INTRODUCTION

Oil shale is a general term applied to all fine grained sedimentary rocks that yield liquid hydrocarbons in excess of 25 litres per tonne of rock when heated to about 500°C (Yen and Chilinganian, 1976; Cook *et al.*, 1981; Tissot and Welte, 1984). Lithologically, these rocks may be shale, marl or carbonates (Tissot and Welte, 1984), or transitional to coal and carbonaceous shale (Cook *et al.*, 1981). Oil shale of the Green River Formation of western USA is described as microlaminated kerogen- and fish-bearing carbonate (Boyer, 1982) and that of the Albert Formation as kerogen-rich dolomitic laminite (St. Peter, 1982). Liquid hydrocarbons (oil) derived from these rocks are produced through the thermal alteration of inherent organic matter at temperatures of 500°C. The bulk of organic matter in oil shale is typically contributed by material of algal origin (exinite macerals) with only minor contributions from material of (terrestrial) plant origin (humics: vitrinite, inertinite macerals; Hutton *et al.*, 1980). The algal material may be present as poorly preserved detritus or as discrete laminae or masses.

Interest in oil shale development has traditionally reflected oil pricing trends. The world's largest oil shale resource (1 trillion (10^{12}) barrels; Thorne, 1952), contained within the Green River Formation of Eocene age situated in the Green River, Washakie, Sand Wash, Uinta and Piceance Creek Basins of Wyoming-Utah-Colorado, is undeveloped primarily due to the availability of cheaper conventional oil. At the time of writing (1989), development of the Wyoming-Utah-Colorado oil shale for use as a direct source of oil is considered to be economic at $25-35/barrel (Vawter, 1989). Currently, activity in the region is directed toward enhancement of the oil shale development economics through advances in underground mining and retorting technology, oil shale waste management and development of alternate uses and markets for oil shale products. Similarly, New Brunswick oil shale is considered to be uneconomic on the basis of oil yield but is attracting attention for the potential offered in reducing sulphur emissions during co-combustion with high sulphur coal for thermal power generation (Macauley *et al.*, 1985). In Australia and China, the cost of developing oil shale using open pit mining methods is competitive with or lower than the world oil price (Wright and Browning, 1989; Lin Qian and Qiu Wang, 1989), such that development of the resource is warranted. Development of the Stuart oil shale deposit in Australia (with a resource of 3×10^9 barrels) is in the initial stages with commercial production scheduled for the year 2000 (Wright and Browning, 1989).

Oil shale has been reported in Nova Scotia since the 1800s in areas of Cape Breton Island, the northern mainland and the southern mainland (Annapolis Valley). Twelve areas are reported to contain oil shale (Fig. 1). All occur within Upper Paleozoic strata that range in age from middle Devonian to late Pennsylvanian (Fig. 2).

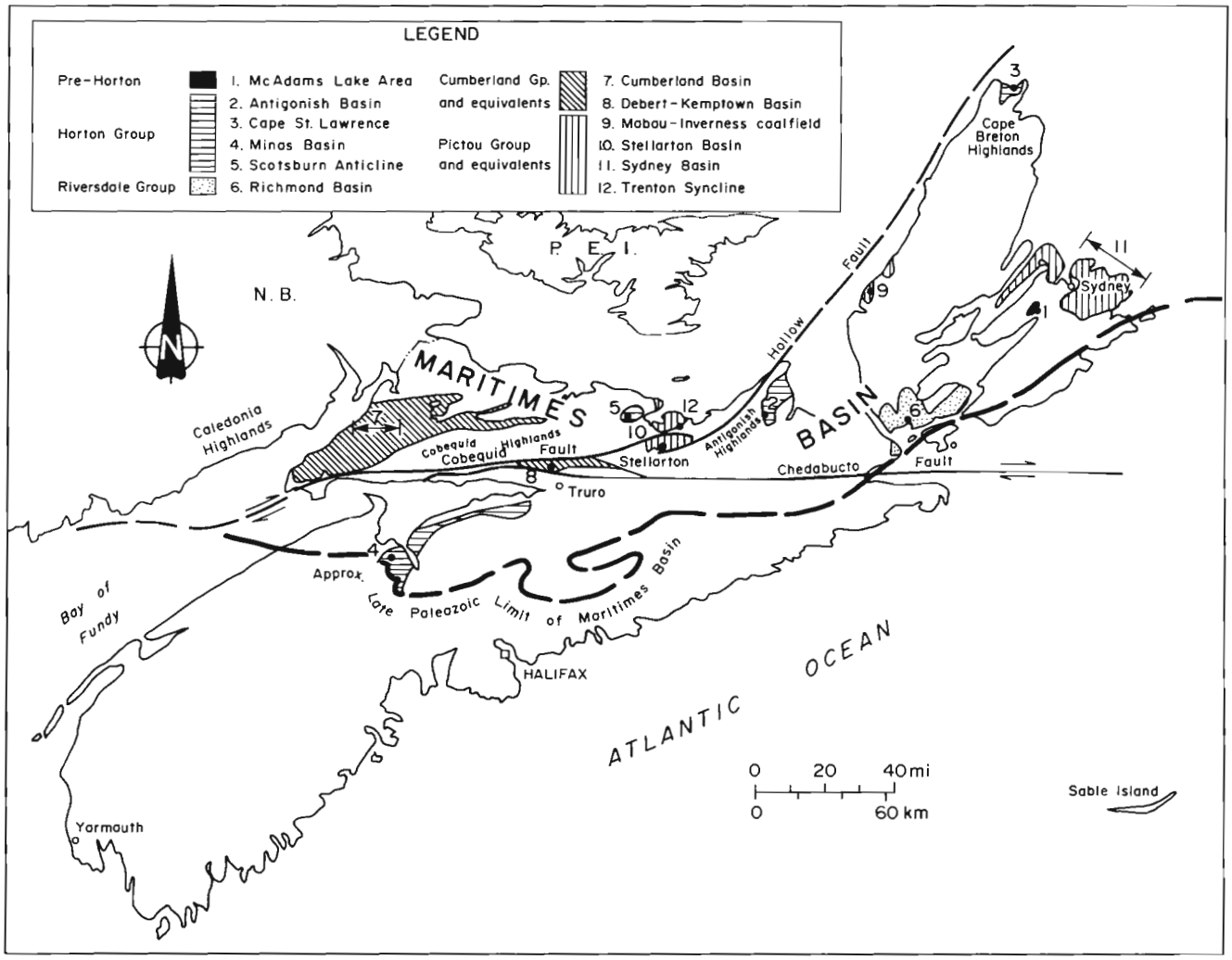

Figure 1. Areas of Nova Scotia reported to contain oil shale. Limit of Maritimes Basin after Naylor et al. (1989).