GM 46134

REVERSE CIRCULATION OVERBURDEN DRILLING AND HEAVY MINERAL GEOCHEMICAL SAMPLING

Ministère de l'Énergie et des Ressources
Service de la Géoinformation
Date: 14 MAI 1988
No G.M.: 46134

FAIRLADY ENERGY INC.

DROUET TOWNSHIP, QUEBEC

REVERSE CIRCULATION OVERBURDEN DRILLING AND HEAVY MINERAL GEOCHEMICAL SAMPLING

PREPARED BY:
D.R. HOLMES, S.A. AVERILL AND K.A. MACNEIL

OVERBURDEN DRILLING MANAGEMENT LIMITED

NOVEMBER 1987

ÉNERGIE ET RESSOURCES - SECTEUR MINES
REÇU
-9 FEV 1988
BUREAU RÉGIONAL
ROUYN NORANDA

TABLE OF CONTENTS

FIGURES

Page

TABLES

PLANS

APPENDICES

1.0 SUMMARY

This report details the results of a 45-hole reverse circulation overburden drilling/heavy mineral geochemical sampling program conducted by Fairlady Energy Inc., on its Drouet Property option in Drouet Township, northcentral Quebec. The drilling was performed to develop diamond drill targets in the area of a known gold showing where a major, locally auriferous shear zone -- the Lac Bernard Fault -- passes through the property. Total projects costs averaged $185.76 per metre.

The drill area is underlain by east-southeast trending Archean metasediments, quartz-feldspar porphyry and gabbro sills, and a northeast trending Proterozoic diabase dyke. Regional mapping indicates these rocks occur near the axis of, or along the south limb of a major syncline (Lac Caopatina Syncline). In the drill area this fold axis appears to occur in the same position as the Lac Bernard Fault.

Bedrock samples from a number of reverse circulation drill holes have weakly elevated gold values (10-90 ppb Au), display varying effects of shear deformation and veining, and may contain such common gold associate minerals as Fe/Mg carbonate, fuchsite, tourmaline and finely disseminated pyrite. These features indicate potential for significant gold mineralization in the area but are not by themselves diagnostic of such mineralization.

The overburden in the drill holes averages 4.2 metres in depth and consists of Late Wisconsinan and Holocene age strata; older units were unprotected during the Wisconsinan glaciation because the area is topographically elevated. The direction of Late Wisconsinan ice flow was approximately 210 degrees and Chibougamau Till deposited by this ice forms a nearly continuous horizon across the property. The till is in contact with and largely derived from bedrock which makes it an excellent geochemical sampling medium. Gravel, sand, silt and clay units deposited in ice-marginal Lake Ojibway overlie the till and are in turn capped by Holocene accumulations of peat.

The gold background of the Fairlady heavy mineral concentrates is elevated but still within normal Abitibi Belt ranges. Fifteen of the twenty-one detected heavy mineral gold anomalies are caused by nugget or cluster effects related to the sampling procedure and are thus of no exploration significance. Other heavy mineral gold anomalies in Holes 18, 22, 24 and 31 appear to define short, narrow dispersal trains from small, subcropping sources of limited grade.

A program of diamond drilling to locate and test the gold dispersal sources is recommended. This program consisting of eleven 200 metre holes will cost approximately $220,000. Six priority holes are indicated if budget restrictions do not allow all eleven holes to be drilled.

2.0 INTRODUCTION

2.1 Project Outline

From May 5 to May 11, 1987, Fairlady Energy Inc. conducted a 45-hole program of reverse circulation overburden drilling for the purpose of heavy mineral geochemical sampling on its 22-claim Drouet Property in Drouet Township, Quebec near the eastern margin of the Abitibi Greenstone Belt (Fig. 1, 2, 3).

The property is believed to straddle the Lac Bernard Fault (Baker, 1986), a recently discovered lineament that has been compared to such auriferous structures as the Cadillac - Larder Lake Break and the Destor - Porcupine Fault. A small gold showing (Gobeil Showing) in the northeastern part of the claim block as well as scattered gold mineralization along a 30 kilometre stretch of the Fault being explored by Esso suggests potential for significant mineralization on the Drouet Property.

The drill program was designed specifically to determine the gold potential of bedrock proximal to the Lac Bernard Fault and to establish diamond drill targets in this area. A secondary consideration was to complete the program prior to a May 30, 1987 obligation to Victoria-Diego Resources Corp., the optioner of the property.

Fairlady contracted Heath and Sherwood Drilling (1986) Inc. of Kirkland Lake, Ontario, to perform the drilling and Overburden Drilling Management Limited (ODM) of Nepean, Ontario, to manage the program. Geologist R. Huneault and geotechnician P. Bisson spotted, logged (Appendix A) and sampled the drill holes and supervised the drilling.

Forty-five drill holes (DR-87-01 to 45) were completed (Plan 1, Appendix A). All of the holes were drilled through the overburden cover, which is of Quaternary age and mostly of glacial origin, and approximately 1.5 metres into the underlying bedrock which is of Archean age. A total of 88 overburden samples and 46 bedrock chip samples was collected (Table 1). Heavy mineral concentrates (Appendix B)

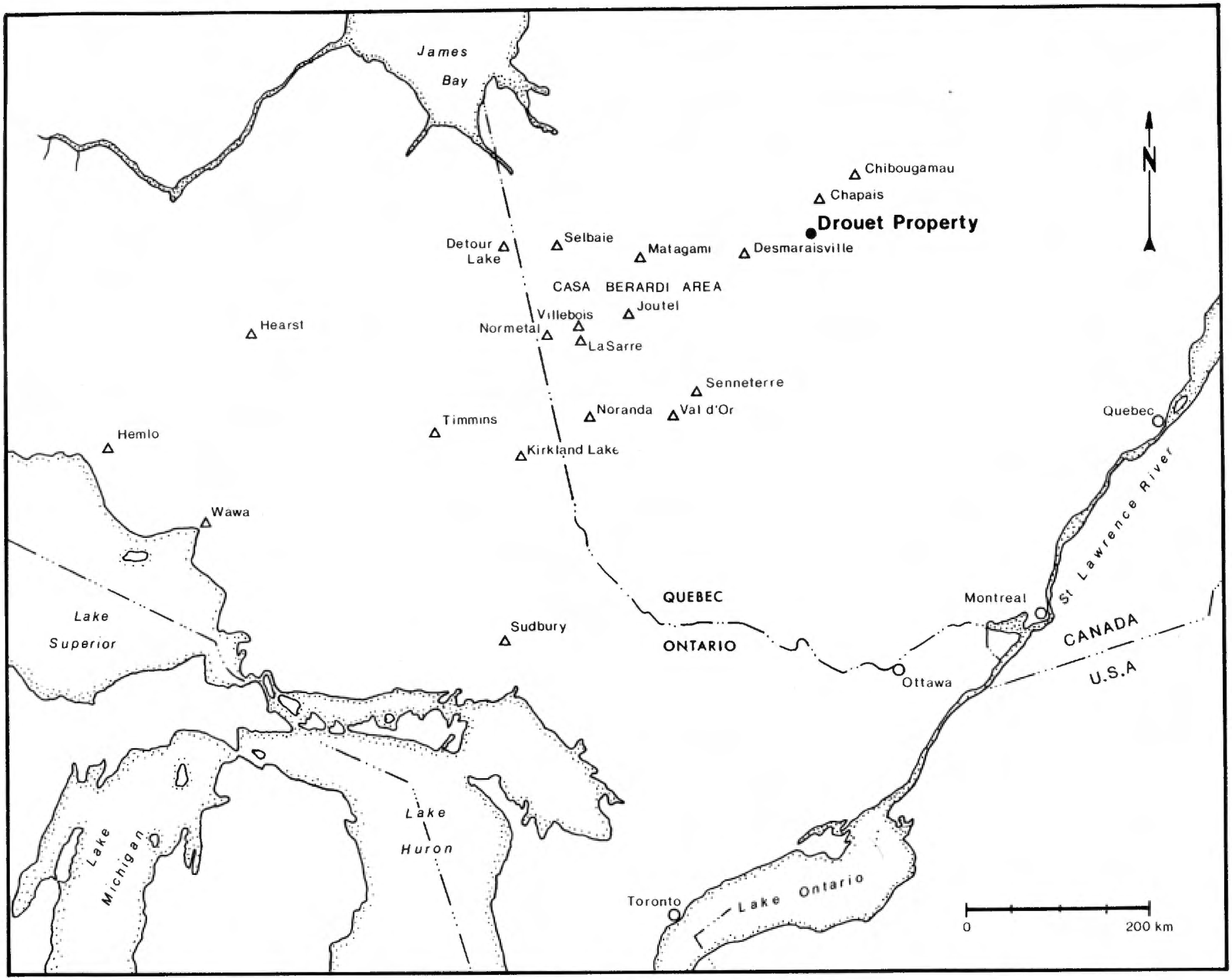


Figure 1 - Drouet Property Location Map

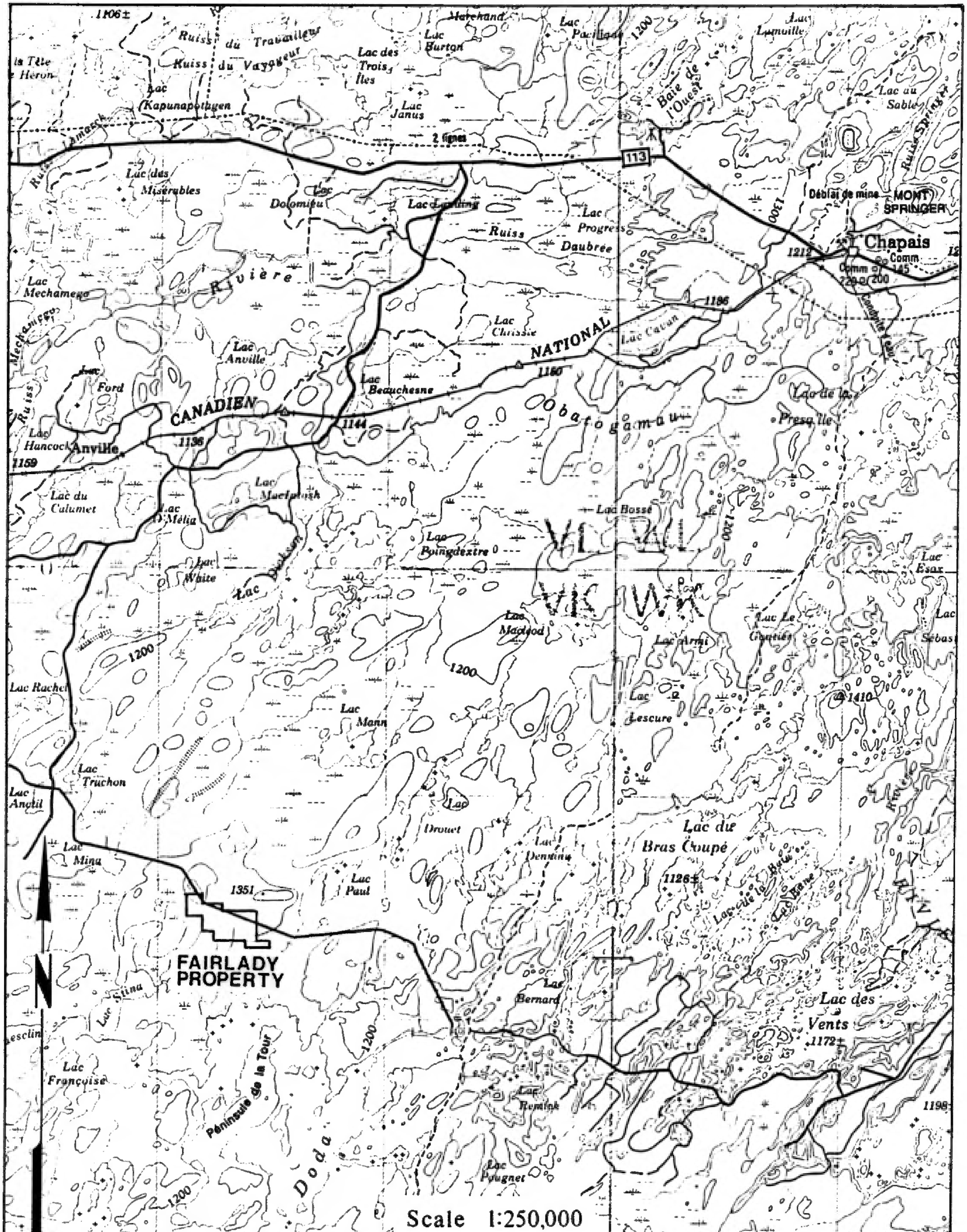
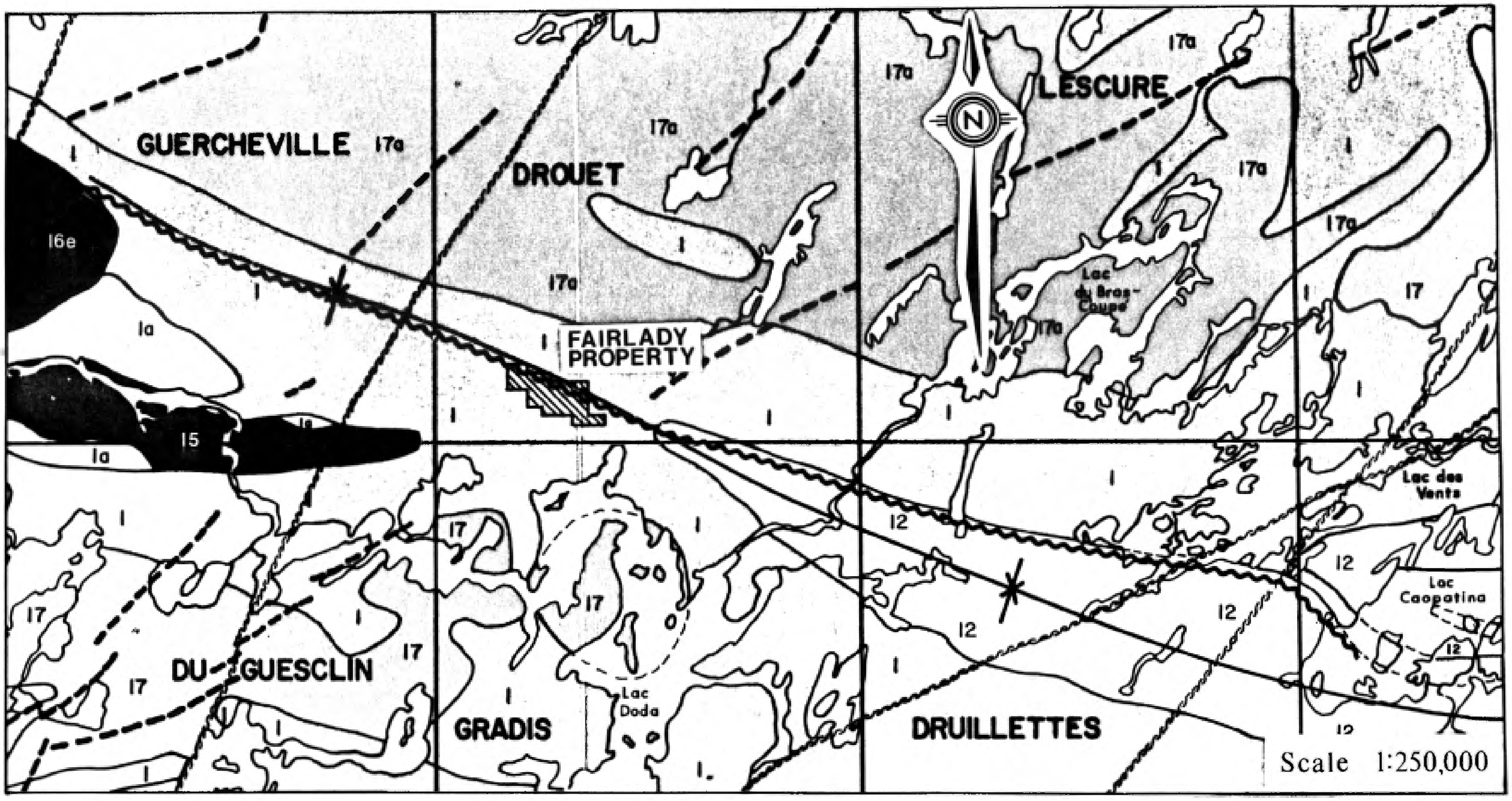


Figure 2 - Drouet Property Access Map



LEGEND

17	Lapparent Puton: undetermined granitoid
16	La Ronde Stock: granodiorite
15	Tonalitic intrusive
12	Opémisca Group: volcanic-sedimentary rocks; tuff, lava, sandstone, argillite
1a	Lac la Ronde anorthosite complex
1	Obatogamau Formation: porphyritic mafic lava, tuff, gabbro, minor beds of felsic lava, graphitic argillite, exhalite.

Figure 3 - Geological Setting of the Drouet Property (Racicot, 1983)

Hole Number	Claim Number	Metres Drilled		Hole Depth (metres)	Samples Collected	
		Overburden	Bedrock		Overburden	Bedrock
DR-87- 01	L8+70W; BL	1.9	1.5	3.4	1	1
02	L8+70W; 1+00S	2.0	1.5	3.5	1	1
03	L8+70W: 2+00S	3.2	1.3	4.5	1	1
04	L9+00W; 3+00S	0.5	1.0	1.5	0	1
05	L9+00W; 4+00S	2.1	0.9	3.0	1	1
06	L11+00W; 4+00S	5.5	1.0	6.5	2	1
07	L11+00W; 3+00S	4.6	1.4	6.0	1	1
08	L11+00W; 2+00S	2.2	1.3	3.5	1	1
09	L11+00W; 1+00S	1.5	2.0	3.5	1	2
10	L11+25W; 0+05S	1.0	1.0	2.0	1	1
11	L11+00W 1+00N	0.5	0.5	1.0	0	1
12	L9+00W; 1+00N	1.4	1.1	2.5	2	1
13	L13+00W; 1+00N	2.2	0.8	3.0	1	1
14	L13+00W; BL	1.6	1.4	3.0	1	1
15	L13+60W; 1+00S	4.8	1.2	6.0	2	1
16	L13+50W; 2+10S	1.2	0.8	2.0	1	1
17	L13+00W; 3+00S	3.0	1.5	4.5	1	1
18	L13+00W; 3+90S	5.0	1.0	6.0	2	1
19	L15+00W; 4+00S	5.0	1.5	6.5	1	1
20	L15+00W; 3+00S	3.4	1.6	5.0	2	1
21	L15+00W; 2+00S	2.0	1.5	3.5	1	1
22	L15+00W; 1+00S	2.6	1.9	4.5	1	1
23	L15+00W; BL	1.4	1.6	3.0	1	1
24	L17+00W; 0+10S	1.6	1.4	3.0	1	1
25	L17+00W; 1+00S	1.5	1.5	3.0	1	1
26	L17+00W; 2+00S	1.0	0.5	1.5	1	1
27	L17+00W; 3+00S	2.0	1.0	3.0	1	1
28	L17+00W; 4+10S	3.4	1.6	5.0	1	1
29	L19+00W; 4+00S	5.7	1.8	7.5	2	1
30	L18+50W; 3+00S	5.9	1.6	7.5	3	1

Table 1 - Drilling Statistics

Hole Number	Claim Number	Metres Drilled		Hole Depth (metres)	Samples Collected	
		Overburden	Bedrock		Overburden	Bedrock
DR-87- 31	L18+00W; 2+25S	4.8	1.2	6.0	2	1
32	L20+75W; 4+00S	6.0	1.5	7.5	2	1
33	L21+00W; 3+00S	7.2	1.3	8.5	2	1
34	L23+00W; 2+00S	22.8	1.2	24.0	13	1
35	L23+00W; 1+25S	14.2	1.3	15.5	9	1
36	L21+00W; 1+00S	7.0	1.5	8.5	2	1
37	L21+30W; 1+90S	10.4	1.6	12.0	3	1
38	L21+00W; BL	4.2	1.3	5.5	2	1
39	L23+00W; BL	13.4	1.1	14.5	7	1
40	L23+00W; 1+00N	11.6	1.4	13.0	6	1
41	L19+00W; BL	1.0	1.0	2.0	1	1
42	L19+25W; 0+75S	2.1	0.9	3.0	1	1
43	L16+90W; 1+75N	1.5	1.5	3.0	1	1
44	L15+25W; 2+25N	0.7	0.8	1.5	0	1
45	L15+25W; 1+30N	2.0	1.0	3.0	1	1
TOTALS		188.6	57.3	245.9	88	46

Table 1 - Drilling Statistics (cont'd)

were prepared from the overburden samples at ODM's Nepean, Ontario and Rouyn, Quebec laboratories. Gold particles sighted during processing were measured to determine their individual contributions to the overall gold content of the concentrates and were classified according to their distance of glacial transport (Appendix C).

The bedrock chip samples were logged under a binocular microscope (Appendix D) and their lithologies were related to the established Archean stratigraphy (Plan 1; Fig. 3). Subsamples of the bedrock chips and 3/4 splits of the heavy mineral concentrates were analyzed for gold, arsenic, copper and zinc (Appendices E, F).

A preliminary report on bedrock stratigraphy and alteration, and overburden gold grain results was completed by S.A. Averill on May 29, 1987. The present report constitutes the final documentation of the work performed and includes a full interpretation of processing and analytical data. An analysis of local Archean and Quaternary stratigraphy is included and used in the interpretation of the bedrock and heavy mineral geochemistry.

2.2 Principles of Deep Overburden Geochemistry in Glaciated Terrain

During the Pleistocene epoch of the Quaternary period, the crowns of all ore bodies that subcropped beneath the continental ice sheets of North America were eroded and dispersed down-ice in the glacial debris. The dispersal mechanisms were systematic (Averill, 1978) and the resulting ore "trains" in the overburden are generally long, thin and narrow but most importantly are several hundred times larger than the parent ore bodies. These large trains can be used very effectively to locate the remaining roots of the ore bodies.

Because the dispersal trains originated at the base of the ice, they are either partly or entirely buried by younger, nonanomalous glacial debris. Most trains are confined to the bottom layer of debris deposited during glacial recession--the basal till. In fact, the sampling of glacial overburden for exploration purposes is commonly referred to as "basal till sampling". It is important to note, however, that in areas affected by multiple glaciations the bottom layer of debris in the overburden section may be only the lowermost of several stacked basal tills, and that a dispersal train may occur at any level within any one of the basal till horizons. Consequently, the term "basal till sampling" is not synonymous with the collection of samples from the base of the overburden section. Moreover, the term is not strictly correct because significant glacial dispersion trains can occur in formations other than basal till.

From the foregoing statements, it can be seen that glacial dispersion and glacial stratigraphy are interdependent. Consequently, the effectiveness of overburden sampling as an exploration method is related to the ability of the sampling equipment to deliver stratigraphic information from the unconsolidated glacial deposits. In areas of deep overburden, including most of the Abitibi Greenstone Belt in northwestern Quebec, drills must be used. Most drills have been designed to sample bedrock and are unsuitable for overburden exploration, but in the last fifteen years rotasonic coring rigs and reverse circulation rotary rigs have been developed to sample the overburden as well as the bedrock. Both drills provide accurate stratigraphic information throughout the hole and also deliver large samples that compensate for the natural inhomogeneity of glacial debris.

Reverse circulation rotary rigs are much more widely used in the Abitibi than are rotasonic coring rigs. They employ dual-tube pipe and a tricone bit with the outer pipe acting as a casing to contain the drill water for recirculation and to prevent contamination of samples by material caving from overlying sections. Air and water are injected at high pressure through the annulus between the outer and inner pipes to deliver a continuous sample of the entire overburden section through the small inner pipe (Fig. 4). The sample is disturbed but returns to surface instantly, and the precise positions of stratigraphic contacts can be identified. Full sample recovery is possible in all formations regardless of porosity or consistency, although sample loss due to blow-out commonly occurs in the first 1 to 3 metres of the hole until a sediment seal is made around the outer pipe.

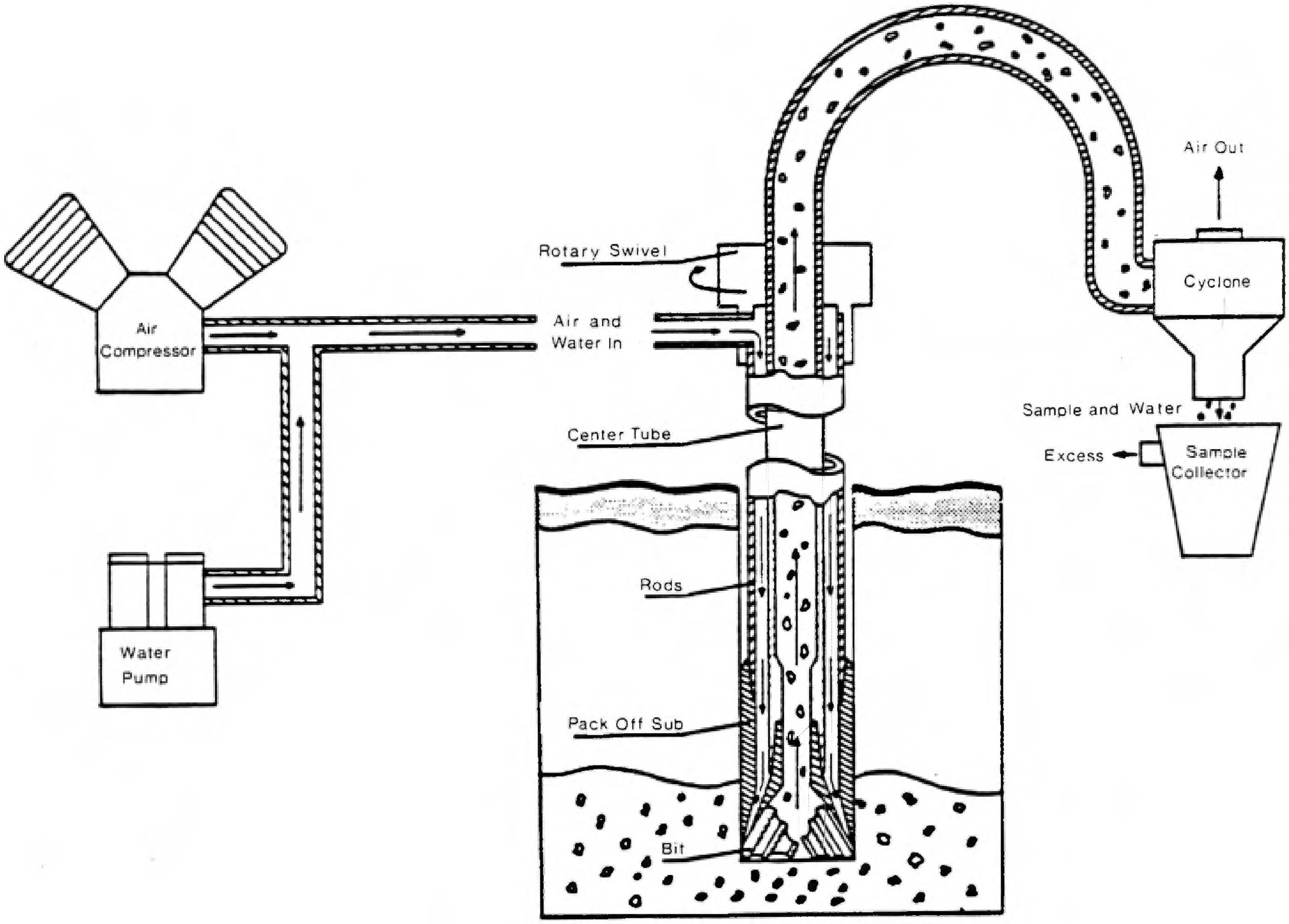


Figure 4
Schematic Diagram of a Typical Reverse Circulation Rotary Drilling System

Reverse circulation holes are normally extended 1.5 metres into bedrock. Cuttings of maximum 1 cm size are obtained. These cuttings are used to determine the bedrock stratigraphy, structure and geochemistry and are also compared to the till clasts to help determine ice flow directions and glacial dispersal patterns.

Most of the glacial overburden in Canada is fresh, and metals in the overburden occur in primary, mechanically dispersed minerals rather than in secondary chemical precipitates. While ore mineral dispersal trains are very large, they are also weak due to dilution by glacial transport and are difficult to identify from a normal "soil" analysis of the fine fraction of the samples. Consequently, heavy mineral concentrates are prepared to amplify the primary anomalies, and analysis of the fines is normally reserved for areas where significant post-glacial oxidation is evident. The heavy mineral concentrates are very sensitive, and special care must be taken to avoid the introduction of contaminants into the samples. On gold exploration programs, it is advantageous to separate and examine any free gold particles because most gold anomalies in heavy mineral concentrates are caused by background nugget grains that are of no interest.

2.3 Property Description and Access

The Drouet Property consists of 22 contiguous mining claims in south-central Drouet Township approximately 40 kilometres southwest of Chapais, Quebec (Fig. 2, 5; Table 2). The property is accessible by following a secondary gravel road which leads southward from Highway 113 at a point 18 kilometres west of Chapais. The Drouet Property straddles a southeastern branch of this road between Lac Doda and Lac Paul approximately 35 kilometres from Highway 113.

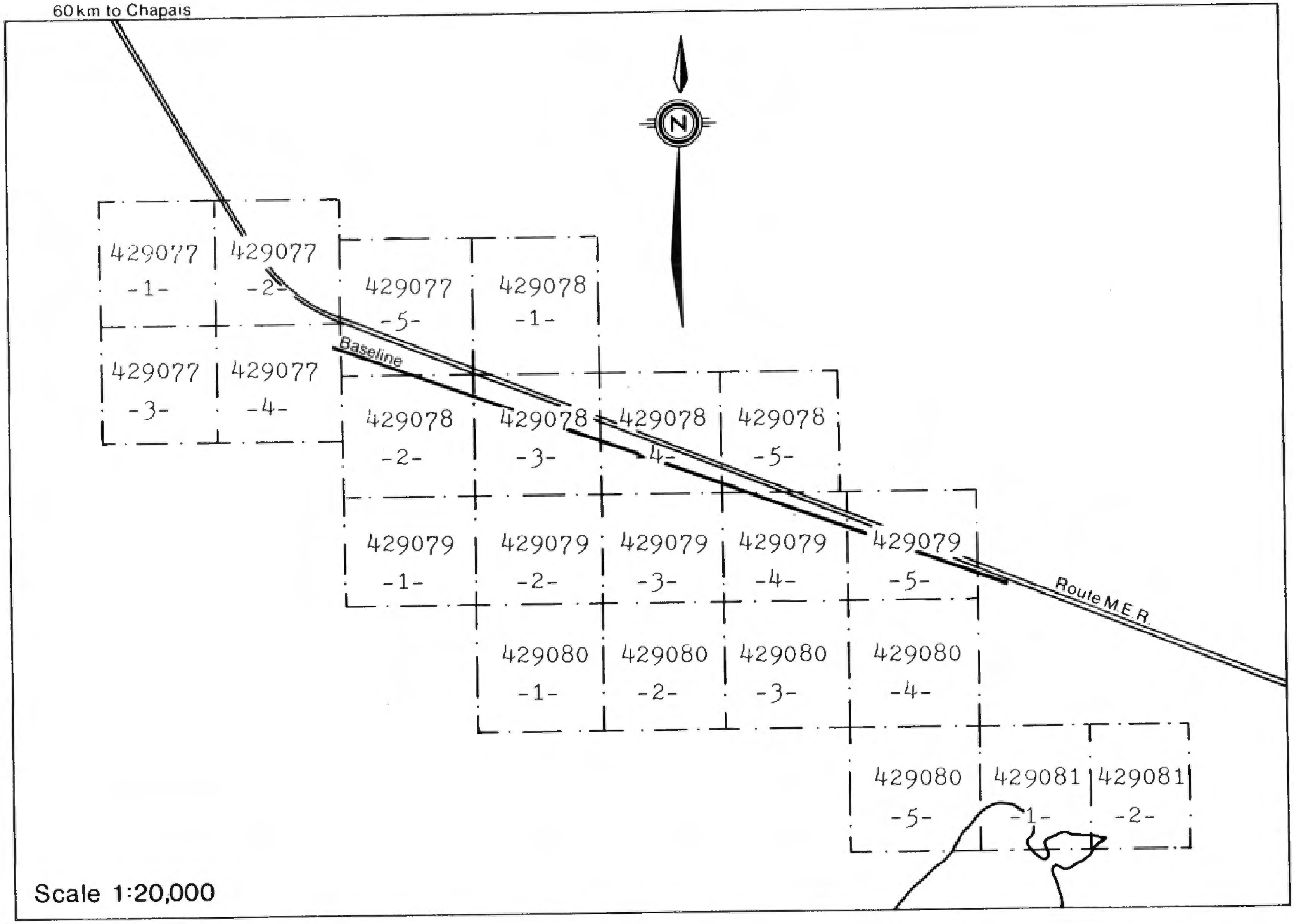


Figure 5 - Claim Map

License	Claim	Township
429077	1-5	Drouet
429078	1-5	Drouet
429079	1-5	Drouet
429080	1-5	Drouet
429081	1-2	Drouet
TOTAL	22 claims; 355 hectares	

Table 2 - List of Mining Claims, Drouet Property

2.4 Physiography and Vegetation

The Drouet Property lies within the southeastern portion of the Abitibi Uplands (Bostock, 1968), a north-sloping clay belt region that was covered by Lake Ojibway 10,000 years ago during Late Wisconsinan ice withdrawal. The southern boundary of the clay belt is the Hudson Bay - St. Lawrence River drainage divide and also roughly coincides with the southern edge of the Abitibi Greenstone Belt. Average overburden thickness in the clay belt typically ranges from 10 metres in the south where Lake Ojibway was shallow to 30 metres in the north where the lake was deeper. Average overburden thickness in the 45 Drouet drill holes was 4.2 metres.

