

GM 51586

GEOLOGICAL REPORT ON THE GREATER MALARTIC, CONDUCTIVE ZONE, TOUSSAINT CERE AND CONTACT ZONE SHOWINGS, B-8 CLAIMS, ORION PROJECT (QORN)

Documents complémentaires

Additional Files



Licence



License

Cette première page a été ajoutée
au document et ne fait pas partie du
rapport tel que soumis par les auteurs.

Énergie et Ressources
naturelles

Québec 



MINISTÈRE DE L'ÉNERGIE ET DES RESSOURCES
SERVICE DE LA GESTION DES DOCUMENTS
DIVISION DU MICROFILM

CE MICROFILM EST PRODUIT POUR LE
SERVICE DE LA GÉOINFORMATION

GM

5 1 5 8 6

MICROFILMÉ PAR LA DIVISION DU MICROFILM

CAMÉRA:

MODÈLE

MRD-2-1

NUMÉRO DE SÉRIE

TAUX DE RÉDUCTION:

27 x

DATE: 26 FEVRIER 93

OPÉRATEUR(TRICE):

J.B.

DEC 14 1992

92 11727 -9 26

B-8 CLAIMS, ORION PROJECT (QORN)
Bousquet Township, Abitibi, Québec:
Geological report on the Greater Malartic,
Conductive Zone, Toussaint Céré and Contact
Zone showings.

by
Christian Massicotte, B.Sc.
Harold Desbiens, M.Sc.
Project Geologists
April 1992

LAC Minerals Ltd.
Exploration Division

ÉNERGIE ET RESSOURCES
SECTEUR MINES

18 SEP. 1992

Bureau régional Val d'Or

MER - S.I.S.E.M.	1993/02/08
GM 51586	

92273011
11 +5

Abstract

The Orion-Bousquet project is subdivided into several claim blocks, including the B-8 claims where two showings were stripped near the end of 1990. Mapping of these strippings was done in 1990 and 1991.

This report presents the results of the sampling of several showings, and the detailed mapping of the Greater Malartic and the Toussaint Céré Showing strippings.

TABLE OF CONTENTS

	Page
1.0 Introduction	2
2.0 Property, description and location	2
3.0 Regional geology	5
4.0 Property geology	10
5.0 Previous work	11
6.0 Economic geology	21
7.0 1990 strippings on the Greater Malartic and Toussaint Céré Showings	23
7.1 The Greater Malartic Showing	23
7.1.1 Geology	23
7.1.2 Structure	25
7.1.3 Mineralization	26
7.1.4 Results	28
7.2 The Toussaint Céré Showing	30
7.2.1 Geology	30
7.2.2 Structure	31
7.2.3 Mineralization	32
7.2.4 Results	34
8.0 Conclusion and recommendations	34
9.0 References	36

LIST OF PLATES

Plate I.	Greater Malartic Showing, October 1990	24
Plate II.	Flat quartz veins in carbonatized sediments	25
Plate III.	Well preserved bedding in sediments	26
Plate IV.	Iron-formations showing isoclinal folding	27
Plate V.	Folded iron-formations showing text-book examples of boudinage	28
Plate VI.	Dextral displacement of iron-formations	29
Plate VII.	One of the authors hammering on gossan, October 1991	29
Plate VIII.	Toussaint Céré Showing, September 1991	30
Plate IX.	Folded contact between greywackes and (light colour) chloritized siltstones	31
Plate X.	Deformed and boudined quartz veins	32
Plate XI.	Crenulation (regional schistosity S2?) of SO	33
Plate XII.	Folded arsenopyrite bands	33

LIST OF TABLES

Table I.	List of the B-8 claims, Orion project	5
Table II.	Principal mineralizations associated with the Cadillac Structural Zone, Bousquet-Cadillac District	8
Table III.	Principal mineralizations associated with the Bousquet-Dumagami Structurale Zone, Bousquet-Cadillac District	9
Table IV.	Historical drilling on or near the B-8 claims, Orion project Bousquet Township	12
Table V.	Best results from historical drilling on or near the B-8 claims, Orion project	13
Table VI.	Exploration work on the B-8 claims, Orion project	15
Table VII.	Diamond drilling by LAC Minerals Ltd. on the B-8 claims, Orion project, Bousquet Township	16
Table VIII.	Best results from diamond drilling for LAC Minerals Ltd. on the B-8 claims, Orion project	17
Table IX.	1990 Grab samples on the B-8 claims, Orion project	19

LIST OF FIGURES

Figure 1	LAC Minerals Ltd. properties	3
Figure 2	Claims distribution	4
Figure 3	Regional Geology	6

LIST OF MAPS

Map I	Surface Geology
Map II	Location of showings
Map III	D.D.H. Compilation
Map IV	Location of 1990 Grab samples
Map V	Location of 1990 strippings
Map VI	Geology of the Greater Malartic stripping
Map VII	Track sampling of the Greater Malartic stripping
Map VIII	Geology of the Toussaint Céré stripping
Map IX	Track sampling of the Toussaint Céré stripping

Property: Orion - B-8 claims

Township: Bousquet
Ranges: VIII & IX
District: Cadillac - Bousquet
Province: Québec
Lat.: 48°15'30" **Long:** 78°36'30"
S.N.R.C.: 32D/07-104
No. Claims: 6 claims
Area: 96 hectares
Ownership: 100% LAC Minerals Ltd.
Prospect: Gold
Access: Via dirt road north of highway #117, about 16.5 Km west of Cadillac.

1.0 Introduction:

During the month of August 1990, a geological reconnaissance program covered the B-8 claims of the Orion project. The following month, two showings were stripped to verify the nature and provenance of anomalous gold values obtained from grab sampling of old trenches. Channel sampling and mapping of the Greater Malartic and Toussaint Céré showings were executed in October 1990 and September 1991.

2.0 Property, description and location:

The B-8 claims forming part of the Orion project, are located 6 km west of the Doyon mine (50% LAC Minerals, 50% Cambior). Access is provided by 3.5 Km of dirt roads heading north of highway #117, 16.5 Km west of the town of Cadillac (Fig. 1). The property consists of 6 claims listed in Table I, for an area totalling 96 hectares, in Range VIII and IX, Bousquet Township (Fig. 2). All claims are in very good standing, with more than 100,000\$ in excess credits.

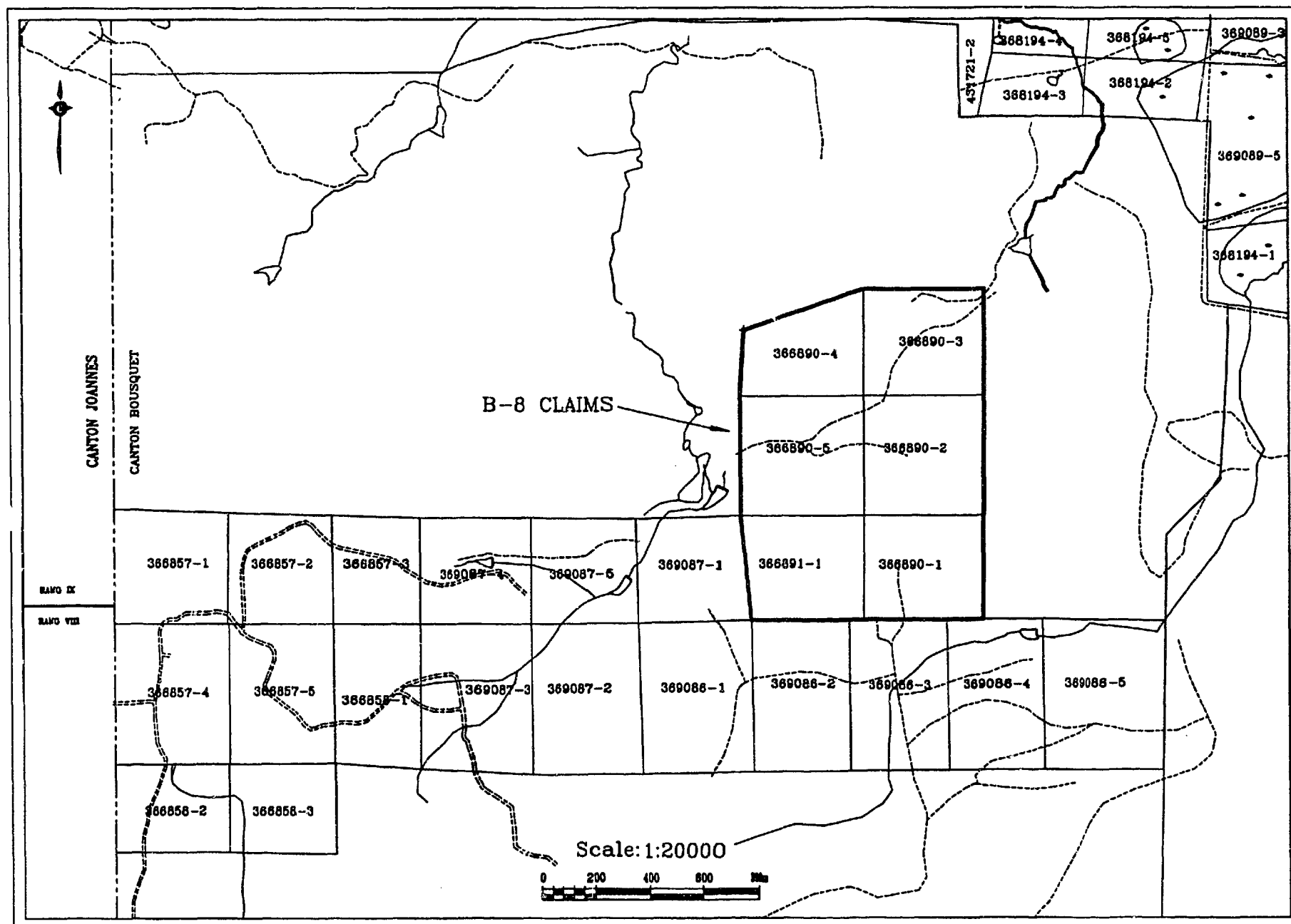


FIGURE 2 : CLAIMS DISTRIBUTION

Table I. List of the B-8 claims, Orion project.

Township	Claim #	Staked on	Expiry date	Area (ha)	Rent (\$)	Req. work (\$)	Exc. credits (\$)
Bousquet	3668901	04/10/77	04/09/93	16	20.00	500.00	25828.78
Bousquet	3668902	04/10/77	04/09/93	16	20.00	500.00	21387.95
Bousquet	3668903	04/10/77	04/09/93	16	20.00	500.00	4261.79
Bousquet	3668904	04/10/77	04/09/93	16	20.00	500.00	13718.50
Bousquet	3668905	04/10/77	04/09/93	16	20.00	500.00	14868.18
Bousquet*	3668911	04/11/77	04/10/93	16	20.00	500.00	23043.66
TOTAL				96	120.00	3000.00	103108.86

3.0 Regional Geology:

The bedrock of the Bousquet-Cadillac mining district belongs to the Archean Abitibi Greenstone volcano-sedimentary Belt, forming part of the Superior Province of the Canadian Shield. Its geology is composed of metavolcanic rocks forming large volcanic complexes such as the Blake River Group (BRG) and the Malartic Group (MG), limited by faults of regional extent and/or by narrow metasedimentary belts (such as the Cadillac Group (CG) and the Kewagama Group (KG)).

From north to south, the regional geology consists of : ultramafic to mafic metavolcanics of the Malartic Group ; metasedimentary Kewagama Group (greywackes, conglomerates, argillites); metavolcano-sedimentary Blake River Group (bimodal series of mafic and felsic flows); metasedimentary Cadillac Group (greywackes, argillites, iron-formations); mafic to ultramafic metavolcanics of the Piché Group (PG); and finally metasedimentary rocks of the Pontiac Group (POG) (greywackes and black shales) (Fig. 3).

