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URANIUM OCCURRENCES IN NEW BRUNSWICK

Compiled

by

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URANIUM IN NEW BRUNSWICK

INTRODUCTION

Major discoveries of uranium deposits in the western hemisphere were made during the period from 1950 and 1980, with exploration for the metal reaching its peak during the mid-seventies. In the early 1980's, overproduction and tighter environmental regulations culminated in depressed prices in the world market. As a result, exploration for uranium lost momentum and currently has fallen behind other metalliferous minerals.

Nash et al (1981) have enumerated several aspects of the evolution of the uranium geochemical cycle along with its implications for metallogenic provinces and ore deposits. They also outlined various necessary ingredients and criteria for recognizing such metallogenic provinces related to uranium deposits.

A number of criteria such as host rocks, structural setting, form, mineralogy and geochemistry have been used to classify uranium deposits. Nash et al (1981) have categorized

economically important uranium deposits into what have been referred to as "deposit types" using mainly geologic parameters such as host rock, structural setting and process of ore formation. From the above classification, uranium deposits, can be categorized under the following eight types of deposits (Nash et al 1981) in the general sense of order of frequency and size.

1.	Quartz - pebble conglomerate	20%
2.	Unconformity	16%
3.	Ultrametamorphic	6%
4.	Classical Vein	5%
5.	Igneous Associated	6%
6.	Sandstone	45%
7.	Calcrete	2%
8.	Shale	N/A

The estimated reserves from these deposits is calculated at about 2990 x 10^3 short tons with grades ranging from 0.02 to 2.0 per cent of U_3O_8.

From the classification and available statistics, more than 80 per cent of uranium deposits from the western world are hosted by sedimentary rocks, more specifically sandstones and

conglomerates. It is also recognized that about 80 per cent of North American resources (20 per cent of world uranium resources) come from quartz - pebble conglomerates as placer deposits, formed during late Archean - early Proterozoic times (Nash et al 1981).

According to Rackley (1972) and Nash et al (1981), uranium deposits hosted by sandstones are of widespread occurrence in the Western United States and account for about 95 per cent of United States resources. This economically important type of uranium deposit is recognized in Western and Eastern Europe, South America and South Africa. Sandstone-type deposits are limited to rocks with the age range of 400 to 45 Ma (Derry, 1980).

CHARACTERISTICS OF SANDSTONE TYPE DEPOSITS

According to Rackley (1976) and Nash (1981) some of the important signatures of sandstone-type deposits include:-

1) Fluvio-lacustrine molasse-like sequences within intramontane basins and across broad intracratonic piedmonts.

2) Diagenetically reduced fluvial sandstones such as arkosic or micaceous sediments.

3) Thin interbed wedges and intercalations of overbank and lacustrine mudstone lenses.

4) Source rocks for the epiclastic sandstone are largely granitoid rocks in the immediate proximity of the basin, but may also include in part volcanic, metamorphic and multi-cyclic sedimentary rocks.

5) Presence of oxidizing and reducing facies conditions indicated by the presence of pyrite and organic material.

6) Permeable host rocks providing necessary hydrologic conductivity for passage of ore-forming fluids during mineralization which may be represented by a fine to medium grained arkosic to quartzose sandstone in a fluvial channel to sand bar facies environment.

7) Although many of the sandstone-type deposits are bedded deposits restricted to depositional units, sharply discordant features such as roll fronts or tabular features which are peneconcordant to bedding are common and often relate to some significant ore bodies.

8) Sharp contact relationships between mineralized and non-mineralized country rocks are very common.

URANIUM OCCURRENCES IN NEW BRUNSWICK

This report is accompanied by a map (scale 1:500,000) showing the location of each of the uranium occurrences. A brief description, location and geological setting for each occurrence is listed in the following pages.

Projected demand for energy based fuel resources required an increase in exploration activity during 1970 in order to bridge the gap between conventional fossil hydrocarbon

fuels and other secondary energy related resources such as uranium. Uranium occurrences have been known in New Brunswick since the early 1970's (Gross, 1957). However, the search for uranium in New Brunswick was spurred by the discovery of uranium anomalies outlined by regional geochemical (Austria, 1977, 1979a, and 1979b) and airborne radiometric surveys conducted as joint programs by the federal and provincial governments (Geological Survey of Canada, 1976). These regional surveys were conducted, in conjunction with the Carboniferous drilling project (Ball, 1982) under the federal and provincial agreement. Chandra (1979, 1981) produced a radioactive heat map of the province and conducted studies to correlate airborne and ground radiometric anomalies.

In New Brunswick, as in other regions of the Northern Appalachians, Carboniferous basins are recognized as the most favourable potential sites for uranium deposits of economic importance. The Carboniferous basins in New Brunswick are largely fault-controlled, graben structures with molasse facies sediments derived for the most part from adjacent positive areas (horsts) of granitoid and/or volcanic terranes of pre-Carboniferous basement rocks (Kelly, 1967, Belt, 1968 and Howie, 1979). The development of these basins is believed to have taken place either within a short span of tensional regime during the waning stages of Acadian

compression or immediately after Late Devonian plutonism. The spatial and temporal distribtuion of lithologies and the diachronous relationships between various stratigraphic units in the Carboniferous basin, particularly during the Mississippian suggest that the basin configuration and depositional history kept changing with time. This aspect is amply demonstrated by Carter and Pickerill (1985) and Pickerill and Carter (1980).

Many uranium occurrences in the province are of the sandstone-conglomerate type and are associated with pyrite and copper deposits. Much emphasis has been placed on locating roll-type deposits in oxidation-reduction environments where fluvial sandstones may contain diagenetic coalified fossil plant material and pyrite. This exploration approach stems from the understanding that Carboniferous basins of the Maritime Provinces have striking similarities to uranium districts of the Colarado Plateau of the United States (Rackley, 1976). The Carboniferous basin in New Brunswick comprises thick sequences of red oxidized clastic terrestrial sediments along with grey clastic sediments enriched with coaly plant remains.

Although none of the sandstone-type uranium occurrences/ showings fall in the ranks of an economic deposit, particularly with the present depressed prices, a few occurrences are worthy of note. These are:

1. Millstream - Lower Millstream

2. Salisbury-Berry-Shediac Belt

3. Northview

4. West Mill Settlement

Other non-sandstone type uranium occurrences of possible economic importance are:

1. Duck Lake (Juvenile Mountain), which is associated with a mafic volcanic unit between two fanglomerate units of Mississippian age.

2. Manners-Sutton-Harvey Station-York Mills area, which is primarily structurally controlled along late faults and fractures in highly altered rocks of Mississippian age.

3. Long Lake uranium, associated with vein type in late fracture zones within Late Devonian biotite quartz-monzonite. These occurrences are associated with pyrite, fluorite, arsenopyrite, tin, tungsten and molybdenum.

Association of uranium deposits with late Paleozoic plutonic rocks is frequent in the Hercynian orogenic belt. Some of the granitic plutons (e.g. in Massif Central, France; Bohemian Massif, Czechoslovakia) are accompanied, in addition to uranium, with aureoles of tin, tungsten or gold mineralization (Rich et al 1977).

As shall be shown in this report, the uranium-tin-tungsten-molybdenum-gold elemental assemblages are associated with the Lower Mississippian granitic rocks in the Appalachian orogenic belt too. Therefore the uranium occurrences associated with the Lower Mississippian granitic rocks may be used as path-finders in exploration for other mineral commodities.

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INFORMATION AND SUMMARY SHEETS

Uranium 21-P/10E

Chiasson (Shippegan Island) 1 47°43'50"N 64°38'00"W

Work:

1954: - J.W. McCarthy and M.J. Boylen, Eng.
- geological mapping
- scintillometer survey of the sea floor and local water wells

1957: - C. McAllister and J.W. McCarthy
- 7 shallow DDH, no logs

Geology: Radioactive material (U_3O_8?) occurs in hematitic rich layers of buff to reddish brown, medium-grained arkosic sandstone of Pennsylvanian age. The beds are about 5 cm. thick and are flat lying. The radioactive material appear to be concentrated along plant bearing beds with hematite staining and carbon coated.

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Unknown.
1957: Tiffany Mines Ltd., McCarthy option, Shippegan Island; New Brunswick Department of Natural Resources, Mineral Resources Branch, National Topographic System File 21-P/10-7.

Uranium — 21-0/16E

Durham Centre 2 — 47°54'30"N 66°01'30"W

Uranium and lead are reported to occur in the volcanic rocks of the Chaleur Group Also anomalous values of radioactive material was noted in a sample collected one-quarter mile south of Jacquet River post office.

References:

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1970 New Brunswick Department of Natural Resources, Map Series 70-2.

Little, H. W.
1974 Uranium in stream sediments, Bathurst - Jacquet River District, New Brunswick. Geological Survey of Canada, Paper 74-1, pl. B.

Uranium — 21 0/15E

Atholville 3 — 47°59'55"N 66°42'34"W

Work:

1953: Geological mapping and DDH by M. J. Boylen, Engineering.

1957: Sampling and analytical work by the Geological Survey of Canada - Gross, G. A.

Geology: The mineralization is a black, brittle and patchy looking radioactive material disseminated in quartz - feldspar porphyry occurs as a dyke or sill in Devonian slate. The quartz-feldspar porphyry is fine grained (chilled margin?) within about 3 cm. from the contact with slate. The shallow dipping contact is parallel to the strike of slate. The black mineralization material revealed a value of 2.3% U_3O_8 (equivalent).

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1941: Campbellton: Geological Survey of Canada, Map 621A.

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1971: Campbellton area (east half): New Brunswick Department of Natural Resources, Plate 71-40.

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1957: Uranium Deposits in Gaspe, New Brunswick, and Nova Scotia, Paper 57-2: Geological Survey of Canada, pp 10.

Uranium 21 0/15W

Associated mineral/metal: V

Cox Brook 4 47°51'16"N 66°56'13"W

Work:

1953: Property by C.T. Ritchie - optioned to the Hirsbhorn interests in 1953-54.

1954: Again optioned to M.J. Boylen on behalf of Brunswick Mining and Smelting Co. - some DDH - logs not available.

Geology: The radioactive material occurs in a very fine-grained felsite dyke which cuts dark grey to black slate and slaty argillite, less than 1 km. from a granitic mass. The radioactive material is present in irregular veinlets of about 1 cm. wide and in disseminated spacks and streaks along narrow fractures in the dyke. The dyke along these fractures is altered. Fragments of black material examined by the Geological Survey of Canada consisted of a mixture of hydrocarbon and uraninite or pitchblende.

Chip samples taken by M.J. Boylen, Engineering Offices Limited were reported to contain 0.21 and 0.05% U_3O_8.

The sediments are of Ordovician age and the felsic dyke is of Devonian age.

References:

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1962: Canadian Deposits of Uranium and Thorium: Econ. Geol., Series 16, 2nd edition, p. 238; Geological Survey of Canada.

Uranium 21 J/14W

Plaster Rock 5 47°57'58"N 67°28'15"W

1979: - Geology by Mineral Resources Branch, New Brunswick Department of Natural Resources.