Relief is low, varying from 367 to 372 m ASL across the drill area. Most of the property is elevated and well drained. Surficial materials comprise sparse bedrock exposure with intervening till upon which is developed a series of De Geer recessional moraines. The bedrock, till and moraines are patchily mantled by thin glaciolacustrine sediments and organics. Approximately 50 percent of the area has been logged. The remainder of the property supports a mature boreal forest interrupted by small areas of swamp.

2.5 Previous Work

Portions of Drouet Township were included in regional mapping projects undertaken by the Quebec government (Remick, 1956; Gobeil and Racicot, 1983; Tait and Chown, 1987) although the scale of the mapping was not sufficient to allow detailed property scale stratigraphic interpretation. Also, the Lac Bernard Fault was not recognized.

In 1967, Serem conducted base metal exploration in the Drouet Property area. Their program consisted of electromagnetic and magnetic surveys followed by three diamond drill holes to test conductive targets immediately north of the Drouet Property. Baker (1987) reports "minor, but significant gold values" in these holes but does not elaborate.

In 1984, Andre Gobeil sampled a sheared mafic volcanic outcrop along the gravel road running through the northern part of the property. The sample is reported to have assayed 0.16 oz/ton gold (Baker, 1986). Based on this showing, Peter Smith of Montreal staked 22 claims. In 1985 Victoria Diego Resources Corp. optioned the claims and carried out limited linecutting, geophysics and trenching to further evaluate the showing. Results of this work were not reported to ODM. It was also about this time that Esso began acquiring nearby property to cover a laterally extensive, locally auriferous shear zone (Lac Bernard Fault) similar to the Cadillac - Larder Lake and Destor -Porcupine Faults.

Fairlady Energy Inc. entered into an option agreement with Victoria-Diego but details of this arrangement are not available. Baker (1987) reviewed previous work on the property and surrounding areas and concluded the property straddled the Lac Bernard Fault. He recommended a program of linecutting, geophysical surveys, reverse circulation drilling and diamond drilling. To date, linecutting, and magnetic and horizontal loop electromagnetic surveys have been completed as well as the reverse circulation drilling program discussed in this report.

2.6 Project Costs

Budgeted and actual costs for the 1987 reverse circulation drilling program are presented in Table 3. The budget figure of $67,700.00 ($111.03/metre, $33.85/foot) was based on the following assumptions:

1. Forty holes totalling 2,000 feet (600 metres); average 50 feet (15 m) per hole
2. Drilling productivity at 25 feet (7.5 m) per operating hour
3. An average bit life of 200 feet (60 m)
4. A total of 120 overburden samples (average 3 samples per hole)

			Budget			Actual		
	Service	Company	$ Total	$/Metre	$/Foot	$Total	$/Metre	$/Foot
1.	Pre-drilling	ODM	700.00	1.15	0.35	651.87	2.65	0.81
2.	Drilling operations and road clearing	H&S	43,000.00	70.54	21.50	25,000.00	101.67	30.99
3.	Field supervision, logging, sampling	ODM	9,000.00	14.76	4.50	6,980.89	28.40	8.65
4.	Sample shipping and processing	Various, ODM	5,000.00	8.20	2.50	474.55 3,596.00	1.93 14.62	0.59 4.46
5.	Analytical	Bondar-Clegg	3,000.00	4.92	1.50	3,424.00	13.92	4.24
6.	Report	ODM	7,000.00	11.48	3.50	(est) 5,600.00	22.77	6.94
	TOTALS		67,700.00	111.05	33.85	46,127.31	185.96	56.68

Table 3 - Budgeted and Actual Costs, Drouet Property

Hole depth averaged 19 feet (5.5 m), 65 percent below the budget estimate. The total number of overburden samples was 88, 27 percent below budget. Because the drill holes were so short, drilling productivity fell 32 percent to 17 feet (5.2 m) per hour. Bit life averaged 202 feet (61 m) compared to an estimate of 200 feet. As a result of the reduced hole depth and fewer overburden samples, costs fell allowing five additional holes to be drilled. With the additional holes, total project costs were still only $46,127.31 compared to our initial estimate of $67,700.00.

3.0 DRILLING AND SAMPLING

3.1 Drill Hole Pattern

Any gold mineralization on the Drouet Property would probably be sheared-controlled and strike northwest-southeast parallel to the Lac Bernard Fault. The Fairlady drill traverses were oriented northeast-southwest to take advantage of the existing goephysical grid lines and to provide detailed sections across the fault. Traverses with this orientation have the disadvantage of being parallel to the direction of ice movement (southwest in both Late Illinoian and Late Wisconsinan time). However, the traverse separation was only 200 metres which is less than the width of most known gold dispersal trains from deposits having the same relative orientation as the Lac Bernard Fault (perpendicular to ice movement); it is therefore improbable that any trains would fall between traverses. Hole separation along the traverses was only 100 metres which is much less than the average 400 to 800 metre length of known gold dispersal trains (Table 4).

3.2 Drilling Equipment

Heath and Sherwood's drill rig employed an Acker MP drill head with a 3 metre feed cylinder. The drill, together with all its ancillary equipment including air compressor, water pump and logging and sampling facilities, was unitized and enclosed on the bed of a Nodwell Model 160 tracked carrier for all-terrain mobility and all-weather operation.

PROVINCE	GOLD DEPOSIT	TRAIN LENGTH[1](m) TRACED	TRAIN LENGTH[1](m) EST. TOTAL
Saskatchewan	Lake "X"[2]	300	300
Saskatchewan	Star Lake	300	800
Saskatchewan	Lake "Y"	500	1000
Saskatchewan	Waddy Lake[2]	600	2000
Ontario	McCool	300	400
Quebec	Cooke Mine[3]	800	1000
Quebec	Golden Pond West	300	400[4]
Quebec	Golden Pond	400	500[4]
Quebec	Golden Pond East	100	1000

1 - Based on minimum 10 gold grains of similar size and shape per 8 kg sample for free gold trains and on coincident high gold and base metal assays for invisible gold trains

2 - Deposit oriented parallel to glacial ice advance

3 - Invisible gold deposit

4 - Train foreshortened by erosion in last ice advance

Table 4 - Heavy Mineral Gold Dispersal Trains Identified by Overburden Drilling Management Limited Laboratory

The rig employed an air compressor with a rated capacity of 300 cfm at 160 psi and a water pump having a capacity of 20 gpm at 600 psi. Water flow was normally restricted to 4-5 gpm to improve recovery of fines. The rig was equipped with a 12 volt DC Cool White fluorescent fixture that simulates natural sunlight for accurate sample logging. All equipment except the air compressor and Nodwell carrier was operated hydrostatically from a central diesel engine.

The rig carried twenty 10-foot drill rods. The holes were logged in metres using the approximate conversion factor of 3 metres to 10 feet. This resulted in the logged hole depth being 1.6 percent less than true depth.

Heath and Sherwood supported the drill rig with a Nodwell GT-1000 muskeg tractor equipped with a 400-gallon, exhaust-heated water tank.

3.3 Logging and Sampling

The Drouet samples were collected in two 20 litre buckets coupled with a plastic tube. This procedure ensures a quiet settling environment thus reducing the loss of fines encountered if only one bucket is used and allowed to overflow. Most of the clay is still lost but a research study made by ODM (Dimock, 1985) showed that sand loss is insignificant and silt loss is reduced to 40 percent compared to 72 percent with the one-bucket system. Interestingly, fine gold is lost in direct proportion to fine minerals of low specific gravity such as quartz and feldspar because the flake shape rather than high density of fine gold is the primary factor controlling the rate of settling. Further research conducted by ODM (Kurina, 1986) on various inlet/outlet attachments on the second bucket showed an additional 33 percent of the fine material in the overflow could be retained by utilizing a horizontally curved inlet tube, which induces spiral flow, and a vertical stack skimmer on the outlet. The two-bucket system with the modified flow configuration was employed on the Drouet program.

A 10-mesh (1700 micron) screen was employed over the first bucket to separate and discard the majority of rock cuttings and thereby increase the proportion of matrix material which is used to identify and trace dispersal trains. The +10 mesh rock cuttings were constantly monitored to discern any variations which could give clues to overburden stratigraphy, or for any clasts indicative of an environment suitable for gold or base metal mineralization. Approximately 20 percent of the cuttings were kept for future reference. The degree of sorting of the -10 mesh matrix was monitored to differentiate till from sand and gravel.

Till units were sampled continuously using an average sample interval of 1.5 metres. Glaciolacustrine clay and silt were not sampled because they are of no exploration value.

In the field, both the overburden and bedrock samples were assigned a number denoting the drilling project (DR), the year, the position of the hole in the drilling sequence and the position of the sample in the drill hole. Thus a designation such as DR-87-35-03 indicates the third sample collected from the thirty-fifth hole drilled in 1987.

Following collection, the overburden samples were reduced to 7-9 kilograms with an aluminum scoop, packed in heavy plastic bags and shipped in 20-litre metal pails to the ODM processing laboratory in Nepean, Ontario.

3.4 Sample Processing

ODM's processing procedures for overburden samples are illustrated in the flow sheet of Figure 6 and may be summarized as follows:

First, a 250 gram character sample is extracted from the bulk sample using a tube-type sampler. This character sample is dried and stored for future reference. On some programs, its minus 250 mesh fraction is separated and analyzed to allow comparison with the heavy mineral analyses.

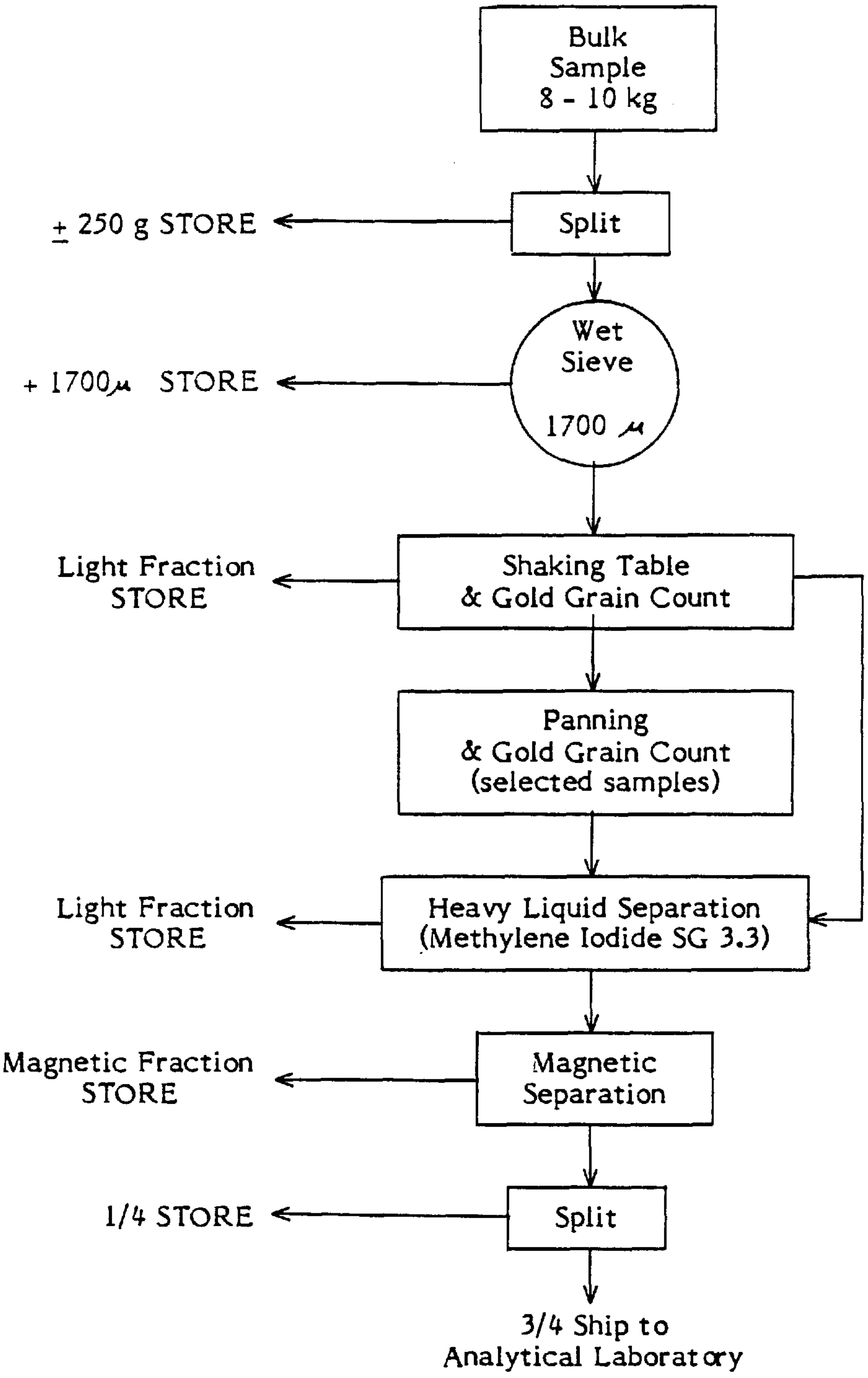


Figure 6 - Sample Processing Flow Sheet

The remainder of the bulk sample is weighed wet and is sieved at 1700 microns (10 mesh). The +1700 micron clasts are weighed wet and the -1700 micron matrix is processed on a shaking table to obtain a preconcentrate. The table concentrate and all fractions obtained from it are weighed dry. The Drouet sample weights are listed in Appendix B.

While the samples are being tabled, special procedures developed by ODM are used to effect the separation of gold grains from the other heavy minerals. These grains are picked from the deck, placed under a binocular microscope, measured to obtain an estimate of their contribution to the eventual assay of the concentrate (Table 5), and classified as delicate, irregular or abraded (Fig. 7) to determine their approximate distance of glacial transport. Photomicrographs (35 mm slides) are taken if more than 10 gold grains are present.

Magnetite, with a specific gravity of 5.2, is the heaviest of the common minerals and normally forms the top mineral band on the table above garnet and epidote/pyroxene. Common flake gold coarser than 125 microns separates completely from the magnetite and is readily counted. Fine gold, thick gold and delicate gold travel with the magnetite due to size and shape effects, and only 10 to 20 percent of such grains are readily sighted on the table. Gold particles can also be obscured by pyrite which, if it is abundant, tends to cross the table in the gold path. However, ODM has developed a special panning technique to recover the hidden particles together with some copper, lead and arsenic pathfinder minerals. Samples are normally panned if two or more gold particles are sighted on the table or if any delicate gold is seen or if the table concentrate contains more than 10 percent pyrite. The Drouet table and pan gold counts are listed in Appendix C.

After the gold grains have been examined, they are recombined with the table concentrate. This concentrate is dried and a heavy liquid separation in methylene iodide (specific gravity 3.3) is performed. The light fraction (S.G. less than 3.3) is stored and the heavy fraction undergoes a magnetic separation to remove drill steel and magnetite. The Drouet magnetic separates were checked to

Size Classification	Flake Diameter (microns)	ppb Au
Very Fine	50	10
"	100	- 100
Fine	150	330
"	200	760
Medium	300	2,400
"	400	5,400
"	500	10,000
Coarse	600	16,200
"	700	24,000
"	800	33,300
"	900	43,700
"	1,000	55,000
Very Coarse	1,000+	55,000+

Table 5 - Geochemical Contribution of One Gold Grain to a Fifteen Gram Samples

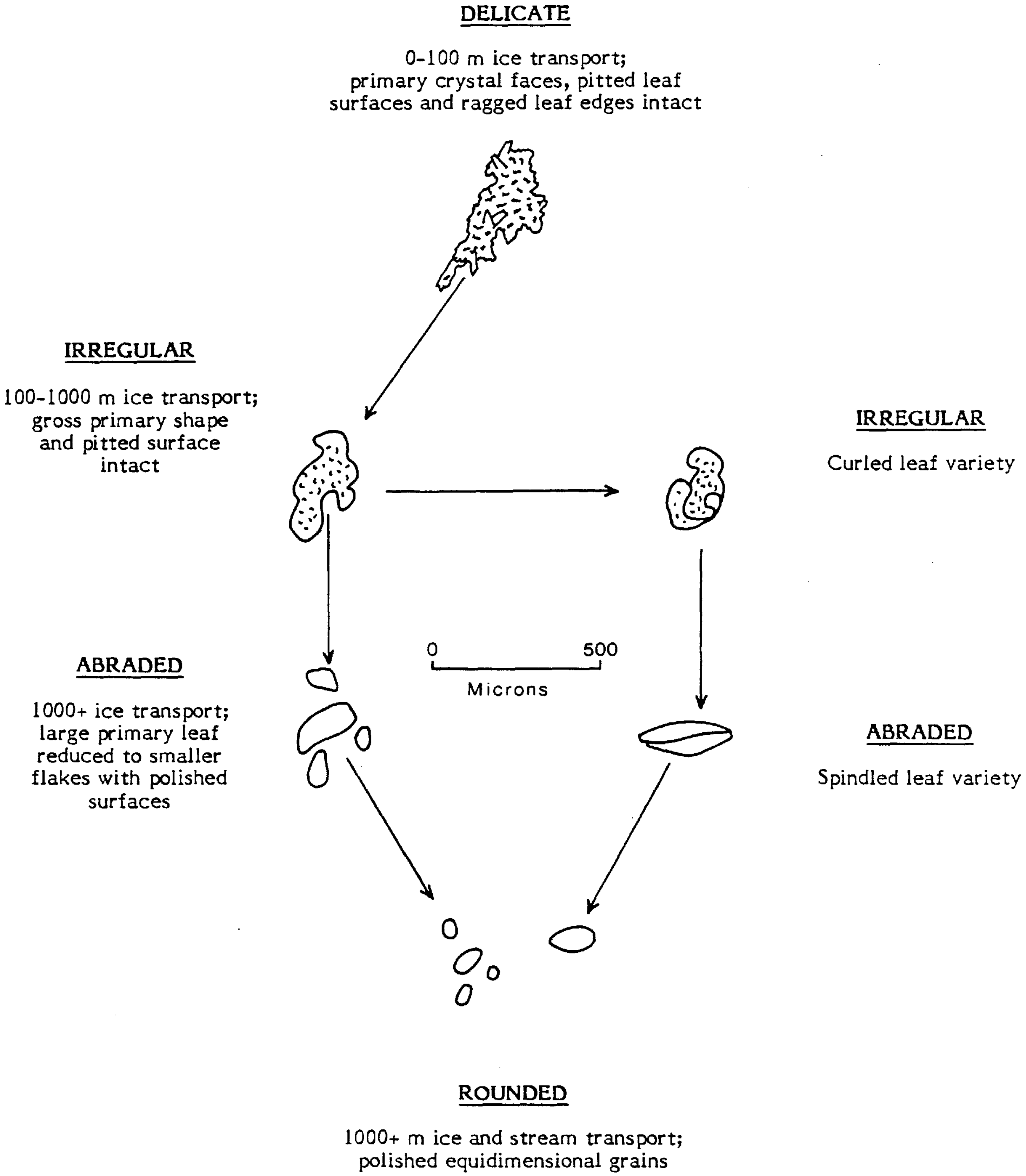


Figure 7 - Effects of Glacial Transport on Gold Particle Size and Shape

ensure that they contained not more than five percent pyrrhotite. The non-magnetic heavy minerals were separated into a 3/4 analytical subsample and a 1/4 library subsample using a riffled microsplitter.

3.5 Sample Analysis

Subsamples of the bedrock chips (Appendix E) and 3/4 splits of the non-magnetic overburden heavy mineral concentrates (Appendix F) were homogenized by pulping in a shatter-box and were then analyzed for gold by fire assay with atomic absorption finish, for Cu and Zn by atomic absorption, and for As by colourimetry. Whole rock compositions for the bedrock samples were determined by DC-plasma and gravimetric (LOI) methods. All analytical work was done by the Ottawa laboratory of Bondar-Clegg and Company Limited to the specifications shown in Table 6.

Gold grains are malleable and thus are difficult to homogenize with the rest of the sample, often forming flattened "metallics" in the pulp. To alleviate this problem and obtain representative gold assays, concentrates that were known to contain one or more coarse gold grains (generally over 200 microns) individually capable of producing an anomalous assay (over 1000 ppb) were screened at 150 mesh after pulping. Separate gold determinations were then made on the -150 mesh pulp and the +150 mesh metallics, and a weighted average assay was calculated.

4.0 BEDROCK GEOLOGY

4.1 Regional Geology

The Drouet property is in the eastern Matagami - Chibougamau section of the Archean, Abitibi Greenstone Belt and 2 to 3 km south of the granitoid Lapparent Pluton. The Abitibi Belt comprises repeated komatiitic through tholeiitic to calc-

Sample Type	Sample Preparation	Element		Lower Detection Limit		Extraction	Method
All bedrock chips and H.M.C.s	Pulverize to -200 mesh	Cu	Copper	1	PPM	$HCl-HNO_3$, (1:3)	Atomic Absorption
		Zn	Zinc	1	PPM	$HCl-HNO_3$,(1:3)	Atomic Absorption
		As	Arsenic	2	PPM	HNO_3-HClO_4	Colourimetric
		*Au	Gold	5	PPB	Aqua Regia	FA-AA @ 10 gm weight unless otherwise indicated
Pulp and metallics H.M.C.s	Pulverize to -200 mesh; screen 150 mesh, weigh +150 and -150	Au	-150	0.01	PPM	Aqua Regia	Fire Assay AA
		Au	+150	0.01	PPM	Aqua Regia	Fire Assay AA
		Au	Average				Calculated
All bedrock chips	Pulverize to -200 mesh	SiO_2	Silica (SiO_2)	0.01	PCT	Borate Fusion	DC Plasma
		TiO_2	Titanium (TiO_2)	0.01	PCT	Borate Fusion	DC Plasma
		Al_2O_3	Alumina (Al_2O_3)	0.01	PCT	Borate Fusion	DC Plasma
		Fe_2O_3*	Total Iron (Fe_2O_3*)	0.01	PCT	Borate Fusion	DC Plasma
		MnO	Magnesium (MnO)	0.01	PCT	Borate Fusion	DC Plasma
		MgO	Magnesium (MgO)	0.01	PCT	Borate Fusion	DC Plasma
		CaO	Calcium (CaO)	0.01	PCT	Borate Fusion	DC Plasma
		Na_2O	Sodium (Na_2O)	0.01	PCT	Borate Fusion	DC Plasma
		K_2O	Potassium (K_2O)	0.01	PCT	Borate Fusion	DC Plasma
		P_2O_5	Phosphorous (P_2O_5)	0.01	PCT	Borate Fusion	DC Plasma
		LOI	Loss on Ignition	0.01	PCT		Gravimetric
		Total	Whole Rock Total	0.01	PCT		

*except pulp and metallics samples

Note: All weight measurements are precise to 0.01 grams

Table 6 - Bondar-Clegg Analytical Specifications

alkalic cycles of lavas and volcaniclastics with coeval clastic and exhalative sedimentary rocks, porphyries, layered basic-ultrabasic sills, and intrusives of potassium poor dioritic to tonalitic composition. These rocks have been complexly deformed, metamorphosed to the subgreenschist to greenschist facies and intruded by late kinematic granodiorite and monzonite plutons (Gariepy, Allègre, Lajoie, 1984).

The stratigraphic classification applicable to the Drouet area is the one developed for the Chibougamau region (MERQ-OGS, 1983; Gobeil and Racicot, 1983). The Archean rocks of the area consist of two mafic-to-felsic volcanic cycles (Roy Group) overlain by a sedimentary-volcanic sequence (Opemisca Group). The rocks of the Roy and Opemisca Groups have been folded about north-south axes, refolded isoclinally about east-trending axes and metamorphosed to the greenschist facies (Allard and Gobeil, 1984). The major structure mapped in the Drouet area is the Caopatina Syncline, the axis of which coincides with the Lac Bernard Fault. The fault is thus a major bedding-parallel shear.

4.2 Bedrock Lithology of the Reverse Circulation Drill Holes

The following four rocks units were intersected in the Drouet reverse circulation drill holes:

1. Mudstone
2. Quartz-feldspar porphyry
3. Gabbro
4. Diabase

The mudstone, porphyry and gabbro are of Archean age (Table 7). They belong to the regionally extensive Obatagamau Formation of the Roy Group (Tait and Chown, 1987). On the Jensen Cation plot (Fig. 8), the porphyry samples fall predominantly in the calc-alkalic rhyolite field and the gabbro samples fall in the tholeiitic basalt field.

Proterozoic	
4	Diabase
Archean	
3	Gabbro
2	Quartz-feldspar porphyry
1	Mudstone

Table 7 - Table of Bedrock Lithologies

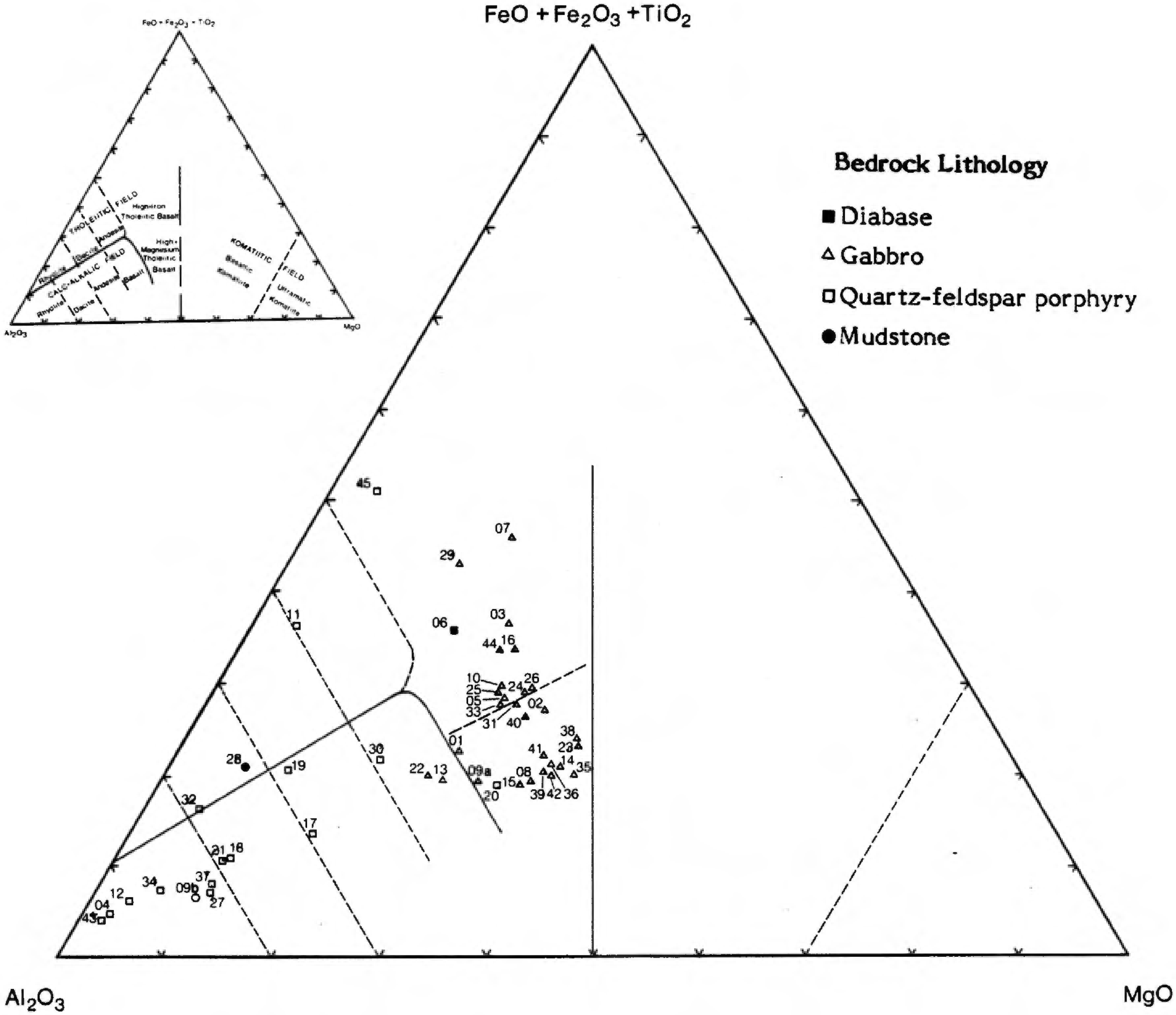


Figure 8 - Jensen Cation Plot

Mudstone is the only volcano-sedimentary unit present and it occurs in only one drill hole. However, the porphyry and gabbro appear to occur as subvolcanic sills and their orientation, which is east-southeast parallel to the regional strike of the Lac Bernard Fault, can be used to approximate the stratigraphic trend.

The gabbro forms a major, 300-400 m thick central sill and two thinner flanking sills. The large central sill is marked by a resistivity high. Quartz-feldspar porphyry forms three sills that alternate with the gabbro sills. Diabase, which was intersected only in one drill hole, forms a narrow, northeast-trending dike at the east end of the drill area. This dike probably fills a late-stage tensional fault as significant offsets occur in some of the porphyry and gabbro sills where they are crossed by the diabase. Similar diabase dikes elsewhere in the Abitibi Greenstone Belt are generally considered to be of Early Proterozoic age.

All of the Archean rocks have been metamorphosed to sub-greenschist to greenschist facies; diabase is unmetamorphosed as is a young quartz-feldspar porphyry dike that intrudes the Archean porphyry in Hole 19. Most of the gabbro samples are well foliated to schistose especially in the east where shearing is so pronounced that the mineral grains are shredded to a fraction of their primary grain size. The shearing is undoubtedly related to the Lac Bernard Fault; Tait and Chown (1987) did not recognize the fault and therefore mapped the sheared gabbro as basalt.

The porphyry is also affected by shearing but due to its siliceous and brittle nature it responds by becoming brecciated and microlaminated. Samples from the northern porphyry sill (Holes 11, 12, 43, and 45) are, on average, more deformed than samples from any other horizon in the drill area; this sill is therefore inferred to lie on the axis of the fault. Other sheared and deformed samples intersected during the drilling may be the result of a network of splay faults characteristic of a zone of shearing.

Sheared samples of gabbro contain up to 25 percent hydrothermal Fe/Mg carbonate. Quartz-feldspar porphyry samples along both sides of the main gabbro sill are also enriched in Fe/Mg carbonate and locally contain other hydrothermal minerals such as fuchsite, flourite and tourmaline. In addition, Holes 11 and 45 on the northern porphyry sill intersected significant concentrations of hydrothermal, crystalline pyrite.

The bedrock topography across the property is relatively flat and does not appear to be influenced by the presence of the Lac Bernard Fault.

4.2.1 Lithologic Descriptions

Detailed binocular lithologic descriptions of the bedrock samples were prepared (Appendix D) to confirm and amplify field descriptions with the objective of producing an accurate stratigraphic map. Particular attention was paid to primary features, and the rocks were assigned genetic names such as gabbro rather than metamorphic names such as chlorite-carbonate schist.

