42	.74	180	.21	6	3.42	.07	1.32	1
50027	6	103	10	97	.4	5	19	1513	5.32	246	5	ND	3	46	.2	16	6	60	.67	.164	17	48	.48	137	.18	8	2.27	.06	1.17	1
50028	5	96	8	143	.3	6	20	2064	6.42	208	5	ND	3	53	.2	28	2	89	.79	.215	16	43	.63	208	.23	5	3.24	.06	1.79	1
RE 50024	5	168	8	109	.5	10	24	1396	6.27	144	5	ND	2	109	.2	34	2	95	1.00	.203	16	41	.64	165	.15	8	3.11	.09	1.15	1
50029	5	141	11	188	1.1	7	24	2282	6.35	193	5	ND	2	57	.7	29	2	115	.86	.220	16	41	.66	235	.24	11	3.34	.06	1.66	1
50030	3	141	11	189	4.4	12	26	2565	6.78	86	5	ND	2	53	.5	53	7	148	.75	.179	15	30	.85	288	.28	2	3.64	.07	1.76	1
50031	4	168	9	167	1.1	12	30	2261	7.35	257	5	ND	2	51	.2	26	2	143	.75	.179	17	30	.87	300	.28	6	3.64	.05	1.96	1
50032	5	147	12	128	.7	12	27	1679	6.60	211	5	ND	2	48	.2	17	2	117	.95	.195	23	33	.73	235	.23	6	3.31	.05	1.78	1
50033	3	174	2	112	1.0	13	29	1151	6.82	183	5	ND	3	53	.2	6	3	135	.85	.191	24	32	.88	229	.30	9	3.44	.06	2.00	1
50034	3	105	5	68	.5	10	24	897	5.97	79	5	ND	3	66	.2	3	4	116	1.36	.199	26	25	.84	149	.20	7	2.68	.06	1.25	1
50035	3	150	8	104	.6	17	27	1222	7.42	19	5	ND	4	95	.6	2	3	135	2.45	.161	20	24	1.14	64	.08	2	2.84	.09	.34	1
50036	2	83	19	113	.5	12	25	1507	5.78	23	5	ND	3	110	.5	2	2	172	2.96	.155	19	24	1.34	224	.30	2	3.53	.15	1.72	1
STANDARD C	18	57	37	129	7.4	68	32	1041	3.96	41	21	7	36	54	17.9	14	21	56	.50	.088	38	58	.94	191	.09	34	1.88	.06	.14	11

ICP - .500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN FE SR CA P LA CR MG BA TI B W AND LIMITED FOR NA K AND AL. AU DETECTION LIMIT BY ICP IS 3 PPM.
- SAMPLE TYPE: PULP Samples beginning 'RE' are duplicate samples.

DATE RECEIVED: DEC 9 1992 **DATE REPORT MAILED:** Dec 15/92 **SIGNED BY** C. Leong ...D.TOYE, C.LEONG, J.WANG; CERTIFIED B.C. ASSAYERS

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
50037	1	59	6	91	.5	10	22	1367	5.63	47	5	ND	4	110	.2	2	2	180	2.81	.161	17	18	1.21	230	.32	2	3.32	.30	2.04	1
50038	2	144	9	44	.5	9	15	824	5.13	85	5	ND	4	79	.2	2	2	115	2.91	.173	22	20	.73	106	.07	6	1.91	.15	.62	1
50039	14	11	7	5	.3	4	7	236	.47	1660	5	ND	9	15	.2	26	2	3	1.35	.013	13	126	.03	78	.01	9	.53	.01	.34	1
50040	17	9	7	6	.3	4	1	67	.29	62	5	ND	10	9	.2	6	2	1	.29	.003	16	163	.01	85	.01	4	.36	.01	.30	1
50041	17	6	8	5	.3	5	1	44	.32	17	5	ND	9	7	.2	11	2	1	.09	.002	12	168	.01	94	.01	3	.30	.01	.29	1
50042	17	4	46	6	.3	3	1	98	.14	25	5	ND	12	12	.2	4	2	1	.55	.003	11	110	.01	149	.01	8	.35	.01	.34	1
RE 50047	17	6	3	10	.2	4	1	51	.27	4	5	ND	8	7	.2	5	2	1	.10	.002	12	164	.01	64	.01	4	.43	.01	.35	1
50043	18	6	5	4	.4	5	1	84	.30	18	5	ND	9	11	.2	6	2	2	.25	.003	14	179	.01	69	.01	5	.36	.01	.29	1
50044	17	5	13	26	.3	5	1	55	.24	58	5	ND	9	9	.2	7	2	1	.18	.002	12	178	.01	79	.01	4	.33	.01	.31	1
50045	16	6	4	4	.1	5	1	49	.25	12	5	ND	8	8	.2	6	2	1	.14	.002	12	168	.01	72	.01	5	.30	.01	.28	1
50046	19	6	5	5	.1	5	1	44	.24	6	5	ND	9	8	.2	4	2	1	.10	.002	14	177	.01	63	.01	4	.28	.01	.25	1
50047	17	7	7	9	.3	4	1	47	.23	5	7	ND	8	7	.2	7	2	1	.09	.002	12	165	.01	60	.01	4	.42	.01	.35	1
50048	14	6	7	8	.2	4	1	53	.25	45	5	ND	8	9	.2	5	2	1	.11	.002	13	125	.01	75	.01	4	.45	.01	.38	1
50049	14	9	3	6	.1	4	1	50	.30	5	6	ND	8	8	.2	5	2	1	.09	.002	13	117	.01	79	.01	5	.54	.02	.42	1
50050	16	6	3	5	.1	4	1	42	.24	4	5	ND	7	9	.2	4	2	1	.15	.002	12	148	.01	80	.01	5	.49	.01	.39	1
50051	12	14	6	17	.2	4	1	66	.42	9	5	ND	9	13	.3	6	2	1	.23	.003	14	105	.01	74	.01	4	.56	.02	.41	1
50052	13	8	10	11	.1	3	1	54	.30	16	5	ND	8	12	.2	8	2	1	.20	.003	13	117	.01	116	.01	3	.49	.02	.44	1
50053	11	16	19	22	.1	3	1	58	.42	12	5	ND	9	11	.3	17	2	1	.23	.004	15	90	.02	91	.01	5	.64	.02	.49	1
50054	11	20	14	18	.3	2	1	44	.33	17	5	ND	11	11	.3	11	2	1	.13	.007	17	83	.02	50	.01	5	.76	.02	.50	1
50055	2	62	8	65	.5	9	18	508	5.09	587	6	ND	6	73	.2	14	2	120	1.14	.179	24	14	.61	143	.26	7	3.09	.28	2.03	1
50056	1	114	7	77	.5	25	18	643	6.82	664	5	ND	3	63	.2	5	2	113	.92	.135	14	29	.62	171	.28	7	3.30	.27	2.19	1
50057	3	97	8	72	.4	50	13	830	5.02	243	5	ND	1	29	.2	8	2	44	.58	.075	9	27	.40	172	.16	11	2.08	.06	1.48	1
50058	3	54	5	58	.6	62	11	768	3.77	393	5	ND	2	29	.2	15	2	42	.44	.061	7	33	.33	164	.14	11	1.78	.06	1.27	1
50059	3	66	5	57	.1	68	11	825	4.44	284	5	ND	1	37	.2	7	2	47	.50	.072	6	48	.39	156	.14	7	1.88	.08	1.27	1
50060	3	69	10	163	.4	50	13	859	5.14	402	5	ND	1	52	.8	6	2	43	.68	.068	5	39	.55	132	.14	6	2.16	.11	1.36	1
50061	3	61	5	154	.3	69	10	828	4.40	291	5	ND	2	63	.8	10	2	46	.63	.070	5	41	.55	130	.13	5	2.11	.12	1.26	1
50062	2	52	8	275	.5	90	14	522	3.41	1445	5	ND	1	29	2.4	23	2	35	.38	.072	5	43	.32	110	.08	9	1.38	.03	.94	1
50063	2	49	8	184	.3	83	12	640	3.44	882	5	ND	1	21	1.3	17	2	34	.48	.050	5	40	.39	96	.10	6	1.45	.03	1.03	1
50064	3	55	5	281	.5	137	13	512	3.23	707	5	ND	1	15	2.7	15	2	33	.35	.035	5	75	.33	79	.09	7	1.23	.02	.89	1
50065	2	56	8	155	.4	76	10	375	3.48	894	5	ND	2	29	1.2	18	2	30	.40	.053	6	35	.36	81	.09	6	1.32	.03	.93	1
50066	11	8	8	48	.2	9	2	97	.49	143	5	ND	10	44	.4	10	2	3	.35	.010	12	95	.04	48	.01	6	.78	.05	.42	1
50067	13	4	3	8	.1	4	1	40	.36	36	5	ND	7	45	.2	7	2	1	.31	.005	7	116	.01	49	.01	4	.64	.05	.31	1
50068	14	9	2	3	.1	5	1	33	.48	29	5	ND	7	60	.2	5	2	1	.25	.005	5	150	.01	35	.01	5	.63	.05	.32	1
50069	13	7	9	13	.1	4	1	59	.21	62	5	ND	9	262	.2	9	2	1	1.34	.006	6	110	.02	44	.01	3	1.62	.26	.30	1
50070	4	52	9	62	.1	54	13	220	3.81	1343	5	ND	1	92	.2	15	6	36	.76	.058	4	46	.53	87	.10	6	2.10	.16	1.09	1
50071	4	53	6	40	.2	51	12	293	3.93	264	5	ND	1	106	.2	2	2	58	1.24	.058	4	66	.62	120	.14	6	3.13	.25	1.38	1
50072	4	35	6	49	.4	49	11	515	3.28	133	5	ND	2	114	.2	3	2	74	1.71	.064	4	76	.70	129	.16	6	3.70	.26	1.36	1
STANDARD C	18	60	38	132	7.1	70	31	1055	3.96	38	21	7	37	52	18.8	15	21	57	.50	.085	39	60	.91	182	.09	34	1.88	.08	.16	11

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
50073	4	51	6	79	.2	53	13	1033	4.91	124	5	ND	1	120	.2	2	2	76	1.86	.058	2	62	.94	139	.18	4	4.74	.16	1.60	1
50074	5	60	8	134	.4	45	17	603	5.20	335	5	ND	1	187	.2	2	2	104	2.71	.066	2	77	1.07	116	.20	4	5.85	.25	1.51	1
50075	8	43	13	48	.4	56	17	363	3.55	657	5	ND	1	191	.2	3	2	108	2.71	.058	2	123	.51	103	.15	4	5.29	.26	1.15	1
50076	6	39	11	1193	.4	56	14	526	3.60	543	5	ND	1	112	9.9	6	2	66	.86	.057	2	83	.32	92	.14	6	2.41	.10	1.15	1
50077	12	13	11	758	.2	6	4	103	1.17	175	5	ND	12	86	6.9	8	2	7	.67	.013	4	87	.08	60	.01	7	1.72	.07	.58	1
50078	14	5	8	19	.2	4	1	49	.38	85	5	ND	10	162	.2	6	2	2	.86	.009	5	118	.02	79	.01	5	1.66	.10	.40	1
50079	15	5	6	8	.2	4	1	44	.30	25	5	ND	10	71	.2	5	2	1	.58	.007	7	143	.01	62	.01	4	.89	.07	.28	1
50080	15	4	5	12	.2	4	1	33	.27	28	6	ND	11	17	.2	4	2	1	.21	.006	7	140	.01	41	.01	4	.58	.03	.26	1
50081	17	3	2	5	.1	4	1	62	.30	49	5	ND	10	15	.2	5	2	1	.63	.005	10	165	.01	39	.01	4	.52	.02	.24	1
50082	15	4	6	8	.2	5	1	44	.30	104	5	ND	8	56	.2	3	2	1	.81	.008	8	157	.01	49	.01	4	1.33	.08	.31	1
RE 50087	6	47	7	63	.5	29	16	1123	4.57	166	5	ND	2	150	.4	2	2	127	5.09	.073	3	93	.99	58	.20	2	6.46	.29	1.41	1
50083	9	46	10	376	.6	54	18	2151	3.79	322	5	ND	1	142	2.8	2	2	135	4.78	.072	4	147	.49	55	.18	3	5.86	.24	1.28	1
50084	10	48	31	106	1.3	31	17	1150	4.33	265	5	ND	1	150	.5	2	2	128	4.92	.073	4	134	.48	68	.20	2	6.84	.27	1.32	1
50085	5	77	11	49	.5	24	18	1032	4.57	405	5	ND	3	143	.2	2	3	115	6.42	.075	4	77	.91	51	.17	2	6.36	.31	.93	1
50086	7	68	8	48	.6	26	16	1138	4.60	320	5	ND	2	153	.4	2	2	113	5.99	.075	4	105	.81	52	.17	2	6.25	.33	.91	1
50087	6	48	5	65	.5	30	16	1155	4.62	172	5	ND	2	155	.2	2	3	131	5.27	.076	3	94	1.02	59	.21	2	6.69	.30	1.51	1
50088	8	86	7	57	.6	37	19	819	6.10	234	5	ND	2	139	.4	2	2	129	4.28	.068	2	115	.69	54	.18	3	6.33	.31	1.17	1
50089	8	63	6	71	.5	38	17	712	5.40	716	5	ND	1	118	.2	2	2	120	3.18	.073	2	125	1.03	61	.18	3	5.93	.26	1.44	1
50101	6	51	12	3336	.5	31	14	8648	4.29	13	5	ND	2	33	.5	2	2	60	.77	.094	9	105	1.78	51	.12	2	2.68	.08	.37	1
50102	4	40	14	3018	.5	33	20	14359	4.37	13	5	ND	2	35	.4	2	2	63	1.01	.108	9	101	1.79	50	.14	2	2.79	.08	.46	1
50103	4	35	9	2164	1.0	32	15	14577	4.76	11	5	ND	2	29	1.5	2	4	56	.79	.104	9	91	1.70	49	.11	2	2.63	.05	.46	1
50104	6	54	16	2255	.5	26	8	2965	7.46	21	5	ND	2	20	5.0	2	2	40	.41	.113	15	97	1.42	38	.06	3	2.11	.02	.21	1
50105	5	45	13	1078	.2	19	7	3473	5.01	14	5	ND	2	19	3.0	2	2	57	.29	.101	15	96	1.80	45	.11	10	3.11	.02	.46	1
50106	5	54	16	935	.5	11	6	2990	4.41	14	5	ND	2	22	3.0	6	2	30	.29	.102	16	79	1.58	38	.05	8	2.44	.01	.36	1
50108	4	33	151	2146	1.4	57	15	9776	4.57	40	5	ND	2	20	3.3	2	2	54	.51	.100	9	88	1.65	31	.14	4	2.94	.03	.58	1
50109	9	88	1657	873	6.9	15	8	7390	2.44	177	5	ND	3	16	4.6	11	2	11	.12	.053	12	97	.21	154	.04	3	.94	.01	.31	1
50110	5	60	1269	528	14.2	8	7	5698	1.53	58	5	ND	3	10	4.1	12	2	7	.06	.034	13	75	.14	112	.02	3	.80	.01	.33	1
50112	7	102	3425	449	9.4	5	5	3278	1.43	72	5	ND	6	19	4.3	9	2	1	.02	.060	16	85	.02	34	.01	4	.52	.01	.33	1
50113	7	185	1293	243	3.9	4	2	597	.83	37	5	ND	8	7	6.1	11	2	1	.01	.025	22	86	.01	23	.01	7	.47	.01	.30	1
50114	8	54	1684	189	7.7	4	3	1836	1.07	70	5	ND	8	4	1.1	24	3	1	.02	.027	20	80	.02	29	.01	8	.65	.01	.39	1
50115	6	58	777	166	12.3	2	2	1073	.94	45	5	ND	7	3	.7	20	2	1	.01	.013	17	70	.01	22	.01	5	.56	.01	.32	1
50116	8	99	998	228	31.7	3	3	1172	1.68	73	5	ND	8	3	.8	33	4	1	.01	.017	17	93	.01	23	.01	6	.63	.01	.38	1
50117	7	51	675	191	17.5	3	2	2144	.89	55	5	ND	6	5	1.7	20	2	1	.01	.008	18	90	.01	27	.01	4	.54	.01	.35	1
50118	7	63	546	227	14.6	3	2	1529	1.05	49	5	ND	7	5	1.3	16	2	1	.01	.014	17	92	.01	18	.01	3	.49	.01	.33	1
50119	7	122	1425	445	23.8	3	5	3781	1.77	139	5	ND	5	11	4.3	16	3	1	.01	.032	15	86	.02	33	.01	4	.52	.01	.33	1
50120	6	54	2004	339	22.2	3	3	1468	1.35	177	5	ND	8	6	1.5	18	3	1	.01	.033	18	72	.01	23	.01	6	.49	.01	.28	1
50121	7	60	1282	326	12.2	3	2	85	1.59	142	5	ND	9	2	1.1	15	4	1	.02	.022	16	74	.01	14	.01	4	.42	.01	.26	1
STANDARD C	18	58	42	125	6.6	67	31	1108	3.96	41	23	7	38	52	16.9	14	19	56	.52	.087	36	59	.93	187	.08	35	1.88	.06	.14	11

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
50122	6	69	1606	373	34.7	3	2	1791	1.83	111	5	ND	7	3	2.4	19	3	1	.01	.028	13	62	.01	25	.01	3	.35	.01	.25	1
50123	5	40	635	194	11.0	2	1	650	.79	110	5	ND	9	3	.8	11	2	1	.01	.010	18	58	.01	19	.01	3	.44	.01	.24	1
50124	4	44	1355	237	4.6	2	2	1437	.87	171	5	ND	9	2	1.0	11	4	1	.01	.012	18	43	.01	17	.01	4	.49	.01	.26	1
50125	3	76	2208	421	3.9	2	3	2481	2.46	154	5	ND	8	3	1.0	7	2	1	.01	.020	15	31	.02	26	.01	3	.49	.01	.25	1
50126	6	120	2219	585	10.7	3	6	4434	2.29	91	5	ND	6	6	2.4	23	2	1	.02	.012	9	38	.02	21	.01	4	.58	.01	.30	1
50127	4	205	1004	426	23.7	3	4	3516	2.31	83	5	ND	6	7	3.1	28	2	1	.02	.010	8	44	.02	33	.01	4	.47	.01	.30	1
50128	5	29	810	193	3.4	2	2	1316	.55	93	5	ND	7	3	.9	11	2	1	.02	.005	7	54	.01	22	.01	5	.43	.01	.28	1
50129	6	28	634	229	4.7	3	3	1379	.90	36	5	ND	7	2	.7	13	2	1	.02	.004	8	59	.01	20	.01	5	.51	.01	.26	1
50130	5	15	600	154	4.2	2	1	647	.63	21	5	ND	9	2	.3	14	2	1	.01	.004	15	49	.01	15	.01	4	.57	.01	.26	1
50131/32	5	23	623	227	12.9	2	2	683	.96	17	5	ND	9	1	.6	22	2	1	.02	.004	12	46	.01	9	.01	3	.60	.01	.28	1
50133	7	49	4580	788	35.4	5	4	1460	1.77	38	5	ND	9	2	8.2	25	2	1	.02	.006	12	65	.01	17	.01	4	.77	.01	.29	[illegible]
50134	7	41	5966	722	5.0	5	2	234	1.28	15	5	ND	9	4	123.0	17	2	1	.01	.012	16	68	.01	22	.01	4	.48	.01	.26	1
50135	6	83	10642	3125	8.8	9	4	400	2.52	29	5	ND	8	3	61.7	18	2	1	.02	.019	13	53	.02	14	.01	4	.44	.01	.26	1
50136	7	14	1632	325	7.2	3	1	120	1.57	64	5	ND	8	2	2.0	23	2	1	.02	.019	15	70	.01	13	.01	4	.43	.01	.23	1
50137	9	135	5324	870	12.3	4	1	145	.98	39	5	ND	8	1	9.6	18	2	1	.01	.007	11	81	.01	14	.01	4	.35	.01	.23	1
50138	9	26	1885	455	4.1	4	2	76	.91	23	5	ND	9	2	6.9	17	2	1	.01	.012	13	90	.01	26	.01	5	.43	.01	.23	1
50139	8	136	14810	7451	14.5	14	4	55	1.62	2	5	ND	8	2	62.9	21	2	1	.01	.002	12	67	.01	15	.01	5	.37	.01	.27	1
50140	8	116	9031	9096	16.1	12	2	65	1.60	13	5	ND	9	2	59.7	16	2	1	.01	.004	14	76	.01	17	.01	3	.40	.01	.27	1
50141	8	155	8003	7465	10.9	12	2	54	2.05	14	5	ND	8	2	50.4	17	2	1	.01	.003	13	73	.01	15	.01	3	.38	.01	.27	1
50143	10	135	16667	3410	11.1	6	1	45	1.53	7	5	ND	10	2	63.6	18	2	1	.01	.002	13	63	.01	14	.01	3	.41	.01	.28	1
50144	12	64	6590	1987	11.0	3	1	128	1.83	26	5	ND	10	3	14.8	21	2	1	.01	.012	18	82	.01	21	.01	3	.54	.01	.28	1
50145	8	25	1089	181	6.8	2	1	60	.93	23	5	ND	9	1	.7	19	2	1	.01	.007	15	59	.01	12	.01	4	.44	.01	.26	1
50146	7	26	667	150	1.7	2	1	162	1.09	19	5	ND	9	1	.4	12	2	1	.01	.006	14	54	.01	13	.01	4	.47	.01	.28	1
50147	5	15	442	189	3.3	2	1	30	.55	10	5	ND	9	1	.9	11	2	1	.01	.004	16	53	.01	12	.01	4	.40	.01	.26	1
50148	8	37	668	250	3.9	3	1	28	1.72	41	5	ND	10	1	.9	18	2	1	.01	.003	13	63	.01	11	.01	4	.46	.01	.27	1
50149	3	192	5182	4503	9.8	2	1	62	1.43	16	5	ND	8	1	42.5	22	2	1	.01	.001	12	24	.01	11	.01	3	.44	.01	.28	3
50150	5	91	2141	2256	11.0	2	1	38	1.43	60	5	ND	8	1	18.2	23	2	1	.01	.003	11	22	.01	11	.01	4	.44	.01	.27	1
50151	5	39	723	345	14.9	2	1	32	1.62	72	5	8	9	3	1.6	23	2	1	.01	.004	13	22	.01	17	.01	4	.48	.01	.30	1
RE 50147	5	15	443	191	3.6	2	1	30	.56	11	5	ND	9	1	.9	10	2	1	.01	.004	16	52	.01	12	.01	4	.40	.01	.26	[illegible]
50152	8	121	5159	5634	7.5	3	2	64	.79	97	5	ND	8	3	132.7	11	2	1	.02	.003	14	24	.01	19	.01	5	.44	.01	.29	[illegible]
50153	5	267	1925	15693	5.5	5	4	126	1.24	278	5	ND	8	3	183.6	16	4	1	.02	.003	12	29	.01	19	.01	3	.45	.01	.29	1
50154	5	235	1702	12117	10.8	4	4	86	1.29	464	5	ND	8	2	116.4	16	14	1	.01	.002	11	41	.01	17	.01	5	.46	.01	.31	1
50155	2	86	581	3642	2.8	3	3	54	1.03	513	5	ND	9	5	52.4	14	5	1	.02	.003	17	18	.01	29	.01	3	.56	.01	.30	1
50156	3	160	949	782	3.7	2	2	27	1.24	724	5	2	8	1	13.9	12	5	1	.02	.001	15	23	.01	18	.01	3	.48	.01	.29	1
50157	3	144	741	674	6.3	2	1	34	.95	381	5	ND	8	1	9.7	11	2	1	.01	.001	13	29	.01	17	.01	4	.44	.01	.28	1
50158	6	93	382	7683	2.4	3	4	63	1.02	314	5	ND	8	2	102.7	11	2	1	.01	.002	13	53	.01	16	.01	3	.45	.01	.27	1
50159	12	120	1039	2041	4.4	5	2	82	1.40	321	5	ND	9	3	34.7	8	2	2	.02	.007	14	116	.02	19	.01	4	.49	.01	.27	1
STANDARD C	18	56	41	123	6.6	67	30	1115	3.96	42	18	7	38	52	17.1	15	19	56	.52	.087	35	56	.93	187	.08	34	1.88	.06	.14	10

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
50160	13	68	385	389	8.5	5	1	590	1.47	341	5	ND	7	3	1.3	8	2	2	.03	.007	15	98	.04	23	.01	7	.90	.01	.44	1
50161	18	43	337	4324	6.9	3	2	85	1.05	427	5	ND	10	2	44.7	8	2	1	.01	.003	14	59	.01	20	.01	5	.69	.01	.36	3
50162	8	41	98	6051	.8	4	9	83	.57	794	5	ND	8	2	61.0	5	2	1	.01	.002	11	54	.01	19	.01	5	.65	.01	.33	3
50163	6	44	22	4859	.8	6	6	383	1.00	203	5	ND	9	4	42.5	6	2	1	.02	.004	10	47	.02	23	.01	4	.57	.01	.33	2
50164	6	98	30	4076	1.7	18	8	3298	5.39	106	5	ND	4	19	19.1	8	3	32	.07	.026	9	57	.43	65	.22	2	2.12	.01	1.14	1
50165	6	74	12	8148	.8	26	5	2914	4.80	181	5	ND	5	22	58.4	12	2	24	.05	.013	8	68	.15	64	.17	6	1.90	.01	1.28	6
50166	14	29	45	6425	1.1	17	5	1487	2.73	920	5	ND	7	40	47.7	10	3	12	.07	.021	11	118	.08	44	.07	6	1.13	.01	.74	3
50167	9	31	37	3370	.9	14	2	1781	2.67	74	5	ND	7	21	24.0	8	2	10	.04	.012	11	104	.08	35	.07	5	.96	.01	.60	2
50168	9	41	35	1475	.9	11	2	1464	2.82	31	5	ND	7	22	7.2	7	2	9	.04	.011	12	101	.08	33	.04	5	.87	.01	.45	1
RE 50173	10	80	46	4082	1.6	10	3	1230	3.56	254	5	ND	8	19	22.8	7	2	2	.04	.010	10	95	.04	25	.01	5	.58	.01	.39	2
50169	12	49	40	2048	1.8	12	3	1103	2.66	50	5	ND	9	16	11.8	6	2	5	.03	.009	12	123	.05	34	.02	4	.63	.01	.43	1
50170	10	58	40	2389	1.0	10	2	1316	3.24	68	5	ND	9	23	14.3	7	2	4	.05	.015	14	101	.06	28	.02	5	.73	.01	.44	1
50171	8	56	24	3561	.8	11	3	1419	2.77	118	5	ND	8	20	20.5	9	2	3	.05	.013	15	81	.04	26	.02	6	.69	.01	.44	1
50172	8	69	28	3313	1.2	9	2	1190	3.48	69	5	ND	9	18	20.4	7	2	3	.04	.011	13	74	.05	28	.02	6	.72	.01	.48	1
50173	10	77	48	4029	1.4	9	3	1191	3.42	271	5	ND	8	18	22.8	8	2	2	.04	.010	9	91	.03	23	.01	5	.52	.01	.38	2
50174	7	112	58	5712	2.0	17	5	1251	4.02	224	5	ND	6	35	36.3	12	2	5	.06	.019	13	61	.04	22	.01	7	.66	.01	.44	1
50175	10	57	64	4610	1.8	7	3	568	1.96	124	5	ND	9	7	31.8	11	2	1	.02	.005	8	86	.02	23	.01	5	.47	.01	.33	1
50176	9	30	57	3520	1.5	5	1	488	1.40	73	5	ND	9	7	23.2	8	2	1	.01	.004	8	89	.01	25	.01	4	.41	.01	.32	1
50177	11	28	30	2586	.9	6	1	310	1.40	50	5	ND	9	8	16.6	6	2	1	.01	.005	8	112	.02	26	.01	4	.45	.01	.31	1
50178	10	57	39	4516	1.4	12	3	1019	2.50	50	5	ND	8	37	28.7	9	2	3	.06	.016	9	94	.03	25	.01	5	.51	.01	.34	1
50179	11	65	39	4201	1.6	13	4	597	2.78	49	5	ND	8	21	24.7	13	2	2	.03	.012	11	94	.03	27	.01	5	.57	.01	.35	1
50180	11	69	43	4443	1.6	17	4	1461	3.32	55	5	ND	7	34	24.0	5	2	4	.06	.016	11	92	.05	27	.01	6	.58	.01	.39	1
50181	11	69	53	4745	2.2	13	4	1072	3.02	103	5	ND	8	17	28.3	7	2	2	.03	.008	9	120	.03	26	.01	5	.46	.01	.34	1
50182	12	49	51	3846	1.8	10	4	571	1.85	84	5	ND	10	16	23.8	8	2	1	.03	.009	8	104	.02	26	.01	4	.46	.01	.33	1
50183	14	39	31	3997	1.3	7	3	220	1.38	114	5	ND	9	7	29.0	8	2	2	.02	.004	8	122	.03	28	.01	6	.50	.01	.32	1
50184	14	47	26	3630	1.1	7	2	153	1.62	54	5	ND	10	12	25.8	7	2	1	.02	.006	9	117	.02	24	.01	4	.49	.01	.31	1
50185	13	43	31	3169	1.3	8	3	226	1.53	100	5	ND	8	5	19.4	8	2	1	.01	.003	9	125	.02	22	.01	4	.41	.01	.28	1
50186	12	64	28	4674	1.4	9	3	527	1.97	128	5	ND	8	7	30.3	8	2	2	.02	.004	10	112	.03	24	.01	5	.57	.01	.35	1
50187	15	88	35	5476	2.4	11	7	423	2.13	125	5	ND	9	7	37.1	10	4	2	.02	.005	12	104	.03	20	.01	6	.65	.01	.40	1
50188	15	102	41	4298	2.0	11	5	277	2.23	131	5	ND	9	7	27.5	17	3	2	.02	.004	11	116	.04	22	.01	5	.58	.01	.33	1
50189	14	155	24	5409	2.5	13	10	543	3.08	407	5	ND	8	6	37.6	16	4	2	.02	.005	13	132	.04	17	.01	6	.64	.01	.38	1
50190	16	97	25	5268	1.9	10	4	652	2.52	215	5	ND	9	6	37.2	13	6	2	.01	.003	11	152	.03	14	.01	4	.53	.01	.33	1
50191	14	89	25	5399	2.0	8	4	1139	2.43	594	5	ND	8	4	39.5	13	4	1	.01	.003	10	139	.02	14	.01	4	.51	.01	.34	1
50192	7	82	19	5989	1.5	6	6	648	2.47	331	5	ND	8	2	45.5	12	3	1	.01	.002	9	71	.03	15	.01	4	.59	.01	.37	1
50193	9	86	32	6287	2.0	7	4	494	2.36	168	5	ND	7	3	50.0	17	6	1	.01	.002	8	90	.03	14	.01	4	.52	.01	.33	1
50194	8	93	23	4473	1.7	8	6	664	2.53	348	5	ND	7	3	32.1	13	4	1	.01	.003	12	68	.02	15	.01	5	.53	.01	.34	1
50195	8	94	23	9082	1.6	10	6	1076	2.71	368	5	ND	7	4	70.3	13	4	3	.03	.007	10	74	.07	18	.01	4	.73	.01	.39	1
STANDARD C	18	56	39	125	6.6	67	31	1113	3.96	40	18	7	38	52	17.0	15	19	56	.52	.087	36	57	.94	188	.08	34	1.88	.06	.14	11

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
50196	9	66	28	4657	1.8	6	3	427	1.62	612	5	ND	9	5	39.2	9	3	1	.01	.004	10	87	.02	21	.01	8	.74	.02	.52	1
50197	7	161	36	5276	3.4	5	4	574	2.66	749	5	ND	7	4	47.6	14	5	1	.01	.003	11	66	.02	31	.01	13	1.31	.02	.90	1
50198	7	222	150	10484	14.3	18	6	701	3.36	1317	5	ND	6	5	92.4	19	20	7	.01	.004	10	57	.03	37	.02	13	1.41	.02	.93	1
50199	6	293	147	14598	11.5	22	5	1621	4.53	1268	5	ND	4	7	135.9	20	15	12	.02	.005	10	63	.04	41	.02	13	1.48	.02	1.02	1
50200	7	313	316	13612	23.9	20	7	4883	5.12	830	5	ND	4	7	127.7	28	36	4	.04	.009	12	70	.03	29	.01	8	.97	.02	.65	1
50201	11	166	25	4463	3.1	11	5	502	2.41	600	5	3	7	4	38.1	9	7	1	.01	.004	15	102	.02	25	.01	14	1.18	.02	.80	1
50202	10	111	21	1118	1.7	5	4	157	1.61	567	5	ND	7	4	7.0	10	7	1	.01	.004	15	84	.01	21	.01	12	.94	.02	.68	1
50203	16	128	22	3129	2.1	9	7	205	1.88	631	5	ND	6	4	26.3	15	3	1	.01	.004	13	124	.02	24	.01	16	1.20	.02	.81	1
50204	14	259	87	13648	12.3	9	9	631	4.43	62	5	3	6	4	134.8	34	25	1	.01	.004	13	101	.02	25	.01	14	1.13	.02	.78	1
50205	12	129	49	7520	6.6	8	7	499	2.73	131	5	2	7	5	71.5	26	18	1	.01	.004	18	130	.02	30	.01	19	1.54	.02	1.01	1
50206	11	103	15	3645	1.4	8	7	371	2.01	103	5	ND	8	8	31.9	11	3	1	.01	.005	17	116	.02	29	.01	17	1.31	.02	.87	1
50207	9	136	13	1705	1.6	9	7	562	2.64	35	5	ND	7	4	9.3	14	5	1	.07	.003	17	107	.03	27	.01	12	1.25	.02	.84	1
50208	8	128	7	2611	1.3	7	10	1232	2.87	45	6	ND	7	3	20.7	14	2	1	.02	.004	17	95	.02	27	.01	9	1.07	.02	.73	1
50209	10	130	14	7557	2.2	10	10	1100	2.70	30	5	ND	5	3	69.5	18	6	1	.02	.003	12	111	.02	27	.01	10	1.12	.02	.78	1
50210	16	138	10	1819	1.9	9	12	671	2.60	32	5	ND	8	7	10.4	11	2	1	.02	.005	12	115	.01	20	.01	10	.78	.01	.57	1
50211	14	77	25	1616	1.8	8	7	464	1.53	26	5	ND	8	9	10.8	11	3	1	.02	.005	11	128	.02	45	.01	12	1.00	.02	.74	1
50212	12	92	50	2917	2.7	8	6	437	1.65	232	5	ND	8	11	21.4	12	3	1	.02	.005	12	104	.03	69	.01	10	.83	.02	.74	1
50213	13	96	37	3289	1.8	8	5	502	1.92	60	5	ND	8	7	24.9	14	2	1	.01	.004	12	126	.04	41	.01	9	.73	.01	.55	1
50214	11	151	21	3741	1.7	11	11	690	2.78	69	5	ND	7	6	31.9	12	5	2	.01	.003	13	103	.03	43	.01	12	1.26	.02	.87	1
50215	10	247	12	1975	1.4	23	17	862	3.68	154	5	ND	7	4	8.9	14	12	3	.01	.003	14	87	.03	29	.01	10	1.17	.02	.77	1
50216	10	183	15	2905	1.6	20	6	1045	2.48	337	5	ND	6	9	19.4	14	3	3	.02	.006	13	89	.02	29	.01	11	1.04	.02	.72	1
50217	10	195	23	2034	2.7	16	6	753	2.69	719	5	ND	7	8	16.0	14	9	2	.02	.005	13	95	.02	27	.01	12	1.04	.02	.72	1
50218	12	289	84	5372	8.0	17	7	1375	4.68	698	5	2	6	8	46.3	14	21	4	.02	.005	14	94	.02	25	.01	8	.89	.01	.63	1
50219	8	155	35	3614	1.6	11	7	693	2.28	199	5	ND	6	8	29.9	6	2	1	.01	.005	17	86	.02	24	.01	10	.93	.01	.65	1
50220	12	199	250	6459	6.2	8	9	1023	3.12	96	5	ND	7	8	59.5	17	13	1	.01	.005	12	103	.02	23	.01	10	.75	.01	.53	1
50221	8	218	175	5384	4.6	13	9	806	3.21	586	5	ND	7	11	45.6	13	8	2	.02	.007	12	74	.01	23	.01	8	.74	.01	.52	1
50222	9	209	172	6491	5.0	12	7	1044	3.12	239	5	ND	6	7	55.2	13	7	3	.01	.004	10	83	.02	28	.01	10	1.09	.02	.76	1
50223	8	174	192	6858	5.4	20	13	1308	3.33	308	5	ND	6	5	59.0	24	6	5	.01	.003	8	72	.03	38	.02	14	1.50	.02	.99	1
50224	10	61	101	10165	5.6	8	6	717	2.36	243	5	ND	7	3	93.0	10	8	1	.01	.002	8	95	.01	20	.01	6	.62	.01	.46	1
50225	11	70	93	8455	5.5	8	7	1541	2.19	153	5	ND	6	4	75.3	14	10	1	.02	.003	9	91	.01	18	.01	6	.55	.01	.42	1
50226	11	94	27	10494	3.6	5	6	693	2.13	90	5	ND	6	14	98.0	12	13	1	.02	.005	8	86	.01	16	.01	5	.51	.01	.40	1
50227	11	106	20	7164	2.3	6	4	304	1.96	106	5	ND	7	14	65.1	10	4	1	.02	.006	9	95	.01	19	.01	7	.50	.01	.41	1
50228	11	106	26	7123	1.4	6	4	461	1.72	414	5	ND	6	9	65.4	9	2	1	.01	.005	12	97	.01	21	.01	6	.49	.01	.40	1
50229	11	90	26	5500	1.2	7	3	400	1.55	245	5	ND	7	7	47.1	14	2	1	.01	.004	13	93	.03	22	.01	6	.54	.01	.40	1
RE 50225	11	66	89	8114	5.8	9	7	1489	2.12	145	5	ND	6	4	73.6	16	9	1	.02	.002	8	92	.01	17	.01	5	.53	.01	.41	1
50230	10	71	26	4927	1.2	6	2	325	1.14	293	5	ND	7	13	44.6	13	2	1	.02	.007	12	91	.02	23	.01	8	.60	.01	.46	1
50231	10	97	24	6326	1.1	6	4	500	1.77	329	5	ND	6	14	57.3	10	2	1	.02	.007	13	88	.02	19	.01	6	.53	.01	.38	1
STANDARD C	18	61	38	133	7.4	69	31	1065	3.96	40	17	7	36	52	18.8	14	19	57	.50	.086	39	59	.95	183	.09	34	1.88	.08	.15	10

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
50232	12	104	19	4113	1.2	5	6	458	1.80	156	5	ND	7	6	33.4	5	4	1	.01	.004	15	104	.01	20	.01	7	.65	.01	.48	1
50233	14	99	20	4000	1.2	5	4	391	1.30	146	5	ND	8	10	32.7	8	2	1	.02	.006	15	119	.02	22	.01	7	.52	.01	.39	1
50234	14	72	36	4064	1.6	5	4	354	1.10	130	5	ND	9	6	34.6	13	3	1	.02	.004	13	118	.03	19	.01	7	.50	.01	.38	1
50235	15	47	60	4724	1.7	7	3	331	1.16	39	5	ND	8	5	38.5	10	3	1	.01	.004	12	132	.03	26	.01	7	.47	.01	.37	1
50236	15	40	54	2265	1.9	5	3	382	1.33	71	6	ND	8	5	17.7	10	4	1	.01	.004	11	122	.03	25	.01	5	.46	.01	.35	1
50237	17	39	64	3587	1.9	7	2	375	1.10	57	5	ND	8	4	26.8	8	5	1	.01	.003	13	151	.02	27	.01	5	.50	.01	.40	1
50238	14	67	63	2696	2.7	5	3	706	1.89	89	5	ND	9	5	22.4	15	7	1	.01	.004	8	132	.03	19	.01	6	.50	.01	.37	1
50239	14	45	74	3129	2.4	5	3	491	1.20	46	5	ND	8	5	26.0	12	5	1	.01	.003	8	124	.01	20	.01	5	.42	.01	.32	1
50240	11	98	66	761	3.2	9	5	2391	2.74	42	5	ND	6	4	2.4	19	14	1	.03	.004	10	108	.02	18	.01	7	.53	.01	.41	1
50241	14	37	87	1636	2.8	5	2	421	1.08	101	5	ND	8	5	10.8	11	7	1	.01	.004	9	140	.01	18	.01	7	.42	.01	.35	1
50242	14	42	23	2206	.8	5	2	313	1.12	59	5	ND	8	8	16.5	6	3	1	.02	.006	8	141	.01	17	.01	6	.49	.01	.40	1
50243	15	38	41	2796	1.3	4	1	243	1.19	36	5	ND	8	5	20.5	5	2	1	.01	.004	10	149	.01	19	.01	5	.41	.01	.36	1
50244	13	36	37	3349	1.3	4	1	279	1.07	69	5	ND	8	8	25.7	8	2	1	.01	.005	8	137	.01	19	.01	6	.42	.01	.37	1
50245	15	44	35	3702	1.4	4	2	255	1.29	164	5	ND	8	6	28.0	7	4	1	.01	.004	10	139	.01	17	.01	7	.44	.01	.38	1
RE 50250	14	63	44	2515	1.3	5	2	275	1.29	222	5	ND	8	17	20.8	8	2	1	.03	.009	16	134	.02	29	.01	5	.44	.01	.39	1
50246	13	31	31	2320	1.2	4	1	282	.98	107	5	ND	9	13	17.9	6	2	1	.02	.008	17	130	.01	26	.01	5	.47	.01	.42	1
50247	15	68	48	2527	2.2	5	2	265	1.46	37	5	ND	8	4	20.7	10	6	1	.01	.003	8	138	.01	14	.01	5	.43	.01	.35	1
50248	13	39	45	2722	1.4	5	1	281	1.07	59	5	ND	9	8	21.5	9	3	1	.02	.006	14	120	.01	26	.01	5	.42	.01	.37	1
50249	14	50	41	2288	1.1	6	2	261	1.19	164	5	ND	7	17	18.4	5	2	1	.02	.008	14	141	.01	30	.01	4	.40	.01	.36	1
50250	14	60	42	2444	1.3	5	2	269	1.24	233	5	ND	8	17	20.2	8	4	1	.03	.009	15	131	.02	27	.01	5	.42	.01	.36	1
50251	14	44	36	550	.7	5	2	201	.98	63	5	ND	7	10	1.9	3	2	1	.01	.005	12	135	.01	26	.01	4	.35	.01	.31	1
50252	14	69	39	501	2.0	5	3	262	1.04	22	5	ND	8	15	1.2	8	2	1	.02	.008	16	137	.02	22	.01	4	.45	.01	.39	1
50253	14	75	46	573	1.2	5	3	264	1.33	83	5	ND	8	12	1.5	10	3	1	.02	.007	13	141	.01	21	.01	5	.43	.01	.39	1
50254	14	96	25	853	1.5	6	4	215	1.56	79	6	ND	9	12	4.2	7	2	1	.02	.007	14	143	.01	15	.01	5	.42	.01	.36	1
50255	13	59	33	739	1.3	5	3	292	1.15	81	5	ND	9	13	4.1	7	2	1	.03	.008	18	118	.02	21	.01	5	.42	.01	.36	1
50256	14	83	50	709	1.3	5	3	328	1.44	27	5	ND	9	13	.9	9	2	1	.02	.008	13	125	.01	24	.01	4	.37	.01	.34	1
50257	14	90	28	429	.6	4	3	348	1.50	37	5	ND	8	27	.5	7	3	1	.05	.015	14	126	.01	24	.01	5	.36	.01	.33	1
50258	13	73	30	770	1.8	5	2	263	1.21	90	5	ND	9	22	4.4	6	2	1	.03	.010	16	136	.01	32	.01	6	.45	.01	.42	1
50259	13	80	30	375	.5	4	2	289	1.11	111	5	ND	9	28	1.6	6	2	1	.04	.014	15	134	.01	25	.01	5	.40	.01	.38	1
50260	13	107	41	366	1.2	4	2	372	1.49	150	7	ND	9	9	1.1	9	2	1	.02	.006	16	133	.01	21	.01	6	.37	.01	.37	1
50261	12	79	42	577	.6	4	3	304	1.11	222	5	ND	8	10	2.8	7	2	1	.02	.006	16	122	.01	25	.01	4	.38	.01	.35	1
50262	12	42	45	346	.5	5	2	260	.74	76	5	ND	8	12	1.6	6	2	1	.02	.006	15	128	.01	25	.01	4	.36	.01	.34	1
50263	10	47	39	388	.5	5	3	353	.92	452	5	ND	8	7	1.3	7	2	1	.01	.004	17	115	.01	23	.01	4	.35	.01	.32	1
50264	12	67	38	567	.9	5	4	410	1.35	642	5	ND	9	7	2.3	8	2	1	.01	.004	15	131	.01	24	.01	5	.40	.01	.38	1
50265	9	81	44	1108	1.4	3	9	295	1.59	1223	5	ND	8	6	4.2	8	5	1	.01	.003	10	83	.01	23	.01	6	.51	.01	.42	1
50266	8	92	52	1774	2.2	4	6	196	1.90	86	5	ND	8	8	12.0	10	6	1	.02	.005	9	68	.03	23	.01	6	.58	.01	.43	1
50267	2	95	635	3728	6.7	18	13	3310	4.39	57	5	ND	2	32	42.9	12	9	38	.07	.052	13	50	.94	47	.08	7	2.04	.02	.49	1
STANDARD C	18	59	38	131	7.5	72	31	1053	3.96	42	19	7	37	54	18.7	14	19	57	.49	.085	39	59	.94	182	.09	35	1.88	.08	.16	11

