(32) BYERS BROOK

U.T.M.G. - N-504495
E-42939

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

This occurrence, often referred to as the Grant Prospect, is located 9.8 miles southeast of Auld Cove and approximately 1,500 feet southwest of Highway 344 (Marine Drive). No minerals have been found in Byers Brook itself; though barite and celestite occurs in two unnamed brooks immediately south of Byers Brook. Barite has only been found as float in both brooks; however, the celestite is found in situ in the most southerly brook (Fig. 98 and 99).

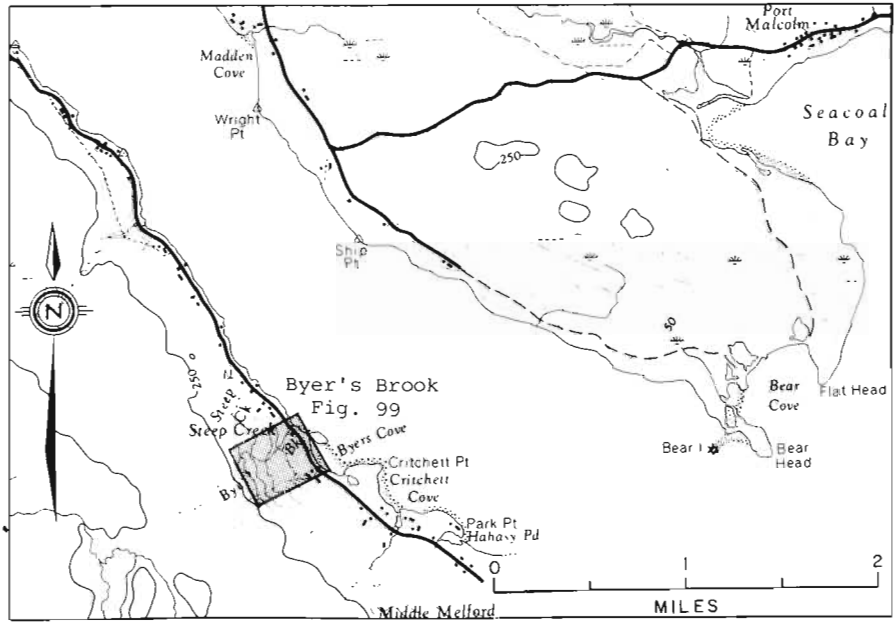


Figure 98

This deposit was first reported in 1971 by A. D. Hudgins who optioned the property to FMC Limited in the same year. FMC Limited undertook a geological survey and a diamond drilling program in an effort to determine the extent of the celestite deposit and to locate the source