Reasonably accurate measurements of primary mineralogy, structure, texture, degree of metamorphism and alteration can be made from chip samples with a binocular microscope, but inherent limitations are present. These limitations include:

1. Inability to differentiate gray plagioclase from pale gray-brown and gray-green pyroxene where the grain size is less than 0.1 mm as in many volcanic rocks. This often precludes differentiation of intermediate volcanics from mafic volcanics in the Abitibi Belt as extensive areas have undergone only subgreenschist facies metamorphism such that primary pyroxene is preserved. In greenschist facies areas where pyroxene has been largely converted to darker green amphibole and chlorite, intermediate and mafic units can be differentiated.

2. Inability to determine bedding thickness or fragment size where the dimensions of the beds or fragments are greater than the 1 cm diameter of the coarsest drill cuttings.

3. Inability to recognize tops in bedded sections.

4. Difficulty in differentiating certain primary structures such as pillow selvages from secondary veins and shears.

5. Necessity of inferring gross mineralogy of aphanitic samples from rock colour and hardness.

4.2.1.1 Mudstone (Unit 1)

The single intersection of mudstone, from Hole 28 in the southern portion of the drill area, represents the only remnant of volcano-sedimentary rock identified on the property by the drill program. The mudstone is dark gray to black in colour, aphanitic, schistose, locally crenulated and contains 20 to 70 percent dark gray chlorite with minor amounts of sericite and graphite. Thin chert laminations constitute 10 percent of the sample. They contain up to 5 percent stringer pyrite and 10 percent finely disseminated hematite.

On the Jensen Cation Plot (Fig. 8) the mudstone plots in the tholeiitic rhyolite field, reflecting its cherty character.

4.2.1.2 Quartz-Feldspar Porphyry (Unit 2)

Quartz-feldspar porphyry was intersected in 15 of the 45 drill holes (Plan 1). Typically the porphyry is a pale gray to buff colour but may have pinkish (Hole 04) or yellow-green (Hole 12) overtones. The best examples of primary porphyry are in Holes 04, 27, 34 and 37. These specimens have a massive structure and a distinctly porphyrytic texture with randomly oriented phenocrysts of plagioclase and quartz accounting for 5 to 25 percent of the rock. Plagioclase phenocrysts are a cloudy white colour, range from 0.3 to 3.0 mm, are anhedral to subhedral in shape and predominate over quartz phenocrysts by a ratio of 5 to 10:1. Quartz phenocrysts are generally colourless and are subhedral with a grain size range of 0.5 to 1 mm.

The groundmass comprises 75 to 95 percent of the porphyry, is very hard (i.e. siliceous) and consists of aphanitic to 0.1 mm grains of feldspar and quartz (relative proportions not discernible).

The other porphyry samples display varying degrees of shear deformation. Since the quartz-feldspar porphyry is a siliceous and brittle rock its response to shear deformation is mainly brittle rather than ductile. The best example of this occurs in Hole 17 where shattering and microbrecciation of the groundmass and phenocrysts produces a rubbly texture that resembles the sandy texture of graywacke. Some chips from this sample also display shear seams of sericite and chlorite that are of measurable thickness. This is the most common response to deformation of the porphyry in other holes. Another type of deformation response is exemplified by Hole 43; here the whole sample is a microlaminated schist with no evidence of feldspar phenocrysts and only rare "ghosts" of quartz phenocrysts. The sericite partings are minutely spaced and too thin to be measured. This is essentially the same feature as the shredding of the gabbro and is less conspicuous only because of the lack of mafic minerals.

Although the sheared samples have been logged as quartz-feldspar porphyry the lack of primary textures and structures due to strong deformation means that some of the samples, such as that of Hole 32, could be extrusive dacites or rhyolites.

Disseminated and vein Fe/Mg carbonate constitutes less than 2 percent of the undeformed porphyry samples but varies from 2 to 15 percent in the schistose, brecciated and microlaminated samples in such holes as 20 and 43 and reaches a high of 50 percent in Hole 30. In addition to being enriched in Fe/Mg carbonate the two porphyry sills flanking the main gabbro sill also contain local concentrations of hydrothermal pyrite (10 to 25 percent with accompanying visible silicification in Holes 11 and 45) as well as traces of fuchsite, tourmaline and fluorite. The hydrothermal alteration and shear lamination are strongest on the northern porphyry sill suggesting that the main axis of the Lac Bernard Fault occurs here.

Chemically, the porphyry samples plot in the calc-alkalic rhyolite, dacite and andesite fields on the Jensen Cation Plot (Fig. 8). Exceptions include Samples 11-01 and 45-02 which are very high in Fe_2O_3 due to the presence of 10 and 25 percent hydrothermal pyrite, respectively. Porphyry samples from Holes 20 and 30 have higher than expected MgO concentration due to introduced Fe/Mg carbonate.

4.2.1.3 Gabbro (Unit 3)

Gabbro was intersected in 28 drill holes; 25 of these are on the large central sill.

The gabbro samples range from massive to schistose and often display features of ductile shear deformation. The variation is well illustrated by the drill traverse along the south side of the main access road. Holes 38 and 39 in the west intersected essentially primary massive gabbro having a grain size which varies from 0.5 to 5 mm. No penetrative deformation is observed allowing the preservation of the primary porphyrytic, ophitic texture and primary pyroxene-plagioclase-quartz mineralogy. In Holes 01 and 10 in the east the gabbro has been sheared, reducing the grain size of the original coarse minerals and thus masking the original texture. The best direct evidence that these rocks are gabbro and not basalt is the presence of a mixed grain size in which relict quartz, rutile, magnetite or plagioclase crystals remain to give some indication of original grain size.

Plagioclase: mafic mineral ratios in the gabbros are consistently in the range of 50-60: 40-50. The least altered and sheared samples commonly contain one percent blue quartz eyes and up to thirty percent augite phenocrysts. Increasing alteration and shearing results in mafic minerals being wholly represented by chlorite (± actinolite). All plagioclase is cloudy and is assumed to be saussuritized.

Carbonate content of the gabbros ranges from nil to approximately fifteen percent. Both calcite and Fe/Mg carbonate are present. The carbonate occurs mostly as interstitial disseminations or locally as stringers or foliation and shear plane coatings. Concentrations of carbonate also occur with quartz in veinlets that normally constitute less than two percent of the sample. The sample from Hole 09 contains an anomalously high 80 percent quartz-Fe/Mg carbonate vein material.

Disseminated magnetite is present in six of the twenty-eight gabbro samples. Concentrations are less than two percent except in Hole 29 with ten percent. Iron sulphides do not exceed one percent. Pyrite is most common, occurring as disseminations and local stringer-like concentrations along foliation and shear planes. A trace of disseminated chalcopyrite was observed in the gabbro of Hole 40.

Gabbro samples plot essentially in the tholeiitic basalt field of the Jensen Cation Plot (Fig. 8). A fairly wide scatter is attributed to the effects of shear-controlled hydrothermal alteration.

4.2.1.4 Diabase (Unit 4)

A diabase dike was intersected in Hole 06 near the eastern end of the drill area. The diabase is massive with an equigranular ophitic texture. It consists of 50 percent cloudy white plagioclase laths (to 3 mm), 30 percent brownish, randomly oriented, interstitial and phenocryst (to 2 mm) pyroxene with 5 percent epidote and traces of biotite, pyrite and pyrrhotite. It also contains 10-15 percent magnetite and a trace of hematite.

4.3 Bedrock Geochemistry

All bedrock chip samples from the reverse circulation drilling program were analyzed for copper, zinc, arsenic and gold. The analytical results are presented in Appendix E.

The gold background for Abitibi Belt samples is 5 ppb or less. Eleven of the Fairlady bedrock samples gave weakly anomalous results of 10 to 90 ppb Au (Plan 1). Copper and zinc occur at background levels ranging from approximately 10 to 150 ppm with mean values of 55 to 60 ppm. These values are considered normal for the Abitibi region. Slightly elevated copper values (greater than 100 ppm) occur in eight of the gabbros as could be expected due to the abundance of mafic minerals; one 263 ppm value in Hole 40 results from the approximately 0.05 percent finely disseminated chalcopyrite that was observed in the gabbro here. Analytical results for arsenic range from less than two to 33 ppm with a mean value of 8 ppm. As with the copper and zinc, absolute values for arsenic are weak although some trends are apparent. In particular, elevated arsenic assays (greater than 10 ppm) appear to be associated with the quartz-feldspar porphyry sills both south and north of the main gabbro sill and also occur in the diabase dike. The elevated arsenic in the north may be related to the presence of the Lac Bernard Fault. A parallel situation is noted south of Val d'Or and also in the Casa-Berardi area where arsenic appears to define the Cadillac - Larder Lake Break and the Casa-Berardi Break, respectively.

A brief examination of Plan 1 indicates some trends in the relationship between bedrock geology and the anomalous gold values. These trends are:

1. The eleven anomalous gold values are located in the east-central portion of the drill area; five are in gabbro and six in quartz-feldspar porphyry samples.

2. Nine of the eleven anomalies are associated with Fe/Mg carbonate alteration and/or other hydrothermal minerals (tourmaline, fuchsite, fluorite or pyrite) and/or elevated levels of As.

3. The gold anomalies are weak (10 to 90 ppb) but often occur in adjacent drill holes and thus appear to be interrelated.

These trends suggest that the most favourable gold exploration targets are in the east half of the property. They also suggest that the gold mineralization is associated with the main gabbro sill and with the central and especially the northern porphyry sills.

5.0 OVERBURDEN GEOLOGY

5.1 Quaternary History and Stratigraphy of the Abitibi Region

The Quaternary geology of the Abitibi region, as determined by ODM from thousands of drill holes and scanty literature, is summarized in Figure 9 and Table 8. Tills from three major glaciations and sediments from two interglacial periods are present.

The oldest till was deposited by ice moving southward from Hudson Bay -- possibly 1 million years ago in Kansan time -- and is enriched in clasts of Proterozoic sandstone and Paleozoic limestone. This till is so rarely preserved that it is of no significance in exploration. The next till (Lower Till) was deposited by ice moving southwestward from Nouveau Quebec in Illinoian time more than 125,000 years ago. It is preserved in many buried valleys and contains the dispersal trains from any mineralization in these valleys. The youngest till was deposited 10,000 years ago by Late Wisconsinan ice of the Laurentide sheet that had split into a southeast-moving Hudson mass west of Longitude 78°W (Val d'Or) and a southwest-moving New Quebec sheet east of this longitude. The esker-like Harricana Moraine was deposited at the contact between the two ice masses, the till to the west is known as Matheson Till; that to the east has not been formally named but we call it Chibougamau Till.

In Yarmouth and Sangamon time immediately following the Kansan and Illinoian glaciations, respectively, interglacial sediments including soil profiles and northward-transported fluvial gravels were deposited on the Kansan and Illinoian tills. The gravels consist mostly of recycled till debris, are oxidized, and often contain wood fragments.

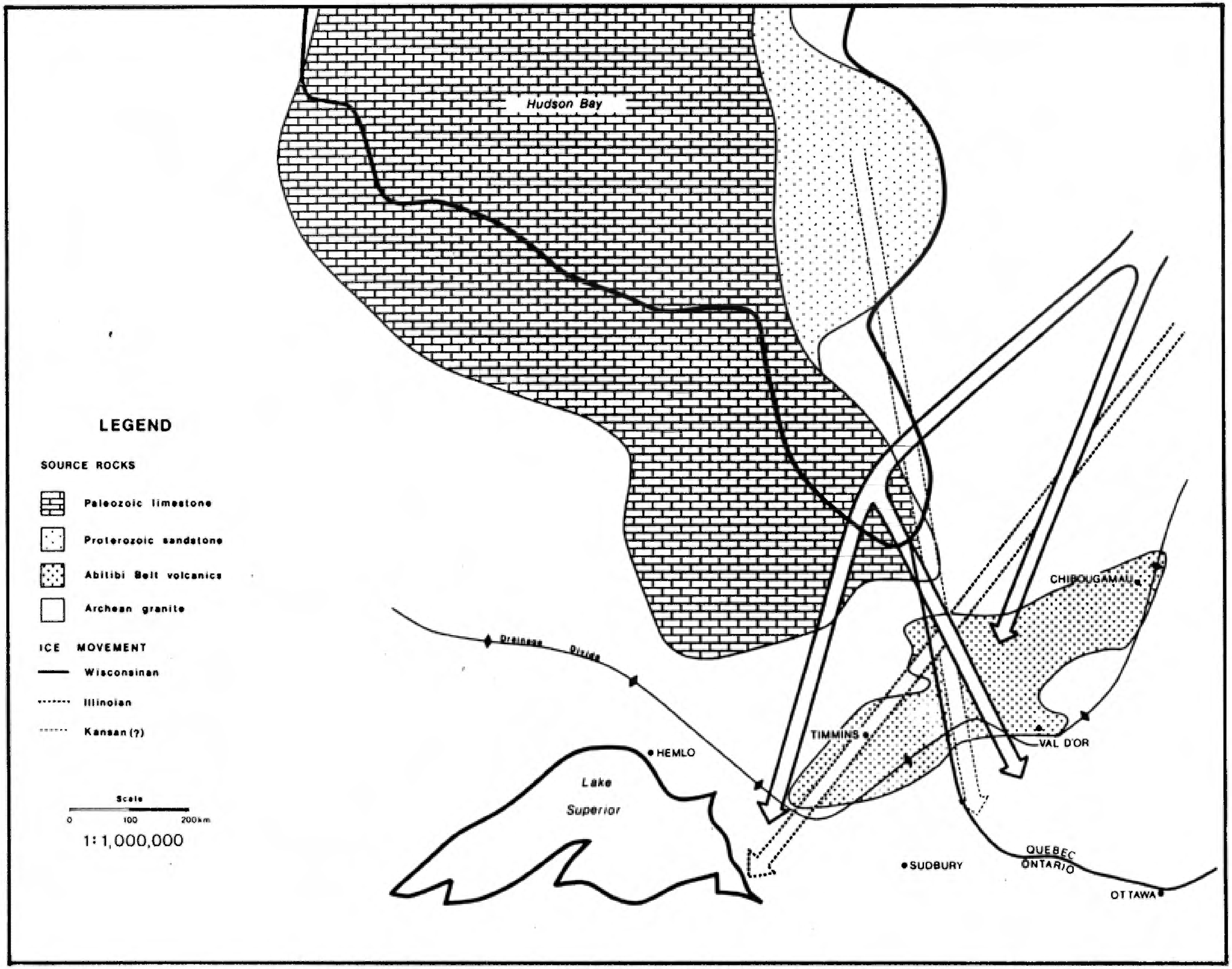


Figure 9 - Glacial History of the Abitibi Region

Abitibi Quaternary Stratigraphy

0 Years B.P.	**HOLOCENE**	
	7	Holocene sediments
		7b - forest-peat member
		7a - fluvial member
10,000 Years B.P.	**PLEISTOCENE**	
	LATE WISCONSINAN	
	6	Cochrane Unit
		6c - regressive sediments
		6b - till
		6a - transgressive sediments
	5	Ojibway II Sediments
		5d - littoral and aeolian member
		5c - glaciolacustrine clay member
		5b - glaciolacustrine sand member
		5a - glaciofluvial member
	4	Chibougamau/Matheson Till
100,000 Years B.P.	**EARLY WISCONSINAN AND SANGAMON**	
	3	Missinaibi Sediments
		3c - Ojibway I member
		3b - forest-peat member
		3a - fluvial member
	ILLINOIAN	
	2	Lower Till and Sediments
1,000,000 Years B.P.	**YARMOUTH AND KANSAN**	
	1	Older Till and Sediments

Table 8 - Table of Quaternary Formations for the Abitibi Region

In Early Wisconsinan time 100,000 years ago and in Late Wisconsinan time 10,000 years ago, the region was flooded by glacial Lakes Ojibway I and II respectively, and varved clay, silt and fine sand sheets up to 30 metres thick were deposited. The Ojibway I sediments coarsen upward because they were deposited from a transgressive ice sheet. They were overridden by the 2 km thick Wisconsinan ice sheet and are indurated, dry and platy whereas the Ojibway II sediments were deposited from regressive ice, fine upward and are soft. Glaciofluvial esker/delta sands and gravels were deposited by the meltwater rivers that fed both lakes.

The final glacial event in the Abitibi was a minor southeastward re-advance of a thin lobe of ice from the Hudson mass into the north part of Lake Ojibway II, depositing Cochrane Till which consists mainly of clay recycled from the soft lake bed. When the Cochrane ice melted, Lake Ojibway II drained catastrophically, exposing the Late Wisconsinan esker ridges which were subject to considerable erosion by wave and wind action until they became stabilized by vegetation.

5.2 Quaternary Geology of the Drouet Property

During Late Wisconsinan time the Drouet Property area was covered first by the New Quebec lobe of the Laurentide ice sheet and then by the southeastern edge of Lake Ojibway II, resulting in the deposition of Chibougamau Till and Ojibway II sediments respectively. Water depth probably varied between 10 and 15 metres (Vincent and Hardy, 1979); thus the Ojibway II sediments are thin and patchy. Similar conditions can reasonably be assumed to have prevailed in Lake Ojibway I in Early Wisconsinan time, although this lake was probably shallower as the land surface had not been recently depressed by a heavy ice load as it had in Late Wisconsinan time. Thus the layer of sediments that was deposited on the lake bottom was too thin to be preserved or to protect the underlying pre-Wisconsinan deposits from erosion during the Wisconsinan glaciation, and only deposits of Late Wisconsinan and Holocene age were intersected in the drilling. These units are described in detail below; complete cross sections for the area are shown in Figure 10.

5.2.1 Chibougamau Till (Abitibi Unit 4)

Till deposited by the New Quebec ice mass (Chibougamau Till) is the oldest unit preserved on the Drouet Property. It was intersected in all drill holes reaching a maximum thickness of 18.7 metres in Hole 34 although it is less than 2.0 metres thick in 67 percent of the drill holes. The thickest till intersections occur in a bedrock depression in the western part of the drill area which entrapped debris as the ice melted.

The till matrix consists largely of beige to gray-beige fine grained sand and silty rock flour rather than recycled Early Wisconsinan glaciolacustrine clay, reflecting the shallow depth of Lake Ojibway I in the area. The Chibougamau Till contacts bedrock in all of the 45 holes, and is mostly bedrock-derived making it a very good medium for geochemical prospecting. Stratification indicative of meltout in deep water is rarely apparent although the thick till section in Hole 34 appears to be slightly sorted and underconsolidated.

Clast lithologies in the till are generally 70 percent Abitibi volcanics and metasediments and 40 percent granitoids, with the Abitibi component rising to 80 percent in some sections. Most of the granitoids as well as the Abitibi clasts are probably short-travelled as the Lapparent Pluton is only 2-3 km up ice.

5.2.2 Ojibway II Sediments (Abitibi Unit 5)

The following sediments were deposited while the Drouet Property was flooded by Lake Ojibway II:

Subunit 5a	Glaciofluvial sand, gravel ± melt-out till deposited as De Geer moraines concurrently with the deposition of Chibougamau Till.
Subunit 5c	Ice-distal silty glaciolacustrine clay.

Only one De Geer moraine was intersected (Holes DR-87-33, 34 and 37 in the southwestern portion of the drill area) but these moraines are common across the Chibougamau region. The current theory is that De Geer moraines are recessional ice-front features formed by annual ice-calving (Fairbridge, 1968). The moraine ridges develop in crevasses parallel to the ice front in areas where the ice is standing in shallow water. The crevasses are infilled with sand, gravel and lesser amounts of melt-out till. De Geer moraines of the Chibougamau region are frequently covered by glaciolacustrine clays and sands. They are 200 to 1000 metres apart reflecting one year's ice retreat and are generally 3-5 metres high.

Ice distal glaciolacustrine clay-silt (Subunit 5c) is present in 18 of the 45 drill holes and reaches a maximum thickness of 3.2 m in Hole 29. The most extensive exposures are in the southwestern part of the drill area where the bedrock surface is lower and Lake Ojibway II was therefore deeper. The clay/silt deposits overlie either Chibougamau Till or De Geer moraines and tend to smooth and flatten surface topography.

5.2.3 Holocene Sediments (Abitibi Unit 7)

Peat (Subunit 7b), deposited during the 8,000 years that have elapsed since the draining of Lake Ojibway II, overlies the Quaternary deposits in all of the drill holes. It is generally less than 1 metre thick.

6.0 OVERBURDEN GEOCHEMISTRY

6.1 Regional Gold and Base Metal Background and Anomaly Threshold Levels

Heavy mineral gold anomaly threshold levels and properties of significant gold dispersion trains are detailed in Appendix G. In summary, visible gold particles of various sizes are randomly scattered through the till and the absence or presence of one or two of these particles in a standard 8 kilogram sample may result in an analytical background ranging from less than 10 to greater than 50,000 ppb (Table 5). Because of this great variability, which is known as the "nugget effect", we have established an anomaly threshold level of 10 grains of visible gold. Recognizing that some anomalies may be caused by gold occluded in sulphides or other minerals rather than by free gold grains, we also investigate any anomalies over a second, 1,000 ppb threshold. The 1,000 ppb value is based on the observation that heavy mineral concentrates from most gold dispersion trains have a gold content similar to that of the source mineralization; thus 1,000 ppb in the till is suggestive of anomalous bedrock and values over 3,000 ppb are suggestive of ore-grade mineralization. Significant anomalies, in addition to being caused by more than 10 gold grains or by occluded gold, also generally display vertical stratigraphic continuity within the host till horizon and may have an associated pathfinder metal, particularly arsenic or copper. Delicate or irregular gold grains are also significant as they normally indicate a proximal source. Finally, the gold grains should be of a common size, indicating derivation from a single source.

The base metal background of a heavy mineral concentrate, and particularly of our high-density methylene iodide concentrates, is higher than that of a raw till sample, ranging up to several hundred ppm, because base metals tend to substitute to a significant extent for other metal ions in the structures of heavy silicate and sulphide minerals such as pyroxene and pyrite. The established anomaly threshold level for Cu and Zn, indicating the presence of ore-type minerals such as chalcopyrite and sphalerite in the sample, is greater than 800 ppm. Because till concentrates from dispersion train samples tend to grade the same as the bedrock source mineralization, massive sulphide deposits which typically grade 50,000 ppm (5 percent) combined Cu-Zn often produce anomalies over 10,000 ppm in each metal. The anomaly threshold level for arsenic is the same as for Cu and Zn but only those arsenic anomalies having a gold association are significant.

Significant base metal anomalies, like significant gold anomalies, normally display vertical continuity in the host till and have a pathfinder association. In the case of copper and zinc, the presence of grains of banded massive pyrite-chalcopyrite-sphalerite mineralization in the concentrate is a favourable indicator whereas the presence of only coarse crystalline vein-type chalcopyrite or sphalerite is unfavourable.

6.2 Drouet Heavy Mineral Gold Anomalies

Seventeen of the eighty-eight Drouet heavy mineral concentrates (19 percent) yielded measured and/or calculated gold assays greater than or equal to our 1000 ppb anomaly threshold. Visible gold was observed in 59 samples (67 percent). The total number of grains was 330 with eight samples meeting our second, 10-grain anomaly threshold. Four of these eight samples, from Holes 18, 22, 24 and 31 are from the seventeen that assayed over 1,000 ppb. Thus, 21 of the 88 samples collected (24%) met or exceeded one or both of our anomaly threshold levels. The 21 anomalies are scattered in 19 of the 45 drill holes. All of the anomalies are in Chibougamau Till.

In the Abitibi region, on average, 10 percent of samples that contain only background levels of gold yield anomalous results due to:

1. The chance occurrence of one or two coarse gold grains in the sample ("nugget effect"), or

2. The chance clustering of 10 or more fine gold grains in the sample ("cluster effect").

The 10 percent Abitibi background noise is entirely attributable to the sampling procedure (i.e. samples are too small to give representative gold grain counts and gold assays). The fact that 24 percent of the Drouet samples are anomalous reflects the nearby presence of a regionally auriferous structure -- the Lac Bernard Fault --and the potential of the property itself for hosting gold mineralization.

A systematic, three-stage screening process has been applied to each of the anomalous samples (Table 9) with the objective of eliminating high background noise and isolating any dispersal train anomalies that may be present.

Gold Anomalies				Grains V.G. (*Not Panned)	1st Stage Screening (Strat. Cont.)	2nd Stage Screening (Meas. Assay: Calc. Assay)	3rd Stage Screening (Nugget Effect)	Remarks	Anomaly Class
Hole No.	Sample No.	Au Assay (ppb) Meas.	Au Assay (ppb) Calc.						
DR-87- 06	01	690	1,028	1*	No	Good	Observed		Nugget
09	01	1,030	524	3	Basal	Good	Observed	Small (9.6 g) heavy mineral concentrate	Nugget
15	02	845	845	12	Basal	Good	No	9 of 12 gold grains abraded, 3 irregular	Cluster
18	01	2,820	579	17	Vertical	High	No	Only 1% pyrite; 9 of 17 gold grains delicate, 4 irregular, 4 abraded	Dispersion
	02	340	238	17	Basal, Vertical	Good	No	Only 1% pyrite; 5 of 17 gold grains delicate, 10 irregular, 2 abraded	Dispersion
19	01	235	166	10	Basal	Good	No	2 of 10 gold grains delicate, 2 irregular, 6 abraded	Cluster
20	02	2,475	125	9	Basal	High	Inferred	Check panned 1/4 concentrate, found 1 delicate gold grain 50 x 125 microns, 3% pyrite; INA check assays = ____ ppb	Nugget
21	01	1,005	NA	0	Basal	High	Inferred	Small concentrate -- 4 grams	Nugget
22	01	2,735	959	41	Basal	High	No	Only 1% pyrite; 24 of 41 gold grains delicate, 17 irregular	Dispersion
23	01	2,070	248	6	Basal	High	Inferred	Check panned 1/4 concentrate, found 2 delicate gold grains both 25 x 25 microns, 1% pyrite; INA check assays = ____ ppb	Nugget
24	01	G20,000	1,081	22	Basal	High	No	Only 2% pyrite; 20 of 22 gold grains delicate, 2 abraded	Dispersion
27	01	3,045	41	1*	Basal	High	Inferred	Check panned 1/4 concentrate, found 1 delicate gold grain 25 x 25 microns, 1% pyrite; INA check assays = ____ ppb	Nugget

Table 9 - Heavy Mineral Gold Anomaly Screening

Gold Anomalies				Grains V.G. (*Not Panned)	1st Stage Screening (Strat. Cont.)	2nd Stage Screening (Meas. Assay: Calc. Assay)	3rd Stage Screening (Nugget Effect)	Remarks	Anomaly Class
Hole No.	Sample No.	Au Assay (ppb) Meas.	Calc.						
DR-87- 28	01	1,235	228	4	Basal	High	Inferred	Check panned 1/4 concentrate, no V.G., 1% pyrite; INA check assay = ____ ppb	Nugget
29	02	1,310	587	4	Basal	High (slightly)	Inferred/ Observed	Check panned 1/4 concentrate, no V.G., 1% pyrite; analytical results may reflect small split (7 grams) analyzed; INA check assay = ____ ppb	Nugget
31	01	835	318	17	Vertical	High	No	Only 1% pyrite; 6 of 17 gold grains delicate, 4 irregular, 7 abraded	Dispersion
	02	1,640	432	31	Basal, Vertical	High	No	Only 1% pyrite; 18 of 31 gold grains delicate, 5 irregular, 8 abraded	Dispersion
33	02	1,525	447	1*	Basal	High	Inferred	Check panned 1/4 concentrate, found 2 abraded gold grains both 50 x 50 microns, 2% pyrite; INA check assay = ____ ppb	Nugget
35	02	14,060	4,022	7	No	High	Observed	Pulp and metallics assay, mostly coarse gold detected, estimated 0.5% py.; 300 x 550 micron grain probably abnormally thick	Nugget
38	02	1,885	223	1*	Basal	High	Inferred	Check panned 1/4 concentrate, no V.G., 1% pyrite; INA check assay ____ ppb	Nugget
40	01	1,130	1,701	1*	No	Good	Observed	Pulp and metallics assay, mostly coarse gold detected	Nugget
43	01	2,995	NA	0	Basal	High	Inferred	No visible gold, check panned 1/4 concentrate, no V.G., 1% pyrite; INA check assay = ____ ppb	Nugget

Table 9 - Heavy Mineral Gold Anomaly Screening

The first stage in the screening is to downgrade anomalies which have no stratigraphic continuity, although no anomalies are eliminated on this basis alone. An anomaly at the base of a till horizon or in a one-sample thick till horizon is automatically assumed to have stratigraphic continuity even though it generally does not. A lack of stratigraphic continuity is displayed by a single, isolated anomalous sample within or at the top of a multi-sample till horizon or by an anomaly in sand or gravel. A gold anomaly with no stratigraphic continuity is generally caused by a single nugget or by an erratic cluster of background gold grains (the "cluster effect"). These nugget or cluster anomalies sometimes occur in consecutive samples in a drill hole and occasionally they are contiguous with a gold anomaly of another type; we refer to this as "chance" continuity and treat the anomalies as if they had no continuity. Three of the twenty-one Drouet anomalies have no stratigraphic continuity.

The second stage in the screening is used for anomalous samples with observed gold grains. The calculated (predicted) visible gold assays are compared to the measured Bondar-Clegg assays to determine whether sufficient visible gold was present in the samples to produce the Bondar-Clegg assays. In samples with observed nuggets and little or no fine visible gold (i.e. less than 10 grains), either a good correlation of the two assays or a low measured assay indicates that essentially all of the gold in the concentrate is in the nuggets and the anomaly is of no significance. Equally insignificant are cluster anomalies in which more than 10 fine gold grains of abraded morphology are present but both the calculated and measured assays are less than 1,000 ppb; indeed we have never succeeded in tracing any abraded visible gold anomaly to a bedrock source. On the other hand, delicate or irregular gold in anomalous concentrations (more than 10 grains) but producing sub-anomalous assays may indicate a proximal sub-ore grade source or a narrow restricted source (vein) which could have important exploration implications.

We consider the correlation between a calculated and measured assay to be "good" if the calculated assay is not more than twice as high as or fifty percent less than the measured assay; this allows for a doubling or halving of the normal thickness factor for flake gold particles used in the calculation. Six of the twenty-one Drouet anomalies show good assay correlation. Two of these contain single gold grains and have no stratigraphic continuity. Another sample displays basal continuity but contains only three gold grains. Two other samples with basal continuity contain 12 and 10 grains of mostly abraded gold but assay less than 1000 ppb. The remaining sample (DR-87-18-02) also assays less than 1000 ppb but contains 17 gold grains the majority of which are delicate or irregular in shape. This sample displays basal continuity and is vertically contiguous with a similar but better anomaly in Sample 18-01. Anomalous Hole 18 will be considered separately in a forthcoming chapter.

A low measured assay for a concentrate with one or more observed nuggets indicates nugget retention in the 1/4 library split of the concentrate. If no other gold is present in the concentrate, the measured assay for the 3/4 concentrate will be below the 1000 ppb anomaly threshold. None of the Drouet anomalies are of this type.

The second-stage screening is very reliable because it is based on direct observation of the gold grains. This screening has effectively eliminated 5 of the 21 Drouet gold anomalies at the 100 percent confidence level. Two of the same anomalies have no stratigraphic continuity and thus were also eliminated by the first-stage screening.

The third stage in the screening applies to samples in which the measured assays are over 1000 ppb and are too high to be accounted for by the gold grains, if any, observed during processing. High measured assays can be caused by any one of the following:

1. A nugget that was recovered but not sighted during processing.

2. A sighted nugget for which the actual thickness is greater than the assumed thickness (0.1-0.2 x diameter) used in the assay calculation.

3. The difference in weight between the total concentrate on which the calculation is based and the portion of 3/4 concentrate that is assayed (applies only to samples in which a nugget is present, as fine gold would be evenly distributed through the sample).

4. A large number of missed fine gold grains.

5. Gold occluded in pyrite or another heavy mineral.

Unsighted nuggets normally account for about 80 percent of unexpectedly high assays, the thickness and weight factors for 10-20 percent, and fine gold and occluded gold for less than 10 percent. Only the fine gold and occluded gold anomalies are significant.

The third-stage screening is basically an indirect method in which a mineralogical investigation of the retained 1/4 concentrate is made, principally by panning, to determine the probable cause of the high assay in the 3/4 concentrate. The 3/4 concentrate itself cannot be panned as it is pulped (ground in a shatter-box) and largely consumed (by acid digestion) during analysis unless the analysis is by the non-destructive instrumental neutron activation (INA) method.