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
50268	4	46	557	6668	4.7	33	16	4171	4.37	34	5	ND	4	32	64.9	5	3	60	.15	.076	12	52	1.15	43	.08	5	2.27	.01	.39	4
50269	3	45	644	5600	3.6	35	13	3791	4.41	25	5	ND	3	22	95.8	6	2	56	.11	.061	12	52	.95	45	.07	6	2.22	.01	.39	2
50270	4	49	2245	1292	14.7	10	4	2186	4.65	35	5	ND	4	17	37.5	13	2	52	.04	.084	18	65	.54	69	.04	4	1.93	.01	.21	1
50271	4	60	820	1725	27.0	11	5	2828	4.66	46	5	ND	3	14	117.9	7	2	57	.03	.047	15	59	.67	104	.09	4	2.08	.01	.40	1
50272	5	147	541	1841	12.6	14	6	2785	5.46	91	5	ND	3	19	71.2	9	3	60	.03	.064	16	75	.81	54	.12	5	2.17	.01	.55	1
50273	3	31	1723	2465	7.9	16	7	2985	4.35	31	5	ND	3	19	26.8	9	2	63	.06	.079	16	75	.88	42	.11	4	2.27	.01	.66	1
50274	5	47	2984	5177	16.4	28	11	4121	4.74	53	5	ND	3	23	45.1	12	2	61	.09	.094	14	93	1.11	41	.11	6	2.32	.01	.40	2
50275	5	95	209	1612	5.5	11	7	1945	3.87	34	5	ND	3	19	25.2	10	2	39	.03	.063	15	73	.61	37	.11	7	1.86	.01	.64	1
50276	6	175	783	3770	13.1	20	12	3018	4.31	26	5	ND	3	21	74.8	10	20	40	.03	.054	13	86	.87	42	.13	5	2.04	.01	.53	1
50277	5	67	404	2783	7.4	18	7	3444	4.89	96	5	ND	4	18	37.6	12	8	57	.06	.114	16	82	1.04	42	.10	3	2.17	.01	.46	1
50278	4	71	466	1637	8.0	10	4	2689	4.47	66	5	ND	3	17	57.2	9	4	51	.03	.085	17	73	.82	53	.12	4	2.07	.01	.54	1
RE 50283	1	48	822	1004	6.7	13	5	5535	4.74	53	5	ND	3	13	13.3	4	2	60	.08	.099	15	62	1.33	54	.13	5	2.90	.01	.78	1
50279	4	171	677	3290	10.9	15	7	1755	3.98	70	5	ND	3	20	258.9	11	7	49	.03	.069	17	58	.55	63	.14	5	1.86	.01	.73	1
50280	5	149	840	5308	9.0	21	13	1814	3.07	72	5	ND	3	19	164.4	12	6	40	.02	.050	17	51	.47	63	.13	5	1.71	.01	.60	1
50281	6	153	2252	5053	20.0	31	13	3057	4.08	94	5	ND	3	21	114.4	19	6	51	.03	.075	16	55	.77	64	.14	6	2.11	.01	.67	1
50282	2	146	1192	4628	10.2	30	13	5255	5.48	48	5	ND	2	19	116.6	7	2	66	.05	.087	16	63	1.28	60	.17	4	2.84	.01	.92	1
50283	1	50	869	1047	6.7	14	6	5742	4.90	53	5	ND	3	14	14.3	2	2	62	.09	.102	15	65	1.39	55	.13	5	2.99	.01	.77	1
50284	2	51	2426	3250	14.5	65	9	4369	4.38	83	5	ND	3	28	80.0	11	2	75	.05	.095	19	67	1.13	70	.08	5	2.52	.01	.61	1
50285	2	59	522	2770	4.6	29	13	2323	3.90	64	5	ND	3	34	23.9	10	3	65	.20	.116	18	51	.73	63	.06	5	1.91	.01	.67	1
50286	3	233	951	8813	30.7	28	20	2488	4.66	38	5	2	2	40	63.3	10	44	44	.33	.118	14	57	.93	62	.09	5	2.18	.02	.87	1
50287	3	381	545	5122	18.7	34	24	1904	5.13	59	5	7	3	39	34.2	7	17	45	.37	.128	16	61	.91	56	.09	6	2.11	.01	.98	1
50288	4	252	46	10426	5.4	36	19	2821	4.50	131	6	ND	3	42	74.1	7	4	35	.35	.116	14	54	.78	56	.04	7	1.90	.01	.56	4
50289	5	219	111	6009	5.8	35	18	2175	3.83	48	8	ND	3	36	41.3	8	3	30	.38	.132	14	54	.48	48	.02	6	1.57	.01	.48	1
50290	4	113	260	10018	8.3	40	25	4619	5.16	56	9	ND	3	46	70.8	11	4	32	.45	.144	9	61	.31	35	.01	4	1.36	.01	.31	1
50291	2	78	264	9353	7.0	38	18	4547	6.14	15	5	ND	2	43	62.2	6	6	54	.38	.128	12	75	1.26	77	.11	6	2.64	.02	.84	1
50292	1	190	35	5158	2.7	35	17	5481	6.44	22	5	ND	3	37	35.1	5	2	35	.39	.126	11	46	.99	42	.05	6	2.12	.01	.58	1
50293	1	191	88	7404	5.9	29	16	5093	6.33	28	5	ND	2	38	50.8	2	5	37	.34	.110	10	47	1.15	51	.05	7	2.35	.01	.53	1
50294	5	206	110	7820	9.8	31	23	5006	5.59	42	5	ND	1	33	54.0	6	13	30	.39	.125	11	52	.53	45	.03	5	1.55	.01	.53	1
50295	3	198	65	9288	7.3	29	16	5470	5.75	103	5	ND	2	56	67.4	4	9	33	.37	.118	10	59	.73	47	.03	6	1.75	.01	.49	1
50296	3	230	54	9034	6.1	31	21	5134	5.77	83	6	ND	2	44	65.0	7	8	28	.42	.135	11	42	.30	52	.02	6	1.23	.01	.52	1
50297	4	127	110	5484	5.6	24	18	4011	5.29	118	5	ND	3	39	36.9	6	7	22	.34	.103	10	42	.45	41	.02	5	1.32	.01	.43	1
50298	4	106	72	4002	4.4	22	13	3618	4.90	87	5	ND	3	46	26.5	4	7	23	.29	.091	11	49	.43	54	.02	8	1.36	.02	.59	1
50299	5	105	92	4815	4.1	26	14	3533	4.42	116	5	ND	3	52	32.0	6	4	21	.28	.089	11	51	.33	48	.02	8	1.19	.02	.50	1
50300	4	102	127	6036	3.8	26	16	3915	5.09	367	5	ND	3	26	39.8	4	3	23	.30	.094	11	52	.44	50	.03	6	1.31	.01	.61	1
50301	4	102	408	10145	5.9	27	18	4980	4.93	123	5	ND	3	26	67.7	3	2	22	.35	.108	12	46	.34	47	.03	9	1.19	.01	.46	2
50302	5	147	448	13629	6.6	32	20	5961	6.30	39	5	ND	3	36	90.4	4	2	30	.41	.130	14	49	.34	45	.05	5	1.22	.01	.55	9
50303	3	134	303	7525	6.1	26	13	5138	5.65	19	5	ND	3	33	44.5	3	5	38	.35	.113	13	64	.73	69	.11	7	1.97	.01	.98	1
STANDARD C	18	57	38	129	7.5	71	31	1024	3.96	42	18	7	35	52	18.6	14	20	54	.51	.083	37	60	.91	189	.09	33	1.88	.08	.16	10

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

ACME ANALYTICAL

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
50304	4	220	231	6341	9.5	38	31	5316	7.84	84	5	ND	4	34	33.5	4	14	24	.31	.117	16	44	.33	46	.05	4	1.21	.01	.62	1
50305	4	112	68	8210	5.4	44	29	2495	6.06	157	5	ND	3	29	39.7	4	6	22	.21	.109	12	49	.44	44	.06	5	1.46	.01	.55	1
50306	5	175	42	5169	3.9	28	20	1596	4.98	540	5	ND	3	32	77.0	7	6	29	.23	.104	12	52	.83	65	.10	4	1.92	.01	.86	1
50307	3	103	604	8712	4.8	56	23	3473	6.77	24	5	ND	2	33	53.4	3	4	47	.26	.130	10	58	.87	96	.25	2	2.41	.01	1.46	1
50308	2	66	1237	10250	6.8	48	24	5166	6.06	38	5	ND	1	20	54.0	2	4	44	.32	.113	9	72	1.23	65	.28	4	2.82	.02	1.84	1
50309	3	75	2665	8690	10.4	33	17	5186	5.50	5	5	ND	2	22	38.8	6	2	56	.37	.115	10	72	1.24	75	.26	2	2.86	.02	1.62	1
50310	3	82	492	7343	2.8	32	22	6193	5.74	23	5	ND	2	16	39.6	2	2	49	.34	.121	8	72	1.52	73	.29	3	3.04	.02	1.96	1
50311	2	6	132	1193	.8	33	9	5815	5.32	2	5	ND	2	14	3.5	2	2	57	.36	.120	10	76	1.72	364	.34	3	3.57	.02	2.59	1
50312	2	56	1161	3655	4.7	30	16	6316	5.45	9	5	ND	3	17	17.0	2	2	52	.35	.117	10	80	1.56	348	.32	4	3.38	.02	2.39	1
50313	2	119	288	10435	4.5	38	19	4512	6.03	22	5	ND	1	21	63.5	3	5	46	.35	.119	9	68	1.33	51	.27	3	2.84	.02	1.92	1
50314	3	86	59	7752	1.2	32	11	5444	5.27	4	5	ND	2	28	41.0	2	2	49	.34	.117	9	79	1.46	186	.29	4	3.17	.02	2.00	[illegible]
50315	4	91	109	7171	2.6	31	17	5024	6.03	16	5	ND	2	27	37.9	2	3	50	.35	.119	9	74	1.50	94	.29	4	3.32	.02	2.06	1
50316	3	55	71	4984	1.3	33	16	4840	5.58	26	5	ND	2	32	23.3	2	2	47	.35	.118	9	69	1.38	95	.27	4	3.10	.02	1.86	1
50317	3	73	358	8166	3.1	33	18	5017	6.38	26	5	ND	1	30	45.1	2	2	52	.33	.114	8	73	1.38	60	.29	3	3.22	.02	2.09	1
50318	1	57	1560	6247	5.9	31	11	4902	5.71	14	5	ND	2	27	33.4	2	2	53	.33	.110	8	74	1.36	162	.32	4	3.32	.02	2.54	1
50319	3	88	257	6306	2.3	34	14	3819	5.27	17	5	ND	2	31	32.2	2	2	45	.31	.102	8	68	.86	65	.27	4	2.35	.02	1.84	1
50320	3	90	262	8924	4.2	33	15	2541	4.96	11	5	ND	2	48	43.7	3	5	40	.23	.076	8	71	.65	104	.23	4	1.99	.02	1.53	1
50321	4	92	117	12613	2.4	35	17	2246	5.12	5	5	ND	3	49	66.7	2	2	41	.19	.061	9	72	.59	130	.22	4	1.86	.02	1.47	3
50322	3	66	81	10598	2.6	28	15	2473	5.91	9	5	ND	3	44	54.4	2	2	46	.28	.094	9	70	.72	92	.24	4	2.23	.02	1.68	1
50323	3	86	95	11454	2.2	33	16	2818	5.98	10	5	ND	3	32	58.4	5	2	47	.29	.095	11	78	.68	59	.24	5	2.14	.02	1.60	2
RE 50320	3	95	279	9414	4.4	34	16	2699	5.27	8	5	ND	2	51	46.2	2	7	42	.24	.080	8	74	.69	91	.25	4	2.13	.02	1.60	1
50324	2	67	144	9170	2.4	29	20	3638	6.25	16	5	ND	2	31	44.3	2	2	50	.35	.117	10	64	.93	58	.28	4	2.76	.02	2.02	1
50325	2	188	178	16459	4.2	28	19	3595	7.63	5	5	ND	2	47	95.0	2	6	52	.31	.107	8	62	.81	50	.23	5	2.59	.02	1.71	3
50326	1	116	47	12752	2.0	34	21	4729	7.72	20	5	ND	2	60	71.4	2	2	55	.31	.108	7	66	1.07	67	.25	3	3.16	.02	1.73	3
50327	1	92	40	10846	1.9	33	17	4881	6.82	10	5	ND	2	36	54.9	2	2	53	.31	.106	8	62	1.22	95	.28	4	3.32	.02	2.02	1
50328	1	95	19	9666	1.1	28	14	4487	6.50	6	5	ND	2	25	47.4	2	2	50	.31	.106	8	60	1.18	123	.24	3	3.13	.02	1.71	1
50329	2	119	29	11760	1.8	37	18	4349	6.92	13	5	ND	2	24	60.8	2	2	50	.29	.100	7	62	1.05	93	.21	3	2.82	.02	1.40	1
50330	1	105	87	11338	3.2	37	21	4395	6.64	13	5	ND	3	22	60.9	3	4	52	.33	.114	10	64	1.12	92	.27	5	3.05	.02	1.79	1
50331	1	132	101	11000	3.9	32	27	3962	6.90	24	5	ND	1	14	57.1	2	5	50	.32	.110	9	62	.96	59	.23	2	2.66	.02	1.50	[illegible]
50332	1	138	62	12651	2.3	30	16	4108	6.85	8	5	ND	3	15	68.7	2	2	47	.32	.109	10	60	.90	101	.17	4	2.62	.01	1.06	[illegible]
50333	1	239	441	11593	24.5	44	50	3118	11.74	179	5	ND	3	16	65.3	4	51	45	.28	.101	7	62	.63	31	.15	2	2.19	.01	.94	1
50334	1	110	115	16949	4.0	31	18	5030	7.66	16	5	ND	2	34	107.2	2	3	55	.29	.099	7	77	.91	82	.22	4	2.48	.01	.95	1
50335	1	83	75	13792	3.4	34	22	5171	7.68	28	5	ND	2	16	85.3	2	5	51	.31	.107	7	71	1.08	91	.19	3	2.75	.01	.95	1
50336	1	121	62	13670	3.5	37	28	5190	7.31	21	5	ND	2	15	76.4	3	2	50	.27	.093	8	63	1.17	87	.22	3	2.88	.01	1.09	1
50337	1	89	39	10988	1.8	35	20	4595	6.84	21	5	ND	2	13	59.9	2	4	50	.26	.089	7	56	1.09	95	.20	4	2.67	.01	1.00	1
50338	1	81	71	12842	4.2	29	25	4641	7.24	50	5	ND	2	14	75.8	2	8	47	.30	.102	7	59	1.10	65	.19	4	2.73	.02	1.00	1
50339	2	110	48	10511	4.1	27	27	4188	7.43	48	5	ND	2	14	60.0	2	8	46	.30	.103	6	70	1.00	66	.18	2	2.53	.01	.95	1
STANDARD C	18	56	38	129	7.3	71	31	1031	3.96	38	19	7	35	52	19.3	14	19	55	.51	.083	38	58	.91	189	.09	34	1.88	.08	.16	10

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
50340	2	113	51	6845	3.9	29	25	4855	7.35	40	5	ND	1	15	28.1	2	8	48	.35	.113	6	56	1.13	84	.20	5	2.90	.01	1.06	1
50341	3	197	65	3176	6.6	32	39	4331	9.74	102	5	ND	1	14	9.5	2	19	46	.33	.107	4	68	1.12	46	.16	4	2.90	.01	1.02	2
50342	3	177	37	6390	4.3	32	31	4568	7.42	71	5	ND	1	15	27.1	2	7	48	.36	.115	6	62	1.18	64	.19	4	3.03	.01	1.32	1
50343	3	118	55	9665	2.1	33	20	4638	6.81	20	5	ND	1	16	39.2	2	6	51	.35	.114	5	64	1.15	95	.22	4	3.19	.01	1.70	1
50344	5	399	105	10892	7.4	35	33	3489	9.70	43	5	ND	1	56	45.7	5	15	46	.33	.110	4	85	.92	50	.18	5	2.44	.01	.95	1
50345	4	335	69	8797	4.2	42	22	3427	8.05	38	5	ND	1	60	35.3	5	15	43	.36	.119	5	84	.54	58	.16	5	2.12	.01	.81	1
50346	3	306	28	10480	2.7	46	31	2879	8.53	88	5	ND	1	37	44.7	3	16	41	.35	.115	5	72	.47	47	.13	5	2.01	.01	.81	1
50347	7	213	43	5552	3.9	39	38	1730	12.90	186	5	ND	1	32	26.0	4	16	27	.29	.095	5	103	.29	35	.10	5	1.36	.01	.57	1
50348	3	215	45	12133	3.4	44	33	2367	9.79	105	5	ND	1	48	56.3	4	14	39	.34	.110	6	62	.34	45	.12	4	1.68	.01	.64	1
50349	7	2271	191	2413	33.4	40	72	1618	13.53	457	5	ND	1	49	6.6	6	142	28	.32	.105	4	101	.26	35	.09	5	1.27	.01	.49	1
50350	4	260	46	10248	2.6	45	24	3349	7.91	47	5	ND	1	60	42.1	4	12	41	.32	.105	6	81	.42	64	.16	5	1.80	.01	.64	1
50351	4	335	60	7605	3.0	48	19	2708	7.05	13	5	ND	1	84	27.7	4	12	40	.35	.115	7	74	.34	97	.15	5	1.60	.01	.64	1
50352	5	891	106	8436	11.2	51	43	2210	9.09	147	5	ND	1	37	30.5	5	38	35	.30	.098	10	93	.33	39	.14	6	1.52	.01	.61	1
50353	7	248	80	10252	3.3	32	16	2861	6.83	21	5	ND	2	64	43.7	4	14	43	.32	.104	10	90	.51	86	.16	4	1.94	.01	.80	1
50354	4	424	119	8787	9.6	34	23	1643	8.47	79	5	ND	2	40	41.0	5	31	36	.33	.110	10	58	.32	55	.11	6	1.74	.01	.75	1
50355	7	151	50	9032	1.4	48	27	1099	5.11	50	5	ND	2	66	41.3	9	5	26	.29	.095	9	90	.20	68	.11	6	1.10	.01	.55	1
50356	7	188	49	13434	2.2	57	35	1805	5.23	34	5	ND	1	40	53.7	9	9	30	.18	.058	10	84	.32	70	.16	4	1.37	.01	.62	1
50357	7	195	28	10273	1.7	74	23	1675	5.60	17	5	ND	2	24	34.7	9	5	32	.06	.020	9	87	.27	63	.14	5	1.30	.01	.62	1
50358	9	215	39	7232	2.4	51	22	2044	6.65	38	5	ND	2	24	25.0	6	4	36	.03	.012	9	101	.37	79	.14	6	1.54	.01	.69	1
50359	14	25	501	133	6.3	6	3	91	.66	40	5	ND	7	9	.4	4	4	2	.01	.007	14	139	.02	157	.01	4	.34	.01	.30	1
50360	15	73	479	114	5.9	6	3	73	.67	49	5	ND	6	6	1.4	5	3	1	.01	.007	11	155	.01	114	.01	5	.33	.01	.26	1
50361	11	36	998	107	4.8	4	3	59	4.05	437	5	ND	11	12	.9	15	5	4	.01	.018	10	104	.04	94	.01	6	.46	.01	.31	1
50362	8	56	68	337	5.2	5	4	101	2.12	107	5	ND	6	33	1.8	11	2	8	.03	.014	13	91	.03	76	.02	5	.48	.01	.30	1
50363	10	792	24	8192	3.4	36	55	83	2.72	211	5	ND	11	42	327.3	11	4	11	.01	.014	15	89	.03	64	.06	5	.66	.01	.31	1
RE 50359	14	25	510	135	6.4	6	3	90	.67	41	5	ND	8	9	.5	4	4	2	.01	.007	14	140	.02	159	.01	4	.35	.01	.31	1
50364	8	441	27	13862	2.1	36	43	885	3.17	97	5	ND	5	41	256.4	9	2	19	.01	.012	12	86	.13	61	.12	6	1.46	.01	.51	5
50365	9	453	34	8749	4.1	28	48	901	3.17	93	5	ND	5	41	283.4	7	6	15	.01	.015	15	96	.14	59	.09	4	1.42	.01	.45	1
50366	7	656	53	1041	10.1	11	14	398	2.57	152	5	ND	8	50	129.0	8	3	20	.01	.033	20	64	.09	79	.08	4	.88	.01	.42	1
50367	6	527	42	1764	12.1	12	9	1144	3.73	95	5	ND	4	27	28.6	11	2	29	.02	.036	16	61	.12	100	.12	5	1.53	.01	.75	1
50368	6	976	27	5486	3.6	22	22	1783	4.16	142	5	ND	4	25	107.4	11	3	34	.03	.039	22	73	.22	139	.19	4	1.99	.01	1.12	1
50369	4	211	63	8461	4.8	27	20	3140	5.12	50	5	ND	1	29	50.1	9	3	52	.06	.059	17	65	1.02	107	.27	3	3.11	.01	2.18	1
50370	4	92	225	4882	2.9	31	16	4400	5.76	38	5	ND	1	65	32.8	2	2	71	.31	.098	14	73	1.77	322	.31	2	5.08	.04	3.52	1
50371	5	184	236	9192	2.1	33	20	4134	5.57	17	5	ND	1	35	28.9	6	2	63	.18	.100	16	69	1.65	189	.33	3	4.04	.01	3.23	1
50372	4	191	106	2838	1.7	24	15	3573	5.85	32	5	ND	4	26	20.9	5	2	57	.07	.067	16	66	1.22	266	.29	4	3.60	.01	2.76	1
50373	8	804	245	2252	10.0	33	31	2243	5.45	33	5	ND	1	22	32.8	9	2	37	.07	.064	13	72	.41	34	.28	4	1.97	.01	1.24	1
50374	6	553	67	3912	1.6	39	27	2781	5.50	40	5	ND	1	31	28.9	8	2	48	.22	.107	10	68	.95	40	.28	4	2.64	.01	1.84	1
50375	8	1181	919	10068	10.7	35	34	2474	4.75	94	13	ND	3	35	584.3	25	6	32	.08	.062	25	64	.52	38	.26	6	2.04	.01	1.15	1
STANDARD C	18	58	40	124	6.6	66	31	1111	3.96	39	18	7	37	52	16.9	14	19	56	.52	.087	36	57	.93	186	.08	34	1.88	.06	.14	10

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
50376	4	197	131	10919	2.5	39	30	3341	5.95	66	5	ND	1	24	103.6	9	2	47	.11	.068	12	68	1.11	74	.29	6	2.90	.01	1.53	1
50377	7	225	49	9677	2.2	48	36	2757	5.75	59	5	ND	2	29	63.6	8	2	36	.17	.082	12	74	.64	69	.25	6	2.25	.01	1.03	1
50378	6	241	75	9458	2.5	34	27	2699	4.91	45	5	ND	4	25	87.6	16	2	30	.11	.061	12	92	.52	73	.22	7	2.13	.02	.92	1
50379	5	234	17	7624	1.2	23	17	2936	5.22	145	5	ND	3	33	27.3	11	2	35	.10	.061	8	69	.48	103	.24	5	2.48	.02	1.35	1
50380	3	147	12	6205	1.0	31	21	4706	7.12	143	5	ND	1	43	22.8	12	2	55	.18	.087	10	79	.78	133	.31	5	3.57	.01	1.87	1
50381	3	43	10	7966	.4	27	12	4398	6.19	107	5	ND	2	28	33.9	9	2	56	.26	.105	15	84	.81	228	.32	5	3.75	.02	2.26	1
50382	3	85	11	5770	1.4	33	13	4279	6.47	87	5	ND	2	29	15.7	13	2	46	.16	.074	10	76	.73	152	.29	5	3.34	.02	2.15	1
50383	9	92	31	7800	1.8	23	13	1228	3.05	133	6	ND	7	18	27.9	14	2	14	.02	.017	10	97	.26	83	.10	5	1.37	.02	.85	1
50384	6	118	35	8260	1.4	38	20	1218	3.81	137	5	ND	5	21	20.7	9	2	15	.07	.037	10	69	.24	58	.16	5	1.30	.01	.86	1
50385	10	205	44	8413	2.0	27	15	731	3.45	625	5	ND	6	19	31.8	11	2	11	.04	.024	9	91	.15	57	.09	4	1.02	.01	.62	1
50386	5	236	13	9403	1.4	40	15	1578	4.73	357	5	ND	4	37	9.0	11	2	27	.12	.061	12	78	.34	66	.20	4	1.61	.01	1.13	1
50387	10	176	26	7830	1.3	14	12	40	1.86	110	5	ND	6	6	9.6	7	2	1	.01	.005	7	104	.01	28	.01	2	.33	.01	.20	1
50388	11	106	30	7198	1.1	14	9	62	1.65	355	5	ND	7	12	11.5	8	2	2	.01	.008	9	126	.01	49	.01	4	.56	.01	.33	1
50389	10	105	16	5951	.7	10	12	53	1.38	129	5	ND	7	8	16.7	4	2	1	.01	.004	11	124	.01	36	.01	3	.56	.01	.34	1
50390	4	122	13	8385	.8	36	26	3742	5.72	105	5	ND	3	25	19.2	14	2	55	.08	.041	11	61	.87	136	.34	5	3.10	.02	2.22	1
50391	4	58	16	10032	.9	28	15	4772	6.08	98	5	ND	3	15	27.5	10	2	54	.14	.058	10	82	.97	126	.35	3	3.39	.02	2.32	1
50392	8	81	30	7175	.8	34	14	1769	3.54	53	5	ND	5	16	10.1	10	2	17	.05	.020	9	93	.36	62	.17	5	1.48	.01	.96	1
50393	9	104	519	11071	9.2	21	13	420	1.80	37	5	ND	6	19	18.5	18	11	8	.02	.016	12	85	.09	64	.06	5	.84	.01	.50	1
50394	7	54	59	10283	1.1	26	10	1809	2.63	55	5	ND	5	15	32.3	8	2	17	.06	.024	8	84	.29	61	.15	4	1.55	.01	1.00	1
50395	3	101	39	9992	1.1	19	13	3335	4.89	57	5	ND	2	16	40.4	11	2	37	.04	.017	8	40	.38	101	.26	4	2.47	.01	1.57	1
50396	2	103	453	9901	5.2	20	13	4005	5.22	50	5	ND	2	18	48.9	8	3	49	.04	.023	11	61	.51	142	.36	5	2.78	.02	1.92	1
50397	2	79	369	7584	3.8	17	8	3712	4.75	23	5	ND	2	17	39.1	5	2	42	.17	.064	11	51	.51	143	.31	5	2.73	.02	1.95	1
50398	4	58	78	5866	2.3	17	7	1956	2.75	66	5	ND	4	18	19.1	8	2	22	.09	.033	11	50	.24	98	.19	6	1.66	.01	1.11	1
50399	6	114	300	11279	17.9	31	16	2563	3.95	98	5	ND	3	19	35.9	11	11	40	.15	.060	12	53	.67	113	.28	4	2.27	.01	1.60	1
50400	1	91	107	11637	3.1	33	16	3567	5.01	33	5	ND	1	23	41.8	8	2	50	.21	.082	9	53	1.12	138	.34	5	3.19	.02	2.24	1
50401	1	111	48	12271	1.7	33	14	3005	4.48	52	5	ND	2	27	43.9	8	2	43	.23	.083	9	48	1.00	137	.31	6	2.78	.02	2.02	2
50402	3	75	19	9723	1.1	27	10	3625	5.08	67	5	ND	2	28	22.4	6	2	52	.12	.047	8	63	1.25	182	.34	4	3.35	.02	2.41	1
50403	1	100	18	5763	1.0	54	15	3888	6.36	36	5	ND	1	27	9.6	4	2	55	.35	.113	5	54	1.49	175	.35	2	4.21	.03	2.73	1
50404	4	103	361	6669	6.7	29	13	2165	3.88	23	5	ND	3	20	12.0	13	2	35	.22	.073	7	65	.94	101	.22	4	2.19	.02	1.39	1
50405	2	71	1064	13458	14.6	32	15	2782	4.57	39	5	ND	2	40	49.2	14	3	52	.22	.072	9	66	1.45	158	.31	3	3.38	.02	2.19	2
RE 50402	2	73	18	9529	.8	26	10	3571	4.99	61	5	ND	1	28	21.6	3	2	51	.11	.045	7	60	1.22	183	.34	4	3.33	.02	2.37	1
50406	2	47	24	12512	1.6	30	14	2492	4.35	36	5	ND	3	37	52.1	9	2	45	.16	.061	9	62	1.20	149	.33	3	2.90	.02	2.08	2
50407	3	65	18	6557	.8	86	17	1928	5.07	49	5	ND	2	33	16.2	4	2	44	.29	.102	9	59	.85	125	.29	3	2.65	.02	1.80	1
50408	4	173	9	12577	1.2	108	25	704	3.24	80	5	ND	4	33	45.1	9	2	26	.14	.053	13	54	.28	78	.15	3	1.52	.01	.69	1
50409	6	91	20	1890	.4	16	17	77	1.09	277	5	ND	6	13	2.4	12	2	7	.02	.008	16	53	.03	48	.02	3	.77	.01	.25	1
50410	7	149	10	4577	.4	25	26	137	1.80	181	5	ND	7	8	1.7	11	2	9	.01	.007	10	68	.13	36	.01	3	.86	.01	.27	1
50411	3	119	10	4002	.5	29	19	438	2.84	307	5	ND	4	25	1.1	11	2	25	.06	.027	16	45	.47	66	.05	2	1.73	.01	.37	1
STANDARD C	18	58	39	129	7.3	71	32	1034	3.96	40	17	7	35	53	18.7	15	18	55	.49	.084	38	58	.93	189	.09	34	1.88	.08	.16	11

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
50412	4	195	10	8063	1.0	51	23	1267	4.75	271	5	ND	5	25	28.9	3	2	29	.18	.063	12	66	.68	76	.23	3	2.06	.01	1.44	1
50413	3	197	10	8643	1.4	40	15	1355	4.64	63	5	ND	3	22	22.9	7	2	35	.04	.020	14	62	.65	85	.27	5	1.97	.01	1.43	1
50414	4	195	15	7396	1.3	37	18	1080	4.36	370	5	ND	4	26	14.9	5	3	23	.08	.033	11	72	.53	70	.20	5	1.65	.02	1.19	1
50415	11	106	14	7515	.8	15	13	433	2.58	251	6	ND	6	12	10.6	11	11	9	.02	.009	15	74	.15	54	.07	5	.90	.01	.54	1
50416	3	116	11	10671	1.3	37	19	2164	4.47	57	5	ND	2	44	24.0	6	2	37	.07	.031	11	63	.72	108	.34	4	2.41	.01	1.59	1
50417	3	99	11	8115	1.0	37	15	2669	4.83	49	5	ND	2	22	12.6	7	2	37	.09	.032	10	68	.69	144	.35	5	2.48	.01	1.73	1
50418	2	76	19	6464	1.3	34	15	3536	5.71	19	5	ND	1	17	5.8	2	2	42	.20	.068	8	65	1.06	194	.37	4	3.25	.02	2.32	1
50419	2	75	31	7465	1.6	31	16	3345	5.04	18	5	ND	1	24	9.1	2	3	42	.11	.038	9	52	1.29	213	.37	4	3.28	.02	2.27	1
50420	3	31	18	4623	.9	41	18	3693	5.31	22	5	ND	2	27	21.7	2	2	48	.30	.096	11	68	1.79	213	.37	4	4.19	.03	2.84	1
50421	1	15	347	5545	8.8	44	16	4734	5.77	13	5	ND	1	104	25.2	2	9	88	1.00	.123	11	86	1.93	173	.31	2	5.70	.14	2.29	1
50422	2	21	102	4664	2.4	48	27	3652	5.45	45	5	ND	1	81	13.0	2	2	89	.74	.118	12	90	1.79	160	.27	2	4.84	.08	1.92	1
50423	3	291	28	6781	2.3	31	15	3202	5.46	28	5	ND	1	26	14.2	5	2	64	.06	.022	11	77	1.52	198	.37	4	3.33	.02	2.42	1
RE 50426	3	69	38	6997	1.6	27	12	2941	5.31	22	5	ND	2	30	32.4	6	2	44	.16	.056	8	75	1.16	239	.35	4	3.02	.02	2.25	1
50424	2	46	180	6584	6.0	33	16	3602	5.65	34	5	ND	1	41	32.2	2	7	56	.06	.029	12	75	1.75	304	.38	3	3.88	.02	2.76	1
50425	3	33	53	4899	1.4	31	15	3071	5.12	23	5	ND	2	31	21.1	2	2	43	.10	.034	10	65	1.41	269	.38	4	3.52	.02	2.55	1
50426	4	70	38	6996	1.7	26	11	2949	5.28	22	5	ND	2	30	32.0	5	2	43	.16	.057	9	75	1.14	258	.36	4	3.03	.02	2.27	1
50427	5	110	73	5829	2.2	31	11	2201	4.51	29	5	ND	2	26	20.5	8	2	30	.33	.107	11	80	.82	202	.28	5	2.52	.02	1.74	1
50428	2	49	47	8167	2.0	27	12	2609	4.90	16	5	ND	2	17	47.2	3	2	45	.37	.122	12	70	1.04	258	.31	4	2.87	.02	2.17	1
50429	3	157	53	9338	2.3	38	16	2150	4.77	76	5	ND	2	21	47.7	6	2	32	.30	.099	14	61	.88	153	.25	6	2.59	.02	1.92	1
50430	2	73	44	9682	1.8	52	16	2665	5.53	67	5	ND	1	23	64.3	9	2	42	.35	.117	9	50	1.11	230	.30	6	3.16	.02	2.47	1
50431	2	58	62	7461	2.7	33	19	3233	6.38	56	5	ND	1	29	40.9	5	2	54	.33	.115	7	53	1.34	318	.35	5	3.93	.02	2.93	1
50432	2	65	100	6513	3.7	34	19	3158	6.48	58	5	ND	2	35	39.9	6	4	49	.35	.120	8	60	1.17	283	.34	5	3.72	.03	2.72	1
50433	3	95	48	5056	2.2	38	20	3325	7.03	18	5	ND	1	23	23.6	2	2	53	.35	.116	7	66	1.13	270	.35	5	3.82	.03	2.79	1
50434	7	168	60	6968	3.4	19	18	2332	5.02	30	5	ND	4	21	31.5	8	2	27	.22	.070	7	89	.71	194	.24	5	2.52	.02	1.89	1
50435	6	215	47	6280	3.4	37	32	2528	6.16	46	5	ND	2	24	24.6	2	3	39	.27	.089	8	74	.89	130	.28	4	3.02	.02	2.26	1
50436	5	283	178	9444	7.9	46	32	2290	6.69	84	5	5	1	25	54.5	12	8	45	.32	.106	11	86	.81	47	.23	4	2.63	.02	1.69	1
50437	3	141	76	7103	3.3	33	18	3625	7.87	18	5	ND	1	25	32.6	7	2	78	.29	.100	8	84	1.34	142	.37	4	4.19	.02	3.11	1
50438	2	47	123	3281	3.0	32	12	3498	6.89	54	5	ND	1	27	17.6	2	2	55	.33	.114	7	66	1.31	384	.37	4	4.07	.02	3.02	1
50439	2	84	298	6661	5.5	31	14	3461	7.21	15	5	ND	1	27	25.8	2	2	58	.30	.103	8	77	1.14	202	.37	3	3.95	.02	2.90	1
50440	6	63	195	6981	3.7	22	11	2565	5.11	26	5	ND	2	17	26.5	5	2	46	.15	.050	9	95	.77	260	.29	5	2.76	.02	2.09	1
50441	3	285	17	8924	1.9	33	16	2863	6.57	299	5	ND	1	23	35.9	3	2	60	.30	.100	10	82	.88	152	.30	3	3.40	.02	2.43	1
50442	5	184	67	11236	2.0	20	14	1939	4.33	234	5	ND	3	18	62.1	8	2	35	.23	.073	9	82	.62	129	.16	4	2.06	.02	1.18	3
50443	2	114	13	7502	1.0	25	14	2821	6.69	51	5	ND	1	19	31.3	5	2	58	.36	.120	7	70	1.19	151	.32	4	3.67	.02	2.80	1
50444	2	85	7	4490	.4	25	11	3255	7.95	209	5	ND	1	21	27.1	2	2	65	.35	.113	6	73	1.32	367	.37	3	4.38	.03	3.14	1
50445	4	110	16	4626	.9	22	12	2581	6.56	124	5	ND	3	17	26.0	7	2	48	.27	.087	7	79	1.11	243	.29	4	3.18	.02	2.29	1
50446	1	96	5	3260	.4	26	13	2661	7.33	83	5	ND	1	18	15.0	3	2	64	.35	.117	9	70	1.36	175	.34	4	3.80	.02	2.92	1
50447	3	155	9	6484	.6	26	18	2319	7.27	77	5	ND	1	16	40.1	2	2	56	.36	.120	9	74	1.29	75	.32	4	3.56	.02	2.69	1
STANDARD C	18	57	38	129	7.0	71	31	1027	3.96	41	20	7	35	52	19.1	14	19	54	.52	.083	38	58	.93	188	.09	34	1.88	.08	.16	10

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
50448	2	126	3	7709	.6	24	14	2658	7.06	29	5	ND	3	17	54.9	2	3	54	.37	.124	10	68	1.28	171	.33	4	3.80	.03	2.60	1
50449	3	92	4	3553	.5	24	15	3274	7.38	44	5	ND	3	17	22.0	2	2	62	.37	.122	7	73	1.34	233	.33	4	4.01	.03	2.71	1
50450	1	110	2	3877	.8	28	19	3341	7.70	58	5	ND	3	19	22.1	2	2	68	.36	.121	9	64	1.36	154	.34	4	4.17	.03	2.82	1
50451	2	170	7	7734	1.2	34	19	3558	8.43	119	5	ND	2	16	46.3	2	2	75	.36	.123	11	70	1.52	123	.36	3	4.66	.03	3.01	1
50452	1	155	9	3519	.9	27	18	3222	7.81	300	5	ND	3	16	15.1	2	2	66	.35	.120	15	64	1.46	148	.34	2	4.23	.02	2.85	1
50453	2	249	10	4708	2.4	31	19	3795	8.74	174	5	ND	3	27	20.1	2	2	72	.39	.123	7	69	1.56	141	.36	2	4.66	.05	3.05	1
50454	1	255	2	3316	1.6	27	16	3303	7.38	470	5	ND	3	20	12.0	2	2	68	.36	.123	8	63	1.44	297	.33	4	4.43	.02	2.98	1
50455	1	366	12	10992	3.4	29	17	3237	7.03	798	5	ND	3	25	62.7	11	2	62	.34	.115	11	57	1.27	131	.23	5	3.74	.02	1.94	1
50456	1	847	44	10869	7.4	32	17	2957	7.24	117	5	ND	3	19	58.6	8	3	58	.34	.116	7	58	1.27	109	.27	4	3.74	.02	2.19	1
50457	1	177	2	4351	1.4	26	11	3038	7.07	113	8	ND	4	19	13.5	6	2	64	.35	.118	8	65	1.32	304	.32	4	4.13	.02	2.74	1
50458	1	243	2	8211	1.1	32	15	2971	8.16	189	5	ND	3	17	33.8	21	2	60	.32	.108	6	62	1.21	95	.32	3	3.97	.02	2.63	1
50459	1	283	17	17795	2.1	34	31	2847	9.90	581	7	ND	3	16	89.5	55	7	55	.29	.098	12	63	1.11	72	.27	2	3.61	.02	2.13	2
50460	1	123	8	6346	1.0	30	13	3453	7.88	106	5	ND	4	25	33.5	2	2	65	.36	.124	8	63	1.35	266	.34	2	4.48	.02	2.81	1
50461	1	207	5	4892	.9	35	14	3687	8.71	75	6	ND	4	21	21.8	8	2	66	.36	.123	8	63	1.44	158	.37	3	4.80	.03	3.12	1
50462	1	80	43	3571	1.4	24	11	3646	7.77	62	5	ND	4	19	3.4	2	2	63	.27	.090	7	61	1.43	340	.37	2	4.60	.03	2.96	1
50463	1	141	29	5937	2.1	29	21	3572	8.06	56	5	ND	4	16	13.5	3	2	70	.31	.105	6	67	1.45	211	.39	2	4.59	.03	3.12	1
50464	2	316	124	3883	6.9	24	19	2677	7.07	19	5	ND	3	15	20.1	6	12	48	.26	.088	6	68	1.06	124	.29	2	3.20	.02	2.19	1
RE 50460	1	123	9	6242	.9	30	13	3408	7.78	113	5	ND	3	24	32.9	4	2	64	.36	.123	7	63	1.33	255	.33	3	4.41	.03	2.82	1
50465	2	198	24	5793	2.7	25	14	3181	7.59	26	5	ND	4	17	31.9	7	2	61	.33	.111	8	72	1.29	288	.38	3	4.08	.03	2.89	1
50466	1	158	7	3436	1.1	30	20	3779	9.08	11	5	ND	4	16	12.5	2	2	65	.33	.112	5	67	1.48	204	.43	2	4.74	.03	3.37	1
50467	1	139	20	3627	2.0	30	24	3559	8.72	31	6	ND	4	18	9.9	5	3	64	.32	.108	7	67	1.47	180	.41	2	4.54	.03	3.12	1
50468	2	118	4	3731	.9	32	20	3533	8.56	34	5	ND	4	18	11.8	8	2	65	.35	.120	7	72	1.45	292	.42	3	4.50	.03	3.23	1
50469	2	180	4	4115	.9	30	22	3367	8.81	58	5	ND	3	19	9.3	8	2	63	.34	.116	6	70	1.42	155	.39	2	4.29	.03	3.04	1
50470	2	170	11	5567	2.1	28	18	3337	7.92	384	5	ND	3	24	19.7	10	2	65	.35	.119	8	72	1.43	198	.37	3	4.23	.03	2.95	1
50471	2	99	5	6980	.8	29	17	3737	7.93	312	5	ND	3	21	41.8	2	2	63	.35	.119	8	71	1.39	242	.41	2	4.40	.03	3.11	1
50472	3	77	10	4415	1.4	25	17	3150	7.11	431	5	ND	4	18	22.1	3	2	53	.31	.103	6	72	1.14	198	.35	3	3.63	.03	2.61	1
50473	1	70	7	3262	1.1	25	15	3456	7.83	4694	5	ND	4	23	12.6	7	2	62	.35	.117	7	62	1.26	199	.38	3	4.08	.02	2.96	1
50474	3	227	26	4025	2.6	30	25	2719	7.89	1163	5	ND	3	22	9.2	8	4	58	.34	.116	6	65	1.14	105	.32	2	3.34	.02	2.43	1
50475	3	456	97	3428	10.1	24	41	1917	8.16	203	5	2	4	22	2.9	14	30	49	.35	.119	8	55	1.07	67	.24	3	2.78	.02	1.71	1
50476	2	313	37	3080	3.2	24	27	2671	7.64	260	5	ND	3	23	1.0	2	2	60	.33	.110	6	70	1.30	97	.34	4	3.46	.03	2.52	1
50477	3	242	17	3381	1.9	30	31	3457	9.36	292	8	ND	4	19	1.1	7	2	71	.33	.114	7	69	1.66	122	.41	2	4.43	.03	3.10	1
50478	2	177	103	1575	5.5	27	26	3021	8.23	424	5	ND	3	22	2.6	2	4	72	.34	.114	7	75	1.53	151	.39	8	4.03	.03	2.96	1
50479	2	113	16	4290	2.0	29	16	3434	8.10	137	5	ND	4	15	28.3	4	2	77	.35	.118	8	80	1.58	195	.42	3	4.41	.03	3.25	2
50480	3	98	12	4013	.9	28	16	3302	7.95	77	5	ND	3	14	20.3	2	2	75	.36	.121	8	82	1.44	194	.43	3	4.23	.03	3.18	1
50481	4	301	32	5955	2.9	29	50	1771	7.96	127	5	3	3	18	18.0	14	17	49	.35	.118	7	68	.93	68	.26	4	2.60	.02	1.99	1
50482	4	659	166	2805	14.3	32	45	1417	7.34	59	5	13	2	17	1.2	10	39	47	.33	.111	6	68	.98	58	.23	3	2.18	.02	1.70	1
50483	3	811	216	3988	18.1	35	48	1053	6.58	55	5	6	3	14	11.3	16	37	36	.34	.113	7	60	.75	57	.17	5	1.70	.02	1.25	1
STANDARD C	17	58	38	130	7.4	72	31	1047	3.96	42	19	7	36	53	19.4	14	19	56	.50	.085	38	59	.94	190	.09	34	1.88	.08	.16	10

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
50484	4	273	31	4165	2.1	28	24	1700	6.78	59	5	ND	2	16	16.5	7	7	53	.31	.106	6	61	1.19	63	.27	5	2.64	.02	2.08	4
50485	2	64	861	6008	4.3	18	11	5951	4.51	13	5	ND	1	15	29.5	3	3	36	.32	.086	13	57	.92	30	.05	5	2.10	.02	.50	1
50486	3	50	1439	4896	7.0	17	10	7535	4.85	16	5	ND	1	14	24.1	6	5	33	.29	.076	11	49	1.05	24	.05	5	2.31	.01	.50	1
50487	2	44	571	1769	3.2	23	16	10682	5.23	27	5	ND	1	15	8.5	3	2	45	.50	.116	18	49	1.39	29	.11	5	2.72	.02	.61	1
50488	2	58	1247	1245	5.6	20	14	8310	4.61	17	5	ND	1	18	5.7	4	3	47	.47	.117	14	54	1.33	33	.15	5	2.42	.03	.70	1
50489	1	26	428	425	2.2	20	14	10353	4.61	21	5	ND	1	29	1.8	2	2	44	1.49	.112	15	47	1.32	34	.16	4	2.60	.01	.95	1
RE 50494	1	19	372	1300	2.1	12	8	5031	3.57	13	5	ND	1	32	7.2	3	2	24	.29	.070	12	30	.84	70	.11	5	2.06	.02	1.09	1
50490	2	33	1191	3538	5.9	18	12	8938	5.18	20	6	ND	1	19	17.2	3	2	44	.50	.095	13	53	1.20	34	.11	6	2.63	.01	.78	1
50491	8	48	1013	4731	5.0	8	6	3180	2.30	13	5	ND	4	10	26.4	5	3	11	.16	.034	9	58	.43	32	.02	5	1.19	.01	.41	2
50492	3	32	1158	3388	5.3	12	6	3331	3.09	16	5	ND	2	16	20.1	5	3	21	.23	.068	13	46	.64	44	.04	7	1.72	.01	.47	2
50493	3	22	839	4193	4.4	13	6	3235	2.94	22	9	ND	4	22	24.9	7	2	18	.25	.071	13	45	.61	44	.05	6	1.68	.01	.55	3
50494	1	19	360	1301	2.0	12	8	4882	3.49	11	5	ND	1	32	7.1	2	2	23	.27	.068	12	28	.81	69	.10	5	2.02	.01	1.07	1
50495	1	46	747	3179	3.8	16	11	4642	3.92	21	5	ND	2	17	16.7	7	2	29	.38	.092	20	30	1.02	63	.10	4	2.22	.02	.99	1
50496	2	51	219	1747	1.7	20	14	3980	4.08	16	5	ND	1	41	9.2	2	2	62	1.64	.106	11	52	1.39	76	.17	2	2.90	.06	1.12	1
50497	2	17	416	446	2.1	22	15	4275	3.69	21	5	ND	1	45	2.2	2	2	72	2.17	.103	12	56	1.50	52	.15	2	2.66	.08	.65	1
50498	1	88	1671	3606	9.4	21	15	4353	5.24	16	5	ND	1	36	20.3	9	2	75	1.24	.114	10	50	1.70	39	.12	2	2.98	.05	.43	1
50499	3	91	1677	9375	12.5	23	17	3924	5.29	18	5	ND	1	24	56.7	7	10	78	.99	.118	12	63	1.66	26	.08	3	2.90	.04	.28	1
50500	1	12	75	977	.8	23	16	4473	4.47	22	5	ND	1	55	5.5	2	2	93	2.45	.117	12	52	1.76	64	.15	2	3.12	.08	.71	1
50501	1	43	50	1962	5.4	23	16	3683	4.35	19	5	14	1	45	11.8	2	2	79	1.98	.116	12	52	1.61	73	.17	2	3.01	.10	.95	1
50502	1	96	91	5789	3.6	23	17	4248	5.54	13	5	ND	1	40	36.7	6	5	61	.64	.118	11	51	1.62	48	.09	2	2.83	.06	.38	1
50503	1	136	316	989	14.9	24	18	3167	6.40	17	5	5	2	30	6.1	6	27	65	.71	.121	9	59	1.66	39	.08	2	2.81	.05	.30	1
50504	1	29	49	2977	1.6	25	21	2981	4.81	25	5	ND	2	48	18.2	2	3	97	1.69	.113	12	62	1.64	91	.23	2	3.14	.16	1.19	1
50505	2	40	77	5288	3.4	27	15	2802	5.19	15	5	ND	2	41	33.1	2	5	91	1.55	.107	12	72	1.68	90	.18	2	3.27	.15	1.11	1
50506	1	41	45	4025	1.9	27	15	2597	5.12	15	5	ND	1	34	25.2	2	2	84	1.14	.107	13	73	1.59	106	.18	2	3.20	.10	1.17	1
50507	1	20	28	478	.6	28	18	2861	3.80	26	5	ND	2	52	2.7	2	2	85	2.23	.112	16	72	1.49	152	.19	2	3.30	.11	1.39	1
50508	2	12	28	543	.6	29	16	3174	4.14	24	5	ND	2	59	2.9	2	2	89	1.82	.113	14	84	1.65	172	.23	2	3.87	.20	1.57	1
50509	1	29	41	2027	.9	31	15	4462	4.87	15	5	ND	1	66	10.2	2	2	81	1.22	.109	14	78	1.50	203	.25	2	4.09	.25	1.84	1
50510	2	21	353	1823	2.7	30	17	6248	5.13	25	5	ND	1	70	6.7	2	2	92	.85	.114	14	89	1.27	135	.25	2	3.89	.27	1.73	1
50511	3	41	57	3237	.9	23	10	2922	3.81	18	5	ND	3	33	10.2	4	2	43	.41	.109	14	62	.57	97	.22	5	2.47	.04	1.53	1
50512	4	22	86	5205	1.4	15	9	3006	4.02	38	5	ND	2	16	26.7	2	2	32	.23	.070	10	72	.39	76	.20	6	2.07	.02	1.49	1
50513	2	11	253	7022	4.3	22	14	5152	5.82	18	7	ND	1	24	34.6	6	5	49	.36	.116	11	58	.55	109	.28	6	3.16	.02	2.32	1
50514	7	28	249	4695	3.7	13	5	2063	3.71	15	5	ND	4	11	23.2	7	5	24	.18	.056	11	91	.25	59	.12	4	1.66	.02	1.13	1
50515	8	29	216	3904	2.2	4	3	121	.89	13	5	ND	7	5	26.5	4	3	1	.04	.011	12	99	.02	24	.01	4	.40	.01	.33	2
50516	10	32	3181	5120	13.0	6	3	198	1.31	278	5	ND	7	7	31.0	16	2	3	.09	.015	13	95	.07	21	.01	5	.49	.01	.34	3
50517	9	30	1063	2648	3.4	4	2	59	.67	10	5	ND	7	8	15.5	3	2	1	.05	.012	8	90	.01	32	.01	3	.38	.01	.32	2
50518	9	38	548	3706	3.1	4	2	525	.83	8	5	ND	6	10	24.1	2	3	3	.12	.015	9	98	.07	30	.01	3	.41	.01	.29	2
50519	8	62	83	2884	1.6	3	3	50	.80	12	5	ND	6	7	19.1	3	2	1	.03	.008	7	83	.01	30	.01	4	.35	.01	.30	3
STANDARD C	18	57	39	129	7.2	71	31	1026	3.96	39	17	7	37	51	18.6	15	19	54	.51	.083	38	59	.91	187	.09	34	1.88	.08	.16	10

