

MINERAL OCCURRENCE DATABASE

OCCURENCE NUMBER:	F15-023
OCCURENCE NAME:	Lake Enon (MacRae Pit, Enon Pit) Pb, Zn Occurrence
COMMODITIES:	Sr, Pb, Zn, Cu
MINERALS:	celestite, galena, sphalerite, chalcopyrite, malachite
STATUS:	Occurrence
COUNTY:	Cape Breton

CLAIM INFORMATION (Coordinates in UTM NAD83)					
Claim Map	Tract	Claim	Easting	Northing	Zone
11F/15A	51	A	691043	5075508	20
11F/15A	71	B	692073	5077058	20

HOST ROCK INFORMATION		
Stratigraphic Unit	Age	Host Rock(s)
Windsor Group	Mississippian	Silty Limestone

LOCATION DIRECTIONS

Coordinates 1- MacRae pit: Located east of the Loch Lomond-Enon Road, approximately 1 km north of the junction with the road to Mira River, at Enon. The pit cannot be seen from the Enon Lake Road because it is located at the end of a gated dirt road. The Pb-Zn mineralization is exposed at the southeast end of the open pit.

Coordinates 2- Lake Enon pit: The pit and mill are located along the west side of the Enon Lake -Loch Lomond Road, at the south end of Enon Lake.

SURVEYS

drilling

geological mapping

GEOLOGICAL DESCRIPTION

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The Pb-Zn mineralization documented in this mineral occurrence record occurs within the MacRae and Lake Enon celestite ore bodies. It is found in outcrops exposed within the two celestite open pit mines and has been intersected in several diamond drillholes drilled on the two celestite deposits.

The host rocks for the Pb-Zn mineralization form part of the Windsor Group stratigraphy exposed in the Loch Lomond Basin. The Loch Lomond Basin and the Glengarry Half Graben are Carboniferous structural basins containing up to 2000 m of continental and marine sedimentary rocks (Boehner and Prime, 1993). They are located in southeastern Cape Breton Island, and although they are given separate names, they are genetically related and spatially connected. The basin fill ranges in age from Early- to Late- Carboniferous and overlies Hadrynian to Devonian metasedimentary and igneous rocks with angular unconformity.

The Windsor Group is subdivided in these basins into the Enon, Loch Lomond and Uist Formations (Boehner and Prime, 1993). The Enon and Loch Lomond Formations are composed of interstratified anhydrite, gypsum, red and grey-green sandstone-siltstone, conglomerate and marine limestone. The evaporites form the dominant rock types found in both of these formations.

The Uist Formation directly overlies the Loch Lomond Formation. The contact is interpreted to be a disconformity (Boehner and Prime, 1993). The Uist Formation differs from the underlying Enon and Loch Lomond formations in that it is dominated by sandstone, siltstone and fine conglomerate, with subordinate limestone, dolostone and minor gypsum and anhydrite.

Structure

Boehner and Prime (1993) described the basins as open, fault truncated synclines, but recent drilling in the Loch Lomond Basin near Lake Uist, defined a large, isoclinal, recumbent fold affecting rocks of the MacKeigan Lake, Uist and Loch Lomond Formations. The drilling results suggest a second stage of folding related to the regional faulting of the Loch Lomond Basin may have played a role in bringing mineralized, Lower Windsor Group rocks to the surface within the central section of the Loch Lomond Basin.

The Loch Lomond Basin and Glengarry Half Graben are bounded to the northwest by the Lennox-Passage Fault, a northeast-trending, high-angle fault which separates the basins from the basement rocks that comprise the East Bay Hills. Movement along this fault may have resulted in the formation of the isoclinal fold described above. The Terra Nova Fault, a northwest trending, high-angle, transverse fault separates the Loch Lomond Basin from the Glengarry Half Graben. The southeast boundary of the two basins is a profound angular unconformity with basement volcanic rocks of the Stirling Belt, and the plutonic rocks of the Chisholm Brook and Salmon River Plutons.

Mineralization

The quantity of galena found in the celestite open pits is quite variable, ranging from trace disseminations to areas of massive mineralization. The celestite ore mined in both open pits contained average Pb-concentrations of slightly less than 0.5%. The Pb concentrations increase significantly near the Terra Nova Fault which cuts the MacRae celestite ore body along the east side of the open pit.