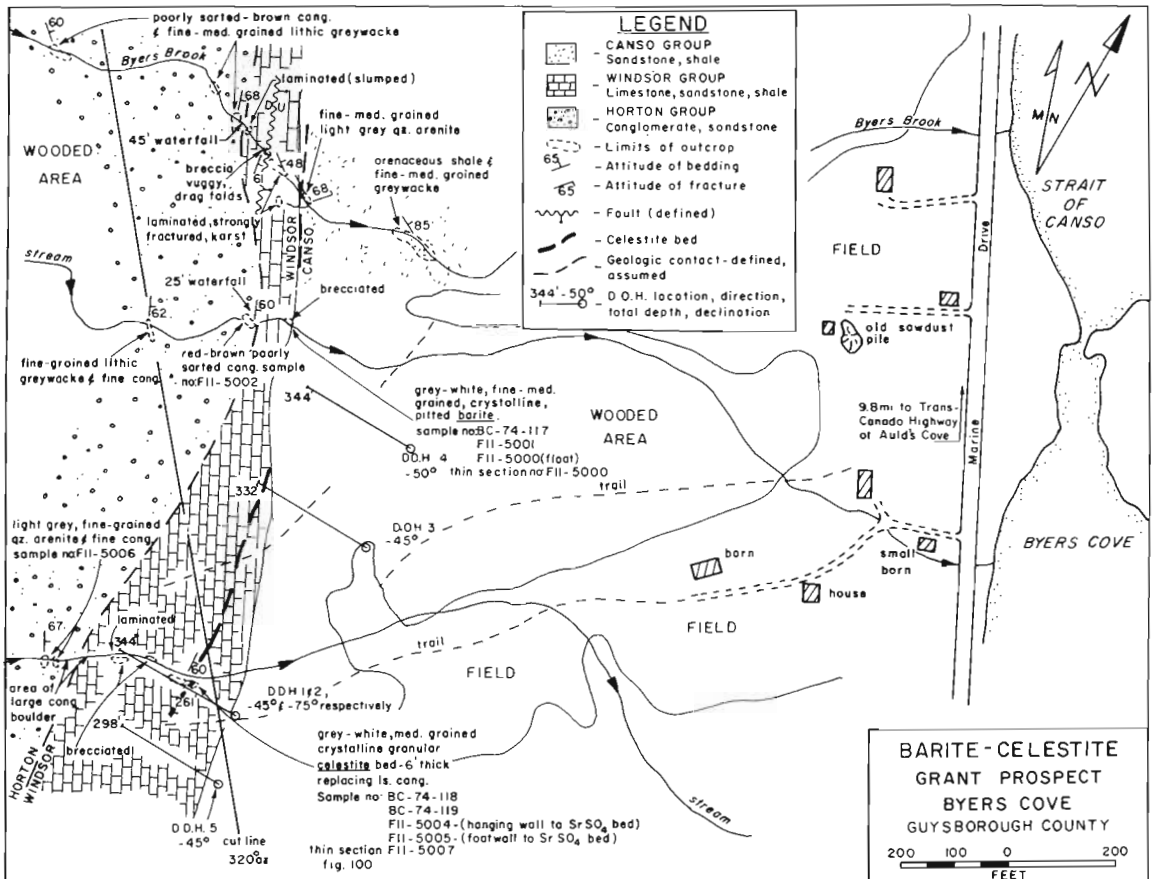
LEGEND
CANSO GROUP Sandstone, shale
WINDSOR GROUP Limestone, sandstone, shale
HORTON GROUP Conglomerate, sandstone
Limits of outcrop
Attitude of bedding
Attitude of fracture
Fault (defined)
Celestite bed
Geologic contact - defined, assumed
D.D.H. location, direction, total depth, declination
poorly sorted - brown cong. & fine - med. grained lithic greywacke
Byers Brook
laminated (slumped)
fine - med. grained light gray qz. arenite
45' waterfall
breccia vuggy, drag folds
orenaceous shale & fine - med. grained greywacke
laminated, strongly fractured, karst
WINDSOR
CANSO
stream
25' waterfall
brecciated
WOODED AREA
fine-grained lithic greywacke & fine cong.
red-brown poorly sorted cong. sample no: FII-5002
grey-white, fine-med. grained, crystalline, pitted barite.
sample no: BC-74-117
FII-5001
D.D.H. 4 FII-5000 (float)
-50° thin section no: FII-5000
trail
light grey, fine-grained qz. arenite & fine cong.
sample no: FII-5006
D.D.H. 3
-45°
born
small born
house
FIELD
laminated
area of large cong. boulder
brecciated
HORTON
WINDSOR
D.D.H. 1 & 2, -45° & -75° respectively
grey-white, med. grained crystalline granular celestite bed - 6' thick replacing ls. cong.
Sample no: BC-74-118
BC-74-119
FII-5004 - (hanging wall to $SrSO_4$ bed)
FII-5005 - (footwall to $SrSO_4$ bed)
thin section FII-5007
fig. 100
D.D.H. 5
-45° cut line
320°
Byers Brook
FIELD
Drive
old sawdust pile
9.8mi to Trans-Canada Highway at Auld's Cove
Marine
STRAIT OF CANSO
BYERS COVE
MN
BARITE - CELESTITE
GRANT PROSPECT
BYERS COVE
GUYSBOROUGH COUNTY
200 100 0 200
FEET
JBC

Figure 99

of the barite float. The drilling program consisted of six diamond-drill holes totalling 1,579 feet.