An absence or minimal amount of fine visible gold in the 1/4 concentrate precludes the occurrence of fine gold in anomalous concentrations in the 3/4 analytical split, and such anomalies can be assumed to have been caused by a missed or unusually thick nugget or by occluded gold. The potential for occluded gold is greatest in samples that contain pathfinder minerals or more than 10 percent pyrite. Where uncertainty exists the 1/4 concentrate can be analyzed by the non-destructive INA method with the hope of duplicating the 3/4 analysis and thereby proving the presence of occluded gold. The third-stage screening then becomes a direct rather than indirect method and is essentially 100 percent reliable.

Ten of the fifteen anomalies that gave unexpectedly high measured assays were amenable to third stage screening. To determine the cause of the anomalous results, the retained 1/4-heavy mineral concentrates of eight of these samples were panned. Of the two remaining samples, DR-87-21-01 was not split prior to analysis because of its small size (4 grams) but a single 125 to 150 micron gold grain in a sample this small could account for the reported 1005 ppb Au result. The second sample (DR-87-35-02)·assayed 14,060 ppb versus a calculated assay of 4022 ppb gold. The sample contained six small gold grains (less than 175 microns) and one large nugget (300 x 550 microns). A pulp and metallics assay on this sample revealed the majority of the gold to be in the +150 mesh fraction indicating additional fine gold or sulphide occluded gold was not present. The third dimension (thickness) of the large nugget was probably greater than that calculated in our equation accounting for the difference in measured and calculated assays. This anomaly also had no stratigraphic continuity -- further indicating its erratic nature.

Initial processing of the other eight samples had revealed visible gold contents of zero to nine grains per sample. Check pannings of the 1/4-concentrates revealed zero to two grains per sample. All of these grains are so fine that they would not contribute more than 50 ppb gold to the assays; thus the anomalies are not caused by fine visible gold. Occluded gold can also be discounted as pyrite levels do not exceed three percent in any sample and other pathfinder minerals are absent. Other workers (M. Durocher, personal communication) have also noted the rarity of occluded gold in the region. Thus these eight anomalous samples can be inferred, with a high degree of confidence, to be due to erratic background nuggets that were recovered but not sighted during sample processing. As a final check the 1/4-splits of these eight anomalous samples should be submitted to Bondar Clegg for INA analysis to confirm the erratic nature of the anomalous results. Although nine of these ten high assay anomalies displayed basal continuity this reflects the thin till and limited number of samples rather than any preferred gold concentration at the overburden-bedrock interface.

With five and ten anomalous samples now eliminated with complete confidence by second and third stage screening, respectively, Samples 18-01, 02, 22-01, 24-01 and 31-01, 02 have been identified as being potentially significant.

6.2.1 Potentially Significant Gold Anomalies

The Drouet gold anomaly screening results are summarized on Plan 2 where drill holes that contain anomalous levels of gold are plotted INPUT-fashion on the bedrock geology/carbonate alteration base. If two or more anomalous samples are present in a hole, the best anomaly is shown. The cross-hair indicates a gold content greater than or equal to the 1,000 ppb (measured or calculated) or 10 grains/sample anomaly threshold levels. Quadrants one through four (clockwise from upper right) represent greater than or equal to 1,000 ppb Au, ten or more grains of visible gold, stratigraphic continuty and a pathfinder metal association respectively.

The anomalies that survived the screening -- in Holes 18, 22, 24 and 31 -- are circled on Plan 2 and here discussed in detail . These anomalies stand out from other anomalies on the property and have similarities to dispersal train anomalies from other areas of the Abitibi Belt (Appendix G). The similarities noted in sample processing and analytical results from these holes (Table 10) suggest that all significant anomalies in the relatively small drill area should have the same characteristics. This helps in dismissing other anomalies which lack some of the characteristics noted in samples from Holes 18, 22, 24 and 31.

The characteristics shared by the Hole 18, 22, 24 and 31 anomalies are:

1. Abundant visible gold (17-41 grains)

2. Abundant delicate and irregular gold (60-100% of total gold)

3. Low proportions of sulfides (1-3%)

4. No, or very weak element association

5. High measured assays relative to calculated assays, except for Sample 18-02

	Visible Gold				Assays (ppb)			
Hole/Sample No.	Delicate	Irregular	Abraded	Total	Measured	Calculated	% Sulfides	% Delicate + Irregular Gold
DR-87-18-01	9	4	4	17	2,820	579	1	77
18-02	5	10	2	17	340	238	3	88
22-01	24	17	-	41	2,735	959	1	100
24-01	20	-	2	22	G 20,000	1,081	2	91
31-01	6	4	7	17	835	318	1	59
31-02	18	5	8	31	1,640	432	1	74

Table 10 - Gold Anomaly Data - Holes 18, 22, 24 and 31

6. Restriction of anomalies to single holes.

These characteristics when considered with the detailed drilling pattern and results from other holes indicate short, narrow dispersal trains consistent with sources of limited sub-crop size. Except for Sample 24-01 which assayed greater than 20,000 ppb, gold results are less than 3,000 ppb. As a "rule of thumb" we have found that heavy mineral concentrates from dispersal trains in till have a similar grade to that of the bedrock source near this source. If this holds true, subcropping sources on the Drouet Property may be sub-economic at grades less than 3,000 ppb (0.1 oz/t). However, both grade and continuity of these sources could improve at depth.

While anomalous dispersion in Holes 18, 22 and 24 indicates three distinct sources, anomalous results in samples of Hole 31 may represent dispersion from the same source responsible for the Hole 24 dispersion. The 210° azimuth of Late Wisconsinan ice advance is parallel to a line joining Holes 24 and 31 and visible gold found in Hole 31 displays morphologic characteristics consistent with increased transport distances when compared to visible gold in Hole 24.

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 Gold Potential of the Drouet Property

The Fairlady Drouet Property has potential for hosting significant bedrock gold mineralization. Fairlady's assumption that the property straddles the Lac Bernard Fault appears to be correct. Strong ductile and brittle shear deformation and hydrothermal alteration as well as weakly anomalous bedrock gold values occur in the main gabbro sill and in the two quartz-feldspar porphyry sills flanking the main gabbro sill. In these areas of the property, pyrite and Fe/Mg carbonate enrichment, and traces of fuchsite, tourmaline and flourite attest to one or more mineralizing events.

The visible gold content of the till is relatively high and considering the detailed hole spacing a high degree of confidence may be placed in the heavy mineral results. Most of the overburden gold anomalies on the property are nugget anomalies attributable to sampling procedure and are of no exploration significance.

Anomalous dispersion of visible delicate gold in till of Holes 18, 22, 24 and 31 is of significance but the dispersal trains appear to be short and of limited width (less than 100 m) and strength suggesting the sources are of marginal strike length and thickness and grade. However, these conditions could improve at depth. Specific host rock lithologies cannot be predicted but based on available data from the program it is believed the gold sources are of vein type related to deformation and alteration proximal to the Lac Bernard Fault. The lack of any significant sulfide or element association with the gold renders detailed geophysics of limited use in further defining source areas. Diamond drilling is the most effective means of follow-up exploration.

7.2 Recommended Follow-up

The gold dispersion on the Drouet Property is restricted to the east-central part of the drill area as outlined in Plan 2. The primary objective of follow-up exploration is to determine the bedrock sources of gold found in tills of Holes 18, 22, 24 and 31; the most effective means of follow-up is diamond drilling. As the azimuth of ice-advance (approximately 210°) is sub-perpendicular to Archean stratigraphy and structure, diamond drill cross-sections centered on anomalous reverse circulation drill Holes 18, 22, 24 and 31 and oriented approximately 210° should intersect mineralized zones contributing gold to the till while providing structural and stratigraphic information.

Plan 2 displays the diamond drill holes recommended and their proposed coordinates. As the holes are designed to intersect what are expected to be small, near surface sources they should be of restricted length (200 metres). The holes should be drilled towards the south at a 50° angle to cut upright stratigraphy on the south limb of the Caopatina Syncline. A total of eleven, 200 metre holes is proposed (2200 m. of drilling). All inclusive costs of $100/m would mean a total expenditure of $220,000.

The program envisioned is intended to determine the bedrock sources of till gold and does not include provision for probing the vertical or lateral extension of any gold zones intersected.

K. A. MacNeil

K.A. MacNeil

8.0 CERTIFICATE - KENZIE A. MACNEIL

I, Kenzie A. MacNeil, residing at 2164 Blossom Drive, Ottawa, Ontario hereby certify as follows:

That I attended St. Francis Xavier University at Antigonish, Nova Scotia and graduated with a B.Sc. in Geology in 1978.

That I have worked continuously in the field of exploration geology since 1979.

That I am a consulting geologist employed by Overburden Drilling Management Limited, 107-15 Capella Court, Nepean, Ontario.

That this technical report is based on data gathered on the subject property by employees of Overburden Drilling Management and interpreted by myself and other employees.

That I have no direct or indirect interest in Fairlady Energy Inc.

Kenzie A. MacNeil

Kenzie A. MacNeil, B.Sc.

Dated at Ottawa this 10th day of November, 1987

9.0 REFERENCES

Allard, G.O., Gobeil, A. 1984:	General Geology of the Chibougamau Region, in Chibougamau Stratigraphy and Mineralization, CIM special Volume 34.
Averill, S.A. 1978:	Overburden Exploration and the New Glacial History of Northern Canada; Canadian Mining Journal, Vol. 99, No. 4, p. 58-64.
Baker, N.W. 1987:	Victoria Diego Property, Chibougamau Area, Quebec. Proposed Work Program for 1987. Fairlady Energy Inc., January 19, 1987.
Baker, N.W. 1986:	Gold properties - Chibougamau Area Quebec; prepared for Morgain Minerals Inc., Nelson W. Baker Geological Services Ltd., West Hill, Ontario, Canada.
Bostock, H.S. 1968:	Physiographic Subdivisions of Canada: in Geology and Economic Minerals of Canada, 5th Edition, edited by R.J.W. Douglas; Geological Survey of Canada, Economic Geology Report No. 1, p.16.
Clifton, H.E., Hubert, A., Phillips, R.L. 1967:	Marine Sediment Sample Preparation for Analysis for Low Concentrations of Fine Detrital Gold; U.S. Dept. Interior, Geol. Surv. Circ. 545, 11p.
Dimock, B.K. 1985:	A Comparative Study of Sample Recovery Systems in Glacial Overburden Exploration; Student Work Report Prepared for Overburden Drilling Management Limited and Faculty of Science, University of Waterloo, 32 p.
Fairbridge, R.W. 1968:	Washboard Moraines and Other Minor Moraine Types; The Encyclopedia of Geomorphology, p. 1213-1218.
Gariepy, C., Allègre, C.J., Lajoie, J. 1984:	U-Pb Systematics in Single Zircons from the Pontiac Sediments, Abitibi Greenstone Belt, Can. Journal of Earth Sciences, Vol. 21, No. 11, p. 1296-1304.
Gobeil, A. Raciot, D. 1983:	Carte Lithostratigraphique de la Region de Chibougamau, Ministere de l'Energie et des Resources, MM-83-02, 1:250,000.

Gray, R.S. 1983: Overburden Drilling as a Tool for Gold Exploration; 85th Annual General Meeting of CIM-1983, Paper No. 19.

Kurina, K.P. 1986: Modifications to the Two-Bucket System for Reverse Circulation Drill Hole Sampling: Effects on Fine Particle Retention; Student Work Report Prepared for Overburden Drilling Management Limited and Faculty of Science, University of Waterloo, 20 p.

MERQ-OGS 1983: Lithostratigraphic Map of the Abitibi Subprovince; Ontario Geological Survey/Ministère de l'Energie et des Ressources, Québec, 1:500,000, Catalogued as "Map 2484" in Ontario and "DV 83-16" in Québec.

Remick, J.H. 1956: Preliminary report on the Anville-Drouet Area; Dept. of Mines, Geological Surveys Branch, Province of Quebec, P.R. No. 322, 7 p.

Tait, L. Chown, E.H. 1987: Géologie de la Région de Du Guesclin, District de Chibougamau; Ministere de l'Energie et des Ressources, DP-87-12, 1:20,000.

Vincent, J-S., Hardy, L. 1979: The Evolution of Glacial Lakes Barlow and Ojibway, Quebec and Ontario; Geol. Surv. Can., Bull. 316, 18 p.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 5,6,7 19 87

SHIFT HOURS

_____ TO _____

TOTAL HOURS

_____

CONTRACT HOURS

_____

HOLE NO DR-87-01 LOCATION BL 8+70 W

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. CB69003 BIT FOOTAGE 0-3.4 m

MOVE TO HOLE 5:30 - 5:45 (MAY 6)

DRILL 8:15 - 9:30 (MAY 7)

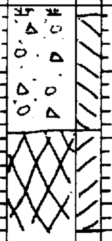
MECHANICAL DOWN TIME 3:00 MAY 5 to 5:30 MAY 6 Fix track, Fix shack frame

DRILLING PROBLEMS

OTHER 7:45 - 3:00 stuck, lost one track (MAY 5)

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG



DEPTH IN METRES: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

0 - 0.2 Muskeg

0.2 - 1.9 Till
- gray silt matrix
- pebbly - 90% V/s
  10% Gr.

1.9 - 3.4 Bedrock
- medium green
- well foliated to schistose
- 5% dissem. calcite
- chloritized

INTERMEDIATE VOLCANIC

E.O.H. 3.4 meters.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 7 1987

HOLE NO DR-87-02 LOCATION 8+70 W 1+00 S

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. SB69003 BIT FOOTAGE 3.4-6.9 m.

SHIFT HOURS

____ TO ____

MOVE TO HOLE

DRILL 9:30 - 10:15

TOTAL HOURS

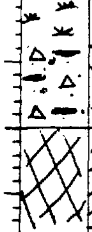
MECHANICAL DOWN TIME

DRILLING PROBLEMS

CONTRACT HOURS

OTHER

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0				0-0.8 Muskeg.
1			01	0.8-2.0 Till - grey silt to fine sand matrix - cobbly 90% V/S 10% Granitics
2			02	2.0-3.5 Bedrock - medium green - well Foliated to schistose - few white quartz veins INTERMEDIATE VOLCANIC
				E.O.H. 3.5 meters.

Depth scale: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20

Rémy Huneault

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

HOLE NO DR-87-03 LOCATION 8+70W 2+00S

DATE MAY 7 1987

GEOLOGIST R.Huneault DRILLER T Halsall BIT NO. S369003 BIT FOOTAGE 69-4.4m.

SHIFT HOURS

______ TO ______

MOVE TO HOLE ______

DRILL 10:15 - 11:00

TOTAL HOURS ______

MECHANICAL DOWN TIME ______

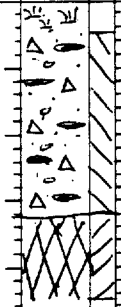
DRILLING PROBLEMS ______

CONTRACT HOURS ______

OTHER ______

MOVE TO NEXT HOLE ______

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–3.2			01	0-0.5 Muskeg 0.5-3.2 Till 0.5-1.0 poor return - beige oxidized fine sand matrix 1.0-3.1 grey silt to fine sand matrix. From 2.5-3.0 occasional gray gritty clay lumps. cobbly 80% V/s, 20% Gr.
3.2–4.5			02	3.2-4.5 Bedrock - dark green - relatively hard - foliated - fine grain MAFIC VOLCANIC E.O.H. 4.5 meters



Rémy Huneault

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 7 19 87

HOLE NO DR-87-04 LOCATION 9+00 W 3+00 S

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. CB69003 BIT FOOTAGE 11.4 - 12.9m

SHIFT HOURS

_____ TO _____

MOVE TO HOLE _____

DRILL 11:00 - 12:30

TOTAL HOURS _____

MECHANICAL DOWN TIME _____

DRILLING PROBLEMS _____

CONTRACT HOURS _____

OTHER _____

MOVE TO NEXT HOLE _____

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
1			01	0-0.3 Muskeg 0.3-0.5 Till - beige fine sand matrix - very poor return and very short interval. - not able to get sufficient sample - not sampled 0.5-1.5 Bedrock - pale buff color - well foliated - hard, non calcareous - Trace finelly dissem. pyrite FELSIC VOLCANIC E.O.H. 1.5 meters.
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

Rémy Huneault

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 7 1987

SHIFT HOURS

____ TO ____

TOTAL HOURS

____

CONTRACT HOURS

____

HOLE NO DR-87-05 LOCATION 9+00 W 4+00 S

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. SB69003 BIT FOOTAGE 12.9-15.9m

MOVE TO HOLE

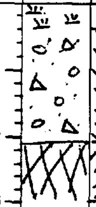
DRILL 12:30 - 2:00

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER

MOVE TO NEXT HOLE



DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
1			01	
2			02	
3				

0 - 0.4 Muskeg

0.4 - 2.1 Till

- beige oxidized fine sand matrix
- pebbly 50% dark green volc.
  40% pale buff volc.
  10% Granitics

2.1 - 3.0 Bedrock

- medium green
- very hard, non calcareous
- very fine grain
- trace dissem. pyrite

INTERMEDIATE VOLCANIC

E.O.H. 3.0 meters

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 7 19 87

SHIFT HOURS

_____ TO _____

TOTAL HOURS

_____

CONTRACT HOURS

_____

HOLE NO DR-87-06 LOCATION L 11+00 W 4+00 S

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. CB69003 BIT FOOTAGE 15.9-22.4

MOVE TO HOLE 2:00 - 2:15

DRILL 2:15 - 3:45

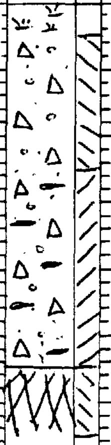
MECHANICAL DOWN TIME _____

DRILLING PROBLEMS _____

OTHER _____

MOVE TO NEXT HOLE _____

DEPTH IN METRES | GRAPHIC LOG | INTERVAL | SAMPLE NO. | DESCRIPTIVE LOG



Depth (m): 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Sample no.: 01 (c. 1.5 m), 02 (c. 4 m), 03 (c. 6 m)

0 - 0.5 Muskeg

0.5 - 5.5 Till

0.5 - 2.5 - very fine beige sand matrix
- pebbly 70% V/S 30% Gr.
- very poor return

2.5 - 5.5 · gray silt matrix
- cobbly 90% V/S 10% Gr.

5.5 - 6.5 Bedrock
- black spotted white
- massive
- medium grain
- biotitic
- 1% magnetite

GRANODIORITE

E.O.H. 6.5 meters

Rémy Huneault

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 7 1987

HOLE NO DR-87-07 LOCATION L 11+00 W 3+00 S

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. CB6900 BIT FOOTAGE 224.28.4 m

SHIFT HOURS

____ TO ____

MOVE TO HOLE

DRILL 3:45 - 4:15

TOTAL HOURS

MECHANICAL DOWN TIME

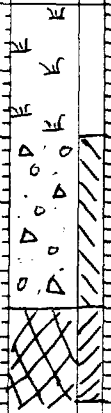
DRILLING PROBLEMS

CONTRACT HOURS

OTHER

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
0–6		2.0–4.6	01	0 - 2.0 Muskeg.
		4.6–6.0	02	2.0 - 4.6 Till



0 - 2.0 Muskeg.

2.0 - 4.6 Till

- Fine gray silt to fine sand matrix
- pebbly 50% v/s but quickly changing down hole to 80% v/s 20% Gr.

4.6 - 6.0 Bedrock

- dark green
- well foliated
- fine grain
- chloritized, moderately soft.
- 5% dissem. calcite

MAFIC VOLCANIC

E.O.H. 6.0

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE May 7 19 87

SHIFT HOURS

______ TO ______

TOTAL HOURS

CONTRACT HOURS

HOLE NO DR-87-CP LOCATION L 11+00W 2+00S

GEOLOGIST R Huneault DRILLER T Halsall BIT NO. 826900S BIT FOOTAGE 28.4→31.9 (3.5)

MOVE TO HOLE

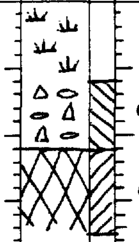
DRILL 4.15 → 5.00

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER

MOVE TO NEXT HOLE



DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				0→1.2 Muskeg
1			01	1.2→2.2 Till grey silt matrix
2			02	pebbly - 80% v/s 20% Gr. 2.2→3.5 Bedrock
3				- medium green - very well foliated
4				- non calcareous - mafics gone to chlorite
5				INTERMEDIATE VOLCANIC
6				E.O.H. 3.5
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 7 1987

HOLE NO DR-87-09 LOCATION L 11+00 W 1+00 S

GEOLOGIST ________ DRILLER ________ BIT NO. ________ BIT FOOTAGE 31.9 - 35.4

SHIFT HOURS

________ TO ________

MOVE TO HOLE ________

DRILL 5:00 - 5:45

TOTAL HOURS

____

MECHANICAL DOWN TIME ________

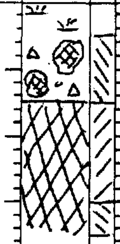
DRILLING PROBLEMS ________

CONTRACT HOURS

____

OTHER ________

MOVE TO NEXT HOLE ________



DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.
1			01
2			02A
3			02B
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

DESCRIPTIVE LOG

0 - 0.5 Muskeg.

0.5 - 1.5 Till + bedrock
- rubbly
- very fractured bedrock with till infilling
- till has gray beige sandy matrix.

1.5 - 3.5 Bedrock

1.5 - 3.0
- very rubbly
- well foliated
- 50% mafic volcanic 50% quartz vein

3.0 - 3.5
- pale green
- fine grain
- foliated
- Felsic volcanic

NOTE: collected (-10) sample labelled 02 A,B (-10) because suspect overburden seepage.

E.O.H. 3.5 meters

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE May 7 1987

SHIFT HOURS

_______ TO _______

TOTAL HOURS

CONTRACT HOURS

HOLE NO DR-87-10 LOCATION L11+25W 0+05S

GEOLOGIST R Huneault DRILLER T. Halcall BIT NO. CB 69003 BIT FOOTAGE 35 + 237 f (2.0

MOVE TO HOLE

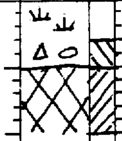
DRILL 5:45 → 6:30

MECHANICAL DOWN TIME 6:30 → 7:15 repair track

DRILLING PROBLEMS

OTHER Travel 7:15 → 8:15

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20			01 02	0 → 0.6 Muskeg 0.6 → 1.0 Till (Till cover very thin, poor return) - fine sand beige matrix quickly changing to a grey silt matrix - pebbly - 75% V/s 25% Gr 1.0 → 2.0 BEDROCK - Dark green - very well foliated, sheared - 2% calcite along shear planes - trace disem. pyrite - mafics now chlorite MAFIC VOLCANIC E.O.H. 2.0.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE May 8 1987

SHIFT HOURS

____ TO ____

TOTAL HOURS

____

CONTRACT HOURS

____

HOLE NO DR-87-11 LOCATION L 11+00 W 1+00 N

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. CB69003 BIT FOOTAGE 37.4-38.4

MOVE TO HOLE 8:00 - 8:15

DRILL 8:15 - 8:45

MECHANICAL DOWN TIME ____

DRILLING PROBLEMS ____

OTHER ____

MOVE TO NEXT HOLE ____

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				0 - 0.2 Muskeg
1			01	0.2 - 0.4 Till (no return)
2				0.5 - 1.0 Bedrock - pale gray - green
3				- shistose
4				- 5% dissem. pyrite along shear planes.
5				FELSIC VOLCANIC
6				E.O.H. 1.0 meters
7				
8				Rég Huneault
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 8 1987

HOLE NO DR-87-12 LOCATION L 9+00 W 1+00 N

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. CB69003 BIT FOOTAGE 38.4 - 40.9

SHIFT HOURS

______ TO ______

MOVE TO HOLE 8:45 → 9:15

DRILL 9:15 → 9:45

TOTAL HOURS

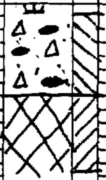
MECHANICAL DOWN TIME

DRILLING PROBLEMS

CONTRACT HOURS

OTHER

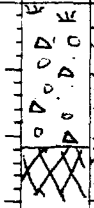
MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG	
				0 → 0.2 Muskeg	
1			01	0.2 → 1.4 Till - poor return, sample very small, undersize	1 R.C. sample and 1 pit sample collected for a total of 2 overburden samples
2			02	- Beige, fine sand matrix, cobbly 90% V/S 10% Gr. 1.4 → (2.5) BEDROCK	
3				- Pale green - well foliated	
4				- fine grain, hard - No carbonate	
5				FELSIC VOLCANIC E.O.H. 2.5 meters	
6					
7				Note: DR-87-12P = pit sample collected at 9+25W 0+75N	
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 8 1987
SHIFT HOURS
____ TO ____
TOTAL HOURS
____
CONTRACT HOURS
____

HOLE NO DR-87-13 LOCATION L 13+00 W 1+00 N
GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. CB67003 BIT FOOTAGE 409-439
MOVE TO HOLE 9:45 - 10:00
DRILL 10.00 - 10.45
MECHANICAL DOWN TIME
DRILLING PROBLEMS
OTHER
MOVE TO NEXT HOLE



DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				0-0.4 Muskeg
1			01	0.4-2.2 Till gray silt matrix
2				pebbly 90% V/S 10% Gr.
			02	
3				
4				2.2-3.0 Bedrock - medium green colour
5				- well foliated - chloritized
6				
7				Intermediate Volcanic E.O.H. 3.0
8				
9				
10				Rémy Huneault
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE May 8 1987

SHIFT HOURS
____ TO ____

TOTAL HOURS
____

CONTRACT HOURS
____

HOLE NO DR-87-14 LOCATION L 13+00W BL

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. G369004 BIT FOOTAGE 0 - 3.0

MOVE TO HOLE

DRILL 10:45 - 11:45

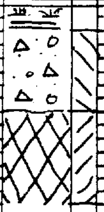
MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
1			01	
2			02	
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				



0-0.2 Muskeg

0.2-1.6 Till
- at 0.2 very thin bed of clay → beige, smooth soft.
- till matrix is beige fine sand
- pebbly 75% V/s, 25% Gr.

1.6-3.0 Bedrock
- medium green colour
- well foliated
- chloritized

Intermediate Volcanic

Remy Huneault

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE May 8 1987

SHIFT HOURS
______ TO ______

TOTAL HOURS
______

CONTRACT HOURS
______

HOLE NO DR-87-15 LOCATION L 13+60 W 1+00S

GEOLOGIST R. Huncault DRILLER T Hallsall BIT NO. CB69004 BIT FOOTAGE 3.0-9.0

MOVE TO HOLE ______

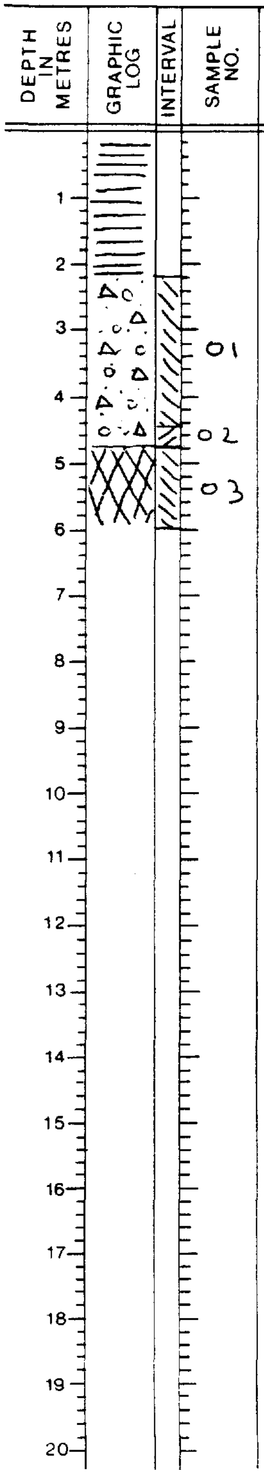
DRILL 11:45 - 12:15

MECHANICAL DOWN TIME ______

DRILLING PROBLEMS ______

OTHER ______

MOVE TO NEXT HOLE ______



DESCRIPTIVE LOG

0-0.2 Muskeg

0.2-2.2 Clay
- beige, soft, smooth
- occasional silt

2.2-4.8 Till
- gray beige silt to fine sand matrix.
- pebbly 70% v/s
30% Gr.

4.8-6.0 Bedrock
- medium green colour
- well foliated
- fine grain

Intermediate Volcanic

E.O.H. 6.0 meters

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE May 8 1987

SHIFT HOURS

_____ TO _____

TOTAL HOURS

_____

CONTRACT HOURS

_____

HOLE NO DR-87-16 LOCATION L 13+50 W 2+10 S

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. CB69004 BIT FOOTAGE 9.0 - 11.0

MOVE TO HOLE _____

DRILL 12:15 - 1:30

MECHANICAL DOWN TIME _____

DRILLING PROBLEMS _____

OTHER _____

MOVE TO NEXT HOLE _____

DEPTH IN METRES | GRAPHIC LOG | INTERVAL | SAMPLE NO. | DESCRIPTIVE LOG

0 - 0.2 Muskeg

0.2 - 1.0 Silt
- ochre, oxidized
- few fine sand beds
- poor return

1.0 - 1.2 Till
- no return in drill but got a sample in shovel dug pit.
- beige fine sand matrix
- cobbly.

Labelled DR-87-PT-16)

1.2 - 2.0 Bedrock
- dark green
- weakly foliated
- very hard

Mafic Volcanic

E.O.H: 2.0 meters

Remy Huneault

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE May 8 1987

SHIFT HOURS

______ TO ______

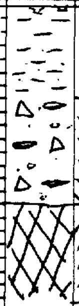
TOTAL HOURS

______

CONTRACT HOURS

______

HOLE NO DR-87-17 LOCATION L 13+00 W 3+00 S
GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. SB69004 BIT FOOTAGE 11.0 - 15.5
MOVE TO HOLE
DRILL 1:30 - 2:15
MECHANICAL DOWN TIME
DRILLING PROBLEMS
OTHER
MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20			01 02	0 - 0.2 Muskeg 0.2 - 1.4 Silt - beige - occasional fine sand beds 1.4 - 3.0 Till - grey beige fine sand matrix - cobbly - 65% V/S 35% Gr. 3.0 - 4.5 Bedrock - variable. 3.0 - 3.8 pale green 3.8 - 4.2 medium green 4.2 - 4.5 pale green - well foliated - 2% calcite fracture infilling. Felsic Volcanic E.O.H. 4.5 meters Rémy Huneault.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 8 19 87

SHIFT HOURS

______ TO ______

TOTAL HOURS

______

CONTRACT HOURS

______

HOLE NO DR-87-18 LOCATION L 13+00W 3+90S

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. CB69004 BIT FOOTAGE 15.5-21.5

MOVE TO HOLE ______

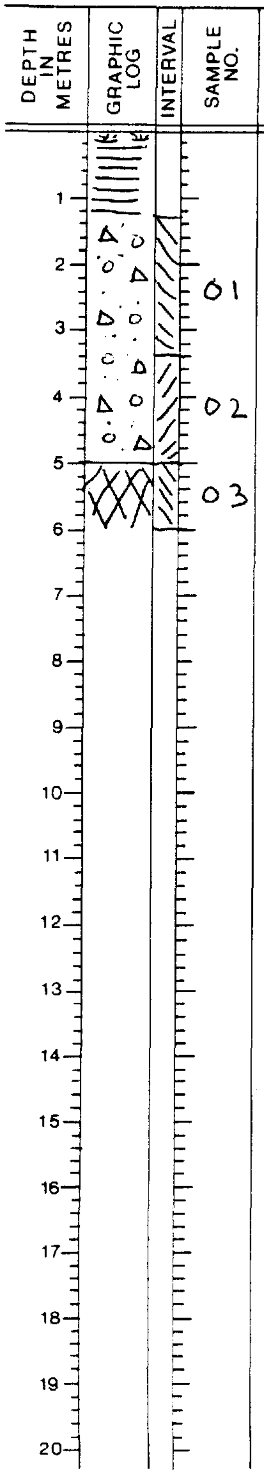
DRILL 2:15 - 3:15

MECHANICAL DOWN TIME ______

DRILLING PROBLEMS ______

OTHER ______

MOVE TO NEXT HOLE ______



DESCRIPTIVE LOG

0 - 0.2 Muskeg.

0.2 - 1.3 Clay
- beige, smooth, soft.

1.3 - 5.0 Till
- gray silt to fine sand matrix.
- pebbly - 65% v/s
35% Gr.

