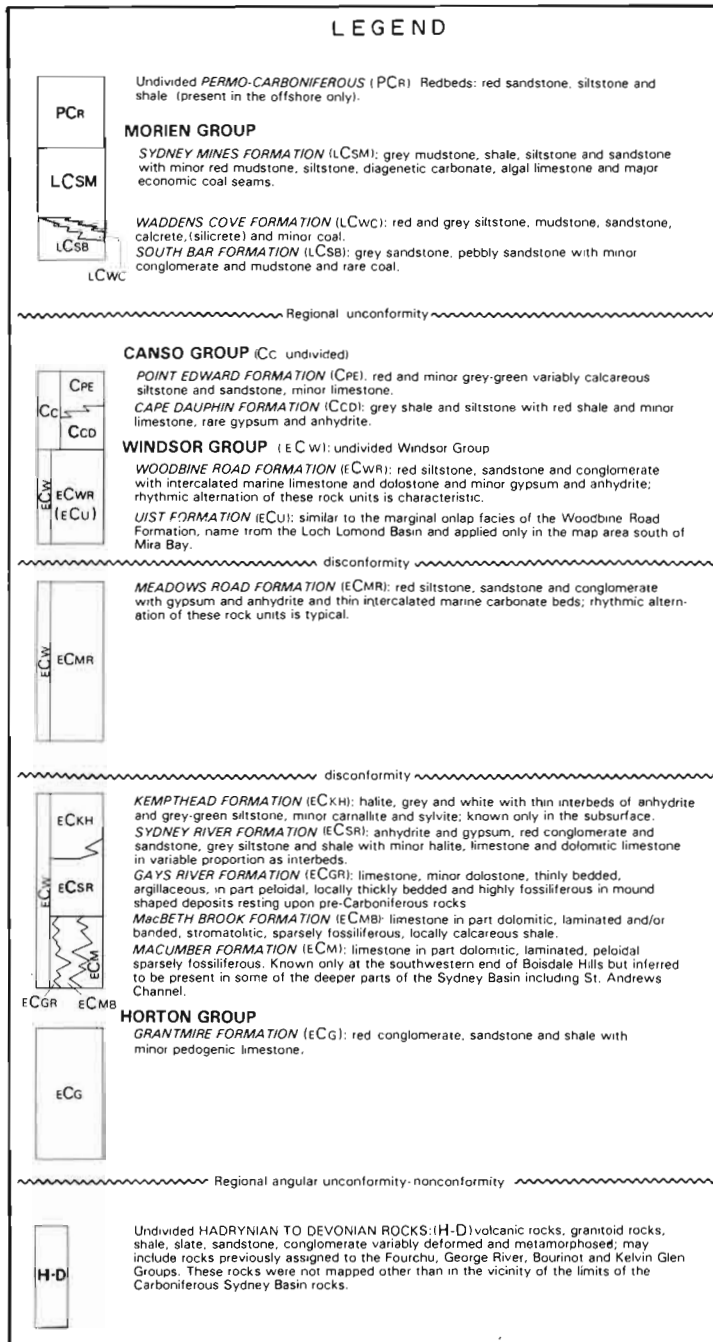


# CHAPTER 3. CAPE BRETON COUNTY



after Bohner and Giles, 1986

Figure 3-1. Geological legend for Cape Breton County gypsum and anhydrite occurrence maps.

**SYMBOLS**

- Gypsum or anhydrite outcrop . . . . . ▲
- Karst topography . . . . . k
- Rock sample location . . . . . R-253
- Drillhole location . . . . . J-207
- Geological contact . . . . . ———
- Fault . . . . . - - - - -
- Thrust fault, barbs point downdip . . . . . —▲▲▲
- Quarry, active . . . . . ⚡
- Quarry, abandoned . . . . . ⚡
- Anticline . . . . . ———
- Syncline . . . . . ———
- Unconformity . . . . . ———

Figure 3-1. Continued.

