(61) DETTER CREEK (McNabs Cove Area)

U.T.M.G. - N-506516
E-67557

N.T.S. - 11F/10D (1:50,000)

This occurrence is found in situ on a small point along the shore of the Bras d'Or Lake, approximately 900 feet south of Detter Creek and 400 to 500 feet west of Highway 4. Detter Creek is situated approximately midway between Hay Cove and Soldiers Cove (Fig. 172).

No exploratory work for barite or fluorite has been conducted in this area. It was first noted to occur here by Murray (1967, p. 83) during the course of investigations on limestone occurrences in Cape Breton Island during the years 1962-1965.

This occurrence is situated in carbonate rocks of the Windsor Group which overlie clastic sedimentary rocks of the Horton Group. The Horton Group forms an extensive part of the region to the south and east of the showing. Approximately two miles to the northeast and to the southwest of the deposit, gabbroic rocks intrude both the Horton and Windsor Group rocks. Major faults striking northeast affect the Horton and Windsor Group rocks but not the igneous intrusions.

The host rock is a grey, fine-grained, laminated limestone striking from 041° to 063° azimuth and dipping 25° towards the northwest. This limestone is part of the Central basin beds of the Windsor Group. The outcrops show extensive folding, shearing and fracturing, features which are quite likely related to a fault striking 022° azimuth that passes through this area just southeast of the barite-fluorite occurrences.

No other rock types were noted to crop out in the immediate vicinity of the mineral occurrences.

The fluorite is structurally controlled, occupying fractures along with calcite, which is the predominant mineral. The majority of these fractures are found to have an attitude of 120° azimuth/70° southwest and attain a maximum width of 3/4 inch (Fig. 173). Approximately 75 feet east of the fluorite veins, the

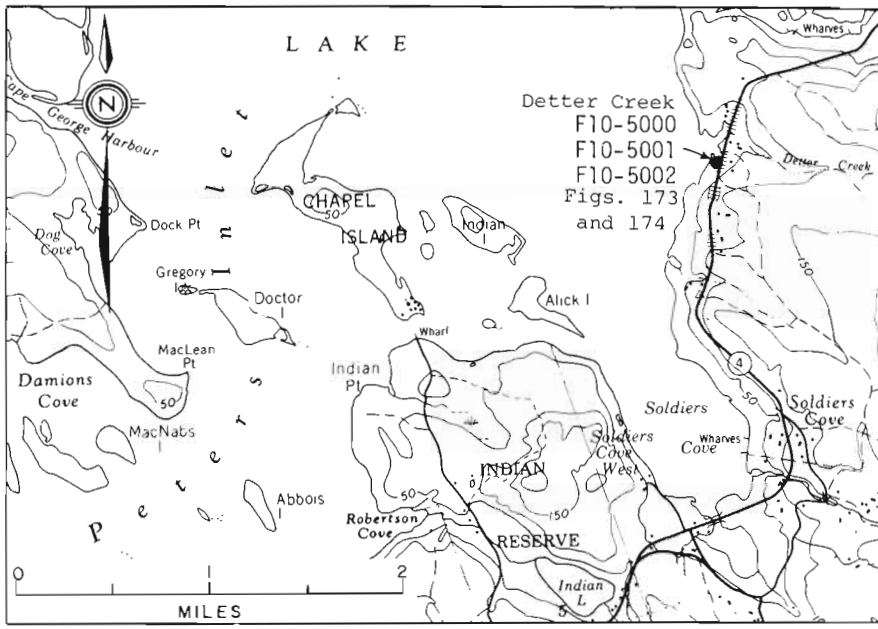
L A K E
Detter Creek
F10-5000
F10-5001
F10-5002
Figs. 173
and 174
Wharves
Detter Creek
Cape George Harbour
Dock Pt
Dog Cove
Gregory Is
Doctor
CHAPEL
ISLAND
Indian
Alick I
Wharf
MacLean Pt
Damions Cove
MacNabs
Indian Pt
Soldiers
Soldiers Cove
Soldiers Cove West
Wharves Cove
INDIAN
RESERVE
Abbots
Robertson Cove
Indian L
Peters Inlet
0
2
MILES

Figure 172

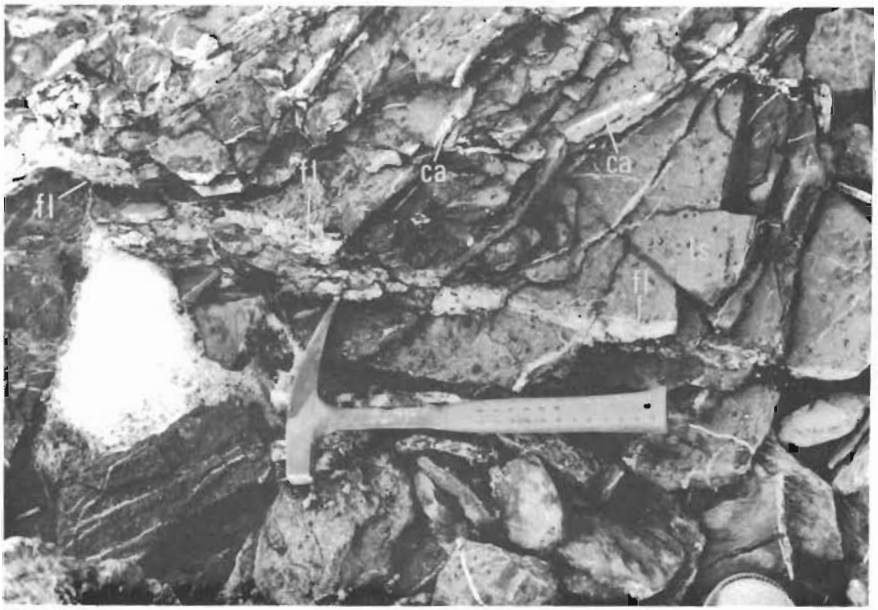

Figure 173 - Detter Creek. Fluorite veins in thinly laminated limestone (lower Windsor Group), fl - fluorite, ca - calcite.