5.0 - 6.0 Bedrock
- weathered, ochre colour on surface.
- then yellow to buff color
- sericitic

Felsic Volcanic

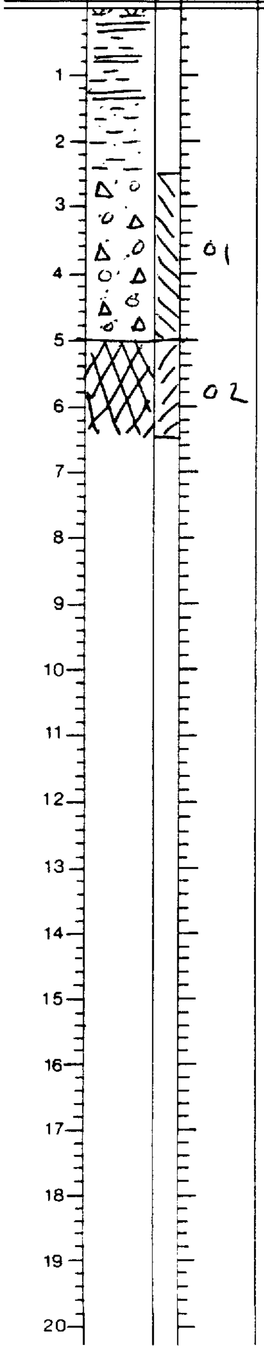
E.O.H. 6.0 meters

Rejean Huneault

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE May 4 1987
HOLE NO DR-87-19 LOCATION L15+00W 4+00S
GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. CB69004 BIT FOOTAGE 21.5 · 28.
SHIFT HOURS
______ TO ______
MOVE TO HOLE 3:15 - 3:30
DRILL 3:30 - 4:15
TOTAL HOURS
MECHANICAL DOWN TIME
DRILLING PROBLEMS
CONTRACT HOURS
OTHER
MOVE TO NEXT HOLE

DEPTH IN METRES | GRAPHIC LOG | INTERVAL | SAMPLE NO. | DESCRIPTIVE LOG



0 - 0.2 Muskeg

0.2 - 1.6 Clay
- beige, soft, smooth
- occasional silt beds

1.6 - 2.5 Silt
- beige
- occasional fine sand

2.5 - 5.0 Till
- gray silt to fine sand matrix.
- pebbly 65% V/S
35% Gr.

5.0 - 6.5 Bedrock
- pale buff colour
- foliated
- fine grain

- from 5.9 - 6.0 colour changes to dark gray, very cherty

Felsic Volcanic
E.O.H. 6.5 meters

Remy Huneault

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE May 8 1987

SHIFT HOURS
_____ TO _____

TOTAL HOURS
_____

CONTRACT HOURS
_____

HOLE NO DR-87-20 LOCATION L 15+00W 3+00 S

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. CB69004 BIT FOOTAGE 28.0-33.0

MOVE TO HOLE _____

DRILL 4:15-4:45

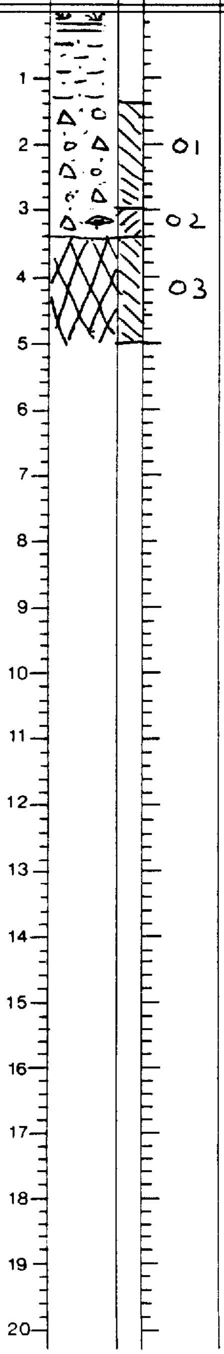
MECHANICAL DOWN TIME _____

DRILLING PROBLEMS _____

OTHER _____

MOVE TO NEXT HOLE _____

DEPTH IN METRES | GRAPHIC LOG | INTERVAL | SAMPLE NO. | DESCRIPTIVE LOG



0-0.2 Muskeg

0.2-0.4 Clay
- beige, smooth, soft.

0.4-1.4 Silt
- beige
- occasional fine sand

1.4-3.4 Till
1.4-3.0 gray beige silt matrix
pebbly 60% v/s
40% Gr.
3.0-3.4 gray silt matrix
cobbly 80% v/s
20% Gr.

3.4-5.0 Bedrock
- weathered, ochre on surface.
- rusty yellow colour
- sericitic
- sheared, well foliated.

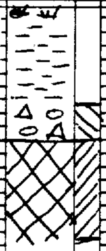
Felsic Volcanic

E.O.H. 5.0 meters

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE May 8 1987
SHIFT HOURS
_____ TO _____
TOTAL HOURS
_____
CONTRACT HOURS
_____

HOLE NO DR-87-21 LOCATION L15+00W 2+00S
GEOLOGIST B. Huneault DRILLER J. Halsall BIT NO. CB64004 BIT FOOTAGE 33.0→36.5 (3.5)
MOVE TO HOLE
DRILL 4:45 → 5:15
MECHANICAL DOWN TIME
DRILLING PROBLEMS
OTHER
MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				0→0.2 Muskeg
1				0.2→1.5 Silt (Poor return) -Beige -Occasional fine sand.
2			01	1.5→2.0 Till - Gray-Beige fine sand matrix -pebbly - 70% v/s 30% Gr.
3			02	2.0→3.5 Bedrock -pale green to gray green -very fine grain, well foliated -sericitic Felsic Volcanic E.OH. 3.5 meters
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE May 8 1987

SHIFT HOURS

____ TO ____

TOTAL HOURS

CONTRACT HOURS

HOLE NO DR-87-22 LOCATION L15+00W 1400S

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. CB69004 BIT FOOTAGE 36.5-41.0

MOVE TO HOLE

DRILL 5:15 - 6:00

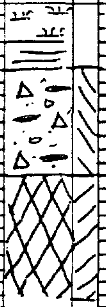
MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
1				
2			01	
3				
4			02	
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				



0-0.6 Muskeg

0.6-1.0 Clay
- brown, mixte with organics.

1.0-2.6 Till
- fine gray-beige sand matrix
- cobbly 60% V/s 40% Gr.

2.6-4.5 Bedrock
- medium green colour
- schistose
- chloritic
- 3% dissem. carbonate

Intermediate Volcanic

E.O.H. 4.5

Rémy Huneault.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE May 9 1987

SHIFT HOURS

_____ TO _____

TOTAL HOURS

_____

CONTRACT HOURS

_____

HOLE NO DR-87-23 LOCATION L 15+00W BL.

GEOLOGIST R-Huneault DRILLER T. Halsall BIT NO. CB69004 BIT FOOTAGE 41.0-44.0

MOVE TO HOLE _____

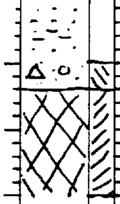
DRILL 9:30 - 10:00

MECHANICAL DOWN TIME 7:45 - 9:30 repare hydraulic leak

DRILLING PROBLEMS _____

OTHER TRAVEL MORNING 6:45 - 7:45

MOVE TO NEXT HOLE _____

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				0-0.2 Muskeg.
1			01	0.2-1.0 Sand
2			02	- ochre, oxidized fine - occasional silt bed.
3				1.0-1.4 Till
4				- gray beige to gray silt matrix
5				- pebbly 65% Vs 35% Gr.
6				
7				1.4-3.0 Bedrock
8				- dark green - well foliated
9				- chloritized
10				Mafic Volcanic
11				
12				E.O.H. 3.0
13				Remy Huneault
14				
15				
16				
17				
18				
19				
20				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 9 1987
SHIFT HOURS
____ TO ____
TOTAL HOURS
____
CONTRACT HOURS
____

HOLE NO DR-87-24 LOCATION L 17+00W 0+10S
GEOLOGIST R. Hureault DRILLER T. Halsall BIT NO. CB69004 BIT FOOTAGE 44.0 - 47.0
MOVE TO HOLE
DRILL 10:00 - 10:45
MECHANICAL DOWN TIME
DRILLING PROBLEMS
OTHER
MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
			01	0-0.1 Muskeg
1				0.1-1.6 Till
2			02	- beige fine sand matrix - cobbly 70% V/S 30% Gr.
3				1.6-3.0 Bedrock
4				- dark green
5				- foliated - medium grain
6				- 15% amphibole phenocrysts
7				MAFIC VOLCANIC
8				E.O.H. 3.0 meters
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE May 9 1987

HOLE NO DR-87-25 LOCATION L17+00W 1+00S

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. CB69004 BIT FOOTAGE 47.0-50.0 m

SHIFT HOURS

____ TO ____

MOVE TO HOLE

DRILL 10:45 - 11:30

TOTAL HOURS

MECHANICAL DOWN TIME

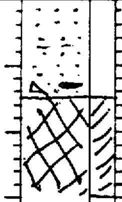
DRILLING PROBLEMS

CONTRACT HOURS

OTHER

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG



01

0-0.2 Muskeg

0.2-1.2 Sand
- ochre to beige
- oxidized
- occasional silt beds

1.2-1.5 Till
- beige fine sand matrix
- cobbly 60% V/S 40% Gr
- poor return
- no sample

NOTE: Dug pit and collected lower sand section and till. Sample labelled DR-87-PT-25

Pit located L17+00W 0+95S

1.5-3.0 Bedrock
- dark green
- foliated (weakly)
- fine grain

MAFIC VOLCANIC

E.O.H. 3.0 metres

Rémy Huneault

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 9 1987

SHIFT HOURS

____ TO ____

TOTAL HOURS

____

CONTRACT HOURS

____

HOLE NO DR-87-26 LOCATION L 17+00W 2+00S

GEOLOGIST R.Huneault DRILLER T. Halsall BIT NO. SB69004 BIT FOOTAGE 50.0-51.5m

MOVE TO HOLE

DRILL 11:30 - 12:30

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20			01 02	0-0.2 Muskeg 0.2-0.6 Sand - fine grain - oxidized ochre colour. 0.6-1.0 Till - beige fine sand matrix - cobbly. 1.0-1.5 Bedrock. - dark green - weakly foliated - fine grain MAFIC VOLCANIC E.O.H. 1.5 meters Remy Huneault

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 9 1987

HOLE NO DR-87-27 LOCATION L17+00W 3+00S

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. CB69004 BIT FOOTAGE 51.5-54.5m

SHIFT HOURS

_____ TO _____

MOVE TO HOLE

DRILL 12:30 - 1:15

TOTAL HOURS

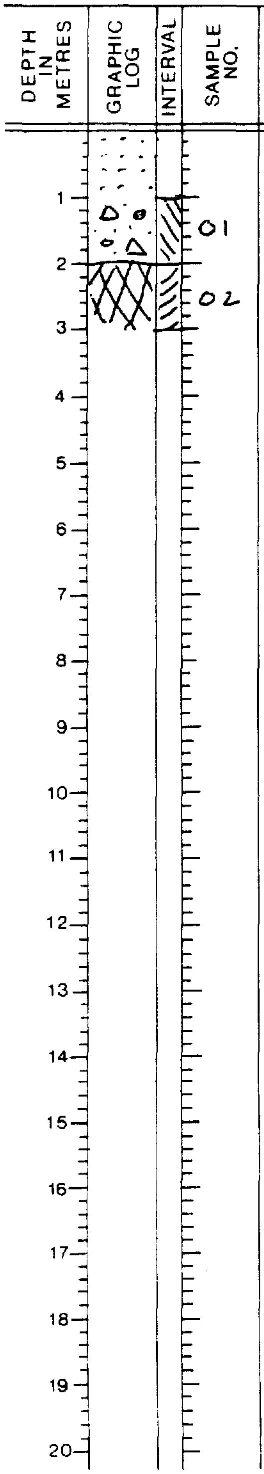
MECHANICAL DOWN TIME

DRILLING PROBLEMS

CONTRACT HOURS

OTHER

MOVE TO NEXT HOLE



DESCRIPTIVE LOG

0-0.2 Muskeg

0.2-1.0 Fine sand
- oxidized
- ochre to beige color.

1.0-2.0 Till
- beige to gray beige fine sand matrix
- pebbly 70% V/S
30% Gr.

2.0-3.0 Bedrock
- buff colour
- foliated
- 0.5% fracture calcite
- porphyritic → quartz and feldspar phenocrysts.

Quartz / Feldspar Porphyry

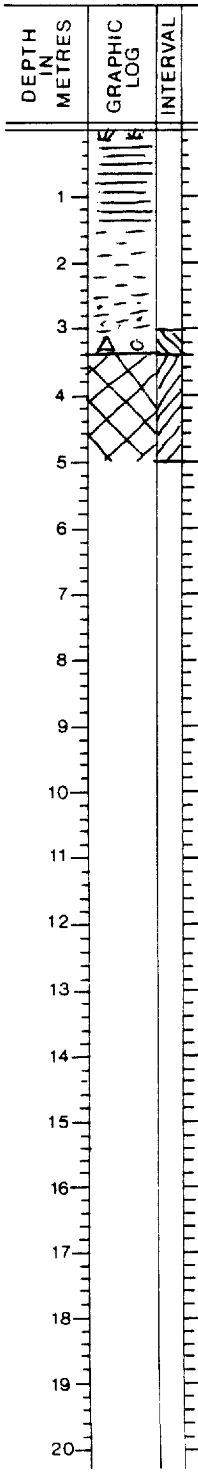
E.O.H. 3.0 meters

Rémy Huneault

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE May 9 1987
SHIFT HOURS
____ TO ____
TOTAL HOURS
____
CONTRACT HOURS
____

HOLE NO DR-87-28 LOCATION L17+00W 4+10S
GEOLOGIST R. Huneault DRILLER T Halsall BIT NO. CB69004 BIT FOOTAGE 54.5→59.5 (5.0)
MOVE TO HOLE
DRILL 1:15 → 2:00
MECHANICAL DOWN TIME
DRILLING PROBLEMS
OTHER
MOVE TO NEXT HOLE



SAMPLE NO.	DESCRIPTIVE LOG
	0→0.2 Muskeg
	0.2→1.4 Clay - beige, smooth, soft
	1.4→3.0 Silt - beige to grey beige - occasional fine sand
01	3.0→3.4 Till - fine sand, grey beige matrix - pebbly 65% v/s 35% Gr.
02	3.4→5.0 BEDROCK - Dark grey - schistose - soft, grey chlorite - very fine grain MUDSTONE (SLate)
	E.O.H. 5.0m

Rémy Huneault

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 9 1987

SHIFT HOURS

_____ TO _____

TOTAL HOURS

CONTRACT HOURS

HOLE NO DR-87-29 LOCATION L19+00W 4+00S

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. CB69004 BIT FOOTAGE 59.5 · 67.0

MOVE TO HOLE

DRILL 2:00 - 3:00

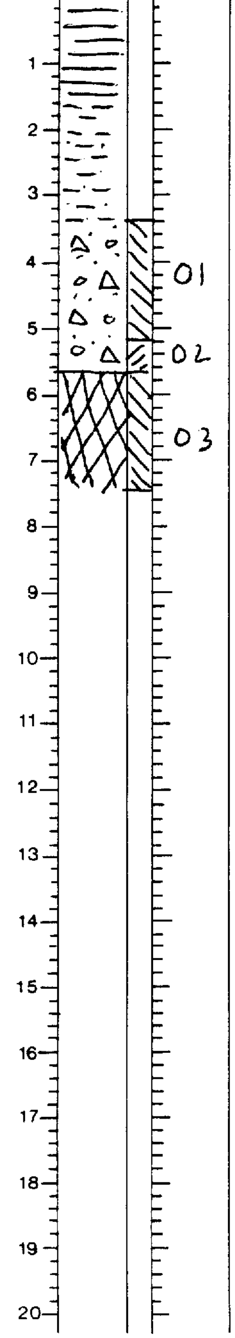
MECHANICAL DOWN TIME 3:00 - 5:30 replace cross-bars on track.

DRILLING PROBLEMS

OTHER 5:30 - 6:30 travel to town

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG



0-0.2 Muskeg.

0.2-1.5 Clay
- beige, smooth, soft.

1.5-3.4 Silt
- beige to gray beige
- occasional fine sand

3.4-5.7 Till
- grey beige fine sand matrix
- pebbly 75% v/s 25% Gr.

5.7-7.5 Bedrock
- dark green
- well Foliated to schistose
- fine grain

MAFIC VOLCANIC

E.O.H. 7.5 meters

Rémy Huneault

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 10 19 87

SHIFT HOURS

____ TO ____

TOTAL HOURS

CONTRACT HOURS

HOLE NO DR-87-30 LOCATION L 18+50W 3+00S

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. CB69004 BIT FOOTAGE 67.0-74.5

MOVE TO HOLE

DRILL 8:15-9:15

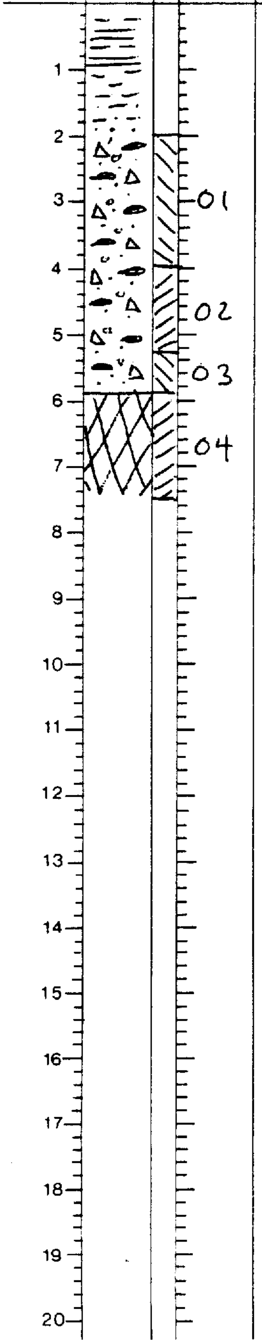
MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER TRAVEL to drill 7:15-8:15 am.

MOVE TO NEXT HOLE

DEPTH IN METRES | GRAPHIC LOG | INTERVAL | SAMPLE NO. | DESCRIPTIVE LOG



0-0.2 Muskeg

0.2-2.0 Clay and Silt
- clay is beige, smooth, and soft.
- silt is beige
- occassional beige fine sand beds

2.0-5.9 Till
- beige silt to fine sand matrix.
- cobbly 65% v/s 35% Gr.

5.9-7.5 Bedrock.

5.9-6.5 - pale green to buff
- schistose (phyllitic)
- 5% dissem. calcite
- 1% fuchite
- soft.

Felsic Volcanic

6.5-7.5 - pale to medium green
- foliated
- trace calcite

Intermediate Volcanic

E.O.H. 7.5 meters

Remy Huneault

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 10 1987

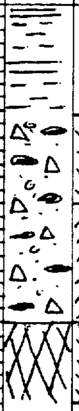
SHIFT HOURS
_____ TO _____

TOTAL HOURS
_____

CONTRACT HOURS
_____

HOLE NO DR-87-31 LOCATION L 18+00 W 2+25 S
GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. M59331 BIT FOOTAGE 0 - 6.0
MOVE TO HOLE
DRILL 9:15 - 10:30
MECHANICAL DOWN TIME
DRILLING PROBLEMS
OTHER
MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
1				0 - 0.1 Muskeg. 0.1 - 1.7 Silt - beige - occasional beige, soft smooth clay bed.
2–3			01	1.7 - 4.8 Till - beige fine sand to silt matrix - cobbly 65% V/s 35% Gr.
4			02	
5–6			03	4.8 - 6.0 Bedrock - medium green colour - fine grain - weakly foliated - trace dissem. pyrite Intermediate Volcanic E.O.H. 6.0
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				



Reiny Huneault

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 10 1987

SHIFT HOURS

____ TO ____

TOTAL HOURS

CONTRACT HOURS

HOLE NO DR-87-32 LOCATION L 20+75W 4+00S

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. MS9331 BIT FOOTAGE 60-135

MOVE TO HOLE 10:30 - 10:45

DRILL 10:45 - 11:45

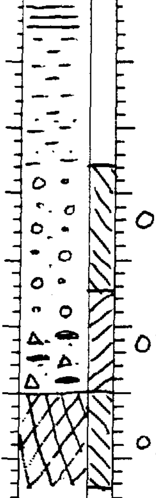
MECHANICAL DOWN TIME

DRILLING PROBLEMS Pulled out at 6.0 meters; rods clogged;

OTHER

MOVE TO NEXT HOLE

DEPTH IN METRES | GRAPHIC LOG | INTERVAL | SAMPLE NO. | DESCRIPTIVE LOG



DEPTH IN METRES	SAMPLE NO.
3-4	01
5-6	02
6-7.5	03

0-0.1 Muskeg

0.1-0.5 Clay
- beige, smooth, soft

0.5-2.6 Silt
- beige
- occasional beige fine sand beds.

2.6-5.0 Gravel
- interbedded beige sand and gravel.
- pebbles are 60% V/S 40% Gr.
- very granular beds in gravel sections.

5.0-6.0 Till
- grey beige silt matrix
- cobbly 65% V/S, 35% Gr.

6.0-7.5 Bedrock.
- dark gray
- schistose
- gray chlorite
- trace finelly dissem. pyrite.
- relatively soft.

Mudstone (slate)

E.O.H. 7.5 meters

Remy Huneault

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 10 1987

SHIFT HOURS

____ TO ____

TOTAL HOURS

CONTRACT HOURS

HOLE NO DR-87-33 LOCATION L 21+00W 3+00S

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. M59331 BIT FOOTAGE 13.5-22.0

MOVE TO HOLE

DRILL 11:45 - 12:30

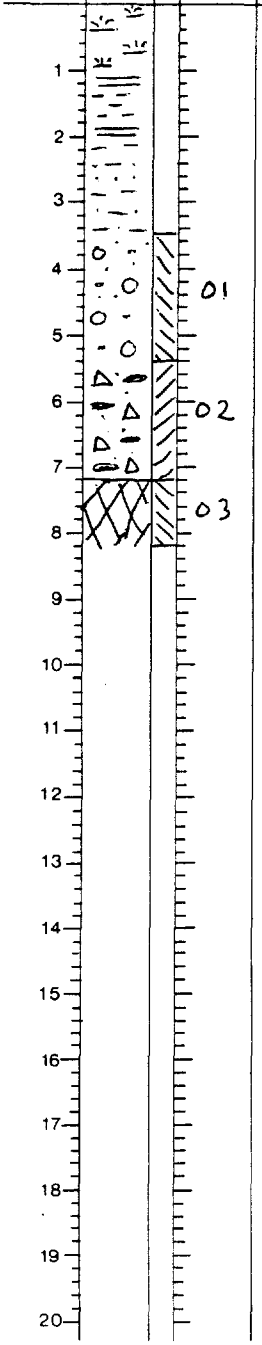
MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG



0-1.0 Muskeg

1.0 - 3.5 Silt
- beige
- few thin clay beds
- occasional fine sand

3.5 - 5.4 Gravel
- interbedded gravel and sand ; beige
- pebbles - 50% V/S
50% Gr.

5.4 - 7.2 Till
- gray-beige silt matrix
- cobbly 75% V/S
25% Gr.

7.2 - 8.2 Bedrock
- medium green
- foliated
- very fine grain

Intermediate Volcanic

E.O.H. 8.2 meters

Reiny Huneault

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 10 1987

SHIFT HOURS
____ TO ____

TOTAL HOURS
____

CONTRACT HOURS
____

HOLE NO DR-87-34 LOCATION L 23+00 2+00 S

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. M59331 BIT FOOTAGE 22.0 - 46.0

MOVE TO HOLE 12:30 - 12:45

DRILL 12:45 - 2:45

MECHANICAL DOWN TIME

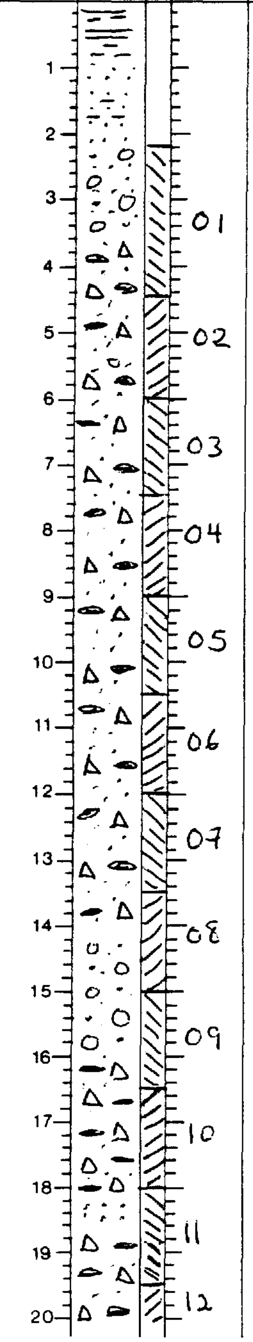
DRILLING PROBLEMS

OTHER

MOVE TO NEXT HOLE

Page 1 of 2

DEPTH IN METRES | GRAPHIC LOG | INTERVAL | SAMPLE NO. | DESCRIPTIVE LOG



0-0.1 Muskeg.

0.1-1.0 Silt
- beige
- few thin beige clay beds.

1.0-2.2 Sand
- beige fine sand
- occasional silt

2.2-3.5 Gravel
- very porous, poor return
- few sand beds (beige)
- pebbles 60% V/S
40% Gr.

3.5-22.2 Till
- beige to gray beige fine sand matrix
- cobbly 60% V/S
40% Gr.

from 14.2 to 16.0 poor return coarse granular gravel

from 18.3 to 18.5 beige fine sand.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE ________ 19 __

SHIFT HOURS

______ TO ______

TOTAL HOURS

______

CONTRACT HOURS

______

HOLE NO 34 LOCATION ______

GEOLOGIST ______ DRILLER ______ BIT NO. ______ BIT FOOTAGE ______

MOVE TO HOLE ______

DRILL ______

MECHANICAL DOWN TIME ______

DRILLING PROBLEMS ______

OTHER ______

MOVE TO NEXT HOLE ______

Page 2 of 2

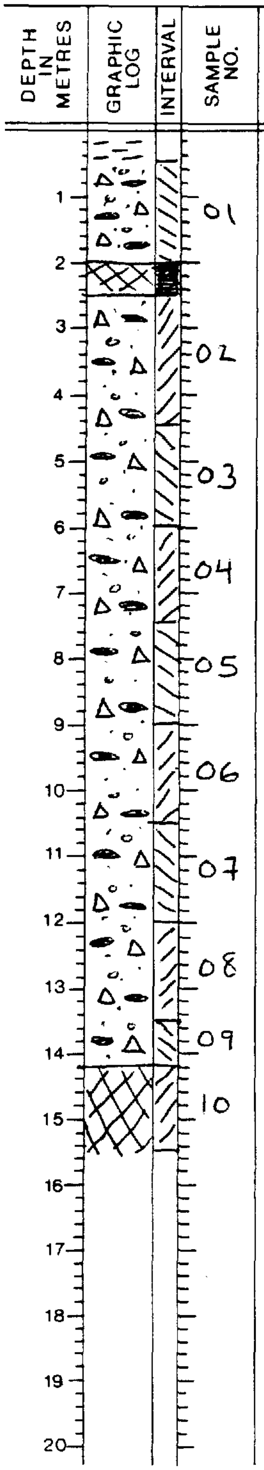
DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
			12 cont.	
21				22.2 - 24.0 Bedrock
22			13	22.2 - 22.8 - rubbly - fracture
23			14	22.8 - 24.0 - buff colour - well Foliated - fine grain - sericitic
24				
25				Felsic Volcanic
26				E.O.H. 24.0 meters.
27				
28				Rémy Huneault.
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 10 1987
HOLE NO DR-87-35 LOCATION L 23+00 W 1+25 S
GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. M59331 BIT FOOTAGE 46.0-61.5 m

SHIFT HOURS
____ TO ____
TOTAL HOURS
CONTRACT HOURS

MOVE TO HOLE
DRILL 2:45 - 5:30
MECHANICAL DOWN TIME
DRILLING PROBLEMS
OTHER
MOVE TO NEXT HOLE



DESCRIPTIVE LOG

0-0.2 Muskeg.

0.2-0.5 Silt
- beige

0.5-14.2 Till
- beige fine sand matrix.
- cobbly 50% V/S
50% Gr.

2.0-2.5 Boulder
- Felsic volcanic

- pebbly between 2.5 and 5.0 meters.

14.2-15.5 Bedrock
- medium green
- porphyritic
- feldspar phenocrysts

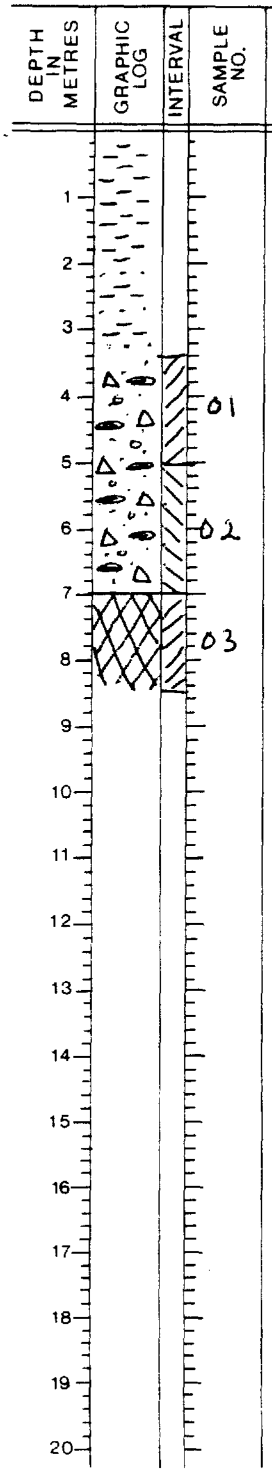
Feldspar Porphyry

E.O.H. 15.5 meters

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 10 19 87
SHIFT HOURS
_____ TO _____
TOTAL HOURS
_____
CONTRACT HOURS
_____

HOLE NO DR-87-36 LOCATION L 21+00 W 1+00 S
GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. MS9331 BIT FOOTAGE 61.5 · 70.0
MOVE TO HOLE
DRILL 5:30 - 6:15
MECHANICAL DOWN TIME
DRILLING PROBLEMS
OTHER TRAVEL TO TOWN 6:15 · 7:15 p.m.
MOVE TO NEXT HOLE



DESCRIPTIVE LOG

0 - 0.2 Muskeg

0.2 - 3.4 Silt
- beige
- occasional fine sand.

3.4 - 7.0 Till
- grey beige fine sand matrix
- cobbly 65% V/S 35% Gr.

7.0 - 8.5 Bedrock
- medium green
- schistose
- locally foliated
- fine grain

Intermediate Volcanic

E.O.H. 8.5 meters

Rémy Huneault

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 11 1987

SHIFT HOURS

_____ TO _____

TOTAL HOURS

_____

CONTRACT HOURS

_____

HOLE NO DR-87-37 LOCATION L21+30 W 1+90 S

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. MS9331 BIT FOOTAGE 70.0 - 82.0

MOVE TO HOLE

DRILL 8:15 - 9:30

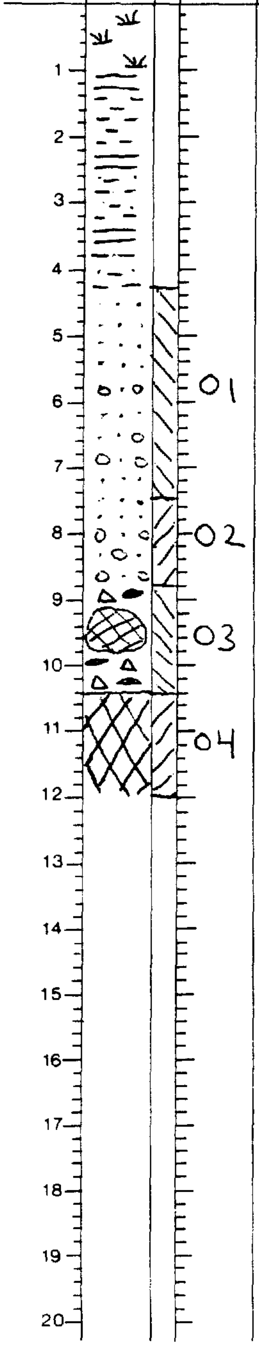
MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER Travel to drill 7:15 to 8:15

MOVE TO NEXT HOLE

DEPTH IN METRES | GRAPHIC LOG | INTERVAL | SAMPLE NO. | DESCRIPTIVE LOG



0-1.0 Muskeg.