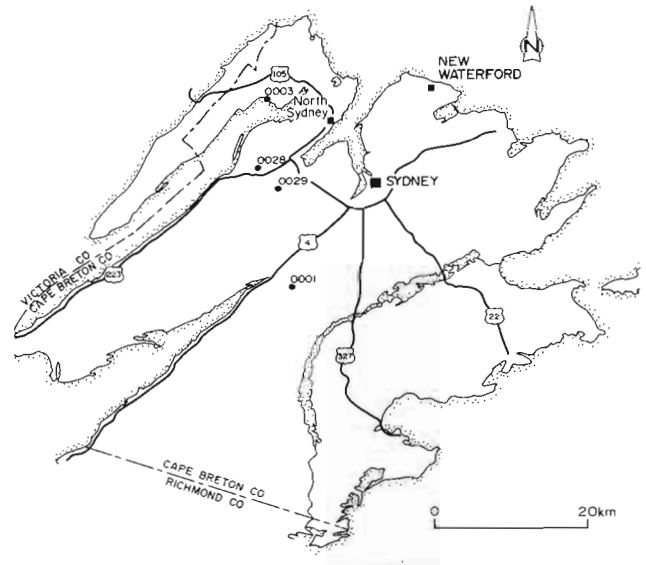
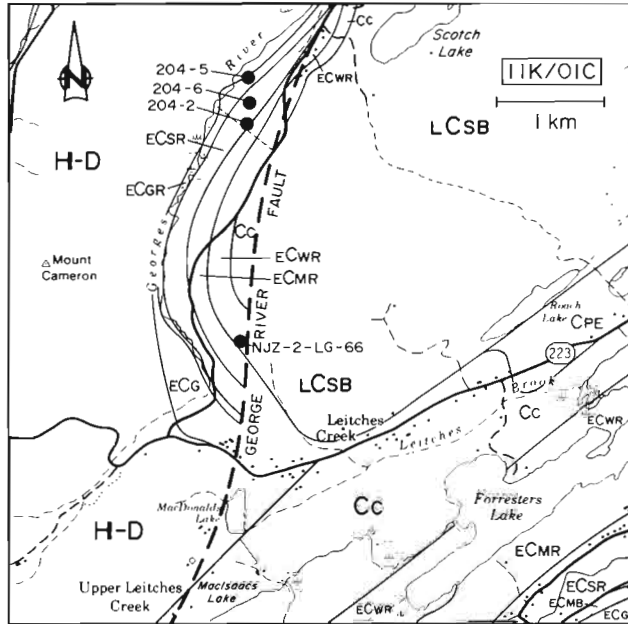


Figure 3-2. Location map for Cape Breton County gypsum and anhydrite occurrences by reference number.

**LEITCHES CREEK (0028)**  
 NTS 11K/01C  
 UTM 702310 E 5114320 N

The Leitches Creek occurrence area is located 10 km southwest of North Sydney, Cape Breton County (Fig. 3-3). It consists of gypsum and anhydrite beds on the lower part of the Windsor Group, encountered in a drill-hole completed in this area by New Jersey Zinc in 1967 (New Jersey Zinc Exploration Co. (Canada) Ltd., 1967) and later by Noranda Exploration in 1975 (MacArthur and Nash, 1975).



Geology after Boehner and Giles, 1986

Figure 3-3. Location and geology of the Leitches Creek occurrence area. See Figures 3-1 and 3-2 for legend and location.