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
50520	9	37	61	2981	1.4	4	2	54	.53	6	5	ND	8	11	17.1	2	2	1	.04	.012	9	98	.01	30	.01	3	.34	.01	.25	2
50521	10	16	13	308	.2	5	1	51	.35	4	5	ND	7	15	1.0	2	2	1	.05	.015	11	108	.01	33	.01	3	.36	.01	.27	1
RE 50525	4	16	360	584	1.0	17	9	5208	5.86	5	5	ND	1	13	2.0	2	2	45	.28	.085	7	47	.53	138	.25	3	3.17	.01	2.37	1
50522	11	49	38	3103	.7	6	4	121	1.03	21	5	ND	6	11	18.3	6	2	1	.06	.016	7	102	.02	32	.01	2	.35	.01	.25	1
50523	3	18	140	1930	1.7	21	13	3738	3.96	21	5	ND	2	25	5.9	2	3	47	.50	.088	8	63	.56	70	.15	2	2.68	.04	.92	1
50524	3	12	124	2685	.5	18	10	4957	5.52	2	5	ND	2	17	10.7	3	2	47	.37	.097	8	65	.49	142	.25	2	3.01	.02	2.28	3
50525	3	16	357	580	1.0	17	9	5137	5.81	4	5	ND	1	13	1.9	2	2	45	.29	.084	7	46	.53	137	.25	4	3.12	.01	2.38	1
50526	6	22	573	958	1.5	14	6	4320	5.12	2	5	ND	2	18	3.8	2	2	31	.20	.059	7	74	.38	102	.19	3	2.47	.01	1.61	1
50527	4	20	150	2830	1.3	19	9	5684	6.56	21	5	ND	1	29	15.1	4	6	38	.19	.050	11	65	.44	96	.19	4	2.68	.01	1.57	3
50528	5	60	152	6819	2.2	19	11	5450	5.98	37	5	ND	1	34	37.3	4	4	40	.22	.064	8	66	.37	103	.20	3	2.61	.01	1.80	1
50529	6	30	139	2227	2.2	11	5	3643	4.08	26	5	ND	4	20	13.1	6	4	15	.11	.032	6	74	.24	50	.10	3	1.72	.01	1.11	1
50530	9	33	84	965	1.1	8	3	1701	2.51	15	5	ND	5	14	5.8	7	2	5	.05	.013	8	81	.12	42	.03	3	.86	.01	.45	1
50531	6	28	101	3232	1.7	17	6	2908	3.95	10	5	ND	3	12	17.4	7	2	22	.21	.062	6	68	.27	85	.14	4	1.62	.01	1.06	3
50532	2	63	33	3688	1.0	26	15	5095	6.87	4	5	ND	1	22	14.8	3	2	54	.40	.113	5	67	.94	140	.28	3	3.56	.02	2.73	1
50533	2	7	8	2930	.7	27	14	5806	6.62	11	5	ND	1	20	9.9	2	2	62	.42	.102	5	64	1.21	214	.29	2	4.45	.03	3.37	2
50534	2	10	25	4081	1.4	25	14	6103	7.48	8	5	ND	1	15	14.8	2	3	62	.37	.105	4	77	.87	203	.32	2	4.16	.02	3.46	1
STANDARD C	18	58	38	123	6.6	66	30	1107	3.96	40	18	7	37	52	16.9	14	19	56	.49	.087	35	57	.93	189	.08	35	1.88	.07	.14	11

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

CDN RESOURCE LABORATORIES LTD.
6329 BERESFORD STREET, BURNABY, B.C. V5E 1B3 / PH: 435-8376 / FAX: 435-9746

** ASSAY REPORT **

To: Granges Inc.
2300 - 885 West Georgia St.
Vancouver, B.C.
V6C 3E8

Number: 92205
Date: December 4, 1992
Proj.: 120

Attn: Bruce Downing cc. Gord Allen

	Au oz/ton	Ag oz/ton
50278	0.012	0.26
50279	0.002	0.31
50280	0.004	0.26
50281	0.004	0.60
50282	0.008	0.33
50283	<0.002	0.22
50284	0.002	0.41
50285	0.006	0.13
50286	0.076	0.99
50287	0.210	0.51
50288	0.010	0.16
50289	0.010	0.16
50290	0.008	0.23
50291	0.004	0.22
50294	0.042	0.31
50295	<0.002	0.24
50296	<0.002	0.16
50297	0.004	0.13
50298	0.002	0.14
50299	0.002	0.12
50300	0.004	0.13
50301	0.004	0.16
50302	0.028	0.20
50303	0.020	0.19
50304	0.036	0.30
50305	0.008	0.17
50306	0.006	0.12
50307	0.008	0.16
50308	0.004	0.22
50309	<0.002	0.32
50310	<0.002	0.10
50311	<0.002	0.05
50312	<0.002	0.16
50313	0.002	0.16
50314	<0.002	0.06
50315	0.002	0.09
50316	<0.002	0.06
50317	<0.002	0.12
50318	<0.002	0.19

Duncan Sandeman
Licensed Assayer of British Columbia

CDN RESOURCE LABORATORIES LTD.
6329 BERESFORD STREET, BURNABY, B.C. V5E 1B3 / PH: 435-8376 / FAX: 435-9746

** ASSAY REPORT **

To: Granges Inc.
2300 - 885 West Georgia St.
Vancouver, B.C.
V6C 3E8

Number: 92205
Date: December 4, 1992
Proj.: 120

Attn: Bruce Downing cc. Gord Allen

	Au oz/ton	Ag oz/ton
50319	<0.002	0.08
50320	<0.002	0.15
50321	<0.002	0.08
50322	0.002	0.09
50323	0.004	0.07
50324	0.004	0.07
50325	0.004	0.16
50326	0.002	0.07
50327	<0.002	0.07
50328	<0.002	0.06
50329	<0.002	0.07
50330	0.002	0.13
50331	0.002	0.11
50332	0.002	0.09
50333	0.056	0.58
50334	0.014	0.08
50335	0.006	0.14
50336	0.024	0.14
50339	0.008	0.15
50340	0.002	0.17
50341	0.014	0.25
50342	0.010	0.17
50343	0.002	0.07
50344	0.018	0.30
50345	0.018	0.21
50346	0.012	0.12
50347	0.052	0.14
50348	0.008	0.14
50349	0.034	1.08
50350	0.002	0.09
50351	0.002	0.11
50352	0.030	0.37
50353	0.006	0.12
50354	0.048	0.28
50355	0.006	0.05
50356	0.008	0.07
50357	0.002	0.06
50358	0.014	0.07
50359	<0.002	0.17

Duncan Sanderson
Licensed Assayer of British Columbia

CDN RESOURCE LABORATORIES LTD.
6329 BERESFORD STREET, BURNABY, B.C. V5E 1B3 / PH: 435-8376 / FAX: 435-9746

** ASSAY REPORT **

To: Granges Inc.
2300 - 885 West Georgia St.
Vancouver, B.C.
V6C 3E8

Number: 92205
Date: December 4, 1992
Proj.: 120

Attn: Bruce Downing cc. Gord Allen

	Au oz/ton	Ag oz/ton
50360	0.006	0.25
50361	0.014	0.14
50362	0.012	0.17
50363	0.006	0.11
50364	0.002	0.06
50365	0.008	0.11
50366	0.014	0.30
50367	0.022	0.40
50368	0.002	0.12
50369	0.004	0.17
50370	<0.002	0.13
50371	<0.002	0.07
50372	<0.002	0.07
50373	0.010	0.33
50374	0.002	0.07
50375	0.006	0.32
50376	<0.002	0.08
50377	0.004	0.07
50378	0.006	0.07
50379	0.002	0.05
50380	0.004	0.06
50381	<0.002	0.05
50382	0.010	0.07
50383	0.012	0.06
50384	0.004	0.17
50385	0.006	0.07
50386	0.004	0.06
50387	0.018	0.05
50388	0.006	0.04
50389	0.006	0.03
50390	0.002	0.05
50391	<0.002	0.05
50392	<0.002	0.04
50393	0.002	0.28
50394	0.008	0.07
50395	0.002	0.07
50396	<0.002	0.18
50397	0.002	0.15
50398	0.004	0.08
50399	0.024	0.38

Duncan Sanderson
Licensed Assayer of British Columbia

CDN RESOURCE LABORATORIES LTD.
6329 BERESFORD STREET, BURNABY, B.C. V5E 1B3 / PH: 435-8376 / FAX: 435-9746

** ASSAY REPORT **

To: Granges Inc.
2300 - 885 West Georgia St.
Vancouver, B.C.
V6C 3E8

Number: 92205
Date: December 4, 1992
Proj.: 120

Attn: Bruce Downing cc. Gord Allen

	Au oz/ton	Ag oz/ton
50402	<0.002	0.06
50403	<0.002	0.07
50404	<0.002	0.21
50405	<0.002	0.46
50406	<0.002	0.07
50407	<0.002	0.07
50408	<0.002	0.30
50409	0.002	0.02
50410	0.002	0.02
50411	<0.002	0.03
50412	<0.002	0.05
50413	0.002	0.06
50414	0.004	0.07
50415	0.008	0.03
50416	0.004	0.06
50417	0.002	0.05
50418	0.002	0.07
50419	<0.002	0.08
50420	<0.002	0.05
50421	<0.002	0.28
50422	<0.002	0.08
50423	<0.002	0.08
50424	<0.002	0.20
50425	<0.002	0.08
50426	<0.002	0.07
50427	<0.002	0.08
50428	0.004	0.08

Duncan Sanderson
Licensed Assayer of British Columbia

CDN RESOURCE LABORATORIES LTD.
6329 BERESFORD STREET, BURNABY, B.C. V5E 1B3 / PH: 435-8376 / FAX: 435-9746

** ASSAY REPORT **

To: Granges Inc.
2300 - 885 West Georgia St.
Vancouver, B.C.
V6C 3E8

Number: 92207
Date: December 9, 1992
Proj.: 120

Attn: Bruce Downing cc. Gord Allen

	Au oz/ton	Ag oz/ton
50432	0.003	0.03
50433	0.001	0.05
50434	0.004	0.13
50435	0.007	0.05
50436	0.240	0.03
50437	0.012	0.07
50438	0.002	0.02
50439	0.006	0.01
50440	0.001	0.04
50441	0.010	0.09
50442	0.010	0.22
50443	0.006	0.03
50444	0.006	0.04
50445	0.005	0.09
50446	0.003	0.03
50447	0.010	0.07
50448	0.009	0.02
50449	0.003	0.07
50450	0.006	0.05
50451	0.008	0.07
50452	0.010	0.08
50453	0.011	0.04
50454	0.005	0.06
50457	0.001	0.03
50458	0.001	0.04
50459	0.022	0.01
50460	0.002	0.03
50461	0.006	0.04
50462	0.001	0.18
50463	0.006	0.02
50464	0.023	0.06
50465	0.010	0.04
50466	0.018	0.02
50467	0.029	0.02
50468	0.006	0.02
50469	0.007	0.02
50470	0.012	0.02
50471	0.005	0.03
50472	0.004	0.07

Duncan Sanderson
Licensed Assayer of British Columbia

CDN RESOURCE LABORATORIES LTD.

6329 BERESFORD STREET, BURNABY, B.C. V5E 1B3 / PH: 435-8376 / FAX: 435-9746

** ASSAY REPORT **

To: Granges Inc.
2300 - 885 West Georgia St.
Vancouver, B.C.
V6C 3E8

Number: 92207
Date: December 9, 1992
Proj.: 120

Attn: Bruce Downing cc. Gord Allen

	Au oz/ton	Ag oz/ton
50473	0.019	0.07
50474	0.006	0.05
50475	0.062	0.06
50476	0.013	0.06
50477	0.015	0.12
50478	0.021	0.06
50479	0.010	0.06
50480	0.009	0.10
50481	0.098	0.07
50482	0.325	0.05
50483	0.140	0.05
50484	0.041	0.03
50485	0.002	0.03
50486	0.008	0.03
50487	0.002	0.02
50488	<0.001	0.03
50489	<0.001	0.03
50490	0.001	0.03
50491	0.001	0.03
50492	0.001	0.03
50493	0.002	0.03
50494	0.001	0.04
50495	0.003	0.04
50496	0.002	0.03
50497	0.001	0.03
50500	0.001	0.04
50501	0.059	0.02
50502	0.015	0.02
50503	0.092	0.04
50504	0.018	0.12
50505	0.005	0.05
50506	0.003	0.03
50507	0.002	0.04
50508	0.001	0.02
50509	0.001	0.03
50510	<0.001	0.03
50511	0.001	0.02
50512	0.003	0.02
50513	0.003	0.03

Duncan Sanderson

Licensed Assayer of British Columbia

CDI RESOURCE LABORATORIES LTD.
6329 BERESFORD STREET, BURNABY, B.C. V5E 1B3 / PH: 435-8376 / FAX: 435-9746

** ASSAY REPORT **

To: Granges Inc.
2300 - 885 West Georgia St.
Vancouver, B.C.
V6C 3E8

Number: 92207
Date: December 9, 1992
Proj.: 120

Attn: Bruce Downing cc. Gord Allen

	Au oz/ton	Ag oz/ton
50514	<0.001	0.05
50515	0.002	0.02
50516	0.004	0.17
50517	0.001	0.05
50518	0.002	0.03
50519	0.003	0.01
50520	0.004	0.01
50521	0.001	<0.01
50522	0.001	<0.01
50523	0.001	0.02
50524	0.001	0.01
50526	<0.001	0.02
50527	0.004	0.02
50528	0.003	0.03
50529	0.004	0.02
50530	0.009	0.01
50531	0.002	0.02
50532	<0.001	0.01
50533	0.001	0.01

Duncan Sanderson
Licensed Assayer of British Columbia

CDN RESOURCE LABORATORIES LTD.
6329 BERESFORD STREET, BURNABY, B.C. V5E 1B3 / PH: 435-8376 / FAX: 435-9746

** ASSAY REPORT **

To: Granges Inc.
2300 - 885 West Georgia St.
Vancouver, B.C.
V6C 3E8

Number: 92207
Date: December 9, 1992
Proj.: 120

Attn: Bruce Downing cc. Gord Allen

	Original Au oz/ton	Reassay Au oz/ton
50436	0.240	0.166
50464	0.023	0.026
50475	0.062	0.071
50481	0.098	0.109
50482	0.325	0.397
50483	0.140	0.190
50503	0.092	0.137
50504	0.018	0.008

Duncan Sanderson
Licensed Assayer of British Columbia

CDI RESOURCE LABORATORIES LTD.
6329 BERESFORD STREET, BURNABY, B.C. V5E 1B3 / PH: 435-8376 / FAX: 435-9746

120.040.009

* GEOCHEMICAL REPORT *

To: Granges Inc.
2300 - 885 West Georgia St.
Vancouver, B.C.
V6C 3E8

Number: 92218
Date: December 15, 1992
Proj.: 120

Attn: Bruce Downing cc. Gord Allen

	Au ppb
D 92-32	
90 - 100	60
100 - 110	50
110 - 120	60
120 - 130	60
130 - 140	40
140 - 150	20
150 - 160	20
160 - 170	40
170 - 180	40
180 - 190	30
190 - 200	30
200 - 210	30
210 - 220	20
220 - 230	120
230 - 240	120
240 - 250	70
250 - 260	40
260 - 270	30
270 - 280	50
280 - 290	30
290 - 300	200
300 - 310	120
310 - 320	30
320 - 330	20
330 - 340	20
340 - 350	20
350 - 360	30
360 - 370	40
370 - 380	30
380 - 390	40
390 - 400	NS
400 - 410	100
410 - 420	10
420 - 430	60
430 - 440	30
440 - 450	20
450 - 460	10
460 - 470	20
470 - 480	60

Duncan Sanderson
Licensed Assayer of British Columbia

CDN RESOURCE LABORATORIES LTD.
6329 BERESFORD STREET, BURNABY, B.C. V5E 1B3 / PH: 435-8376 / FAX: 435-9746

* GEOCHEMICAL REPORT *

To: Granges Inc.
2300 - 885 West Georgia St.
Vancouver, B.C.
V6C 3E8

Number: 92218
Date: December 15, 1992
Proj.: 120

Attn: Bruce Downing cc. Gord Allen

	Au ppb
BD 92-32	
480 - 490	30
490 - 500	10
BD 92-33	
40 - 50	30
50 - 60	80
60 - 70	180
BD 92-34	
40 - 50	160
50 - 60	170
60 - 70	170
70 - 80	180
80 - 90	60
90 - 100	190
100 - 110	1440
110 - 120	1190
120 - 130	200
130 - 140	180
140 - 150	100
150 - 160	150
160 - 170	320
170 - 180	500
180 - 190	240
190 - 200	180
200 - 210	410
210 - 220	NS
220 - 230	90
230 - 240	270
240 - 250	120
250 - 260	300
260 - 270	200
270 - 280	230
280 - 290	380
290 - 300	160
300 - 310	120
310 - 320	590
320 - 330	600

Duncan Sanderson
Licensed Assayer of British Columbia

CDI RESOURCE LABORATORIES LTD.

6329 BERESFORD STREET, BURNABY, B.C. V5E 1B3 / PH: 435-8376 / FAX: 435-9746

* GEOCHEMICAL REPORT *

To: Granges Inc.
2300 - 885 West Georgia St.
Vancouver, B.C.
V6C 3E8

Number: 92218
Date: December 15, 1992
Proj.: 120

Attn: Bruce Downing cc. Gord Allen

	Au ppb
BD 92-34	
330 - 340	230
340 - 350	190
350 - 360	560
360 - 370	1010
370 - 380	2100
380 - 390	530
390 - 400	170
400 - 410	< 90
410 - 420	430
420 - 430	500
430 - 440	200
440 - 450	1400
450 - 460	1050
BD 92-36	
70 - 80	70
80 - 90	140
90 - 100	80
100 - 110	190
110 - 120	100

NOTE:

NS indicates no sample.
IS indicates insufficient sample for analysis.

Duncan Sanderson
Licensed Assayer of British Columbia

ACME A[illegible]YTICAL LABORATORIES LTD. [illegible] E. HASTINGS ST. V[illegible]COUVER B.C. [illegible]A 1[illegible] [illegible]NE(6[illegible],253[illegible]8 [illegible]4[illegible]-17

GEOCHEMICAL ANALYSIS CERTIFICATE

JAN 11 1993

Granges Inc. PROJECT BLACKWATER-DAVIDSON File # 93-0020 Page 1

2300 - 885 W. Georgia St., Vancouver BC V6C 3E8

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
BD-92-32 90-100	2	75	134	342	.9	160	23	950	2.25	150	5	ND	14	98	2.4	9	2	24	1.37	.029	20	71	.64	282	.04	5	2.45	.67	.49	61
BD-92-32 100-110	6	68	3648	17556	20.9	33	14	2391	3.03	69	5	ND	11	67	152.0	29	5	29	.74	.044	16	32	.33	172	.09	16	2.01	.33	.69	14
BD-92-32 110-120	6	35	344	2033	3.9	30	16	2503	2.19	50	5	ND	11	57	17.9	11	2	10	.92	.018	14	20	.25	188	.05	6	1.77	.32	.50	18
BD-92-32 120-130	4	22	229	596	1.5	20	12	1879	1.78	49	5	ND	14	60	5.1	9	2	7	.81	.016	16	18	.22	204	.04	10	1.47	.36	.46	10
BD-92-32 130-140	1	24	81	363	.5	13	6	1068	1.62	26	5	ND	15	50	2.7	8	2	8	.53	.018	21	11	.23	172	.04	8	1.27	.51	.39	4
BD-92-32 140-150	2	38	84	222	1.1	52	13	1367	3.46	67	5	ND	3	72	1.5	15	4	29	.70	.016	7	36	.31	276	.13	12	1.97	.14	.62	41
BD-92-32 150-160	2	33	200	700	1.2	39	13	924	3.48	60	5	ND	2	73	6.1	23	6	30	.70	.024	7	25	.26	274	.11	11	1.97	.13	.62	37
BD-92-32 160-170	1	137	174	292	1.5	35	13	721	3.96	220	5	ND	12	69	1.9	27	4	55	.79	.118	25	15	.40	182	.10	13	2.94	.51	1.09	87
BD-92-32 170-180	2	76	294	687	2.2	18	13	1112	3.48	38	5	ND	13	87	6.3	9	2	59	.91	.100	24	17	.51	182	.10	11	2.46	.58	.67	20
BD-92-32 180-190	2	93	144	546	1.1	21	13	1589	3.84	94	5	ND	10	83	4.4	14	2	58	.81	.096	22	20	.46	227	.15	17	2.69	.48	1.00	59
BD-92-32 190-200	5	112	77	248	.7	24	15	1997	4.60	157	5	ND	6	98	1.4	18	6	62	1.08	.109	19	56	.46	280	.22	9	3.00	.34	1.32	86
BD-92-32 200-210	2	210	45	307	1.6	39	22	2174	5.55	113	5	ND	4	100	.8	25	2	114	1.01	.142	18	14	.62	349	.23	13	3.61	.28	1.60	150
BD-92-32 210-220	2	216	59	317	1.9	43	24	2205	5.73	105	5	ND	4	99	1.2	28	2	121	.98	.145	18	12	.64	353	.24	10	3.67	.25	1.65	148
BD-92-32 220-230	2	238	80	398	1.6	73	25	1071	5.31	105	5	ND	6	79	2.3	6	2	110	.85	.114	21	16	.69	266	.21	18	3.64	.38	1.66	264
BD-92-32 240-250	7	289	65	123	2.8	26	160	819	2.53	748	5	ND	6	52	.7	18	2	31	1.29	.030	12	61	.19	217	.06	9	1.26	.10	.61	221
BD-92-32 250-260	6	163	17	43	.3	11	94	283	1.26	53	5	ND	6	24	.2	7	2	6	.31	.010	10	40	.05	168	.02	2	.54	.04	.38	142
BD-92-32 260-270	5	173	28	47	.4	8	113	209	1.12	35	5	ND	6	17	.5	5	2	3	.20	.006	9	27	.04	124	.01	2	.43	.04	.32	157
BD-92-32 270-280	6	247	135	206	1.1	18	147	361	2.85	64	8	ND	5	22	1.8	7	2	3	.27	.007	8	36	.04	109	.01	3	.38	.03	.26	190
BD-92-32 280-290	7	86	124	385	1.1	20	16	250	1.66	24	5	ND	6	13	3.0	9	4	3	.13	.007	9	32	.03	88	.01	2	.34	.03	.23	176
BD-92-32 290-300	11	56	61	127	.5	14	6	156	.88	19	5	ND	5	12	.9	5	2	3	.15	.006	9	90	.03	85	.01	2	.37	.03	.27	130
BD-92-32 300-310	10	88	105	242	.6	20	7	189	1.38	24	5	ND	6	15	1.9	8	2	3	.21	.007	10	70	.03	102	.01	2	.42	.03	.31	223
BD-92-32 310-320	8	47	76	206	.6	19	6	242	2.31	32	5	ND	5	12	1.8	6	2	3	.12	.006	9	56	.02	105	.01	2	.28	.03	.24	88
BD-92-32 320-330	11	58	76	177	.5	32	9	318	2.91	45	5	ND	5	26	1.1	7	2	10	.37	.013	9	84	.08	122	.03	3	.61	.06	.30	104
BD-92-32 330-340	5	48	45	87	.5	16	7	204	2.29	138	8	ND	6	28	.5	12	4	19	.39	.034	12	19	.12	85	.05	19	.95	.11	.46	61
BD-92-32 340-350	6	118	20	119	.4	64	19	597	5.75	329	5	ND	3	28	.2	8	10	42	.43	.052	8	48	.26	145	.12	8	1.75	.09	.88	139
BD-92-32 350-360	4	61	74	444	.8	91	17	728	5.16	497	5	ND	2	38	3.2	12	2	34	.43	.054	6	42	.32	77	.12	8	1.68	.08	.78	35
BD-92-32 360-370	4	59	158	670	1.2	114	14	477	4.49	931	5	ND	2	29	6.3	12	2	28	.33	.044	7	49	.28	92	.09	4	1.33	.05	.70	28
BD-92-32 370-380	7	70	145	301	.9	19	4	190	1.13	101	5	ND	5	38	2.7	9	2	3	.27	.010	7	42	.05	63	.01	3	.81	.05	.34	146
BD-92-32 380-390	4	41	307	1313	2.1	36	8	315	2.43	166	5	ND	4	107	13.0	6	2	20	.97	.021	6	30	.19	88	.07	7	1.93	.15	.46	47
RE BD-92-32 340-350	6	118	25	133	.3	59	18	571	5.45	323	5	ND	3	28	.2	6	2	40	.42	.050	8	45	.25	136	.12	16	1.69	.08	.84	140
BD-92-32 400-410	3	47	55	147	.7	51	22	334	4.71	169	5	ND	1	236	.8	2	6	68	3.40	.038	5	54	.56	95	.15	6	6.66	.37	.67	24
BD-92-32 410-420	3	43	22	644	.4	64	14	339	4.07	274	5	ND	2	156	6.3	2	2	56	1.88	.044	6	46	.35	91	.12	5	3.62	.22	.67	29
BD-92-32 420-430	7	48	28	239	.4	20	5	187	1.46	79	5	ND	6	174	2.4	6	4	14	1.14	.015	7	43	.13	65	.03	3	1.92	.16	.33	56
BD-92-32 430-440	11	103	38	303	.4	50	11	348	3.07	97	5	ND	7	101	2.6	5	7	20	.89	.022	9	80	.22	98	.04	9	1.79	.22	.40	148
BD-92-32 440-450	7	34	10	58	.3	20	4	182	1.61	66	5	ND	6	35	.6	4	3	3	.51	.008	8	36	.04	47	.01	5	.49	.04	.17	50
BD-92-32 450-460	9	54	18	82	.4	27	6	299	2.33	128	10	ND	6	43	.8	6	2	4	.61	.011	9	47	.05	74	.01	3	.59	.05	.20	77
BD-92-32 460-470	5	70	48	400	.6	50	23	1154	4.06	211	5	ND	3	146	4.1	2	6	79	4.08	.046	6	54	.36	70	.15	5	5.36	.27	.62	50
STANDARD C	18	58	39	132	7.3	68	32	1059	3.96	41	19	7	36	51	19.1	15	21	57	.50	.088	39	61	.91	185	.09	37	1.88	.06	.14	11

ICP - .500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HNO3-H2O AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 ML WITH WATER.
THIS LEACH IS PARTIAL FOR MN FE SR CA P LA CR MG BA TI B W AND LIMITED FOR NA K AND AL. AU DETECTION LIMIT BY ICP IS 3 PPM.
- SAMPLE TYPE: PULP   Samples beginning 'RE' are duplicate samples.

DATE RECEIVED: JAN 5 1993 **DATE REPORT MAILED:** Jan 7/93 **SIGNED BY**.......... D.TOYE, C.LEONG, J.WANG; CERTIFIED B.C. ASSAYERS

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
BD-92-32 470-480	9	112	27	125	.6	48	23	758	4.88	293	5	ND	1	127	.8	2	11	64	3.95	.042	6	95	.39	90	.14	7	5.02	.28	.58	107
BD-92-32 480-490	3	78	42	168	.9	47	24	838	6.43	245	5	ND	2	156	2.4	2	2	80	5.33	.053	6	30	.53	80	.18	2	6.55	.34	.64	22
BD-92-32 490-500	5	83	18	94	.7	66	24	636	7.47	266	5	ND	1	144	1.2	2	3	82	3.88	.047	5	56	.52	67	.17	2	6.52	.32	.71	50
BD-92-33 40-50	3	179	195	2418	2.7	30	13	2799	5.57	53	5	ND	8	31	3.3	5	4	41	.49	.087	13	36	1.01	80	.08	2	1.95	.19	.30	37
BD-92-33 50-60	2	86	991	1289	5.2	23	8	3096	3.59	66	5	ND	8	16	3.3	16	8	20	.22	.060	12	23	.48	54	.05	2	1.09	.11	.28	77
BD-92-33 60-70	5	193	748	3699	21.4	21	7	1809	2.43	272	5	ND	9	16	31.5	8	4	9	.18	.028	13	28	.24	65	.02	4	.78	.12	.26	170
BD-92-34 40-50	4	87	154	770	1.8	17	11	963	2.49	52	5	ND	7	49	18.6	2	2	28	.57	.043	16	42	.39	109	.06	19	1.10	.23	.19	74
BD-92-34 50-60	4	88	208	976	2.4	23	13	1248	2.54	42	5	ND	9	61	13.4	2	2	26	.66	.041	18	36	.46	140	.06	7	1.23	.31	.23	59
BD-92-34 60-70	5	139	292	589	3.1	21	13	890	3.71	145	6	ND	12	51	17.6	5	6	29	.36	.040	22	38	.40	83	.03	7	1.73	.36	.38	28
BD-92-34 70-80	4	142	287	507	3.4	17	13	798	3.49	143	5	ND	12	52	12.0	3	10	27	.36	.032	22	23	.35	80	.03	8	1.69	.35	.41	25
BD-92-34 80-90	5	65	262	550	3.6	15	8	982	2.73	29	5	ND	10	39	15.7	6	3	22	.27	.052	18	28	.32	116	.03	3	1.29	.23	.41	22
BD-92-34 90-100	3	50	333	1110	4.2	10	6	1864	3.32	45	8	ND	10	36	22.3	4	6	29	.27	.052	20	32	.53	89	.05	3	1.58	.30	.35	14
BD-92-34 100-110	4	111	115	3502	4.3	26	12	1015	2.70	53	7	ND	13	54	23.8	2	7	21	.57	.067	20	31	.40	110	.02	5	1.34	.38	.31	25
BD-92-34 110-120	4	874	557	24323	51.6	58	79	970	11.92	15722	5	ND	11	44	156.5	95	83	10	.42	.057	15	22	.26	5	.01	22	.92	.36	.18	12
BD-92-34 120-130	6	84	946	5150	5.6	28	18	4022	5.34	253	5	ND	7	45	24.3	5	9	38	.53	.086	15	59	1.06	88	.21	5	2.59	.20	1.25	48
BD-92-34 130-140	3	268	479	15720	44.5	32	21	4991	5.61	483	5	ND	8	55	98.4	9	86	20	.46	.084	17	28	.40	60	.02	4	1.25	.20	.38	16
BD-92-34 140-150	3	152	105	6159	6.4	28	16	3264	4.42	376	5	ND	8	50	39.0	4	13	19	.42	.087	15	27	.45	69	.01	5	1.31	.19	.39	61
BD-92-34 150-160	6	135	166	5713	8.6	27	17	3330	4.93	523	5	ND	8	54	34.7	6	16	22	.40	.078	15	40	.44	53	.02	6	1.72	.20	.50	39
BD-92-34 160-170	3	119	270	6762	4.5	31	19	3590	4.91	255	5	ND	9	43	36.1	4	13	28	.44	.081	17	39	.60	81	.08	6	1.94	.24	.68	21
BD-92-34 170-180	4	149	267	6964	4.7	27	20	3447	4.70	258	5	ND	7	37	42.2	2	8	24	.38	.088	15	37	.47	79	.05	4	1.46	.15	.53	73
BD-92-34 180-190	3	148	173	5766	6.1	28	17	2812	5.22	222	5	ND	8	44	34.0	4	12	33	.38	.084	14	45	.77	107	.15	6	1.96	.18	.87	38
BD-92-34 190-200	3	104	543	4887	4.1	25	16	2749	4.89	313	5	ND	9	53	27.7	4	11	29	.52	.080	15	44	.72	101	.14	7	1.90	.21	.88	74
BD-92-34 200-210	3	70	324	2513	3.3	18	13	2064	3.29	204	5	ND	14	87	15.8	3	3	16	.88	.053	21	38	.55	129	.07	11	1.35	.39	.50	46
BD-92-34 220-230	2	88	1094	5045	5.2	30	15	4369	4.99	123	5	ND	6	29	22.3	4	7	40	.38	.093	13	45	1.07	160	.23	2	2.26	.12	1.30	62
BD-92-34 230-240	4	128	560	5366	3.7	31	20	4019	5.35	629	5	ND	7	32	26.8	7	5	37	.40	.087	14	55	1.04	78	.19	9	2.45	.19	1.19	65
BD-92-34 240-250	1	99	306	5810	2.7	31	16	3983	5.28	133	5	ND	4	30	28.3	3	10	36	.41	.108	11	39	1.14	147	.22	2	2.05	.05	1.23	63
BD-92-34 250-260	3	121	202	12861	3.3	32	19	3838	5.46	61	5	ND	4	35	74.4	2	8	34	.42	.104	11	33	1.00	85	.21	2	1.94	.08	1.05	6
BD-92-34 260-270	4	110	206	9320	3.8	31	23	2998	5.83	404	5	ND	6	43	46.9	5	2	33	.35	.076	13	52	.74	70	.16	7	2.01	.18	1.07	10
BD-92-34 270-280	2	98	172	9536	3.5	30	20	2695	5.27	520	5	ND	6	44	45.8	3	4	32	.41	.082	13	34	.64	90	.14	4	1.74	.13	.91	26
BD-92-34 280-290	3	109	132	9706	3.1	29	19	3349	5.73	756	5	ND	6	49	47.6	4	2	38	.38	.086	13	56	.86	87	.16	12	2.46	.17	1.11	25
BD-92-34 290-300	1	11	18	616	.2	3	2	335	.56	51	5	ND	1	7	3.8	2	2	3	.07	.008	2	8	.08	27	.02	4	.23	.03	.09	4
BD-92-34 300-310	2	89	66	8574	1.8	31	17	3032	5.28	84	5	ND	10	37	39.0	3	7	34	.41	.071	15	35	.81	131	.15	9	2.06	.26	.86	4
RE BD-92-34 260-270	4	102	204	9079	4.2	30	23	2890	5.73	397	5	ND	6	41	47.0	3	8	31	.34	.073	12	51	.72	87	.16	4	1.94	.18	1.04	6
BD-92-34 310-320	6	112	161	11778	4.1	37	22	3701	7.31	341	5	ND	6	37	66.2	5	9	40	.35	.079	13	81	.77	68	.16	2	2.18	.15	.74	4
BD-92-34 320-330	5	113	211	11446	3.6	34	22	3804	6.40	307	5	ND	4	27	62.4	6	8	35	.36	.091	11	69	.85	79	.19	4	1.94	.06	.80	5
BD-92-34 330-340	3	82	98	6036	2.2	29	24	2864	5.64	145	5	ND	11	33	29.7	2	3	32	.37	.058	17	59	.82	99	.12	3	2.32	.31	.63	20
BD-92-34 340-350	3	72	92	11994	2.3	26	20	3124	5.43	62	5	ND	11	35	65.8	2	4	31	.42	.059	17	44	.81	89	.13	2	2.01	.31	.61	2
STANDARD C	18	56	39	134	7.6	68	32	1053	3.96	42	19	7	37	54	19.1	15	18	57	.50	.084	39	60	.91	189	.09	35	1.88	.06	.14	10

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

Granges Inc. PROJECT BLACKWATER-DAVIDSON FILE # 93-0020

SAMPLE#	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm
BD-92-34 350-360	2	78	83	3733	2.8	33	21	2872	6.21	99	5	ND	10	49	16.3	3	2	29	.98	.060	17	42	.71	61	.12	2	1.92	.34	.66	53
BD-92-34 360-370	2	52	96	2130	1.9	20	14	1795	3.71	123	5	ND	5	24	9.7	3	2	17	.26	.037	10	52	.43	76	.08	7	1.33	.18	.32	33
BD-92-34 370-380	7	109	153	4956	4.2	37	27	3392	7.45	228	5	ND	8	42	23.3	2	2	33	.48	.073	16	92	.82	52	.15	8	2.46	.26	.81	46
BD-92-34 380-390	7	158	333	5232	4.4	38	21	3532	7.53	263	5	ND	8	37	29.8	2	2	33	.45	.074	15	89	.88	100	.15	4	2.59	.22	.90	79
BD-92-34 390-400	7	172	201	6221	4.6	32	20	3385	6.82	466	5	ND	8	46	33.9	5	2	35	.46	.077	16	129	.83	80	.14	14	3.08	.25	1.08	28
BD-92-34 430-440	6	377	109	7083	4.3	41	21	2779	5.82	88	5	ND	8	53	30.3	3	2	33	.44	.087	19	86	.53	67	.16	18	2.37	.23	.88	13
BD-92-36 70-80	5	121	1080	2344	4.3	28	15	5475	4.65	104	5	ND	10	39	12.7	2	2	31	.55	.081	21	60	1.19	97	.10	6	2.76	.32	.67	26
BD-92-36 80-90	4	84	831	1737	3.7	34	13	5462	4.46	38	5	ND	11	43	8.9	2	2	28	.63	.079	23	49	1.11	104	.08	7	2.51	.33	.43	24
BD-92-36 90-100	2	67	596	1944	4.0	26	8	5031	3.60	11	5	ND	11	34	11.9	2	2	18	.49	.053	20	44	.76	86	.05	4	1.92	.30	.40	56
BD-92-36 100-110	5	74	664	2077	3.3	25	7	2951	3.16	7	5	ND	8	27	14.2	2	2	12	.33	.046	15	27	.49	62	.03	3	1.21	.16	.31	86
RE BD-92-36 70-80	4	116	1105	2118	4.2	28	15	5458	4.63	90	5	ND	10	38	12.7	2	3	30	.55	.080	21	62	1.18	97	.10	7	2.73	.32	.66	28
BD-92-36 110-120	6	64	477	1723	2.1	18	8	3209	3.17	14	5	ND	7	26	10.4	2	2	17	.36	.055	17	53	.65	79	.06	3	1.69	.17	.70	30
STANDARD C	20	57	38	126	7.0	69	31	999	3.96	39	16	7	37	52	18.8	15	19	54	.50	.083	40	60	.90	191	.09	35	1.88	.07	.14	10

Sample type: PULP. Samples beginning 'RE' are duplicate samples.

APPENDIX III

WHOLE ROCK GEOCHEMISTRY

Granges Inc.

Blackwater - Davidson Project

Sample No	24621	24622	24705	24633	24601	24602
Location	surface	surface	surface	surface	DAV-11	DAV-11
Rocktype	Rhy 1	Rhy 2	Rhy 2	Rhy 1	And	Dac
Texture	flow	frag	frag	?	frag	flow
ID No.	1	2	3	4	5	6
All Data						
SiO2 wt%	71.10	69.20	69.20	74.20	58.70	69.20
TiO2	0.28	0.38	0.47	0.17	1.07	0.34
TiO2 (Dav-11)					1.07	0.34
TiO2 (B-D, Surf.)	0.28	0.38	0.47	0.17		
TiO2 (Capoose)						
TiO2 (BD92-32)						
TiO2 (BD92-33, 36)						
TiO2 (BD92-34, 35)						
Al2O3	14.30	13.60	14.10	13.50	17.10	13.10
Fe2O3	1.98	2.75	3.31	1.43	7.46	2.37
MnO	0.09	0.10	0.11	0.17	0.87	0.21
MgO	0.47	0.48	1.13	0.22	1.65	0.33
CaO	1.93	1.81	2.16	0.67	0.94	0.35
Na2O	4.17	4.15	4.22	2.00	1.72	0.27
K2O	2.85	3.71	3.76	4.23	4.54	6.41
P2O5	0.06	0.13	0.16	0.03	0.44	0.11
CO2	0.01	0.90	0.01	0.41	0.39	0.14
S	0.01	0.02	0.01	0.18	0.93	1.01
LOI	2.35	2.65	0.85	1.70	4.00	2.40
Total	99.87	100.26	99.96	99.08	100.88	96.58
Zr ppm	143	102	113	106	186	121
Y	2.8	8.3	6.3	4.5		
Nb	14	21	19	15	13	13
Hf	4.6	3.8	4	3.5	4.9	3.9
Th	11	12	13	12	7.8	10
Ba	1100	680	720	970	1200	2000
Cu	3.4	18.8	12.7	4.8	72.3	49.8
Pb	12	9	2	20	488	2690
Zn	13.7	45.5	46.7	626	7070	12700
Sb	5.1	1.7	0.8	8.9	39	41
As	16	9	4	18	35	13
Ag	0.3	0.3	0.1	0.1	2.7	13.1
Au ppb	2	2	2	2	6	5
Hg	5	7	5	206	9	26

Granges Inc.

Blackwater - Davidson Project

Sample No	24621	24622	24705	24633	24601	24602
Location	surface	surface	surface	surface	DAV-11	DAV-11

Blackwater - David

Sample No	24603	24604	24605	24606	24607	24608	24609
Location	DAV-11	DAV-11	DAV-11	DAV-11	DAV-11	DAV-11	DAV-11
Rocktype	And	Dac	And	Rhy 1	And	Rhy 1	And
Texture	frag	frag	flow	?	frag	?	frag
ID No.	7	8	9	10	11	12	13

All Data

SiO2 wt%	59.20	71.10	56.70	71.90	62.80	73.80	63.50
TiO2	1.03	0.36	1.03	0.16	0.62	0.13	0.72
TiO2 (Dav-11)	1.03	0.36	1.03	0.16	0.62	0.13	0.72
TiO2 (B-D, Surf.)							
TiO2 (Capoose)							
TiO2 (BD92-32)							
TiO2 (BD92-33, 36)							
TiO2 (BD92-34, 35)							
Al2O3	17.30	13.40	16.90	11.90	15.50	13.10	15.40
Fe2O3	8.92	2.68	9.37	5.83	9.00	1.51	8.04
MnO	0.80	0.33	1.23	0.13	0.83	0.04	0.61
MgO	0.83	0.37	1.62	0.29	1.05	0.13	0.69
CaO	0.85	0.36	0.85	0.23	0.53	0.23	0.48
Na2O	0.23	0.18	0.88	0.01	0.10	0.11	0.17
K2O	5.75	5.09	5.74	3.81	6.23	7.48	5.88
P2O5	0.44	0.11	0.44	0.03	0.25	0.03	0.19
CO2	0.44	0.25	0.51	0.57	0.26	0.01	0.26
S	0.46	0.74	0.82	3.10	0.67	0.64	0.61
LOI	3.70	2.80	3.95	4.40	2.80	1.85	2.80
Total	100.98	98.12	101.07	102.52	101.25	99.20	100.06
Zr ppm	172	109	192	87	170	81	156
Y							
Nb	12	12	13	13	13	14	12
Hf	5.2	3.5	5.2	2.9	4.8	2.8	4.4
Th	7.3	9.3	7.8	8.7	8.9	10	8.3
Ba	940	780	1400	200	1300	1800	1200
Cu	54.7	66.5	50.9	208	68.5	75.1	95.4
Pb	30	2410	19	471	57	39	167
Zn	1220	9210	316	757	3690	3480	7260
Sb	13	26	13	200	16	17	17
As	39	41	6	98	43	110	130
Ag	1	9.5	1.2	6.4	2.1	1	3.6
Au ppb	2	38	100	2000	46	150	210
Hg	5	21	5	9	9	16	16

Granges Inc.

Blackwater - David

Sample No	24603	24604	24605	24606	24607	24608	24609
Location	DAV-11	DAV-11	DAV-11	DAV-11	DAV-11	DAV-11	DAV-11
Rocktype	And	Dac	And	Rhy 1	And	Rhy 1	And
Texture	frag	frag	flow	?	frag	?	frag

Granges Inc.

Blackwater - David

Sample No	24610	24611	24612	24635	24636	24637	24638
Location	DAV-11	DAV-11	DAV-11	Capoose	Capoose	Capoose	Capoose
Rocktype	Rhy 1	And	Dac	Dac	Rhy 1	Rhy 1	Rhy 1
Texture	?	flow	frag				int ?
ID No.	14	15	16	17	18	19	20
All Data							
SiO2 wt%	72.20	58.80	69.40	67.60	74.40	72.60	76.10
TiO2	0.16	0.93	0.29	0.45	0.17	0.19	0.14
TiO2 (Dav-11)	0.16	0.93	0.29				
TiO2 (B-D, Surf.)							
TiO2 (Capoose)				0.45	0.17	0.19	0.14
TiO2 (BD92-32)							
TiO2 (BD92-33, 36)							
TiO2 (BD92-34, 35)							
Al2O3	14.00	16.40	12.90	15.20	13.10	13.40	12.30
Fe2O3	3.89	10.20	3.21	3.17	2.36	1.73	1.27
MnO	0.08	0.90	0.27	0.90	1.93	0.19	1.48
MgO	0.36	0.95	0.22	0.98	0.33	0.24	0.24
CaO	0.22	0.68	0.26	2.45	0.36	0.28	0.41
Na2O	0.07	0.12	0.22	0.21	0.01	0.12	0.01
K2O	4.51	7.31	5.47	6.92	3.76	7.80	4.93
P2O5	0.03	0.38	0.06	0.17	0.03	0.04	0.03
CO2	0.01	0.13	0.34	0.06	0.01	0.01	0.01
S	1.84	0.28	1.53	0.19	0.15	0.81	0.07
LOI	3.90	2.20	3.10	1.35	2.10	1.65	1.65
Total	101.44	100.21	97.55	100.10	98.88	99.25	98.78
Zr ppm	88	191	100	153	104	111	83
Y				2.5	1.3	2.1	3.8
Nb	14	13	16	12	14	12	16
Hf	3.3	5	3	4.5	3.4	3.6	3
Th	9.9	7.8	9.5	8.9	5.3	10	7.1
Ba	340	1500	1200	2100	240	2200	440
Cu	298	50	130	14.6	3.9	65.2	6.3
Pb	320	30	24	32	20	60	25
Zn	2110	2700	12200	871	21.8	18.3	107
Sb	68	10	14	4.4	1.7	2	7.4
As	270	32	130	41	290	8	150
Ag	5.5	1.2	1.7	0.3	2.2	2.2	0.1
Au ppb	1000	10	400	42	69	22	5
Hg	9	10	47	5	7	5	5

Granges Inc.

Blackwater - David

Sample No	24610	24611	24612	24635	24636	24637	24638
Location	DAV-11	DAV-11	DAV-11	Capoose	Capoose	Capoose	Capoose

Granges Inc.

Blackwater - David* 1992 drilling

Sample No	50601	50602	50603	50604	50605	50606	50607
Location	BD92-32	BD92-32	BD92-32	BD92-32	BD92-32	BD92-33	BD92-33
Rocktype	Interm.	sdst.	felsic	felsic	felsic	interm.	felsic
Texture	frag.		flow	flow	frag.	frag	flow
ID No.	21	22	23	24	25	26	27
	21	22	23	24	25	26	27
All Data							
SiO2 wt%	73.60	57.50	77.80	74.90	80.10	56.40	77.40
TiO2	0.36	1.11	0.11	0.13	0.13	0.93	0.16
TiO2 (Dav-11)							
TiO2 (B-D, Surf.)							
TiO2 (Capoose)							
TiO2 (BD92-32)	0.36		0.11	0.13	0.13		
TiO2 (BD92-33, 36)						0.93	0.16
TiO2 (BD92-34, 35)							
Al2O3	14.80	18.30	13.10	14.70	12.60	16.10	13.50
Fe2O3	2.73	9.67	0.62	1.20	0.98	7.46	1.98
MnO	0.37	0.49	0.02	0.03	0.02	2.13	0.15
MgO	0.53	1.11	0.15	0.24	0.23	3.06	0.15
CaO	1.33	1.68	0.37	0.38	0.52	2.07	0.14
Na2O	0.26	2.27	0.03	0.07	0.10	2.38	0.02
K2O	3.83	6.71	7.20	6.86	3.56	3.85	4.55
P2O5	0.04	0.67	0.03	0.03	0.04	0.37	0.05
CO2	0.55	0.21	0.10	0.19	0.19	2.01	0.03
S	0.11	0.49	0.01	0.17	0.09	0.16	0.01
LOI	2.60	2.10	1.06	1.60	2.00	4.45	2.10
Total	101.47	102.31	100.71	100.63	100.68	102.30	100.40
Zr ppm	147	174	73	84	81	195	93
Y	4	24	2	7	4	2	2
Nb	13	9	12	16	17	12	15
Hf							
Th							
Ba	606	1090	2180	1550	431	1110	292
Cu	3.7	124	6.9	19.2	5.5	67.8	33
Pb	360	16	6	18	2	6	767
Zn	1900	116	8.8	14.9	3.1	2760	186
Sb							
As	3	276	19	8	11	9	118
Ag	0.9	0.6	0.1	0.1	0.1	2	7.8
Au ppb							
Hg							

Granges Inc.

Blackwater - David* 1992 drilling

Sample No	50601	50602	50603	50604	50605	50606	50607
Location	BD92-32	BD92-32	BD92-32	BD92-32	BD92-32	BD92-33	BD92-33

Granges Inc.

Blackwater - David

Sample No	50610	50611	50612	50613	50614	50615	50616
Location	BD92-33	BD92-33	BD92-33	BD92-33	BD92-33	BD92-34	BD92-34
Rocktype	felsic	felsic	felsic	felsic	felsic	interm.	interm.
Texture	flow	frag.	frag.	frag.	frag.	frag.	frag.
ID No.	28	29	30	31	32	33	34
	28	29	30	31	32	33	34
All Data							
SiO2 wt%	78.20	71.20	76.20	76.00	73.90	63.40	60.50
TiO2	0.16	0.30	0.16	0.15	0.14	0.80	0.87
TiO2 (Dav-11)							
TiO2 (B-D, Surf.)							
TiO2 (Capoose)							
TiO2 (BD92-32)							
TiO2 (BD92-33, 36)	0.16	0.30	0.16	0.15	0.14		
TiO2 (BD92-34, 35)						0.80	0.87
Al2O3	13.60	14.30	13.50	13.40	13.90	15.80	15.30
Fe2O3	1.45	3.76	3.43	2.05	1.93	6.83	8.14
MnO	0.07	0.34	0.10	0.09	0.06	0.45	0.73
MgO	0.14	0.21	0.18	0.14	0.10	1.53	1.68
CaO	0.14	0.20	0.14	0.14	0.14	0.19	0.63
Na2O	0.01	0.14	0.04	0.07	0.08	0.10	0.21
K2O	4.06	7.57	4.22	5.96	7.48	7.09	4.55
P2O5	0.03	0.06	0.03	0.03	0.03	0.27	0.38
CO2	0.02	0.18	0.33	0.09	0.10	0.02	1.36
S	0.01	0.90	1.17	0.51	0.51	0.82	2.50
LOI	2.05	1.86	3.05	2.00	1.50	3.60	5.80
Total	100.11	101.31	102.71	100.77	100.00	101.69	103.51
Zr ppm	94	105	98	87	93	165	174
Y	2	2	6	3	2	2	2
Nb	16	16	14	16	14	15	12
Hf							
Th							
Ba	194	892	196	620	751	1090	762
Cu	16.1	44.3	83.4	36.6	83.3	136	180
Pb	366	29	7	48	29	676	54
Zn	93.3	1510	2960	1140	318	2380	12100
Sb							
As	9	40	20	41	59	33	38
Ag	4.5	0.9	1	1.1	0.9	10.6	3.4
Au ppb							
Hg							

Granges Inc.