- Stream sediment geochemistry and trenching by Urangesellschaft Canada Ltd., Assessment Report 472472; E. Linz

Geology: The Plaster Rock anomaly occurs on the western flank of the Plaster Rock Basin described by St. Peter (1979). The anomaly is underlain by the Plaster Rock Formation consisting of red and green, friable shale with interbeds of red, gypsiferous shale and white, massive and fibrous gypsum. The Plaster Rock Formation is temporally correlated to the Windsor Group. The Plaster Rock Basin is interpreted as an isolated, fault-generated, intermontane graben-like structure (St. Peter, 1979). Trench samples by Urangesellschaft gave values of 158 ppm, 98 ppm and 77 ppm of U. The ground gamma-ray survey by Chandra (1981) located a significant radiometric anomaly of 24 ppm eu. Two rock samples collected by Chandra (1981) yielded 4.5 and 8.8 ppm eu.

References:

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1979: Geology of Wapske-Odell River - Arthurette region, New Brunswick; Mineral Resources Branch, Department of Natural Resources, New Brunswick, Map Report 79-2, 32 p.

1979: Geology, geochemical survey and trenching by Urangesellschaft Canada Ltd., E. Linz, New Brunswick Department of Natural Resources, Assessment File 472472.

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1981: Ground investigation of Airborne gamma-ray radiometric anomalies in New Brunswick by Truck-mounted and hand-held gamma-ray sensors, Unpublished M.Sc. Thesis, University of New Brunswick.

Uranium 21 J/14W

Associated Metals: Cu

Northview 6 46°58'40"N 67°27'00"W

Work:

1977 New Brunswick Department of Natural Resources, Mineral Resources Branch regional radiometric survey.

1978 Staking of claims and regional well water geochemical survey by Lacana Mining Corporation - B.E. MacNabb,

1979 Geological mapping, geochemical and trenching and identification of B, F and G showings - MacNabb, B.E. and Pichette, R.J.

1979 Geological mapping by New Brunswick Department of Natural Resources, Mineral Resources Branch.

1980 Radiometric studies by New Brunswick Department of Natural Resources, Mineral Resources Branch.

Geology: According to Chandra (1981), the North view airborne anomaly is located in an isoloated arm of Mississippian sedimentary rocks separated from the Plaster Rock Basin by a horst structure of older Pre-Carboniferous basement. The pre-Carboniferous rocks comprise sedimentary and volcanic rocks of Perham Formation of Silurian age (Fyffe, 1982). It is believed that the horst structure may have been produced, during post-Carboniferous times, due to thrusting along a major fault, at Sisson Ridge, that sub-parallels the Rocky Brook - Millstream Fault (personal communication - Chandra and St. Peter, 1985).

The claim area is underlain by red beds of friable mudstone and grey fissile siltstone belonging to Arthurette red-bed member of the Plaster Rock Formation (St. Peter 1979). The uranium showings occur in the red and greenish grey siltstone.

The uranium and cooper values in the samples from trenches are as follows:-

F	U - 35 ppm	Cu - 4350 ppm
B; nodule	U - 2.43%	Cu - 8.32%
host rocks	U - 0.002%	Cu - 0.08%

References:

Chandra, J.J.
1980: Ground investigation of airbone radiometric anomalies, New Brunswick; Geological Surveys Branch, Department of Natural Resources, New Brunswick, open File Report 80-11, 111 p.

1981: Ground investigation of airbone gamma-ray radiometric anomalies in New Brunswick by truck-mounted and hand-held gamma-ray sensors. Unpublished M.Sc. Thesis, University of New Brunswick.

Fyffe, L.R.
1982: Compilation Map N.R. 4; Geology: Woodstock, scale 1:250,000, New Brunswick Department of Natural Resources.

MacNabb, B.E. and Pichette, R.J.
1978 & 1979: Assessement work, Lacana Uranium Joint Venture, Fredericton Project New Brunswick Department of Natural Resources Assessment Files 472231 and 472433.

St. Peter, C.
1979: Geology of Wapske-Odell River-Arthurette region, New Brunswick; Minerals Resources Branch, Department of Natural Resources, New Brunswick; Map Report 79-2, 32 p.

Uranium 21 O/02W

Associated minerals/metals: Cu, pb,
Zn, Ag, Au, Th, Mo

Shawn 7 47°01'30"N 66°53'30"W

1974 Geological mapping by Geological Survey of Canada.

1975 Geological mapping by New Brunswick Department of Natural Resources.

1971 Geochemical work on Campbell River Project - Gleeson and Adams.

1979 Geology and geochemistry and identification of anomalies 22, 23, 24: Canadian Occidental Petroleum Ltd., Minerals Division.

1980 Geology, soil geochemistry, rock geochemistry, scintillometer survey and trenching; Canadian Occidental Petroleum Ltd., Minerals Division.

Geology: The Shawn Group claims block is underlain by a foliated cataclastic granite of Ordovician age and a granitic to quartz-monzonitic pluton of Devonian age. The assumed contact between the two strikes about east-west (Crouse 1975). Farther northwest the granitoid rocks are in faulted contact with Cambro-Ordovician meta-sedimentary and meta-volcanic rocks (Davies, J.L., 1977 and Skinner 1974).

Mapping of outcrops and float in the claim area resulted in delineating 4 types of granite which are:

1) medium to coarse-grained granite, locally with quartz, veins, carrying occasionally molybdenum,

2) a spotted (spots, often 1 cm diameter containing chlorite) medium to coarse grainte granite,

3) medium to coarse-grained biotite quartz-monzonite,

4) altered, heavily silicified and sericitized and in places brecciated versions of some or all the above granites.

The last type of granite yielded anomalous high values of U, Cu, Pb, Zn, Ag, and Mo. The mineralization is related to alteration. Ore minerals recognized in handspecimens are molybdenum hosted quartz veins in fresh granite, and autunite occurring in strongly veined, highly silicified, Fe-rich altered granite. The U value is 8800 ppm and for the other elements are: Cu - 5680 ppm, Pb - 6000 ppm, Zn - 3580 ppm, Ag - 11 ppm, Mo - 8800 ppm and Au - 90 ppb.

High U values were recorded in two soil profiles in two trenches with a maximum value of 29 ppm from "A" horizon of soil samples.

The Canadian Occidental Petroleum Ltd., concluded that Anomalies 17 and 18 in the northwest part of the grid near the lakeshore are of economic interest due to their high values in Uranium (9.3 - 51.0 ppm) and silver (1.8 - 2.5 ppm). Additional geochemical and geophysical surveys are planned for the area.

References:

Skinner, R.
1974 Geology of the Tuadook Lake Map area, New Brunswick, (21J/15) Paper 74-33; Map 1402A; Scale 1:50,000.

Crouse, G.
1975 Geology of Map-area K-11, "Long and Trouser Lakes" New Brunswick Department of Natural Resources Plate 77-191. Scale 1 inch = 1/4 mile.

Crouse, G.
1975 Geology of Map-area K-12, "Gulquac and Island Lakes", New Brunswick Department of Natural Resources, Plate 77-192. Scale 1:50,000.

Davies, J.J.
1977 Geological Map of Northern New Brunswick, New Brunswick Department of Natural Resoruces, Map N.R. 3, Scale 1:250,000.

Robertson, D.M.
1979 Geology and Geochemistry of Anomalies 22, 23, 24, August 1979.

Lipowitch, T.
1980 Geology and geochemistry of the northern part of the Shawn claim Group. New Brunswick Department of Natural Resources Assessment Report 472697 - Canadian Occidental Petroleum Ltd.

Barclay, W.
1981 Barclay Exploration Services Ltd. to Canadian Occidental Petroleum Ltd. on the geophysical surveys on Shawn Claim Group. New Brunswick Department of Natural Resources Assessment Report No. 472796.

Uranium 210/02W

Associted minerals/metals: Cu, Pb, Zn, Ag, Mo and Mn an d Sn

Long Lake 8 47°03'10"N 66°53'30"W

Work:

1962 Geological mapping by the Geological Survey of Canada.

1975 Geological mapping by the New Brunswick Department of Natural Resources under Provincial-Federal Agreement, DREE Program.

1971 Geology and geochemistry of the Long Claim Group: Canadian Occidental Petroleum Ltd., Neelands, J.T.

1973 Geophysics - Induced Polarization Survey, Long Lake Claim Group: Canadian Occidental Petroleum Ltd., Glackmeyer, K., Diamond Drilling - Long Group: Saracoglu, N.

1979 Project Campy. Campbell River Area, New Brunswick, Stream Sediment Geochemistry, Data Treatment and Mapping, C.A.S.E. April 1979. Canadian Occidental Petroleum Ltd., Martin, L.

1980 Geology and geochemistry of the Long Claim Group., Canadian Occidental Petroleum Ltd., Robertson, D.M.

1980 Geology and geochemistry of Long Claim Group, Canadian Occidental Petroleum Ltd., Hauseux, M.

Geology: The Long Claim Group is underlain by Cambro-Ordovician metasedimentary rocks that are intruded by Devonian quartz-monzonite. Prominent northwest trending faults and shear zones are identified. This episode of deformation is followed by brecciation which probably resulted in zones rich in carbonate in the area north of quartz-monzonite and silica (notably jasperoid - chalcedony) in the area to the southwest. It is believed that later phase of faulting resulted in the emplacement of a muscovite granite under or close the shores of Long Lake.

A detailed geochemical soil survey for Cu, Pb, Zn, Ag, Mo, U and Mn, a scintillometer survey, trenching, mapping and propspecting were completed on the Long claims during spring and summer of 1980. Magnetometer,

I.P., and VLF surveys, followed by drilling are described in separate reports by F.L. Jagodits. A total of 142 grid line km were cut and/or picketed; 550 m of ground were trenched in 19 locations; 1922 soil samples were collected on the grid and in trenches, and 81 rock samples and 30 (water, precipitate, and wood) samples gathered selectively from the property.

A number of coincident anomalies of uranium are identified in the claim block. Uranium values range from 0.2 - 215 ppm. A float sample of chalcedony-veined brecciated granite along northeastern shore of Long Lake yielded 3300 ppm U and is reported to contain autunite-torbernite. A bedrock sample of altered quartz-feldspar porphyry 1 km. northeast of the lake shore contains 845 ppm U. Some of the float samples showing anomalous uranium also show high values of molybdenum.

The Long Claim Group show mineralized zones within 3 km. of granite contact with the Cambro-Ordovician metasedimentary rocks exposed to the north. The mineralization occur as quartz-sulphide veins within at least four northwest-trending fracture zones. In the vicinity of quartz-sulphide veins, the feldspar-quartz-biotite of granite and porphyry are altered to an assemblage of sericite, chlorite, silica and pyrite resulting in a greenish grey rock. The sulphide mineralization in the veins include pyrite, chalcophyrite, covellite, sphalerite, galena, molybdenite, arsenopyrite, matildite and native bismuth. Maximum values yielded over widths of about one-half meter are Zn - 15.3%, Cu - 3.12% and Pb - 0.3%. Occurrence of cassiterite has been reported in float and one bed rock sample of a vein that contained values between 0.01 and 0.1% Sn.