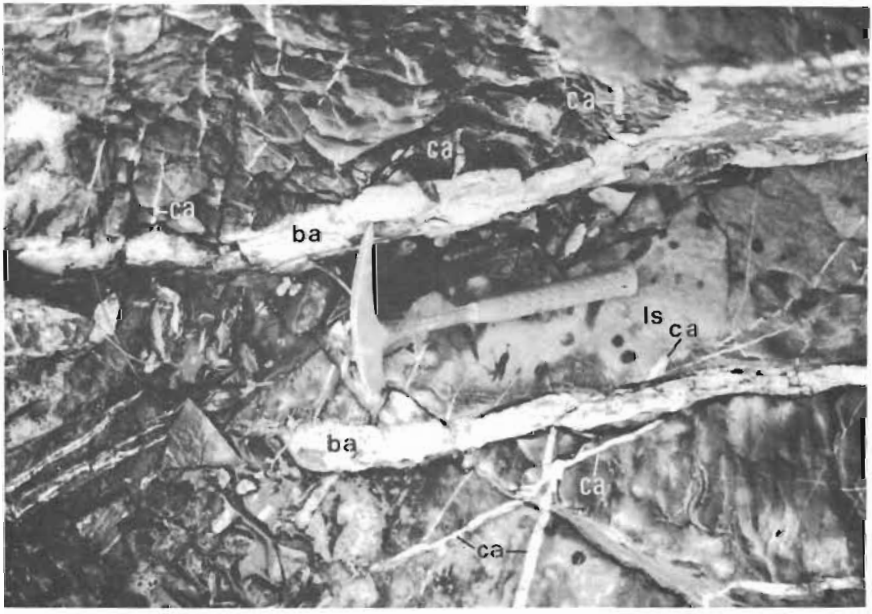

Figure 174 - Detter Creek. Calcite veins truncated by barite veins in thinly laminated limestone (lower Windsor Group), ba - barite, ca - calcite, ls - limestone.

barite is found filling fractures which attain a maximum width of two inches and strike 180° azimuth and dip 80° towards the west (Fig. 174). It is interesting to note that while calcite is found closely associated with the barite, the majority of the calcite veins are truncated by the barite. This suggests that the majority of the calcite mineralization pre-dates the barite. No barite was observed intimately associated with the fluorite, or vice versa, suggesting that the two minerals may have been deposited at different times.

The barite is pinkish cream in colour, is coarsely crystalline in texture, and displays a bladed habit. Minerals closely associated with the barite include calcite and hematite, the latter of which is found coating the cleavage planes of the barite, giving it its pinkish colour.

The fluorite ranges in colour from translucent white, pale grey-white, to purple, and appears to be coarsely crystalline in texture, although for the most part the grain boundaries are not readily visable. The obscuring of the grain boundaries seems to be due to post-mineralization shearing. Minerals associated with the fluorite are calcite and hematite, the latter of which is altering to limonite.

Grab samples were taken from the mineralized veins and the host rock, and submitted for chemical analysis. The location sampled is shown on Figure 172, and the analytical results are listed below and in appendix III.

Rock Type	Sample No.	Per cent			ppm		
		$BaSO_4$	$SrSO_4$	F	Cu	Pb	Zn
Barite	F10-5000	88.20	8.30	.10	5	20	5
Limestone	F10-5001	.32	.34	.12	150	100	30
Limestone, fluorite	F10-5002	1.33	.14	27.31	10	100	100

In thin section (no. F10-5002) the boundary between the fluorite and the host rock is sharp, indicating that no replacement of the host rock by fluorite has taken place. The fluorite is cut by numerous small fractures and octahedral and rectangular-shaped spaces, which have been filled with fine to coarse-grained calcite. The presence of these inclusions is probably a result of shearing; pieces of the fluorite being ripped along cleavage

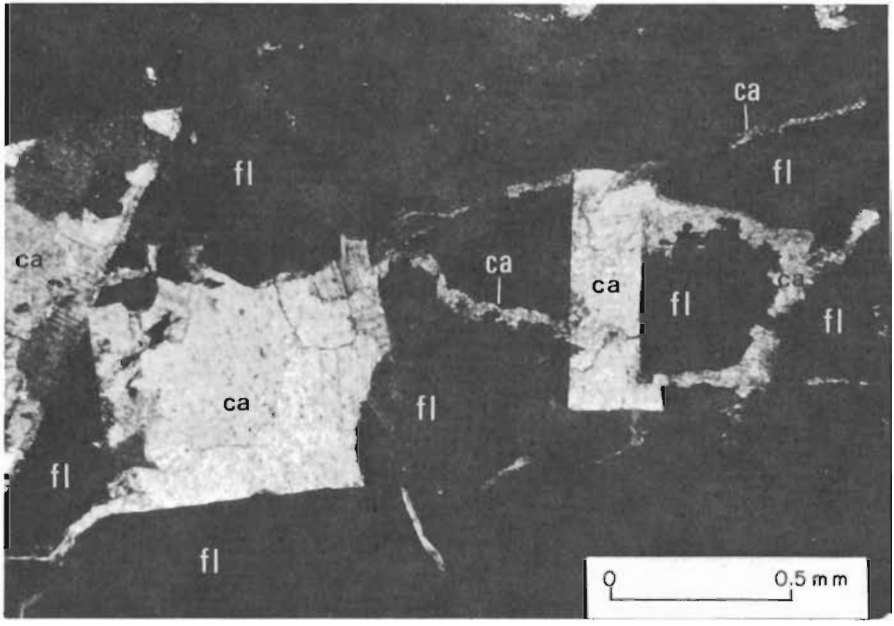

Figure 175 - Detter Creek. Calcite pseudomorphic after fluorite and filling small fractures. Note the embayed nature of the fluorite by calcite in the right hand side of the photograph. Crossed Nicols, fl - fluorite, ca - calcite.

from the vein. These inclusions are often contiguous with the calcite veinlets. Further evidence of shearing is provided by the larger, euhedral calcite grains which display bent cleavages. The calcite also shows evidence of having replaced some of the fluorite. This is suggested by: (a) sharp, regular, calcite-fluorite grain boundaries becoming irregular, appearing as if the calcite has "eaten" into the fluorite, and (b) rounded fragments of fluorite embayed by calcite (Fig. 175).