1.0-4.3 Silt
- beige
- occasional fine sand beds
- occasional thin clay beds

4.3-7.8 Sand
- beige medium sand
- occasional thin granular gravel beds.

7.8-8.8 Gravel.
- coarse granular matrix
- occasional medium sand beds.

8.8-10.4 Till
- gray beige fine sand matrix
- cobbly 80% v/s 20% Gr.

(9.0-9.8 Boulder - Felsic Volcanic)

10.4-12.0 Bedrock
- buff colour
- 10% quartz veins
- sheared, foliated locally schistose
- sericitic
- very fine grain

Felsic Volcanic

E.O.H. 12.0

Suspect DeGeer Moraine

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 11 1987

HOLE NO DR-87-38 LOCATION L 21+00 W BL

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. MS9331 BIT FOOTAGE 82.0 - 87.5

SHIFT HOURS

____ TO ____

MOVE TO HOLE ____

DRILL 9:30 - 10:15

TOTAL HOURS ____

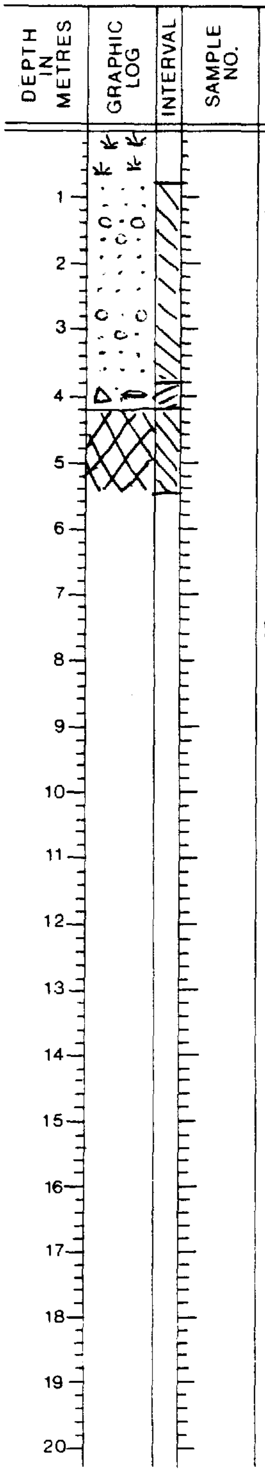
MECHANICAL DOWN TIME ____

DRILLING PROBLEMS ____

CONTRACT HOURS ____

OTHER ____

MOVE TO NEXT HOLE ____



DESCRIPTIVE LOG

0 - 0.8 Muskeg.

0.8 - 3.8 Sand

- interbedded fine and medium beige sand
- occasional thin beds of granular gravel.

3.8 - 4.2 Till

- gray beige fine sand matrix.
- cobbly 70% v/s 30% Gr.

4.2 - 5.5 Bedrock

- medium green colour
- foliated
- fine grain

Intermediate Volcanic

E.O.H. 5.5 meters

Rémy Huneault

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 11 1987

SHIFT HOURS

______ TO ______

TOTAL HOURS

CONTRACT HOURS

HOLE NO DR-87-39 LOCATION L 23+00 W BL.

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. MS9331 BIT FOOTAGE 87.5-102.0

MOVE TO HOLE

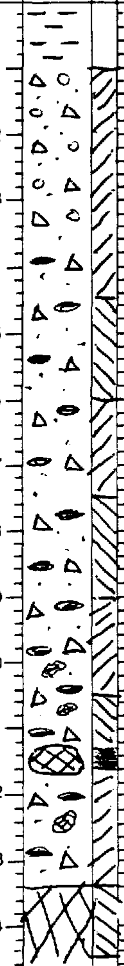
DRILL 10:15 - 12:30

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER

MOVE TO NEXT HOLE



DEPTH IN METRES	SAMPLE NO.	DESCRIPTIVE LOG
		0-0.1 Muskeg
1		0.1-1.0 Silt
		- poor return
2		- beige, oxidized
3	01	
		1.0-13.4 Till
4		
		1.0-3.5- intermittent return
5	02	- beige fine sand matrix
6		- pebbly 60% v/s 40% Gr.
7	03	
		3.5-13.4 - grey beige silt matrix
8	04	
		- cobbly 70% v/s 30% Gr
9		
10	05	- gradual volcanic clast content increase
11	06	from 8.5-13.4 up to 85% v/s 15% Gr.
12		
13	07	(11.3-11.6 Boulder - Mafic Volcanic)
14	08	13.4-14.5 Bedrock
15		- medium green colour
		- Medium grain
16		Intermediate Volcanic
17		E.O.H. 14.5 meters
18		
19		Huneault
20		

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 11 1987

SHIFT HOURS

____ TO ____

TOTAL HOURS

CONTRACT HOURS

HOLE NO DR-87-40 LOCATION L23+00W 1+00N

GEOLOGIST R.Huncault DRILLER T.Halsall BIT NO. CB69005 BIT FOOTAGE 0 - 13.0

MOVE TO HOLE 12:30 - 12:45

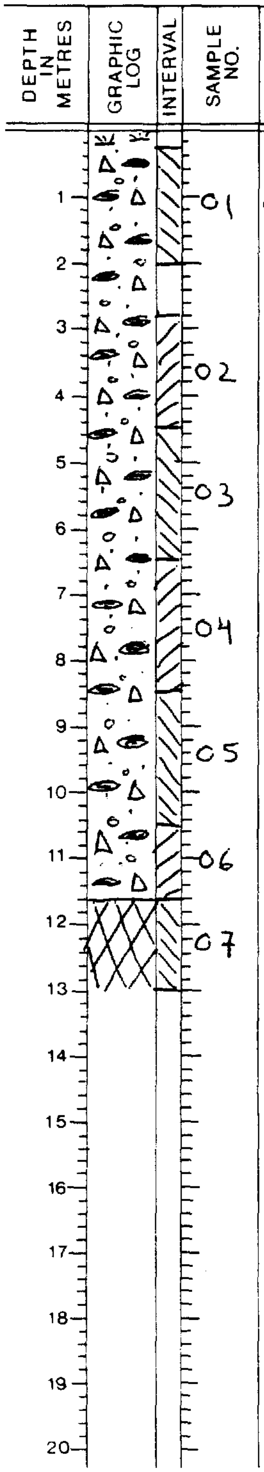
DRILL 12:45 - 2:45

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER

MOVE TO NEXT HOLE



DESCRIPTIVE LOG

0 - 0.3 Muskeg

0.3 - 11.6 Till
- beige silt to fine sand matrix
- cobbly 65% V/S 35% Gr.
- very stoney (slow penetration)

(from 2.0 - 2.8 no return)

11.6 - 13.0 Bedrock
- medium green colour
- weakly foliated
- fine grain
- trace dissem pyrite

Mafic Volcanic

E.O.H. 13.0 meters

Rémy Huncault

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 11 1987

SHIFT HOURS

____ TO ____

TOTAL HOURS

____

CONTRACT HOURS

____

HOLE NO DR-87-41 LOCATION L19+00W BL.

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO CB69005 BIT FOOTAGE 130-150

MOVE TO HOLE 2:45 - 3:00

DRILL 3:00 - 4:15

MECHANICAL DOWN TIME ____

DRILLING PROBLEMS ____

OTHER ____

MOVE TO NEXT HOLE ____

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
1			01	0-0.5 Muskeg 0.5-0.8 Till - beige fine sand matrix - poor return; intermittent (0.8-1.0 Boulder - granitic) Tonalite 1.0-2.0 Bedrock - medium green colour - Foliated - fine grain Intermediate Volkanic E.O.H 2.0 meters NOTE: P.t sample DR-87-PT-41 (sample interval 0.5 to 1.0 meters)
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

Rémy Huneault.

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE May 11 1987

SHIFT HOURS

____ TO ____

TOTAL HOURS

____

CONTRACT HOURS

____

HOLE NO DR-87-42 LOCATION L 19+25 W 0+75 S

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. CB65005 BIT FOOTAGE 15.0-18.0

MOVE TO HOLE ____

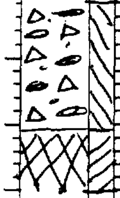
DRILL 4:15 to 4:45

MECHANICAL DOWN TIME ____

DRILLING PROBLEMS ____

OTHER ____

MOVE TO NEXT HOLE ____



DEPTH IN METRES	SAMPLE NO.	DESCRIPTIVE LOG
		0 - 0.2 Muskeg
1	01	0.2 - 2.1 Till
2		- beige fine sand matrix
	02	- intermittent return
3		- cobbly 70% v/s
4		30% Gr.
5		
		2.1 - 3.0 Bedrock
6		- medium green colour
7		- Foliated
8		- very hard
9		- fine grain
10		Intermediate Volcanic
11		E.O.H. 3.0
12		Huneault
13		
14		
15		
16		
17		
18		
19		
20		

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 11 1987

SHIFT HOURS

_____ TO _____

TOTAL HOURS

CONTRACT HOURS

HOLE NO DR-87-43 LOCATION L16+90 W 1+75N

GEOLOGIST R.Huneault DRILLER T Halsall BIT NO CB69005 BIT FOOTAGE 18.0-21.0

MOVE TO HOLE 4:45 - 5:00

DRILL 5:00 - 6:00

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.
1			01
2			02
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

DESCRIPTIVE LOG

0-0.5 Muskeg

0.5-1.5 Till
- intermittent return
- beige silt matrix
- cobbly 70% v/s
  30% Gr.

1.5-3.0 Bedrock
- pale green to buff colour
- schistose
- very hard, aphanitic
- sericitic

Felsic Volcanic

E.O.H. 3.0

Rémy Huneault

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 11 1987

SHIFT HOURS

____ TO ____

TOTAL HOURS

CONTRACT HOURS

HOLE NO DR-87-44 LOCATION L 15+25 W 2+25 N

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO SB6900S BIT FOOTAGE 21.0-22.5

MOVE TO HOLE 6:00-6:15

DRILL 6:15-7:15

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				0-0.2 Muskeg
1			01	0.2-0.7 Till (no return)
2				0.7-1.5 Bedrock
3				- dark green
4				- foliated - very hard, fine grain
5				- trace dissem. pyrite
6				MAFIC VOLCANIC
7				
8				E.O.H 1.5 meters
9				Remy Huneault
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

OVERBURDEN DRILLING MANAGEMENT LIMITED
REVERSE CIRCULATION DRILL HOLE LOG

DATE MAY 11 1987

SHIFT HOURS

____ TO ____

TOTAL HOURS

CONTRACT HOURS

HOLE NO OR-87-45 LOCATION L15+25 W 1430N

GEOLOGIST R. Huneault DRILLER T. Halsall BIT NO. CB69005 BIT FOOTAGE 22.5-25.5

MOVE TO HOLE

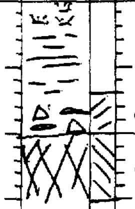
DRILL 7:15 - 8:15

MECHANICAL DOWN TIME

DRILLING PROBLEMS

OTHER 8:15 - 9:30 travel to town

MOVE TO NEXT HOLE

DEPTH IN METRES	GRAPHIC LOG	INTERVAL	SAMPLE NO.	DESCRIPTIVE LOG
				0 - 0.5 muskeg
1				0.5 - 1.4 Silt
			01	- beige, oxidized
2			02	- occasional thin clay beds
3				
4				1.4 - 2.0 Till
5				- gray beige silt matrix
				- cobbly 65% V/S 35% Gr.
6				
7				2.0 - 3.0 Bedrock
8				- buff to gray colour
				- well foliated, sheared
9				- 25% dissem. pyrite
10				- 3% dissem. calcite
11				- cherty
12				Felsic Volcanic
13				E.O.H. 3.0
14				
15				Rémy Huneault
16				
17				
18				
19				
20				

FADR1MAY.WR1

OVERBURDEN DRILLING MANAGEMENT LIMITED

TOTAL # OF SAMPLES IN THIS REPORT = 40

LABORATORY SAMPLE LOG

SAMPLE NO.	WEIGHT (KG.WET)			WEIGHT (GRAMS DRY)					AU		DESCRIPTION											CLASS
						M. I. CONC					CLAST					MATRIX						
	TABLE SPLIT	+10 CHIPS	TABLE FEED	TABLE CONC	M.I. LIGHTS	CONC. TOTAL	NON MAG	MAG	NO. V.G.	CALC PPB	SIZE	%				S/U	SD	ST	CY	COLOR		
												V/S	GR	LS	OT					SD	CY	
DR-87																						
01-01	4.6	0.8	3.8	86.6	123.4	20.4	17.4	3.0	2	80	P	70	20	10	C	U	Y	Y	Y	B	B	TILL
02-01	8.4	1.4	7.0	146.3	97.7	48.6	36.5	12.1	7	114	P	20	80	TR	NA	U	Y	Y	Y	B	B	TILL
03-01	9.0	1.0	8.0	169.5	129.4	40.1	32.6	7.5	3	126	P	70	30	NA	NA	U	Y	Y	Y	B	B	TILL
05-01	8.6	0.0	8.6	162.9	117.7	45.2	36.6	8.6	5	132	TR	NA	NA	NA	NA	S	M	Y	Y	B	B	SAND
06-01	1.6	0.0	1.6	62.0	56.0	6.0	4.8	1.2	1	1028	TR	NA	NA	NA	C	S	F	Y	Y	GB	BN	SAND
-02	8.4	0.6	7.8	134.8	73.1	61.7	42.9	18.8	7	62	P	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
07-01	8.0	0.3	7.7	115.1	54.2	60.9	38.1	22.8	7	188	P	60	40	NA	NA	U	Y	Y	Y	B	B	TILL
08-01	4.8	0.2	4.6	100.5	71.5	29.0	18.3	10.7	3	35	P	20	80	TR	C	U	Y	Y	Y	GB	GB	TILL
09-01	3.5	0.7	2.8	103.5	86.3	17.2	9.6	7.6	3	524	P	60	NA	40	NA	U	Y	Y	Y	B	B	TILL
10-01	0.9	0.1	0.8	30.1	28.4	1.7	1.4	0.3	0	NA	P	30	70	NA	NA	U	Y	Y	Y	B	B	TILL
12-01	0.6	0.0	0.6	47.4	45.0	2.4	2.1	0.3	0	NA	TR	NA	NA	NA	NA	U	Y	Y	Y	B	B	TILL
-PT	7.8	2.5	5.3	133.3	116.0	17.3	16.2	1.1	0	NA	P	30	70	NA	C	U	Y	Y	Y	BN	BN	TILL
13-01	7.0	0.6	6.4	144.0	97.3	46.7	41.2	5.5	2	129	P	15	85	NA	NA	U	Y	Y	Y	B	B	TILL
14-01	4.1	0.5	3.6	64.9	46.1	18.8	15.0	3.8	1	67	P	20	80	NA	NA	U	Y	Y	Y	B	B	TILL
15-01	6.7	0.5	6.2	154.9	123.3	31.6	23.6	8.0	6	89	P	10	90	NA	NA	U	Y	Y	Y	B	B	TILL
-02	4.9	0.4	4.5	121.8	86.3	35.5	27.6	7.9	12	845	P	25	75	NA	NA	U	Y	Y	Y	B	B	TILL
16-PT	2.1	0.2	1.9	81.8	76.0	5.8	4.9	0.9	0	NA	P	10	90	TR	C	U	Y	Y	Y	B	B	TILL
17-01	7.3	1.0	6.3	127.5	95.8	31.7	24.0	7.7	0	NA	P	35	65	NA	NA	U	Y	Y	Y	B	B	TILL
18-01	8.7	1.2	7.5	151.5	115.5	36.0	25.7	10.3	17	579	P	30	70	NA	NA	U	Y	Y	Y	B	B	TILL
-02	8.8	1.0	7.8	169.8	130.6	39.2	29.0	10.2	17	238	P	75	25	NA	NA	U	Y	Y	Y	GB	GB	TILL
19-01	7.5	0.8	6.7	228.2	184.2	44.0	31.6	12.4	10	166	P	50	35	15	NA	U	Y	Y	Y	B	B	TILL
20-01	5.9	0.4	5.5	165.7	136.5	29.2	24.7	4.5	5	780	P	50	50	NA	NA	U	Y	Y	Y	B	B	TILL
-02	4.8	1.3	3.5	118.8	99.5	19.3	15.0	4.3	9	125	P	40	60	NA	NA	U	Y	Y	Y	B	B	TILL
21-01	1.7	0.0	1.7	44.5	40.5	4.0	3.2	0.8	0	NA	TR	NA	NA	NA	NA	U	Y	Y	Y	B	B	TILL
22-01	4.8	0.4	4.4	130.2	105.4	24.8	20.2	4.6	41	959	P	70	30	NA	NA	U	Y	Y	Y	B	B	TILL
23-01	3.5	0.3	3.2	119.7	104.5	15.2	11.7	3.5	6	248	P	70	30	NA	NA	U	Y	Y	Y	B	B	TILL
24-01	1.6	0.2	1.4	75.5	68.7	6.8	5.4	1.4	22	1081	P	80	20	NA	NA	U	Y	Y	Y	B	B	TILL
25-PT	4.3	0.6	3.7	53.2	48.8	4.4	3.6	0.8	0	NA	P	80	20	NA	NA	U	Y	Y	Y	B	B	TILL
26-01	1.3	0.0	1.3	49.6	47.3	2.3	2.1	0.2	0	NA	TR	NA	NA	NA	NA	U	Y	Y	Y	BN	BN	TILL
27-01	3.4	0.2	3.2	70.5	59.4	11.1	9.1	2.0	1	41	P	70	30	NA	NA	U	Y	Y	Y	B	BN	TILL
28-01	5.5	0.2	5.3	130.7	106.3	24.4	18.4	6.0	4	228	P	20	80	NA	NA	U	Y	Y	Y	B	B	TILL
29-01	7.7	0.6	7.1	122.5	84.8	37.7	26.9	10.8	5	64	P	60	40	NA	NA	U	Y	Y	Y	B	B	TILL
-02	3.3	0.4	2.9	97.3	78.6	18.7	13.3	5.4	4	567	P	70	30	NA	NA	U	Y	Y	Y	BGN	GN	TILL
30-01	7.1	0.4	6.7	189.3	155.8	33.5	25.2	8.3	5	62	P	60	40	NA	NA	U	Y	Y	Y	B	B	TILL
-02	7.9	1.2	6.7	172.5	133.4	39.1	30.8	8.3	2	70	P	70	30	NA	NA	U	Y	Y	Y	B	B	TILL
-03	6.6	1.0	5.6	187.8	152.5	35.3	29.0	6.3	4	27	P	60	40	NA	NA	U	Y	Y	Y	B	B	TILL
31-01	7.5	1.2	6.3	149.5	128.1	21.4	20.7	0.7	17	316	P	70	30	NA	NA	U	Y	Y	Y	B	B	TILL
-02	7.9	1.8	6.1	167.6	132.7	34.9	27.2	7.7	31	432	P	70	30	NA	NA	U	Y	Y	Y	B	B	TILL
32-01	8.0	1.2	6.8	162.3	134.0	28.3	21.8	6.5	7	80	P	30	70	NA	NA	U	Y	Y	Y	B	B	TILL
32-02	6.6	1.6	5.0	245.8	217.5	28.3	21.7	6.6	0	NA	P	40	60	NA	NA	U	Y	Y	Y	B	B	TILL

FADR1JUN.WR1

OVERBURDEN DRILLING MANAGEMENT LIMITED

TOTAL # OF SAMPLES IN THIS REPORT = 48

LABORATORY SAMPLE LOG

SAMPLE NO.	WEIGHT (KG.WET)			WEIGHT (GRAMS DRY)					AU		DESCRIPTION											CLASS
						M. I. CONC					CLAST					MATRIX						
	TABLE SPLIT	+10 CHIPS	TABLE FEED	TABLE CONC	M.I. LIGHTS	CONC. TOTAL	NON MAG	MAG	NO. V.G.	CALC PPB	SIZE	%				S/U	SD	ST	CY	COLOR		
												V/S	GR	LS	OT					SD	CY	
DR-87																						
33-01	7.6	0.6	7.0	142.8	122.1	20.7	15.8	4.9	1	64	P	60	40	NA	NA	U	Y	Y	Y	B	B	TILL
-02	9.2	2.4	6.8	197.3	153.8	43.5	30.4	13.1	1	447	P	70	30	NA	NA	U	Y	Y	Y	GB	GB	TILL
34-01	8.2	0.8	7.4	139.6	101.3	38.3	28.4	9.9	0	NA	P	60	40	NA	NA	U	Y	Y	Y	B	B	TILL
-02	8.0	0.8	7.2	181.9	139.8	42.1	29.7	12.4	1	22	P	30	70	NA	NA	U	Y	Y	Y	B	B	TILL
-03	8.2	0.8	7.4	145.9	113.8	32.1	23.7	8.4	1	27	P	50	50	NA	NA	U	Y	Y	Y	B	B	TILL
-04	8.1	0.7	7.4	137.6	103.1	34.5	25.5	9.0	3	368	P	40	60	NA	NA	U	Y	Y	Y	B	B	TILL
-05	7.6	0.6	7.0	217.8	183.6	34.2	25.6	8.6	0	NA	P	20	80	NA	NA	U	Y	Y	Y	B	B	TILL
-06	8.1	0.6	7.5	234.9	198.6	36.3	26.1	10.2	1	14	P	10	90	NA	NA	U	Y	Y	Y	B	B	TILL
-07	7.9	1.0	6.9	257.6	221.1	36.5	27.8	8.7	0	NA	P	20	80	NA	NA	U	Y	Y	Y	B	B	TILL
-08	7.9	1.4	6.5	161.3	138.0	23.3	18.5	4.8	0	NA	P	20	75	5	NA	U	Y	Y	Y	B	B	TILL
-09	7.6	0.4	7.2	145.9	120.9	25.0	20.5	4.5	1	4	P	5	95	NA	NA	U	Y	Y	Y	B	B	TILL
-10	8.2	0.7	7.5	333.8	293.1	40.7	32.9	7.8	1	6	P	5	95	NA	NA	U	Y	Y	Y	B	B	TILL
-11	7.5	0.6	6.9	240.4	206.1	34.3	27.2	7.1	0	NA	P	5	95	NA	NA	U	Y	Y	Y	B	B	TILL
-12	8.2	0.8	7.4	180.6	134.8	45.8	35.9	9.9	0	NA	P	10	90	NA	NA	U	Y	Y	Y	B	B	TILL
-13	8.3	1.4	6.9	178.2	134.6	43.6	34.0	9.6	5	101	P	15	85	NA	NA	U	Y	Y	Y	B	B	TILL
35-01	7.8	0.8	7.0	156.8	125.0	31.8	24.0	7.8	1	8	P	15	85	NA	NA	U	Y	Y	Y	B	B	TILL
-02	7.9	0.7	7.2	186.7	150.3	36.4	26.4	10.0	7	4022	P	20	80	NA	NA	U	Y	Y	Y	B	B	TILL
-03	7.7	0.9	6.8	194.7	158.3	36.4	28.0	8.4	0	NA	P	40	60	NA	NA	U	Y	Y	Y	B	B	TILL
-04	7.8	0.9	6.9	178.8	132.3	46.5	33.7	12.8	0	NA	P	25	75	NA	NA	U	Y	Y	Y	B	B	TILL
-05	8.0	0.4	7.6	121.1	78.0	43.1	31.5	11.6	4	31	P	20	80	NA	NA	U	Y	Y	Y	B	B	TILL
-06	7.9	0.4	7.5	138.9	108.8	30.1	22.5	7.6	1	67	P	10	90	NA	NA	U	Y	Y	Y	B	B	TILL
-07	8.2	0.8	7.4	146.7	108.3	38.4	28.4	10.0	1	7	P	5	95	NA	NA	U	Y	Y	Y	B	B	TILL
-08	8.1	1.4	6.7	189.6	155.7	33.9	25.7	8.2	7	144	P	15	85	NA	NA	U	Y	Y	Y	B	B	TILL
-09	7.2	1.2	6.0	147.0	108.6	38.4	30.2	8.2	2	25	P	25	75	NA	NA	U	Y	Y	Y	B	B	TILL
36-01	7.3	0.6	6.7	138.9	107.8	31.1	23.5	7.6	0	NA	P	25	75	NA	NA	U	Y	Y	Y	B	B	TILL
-02	6.7	1.4	5.3	249.2	212.1	37.1	28.2	8.9	0	NA	P	40	60	NA	NA	U	Y	Y	Y	B	B	TILL
37-01	7.9	0.6	7.3	215.3	189.6	25.7	20.0	5.7	3	588	P	30	70	NA	NA	U	Y	Y	Y	B	B	TILL
-02	5.1	1.0	4.1	147.7	125.1	22.6	17.4	5.2	6	298	P	50	50	NA	NA	U	Y	Y	Y	B	B	TILL
-03	8.1	1.0	7.1	139.1	122.5	16.6	12.7	3.9	0	NA	C	10	70	20	NA	U	Y	Y	Y	B	B	TILL
38-01	7.9	0.4	7.5	205.4	170.3	35.1	28.5	6.6	4	117	P	15	85	TR	NA	U	Y	Y	Y	B	B	TILL
-02	5.6	0.8	4.8	133.1	104.6	28.5	22.1	6.4	1	223	P	30	70	NA	NA	U	Y	Y	Y	B	B	TILL
39-01	5.7	0.2	5.5	163.0	134.9	28.1	21.9	6.2	0	NA	P	10	90	NA	NA	U	Y	Y	Y	B	B	TILL
-02	7.9	1.0	6.9	176.0	137.3	38.7	28.6	10.1	0	NA	P	15	85	NA	NA	U	Y	Y	Y	B	B	TILL
-03	8.1	0.8	7.3	153.3	113.1	40.2	30.0	10.2	0	NA	P	10	90	NA	NA	U	Y	Y	Y	B	B	TILL
-04	8.2	0.7	7.5	166.6	126.1	40.5	28.3	12.2	0	NA	P	15	85	NA	NA	U	Y	Y	Y	B	B	TILL
-05	8.1	0.9	7.2	192.6	151.3	41.3	30.3	11.0	1	6	P	20	80	NA	NA	U	Y	Y	Y	B	B	TILL
-06	7.8	0.2	7.6	148.9	109.5	39.4	32.1	7.3	4	57	P	10	90	NA	NA	U	Y	Y	Y	GB	GB	TILL
-07	7.9	0.5	7.4	129.2	96.6	32.6	25.4	7.2	1	15	P	20	80	NA	NA	U	Y	Y	Y	GB	GB	TILL
40-01	2.0	0.0	2.0	82.9	74.4	8.5	6.7	1.8	1	1701	TR	NA	NA	NA	NA	U	Y	Y	Y	B	B	TILL
-02	6.9	0.3	6.6	157.6	123.8	33.8	24.9	8.9	0	NA	P	10	90	NA	NA	U	Y	Y	Y	B	B	TILL
-03	8.0	0.7	7.3	145.5	106.3	39.2	29.7	9.5	1	13	P	15	85	NA	NA	U	Y	Y	Y	B	B	TILL
-04	8.1	0.4	7.7	207.0	168.8	38.2	29.9	8.3	0	NA	P	20	80	NA	NA	U	Y	Y	Y	B	B	TILL
-05	7.6	0.7	6.9	126.8	97.1	29.7	22.5	7.2	0	NA	P	10	90	NA	NA	U	Y	Y	Y	B	B	TILL
-06	6.6	0.4	6.2	140.7	112.2	28.5	21.9	6.6	1	46	P	25	85	NA	NA	U	Y	Y	Y	B	B	TILL

FADR1JUN.WR1
TOTAL # OF SAMPLES IN THIS REPORT = 48

OVERBURDEN DRILLING MANAGEMENT LIMITED

LABORATORY SAMPLE LOG

SAMPLE NO.	WEIGHT (KG.WET)			WEIGHT (GRAMS DRY)					AU		DESCRIPTION											CLASS
						M. I. CONC					CLAST					MATRIX						
	TABLE SPLIT	+10 CHIPS	TABLE FEED	TABLE CONC	M.I. LIGHTS	CONC. TOTAL	NON MAG	MAG	NO. V.G.	CALC PPB	SIZE	%				S/U	SD	ST	CY	COLOR		
												V/S	GR	LS	OT					SD	CY	
DR-87																						
41-PT	7.4	0.0	7.4	58.8	53.2	5.6	5.3	0.3	1	191	TR	NA	NA	NA	C	U	Y	Y	Y	B	BN	TILL
42-01	3.6	0.0	3.6	116.7	99.0	17.7	14.6	3.1	0	NA	TR	NA	NA	NA	NA	U	Y	Y	Y	B	B	TILL
43-01	1.9	0.2	1.7	122.1	112.8	9.3	7.4	1.9	0	NA	P	40	60	NA	NA	U	Y	Y	Y	B	B	TILL
45-01	5.8	0.2	5.6	284.1	126.6	157.5	151.7	5.8	2	10	P	20	80	NA	NA	U	Y	Y	Y	GB	BN	TILL

GOLD CLASSIFICATION

VISIBLE GOLD FROM SHAKING TABLE AND PANNING

FADRIMAY.WR1
TOTAL # OF PANNINGS 28

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS ABRADED T	NUMBER OF GRAINS ABRADED P	NUMBER OF GRAINS IRREGULAR T	NUMBER OF GRAINS IRREGULAR P	NUMBER OF GRAINS DELICATE T	NUMBER OF GRAINS DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
DF-87													
01-01	Y	50 X 75	13 C			1				1			EST. 1% PYRITE
		75 X 100	18 C	1						1			
										2	17.4	80	
02-01	Y	25 X 25	5 C				1			1			EST. 1% PYRITE
		25 X 50	8 C					1		1			
		50 X 50	10 C		1					1			
		50 X 75	13 C	1			1			2			
		75 X 100	18 C		1					1			
		75 X 150	22 C	1						1			
										7	36.5	114	
03-01	Y	25 X 50	8 C			1				1			EST. 1% PYRITE
		25 X 75	10 C		1					1			
		75 X 200	27 C	1						1			
										3	32.6	126	
05-01	Y	25 X 50	8 C		1					1			EST. 0.5% PYRITE
		25 X 75	10 C	1						1			
		50 X 75	13 C			1	1			2			
		125 X 150	27 C	1						1			
										5	36.6	132	
06-01	N	150 X 150	29 C	1						1			
										1	4.8	1028	
-02	Y	25 X 50	8 C	1	2					3			EST. 1% PYRITE
		50 X 75	13 C	1	1					2			
		75 X 75	15 C		1					1			
		75 X 100	18 C		1					1			
										7	42.9	62	
07-01	Y	25 X 25	5 C				1			1			EST. 0.5% PYRITE
		25 X 50	8 C			1				1			
		50 X 100	15 C	1						1			
		50 X 125	18 C		2					2			
		75 X 75	15 C		1					1			
		100 X 175	27 C	1						1			
										7	38.1	188	

GOLD CLASSIFICATION

VISIBLE GOLD FROM SHAKING TABLE AND PANNING

FADR1MAY.WR1

TOTAL # OF PANNINGS 28

				NUMBER OF GRAINS									
				ABRADED		IRREGULAR		DELICATE		TOTAL	NON	CALC V.G.	
SAMPLE #	PANNED										MAG	ASSAY	
	Y/N	DIAMETER	THICKNESS	T	P	T	P	T	P		GMS	PPB	REMARKS
DR-87													
08-01	Y	25 X 50	8 C		1					1			EST. 1% PYRITE
		25 X 75	10 C			1				1			150 MARCASITE PELLETS
		50 X 75	13 C	1						1			
										3	18.3	35	
09-01	Y	25 X 50	8 C						1	1			EST. 0.5% PYRITE
		75 X 75	15 C					1		1			
		75 X 100	75 M						1	1			
										3	9.6	524	
10-01	N	NO VISIBLE GOLD											
12-01	N	NO VISIBLE GOLD											
-PT	N	NO VISIBLE GOLD											
13-01	Y	75 X 200	27 C				1			1			EST. 20% PYRITE
		100 X 100	20 C				1			1			
										2	41.2	129	
14-01	N	75 X 100	18 C			1				1			
										1	15.0	67	
15-01	Y	25 X 50	8 C		2		1			3			EST. 0.5% PYRITE
		25 X 75	10 C		1					1			
		50 X 125	18 C	1						1			
		75 X 75	15 C			1				1			
										6	23.6	89	
-02	Y	25 X 25	5 C				1			1			EST. 0.5% PYRITE
		25 X 50	8 C				1			1			
		50 X 50	10 C	1	2					3			
		50 X 75	13 C	2						2			
		50 X 100	15 C		1					1			
		75 X 75	15 C		1					1			
		100 X 100	20 C	1						1			
		100 X 175	100 M	1						1			
		125 X 175	29 C			1				1			
										12	27.6	845	
16-PT	N	NO VISIBLE GOLD											