References:

Anderson, F.D.
1962 Geology, Tobique, New Brunswick. G.S.C. Map 37-1962, Scale 1 inch to 2 miles.

Crouse, G.
1975 Geology of map-area K-11, "Long and Trouser Lakes" New Brunswick Department of Natural Resources, Plate 77-191, Scale 1 inch = 1/4 mile.

Fiset, N.K. and Lewis, M.
1980 Geophysical work on Long Claim Group by Scintrex Ltd. for Canadian Occidental Petroleum Ltd., New Brunswick Department of Natural Resources Assessment Report 472556.

Glackmeyer, K.
1973 Induced Polarization Survey, Long Lake Claim Group. New Brunswick Department of Natural Resources Assessment Report 470797

Hauseux, M.
1981 Geology and geochemistry of Long Claim Group, Canadian Occidental Petroleum Ltd., New Brunswick Department of Natural Resources Assessment Report 472695.

Leonard, K.W.
1982 Geology and geochemistry of Long Claim Group, Canadian Occidental Petroleum Ltd., New Brunswick Department of Natural Resoruces Assessment Report 472797.

Martin, L.
1979 Project Campy. Campbell River Area, New Brunswick, Stream Sediment Geochemistry, Data Treatment and Mapping, C.A.S.E. april 1979.

Needlands, J.T.
1971 Geology and geochemistry of the Long Claim Group. New Brunswick Department of Natural Resources Assessment Report 470794.

Robertson, D.M.
1980 Geology and geochemistry of the Long Claim Group.

Saracoglu, N.
1973 Diamond Drilling - Long Group.

Skinner, R.
1975 Geology of the Tuadook Lake Map-Area, New Brunswick (21 J/15), Paper 74-33, G.S.C.

Uranium 21-J/9E

Associated mineral/metal: Coal

Renous Property 9 46°44'30"N 66°14'10"W

Work:

1969 - stream sediment survey - Villard.

1970 - soil and radon anomaly required detailed follow-up.

1971 - detailed soil and radon detection survey.

1972 - drilling of 2 separate areas of anomalous soils.
- high of 2.2 ppm U in grey mudstone of DDH R-1, 39 m deep. Geologist: H.C. Sakrison.

DDH #R-1

0	-	6 m	overburden
6	-	38 m	Hopewell Group
38	-	39 m	Carboniferous
39	-	52 m	Carboniferous siliceous unit and conglomerate
52 m			Total Depth

DDH #R-2 Vertical

0	-	6 m	overburdn
6	-	13 m	Pictou Group-minor coaly material
13	-	46 m	Hopewell Group
46 M			Total Depth

Geology: The property is located at the western margin of the Central Carboniferous Basin of New Brunswick. Late Mississippian - Early Pennsylvanian rocks of the Hopewell group crop out at the south and southwest margins of the basin. They consists of red-bed conglomerates, arkosic sandstones and siltstones and lie stratigraphically above Windsor limestone. Similar red-bed sequences exposed along the western margin of the basin, including the Renous area, have been provisionally assigned to the Hopewell group (van de Poll, 1972). Pennsylvanian-Upper Carboniferous non-marine sedimentary rocks of the Pictou gorup overlie Hopewell rocks and make up over 90% of the surface exposures in the basin.

References:

Sakrison, H.C.
1972: Cominco Limited, project termination report, Renous property; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 21-J/9E, No. 470284 and 470285.

Uranium 21-J/9W

Associated minerals/metals: Cu

Dungarvon River 10 46°41'30:N 66°26'43"W

Work:

1980 - Geological mapping by New Brunswick Department of Natural Resources.

1981 - Minorex, geophysical and soil geochemical work.
- Anomalous radioactivity was noted along the assumed contact between basement Silurian rocks and Carboniferous sediments; uranium and copper soil anomalies also occur along or near the contact.

Geology: The property lies in an outlier of Carboniferous sediments along faulted contact with Silurian (basement) sediments. Arkosic sediments, similar to the red beds of the New Brunswick Platform, are thought to be derived from the Devonian granites of the Miramichi Anticlinorium.

The radioactive anomalies straddled the inferred contact between the Carboniferous and Silurian sediments.

References:

Adams, K.
1981: Minorex Limited, Dungarvon River; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 21-J/9W, No. 472781.

Austria, V.
1979: A study of geochemical distribution of uranium with relevance to exploration, New Brunswick Department of Natural Resources, open file Report 79-7.

Chandra, J.
1981: Reconnaissance ground investigation of the Dungarvon River (airborne) radiometric anomaly, Northumberland County, New Brunswick; New Brunswick Department of Natural Resources, Mineral Resources Branch, Open File Report 81-18.

Uranium 21-J/9W

Associated mineral/metal: Cu

Renous River 11 46°44'00"N 66°17'00"W

Work:

1981:
- Minorex
- soil geochemistry (U, Cu), geophysics (Magnetics, VLF-EM, Spectrometer), radon in soil gas surveys
- radon-in-soil gas spectrometer, and soil copper anomalies were found coincident on high ground flanking a cedar swamp. Uranium anomalies fell within an area of 0.4 x 0.8 km in the swamp itself. Thirty-seven holes were drilled into overburden with a CME-5 soil auger; no mineralization was noted.

Geology: The area is underlain by maroon to red sandstones, siltstones and conglomerates of the basal Carboniferous; the beds dip 40-45° towards the basin. A regional gravity low possibly indicates a graben structure along the basin margin. The average soil sample geochem yielded 8.3 ppm of U and 14 ppm of Cu whereas the overburden yielded 4.8 ppm U and 26 ppm of Cu.

References:

Adams, K.
1981: Minorex Limited, Renous River; New Brunswick Department of Natural Resources Branch, Assessment File, 21-J/9W, No. 472780.

Uranium 21-J/9W

Associated mineral/metal: Cu

Whetstone Brook 12 46°44'00"N 66°19'00"W

Work:

1979-1981: - Geologic mapping

1982: - soil geochemistry, radon in soil, spectrometer surveys
- 2 anomalous uranium-copper trends were found, subparallel to the Carboniferous Platform margin, suggesting a bedrock influence. These are possibly related to high background levels in red-bed conglomerate and sandstone.

Geology: Basal Carboniferous sandstones, siltstones, and conglomerates lie unconformably and locally in fault contact with basement Silurian slates, quartzite and greywacke. The Carboniferous strata dip steeply (40-85°) toward the east at the margin of New Brunswick Platform. Cross-bedded sandstone and coarse conglomeratic channel fills indicate an alluvial fanglomeratic facies grading into outwash plains adjacent to a mountain range. The graben structure by the basin is indicated by a gravity low.

References:

Adams, K.
1982: Minorex Limited, Whetstone Brook; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File, 21-J/9W, No. 472814.

Uranium 21-J/16E

Monaghan Brook 13 46°46'00"N 66°13'00"W

Work:
- soil geochem, geophysics includes radon-in-soil gas, spectrometer and magnetrometer surveys;
- geological prospecting

1981:
- Minorex
- coincident radon and spectrometer anomalies fall in a U-shaped pattern following a topographic contour along the top of a hill between 2 river valleys, probably related to a conglomerate containing carbonized plant material. Copper and uranium soil anomalies show a similar distribution and suggest organic scavenging has occurred in cedar swamps flanking the hill. It is expected that uranium and copper values in bed rock be much higher than those obtained in the overburden.

Geology: A basal red unit exposed along the margins of the New Brunswick Carboniferous Platform is overlain by green and grey conglomerate, sandstone and siltstone at Monaghan Brook. The sediments here are flat to gently dipping in a southeast direction. The rocks contain plant fragments and pyrite.

References:

Adams, K.
1981: Minorex Limited, Monaghan Brook; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File, 21-J/16E, No. 472782.

Uranium 21 J/15E

Associated mineral/metal: Mo

Catamaran Fault 14 46°45'17"N 66°36'50"W

Work:

1979: Radon-in-soil and radon in water gas ground scintillometer survey, soil and silt geochem survey, and trenching by Mirorex Ltd.

1980: Additional geochemical work and trenching.

Geology: The claim block is underlain by Cambro-Ordovician sedimentary rocks in the immediate vicinity south of Catamaran Fault. The rocks exposed include phyllite, metaquartzite, meta-amphibolite. Two ages of granite are noticed in the general vicinity of the claim block. The older granite (Ordovician) is seen along east-west part of Rocky Brook shear zone whereas the younger Dungarvon stock occurs to the south showing subhorizontal exfoliation.

Anamolous values of uranium with moderate values of molybdenum is suspected to be associated with aplite and/or pegmatite veins. But later, it was confirmed that the high uranium anamoly was not associated with the bed rock but was due to high K_2O that gave high scintillometer counts.

References:

Adams, K.
1980: Catamaran Claim Group. New Brunswick Department of Natural Resources, Assessment File Report 472522.

Adams, K.
1981: Catamaran Claim Group. New Brunswick Department of Natural Resources, Assessment File Report 472664.

Uranium 21 J/10E

McConnell Brook 15 46°44'00"N 66°37'30"W

Work:

1978: Geology, prospecting, soil sampling and diamond drilling.

1979: Radon-in-soil and radon-in-water gas surveys, spectrometer and magnetometer surveys, silt and soil geochem work and trenching.

Geology: The claim block is underlain by biotite quartz-monzonite with minor biotite-muscovite quartz-monzonite. The granite is exfoliated with shear zones along which feldspar is altered to kaolin. Along joints and fractures magnetite is altered with hematitic stains. A few pegmatite pods also occur in the quartz-monzonite.

High isoloated values of radon and uranium is encountered in water and springs but it was not found to be associated with the bed rock.

References:

Adams, K.
1978: McConnell Brook Claims, New Brunswick Department of Natural Resources, Assessment File 472315.

Adams, K.
1980: McConnell Brook Claims, New Brunswick Department of Natural Resources, Assessment File 472521.

Austria, V.
1979: New Brunswick Mineral Resources Branch, open File 79-7.

Cross, D.B.
1978: McConnell Brook Claims, New Brunswick Department of Natural Resources, Assessment File 472369.

Uranium 21 J/10E

Associated minerals/metals:
Cu, Pb, Zn and Ag

Rocky Brook 16 46°38'57"N 66°37'23"W

Work:

1978 Geological mapping, soil geochemistry, till geology and scintillometer survey.

Geology: The claim block is underlain by biotite quartz-monzonite of Devonian age. The granite intrudes Cambro-Ordovician sedimentary and mafic volcanic rock which are hornfelsed.

Anamolous uranium highs were delineated and seem to be associated with water seepage zones. One of these anomalies indicated as high as 1400 cps which was identified to be due to uranium concentration in organic matter. The organic matter was analysed to yield 240 ppm U_3O_8. The source of uranium is suspected to be the granite/quartz-monzonite.

Assays obtained gave: (in ppm)

	U_3O_8	Cu	Pb	Zn	Ag
Background	2	8	26	40	.8
Threshold	9	20	41	90	1.8

References:

Grant, D.B.
1978: Rocky Brook Claims, Aquitaine Company of Canada Ltd. New Brunswick Department of Natural Resources, Assessment Report 472461.