The hematite is primarily found replacing the calcite, often pseudomorphically after the octahedral and rectangular-shaped calcite inclusions.

From the above observations, a possible paragenesis for the mineralization here appears to be (Fig. 176):

Figure 176

The size of the deposit observed to date is insufficient to be considered of economic importance at the present time. However, it is believed that further exploratory work is warranted in the area, particularly in the vicinity of the fault, as it seems quite likely that it may have played a role in the localization of the ore minerals.

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1954: Southeast Cape Breton Island, N. S.; Geol. Surv. Can., Mem. 277.

(62) PINE BROOK

U.T.M.G. - N-507307
E-68468

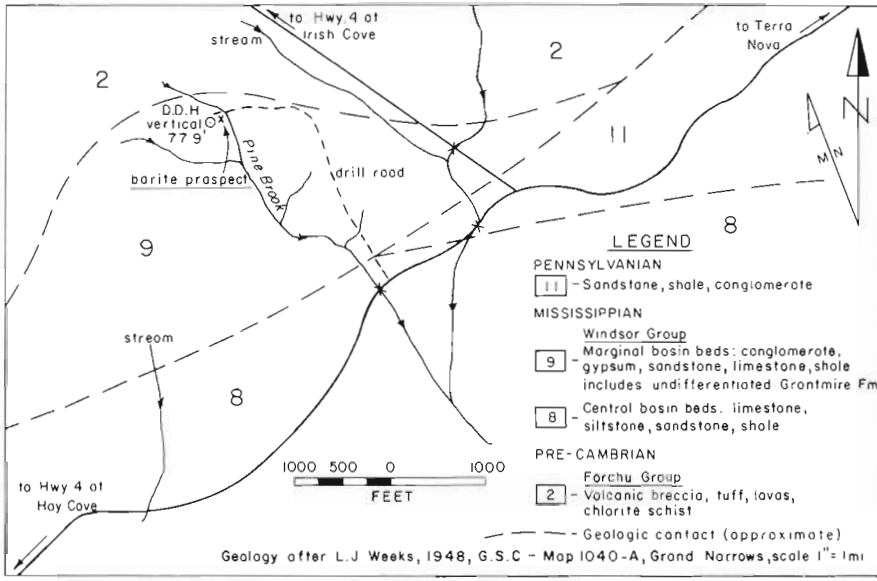
N.T.S. - 11F/15A(1:50,000)

The barite occurrence is found on Pine Brook, which is located just northeast of a small country hamlet known as Lake Uist. The prospect can be reached by walking northwest and west for approximately 2,500 feet on a drill road which intersects the main gravel road 100 feet northeast of Pine Brook (Fig. 23 and 177).

This occurrence was first mentioned in the literature of Fletcher in the Geological Survey of Canada Annual Report for the years 1876-1877. It did not receive attention as a potential prospect until 1962, when Lura Corporation Ltd. and Milado Mines Ltd. undertook investigations for associated lead-zinc deposits. This work included trenching, geochemical surveys and geophysical surveys. However, the prospect was overshadowed by more favourable results obtained by the same companies on property on the east side of Lake Enon which resulted in a major celestite discovery. It was not until 1971 that additional work was conducted on the prospect when Kaiser Celestite Mining Limited sank one drillhole totalling 77.9 feet. This hole cut three feet of barite with minor associated sulphides (chalcopyrite, galena and sphalerite).

The prospect is situated in carbonate and clastic sedimentary rocks of the marginal basin beds (Windsor Group), which unconformably overlie metamorphic rocks of the Fourchu Group. To the south and southeast a major northeast trending fault separates the Marginal basin beds from the Central basin beds (Windsor Group). The Marginal basin beds form an area roughly lense shaped with the long axis striking northeast and approximately two miles in length. Where these beds pinch out in the northeast the clastic sedimentary rocks of Late Carboniferous Age are in fault contact with the Fourchu Group.

Although the barite was not observed in situ (trenches slumped), the diamond-drill log by Kaiser Celestite Mining Limited indicate the deposit to be a bed three feet thick (apparent thickness). This bed is bound


to Hwy 4 at Irish Cove
stream
to Terra Nova
2
2
11
D.D.H vertical 779'
barite prospect
Pine Brook
drill road
9
8
8
stream
LEGEND
PENNSYLVANIAN
11 - Sandstone, shale, conglomerate
MISSISSIPPIAN
Windsor Group
9 - Marginal basin beds: conglomerate, gypsum, sandstone, limestone, shale includes undifferentiated Grantmire Fm
8 - Central basin beds. limestone, siltstone, sandstone, shale
PRE-CAMBRIAN
Forchu Group
2 - Volcanic breccia, tuff, lavas, chlorite schist
Geologic contact (approximate)
1000 500 0 1000
FEET
to Hwy 4 at Hay Cove
Geology after L.J Weeks, 1948, G.S.C - Map 1040-A, Grand Narrows, scale 1"= 1mi
N
MN