The Blake River Group is bounded to the north and south by the Parfouru Lake and Dumagami Faults (Marquis et al. 1990) which form the contacts with the adjacent Kewagama and Cadillac Group sediments. The volcanic stratigraphy of the Blake River Group in the Bousquet area has been divided into four units by Gunning (1937): the oldest Tholeiitic Basalt unit to the north (unit BR-1); the Quartz Porphyritic Sodic Rhyolite unit (BR-2); the Heterogeneous unit (BR-3) composed of interstratified mafic and felsic volcanics, andesitic flows and blocky tuffs, and felsic volcanoclastics; and the youngest Felsic Volcanic unit (BR-4) to the south. The Mooshla stock, a synvolcanic igneous body composed primarily of quartz diorite, intrudes the Blake River Group volcanics in the western portion of the district.

PAGE(S)

6

MICROFILMÉE(S) SUR 35 MM

The entire volcano-sedimentary sequence has experienced upper greenschist facies regional metamorphism and structural deformation which has imparted a predominantly E-W oriented foliation to the lithologies (e.g., Tourigny et al. 1989a). Structural deformation has also resulted in the development of numerous faults and shear zones in the region; most of the gold mineralization of the district occurs in association with the earlier E-W oriented structure Cadillac (CSZ) and Bousquet-Dumagami (BDSZ) structural zones, the later NE-SW oriented structures (e.g. Bousquet River and Doyon Faults) post-date Au mineralization. Post-metamorphic Proterozoic diabase dikes crosscut all Archean lithologies. The rocks located along and between these two structural zones are strongly deformed (extensive isoclinal folding steeply plunging to the west, NE-SW and NW-SE cross-faulting).

The earliest days of this mining camp (i.e. 1920-50's) were concentrated along the Cadillac Structural Zone (CSZ) where low tonnage/high grade tensional vein systems were exploited. These mineralizations were characterized by coarse visible gold in late cracks and seals or disseminated pyrite-pyrrhotite-arsenopyrite within narrow cherty-like dark-grey quartz veinlets or whitish quartz-ankerite veins located in the immediate vicinity of the Cadillac Break. Although of the spectacular nature of the gold in the CSZ, its past exploration proved to be very difficult due to its erratic distribution and only the famous O'Brien mine (1926-56, 1978-80: 1 148 750 T @ 15.31 g/T Au; 1.2 g/T Ag) proved to be an economic mineralization.

Other subeconomic mineralizations located along the Cadillac Structural Zone are presented in Table II and Fig. 3.

More recently (1970-90's), important gold mineralizations were uncovered along the Bousquet-Dumagami Structural Zone (BDSZ) developed in Blake River intermediate to felsic volcanoclastics (BR-3 and BR-4) and Mooshla synvolcanic stock. These auriferous mineralizations typically consist either of zones of abundant chalcopyrite & pyrite-rich quartz veinlets with disseminated pyrite, or of zones of massive to semi-massive sulphides (pyrite-chalcopyrite-bornite-sphalerite) oriented (or reoriented) parallel or slightly oblique to regional E-W schistosity. Alteration associated with veining and Au mineralization is generally characterized by a combination of chloritization, sericitization, silicification and carbonatization. Vein-associated Au mineralization is proposed as post-peak metamorphism in the district. The principal mineralizations located along the Bousquet Dumagami Structural Zone are presented in Table III and Fig. 3.

Table II. Principal mineralizations associated with the Cadillac Structural Zone, Bousquet-Cadillac District.
 (* = see location on fig. 3)

*	NAME	TYPE OF MINERALIZATION	HOSTING LITHOLOGY	PRODUCTION/RESERVE OR D.D.H. INTERSECTION
8.	Pandora No.2,3,4	E-W quartz veins	Porphyritic syenite, Graywackes, Iron Formations	Prod: 178 000 T @ 5.06 g/T Au
9.	Wood Cadillac and	E-W B.I.F. + quartz veins	Iron formations	Prod: 581 490 T @ 5.53 g/T Au
10.	Central		Graywackes	Res. 530 000 T @ 5.0 g/T Au
11.	Kewagama	N-S quartz veins	Conglomerates, Porphyritic andesites	Prod: 2 450 T @ 11.66 g/T Au
12.	O'Brien	E-W quartz veins	Conglomerates, Porphyritic andesites	Prod: 1 148 750 T @ 15.31 g/T Au
13.	New Alger (Thompson Cadillac)	E-W quartz veins	Graywackes, Porphyritic andesites	Prod: 158 760 T @ 12.0 g/T Au
14.	Bouscadillac (Graham Bousquet)	E-W quartz veins	Basalt	Res. 36 000 T @ 7.84 g/T Au 5.83 g/T Au over 3.4 meters
15.	Norman Lake (Sudbury Contact Mines)	E-W quartz veins	Brecciated, Basalts & ultramafics	9.6 g/T Au over 1.5 meters 4.8 g/T Au over 1.5 meters 18.3 g/T Au over 0.63 meters
16.	Doreva	E-W quartz veins	Sericite schist (greywackes)	Unavailable
17.	Norgold (Calder Bousquet No.3)	N075° quartz veins	Basalt & ultramafics, Greywackes	4.69 g/T Au over 1.44 meters 2.4 g/T Au over 1.11 meters
18.	Odyno (Calder Bousquet No.1)	N075° quartz-veins	Greywackes, Basaltic tuffs	2.0 g/T Au over 6.17 meters 10.9 g/T Au over 1.1 meters

(From Desbiens, H., Massicotte, C. 1991)

Table III. Principal mineralizations associated with the Bousquet-Dumagami Structurale Zone, Bousquet-Cadillac District.
(* = see location Fig. 3)

*	NAME	TYPE OF MINERALIZATION	HOSTING LITHOLOGY	PRODUCTION/RESERVE OR D.D.H. INTERSECTION
1.	Mouska	N290° sulfide veins	Basalt	Res: 870 000 T @ 6.2 g/T Au
2.	Mic Mac	N290° quartz veins	Basalt	Prod: 725 600 T @ 4.11 g/T Au
3.	Mooshla "A"	N010° quartz veins	Granite	Prod: 4 450 T @ 29.8 g/T Au, Grab samples: 688 g/T Au + 349 g/T Au
4.	Doyon No.1	E-W quartz veins and disseminated sulfides	Rhyolitic tuffs & Agglomerates	Res + Prod: 2.8 MT @ 5.3 g/T Au
	Doyon No.2	N095° quartz veins and disseminated sulfides	Rhyolitic tuffs & Agglomerates	Res + Prod: 14.8 MT @ 5.1 g/T Au
	West Zone	N-S quartz-sulfides veins	Granodiorite	Res + Prod: 3.8 MT @ 10.5 g/T Au
5.	Bousquet No.1	N095° disseminated pyrite	Andesitic + Rhyolitic tuffs	Res + Prod: 11.0 MT @ 4.8 g/T Au
6.	Bousquet No.2	E-W massive sulfides	Brecciated rhyolite	Res + Prod: 10.2 MT @ 7.2 g/T Au
7.	La Ronde (Dumagami)	E-W massive sulfides	Rhyolitic tuffs	Res + Prod: 7.2 MT @ 5.1 g/T Au

(From Desbiens, H., Massicotte, C. 1991)

4.0 Property geology:

The B-8 claims are underlain by two primary lithological groups: the Blake River Group (BRG) metavolcanics and the Cadillac Group (CG) metasediments. The contact between the two groups is sheared and represents the western extension of the Dumagami Fault (Sauvé et al., 1990; Marquis et al, 1990; Tourigny et al. 1988). On the property the contact is folded with sub-vertical plunge of the fold axis. The northern and western part of the property consist mainly of BRG volcanics, whereas sedimentary rocks of the CG occupy the remaining ground on the claims.

Mapping done in 1978 by R. Sansfaçon covered all the property. Outcrops are more or less abundant, with irregular topography of small scale. The intense alteration (silicification, chloritization, biotitization and ankeritization) combined with the strong deformation of both groups, make difficult their structural and geological interpretations (MAP I).

The volcanic rocks of the BRG on the claims were subdivided by Sansfaçon into four main rock composition: felsic, intermediate, intermediate to mafic and mafic volcanics. The felsic rocks include schistose sericitized felsic tuffs, with blocky fragments and quartz-feldspar phenocrysts, and silicified massive felsic tuffs. The latter one is present at contacts with mafic rocks and is often mineralized in shear zones. The intermediate volcanics are composed of sericite, chlorite and silica, with biotite restricted to fractures or schistosity plans. The intermediate to mafic volcanics are either pillowed or flow brecciated with silicification most of the times. Finally, the mafic tuffs are dark green chloritic matrix and have biotite phenocrysts. Small clasts (maximum diameter of 2 cm) are locally observable.

On the B-8 claims, the CG consists of interbedded sandstones / siltstones / mudstones. A few beds of iron-formation are present in the southeastern part of B-8, where Brosseau tested their economic potential (GM-22248).

Structurally, the property shows great complexity, with several folds, shears and faults. Bedding S0 was defined by Sansfaçon as having a strike (plus or minus 10°) of N057°E to N075°E with varying dips of 70 to 90°. The regional S2 schistosity is more or less E-W steeply dipping either to the south or to the north. There is a possibility of an earlier S1 schistosity, cut by S2, striking either SE or NE (Sansfaçon, 1978). Finally, a S3 fracture / schistosity cuts all of the previous ones, striking N010° to N020°E and dipping 85° to 90°E.

Several minor (to major) "S", "M" and "Z" isoclinal to open folds are present on the outcrops with usually a vertical axis plunging to the west or the east. Many shear / fault systems are defined, with the most important one being the E-W system hosting most of the mineralizations. Later systems are NW-SE, NE-SW and N-S oriented.

5.0 Previous work:

The first reported exploration work on the property started in 1937. Since then, several companies executed geochemical, geophysical, geological and diamond drilling up to 1977 when LAC Minerals staked the six claims. The following is a summary of the exploration history on the B-8 claims.

- 1937 The northwestern part of the B-8 claims was included in geological mapping by Norgold Mines Ltd. (GM-5934C).

- 1940 Trenching over a gold-bearing structure by Greater Malartic Gold Mines on claims staked in 1939 by Myrand & Gélinas. Five holes (Table IV) totalling 307.15 meters were put down on this structure, returning a 13.4 g Au/T over 1.22 meters (Table V). A sixth hole (8.23 meters) tested a quartz vein south of the Greater Malartic Showing (GM-5911).

- 1947 One hole (D47-02) from a drilling campaign of 5 holes by Dome Explorations was located in the central western part of the claims, for 133.20 meters. Another hole (D47-01) was collared just west of the property (GM-6991).

- 1956 EM and magnetic surveys for Malartic Goldfields were executed over part of the northwestern claims (GM-25591, 25770).

- 1963 Following an electromagnetic survey, Norlex Mines Ltd. implanted 6 diamond drill holes totalling 622.4 meters. The Conductive Zone, delineated by the EM survey, southwest of the Greater Malartic Showing, was investigated by 2 holes for 242.9 meters, while the latter was checked by 3 holes (257.3 meters). The best value came from the Conductive Zone with 3.8 g Au/T / 1.83 meters. A sixth hole (N63-03) was collared east of the claims (GM-13310, 13555a).

- 1967 An evaluation of the economic potential of the iron-formations accompanied with magnetic survey in the southeast quadrant of the claims was accomplished for Yvon Brosseau. The iron-formations were classified as non-economical. (GM-22248).

- 1970 The Quebec Department of Natural Resources (Q.D.N.R.) conducted an airborne input survey over the area.

Table IV. Historical drilling on or near the B-8 claims, Orion project, Bousquet Township.