Wilson, A.J.
1978: Rocky Brook Claims, Aquitaine Company of Canada Ltd. New Brunswick Department of Natural Resources, Assessment Report 472237.

Uranium 21-I/2W

Associated Mineral/Metal: Cu

Berry Mills-Shediac River 17 46°06'43"N 64°56'15"W

Work:

1978: - Canadian Nickel (Berry Mills)
- 1 drill hole intersected 17 m of overburden and 76 m of Moncton Group coarse-grained polymictic conglomerate. No uranium mineralization.

1979: - Canadian Nickel (Berry Mills)
- soil geochemistry; several anomalies, up to a high of 2600 ppm U, including an anomalous zone over 7 lines with highs of 700 and 1800 ppm U; Cu anomalies are isolated, 1 value recorded of 135 ppm.
- scintillometer, alphameter - no significant anomalies.
- diamond drilling; 1 hole intersected sandstone and mudstone from 8 to 130 m; sandstone, grit, and conglomerate from 130 to 211 m.

1979: - Canadian Nickel (Shediac River)
- geochemistry anomalies (up to 200 ppm U, 225 ppm Cu in soils) and scintillometer anomalies up to 150 c.p.s.
- 1 diamond drill hole intersected 122 m of sandstone, mudstone, and conglomerate; no U mineralization.

1979: - Three of the holes (BH 59080, 59081, 59082), for a total of 381.1 meters, were completed in the Berry Mills area and consisted of an undercut and two bracket holes to test an intersection (0.30% U_3O_8 over 1.5') from the 1978 drill program. Minor radioactivity was encountered in only one hole at the red/grey facies boundary within the Pennsylvanian sediments; no anomalous radioactivity was found at the Pennsylvanian-Mississippian unconformity. The fourth hole (BH 59083) was drilled to 61.0 meters to test the Pennsylvanian-Mississippian unconformity in the Steeves Mountain area at a location 100 meters south of a previous Canico borehole; no anomalous radioactivity was encountered. The following six holes (BH 59084 - 59089) were drilled along a

section to test an anomalous (radon, soil, scintillometer) situation at the Mississippian-Pennsylvanian unconformity in the Shediac River area and to obtain information about the contact. None of the holes encountered anomalous radioactivity. The final hole of the program (BH 59090) was drilled to test an area of surface radioactivity in a sandstone quarry south of the Lutes Mountain boulder occurrence. No anomalous radioactivity was encountered in the hole.

1980: - Canadian Nickel (Berry Mills-Shediac River)
- soil, scintillometer, alphameter surveys; diamond drilling (2 920 m in 11 holes). Weak anomalous radiometric trends were found in 2 areas near Berry Mills; an 8 cm thick carbon-bearing bed in grey-green sandstone in one of these areas assayed 150 ppm U_3O_8. Three strongly anomalous areas were outlined by a soil survey near Shediac River; 1 of these featured coincident scintillometer and alphameter anomalies. Drilling found minor radioactivity in only one hole: at the red/grey facies boundary in Pennsylvanian sediments; no radioactivity was detected at the Pennsylvanian/ Mississippian unconformity.

1981: - Canadian Nickel
- weak soil, alphameter and scintillometer anomalies recorded. Eight holes were drilled, totalling 589 m, and succeeded in locating a 26 cm zone of 800 ppm U_3O_8 in green and brown sandstone.

1982: - Canadian Nickel
- 1 283 km of airborne E-M flown; no significant anomalies revealed.

Geology: The oldest rocks that underlie the Kingston Uplift on the Berry Mills-Shediac River property are metamorphosed quartz diorites and the felsic ignimbrites of the pre-Carboniferious basement complex. They are overlain by lower Mississippian continental red beds of the Memramcook Formation. Lacustrine grey shales, siltstones and sandstones of the Albert Formation overlie the red Memramcook clastics and are in turn overlair by red sandstones and conglomerates of the Moncton Group. Pennsylvanian sandstones and mudstones of the Pictou Group flank the Kingston Uplift and represent the youngest rocks in the area.

References:

Krause, B.R.
1982: Airborne Electromagnetic Geophysical Survey Report, (Berry Mills-Shediac River); Canadian Nickel Company Limited, New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 472812.

MacGibbon, T.
1979: Geochemical-geophysical-diamand drilling; Berry Mills-Shediac River Property; Canadian Nickel Company Ltd., New Brunswick Department of Natural Resources, Assessment File 472376.

1978: Geochemical-geophysical-diamand drilling; Berry Mills-Shediac River Property; Canadian Nickel Company Ltd., New Brunswick Department of Natural Resources, Assessment File 472215.

1979: Geochemical-geophysical-diamond drilling, Berry Mills-Shediac River Property; Canadian Nickel Company Ltd., New Brunswick Department of Natural Resources, Assessment File 472381.

1980: Geochemical-geophysical-diamond drilling, Berry Mills-Shediac River Property; Canadian Nickel Company Ltd., New Brunswick Department of Natural Resources, Assessment File 472515.

Pasalj, R.
1981: Geochemical-geophysical-diamond drilling, Berry Mills-Shediac River Property; Canadian Nickel Company Ltd., New Brunswick Department of Natural Resources, Assessment File 472660.

Uranium 21-I/2W

Cocagne River 18 46°14'00"N 64°54'00"W

Work:

1977: - Canadian Nickel
- coincident scintillometer and soil geochemical anomalous trends were found, and a few anomalous emanometer readings on one line. Two holes were drilled, intersecting dark brown sandstone and siltstone, but no mineralization.

References:

MacGibbon, A.G.
1977: Canadian Nickel Company Limited, Cocagne River; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 471585.

Uranium 21-I/2W

Associated Mineral/Metals: Y, Cu

Lutes Mountain 19 46°10'00"N 64°53;00"W

Work: A group of three claim blocks consisting of 343 claims was staked by B.P. Oil in 1970 north of the Trans-Canada Hwy, between Berry Mills and Irishtown in Westmorland County, N. B.

Fourteen highly uranium mineralized red-conglomerate floats were discovered on Lutes Mountain in 1970. The floats assay 0.3% Uranium, 1.0% Copper and 0.1% Yttrium. Numerous trenches and a total of about 950 m of diamond drilling in 14 holes attempted to locate the source of the mineralization with no success. "The floats as the result of the exploration effort are considered to be foreign to the Lutes Mountain Area" (Aitken, 1973).

The uranium mineralization located in floats was later considered to be derived from Memramcook Formation basal conglomerates overlying a Devonian or older mass of diorite on Lutes Mountain. The Memramcook Formation is overlain by Albert Formation shale to the south of the claim group.

Stream sediment analysis, glacial till fabric analysis and soil-gas radon surveys were carried out in an attempt to localize the source of the floats. Two substantial radon in soil-gas (in C.P.M.) anomalies of over 15 times background were recorded.

1970-72:
- BP Oil Ltd.
- mineralized red conglomerate float discovered, 0.3%U; 1.0% Cu and 0.1% Y.
- geochemical exploration included stream sediment analyses, glacial till - fabric analyses and soil-gas radon surveys. Two radon gas anomalies of over 15 X background were recorded.
- a scintillometer survey was completed in 1972.
- trenching and 914 m of drilling (14 holes) failed to locate the source of mineralization.

1976:
- Aquitaine Co. of Canada.
- IP, radiometric, geochemistry and geology surveys.
- geochemical studies found a uranium high of 32 ppm, and a general correlation between uranium and copper. The IP survey found 1 small chargeability high.

1977: - -Aquitaine Co. of Canada
- soil radon (track etch) surveys outlined several anomalous areas. Diamond drilling (5 holes, 549 m) intersected shales and conglomerates; down-hole radiometric logging recorded weak anomalies in 2 holes. One of the anomalous sections in hole LM5 was split, and assayed 381 ppm U_3O_8, related to a dark red-brown discoloration of a sandy conglomerate, representing a former redox interface.

1977: - Casan Mining Ltd.
- geology, radon gas and spectrometric surveys; some good anomalies found by the latter. Moderately readioactive red boulder conglomerate is separated from shale formations to the north by a northeast-trending fault, which post-dated major folding, forming a poorly defined synclinal structure.

1978: - Norcen Energy Resources
- basal till samples were analysed for Cu and U, with 1 isolated anomaly of 18 ppm U and 100 ppm Cu, discovered. Cu and U in soil were quite low, and no correlation with basal tills was noted.

1979: - Casan Mining Ltd.
- a radon gas survey confirmed the anomalous areas previously found by spectrometer surveys, and no new anomalies were uncovered. Trenching exposed unmineralized conglomerate and shale.

1979: - Norcen Energy Resources
- mapping, geochemistry (U, Cu in soils and glacial tills), VLF, scintillometer prospecting, drilling (13 holes, 1 752 m). Six uranium anomalies were outlined in soils, up to a maximum value of 227 ppm; maximum value of uranium in glacial tills was 52 ppm. Two major conductive zones were defined by VLF surveying, and 1 apparent structural source for uranium mineralization was located. No significant radioactivity was encountered in any drill holes.

Geology: The claim area lies on the Kingston Uplift, a northeast trending ridge of Mississippian strata overlying a pre-Carboniferous basement-high separating the Pennsylvanian of the Moncton basin from the main

Pennsylvanian	Petitcodiac Group	Red & grey sandstone claystone & some siltstone
	.....Unconformity.....	
Mississippian	Moncton Group	Red SSt., Congl., & Shales
	Albert Group	Predominantly grey shale
	Memramcook Formation	Basal red congl. & green SSt.
	.....Unconformity.....	
Pre-Carboniferous Basement		Sheared diorite & gneissic granite

The irregular surface of the basement is overlain by sedimentary formation with interfingering relationship with one another. The strata strike in an eastwesterly direction with moderate dips to the southeast.

References:

Aitken, R.N.
1973: B.P. Oil Limited, the significance of mineralization at Lutes Mountain, New Brunswick, New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 470212.

Cowan, M.F.
1977: Aquitaine Company of Canada, Lutes Mountain; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 472140.

Holtz, W.T.
1976: Aquitaine Company of Canada, Lutes Mountain; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 470262.

Nikhanj, Y.S.
1972: B.P. Oil Limited, assessment work report, Lutes Mountain, New Brunswick, New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 470211.

Oicle, R.G.
1978: Norcen Energy Resources, Lutes Mountain, New Brunswick, New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 472336.

Roberts, G.L.
1977: Casan Mining Limited, Lutes Mountain, New Brunswick, New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 472127.

Roberts, G.L.
1979: Casan Mining Limited, Lutes Mountain, New Brunswick Department of Natural Resources, Minerals Resources Branch, Assessment File 472459.

Wilson, G.L., Oicle, R.G., Smith, L.J. and Sawyer, D.A.
1979: Norcen Energy Resources, Lutes Mountain, New Brunswick Department of Natural Resources, Minerals Resources Branch, Assessment File 472458.