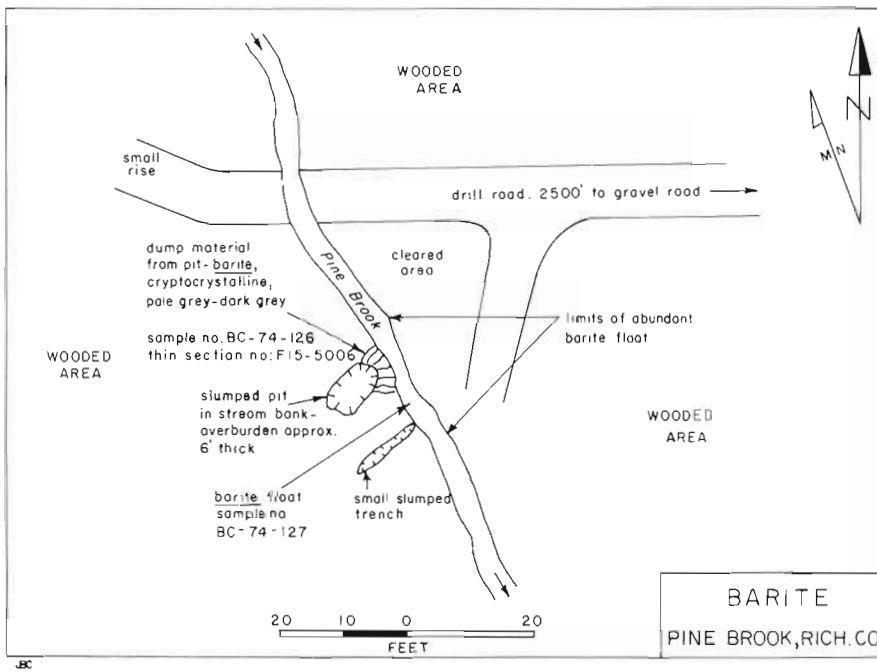

WOODED AREA
small rise
drill road. 2500' to gravel road
dump material from pit- barite, cryptocrystalline, pale grey-dark grey
cleared area
Pine Brook
sample no. BC-74-126
thin section no: F15-5006
limits of abundant barite float
WOODED AREA
slumped pit in stream bank- overburden approx. 6' thick
WOODED AREA
barite float sample no BC-74-127
small slumped trench
20 10 0 20
FEET
N
MN
BARITE
PINE BROOK, RICH. CO.
JBC

Figure 177

on the hangingwall and footwall by a light green-grey siltstone and light grey-green mudstone respectively.

A red sandstone and conglomerate outcrop found in the brook some 300 feet downstream of the trenches appears to be striking approximately 035° azimuth and dipping approximately 10° towards the southeast. It is quite likely that the barite bed would have a similar attitude. These beds are designated the "marginal basin beds" by Weeks (1954) and are believed to be part of the B-subzone of the Windsor Group.

In hand specimen the barite is pale grey, grey-white and dark grey in colour and is cryptocrystalline in texture. Some specimens show brecciation; the breccia fragments ranging in size from 1/32 inch to 1/2 inch, but generally being approximately 1/8 inch in size. These fragments are cemented with dark, fine-grained minerals that chemical analysis show to be sphalerite and galena.

Grab samples of the mineralized float were collected and submitted for chemical analysis. The sample location is shown on Figure 177, and the analytical results are found below and in appendix III.

Rock Type	Sample No.	Per cent			ppm		
		$BaSO_4$	$SrSO_4$	F	Cu	Pb	Zn
Barite	BC-74-126	93.30	2.20	.08	180	100	5030
Barite	BC-74-127	96.30	2.33	.04	90	60	1030

In thin section F15-5006 the barite occurs as small, equidimensional, anhedral grains and constitutes approximately 82 to 86 per cent of the rock. The remainder is made up of approximately 12 to 14 per cent calcite (limestone), and 1 to 2 per cent opaques (sphalerite). The calcite is found finely disseminated throughout the barite and as relict clumps sporadically distributed throughout the rock (Fig. 178). The opaques are primarily found as aggregates of small, spherical masses cementing brecciated barite and healing hairline cracks. Occasionally it can be seen sparsely disseminated in the barite and as a minor replacement phenomena of calcite as well as barite.

It appears that the barite is a stratigraphically controlled deposit, having preferentially replaced a specific horizon in the sequence of beds comprising the Windsor Group at this locality. This, in conjunction with

the presence of sphalerite renders it an interesting prospect which undoubtedly should receive further attention in the near future. The relationship between this deposit and the celestite deposit at the Kaiser Celestite Mine, Lake Enon, is uncertain; however, it is worthy of note that both deposits are hosted by "marginal basin beds" of the Windsor Group, which flank a paleotopographic high.