GOLD CLASSIFICATION

VISIBLE GOLD FROM SHAKING TABLE AND PANNING

FADR1MAY.WR1
TOTAL # OF PANNINGS 28

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
DR-87													
17-01	N	NO VISIBLE GOLD											
18-01	Y	25 X 25	5 C						3	3			EST. 1% PYRITE
		25 X 50	8 C		1		1		3	5			
		25 X 75	10 C						1	1			
		50 X 50	10 C					1		1			
		50 X 75	13 C				1			1			
		50 X 150	20 C	1						1			
		75 X 75	15 C			1				1			
		75 X 100	18 C				1			1			
		75 X 150	22 C	1						1			
		100 X 125	22 C	1						1			
		100 X 225	31 C					1		1			
										17	25.7	579	
-02	Y	25 X 25	5 C				4		1	5			EST. 3% PYRITE
		25 X 50	8 C				3	1	1	5			
		50 X 50	10 C				1		1	2			
		50 X 75	13 C	1				1		2			
		75 X 100	18 C				1			1			
		100 X 125	22 C	1		1				2			
										17	29.0	238	
19-01	Y	25 X 50	8 C	1				1		2			EST. 0.5% PYRITE
		50 X 50	10 C	2			1			3			
		50 X 75	13 C	1	1					2			
		50 X 100	15 C	1						1			
		50 X 175	22 C					1		1			
		75 X 100	18 C			1				1			
										10	31.6	166	
20-01	Y	25 X 50	8 C		2					2			EST. 2% PYRITE
		50 X 50	10 C		1					1			
		100 X 150	25 C	1						1			
		200 X 250	42 C	1						1			
										5	24.7	780	
-02	Y	25 X 25	5 C		1				1	2			EST. 3% PYRITE 50% OF PYRITE OXIDIZED
		25 X 50	8 C		1				2	3			
		50 X 50	10 C			1				1			
		50 X 75	13 C	1	1					2			
		50 X 100	15 C						1	1			

GOLD CLASSIFICATION
===================
VISIBLE GOLD FROM SHAKING TABLE AND PANNING

FADRIMAY.WR1
TOTAL # OF PANNINGS 28

NUMBER OF GRAINS

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	ABRADED		IRREGULAR		DELICATE		TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
				T	P	T	P	T	P				
DR-87													
										9	15.0	125	
21-01	N	NO VISIBLE GOLD											
22-01	Y	25 X 25	5 C				4	6	4	14			EST. 1% PYRITE
		25 X 50	8 C			2		2		4			PHOTOMICROGRAPH AVAILABLE
		25 X 125	15 C					1		1			FILM REFERENCE #04
		50 X 50	10 C			3	2	2	1	8			
		50 X 75	13 C				2	2	4	8			
		50 X 100	15 C				2			2			
		50 X 125	18 C			1				1			
		75 X 150	22 C						1	1			
		75 X 175	25 C				1			1			
		75 X 250	31 C						1	1			
										41	20.2	959	
23-01	Y	25 X 25	5 C						2	2			EST. 1% PYRITE
		50 X 50	10 C	1						1			
		50 X 100	15 C		1					1			
		50 X 125	18 C		1			1		2			
										6	11.7	248	
24-01	Y	25 X 25	5 C						8	8			EST. 2% PYRITE
		25 X 50	8 C	1						1			
		50 X 50	10 C						7	7			
		50 X 100	15 C					1		1			
		75 X 75	15 C	1					3	4			
		75 X 100	18 C						1	1			
										22	5.4	1081	
25-FT	N	NO VISIBLE GOLD											
26-01	N	NO VISIBLE GOLD											
27-01	N	50 X 75	13 C	1						1			
										1	9.1	41	
28-01	Y	25 X 75	10 C	1						1			EST. 1% PYRITE
		50 X 75	13 C		1					1			
		75 X 125	20 C	1						1			
		100 X 125	22 C					1		1			

GOLD CLASSIFICATION
==================
VISIBLE GOLD FROM SHAKING TABLE AND PANNING

FADR1MAY.WR1
TOTAL # OF PANNINGS 28

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS ABRADED T	P	IRREGULAR T	P	DELICATE T	P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
DR-87													
										4	18.4	228	
29-01	Y	25 X 25	5 C		1				1	2			EST. 0.5% PYRITE
		25 X 50	8 C			1			1	2			
		75 X 125	20 C			1				1			
										5	26.9	64	
-02	Y	25 X 75	10 C			1				1			EST. 2% PYRITE
		50 X 75	13 C		1					1			
		75 X 100	18 C	1						1			
		200 X 125	31 C			1				1			
										4	13.3	587	
30-01	Y	25 X 50	8 C			1		1		2			EST. 1% PYRITE
		50 X 75	13 C	1	1					2			
		50 X 100	15 C		1					1			
										5	25.2	62	
-02	Y	75 X 75	15 C	1						1			EST. 1% PYRITE
		75 X 125	20 C	1						1			
										2	30.8	70	
-03	Y	25 X 25	5 C		1		1			2			EST. 10% PYRITE
		25 X 50	8 C		1					1			
		75 X 75	15 C		1					1			
										4	29.0	27	
31-01	Y	25 X 25	5 C		2				2	4			EST. 1% PYRITE
		50 X 50	10 C	1	1		1	1	2	6			
		50 X 75	13 C			1				1			
		50 X 100	15 C		1					1			
		75 X 75	15 C			1			1	2			
		75 X 100	18 C	1	1	1				3			
										17	20.7	318	
-02	Y	25 X 25	5 C		4	1		1	6	12			EST. 1% PYRITE
		25 X 50	8 C						4	4			
		25 X 75	10 C			1				1			
		50 X 50	10 C					2		2			
		50 X 75	13 C		2	1		2	1	6			
		50 X 100	15 C					1		1			

GOLD CLASSIFICATION

VISIBLE GOLD FROM SHAKING TABLE AND PANNING

FADR1MAY.WR1
TOTAL # OF PANNINGS 28

SAMPLE #	PANNED Y/N	DIAMETER	THICKNESS	NUMBER OF GRAINS ABRADED T	ABRADED P	IRREGULAR T	IRREGULAR P	DELICATE T	DELICATE P	TOTAL	NON MAG GMS	CALC V.G. ASSAY PPB	REMARKS
DR-37													
		75 X 75	15 C		1					1			
		75 X 100	18 C			1			1	2			
		75 X 150	22 C	1						1			
		100 X 150	25 C			1				1			
										31	27.2	432	
32-01	Y	25 X 25	5 C		1					1			EST. 0.5% PYRITE
		25 X 50	8 C		2		2			4			
		50 X 75	13 C			1				1			
		50 X 125	18 C	1						1			
										7	21.8	80	
32-02	N	NO VISIBLE GOLD											

```
GOLD CLASSIFICATION
===================
VISIBLE GOLD FROM SHAKING TABLE AND PANNING

FADR1JUN.WR1                                        NUMBER OF GRAINS
TOTAL # OF PANNINGS       13             ------------------------------------
                                         ABRADED   IRREGULAR   DELICATE  TOTAL NON    CALC V.G.
SAMPLE #  PANNED                         =======   =========   ========  ===== MAG      ASSAY
           Y/N    DIAMETER   THICKNESS    T    P     T    P     T    P         GMS      PPB    REMARKS

 DR-87
                                                                           2   30.2       25

   36-01   N   NO VISIBLE GOLD

     -02   N   NO VISIBLE GOLD

   37-01   Y       50 X  50      10 C          1                           1                   EST. 0.5% PYRITE
                  100 X 250      34 C     1                                1
                  125 X 150      27 C     1                                1
                                                                        ------------------
                                                                           3   20.0      588

     -02   Y       25 X  50       8 C          1                           1                   EST. 1% PYRITE
                   50 X  50      10 C     1                                1
                   50 X  75      13 C     1                                1
                   50 X 100      15 C          1                           1
                   75 X 100      18 C          1                           1
                  100 X 150      25 C     1                                1
                                                                        ------------------
                                                                           6   17.4      298

     -03   N   NO VISIBLE GOLD

   38-01   Y       50 X  50      10 C          1                           1                   EST. 0.5% PYRITE
                   75 X  75      15 C          1                           1
                   75 X 100      18 C     1                                1
                   75 X 125      20 C     1                                1
                                                                        ------------------
                                                                           4   28.5      117

     -02   N      100 X 200      29 C     1                                1
                                                                        ------------------
                                                                           1   22.1      223

   39-01   N   NO VISIBLE GOLD

     -02   N   NO VISIBLE GOLD

     -03   N   NO VISIBLE GOLD

     -04   N   NO VISIBLE GOLD

     -05   N       50 X  50      10 C     1                                1
                                                                        ------------------
                                                                           1   30.3        6

     -06   Y       25 X  50       8 C          1                           1                   EST. 2% PYRITE
```

```
GOLD CLASSIFICATION
===================
VISIBLE GOLD FROM SHAKING TABLE AND PANNING

FADR1JUN.MR1                                          NUMBER OF GRAINS
TOTAL # OF PANNINGS       13                  ----------------------------------
                                              ABRADED   IRREGULAR  DELICATE TOTAL NON    CALC V.G.
SAMPLE #  PANNED                              =======   ========   ======== ===== MAG      ASSAY
           Y/N     DIAMETER   THICKNESS        T    P    T    P     T    P        GMS      PPB    REMARKS

 DR-87
                   50 X  75       13 C    1                              1
                   50 X 150       20 C    1                              1
                  100 X 100       20 C    1                              1
                                                                      --------------------
                                                                         5   34.0      101

   35-01    N      50 X  50       10 C    1                              1
                                                                      --------------------
                                                                         1   24.0        8

     -02    Y      25 X  50        8 C         1         1               2                 EST. 0.5% PYRITE
                   50 X  50       10 C         1                         1
                   75 X  75       15 C         1                         1
                   75 X 100       18 C    1                              1
                  175 X 175       34 C              1                    1
                  300 X 550       71 C    1                              1
                                                                      --------------------
                                                                         7   26.4     4022

     -03    N   NO VISIBLE GOLD

     -04    N   NO VISIBLE GOLD

     -05    Y      25 X  25        5 C                             1     1                 EST. 1% PYRITE
                   50 X  50       10 C    1                              1
                   50 X  75       13 C    1              1               2
                                                                      --------------------
                                                                         4   31.5       31

     -06    N      75 X 125       20 C    1                              1
                                                                      --------------------
                                                                         1   22.5       67

     -07    N      25 X  75       10 C    1                              1
                                                                      --------------------
                                                                         1   28.4        7

     -08    Y      25 X  50        8 C    1                              1                 EST. 1% PYRITE
                   25 X  75       10 C    2                              2
                   50 X  50       10 C              1                    1
                   50 X 125       18 C    1                              1
                   75 X 100       18 C    2                              2
                                                                      --------------------
                                                                         7   25.7      144

     -09    Y      50 X  75       13 C    2                              2                 EST. 1% PYRITE
                                                                      --------------------
```

```
GOLD CLASSIFICATION
===================
VISIBLE GOLD FROM SHAKING TABLE AND PANNING

FADR1JUN.WR1                                    NUMBER OF GRAINS
TOTAL # OF PANNINGS       13
                                       ------------------------------------
                                       ABRADED   IRREGULAR  DELICATE TOTAL NON    CALC V.G.
SAMPLE #  PANNED                       =======   =========  ======== ===== MAG      ASSAY
           Y/N    DIAMETER   THICKNESS    T    P    T    P    T    P       GMS      PPB    REMARKS

 DR-87
   33-01    N      75 X  100      18 C    1                              1
                                                                      --------------------
                                                                         1   15.8       64

     -02    N     175 X  250      40 C    1                              1
                                                                      --------------------
                                                                         1   30.4      447

   34-01    N   NO VISIBLE GOLD

     -02    N      50 X  100      15 C    1                              1
                                                                      --------------------
                                                                         1   29.7       22

     -03    N      75 X   75      15 C    1                              1
                                                                      --------------------
                                                                         1   23.7       27

     -04    Y      75 X   75      15 C         1                         1                 EST. 1% PYRITE
                   75 X  100      18 C    1                              1
                  175 X  175      34 C    1                              1
                                                                      --------------------
                                                                         3   25.5      368

     -05    N   NO VISIBLE GOLD

     -06    N      50 X   75      13 C         1                         1
                                                                      --------------------
                                                                         1   26.1       14

     -07    N   NO VISIBLE GOLD

     -08    N   NO VISIBLE GOLD

     -09    N      25 X   50       8 C    1                              1
                                                                      --------------------
                                                                         1   20.5        4

     -10    N      50 X   50      10 C    1                              1
                                                                      --------------------
                                                                         1   32.9        6

     -11    N   NO VISIBLE GOLD

     -12    N   NO VISIBLE GOLD

     -13    Y      25 X   25       5 C         1    1                    2                 EST. 1% PYRITE
```

GOLD CLASSIFICATION

VISIBLE GOLD FROM SHAKING TABLE AND PANNING

FADR1JUN.WR1
TOTAL # OF PANNINGS 13

SAMPLE #	PANNED			NUMBER OF GRAINS ABRADED		IRREGULAR		DELICATE		TOTAL	NON MAG	CALC V.G. ASSAY	
	Y/N	DIAMETER	THICKNESS	T	P	T	P	T	P		GMS	PPB	REMARKS
DR-87													
		50 X 75	13 C	1	1					2			
		75 X 100	18 C	1						1			
										4	32.1	57	
-07	N	50 X 75	13 C	1						1			
										1	25.4	15	
40-01	N	150 X 250	38 C	1						1			
										1	6.7	1701	
-02	N	NO VISIBLE GOLD											
-03	N	50 X 75	13 C	1						1			
										1	29.7	13	
-04	N	NO VISIBLE GOLD											
-05	N	NO VISIBLE GOLD											
-06	Y	75 X 100	18 C	1						1			EST. 2% PYRITE
										1	21.9	46	
41-PT	Y	75 X 100	18 C					1		1			NO SULPHIDES
										1	5.3	191	
42-01	N	NO VISIBLE GOLD											
43-01	N	NO VISIBLE GOLD											
45-01	Y	25 X 50	8 C	1						1			EST. 75% PYRITE
		100 X 100	20 C	1						1			
										2	151.7	10	

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
DR-87 01-01	Dark green with white veins	Schistose with parallel quartz, carb. and pyrite veins	Primary quartz and magnetite 0.5 other minerals shredded by shearing <0.5	Masked by schistosity	50% dk. gn. chlorite (no px. preserved) - trace actinolite 50% plag. (shredded) 1% colourless quartz grains (primary groundm	10% vein calcite 1% dissem. calcite 20% vein and dissem Fe/Mg carb.	1% dissem. and vein pyrite	trace magnetite	GABBRO
02-02	Dark green with white speckles and white veins	Schistose with parallel quartz and carbonate veins	Primary quartz and magnetite 0.5mm plag phenos 1mm other minerals shredded <0.5mm	Masked by schistosity	50% dk gn. chlorite (no px. preserved.) - trace actinolite 50% plag. (occasional preserved phenos. <1% of sample. remaining shredded) 1% blue and colourless quart grains (primary grai	5% vein calcite 1% dissem calcite 20% vein and dissem Fe/Mg carb.	0.5% dissem. and vein pyrite	trace magnetite	GABBRO
03-02	Dark green and white (speckled)	Massive to weakly foliated	Px. phenos 1 to 5mm plag. phenos 0.5 to 1.5mm Qtz. eyes 0.5mm	Porphyritic, ophitic, with inequigranular, interlocking groundmass. Px. phenos. poikilitically enclose plag. 4:1 plag. phenos are anhedral	60% dk. gn. px. (half are randomly oriented phenos.) 40% cloudy white plag. (half are phenos) 05% pale blue quartz	trace dissem and < 1% vein calcite 1% Fe/Mg carb.	trace dissem. PY.	Nil	GABBRO
04-01	Pink to buff	Massive	Feldspar plag. 0.5 to 3 Qtz. phenos 0.5 groundmass aphanitic	Porphyritic, quartz and Feldspar phenos. randomly oriented in very fine grained (cherty) groundmass	10% cloudy white plag. phenos. 2% colourless groundmass cherty (hard) aphanitic quartz and Feldspar 1% sericite shears <1% chlorite, dk. gn.	2% Fe/Mg carb.	trace dissem. PY.	Nil	QUARTZ FELDSPAR PORPHYRY
05-02	Medium green and white (speckled)	Massive to weakly foliated	px phenos 1-2mm plag. phenos upto 1mm groundmass ave. 0.5	Porphyritic, ophitic px. phenocrysts enclose plag. with diabasic groundmass	50% dk. and pale gn. px. (partially chloritized) (25% of px. phenocrysts) 50% cloudy white plag. (25% of plag. phenocrysts)	5% dissem. and vein calcite 2% Fe/Mg carb. vein infilling	0.5% dissem PY.	Nil	GABBRO

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
DR-87 06-03	Dark brown-black and white 50/50	Massive	px. phenos 0.5 to 2mm plag laths 0.5 to 3mm other minerals ave 0.5	ophitic, areas of large poikilitic px. phenos. enclosing plag laths separated by areas of diabase in which px. and other minerals are interstitial grains between plag. laths	30% brownish, randomly oriented px. phenos 5% epidote trace biotite 50% cloudy white plag. laths	Nil	trace pyrite trace pyrrhotite	10-15% magnetite tr. hematite	DIABASE
07-02	Dark green and white veins	well Foliated locally schistose	px and chl. phenos. 0.5-2.0mm qtz eyes. 0.5mm groundmass <0.2.	Porphyrytic, ophitic with diabasic groundmass Locally masked by schistosity.	60% dk. gn. px. and chlorite (about 10% as phenos.) 35% plag., cloudy white 5% blue and colourless quartz grains	5% dissem. calcite 5% dissem. and vein Fe/Mg carb.	trace dissem. py.	2% Magnetite dissem.inated crystals	GABBRO
08-02	Dark green and white (speckled)	Moderately Foliated, locally schistose	Px. phenos. 0.5 to 2mm qtz eyes 0.3mm groundmass 0.2mm	Porphyritic, ophitic (px. phenos. poikilitically enclose plag.) with diabasic groundmass	40% pyroxene, dk gn., mostly as phenos 10% chlorite mostly along shears 50% plag. mostly as groundmass <1% blue quartz	<1% Fe/Mg carb. vein	0.1% dissem. py.	Nil	GABBRO
09-02	Dark green and white (50/50)	Massive to locally schistose	px. and plag. phenos 0.5 to 1.5 locally minerals sheared to <0.1	Ophitic, px phenos. poikilitically enclose plag. locally texture masked by schistosity	50% green chloritized px. both as phenos. and shredded groundmass, 10% sericite 25% cloudy white plag. both as phenos and as shredded groundmass <1% quartz phenos	25% Fe/Mg carb. vein	trace py.	Nil	GABBRO
09-02B	80% light gray 20% green	Gray vein material massive green colour schistose, microlaminated	Gray aphanitic Green minerals shredded to <0.1	masked by schistosity	green part of rock Consists of shredded chloritized px. and cloudy white plag grains <1% quartz phenos. 5% sericite	80% gray Fe/Mg carb vein	Nil	Nil	GABBRO/ Fe/Mg carb vein

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
DR-87 10-02	Dark green with white veins	Schistose with 25% schistosity - parallel quartz -carbonate veins	Primary quartz + magnetite 0.5 Other minerals shredded < 0.2	Masked by schistosity	50% chlorite (no px. preserved) 50% plag. 1% blue qtz grains (primary groundmass)	10% vein calcite 1% dissem. calcite	0.1% dissem py.	1% dissem magnetite to 0.5 mm	GABBRO
11-01	Pale gray-green to buff (blotchy)	schistose with 5 % sericite and chlorite along shear partings, 10% quartz-pyrite veins parallel to foliation	aphanitic pyrite cubes upto 0.5	aphanitic texture of groundmass, (cherty) blotchy	80% of rock blotchy gray due to silicification (gray chert replacement of feldspar) 10% sericite and gn. chlorite along shear partings	10% Fe/Mg carb. dissem. and in veins	10% secondary hydrothermal py. associated with quartz veins parallel to foliation	trace tourmaline needles trace fuchsite	QUARTZ FELDSPAR PORPHYRY
12-02	Pale yellow-green to buff	Massive to weakly Foliated	aphanitic groundmass feldspar phenos 0.5-1mm	aphanitic texture of groundmass with 5% vague feldspar phenocrysts	5% feldspar phenos. in hard cherty groundmass 1% sericite and chlorite along shear partings 0.5% quartz phenos.	1% Fe/Mg carb. dissem. and in veins	trace dissem. py.	trace leucoxene along shear partings < 1% fuchsite trace tourmaline needles	QUARTZ FELDSPAR PORPHYRY
13-02	Dark green with white speckles	Massive with upto 20% of sample being schistose	px. phenos 1-4mm plag phenos 1-2 mm groundmass ave. 0.5 mm	Porphyritic, ophitic with diabasic groundmass texture locally masked by schistosity	15% dk to pale gn. px (half as phenos! partially chloritized) 35% dk gn. chlorite (upto 20% as chlorite shears) 50% cloudy white plag. (10% as phenos.)	1-2% Fe/Mg	trace dissem. py.	Nil	GABBRO
14-02	Dark green	Schistose	Mixed grain size, phenocrysts upto .5mm shredded groundmass 0.1 to 0.2 mm	Masked by schistosity	40% dk. gn. chlorite 10% pyroxene (phenos) 50% plag. (mostly shredded, occasionally as phenocrysts (10% of chl. as shears)	5% Fe/Mg carb. vein infilling 5% vein calcite 1% dissem calcite	0.1% dissem. py.	Nil	GABBRO

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
DR-87 15-03	Pale green	Schistose with plagioclase and pyroxene phenocrysts stretched parallel to schistosity.	Primary plag. and px. phenos. 0.5 to 2mm groundmass ave. 0.5	Porphyrytic, ophitic (px. and plag. phenos.) partially masked by schistosity	40% light gn. px. (half as phenos) 10% dk. gn chloritized px. phenos. 50% plag. (half as phenos) cloudy/white colour < 0.5% colourless qtz.	<1% Fe/Mg carb. 1% dissem. calcite	Nil	Nil	GABBRO
16-01	Dark green and white (speckled)	Massive to weakly foliated	px. phenos 1-3mm plag. phenos 1mm qtz. grains 0.5-1mm groundmass ave. 0.5	Pophyrytic, ophitic (px. phenos. poikilitcally enclose plag.) with diabasic groundmass	60% dk. gn. px., partially chloritized (half as phenos.) 35% cloudy white plag. (half as phenos) 5% blue quartz grains	trace Fe/Mg carb. dissem.	0.5% dissem. py.	Nil	GABBRO
17-01	70% pale gray chips 30% dk. gn. chips	Gray: Rubbly, microshattered Green: Schistose	Gray: Qtz.+plag phenos 0.2 to 2.0 Groundmass aphanitic Green: Masked by schistosity	Gray: Porphyrytic with aphanitic groundmass, phenocrysts mostly reduced by shatter brecciation Green: Masked by schistosity	Gray: 5% qtz phenos >5% feld. phenos (% uncertain due to shattering; blend with groundmass); hard siliceous grmass, with 1-5% chl. } 5-10% ser. Green: 70% ser. 30% chl.	3% fracture Fe/Mg carb. (dolomite)	1% stringer py. as breccia + shear infill	Nil	QTZ.-FELD. POR.
18-03	Pale gray to buff	Massive	Felds phenos 0.5-2.0mm qtz phenos. 0.5-2.0mm groundmass aphanitic	Porphyrytic, feldspar, quartz phenos. in aphanitic groundmass	1% gn. chlorite 5% gray feldspar phenos 2-5% colourless quartz phenos aphanitic hard, siliceous cherty groundmass	2% dissem. Fe/Mg carb.	trace py.	trace fuchsite trace tourmaline needles	QUARTZ FELDSPAR PORPHYRY
19-02	Buff	Massive	Felds. phenos 0.5-2.0mm qtz. phenos 0.5 groundmass aphanitic	Porphyrytic, vague outlines of feldspar phenos. in aphanitic groundmass.	2-5% Felds. phenos randomly oriented 2% quartz phenos., aphanitic groundmass hard 'cherty'	5% dissem. calcite 5% dissem Fe/Mg carb.	trace py.	trace flourite	QUARTZ FELDSPAR PORPHYRY.

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
DR-87 19-02B	40% Buff colour 60% gray-brown	Buff weakly foliated Gray massive with a lot of cooling cracks	Buff aphanitic groundmass vague Felds. phenos 1mm Gray plag phenos 3mm qtz phenos groundmass f.g.	Buff Porphyrytic 1% plag. phenos. in aphanitic groundmass (siliceous) Gray Porphyrytic, plag. and quartz phenos. in fine grained groundmass	Buff 1% plag. phenos in aphanitic siliceous groundmass Gray 25% plag phenos. cloudy white, 10% colourless quartz phenos.	Buff 5% dissem Fe/Mg carb. Gray 5% dissem. calcite 2% dissem Fe/Mg. carb.	Buff trace dissem. py., pyrite along contact between two porphyry types Gray 0.5% py associated with qtz. phenos.	Nil	QUARTZ FELDSPAR PORPHYRY
20-03	Pale gray buff 5% green	moderately to well foliated 20% schistose (green)	Qtz. and plag phenos. 0.5-2.0 groundmass < 0.5	porphyrytic with aphanitic groundmass locally masked by schistosity	20% chlorite/sericite shears (50/50) gn. colour 10% cloudy white plag. phenos 2-3% colourless quartz grains groundmass hard, cherty	10% Fe/Mg carb. dissem 5% Fe/Mg vein carb.	0.5% py along foliation tr. chalcopyrite as breccia and shear infill	Nil	QUARTZ FELDSPAR PORPHYRY
21-02	Pale gray-green to buff	foliated	Qtz. and plag. phenos. 0.5-2.0mm	porphyrytic with aphanitic groundmass	20% dkgn chlorite along planes of foliation 10% sericite 5% cloudy white plag. phenos 5% colourless quartz phenos aphanitic groundmass, hard, cherty	2-5% Fe/Mg dissem. carb.	0.5% dissem. py.	Nil	QUARTZ FELDSPAR PORPHYRY
22-02	Dark and pale green	Schistose	Primary quartz 0.5mm other minerals shredded < 0.2	Masked by schistosity	50% chlorite (10% as shear infilling) 50% plag 1% blue quartz grains (primary groundmass)	10% dissem. calcite 5% vein calcite 1% Fe/Mg carb. vein infilling	0.1% dissem. py	0.1% dissem. tourmaline needles 5% of sample bleached.	GABBRO
23-02	Dark green with white (speckled)	Schistose	Primary quartz grains 0.5mm groundmass mostly shredded grains due to shearing < 0.2mm	Masked by schistosity	50% dk. gn. chlorite 50% plag. 2% blue and colourless quartz grains	5% dissem. calcite 5% Fe/Mg carb. dissem.	trace dissem. py.	Nil	GABBRO

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
DR-87 24-02	Dark green	Overall weakly foliated, (locally massive), 2% chlorite shear seams accompanied by 5% rusty qtz veins with vugs after carb.	Px. phenos 1 to 2 Groundmass 0.3-0.5 Locally shredded finer	Porphyrytic, ophitic (px. phenos poikilitically enclose plag) with diabasic groundmass	40% dk.gn px. (20% as phenos, 80% alt. to chlorite) 60% groundmass plag. laths 0.5% blue groundmass qtz.	3% dissem Fe/Mg carb (probably dolomite)	Trace dissem. py.	Nil	GABBRO
25-01	Dark green	massive to weakly Foliated	Px. phenos 1 to 1.5mm groundmass 0.2-0.5	porphyrytic, ophitic px. phenos. poikilitically enclose plag) with diabasic groundmass	60% dk gn. px. (partially chloritized) 10% as phenos. 40% plag. groundmass 0.5% colourless quartz	5% dissem. calcite 5% dissem. Fe/Mg carb.	0.5% dissem. PY.	Nil	GABBRO
26-02	Dark green with white (speckled)	Massive to weakly foliated	Px. phenos 1-3mm plag. phenos 1-2mm groundmass ave. 0.5	Porphyrytic, ophitic px. phenos. poikilitically enclose plag. phenos.) interlocking diabasic groundmass	50% dk gn. px., partially chloritized half as phenos. 50% cloudy white plag. (10% as phenos.) 0.1% colourless quartz	5% calcite vein 3% dissem. calcite 2% dissem Fe/Mg. carb.	0.1% dissem. py	1% dissem magnetite.	GABBRO
27-02	Pale buff-gray	Massive. Zero foliation, random phenos.	Qtz. + plag. phenos 0.5-2.0 Groundmass <0.05	Distinctly porphyrytic with cherty groundmass	2-3% colourless qtz. phenos 20% clear (unalt). gray plag. phenos Groundmass is hard (siliceous) with no mafics, 1% sericite flecks	2% Fe/Mg carb (dolomite), mainly around rims of plag. phenos.	Nil	Plag. phenos contain est. 1-2% iron oxide dust (imparts gray colour)	QTZ-FELD. POR.
28-02	Dark gray	Schistose, locally crenulated Bedded (faintly; contains 5-10% chert laminations)	aphanitic <0.1	Masked by schistosity; chert is sugary	20-25% dk gray chlorite along foliation up to 70% overall remaining minerals shredded by shearing 1% sericite	trace Fe/Mg carb. dissem. and along Fractur	Chert laminae contain up to 5% stringer py.	Chert laminae contain up to 10% finely dissem. hematite trace graphite	MUDSTONE

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
DR-87 29-02	Dark green	Schistose structure with remnant primary quartz eyes	Primary qtz. eyes 0.3-1.mm px., chl., plag. primary grains shredded due to shearing to <0.2 mm	Masked by schistosity	80% dk.gn. chlorite no preserved phenos. 15% cloudy white plag. no preserved phenos. 5% blue quartz grains (physically resistant primary grains)	2% dissem. and vein calcite 2% dissem. and vein Fe/Mg carb.	0.5% dissem. PY.	10% magnetite and ilmenite grains streaked along Foliation	GABBRO
30-04	60% white 20% buff 20% dark green	No host rock. Sample is 60% qtz-carb. veins, 30% sericitic shear seams + 20% chloritic shear seams	NA	NA	Sericitic shears are >50% sericite Chloritic shears are >50% chlorite 0.5% of fuchsite shears	Qtz-carb. veins contain 50% Fe/Mg carb Shears contain 1-5%	1% cubic py. conc. in sericitic shears + vein walls	Chloritic shears contain 1% rutile/sphene/leucoxene	QTZ-FELD POR (?) 100% veins + shears
31-03	Dark green and white (speckled)	Massive to weakly foliated	px. phenos 0.5 to 2mm plag. phenos 0.5 to 2mm groundmass ave. 0.5	Porphyrytic, ophitic with inequigranular diabasic groundmass	50% dk to pale gn. partly chloritized (half are randomly oriented phenos) 50% cloudy white plag. (half as randomly oriented phenos) <0.5% blue, colourless qtz.	2-5% dissem. and vein calcite 1% Fe/Mg carb. vein infilling	0.5% dissem py.	Nil	GABBRO
32-03	Pale to medium gray-green	Well Foliated, micro laminated	Quartz phenos 0.5 m other minerals shredded by schistosity	Porphyrytic, quartz phenos in aphanitic groundmass. locally masked by schistosity	50% gray chlorite along shears 2% quartz phenos. in siliceous groundmass	2% Fe/Mg dissem carb.	0.5% dissem. and vein pyrite	Nil	QUARTZ FELDSPAR PORPHYRY
33-03	Dark green	Moderately to well Foliated 10% of sample sheared	px., chlorite phenos. 1mm plag. phenos 1mm groundmass <0.5mm shredded	Porphyrytic, ophitic with diabasic groundmass locally masked by schistosity	40% dk.gn. px 30% dk gn. chlorite (5% of px. are phenos. oriented along Foliation) 30% plag. (2% are phenos. oriented along Foliation.	trace Fe/Mg carb. dissem.	Nil	Nil	GABBRO