Hole #	Started on	Bearing	Dip	Length (m)	Target	Location	Company
GM40-01	/ /40	180°	-45°(?)	8.23	E-W quartz vein	25+40E; 1+70N	Greater Malartic Mines Ltd.
GM40-02	/ /40	015°	-45°(?)	39.32	Greater Malartic Showing	27+00E; 8+70N	Greater Malartic Mines Ltd.
GM40-03	/ /40	015°	-45°(?)	78.64	Conductive Zone	22+25E; 10+70N	Greater Malartic Mines Ltd.
GM40-04	/ /40	015°	-45°(?)	47.76	Conductive Zone	22+45E; 10+70N	Greater Malartic Mines Ltd.
GM40-05	/ /40	015°	-45°(?)	48.16	Greater Malartic Showing	27+15E; 8+55N	Greater Malartic Mines Ltd.
GM40-06	/ /40	015°	-45°(?)	93.27	Greater Malartic Showing	27+35E; 8+60N	Greater Malartic Mines Ltd.
D47-01	/06/47	045°	-45°	168.25	Magnetic anomaly	22+70E; 8+70N	Dome Exploration
D47-02	/06/47	010°	-45°	133.20	Magnetic anomaly	25+00E; 6+60N	Dome Exploration
N63-01	02/08/63	010°	-45°	120.70	Conductive Zone	27+35E; 6+45N	Norlex Mines Ltd.
N63-02	10/08/63	010°	-45°	122.22	Conductive Zone	28+65E; 6+50N	Norlex Mines Ltd.
N63-03	18/08/63	010°	-55°	122.22	Magnetic anomaly	33+65E; 4+85N	Norlex Mines Ltd.
N63-04	01/09/63	010°	-45°	92.96	Greater Malartic Showing	27+05E; 8+50N	Norlex Mines Ltd.
N63-05	05/09/63	010°	-45°	74.68	Greater Malartic Showing	26+80E; 8+60N	Norlex Mines Ltd.
N63-06	09/09/63	010°	-55°	89.61	Greater Malartic Showing	27+00E; 8+20N	Norlex Mines Ltd.
RA74-02W	/05/74	000°	-50°	22.25	Conductive Zone	?	Royal Agassiz Mines Ltd.
RA74-03W	/05/74	000°	-45°	57.91	Conductive Zone	?	Royal Agassiz Mines Ltd.
RA74-03	04/12/74	000°	-45°	130.15	Toussaint Céré Showing	28+50E; 2+75N	Royal Agassiz Mines Ltd.
RA74-04	10/12/74	000°	-45°	169.77	Conductive Zone	27+95E; 6+30N	Royal Agassiz Mines Ltd.
RA74-05	14/12/74	000°	-45°	124.05	Toussaint Céré Showing	27+95E; 3+10N	Royal Agassiz Mines Ltd.

Table V. Best results from historical drilling on or near the B-8 claims, Orion project.

Hole #	# of assays		Maximum values	
	Au	Ag	Au (g/T)	Ag (g/T)
GM40-01	-	-	-	-
GM40-02	1	-	13.4/0.30m	-
GM40-03	-	-	-	-
GM40-04	-	-	-	-
GM40-05	-	-	-	-
GM40-06	-	-	-	-
D74-01	-	-	-	-
D74-02	-	-	-	-
N63-01	7	-	3.8/1.83m	-
N63-02	14	-	Tr	-
N63-03	-	-	-	-
N63-04	5	-	2.4/0.91m	-
N63-05	-	-	-	-
N63-06	9	9	2.8/0.61m	4.5
RA74-02W	5	-	?	-
RA74-03W	-	-	-	-
RA74-03	86	-	1.4/1.52m	-
RA74-04	58	38	Tr	Tr
RA74-05	53	-	Tr	-

- 1973 Prospecting Geophysics executed an EM survey for Royal Agassiz Mines Ltd. in order to locate on the ground the airborne input anomalies detected by the Q.D.N.R. survey. The input anomalies coincidental with the Conductive Zone were successfully relocated.
- 1974 This was a very active year for Royal Agassiz Mines Ltd. Prospecting and detailed geological mapping were done, accompanied by grab sampling, trenching and soil sampling in the vicinity of the Toussaint Céré Showing. A magnetic survey was also conducted in order to help geological interpretation.
- In May of 1974, two short holes using a light winkie drill ended short of their target, the Conductive Zone.
- In December of 1974, Royal Agassiz came back with a 3 holes diamond drilling campaign of 424 meters. Holes RA74-03 and 05 investigated the Toussaint Céré Showing, while hole RA74-04 intersected the Conductive Zone (GM-30249, 31142, 31143).
- 1977 In April of 1977, Long LAC Mineral Exploration Ltd. (Now known as LAC Minerals Ltd.) acquired the 6 claims of B-8 (Table VI).
- 1978 An airborne survey (mag, VLF, EM) flown by Aerodat Ltd. in April covered part of the Bousquet, Joannes, La Pause and Cléricy townships, including the B-8 claims.
- This was followed in the summer by 14.1 Km of linecutting (N-S lines) accompanied by magnetic and VLF (EM-16) surveys on these lines. Detailed mapping by Robert Sansfaçon, grab sampling and soil geochemistry (500 samples analysed for Au, Cu, Zn, Pb) were executed within the same year.
- 1979 Due to the complexity of the structural geology, 5.0 Km of E-W compass-lines were surveyed by VLF (EM-16) using a different transmitting station.
- 1980 A diamond drilling campaign of 3 holes totalling 373.6m took place in June (Table VII): D.D.H. OR80-29's (133.4m) best value was 0.3 g Au/T / 1.5m from the Conductive Zone. Holes OR80-26 and 28 in the west part of the claims returned gold values of 0.8 g/T and lower (Table VIII).

Table VI. Exploration work on the B-8 claims, Orion project.

Exploration	Type	# unit	Year	Comments
Claim staking		6 claims	04-77	
Line Cutting		14.1 km	03-78	Line spacing of 100 m, N-S.
Line Cutting		9.9 km	01-88	Line spacing of 100 m, E-W.
Line Cutting		12.3 km	10-90	Cleaning of old N-S lines.
Geology		12.3 km	09-78	With grab sampling.
Geology	Reconnaissance mapping		08-90	Visit of showings, some sampling.
Geology	Detailed mapping		10-91	Greater Malartic & Toussaint Cere showings.
Ground Geophysics	Mag.	12.3 km	05-78	On N-S lines.
Ground Geophysics	Mag.	24.0 km	10-88	On E-W & N-S lines.
Ground Geophysics	Magnetic compilation	22.2 km	12-88	Regional compilation.
Ground Geophysics	V.L.F.	12.3 km	05-78	On N-S lines.
Ground Geophysics	V.L.F.	5.0 km	06-79	On E-W compass-lines.
Ground Geophysics	V.L.F.	24.0 km	10-88	On E-W & N-S lines
Ground Geophysics	I.P.	12.3 km	10-90	Dipole-Dipole, a=25m, n=1 to 5.
Airborne Survey	Mag., V.L.F., EM	6.1 km	04-78	Line spacing of 200 m.
Geochemistry	Soil (A,B, or C horizon)	12.3 km	09-78	500 samples every 25 m on N-S lines (Au, Cu, Zn, Pb).
Geochemistry	Au ppb	6 holes	09-90	OR80-26, OR80-28, OR80-29, OR83-10, OR88-02, OR88-03.
Geochemistry	Au ppb	2 holes	01-91	OR90-43, OR90-44.
Stripping	Greater Malartic Showing	3200 m ²	09-90	By Les Entreprises Rene Sigouin Inc.
Stripping	Toussaint Cere Showing	400 m ²	09-90	By Les Entreprises Rene Sigouin Inc.
Diamond drilling	1980	3 holes	06-80	Total of 373,6 m.
Diamond drilling	1983	1 hole	12-83	Total of 215,0 m.
Diamond drilling	1988	2 holes	01-88	Total of 270,7 m.
Diamond drilling	1990	2 holes	12-90	Total of 326,8 m.

Table VII. Diamond drilling by LAC Minerals Ltd. on the B-8 claims, Orion project, Bousquet Township.

Hole #	Line	Station	Started	Finished	Bearing (°)	Dip (°)	Casing (m)	Length (m)	Target
OR80-26	25+00E	4+00N	10/06/80	13/06/80	180°	-50°	4.30	121.00	V.L.F. anomaly
OR80-28	24+00E	0+60N	16/06/80	14/06/80	000°	-45°	4.50	119.20	Contact Showing
OR80-29	30+00E	5+75N	23/06/80	27/06/80	000°	-45°	10.70	133.40	Conductive Zone
OR83-10	26+00E	0+95N	15/12/83	22/12/83	000°	-45°	1.00	215.00	Contact Showing
OR88-02	27+80E	8+90N	16/01/88	18/01/88	270°	-46°	4.60	149.70	Greater Malartic Showing
OR88-03	27+75E	3+25N	19/01/88	21/01/88	090°	-45.5°	6.70	121.00	Toussaint Cere Showing
OR90-43	26+00E	8+75N	16/12/90	18/12/90	000°	-55°	1.83	151.18	Greater Malartic Showing
OR90-44	27+00E	6+75N	18/12/90	20/12/90	000°	-48°	6.10	175.57	Conductive Zone

Table VIII. Best results from diamond drilling for LAC Minerals Ltd. on the B-8 claims, Orion project.

Hole #	# of assays				Maximum values			
	Au	Ag	Cu	Zn	Au (g/T)	Ag (g/T)	Cu (ppm)	Zn (ppm)
OR80-26	25	-	-	-	0.8	-	-	-
OR80-28	47	-	-	-	0.8	-	-	-
OR80-29	36	-	-	-	0.3	-	-	-
OR83-10	42	-	-	-	0.5	-	-	-
OR88-02	35	11	2	-	2.7/1.5m	6.2	472	-
OR88-03	26	-	-	-	Tr	-	-	-
OR90-43	24	-	-	-	Tr	-	-	-
OR90-44	23	-	2	2	0.2	-	90	200

1983 One hole (OR83-10) of 215.0 meters was collared 200 meters east of hole OR80-28. Maximum value was 0.5 g Au/T / 1.5m.

1988 Linecutting totalling 9.9 Km was undertaken with E-W lines. A short drilling campaign of 2 holes of 270.7m (OR88-02, 03) was implanted to verify the possibility of north-south orientation of the mineralization at the Greater Malartic and Toussain Céré Showings. The sulfides encountered in the E-W holes was parallel to the core...

In October 1988, detailed magnetic and VLF surveys were done on the N-S and E-W lines. Data from the magnetic survey was then incorporated in a regional compilation.

1990 Selected mapping of the mineralized occurrences on the B-8 claims was accomplished in August. Grab samples from old trenches were analyzed for gold, silver, copper and zinc (Table IX). One grab sample from the Greater Malartic Showing assayed 12.5 g Au/T from silicified sediments heavily mineralized in arsenopyrite, pyrite, pyrrhotite. Anomalous values combined with previous exploration work and poor exposure of the mineralized zones incited LAC to strip the Greater Malartic and the Toussaint Céré Showings.

Stripping of these showings took place in September and was done by Les Entreprises René Sigouin Inc. A total of approximately 3,600 m² was deforested and stripped of its thin overburden (less than 1.0 meter). Mapping and channel sampling had to be brief due to the proximity of winter. While the stripping took place, all of LAC Minerals diamond drill holes were systematically sampled for gold in ppb.

In October, a detailed I.P. survey, executed by Val d'Or Géophysiques, covered all the N-S lines and additional ground to the south belonging also to LAC Minerals. Interesting anomalies coinciding with some known mineralized zones extended the latter where outcrops were scarced. Putting all of the newly acquired information, two holes were assigned on the B-8 claims in December; hole OR90-43 (151.18m) to check the westerly lateral extension of the Greater Malartic Showing, and hole OR90-44 (175.57m) trying to repeat the 3.8 g Au/T / 1.83m obtained on the Conductive Zone by Norlex in 1963. The best value was only 0.2 g Au/T.