Sphalerite occurs with the galena, but it is difficult to detect visually, and therefore, has primarily been detected in the analyses of outcrop and drillcore samples collected in the mineralized zones. Patchy concentrations of chalcopyrite and pyrite also occur in a silty-limestone unit exposed in the southeast end of the MacRae open pit, near the Terra Nova Fault, but this type of mineralization is not well documented in the assessment files.

Recent exploration work conducted in these basins has focused on finding a hidden, sedex style Pb-Zn deposit developed along the downthrown side of one of the regional faults described above. The Irish style Pb-Zn deposits have been used as the model for this recent exploration. Although low-grade Pb-Zn mineralization is common in Windsor Group lithologies found in these basins, drilling has not been successful in delineating an economic deposit. However, the economic grade mineralization found in mineralized boulders along the shores of Lake Uist and Loch Lomond Lakes continues to provide encouragement that a Pb-Zn deposit exists somewhere within the Loch Lomond Basin and the Glengarry Half Graben.

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PREVIOUS WORK

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The two sets of coordinates provided in this mineral occurrence record are locations for the MacRae and Lake Enon celestite open-pit operations. The Pb-Zn mineralization that occurs with the celestite in both open pits is the focus of this mineral occurrence record (F15-023), but it should be noted that celestite was the only mineral mined from both of these open pits.

Leahey (1975): Noranda Exploration Company Limited completed a geological mapping survey over the Loch Lomond Basin and Glengarry Half Graben. They followed up on this survey by drilling 13 diamond-drillholes for a total footage of 4516 feet. None of these holes were drilled to test the Pb-Zn showing documented in this mineral occurrence record. The two celestite open pits were described in this report as follows:

"Deposit E (Lake Enon pit): Celestite occurs replacing a medium to light brown silty limestone 48.1% SrSO₄ as the average grade: medium to coarse grained, light grey to brown in colour. Ranges from 2-30 feet in thickness. Overlain by siltstone, sandstone, and conglomerate: underlain by limestone. Galena occurs in massive zones and as disseminations within the celestite, and within unmineralized limestone and conglomerate. The galena is believed to be related to faulting. The average composition of the ore zone is SrSO₄ 48.1%, BaSO₄ 1.01%, CaCO₃ 30.6%, SiO₂ 16.2%, Fe₂O₃ 1.38%, Pb 0.47%.

Deposit F (MacRae pit): Celestite occurs within a silty limestone conglomerate: -60.1% SrSO₄ is the average grade of the zone: medium to coarse grained in texture: ranges from 2-23 feet in thickness: overlain by "Munroe" conglomerate. Galena occurs as disseminations and as massive zones within the celestite. Galena closely related to limestone clasts within the celestite. The average composition of the ore zone gave SrSO₄ 60.1%, BaSO₄ 1.39%, CaCO₃ 16.4%, SiO₂ 13.9%, Fe₂O₃ 1.07%, Pb 0.49%."

Forgeron (1977): Forgeron was contracted by the Nova Scotia Department of Mines to compile a summary report of work conducted by Kaiser Celestite Mining Company in the Loch Lomond Basin and Glengarry Half Graben.

Hannon (1989): A. C. A. Howe completed an open pit mining cost estimate of the MacRae Celestite Deposit for Timminico Limited. Celestite reserves were estimated at 397 000 tonnes grading 55.73% SrSO₄.

Titano (1990): A. C. A. Howe International Limited resampled some of the drillcore collected by Kaiser Celestite Mining Limited in 1974 and 1975. this core is stored at the Nova Scotia Department of Natural Resources core library in Stellarton, Nova Scotia. Results of the drillcore analysis indicated that the Pb-content in the Zone 3 celestite body ranged from 0.013% -0.99% in samples which did not contain any visible galena, and the Pb-content in Zone 2 ranged from 0.027%-1.75% Pb in samples that did not contain any visible galena. The total barium content ranged from 0.31%-0.76% in Zone 2 and from 0.17% to 1.0% in Zone 3.

Grosz (1993): Cominco Limited drilled one hole east of the MacRae Celestite open pit mine in Tract 49, claim M, map sheet 11F/15A to test the Lower Carboniferous Windsor Group stratigraphy for Pb-Zn mineralization, east of the Terra Nova Fault. Mineralization consisting of very fine specks and veinlets of galena and pyrite, thin veinlets of sphalerite and a few specks of chalcopyrite were intersected in micritic and oolitic limestone of the Enon Formation, and to a lesser extent in the conglomerate units of the Enon Formation. Analyses of core samples collected from this drillhole returned concentrations as high as 6000 ppm Pb over 4.5 feet and 3600 ppm Zn over 2 feet.