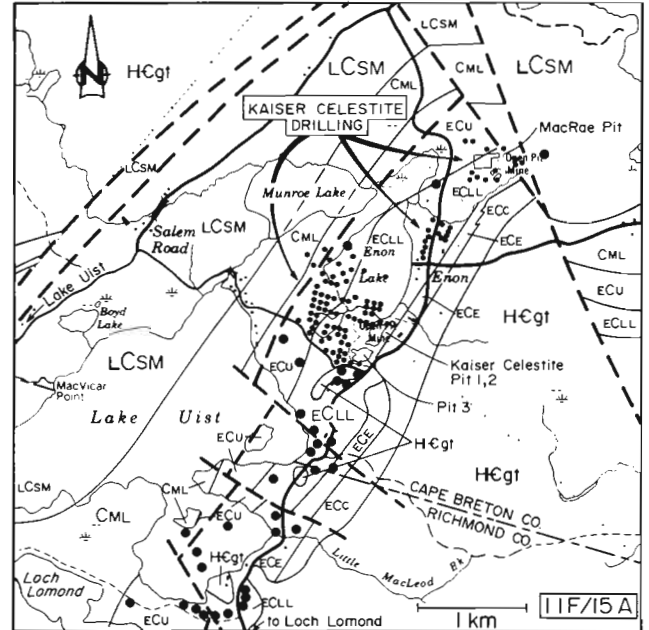
Recent geological mapping (Boehner and Giles, 1986) indicated that this area is underlain by a moderate to steeply dipping sequence of Windsor Group strata. These interbedded evaporites, carbonates and clastics strike north-south, dip to the east and are underlain to the west by Horton Group clastics and George River Group metamorphic rocks. The section is in fault contact to the east with clastics of the Morien Group.

Although of geological interest, this area is not of economic interest.

**LOCH LOMOND (0027)**  
 NTS 11F/15A  
 UTM 690000 E 5074000 N

The Loch Lomond Basin occupies the central portion of a northeasterly trending structural depression which runs

from St. Peters in the southwest to Marion Bridge in the northeast (Fig. 3-4). The sedimentary rocks found in this depression are mainly early Carboniferous in age. Windsor Group rocks of the Loch Lomond Basin are fault-bound by the Devono-Carboniferous l'Ardoise Block to the southwest and the Glengarry Half Graben to the northeast. They are also in fault contact with the basement in East Bay Hills to the northwest and onlap onto crystalline basement including the Loch Lomond Pluton to the southeast (Boehner and Prime, 1985).



Geology after Boehner and Prime, 1985

Figure 3-4. Location and geology of the Loch Lomond occurrence area. See Figures 3-1 and 3-2 for legend and location.

The Basin is in the form of a northeastern-southwestern trending half-graben (Boehner, 1983). Its Carboniferous succession is dominated by continental alluvial-fluvial and marine evaporite, carbonate rocks. Detailed geological interpretation of the area, using extensive drillhole information has been carried out by Forgeron (1977) and Boehner (1983).

Sedimentary rocks dip into the basin at 10-20° to the northwest under the waters of Enon Lake, Lake Uist and Loch Lomond. Windsor Group sections representing Cycles 2-5 (B-E Subzones) display rapid change from evaporite dominated at Passage Bridge to terrigenous conglomerate-breccia dominated at the MacRae property about 6 km to the northeast. Gypsum and anhydrite horizons are most abundant in the Lower Windsor (Enon and Loch Lomond Formations) with minor interbeds in the basal part of the Canso Group (MacKeigan Lake Formation). These are greatly com-

plicated by karstification and solution collapse along the southwestern edge of the Basin. Small scale faulting in the Basin resulted in minor displacement of the evaporite beds.

Due to the prevalent karstification and overburden cover which occurs in the Loch Lomond Basin, gypsum and anhydrite are not seen in outcrop in the area. Most of the evaporites to be found in the Basin subcrop beside or beneath the lakes which occur in the centre of the Basin. Owing to these two factors it is doubtful that any open-pit mining of gypsum and anhydrite would be undertaken.

**MEADOWS ROAD (0001)**  
NTS 11K/01B  
UTM 703685 E 5100910 N

The Meadows Road occurrence area is located 12 km southwest of Sydney, Cape Breton County (Fig. 3-5). Several areas of karst topography and limited outcrops can be found within an area extending from Woodbine in the southeast to East Bay in the northwest. Morton Chemicals drilled a series of three holes here in 1961-62 as part of a salt exploration program (Bell, 1961). The Nova Scotia Department of Mines and Energy drilled two holes in the area in 1984 (WR-84-2 not shown in this map area) to determine the local stratigraphy (MacDougall and Polley, 1985) and an additional eight holes in 1986 as part of an investigation of the gypsum and anhydrite resources (Adams, 1988).