Table IX. 1990 Grab Samples on the B-8 claims, Orion project.

Sample #	Field #	Showing	Location		Results			
			Line	Station	Au (ppb)	Ag (g/T)	Cu (ppm)	Zn (ppm)
32545	QORN-01	Greater Malartic	26+90E	8+85N	1100	<0.5	36.5	26.4
32546	QORN-02A	Greater Malartic	27+12E	8+87N	5200	<0.5	40.3	20.8
32547	QORN-02B	Greater Malartic	27+12E	8+87N	2300	<0.5	80.1	49.5
32548	QORN-02C	Greater Malartic	27+12E	8+87N	4300	<0.5	57.8	22.0
32549	QORN-02D	Greater Malartic	27+12E	8+87N	4500	<0.5	56.0	17.9
32550	QORN-02E	Greater Malartic	27+12E	8+87N	1800	<0.5	109.0	32.8
32551	QORN-03	Greater Malartic	27+12E	8+87N	8	0.6	7.9	56.1
32614	QORN-15	Greater Malartic	26+90E	8+85N	105			
32615	QORN-16A	Greater Malartic	27+12E	8+87N	1800			
32616	QORN-16B	Greater Malartic	27+12E	8+87N	330			
32617	QORN-17	Greater Malartic	27+12E	8+87N	5000			
32619	QORN-19A	Greater Malartic	27+12E	8+87N	5000			
32620	QORN-19B	Greater Malartic	27+12E	8+87N	12500			
32552	QORN-04A	Conductive Zone	28+60E	7+10N	30	<0.5	27.6	23.0
32553	QORN-04B	Conductive Zone	28+60E	7+10N	18	<0.5	44.5	54.0
32554	QORN-04C	Conductive Zone	28+60E	7+10N	4	<0.5	20.5	37.5
32555	QORN-04D	Conductive Zone	28+60E	7+10N	5	<0.5	136.0	88.7
32621	QORN-20A	Conductive Zone	24+00E	9+25N	5			
32622	QORN-20B	Conductive Zone	24+00E	9+25N	27			
32623	QORN-20C	Conductive Zone	24+00E	9+25N	41			
32624	QORN-20D	Conductive Zone	24+00E	9+25N	4			
32631	QORN-27A	Conductive Zone	24+00E	9+25N	31			
32632	QORN-27B	Conductive Zone	24+00E	9+25N	21			
32637	QORN-20E	Conductive Zone	24+00E	9+25N	37			
32639	QORN-28	Conductive Zone	28+18E	6+77N	<1			
32640	QORN-29	Conductive Zone	28+25E	6+90N	<1			
32641	QORN-30	Conductive Zone	28+40E	6+85N	<1			
32642	QORN-31A	Conductive Zone	28+40E	7+15N	2			
32643	QORN-31B	Conductive Zone	28+40E	7+15N	1			
32644	QORN-31C	Conductive Zone	28+40E	7+15N	<1			
32645	QORN-32	Conductive Zone	29+15E	7+05N	5			
32646	QORN-33	Conductive Zone	29+15E	6+65N	2			
32647	QORN-34	Conductive Zone	29+65E	6+65N	<1			
32648	QORN-35	Conductive Zone	30+10E	6+50N	<1			

Sample #	Field #	Showing	Location		Results			
			Line	Station	Au (ppb)	Ag (g/T)	Cu (ppm)	Zn (ppm)
32556	QORN-05	Toussaint Céré	28+45E	3+42N	1500	0.6	52.1	74.3
32601	QORN-06A	Toussaint Céré	28+45E	3+35N	395			
32602	QORN-06B	Toussaint Céré	28+45E	3+35N	310			
32603	QORN-07	Toussaint Céré	28+45E	3+35N	85			
32604	QORN-08A	Toussaint Céré	28+43E	3+27N	30			
32605	QORN-08B	Toussaint Céré	28+43E	3+27N	45			
32606	QORN-09	Toussaint Céré	28+60E	3+13N	15			
32607	QORN-10	Toussaint Céré	28+58E	3+35N	55			
32608	QORN-11A	Toussaint Céré	28+43E	3+55N	30			
32609	QORN-11B	Toussaint Céré	28+43E	3+55N	35			
32610	QORN-12A	Toussaint Céré	28+40E	3+50N	40			
32611	QORN-12B	Toussaint Céré	28+40E	3+50N	400			
32612	QORN-13	Toussaint Céré	28+48E	3+62N	125			
32613	QORN-14	Toussaint Céré	28+48E	3+62N	40			
32649	QORN-37A	Contact Zone	25+92E	1+45N	9	1.0	119.0	2700.0
32650	QORN-37B	Contact Zone	25+92E	1+45N	<1	<0.5	71.1	178.0
32651	QORN-36A	Contact Zone	23+90E	1+20N	370			
32652	QORN-36B	Contact Zone	23+90E	1+20N	380			
32618	QORN-18	None	28+90E	1+97N	55	N.D.	N.D.	N.D.
32625	QORN-21	None	23+85E	9+45N	<5			
32626	QORN-22	None	24+05E	9+75N	4			
32627	QORN-23	None	24+50E	10+15N	<5			
32628	QORN-24	None	24+00E	11+30N	<5			
32629	QORN-25	None	23+15E	10+25N	<5			
32630	QORN-26	None	23+00E	10+05N	<5			

1991 In January, the two recent drill holes were systematically sampled for gold in ppb, completing the same program started in September of 1990.

In October, the mapping of the Greater Malartic and the Toussaint Céré Showings was completed. Channel sampling was done in November.

6.0 Economic Geology:

For the size of the property, mineralization on the B-8 claims is widespread. Overall, it can be subdivided into five "showings": Greater Malartic, Conductive Zone, Toussaint Céré, Central Structure and the Contact Showing (MAP II).

The Greater Malartic Showing is located on line 27E, 8+75N and was worked on initially by Greater Malartic Mines Ltd. (GMML) in 1940. Trenching revealed the presence of a shear zone in what was believed to be "rhyolite". Mineralization consists of arsenopyrite, pyrite, and pyrrhotite. Several quartz veins and stringers often highly deformed are also present. No records of grab sampling by GMML are available but diamond drilling on the showing returned a 13.4 g Au/T / 0.30 meters. This is the only available result from sampling of these holes. In 1963, Norlex Mines Ltd. (NML) drilled 3 holes under the showing (N63-04,05,06) totalling 257.25 meters returning 2.8 g Au/T / 0.61 meters (N63-06) and 2.4 g Au/T / 0.91 meters (N63-04) respectively at 55.4 and 20.2 meters from the surface (MAP III, Table V).

Royal Agassiz Mines Ltd. (RAML) was the next company to work on the showing. Despite a 6.2 g Au/T from one of their six grab samples, no further work was executed on this site.

More samples (5) were taken during Sansfaçon's mapping for LAC Minerals Ltd. (LAC) in 1978, with the best value being 2.1 g Au/T. As mentioned previously, hole OR88-02 verified the possibility of a N-S orientation of the mineralization, but what was intersected in the west bearing hole was sub-parallel to the core... When the authors visited the old trenches in 1990, interesting results were obtained from the 13 grab samples collected, as indicated in Table IX and on MAP IV, with a maximum of 12.5 g Au/T. This prompted the decision to strip the area in 1990.

The Conductive Zone, located on line 28+50E, 7+00N, is composed of semi-massive sulfides (pyrrhotite, pyrite, arsenopyrite) in silicified greywackes (previously believed to be dacites). The presence of trenches over this structure was first reported in 1940 by Greater Malartic Mines Ltd. Only trace of gold was obtained from a heavily mineralized sample taken by S.H. Ross of the Québec Bureau of Mines. Later in 1963, an electromagnetic survey by Norlex Mines Ltd. delineated the zone striking approximately 095°-275° and steeply dipping to the south. A value of 3.8 g Au/T / 1.83 meters was obtained from one of the two holes drilled on

the conductor, 55 meters beneath surface. The EM conductor was outlined by the Q.D.N.R. airborne input survey in 1970. Royal Agassiz visited the showing in 1974, following another EM survey done the previous year. Maximum values of 0.3 g Au/T, Tr Ag, 100 ppm Cu and 200 ppm Zn were returned from 5 grab samples collected from their stripping on the zone. Two light winkie-drill holes attempted the same year to investigate it, but they never reached their target. It was then decided to test the Conductive Zone (RA74-04 for 169.77 meters): a 6.86 meters wide horizon of mineralized rocks and a 6.55 meters wide graphitic horizon, 30 meters apart, were intersected in the hole.

The showing was revisited in 1978 by Sansfaçon (LAC Minerals Ltd.), who collected one grab sample returning only 0.3 g Au/T. In 1980, LAC drilled hole OR80-29 (133.4 m) 150 meters along strike to the east, but again with low gold values lower than or equal to 0.3 g Au/T.

The Conductive Zone was surveyed by magnetic, V.L.F. and I.P. surveys from 1988 to 1990, which extended the zone laterally. Using the I.P. data, it was then correlated with the pyrrhotite-pyrite mineralization on line 24E, 9+25N. In 1940, this mineralized occurrence was interpreted to be the western extension of the Greater Malartic Showing. Visits in 1990 confirmed the similarity of this mineralization with the one outcropping at the Conductive Zone. Grab sampling at both sites returned low values in Au, Ag, Cu, Zn (Table IX). A final attempt on the zone was done by LAC at the end of 1990, with hole OR90-44 in the vicinity of N63-01 (which gave the 3.8 g Au/T / 1.83m); although semi-massive to massive mineralization was encountered (70% Po / 0.3m), results were deceiving (Table VIII).

Located at L28+35E, 3+50N, the Toussaint Céré Showing consists of disseminated sulfides (5% of arsenopyrite-pyrite) in highly deformed greywackes/siltstones, accompanied by several quartz or quartz - ankerite - chlorite veins. Host rock was described when it was first discovered in 1974, as biotite chlorite schist. Sampling by B.H. Husson of Royal Agassiz, reported up to 3.4 g Au/T from one of their 9 grab samples. Visits and sampling on the showing by Sansfaçon (1978) and the authors (1990) returned a maximum value of 1.5 g Au/T.

Soil geochemical surveys by Royal Agassiz around and over the showing enabled them to discover a nearby narrow quartz - chlorite shear mineralized with specks of arsenopyrite, pyrrhotite, chalcopyrite, coinciding with an arsenic anomaly. Values up to 2.4 g Au/T from grab samples confirmed the anomalous gold content of the shear. Holes RA74-03 and 05, totalling 254.2 meters tested at depth the Toussaint Céré Showing and its inferred lateral extension to the west (51.8 meters from trenches). A maximum value of 1.4 g Au/T / 1.52 m was reported in D.D.H. RA74-03. The possibility of a N-S orientation of the mineralization was verified in 1988 (OR88-03, 121.0 m), but no mineralization was observed.

The Central Structure Showing, located near L25E, 5+50N is poorly documented, as only Royal Agassiz had done some work on it. They describe the mineralization as quartz - carbonate veins, some of them showing tourmaline with little pyrite and pyrrhotite. This zone is a few feet wide, although the south wall of the shear was never seen. It is found at the south contact between a "rhyolite" and an andesite. Two grab samples gave 1.4 g Au/T and 0.7 g Au/T with

Tr Ag. No samples were collected at this location during Sansfaçon's mapping. Finally, the last "showing", named the Contact Showing by the authors, represents a mineralized zone at the contact or near the contact between Blake River volcanics and Cadillac sediments. Mineralization is composed of arsenopyrite, pyrite, pyrrhotite in silicified volcanics (?). This zone shows great response under I.P. survey, and extends itself from L30E, 0N to L23E, 1+50N (where the survey ended). Although the limited exposures, the style of the mineralization and alteration is very similar to what was observed at the Greater Malartic Showing, located in similar environments. Grab sampling by Sansfaçon and the authors report anomalous values in gold and zinc (see Table IX).