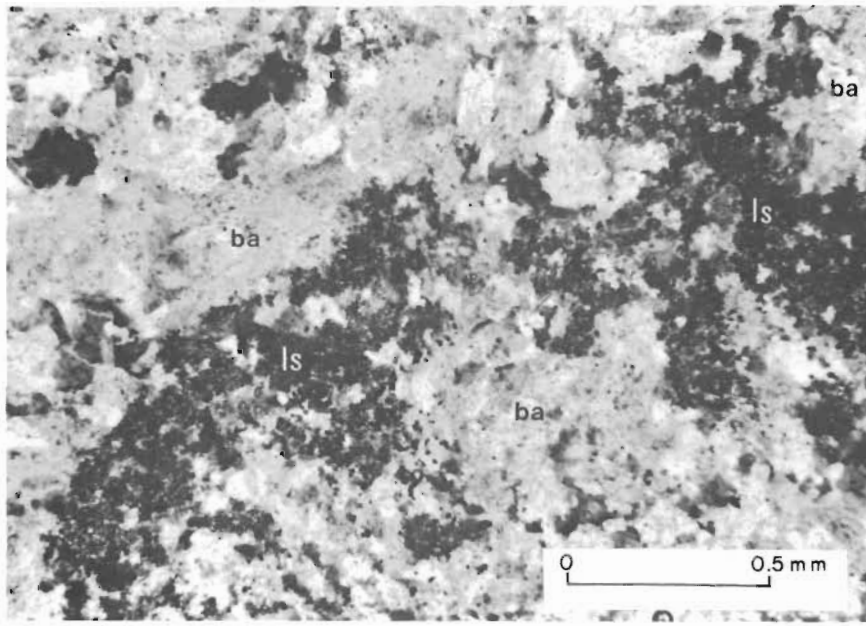


Figure 178 - Pine Brook. Barite replacing fine-grained limestone. Note the embayed, unreplaced portions of limestone. Crossed Nicols, ba - barite, ls - limestone.

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Weeks, L. J.
1954: Southeast Cape Breton Island; Geol. Surv. Can., Mem. 277.

(63) REAR BLACK RIVER

U.T.M.G. - N-506094
E-64595

N.T.S. - 11F/11D (1:50,000)

The celestite showing is situated approximately 4,225 feet south of the highway that skirts the south shore of West Bay (Bras d'Or Lake). It is most easily reached by walking south and southeast on a drill road that begins at the rear of the R. C. MacIntosh farm and first intersects Rear Black River at a distance of 3,000 feet from the farm; and then following the drill road which now generally parallels the stream or runs through it, for an additional 1,225 feet upstream. The celestite occurs in situ in the floor of the stream, and is marked by heavy celestite float appearing as a conspicuous light, buff grey colour that stands out anomalously from the surrounding, darker coloured fluviatile sediments (Fig. 179, 180, and 181).