Upon completion of this program the source of the barite remained undetermined and the celestite occurrence was only proven over a strike length of approximately 500 feet. The thickness and grade of the celestite was also found to vary from hole to hole. In diamond-drill hole 1, the grade of the celestite was found to decrease at depth, with the maximum grade over a two foot section not exceeding 38 per cent celestite. However, the overall thickness of the celestite zone increased from the six to eight foot thickness evident in outcrop to a true thickness of 38.25 feet, with the grade of celestite averaging 23.6 per cent over this section. FMC have concluded that the celestite bearing zone faults out in the vicinity of D.D.H. 4, but it is not entirely certain whether this is indeed the case. It is quite possible that it is simply a pinch out.

This celestite-barite prospect is situated in carbonate rocks of the Windsor Group (Early Carboniferous Age). These rocks are conformably underlain by terriginous clastic sedimentary rocks of the Horton Group (Early Carboniferous Age) and overlain by clastic sedimentary rocks of the Canso Group (Early Carboniferous and Late Carboniferous Age). These units form the east limb of a northerly striking anticline. Only minor faulting, attributed to the Maritime Disturbance and/or the Palisades Disturbance is visable in the prospect area.

The celestite mineralization was stratigraphically controlled, the celestite occurring as a replacement bed in a limestone conglomerate which strikes 180° azimuth and dips 60° towards the east (Fig. 100). The conglomeratic nature of the host rock has been preserved.

The celestite bed is bound on both the footwall and the hangingwall by a massive grey limestone which has only been partially replaced by celestite in the immediate vicinity of the contacts.

Stratigraphically beneath the massive limestone is a strongly brecciated and fractured limestone similar to that found cropping out in the vicinity of the barite float. This is underlain by a thinly laminated, dark grey, dense, fine-grained limestone that forms the basal member of the A-subzone, Windsor Group in this area.

The massive limestone and limestone conglomerate found hosting the celestite on the most southerly brook, is not present on Byers Brook, or the brook containing the barite float. On Byers Brook, the Windsor Group rocks are composed of laminated, grey, dense, fine-grained limestone and strongly brecciated and fractured limestone. A small fault striking 160° azimuth is found here, with the upthrown and downthrown blocks indicated by drag folding. Karst topography is also evident on Byers Brook, and is marked by a stream originating from a small limestone cave in the steep bank on the south side of the brook. No barite or celestite was encountered on this brook.

Rocks of the Windsor Group examined on all three brooks and the surrounding area have a fairly uniform attitude, generally striking in a northerly direction and dipping from 60° to 70° east. The thickness of the limestone varies considerably over this area. In the vicinity of Byers Brook, it is approximately 90 feet thick; on the first stream south of Byers Brook, it is only about 50 feet thick; and on the stream with the celestite showing, the limestone appears to thicken to approximately 300 feet. The celestite bed pinches out as the thickness of the limestone decreases.

The contact between the Windsor Group limestones and the more resistant, underlying Horton Group clastic sedimentary rocks is marked by a steep drop in elevation which is expressed in the streams as waterfalls. The rocks comprising the Horton Group in this area are composed essentially of red-brown conglomerate, fine to medium-grained lithic greywacke and minor fine-grained quartz arenite. These rocks generally strike in a north direction and dip from 60° to 67° towards the east, indicating a conformable contact with the overlying Windsor Group rocks.

Overlying the Windsor Group are rocks of the Canso Group which crop out on Byers Brook. These rocks are composed of fine to medium-grained light grey quartz arenite, fine to medium-grained greywacke and arenaceous shale, and are found to strike 120° azimuth and dip from vertical to 85° towards the northeast. The contact between the Canso Group rocks and the Windsor Group rocks is not visible.