Uranium 21-I/2W

Associated metal/mineral: ThO_2

McQuade Brook 46°13'56"N 64°47'23"W
Irishtown - Scotch Settlement 20

Work:

1979: - Amrex Ltd.
- values of up to 8 ppb U and 1500 pc/l Rn were recorded in well waters. Grab samples yielded up to 0.095% U_3O_8, 0.095% ThO_2, 13.2% P_2O_5 in a banded shale/marlstone along Scotch Settlement Road. Two trenches were dug over these showings.

1980: - J.L. Newhouse
- prospecting; magnetics, VLF, scintillometer surveys. Radioactivity was discovered in a dark grey pyritic dolomitic siltstone and dolomitic shale, calcareous hematized grit of the Albert Formation.

Geology: The Claim group lies at the NE end of a NE-SW trending ridge of Mississippian sediments overlying a pre-Carboniferous basement high separating the Pennsylvanian of the Moncton basin from the main Pennsylvanian basin of central New Brunswick. The basement consists of highly sheared diorite and granites. Its irregular surface is overlain by the Memramcook Formation and the Albert Formation of Upper Devonian to Lower Mississippian age.

The Memramcook consists of red bed conglomerates, locally interbedded with sandstones and shales of probable continental origin. B.P. Ltd. noted a model content of 98 percent of granite pebbles in these conglomerates and arkoses indicating a granitic source area of Pre-Devonian age. The Albert Formation consists largely of black shales, dolomite and limestone.

The Mississippian Moncton Group consists of red and green siltstone, sandstone, conglomerate and breccia. The Mississippian and older rocks are lapped over by the Pennsylvanian Petiticodiac Group, consisting of red-brown, partly calcareous, claystone and grey to green fine to medium grained sandstone and siltstone. The sandstones have quartz, feldspar, mica, greenstone grains and a few quartz pebbles.

The shape of the base of the Pennsylvanian is not yet known in the local area, but it seems quite likely that the present day surface of the Kingston Uplift must be quite close to the basal Pennsylvanian unconformity.

References:

Amrex Ltd.
1979: New Brunswick Department of Natural Resources, Assessment Report 472470.

Newhouse, J.K.
1980: Irishtown; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 472508.

Uranium 21-I/2W

Associated minerals/metals: Pb, Cu,V

Shediac River 21 46°12'30"N 64°47'49"W

Work:

----: - New Brunswick Department of Natural Resources
- 3 DDH, 1 of 30 m, 2 of 15 m; the 30 m hole gave above background radioactivity readings between 10.8-12.5 m in a medium-grained arkose.

Geology: The rocks in the area are red to chocolate brown conglomerates and arkoses belonging to the Memramcook Formation of Mississippian age. The beds are steeply dipping to the north and strike north-easterly parallel to the Shediac River.

The mineralization occurs on the south limb of the Kingston Uplift, in the close proximity to the Mississippian-Pennsylvanian contact. VLF - EM suggests that the Pennsylvanian rocks laps on to the Mississippian on the south side of the Uplift. The mineralization is localized along bedding faults in a medium to coarse grained red to chocolate brown arkose of the Memramcook Formation. Radioactivity is confined to a plane, with little dissemination in the adjoining rocks. The mineralized alteration zones are filled with a soft blackish sooty mineral. From examination of the surface showing, the mineralization appears to be confined to narrow widths along major fault zones. Much is scattered through the conglomerate with plant trash, and traces of Cu and intermittant mineralization can be traced over a length of about 480 m. Unless the widths of the mineralized zones can be markedly increased, the prospect offers little possibility of economic development.

Sampling and Assay Results and Drilling

The channel across the most radioactive zone at the Main Showing yielded only ¼ lb/ton U_3O_8 in contrast to one estimate based on radioactivity measurement by the Geological Survey of Canada of over 3 lb/ton. BP concluded that the radioactivity was due to daughter products in disequilibrium with the parent uranium. One hand specimen from this bed yielded 0.11% U_3O_8.

A thin section from the highest grade bed showed angular quartz grains in a calcite cement, possibly being a crushed zone. An autoradiograph showed that the radioactivity is in discontinuous lenses parallel to the bedding. Pink dolomite stringers following cracks at a large angle to bedding fluoresce pinkish-orange under ultraviolet light.

The rock contains 0.15% U_3O_8, 0.1% Mn, 0.5% Ti, 0.01% V, 0.01% Pb and 0.01% Cu.

References:

Smith, J.C.
1958: Shediac River uranium; New Brunswick Department of Natural Resources, Mineral Resources Branch, Mineral Occurrence File 21-I/2W.

Uranium — 11-L/4W

Cape Spear 22 — 46°02'-46°08'N, 63°50'-64°00'W

Work:

1980:
- Brunswick Mining & Smelting
- soil sampling

1981:
- Brunswick Mining & Smelting
- stream sampling, diamond drilling (8 holes, 799 m), downhole geophysical logging.
- a series of soil geochemistry anomalies was outlined at the base of the east-west ridge north of Melrose, correlating very well with silt anomalies. Drilling intersected anomalous radioactivity (190 ppm U over 0.6 m) in 1 hole, associated with narrow yellow-brown reduced horizons and several 2 cm thick pyritic coal seams.

Geology: The area is underlain by continental clastic sediments of the Pennsylvanian Pictou Group, consisting of brown to grey-green conglomerate, sandstone, shale and siltstone with minor thin coal seams. Dips are less than 10°. Radioactive occurrences in outcrop and drill holes indicate broad low-level uranium enrichment and possible roll-type deposits. Grey-green medium to croarse-grained sandstone interbedded with red-brown mudstone and siltstone form fining upward cycles, with a mudchip conglomerate commonly developed at the base associated with a pale green reducing horizon. Coal seam up to 2 cm thick are found with finely crystallized pyrite.

References:

Graves, G.
1981: Brunswick Mining & Smelting, Cape Spear; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 472662.

Uranium 21-I/1W

Associated minerals/metals:
Cu, Pb, Zn, Ag

Midgic 23 45°57'30"-46°07'N
64°16'-64°22'30"W

Work:

1980: - Brunswick Mining & Smelting
- soil geochemistry, diamond drilling (3 holes, 238 m). Several anomalous trends were noted in the soil survey; uranium anomalies occur along and at the base of a ridge or topographic high parallel to regional strike. Drill holes spotted to test these anomalies encountered no mineralization.

Geology: The area is underlain by continental clastic sediments of the Pictou Group (Pennsylvanian), including brown to greensih grey conglomerate, sandstone, siltstone, shale, with minor coal seams. Radioactive occurrences indicate broad, low-level uranium enrichment. The distribution of soil uranium anomalies along a ridge underlain by a shallowly-dipping (5-10° east) sandstone unit suggests possible "roll-type" mineralization. Rock types encountered in diamond drilling were mainly sandstone and mudstone with some siltstone and mudclast conglomerate, mostly reddish in colour.

References:

Cooper, P.
1980: Brunswick Mining & Smelting, Midgic Group; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 472538.

Graves, G.
1980: Brunswick Mining & Smelting, Midgic Group; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 472610.

Graves, G.
1981: Brunswick Mining & Smelting, Midgic Group; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 472777.

Uranium

Ridge Brook 24

21 I/3W

46°04'00"N 65°18'00"W

A previously unreported radioactive occurence, up to 20 times background and containing as much as 82.7 ppm uranium, was discovered along Ridge Brook, a tributary of the Canaan River, some 48 km due west of Moncton. It is on the east bank of the stream about 4 km upstream (south) from its junction with the Canaan River and 0.75 km upstream from the point where it flows beneath provincial highway 112. The poorly exposed host rock is a grey, iron-stained, laminated argillite. The zone of radioactivity extends for several tens of metres along the river bank and is a minimum of several metres in thickness. This uranium mineralization was not detected by stream sediment geochemistry (Smith, 1968). The host rock is believed to be pre-Carboniferous in age and to be positioned immediately beneath the pre-Carboniferous unconformity (Stewart, 1939). If these stratigraphic relationships are correct, this occurrence may represent a mineralized horizon which has perhaps not previously been recognized.

References:

Dunsmore, H.E.
1977: Uranium resources of the Permo-Carboniferous Basin, Atlantic Canada: Geological Survey of Canada, Paper 77-1B, p. 347.

Stewart, J.S.
1939: Alward Brook: Geological Survey of Canada, Map 605A.

Uranium 21-H/15W

Weldon Creek 25 45°52'00"N 64°47'00"W

Work:

1968: - Mineral Resources Branch

1970: - Falconbridge Nickel Mines
- results indicated anomalous U values in a stream draining to the north into Weldon Stream.

Note: See Jordon Mountain and Collier Mountain.

References:

Lockhart, A.W.
1970: Falconbridge Nickel Mines Limited, Millstream claim group; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File No. 470596.

Uranium 21 H/15W

Hayward Brook 26 45°49'00"N 64°57'00"W

Work:

1977: Soil geochemistry, geophysics-scintillometer survey indicate moderate anomalies. Soil geochemistry indicated 20 ppm and scintillometer survey showed anomalies up to 110 cps.

Reference:

MacGibbon, A.T.
1977: Geochemical-geophysical report, Hayward Brook, Canadian Nickel Company Ltd., New Brunswick Department of Natural Resources, Assessment Report 472119.

Uranium 21-H/14W

Kinnear Settlement (Havelock) 27 45°58'00"N 65°15'00"W

Work:

1972:
- BP Minerals Ltd.
- extensive regional geochemical sampling of stream waters and sediments.
- evidence of uranium mineralization is in the form of hyrdogeochemical anomalies.

References:

Nikhanj, Y.S.
1972: BP Minerals Limited, Kinnear Settlement, Havelock area; New Brunswick Department of Natural Resources, Mineral Resources Branch, National Topographic System File, 21-H/14-26.

Uranium 21-H/14W

Havelock 28 45°58'30"N 65°19'30"W

Work:

1971-73: - Water sample geochemistry by BP Minerals Ltd.

1975: - BP Minerals Ltd. Derek M. Taylor.
- diamond drilling (1 hole, 152 m) to test the results of an early 1970's water sampling program, which disclosed some uranium and radon anomalies. No anomalous radioactivity was detected in the cross-bedded sandstone in drill core. Numerous anhydrite and gypsum veinlets were seen in the lower parts of the core.

1977: - Canadian Nickel; R. L. Horst
- 1 major soil uranium anomaly (2-40 ppm) over an area of 180 x 915 m was located, as well as several scattered smaller anomalies probably reflecting organic scavenging. One drill hole (19 m) intersected Windsor limestone and Moncton sandstone-conglomerate; no mineralization seen. Local high scintillometer highs up to 36 c.p.s. were encountered.

1978: - Canadian Nickel; R.L. Horst
- several soil uranium anomalies (2-42 ppm) in organic rich swamy areas found, and some coincident scintillometer anomalies were noted. These are likely related to organic scavenging in swampy area.

1979: - Canadian Nickel
- 2 diamond drill holes (88 m) tested soil anomalies, intersecting Windsor limestone and Moncton Group red sandstone and conglomerate, but no mineralization.

References:

Horst, R.L.
1977: Canadian Nickel Company Limited, Havelock; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 470471.