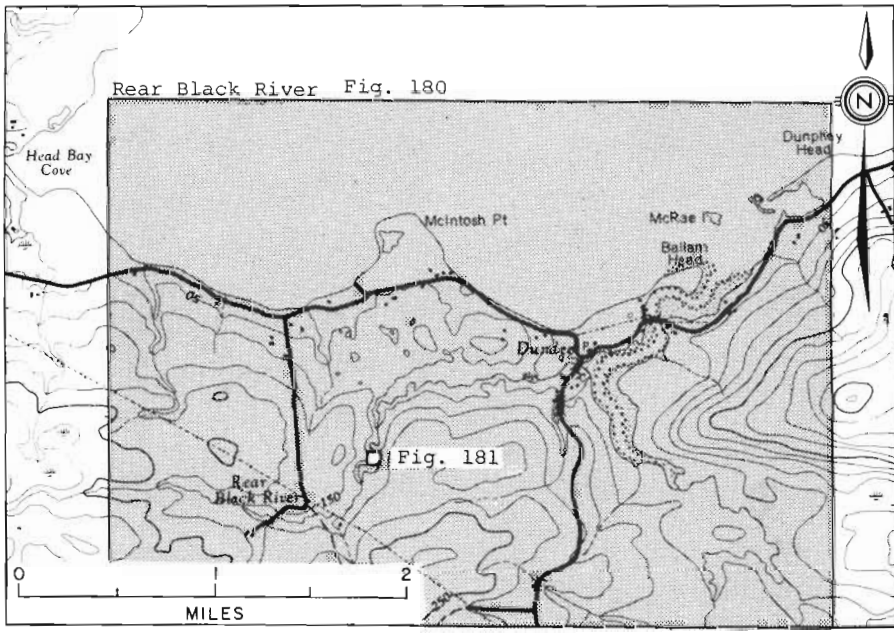

Figure 179

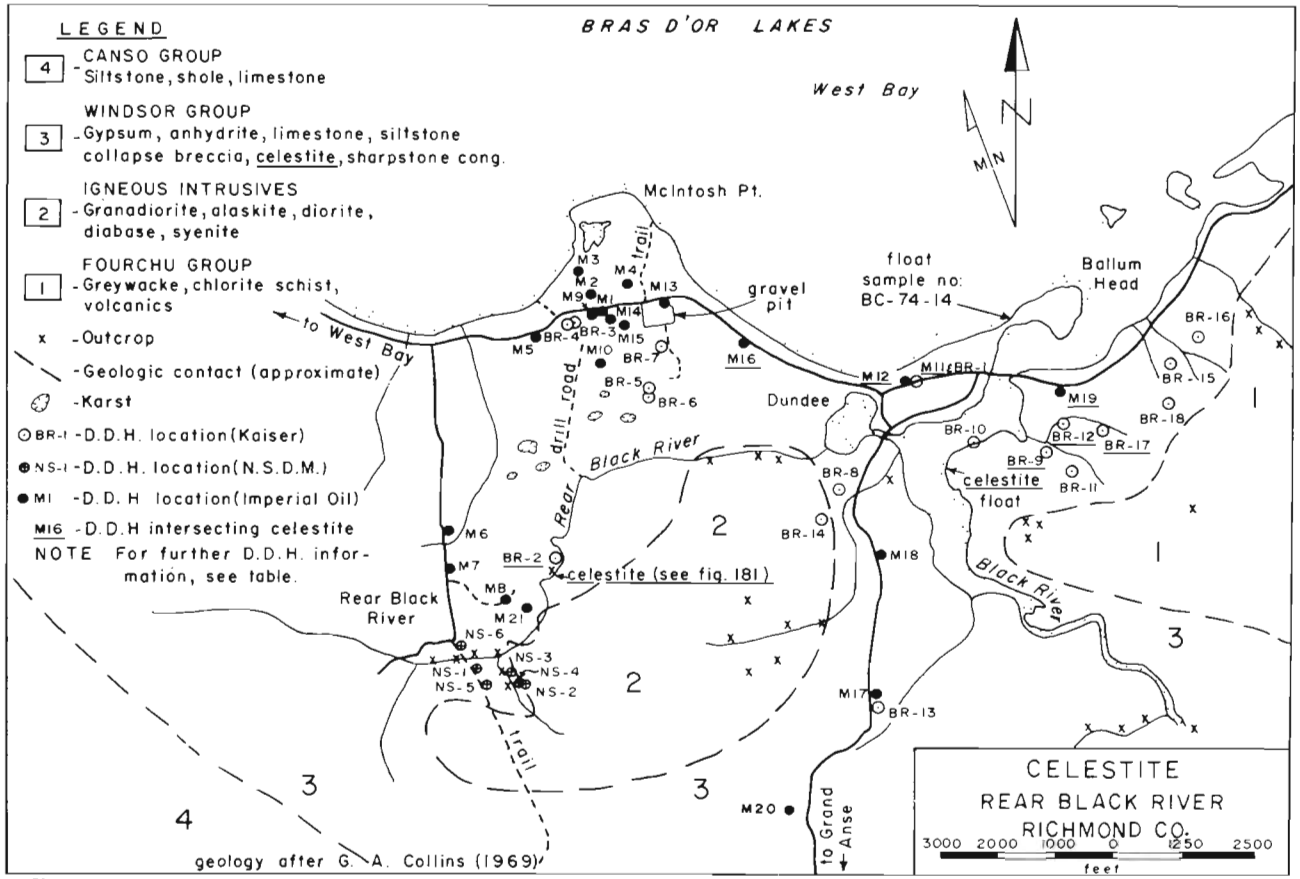
LEGEND
4 - CANSO GROUP
Siltstone, shole, limestone
WINDSOR GROUP
3 - Gypsum, anhydrite, limestone, siltstone
collapse breccia, celestite, sharpstone cong.
IGNEOUS INTRUSIVES
2 - Granadiorite, alaskite, diorite,
diabase, syenite
FOURCHU GROUP
1 - Greywacke, chlorite schist,
volcanics
x - Outcrop
- Geologic contact (approximate)
- Karst
BR-1 - D.D.H. location (Kaiser)
NS-1 - D.D.H. location (N.S.D.M.)
M1 - D.D.H location (Imperial Oil)
M16 - D.D.H intersecting celestite
NOTE For further D.D.H. information, see table.
BRAS D'OR LAKES
West Bay
MIN
McIntosh Pt.
trail
gravel pit
float sample no: BC-74-14
Ballum Head
to West Bay
drill road
Rear Black River
Dundee
celestite float
celestite (see fig. 181)
Rear Black River
Black River
trail
to Grand Anse
geology after G. A. Collins (1969)
CELESTITE
REAR BLACK RIVER
RICHMOND CO.
3000 2000 1000 0 1250 2500
feet

Figure 180

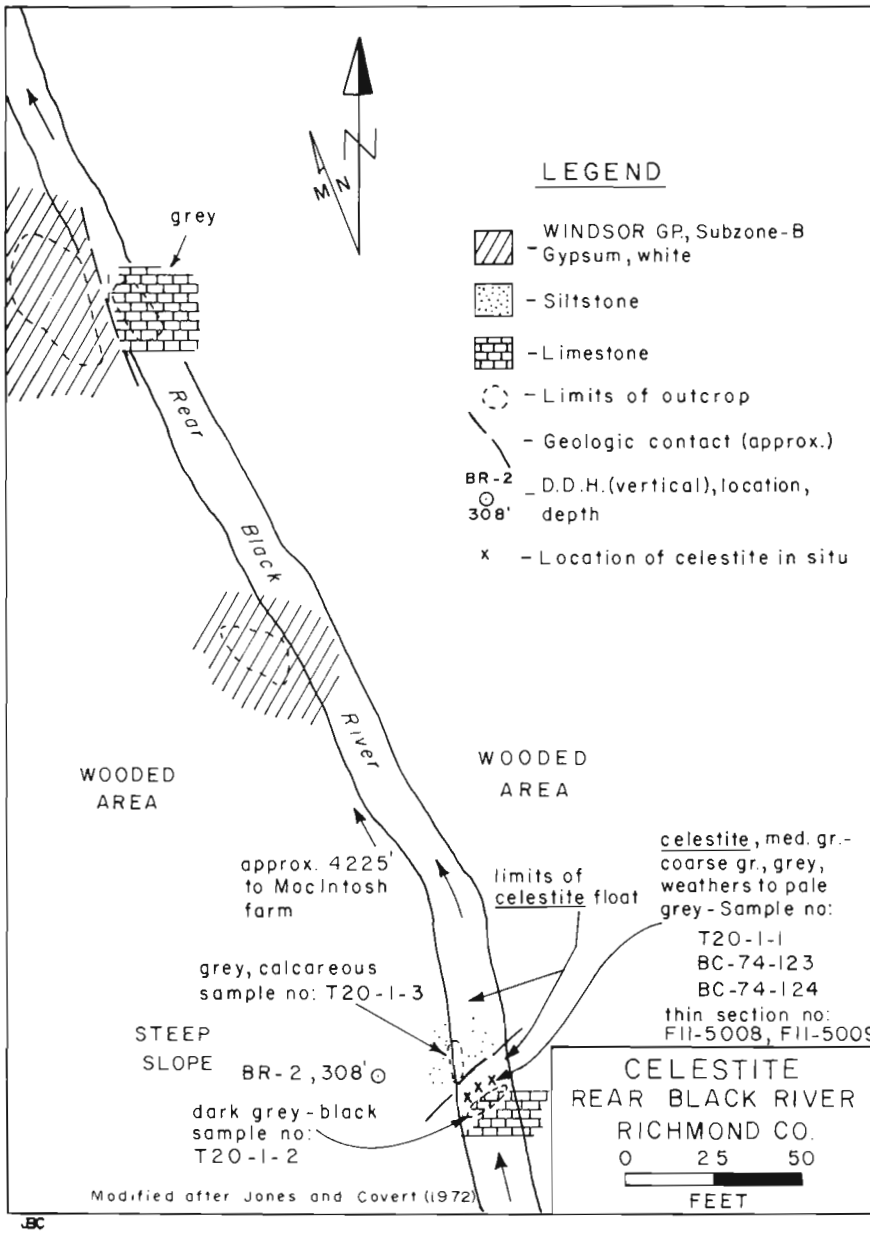
LEGEND
WINDSOR GP, Subzone-B Gypsum, white
Siltstone
Limestone
Limits of outcrop
Geologic contact (approx.)
BR-2 308' D.D.H.(vertical), location, depth
x Location of celestite in situ
grey
Rear Black River
WOODED AREA
WOODED AREA
approx. 4225' to MacIntosh farm
limits of celestite float
celestite, med. gr.-coarse gr., grey, weathers to pale grey - Sample no:
T20-1-1
BC-74-123
BC-74-124
thin section no:
FII-5008, FII-5009
grey, calcareous sample no: T20-1-3
STEEP SLOPE
BR-2, 308'
dark grey-black sample no: T20-1-2
Modified after Jones and Covert (1972)
CELESTITE
REAR BLACK RIVER
RICHMOND CO.
0 25 50
FEET