No mineralized zones were observed in either the Canso Group rocks or the Horton Group rocks, but it is

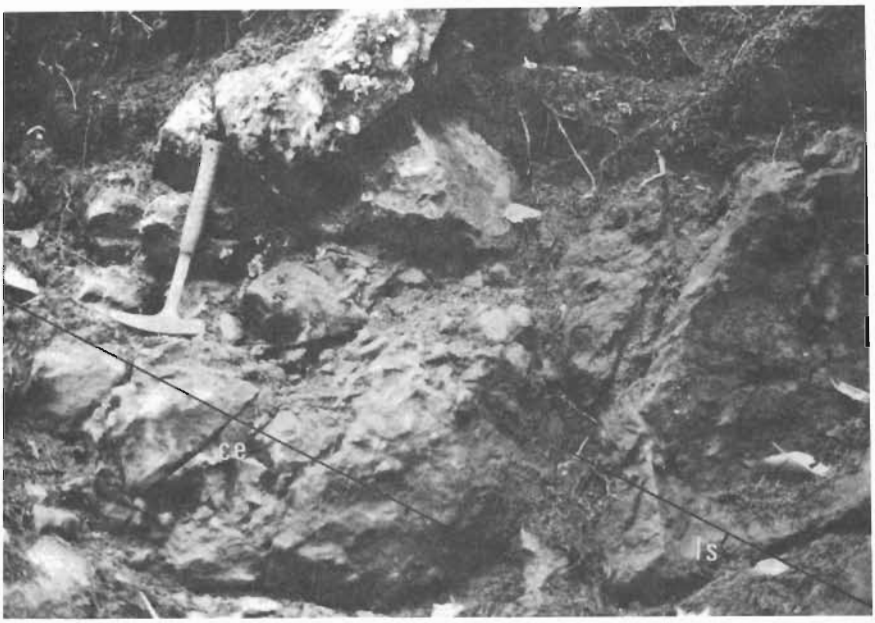


Figure 100 - Byers Brook. Steeply dipping, conglomeratic celestite bed in stream bank. Looking south. ce - celestite, ls - limestone.

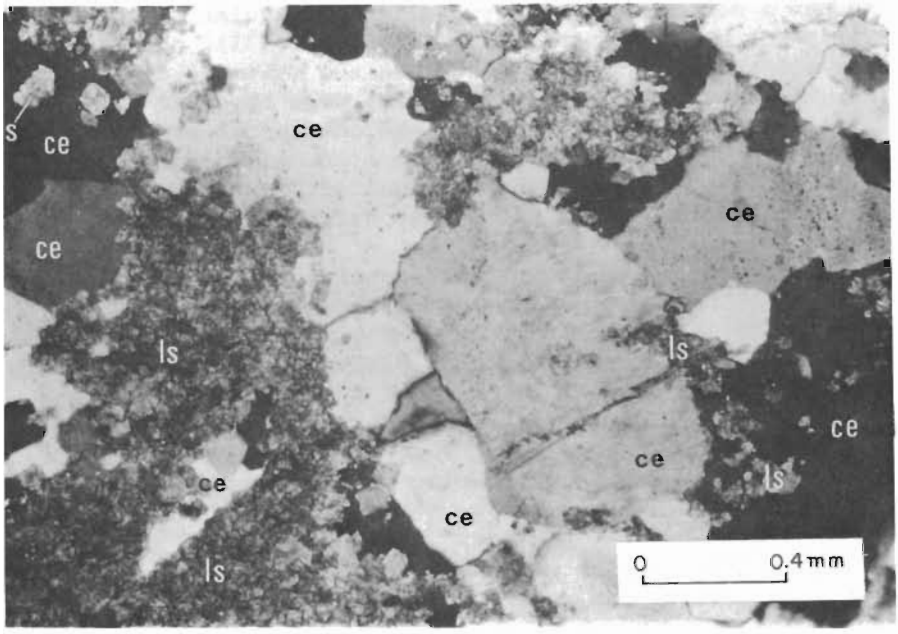


Figure 101 - Byers Brook. Celestite replacing limestone. Note the relict limestone inclusions in the celestite grains and the embayed nature of the limestone. Crossed Nicols, ce - celestite, ls - limestone.

interesting to note that a sample of Horton conglomerate (sample no. F11-5002) analyzed 3.2 per cent barite.