Horst, R.L.
1977: Canadian Nickel Company Limited, Havelock; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 472392.

Taylor, D.M.
1975: BP Minerals Limited, Havelock; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 470613.

Unknown.
1979: Canadian Nickel Company Limited, Havelock; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 472377.

Uranium 21 H/14W

Cornhill - Glenvale 29 45°55'00"N 65°18'30"

Work:

1947: - Exploration for oil

1970: - Gravity survey for salt and potash by New Brunswick Department of Natural Resources.

1974: - B.P. Oil Ltd. and Falconbridge Nickel Co. Ltd. - geochemistry and drilling.

1975: - Canadian Nickel Co. Ltd. - airborne spectrometer survey; ground scintillometer survey, radon, soil surveys.

1977: - Canadian Nickel - R. L. Horst
- scintillometer anomalies were related to the high clay content of near-surface Albert Formation shales; soil geochemistry anomalies were thought to be due to uranium scavenging by organic materials. Stream sediment anomalies were recorded and airbone spectrometric anomalies are located in the area.

1978: - Canadian Nickel
- radon detectors found no anomalies.

Geology: The Cornhill area is underlain by the Hiram Brook Member of the Albert Formation. In general, Albert grey beds grade conformably upwards into Moncton redbeds although fault contacts and unconformities occur in some areas. The graditional Albert-Moncton contact, following Gussow's example, is placed where redbeds become predominent or where the lithologic character changes sharply from fine-grained to conglomeratic such as at the prominent Moncton ridge to the west. The Moncton Group above the Albert consists mainly of maroon to reddish brown sandstones, siltstone and conglomerate with shale interbeds and limestone nodules, all generally micaceous and ripple-marked or mud-cracked, suggestive of a fresh water continental sequence. The Albert Formation grades conformably below into the piedmont alluvial redbed deposits of the Memramcook conglomerate.

The Albert Formation consists of the Dawson Settlement, Frederick Brook, Hiram Brook, Gautreau and Weldon from oldest to youngest (Carter and Pickerill, 1985), with variable thicknesses and lithologies. The Dawson Settlement Member overlies the Memramcook red-bed conglomerate and consists of grey conglomerate to gritty sandstone, with a calcareous matrix and minor limestone with variable thickness. The Frederick Brook Member, composed mainly of oil shales of bituminous, paper like friable nature with minor limestone and abundant fish remains has a graditional contact both on its upper and lower boundaries. Contacts are placed where the first shales low in bitumen and lacking in fish remains appear. The Hiram Book Member, in excess of 650 m thick, lies above the oil shale sequence and below the Gautreau Salt member. It consists of a heterogenous and variable sequence of grey siltstone, sandstone and shale, generally either calcareous or bituminous. The siltstones and sandstones display great variability and discontinuity both vertically and horizontal. They are mainly grey to green to light grey, calcareous and/or bituminous, and finely micaceous, argillaceous, and feldspathic. The shales are generally grey to black, laminated or fissile with 1-4 cm. partings, micaceous, and highly calcareous. The sandstone units appear lenticular and may be related to deltaic units. The shale-siltstone environment was probably quiescent moderately deep water in a lake or landlocked arm of the sea.

In upper Albert time, conditions became increasingly arid and in immediate past-Albert time a local arm of the sea probably invaded the area and its water evaporated intensely to produce the Gautreau evaporates. A return to more humid conditions resulted in further shale, siltstone and sandstone deposition above the evaporates as red-beds of the lower Moncton Formation. Subsequent uplifting of the area resulted in rapid weathering and coarse fanglomerates - alluvial fans of the Moncton Formation. This continental sequence was followed by another marine invasion during Windsor time, depositing extensive carbonates which probably covered the Cornhill area. Remnants of limestone float occur scattered throughout the area. A Windsor limestone sequence is preserved in a broad syncline at Havelock and overlies Moncton sediments to the southeast of Cornhill where extensive gypsum deposits occur. A subsequent regression resulted in additional continental fluviatile sedimentation during Hopewell and Pennsylvanian time which further overlie the Windsor to the southeast.

References:

Horst, R. L.
1977: Canadian Nickel Company Limited, Cornhill-Glenvale; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment Files 470466, 470467, 470468, 470469, 472106.

Horst, R. L.
1978: Canadian Nickel Company Limited, Cornhill-Glenvale; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment Files 472188, 472189, 472190, 492191, 472282.

Carter, D.C. and Pickerill, R.K.
1985: Lithostratigraphy of the Late Devonian-Ealy Carboniferous Horton Group of the Moncton Subbasin, Southern New Brunswick. To be published in Maritime sediments.

Uranium 21-H/14W

Associated mineral/metal: Cu, Zn

Dee Brook 30 45°54'00"N 65°27'00"W

Work:

1969: - Noranda Exploration Company., C.M. Logan.
- stream and soil geochemistry (analysis for Cu, Zn and U_3O_8. Background U_3O_8 3-4 ppm, anomalies of 20-40 ppm on Jordon Brook and the north tributary of Dee Brook. The Dee Brook areas have a threshold value of 8-10 ppm U_3O_8.

1977: - Aquitaine Co. of Canada, M.F. Cowan.
- track-etch (several scattered anomalies of unknown significance).
- airborne spectrometer (no anomalies located, possibly due to thick overburden).

Geology: The eastern side of the property is underlain by red conglomerate interbedded with coarse red sandstone. The conglomerate has a sandy matrix and pebbles of highly variable size. The strike varies from N09E to N21°W with an easterly dip of between 30° and 35°. Along the western edge of the property, coarse red sandstone predominates. Still farther west along Cementary Road, which cuts the property in an east-west direction, mafic volcanic rocks outcrop along side the road. These are part of a pre-carboniferous igneous-sedimentary complex which lies unformably below the red sandstone and conglomerate.

References:

Cowan, M.F.
1977: Aquitaine Company of Canada Limited, Dee Brook; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 470484.

Logan, C.M.
1970: Noranda Exploration Company Limited, Dee Brook New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 470625.

Uranium 21-H/14W

Associated mineral/metals: Cu

Jordon Mountain 31 45°49'45"N 65°26'00"W

Work:

1968: - New Brunswick Department of Natural Resources
- uranium analysis of material collected in 1962 by A.Y. Smith. Results published in New Brunswick Mineral Resources Branch Information Circular 68-3.

1970: - Falconbridge Nickel Mines
- sampling and analysis of streams flowing over rocks of the Albert Formation and Moncton Group in the Jordon Mountain area and the area bordering the northwest flanks of the Caledonia Highlands (at 152 m intervals).
- results indicated anomalous uranium values in 2 areas, one east and one west of Jordon Mountain.

1975: - Kerr-Addison Mines; D. Constable.
- fission-track survey indicated one anomaly in the center of the property, 4 times background, in red sandstone and conglomerate of the Moncton Group.

1977: - Canadian Nickel Co. Ltd., R. L. Horst.
- geological prospecting, soil geochemistry and scintillometer work indicated large areas of anomaly, on both "A" and "B" groups of claims, in the vicinity of Gould Brook and Hawks Brook. These anomalies are partly suspected to be related to organic enrichment and partly due to enrichment along Moncton Group sandstone and the pre-carboniferous basement rocks.

1978: - Canadian Nickel; R.L. Horst.
- a large scintillometer anomaly on the western part of the "B" property was correlated to a near-surface high background potassium-rich Precambrian rhyolite tuff. Geochemical anomalies in the eastern section coincided with both a marshy area long Gould Brook, and with the implied Precambrian-Moncton conglomerate unconformity. A 52 m drill hole intersected no uranium mineralization.

1981: - Collucci, James
- conducted soil geochemistry, prospecting, pitting trenching and drilling a short DDH to locate uranium and copper anomalies in Jordan Mountain claim block. The investigations did not result in finding any mineralization.

Note: See Collier Mountain and Weldon Creek.

References:

Constable, D.W.
1975: Kerr-Addison Mines Limited, Jordon Mountain; New Brunswick Department of Natural Resources, Mineral Resoures Branch, Assessment File 470624.

Horst, R.L.
1977: Canadian Nickel Company Limited, Jordon Mountain; New Brunswick Department of Natural Resources, Mineral Resoures Branch, Assessment Files 470464, 470465.

Horst, R.L.
1978: Canadian Nickel Company Limited, Jordon Mountain; New Brunswick Department of Natural Resources, Mineral Resoures Branch, Assessment Files 472205.

Lockhart, A.W.
1970 Falconbridge Nickel Mines Limited, assessment work report, Millstream claim group; New Brunswick Department of Natural Resources, Mineral Resoures Branch, Assessment Files 470596.

Colucci, J.
1983: Jordon Mountain Group, New Brunswick Department of Natural Resources, Mineral Resoures Branch, Assessment Files 472491.

Uranium

21-H/14W

Mount Pisgah 32

45°49'00"M 65°27'00"W

Work:

1977: - Canadian Nickel
- slightly anomalous scintillometer and soil geochemical values records.

References:

Horst, R.L.
1977: Canadian Nickel Company Limited, Mount Pisgah; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 470470.

Uranium 21-H/14W

Harrison Brook 33 45°47'00"N 65°29'10"W

Work:

1976: - Canadian Nickel
- one hole drilled, intersecting red sandstone to 26 m; no mineralization in core.

1977: - Canadian Nickel
- uranium assays near background levels; geology, geochemistry suggest uranium accumulations in organic-rich zones.

Geology: Moncton Group sandstone, conglomerate and ferrunginous arkose with a possible gradational contact to Albert Formation sandstone and shale.

References:

Horst, R.L.
1977: Canadian Nickel Company Limited, Harrison Brook; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 472096.

MacGibbon, A.T.
1976: Canadian Nickel Company Limited, Harrison Brook; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 472067.

Uranium — 21 H/12E + 13E

Associated mineral/metal: V, Mo

Millstream - Lower Millstream 34 — 45°41'30"N - 45°50'30"N, 65°27'15"W - 65°41'25"W

Work:

1968: - A regional stream sediment survey - jointly by the Geological Survey of Canada and New Brunswick Department of Natural Resources (A.Y. Smith - New Brunswick Department of Natural Resources, Report 68-3) in 1968, spurring uranium activity in the area.

1969: - Falconbridge Nickel Mines Ltd., Hale and Associates, A. W. Lockhart., soil geochemistry, prospecting.

1975: - Kerr - Addison Mines Ltd., D.W. Constable. track-etch survey; when contoured, the track densities indicate a north-south trend, perhaps reflecting a fault, or the distribution of a uraniferous formation. The area is underlain by Albert Formation grey siltstone and Moncton Group red sandstone and conglomerate.

1975: - Canadian Nickel Co. Ltd., T. MacGibbon. soil geochemistry, scintillometer surveys and bore hole drilling. Found a northeast trending anomaly.

1976: - Canadian Nickel
- soil geochemistry, scintillometer surveys, diamond drilling.
- soil sampling located significant uranium anomalies up to 60 ppm in an area 300 x 760 m; scintillometer work revealed an elongate anomaly of 50-120 cps coincident with the soil anomaly. Three holes were drilled for a total of 164 m, intersecting mostly limestone and mudstone, but no significant mineralization.