Blackwater - David

Sample No	50610	50611	50612	50613	50614	50615	50616
Location	BD92-33	BD92-33	BD92-33	BD92-33	BD92-33	BD92-34	BD92-34

Granges Inc.

Blackwater - David

Sample No	50617	50618	50621	50622	50626	50627
Location	BD92-34	BD92-34	BD92-36	BD92-36	BD92-35	BD92-35
Rocktype	interm.	interm.	interm.	felsic	felsic	interm.
Texture	frag.	frag.	frag.	frag.	frag.	frag.
ID No.	35	36	37	38	39	40
	35	36	37	38	39	40
All Data						
SiO2 wt%	61.00	59.20	57.30	74.30	77.10	58.80
TiO2	1.00	0.99	0.98	0.14	0.14	1.02
TiO2 (Dav-11)						
TiO2 (B-D, Surf.)						
TiO2 (Capoose)						
TiO2 (BD92-32)						
TiO2 (BD92-33, 36)			0.98	0.14		
TiO2 (BD92-34, 35)	1.00	0.99			0.14	1.02
Al2O3	16.30	15.90	16.10	14.00	13.90	17.00
Fe2O3	9.96	10.80	10.50	1.28	1.42	9.71
MnO	1.20	0.73	0.62	0.03	0.06	0.77
MgO	1.31	1.20	2.82	0.11	0.23	2.90
CaO	0.59	0.57	0.99	0.20	0.13	0.78
Na2O	0.20	0.25	2.45	0.18	0.03	0.17
K2O	5.36	4.68	4.02	8.25	4.74	6.34
P2O5	0.32	0.37	0.39	0.06	0.03	0.31
CO2	0.07	0.02	0.15	0.02	0.02	0.02
S	1.52	2.16	1.50	0.43	0.04	0.42
LOI	2.95	3.60	4.05	1.45	2.15	2.70
Total	102.77	101.46	102.85	100.60	100.13	101.96
Zr ppm	186	184	182	98	95	193
Y	2	2	2	2	2	3
Nb	12	13	13	15	17	13
Hf						
Th						
Ba	945	818	930	1240	514	1270
Cu	109	178	176	39	10.1	173
Pb	92	40	277	102	119	133
Zn	9500	13000	4370	2180	60.4	4420
Sb						
As	6	15	3	4	20	26
Ag	1.9	2.5	9.3	1.2	2.8	5.2
Au ppb						
Hg						

Granges Inc.

Blackwater - David

Sample No	50617	50618	50621	50622	50626	50627
Location	BD92-34	BD92-34	BD92-36	BD92-36	BD92-35	BD92-35

Granges Inc.

Blackwater - David

Sample No	50629	50630	50632
Location	BD92-35	BD92-35	BD92-35
Rocktype	interm.	interm.	interm.
Texture	frag.	flow	flow
ID No.	42	43	44
	42	43	44

All Data

SiO2 wt%	59.00	57.00	57.00
TiO2	0.87	1.06	1.00
TiO2 (Dav-11)			
TiO2 (B-D, Surf.)			
TiO2 (Capoose)			
TiO2 (BD92-32)			
TiO2 (BD92-33, 36)			
TiO2 (BD92-34, 35)	0.87	1.06	1.00
Al2O3	16.20	16.10	15.60
Fe2O3	10.10	13.10	13.30
MnO	0.82	0.57	0.57
MgO	1.95	2.58	2.33
CaO	0.31	0.69	0.61
Na2O	0.13	0.13	0.06
K2O	6.45	6.07	6.10
P2O5	0.20	0.41	0.37
CO2	0.01	0.11	0.03
S	0.96	1.57	2.23
LOI	2.90	2.90	3.15
Total	100.77	103.35	103.35
Zr ppm	176	180	175
Y	6	2	2
Nb	14	13	14
Hf			
Th			
Ba	840	937	954
Cu	46.5	129	230
Pb	4	8	25
Zn	8290	8450	2520
Sb			
As	136	51	367
Ag	1.2	1.4	2.2
Au ppb			
Hg			

Granges Inc.

Blackwater - David

Sample No	50629	50630	50632
Location	BD92-35	BD92-35	BD92-35

X-RAY ASSAY LABORATORIES 06-JAN-93 REPORT ----- REF. 13942 PAGE 1

SAMPLE	LI PPM ICP	BE PPM ICP	CO2 % COULOM	NA % ICP	NA2O % WR	MG % ICP	MGO % WR	AL % ICP	AL2O3 % WR	SIO2 % WR	P % ICP
50601	41	1.2	.55	.09	.25	.14	.53	1.51	14.8	73.5	<.01
50602	61	1.3	.21	.06	2.27	.51	1.11	2.48	18.3	57.5	.27
50603	<1	<.5	.10	.02	.03	<.01	.15	.36	13.1	77.8	<.01
604	2	<.5	.19	.02	.07	.01	.24	.44	14.7	74.9	<.01
605	1	<.5	.19	.04	.10	.01	.23	.54	12.5	80.1	<.01
0606	68	.8	2.01	.11	2.38	1.72	3.06	2.76	16.1	56.4	.16
50607	2	<.5	.03	.02	.02	<.01	.15	.57	13.5	77.4	.01
50610	<1	<.5	.02	.02	<.01	<.01	.14	.52	13.6	78.2	<.01
50611	8	.8	.18	.02	.14	.05	.21	.65	14.3	71.2	.01
50612	2	.6	.33	.02	.04	.01	.18	.47	13.5	75.2	<.01
50613	<1	.5	.09	.02	.07	.02	.14	.48	13.4	76.0	<.01
50614	<1	.6	.10	.02	.08	<.01	.10	.41	13.9	73.9	<.01
50615	18	1.1	.02	.02	.10	.80	1.53	1.90	15.8	63.4	.11
50616	17	1.2	1.35	.02	.21	.74	1.58	1.35	15.3	60.5	.16
50617	33	1.5	.07	.02	.20	.54	1.31	1.75	16.3	61.0	.12
50618	19	1.7	.02	.02	.25	.52	1.20	1.60	15.9	59.2	.14
50621	67	1.6	.15	.06	2.45	1.59	2.82	2.79	16.1	57.3	.16
50622	<1	<.5	.02	.02	.18	.01	.11	.40	14.0	74.3	.01
50626	2	<.5	.02	.02	.03	.01	.23	.52	13.9	77.1	<.01
50627	67	1.6	.02	.07	.17	1.53	2.90	4.15	17.0	58.8	.12
50628	2	<.5	.01	.02	.15	.01	.24	.56	14.6	73.3	<.01
50629	62	1.4	.01	.02	.13	.98	1.95	3.26	16.2	59.0	.07
50630	49	1.9	.11	.03	.13	1.29	2.58	3.52	16.1	57.0	.16
50632	51	2.1	.03	.03	.06	1.21	2.33	3.29	15.6	57.0	.15
XRA CONTROL	--	--	--	--	--	--	--	--	--	--	--
SY-2	--	--	--	--	4.24	--	2.68	--	12.2	60.6	--
SY-2	--	--	--	--	4.30	--	2.68	--	12.2	60.5	--
WET LAB CONTROL	--	--	46.5	--	--	--	--	--	--	--	--
DCP CONTROL	7	<.5	--	.03	--	.27	--	.64	--	--	.03
50601	40	1.3	.55	.09	.23	.14	.52	1.52	14.9	73.6	<.01
50615	17	1.0	.03	.02	--	.74	--	1.79	--	--	.10
50617	--	--	--	--	--	--	--	--	--	--	--

SAMPLE	P2O5 % WR	S % LECO	K % ICP	K2O % WR	CA % ICP	CAO % WR	SC PPM ICP	TI % ICP	TIO2 % WR	V PPM ICP	CR PPM ICP
50601	.04	.11	.63	3.83	.75	1.33	.6	.01	.359	6	70
50602	.67	.49	1.58	5.71	.78	1.58	6.2	.12	1.11	102	60
50603	.03	.01	.34	7.20	.09	.37	<.5	<.01	.110	<2	191
50604	.03	.17	.38	6.86	.18	.38	<.5	<.01	.130	<2	161
50605	.04	.09	.33	3.56	.24	.52	<.5	<.01	.126	<2	188
50606	.37	.16	.53	3.85	.96	2.07	5.4	.08	.930	105	108
50607	.05	<.01	.51	4.55	.02	.14	<.5	<.01	.159	<2	120
50610	.03	<.01	.43	4.05	.01	.14	<.5	<.01	.163	<2	87
50611	.05	.90	.55	7.57	.04	.20	<.5	<.01	.297	8	127
50612	.03	1.17	.43	4.22	.02	.14	<.5	<.01	.161	2	154
50613	.03	.51	.42	5.96	.01	.14	<.5	<.01	.146	<2	179
50614	.03	.51	.41	7.48	.02	.14	<.5	<.01	.135	2	104
50615	.27	.82	.54	7.09	.05	.19	3.2	.04	.796	58	132
50616	.38	2.50	.40	4.55	.34	.63	1.3	<.01	.867	36	97
50617	.32	1.52	1.31	5.36	.28	.59	1.7	.08	.995	56	98
50618	.37	2.16	.78	4.68	.30	.57	1.3	.04	.989	56	84
50621	.39	1.50	.33	4.02	.47	.99	4.8	.03	.978	91	100
50622	.05	.43	.41	8.25	.03	.20	<.5	<.01	.143	<2	114
50626	.03	.04	.49	4.74	<.01	.13	<.5	<.01	.141	<2	228
50627	.31	.42	2.71	6.34	.44	.78	5.7	.24	1.02	100	84
50628	.03	1.14	.49	5.96	<.01	.13	<.5	<.01	.159	2	158
50629	.20	.96	2.40	6.45	.13	.31	4.2	.25	.871	79	97
50630	.41	1.57	2.77	6.07	.38	.69	4.0	.27	1.06	88	143
50632	.37	2.23	2.63	6.10	.34	.61	3.4	.30	1.00	88	103
XRA CONTROL	--	--	--	--	--	--	--	--	--	--	--
SY-2	.43	--	--	4.48	--	7.98	--	--	.147	--	--
SY-2	.43	--	--	4.47	--	7.98	--	--	.146	--	--
WET LAB CONTROL	--	--	--	--	--	--	--	--	--	--	--
DCP CONTROL	--	--	.04	--	.34	--	1.0	.06	--	24	75
50601	.04	--	.62	3.84	.77	1.33	.6	.02	.368	7	76
50615	--	--	.50	--	.05	--	2.9	.04	--	54	122
50617	--	--	--	--	--	--	--	--	--	--	--

SAMPLE	CR2O3 % WR	MN % ICP	MNO % WR	FE % ICP	FE2O3 % WR	CO PPM ICP	NI PPM ICP	CU PPM ICP	ZN PPM ICP	AS PPM ICP	RB PPM XRF
50601	.02	.16	.37	1.29	2.73	3	8	3.7	1900	<3	138
50602	.01	.16	.49	5.78	9.67	17	1	124	115	276	140
50603	.04	<.01	.02	.23	.62	<1	3	6.9	8.8	19	142
50604	.04	<.01	.03	.51	1.20	<1	7	19.2	14.9	8	125
50605	.04	<.01	.02	.39	.98	<1	3	5.5	3.1	11	86
50606	.02	1.65	2.13	4.77	7.46	20	143	57.8	2760	9	111
50607	.02	.06	.15	.82	1.98	<1	1	33.0	186	118	127
50610	.02	<.01	.07	.58	1.45	<1	3	16.1	93.3	9	110
50611	.02	.10	.34	2.23	3.76	2	8	44.3	1510	40	137
50612	.04	.03	.10	1.71	3.43	5	11	83.4	2950	20	111
613	.04	.03	.09	1.02	2.05	2	3	36.6	1140	41	135
514	.03	.03	.06	1.06	1.93	2	4	83.3	318	59	140
0615	.02	.26	.45	4.55	6.83	10	11	135	2380	33	115
50616	.03	.43	.73	5.13	8.14	15	23	180	12100	38	85
50617	.02	.18	1.20	5.51	9.96	18	34	109	9500	6	109
50618	.02	.23	.73	6.41	10.8	21	34	178	13000	15	112
50621	.02	.32	.62	6.95	10.5	23	22	176	4370	<3	92
50622	.03	<.01	.03	.55	1.28	2	5	39.0	2180	4	159
50626	.04	<.01	.06	.42	1.42	<1	3	10.1	60.4	20	102
50627	.02	.35	.77	6.15	9.71	15	19	173	4420	26	131

SAMPLE	CR2O3 % WR	MN % ICP	MNO % WR	FE % ICP	FE2O3 % WR	CO PPM ICP	NI PPM ICP	CU PPM ICP	ZN PPM ICP	AS PPM ICP	RB PPM XRF
50628	.03	<.01	.06	.98	2.21	9	11	83.9	7170	375	113
50629	.02	.40	.82	6.30	10.1	15	25	46.5	8290	135	168
50630	.03	.26	.57	8.09	13.1	18	24	129	8450	51	110
50632	.02	.26	.57	8.67	13.3	29	28	230	2520	367	114
A CONTROL	--	--	--	--	--	--	--	--	--	--	214
.-2	<.01	--	.33	--	6.43	--	--	--	--	--	--
SY-2	<.01	--	.33	--	6.40	--	--	--	--	--	--
WET LAB CONTROL	--	--	--	--	--	--	--	--	--	--	--
DCP CONTROL	--	.01	--	1.17	--	5	10	11.1	14.5	<3	--
50601	.02	.17	.37	1.33	2.74	4	7	4.7	1930	4	138
50615	--	.24	--	4.18	--	9	10	125	2200	28	--
50617	--	--	--	--	--	--	--	--	--	--	110

SAMPLE	SR PPM ICP	Y PPM XRF	Y PPM ICP	ZR PPM XRF	ZR PPM ICP	NB PPM XRF	MO PPM ICP	AG PPM ICP	CD PPM ICP	SN PPM ICP	SB PPM ICP
50601	35.3	4	3.0	147	7.3	13	3	.9	18	<10	6
50602	43.1	24	14.2	174	<.5	9	4	.6	<1	<10	33
50603	6.5	<2	5.8	73	9.5	12	6	<.1	<1	<10	11
50604	9.0	7	8.2	84	10.5	16	8	<.1	<1	<10	17
50605	37.5	4	6.2	81	12.3	17	4	<.1	<1	<10	9
50606	35.9	2	6.2	195	3.2	12	3	2.0	<1	<10	6
50607	2.0	<2	3.2	93	9.1	15	2	7.8	<1	<10	19
50610	1.3	<2	4.3	94	10.6	16	4	4.5	<1	<10	11
50611	18.7	2	4.3	105	14.5	15	3	.9	11	<10	6
50612	2.1	6	3.9	98	12.1	14	6	1.0	25	<10	11
50613	5.4	3	3.9	87	14.8	16	6	1.1	10	<10	12
50614	6.0	<2	5.1	93	18.0	14	6	.9	<1	<10	11
50615	18.0	<2	5.3	165	5.8	15	3	10.6	42	<10	13
50616	54.9	<2	5.2	174	3.0	12	5	3.4	90	<10	6
50617	42.3	<2	4.1	186	1.9	12	<1	1.9	44	<10	<5
50618	58.8	<2	3.7	184	1.8	13	1	2.5	77	<10	6
50621	37.4	<2	5.2	182	.7	13	<1	9.3	31	<10	6
50622	7.2	<2	3.2	98	11.0	15	4	1.2	15	<10	5
50626	5.3	<2	4.7	95	10.4	17	5	2.8	<1	<10	6
50627	57.3	3	5.2	193	3.0	13	3	5.2	46	<10	7
50628	5.1	<2	5.2	98	17.9	14	3	.8	5	<10	7
50629	11.2	6	6.7	176	5.5	14	2	1.2	19	<10	9
50630	17.2	<2	6.0	180	.8	13	1	1.4	59	<10	9
50632	18.3	<2	4.4	175	<.5	14	2	2.2	3	<10	9
XRA CONTROL	--	128	--	289	--	24	--	--	--	--	--
SY-2	--	--	--	--	--	--	--	--	--	--	--
SY-2	--	--	--	--	--	--	--	--	--	--	--
WET LAB CONTROL	--	--	--	--	--	--	--	--	--	--	--
DCP CONTROL	6.1	--	2.5	--	1.5	--	2	.1	<1	<10	<5
50601	35.8	6	3.2	150	7.4	14	3	1.5	19	<10	9
50615	17.0	--	5.0	--	4.6	--	3	9.6	38	<10	12
50617	--	4	--	188	--	14	--	--	--	--	--

SAMPLE	BA PPM XRF	BA PPM ICP	W PPM ICP	PB PPM ICP	BI PPM ICP	LOI % WR	SUM % WR
50601	605	126	<10	350	<3	2.60	100.4
50602	1090	187	<10	16	<3	2.10	100.5
50603	2180	108	<10	6	<3	1.05	100.5
50604	1550	84	<10	18	<3	1.60	100.2
50605	431	47	<10	<2	<3	2.00	100.2
50606	1110	56	<10	6	<3	4.45	99.2
50607	292	28	<10	767	<3	2.10	100.2
50610	194	18	<10	366	<3	2.05	99.9
50611	892	37	<10	29	<3	1.85	99.9
50612	195	18	<10	7	5	3.05	100.1
50613	620	28	<10	48	5	2.00	100.1
50614	751	29	<10	29	<3	1.50	99.3
50615	1090	45	<10	676	13	3.60	100.1
50616	762	40	<10	54	<3	5.80	98.8
50617	946	194	<10	92	5	2.95	100.2
50618	818	127	<10	40	7	3.60	98.3
50621	930	47	<10	277	16	4.05	100.2
50622	1240	49	<10	102	<3	1.45	100.0
50626	514	145	<10	119	<3	2.15	100.0
50627	1270	347	<10	133	<3	2.70	100.5
50628	805	46	<10	26	<3	2.50	99.4
50629	840	141	<10	4	<3	2.90	98.9
50630	937	412	<10	8	<3	2.90	100.6
50632	954	241	<10	25	7	3.15	100.4
XRA CONTROL	433	--	--	--	--	--	--
SY-2	--	--	--	--	--	.00	99.5
SY-2	--	--	--	--	--	.00	99.4
WET LAB CONTROL	--	--	--	--	--	--	--
DCP CONTROL	--	26	<10	2	4	--	--
50601	625	126	22	364	<3	2.65	100.6
50615	--	42	<10	626	10	--	--
517	980	--	--	--	--	--	--

APPENDIX IV

PETROGRAPHIC REPORTS

PETROGRAPHIC REPORT ON 29 THIN SECTIONS FROM THE BLACKWATER-DAVIDSON PROPERTY, B.C.

Report for: Gordon Allen
Granges Inc.
2300-885 West Georgia St.
Vancouver, B.C.
V6T 2Z4.

Jan. 25, 1993

Your reference: letter dated November 22, 1992; Project 120.

Samples submitted: 50601-50620, 50621-50623, 50626-50632.

SUMMARY:

This suite of volcanic rocks ranges from very light coloured, flow banded felsic (rhyolite) to very dark, mafic (?basalt), with intermediate quartz andesites, andesites, and ?basaltic andesites. Whole-rock chemistry is helpful in making these classifications; the samples may be roughly divided as follows:

Flow-banded to fragmental, felsic, potassic, rhyolitic (50603, 4, 5, 7-14, 22, 26; 28 is possibly rhyodacitic). They are composed of clasts to 3 cm size of alternating layers of fine-grained quartz and variably clay-sericite altered K-feldspar.

Fragmental to rarely porphyritic intermediate andesitic (50606, 15-21, 23, 30-32). These are composed of sericite pseudomorphs of plagioclase phenocrysts and quartz-biotite-sericite-sulfide after ?mafic phenocrysts, plus large rounded quartz-sulfide ?amygdules in some samples (30, 32) in a matrix consisting almost entirely of fine secondary biotite, sericite or clay.

Fragmental basalt or basaltic andesite (50627, 29), made up of dark biotite or sericite altered clasts to 3 cm diameter in a biotite-clay-sericite-quartz altered matrix.

One sample (50601) is a quartz-feldspar porphyry, possibly dacitic, and 50602 appears to be a fine gabbro or quartz diabase, consisting of albitized plagioclase, biotite altered mafics, and magnetite.

Alteration falls into one or two general categories: the felsic rocks are generally altered to clay-sericite-quartz (ẟ carbonate, generally dolomitic or ankeritic in a few; garnet is present in 50603, 14, 15). The intermediate to mafic rocks are altered to significant or major amounts of fine brown secondary biotite, sericite, quartz, or in some cases chlorite/hydrobiotite (possibly after secondary biotite), sericite and quartz. There could be pyrophyllite in 50626, and minor secondary K-spar in 50629. Much of this alteration is potassic, and this is reflected in the generally high K2O values for all samples (4-7%).

Sulfide mineralization is common in this suite, with many samples containing 2-5% clotty to disseminated sulfide

blebs, in places distributed along microfractures. Pyrrhotite is most common, but it is altered in many samples to a mixture of secondary pyrite and lesser marcasite, especially in the felsic volcanics where pyrite is more often dominant. Sphalerite is as widespread but less abundant (witness the 0.2 to 1.2% Zn values in most of the samples). Chalcopyrite is common but present in traces only, generally intimately bound as inclusions in sphalerite or rarely pyrrhotite (both sphalerite and chalcopyrite are intimately locked with gangues in these samples). Galena and arsenopyrite are rare, as Pb and As values of a few hundred ppm attest; silver minerals were not seen (Ag values are 10 g/t or less). Rutile is common as the altered TiO_2-bearing mineral in the more mafic samples; specular hematite also occurs in several.

Craig H.B. Leitch, Ph.D., P.Eng.

(604) 921-8780 or 666-4902

50601: CLAY-SERICITE, CHLORITE, BIOTITE ALTERED QUARTZ-FELDSPAR PORPHYRY CUT BY SPHALERITE-CARBONATE VEINS

Pale grey-green, fine-grained plagioclase porphyry cut by a fracture network of dark sphalerite (slightly magnetic due to ?pyrrhotite) and white ?carbonate that reacts slightly to cold dilute HCl. From hole BD92-32; geochem indicates a felsic volcanic with 73.6% SiO2, 14.8% Al2O3, 2.7% Fe2O3, 0.2% Zn, 350 ppm Pb; mineralogy in polished thin section is:

Clay-sericite (after feldspar, mainly)	50%
Quartz (phenocrysts)	5%
(groundmass; partly secondary)	25%
Chlorite	5%
Sphalerite	5%
Muscovite (partly after ?biotite)	5%
Biotite (secondary)	3%
Carbonate (dolomite?)	1%
Pyrrhotite, galena, chalcopyrite	1%
Rutile, sphene	<1%
Zircon	tr

This rock consists of quartz phenocrysts and vague relic plagioclase sites, plus scattered mafic sites (now sulfides and chlorite) in a fine matrix of quartz and clay-sericite. Veins are made up of sphalerite, minor carbonate and chlorite.

Quartz phenocrysts are clear and glassy, and up to 0.5 mm in diameter. They are euhedral to subhedral (broken in many cases), unstrained but crossed by many fractures.

Former plagioclase phenocrysts were up to 2 mm long and euhedral to subhedral; they are now completely replaced by fine-grained clay-sericite and minor ?quartz.

Former ?mafic phenocrysts are subhedral patches up to 0.75 mm across, now composed of fine subhedral flakes of pale green chlorite, or rarely quartz and brown secondary biotite (especially at rims), plus sulfides (sphalerite mainly). Equidimensional shapes suggest these may have been ?pyroxene. Scattered flakes of euhedral muscovite to 0.25 mm diameter may have originally been ?biotite. Zircon is found as large euhedral crystals up to 80 μm long.

The matrix consists of fine-grained anhedral, interlocking quartz (probably partly secondary) and clay-sericite, plus minor opaques (rutile or sphene, after former Ti-bearing minerals). The textures suggest abundant former shards and fragments up to 2.5 mm long, indicating a fine fragmental felsic volcanic (rhyolitic crystal-lapilli tuff).

Veins consist of massive sphalerite as subhedral crystals to 2.5 mm size, with occasional patches of fine-grained (0.05 mm) anhedral carbonate, subhedral pale green chlorite, and subhedral quartz. There is minor subhedral pyrrhotite to 0.25 mm diameter (partly altered to supergene pyrite/marcasite), and rare inclusions of chalcopyrite to 50 μm long; galena forms rare subhedral crystals to 0.4 mm across. Chlorite is length-slow, with weak birefringence and pleochroism indicating inter-mediate Fe:Mg ratios.

50602: ALBITE-BIOTITE-SERICITE ALTERED FINE GABBRO/DIABASE

Fine-grained gabbro or diabasic-textured rock consisting of white plagioclase crystals set in a mesh of dark mafics. Rock is weakly magnetic and shows weak reaction to cold dilute HCl; no sulfides visible in spite of 0.5 % S. From hole BD92-32; Na/Ca ratio of greater than 1, SiO2 of 67.6%, very high P2O5 of 0.7%, high K2O Of 6.7%m high Fe2O3 of 9.7%, anomalous As, Sb of 280, 33 ppm. Mineralogy in thin section is:

Plagioclase (albite)	60%
Biotite (secondary)	20%
Sericite (after feldspar, mainly)	10%
Quartz (mainly primary)	7%
Opaque (?martitized magnetite)	3%
Carbonate (?calcite)	<1%
Apatite	tr

Plagioclase forms slender euhedral crystals up to 2.5 mm long with relief less than adjacent quartz and extinction angles Y^010 of 18x indicating almost pure albite (An_{0-5}) compositions. Most show minor to moderate alteration to fine sericite and minor secondary biotite, especially along cleavage and fracture planes. Fine needles of apatite up to 0.25 mm long are found in the plagioclase; they could be primary - the P2O5 content is unusually high.

The mafic mineral of this rock has been entirely replaced by fine matted secondary brown biotite. The crystals were up to 1.5 mm across, but the shapes are controlled by the plagioclase crystals in a sub-ophitic texture so no guesses can be made as to the original mafic.

Quartz is found as scattered sub-to euhedral crystals to 1 mm across that crystallized last in interstices between the other minerals. Carbonate forms fine anhedral grains up to 0.35 mm across associated with opaque grains and some ?secondary or recrystallized quartz. There should be zircons in this rock (174 ppm) but I can't see any.

Although the alteration is non-destructive of texture, this is a well altered rock (secondary biotite, sericite, minor quartz as indicated by the high K2O content) and the plagioclase appears to be thoroughly albitized from an originally probably more calcic composition. There is no sulfide mineralization associated; the identity of the opaques remains unresolved. Original composition appears to be more silicic than most diabases, as indicated by the high SiO2 content, although TiO2 is over 1%.

<u>50603: WEAKLY CLAY-SERICITE-CARBONATE ALTERED, FLOW-BANDED, ?GARNET-BEARING RHYOLITE</u>

Pale grey-white to creamy, flow-banded ?rhyolite (SiO_2 77.8%, Al_2O_3 13.1%; K_2O 7.2%,; very low P_2O_5, TiO_2, MgO, MnO, Fe_2O_3) from hole BD92-32. Very low base metals, but high Ba (0.2%). Hand specimen is not magnetic and reacts only slightly to cold dilute HCl. Modal mineralogy in thin section is:

Quartz (partly secondary)	50%
K-feldspar (?largely primary)	35%
Clay-sericite	15%
Carbonate (?calcite)	<1%
Garnet (?)	<1%
Opaque	tr

The bulk of this rock consists of highly anhedral, irregular quartz 0.1-0.2 mm crystals in a matrix of variably sericitized feldspar; there are alternatin layers rich in feldspar and in quartz. Quartz aggregates to 1 mm diameter are rounded and composed of interlocking, strained grains similar in size to those in the matrix (about 0.1-0.2 mm on average; strong recrystallization evidenced by strongly sutured boundaries indicate some quartz may be secondary, or at least that significant recrystallization has taken place from the original volcanic state.

Feldspar also forms anhedral, irregular, tightly interlocking crystals up to 0.15 mm diameter, intersitial to the quartz. The relief significantly below quartz and the high K_2O, low Na_2O content of this rock suggests it is all K-feldspar, although no twinning can be seen. Most is at least mildly (to moderately) replaced by ultra-fine clay and sericite of up to 25 fm in diameter, plus minor carbonate as rare anhedral aggregates to 0.05 mm diameter. This may be calcite; it is hard to be sure when so little is present, but there is definite reaction to acid in places.

Rare euhedral crystals to 0.1 mm diameter of a high relief, brownish, isotropic mineral are likely to be garnet. Opaques are rare, forming fine (0.05 mm) sub- to euhedral crystals of unknown identity (possibly Fe-Ti oxides). They occur in quartz aggregates; a few high-relief, high-birefringence crystals also found in this location look to be ?zircons.

This is a weakly sericitized, possibly garnet-bearing, flow-banded rhyolite lacking in sulfide mineralization.

50604: SERICITIZED, FELSIC, K-SPAR RICH VOLCANIC FRAGMENTAL (BRECCIATED BY QUARTZ-MINOR CARBONATE-SERICITE MATRIX)

Pale grey-white to creamy, coarsely fragmental felsic volcanic rock characterized by large (several cm) highly irregular white fragments in a grey siliceous matrix, part of which bears sulfides (pyrite and magnetic pyrrhotite). Strong reaction to cold dilute HCl in certain places. From hole BD92-32, this is a felsic volcanic with 75% SiO_2, 15% Al_2O_3, 7% K_2O, and low Na, Ca, Mg, Mn and Fe; base metals are also low. Modal mineralogy in thin section is:

K-feldspar (partly sericitized)	60%
Quartz (largely secondary, matrix)	30%
Sericite, clay	15%
Carbonate (calcite)	3%
Opaque	2%

The large fragments in this rock are somewhat similar to 50603 in their composition (mainly K-feldspar) although different in texture, lacking the flow-banding with quartz. K-feldspar forms subhedral, feathery, interlocking crystals optically continuous up to about 0.5 mm in diameter. Most are strongly dusted by clay and partly altered to fine sericite. Minor quartz intersitial to or in some cases internal to the feldspar crystals appears to be secondary, but some euhedral quartz crystals of 0.2 mm size could be primary.

The matrix to the fragments consists largely of relatively coarse-grained, anhedral, highly strained quartz of up to 0.7 mm diameter. Swarms and trails of immature (irregular-shaped) fluid inclusions are abundant in this quartz, most appearing to be single-phase (?liquid) and therefore probably of low temperature, perhaps <150 xC. Some of the quartz has radial structure and/or faint traces of former chalcedonic texture. Several generations of veining are apparent, ending with thin stringers of 0.2 mm thickness, associated with minor carbonate (calcite) as anhedral to subhedral grains to 0.25 mm diameter. Sericite is also found as fine subhedral flakes up to 25 fm in diameter, aggregating to 0.1 mm across. In places, replacement of adjacent wallrock clasts has taken place by intense quartz replacement, leaving a net of "holy" quartz poikilitically enclosing remnants of clay-sericite altered feldspar.

Opaque is present as large irregular masses of sulfide to 1 cm across in this section, although formed of an- to subhedral individual crystals up to about 0.5 mm diameter. In summary, this appears to be a potassic felsic volcanic (rhyolite?) that has been significantly brecciated (possibly auto-brecciated) and veined/altered by abundant secondary silica and lesser sericite, with traces of carbonate and minor sulfides. Base and precious metals do not appear to be associated with this alteration.

<u>50605: STRONGLY SERICITE-MINOR QUARTZ/OPAQUE ALTERED, FLOW-BANDED FELSIC VOLCANIC (?RHYOLITE)</u>

Pale greenish-grey, fine-grained, strongly flow-banded rhyolite (12.6% Al_2O_3, 80% SiO_2, low MgO, MnO, Fe_2O_3, TiO_2, CaO, and Na_2O but high K_2O: ?5.6%). Also from hole BD92-32, very low base and precious metal contents. Hand specimen is non-magnetic, and there is no reaction to cold dilute HCl. A few 2-3 mm subhedral quartz (white) and ?relict feldspar (purplish-grey) phenocrysts are evident. Modal mineralogy in thin section is simple:

Quartz (?mainly primary)	50%
Sericite (?after feldspar)	45%
Relict feldspar	5%
Opaque	<1%
Sphene, rutile	<1%

This rock consists of about equal parts of coarsely crystalline, rounded to subhedral quartz in a matrix of fine sericite, probably after feldspar. The quartz crystals are up to 0.5 mm diameter, although they may aggregate to as much as 1 mm long in what appear to be former ?quartz eyes and/or lenses along the flow banding. The crystals are all highly strained, with undulose extinction, sutured grain boundaries, and a recrystallized appearance.

The intervening matrix consists of patches of low relief and low birefringence (?clay-altered K-feldspar) veined by and in general completely replaced by fine-grained, high birefringence sericite (subhedral flakes up to about 25 /m). In places, a fine network of fractures follows the areas between quartz grains, marked by fine opaques (20-50 /m) of uncertain identity, and very fine (5-15 /m grains of ?sphene or rutile. Secondary quartz grows perpendicular to some of these fractures, especially where opaques are concentrated, suggesting the opaques may be sulfide. However, base and precious metal values are absent.

In summary, this appears to be a strongly sericite-?quartz altered felsic flow-banded volcanic, probably originally a rhyolite.

50606 SERICITE-CHLORITE-CARBONATE-SPHALERITE ALTERED, PLAGIOCLASE-?PYROXENE PORPHYRITIC INTERMEDIATE VOLCANIC

Light grey, fine-grained volcanic porphyry characterized by 1-2 mm feldspar and smaller dark mafic relic phenocrysts in an aphanitic groundmass. The rock is strongly fractured; slight reaction to cold dilute HCl occurs only along the fractures (2% CO_2). The rock is slightly magnetic and smells strongly of sulfide when reacted to acid (although total S is only 0.16). This is the most mafic rock in hole BD92-33 (SiO2 68,4%; Al2O3 16.1%; high Mg, Na, Ca, Fe, Ti, P and incredibly high Mn) and with anomalous Zn (0.3%), suggesting most of opaque is sphalerite. Modal mineralogy in thin section is:

Plagioclase (relict, mostly groundmass)	35%
Clay-sericite (after feldspar)	30%
Chlorite (after mafics)	20%
Carbonate (?dolomite)	10%
Opaque (?sphalerite)	2%
(Fe-Ti oxides)	2%
Quartz (secondary)	1%

This rock consists of about 25-30% relict plagioclase and 10-15% relict mafic phenocrysts in a fine-grained, altered groundmass of plagioclase microlites and opaques.

Plagioclase phenocrysts are euhedral and up to 3.5 mm long. They are altered partly to completely to very fine-grained clay-sericite, chlorite and anhedral carbonate, starting along cleavages and fractures or rims. The carbonate may be dolomitic judging by its slowness to react in hand specimen. Relatively high birefringence and positive optical sign suggest a calcic composition, about andesine-labradorite; Na2O is about equal to CaO.

Mafic phenocrysts are pseudomorphed by chlorite, opaques and minor apatite. Chlorite forms very fine-grained (10-20 fm) aggregates with bright green pleochroism, anomalous blue birefringence, and length-slow character indicating an Fe-rich character (Fe:Mg 0.6?). Opaques are subhedral and up to 0.25 mm in diameter; if they are sphalerite, it must be Fe-rich since no light is passed through the crystals. Some opaques are probably Fe-Ti oxides, but the 0.3% Zn requires at least some sphalerite. Others are sphene, as subhedral crystals up to 30 fm diameter. The rectangular to equidimensional shapes of the pseudomorphs suggests they were probably pyroxenes.

The groundmass consists largely of partly to completely altered feathery plagioclase microlites averaging about 0.05-0.1 mm long, set in a matrix of very fine (15 fm) chlorite and opaques, probably Fe-Ti oxides.

This is a mafic-intermediate volcanic porphyry, possibly a flow, that has undergone significant sericite-carbonate-chlorite alteration, apparently accompanied by minor (Zn) sulfide mineralization. A large-scale autobrecciation texture is apparent in hand specimen. Ag content is about 2 g/t; Au content is not known.

50607: SERICITIZED K-SPAR RICH, FINE-GRAINED FELSIC ?FLOW VOLCANIC CONTAINING SCATTERED RELICT FELDSPAR PHENOCRYSTS

Creamy-grey white, ultra-fine grained, chalky-looking but hard (siliceous) felsic volcanic rock from hole BD92-33; geochemistry indicates felsic composition for the rest of this hole, with 71-78% SiO_2, 13-14% Al_2O_3, low Na_2O and high K_2O contents, and generally low to very low Mg, P, Ti, Ca, Mn and Fe contents. Although Cu and Zn contents are low, Pb and As are anomalous (800 and 120 ppm respectively), and Ag is 8 g/t. The rock is non-magnetic and shows no reaction to cold dilute HCl. Mineralogy in thin section is approximately:

Relict K-feldspar	45%
Sericite, clay (after feldspar)	35%
Quartz (partly secondary)	20%
Limonite	<1%

This specimen appears to be made up mainly of fine-grained, somewhat spherulitic-textured feldspar which is partly to in places completely sericitized. Judging by the high K_2O (4.6%) and low Na_2O (0.02) contents, it probably is mostly K-feldspar. It forms small, rounded to subhedral crystals generally less than 0.1 mm in diameter. Sericitization starts from the interstitial areas and progresses to complete replacement of some grains.

Quartz is found as lesser, subhedral crystals of similar size to the feldspar that are clear and relatively free of alteration.

There is very little evidence of former mafic minerals in this specimen, but perhaps the occasional euhedral crystals of muscovite up to 0.1 mm and patches of sericite/opaques to 0.5 mm in diameter could represent former biotite crystals. Patches of fine clay-sericite with euhedral outlines, up to 2 mm long, could have been scattered plagioclase phenocrysts. Scattered 1-2 mm vugs sometimes contain sericite, suggesting some may be the sites of former phenocrysts that have plucked out during section preparation.

Most opaques in this rock are now converted to goethitic (orange-brown) limonite. There may be minor sphene as subhedral 25 fm crystals, derived from an original low Ti-mineral content.

This appears to have been a felsic, fine-grained volcanic containing scattered phenocrysts of ?plagioclase and biotite in a groundmass of K-feldspar prior to significant sericitization. The source of the anomalous Pb and Ag contents is not obvious; they are probably now in the limonites.

<u>50608: QUARTZ-SERICITE ALTERED ?FELSIC, K-SPAR RICH VOLCANIC CONTAINING ABUNDANT DISSEMINATED PYRITE AND SPHALERITE</u>

Fine-grained, creamy-white, highly altered felsic volcanic containing significant, non-magnetic disseminated sulfides, and some grey sulfides along rare thin veinlets. Chemistry is lacking for this sample; mineralogy in polished thin section is approximately:

Quartz (could be largely secondary)	40%
Feldspar (?K-spar, partly sericitized)	40%
Sericite (after feldspar)	13%
Pyrite	5%
Sphalerite	2%
Galena	<1%
Chalcopyrite	tr

This appears to be a highly altered rock, composed of fine-grained relict feldspar and quartz somewhat similar to 50607 but lacking any indications of former phenocrysts. Iron sulfides form large compact masses, surrounded by vugs, while base-metal sulfides form fine filigrees interstitial to the silicates. Pyrite forms coarse an- to subhedral crystals up to 1 mm in diameter (aggregating to 5 mm). Lamellar character of portions of these aggregates suggests they may be after former pyrrhotite. Minor amounts of chalcopyrite are found associated with pyrite as subhedral grains to 0.25 mm diameter. Sphalerite, with lesser admixed galena and inclusions of chalcopyrite, form subhedral to anhedral crystals to 0.5 mm diameter in masses of up to 1 mm across. Minor pyrite and chalcopyrite are associated with some of these areas.

Quartz is the most abundant mineral, forming fine anhedral crystals generally less than 0.1 mm in diameter that are relatively clear and of significantly higher relief compared to the surrounding feldspar. Near sulfides the quartz is very clear and probably secondary; in the rest of the rock it is clouded by minor fine clay-sericite and most likely represents primary (although recrystallized) quartz.

Feldspar forms fine subhedral to anhedral crystals of similar size to the quartz, with low relief in spite of the sericitization suggesting K-feldspar.

Sericite is generally very fine (5-15 fm size) and subhedral, most abundant in the interstices between quartz and feldspar crystals. Near the pyrite masses, however, it forms coarser (to 30 fm) euhedral flakes in masses up to 1 mm across. Sphalerite and galena are found within the sericite.

This appears to be a massive, felsic-potassic volcanic lacking any porphyritic character that has undergone significant quartz-sericite (phyllic) alteration and sulfide mineralization, including Zn and Pb sulfides.

50609: SERICITIZED FINE FELDSPAR PORPHYRITIC ?RHYOLITE CONTAINING BLOBS AND DISSEMINATIONS OF SULFIDE

Creamy-white, very fine-grained volcanic cut by thin dark sulfide stringers and containing distinctive rounded dark blebs (mainly finely divided sulfide) to 3-4 mm size. Sulfides are not magnetic. No geochemistry available for this sample; in polished thin section, mineralogy is:

Quartz (largely primary)	40%
Relict K-feldspar	30%
Sericite, clay	25%
Pyrite/marcasite	2%
Sphalerite	1%
Galena	<1%
Chalcopyrite	tr
Zircon (?)	tr

This specimen is very similar to the preceding two sections (50607 and 8) in being composed mainly of fine-grained quartz and moderately to strongly sericitized feldspar, probably K-fedspar judging by the index lower than quartz. The ?K-feldspar forms fine subhedral crystals up to perhaps 0.2 mm long (difficult to say on account of the alteration, which varies from flecking by very fine clay and sericite to complete replacement). Feldspar forms a matrix hosting the quartz, which occur as fine sub- toanhedral crystals generally less than 0.1 mm in diameter. Most show incipient alteration by fine clay and sericite around their margins; rare clear grains near sulfides are ?secondary.

There are also scattered relict phenocryst sites, probably representing both former plagioclase and mafic crystals. Former plagioclase crystals were up to 2 mm long and euhedral; they are now pseudomorphed by fine, but crystalline, sericite flakes to 30 /m in diameter. Clusters of a high-relief, high-birefringence mineral in them may be ?zircon, to 50 /m long. Other less euhedral patches up to 1 mm long of sulfide with minor quartz and sericite may be after mafic crystals such as amphibole or pyroxene.

Sulfides in the rounded blebs include cores of pyrite or marcasite (partly strongly anisotropic, but not magnetic) as anhedral grains of about 0.1 mm, aggregating to 1 mm across, surrounded by or intergrown with lesser sphalerite, galena and minor chalcopyrite. It is possible that some of the iron sulfides represent the alteration of former pyrrhotite. The bulk of the sulfides in the surrounding round "blob" are too fine to polish properly, and so cannot be seen in section, but they are most likely iron sulfides. Sphalerite has bright orange-brown internal reflections, implying a moderate Fe content, and forms anhedral aggregates to 1 mm across, generally with fine inclusions of chalcopyrite (5-20 /m size). Galena crystals are more euhedral and up to 0.2 mm diameter.

This sample probably represents a fine ?flow rhyolite that has been moderately sericitized and sulfidized, with a little secondary quartz near the sulfides.

50610: SERICITE-MINOR QUARTZ ALTERED, FINE FELSIC (RHYOLITE) FLOW CUT BY LIMONITIC FRACTURES, POSSIBLY AFTER SULFIDE

Pale creamy green, very fine-grained altered felsic volcanic from hole BD92-33 of probable rhyolite composition (high SiO_2 of 78.2% and K_2O of 4.2%, very low Na, Mg, P, Ca, Ti, Mn, Fe). Base metal contents are low except for anomalous Pb (370 ppm) and Ag (5 g/t). Rock is non-magnetic and crossed only by thin limonitic fractures. Modal mineralogy in thin section is:

Sericite, clay	40%
Relict ?K-feldspar	35%
Quartz (primary)	20%
(secondary)	3%
Muscovite	1%
Limonite	1%

Again, this rock is similar to 50607-9 in being composed principally of fine quartz in a matrix of sericitized ?K-feldspar, hosting scattered altered relics of phenocrysts. Quartz of the matrix occurs as sub- to anhedral crystals generally about 0.05 mm in diameter that are clear compared to the matrix. The matrix consists of areas higher in relief than the quartz, probably mostly sericite, and vague patches lower in relief that may be relict K-feldspar. If so, the K-feldspar formed subhedral crystals up to about 0.1 mm size that have been partly to completely replaced by very fine (5-15 /m) clay and sericite. There is a suggestion of former fragments visible as boundaries where the texture distinctly coarsens or fines. These clasts are generally of a few mm size.

Former phenocrysts are rare and are represented by rectangular-shaped areas up to 0.5 m long of coarser (up to 0.1 mm) clear secondary quartz and lesser sericite (stained yellow-brown by limonite, probably after minor sulfides). These may bave been former mafic sites; euhedral plagioclase sites up to 2 mm long, now completely replaced by fine sericite flakes of 5-25 /m size, are rare, implying an even more felsic composition than 50607-09.

Opaques are entirely limonite, mainly as amorphous red-brown masses along fractures but spreading out into wallrock as very fine disseminations. Both are probably transported rather than indigeneous limonite, but are still likely derived by oxidation of former sulfides.

This rock is similar to 50607-09 in terms of felsic (rhyolitic) original composition, sericite-minor quartz alteration, and possible minor sulfide content.

<u>50611: SERICITIZED FINE FLOW-BANDED RHYOLITE BRECCIA HOSTING CLASTS OF SULFIDE MINERALIZED, PORPHYRITIC FELSIC VOLCANIC</u>

Light grey-green, vaguely flow-banded fine-grained volcanic hosting fragments of other felsic, porphyritic volcanics that themselves host smaller clasts of various flow-banded and porphyritic volcanics; in short, a volcanic breccia with (angular) clast size of the order of several cm. Geochemistry indicates a potassic (7.7% K_2O), felsic rock (71% SiO_2) with low Na, Ca, Mg, Fe, etc. Sulfides largely confined to the border of the larger clast include strongly magnetic pyrrhotite and minor sphalerite (0.9% S, 1600 ppm Zn); mineralogy in polished thin section is:

<u>Flow-banded host</u>		<u>Porphyritic clast</u>	
Clay-sericite	40%	Quartz (secondary)	30%
Relict K-feldspar	30%	Sericite	30%
Quartz	20%	Biotite (secondary)	20%
Limonite, rutile	<5%	K-spar (?sanidine)	15%
Biotite (secondary)	<5%	Pyrrhotite	5%
Rutile	tr	Sphalerite	<1%

The host rock is simple, consisting of very fine relict ?K-feldspar (guess on basis of high K_2O content of the rock) alternating with 0.1-0.5 mm thick laminae richer in quartz to give the flow-banded appearance. It is very difficult to judge the size of former K-feldspar crystals, but they were probably less than 0.05 mm in diameter. They are now largely clay-sericitized by fine flakes of 5-15 fm size. Quartz forms sub- to anhedral crystals rarely up to 0.1 mm in diameter, generally also partly attacked by clay-sericite around the margins. Rare patches to 2 mm long in the plane of foliation are composed largely of fine (25 fm) matted deep brown secondary biotite, possibly after former mafic minerals, and there are vague outlines of former ?K-spar phenocrysts up to 1 mm long, also aligned in the banding.

The clast consists of relict plagioclase, mafic, and K-spar phenocrysts plus lithic shards and angular clasts to 0.5 cm diameter in a fine, largely secondary quartz-sericite matrix. Sericitized plagioclase relics are up to 2 mm long, euhedral in outline, and have rims replaced by quartz. Former ?mafic phenocrysts are of similar size, less regular in outline, and are replaced by fine matted secondary biotite as in the host rock, plus variable amounts of sulfide and some quartz. K-feldspar crystals are subhedral, up to 1 mm long, and appear recrystallized to a patchwork of smaller domains, but have a low negative 2v (30-40x) suggesting either sanidine or a very pure orthoclase. The matrix consists of abundant, highly anhedral and interlocked quartz grains ranging up to 0.2 mm in diameter. Some of the larger ones form areas that could represent recrystallized quartz phenocrysts. Lithic fragments have a wide range in composition from mainly secondary biotite to mainly plagioclase microlites to mainly sericite. Sulfides are mainly subhedral pyrrhotite aggregating to 1-2 mm across and sphalerite to 1 mm across. Sphalerite contains fine (5-20 fm) inclusions of pyrrhotite and chalcopyrite.