Figure 181

This area was first prospected for celestite-barite-base metals in 1971, by the Milmor Syndicate, which resulted in the discovery of extensive celestite float and a celestite outcrop on Rear Black River. Follow-up work in the form of geochemical surveys and diamond drilling was undertaken during 1971-1972 by Kaiser Celestite Mining Limited and Imperial Oil Limited. Kaiser Celestite Mining Limited drilled 18 diamond-drill holes totalling 2,853 feet and Imperial Oil Limited drilled 21 holes totalling 7,498 feet. The locations of these holes are plotted on Figure 180 and pertinent information on these holes, including depth of celestite intersections, are found in Table 12.

The prospect is located in Windsor Group rocks, which in this area are composed of carbonates, evaporites and clastic sedimentary rocks. These unconformably overlie metamorphic rocks of the Fourchu Group and Devonian igneous intrusions. The igneous rocks intrude the Fourchu Group, however both occur as paleotopographic highs and form the basement rocks to the younger Windsor Group. The Canso Group is comprised of clastic sedimentary rocks and conformably overlies the Windsor Group.

In outcrop the host rock is for the most part a fine-grained, dark grey to black limestone. Immediately south of the celestite is a small outcrop of grey, calcareous siltstone. The contact between the celestite and the siltstone was not seen due to poor outcrop exposure and because they occur directly in the river bed. Two low profile outcrops of gypsum are found approximately 130 and 250 feet downstream from the celestite showing. This gypsum is grey-white in colour and occasionally shows some red colourations due to the presence of minor quantities of hematite.

It was not possible to determine whether the celestite occurs as a vein or a bed, nor was it possible to obtain an attitude of the enclosing rocks. However, better outcrop exposures both upstream and downstream of the celestite occurrence, show the Windsor Group rocks to be generally striking in an east and northeast direction and dipping shallowly towards the north.

Information obtained through diamond drilling indicate the bulk of the celestite in this region occurs as stratiform deposits with only minor quantities as cavity fillings. The following statements concerning the

TABLE 12

PERTINENT DIAMOND-DRILL HOLE INFORMATION

HOLE NUMBER	DEPTH (FEET) FROM	TO	APPARENT THICKNESS	% $SrSO_4$	TOTAL DEPTH (FEET)
BR-2	108.0	108.6	0.6	18.9	
	128.0	129.0	1.0	25.3	308.0
BR-9	49.0	52.2	3.2	40-50	
	60.0	68.0	8.0	90+	
	131.0	131.2	0.2	30.0	198.0
BR-12	141.5	145.2	3.7	3.1-8.6	
	145.2	147.2	2.2	36.6	
	149.5	151.4	1.9	10.5	
	151.4	152.0	0.6	30.6	
	157.5	159.7	2.2	5.7	
	159.7	186.9	27.2	2.1-7.6	
	186.9	187.7	0.8	26.5	
	187.7	190.7	3.0	43.3	
	195.4	196.2	0.8	25.7	
	215.4	217.2	1.8	27.9	
	217.2	219.7	2.5	5.0	
	219.7	224.8	5.1	18.0-24.0	
	224.8	228.6	3.8	7.7	
	228.6	230.8	2.2	33.0	
	230.8	237.0	6.2	6.0-8.5	237.0
BR-17	139.3	142.0	2.7	55.0-65.0	
	178.8	179.8	1.0	5.0-15.0	
	179.8	181.4	1.6	30.0-40.0	
	181.4	184.3	2.9	5.0-15.0	187.0
M-11	444.0	450.0	6.0	90.0	934.0
M-12	540.0	541.0	1.0	40.0-50.0	
	686.0	691.0	5.0	70.0-80.0	804.0
M-19	96.0	97.0	1.0	10.0-15.0	934.0

geology and the mineralization in the Rear Black River area made evident through diamond drilling in particular are given by Forgeron (1972):

> "One general impression gathered from this work was that the area has a particularly thick glacial till cover, in place up to 100 feet. ... Numerous boulders of B-subzone (fossiliferous, black, fine-grained) limestone were found through out the property, containing copper, silver, lead, and zinc mineralization. This float type limestone was found with interesting base metal values in three of the holes (BR-2, BR-3, and BR-7), and in outcrop on one of the streams.
>
> "To date $SrSO_4$ has been found only within beds above the Black River Evaporite. Here celestite occurs within three lithological units, mudstone, limestone and gypsum. Celestite within the limestone and mudstone is generally of intermediate grade, 30-40 per cent. Within the gypsum the grade tends to be higher."