7.0 1990 strippings on the Greater Malartic and Toussaint Céré Showings

After viewing most of the mineralized zones on the B-8 claims, and with the aid of sampling, it was decided to strip the Greater Malartic and Toussaint Céré Showings (MAP V). Overburden was estimated to be at the most 2 meters, and most of the good results from the sampling came from these zones.

"Les Entreprises René Sigouin Inc." were contracted in September 1990 to perform the stripping and cleaning of the Greater Malartic Showing, and the Toussaint Céré Showing. Areas of 3,200 m² and 400 m² respectively were deforested and stripped of their overburden. The surface was then holed using nearby water and fuel pumps. Quick mapping and channel sampling were undertaken late in September 1990, and completed during the month of October of 1991.

7.1 The Greater Malartic Showing

Located on line 27+00E, 8+85N, the Greater Malartic Showing had been trenched in 1940 by Greater Malartic Mines Ltd. Five trenches were localized in 1990 during the authors visits, from which several "in-place" or "sub-in-place" grab samples were collected. The area was closely inspected to determine the total area hosting the mineralization, and at the same time with little as possible overburden. Initially, the area to be stripped was approximately 50 m X 20 m, but close supervision of the operation incited to extend the stripping surface to roughly 80 m X 40 m (Plate I). Both stripping and cleaning of the zone were completed within 9 days.

7.1.1 Geology:

After consulting previous reports and logs, the mineralization was reported to be in silicified felsic volcanics. When the showing was stripped, two main units were observed: metasedimentary rocks and intermediate - mafic metavolcanics (MAP VI).



Plate I. Greater Malartic Showing, October 1990 (looking west)

The metasedimentary rocks belong to the Cadillac Group. Initial compilation had its northern contact further south. They are composed predominantly of fine grained siltstones and lean oxide iron-formations (magnetite), with minor argillitic beds. The iron-formations are composed of narrow beds of magnetite (5-50%, 1-2 mm) ranging from a few millimeters to 5 cm. The metavolcanic rocks seem to be andesites, with some vesicles present in the southwest part of the stripping. However this unit could be altered fine grained sedimentary rocks. Alteration throughout the stripping is intense, and consists variably of silicification, ankeritization, or chloritization. Silicification is mainly restricted to the sediments, in particular to where sulfides are present. It is sometime so intense that the protolith has a cherty-rhyolitic look as mentioned in previous work. The chloritization gives a greenish-grey color to the weathered surface of the sediments, and is medium to strong in intensity. Finally, the ankeritization is strong where present, and gives the weathered surface of the rocks a beige to rusty color.

Quartz veins and veinlets on the stripping are quite abundant, with the biggest ones found in the gossan. Veins are either parallel or oblique to the schistosity, and often show tight isoclinal folding. They are typically composed of quartz, ankerite, and locally coarse grained arsenopyrite. Most of the veins are subvertical, except in the eastern part of the stripping where they show a subhorizontal attitude (30° to the east) (Plate II).

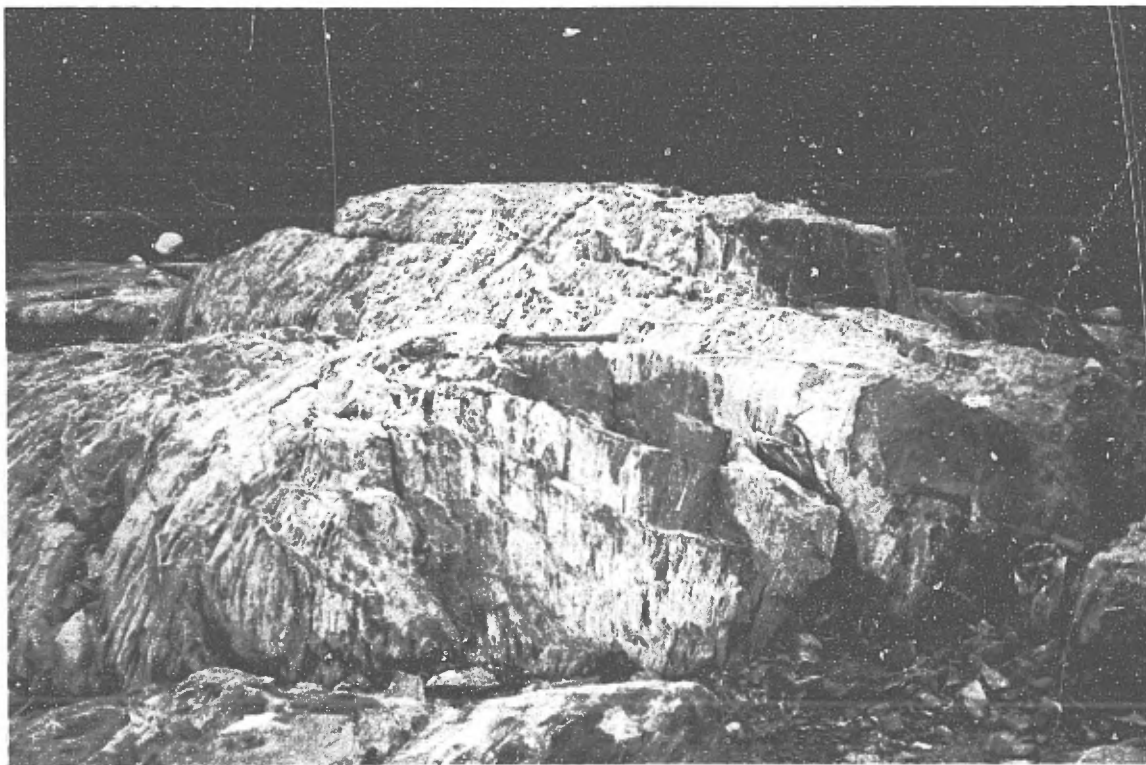


Plate II. Flat quartz veins in carbonatized sediments (hammer head pointing north)

7.1.2 Structure:

The Greater Malartic Showing area is specially characterized by the complexity and intensity of its deformation. Fortunately, the presence of lean iron-formation acted as excellent marker horizon as well as some well preserved beddings throughout most of the sedimentary rocks (Plate III).

The most important structural feature observed on this showing is the strong isoclinal folding, very well outlined by the iron-formations, undergone by the rocks, (Plate IV). Some folds show text-book examples of boudinage (Plate V). Axial planes of these folds seem to correspond to the regional schistosity observed on the showing and in the immediate vicinity, being roughly 290° - 110° with subvertical dip to the north, or to the south. Fold axis have subvertical plunge. Some faults and splay faults with the same attitude displace with a dextral movement the sequence from less than one meter to probably more than 20 meters (Plate VI).

One well-defined narrow shear zone (1.0 meter wide) was noted near L27+00E, 8+96N, oriented 115° and dipping to the south (85°). It shows strong chloritization and is moderately mineralized with 5-10% arsenopyrite-pyrite. The shear seems to end near L27+15E. Several late faults are present, which can be grouped into two main orientations: NW and NNE. Both

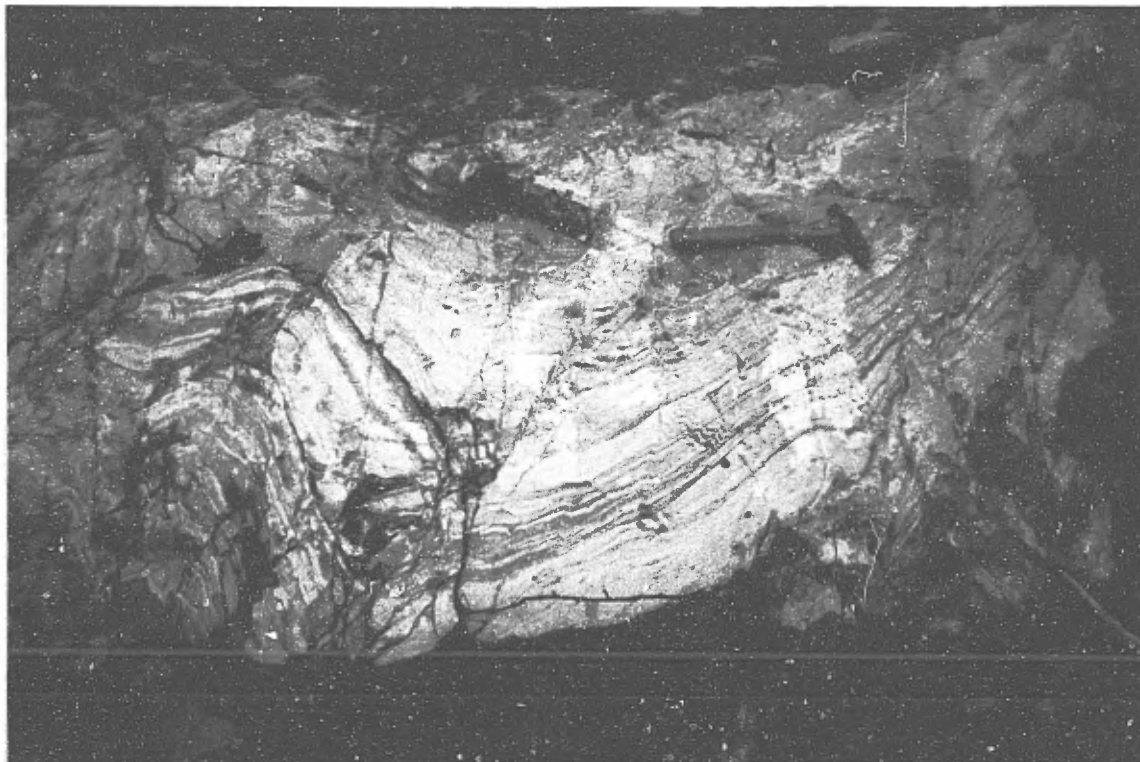


Plate III. Well preserved bedding in sediments (hammer head pointing north)

of them possess steep dips. Most of the joints measured on the stripping have predominantly a NNE orientation.

7.1.3 Mineralization:

As mentioned previously, most of the mineralization is found in a disseminated state in the sedimentary rocks where the silicification is most intense. Sulfides are composed in order of importance of arsenopyrite, pyrite and pyrrhotite and give a gossan look to the outcrop (Plate VII). Local "patches" of sulfides are made up of almost massive arsenopyrite with lesser amounts of pyrite specially in the vicinity of quartz veining. Sampling prior to the stripping of such mineralization returned a value of 12.5 g Au/T. More often, the host rocks contain 2-10% sulfides. Arsenopyrite is usually found as euhedral crystals up to 1 cm in length, but generally less than 3 mm, mostly disseminated in the sediments, and locally in quartz veins. Pyrite and pyrrhotite are less abundant and occur only in the host rock. Most of the quartz veins are not mineralized.