1977: - Canadian Nickel
- soil geochemistry, scintillometer surveys, diamond drilling.
- coincident soil uranium (up to 85 ppm) and scintillometer anomalies (65-150 cps) were discovered and tested by 5 drill holes (436 m), intersecting weak uranium mineralization in sandstone, siltstone, grit and limestone.

1978: - Canadian Nickel
- a total of 2 474 m of diamond drilling completed in 24 holes to test soil and scintillometer anomalies. Results were not encouraging; low grade mineralization was intersected in 4 holes in 2 separate areas. U_3O_8 was found associated with a solid black hydrocarbon (albertite) attaining thicknesses of up to 7 m in one hole. U_3O_8 assays vary from 0.02% in sections of albertite varying in thickness from 0.3 to 7.0 m. Lithologies are sandstone-siltstone-grit interbedded with limestone.

1981: - J.J. Chandra, New Brunswick Department of Natural Resources; Reconnaissance ground investigation of the Lower Millstream (airbone) radiometric anomaly.

The strata exposed in the Lower Millstream area are Lower Carboniferous sedimentary rocks. These include representatives of the Albert Formation, Moncton Group, Windsor Group and Hopewell Group. South of Lower Millstream, the strata are folded into the northeast trending Case Syncline. In the immediate vicinity of the airbone anomaly, the geology becomes complex as a result of the Middleton Fault (Crosby and Waugh, 1975). The area of detailed ground radiometric survey is covered by surficial material. However, Crosby and Waugh (1975) indicate that the area is underlain by red-brown to grey conglomerates and sandstone of the Moncton Group.

Several radioactive highs between 4-12 ppm eU were detected along the GSP-3 hand-held spectrometer traverses. These zones of increased radioactivity are coincident with the airborne anomaly. Only three outcrops (red conglomerates) were analysed spectrometrically for uranium. None of these outcrops were in the vicinity of the anomalies. The uranium values are in the 1.8-2.1 ppm range.

Water analysis indicate a higher than normal concentration of uranium (29.50 ppb) which is coincident with the high zones detected by the ground gamma-ray survey.

An unofficial (personal communication, W. Vanderklift, 1985) estimate of about 1 million tons with an ore grade upto 0.5% U_3O_8 has been arrived at by the Canadian Nickel Company Ltd.

References:

Chandra, J.
1981: Reconnaissance ground investigation of the Lower Millstream (airbone) radiometric anomaly, Kings County; New Brunswick Department of Natural Resources, Mineral Resources branch, Open File Report 79-17.

Constable, D.W.
1975: Kerr-Addison Mines Limited, Millstream; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 470597.

Crosby, K.S. and Waugh, D.C.E.
1975: Limestone and gypsum investigations in southeastern New Brunswick, Volume 1; Mineral Resources Brunch, Department of Natural Resources, N. B., 124 p.

Horst, R.L.
1977: Canadian Nichel Company Limited, Millstream; New Brunswick
Department of Natural Resources, Mineral Resources Branch, Assessment File 472232.

Lockhart, A.W.
1970: Falconbridge Nickel Mines Limited, Millstream; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 470596.

MacGibbon, A.T.
1976: Canadian Nickel Company Limited, Millstream; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 470577.

MacGibbon, A.T.
1978: Canadian Nickel Company Limited, Millstream; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 472232.

Uranium 21-H/13E

Berwick 35 45°47'00"N 65°35'00"W

Work:

1977:
- Canadian Nickel
- geochemical and geophysical surveys, diamond drilling.
- a 60-200 m wide anomalous linear radiometric trend of 60-75 cps parallels Mill Brook for 976 m. Minor soil uranium anomalies were detected. Three holes were drilled to depths of 14, 13 and 16.5 m, intersecting weak mineralization in one hole and 2.3 m of 350 ppm U_3O_8 associated with albertite in another hole. Sandstone, siltstone, grit and limestone of Carboniferous age were cored.

References:

Horst, R.L.
1977: Canadian Nicel Company Limited, Berwick; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 470499.

Uranium 21-H/14W

Associated mineral/metal: Cu

Smith Creek 36 45°48'00"N 65°30'00"W

Work:

1971:
- Erasmina Ltd.
- geochemical soil sampling for Cu and U, Geiger counter traverses.
- anomalous soils gave no Geiger counter results; trenching was completed over the anomalous area.

References:

Colucci, J.
1971: Erasmina Limited, Smith Creek group; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 470595.

Uranium

Wards Creek 37

21-H/12E

45°38'00"N 65°32'30"W

Work:

1979: - Uranerz Exploration and Mining Ltd., Z. Madon and C. Jenkins.
prospecting, trenching, chip sampling, detailed scintillometer and carborne spectrometer.
Geologic mapping and radiometric surveys in the area delineated a dark green fanglomerate and/or maroon conglomerate - arkosic sandstone in the Memramcook Formation yielding anomalous uranium values. Assays of U_3O_8 range from less than 10 ppm to greater than 1000 ppm uranium values for each of the lithologies in stratigraphic succession (top to bottom).

(F_2) SS. - SILTSTONE

- Fine grained
- Minor pebble-size clasts
- Dark Green
- 50 - 100 c/s

(F_1) MUDSTONE

- Olive green
- Massive
- 150 - 200 c/s

(E) CONG. SS.

- Rusty green medium - fine gr. matrix
- Slickensides
- 500 - 700 c/s

(D) ARKOSIC - SS.

- Greyish - green, massive
- Harid
- 250 - 500 c/s

(C) FANGLOMERATE - CONG. SS.

- Friable at base
- Sandy blackish - green matrix
- 300 - 1300 c/s

(B) ARKOSIC - SS.

- Friable, soft
- Homogeneous, dull brown
- 200 - 225 c/s

(A) FANGLOMERATE - CONG. SS.

- Sandry blackish-green matrix
- Calcareous
- 150 - 200 c/s

1981:
- Uranerz Exploration and Mining
- diamond drilling (11 holes, 1 100 m)
- 2 holes intersected weak radioactive material; in a thin bed of green arkosic fanglomerate overlain by green siltstone near the Cumberland Ridge showing, and in a thin bed of green siltstone associated with pyrite, coaly material and carbonate near the Dean Valley showing. Best assay results were 42.7 ppm U_3O_8 over 0.5 m and 88.7 ppm U_3O_8 over 0.2 m.

Geology: Stratigraphic column: 3) fanglomerate, mudstone, siltstone; 2) red siltstone, sandstone, conglomerate; 1) grey-green mudstone, shale. Depth to basement: 40-137 m (average 120 m).

References:

Gariepy, Y.
1981: Uranerz Exploration and Mining, Wards Creek; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 472729.

Madon, Z. and Jenkins, C.
1979: Uranerz Exploration and Mining, Wards Creek; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 472448.

Uranium 21-H/12W

Associated Minerals/metals: hydrocarbons and V

Hampton 38 45°34'00"N 65°48'00"W

Work:

----: - an attempt was made during the early part of the century to mine the hydrocarbons for fuel.

1953: - Kingston Uranium Ltd., R.B. Hunziker, D.W. Brittin.
- resistivity survey outlined the hydrocarbon vein.
- 7 drill holes totalling 348 m; U_3O_8 - 0.03%.

1957: - Report by Gross, Geological Survey of Canada. Precambrian or early Palaeozoic acid and basic volcanic rocks underlie the area on the northwest side of the fault and shale of the Kennebecasis Group underlie the area southeast of it. In the vicinity of the radioactive occurence the fault passes through rocks of the Kennebecasis Group and a band of sedimentary rocks about 175 m wide and 800 m long is present on the northwest side of the fault. The sedimentary rocks exposed on the Hampton prospect consist mainly of grey shale, beds of argillite containing numerous grit-size fragments of quartz and fedspar, lenses of conglomerate, black shale, and grey dolomite.

The vein is exposed at the base of the southeast side of a steep hill. The zone of intense shearing, which strikes north 10 degrees east and dips steeply to the east, is 5 to 7 m wide. Jet black, brittle hydrocarbon having a conchoidal fracture is present in the shear zone over a width of 4 to 5 m. Lenses up to a meter wide are composed of nearly pure hydrocarbon and much of the zone the rock has been partly replaced by hydrocarbon and altered to a black fissile slaty material. At the west side of the shear zone a band of hydrocarbon about 70 cm wide and exposed for 3.5 m to the northwest appears to follow a subsidiary structure that strikes north 40 degrees west and dips vertically. Dark slate, conglomerate, and lenses of massive dolomite outcrop on the side of the hill immediately southwest of the vein. Numerous thin pink to white calcite veins form a network cutting the vein zone.

The radioactive material is confined to the zone that contains hydrocarbon and the strongest radioactivity is in the lenses of nearly pure hydrocarbon. Chip samples were taken by the writer in a trench across the vein of black slaty hydrocarbon 10 feet north of the main exposure. These samples showed 0.049, 0.053, and 0.024 per cent U_3O_8 by the equilibrium method, for widths of 1 m, 80 cm and 80 cm respectively.

About 25 m southwest of the main exposure another shear zone is exposed on the side of the hill. This zone strikes north 30 degrees east and dips 85 degrees southeast. Hydrocarbon is present over a width of 4 m but is most abundant in a band of 1.8 m wide. A chip sample from the most highly radioactive part of this strucutre showed 0.04 per cent U_3O_8 by the equilibrium method. The mine shaft was sunk at the junction of the main shear zone and this subsidiary zone.

The main vein of hydrocarbon is exposed in the creek bed about 85 m north of the first outcrop described. Knobs of black material rich in hydrocarbon are found over a width of 12 feet and a Geiger counter showed four to five times background count.

The hydrocarbon in this fault zone probably originated from petroleum that was once present in the Albert Formation, a part of the Kennebecasis Group. The source of the uranium is not known but it may have been leached from the sedimentary rocks by ground water and precipitated by the carbon in the vein. Some of the rhyolitic and porphyritic felsic volcanic rocks in the Kingston Group to the west of the fault give up to twice background count on a Geiger counter, suggesting that uranium may have been leached from rocks of this group and precipitated in the fault zone.

1976: - Canadian Nickel Company Ltd., Horst, R.L.
- scintillometer, emanometer, soil geochemistry, diamond drilling.
- the scintillometer survey detected anomalous values in the area of a known uramium showing (40 - 150 cps), potassium-rich Kingston Group volcanics (40-80 cps) and a possible extension of the uranium zone to the southwest (40-50 cps).

Anomalous soil uranium values also occur near the main showing and on the possible southwest extension. Two diamond drill holes (153 and 107 m) intersected uranium mineralization associated with albertite (0.07% from 64-69 m and 0.01% at 49 m), and terminated at or near Precambrian basement. Rock types are predominantly grey limestone, sandstone, siltstone, and grit.

Geology: The occurrence of dark, brittle hydrocarbon in dark shale is known about 0.8 km northwest of Highway No. 2, along a brook about 6.4 km northeast of Hampton, Kings County.