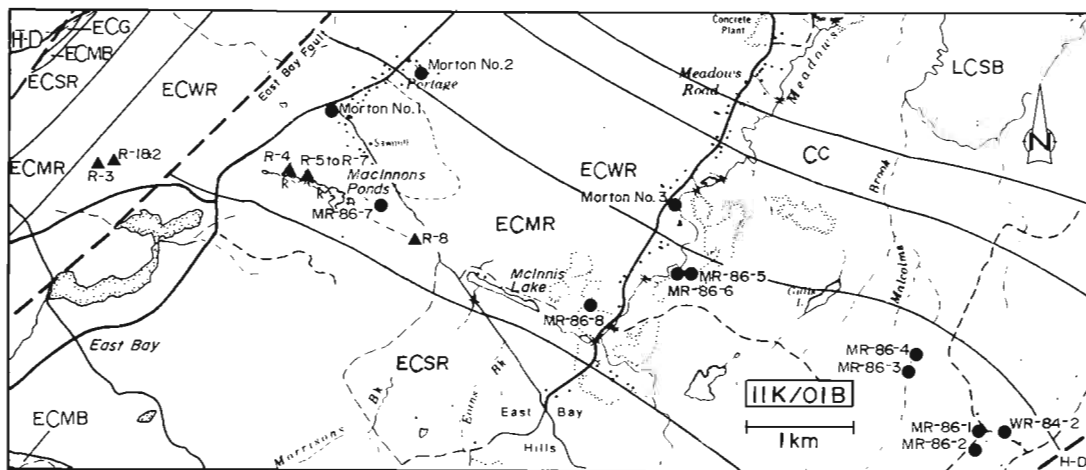
Regional geological mapping by Boehner and Giles (1986) indicated that much of this area is underlain by sedimentary rocks of the Carboniferous aged Horton, Windsor and Canso Groups which are in fault contact

with much older igneous and metamorphic rocks to the southeast. Over most of the area the younger strata strike southeastward and dip gently to the north except in the northwest across the East Bay Fault where they strike northeastward and dip to the south. Interbedded evaporites, carbonates and clastics of the Windsor Group Meadows Road Formation are of greatest interest. It is overlain by the clastic dominated Woodbine Road Formation and underlain by the Sydney River Formation which is clastic dominated near the margins of the Sydney Basin as is the case in this locale.

North of East Bay several small rounded exposures of light grey gypsum, containing varying amounts of carbonate material, can be found. Small areas of light karst topography are seen in the same area. A number of outcrops of fine grained, white gypsum containing minor intermixed carbonate can be seen in the area of MacKinnons Ponds. Both MacKinnons Ponds and McInnis Lake, to the southeast, are believed to be the surficial expression of the dissolved upper portions of calcium sulphate interbeds.

Drillhole data from all three drilling programs indicate that gently dipping calcium sulphate beds are present in the Meadows Road area. These beds are high purity, hydrated to gypsum in their upper portions and may be amenable to underground mining. Much additional work would be required to determine the potential of this area. The rapid residential development of much of this area may inhibit its mineral potential.

Further details on the 1986 drilling program carried out by the Department of Mines and Energy can be obtained from Adams (1988).