<u>50612: QUARTZ-SERICITE ALTERED FLOW-BANDED FELSIC VOLCANIC WITH CLASTS OF SIMILAR ROCK AND DISSEMINATED SULFIDE</u>

Light grey-green, fine-grained felsic volcanic hosting variable pale grey and green angular fragments to 0.5 cm size. From hole BD92-33; geochemistry is indicative of a felsic (?rhyolitic) volcanic with 76% SiO_2 but less potassic (4.2% K_2O). Significant sulfides (weakly magnetic) are confirmed by 1.2% S, 0.3% Zn. Mineralogy in polished thin section is approximately:

Quartz (primary and secondary)	50%
Clay-sericite	35%
Relict feldspar (?K-feldspar)	10%
Pyrite	3%
Sphalerite	1%
Carbonate (?dolomite or ankerite)	1%
Chalcopyrite	tr

The bulk of this rock consists of quartz, both ?primary and secondary, in a vaguely flow-banded arrangement with lenses of clay-sericite after feldspar, or in clasts that frequently themselves are flow-banded.

Quartz forms subhedral crystals up to 0.25 mm diameter (0.4 mm long in patches of clearer, secondary quartz). Most crystals in the matrix are attacked at their margins and along fractures by clay-sericite.

The intervening masses are low in relief compared to quartz, possibly because they are K-feldspar or because they are mainly clay. Thin anastamosing veinlets of higher relief, higher birefringence sericite criss-cross the rock, generally interstitial to the quartz. Some highly clay-altered clasts could have been mainly K-feldspar (?shards or phenocrysts); others may have been plagioclase. Quartz eyes are not seen; patches of sulfide and secondary quartz may have been mafic crystals.

Thin, 0.1 mm late veinlets of carbonate and sulfide cross the sericite fractures. The carbonate does not appear to react to cold dilute HCl and may be ankerite or dolomite. It forms subhedral crystals up to 0.15 mm long; sulfide is similarly sized pyrite.

Sulfides consist of anhedral to subhedral pyrrhotite, largely breaking down to secondary pyrite *q* marcasite, as aggregates up to several mm across. Rare chalcopyrite is associated as subhedral grains to 0.05 mm diameter. Sphalerite occurs mainly separate from the iron sulfides as subhedral aggregates up to 3 mm long, containing fine (<25 *f*m) inclusions of pyrrhotite and chalcopyrite. The sulfides appear to have a typical replacement mode of origin, closely associated with quartz-sericite (phyllic) alteration of this felsic fragmental volcanic (?rhyolitic lapilli tuff). Carbonate appears to be late, and not associated with base metal mineralization.

50613: QUARTZ-SERICITE ALTERED FELSIC (?RHYOLITIC) VOLCANIC CUT BY NETWORK OF QUARTZ-SERICITE-PYRITE±SPHALERITE VEINS

Light creamy-buff, strongly altered and sulfide mineralized felsic volcanic with a brecciated or ?autobrecciated texture caused by a net of greenish quartz-sericitic and/or sulfide fractures. Rock is weakly magnetic (sulfides only) and shows no reaction to HCl. From hole BD92-33, another of the felsic (?rhyolitic) volcanics with high SiO2 and K2O (76% and 7% respectively) and low Na, Ca, P, Ti, Mn, Mg, and Fe. The only anomalous base metal is Zn at 1000 ppm. Mineralogy in polished thin section is:

Quartz (largely secondary)	55%
Clay-sericite	40%
Pyrite, marcasite	3%
Carbonate (dolomite or ankerite)	<1%
Sphalerite	<1%
Chalcopyrite	tr

As in the other felsic rocks in this hole, this specimen consists mainly of quartz with intersitial clay-sericite probably largely after former feldspar although no feldspar can now be recognized.

Quartz occurs in a variety of forms, including dusty an- to subhedral ?primary grains of about 0.1-0.2 mm diameter, locally aggregated to 0.5 mm lenses; clear secondary quartz to 0.4 mm diameter, in clots in places associated with sulfides, and thin veinlet quartz to 0.1 mm thick. The ?primary quartz is strongly attacked at margins and along fractures by fine clay-sericite, and is also strongly recrystallized to finer, in places clearer subhedral domains by secondary silica action.

Clay-sericite is present as tiny matted flakes of 5-10 µm diameter criss-crossed by very thin (20 µm) "veins" of coarser, higher birefringence sercite, in domains up to 0.75 mm long that may have been feldspar, probably K-feldspar judging by the high content of K2O. A few patches of coarser (25 µm) sericite, with quartz, sulfides and vugs, may represent former mafic sites. Rarely these may include a few subhedral grains of high relief carbonate to 0.05 mm across, likely dolomite or ankerite judging by its lack of reaction to cold dilute HCl.

Sulfides are mainly pyrite as subhedral crystals or crystal aggregates to 1 mm across, or mitures of pyrite and marcasite, likely after former pyrrhotite (lath-like shape in places also suggests this). In places there is minor associated sphalerite as subhedral aggregates to 0.7 mm across, and rare chalcopyrite as subhedral grains to 0.1 mm with the sphalerite. As in 50612, this is a moderately to strongly quartz-sericite veined and altered ?rhyolitic volcanic (lacking fragmental texture in this case) with significant sulfide fracturing but low base-metal content, and no significant precious metals (although Au contents are not known).

50614: SERICITE-QUARTZ ALTERED, GARNET-BEARING ?RHYOLITE

Light grey-green, fine-grained volcanic containing a large (1 cm diameter) red-brown porphyroblast of ?garnet. This specimen is non-magnetic, comes from hole BD92-33, and the geochemistry is again indicative of a potassic, felsic (?rhyolitic) volcanic with high SiO_2 and K_2O, very low Mg, Na, Ca, Fe, Ti, P, and base/precious metals. I find it surprising that the Mn content is so low given the fact that most of the garnets in these rocks are manganiferous; modal mineralogy in polished thin section is approximately:

Clay-sericite (after ?feldspar)	40%
Garnet (porphyroblast)	25%
Quartz (partly secondary)	25%
Relict feldspar (?K-feldspar)	5%
Carbonate (after garnet)	3%
Sphene	1%
Muscovite (after ?biotite)	1%
Pyrrhotite (minor alteration to marcasite)	<1%
Galena, arsenopyrite, sphalerite, chalcopyrite	tr

The ?garnet porphyroblast is about 1.5 cm across, completely isotropic except near altered patches, and pale yellowy-brown in colour similar to the garnets described in my report to you on Sept. 7, 1992 on five thin sections. Irregular, interconnected areas within the garnet (like poikilitic inclusions) are composed of fine-grained (0.1-0.2 mm) quartz, carbonate and sericite. The carbonate does not react to cold dilute HCl and so may be dolomite or ankerite. In a few places, sulfides are associated with euhedral muscovite flakes to 0.2 mm diameter, euhedral, clear quartz to 0.1 mm, and subhedral carbonate to 0.1 mm diameter. Sulfides include galena up to 0.5 mm across, pyrrhotite and rare arsenopyrite as subhedral crystals to 0.2 mm.

The host rock appears to have been a felsic fragmetnal containing about 45% angular clasts up to 1 cm in size. These are now mostly either clay-sericite altered with relics of ?K-feldspar, or quartz altered. The clast hosting the garnet is mainly very fine (5-25 μm) sericite, with lesser interstitial quartz of similar size. The texture suggests flow banding, or perhaps is merely due to fine lacy networks of sericite fractures. Relict phenocryst sites consist of euhedral muscovite books up to 0.2 mm diameter, possibly after ?biotite, and euhedral shaped patches of carbonate and ?pale brown biotite to 0.3 mm (these may have been garnet). Quartz forms a lacy, partly secondary, network of thin veinlets to 0.2 mm thick composed of anhedral crystals to 0.1 mm diameter, with minor sulfides (pyrrhotite q marcasite, galena, sphalerite, chalcopyrite) as sub- to euhedral crystals to 0.2 mm across.

In the rest of the rock, quartz is of similar habit but is finer (0.05 mm) and more abundant, apparently replacing plagioclase phenocrysts up to 2 mm long and forming a very siliceous matrix to the sericitized clasts. There is minor very fine sphene (5-20 μm) scattered in the matrix.

50615: SERICITE-BIOTITE-QUARTZ ALTERED INTERMEDIATE FRAGMENTAL VOLCANIC WITH SPHALERITE-RICH CLASTS

Dark grey, fine-grained, mafic-looking (?secondary biotite) fragmental volcanic, containing a large rounded to sub-angular pale greenish clast with abundant sphalerite. Pyrrhotite (magnetic) is common in the rest of the rock. This sample comes from hole BD92-34; the moderate SiO_2 of 63% and higher Al_2O_3 of 16%, together with TiO_2 of 0.8%, P_2O_5 of 0.27%, and high Fe (6.8%) and Mn (0.5%), indicate an intermediate (andesitic?) rock. Minor Zn (2300 ppm) and Pb (700 ppm) are accompanied by elevated Ag (11 g/t); Cu is slightly elevated throughout this hole at 100-200 ppm, compared to the lower values of the felsic volcanics. Mineralogy in polished thin section is:

Sericite	40%
Quartz (partly secondary)	25%
Secondary biotite	20%
Garnet	10%
Chlorite	3%
Pyrite, pyrrhotite	1%
Hematite	1%
Sphalerite	<1%

This rock consists essentially of angular to subangular clasts up to 2.5 cm diameter in a very fine siliceous matrix. The clasts are generally finely porphyritic, with euhedral relict plagioclase and mafic phenocrysts up to 1 mm in length visible. Alteration is strong throughout, to secondary biotite, quartz and sericite. The majoritiy of the clasts, especially the smaller (0.5 cm) ones, consist of sericitized plagioclase and biotitized mafic relics in a matrix of quartz, sericite and biotite. Many of these clasts are also replaced by relatively fine (0.2 mm diameter) clear, colourless, completely isotropic garnets (not brown and coarse as so many garnets are in these rocks). One large clast (green in hand specimen) consists of smaller, angular clasts mainly of secondary biotite and minor garnet, in a matrix of sericite and minor hematite. Elongate, rectangular areas up to 4 mm long appear to be former ?mafic phenocrysts, replaced by coarse (0.3 mm) clear quartz, garnet, sphalerite (gchalcopyrite) to 0.5 mm, pyrite to 1mm, biotite, minor pyrrhotite (0.1 mm) and chlorite.

Both sericite and secondary biotite form very fine matted subhedral flakes up to about 50 fm in diameter but averaging 10-20 fm. They are coarsest where associated with patches of clear, secondary quartz and sulfides. Chlorite forms subhedral flakes up to 0.25 mm diameter with anomalous blue birefringence and green pleochroism indicating high Fe content. The matrix to the clasts consists largely of ?secondary quartz as fine anhedral crystals to 0.05 mm diameter, with minor sericite, hematite and biotite.

The significance of the garnet in this rock is unclear, except that it is obviously secondary. The bulk of the sulfide mineralization appears to be of replacement origin; presumably the pale green clast was more receptive.

50616: SERICITE-HYDROBIOTITE-QUARTZ ALTERED, FINE FRAGMENTAL INTERMEDIATE VOLCANIC WITH SIGNIFICANT WISPY SPHALERITE

Light grey-green, fine fragmental volcanic rock with wispy veinlets and replacements of sulfide that are only weakly magnetic. From hole BD92-34, significant CO_2 indicates carbonate but no reaction to cold dilute HCl. All the samples in this hole (50615-18) have similar low Na2O, moderate MgO and Al2O3, significant Fe2O3, P2O5 and TiO2, and lower SiO2 (60%) values indicative of an intermediate volcanic; S is high at 2.6%, and K2O moderate at 4.5%. Zn content is high at 1.2%; Cu 180 ppm, but Ag is low at only 3.4 g/t. Modal mineralogy in polished thin section is:

Secondary quartz, matrix quartz	35%
Secondary biotite ("hydrobiotite")	30%
Sericite	20%
Carbonate (ankerite or dolomite)	5%
Relict K-feldspar (?sanidine)	5%
Pyrrhotite, pyrite	3%
Sphalerite, trace chalcopyrite	1%
Chlorite, apatite	<1%

This is a fine intermediate fragmental, composed of about 50-60% tightly packed, subangular to angular clasts of variable altered lithologies and shards of minerals in a matrix of fine quartz and sericite. The clasts range from common finely porphyritic to rare massive and almost textureless. The former consist of relict plagioclase and mafic (?pyroxene) phenocrysts, replaced by sericite or less commonly quartz, and secondary biotite and sericite q quartz, respectively. The secondary biotite replacing mafics has low birefringence and greenish-brown colour of a hydrous biotite (intermediate to chlorite in composition) and forms fine matted flakes to about 25 /m in size; sericite forms subhedral flakes of similar size except where associated with coarser quartz and sulfides, where it is up to 50 /m in diameter. A few clasts are mainly composed of this secondary hydrobiotite, with minor fine Fe-Ti oxides (subheral rutile crystals up to 0.1 mm long). Subhedral feldspar crystals up to 0.7 mm in size with low relief and virtually zero (negative) 2V may be sanidine.

The matrix to the clasts consists mainly of very fine (5-20 /m) highly anhedral and interlocking quartz with minor sericite. Patches of coarser, clear quartz as anhedra to 0.1 mm are clearly secondary, associated with sphalerite as subhedral aggregates to 0.5 mm across, pyrrhotite to 2 mm, subhedral carbonate to 0.15 mm, and rare chlorite as pale green, anomalous blue (Fe-rich) flakes to 0.1 mm. Rare apatite crystals are up to 0.1 mm long; traces of chalcopyrite are found as inclusions up to 25 /m long in sphalerite and rare separate grains to 0.1 mm. The thin veinlets (<0.1 mm) are composed of very fine pyrite that appears to be later than most of the other sulfides. Where the veinlets cross pyrrhotite, they are cored by pyrrhotite. Most sulfides (pyrrhotite and sphalerite) appear to have replaced former phenocrysts in this highly altered rock.

50617: SERICITE-CHLORITE-QUARTZ ALTERED, PYRITE-SPHALERITE CRACKLED, FINE INTERMEDIATE LAPILLI TUFF

Pale grey-green, finely fragmental intermediate volcanic composed of 50% angular clasts to 5 mm in an altered aphanitic matrix. Minor sulfides (pyrite visible, sphalerite suggested by 1% Zn, 1.5% S. SiO_2 of 61%, Al_2O_3 of 16%, and moderate contents of MgO (1.75), Fe_2O_3 (10%), TiO_2 (1%) and P_2O_5 (0.3%) indicate an intermediate rock. Modal mineralogy in polished thin section is:

Sericite	35%
Chlorite	30%
Quartz (partly secondary)	20%
Alkali feldspar (?K-feldspar)	10%
Pyrite	3%
Rutile, sphene	1%
Sphalerite	1%

One 5 mm clast consists of feldspar phenocrysts in a fine quartzo-feldspathic matrix. K-feldspar originally formed subhedral phenocrysts and shards up to 1 mm diameter; they are now partly replaced by fine sericite at margins and along fractures, or rarely by sphalerite. Small (negative) 2V suggests sanidine. Rare broken quartz phenocrysts to 0.5 mm across contain trails of vapour-rich fluid inclusions.

Abundant smaller (1-2 mm) subrounded clasts consist almost entirely of chlorite (actually brownish-green hydrobiotite, or in places secondary biotite altered to chlorite), with variable amounts of sericite. Some of these are euehdral relict mafics, others are not. Other clasts consist mainly of fine anhedral interlocking quartz and/or alkali feldspar, or of a matrix of partly sericitized plagioclase (or alkali feldspar?) microlites of about 0.1 mm length hosting sericitized feldspar laths and altered mafic relics to 0.5 mm size. Patches of fine clay-sericite may be the sites of former plagioclase shards in a crystal-lithic tuff, or completely sericitized rock fragments.

The matrix to the clasts is composed of fine-grained (about 10-30 fm) chlorite, sericite, rutile, and ?quartz. Rutile forms clusters up to 0.2 mm across of tiny crystals; a few euhedral crystals of sphene are up to 0.15 mm long. Sulfides are mainly distributed along very thin veinlets up to 0.5 mm thick, with minor secondary quartz as recrystallized subhedral crystals up to 0.25 mm long. Pyrite occurs as anhedral crystals of about 0.05 mm size, aggregating in places to 0.5 mm, or else as lath-like crystals to 0.3 mm long that suggest they are after pyrrhotite. Pyrite is associated with rutile that has very pale internal reflections and sphalerite with deep reddish brown internal reflections, forming subhedral to anhedral crystals rarely as much as 0.3 mm across. Significant TiO_2 minerals confirm that this was an intermediate volcanic, highly altered to sericite-biotitegquartz and minor sulfides.

50618: INTENSELY SERICITE-CHLORITE-QUARTZ ALTERED INTERMEDIATE PORPHYRITIC FLOW WITH SIGNIFICANT SULFIDES

Very dark grey to black, fine grained altered volcanic rock containing significant coarse sulfides (pyrite) and fine-grained strongly magnetic material. Geochemistry indicates this is an intermediate volcanic from hole BD92-34 with only 59% SiO_2, 16% Al_2O_3, and significant MgO (1.2%), P_2O_5 (0.4%), TiO_2 (1%) and Fe_2O_3 (11%); K_2O and S are also high at 4.7% and 2.2%, with the highest Zn of the suite at 1.3% and anomalous Cu (180 ppm) although Ag is low at 2.5 g/t. Mineralogy in polished thin section is:

Sericite	55%
Quartz (?largely secondary)	25%
Chlorite	15%
Pyrite, pyrrhotite	2%
Sphalerite	1%
Rutile	1%
Chalcopyrite	<1%

This appears to be a porphyritic flow rock composed of about 30% relict plagioclase and ?10-15% relict mafic phenocrysts in a fine but phaneritic groundmass. A tendency to autobrecciation is seen in vaguely defined ?clasts to about 5 mm across, of similar composition to the rest of the rock. Former plagioclase phenocrysts are mainly small (1 mm long) but range up to 5x3 mm. They have euhedral outlines and are pseudomorphed by rosettes of sericite to 50 fm diameter, plus lesser chlorite, quartz, and opaques (mainly pyrite as subhedral crystals to 1 mm across). Quartz forms subhedral secondary crystals that are clear, unstrained and up to 0.2 mm across. Former ?mafic phenocrysts are replaced by major pyrite plus minor chlorite, quartz and sericite, in subhedral-shaped areas up to 1.5 mm across.

The groundmass is made up of seriate-textured (i.e. gradationally smaller) sericite pseudomorphs of plagioclase crystals, ranging down from 1 mm to 0.2 mm long, set in a matrix of finer (0.1 mm) subhedral quartz and sericite-chlorite-rutile mainly less than 30 fm in size. The vague ?clasts show a more well-developed groundmass of non-seriate plagioclase microlites of about 0.15 mm length (now completely sericitized). Chlorite has distinct green colour but is difficult to type due to intimate mixing with sericite; it may be a variety of hydro-biotite rather than chlorite.

The sulfides in this rock are mainly pyrite, but are in complex intergrowths with chalcopyrite and sphalerite such that an aggregate grain 1 mm across consists of subhedral pyrite to 0.5 mm, plus anheral pyrrhotite to 0.05 mm, sphalerite with very few, dark internal reflections (i.e. iron-rich) to 0.1 mm, and chalcopyrite to 0.1 mm. There is also very fine (5-25 fm) anhedral sphalerite, pyrite, chalcopyrite and rutile disseminated throughout the rock. In spite of the high Zn assay, much of the sphalerite in this rock would be difficult to recover.

<u>50619: INTENSELY CHLORITE-SERICITE-QUARTZ ALTERED ?INTERMEDIATE VAGUELY FRAGMENTAL VOLCANIC, SIGNIFICANT SULFIDE</u>

This is a buff to light brown, highly altered ?intermediate volcanic (geochemistry not available for this sample) that is crackled by thin, fine sulfide-rich veinlets and contains coarse patches of (non-magnetic) sulfides. There is no reaction to cold dilute HCl; mineralogy in polished thin section is approximately:

Chlorite (hydrobiotite)	35%
Sericite	30%
Quartz (mainly secondary?)	20%
Secondary biotite	5%
Pyrite, marcasite	3%
Carbonate (ankerite or siderite)	3%
Sphalerite	1%
Rutile	1%
Chalcopyrite	<1%

As in 50618, large (up to 4 mm long) altered relics of ?plagioclase and mafic phenocrysts or shards, or possibly even lithic fragments, are set in a highly altered matrix veined by coarse secondary quartz and sulfides. The altered relics consist of 1) primarily fine, <25 fm, sericite plus minor chlorite and quartz (?after euhedral plagioclase), 2) somewhat rounded chlorite plus lesser carbonate, secondary biotite, quartz and sulfides (?after subhedral pyroxene). Carbonate forms subhedral crystals up to 0.1 mm across with very high relief, probably siderite or ankerite. Chlorite has pale greenish to brownish colour, anomalous blue interference, is length-slow (Fe-rich) and is transitional to hydrobiotite, forming fine (30 fm) subhedral flakes. Quartz forms anhedral clear crystals to 0.15 mm diameter.

The matrix consist of fine-grained chlorite or hydrobiotite, sericite, and rutile g sulfides of about 25-35 fm size, cemented by and cut by anastamosing veinlets of secondary quartz as subhedral crystals up to 0.5 mm. In places, much coarser quartz veins are found as intensely strained and recrystallized subhedra to 3 mm across, with associated coarser sulfides.

Sulfides include pyrite, sphalerite, and chalcopyrite, with associated or in places intergrown rutile. Pyrite forms subhedral aggregates to 3 mm long that are actually composed of fine-grained (<0.1 mm) mixtures of pyrite and euhedral marcasite that is likely after former pyrrhotite. Thin late veinlets of sulfide crossing the rock are also mainly marcasite. Sphalerite forms subhedral crystals up to 2 mm long with bright orange-brown internal reflections indicating a moderate Fe content. Chalcopyrite is found as rare anhedral grains to 0.2 mm across associated with sphalerite. As in 50618, base-metal sulfides in this sample are mainly very finely intermixed with silicates. Rutile crystals are mainly euhedral and fine (25 fm), but aggregate to 0.1 mm across. This appears to have been a fairly mafic or intermediate volcanic that has been intensely altered to chlorite or biotite, sericite, quartz and sulfides.

50621: SERICITE-CHLORITE-QUARTZ-BIOTITE ALTERED INTERMEDIATE ?FRAGMENTAL VOLCANIC WITH MINOR PYRITE-SPHALERITE

Light grey-brown, altered intermediate volcanic rock from hole BD92-36. Texture largely destroyed by alteration, but appears to have been porphyritic and could have been fragmental. Significant sulfides as coarse disseminated crystals of pyrite, weakly magnetic ?pyrrhotite and very thin veins. Geochemistry (2.5% Na_2O, 2.8% MgO, 16% Al_2O_3, 67% SiO_2, 0.4% P_2O_5, 1% TiO_2, 11% Fe_2O_3 and 4% K_2O, is indicative of a sericite-biotite altered intermediate to mafic volcanic; S content of 1.5% and 0.4% Zn, 180 ppm Cu, 280 ppm Pb, plus 9 g/t Ag indicate weak mineralization. Mineralogy in polished thin section is :

Plagioclase microlites (groundmass)	30%
Sericite	25%
Chlorite	15%
Quartz (largely secondary)	15%
Secondary biotite	10%
Pyrite	3%
Sphalerite	1%
Rutile	1%
Chalcopyrite	<1%

Variations in colour from brownish to clear and more or less porphyritic, seen in thin section, suggest a fragmental character for this sample. Clasts are up to 1 cm across and subrounded. However, most of the ?fragments are of similar composition, consisting of sericitized plagioclase relics and chlorite-biotite altered ?mafic relics in a groundmass of plagioclase microlites, cut by thin veinlets of sulfide.

Former plagioclase crystals were euhedral and up to 4 mm long; they are completely replaced by fine (25 µm) sericite, chlorite, patches of secondary biotite, plus lesser euhedral secondary quartz to 50 µm and sulfides to 0.1 mm across. Former mafic crystals were more subhedral and up to 2 mm long; they are completely replaced by 20 µm secondary biotite, chlorite and sericite, plus quartz and sulfides to 0.1 mm across. Chlorite has bright blue anomalous interference colours but only pale green colour in transmitted light, indicating moderate Fe content. Secondary biotite is only pale brown, indicating a hydro-biotite character or intimate mixing with sericite.

The groundmass consists of variably sericitized plagioclase microlites of about 0.1 mm length in a matrix of 20-30 µm chlorite and rutile, with scattered patches of secondary quartz. Veinlets are highly irregular, anastamose aggregates of 0.1 mm, clear quartz and similar sized anhedral sphalerite, pyrite and rare chalcopyrite. In places the iron sulfide is subhedral pyrrhotite to 0.25 mm across. Sphalerite forms mainly very fine grains intimately mixed with gangues but occasionally 1.5 mm subhedral aggregates with deep red internal reflections. Chalcopyrite grains are anhedral and up to 0.1 mm diameter. Rutile crystals are subhedral and average about 20 µm long.

50622: INTENSELY CLAY-SERICITE-QUARTZ ALTERED FELSIC (?RHYOLITE) FLOW VOLCANIC, MINOR PYRITE-SPHALERITE

Creamy-buff, fine-grained, strongly altered ?felsic volcanic rock cut by fine sulfide veinlets (non-magnetic) and with disseminated sphalerite. From hole BD92-36; geochemistry (14% Al_2O_3, 74% SiO_2, 0.06% P_2O_5, 0.11% TiO_2, high K_2O of 8.3%, low Na, Ca, Fe and Mg) confirms the felsic (rhyolite?) nature. Lower S (0.4%), Zn (0.2%) and Pb (100 ppm) compared to 50621; negligible Ag at 1 g/t. Mineralogy in polished thin section is:

Clay-sericite (after ?alkali feldspar)	45%
Quartz (partly secondary)	45%
Hydrobiotite	5%
Pyrite	3%
Sphalerite	<1%
Rutile	<1%

Quartz forms subhedral crystals generally less than 0.2 mm long, elongated subparallel to what may have been original flow-banding; this may be largely primary quartz. In places obviously secondary quartz forms rounded subhedral to anhedral crystals with radiating (chalcedonic) structure, up to 0.4 mm diameter. Sulfides are partly associated with the latter quartz, especially where it forms highly irregular, anastamosing thin veinlets up to 0.25 mm thick crossing the compositional layering.

The matrix to the quartz consists of clay and sericite, generally arranged as patches of clay as extremely fine crystals about 5-10 μm in diameter (with low birefringence and relief, probably kaolinite) rimmed by slightly coarser (15-20 μm) sericite with higher birefringence and relief, possibly illite. In places the clay-sericite appears to replace a subhedral feldspar crystal up to 0.5 mm long, suggesting that the rock originally consisted of quartz and alkali feldspar. Minor rutile occurs as euhedral prisms to 50 μm long, generally intermixed with sericitic portions of the rock; the sparseness of the TiO_2 relics confirms the felsic nature of this rock.

Sulfides consist of sub- to anhedral crystals to 0.5 mm diameter of pyrite, with associated finer anhedral crystals of sphalerite to 0.25 mm diameter, and rare chalcopyrite as anhedra to 0.05 mm across generally intergrown with sphalerite. The rock is cut, as in other specimens of this suite, by hairline width fractures of very fine-grained pyrite.

This appears to be a vaguely flow-banded felsic volcanic in which the original alkali feldspar has been extensively converted to potassium-rich clay and sericite; quartz has been recrystallized but there may not have been significant addition of silica.

<u>50623: QUARTZ-CLAY-SERICITE-CHLORITE±BIOTITE ALTERED COARSE FELSIC FRAGMENTAL VOLCANIC WITH MINOR SULFIDES</u>

Grey-buff/cream, coarsely fragmental volcanic composed of angular clasts to 4 cm across, some of which look like rocks already described in this suite (white flow-banded rhyolite like 50622, or grey-green intermediate porphyritic volcanic, slightly magnetic, like 50619, 50621). The matrix to the clasts appears to be white and siliceous but geochemistry is not available for this sample. Mineralogy in polished thin section is approximately:

Quartz (partly secondary)	40%
Clay-sericite	20%
Alkali feldspar (?K-spar)	20%
Chlorite (hydrobiotite)	15%
Secondary biotite	3%
Sphalerite	1%
Pyrite	<1%
Galena, rutile	<1%

The major white flow-banded clast consists of alternating laminae up to 2.5 mm thick of quartz and ?akali feldspar. The latter has lower relief than the quartz and may be K-feldspar. It is very fine-grained, forming a felted mass of feathery, subhedral, interlocking crystals that may be up to 0.2 mm long but it is difficult to be sure due to the vague boundaries between crystals. The crystals are also dusted by extremely fine (1-5 µm) flecks of clay-sericite. Quartz, on the other hand, forms coarser but highly anhedral, irregular, interlocked crystals up to 0.2 mm in diameter that are also highly strained (undulose extinction, sutured grain boundaries). The coarsest quartz appears to be secondary, suggesting that the 50 µm grains are original and that significant recrystallization (± some addition of silica?) has occurred during alteration. Chlorite is a common accessory in the quartz-rich layers, forming patches up to 1 mm long composed of subhedral crystals up to 25 µm diameter with weak but distinct greenish-brown pleochroism; in places moderate birefringence of about 0.1 to 0.15 and length-slow character suggests it may be partly hydrobiotite. Rutile forms fine needles up to 30 µm long in the chlorite. Patches of sericite up to 0.5 mm across are found as subhedral flakes to 50 µm diameter.

The other clasts consist of green chlorite, greenish-brown hydrobiotite or intimately intermixed chlorite and sericite, and minor brown secondary biotite, in a matrix of ?largely secondary quartz and sulfides, or else fine-grained quartz containing relict ?K-feldspar phenocrysts up to 1 mm diameter. The mafic minerals average about 25 µm in diameter, while quartz forms anhedral to subhedral crystals up to 0.25 mm across. Sulfides are largely sphalerite, as anhedral highly irregular crystals or aggregates up to 0.25 mm across, but there is also minor galena as subhedral crystals to 0.5 mm across and subhedral pyrite to 0.3 mm diameter. Sphalerite contains minute (10 µm) inclusions of pyrite and chalcopyrite; there is rare hematite to 0.1 mm.

50626: QUARTZ-CLAY-SERICITE-?PYROPHYLLITE ALTERED FELSIC FRAGMENTAL VOLCANIC (?RHYOLITIC LAPILLI TUFF)

Light grey matrix to chalky white fine angular fragments in this felsic volcanic rock from hole BD92-35; major element geochemistry (77% SiO_2, 14% Al_2O_3, very low P and Ti, Na, Mg, Ca and Fe but moderate K_2O at 4.7%) confirm felsic (?rhyolite or rhyodacite) composition. The rock is not magnetic and shows no reaction to cold dilute HCl. No sulfides visible; virtually barren in base metals (1 Cu, 60 Zn, 120 Pb) and low in precious metals (3 g/t Ag). Modal mineralogy in thin section is:

Quartz (largely secondary)	45%
Sericite, ?pyrophyllite	30%
Clay	15%
Relict ?K-feldspar	10%
Limonite (goethite)	tr

This is a strongly phyllic (quartz-sericite-clay) altered fragmental felsic volcanic, composed of variably flow-banded, spherulitic or massive clasts up to 1.5 cm long in a coarse (hoghly recrystallized) matrix of secondary quartz and minor sericite. Some smaller clasts, seen as chalky white but still harder than steel in hand specimen, are entirely replaced by fine-grained (12-20 μm) clay, silica and sericite. Other clasts are replaced by slightly coarser (up to 50 μm diameter) rosettes of a micaceous mineral that is brownish compared to the clear sericite; it could be sericite or possibly pyrophyllite (birefringence is unusually high, and the radial aggregates are suggestive of the latter) but X-ray diffraction would be necessary to decide this. Clay has low birefringence and relief below that of quartz, and is fine-grained compared to some other areas of lower relief that may be relict feldspar, possibly K-feldspar. These appear to have originally formed subhedral crystals up to 0.25 mm long, and are now mainly altered to clay and sericite.

The matrix is mainly anhedral to subhedral quartz that appears to have undergone strong recrystallization during alteration; addition of silica is shown by minor quartz veining up to 0.25 mm thick, in several cross-cutting generations. Quartz of the matrix is highly strained, with interlocked and mildly sutured boundaries; crystals are up to 0.6 mm long, and show effects of minor clay-sericite alteration at their margins. Later veining across these quartz grains is evidenced by trails of fluid inclusions marking the walls of the veins. Sericite occurs interstitially to the quartz as fine subhedral flakes to 30 μm diameter. Limonite occurs as rare patches of transported material up to 0.5 mm across, possibly derived by oxidation of traces of sulfides.

In summary, although not obvious in hand specimen, the original fragmental texture of this rhyolitic volcanic is virtually destroyed in thin section by strong quartz-caly-sericite ($\pm$ pyrophyllite) alteration and veining.

50627: INTENSELY SERICITE-BIOTITE-QUARTZ ALTERED FRAGMENTAL MAFIC VOLCANIC, MINOR ?SULFIDE

Dark grey-brown, vaguely fragmental, mafic-looking volcanic rock also from hole BD92-35 but with strikingly different chemistry than 50626: this could have been a basalt, with SiO_2 of only 59%, Al_2O_3 of 17%, high MgO of 2.9%, Fe_2O_3 of 10%, P_2O_5 of 0.5, TiO_2 of 1%; K_2O is still elevated at 6.3%, suggesting dark colour is due to secondary biotite. Minor Zn (0.4%), Cu (170 ppm) and Ag (5 g/t) although no sulfides visible in hand specimen; Pb is low at 130 ppm. Rock is very slightly magnetic; no reaction to cold dilute HCl. Mineralogy in thin section is:

Sericite	40%
Secondary biotite	35%
Quartz (largely secondary)	15%
?Carbonate (dolomite or ankerite)	5%
Opaque (sphalerite, ?pyrite)	3%
Rutile, sphene	1%
Apatite	<1%
Limonite	tr

This is a very mafic rock, with the most intense secondary biotite I can recall seeing. The original fragmental character has been largely destroyed by alteration, but is still visible in thin section with fine angular clasts and relict phenocryst sites to several mm long in addition to the larger brown clasts seen in hand specimen.

The large clasts are up to 3 cm long and consist of irregular patches mainly of brown secondary biotite, patches of sericite, and semi-opaque areas (?carbonate) in a matrix of slightly coarser secondary quartz, sulfides and sericite. The patches are up to 2-3 mm in diameter, but have no regular shapes suggesting they are after former phenocrysts; if they are, alteration has destroyed their outlines. Both biotite and sericite form fine subhedral flakes of about 25-50 fm diameter; the ?carbonate in the semi-opaque patches is of the order of 25 fm in size, and the patches (some with regulr outlines suggestive of former mafics) are up to 0.7 mm across. Minor amounts of ?sphene and/or rutile as fine subhedral crystals to 50 fm long are found with the ?carbonate. Apatite crystals form euhedral prisms to 0.15 mm diameter, mainly in the patches of biotite, suggesting they may have originally been mafic patches. Quartz forms subhedral crystals up to 0.2 mm across; sulfides include deep reddish sphalerite as subhedra to 0.05 mm and opaques of similar size, possibly Fe-sulfides.

Fragments in the rest of the rock are variably sericite or biotite altered, angular and about 2 mm in size. They are mixed with elongate sericitized plagioclase relics to 3 mm long, both set in a matrix of fine-grained quartz, sericite and minor rutile of about 25 fm average size. There are minor disseminated opques (?sulfides), especially as patches up to 0.3 mm across in biotitic clasts. Rare subhedral quartz crystals may be primary (now recrystallzed) and there are also euhedral apatite crystals.

50628: SERICITE-QUARTZ-CLAY-PYRITE ALTERED FELSIC FRAGMENTAL VOLCANIC WITH PATCHES OF ?CARBONACEOUS MATTER

Creamy grey-white, coarsely fragmental felsic volcanic rock containing large flow-banded clasts up to 3 cm across. Sample is from hole BD92-35; chemistry (K_2O 6%, SiO_2 73%, Al_2O_3 14.6%; very low Na, Mg, Ca,, Fe, P_2O_5, and TiO_2) indicate a felsic rock, possibly rhyodacite. It contains significant Zn (0.7%), S (1.1%), As (375 ppm) but very low Pb and Ag. Sulfides are concentrated in irregular blebs or thin fractures and are not magnetic. Mineralogy in polished thin section is:

Sericite	60%
Quartz (largely secondary)	30%
Clay	5%
Pyrite, marcasite	3%
?Carbonaceous matter	1%
Sphalerite	1%
Covellite	tr

In thin section, the fragmental nature is really only disclosed by varying orientations of flow-banding in the subangular clasts. Banding consists of alterating layers of quartz- or sericite-rich material, averaging about 1 mm in thickness. Alkali feldspar is not visible in the layers, probably due to virtually complete sericitization. Some areas internal to sericitized areas do have low relief, but appear to be fine-grained (10-20 ƒm) clay rather than feldspar. Quartz in the layers forms anhedral, highly interlocking grains to 50 ƒm in diameter, with adjacent areas that may have been alkali feldspar altered to sericite as flakes up to 20 ƒm diameter. The margins of quartz grains are also altered. In the sericitic layers, the flakes are subhedral and up to 50 ƒm diameter. In some areas, the rock (especially sericitic areas) is crossed by microfracture networks, essentially intergranular, of opaque that has mainly very low reflectance and may be partly carbonaceous matter (amorphous, grains of a few microns in diameter). However, at high magnifications, very fine particles to 2-3 ƒm diameter of sulfide, probably pyrite, can be seen.

There are scattered subhedral patches of alteration minerals (quartz, sulfides and sericite) that may represent the sites of former mafic or plagioclase crystals. In them, quartz is sub- to euhedral and up to 0.3 mm long; sphalerite forms sub- to anhedral crystals up to 0.5 mm long although mostly mixed with gangue minerals to form highly interlocked grains that would be difficult to separate; and pyrite (with minor marcasite) forms subhedral crystals up to 0.7 mm across. Many appear to have formed after initial pyrrhotite as suggested by the lamellar internal texture and the presence of marcasite. Sphalerite has pale brown internal reflections indicating a low Fe content. Traces of very fine-grained covellite are found with the sphalerite.

50629: INTENSELY BIOTITE-SERICITE-QUARTZ-?K-SPAR ALTERED, FINE MAFIC-INTERMEDIATE CRYSTAL-LAPILLI TUFF

Dark brown, intensely biotite altered mafic fragmental rock very similar to 50627 in appearance except perhaps for slightly finer clasts about 0.5 cm or less in diameter. In this sample, minor sulfides (weakly magnetic) are visible, especially along pale-coloured fractures. There is no reaction to cold dilute HCl. Chemistry is almost identical to that of 50627, indicating a slightly less mafic (basaltic andesite?) protolith for this rock. However, it contains more sulfide (1% S, 0.8% Zn) and anomalous As (130 ppm) as in 50628. Modal mineralogy in thin section is:

Biotite (secondary)	40%
Sericite	35%
Quartz (largely secondary?)	15%
K-feldspar (primary)	5%
Pyrite, pyrrhotite	2%
Sphalerite	2%
Rutile	1%
Apatite	<1%

This rock is composed of about 40-50% biotitic altered fragments and 20-30% plagioclase and lesser ?mafic relict phenocrysts in a siliceous matrix, indicating a mafic-intermediate fine lapilli-crystal tuff protolith. Former plagioclase crystals were euhedral and up to 4 mm long; they are now pseudomorphed by fine (25-35 μm) sericite with minor biotite of similar size and quartz to 50 μm. Possible former mafic crystals are now represented by square to rectangular areas of coarse secondary quartz (subhedral, to 0.25 mm diameter), sulfide (reddish sub- to anhedral sphalerite to 0.1 mm, ?pyrite and minor relict ?pyrrhotite to 0.3 mm), and biotite (euhedral flakes to 0.1 mm with light brown pleochroism). Scattered large phenocrysts are made up of remnants of a clear mineral with small negative 2V that are likely K-feldspar; they are veined by similar material, suggesting some secondary K-spar or at least mobility of K-spar.

Clasts consist mainly of fine secondary biotite of 10-20 μm size, variably intermixed with or varying to almost end-member sericite of similar size; minor amounts of clear secondary quartz and/or K-feldspar occur. In places the texture of the clasts is suggestive of a porphyritic rock.

The matrix consists of fine anhedral ?quartz of about 30 μm diameter, probably largely secondary, and lesser fine sericite, biotite and opaques. The rock is crossed by a few thin (0.5 mm thick) quartz veins consisting of granular, strained quartz to 0.3 mm diameter with interstices of secondary biotite and minor opaques; sulfides are not notably concentrated along the veins, however.

<u>50630: INTENSELY BIOTITE-SERICITE-QUARTZ ALTERED, QUARTZ PORPHYRITIC OR AMYGDULAR ANDESITE</u>

Very dark (almost black), porphyritic volcanic containing large white quartz phenocrysts to 5 mm long in an aphanitic matrix. From hole BD92-35; chemistry indicates a Fe and Mg-rich (8% and 2.6%), moderately potassic (K20 6%) intermediate volcanic (67% SiO2, 16% Al2O3, 0.4% P2O5, 1% TiO2), possibly a quartz andesite. Dark colour and K20 content suggest strong secondary biotite alteration; it is anomalous in Zn (0.6%), S (1.6%) and As and Cu (130 and 60 ppm) but not Ag (1 g/t). Parts of the rock are distinctly magnetic; mineralogy in polished thin section is:

Secondary biotite	40%
Sericite	30%
Quartz (phenocrysts)	15%
(matrix)	10%
Pyrrhotite	3%
Sphalerite, trace chalcopyrite	1%
Carbonate (?ankerite)	<1%
Apatite	<1%
Hematite	<1%

This rock consists of quartz ?phenocrysts or ?amygdules and sericitized plagioclase relics in a matrix of fine secondary biotite. The quartz areas, up to 3 mm across, are rounded in outline and somewhat amoeboid shaped rather than euhedral; they are composed of aggregates of anhedral, sheaf-like strained grains, suggesting they could be amygdules rather than phenocrysts (although in hand specimen they look like partly resorbed crystals). The quartz is crossed by trails of secondary sericite, trace carbonate, fluid inclusions, and rimmed by biotite.

Plagioclase relics are euhedral and either large (up to 4 mm long) or fine (about 0.25 mm long) but are all pseudomorphed by fine subhedral flakes of sericite to 35 fm in diamter plus lesser biotite (20 fm), quartz (anhedral, clear, 50 fm) and sulfides (to 50 fm diameter, pyrite and rare sphalerite).

The matrix is fine (20 fm) medium brown secondary biotite, mixed with a little secondary quartz to 35 fm and minor sericite and sulfides. A thin veinlet, 0.2 mm thick, crosses the slide; it is made up of a core of carbonate (no reaction to acid and brown colour indicates possible ankerite), borders of sericite, and minor limonite plus rare pyrrhotite.

Throughout the rock, fresh (unaltered) pyrrhotite, and sphalerite, occur together, intimately integrown with each other and with gangues, as anhedral crystals up to 0.5 mm across. Sphalerite contains rare 20 fm inclusions of chalcopyrite, and there are small anhedral grains of chalcopyrite associated with pyrrhotite. Apatite occurs as barrel-shaped crystals up to 0.3 mm long; hematite is found as anhedral 0.05 mm diameter aggregates of fine flakes in certain parts of the matrix.

50631: INTENSELY BIOTITE-SERICITE-QUARTZ-CLAY ALTERED, FINE ?INTERMEDIATE (ANDESITIC) CRYSTAL-LAPILLI TUFF

Finely fragmental, dark brown mafic-intermediate volcanic rock with common fine sulfides. No geochemistry available for this sample; strongly magnetic, no reaction to cold dilute HCl visible. Modal mineralogy in polished thin section is:

Biotite (secondary)	30%
Sericite	30%
Quartz (largely secondary0	25%
Clay (?)	10%
Pyrrhotite	2%
Sphalerite	1%
Chlorite	1%
Apatite	<1%
Hematite, rutile	<1%
Chalcopyrite	tr
Tourmaline (schorlitic)	tr

This appears to be a slightly finer fragmental version of the preceeding sample (50630), composed of 30-40% small (1 mm) subangular, variably biotitic to sericitic fragments in a matrix of very fine ?clay, quartz, sericite, biotite and sulfides.

Biotite in the clasts forms subhedral flakes of about 10-20 μm diameter with pale brown pleochroism; sericite flakes are a little coarser (20-30 μm) and more euhedral. Some areas with elongate, euhedral outlines up to 3 mm long suggest they may have been former phenocrysts of ?plagioclase or mafic crystals, now replaced by secondary quartz (25-40 μm), sulfides to 50 μm, sericite, biotite, and chlorite as euhedral, very pale green but anomalous blue birefringent (moderate Fe content) flakes to 75 μm diameter. Chlorite occurs exclusively interstitial to sulfide grains. Barrel-shaped apatite crystals are euhedral and up to 0.2 mm long.

Irregular areas of coarse secondary quartz and sulfides, plus rare tourmaline, cross the slide. Quartz in these areas is clear or altered to clay-sericite at margins, up to 0.2 mm across and sub- to anhedral. Sulfides include pyrrhotite as sub- to anhedral crystals up to 0.5 mm diameter, sphalerite as anhedral masses to 0.2 mm highly interlocked with pyrrhotite and gangues, and chalcopyrite as anhedral masses to 0.1 mm across associated with pyrrhotite and sphalerite. Arsenopyrite occurs as rare euhedral crystals up to 0.05 mm across; as in 50630, hematite is found as aggregates to 0.05 mm diameter, ocmposed of fine specular flakes. Tourmaline forms euhedral prisms to 0.1 mm long with green-brown pleochroism indicating Fe-rich (schorl) composition.

This is a highly biotite-sericite-?clay altered, possibly andesitic rock with the usual minor sphalerite mineralization seen in this suite; As is seen to occur as the mineral arsenopyrite.

50632: INTENSELY BIOTITE-QUARTZ-SERICITE&CLAY? ALTERED, COARSELY PORPHYRITIC INTERMEDIATE (?ANDESITIC) FLOW ROCK

Dark brown to black, highly biotite altered coarse volcanic porphyry containing rounded quartz-sulfide ?eyes or amygdules to 3 mm across. The rock, from hole BD92-35, is magnetic, and the chemistry (67% SiO2, 16.6% Al2O3, 2.3% MgO, 0.4% P2O5, 1% TiO2,13.3% Fe2O3) indicates a mafic-intermediate volcanic, possibly quartz andesite. There is significant sulfide sulfur (2.3%) but only low Zn (0.25%), plus anomalous Cu (250 ppm) and As (370 ppm). Modal mineralogy in thin section is:

Secondary biotite	40%
Quartz (mainly secondary?)	30%
Sericite	20%
Chlorite or clay	5%
Pyrrhotite, trace chalcopyrite	5%
Hematite, sphalerite, rare arsenopyrite	<1%
Apatite	<1%

This specimen has a quite unusual texture, with large amoeboid-shaped areas of quartz and sericitized plagioclase relics in a highly biotitized grroundmass; whether there is a fragmental texture is hard to say. It may just be that the biotitization is variable, making a porphyritic flow rock look fragmental.

The quartz "eyes" are smoothly rounded in outline, up to 1 cm in length, and composed of coarse (up to 3 mm) subhedral quartz and pyrrhotite crystals, &chalcopyrite up to 0.25 mm. The quartz is strongly strained in places, with undulolse extinction, fracturing and granulation, even ?pressure twins evident, and the rim of the quartz patches is finely recrystallized, with fine sulfides. Fluid inclusions with high V/L ratios (40-80%) are common. The quartz areas look like amygdules, but could be phenocrysts.

Plagioclase relic crystals were up to 5 mm long and euheddral in outline; they are pseudomorphed by abundant fine (25 µm) sericite and minor biotite and sulfides of the same size, plus minor an- to subhedral quartz of 0.1 mm size. Relict mafic crystal sites could be represented by areas with subhedral outlines to 3 mm long that are composed of more quartz and sulfide (0.1 mm), with lesser biotite and sericite (25 µm). If so, they probably were pyroxenes.

The groundmass consists of mainly fine secondary biotite and minor hematite and sphalerite (both anhedral grains, about 20-30 µm diameter), mixed in places with sericite or a low birefringence mineral that could be clay or chlorite. Minor quartz is admixed in places, becoming more obvious where it is coarser and secondary (50-100 µm). In these areas some of the quartz takes on a veinlet distribution; sulfides, however, are still generally found as replacements of former crystals (i.e. with biotite or sericite). Veins are short and irregular, up to 1 mm thick, and look similar to the ?amygdules with fine quartz along their margins. Apatite forms slender euhedral crystals up to 0.15 mm long; rare arsenopyrite is up to 20 µm across.

APPENDIX V

SURVEYING PROGRAM USING THE MAGELLAN 5000 GPS UNIT

APPENDIX V

A survey of 82 points in the Blackwater-Davidson area including claim posts, most drill collars, several grid points, and topographic features was conducted by Ross Zawada in November, 1992. The survey instrument used was a Magellan 5000 GPS unit which calculates a position using satellite signals.

A printout of data stored in the unit, waypoint logs, and sketch maps are included in this appendix. A plot of the waypoints is presented in Figure 9.

Repeat surveys at the same waypoints yielded coordinate sets with significant discrepancies, commonly greater than 100m. To confirm the usefulness of the instrument for surveys of this kind (ie. for locating claim fractions or being able to establish precise positions and shapes of grids, etc.) the data would have to be submitted to someone with a base station who could remove errors intentionally introduced in the satellite signal.

If the corrected data are found to be sufficiently accurate it is recommended that the grid, road, and drill hole locations presented in Figure 10 be repositioned to remove errors.

