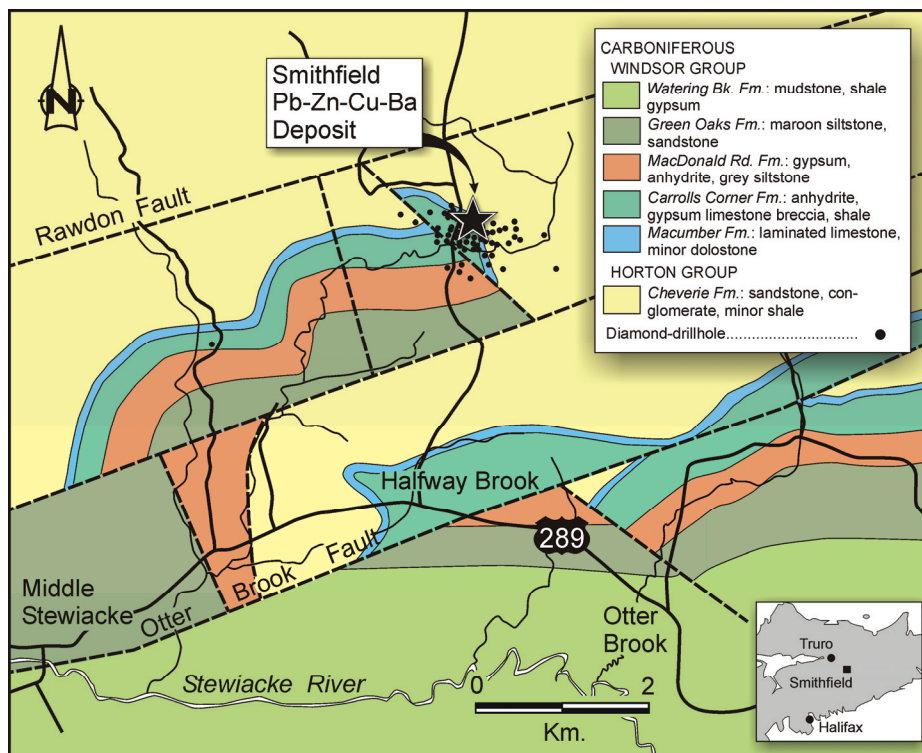


# From The Mineral Inventory Files

## The Smithfield Pb-Zn-Ag-Ba Deposit: Small but First

It is well known that the marine sedimentary rocks and evaporites of Nova Scotia's Windsor Group contain numerous carbonate-hosted base metal and barite deposits. Most notable among these are the Walton Ba-Pb-Zn-Cu-Ag deposit (see v. 24, no. 3) and the currently active Scotia Zinc mine (formerly known as the Gays River Pb-Zn deposit). The distinction of being the first known deposit of this type in the province, however, lies with the Smithfield Pb-Zn-Ag-Ba deposit in Colchester County (see Fig. 1). Base metal-bearing boulders were discovered there in 1880 by Mr. H. Clarke and by 1884 four shafts were sunk, a small mill and smelter erected, and 400 tons of ore processed. Mining continued until 1889, at which time it was recognized that the galena contained silver and that the ore also contained minor quantities of gold. It was estimated that 25,000 tons of 16% lead ore remained when mining ceased in 1889.

The property remained inactive until 1951 except for a small amount of underground development in the mid 1920s and an economic evaluation in 1945. Between 1951 and 1953 Minda Scotia Mines Ltd. carried out an extensive exploration of the property. This consisted of geophysical surveys, sinking of a 65 m deep, cement collared, 3-compartment shaft, 60 m of drifting and cross-cutting into the orebody, 40 surface diamond-drill holes and 363 m of underground drilling. Two mineralized zones were defined: (1) a main zone in faulted and brecciated, finely laminated carbonates of the Windsor Group's basal Macumber Formation, consisting of 500,000 tons of 3.5% Zn and 2.7% Pb, as well as local concentrations of barite up to 15%; and (2) a deposit immediately to the east of the main zone consisting of 500,000 tons of 50-60% pyrite/marcasite containing minor levels of Zn and Pb. This second deposit is hosted partially within the Macumber Formation but extends eastward into the underlying redbed-dominated Horton Group. No mining



**Figure 1.** Geology of the Middle Stewiacke area showing the location of the Smithfield Pb-Zn-Ag-Ba deposit.

was carried out on either of the zones.

In more recent times, Esso Minerals Canada explored the property from 1975-1979, Granges Exploration from 1982-1983 and Westminer Canada Ltd. from 1991-1992. These evaluations encountered similar results to all the earlier exploration activities, with the Granges work determining that the mineralized zone narrows but extends to at least 150 m depth, and the Westminer drilling encountering one spectacular 10.5 m intersection of 28.25% Zn and 1.48% Pb.

The base metal deposit at Smithfield has a strong structural control in a setting very similar to the Walton deposit. Hydrothermal fluids migrated along northwest-trending fault and fracture zones and deposited massive sulphides as fracture fillings and replacement deposits where these structures intersect finely laminated lime-

stone of the Macumber Formation. The deposit is mineralized with argentiferous galena, low-iron sphalerite, barite, pyrite and marcasite.

There is no question that the Smithfield deposit presents itself as an enticing exploration target. The very faults that played a key role in formation of the deposit, however, are themselves the most challenging obstacle to its complete exploration. Figure 1 shows how the deposit lies within a small faulted portion of basal Windsor Group adjacent to a much larger sequence of these same rocks to the west. It is known from the abundant previous drilling that an attractive, but small base metal deposit occurs within the faulted area. The challenge to future explorationists is to determine if there is an extension to this deposit and where it lies.

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