Grosz (1994): Cominco Limited drilled one diamond drillhole in Tract 71, claim A of map sheet 11F/15A to test for carbonate hosted Pb-Zn mineralization along the east side of the Terra Nova Fault, east of the MacRae Celestite open pit mine. The hole was drilled to a depth of 1,255 feet. Analyses of Windsor Group carbonate intersections, containing trace amounts of disseminated galena and sphalerite, returned concentrations of up to 4000 ppm Pb and 2670 ppm Zn over 3 feet. Analyses of intersections of pyrite bearing carbonaceous sandstones of the Silvermine Formation returned concentrations of up to 8400 ppm Pb and 10400 ppm Zn over a 6 inch width.

Cullen (2007): Mercator Geological Service Limited were contracted by Mr. John Prochnau to undertake an exploration program on his claim licences. The exploration program consisted of a 2 hole (150 m) diamond drilling survey and a review of historical exploration data. The drillholes were located west of the MacRae Celestite Pit. Celestite zones Number 2 and 3 were cored in the drillholes. Cullen noted the strike of the paleo-basement topographic high which controls celestite distribution, may change strike from easterly to north-easterly west of

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the MacRae pit. A 30 cm thick zone of limestone intersected in drillhole JP2007-1 was reported to contain up to 20% galena.

SITE DESCRIPTION

The two celestite open-pits were both field checked in 1991 to verify the Pb-Zn occurrences documented in the assessment reports. No mineralization was observed at the Lake Enon open pit, but galena mineralization was located in boulders and outcrop exposed in the northeast corner of the MacRae pit.

Large blocks of silty limestone and celestite containing pockets of massive galena occur at the northeast end of the MacRae open pit. Patchy, limonite stained zones containing pyrite, chalcopyrite, malachite and an unidentified blue mineral were also observed in the large blocks found in this area of the quarry. The blocks containing the mineralization were broken out during the celestite mining operations. Pb-Zn mineralization also occurs in an outcrop exposed immediately east of the large mineralized blocks described above.

The stratigraphic sequence observed in this area of the open pit has been complicated by faulting. In one outcrop exposure, the sequence consists of cream coloured silty limestone and celestite overlain by a 10 cm thick redbed siltstone, a 30 cm thick red conglomerate, and a thick red siltstone, but a short distance east, a 2 m thick limestone conglomerate is sandwiched between two redbed conglomerate units.

The limestone conglomerate is cream coloured and contains angular, iron stained clasts. It appears to be in fault contact with the lower redbed conglomerate unit along a fault which has an approximate strike of 208° Az. and a dip of 58° NW. A second set of hematite coated slickensides strikes 350° Az and dip 50° W.

COMMENTS

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SAMPLE			
SAMPLE ID:	F15-23(01)		
SAMPLE TYPE:	Grab		
ROCK TYPE:	Limestone breccia		
NORTHING:	5075508	EASTING:	691043
SAMPLE DESCRIPTION:			
F15-23(01): This is a sample of grey-to brown, limestone breccia. Angular clasts of grey limestone are set in a matrix composed of crushed limestone and silty calcareous cement.			

SAMPLE TYPE:	Grab		
ROCK TYPE:	massive galena and celestite		
NORTHING:	5075508	EASTING:	691043
SAMPLE DESCRIPTION:			
F15-23(02): This select sample is composed of a mixture of massive galena and celestite. Trace amounts of chalcopryite are found as disseminations within the massive galena. One specimen exhibited complex folding in which the galena mineralization appeared to be deformed by the fold. A seam of weathered pyrite occurs in this same specimen. The samples were collected from both outcrop exposures and the large blocks broken out during the mining operations.			

SAMPLE TYPE:	Grab		
ROCK TYPE:	Celestite		
NORTHING:	5075508	EASTING:	691043
SAMPLE DESCRIPTION:			
F15-23(03): This sample of massive celestite contains pyrite, chalcopryite, galena and an unidentified blue mineral (azurite?).			

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POSSIBLE RESTRICTIONS

UPDATED

Compiled by:

Updated by: G. J. DeMont, January 1992; July 1997; G. J. DeMont, August 2013

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