Concerning the correlation of individual rock units from drillhole to drillhole - "Changes, both vertically and horizontally, are rapid and varied from hole to hole."

In hand specimen the celestite is grey in colour and is medium to coarsely crystalline. In the higher grade material the only visible accessories are minor calcite and sulphides (<1%). As the grade of celestite decreases, the percentage of calcite (limestone) increases. Thin section No. F11-5008 is taken from the lower grade material, and visual examination reveals it to contain 30 to 40 per cent celestite, 55 per cent calcite (limestone), 4 to 5 per cent detrital material, and <1 per cent opaques (sulphides and iron oxides).

In thin section the celestite generally occurs as subhedral to euhedral laths that are randomly oriented and clumped together in irregularly distributed masses throughout the rock. A minor segment of the celestite is made up of anhedral, skeletal grains. The celestite grains often contain numerous, small inclusions of anhedral calcite grains.

The calcite (limestone) for the most part is very fine to fine-grained and generally occurs as

unreplaced clumps of anhedral grains sporadically distributed throughout the rock (Fig. 182). Some recrystallization of the limestone appears to have taken place, resulting in a slightly coarser grained texture and the calcite to take on a subhedral to euhedral form.

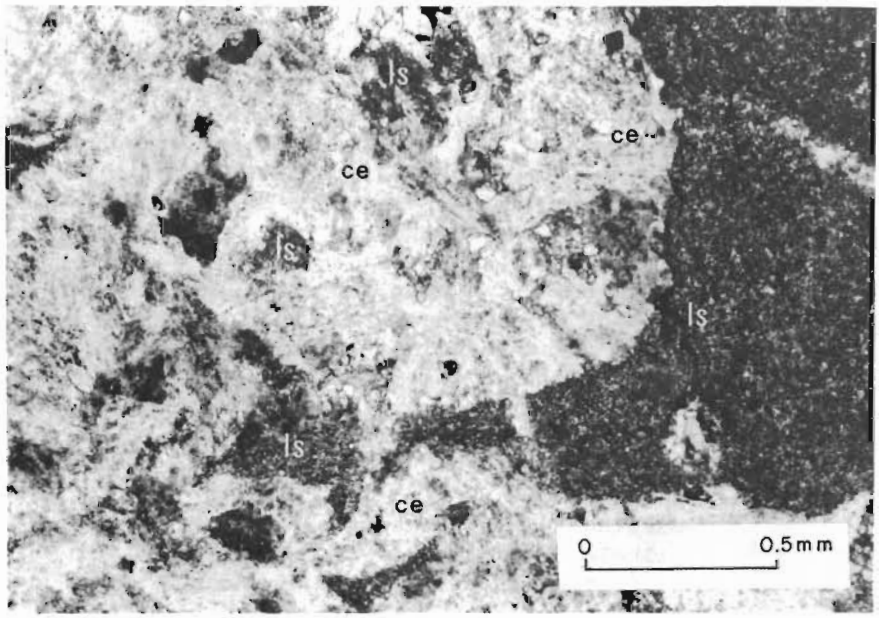

Figure 182 - Rear Black River. Celestite replacing fine-grained limestone. Note the embayed, unreplaced fragments of limestone. Crossed Nicols, ce - celestite, ls - limestone.

The detrital material consists of small clasts of quartz, plagioclase and muscovite that are erratically distributed throughout the rock, but generally restricted to the limestone. These clasts are subrounded to subangular in form.

The opaques occur as small, fine-grained masses occurring along irregular cracks and at the interfaces of celestite and unreplaced clumps of limestone. Minor quantities are also found randomly dispersed throughout the finer grained calcite (limestone). The irregular cracks filled with opaques cut the calcite but not the celestite, suggesting that the opaques predate as well as postdate the celestite mineralization.

Grab samples collected from the mineralized zone were submitted for chemical analysis. The sample locations are shown in Figure 181, and the analytical results are listed below and in appendix III. The locations of samples taken by Jones and Covert (1972), are also indicated in Figure 181, and the analytical data for these samples is listed below.

Rock Type	Sample No.	Per cent			ppm		
		$BaSO_4$	$SrSO_4$	F	Cu	Pb	Zn
Celestite	BC-74-123	3.36	86.50	.05	30	50	140
Celestite	BC-74-124	3.24	90.67	.03	30	50	20

Chemical Analysis of samples taken by Jones and Covert (1972):

Rock Type	Sample No.	Per cent				
		Ba	Sr	F	Cu	Pb
Limestone	T.20.1-2	.060	.072	.045	.003	.014
Siltstone	T.20.1-3	.080	.020	.040	.001	.003
Celestite	T.20.1-1	1.24	41.5	.020	.010	.004

The celestite occurrences here show a number of similarities to the Lake Enon (Loch Lomond) deposit. These are:

(a) stratiform nature of the celestite deposit
(b) lithology of the host rocks
(c) age of the host rock
(d) structural setting of the occurrences (flanking paleotopographic high)
(e) discontinuous and erratic nature of the distribution of the celestite beds
(f) associated base metal sulphides
(g) the rapid facies change displayed by the rock units.

The close resemblance of the geological features of this deposit with those of the Loch Lomond deposits suggests that they have similar origins.

The interesting results obtained to date by exploration groups warrants further exploratory work on this prospect. However, the general scarcity of outcrop and the thickness of the overburden may prove to be a hindrance to the effectiveness of exploration techniques generally employed in areas where these prohibitive factors are not encountered.

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