BLACKWATER DAVIDSON PROPERTY
SURVEY PROGRAM USING MAGELLAN 5000 GPS UNIT
NOVEMBER 1992

Loc.	Time	Northing	Easting	Alt.	Satellites									PDOP	Date	
CAMP	18:26:41.3	+53 10 44.618	−124 51 16.838	1358.37	3	11	21	23	26	0	9	9	9	5.02	11/21/92	NAD27
CAM1	17:47:39.9	+53 10 46.613	−124 51 19.625	1500.72	3	3	11	23	26	9	3	9	9	2.38	11/25/92	NAD27
xR05	18:48:31.2	+53 10 36.368	−124 52 30.781	1511.89	2	11	26	26	0	5	1	9	0	2.23	11/26/92	NAD27
FA11	21:53:53.8	+53 10 07.540	−124 50 30.134	1834.63	2	12	14	25	0	2	3	7	0	1.33	11/26/92	NAD27
W002	00:06:46.6	+53 10 26.849	−124 51 38.557	1554.33	3	25	14	15	20	4	9	9	0	3.23	11/28/92	NAD27
xB18	04:59:57.4	+53 10 23.536	−124 51 30.887	1561.83	3	2	16	27	28	9	9	9	8	3.03	11/28/92	NAD27
xD15	16:16:49.9	+53 10 38.462	−124 51 53.071	1554.52	3	16	17	23	26	5	9	9	9	4.05	11/28/92	NAD27
xD17	16:38:03.2	+53 10 36.897	−124 52 00.554	1382.71	3	17	23	26	28	9	9	9	9	3.51	11/28/92	NAD27
xC03	16:46:23.9	+53 10 36.091	−124 52 06.270	1330.2	3	17	23	26	28	8	9	9	9	4.01	11/28/92	NAD27
xC25	17:40:04.6	+53 10 19.831	−124 51 53.069	1495.91	3	21	23	26	28	9	9	5	9	4.07	11/28/92	NAD27
xC14	20:00:07.5	+53 10 30.792	−124 51 54.187	1507.72	3	11	15	23	21	9	8	9	9	6.44	11/28/92	NAD27
CAMP	18:26:41.3	+53 10 44.618	−124 51 16.838	1358.37	3	11	21	23	26	0	9	9	9	5.02	11/21/92	NAD27
CAM1	17:47:39.9	+53 10 46.613	−124 51 19.625	1500.72	3	3	11	23	26	9	3	9	9	2.38	11/25/92	NAD27
xR05	18:46:31.2	+53 10 36.368	−124 52 30.781	1511.89	2	11	26	26	0	5	1	9	0	2.23	11/26/92	NAD27
FA11	21:53:53.8	+53 10 07.540	−124 50 30.134	1834.63	2	12	14	25	0	2	3	7	0	1.33	11/26/92	NAD27
W002	00:06:46.6	+53 10 26.849	−124 51 38.557	1554.33	3	25	14	15	20	4	9	9	0	3.23	11/28/92	NAD27
xB18	04:59:57.4	+53 10 23.536	−124 51 30.887	1561.83	3	2	16	27	28	9	9	9	6	3.03	11/28/92	NAD27
xD15	16:16:49.9	+53 10 38.462	−124 51 53.071	1554.52	3	16	17	23	26	5	9	9	9	4.05	11/28/92	NAD27
xD17	16:38:03.2	+53 10 36.887	−124 52 00.554	1382.71	3	17	23	26	28	8	9	9	9	3.51	11/28/92	NAD27
xC03	16:46:23.9	+53 10 35.091	−124 52 06.270	1330.2	3	17	23	26	28	8	9	9	9	4.01	11/28/92	NAD27
xC25	17:40:04.6	+53 10 19.831	−124 51 53.069	1495.91	3	21	23	26	28	9	9	5	9	4.07	11/28/92	NAD27
xC14	20:00:07.5	+53 10 30.792	−124 51 54.187	1507.72	3	11	15	23	21	9	8	9	9	6.44	11/28/92	NAD27
0188	03:59:03.6	+53 10 30.874	−124 51 20.321	0	2	16	18	28	0	6	9	4	0	1.62	11/30/92	NAD27
0189	03:59:05.6	+53 10 31.055	−124 51 20.307	0	2	16	18	28	0	5	9	5	0	1.62	11/30/92	NAD27
0190	03:59:06.6	+53 10 31.058	−124 51 20.329	0	2	16	18	28	0	7	9	3	0	1.62	11/30/92	NAD27
0191	03:59:08.6	+53 10 31.109	−124 51 20.373	0	2	16	18	28	0	7	9	4	0	1.62	11/30/92	NAD27
0192	03:59:09.6	+53 10 31.161	−124 51 20.323	0	2	16	18	28	0	5	9	2	0	1.62	11/30/92	NAD27
0193	03:59:11.6	+53 10 31.278	−124 51 20.318	0	2	16	18	28	0	6	9	3	0	1.62	11/30/92	NAD27
0194	03:59:13.6	+53 10 31.340	−124 51 20.289	0	2	16	18	28	0	8	9	4	0	1.62	11/30/92	NAD27
0195	03:59:15.6	+53 10 31.417	−124 51 20.289	0	2	16	18	28	0	6	9	3	0	1.62	11/30/92	NAD27
0196	03:59:17.6	+53 10 31.467	−124 51 20.261	0	2	16	18	28	0	5	9	3	0	1.62	11/30/92	NAD27
0197	03:59:18.6	+53 10 31.481	−124 51 20.220	0	2	16	18	28	0	6	9	4	0	1.62	11/30/92	NAD27
0198	03:59:21.6	+53 10 31.539	−124 51 20.239	0	2	16	18	28	0	7	9	4	0	1.62	11/30/92	NAD27
0199	03:59:23.6	+53 10 31.590	−124 51 20.272	0	2	16	18	28	0	5	9	4	0	1.62	11/30/92	NAD27
0200	03:59:25.6	+53 10 31.665	−124 51 20.275	0	2	16	18	28	0	7	9	4	0	1.62	11/30/92	NAD27
0201	03:59:27.6	+53 10 31.710	−124 51 20.281	0	2	16	18	28	0	7	9	3	0	1.62	11/30/92	NAD27
0202	03:59:29.6	+53 10 31.771	−124 51 20.195	0	2	16	18	28	0	6	9	3	0	1.62	11/30/92	NAD27
0203	03:59:30.6	+53 10 31.800	−124 51 20.227	0	2	16	18	28	0	5	9	3	0	1.62	11/30/92	NAD27
0204	03:59:33.6	+53 10 31.958	−124 51 20.081	0	2	16	18	28	0	8	9	1	0	1.6	11/30/92	NAD27
0205	03:59:36.6	+53 10 32.091	−124 51 20.026	0	2	16	18	28	0	6	9	3	0	1.6	11/30/92	NAD27
0206	03:59:38.6	+53 10 32.194	−124 51 20.048	0	2	16	18	28	0	6	9	4	0	1.6	11/30/92	NAD27
0207	03:59:40.6	+53 10 32.222	−124 51 20.128	0	2	16	18	28	0	6	9	4	0	1.6	11/30/92	NAD27
0208	03:59:41.6	+53 10 32.237	−124 51 20.141	0	2	16	18	28	0	6	9	4	0	1.6	11/30/92	NAD27
0209	03:59:44.6	+53 10 32.309	−124 51 20.171	0	2	16	18	28	0	6	9	4	0	1.6	11/30/92	NAD27
0210	03:59:45.6	+53 10 32.321	−124 51 20.211	0	2	16	18	28	0	4	9	4	0	1.6	11/30/92	NAD27
0211	03:59:47.6	+53 10 32.368	−124 51 20.233	0	2	16	18	28	0	4	9	4	0	1.6	11/30/92	NAD27
0212	03:59:50.6	+53 10 32.436	−124 51 20.306	0	2	16	18	28	0	5	9	5	0	1.6	11/30/92	NAD27
0213	03:59:52.6	+53 10 32.455	−124 51 20.389	0	2	16	18	28	0	5	9	6	0	1.6	11/30/92	NAD27
0214	03:59:55.6	+53 10 32.545	−124 51 20.423	0	2	16	18	28	0	5	9	6	0	1.6	11/30/92	NAD27
0215	03:59:56.6	+53 10 32.560	−124 51 20.421	0	2	16	18	28	0	6	9	5	0	1.6	11/30/92	NAD27
0216	03:59:58.6	+53 10 32.609	−124 51 20.419	0	2	16	18	28	0	5	9	6	0	1.6	11/30/92	NAD27
0217	03:59:59.6	+53 10 32.664	−124 51 20.419	0	2	16	18	28	0	7	9	7	0	1.6	11/30/92	NAD27
0218	04:00:02.6	+53 10 32.718	−124 51 20.413	0	2	16	18	28	0	5	9	5	0	1.6	11/30/92	NAD27
0219	04:00:04.6	+53 10 32.759	−124 51 20.436	0	2	16	18	28	0	7	9	6	0	1.6	11/30/92	NAD27
0220	04:00:07.6	+53 10 32.815	−124 51 20.427	0	2	16	18	28	0	7	9	5	0	1.6	11/30/92	NAD27
0221	04:00:08.6	+53 10 32.847	−124 51 20.412	0	2	16	18	28	0	5	9	4	0	1.6	11/30/92	NAD27
0222	04:00:10.6	+53 10 32.866	−124 51 20.418	0	2	16	18	28	0	7	9	5	0	1.6	11/30/92	NAD27
0223	04:00:13.6	+53 10 32.923	−124 51 20.474	0	2	16	18	28	0	7	9	6	0	1.6	11/30/92	NAD27
0224	04:00:15.6	+53 10 32.968	−124 51 20.490	0	2	16	18	28	0	7	9	6	0	1.6	11/30/92	NAD27
0225	04:00:16.6	+53 10 32.938	−124 51 20.547	0	2	16	18	28	0	7	9	5	0	1.6	11/30/92	NAD27
0226	04:00:19.6	+53 10 32.960	−124 51 20.568	0	2	16	18	28	0	7	9	6	0	1.6	11/30/92	NAD27
0227	04:00:20.6	+53 10 33.009	−124 51 20.538	0	2	16	18	28	0	7	9	4	0	1.6	11/30/92	NAD27
0228	04:00:23.6	+53 10 33.072	−124 51 20.621	0	2	16	18	28	0	4	9	4	0	1.6	11/30/92	NAD27
0229	04:00:26.6	+53 10 33.101	−124 51 20.671	0	2	16	18	28	0	7	9	5	0	1.6	11/30/92	NAD27
0230	04:00:27.6	+53 10 33.117	−124 51 20.776	0	2	16	18	28	0	6	9	4	0	1.6	11/30/92	NAD27
0231	04:00:30.6	+53 10 33.149	−124 51 20.837	0	2	16	18	28	0	6	9	6	0	1.6	11/30/92	NAD27
0232	04:00:32.6	+53 10 33.207	−124 51 20.868	0	2	16	18	28	0	6	9	4	0	1.6	11/30/92	NAD27
0233	04:00:33.6	+53 10 33.271	−124 51 20.877	0	2	16	18	28	0	4	9	6	0	1.6	11/30/92	NAD27
0234	04:00:36.6	+53 10 33.334	−124 51 20.841	0	2	16	18	28	0	4	9	6	0	1.6	11/30/92	NAD27
0235	04:00:38.6	+53 10 33.362	−124 51 20.882	0	2	16	18	28	0	4	9	6	0	1.6	11/30/92	NAD27
0236	04:00:41.6	+53 10 33.462	−124 51 20.867	0	2	16	18	28	0	3	9	5	0	1.6	11/30/92	NAD27
0237	04:00:43.6	+53 10 33.483	−124 51 20.898	0	2	16	18	28	0	3	9	5	0	1.6	11/30/92	NAD27
0238	04:00:45.6	+53 10 33.526	−124 51 20.905	0	2	16	18	28	0	4	9	6	0	1.6	11/30/92	NAD27
0239	04:00:48.6	+53 10 33.554	−124 51 21.005	0	2	16	18	28	0	4	9	6	0	1.6	11/30/92	NAD27
0240	04:00:49.6	+53 10 33.565	−124 51 20.980	0	2	16	18	28	0	6	9	6	0	1.6	11/30/92	NAD27
0241	04:00:52.6	+53 10 33.616	−124 51 21.024	0	2	16	18	28	0	4	9	5	0	1.6	11/30/92	NAD27
0242	04:00:54.6	+53 10 33.620	−124 51 21.035	0	2	16	18	28	0	6	9	7	0	1.6	11/30/92	NAD27
0243	04:00:55.6	+53 10 33.623	−124 51 20.995	0	2	16	18	28	0	4	9	7	0	1.6	11/30/92	NAD27
0244	04:00:58.6	+53 10 33.601	−124 51 21.089	0	2	16	18	28	0	4	9	5	0	1.6	11/30/92	NAD27
0245	04:01:00.6	+53 10 33.601	−124 51 21.077	0	2	16	18	28	0	4	9	6	0	1.6	11/30/92	NAD27
0246	04:01:02.6	+53 10 33.609	−124 51 21.089	0	2	16	18	28	0	4	8	6	0	1.6	11/30/92	NAD27
0247	04:01:04.6	+53 10 33.692	−124 51 20.996	0	2	16	18	28	0	5	9	7	0	1.6	11/30/92	NAD27
0248	04:01:06.6	+53 10 33.692	−124 51 20.895	0	2	16	18	28	0	5	9	7	0	1.6	11/30/92	NAD27
0249	04:01:08.6	+53 10 33.661	−124 51 21.019	0	2	16	18	28	0	5	9	7	0	1.6	11/30/92	NAD27
0250	04:01:11.6	+53 10 33.676	−124 51 20.930	0	2	16	18	28	0	4	9	4	0	1.6	11/30/92	NAD27
0251	04:01:13.6	+53 10 33.705	−124 51 20.917	0	2	16	18	28	0	5	9	6	0	1.6	11/30/92	NAD27
0252	04:01:15.6	+53 10 33.677	−124 51 20.924	0	2	16	18	28	0	7	8	5	0	1.6	11/30/92	NAD27
0253	04:01:17.6	+53 10 33.660	−124 51 20.922	0	2	16	18	28	0	6	9	8	0	1.6	11/30/92	NAD27
0254	04:01:19.6	+53 10 33.640	−124 51 20.938	0	2	16	18	28	0	7	9	7	0	1.6	11/30/92	NAD27
0255	04:01:22.6	+53 10 33.630	−124 51 20.929	0	2	16	18	28	0	7	8	7	0	1.6	11/30/92	NAD27
0256	04:01:23.6	+53 10 33.633	−124 51 20.970	0	2	16	18	28	0	8	9	7	0	1.6	11/30/92	NAD27
0257	04:01:26.6	+53 10 33.614	−124 51 20.894	0	2	16	18	28	0	6	9	5	0	1.6	11/30/92	NAD27

0258	04:01:27.6	+53 10 33.670	−124 51 20.848	0	2	16	18	28	0	6	9	7	0	1.6	11/30/92	NAD27
0259	04:01:29.6	+53 10 33.656	−124 51 20.845	0	2	16	18	28	0	5	9	6	0	1.6	11/30/92	NAD27
0260	04:01:30.6	+53 10 33.637	−124 51 20.804	0	2	16	18	28	0	6	9	6	0	1.6	11/30/92	NAD27
0261	04:01:33.6	+53 10 33.567	−124 51 20.825	0	2	16	18	28	0	7	8	8	0	1.6	11/30/92	NAD27
0262	04:01:36.6	+53 10 33.568	−124 51 20.822	0	2	16	18	28	0	6	8	7	0	1.6	11/30/92	NAD27
0263	04:01:37.6	+53 10 33.572	−124 51 20.832	0	2	16	18	28	0	6	9	8	0	1.6	11/30/92	NAD27
0264	04:01:39.6	+53 10 33.542	−124 51 20.852	0	2	16	18	28	0	6	5	7	0	1.6	11/30/92	NAD27
0265	04:01:40.6	+53 10 33.559	−124 51 20.809	0	2	16	18	28	0	7	7	3	0	1.6	11/30/92	NAD27
0266	04:01:42.6	+53 10 33.564	−124 51 20.769	0	2	16	18	28	0	6	8	5	0	1.6	11/30/92	NAD27
0267	04:01:45.6	+53 10 33.598	−124 51 20.760	0	2	16	18	28	0	7	6	5	0	1.6	11/30/92	NAD27
0268	04:01:47.6	+53 10 33.615	−124 51 20.700	0	2	16	18	28	0	7	8	5	0	1.6	11/30/92	NAD27
0269	04:01:49.6	+53 10 33.603	−124 51 20.712	0	2	16	18	28	0	6	7	3	0	1.6	11/30/92	NAD27
0270	04:01:50.6	+53 10 33.623	−124 51 20.719	0	2	16	18	28	0	5	9	4	0	1.6	11/30/92	NAD27
0271	04:01:52.6	+53 10 33.641	−124 51 20.661	0	2	16	18	28	0	7	8	3	0	1.6	11/30/92	NAD27
0272	04:01:53.6	+53 10 33.647	−124 51 20.668	0	2	16	18	28	0	3	9	5	0	1.6	11/30/92	NAD27
0273	04:01:55.6	+53 10 33.672	−124 51 20.679	0	2	16	18	28	0	6	9	6	0	1.6	11/30/92	NAD27
0274	04:01:57.6	+53 10 33.680	−124 51 20.598	0	2	16	18	28	0	8	9	6	0	1.6	11/30/92	NAD27
0275	04:01:59.6	+53 10 33.703	−124 51 20.553	0	2	16	18	28	0	7	9	7	0	1.6	11/30/92	NAD27
0276	04:02:00.6	+53 10 33.655	−124 51 20.611	0	2	16	18	28	0	7	9	7	0	1.6	11/30/92	NAD27
0277	04:02:02.6	+53 10 33.660	−124 51 20.671	0	2	16	18	28	0	8	9	5	0	1.6	11/30/92	NAD27
0278	04:02:03.6	+53 10 33.692	−124 51 20.574	0	2	16	18	28	0	9	9	5	0	1.6	11/30/92	NAD27
0279	04:02:05.6	+53 10 33.735	−124 51 20.594	0	2	16	18	28	0	5	9	6	0	1.6	11/30/92	NAD27
0280	04:02:07.6	+53 10 33.724	−124 51 20.565	0	2	16	18	28	0	5	9	4	0	1.6	11/30/92	NAD27
0281	04:02:09.6	+53 10 33.725	−124 51 20.611	0	2	16	18	28	0	6	9	6	0	1.6	11/30/92	NAD27
0282	04:02:11.6	+53 10 33.682	−124 51 20.651	0	2	16	18	28	0	7	9	5	0	1.6	11/30/92	NAD27
0283	04:02:12.6	+53 10 33.697	−124 51 20.626	0	2	16	18	28	0	7	9	4	0	1.6	11/30/92	NAD27
0284	04:02:13.6	+53 10 33.725	−124 51 20.594	0	2	16	18	28	0	8	9	5	0	1.6	11/30/92	NAD27
0285	04:02:15.6	+53 10 33.734	−124 51 20.543	0	2	16	18	28	0	5	9	5	0	1.6	11/30/92	NAD27
0286	04:05:51.6	+53 10 58.893	−124 50 41.211	0	2	2	18	16	0	1	9	2	0	1.94	11/30/92	NAD27
0287	04:05:56.6	+53 10 58.967	−124 50 41.123	0	2	2	18	16	0	4	9	5	0	1.94	11/30/92	NAD27
0288	04:05:58.6	+53 10 59.002	−124 50 41.046	0	2	2	18	16	0	4	9	2	0	1.94	11/30/92	NAD27
0289	04:06:00.6	+53 10 58.914	−124 50 41.074	0	2	2	18	16	0	2	9	4	0	1.94	11/30/92	NAD27
0290	04:06:02.6	+53 10 58.833	−124 50 41.112	0	2	2	18	16	0	3	9	4	0	1.94	11/30/92	NAD27
0291	04:06:03.6	+53 10 58.982	−124 50 41.032	0	2	2	18	16	0	3	9	3	0	1.94	11/30/92	NAD27
0292	04:06:05.6	+53 10 59.009	−124 50 40.963	0	2	2	18	16	0	2	9	3	0	1.94	11/30/92	NAD27
0293	17:01:52.5	+53 10 04.331	−124 49 54.725	0	2	3	17	28	0	9	6	4	0	3.86	11/30/92	NAD27
0294	17:01:57.5	+53 10 04.530	−124 49 54.541	0	2	3	17	28	0	9	9	7	0	3.86	11/30/92	NAD27
0295	17:01:59.5	+53 10 04.678	−124 49 54.446	0	2	3	17	28	0	9	9	7	0	3.86	11/30/92	NAD27
0296	17:02:01.5	+53 10 04.881	−124 49 54.270	0	2	3	17	28	0	9	9	7	0	3.86	11/30/92	NAD27
0297	17:02:03.5	+53 10 05.007	−124 49 54.167	0	2	3	17	28	0	9	9	5	0	3.86	11/30/92	NAD27
0298	17:02:04.5	+53 10 05.107	−124 49 54.101	0	2	3	17	28	0	9	7	6	0	3.86	11/30/92	NAD27
0299	17:02:06.5	+53 10 05.234	−124 49 54.009	0	2	3	17	28	0	9	8	6	0	3.86	11/30/92	NAD27
0300	17:02:08.5	+53 10 05.316	−124 49 53.859	0	2	3	17	28	0	9	9	6	0	3.86	11/30/92	NAD27
0301	17:02:10.5	+53 10 05.487	−124 49 53.648	0	2	3	17	28	0	6	9	2	0	3.86	11/30/92	NAD27
0302	17:02:11.5	+53 10 05.578	−124 49 53.542	0	2	3	17	28	0	1	9	2	0	3.86	11/30/92	NAD27
0303	17:02:13.5	+53 10 05.737	−124 49 53.386	0	2	3	17	28	0	7	9	1	0	3.86	11/30/92	NAD27
0304	17:02:15.5	+53 10 05.758	−124 49 53.395	0	2	3	17	28	0	7	9	2	0	3.86	11/30/92	NAD27
0305	17:02:17.5	+53 10 05.947	−124 49 53.165	0	2	3	17	28	0	6	9	2	0	3.86	11/30/92	NAD27
0306	17:02:19.5	+53 10 05.993	−124 49 53.169	0	2	3	17	28	0	8	9	3	0	3.86	11/30/92	NAD27
0307	17:02:21.5	+53 10 06.007	−124 49 53.162	0	2	3	17	28	0	6	9	2	0	3.86	11/30/92	NAD27
0308	17:02:23.5	+53 10 06.150	−124 49 52.937	0	2	3	17	28	0	7	9	1	0	3.86	11/30/92	NAD27
0309	17:02:24.5	+53 10 06.162	−124 49 52.888	0	2	3	17	28	0	5	9	2	0	3.86	11/30/92	NAD27
0310	17:02:26.5	+53 10 06.251	−124 49 52.845	0	2	3	17	28	0	8	9	2	0	3.86	11/30/92	NAD27
0311	17:02:28.5	+53 10 06.308	−124 49 52.805	0	2	3	17	28	0	2	9	1	0	3.86	11/30/92	NAD27
0312	17:02:30.5	+53 10 06.190	−124 49 52.906	0	2	3	17	28	0	3	9	1	0	3.86	11/30/92	NAD27
0313	17:02:32.5	+53 10 06.086	−124 49 53.030	0	2	3	17	28	0	2	9	1	0	3.86	11/30/92	NAD27
0314	17:02:33.5	+53 10 06.036	−124 49 52.949	0	2	3	17	28	0	5	9	2	0	3.86	11/30/92	NAD27
0315	17:02:35.5	+53 10 05.910	−124 49 52.964	0	2	3	17	28	0	2	9	3	0	3.86	11/30/92	NAD27
0316	17:02:37.5	+53 10 06.034	−124 49 52.791	0	2	3	17	28	0	3	9	2	0	3.86	11/30/92	NAD27
0317	17:02:38.5	+53 10 06.146	−124 49 52.676	0	2	3	17	28	0	6	9	5	0	3.86	11/30/92	NAD27
0318	17:02:40.5	+53 10 06.204	−124 49 52.624	0	2	3	17	28	0	5	9	2	0	3.86	11/30/92	NAD27
0319	17:02:42.5	+53 10 06.241	−124 49 52.625	0	2	3	17	28	0	3	9	4	0	3.86	11/30/92	NAD27
0320	17:02:44.5	+53 10 06.216	−124 49 52.577	0	2	3	17	28	0	5	9	4	0	3.86	11/30/92	NAD27
0321	17:02:46.5	+53 10 06.224	−124 49 52.487	0	2	3	17	28	0	5	9	3	0	3.86	11/30/92	NAD27
0322	17:02:48.5	+53 10 06.258	−124 49 52.463	0	2	3	17	28	0	3	9	8	0	3.86	11/30/92	NAD27
0323	17:02:49.5	+53 10 06.358	−124 49 52.351	0	2	3	17	28	0	3	9	4	0	3.86	11/30/92	NAD27
0324	17:02:51.5	+53 10 06.338	−124 49 52.277	0	2	3	17	28	0	4	9	3	0	3.86	11/30/92	NAD27
0325	17:02:52.5	+53 10 06.347	−124 49 52.280	0	2	3	17	28	0	4	9	3	0	3.86	11/30/92	NAD27
0326	17:02:54.5	+53 10 06.348	−124 49 52.199	0	2	3	17	28	0	3	9	4	0	3.86	11/30/92	NAD27
0327	17:02:56.5	+53 10 06.266	−124 49 52.227	0	2	3	17	28	0	4	9	4	0	3.86	11/30/92	NAD27
0328	17:02:58.5	+53 10 06.290	−124 49 52.189	0	2	3	17	28	0	4	9	6	0	3.86	11/30/92	NAD27
0329	17:02:59.5	+53 10 06.193	−124 49 52.273	0	2	3	17	28	0	3	9	6	0	3.86	11/30/92	NAD27
0330	17:03:01.5	+53 10 06.223	−124 49 52.265	0	2	3	17	28	0	3	9	6	0	3.86	11/30/92	NAD27
0331	17:03:03.5	+53 10 06.219	−124 49 52.216	0	2	3	17	28	0	2	9	3	0	3.86	11/30/92	NAD27
0332	17:03:04.5	+53 10 06.257	−124 49 52.240	0	2	3	17	28	0	2	9	6	0	3.86	11/30/92	NAD27
0333	17:03:06.5	+53 10 06.378	−124 49 52.119	0	2	3	17	28	0	5	9	5	0	3.86	11/30/92	NAD27
0334	17:03:08.5	+53 10 06.323	−124 49 52.163	0	2	3	17	28	0	6	9	5	0	3.86	11/30/92	NAD27
0335	17:03:10.5	+53 10 06.449	−124 49 52.046	0	2	3	17	28	0	6	9	5	0	3.86	11/30/92	NAD27
0336	17:03:11.5	+53 10 06.486	−124 49 52.063	0	2	3	17	28	0	5	9	7	0	3.86	11/30/92	NAD27
0337	17:03:13.5	+53 10 06.544	−124 49 51.974	0	2	3	17	28	0	6	9	5	0	3.86	11/30/92	NAD27
0338	17:03:14.5	+53 10 06.589	−124 49 51.938	0	2	3	17	28	0	5	9	5	0	3.86	11/30/92	NAD27
0339	17:03:16.5	+53 10 06.424	−124 49 52.140	0	2	3	17	28	0	2	9	7	0	3.86	11/30/92	NAD27
0340	17:03:18.5	+53 10 06.558	−124 49 52.045	0	2	3	17	28	0	5	9	6	0	3.86	11/30/92	NAD27
0341	17:03:20.5	+53 10 06.650	−124 49 51.862	0	2	3	17	28	0	6	9	6	0	3.86	11/30/92	NAD27
0342	17:03:22.5	+53 10 06.711	−124 49 51.766	0	2	3	17	28	0	6	9	6	0	3.86	11/30/92	NAD27
0343	17:03:24.5	+53 10 06.709	−124 49 51.822	0	2	3	17	28	0	4	9	7	0	3.86	11/30/92	NAD27
0344	17:03:26.5	+53 10 06.830	−124 49 51.731	0	2	3	17	28	0	3	9	8	0	3.86	11/30/92	NAD27
0345	17:03:28.5	+53 10 06.860	−124 49 51.753	0	2	3	17	28	0	4	9	8	0	3.86	11/30/92	NAD27
0346	17:03:30.5	+53 10 06.777	−124 49 51.799	0	2	3	17	28	0	1	9	3	0	3.86	11/30/92	NAD27
0347	17:03:32.5	+53 10 06.711	−124 49 51.872	0	2	3	17	28	0	3	9	4	0	3.86	11/30/92	NAD27
0348	17:03:34.5	+53 10 06.553	−124 49 52.054	0	2	3	17	28	0	0	8	5	0	3.86	11/30/92	NAD27
0349	17:03:36.5	+53 10 06.473	−124 49 52.114	0	2	3	17	28	0	2	9	4	0	3.86	11/30/92	NAD27
0350	17:03:38.5	+53 10 06.455	−124 49 52.170	0	2	3	17	28	0	2	9	5	0	3.86	11/30/92	NAD27
0351	17:03:40.5	+53 09 06.774	−124 50 27.433	0	2	23	17	28	0	2	8	5	0	3.06	11/30/92	NAD27
0352	17:03:48.5	+53 10 06.617	−124 49 52.444	0	2	3	17	28	0	4	2	6	0	3.72	11/30/92	NAD27
0353	17:03:51.5	+53 10 06.466	−124 49 52.692	0	2	3	17	28	0	6	3	0	0	3.72	11/30/92	NAD27
0354	17:03:53.5	+53 10 06.449	−124 49 52.673	0	2	3	17	28	0	4	3	1	0	3.72	11/30/92	NAD27

0355	17:03:54.5	+53 10 06.487	−124 49 52.660	0	2	3	17	28	0	4	4	1	0	3.72	11/30/92	NAD27
0356	17:03:56.5	+53 10 06.302	−124 49 52.759	0	2	3	17	28	0	6	5	1	0	3.72	11/30/92	NAD27
0357	17:03:57.5	+53 10 06.437	−124 49 52.564	0	2	3	17	28	0	6	7	1	0	3.72	11/30/92	NAD27
0358	17:03:58.5	+53 10 06.433	−124 49 52.547	0	2	3	17	28	0	7	5	0	0	3.72	11/30/92	NAD27
0359	17:04:01.5	+53 10 06.278	−124 49 52.669	0	2	3	17	28	0	7	5	1	0	3.72	11/30/92	NAD27
0360	17:04:03.5	+53 10 06.347	−124 49 52.632	0	2	3	17	28	0	6	8	2	0	3.72	11/30/92	NAD27
0361	17:12:24.2	+53 09 26.287	−124 50 17.143	1369.92	3	3	23	26	28	9	9	5	9	3.81	11/30/92	NAD27
0362	17:12:33.2	+53 09 26.270	−124 50 17.136	1375.79	3	3	23	26	28	9	9	9	9	3.81	11/30/92	NAD27
0363	17:12:36.2	+53 09 26.248	−124 50 17.132	1374.65	3	3	23	26	28	9	9	6	9	3.81	11/30/92	NAD27
0364	17:12:39.2	+53 09 26.276	−124 50 17.123	1374.75	3	3	23	26	28	8	9	9	4	3.81	11/30/92	NAD27
0365	17:12:43.2	+53 09 26.267	−124 50 17.167	1374.13	3	3	23	26	28	9	9	9	9	3.81	11/30/92	NAD27
0366	17:12:45.2	+53 09 26.279	−124 50 17.086	1380.27	3	3	23	26	28	9	9	9	6	3.81	11/30/92	NAD27
0367	17:12:49.2	+53 09 26.269	−124 50 17.063	1384.79	3	3	23	26	28	9	9	9	9	3.81	11/30/92	NAD27
0368	17:12:52.2	+53 09 26.265	−124 50 17.117	1386.1	3	3	23	26	28	9	9	9	9	3.81	11/30/92	NAD27
0369	17:12:55.2	+53 09 26.235	−124 50 17.137	1386.39	3	3	23	26	28	7	9	9	9	3.81	11/30/92	NAD27
0370	17:12:57.2	+53 09 26.194	−124 50 17.206	1386.26	3	3	23	26	28	8	9	9	9	3.81	11/30/92	NAD27
0371	17:13:01.2	+53 09 26.147	−124 50 17.262	1386.43	3	3	23	26	28	9	9	8	8	3.81	11/30/92	NAD27
0372	17:13:04.2	+53 09 26.087	−124 50 17.368	1384.84	3	3	23	26	28	7	9	6	9	3.81	11/30/92	NAD27
0373	17:13:07.2	+53 09 26.065	−124 50 17.367	1388.89	3	3	23	26	28	7	9	7	9	3.81	11/30/92	NAD27
0374	17:13:09.2	+53 09 26.051	−124 50 17.387	1390.61	3	3	23	26	28	6	9	9	9	3.81	11/30/92	NAD27
0375	17:13:13.2	+53 09 25.987	−124 50 17.420	1393.65	3	3	23	26	28	6	9	8	9	3.81	11/30/92	NAD27
0376	17:13:16.2	+53 09 25.996	−124 50 17.459	1395.47	3	3	23	26	28	8	9	8	9	3.81	11/30/92	NAD27
0377	17:13:19.2	+53 09 25.970	−124 50 17.397	1398.13	3	3	23	26	28	8	8	8	9	3.81	11/30/92	NAD27
0378	17:13:21.2	+53 09 26.010	−124 50 17.379	1398.77	3	3	23	26	28	8	9	9	9	3.81	11/30/92	NAD27
0379	17:13:24.2	+53 09 25.979	−124 50 17.322	1406.19	3	3	23	26	28	8	9	8	9	3.81	11/30/92	NAD27
0380	17:13:27.2	+53 09 25.949	−124 50 17.254	1410.74	3	3	23	26	28	8	9	8	9	3.81	11/30/92	NAD27
0381	17:13:30.2	+53 09 25.898	−124 50 17.238	1415.47	3	3	23	26	28	9	9	9	9	3.81	11/30/92	NAD27
0382	17:13:31.2	+53 09 25.877	−124 50 17.297	1418.65	3	3	23	26	28	7	9	9	9	3.81	11/30/92	NAD27
0383	17:13:33.2	+53 09 25.875	−124 50 17.275	1419.43	3	3	23	26	28	8	8	8	9	3.81	11/30/92	NAD27
0384	17:13:37.2	+53 09 25.832	−124 50 17.238	1427.13	3	3	23	26	28	9	9	8	9	3.81	11/30/92	NAD27
0385	17:13:39.2	+53 09 25.857	−124 50 17.221	1430.74	3	3	23	26	28	8	9	8	9	3.81	11/30/92	NAD27
0386	17:13:42.2	+53 09 25.817	−124 50 17.236	1437.05	3	3	23	26	28	8	8	6	9	3.81	11/30/92	NAD27
0387	17:13:45.2	+53 09 25.822	−124 50 17.217	1443.66	3	3	23	26	28	8	9	7	9	3.81	11/30/92	NAD27
0388	17:13:48.2	+53 09 25.751	−124 50 17.206	1447.79	3	3	23	26	28	6	9	8	9	3.81	11/30/92	NAD27
0389	17:13:52.2	+53 09 25.683	−124 50 17.243	1450.67	3	3	23	26	28	8	9	8	9	3.81	11/30/92	NAD27
0390	17:13:55.2	+53 09 25.587	−124 50 17.241	1449.44	3	3	23	26	28	8	9	7	8	3.81	11/30/92	NAD27
0391	17:13:57.2	+53 09 25.589	−124 50 17.247	1450.93	3	3	23	26	28	9	8	8	9	3.81	11/30/92	NAD27
0392	17:14:00.2	+53 09 25.587	−124 50 17.290	1453.9	3	3	23	26	28	9	8	8	9	3.81	11/30/92	NAD27
0393	17:14:04.2	+53 09 25.527	−124 50 17.244	1460.43	3	3	23	26	28	8	9	7	9	3.81	11/30/92	NAD27
0394	17:14:07.2	+53 09 25.463	−124 50 17.321	1462.87	3	3	23	26	28	9	9	7	9	3.81	11/30/92	NAD27
0395	17:14:09.2	+53 09 25.385	−124 50 17.344	1465.47	3	3	23	26	28	9	9	6	9	3.81	11/30/92	NAD27
0396	17:14:13.2	+53 09 25.354	−124 50 17.304	1471.07	3	3	23	26	28	9	9	4	9	3.81	11/30/92	NAD27
0397	17:14:16.2	+53 09 25.358	−124 50 17.268	1474.19	3	3	23	26	28	9	9	4	9	3.81	11/30/92	NAD27
0398	17:14:19.2	+53 09 25.305	−124 50 17.242	1478.56	3	3	23	26	28	9	9	4	9	3.81	11/30/92	NAD27
0399	17:14:21.2	+53 09 25.312	−124 50 17.231	1480.69	3	3	23	26	28	9	9	4	9	3.81	11/30/92	NAD27
0400	17:14:25.2	+53 09 25.310	−124 50 17.183	1489.33	3	3	23	26	28	9	9	3	9	3.81	11/30/92	NAD27
0401	17:14:26.2	+53 09 25.265	−124 50 17.195	1492.82	3	3	23	26	28	9	9	3	9	3.81	11/30/92	NAD27
0402	17:14:30.2	+53 09 25.294	−124 50 17.150	1495.49	3	3	23	26	28	9	9	3	9	3.81	11/30/92	NAD27
0403	17:14:33.2	+53 09 25.225	−124 50 17.103	1499.11	3	3	23	26	28	9	9	3	9	3.81	11/30/92	NAD27
0404	17:14:36.2	+53 09 25.172	−124 50 17.074	1502.8	3	3	23	26	28	9	9	3	9	3.81	11/30/92	NAD27
0405	17:14:39.2	+53 09 25.131	−124 50 17.116	1505.92	3	3	23	26	28	9	9	3	9	3.81	11/30/92	NAD27
0406	17:14:42.2	+53 09 25.109	−124 50 17.150	1512.45	3	3	23	26	28	9	9	2	9	3.81	11/30/92	NAD27
0407	17:14:45.2	+53 09 25.068	−124 50 17.057	1516.37	3	3	23	26	28	9	9	1	9	3.81	11/30/92	NAD27
0408	17:14:48.2	+53 09 25.062	−124 50 16.974	1518.77	3	3	23	26	28	9	9	4	9	3.81	11/30/92	NAD27
0409	17:14:51.2	+53 09 25.037	−124 50 17.009	1520.9	3	3	23	26	28	9	9	1	9	3.81	11/30/92	NAD27
0410	17:14:54.2	+53 09 25.031	−124 50 16.933	1526.17	3	3	23	26	28	8	8	2	8	3.81	11/30/92	NAD27
0411	17:14:57.2	+53 09 24.966	−124 50 16.894	1529.77	3	3	23	26	28	9	8	2	8	3.81	11/30/92	NAD27
0412	17:15:01.2	+53 09 24.934	−124 50 16.851	1532.12	3	3	23	26	28	9	9	2	8	3.81	11/30/92	NAD27
0413	17:15:03.2	+53 09 24.939	−124 50 16.742	1532.21	3	3	23	26	28	9	9	2	9	3.81	11/30/92	NAD27
0414	17:15:06.2	+53 09 24.917	−124 50 16.682	1536.58	3	3	23	26	28	9	9	5	9	3.81	11/30/92	NAD27
0415	17:15:08.2	+53 09 24.897	−124 50 16.709	1536.14	3	3	23	26	28	9	9	5	9	3.81	11/30/92	NAD27
0416	17:15:12.2	+53 09 24.840	−124 50 16.694	1538.59	3	3	23	26	28	9	9	4	9	3.81	11/30/92	NAD27
0417	17:15:14.2	+53 09 24.836	−124 50 16.699	1536.13	3	3	23	26	28	9	9	4	9	3.81	11/30/92	NAD27
0418	17:15:17.2	+53 09 24.763	−124 50 16.712	1539.1	3	3	23	26	28	9	9	7	9	3.81	11/30/92	NAD27
0419	17:15:19.2	+53 09 24.757	−124 50 16.747	1541.94	3	3	23	26	28	9	8	6	9	3.81	11/30/92	NAD27
0420	17:15:22.2	+53 09 24.743	−124 50 16.689	1546.41	3	3	23	26	28	9	9	4	9	3.81	11/30/92	NAD27
0421	17:15:24.2	+53 09 24.684	−124 50 16.691	1550.41	3	3	23	26	28	8	8	8	9	3.69	11/30/92	NAD27
0422	17:15:28.2	+53 09 24.591	−124 50 16.544	1552.44	3	3	23	26	28	9	9	8	9	3.69	11/30/92	NAD27
0423	17:15:31.2	+53 09 24.560	−124 50 16.439	1555.78	3	3	23	26	28	9	8	7	8	3.69	11/30/92	NAD27
0424	17:15:34.2	+53 09 24.530	−124 50 16.474	1554.91	3	3	23	26	28	8	8	8	8	3.69	11/30/92	NAD27
0425	17:15:35.2	+53 09 24.514	−124 50 16.447	1554.78	3	3	23	26	28	9	9	5	9	3.69	11/30/92	NAD27
0426	17:15:37.2	+53 09 24.479	−124 50 16.421	1557.26	3	3	23	26	28	9	9	5	9	3.69	11/30/92	NAD27
0427	17:15:39.2	+53 09 24.443	−124 50 16.452	1557.13	3	3	23	26	28	9	9	7	9	3.69	11/30/92	NAD27
0428	17:15:40.2	+53 09 24.393	−124 50 16.513	1557.58	3	3	23	26	28	9	9	6	9	3.69	11/30/92	NAD27
0429	17:15:43.2	+53 09 24.366	−124 50 16.419	1560.81	3	3	23	26	28	9	9	5	9	3.69	11/30/92	NAD27
0430	17:15:46.2	+53 09 24.382	−124 50 16.543	1558.14	3	3	23	26	28	9	9	4	9	3.69	11/30/92	NAD27
0431	17:15:48.2	+53 09 24.331	−124 50 16.542	1561.06	3	3	23	26	28	9	9	5	9	3.69	11/30/92	NAD27
0432	17:15:50.2	+53 09 24.294	−124 50 16.546	1563.21	3	3	23	26	28	9	9	5	9	3.69	11/30/92	NAD27
0433	17:15:52.2	+53 09 24.273	−124 50 16.486	1564.68	3	3	23	26	28	8	9	3	9	3.69	11/30/92	NAD27
0434	17:15:54.2	+53 09 24.287	−124 50 16.581	1562.34	3	3	23	26	28	9	9	4	9	3.69	11/30/92	NAD27
0435	17:15:57.2	+53 09 24.286	−124 50 16.568	1563.97	3	3	23	26	28	9	9	4	9	3.69	11/30/92	NAD27
0436	17:15:59.2	+53 09 24.325	−124 50 16.465	1563.34	3	3	23	26	28	9	9	3	9	3.69	11/30/92	NAD27
0437	17:16:00.2	+53 09 24.308	−124 50 16.440	1567.15	3	3	23	26	28	8	9	3	9	3.69	11/30/92	NAD27
0438	17:16:02.2	+53 09 24.323	−124 50 16.295	1566.69	3	3	23	26	28	8	9	2	9	3.69	11/30/92	NAD27
0439	17:16:04.2	+53 09 24.328	−124 50 16.306	1567.86	3	3	23	26	28	8	9	1	9	3.69	11/30/92	NAD27
0440	17:16:08.2	+53 09 24.354	−124 50 16.215	1571.6	3	3	23	26	28	9	9	2	9	3.69	11/30/92	NAD27
0441	17:16:11.2	+53 09 24.384	−124 50 16.158	1572.07	3	3	23	26	28	9	9	5	9	3.69	11/30/92	NAD27
0442	17:16:13.2	+53 09 24.361	−124 50 16.111	1573.11	3	3	23	26	28	9	9	4	9	3.69	11/30/92	NAD27
0443	17:16:15.2	+53 09 24.376	−124 50 16.248	1567.85	3	3	23	26	28	9	9	3	9	3.69	11/30/92	NAD27
0444	17:16:19.2	+53 09 24.362	−124 50 16.076	1572.26	3	3	23	26	28	9	9	3	9	3.69	11/30/92	NAD27
0445	17:16:22.2	+53 09 24.356	−124 50 16.114	1569.92	3	3	23	26	28	9	9	3	9	3.69	11/30/92	NAD27
0446	17:16:24.2	+53 09 24.341	−124 50 16.130	1569.79	3	3	23	26	28	8	9	5	9	3.69	11/30/92	NAD27
0447	17:16:26.2	+53 09 24.335	−124 50 16.159	1569.69	3	3	23	26	28	9	9	3	9	3.69	11/30/92	NAD27
0448	17:16:30.2	+53 09 24.364	−124 50 16.064	1571.11	3	3	23	26	28	9	9	2	9	3.69	11/30/92	NAD27
0449	17:16:33.2	+53 09 24.372	−124 50 15.977	1572.92	3	3	23	26	28	9	9	2	9	3.69	11/30/92	NAD27
0450	17:16:35.2	+53 09 24.401	−124 50 15.884	1575.2	3	3	23	26	28	9	9	2	9	3.69	11/30/92	NAD27
0451	17:16:37.2	+53 09 24.404	−124 50 15.835	1574.51	3	3	23	26	28	9	9	0	9	3.69	11/30/92	NAD27
0452	17:16:41.2	+53 09 24.429	−124 50 15.737	1573.09	3	3	23	26	28	9	9	3	9	3.69	11/30/92	NAD27