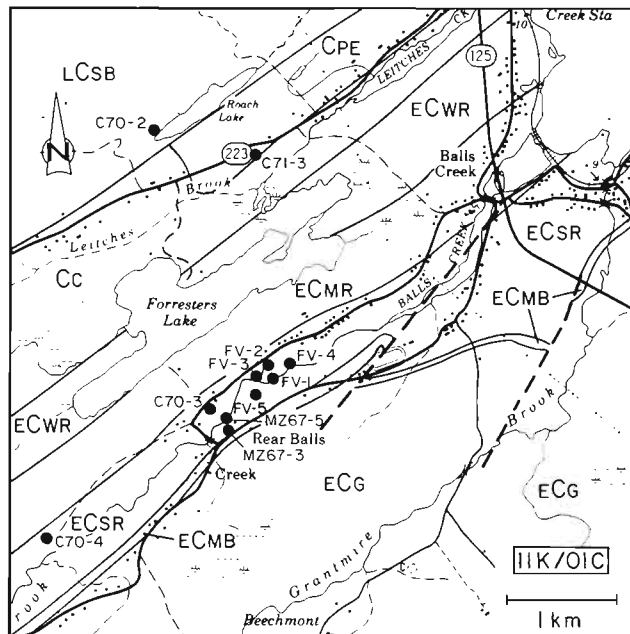


Geology after Boehner and Giles, 1986

Figure 3-5. Location and geology of the Meadows Road occurrence area. See Figures 3-1 and 3-2 for legend and location.

**REAR BALLS CREEK (0029)**  
 NTS 11K/01C  
 UTM 705600 E 5112230 N

Located 9 km southwest of North Sydney, Cape Breton County, the Rear Balls Creek area was the subject of base metal and celestite exploration during the late 1960s and early 1970s (Fig. 3-6). Although no surface evidence of gypsum or anhydrite is known here, eight different drillholes have encountered gypsum, anhydrite or both in the subsurface (Oldale, 1967; Cerro Mining Co., 1972; Forgeron, 1974).



Geology after Boehner and Giles, 1986

Figure 3-6. Location and geology of the Rear Balls Creek occurrence area. See Figures 3-1 and 3-2 for legend and location.

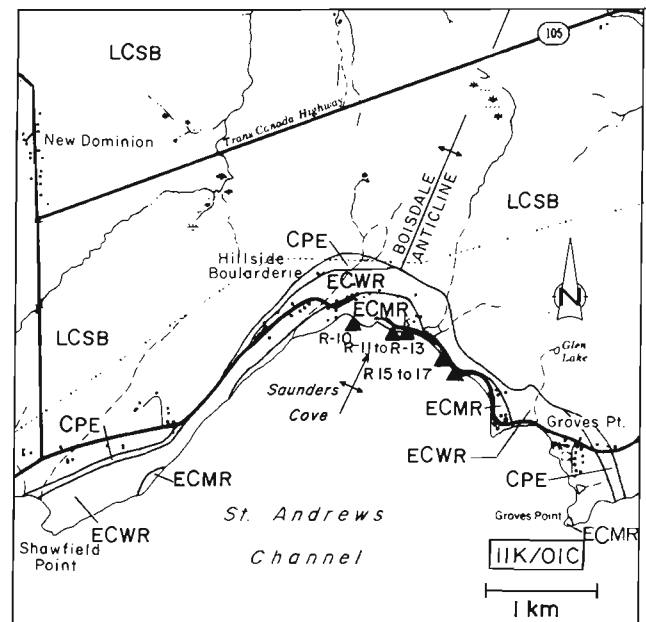
Regional geological mapping by Boehner and Giles (1986) showed this area as being underlain by interbedded evaporites, clastics and carbonates of the Sydney River Formation which strike northeastward and dip to the west. These units are overlain by similar interbedded Windsor Group units to the northwest and are underlain by Horton Group clastics to the southeast.

Although some gypsum horizons attain thicknesses of 12 m or more in this area, the fact that they are underground and dipping 10-45° makes them of little economic interest.

**SAUNDERS COVE (0003)**  
 NTS 11K/01C  
 UTM 703000 E 5124000 N

Located in Hillside Boularderie 7 km west of Bras d'Or, Cape Breton County, Saunders Cove lies on the northern side of St. Andrews Channel (Fig. 3-7). A sequence of interbedded gypsum, limestone and siltstone is found along the shore which Boehner and Giles (1986) placed in the Meadows Road Formation. The largest of the gypsum outcrops are found near the crest of the Boisdale Anticline and therefore the strata dip both to east and west at this point. Minor karst can be seen inland from these outcrops, however it is not very extensive.

Due to its limited areal extent, this occurrence is not of economic interest.



Geology after Boehner and Giles, 1986

Figure 3-7. Location and geology of the Saunders Cove occurrence area. See Figures 3-1 and 3-2 for legend and location.