Because the barite was not observed in situ, it is difficult to determine what controlled the mineralization and the nature of the host rock. However, examination of barite float in hand specimen and in thin section indicates that both open space filling and replacement of the host rock by barite has taken place. In thin section the barite filling the cavities occurs in radiating blades, giving it a feathery extinction pattern. The remainder of the barite occurs as small, anhedral grains. The host rock is probably the limestone breccia found cropping out in the immediate vicinity of the float specimens as remnants of it can be seen associated with the barite. This limestone breccia is in part cemented with white, crystalline calcite, giving the rock a mottled appearance. It is pitted, contains numerous solution cavities and at first glance closely resembles gypsum. It is believed to be a solution collapse breccia.

The celestite ranges in colour from dark grey, mottled grey-white, white, and white to transparent, and has a medium-grained, crystalline, granular texture. Pyrite occurs as disseminations (maximum 1-2%), the dark grey celestite containing more than the white celestite. In thin section the celestite grains were observed to be anhedral in form. Relict and embayed clusters of limestone suggest a replacement mode of origin for the celestite (Fig. 101). Minor amounts of hematite (>1%) are found healing small, irregular hairline fractures.

The barite is white to mottled pale grey-cream white in colour, has a fine to medium-grained, crystalline texture and is pitted and vuggy. The vugs are filled with a dark brown, fine silt and clay size material, giving the specimens a dirty, well weathered appearance. Traces of hematite and pyrite (>0.5% combined) are found associated with the barite. The pitted, vuggy nature of the barite is probably due to the weathering out of unreplaced limestone breccia fragments.

Grab samples were collected from the mineralized zone (celestite), the wallrock, the sandstone, the conglomerate and the barite float, and submitted for chemical analysis. The locations sampled are shown in Figure 99, and the results of the chemical analyses are listed below and in appendix III.

| Rock Type | Sample No. | Per cent $BaSO_4$ | Per cent $SrSO_4$ | F | Cu | ppm Pb | Zn |
|---|---|---|---|---|---|---|---|
| Barite | BC-74-117 | 92.51 | .73 | .03 | 55 | 60 | 60 |
| Celestite, limestone | BC-74-118 | 1.91 | 58.80 | .03 | 10 | 60 | 40 |
| Celestite | BC-74-119 | 1.33 | 93.36 | .04 | 20 | 50 | 30 |
| Barite | F11-5000 | 88.94 | 1.00 | .04 | 270 | 30 | 50 |
| Barite, limestone | F11-5001 | 49.20 | .80 | .03 | 40 | 120 | 90 |
| Conglomerate | F11-5002 | 3.19 | .09 | .04 | 20 | 20 | 30 |
| Celestitic limestone | F11-5004 | .20 | 3.10 | .07 | 740 | 20 | 110 |
| Limestone | F11-5005 | .61 | .17 | .04 | 60 | 110 | 40 |
| Quartz arenite | F11-5006 | .44 | .02 | .05 | 10 | 30 | 20 |

The general lack of barite closely associated with celestite and vice versa, despite the close spatial distribution of the two showings, is worthy of note at this prospect. It is possible that a zonation between the two minerals may be present, or that two periods of mineralization are represented.

Although exploratory work carried out to date has proved discouraging, additional geological mapping is warranted for the area north of Byers Brook and for the area south of the stream on which the celestite crops out. It is possible the limestone units may continue to thicken in the area north of Byers Brook, and the massive limestone, limestone conglomerate and celestite to reappear there. The abrupt nature in which celestite beds appear and then disappear has been amply demonstrated in diamond-drilling programs in the Rear Black River and Lake Enon (Loch Lomond) areas.

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