0453	17:16:51.2	+53 09 24.661	−124 50 15.018	1594.5	3	3	23	26	28	8	9	3	9	3.84 11/30/92	NAD27
0454	17:17:06.2	+53 09 23.694	−124 50 17.327	1552.76	3	3	23	21	28	5	9	9	9	3.87 11/30/92	NAD27
0455	17:17:16.2	+53 09 25.092	−124 50 14.587	1571.77	3	3	23	26	28	9	9	1	9	3.82 11/30/92	NAD27
0456	17:17:26.2	+53 09 25.001	−124 50 14.690	1566.28	3	3	23	26	28	6	9	3	9	3.82 11/30/92	NAD27
0457	17:17:29.2	+53 09 24.936	−124 50 14.751	1563.08	3	3	23	26	28	3	9	3	9	3.82 11/30/92	NAD27
0458	17:17:31.2	+53 09 24.818	−124 50 14.860	1559.56	3	3	23	26	28	6	9	3	9	3.82 11/30/92	NAD27
0459	17:17:34.2	+53 09 24.730	−124 50 15.027	1556.49	3	3	23	26	28	4	9	1	9	3.82 11/30/92	NAD27
0460	17:17:36.2	+53 09 24.730	−124 50 15.096	1552.65	3	3	23	26	28	5	9	1	9	3.82 11/30/92	NAD27
0461	17:17:39.2	+53 09 24.696	−124 50 15.063	1551.21	3	3	23	26	28	5	9	3	9	3.82 11/30/92	NAD27
0462	17:17:41.2	+53 09 24.662	−124 50 16.114	1549.3	3	3	23	26	28	6	9	4	9	3.82 11/30/92	NAD27
0463	17:17:44.2	+53 09 24.646	−124 50 16.140	1546.64	3	3	23	26	28	7	9	3	9	3.82 11/30/92	NAD27
0464	17:17:46.2	+53 09 24.602	−124 50 16.174	1544.31	3	3	23	26	28	7	9	2	9	3.82 11/30/92	NAD27
0465	17:17:48.2	+53 09 24.643	−124 50 16.142	1542.44	3	3	23	26	28	7	9	2	9	3.82 11/30/92	NAD27
0466	17:17:52.2	+53 09 24.628	−124 50 15.161	1540.32	3	3	23	26	28	4	9	3	9	3.82 11/30/92	NAD27
0467	17:17:54.2	+53 09 24.624	−124 50 16.221	1539.77	3	3	23	26	28	5	9	4	9	3.82 11/30/92	NAD27
0468	17:17:56.2	+53 09 24.595	−124 50 15.322	1536.06	3	3	23	26	28	5	9	4	9	3.82 11/30/92	NAD27
0469	17:17:59.2	+53 09 24.560	−124 50 15.335	1536.51	3	3	23	26	28	6	9	5	9	3.82 11/30/92	NAD27
0470	17:18:03.2	+53 09 24.590	−124 50 15.397	1535.24	3	3	23	26	28	7	9	1	9	3.82 11/30/92	NAD27
0471	17:18:05.2	+53 09 24.511	−124 50 15.516	1532.3	3	3	23	26	28	8	9	2	9	3.82 11/30/92	NAD27
0472	17:18:10.2	+53 09 24.584	−124 50 16.503	1497.4	3	3	23	26	17	0	6	9	9	6.41 11/30/92	NAD27
0473	17:53:58.6	+53 10 03.886	−124 50 39.422	1631.82	3	17	21	23	28	9	7	9	6	4.45 11/30/92	NAD27
0474	17:54:06.6	+53 10 03.862	−124 50 39.262	1628.29	3	17	21	23	28	9	8	9	5	4.45 11/30/92	NAD27
0475	17:54:10.6	+53 10 03.898	−124 50 39.172	1632.68	3	17	21	23	28	9	7	9	9	4.45 11/30/92	NAD27
0476	17:54:14.6	+53 10 03.861	−124 50 39.096	1628.42	3	17	21	23	28	9	6	9	6	4.45 11/30/92	NAD27
0477	17:54:16.6	+53 10 03.915	−124 50 39.073	1631.71	3	17	21	23	28	9	6	9	5	4.45 11/30/92	NAD27
0478	17:54:19.6	+53 10 03.854	−124 50 38.961	1630.5	3	17	21	23	28	9	3	9	7	4.45 11/30/92	NAD27
0479	17:54:23.6	+53 10 03.765	−124 50 38.819	1627.32	3	17	21	23	28	9	6	9	5	4.45 11/30/92	NAD27
0480	17:54:26.6	+53 10 03.686	−124 50 38.653	1625.83	3	17	21	23	28	9	7	9	5	4.45 11/30/92	NAD27
0481	17:54:29.6	+53 10 03.546	−124 50 38.545	1615.06	3	17	21	23	28	9	7	9	4	4.45 11/30/92	NAD27
0482	17:54:31.6	+53 10 03.534	−124 50 38.551	1613.34	3	17	21	23	28	9	6	9	4	4.45 11/30/92	NAD27
0483	17:54:34.6	+53 10 03.478	−124 50 38.426	1610.76	3	17	21	23	28	9	6	9	7	4.45 11/30/92	NAD27
0484	17:54:37.6	+53 10 03.448	−124 50 38.310	1612.41	3	17	21	23	28	9	7	9	6	4.45 11/30/92	NAD27
0485	17:54:40.6	+53 10 03.355	−124 50 38.159	1609.36	3	17	21	23	28	9	8	9	5	4.45 11/30/92	NAD27
0486	17:54:42.6	+53 10 03.321	−124 50 38.062	1610.52	3	17	21	23	28	9	8	9	5	4.45 11/30/92	NAD27
0487	17:54:44.6	+53 10 03.286	−124 50 37.998	1609.37	3	17	21	23	28	9	7	9	7	4.45 11/30/92	NAD27
0488	17:54:48.6	+53 10 03.206	−124 50 37.931	1604.37	3	17	21	23	28	9	8	9	7	4.45 11/30/92	NAD27
0489	17:54:51.6	+53 10 03.196	−124 50 37.974	1604.44	3	17	21	23	28	9	7	9	6	4.45 11/30/92	NAD27
0490	17:54:53.6	+53 10 03.176	−124 50 38.001	1602.4	3	17	21	23	28	8	7	9	7	4.45 11/30/92	NAD27
0491	17:54:55.6	+53 10 03.174	−124 50 37.995	1601.91	3	17	21	23	28	9	5	9	6	4.45 11/30/92	NAD27
0492	17:54:59.6	+53 10 03.202	−124 50 37.855	1604.38	3	17	21	23	28	9	7	9	4	4.45 11/30/92	NAD27
0493	17:55:02.6	+53 10 03.162	−124 50 37.775	1607.06	3	17	21	23	28	9	7	9	3	4.45 11/30/92	NAD27
0494	17:55:05.6	+53 10 03.118	−124 50 37.710	1605.56	3	17	21	23	28	9	7	9	5	4.45 11/30/92	NAD27
0495	17:55:08.6	+53 10 03.147	−124 50 37.711	1605.27	3	17	21	23	28	9	7	9	4	4.45 11/30/92	NAD27
0496	17:55:11.6	+53 10 03.162	−124 50 37.657	1606.25	3	17	21	23	28	9	6	9	3	4.45 11/30/92	NAD27
0497	17:55:14.6	+53 10 03.211	−124 50 37.702	1601.74	3	17	21	23	28	9	8	9	4	4.45 11/30/92	NAD27
0498	17:55:17.6	+53 10 03.119	−124 50 37.697	1597.37	3	17	21	23	28	9	8	9	5	4.45 11/30/92	NAD27
0499	17:55:20.6	+53 10 03.058	−124 50 37.690	1595.76	3	17	21	23	28	9	7	9	4	4.45 11/30/92	NAD27
0500	17:55:24.6	+53 10 02.996	−124 50 37.672	1592.67	3	17	21	23	28	9	7	9	4	4.45 11/30/92	NAD27
0501	17:55:27.6	+53 10 03.122	−124 50 37.759	1592.99	3	17	21	23	28	9	8	9	4	4.45 11/30/92	NAD27
0502	17:55:30.6	+53 10 03.130	−124 50 37.730	1589.89	3	17	21	23	28	9	7	9	7	4.45 11/30/92	NAD27
0503	17:55:34.6	+53 10 03.103	−124 50 37.709	1584.2	3	17	21	23	28	9	4	9	3	4.45 11/30/92	NAD27
0504	17:55:37.6	+53 10 03.135	−124 50 37.850	1582.51	3	17	21	23	28	9	7	9	3	4.45 11/30/92	NAD27
0505	17:55:40.6	+53 10 03.109	−124 50 37.638	1578.45	3	17	21	23	28	9	4	9	4	4.45 11/30/92	NAD27
0506	17:55:43.6	+53 10 03.056	−124 50 37.550	1577.34	3	17	21	23	28	9	5	9	5	4.45 11/30/92	NAD27
0507	17:55:46.6	+53 10 03.019	−124 50 37.569	1572.17	3	17	21	23	28	9	7	9	4	4.45 11/30/92	NAD27
0508	17:55:49.6	+53 10 02.969	−124 50 37.564	1569.9	3	17	21	23	28	9	4	9	3	4.45 11/30/92	NAD27
0509	17:55:52.6	+53 10 03.031	−124 50 37.710	1568.88	3	17	21	23	28	9	6	9	4	4.45 11/30/92	NAD27
0510	17:55:54.6	+53 10 03.039	−124 50 37.754	1566.06	3	17	21	23	28	9	3	9	5	4.45 11/30/92	NAD27
0511	17:55:57.6	+53 10 03.123	−124 50 37.845	1566.11	3	17	21	23	28	9	5	9	4	4.45 11/30/92	NAD27
0512	17:56:00.6	+53 10 03.113	−124 50 37.913	1561.05	3	17	21	23	28	9	4	9	4	4.45 11/30/92	NAD27
0513	17:56:03.6	+53 10 03.138	−124 50 38.024	1559.72	3	17	21	23	28	9	4	9	5	4.45 11/30/92	NAD27
0514	17:56:08.6	+53 10 02.618	−124 50 36.618	1524.45	3	17	21	23	28	7	2	9	8	4.4 11/30/92	NAD27
0515	17:56:16.6	+53 10 02.817	−124 50 36.626	1525.34	3	17	21	23	28	2	9	9	9	4.4 11/30/92	NAD27
0516	17:56:23.6	+53 10 03.392	−124 50 37.670	1553.56	3	17	21	23	28	7	9	9	5	4.4 11/30/92	NAD27
0517	17:56:47.6	+53 10 02.525	−124 50 39.596	1544.47	3	17	21	23	28	1	0	9	9	7.52 11/30/92	NAD27
0521	18:21:45.0	+53 09 44.641	−124 50 51.395	1678.5	3	11	17	23	28	9	7	9	9	3.81 11/30/92	NAD27
0522	18:21:54.0	+53 09 44.596	−124 50 51.347	1673.11	3	11	17	23	28	9	9	9	9	3.81 11/30/92	NAD27
0523	18:21:57.0	+53 09 44.547	−124 50 51.346	1671.12	3	11	17	23	28	9	9	9	9	3.81 11/30/92	NAD27
0524	18:22:00.0	+53 09 44.496	−124 50 51.343	1664.28	3	11	17	23	28	9	9	9	9	3.81 11/30/92	NAD27
0525	18:22:03.0	+53 09 44.532	−124 50 51.299	1662.26	3	11	17	23	28	9	9	9	9	3.81 11/30/92	NAD27
0526	18:22:06.0	+53 09 44.537	−124 50 51.260	1661.54	3	11	17	23	28	9	9	9	9	3.81 11/30/92	NAD27
0527	18:22:10.0	+53 09 44.488	−124 50 51.240	1655.31	3	11	17	23	28	9	9	9	9	3.81 11/30/92	NAD27
0528	18:22:12.0	+53 09 44.457	−124 50 51.288	1652.29	3	11	17	23	28	9	9	9	9	3.81 11/30/92	NAD27
0529	18:22:16.0	+53 09 44.457	−124 50 51.270	1646.22	3	11	17	23	28	9	9	9	9	3.81 11/30/92	NAD27
0530	18:22:18.0	+53 09 44.442	−124 50 51.233	1646.64	3	11	17	23	28	8	9	9	9	3.81 11/30/92	NAD27
0531	18:22:22.0	+53 09 44.461	−124 50 51.149	1643.46	3	11	17	23	28	9	9	9	9	3.81 11/30/92	NAD27
0532	18:22:25.0	+53 09 44.483	−124 50 51.087	1643.18	3	11	17	23	28	7	9	9	9	3.81 11/30/92	NAD27
0533	18:22:28.0	+53 09 44.532	−124 50 51.079	1642.04	3	11	17	23	28	5	9	9	9	3.81 11/30/92	NAD27
0534	18:22:30.0	+53 09 44.615	−124 50 51.079	1641.02	3	11	17	23	28	7	9	9	9	3.81 11/30/92	NAD27
0535	18:22:34.0	+53 09 44.604	−124 50 51.029	1636.34	3	11	17	23	28	8	9	9	9	3.81 11/30/92	NAD27
0536	18:22:37.0	+53 09 44.568	−124 50 51.014	1636.66	3	11	17	23	28	7	9	9	9	3.81 11/30/92	NAD27
0537	18:22:40.0	+53 09 44.600	−124 50 51.008	1637.61	3	11	17	23	28	7	8	9	9	3.81 11/30/92	NAD27
0538	18:22:42.0	+53 09 44.569	−124 50 50.990	1631.93	3	11	17	23	28	8	9	9	9	3.81 11/30/92	NAD27
0539	18:22:45.0	+53 09 44.633	−124 50 50.971	1630.56	3	11	17	23	28	8	9	9	9	3.81 11/30/92	NAD27
0540	18:22:48.0	+53 09 44.609	−124 50 51.031	1628.78	3	11	17	23	28	8	9	9	9	3.81 11/30/92	NAD27
0541	18:22:51.0	+53 09 44.650	−124 50 51.065	1628.37	3	11	17	23	28	7	9	9	9	3.81 11/30/92	NAD27
0542	18:22:53.0	+53 09 44.647	−124 50 51.042	1626.17	3	11	17	23	28	7	9	9	9	3.81 11/30/92	NAD27
0543	18:22:57.0	+53 09 44.736	−124 50 50.977	1627.47	3	11	17	23	28	6	9	9	9	3.81 11/30/92	NAD27
0544	18:23:00.0	+53 09 44.733	−124 50 50.990	1620	3	11	17	23	28	8	9	9	9	3.81 11/30/92	NAD27
0545	18:23:03.0	+53 09 44.751	−124 50 51.010	1615.16	3	11	17	23	28	8	9	9	9	3.81 11/30/92	NAD27
0546	18:23:06.0	+53 09 44.797	−124 50 50.967	1613.36	3	11	17	23	28	8	9	9	9	3.81 11/30/92	NAD27
0547	18:23:09.0	+53 09 44.857	−124 50 50.899	1615.06	3	11	17	23	28	9	9	9	9	3.81 11/30/92	NAD27
0548	18:23:13.0	+53 09 44.884	−124 50 50.834	1612	3	11	17	23	28	4	9	9	9	3.81 11/30/92	NAD27
0549	18:23:16.0	+53 09 44.961	−124 50 50.792	1613.34	3	11	17	23	28	9	9	9	9	3.81 11/30/92	NAD27
0550	18:23:18.0	+53 09 44.964	−124 50 50.768	1614.47	3	11	17	23	28	8	9	9	9	3.81 11/30/92	NAD27
0551	18:23:21.0	+53 09 45.039	−124 50 50.752	1614.55	3	11	17	23	28	9	9	9	9	3.81 11/30/92	NAD27
0552	18:23:24.0	+53 09 45.090	−124 50 50.684	1613.97	3	11	17	23	28	9	9	9	9	3.81 11/30/92	NAD27

0553	18:23:27.0	+53 09 45.110	−124 50 50.602	1613.53	3	11	17	23	28	9	9	9	9	3.81	11/30/92	NAD27
0554	18:23:29.0	+53 09 45.195	−124 50 50.542	1616.55	3	11	17	23	28	8	9	9	9	3.81	11/30/92	NAD27
0555	18:23:33.0	+53 09 45.239	−124 50 50.429	1619.54	3	11	17	23	28	8	9	9	9	3.81	11/30/92	NAD27
0556	18:23:36.0	+53 09 45.228	−124 50 50.430	1618.85	3	11	17	23	28	9	6	9	9	3.81	11/30/92	NAD27
0557	18:23:39.0	+53 09 45.294	−124 50 50.313	1619	3	11	17	23	28	9	8	9	9	3.81	11/30/92	NAD27
0558	18:23:41.0	+53 09 45.324	−124 50 50.322	1619.89	3	11	17	23	28	9	8	9	9	3.81	11/30/92	NAD27
0559	18:23:45.0	+53 09 45.368	−124 50 50.260	1620.32	3	11	17	23	28	9	8	9	9	3.81	11/30/92	NAD27
0560	18:23:48.0	+53 09 45.401	−124 50 50.230	1618.45	3	11	17	23	28	7	7	9	9	3.81	11/30/92	NAD27
0561	18:23:51.0	+53 09 45.460	−124 50 50.158	1620.73	3	11	17	23	28	9	7	9	9	3.81	11/30/92	NAD27
0562	18:23:54.0	+53 09 45.541	−124 50 50.079	1621.4	3	11	17	23	28	7	7	9	9	3.81	11/30/92	NAD27
0563	18:23:57.0	+53 09 45.563	−124 50 50.041	1624.05	3	11	17	23	28	7	8	9	9	3.81	11/30/92	NAD27
0564	18:24:01.0	+53 09 45.618	−124 50 50.013	1626.38	3	11	17	23	28	7	8	9	9	3.81	11/30/92	NAD27
0565	18:24:04.0	+53 09 45.678	−124 50 49.968	1623.98	3	11	17	23	28	9	9	9	9	3.81	11/30/92	NAD27
0566	18:24:06.0	+53 09 45.639	−124 50 49.998	1620.77	3	11	17	23	28	8	9	9	9	3.81	11/30/92	NAD27
0567	18:24:09.0	+53 09 45.677	−124 50 49.986	1618.31	3	11	17	23	28	9	8	9	9	3.81	11/30/92	NAD27
0568	18:24:13.0	+53 09 45.710	−124 50 49.954	1618.32	3	11	17	23	28	9	9	9	9	3.81	11/30/92	NAD27
0569	18:24:16.0	+53 09 45.753	−124 50 49.918	1618.7	3	11	17	23	28	8	9	9	9	3.81	11/30/92	NAD27
0570	18:24:18.0	+53 09 45.818	−124 50 49.864	1614.44	3	11	17	23	28	8	8	9	9	3.81	11/30/92	NAD27
0571	18:24:21.0	+53 09 45.798	−124 50 49.842	1611.63	3	11	17	23	28	9	8	9	9	3.81	11/30/92	NAD27
0572	18:24:24.0	+53 09 45.822	−124 50 49.794	1605.95	3	11	17	23	28	7	7	9	9	3.81	11/30/92	NAD27
0573	18:24:29.0	+53 09 45.856	−124 50 50.145	1600.86	3	11	17	23	28	9	9	9	9	3.81	11/30/92	NAD27
0574	18:24:37.0	+53 09 46.028	−124 50 50.013	1600.95	3	11	17	23	28	9	9	9	9	3.81	11/30/92	NAD27
0575	18:24:41.0	+53 09 46.103	−124 50 49.959	1599.48	3	11	17	23	28	9	9	9	9	3.81	11/30/92	NAD27
0576	18:24:43.0	+53 09 46.139	−124 50 49.930	1599.16	3	11	17	23	28	9	9	9	9	3.81	11/30/92	NAD27
0577	18:24:45.0	+53 09 46.208	−124 50 49.846	1602.58	3	11	17	23	28	9	9	9	9	3.81	11/30/92	NAD27
0578	19:31:12.0	+53 11 04.398	−124 50 48.883	1558.18	3	11	23	21	28	9	5	9	0	5.08	11/30/92	NAD27
0579	19:31:20.0	+53 11 04.413	−124 50 48.869	1558.55	3	11	23	21	28	9	8	9	3	5.08	11/30/92	NAD27
0580	19:31:24.0	+53 11 04.326	−124 50 48.775	1560.52	3	11	23	21	28	9	3	9	5	5.08	11/30/92	NAD27
0581	19:31:27.0	+53 11 04.224	−124 50 48.652	1565.04	3	11	23	21	28	9	6	9	7	5.08	11/30/92	NAD27
0582	19:31:36.0	+53 11 05.266	−124 50 49.416	1543.42	3	11	21	23	28	9	9	6	7	5.09	11/30/92	NAD27
0583	19:31:44.0	+53 11 05.256	−124 50 49.287	1539.71	3	11	21	23	28	9	9	9	5	5.09	11/30/92	NAD27
0584	19:31:48.0	+53 11 05.250	−124 50 49.170	1540.24	3	11	21	23	28	9	9	9	8	5.09	11/30/92	NAD27
0585	19:31:51.0	+53 11 05.335	−124 50 49.180	1539.19	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0586	19:31:53.0	+53 11 05.327	−124 50 49.112	1540.71	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0587	19:31:56.0	+53 11 05.421	−124 50 49.180	1537.27	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0588	19:31:60.0	+53 11 05.445	−124 50 49.144	1537.57	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0589	19:32:03.0	+53 11 05.449	−124 50 49.111	1537.17	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0590	19:32:06.0	+53 11 05.450	−124 50 49.028	1538.3	3	11	21	23	28	9	9	8	9	5.09	11/30/92	NAD27
0591	19:32:08.0	+53 11 05.473	−124 50 49.016	1540.05	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0592	19:32:12.0	+53 11 05.437	−124 50 48.944	1542.23	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0593	19:32:15.0	+53 11 05.615	−124 50 48.932	1540.41	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0594	19:32:18.0	+53 11 05.626	−124 50 49.000	1534.59	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0595	19:32:20.0	+53 11 05.674	−124 50 49.014	1534.24	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0596	19:32:24.0	+53 11 05.686	−124 50 48.912	1530.2	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0597	19:32:28.0	+53 11 05.788	−124 50 48.933	1526.11	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0598	19:32:30.0	+53 11 05.834	−124 50 48.887	1523.78	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0599	19:32:33.0	+53 11 05.822	−124 50 48.811	1522.91	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0600	19:32:36.0	+53 11 05.817	−124 50 48.782	1519.7	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0601	19:32:38.0	+53 11 06.008	−124 50 49.902	1511.58	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0602	19:32:42.0	+53 11 06.067	−124 50 48.934	1510.3	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0603	19:32:45.0	+53 11 06.104	−124 50 48.946	1506.56	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0604	19:32:48.0	+53 11 06.267	−124 50 49.030	1503.36	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0605	19:32:51.0	+53 11 06.322	−124 50 49.013	1501.19	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0606	19:32:53.0	+53 11 06.465	−124 50 49.090	1495.71	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0607	19:32:55.0	+53 11 06.456	−124 50 49.102	1494.48	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0608	19:32:58.0	+53 11 06.554	−124 50 49.169	1489.31	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0609	19:33:01.0	+53 11 06.655	−124 50 49.205	1483.97	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0610	19:33:04.0	+53 11 06.751	−124 50 49.272	1478.91	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0611	19:33:06.0	+53 11 06.860	−124 50 49.430	1474.5	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0612	19:33:10.0	+53 11 06.881	−124 50 49.426	1470.14	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0613	19:33:12.0	+53 11 06.987	−124 50 49.479	1463.99	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0614	19:33:15.0	+53 11 07.002	−124 50 49.461	1464.11	3	11	21	23	28	6	9	9	9	5.09	11/30/92	NAD27
0615	19:33:17.0	+53 11 07.068	−124 50 49.555	1464.09	3	11	21	23	28	6	9	9	9	5.09	11/30/92	NAD27
0616	19:33:21.0	+53 11 07.204	−124 50 49.603	1460.44	3	11	21	23	28	9	9	9	9	5.09	11/30/92	NAD27
0617	19:33:24.0	+53 11 07.301	−124 50 49.690	1457.41	3	11	21	23	28	6	9	9	8	5.09	11/30/92	NAD27
0618	19:33:27.0	+53 11 07.360	−124 50 49.734	1454.89	3	11	21	23	28	9	9	9	7	5.09	11/30/92	NAD27
0619	19:33:29.0	+53 11 07.280	−124 50 49.649	1457.83	3	11	21	23	28	6	9	9	7	5.09	11/30/92	NAD27
0620	19:33:32.0	+53 11 07.331	−124 50 49.692	1454.89	3	11	21	23	28	7	9	9	8	5.09	11/30/92	NAD27
0621	19:33:35.0	+53 11 07.314	−124 50 49.695	1454.79	3	11	21	23	28	9	9	9	8	5.09	11/30/92	NAD27
0622	19:33:38.0	+53 11 07.405	−124 50 49.825	1449.74	3	11	21	23	28	9	9	9	7	5.09	11/30/92	NAD27
0623	19:33:41.0	+53 11 07.434	−124 50 49.880	1445.96	3	11	21	23	28	9	9	9	7	5.09	11/30/92	NAD27
0624	19:33:44.0	+53 11 07.546	−124 50 49.980	1441.88	3	11	21	23	28	9	9	9	6	5.09	11/30/92	NAD27
0625	19:33:48.0	+53 11 07.569	−124 50 50.027	1439.95	3	11	21	23	28	9	9	9	6	5.09	11/30/92	NAD27
0626	19:33:51.0	+53 11 07.537	−124 50 49.998	1444.6	3	11	21	23	28	9	9	9	6	5.09	11/30/92	NAD27
0627	19:33:53.0	+53 11 07.483	−124 50 49.978	1446.21	3	11	21	23	28	9	9	9	8	5.09	11/30/92	NAD27
0628	19:33:57.0	+53 11 07.459	−124 50 49.946	1445.72	3	11	21	23	28	9	9	9	5	5.09	11/30/92	NAD27
0629	19:33:60.0	+53 11 07.488	−124 50 49.972	1445.68	3	11	21	23	28	9	9	9	4	5.09	11/30/92	NAD27
0630	19:34:03.0	+53 11 07.543	−124 50 50.068	1443.67	3	11	21	23	28	9	9	9	3	5.09	11/30/92	NAD27
0631	19:34:08.0	+53 11 07.590	−124 50 50.152	1439.66	3	11	21	23	28	9	9	9	4	5.09	11/30/92	NAD27
0632	19:34:10.0	+53 11 07.579	−124 50 50.180	1441.17	3	11	21	23	28	9	9	9	4	5.09	11/30/92	NAD27
0633	19:34:12.0	+53 11 07.628	−124 50 50.237	1441.29	3	11	21	23	28	9	9	9	4	5.09	11/30/92	NAD27
0634	19:34:15.0	+53 11 07.659	−124 50 50.311	1436.71	3	11	21	23	28	9	9	9	0	5.09	11/30/92	NAD27
0635	19:34:24.0	+53 11 08.041	−124 50 50.594	1420.83	3	11	21	23	28	9	9	9	0	5.19	11/30/92	NAD27

0635 19:34:24.0 +53 11 08.041 −124 50 50.594 1420.83 3 11 21 23 28 9 9 9 0 0 5.19 11/30/92 NAD27

SETUP WORKSHEET

SELECT ONE OPTION FOR EACH SETUP FEATURE
(Factory defaults are shown in bold)

MODE
- ☒ **3D**
- ☐ AUTO (Automatic)
- ☐ 2D

TIME DISPLAY
- ☐ **UT (UNIVERSAL COORDINATED TIME)**
- ☒ LOCAL (AM/PM)
- ☐ LOCAL (24-Hour)

MASK ANGLE
- ☒ **10°**
- ☐ 15°
- ☐ 20°
- ☐ 0°
- ☐ 2°
- ☐ 5°

TERRAIN SETTING
- ☒ **INTERRUPTED**
- ☐ OBSCURED
- ☐ CLEAR

DATA SAMPLE RATE
POSITION DATA
- ☒ **1 (EVERY FIX)**
- ☐ Other _____ (2 – 999)
- ☐ 0 (none)

RAW DATA
- ☒ **1 (EVERY FIX)**
- ☐ Other _____ (2 – 999)
- ☐ 0 (none)

COORDINATE SYSTEM
- ☒ **LAT/LON**
- ☐ UTM
- ☐ British grid
- ☐ Irish grid

LAT/LON DISPLAY
- ☐ **DEG/MIN (.01)**
- ☐ DEG/MIN (.0001)
- ☐ DEG/MIN/SEC (1.0)
- ☒ DEG/MIN/SEC (.01)

MAP DATUMS
- ☐ **WGS84**
- ☐ USER 1
- ☐ USER 2
- ☐ USER 3
- ☐ USER 4
- ☐ USER 5
- ☒ NAD27
- ☐ ALASK
- ☐ TOKYO
- ☐ WGS72
- ☐ NAD83
- ☐ AUSTR
- ☐ EUROP
- ☐ OSGB
- ☐ EIRE

ALTITUDE REFERENCE
- ☒ **ALT (ELEV ABOVE MSL)**
- ☐ HAE (HT. ABOVE ELLIPSOID)
- ☐ HAG (HT. ABOVE GEOID)

ALTITUDE UNITS
- ☒ **Meters**
- ☐ Feet

MAGNETIC VARIATION
- ☐ **AUTO MAG (M)**
- ☐ SET (USER SET – U) _ _ ° _ _ E OR W (Specify)
- ☒ TRUE (T)

DISTANCE, SPEED UNITS
- ☒ **Km (kilometers) and Km/HR**
- ☐ MI (statute miles) and MPH
- ☐ NM (nautical miles) and KNOTS (knots)
- ☐ Meters, m/sec
- ☐ Feet, ft/sec

ROUTE MODE
- ☐ **Automatic**
- ☒ Manual

VELOCITY AVERAGE
- ☒ **NONE**
- ☐ 20 SECONDS
- ☐ 120 SECONDS

BATTERY SAVER
- ☐ **OFF**
- ☐ ON

BEEPER
- ☒ **ON**
- ☐ OFF

DISPLAY CONTROL
- ☐ **15**
- ☐ Other ____ (1 through 14)

DATE ORDER
- ☐ **MONTH/DAY/YEAR**
- ☒ DAY/MONTH/YEAR

SETUP WORKSHEET

Wpt XJ06 Jon G. LCF Nov. 23/92. 10:11 AM. Avg PDOP 2.3

SELECT ONE OPTION FOR EACH SETUP FEATURE
(Factory defaults are shown in bold)

MODE
- [x] **3D**
- [ ] AUTO (Automatic)
- [ ] 2D

TIME DISPLAY
- [ ] **UT (UNIVERSAL COORDINATED TIME)**
- [x] LOCAL (AM/PM)
- [ ] LOCAL (24-Hour)

MASK ANGLE
- [x] **10°**
- [ ] 15°
- [ ] 20°
- [ ] 0°
- [ ] 2°
- [ ] 5°

TERRAIN SETTING
- [ ] **INTERRUPTED**
- [ ] OBSCURED
- [x] CLEAR

DATA SAMPLE RATE POSITION DATA
- [x] **1 (EVERY FIX)**
- [ ] Other _____ (2 – 999)
- [ ] 0 (none)

RAW DATA
- [x] **1 (EVERY FIX)**
- [ ] Other _____ (2 – 999)
- [ ] 0 (none)

COORDINATE SYSTEM
- [x] **LAT/LON**
- [ ] UTM
- [ ] British grid
- [ ] Irish grid

LAT/LON DISPLAY
- [ ] **DEG/MIN (.01)**
- [ ] DEG/MIN (.0001)
- [ ] DEG/MIN/SEC (1.0)
- [x] DEG/MIN/SEC (.01)

MAP DATUMS
- [ ] **WGS84**
- [ ] USER 1
- [ ] USER 2
- [ ] USER 3
- [ ] USER 4
- [ ] USER 5
- [x] NAD27
- [ ] ALASK
- [ ] TOKYO
- [ ] WGS72
- [ ] NAD83
- [ ] AUSTR
- [ ] EUROP
- [ ] OSGB
- [ ] EIRE

ALTITUDE REFERENCE
- [x] **ALT (ELEV ABOVE MSL)**
- [ ] HAE (HT. ABOVE ELLIPSOID)
- [ ] HAG (HT. ABOVE GEOID)

ALTITUDE UNITS
- [x] **Meters**
- [ ] Feet

MAGNETIC VARIATION
- [ ] **AUTO MAG (M)**
- [ ] SET (USER SET – U) __ ° __ E OR W (Specify)
- [x] TRUE (T)

DISTANCE, SPEED UNITS
- [x] **Km (kilometers) and Km/HR**
- [ ] MI (statute miles) and MPH
- [ ] NM (nautical miles) and KNOTS (knots)
- [ ] Meters, m/sec
- [ ] Feet, ft/sec

ROUTE MODE
- [ ] **Automatic**
- [x] Manual

VELOCITY AVERAGE
- [x] **NONE**
- [ ] 20 SECONDS
- [ ] 120 SECONDS

BATTERY SAVER
- [x] **OFF**
- [ ] ON

BEEPER
- [x] **ON**
- [ ] OFF

DISPLAY CONTROL
- [ ] **15**
- [ ] Other 7 (1 through 14)

DATE ORDER
- [ ] **MONTH/DAY/YEAR**
- [x] DAY/MONTH/YEAR

SETUP WORKSHEET

SELECT ONE OPTION FOR EACH SETUP FEATURE
(Factory defaults are shown in bold)

MODE
- [x] **3D**
- [ ] AUTO (Automatic)
- [ ] 2D

TIME DISPLAY
- [ ] UT (UNIVERSAL COORDINATED TIME)
- [x] LOCAL (AM/PM)
- [ ] LOCAL (24-Hour)

MASK ANGLE
- [x] 10°
- [ ] 15°
- [ ] 20°
- [ ] 0°
- [ ] 2°
- [ ] 5°

TERRAIN SETTING
- [ ] **INTERRUPTED**
- [ ] OBSCURED
- [x] CLEAR

DATA SAMPLE RATE POSITION DATA
- [x] **1 (EVERY FIX)**
- [ ] Other _____ (2 – 999)
- [ ] 0 (none)

RAW DATA
- [x] **1 (EVERY FIX)**
- [ ] Other _____ (2 – 999)
- [ ] 0 (none)

COORDINATE SYSTEM
- [x] **LAT/LON**
- [ ] UTM
- [ ] British grid
- [ ] Irish grid

LAT/LON DISPLAY
- [ ] **DEG/MIN (.01)**
- [ ] DEG/MIN (.0001)
- [ ] DEG/MIN/SEC (1.0)
- [x] DEG/MIN/SEC (.01)

MAP DATUMS
- [ ] **WGS84**
- [ ] USER 1
- [ ] USER 2
- [ ] USER 3
- [ ] USER 4
- [ ] USER 5
- [x] NAD27
- [ ] ALASK
- [ ] TOKYO
- [ ] WGS72
- [ ] NAD83
- [ ] AUSTR
- [ ] EUROP
- [ ] OSGB
- [ ] EIRE

MT. Davidson. Nov 28/92

WPT X MDN   Avg PDOP = 6.4
X̄ = 50   s = 8.8 m   Time 3.00 53 pm MT.

ALTITUDE REFERENCE

Sat. 13, 15, 20, 25

- [x] **ALT (ELEV ABOVE MSL)**
- [ ] HAE (HT. ABOVE ELLIPSOID)
- [ ] HAG (HT. ABOVE GEOID)

ALTITUDE UNITS
- [x] Meters
- [ ] **Feet**

MAGNETIC VARIATION
- [ ] **AUTO MAG (M)**
- [ ] SET (USER SET – U) _ _ ° _ _ E OR W (Specify)
- [x] TRUE (T)

DISTANCE, SPEED UNITS
- [x] Km (kilometers) and Km/HR
- [ ] **MI (statute miles) and MPH**
- [ ] NM (nautical miles) and KNOTS (knots)
- [ ] Meters, m/sec
- [ ] Feet, ft/sec

ROUTE MODE
- [ ] **Automatic**
- [x] Manual

VELOCITY AVERAGE
- [x] **NONE**
- [ ] 20 SECONDS
- [ ] 120 SECONDS

BATTERY SAVER
- [x] **OFF**
- [ ] ON

BEEPER
- [x] **ON**
- [ ] OFF

DISPLAY CONTROL
- [ ] **15**
- [x] Other __7__ (1 through 14)

DATE ORDER
- [ ] **MONTH/DAY/YEAR**
- [x] DAY/MONTH/YEAR

SETUP WORKSHEET

SELECT ONE OPTION FOR EACH SETUP FEATURE
(Factory defaults are shown in bold)

Feature	Options
MODE	☒ **3D** ☐ AUTO (Automatic) ☐ 2D
TIME DISPLAY	☐ UT (UNIVERSAL COORDINATED TIME) ☒ LOCAL (AM/PM) ☐ LOCAL (24-Hour)
MASK ANGLE	☒ **10°** ☐ 15° ☐ 20° ☐ 0° ☐ 2° ☐ 5°
TERRAIN SETTING	☐ INTERRUPTED ☒ **OBSCURED** ☐ CLEAR
DATA SAMPLE RATE POSITION DATA	☒ **1 (EVERY FIX)** ☐ Other _____ (2 – 999) ☐ 0 (none)
RAW DATA	☒ **1 (EVERY FIX)** ☐ Other _____ (2 – 999) ☐ 0 (none)
COORDINATE SYSTEM	☒ **LAT/LON** ☐ UTM ☐ British grid ☐ Irish grid
LAT/LON DISPLAY	☐ **DEG/MIN (.01)** ☐ DEG/MIN (.0001) ☐ DEG/MIN/SEC (1.0) ☒ DEG/MIN/SEC (.01)
MAP DATUMS	☐ **WGS84** ☐ USER 1 ☐ USER 2 ☐ USER 3 ☐ USER 4 ☐ USER 5 ☒ NAD27 ☐ ALASK ☐ TOKYO ☐ WGS72 ☐ NAD83 ☐ AUSTR ☐ EUROP ☐ OSGB ☐ EIRE
ALTITUDE REFERENCE	☒ **ALT (ELEV ABOVE MSL)** ☐ HAE (HT. ABOVE ELLIPSOID) ☐ HAG (HT. ABOVE GEOID)
ALTITUDE UNITS	☒ Meters ☐ **Feet**
MAGNETIC VARIATION	☐ **AUTO MAG (M)** ☐ SET (USER SET – U) _ _ ° _ _ E OR W (Specify) ☒ TRUE (T)
DISTANCE, SPEED UNITS	☒ Km (kilometers) and Km/HR ☐ **MI (statute miles) and MPH** ☐ NM (nautical miles) and KNOTS (knots) ☐ Meters, m/sec ☐ Feet, ft/sec
ROUTE MODE	☐ **Automatic** ☒ Manual
VELOCITY AVERAGE	☒ NONE ☐ **20 SECONDS** ☐ 120 SECONDS
BATTERY SAVER	☒ **OFF** ☐ ON
BEEPER	☒ **ON** ☐ OFF
DISPLAY CONTROL	☐ **15** ☐ Other _7_ (1 through 14)
DATE ORDER	☐ **MONTH/DAY/YEAR** ☒ DAY/MONTH/YEAR

X PO2
X PO1
X PO3
X PO4 = 2D

SETUP WORKSHEET

SELECT ONE OPTION FOR EACH SETUP FEATURE
(Factory defaults are shown in bold)

MODE
- [x] **3D**
- [ ] AUTO (Automatic)
- [ ] 2D

TIME DISPLAY
- [ ] **UT (UNIVERSAL COORDINATED TIME)**
- [x] LOCAL (AM/PM)
- [ ] LOCAL (24-Hour)

MASK ANGLE
- [x] **10°**
- [ ] 15°
- [ ] 20°
- [ ] 0°
- [ ] 2°
- [ ] 5°

TERRAIN SETTING
- [ ] **INTERRUPTED**
- [ ] OBSCURED
- [x] CLEAR

DATA SAMPLE RATE
POSITION DATA
- [x] **1 (EVERY FIX)**
- [ ] Other _____ (2 – 999)
- [ ] 0 (none)

RAW DATA
- [x] **1 (EVERY FIX)**
- [ ] Other _____ (2 – 999)
- [ ] 0 (none)

COORDINATE SYSTEM
- [x] **LAT/LON**
- [ ] UTM
- [ ] British grid
- [ ] Irish grid

LAT/LON DISPLAY
- [ ] **DEG/MIN (.01)**
- [ ] DEG/MIN (.0001)
- [ ] DEG/MIN/SEC (1.0)
- [x] DEG/MIN/SEC (.01)

MAP DATUMS
- [ ] **WGS84**
- [ ] USER 1
- [ ] USER 2
- [ ] USER 3
- [ ] USER 4
- [ ] USER 5
- [x] NAD27
- [ ] ALASK
- [ ] TOKYO
- [ ] WGS72
- [ ] NAD83
- [ ] AUSTR
- [ ] EUROP
- [ ] OSGB
- [ ] EIRE

Nov. 25/92
1/XDZE
2/XD35
3/XD34

ALTITUDE REFERENCE
- [x] **ALT (ELEV ABOVE MSL)**
- [ ] HAE (HT. ABOVE ELLIPSOID)
- [ ] HAG (HT. ABOVE GEOID)

ALTITUDE UNITS
- [x] Meters
- [ ] **Feet**

MAGNETIC VARIATION
- [ ] **AUTO MAG (M)**
- [ ] SET (USER SET – U) __ ° __ E OR W (Specify)
- [x] TRUE (T)

DISTANCE, SPEED UNITS
- [x] Km (kilometers) and Km/HR
- [ ] MI (statute miles) and MPH
- [ ] NM (nautical miles) and KNOTS (knots)
- [ ] Meters, m/sec
- [ ] **Feet, ft/sec**

ROUTE MODE
- [ ] Automatic
- [x] Manual

VELOCITY AVERAGE
- [x] NONE
- [ ] **20 SECONDS**
- [ ] 120 SECONDS

BATTERY SAVER
- [x] **OFF**
- [ ] ON

BEEPER
- [x] **ON**
- [ ] **OFF**

DISPLAY CONTROL
- [ ] **15**
- [ ] Other _7_ (1 through 14)

DATE ORDER
- [ ] **MONTH/DAY/YEAR**
- [x] DAY/MONTH/YEAR

SETUP WORKSHEET

SELECT ONE OPTION FOR EACH SETUP FEATURE
(Factory defaults are shown in bold)

MODE
- [x] **3D**
- [ ] AUTO (Automatic)
- [ ] 2D

TIME DISPLAY
- [ ] **UT (UNIVERSAL COORDINATED TIME)**
- [x] LOCAL (AM/PM)
- [ ] LOCAL (24-Hour)

MASK ANGLE
- [x] **10°**
- [ ] 15°
- [ ] 20°
- [ ] 0°
- [ ] 2°
- [ ] 5°

TERRAIN SETTING
- [ ] **INTERRUPTED**
- [x] OBSCURED
- [ ] CLEAR

DATA SAMPLE RATE POSITION DATA
- [x] **1 (EVERY FIX)**
- [ ] Other ______ (2 – 999)
- [ ] 0 (none)

RAW DATA
- [x] **1 (EVERY FIX)**
- [ ] Other ______ (2 – 999)
- [ ] 0 (none)

COORDINATE SYSTEM
- [x] **LAT/LON**
- [ ] UTM
- [ ] British grid
- [ ] Irish grid

LAT/LON DISPLAY
- [ ] **DEG/MIN (.01)**
- [ ] DEG/MIN (.0001)
- [ ] DEG/MIN/SEC (1.0)
- [x] DEG/MIN/SEC (.01)

MAP DATUMS
- [ ] **WGS84**
- [ ] USER 1
- [ ] USER 2
- [ ] USER 3
- [ ] USER 4
- [ ] USER 5
- [x] NAD27
- [ ] ALASK
- [ ] TOKYO
- [ ] WGS72
- [ ] NAD83
- [ ] AUSTR
- [ ] EUROP
- [ ] OSGB
- [ ] EIRE

ALTITUDE REFERENCE
- [x] **ALT (ELEV ABOVE MSL)**
- [ ] HAE (HT. ABOVE ELLIPSOID)
- [ ] HAG (HT. ABOVE GEOID)

ALTITUDE UNITS
- [x] Meters
- [ ] **Feet**

MAGNETIC VARIATION
- [ ] **AUTO MAG (M)**
- [ ] SET (USER SET – U) _ _ ° _ _ E OR W (Specify)
- [x] TRUE (T)

DISTANCE, SPEED UNITS
- [x] Km (kilometers) and Km/HR
- [ ] **MI (statute miles) and MPH**
- [ ] NM (nautical miles) and KNOTS (knots)
- [ ] Meters, m/sec
- [ ] Feet, ft/sec

ROUTE MODE
- [ ] **Automatic**
- [x] Manual

VELOCITY AVERAGE
- [ ] NONE
- [ ] 20 SECONDS
- [ ] **120 SECONDS**

BATTERY SAVER
- [x] **OFF**
- [ ] ON

BEEPER
- [x] **ON**
- [ ] OFF

DISPLAY CONTROL
- [ ] **15**
- [x] Other 7 (1 through 14)

DATE ORDER
- [ ] **MONTH/DAY/YEAR**
- [x] DAY/MONTH/YEAR

Nov. 24/92
① PE…LCP ③ mo lcp.
② Mike LCP ④ George LCP
⑤ … Jr.

Explanation of Waypoint Names

$\bar{X}$ - denotes An AVERAGED position
XP** - denotes a waypoint on the pem Grid with the 2 digit number corresponding to A point on the map.
- if a second Averaged position was taken from the Same location then it is identified by $\bar{X}$Q ## a 3rd is $\bar{X}$R ##

RC holes are identified w/ a $\bar{X}$C ## then the corresponding 2 digit # taken from the drill plan map (ie. RC02 = $\bar{X}$C02) if a second ~~pos~~ reading was taken the prefix is $\bar{X}$B ##

DDH's have a $\bar{X}$D## prefix

LCP's are id'ed with letters closely resembling the claim name. (ie. $\bar{X}$DVE = DAVE) the Faw claims are $\bar{X}$F##.
CKJ = Creek Junction.
$\bar{X}$MD = Mount DAVIDSON,

Blackwater

Geodetic Control Unit ph. 387-3164

Position of Geodetic Survey Monument (unique I.D. # 25HN060) on Mt. Davidson using the NAD 27 datum:

53° 08′ 53.5165 N
124° 53′ 17.8536 W
Elev. 1829.1 m

The two averaged positions taken at the control monument in Nov./92 compare as follows.

<u>Wpt.</u> $\bar{x}$MD2

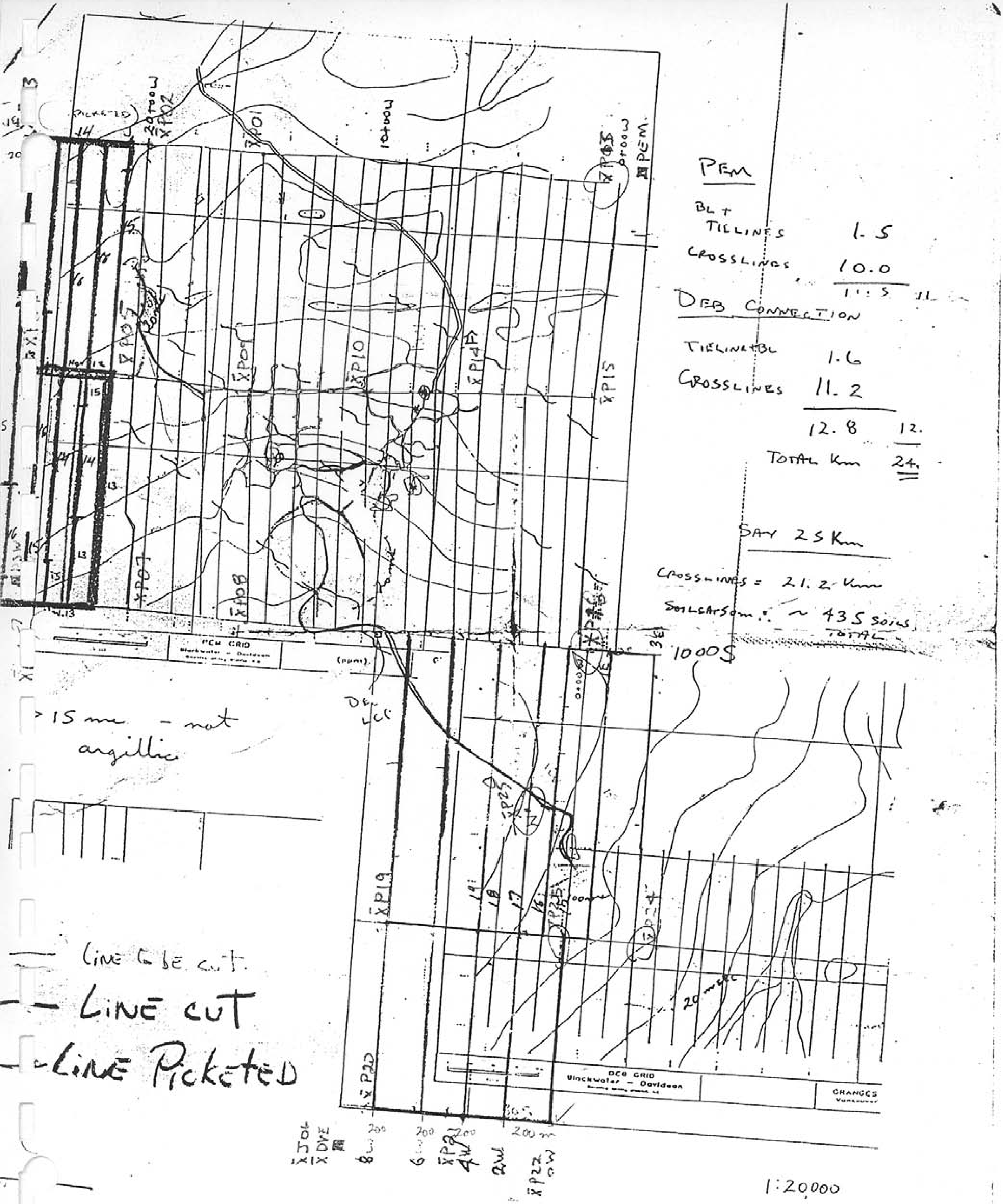
	53° 08′ 54.97″ N	+1.45″
	124° 53′ 19.39 W	+1.54″
	Elev. 1863	+ 33.9 m

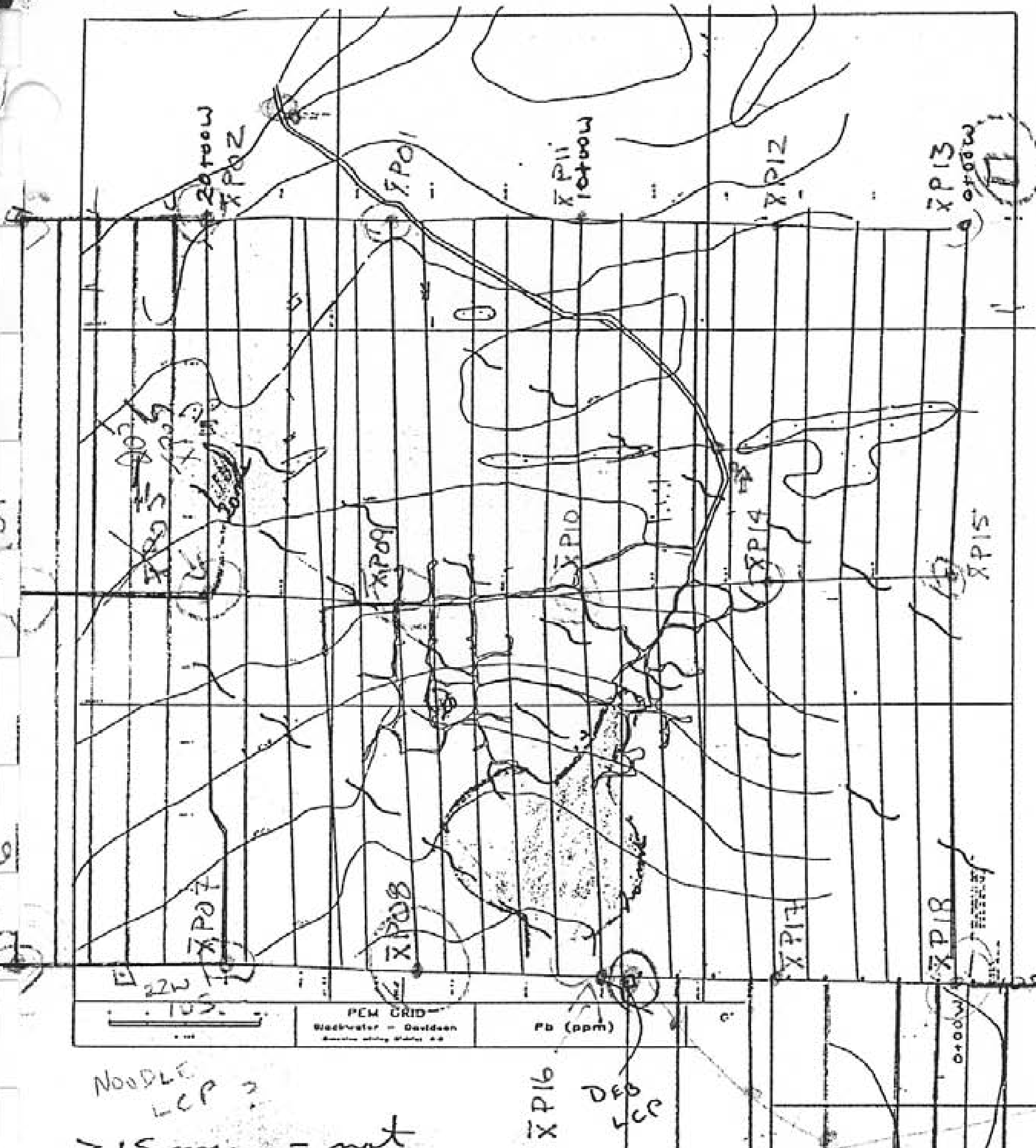
<u>Wpt</u> $\bar{x}$MDV

	53° 08′ 54.93″	+ 1.41″
	124° 53′ 17.53″	− 0.32″
	Elev 1930	+ 100.9 m

Data salvaged from buffer.