Plate IV. Iron-formations showing isoclinal folding (hammer head pointing north)

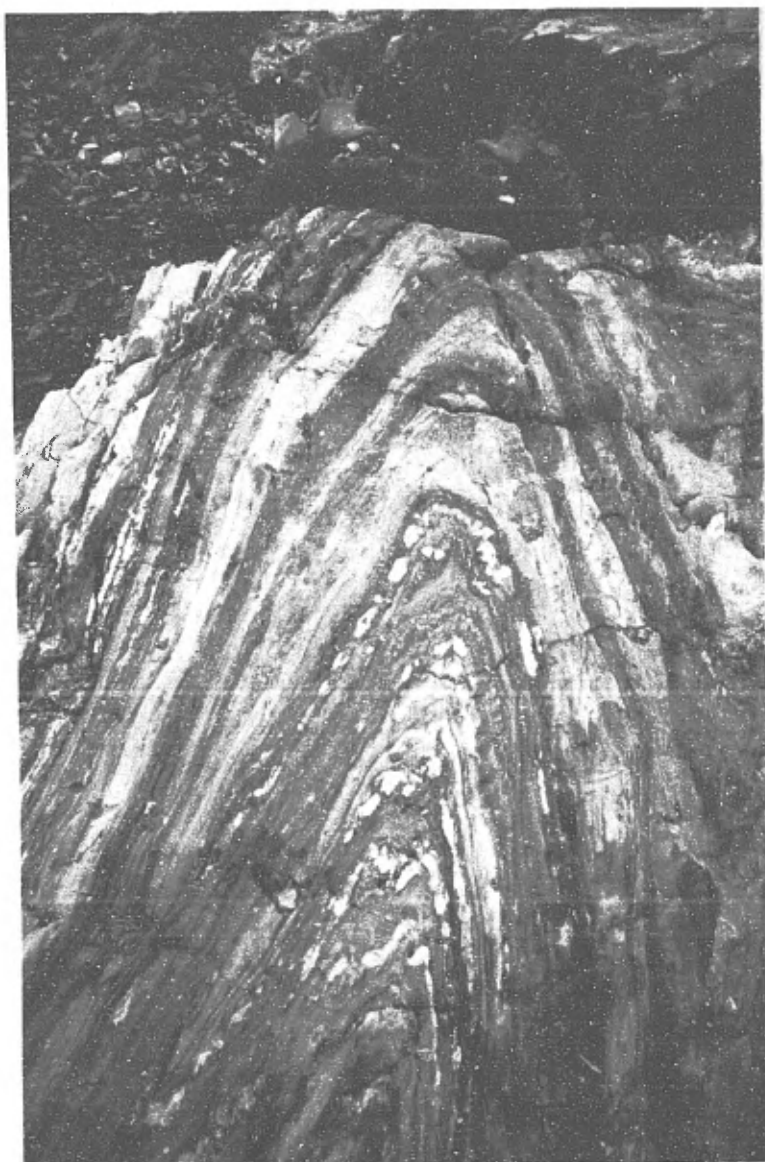


Plate V. Folded iron-formations showing text-book examples of boudinage (looking west)

7.1.4 Results:

A total of 54 channel samples were collected in 1990 and 1991. Lengths of 2 meters were used for each track, and each was analyzed in gold in ppb using a detection limit of 2 ppb and for copper and zinc in ppm. Results are illustrated on Map VII. Although some high values were obtained from the sampling, it is easy to notice the erratic nature of the gold within the showing.

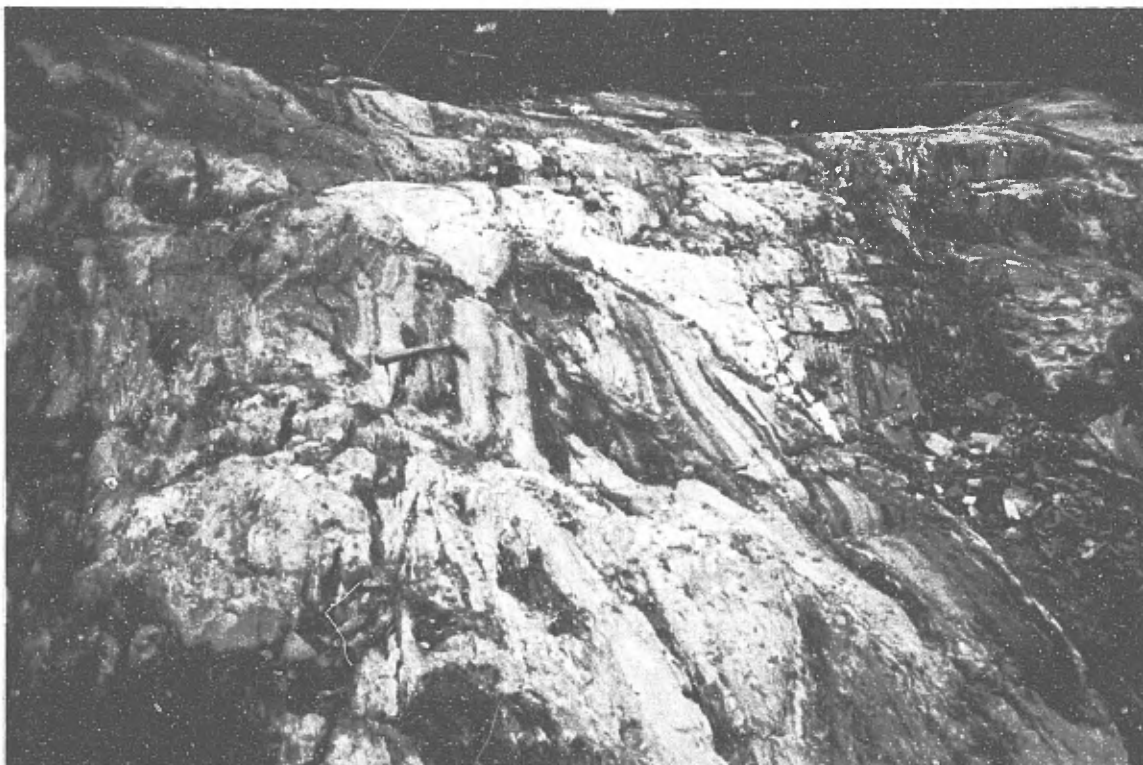


Plate VI. Dextral displacement of iron-formations (hammer head pointing north)

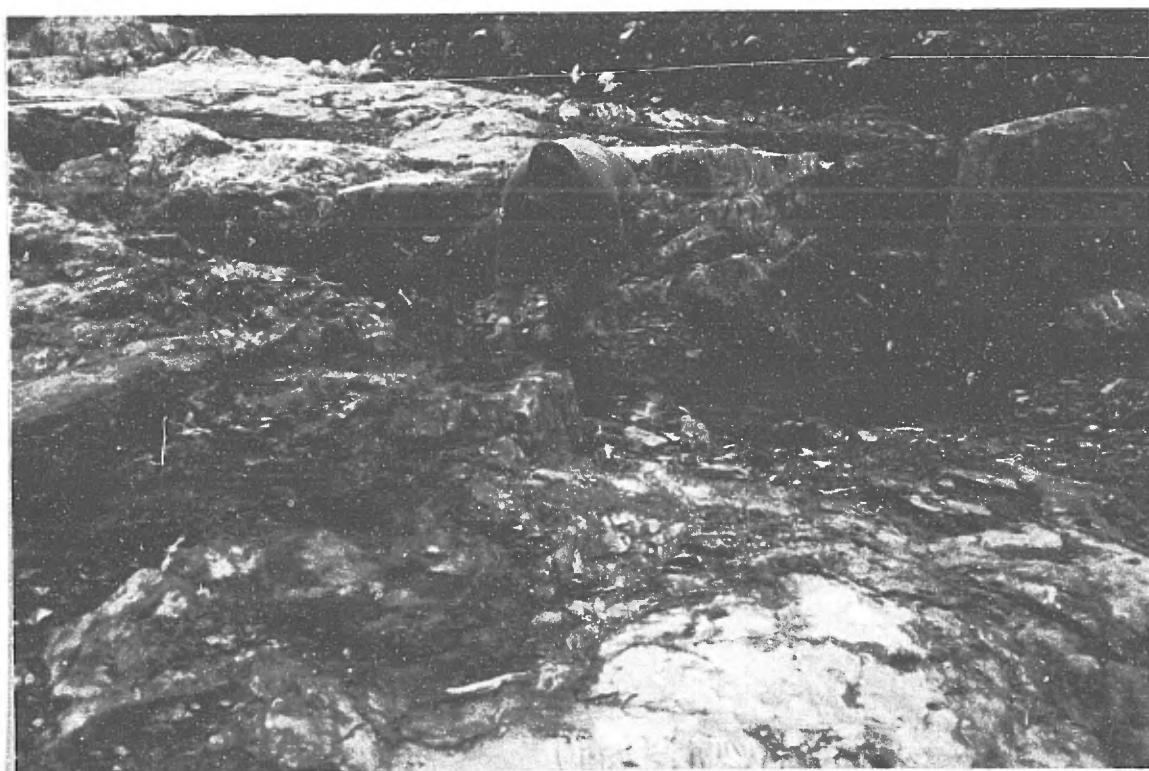


Plate VII. One of the authors hammering on gossan, October 1991. (looking southeast)

7.2 The Toussaint Céré Showing

The Toussaint Céré Showing was first discovered in 1974 by prospector Toussaint Céré. On the existing grid, it is located at L28+35E, 3+40N. Many samples were collected since 1974, and the highest value was 3.4 g Au/T. Since values in gold were constantly anomalous, plus the fact that the showing was covered by less than 1.0 meter of overburden, an area of 400 m² was stripped (Plate VIII). Small scale folding observed in an old trench implied complex deformation. The stripping and cleaning of the area took less than 3 days.



Plate VIII. Toussaint Céré Showing, September 1991 (looking north)

7.2.1 Geology:

Initially, the mineralization was believed to be disseminated in biotite chlorite schists or in narrow bands parallel to the schistosity. It consisted mainly of arsenopyrite, with occasional pyrite, pyrrhotite and chalcopyrite in the walls of quartz veins.

The geology of the stripping is quite simple, consisting of fine-grained greywackes and chloritized siltstones (MAP VIII and Plate IX). The greywackes show a beige weathered surface, while the siltstones are greyish - green due to moderate chloritization. These

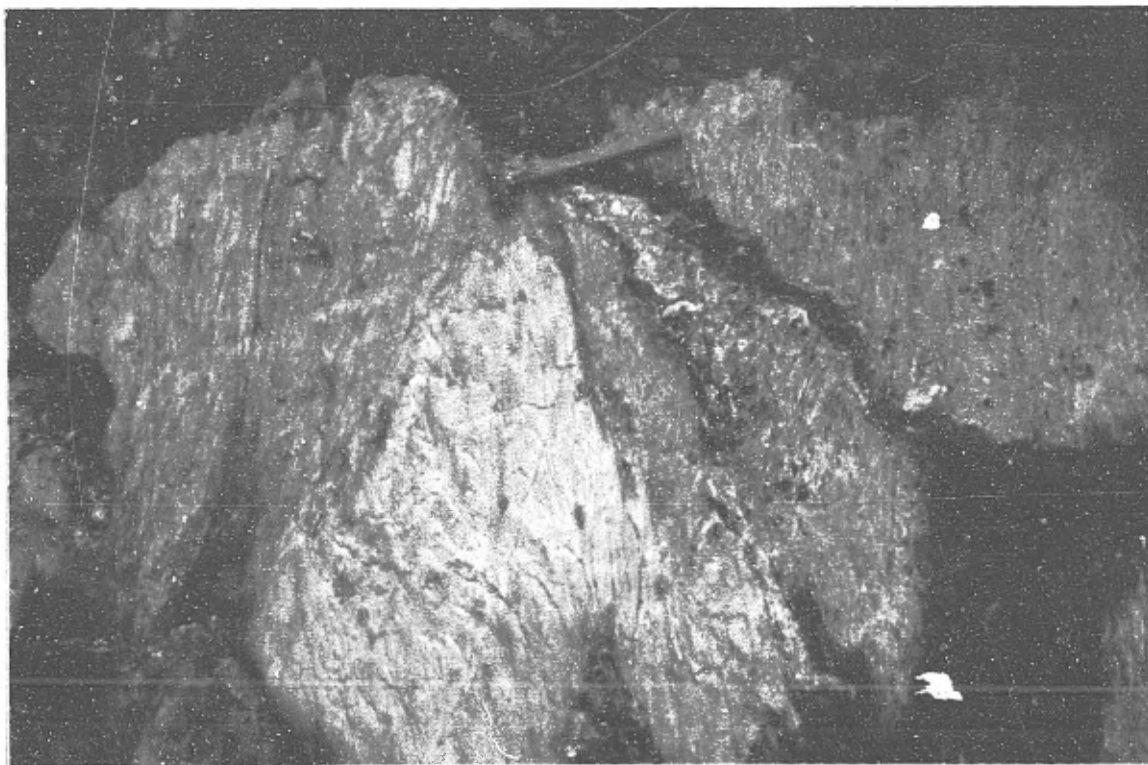


Plate IX. Folded contact between greywackes and (light colour) chloritized siltstones (hammer head pointing north)

metasedimentary rocks are part of the Cadillac Group. Veining on the outcrop is abundant, showing conformable and cross-cutting veins, always folded and often boudined (Plate X). Quartz and chlorite-ankerite are the main constituents of the veins. The biggest one was less than 30 cm in width.