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
DR-87 34-14	Pale gray to buff	Massive to weakly foliated	Feldspar phenos 0.5-1mm chlorite grains 0.5 qtz. grains 0.2 groundmass <0.2	Aphanitic to porphyrytic texture, vague feldspar phenos. in 'cherty' groundmass	5% dk to pale gn. chlorite 1% pale gray to buff feldspar phenos. 0.5% colourless qtz. grains. 1% sericite groundmass is hard 'cherty'	2% Fe/Mg dissem carb	Nil	trace tourmaline needles	QUARTZ FELDSPAR PORPHYRY
35-10	Dark green and white (speckled)	Massive	Px. phenos 1-3 mm plag. phenos .5 to 1mm groundmass ave. 0.5	Porphyritic, ophitic with inequigranular, interlocking groundmass Px. phenos. poikilitically enclose plag. 4:1 plag. phenos are anhedral	50% dk. gn. px. most as randomly oriented phenocrysts 50% plag. (5-10% as phenos.) cloudy white	Nil	trace dissem. py.	Nil	GABBRO
36-03	Dark green and white (speckled)	Massive to weakly foliated with 2% chlorite shears	Px. phenos. 1-3mm plag. phenos .5 to 1mm groundmass ave. 0.5mm	porphyrytic, ophitic with inequigranular, interlocking groundmass	50% dK. gn. px., half as randomly oriented phenos. (partially chloritized) 50% cloudy white plag. (10% as phenos.)	5% vein + dissem. calcite 2% Fe/Mg carb vein and dissem.	trace dissem. py	Nil	GABBRO
37-04	75% pale grey and buff 25% dk. gn and brown	buff weakly foliated gn schistose	buff felds. phenos 0.5-2.0 qtz. grains 0.5 aphanitic groundmass gn qtz. grains 0.5 other minerals masked by schistosity	buff porphyrytic with aphanitic groundmass gn masked by schistosity	buff 1% chlorite grains 5% quartz and 2% felds. phenos. in hard 'cherty' groundmass (siliceous) gn 65% sericite 30% chlorite 5% quartz grains	2% dissem Fe/Mg carb.	Nil	Nil	QUARTZ FELDSPAR PORPHYRY
38-03	Dark green and white (speckled)	Massive to weakly foliated	Px. phenos. 1-2 mm plag. phenos. 1 mm groundmass ave. 0.5	Porphyrytic, ophitic px. phenocrysts enclose plag. with a diabasic groundmass	50% dk. gn. and pale gn px. partly chloritized (half as randomly oriented phenocrysts) 50% plag. cloudy white (10-20% as phenocrysts)	10% dissem. and vein calcite 2-5% Fe/Mg carb. vein infilling	0.5 dissem. py.	Nil	GABBRO

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
DR-87 39-08	Dark green and white (speckled)	Massive	Px. phenos 3 to 5 Plag. phenos 1 to 3 Groundmass av. 0.5	Porphyrytic, ophitic, with inequigranular, interlocking groundmass. Px. phenos poikilitically enclose plag. 4:1. Plag. phenos are anhedral.	40% dk. to pale gn. partly chloritized px. (half as randomly oriented phenos); 60% plag (5-10% as phenos) cloudy white <0.5% pale blue to colourless qtz.	Tr. dissem + <1% vein calcite	Trace dissem. py.	0.1% rutile needles as 0.5 mm clusters	GABBRO
40-07	Dark green and white (speckled)	Massive to weakly Foliated	px. phenos. 1 to 3 mm plag. phenos 1 to 3 mm groundmass ave. 0.5 locally shredded finer	Porphyrytic, ophitic with inequigranular, interlocking groundmass px. phenos. poikilitically enclose plag.)	50% dk to pale gn partly chloritized px. (half as randomly oriented phenos) 50% cloudy white plag (half as randomly oriented phenos)	5% dissem. calcite 5-10% Fe/Mg carb. dissem. and as vein infilling.	0.5% dissem. py. trace chalcopyrite dissem.	Nil	GABBRO
41-01	Dark green and white (speckled)	Massive to weakly Foliated	Px. phenos 1 to 2 mm plag. phenos 0.5 to 1.0 groundmass ave. 0.5	Porphyrytic, ophitic, with inequigranular, interlocking groundmass. px. phenos poikilitically enclose plag. phenos.	50% dk to pale gn partly chloritized px. (half as randomly oriented phenos) 50% plag (half as phenos), cloudy white <0.5% colourless qtz.	trace. dissem. and <1% vein calcite	0.5% dissem. py.	0.1% rutile needles and as .5 mm clusters - red colour	GABBRO
42-02	Dark green and white (speckled)	Weakly Foliated to moderately Foliated	px. (chlorite) phenos. plag. phenos. groundmass ave.	Porphyrytic, ophitic with inequigranular interlocking groundmass. px. and chlorite phenos. poikilitically enclose plag. phenos.	20% dk. gn. to pale gn. px. and 20% dk gn. chlorite (px. & chlorite about half as phenos oriented parallel to Foliation as well as random) 60% cloudy white plag.	trace Fe/Mg carb. dissem.	trace dissem. py	Nil	GABBRO
43-02	Light pinkish - greenish white	schistose micro-laminated as delineated by chlorite and sericite partings	aphanitic feldspar phenos. 0.5 to 1 mm	aphanitic groundmass with 1% 'ghosts' of phenocrysts, not siliceous	1% Feldspar phenocrysts in quartz-Feldspar groundmass (hard) 5-10% sericite and 1% chlorite along shears, laminations	10% Fe/Mg carb.	Trace dissem. py.	trace tourmaline needles on sericite partings	QUARTZ FELDSPAR PORPHYRY

SAMPLE NUMBER	COLOUR	STRUCTURE	GRAIN SIZE (mm)	TEXTURE	MINERALOGY				NAME
					Silicates	Carbonates	Sulphides	Other	
DR-87 44-01	Dark green	Massive to weakly foliated structure	Px. phenos 1-2mm plag. phenos .5 to 1.0 groundmass ave. 0.5	Porphyritic, ophitic, with inequigranular, interlocking groundmass Px. phenos poikilitically enclos plag. phenos.	60% dk to pale gn px (25% as randomly oriented phenos.) 40% plag. cloudy white (10% as phenos.)	< 1% dissem. calcite < 1% Fe/Mg carb	< 1% dissem. py	0.1% rutile needles	GABBRO
45-02	Pale yellow (buff) white	Massive, to weakly Foliated (micro laminati with 25-30% quartz-pyrite Foliation-parallel veins	aphanitic pyrite cubes upto 0.5mm	aphanitic texture, siliceous, 'cherty' groundmass	quartz-Feldspar hard 'cherty' groundmass 5% sericite partings	5% calcite dissem. and vein 2% Fe/Mg carb vein	25% secondary hydrothermal pyrite associated with quartz veins. (crystalline)	Nil	QUARTZ FELDSPAR PORPHYRY

Bondar-Clegg & Company Ltd.
5420 Canotek Rd.,
Ottawa, Ontario,
Canada K1J 8X5
Phone: (613) 749-2220
Telex: 053-3233

BONDAR-CLEGG

Geochemical Lab Report

REPORT: 017-2094

PROJECT: NONE

SAMPLE NUMBER	ELEMENT UNITS	SiO2 PCT	TiO2 PCT	Al2O3 PCT	Fe2O3* PCT	MnO PCT	MgO PCT	CaO PCT	Na2O PCT	K2O PCT	P2O5 PCT	LOI PCT
DR87-01-02-B		46.90	0.69	13.90	8.34	0.14	5.69	9.56	1.52	1.37	0.09	9.85
DR87-02-02-B		54.00	0.80	11.10	9.82	0.15	6.84	8.20	1.05	0.20	0.13	8.25
DR87-03-02-B		52.30	1.48	11.80	15.00	0.27	5.36	7.14	2.82	0.22	0.15	1.55
DR87-04-01-B		72.60	0.10	13.90	1.09	0.01	0.37	0.86	6.01	1.21	0.22	1.60
DR87-05-02-B		47.70	0.76	14.10	12.30	0.22	6.88	12.30	0.42	0.02	0.26	4.10
DR87-06-03-B		47.30	3.40	15.60	15.00	0.18	5.22	7.16	3.49	1.09	0.60	1.10
DR87-07-02-B		46.80	1.75	10.80	19.30	0.22	4.85	7.11	2.20	0.04	0.20	7.55
DR87-08-02-B		45.40	0.43	16.80	9.59	0.16	9.93	9.36	1.79	0.04	<0.01	3.60
DR87-09-02-B(A)		67.90	0.25	12.00	6.41	0.05	5.61	1.42	2.05	0.77	0.16	4.25
DR87-09-02-B(B)		56.50	0.18	21.10	2.42	0.03	2.03	2.18	5.97	2.59	0.10	4.15
DR87-09-02-B(AB)		61.30	0.23	16.10	5.46	0.05	4.81	1.39	3.44	1.73	0.19	3.75
DR87-10-02-B		46.80	1.21	13.40	12.10	0.14	6.46	8.44	2.14	0.08	0.15	9.20
DR87-11-01-B		60.60	0.13	12.90	11.30	0.24	0.68	1.28	3.30	1.61	0.14	5.25
DR87-12-02-B		71.10	0.11	14.30	1.45	0.01	0.57	1.51	5.40	0.95	<0.01	2.05
DR87-13-02-B		45.20	0.55	19.00	9.56	0.15	7.35	10.10	1.71	0.17	0.27	3.75
DR87-14-02-B		45.50	0.62	15.70	10.90	0.15	10.70	7.05	2.03	0.56	0.26	4.25
DR87-15-03-B		44.60	0.49	17.70	9.78	0.15	9.76	9.17	1.73	0.20	0.21	4.05
DR87-16-01-B		49.80	1.06	13.00	14.80	0.24	6.64	9.07	1.59	0.09	<0.01	2.30
DR87-17-02-B		64.60	0.23	14.50	4.12	0.03	2.77	2.08	3.46	1.89	<0.01	3.85
DR87-18-03-B		68.30	0.24	13.40	2.52	0.04	1.44	2.44	5.20	0.94	0.07	3.20
DR87-19-02-B		60.70	1.11	13.90	5.17	0.03	1.88	4.37	4.61	0.85	0.08	5.20
DR87-20-03-B		55.60	0.43	12.80	6.68	0.08	6.42	4.79	1.17	1.32	<0.01	9.15
DR87-21-02-B		73.80	0.26	12.60	2.36	0.02	1.30	0.31	3.74	1.63	0.06	1.45
DR87-22-02-B		48.90	0.55	14.90	7.58	0.10	5.41	7.62	1.79	1.55	0.08	9.60
DR87-23-02-B		47.70	0.63	13.20	10.50	0.13	9.80	5.20	1.70	0.11	0.04	9.50
DR87-24-02-B		52.20	1.05	12.60	11.80	0.19	6.93	7.57	1.46	0.32	0.08	4.05
DR87-25-01-B		48.80	0.85	14.20	12.80	0.13	6.99	6.90	3.19	0.14	<0.01	5.15
DR87-26-02-B		49.50	0.88	12.40	12.30	0.16	7.28	7.76	3.01	0.04	<0.01	4.35
DR87-27-02-B		70.20	0.16	14.90	1.87	0.02	1.56	1.19	4.76	1.36	0.09	1.85
DR87-28-02-B		68.70	0.65	13.90	5.56	0.06	1.12	0.51	2.07	1.99	0.05	2.55
DR87-29-03-B		46.90	2.09	11.70	16.10	0.19	3.75	7.11	2.25	0.01	0.13	7.75
DR87-30-04-B		45.10	0.57	12.40	6.03	0.12	3.16	13.90	0.64	1.62	<0.01	13.75
DR87-31-03-B		49.50	0.85	14.50	12.70	0.20	7.97	10.00	0.71	0.03	<0.01	3.20
DR87-32-03-B		67.50	0.57	14.90	4.13	0.04	0.81	1.46	3.40	1.96	0.06	2.45
DR87-33-03-B		50.40	0.68	14.00	11.90	0.22	6.83	8.85	2.04	0.07	<0.01	4.20
DR87-34-14-B		69.70	0.16	14.80	1.74	0.02	0.87	1.83	4.75	1.74	0.08	1.80
DR87-35-10-B		47.60	0.43	15.10	10.40	0.19	11.10	9.18	2.12	0.07	0.09	3.15
DR87-36-03-B		47.20	0.63	15.10	10.40	0.18	9.92	9.66	2.16	0.03	0.08	5.30
DR87-37-04-B		72.00	0.16	14.00	2.00	0.03	1.43	0.91	2.93	2.35	<0.01	2.05
DR87-38-03-B		47.30	0.66	14.80	12.40	0.19	11.10	8.60	1.28	0.07	0.01	4.15

Bondar-Clegg & Company Ltd.
5420 Canotek Rd.,
Ottawa, Ontario,
Canada K1J 8X5
Phone: (613) 749-2220
Telex: 053-3233

BONDAR-CLEGG

Geochemical Lab Report

REPORT: 017-2094

PROJECT: NONE PAGE 1B

SAMPLE NUMBER	ELEMENT UNITS	Total PCT	Cu PPM	Zn PPM	As PPM	Au PPB
DR87-01-02-B		98.05	44	51	3	15
DR87-02-02-B		100.54	107	69	8	5
DR87-03-02-B		98.09	47	38	2	5
DR87-04-01-B		97.97	11	7	<2	<5
DR87-05-02-B		99.07	142	59	16	<5
DR87-06-03-B		100.15	29	60	<2	<5
DR87-07-02-B		100.83	169	108	11	10
DR87-08-02-B		97.09	62	38	20	10
DR87-09-02-B(A)		100.87	13	98	2	<5
DR87-09-02-B(B)		97.25	6	36	2	<5
DR87-09-02-B(AB)		98.45	10	78	5	<5
DR87-10-02-B		100.12	71	67	5	15
DR87-11-01-B		97.42	11	33	25	25
DR87-12-02-B		97.45	2	22	<2	<5
DR87-13-02-B		97.80	75	64	14	<5
DR87-14-02-B		97.71	39	58	10	<5
DR87-15-03-B		97.84	13	56	8	<5
DR87-16-01-B		98.59	172	68	2	<5
DR87-17-02-B		97.53	34	52	3	<5
DR87-18-03-B		97.79	12	33	3	5
DR87-19-02-B		97.90	17	35	7	15
DR87-20-03-B		98.44	47	115	20	90
DR87-21-02-B		97.53	10	32	4	<5
DR87-22-02-B		98.08	36	66	2	<5
DR87-23-02-B		98.51	64	66	5	<5
DR87-24-02-B		98.26	98	62	14	<5
DR87-25-01-B		99.16	94	39	3	<5
DR87-26-02-B		97.68	136	53	4	<5
DR87-27-02-B		97.97	11	23	8	<5
DR87-28-02-B		97.16	38	61	28	<5
DR87-29-03-B		97.98	54	119	4	<5
DR87-30-04-B		97.29	60	105	2	45
DR87-31-03-B		99.66	57	61	3	5
DR87-32-03-B		97.28	32	133	14	<5
DR87-33-03-B		99.19	103	62	10	<5
DR87-34-14-B		97.49	10	25	2	<5
DR87-35-10-B		99.42	53	42	6	<5
DR87-36-03-B		100.60	37	47	4	<5
DR87-37-04-B		97.86	16	43	<2	<5
DR87-38-03-B		100.56	50	79	7	<5

Bondar-Clegg & Company Ltd.
5420 Canotek Rd.,
Ottawa, Ontario,
Canada K1J 8X5
Phone: (613) 749-2220
Telex: 053-3233

BONDAR-CLEGG

Geochemical Lab Report

REPORT: 017-2246

PROJECT: NONE PAGE 1A

SAMPLE	ELEMENT	SiO2	TiO2	Al2O3	Fe2O3*	MnO	MgO	CaO	Na2O	K2O	P2O5	LOI
NUMBER	UNITS	PCT	PCT	PCT	PCT	PCT	PCT	PCT	PCT	PCT	PCT	PCT
DR87-33-03-BDRK		47.50	0.78	15.40	15.00	0.31	7.13	9.13	0.70	0.04	0.06	4.05

Bondar-Clegg & Company Ltd.
5420 Canotek, Rd.,
Ottawa, Ontario,
Canada K1J 8X5
Phone: (613) 749-2220
Telex: 053-3233

Geochemical Lab Report

REPORT: 017-2246

PROJECT: NONE

SAMPLE NUMBER	ELEMENT UNITS	Total PCT	Cu PPM	Zn PPM	As PPM	Au PPB
DR87-33-03-BDRK		100.10	57	67	10	<5

Bondar-Clegg & Company Ltd.
5420 Canotek Rd.,
Ottawa, Ontario,
Canada K1J 8X5
Phone: (613) 749-2220
Telex: 053-3233

BONDAR-CLEGG

Geochemical Lab Report

REPORT: 017-2094

PROJECT: NONE PAGE 2A

SAMPLE NUMBER	ELEMENT UNITS	SiO_2 PCT	TiO_2 PCT	Al_2O_3 PCT	Fe_2O_3* PCT	MnO PCT	MgO PCT	CaO PCT	Na_2O PCT	K_2O PCT	P_2O_5 PCT	LOI PCT
DR87-39-08-B		50.90	0.54	13.90	8.88	0.16	8.72	10.50	2.33	0.29	0.09	2.10
DR87-40-07-B		48.60	0.82	14.10	12.10	0.17	7.81	9.40	1.65	0.06	0.09	2.80
DR87-41-07-B		47.40	0.73	15.70	10.80	0.16	9.80	9.36	1.41	0.12	0.10	3.15
DR87-42-02-B		46.10	0.43	16.50	10.70	0.16	10.60	8.70	1.48	0.09	0.10	3.20
DR87-43-02-B		70.70	0.12	14.20	0.94	0.02	0.34	2.84	4.98	1.30	<0.01	2.10
DR87-44-01-B		47.70	1.06	13.70	15.10	0.20	6.57	9.64	1.84	0.09	0.09	1.40
DR87-45-02-B		54.00	0.13	10.70	17.20	0.08	0.80	2.49	2.91	1.02	0.04	8.15

REPORT: 017-2094

PROJECT: NONE PAGE 2B

SAMPLE NUMBER	ELEMENT UNITS	Total PCT	Cu PPM	Zn PPM	As PPM	Au PPB
DR87-39-08-B		98.41	29	31	13	<5
DR87-40-07-B		97.60	263	39	2	<5
DR87-41-07-B		98.73	35	50	2	<5
DR87-42-02-B		96.07	48	53	29	<5
DR87-43-02-B		97.53	6	11	<2	10.
DR87-44-01-B		97.39	116	54	3	25
DR87-45-02-B		97.52	15	58	33	45

Bondar-Clegg & Company Ltd.
5420 Canotek Rd.,
Ottawa, Ontario,
Canada K1J 8X5
Phone: (613) 749-2220
Telex: 053-3233

BONDAR-CLEGG

Geochemical Lab Report

REPORT: 017-2322

PROJECT: ODM DATA PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Zn PPM	As PPM	Au PPB	Testwt gms	
DR87-01-01-3/4		290	136	41	85		
DR87-02-01-3/4		841	31	52	770		
DR87-03-01-3/4		162	36	37	150		
DR87-05-01-34		16	18	6	30		
DR87-06-01-3/4		98	42	74	690	2.00	
DR87-06-02-3/4		93	86	31	20		
DR87-07-01-3/4		40	21	12	315		
DR87-08-01-3/4		124	42	83	410		
DR87-09-01-3/4		81	23	34	1030	5.00	
DR87-10-01-3/4		591	40	77	540	0.50	
DR87-12-01-3/4		38	28	36	<50	1.00	
DR87-12-PT-3/4		12	16	6	445		
DR87-13-01-3/4		241	100	153	785		
DR87-14-01-3/4		37	21	12	90	9.00	
DR87-15-01-3/4		43	20	138	325		
DR87-15-02-3/4		31	20	18	845		
DR87-16-PT-3/4		20	20	5	95	2.00	
DR87-17-01-3/4		66	22	124	90		
DR87-18-01-3/4		431	162	105	2820		
DR87-18-02-3/4		574	174	94	340		
DR87-19-01-3/4		44	20	89	235		
DR87-20-01-3/4		75	19	95	265		
DR87-20-02-3/4		333	24	68	2475	9.00	
DR87-21-01-3/4		80	40	30	1005	1.50	
DR87-22-01-3/4		45	18	104	2735		
DR87-23-01-3/4		42	20	94	2070	7.00	
DR87-24-01-3/4		93	22	78	>20000	2.00	— Approx. 26,000
DR87-25-PT-3/4		34	20	158	35	2.00	
DR87-26-01-3/4		307	24	97	180	1.00	
DR87-27-01-3/4		125	28	212	3045	5.00	
DR87-28-01-3/4		30	20	75	1235		
DR87-29-01-3/4		29	16	33	380		
DR87-29-02-3/4		92	24	107	1310	7.00	
DR87-30-01-3/4		61	22	200	250		
DR87-30-02-3/4		110	22	24	30		
DR87-30-03-3/4		312	78	104	945		
DR87-31-01-3/4		61	16	8	835		
DR87-31-02-3/4		410	18	8	1640		
DR87-32-01-3/4		17	18	3	260		
DR87-32-02-3/4		69	23	16	15		

Bondar-Clegg & Company Ltd.
5420 Canotek Rd.,
Ottawa, Ontario,
Canada K1J 8X5
Phone: (613) 749-2220
Telex: 053-3233

BONDAR-CLEGG

Geochemical Lab Report

REPORT: 017-2428

PROJECT: ODM DATA PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Zn PPM	As PPM	Au PPB	Testwt gms
DR87-33-01-3/4		42	40	6	110	
DR87-33-02-3/4		704	46	105	1525	
DR87-34-01-3/4		40	32	6	55	
DR87-34-02-3/4		58	34	6	170	
DR87-34-03-3/4		68	29	11	200	
DR87-34-04-3/4		43	29	11	370	
DR87-34-05-3/4		59	36	8	75	
DR87-34-06-3/4		89	30	6	130	
DR87-34-07-3/4		107	37	21	15	
DR87-34-08-3/4		101	36	6	20	
DR87-34-09-3/4		92	39	5	135	
DR87-34-10-3/4		142	46	13	60	
DR87-34-11-3/4		94	33	16	75	
DR87-34-12-3/4		129	32	28	305	
DR87-34-13-3/4		189	30	23	265	
DR87-35-01-3/4		80	34	6	100	
DR87-35-03-3/4		53	31	5	280	
DR87-35-04-3/4		50	29	3	70	
DR87-35-05-3/4		69	31	12	50	
DR87-35-06-3/4		82	39	12	90	
DR87-35-07-3/4		169	52	54	45	
DR87-35-08-3/4		196	31	16	135	
DR87-35-09-3/4		177	43	37	80	
DR87-36-01-3/4		39	33	2	30	
DR87-36-02-3/4		68	35	5	50	
DR87-37-01-3/4		33	29	2	600	
DR87-37-02-3/4		142	57	47	360	
DR87-37-03-3/4		130	64	87	40	7.00
DR87-38-01-3/4		22	22	2	70	
DR87-38-02-3/4		181	27	35	1885	
DR87-39-01-3/4		53	102	16	90	
DR87-39-02-3/4		94	52	24	35	
DR87-39-03-3/4		101	44	61	25	
DR87-39-04-3/4		215	44	74	15	
DR87-39-05-3/4		104	51	52	40	
DR87-39-06-3/4		90	51	35	60	
DR87-39-07-3/4		141	51	37	20	
DR87-40-02-3/4		54	26	16	15	
DR87-40-03-3/4		103	41	46	260	
DR87-40-04-3/4		121	36	49	25	

Bondar-Clegg & Company Ltd.
5420 Canotek Rd.,
Ottawa, Ontario,
Canada K1J 8X5
Phone: (613) 749-2220
Telex: 053-3233

BONDAR-CLEGG

Geochemical Lab Report

REPORT: 017-2428

PROJECT: ODM DATA

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Zn PPM	As PPM	Au PPB	Testwt gms
DR87-40-05-3/4		168	97	46	25	
DR87-40-06-3/4		590	42	46	70	
DR87-41-PT-3/4		39	35	3	425	2.00
DR87-42-01-3/4		60	29	162	<10	7.00
DR87-43-01-3/4		146	34	45	2995	3.00
DR87-45-01-3/4		58	53	138	80	

Bondar-Clegg & Company Ltd.
5420 Canotek Rd.,
Ottawa, Ontario,
Canada K1J 8X5
Phone: (613) 749-2220
Telex: 053-3233

BONDAR-CLEGG

Geochemical Lab Report

REPORT: 017-2427

PROJECT: ODM DATA PAGE 1

SAMPLE NUMBER	ELEMENT UNITS	Cu PPM	Zn PPM	As PPM	Au-150 PPM	Au+150 PPM	Au Av PPM	TestWt gms	-150Wt gms	+150Wt gms
DR87-35-02-3/4		48	20	3	0.61	308.82	14.06	15.00	17.97	0.82
DR87-40-01-3/4		115	60	3	0.69	9.95	1.13	2.50	4.24	0.21

1. Regional Gold Background

Most gold occurrences in the Abitibi belt are of the free gold type. Even in Casa-Berardi or Hemlo-type deposits having a high pyrite/arsenopyrite content, most of the gold is free although very fine grained (50 microns). Thus, all tills over the Abitibi belt contain scattered free gold particles. Due to the nugget effect -- the chance occurrence of a coarse gold particle in a given sample -- the gold backgrounds of small till samples collected at the same site will vary by several orders of magnitude.

The nugget effect can be overcome if a sample of sufficient size is collected and all of the gold is concentrated into a small heavy mineral fraction that is then analyzed in its entirety (Clifton et. al., 1967). We have found that at least 50 kg of till would be needed to overcome the nugget effect. However, it is impractical to collect, process or analyze samples of this size. We have standardized to 7-9 kg samples because reverse circulation drills deliver this quantity of material during one metre of advance.

Rather than trying to eliminate the nugget effect, we have developed procedures for recognizing and discounting anomalies that are caused by it. Specifically we measure the dimensions of all gold grains sighted on the table or recovered by panning and use these dimensions to calculate the expected contribution of each gold grain to the concentrate assay. In this way, the cause of each high assay is identified and nugget anomalies are screened out.

Most gold particles occur as thin flakes and it is difficult to position these flakes on edge to measure their thickness. However, we have found that each flake can be treated as a disc in which the thickness is a function of the diameter. For flakes of less than 1000 microns diameter, this relationship is expressed by the following equation:

$$t = 0.2d - 0.01\frac{(d-100)\ d}{100}$$

Thus, by simply measuring the diameters of the gold flakes that separate from the samples during tabling, it is possible to calculate the relative volume of gold in a given flake and from this relative volume to calculate the geochemical assay that the flake would produce in a sample of specific size. Clifton (1967) showed that a 100-micron flake will produce a value of approximately 100 ppb in a 15-gram sample. Conveniently, the analyzed 3/4 concentrates of reverse circulation samples also weigh about 15 grams. The range of assays produced in a concentrate of this size by a single gold flake of varying size is shown in Table 5.

It is apparent from the figures in Table 5 that till concentrates that contain no free gold will assay less than 10 ppb provided occluded gold is also absent. Concentrates containing a single gold particle will assay from 10 ppb to more than 55,000 ppb depending on the size of the gold particle. Thus the normal background for till concentrates ranges from less than 10 ppb to more than 55,000 ppb.

We have found that fewer than 30 percent of till concentrates from the Abitibi region yield gold assays lower than 10 ppb. Most samples give assays of 20 to 500 ppb, because they contain one to five gold particles in the 25 to 150 micron range. Erratic clustering of these fine grains occasionally results in an assay over 1000 ppb. Another five to fifteen percent of samples contain a coarser gold grain that produces an assay over 1000 ppb. Occluded gold is rarely present.

2. Gold and Base Metal Anomaly Threshold Levels

Gray (1983) observed that heavy mineral gold assays in a number of dispersion trains tested by Asarco were 3000 ppb or higher. We have arrived at the same 3000 ppb threshold figure in a different manner. As early as 1976, we recognized that the grade of our concentrates within 1 km of source on base metal and uranium dispersion trains was similar to the grade of the source provided the source was of normal width (5 to 10 metres) and was oriented perpendicular to the direction of glacial ice advance. We have since proved that the same relationship applies to gold dispersion trains. Thus, assuming that gold mineralization must grade a minimum of 3 g/tonne (3000 ppb) to be significant, the anomaly threshold level in our concentrates is 3000 ppb.

It is not uncommon for gold deposits in the Abitibi belt to have a subcropping strike length of only 100 metres. Most of these deposits strike sub-parallel to bedrock stratigraphy and sub-perpendicular to glaciation. Using the 3000 ppb anomaly threshold level, a cross-ice reverse circulation drill hole separation of 100 metres would be needed to detect the deposits. However, most of the deposits occur in anomalous horizons that are much larger than the deposits themselves. If a low anomaly threshold is used and careful gold grain counts are made, the anomalous horizons can be detected with confidence using a 300-400 metre hole separation. This greatly reduces exploration costs. We therefore consider any gold values over 1000 ppb to be potentially anomalous.

3. Stratigraphic Properties of a Dispersion Train

Glacial processes are systematic and heavy mineral dispersion trains in tills have specific configurations (Averill, 1978). For example, dispersed material tends to be sheeted progressively upward in the ice with increasing distance from source, causing the trains to rise in the till and thicken down-ice. Lateral spreading, in contrast, is minimal and most trains are tapered ribbons rather than fans.

ODM has traced nine gold dispersion trains (Table 4) and several base metal and uranium trains to source on both new discoveries and known deposits. These trains have had the following properties:

1. At a specific distance from source, the mineralization was confined to a specific level within a specific till unit.

2. The train was at least two samples (2-3 m) thick unless:

    (a) The host till was very thin;

    or (b) The train was intersected within 100 m of source.

3. The width of the train was not more than twice the cross-ice length of the source mineralization.

4. The maximum length of the train for deposits oriented perpendicular to glaciation was 1 km (gold) to 5 km (base metals/uranium).

4. Properties of a Visible Gold Dispersion Train

Five to fifteen percent of background till samples over the Abitibi belt produce heavy mineral gold anomalies higher than our 1000 ppb threshold due to the nugget effect. For the reverse circulation/heavy mineral method to be effective, significant free gold dispersion trains, which are relatively rare, must be differentiated with confidence from the numerous nugget anomalies. This is done on the basis of the gold grain counts rather than the assays. We have found that the gold particles in significant dispersion trains have the following properties:

1. At least 10 gold particles are present per 7 kg of till matrix.

2. The gold particles are of a common size, reflecting the size of crystallization at source.

3. The gold particles are of a common shape, reflecting a common distance of transport from source.

4. Since most gold dispersion trains are traceable for less than one km (Table 4) and gold particles become abraded after one km of ice transport (Fig. 7), the shape of the gold particles is usually irregular or delicate.

Background nugget anomalies, unlike dispersion trains, do not normally repeat vertically or horizontally in the section, although with 10 to 15 percent of samples containing anomalies of this type, chance repetition does occur. Another property common to some gold dispersion trains is the presence of pathfinder minerals because many gold deposits are polymetallic. Even deposits that are considered to be strictly free gold occurrences often have alteration halos containing sufficient pyrite, arsenopyrite, galena, chalcopyrite or molybdenite for a pathfinder association to be evident in the dispersion train. Nugget anomalies have no pathfinder association.

5. Properties of an Occluded Gold Dispersion Train

We have encountered only one occluded gold dispersion train among nine gold trains tested. In one other train, the gold was very fine and more was recovered as composite gold/sulphide grains than as free grains.

In occluded gold trains it is not possible to use gold particle shape to predict distance to source. The distance must be gauged from the vertical positions of the anomaly in the host till and of the till in the stratigraphic succession. In several other respects, however, occluded gold dispersion trains are easier to trace than free gold dispersion trains, especially if the gold is occluded in sulphide minerals. The following specific advantages are cited:

1. A pathfinder mineral association is generally present.
2. The pathfinder minerals often occur in sufficient concentrations that they can be seen in pebbles as well as in the heavy mineral fraction, and the host rock can therefore be determined.
3. The source mineralization is often conductive and can be located by geophysical methods.
4. Gold/pathfinder metal ratios in the concentrates are relatively constant, and any interference from background nuggets is readily recognized.
5. The dispersion trains are longer and more uniform than free gold trains.

Some of these advantages apply only to unoxidized till samples from drill holes. Occluded gold is chemically reconstituted into the clay fraction if the host sulphides are destroyed by oxidation. Thus, in surface pit sampling programs, heavy mineral analysis will detect only the visible gold. Conventional geochemical analysis should be used if occluded gold targets are expected.