$\bar{x}$P13	647 → 578	$\bar{x}$P23	360 → 293
$\bar{x}$P25	577 → 518	$\bar{x}$P09	292 → 001(?)
$\bar{x}$P18	517 → 473		
$\bar{x}$P24	472 → 361		


PEM
BL + TIELINES 1.5
CROSSLINES 10.0
11.5
DEB CONNECTION
TIELINE+BL 1.6
CROSSLINES 11.2
12.8
TOTAL Km 24.
SAY 25 Km
CROSSLINES = 21.2 Km
SOILS AT 50m : ~ 435 SOILS TOTAL
1000S
PEM GRID
Blackwater – Davidson
DEB GRID
Blackwater – Davidson
CHANGES
>15 mm – not argillic
Line to be cut.
LINE CUT
LINE PICKETED
XP01
XP02
XP07
XP08
XP09
XP10
XP14
XP15
XP19
XP20
XP22
XP23
XP24
XP25
200
200 m
1:20,000



PEM

BL + TIELINES	1.5
CROSSLINES	10.0
	11.5 11

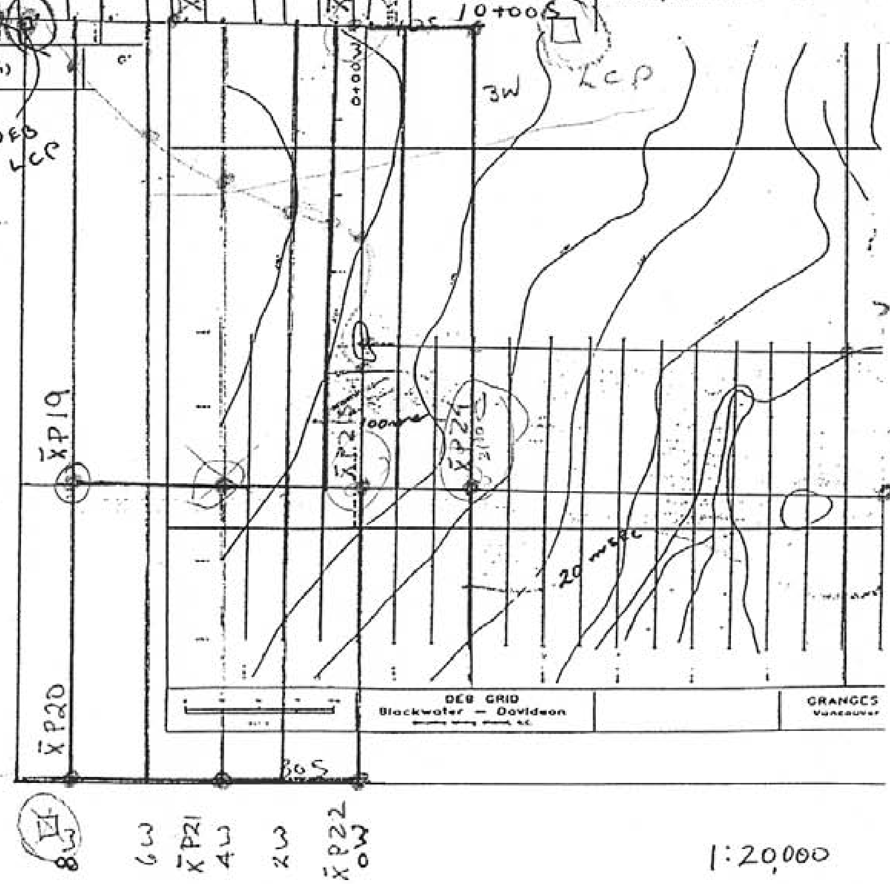
DEB CONNECTION

TIELINE+BL	1.6
CROSSLINES	11.2
	12.8 12.
TOTAL Km	24.

SAY 25 Km

CROSSLINES = 21.2 Km

SOILS AT 50m ∴ ~ 435 SOILS TOTAL



1:20,000

WAYPOINT LOG, LAT/LON

Always keep a written record of all waypoints, especially of waypoints that are named by the unit. Copy these pages for your waypoint notebook.

WAYPOINT NAME: ~~JON6~~ XJ06 | DATE: 23 / 11 / 92
LAT 53 ° 08 . 58.84 N or S | ALTITUDE:
LON 129 ° 51 . 22.26 E or W | 1599.0 f or m
NOTE: AVG pos. (50) S= 4.0 DAVE LCP | DATUM: NAD27

WAYPOINT NAME: XMDV | DATE: 23 4 / 92
LAT 53 ° 08 . 54.93 N or S | ALTITUDE:
LON 129 ° 53 . 17.55 E or W | 1930 f or m
NOTE: on Top of MT. DAV 3:00 pm | DATUM: NAD 27

WAYPOINT NAME: X PEM | DATE: 24 / 11 / 92
LAT 53 ° 11 . 09.55 N or S | ALTITUDE:
LON 124 ° 50 . [illegible] E or W | 1439 f or m
NOTE: [illegible] LCP X-50 | DATUM: NAD27

WAYPOINT NAME: X MKE | DATE: 24 / 11 / 92
LAT 53 ° 12 . 11.92 N or S | ALTITUDE:
LON 124 ° 50 . 51.86 E or W | 1249 f or m
NOTE: Mike LCP | DATUM: NAD27

APPENDIX 4

WAYPOINT LOG, LAT/LON

Always keep a written record of all waypoints, especially of waypoints that are named by the unit. Copy these pages for your waypoint notebook.

WAYPOINT NAME: X MO | DATE: 24 / 11 / 92
LAT 53 ° 12 . 14.69 N or S | ALTITUDE:
LON 124 ° 49 . 37.58 E or W | 1141 f or m
NOTE: Mo LCP | DATUM: NAD27

WAYPOINT NAME: X GgE | DATE: 24 / 11 / 92
LAT 53 ° 11 . 09.89 N or S | ALTITUDE:
LON 124 ° 49 . 28.90 E or W | 1292 f or m
NOTE: George LCP (?) TAG destroyed [illegible] Mo C.P. | DATUM: NAD27

WAYPOINT NAME: X CKJ | DATE: 24 / 11 / 92
LAT 53 ° 10 . 48.20 N or S | ALTITUDE:
LON 124 ° 50 . 07.88 E or W | 1433 f or m
NOTE: creek Junction S=12 | DATUM: NAD27

WAYPOINT NAME: X DEB | DATE: 25 / 11 / 92
LAT 53 ° 10 . 03.53 N or S | ALTITUDE:
LON 124 ° 51 . 29.06 E or W | 1607 f or m
NOTE: DEB LCP | DATUM: NAD27

A-13

APPENDIX 4

WAYPOINT LOG, LAT/LON

Always keep a written record of all waypoints, especially of waypoints that are named by the unit. Copy these pages for your waypoint notebook.

WAYPOINT NAME: XP14 | DATE: 27/11/92
LAT 53 • 10 . 38.25 N or S | ALTITUDE:
LON 124 • 51 . 11.30 E or W | 1764 f or m
NOTE: 500W/BL PEM(?) | DATUM: NAD27

WAYPOINT NAME: XP15 | DATE: 27/11/92
LAT 53 • 10 . 33.26 N or S | ALTITUDE:
LON 124 • 50 . 45.19 E or W | 2D f or m
NOTE: 00W/BL PEM(XX) | DATUM: NAD27

WAYPOINT NAME: XP10 | DATE: 27/11/92
LAT 53 • 10 . 38.12 (N) or S | ALTITUDE:
LON 124 • 51 . 37.07 E or (W) | 2D f or m
NOTE: 10W/00BL PEM(10) | DATUM: NAD27

WAYPOINT NAME: XD12 | DATE: 27/11/92
LAT 53 • 10 . 25.39 N or S | ALTITUDE:
LON 124 • 51 . 36.68 E or W | 1507 f or (m)
NOTE: [illegible] DAV12 collar(?) | DATUM: NAD27

APPENDIX 4

WAYPOINT LOG, LAT/LON

Always keep a written record of all waypoints, especially of waypoints that are named by the unit. Copy these pages for your waypoint notebook.

WAYPOINT NAME: XD23 | DATE: 27/11/92
LAT 53 • 10 . 23.69 (N) or S | ALTITUDE:
LON 124 • 51 . 30.55 E or (W) | 1388 f or (m)
NOTE: DAV23 collar | DATUM: NAD27

WAYPOINT NAME: XC28 | DATE: 27/11/92
LAT 53 • 10 . 34.48 N or S | ALTITUDE:
LON 124 • 51 26.55 E or W | 1505 f or m
NOTE: RC 28 collar | DATUM: NAD27

WAYPOINT NAME: XC18 | DATE: 27/11/92
LAT 53 • 10 26.96 N or S | ALTITUDE:
LON 124 • 51 30.05 E or W | 1457 f or (m)
NOTE: RC18 Collar | DATUM: NAD27

WAYPOINT NAME: XBL8 | DATE: 27/11/92
LAT 53 • 10 . 23.59 (N) or S | ALTITUDE:
LON 124 • 51 30.89 E or (W) | 1562 f or (m)
NOTE: *Same location as XC18 | DATUM: NAD27

Running Avg.
*see reverse

SAmple ZC18 was taken using Aux 4, 50 samples w/ Auto Stop
XB18 " " w/ Running Avg and
using satellites from Aux 5 PDOP compute
lat/lon are pretty consistent by 5= has big diff
as well as Elev.

WAYPOINT LOG, LAT/LON

Always keep a written record of all waypoints, especially of waypoints that are named by the unit. Copy these pages for your waypoint notebook.

WAYPOINT NAME: XD31 — DATE: 27/11/92
LAT 53°10.22.50 N or S — ALTITUDE:
LON 124°51.22.16 E or W — 1457 f or m
NOTE: DAV 31 — DATUM: NAD27

WAYPOINT NAME: XD19 — DATE: 27/11/92
LAT 53°[illegible] N or S — ALTITUDE:
LON [illegible]°51.23.50 E or W — 1625 f or (m)
NOTE: DAV 19 [illegible] — DATUM: NAD27

WAYPOINT NAME: XD03 — DATE: 27/11/92
LAT 53°10.[illegible].60 (N) or S — ALTITUDE:
LON 124°51.23.44 E or (W) — 1527 f or m
NOTE: DAV 03 [illegible] — DATUM: NAD27

WAYPOINT NAME: XC22 — DATE: [illegible]/[illegible]/92
LAT 53°[illegible].39.69 (N) or S — ALTITUDE:
LON [illegible]4°51.30.41 E or (W) — 1597 f or m
NOTE: RC 22 [illegible] — DATUM: NAD27

APPENDIX 4

WAYPOINT LOG, LAT/LON

Always keep a written record of all waypoints, especially of waypoints that are named by the unit. Copy these pages for your waypoint notebook.

WAYPOINT NAME: XC21 — DATE: 27/11/92
LAT 53°10 29.62 N or S — ALTITUDE:
LON 124°51.22.69 E or W — 1458 f or m
NOTE: RC21 collar — DATUM: NAD27

WAYPOINT NAME: XD14 — DATE: 27/11/92
LAT 53°10.33.11 N or S — ALTITUDE:
LON 124°51.21.31 E or W — 1625 f or m
NOTE: DAV 14 collar — DATUM: NAD27

WAYPOINT NAME: XD13 — DATE: 27/11/92
LAT 53°10.33.83 N or S — ALTITUDE:
LON 124°51.15.31 E or W — 1429 f or m
NOTE: DAV 13 [illegible] — DATUM: NAD27

WAYPOINT NAME: XD07 — DATE: 27/11/92
LAT 53°10.34.91 N or S — ALTITUDE:
LON 124°51.12.40 E or W — 1457 f or (m)
NOTE: DAV 7 collar — DATUM: NAD27

WAYPOINT LOG, LAT/LON

Always keep a written record of all waypoints, especially of waypoints that are named by the unit. Copy these pages for your waypoint notebook.

WAYPOINT NAME: XD29	DATE: 27 / 11 / 92
LAT 53 • 10 . 19.92 N or S	ALTITUDE:
LON 124 • 51 . 35.18 E or W	1622 f or (m)
NOTE: DAV 29	DATUM: NAD27.

WAYPOINT NAME: XD28	DATE: 27 / 11 / 92
LAT 53 • 10 . 20.21 N or S	ALTITUDE:
LON 124 • 51 . 31.98 E or W	1608 f or m
NOTE: DAV 28	DATUM: NAD 27

WAYPOINT NAME: XD27	DATE: 27 / 11 / 92
LAT 53 • 10 . 20.39 (N) or S	ALTITUDE:
LON 124 • 51 . 30.05 E or (W)	1445 f or (m)
NOTE: DAV 27	DATUM: NAD27

WAYPOINT NAME: XD26	DATE: 27 / 11 / 92
LAT 53 • 10 . 23.64 N or S	ALTITUDE:
LON 124 • 51 . 27.39 E or W	1672 f or (m)
NOTE: DAV 26	DATUM: NAD 27

APPENDIX 4

WAYPOINT LOG, LAT/LON

Always keep a written record of all waypoints, especially of waypoints that are named by the unit. Copy these pages for your waypoint notebook.

WAYPOINT NAME: XC30	DATE: 27 / 11 / 92
LAT 53 • 10 . 20.01 N or S	ALTITUDE:
LON 124 • 51 . 32.72 E or W	1552 f or m
NOTE: RC 30	DATUM: NAD 27

WAYPOINT NAME: XD22	DATE: 27 / 11 / 92
LAT 53 • 10 . 23.23 N or S	ALTITUDE:
LON 124 • 51 . 25.70 E or W	1709 f or (m)
NOTE: DAV. 22.	DATUM: NAD 27

WAYPOINT NAME: XD09	DATE: 27 / 11 / 92
LAT 53 • 10 . 22.69 (N) or S	ALTITUDE:
LON 124 • 51 . 27.51 E or (W)	1714 f or m
NOTE: DAV 09	DATUM: NAD 27

WAYPOINT NAME:	DATE: / /
LAT • . N or S	ALTITUDE:
LON • . E or W	f or m
NOTE:	DATUM:

WAYPOINT LOG, LAT/LON

Always keep a written record of all waypoints, especially of waypoints that are named by the unit. Copy these pages for your waypoint notebook.

WAYPOINT NAME: X Q 0 4 | DATE: 26 / 11 / 92
LAT 53 ° 10 . 32.63 (N) or S | ALTITUDE:
LON 129 ° 52 . 57.85 E or (W) | 1463 f or (m)
NOTE: SAME POS @ XP04 X-[illegible] | DATUM: NAD27

WAYPOINT NAME: X R D 5 | DATE: 26 / 11 / 92
LAT 53 ° 10 . 36.31 (N) or S | ALTITUDE:
LON 129 ° 52 . 30.78 E or (W) | 2D f or m
NOTE: BL/1995W PEN DRILL RD | DATUM: NAD27

WAYPOINT NAME: X M D 2 | DATE: 26 / 11 / 92
LAT 53 ° 08 . 54.97 (N) or S | ALTITUDE:
LON 129 ° 53 . 19.39 E or (W) | 1863 f or m
NOTE: Pk of Mt. DAvidson | DATUM: NAD 27

WAYPOINT NAME: X F 0 3 | DATE: 26 / 11 / 92
LAT 53 ° 09 . 03.31 (N) or S | ALTITUDE:
LON 129 ° 53 . 15.22 E or (W) | 1831 f or m
NOTE: FALL 3 LCP | DATUM: NAD27

APPENDIX 4

WAYPOINT LOG, LAT/LON

Always keep a written record of all waypoints, especially of waypoints that are named by the unit. Copy these pages for your waypoint notebook.

WAYPOINT NAME: X F 0 5 | DATE: 26 / 11 / 92
LAT 53 ° 09 . 09.23 (N) or S | ALTITUDE:
LON 129 ° 52 . 50.89 E or (W) | 1806 f or m
NOTE: FALL 5 LCP | DATUM:

WAYPOINT NAME: F A L L | DATE: 26 / 11 / 92
LAT 53 ° 10 . 09.59 N or S | ALTITUDE:
LON 129 ° 50 . 30.13 E or W | 2D f or m
NOTE: FALL 11 LCP | DATUM: NAD27

WAYPOINT NAME: __ __ __ __ __ __ | DATE: __ / __ / __
LAT __ __ ° __ __ . __ __ N or S | ALTITUDE:
LON __ __ __ ° __ __ . __ __ E or W | __ __ __ __ __ f or m
NOTE: ________ | DATUM: ________

WAYPOINT NAME: __ __ __ __ __ __ | DATE: __ / __ / __
LAT __ __ ° __ __ . __ __ N or S | ALTITUDE:
LON __ __ __ ° __ __ . __ __ E or W | __ __ __ __ __ f or m
NOTE: ________ | DATUM: ________

WAYPOINT LOG, LAT/LON

Always keep a written record of all waypoints, especially of waypoints that are named by the unit. Copy these pages for your waypoint notebook.

WAYPOINT NAME: XP02 X=10 DATE: 25/11/92
LAT 53° 11 .06 25 (N) or S ALTITUDE:
LON 124° 52 .3493 E or (W) ______ f or (m)
NOTE: 20W/10N PEM Grid DATUM: NAD 27

WAYPOINT NAME: XP01 DATE: 25/11/92
LAT 53° 11 .05 70 N or S ALTITUDE:
LON 124° 52 .0875 E or W 1374 f or m
NOTE: 10N/500W PEM Grid DATUM: NAD 27

WAYPOINT NAME: XP03 DATE: 25/11/92
LAT 53° 11 .07 80 N or S ALTITUDE:
LON 124° 53 .00 85 E or W 1957 f or (m)
NOTE: PEM Grid 10N/25W X=26 DATUM: NAD 27

WAYPOINT NAME: XP04 DATE: 25/11/92
LAT 53° 10 .47 27 N or S ALTITUDE:
LON 124° 53 .03 87 E or W 1931 2D f or (m)
NOTE: PEM Grid BL/25W DATUM: NAD 27

APPENDIX 4

WAYPOINT LOG, LAT/LON

Always keep a written record of all waypoints, especially of waypoints that are named by the unit. Copy these pages for your waypoint notebook.

WAYPOINT NAME: XP08 DATE: 26/11/92
LAT 53° 10 .02 68 (N) or S ALTITUDE:
LON 124° 53 .07 23 E or (W) 1368 f or (m)
NOTE: PEM Grid 10S/15W DATUM: NAD 27

WAYPOINT NAME: XP07 DATE: 26/11/92
LAT 53° 10 .02 49 (N) or S ALTITUDE:
LON 124° 52 .26 20 E or (W) 1512 f or m
NOTE: 10S/20W PEM Grid DATUM: NAD 27

WAYPOINT NAME: XP06 DATE: 26/11/92
LAT 53° 10 .00 06 N or S ALTITUDE:
LON 124° 52 .54 48 E or W 2D f or m
NOTE: PEM Grid 25W/10S (2D) DATUM: NAD 27

WAYPOINT NAME: XPSW DATE: 26/11/92
LAT 53° 10 .01 91 (N) or S ALTITUDE:
LON 124° 52 .51 50 E or (W) 1581 f or (m)
NOTE: PEM SW Corner Post DATUM: NAD 27

Becky Jo LCP
Dave 4N/3W

WAYPOINT LOG, LAT/LON

Always keep a written record of all waypoints, especially of waypoints that are named by the unit. Copy these pages for your waypoint notebook.

WAYPOINT NAME: XD35	DATE: 25/11/92
LAT 53°10.14.83 N or S	ALTITUDE:
LON 124°51.45.84 E or W	1602 f or (m)
NOTE: BD92-35	DATUM: NAD27

WAYPOINT NAME: XD34	DATE: 25/11/92
LAT 53°10.14.85 N or S	ALTITUDE:
LON 124°51.36.99 E or W	1581 f or (m)
NOTE: BD92-34	DATUM: NAD27

WAYPOINT NAME: XD33	DATE: 25/11/92
LAT 53°10.23.29 N or S	ALTITUDE:
LON 124°51.43.63 E or W	1681 f or (m)
NOTE: BD92-33	DATUM: NAD27

WAYPOINT NAME: XD36	DATE: 25/11/92
LAT 53°10.24.85 N or S	ALTITUDE:
LON 124°51.42.71 E or W	f or (m)
NOTE: BD92-36	DATUM: NAD27

APPENDIX 4

WAYPOINT LOG, LAT/LON

Always keep a written record of all waypoints, especially of waypoints that are named by the unit. Copy these pages for your waypoint notebook.

WAYPOINT NAME: CAM 1	DATE: 25/11/92
LAT 53°10.46.61 N or S	ALTITUDE:
LON 124°51.19.63 E or W	1501 f or m
NOTE: Camp CORE RAILS	DATUM: NAD27

WAYPOINT NAME: XD32	DATE: 25/11/92
LAT 53°10.43.84 N or S	ALTITUDE: 4
LON 124°52.32.95 E or W	1465 f or (m)
NOTE: BD92-32	DATUM: NAD27

WAYPOINT NAME: XP05	DATE: 25/11/92
LAT 53°10.56.27 N or S	ALTITUDE: 4
LON 124°52.38.06 E or W	1273 f or m
NOTE: PEM GRID 2000W / 1498N	DATUM: NAD27

WAYPOINT NAME: XQ05	DATE: 25/11/92
LAT 53°10.53.89 (N) or S	ALTITUDE:
LON 124°52.36.11 E or (W)	f or (m)
NOTE: Same POS @ XP05	DATUM: NAD27

x̄ = 19

A-13

WAYPOINT LOG, LAT/LON

Always keep a written record of all waypoints, especially of waypoints that are named by the unit. Copy these pages for your waypoint notebook.

WAYPOINT NAME: XC33	DATE: 27 / 11 / 92
LAT 53 • 10 . 21.56 (N) or S	ALTITUDE:
LON 124 • 51 . 47.92 E or (W)	1538 f or (m)
NOTE: RC 33 collar 12UN AVG	DATUM: NAD27

WAYPOINT NAME: XC11	DATE: 27/11 / 92
LAT 53 • 10 . 25.81 (N) or S	ALTITUDE:
LON 124 • 51 . 50.23 E or (W)	1469 f or (m)
NOTE: NEAR collar / middle of RD X	DATUM: NAD27

WAYPOINT NAME: XD15	DATE: 28 / 11 / 92
LAT 53 • 10 . 38.46 N or S	ALTITUDE:
LON 124 • 51 . 53.07 E or W	1555 f or (m)
NOTE: DAV15 Collar	DATUM: NAD27

WAYPOINT NAME: XD17	DATE: 28 / 11 / 92
LAT 53 • 10 . 36.90 N or S	ALTITUDE:
LON 124 • 52 . 00.55 E or W	1368 f or m
NOTE: collar DAV 17	DATUM: NAD27

APPENDIX 4

WAYPOINT LOG, LAT/LON

Always keep a written record of all waypoints, especially of waypoints that are named by the unit. Copy these pages for your waypoint notebook.

WAYPOINT NAME: XC03	DATE: 28 / 11 / 92
LAT 53 • 10 . 35.09 (N) or S	ALTITUDE:
LON 124 • 52 . 06.27 E or (W)	1380 f or m
NOTE: RC3 collar	DATUM: NAD27

WAYPOINT NAME: XC02	DATE: 28 / / 92
LAT 53 • 10 . 35.39 N or S	ALTITUDE:
LON 124 • 52 . 04.92 E or W	1519 f or m
NOTE: RC2 Collar	DATUM: NAD27

WAYPOINT NAME: XC04	DATE: 28 / 11 / 92
LAT 53 • 10 . 29.26 (N) or S	ALTITUDE:
LON 124 • 52 . 05.52 E or (W)	[illegible] f or (m)
NOTE: RC04 collar	DATUM: NAD27

WAYPOINT NAME: XC31	DATE: 28 / 11 / 92
LAT 53 • 10 . 23.96 (N) or S	ALTITUDE:
LON 124 • 52 . 02.71 E or (W)	1504 f or m
NOTE: RC31 NEAR collar	DATUM: NAD27

WAYPOINT LOG, LAT/LON

Always keep a written record of all waypoints, especially of waypoints that are named by the unit. Copy these pages for your waypoint notebook.

WAYPOINT NAME: XC24	DATE: 28/11/92
LAT 53°10.24.22 N or S	ALTITUDE:
LON 124°53.03.36 E or W	1597 f or m
NOTE: near collar RC24	DATUM: NAD 27

WAYPOINT NAME: ~~XC~~ XC27	DATE: 28/11/92
LAT 53°12.21.49 N or S	ALTITUDE:
LON 124°52.02.15 E or W	1529 f or m
NOTE: RC27 collar	DATUM: NAD 27

WAYPOINT NAME: XC25	DATE: 28/11/92
LAT 53°10.19.63 N or S	ALTITUDE:
LON 124°51.53.17 E or W	1519 f or m
NOTE: NEAR RC25 collar + LN 14 W inters.	DATUM: NAD 27

WAYPOINT NAME: XC26	DATE: 28/11/92
LAT 53°12.30.41 N or S	ALTITUDE:
LON 124°51.56.43 E or W	20 f or m
NOTE: NEAR RC26 collar	DATUM: NAD 27

WAYPOINT LOG, LAT/LON

Always keep a written record of all waypoints, especially of waypoints that are named by the unit. Copy these pages for your waypoint notebook.

WAYPOINT NAME: XC10	DATE: 28/11/92
LAT 53°12.22.92 N or S	ALTITUDE:
LON 124°51.16.92 E or W	1481 f or m
NOTE: Near RC10	DATUM: NAD 27

WAYPOINT NAME: XC06	DATE: 28/11/92
LAT 53°10.34.32 N or S	ALTITUDE:
LON 124°51.58.58 E or W	1485 f or m
NOTE: NEAR RC6 collar	DATUM: NAD 27

WAYPOINT NAME: XC07	DATE: 28/11/92
LAT 53°10.31.79 N or S	ALTITUDE:
LON 124°52.00.31 E or W	1516 f or m
NOTE: Collar RC7	DATUM: NAD 27

WAYPOINT NAME: XC08	DATE: 28/11/92
LAT 53°10.28.20 N or S	ALTITUDE:
LON 124°51.68.27 E or W	1652 f or m
NOTE: collar RC8 (Drill Sump)	DATUM: NAD 27

WAYPOINT LOG, LAT/LON

Always keep a written record of all waypoints, especially of waypoints that are named by the unit. Copy these pages for your waypoint notebook.

WAYPOINT NAME: XP22 | DATE: 29/11/92
LAT 53° 08. 59.23 N or S | ALTITUDE:
LON 124° 50. 36.57 E or W | 1665 f or m
NOTE: TL3S/0W | DATUM: NAD 27

WAYPOINT NAME: XP09 | DATE: 29/11/92
LAT 53° 10. 36.69 N or S | ALTITUDE:
LON 124° 52. 08.46 E or W | 2D f or m
NOTE: PEM BL/ ~~200~~ 15W | DATUM: NAD 27

WAYPOINT NAME: XP23 | DATE: 30/11/92
LAT 53° 10. 06.16 N or S | ALTITUDE:
LON 124° 49. 52.49 E or W | 2D f or m
NOTE: 00W/DEB R.L. | DATUM: NAD 27

WAYPOINT NAME: XP24 | DATE: 30/11/92
LAT 53° 09. 35.73 N or S | ALTITUDE:
LON 124° 50. 17.22 E or W | 1437 f or m
NOTE: DEB BL/1100W | DATUM: NAD 27

APPENDIX 4

WAYPOINT LOG, LAT/LON

Always keep a written record of all waypoints, especially of waypoints that are named by the unit. Copy these pages for your waypoint notebook.

WAYPOINT NAME: XP18 | DATE: 30/11/92
LAT 53° 10. 03.31 N or S | ALTITUDE:
LON 124° 50. 38.10 E or W | 1600 m f or m
NOTE: 10S/00W PEM Grid | DATUM: NAD 27

WAYPOINT NAME: XP25 | DATE: 30/11/92
LAT 53° 09. 49.65 N or S | ALTITUDE:
LON 124° 50. 50.15 E or W | 1631 f or m
NOTE: 2W/ [illegible] | DATUM: NAD 27

WAYPOINT NAME: [illegible] | DATE: 3_/__/__
LAT 53° 11. 06.99 N or S | ALTITUDE:
LON 124° 50. 49.56 E or W | 1903 f or m
NOTE: [illegible] | DATUM: NAD 27

WAYPOINT NAME: ______ | DATE: __/__/__
LAT __° __.__ N or S | ALTITUDE:
LON ___° __.__ E or W | ______ f or m
NOTE: ______ | DATUM: ______

APPENDIX 4

WAYPOINT LOG, LAT/LON

Always keep a written record of all waypoints, especially of waypoints that are named by the unit. Copy these pages for your waypoint notebook.

WAYPOINT NAME: XD30	DATE: 28 / 11 / 92
LAT 53 • 10 28.91 N or S	ALTITUDE:
LON 124 • 51 .51.00 E or W	1522 f or (m)
NOTE: Dav 30 + 24 wlaps.	DATUM: NAD 27

WAYPOINT NAME: XD16	DATE: 28 / 11 / 92
LAT 53 • 10 .53.70 (N) or S	ALTITUDE:
LON 124 • 51 .51.04 E or (W)	1696 f or (m)
NOTE: DAV 16 collar.	DATUM: NAD 27

WAYPOINT NAME: XC14	DATE: 28 / 11 / 92
LAT 53 • 10 .30.79 (N) or S	ALTITUDE:
LON 124 • 51 .59.19 E or (W)	1506 f or (m)
NOTE: Near RC14 @ 12W/15	DATUM: NAD 27

WAYPOINT NAME: XC12	DATE: __ / __ / __
LAT __ • __ . __ N or S	ALTITUDE:
LON __ • __ . __ E or W	__ f or m
NOTE:	DATUM:

APPENDIX 4

WAYPOINT LOG, LAT/LON

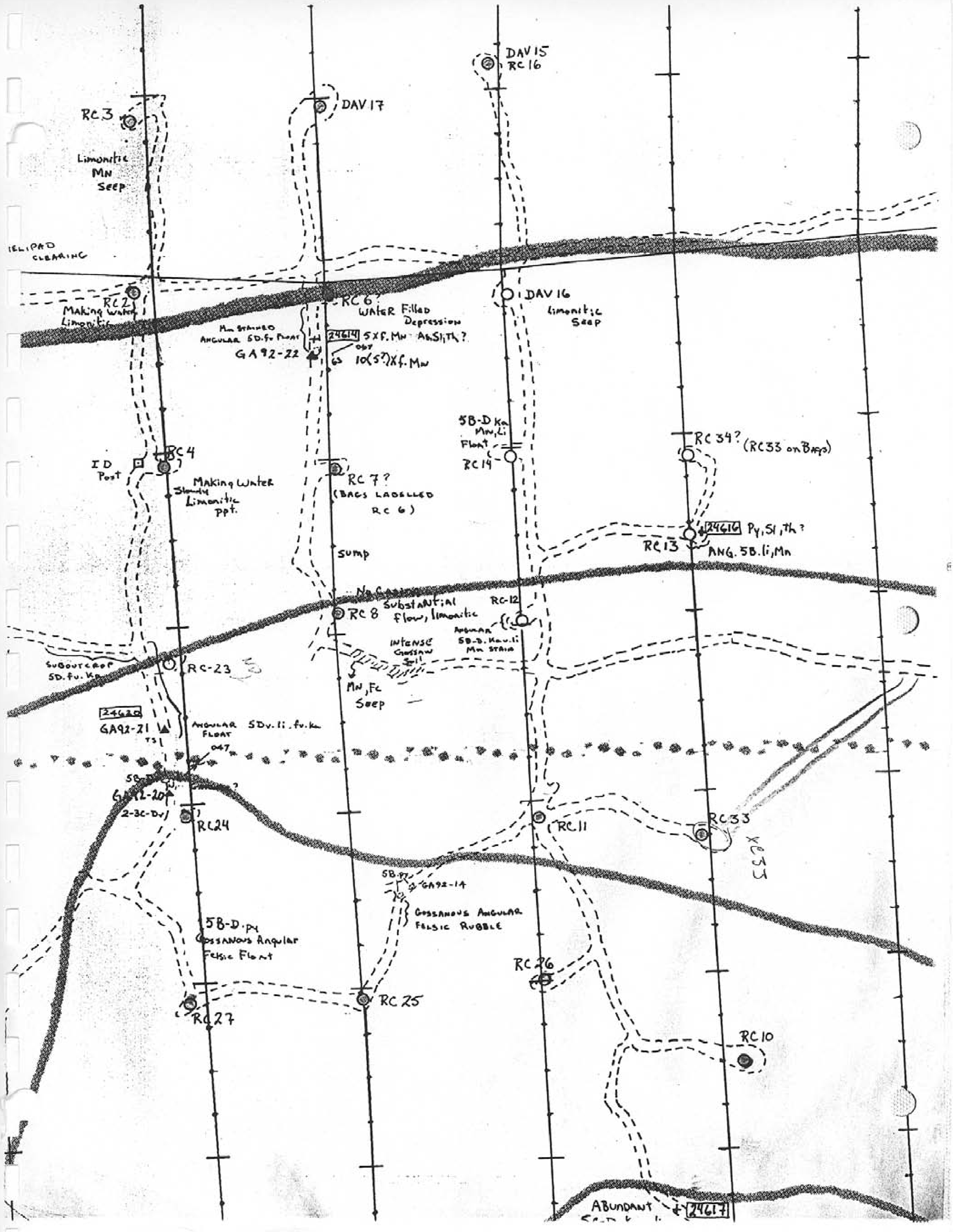
Always keep a written record of all waypoints, especially of waypoints that are named by the unit. Copy these pages for your waypoint notebook.

WAYPOINT NAME: XP19	DATE: 29 / 11 / 92
LAT 53 • 09 24.10 (N) or S	ALTITUDE:
LON 124 • 51 .19.35 E or (W)	1669 f or (m)
NOTE: @ L8W/2250S 29m S of 84/L8W	DATUM: NAD 27

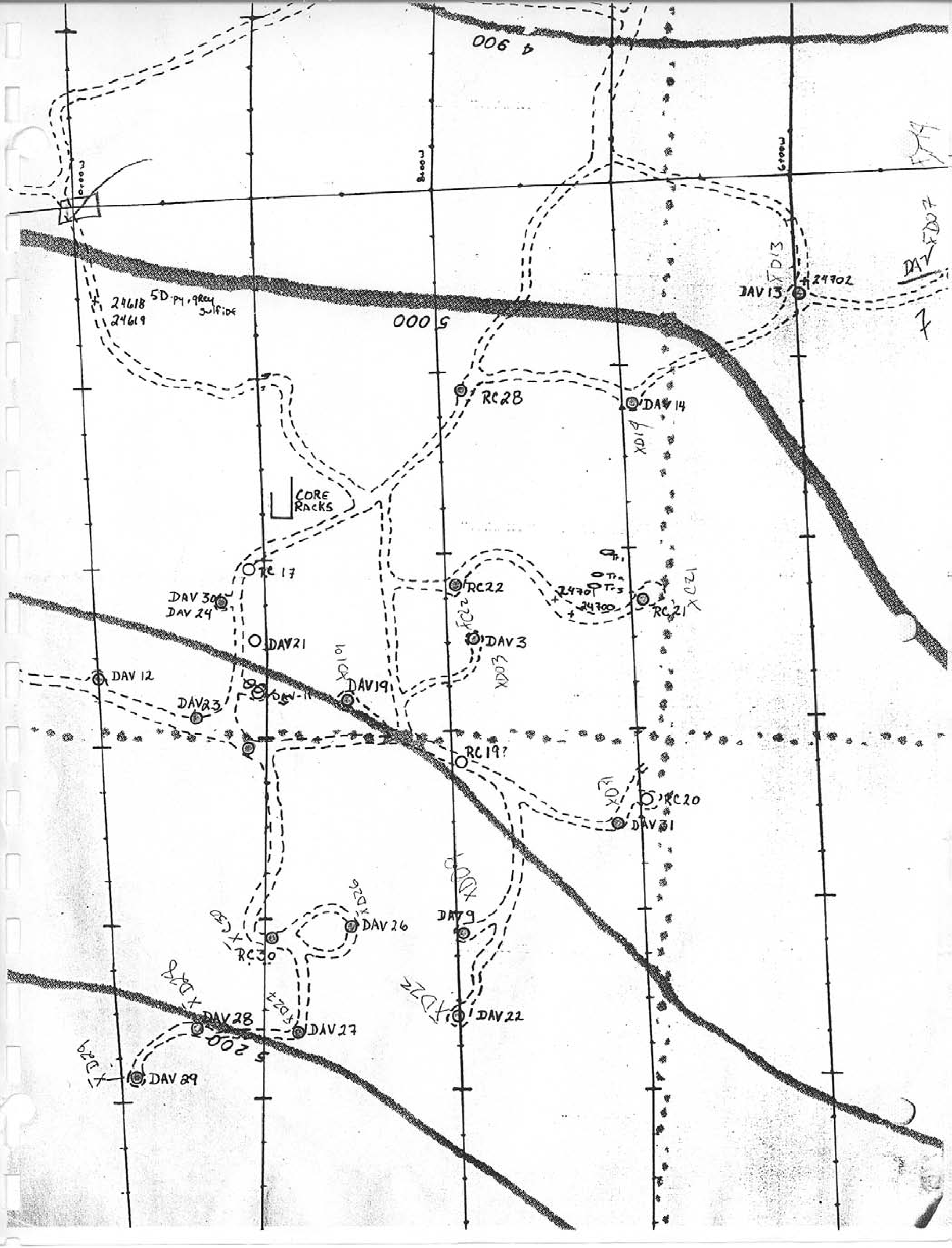
WAYPOINT NAME: XP20	DATE: 29 / 11 / 92
LAT 53 • 09 .00.33 N or S	ALTITUDE:
LON 124 • 51 .22.39 E or W	1570 f or m
NOTE: @ L8W/2975S (T.L. X)	DATUM: NAD 27

WAYPOINT NAME: XDVE	DATE: 29 / 11 / 92
LAT 53 • 08 .54.96 N or S	ALTITUDE:
LON 124 • 51 .21.98 E or W	1656 f or (m)
NOTE: Dave claim post	DATUM: NAD 27

WAYPOINT NAME: XP21	DATE: 29 / 11 / 92
LAT 53 • 08 .57.82 N or S	ALTITUDE:
LON 124 • 50 .59.64 E or W	1577 f or (m)
NOTE: 4W/ 35 T.L.	DATUM: NAD 27



DAV15
RC16
DAV17
RC3
Limonitic
MN
Seep
HELIPAD
CLEARING
RC2
Making Water
Limonitic
RC6
Water Filled
Depression
DAV16
Limonitic
Seep
24614
GA92-22
10(5?)Xf.Mn
5B-D Ka
Mn,Li
Float
RC14
RC34? (RC33 on Bags)
ID
Post
RC4
Making Water
Steady
Limonitic
ppt.
RC7?
(BAGS LABELLED
RC6)
24616
Py,Sl,th?
RC13
ANG. 5B.li,Mn
Sump
RC-12
RC8
Substantial
Flow, limonitic
INTENSE
GOSSAN
Soil
SUBOUTCROP
5D.fu.Ka
RC-23
Mn,Fe
Seep
24620
GA92-21
ANGULAR 5Dv.li.fu.ka
FLOAT
047
RC24
RC11
RC33
RC33
5B-D.py
Gossanous Angular
Felsic Float
GA92-14
GOSSANOUS ANGULAR
FELSIC RUBBLE
RC26
RC25
RC27
RC10
ABUNDANT
24617


4 900
5 000
5 200
24618
24619
5D-py, grey sulfide
24702
DAV 13
DAV 14
RC28
CORE RACKS
RC 17
DAV 30
DAV 24
DAV21
DAV 12
DAV23
DAV19
RC22
DAV 3
RC 21
24700
24701
RC 19?
RC20
DAV 31
DAV 26
RC30
DAV 9
DAV 28
DAV 27
DAV 22
DAV 29

GEOLOGICAL BRANCH ASSESSMENT REPORT

22,936

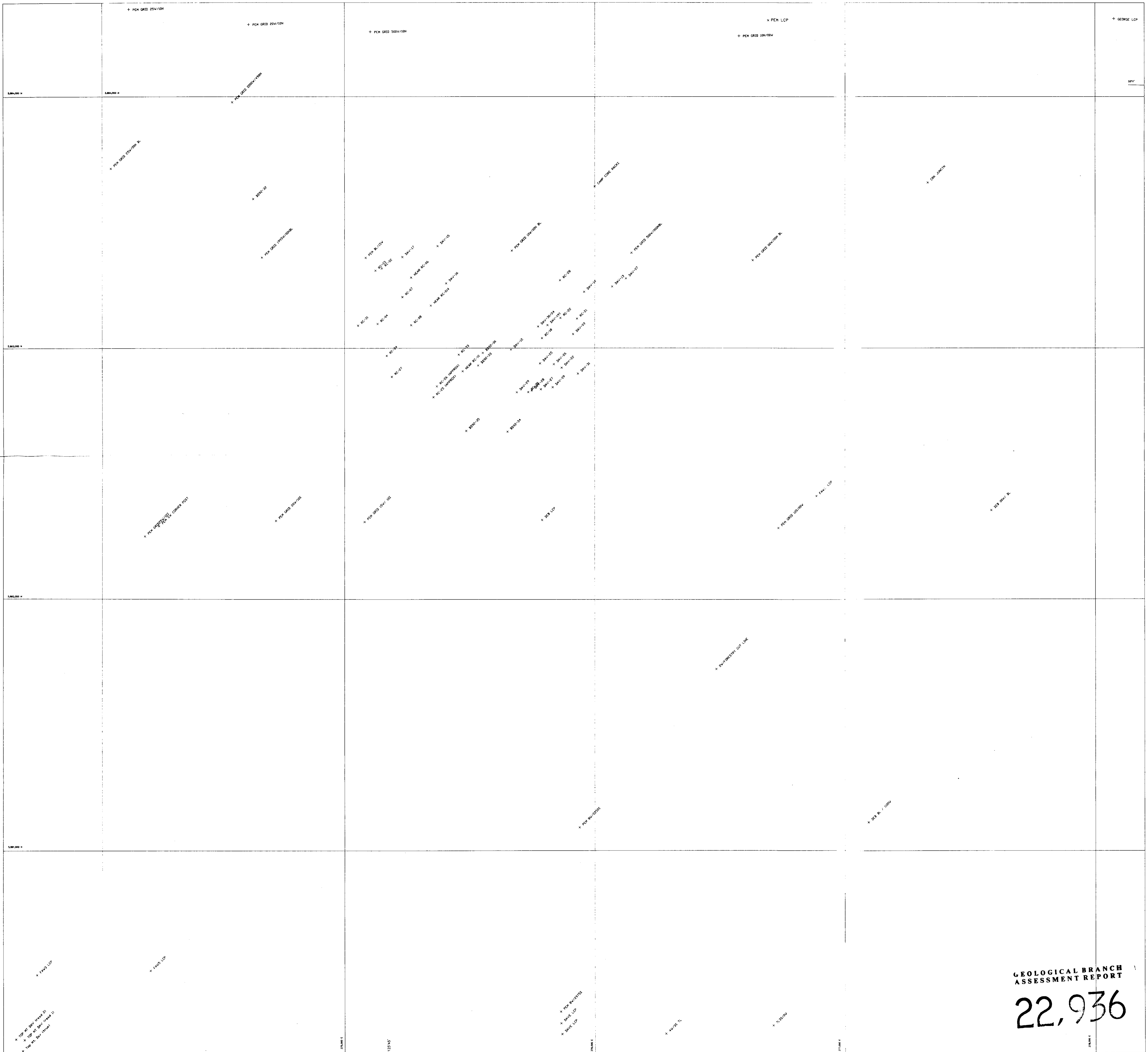
GRANGES INC.
Vancouver B.C.

PEM GRID
Blackwater-Davidson Project
Omenica Mining District, B.C.

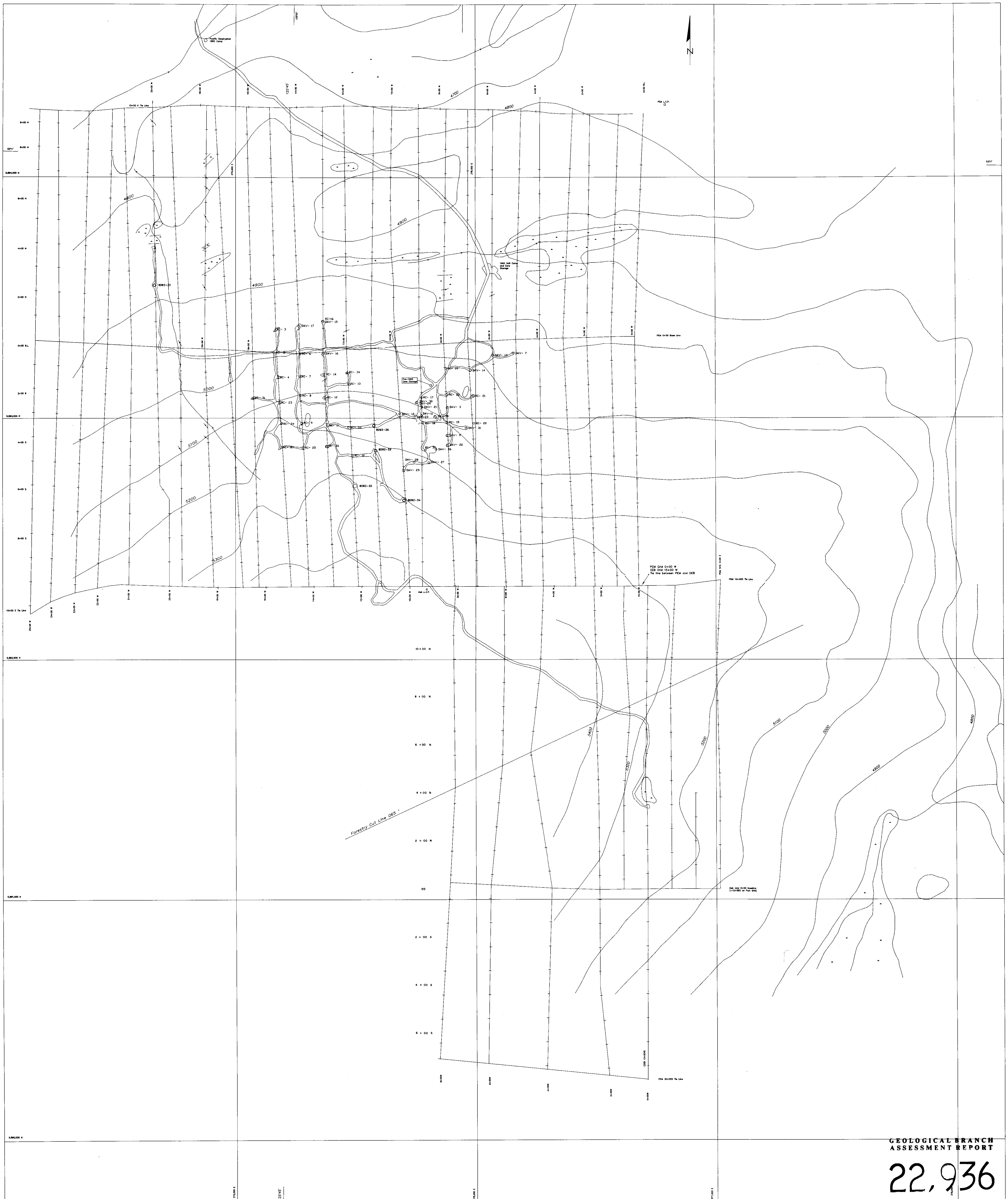
Geophysics and Soil Geochemistry Composite
1992 DIAMOND DRILLING
And
Proposed Diamond Drilling

0 100 200 300 400 m
SCALE

SCALE: 1:5,000	DRAWN BY: R.Z., G.A.
PROJECT No.: 120	DATE: Aug. 1992
NTS No.: 93F/2	DRAWING FILE: MAIN.DWG
Revised: JAN. 1993	
	FIGURE: 5



GRANGES INC. Vancouver B.C.	PEM GRID Blackwater–Davidson Project Omenica Mining District, B.C.	GPS Survey 1992 Averaged and Uncorrected Data	FIGURE: 9



GRANGES INC. Vancouver B.C.	PEM GRID Blackwater–Davidson Project Omenica Mining District, B.C.	PEM Grid and Road System As of December 1992	SCALE Contour Interval = 100 ft.	FIGURE: 10