7.2.2. Structure:

As in the case of the Greater Malartic Showing, the Toussaint Céré Showing demonstrates the complexity of the deformation of the area. Well preserved bedding and the presence of the two sedimentary marker units show consistent open asymmetric folding. Conformable and cross-cutting veins generally follow the pattern of deformation, one of them with a fold axis plunging 62° to the west. Regional schistosity (S2?) is present as crenulation of S0 (see Plate XI). Several tension joints were measured with either NW or NE orientation.



Plate X. Deformed and boudined quartz veins (hammer head pointing north)

7.2.3. Mineralization:

Overall, the stripping shows very little mineralization. The most abundant sulfide is arsenopyrite, which is mainly disseminated or in fine folded bands (see Plate XII). Maximum content of sulfides is lower than 10%, with an average for the stripping of less than 1%. Contrary to Royal Agassiz who reported pyrite, pyrrhotite and chalcopyrite, the authors noted the presence of only a few grains of pyrite in quartz veins. Most of the quartz veins are barren.



Plate XI. Crenulation (regional schistosity S2?) of S0 (hammer head pointing north)

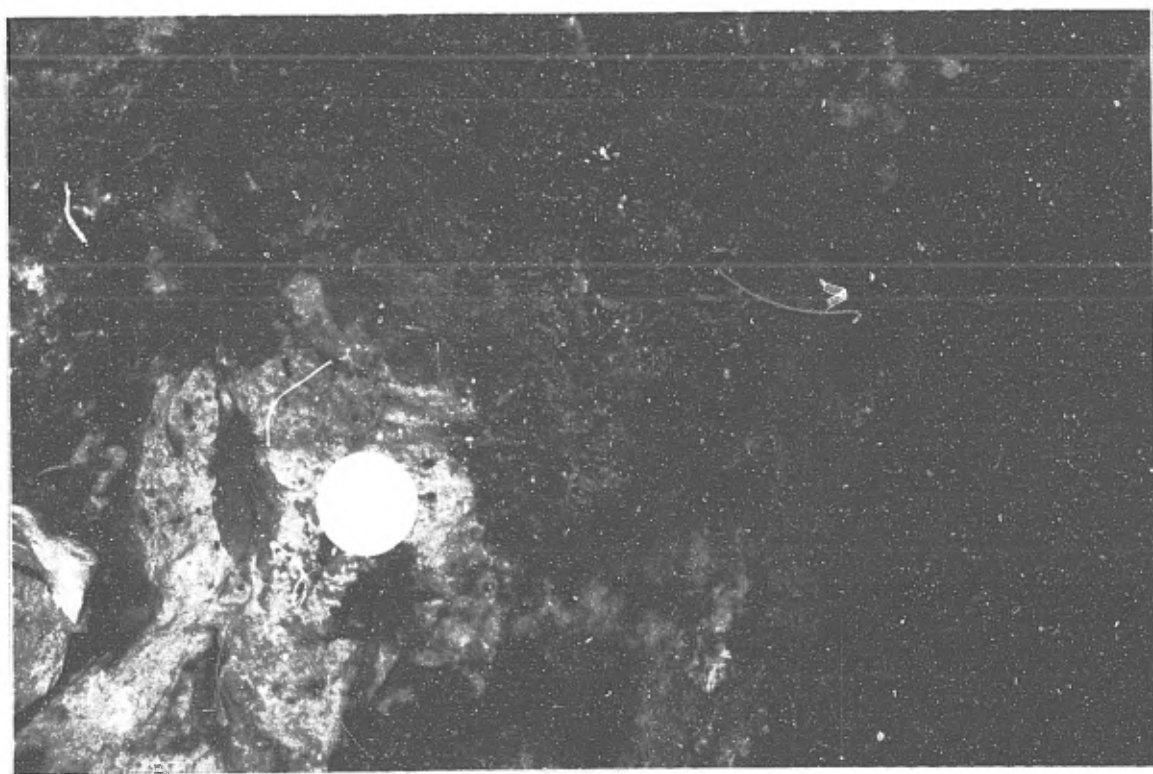


Plate XII. Folded arsenopyrite bands (dollar coin used as scale)

7.2.4. Results:

A total of 18 track samples were collected in 1991, using lengths of 1.5 meters. Results obtained from the sampling program returned low gold values, compared to grab sampling done by LAC (1.5 g Au/T) or Royal Agassiz (3.4 g Au/T). Track sampling results are shown on MAP IV.

8.0 Conclusion and recommendations:

The main objective of both strippings was to examine the nature of the auriferous mineralization at both sites. This enabled us to observe the structural complexity of the host rocks and its enclosed quartz veins. Host rocks are strongly folded and faulted at the stripping scale, suggesting the presence of a larger fold at the regional scale, as illustrated on Figure 3. At the Greater Malartic Showing, gold seems to be associated to the quartz veins and their immediate sulfurized wall rocks. Locally though, gold values were obtained from mineralized quartz veins. The abundance of the veins and sulfide content is greater near fold hinges. One diamond drill hole located 100 meters west of the Greater Malartic Showing did not intersect gold values or similar geology. The Greater Malartic Showing mineralization shows numerous similarities to former Central Cadillac & Wood Cadillac mines (1939-43; 1947-49: 600 000 T @ 5.1 g/T Au) where two main types of mineralization were recognized within this deposit:

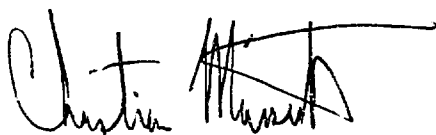
"Sulphide ore" which consists of vertical lenses (2 cm to 2 meters wide; up to 120 m long) of silicified sheared greywackes along two banded iron-formations (magnetite). These lenses were well mineralized with pyrite and arsenopyrite and their gold distributions were irregular. This type of ore was of "better grade" and served as sweetener in former production and,

"Quartz-tourmaline ore", which proved to be the most important from the point of view of tonnage (mined and indicated) and consists of flat quartz-tourmaline-pyrite-arsenopyrite-scheelite-gold tension veins/veinlets located between the Cadillac shear zone and the first iron formation. They occur as ribbon-like veins (5-30 cm wide) and extend laterally along strike over lengths exceeding 1000 feet. They seem to repeat themselves every 30 to 60 cm vertically along a 15 m wide corridor located north of the Cadillac Shear. The subhorizontal quartz-tourmaline vein system seem better developed and of better grade in areas of Z-shaped drag folding and cross-faulting.

The narrowness and the erratic distribution of this type of auriferous mineralization makes very difficult its exploration and exploitation. Old company correspondence frequently mentioned these problems, specially the necessity of manual sorting of the flat quartz-tourmaline ore to prevent a 30 to 50 percent dilution.

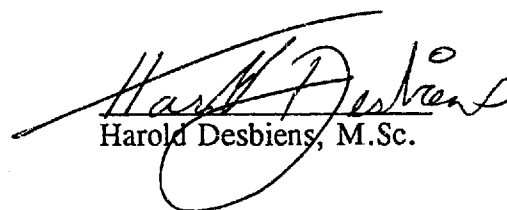
At the Toussaint Céré Showing, the grab sample returning the highest value in gold was a quartz vein with minor amounts of pyrite, in silicified sediments with disseminated arsenopyrite.

For the time being, the economic potential of both showings seems limited and LAC should rather concentrate its future exploration outside the Cadillac Sediments wedge, i.e. on the southwestern part of the property where Blake River volcanics are present.



Christian Massicotte, B.Sc.

CM/cp



Harold Desbiens, M.Sc.

9.0 References:

- Boileau, P., Turcotte, R. (1990); "Levé de polarisation provoquée, propriété de Minerais LAC Ltée. Propriété Orion B-8, B-9, canton de Bousquet, Province de Québec, Novembre 1990." By Val d'Or Geophysique, for LAC Minerals Ltd., 7 p.
- Carré, M. (1980); "Journaux de sondages OR80-26, OR80-28, OR-80-29". Long LAC Mineral Exploration Ltée.
- Conway, P. (1979); "Rapport complémentaire, levé EM-16 (Station N.S.S.), propriétés B-8, B-9, et B-10, canton de Bousquet.", Long LAC Mineral Exploration Ltée, 4 p.
- Doucet, D., Sansfaçon, R. (1984); "Rapport de la campagne de forage 1983-84, Projet Orion, propriété B-2, B-8, B-9, B-10, B-12, C2-G4, G2-G8, C2-G8a, C2-G8b, C2-G10, C2-G13 et Viau, cantons de Bousquet et de Cléricy", LAC Minerals Ltd., 23 p.
- Francoeur, D. (1978); "Rapport géophysique, propriétés B-8, B-9, B-10, canton de Bousquet, Long LAC Mineral Exploration Ltée, 11 p.
- Gunning, H.C. (1941); "Bousquet-Joannes Area Quebec", Memoir 231. Geological Survey Dept. of Mines and Resources Canada.
- Hoy, L.D., Trudel, P., Tourigny, G., Kheang, L., Savoie, A., Crépeau, R. (1990); "Isotopic and fluid inclusion constraints on the origin of vein Au mineralization at Bousquet Township, Quebec". In C.I.M. Special Volume 43, pp. 413-423.
- Husson, B. (1974-75); Royal Agassiz Mines Ltd., GM-30249, 31140, 31141, 31142, 31143.
- Huxhold, P., (1986); "Report on the Reverse-Circulation Overburden Drilling, Bousquet-Ferris and Joannes North Properties, Joannes and Bousquet Townships, Quebec, N.T.S. 32D/7." Ressources Breakwater Inc.

- Huxhold, P., (1987); "Report on the Reverse-Circulation Overburden Drilling, Ferris Doucet "B-1" Property, Bousquet Township, Quebec, N.T.S. 32D/7, June 1987." Ressources Breakwater Inc.
- Lambert, G., Turcotte, R. (1988); "Levé géophysique propriété de Minerais LAC Ltée, projet Orion B-8, canton Bousquet, Province de Québec, Décembre 1988". By Val d'Or Geophysique, for LAC Minerals Ltd., 7 p.
- Marquis, P., Hubert, C., Brown, A.C., Rigg, D.M. (1990); "An evaluation of genetic models for gold deposits of the Bousquet District, Quebec, based on their mineralogic, geochemical, and structural characteristics". In C.I.M. Special Volume 43, pp. 383-399.
- Massicotte, C. (1990); "Journaux de sondages OR90-43, OR90-44, canton Bousquet, Québec." LAC Minerals Ltd.
- Massicotte, C. (1988); "Rapport de la campagne de forage 1988 sur le projet Orion (B-2, B-6, B-8), canton Bousquet", LAC Minerals Ltd., 111 p.
- Misener, D.J. (1978); "Report on airborne electromagnetic, VLF and magnetic surveys on portions of Cléricky, La Pause, Joannes and Bousquet Townships, Quebec". By Aerodat Limited for Long LAC Mineral Exploration Limited, 105 p.
- Public Files, M.E.R.: GM-5911, 5934C, 6991, 13310, 13555a, 22248.
- Sansfaçon, R. (1978); "Rapport géologique, propriétés B-8, B-9, B-10, canton de Bousquet", Long LAC Mineral Exploration Ltée, 17 p.
- Sansfaçon, R. (1979); "Rapport géochimique, propriétés B-8, B-9 et B-10, canton de Bousquet", Long LAC Mineral Exploration Ltée, 9 p.
- Savoie, A., Perreault, G. et Filion, G. (1986); "Geological setting of the Doyon gold deposits, Bousquet, Abitibi, Quebec, Canada". In Proceedings of Gold' 86, an International Symposium on the Geology of Gold, pp. 97-107.

- Savoie, A., Trudel, P., Sauvé, P., Perrault, G. (1990); "Géologie de la mine Doyon, Cadillac, Québec". In C.I.M. Special Volume 43, pp. 401-411.
- Touborg, J.F. (1988); "Report to Novamin Resources Inc./St-Joe Inc. Joint Venture. Subject : A Landstat Interpretation of the Cadillac - Malartic Break, N.W. Quebec, February 1988." Ressources Breakwater Inc.
- Wright, J.L. (1985); "Darius Joint Venture, Bousquet-Ferris Property, Induced Polarization Survey - 1985, Project 2140.04, N.T.S. 32D/7a,b, November 1985." Ressources Breakwater Inc.
- Wright, J.L. (1986); "Darius Joint Venture, Bousquet-Ferris Property, Induced Polarization Survey - 1986, Project 2140.04, N.T.S. 32D/7a,b, November 1986." Ressources Breakwater Inc.
- Wright, J.L., De Carle, R. (1987); "Darius 1971 and 1986 Input Airborne Review, June 22, 1987.", Ressources Breakwater Inc.
- Wright, J.L., Zalnieriunas, R.V. (1985a); "Darius Joint Venture, Bousquet-Ferris Property, Winter 1985 Combined Geophysical Programme, Magnetometer, VLF and HLEM surveys, April 1985." Ressources Breakwater Inc.
- Wright, J.L., Zalnieriunas, R.V. (1990); "Compilation and Interpretation of Ground and Airborne Magnetic Data, January 1990." Ressources Breakwater Inc.
- Zalnieriunas, R.V. (1989); "Darius Joint Venture, Compilation Report on the Ferris-Doucet "B-1" and the Bousquet-Ferris Properties, N.T.S. 32D/7, December 1989." Ressources Breakwater Inc., 42 p.
- Zalnieriunas, R.V. (1990); "Darius Joint Venture, Bousquet-Ferris Property, Report on the 1990 field work for the Bousquet-Ferris property, N.T.S. 32D/7." Ressources Breakwater Inc., 35 p.
- Zalnieriunas, R.V. (1990); "Darius Joint Venture, Bousquet-Ferris Property, Soil Sampling Survey (1990)." Ressources Breakwater Inc.

Zalnieriunas, R.V., Wright, J.L. (1985); "Darius Joint Venture, 1985 Bousquet-Ferris Property report, Geology, Geophysics, ,October 1985." Ressources Breakwater Inc.

ANALYSES

Une Division de SGS Supervision Services Inc.

Téléphone: (819) 764-9108 — Télécopieur: (819) 764-4673

Date: 07.31.90

Client: PINEROIS LAC c/o HAROLD DESRIENS

Project: DORN

Dossier: 120433

~~Technician~~

Numero	AU PPB	CU PPM	ZN PPM	AG PPM
32639	<1	--	--	--
32640	<1	--	--	--
32641	<1	--	--	--
32642	2	--	--	--
32643	1	--	--	--
32644	<1	--	--	--
32645	5	--	--	--
32646	2	--	--	--
32647	<1	--	--	--
32648	<1	--	--	--
32649	9	119.	2700.	1.0
32650	<1	71.1	178.	<0.5
32651	370	--	--	--
32652	380	--	--	--

	Numero	AU PPB	AU PPB	BE PPM	B PPM	SC PPM	V PPM	MN PPM	FEO %	CO PPM
CORV-20	32621	5	--	--	--	--	--	--	--	--
	32622	27	--	--	--	--	--	--	--	--
	32623	41	--	--	--	--	--	--	--	--
	32624	4	--	--	--	--	--	--	--	--
	-21 32625	<5	--	--	--	--	--	--	--	--
-22	32626	4	--	--	--	--	--	--	--	--
-23	32627	<5	--	--	--	--	--	--	--	--
-24	32628	<5	--	--	--	--	--	--	--	--
-25	32629	<5	--	--	--	--	--	--	--	--
-26	32630	<5	--	--	--	--	--	--	--	--
-27	32631	31	--	--	--	--	--	--	--	--
-27	32632	21	--	--	--	--	--	--	--	--
-20	32637	37	--	--	--	--	--	--	--	--
Bousquet II	32638	--	2900	<1	20	4.4	14	41	0.3	3

TECHNI-LAB abitihi inc.

CERTIFICAT D'ANALYSE

NOM: MINERAIS LAC
Division Exploration - Quebec
ADRESSE: C.P. 1090 Malartic (Quebec)
JOY IZO

Projet: 1801
Date: 05/11/90

ATTENTION: M. Christian Massicotte

Votre projet:
QORN - 79014

Echantillon			Au	Au
#			ppb	ppb
			1/2 A/T	1 A/T
Greater Malartic	Shoring	Tract #		
A	33688	#1	55	50
A	33689	#2	30	20
A	33690	#3	810	735
A	33691	#4	3,33 g/t	3,40 g/t
A	33692	#5	440	400
A	33693	#6	30	35
A	33694	#7	400	450
A	33695	#8	710	760
A	33696	#9	50	40
A	33697	#10	990	985
A	33698	#11	275	280
A	33699	#13	110	95
A	33700	#14	70	41
A	33701	#15	6,50 g/t	7,25 g/t
A	33702	#16	200	180
A	33703	#17	370	315
A	33704	#18	65	65
A	33705	#19	63	60
A	33706	#20	120	90
A	33707	#21	23	24
A	33708	#22	280	340
A	33709	#23	27	24
A	33710	#24	3	4
A	33711	#25	3	3
A	33712	#26	150	110
A	33713	#27	4	33

CHIMISTE

Les resultats des echantillons ci-dessus sont certifies

Par: *Stefane Premont*

STÉFANE PRÉMONT

CHIMISTE

Fax: 787-6527

184, Principale, Ste-Germaine JOZ 1M0 Tel et fax: (819) 787-6116

... 1/

TECHNI-LAB

abitibi inc.

CERTIFICAT D'ANALYSE

NOM: MINERAIS LAC
Division Exploration - Quebec
ADRESSE: C.P. 1090 Malartic (Quebec)
JOY IZO

Projet: 1801
Date: 05/11/90

ATTENTION: M. Christian Massicotte

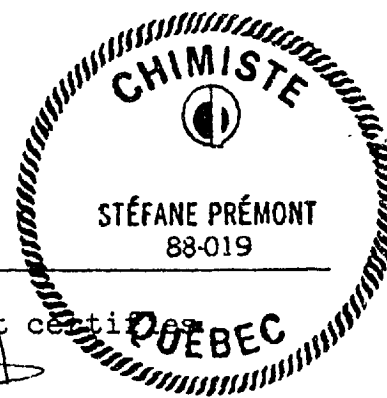
Votre projet:
QORN - 79014

Echantillon	Au	Au
#	ppb	ppb
	1/2 A/T	1 A/T
A 33714	# 28 133	115
A 33715	# 29 2,63 g/t	2,80 g/t
A 33716	# 30 13	13
A 33717	# 31 350	290
A 33718	# 32 20	18
A 33719	# 33 20	30
A 33720	# 34 10	12
A 33721	# 35 117	118
A 33722	# 36 7	5
A 33723	# 37 < 2	3
A 33724	#	
A 33725		
A 33726		
A 37201		g/t
A 37202		g/t
A 37203		
A 37204		

Les resultats des echantillons ci-dessus sont certifiés

Par:

Stefane Premont



TECHNILAB

CERTIFICAT D'ANALYSE

Principale Ste-Germaine

A : MINERAIS INC 185
Division Exploration, Quebec
C.P. 1190
MALABIC (Quebec)
JOY 120

DATE : 12, 11/9
PROJET : 03409

JOZ 1140

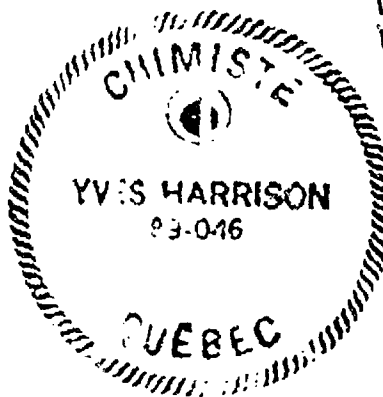
M. Harold Desbiens

Tel (819) 787-6116

Tel (819) 787-6527

Sans frais 1-800-561 9

Echantillon #	Au ppb	Reprise Au g/t	Cuivre ppm	Zinc ppm	
<i>Truck</i>					<i>base</i>
1 86582	47		350	59	↑
2 86583	57		79		
3 86584	57		120	86	
4 86585	23		42	48	
5 86586	873		140 (130)	42 (4)	↑
6 86587	107	<i>Toussant Céré</i> <i>Sherry</i>	45		
7 86588	60		64	66	
8 86589	37		64	82	
9 86590	50 (13)		36	37	
10 86591	13		33	48	↑
11 86592	22		56	55	
12 86593	20		67	46	
13 86594	20		35	48	
14 86595	12		34	39	↑
15 86596	50		28	34	
16 86597	277		48	37	
17 86598	120	<i>Greater Malakite (Tack)</i>	75	40	
18 86599	137		69	67	
86600	< 2		38	39	
86801	10	39	39	31	↑
86802	113	40	62	43	
86803	7	41	37	39	
86804	267	42		30	
86805	107	43		45	



Les resultats des echantillons ci-dessus sont certifies

par: *[Signature]*
Yves Harrison, chimiste.

TECHNI-LAB

pyroanalyse
général
environnement

CERTIFICAT D'ANALYSE

184 Principale, Ste-Germaine

A : MINÉRAIS LAC L'ÉC
Division Exploration Québec
C.P. 1090
MALARTIC (Québec)
JOY 120

DATE : 12/11/91
PROJET : 03409

JOZ 1M0

M. Harold Desbiens

Tél.: (819) 787-6118

Télé.: (819) 787-6527

Sans frais: 1-800-567-6489

Echantillon #	Au ppb	Reprise Au g/t	Cuivre ppm	Zinc ppm
<i>Truck #</i> 44 86806	117		52	43
45 86807	1017	1,08	67	20
46 86808	3483	2,57	90 (88)	17 (18)
47 86809	230		43	28
48 86810	190		39	34
49 86811	773 (760)		41	22
50 86812	2350	1,47	57	25
51 86813	90		40	40
52 86814	1297	1,27	50	40
53 86815	1407	1,80	120	74
54 86816	683		55	56
86817				
86818				
86819				
86820				
86821				
86822				
86825				
86826				
86827				
86828				
86829				
86830				
86832				

Greater Malartic

Val N'Or

J-N. 244E



Les résultats des échantillons ci-dessus sont certifiés

par: *[Signature]*
Yves Harrison, chimiste.



Minerais Lac Ltée
Division Terrains Aurifères

TEL. 757-3547

LABORATOIRE REGIONAL

EXPL. LAC

CERTIFICAT D'ANALYSES
CERTIFICATE OF ANALYSIS

No. 2596

ECHANTILLONS SAMPLES

PROJET QORN

Malartic, Qué.

24-05

1970

RECU DE
RECEIVED FROM

ANALYSES
ASSAYS

1 ZN 1 AG 1 CU

[illegible]

Paul Baum
ANALYSTE / ASSAYER

ANALYST / ASSAYER