The hydrocarbon occurs as a seam, or in lenses up to 1 m long, and as a shaly interbed, exposed in small overgrown pits. The hydrocarbon seam penetrates Albert Formation rocks. It is also exposed as a small wedge along the Peekaboo Fault, in contact with Moncton Group rocks (Gussow, 1953). Precambrian or early Paleozoic acid and basic volcanic rocks underlie the area north of the fault but Paleozoic rocks including grey to red conglomerate, sandstone and shale of the Kennebecasis Formation underlie the area southeast of it. The sedimentary beds exposed at the Hampton prospect consist mainly of grey shale, argillite (containing numerous grit size fragments of quartz and feldspar), lenses of conglomerate, black shale, and grey dolomite. The radioactive material is confined to a hydrocarbon-bearing shear zone about 4.6 to 6 m wide in which black hydrocarbons occur in lenses up to 1 m wide and is most extensive where 2 shear zones intersect.

Drilling indicated the hydrocarbon zone to vary from 5.5 to 9.8 m at depth. The hydrocarbon in this fault zone probably originated from petroleum that was once present in the Albert Formation. The uranium is presumed to have been leached from the sedimentary rocks by ground water and precipitated by the carbon in the vein. Some of the rhyolitic and porphyritic rocks of the Kingston Group to the northwest of the fault yield twice background count on a Geiger counter, suggesting that uranium may have been leached from rocks of this group and precipitated in the fault zone (Gross, 1957).

Samples of the hydrocarbon and shale were analyzed and yielded 0.003% U and 0.005% U with a U_3O_8 equivalent of 0.015% to 0.023%.

Albertite in a section of drill core (Canadian Nickel, 1976) assayed 0.07% U_3O_8 over 5 m.

References:

Carroll, B.M.W.
1977: Hampton uranium; New Brunswick Department of Natural Resources, Mineral Resources Branch, Mineral Occurrence File, 21-H/12W-7.

Gross, G.A.
1957: Uranium deposits of the Gaspe, New Brunswick and Nova Scotia; Geological Surveyof Canada, Paper 57-2.

Gussow, W.C.
1953: Carboniferous stratigraphy and structural geology of New Brunswick; Bulletin of the American Association of Petroleum Geologists, vo. 37, no. 7.

Horst, R.L.
1976: Canadian Nickel Company Limited, Hampton; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 470455.

McMurchy, R.C.
1954: Kingston Uranium Ltd., Hampton, New Brunswick Department of Natural Resources, Mineral Resources Branch, National Topographic System File 21-H/12-4.

Rose, E.R.
1973: Geology of vanadium and vanadiferous occurrences of Canada; Geological Survey of Canada, Economic Geology Report No. 27.

Uranium 21-H/12E

Associated minerals/metals: Oil shale, F, Mo, V, Ni, Zn, B and Th

Kennebecasis Group 39 45°44'00"N 65°37'00"W

Work:

1981: - Gulf Minerals
- stream and spring water, stream sediment surveys, diamond drilling.
- uranium, fluorite and molybdenum and anomalies in stream waters, and low-level uranium anomalies in stream sediments were discovered over the Millstream uranium occurrence. Vanadium, nickel, zinc, boron, and thorium anomalies were also recorded in this vicinity. Five holes were drilled, for a total of 705 m, and down-hole geophysical logging was conducted (natural gamma, long-spaced density, neutron-neutron, SP, caliper, resistance, and focused resistivity).

DH LM-1

0	-	201 m	grey-buff, reduced shale, sandstone, siltstone, typically cyclic and cross-bedded (Albert Formation)
106	-	106.95 m	"bituminous zone", containing albertite - portions of mudstones, shales and siltstones apparently resemble lithologies found in the Albert Mines area although verification is required

DH LM-2

0	-	177 m	red conglomerate, sandstone, grit (Weldon Formation)
177	-	204 m	grey-green sandstone and calcareous siltstone (Albert Formation)

DH LM-5

0	-	96 m	grey-green to red interbedded limestone and mudstone (Albert Formation)
Below 96 m			red and grey sandstone, siltstone, grit (Memramcook Formation)

DH LM-6

0	-	85 m	red conglomerate, sandstone, siltstone (Lower to Middle Moncton Group)

DH LM-7

0	-	52 m	red conglomerate, sandstone, siltstone (Lower to Middle Moncton Group)

Note: portions of LM-2, -5, -6, and -7 given the descriptive logs resemble lithologies found in the Albert Mines area (verification is required).

References:

Workman, A.
1981: Gulf Minerals, Kennebecasis Group; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 472690.

Uranium 21-H/13E + 14W

Kennebecasis River 40 45°46'00"N 65°29'00"W

Work:

1977:
- Canadian Nickel
- scintillometer, soil, geochemistry.
- scintillometer surveys found the property to be moderately anomalous in the central portion; soil geochemistry detected 2 major anomalous zones, one in the northwest (5-90 ppm) and one in the south (5-48 ppm). These were both in swampy terrain and probably due to scavenging by organic-rich soil.

1978:
- Canadian Nickel
- minor scintillometer anomalies and a major soil geochemistry anomaly (up to 340 ppm uranium), 200 by 600 m in area, again related to swampy, organic-rich conditions.

References:

Horst, R.L.
1977: Canadian Nickel Company Limited, Kennebecasis River; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 470463.

Horst, R.L.
1978: Canadian Nickel Company Limited, Kennebecasis River; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 472193.

Uranium — 21-H/14E + 11E

Collier Mountain 41 — 45°46'00"N 65°01'00"W

Work:

1968:
- New Brunswick Mineral Resources Branch
- uranium analysis of material collected in 1962 by A.Y. Smith. Results published in New Brunswick Mineral Resources Branch Information Circular 68-3.

1970:
- Falconbridge Nickel Mines
- sampling and analysis of stream flowing over rocks of the Albert Formation and Moncton Group in the Jordan Mountain area and the area bordering the northwest flank of the Caledonia Highlands (at 152 m intervals).
- results indicated anomalous uranium values in a stream draining to the northwest of Collier Mountain.

Note: See Jordon Mountain and Weldon Creek.

References:

Lockhart, A.W.
1970: Falconbridge Nickel Mines Limited, assessment work report, Millstream claim group; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 470596.

Uranium 21-G/9E

East Queenstown 42 45°42'00"N 66°03'10"W

Work:

1971: - S. Holliday
- stream samples were taken at 190 m intervals covering an area of previously reported anomalous U concentrations. Soil samples were taken on near east-west lines at 30 m intervals.
- 3 diamond drill holes indicated no U in the underlying red Mississippian shale.

DDH #1		60° to west
4.3	-	30 m red beds
30 m		Total Depth
DDH #2		60° to west
5.2	-	23 m red beds
23 m		Total Depth
DDH #3		vertical
3	-	30 m red beds
30 m		Total Depth

References:

Holliday, S.
1972: Report of geochemistry and diamond drill hole east of Queenstown area; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 470166.

MacKenzie, G.S.
1964: Geology map of Hampstead; Geological Survey of Canada, Map 1114A (Scale: 1 inch equals 1 mile).

Uranium

21-G/15E

French Lake 43

45°45'00"N - 45°47'30"W
65°28'30"N - 66°33'00"W

Work:

1980:
- Cominco Ltd., Kipling, R.W.
- geology, radiometrics, well water geochemistry, diamond drilling (3 holes, 904 m), down-hole geophysical logging (gamma ray, SP, neutron-neutron).
- several well water samples were found to be anomalous in uranium. No mineralization was recorded in drill hole logs.

Geology: The area is situated in the axial region of the New Brunswick Carboniferous Platform, underlain by flat lying to shallow dipping Pennsylvanian Pictou Group fluvial sediments consisting of oxidized and reduced mudstones to conglomerates. Drilling intersected red-brown, fine to coarse-grained sandstone, with lesser mudstone, siltstone and conglomerate.

According to Chandra (1981) truck-mounted sensor traverses in the French Lake area yielded a small anomaly that was coincident with an outcrop of red micaceous sandstone. Chemical analysis of sandstone gave a value of 2.7 ppm U while in situ spectrometric (gamma-ray) analysis over the entire outcrop gave an average of 3.74 ppm eU and a high of 4.50 ppm eU. Water samples from the area also yielded high uranium values. Chandra (1981) concludes that anomalous values in well water samples coincide with those from airborne survey

References:

Chandra, J.
1979: Reconnaissance ground investigation of the French Lake (airborne) radiometric anomaly; New Brunswick Department of Natural Resources, Mineral Resources Branch, Open File Report 79-24.

1981: Ground investigations of airborne gamma-ray radiometric anomalies in New Brunswick by truck-mounted and hand-held gamma-ray sensors. Unpublished M.Sc. thesis, University of New Brunswick.

Kipling, R.W.
1980: Cominco Limited, French Lake; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 472571.

Kipling, R.W.
1980: Cominco Limited, French Lake; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 472594.

Uranium 21-G/10E

Associated minerals/metals: F, S, Pb, Cu

West Mill Settlement 44 45°34'35"N 66°35'05"W

Work:

1963-66: - New Brunswick Department of Lands and Mines
- geological mapping of the area.

1971: - New Brunswick Minerals Resources Branch
- regional stream sediment sampling.
- 2 areas underlain by feldspar quartz ashflow porphyry have uranium values 10 times background.

1973: - D. E. Gemmell
- geological mapping of the area.

1975: - Geological mapping and radiometric studies.
- Ruitenberg, Ramachandra, Watters, New Brunswick Department of Natural Resources.

1976: - Rio Canex, Bucknell, W.R. and Shewman, R.W.
- scintillometer readings varied from 12-72 cps; highest values of 3 times background are underlain by quartz latite porphyry. A track-etch survey found several scattered anomalous zones. Twelve holes were drilled (1 218 m), each logged with a gamma-ray probe. The best drill intersection of 0.036% U_3O_8 over 1.2 m occurs in a hematitic-filled fractures. Two other intersections assayed 0.015% U_3O_8 over 1 m, and 0.04% U_3O_8 in altered porphyry adjacent to a fault.

1978: - H.C. McNamara option; Antoniuk, T.
- geology, geochemistry, diamond drilling, down-hole logging (gamma ray).
- geochemical surveys were inconclusive: anomalous values were recorded for uranium, radium and helium in soils, but there was little correlation. Four holes totalling 493 m were drilled to test helium anomalies; all holes had elevated radiometric levels in the tuffaceous units, but no mineralization. Rock types logged were red to grey-green volcaniclastic conglomerate, tuffaceous argillite, and red and green tuff.

1979: - H.C. McNamara option; Lockhart, A.W.
- 12 diamond drill holes (667 m) intersected almost exclusively porphyritic rhyolite weakly to moderately radioactive (3 times background, up to 5 times background in fractures).

Geology: The area is situated near the southern margin of the New Brunswick Platform and includes the northeast end of the Mount Pleasant appendage, underlain by Mississippian Piskahegan Group volcanics and volcaniclastic sediments. The stratigraphic succession includes, from the bottom of the Piskahegan: 26 m of redbeds, 134 m South Oromocto basalt, 229 m Carrow Formation volcaniclastic conglomerate, siltstone and argillite. Dips are 14° to the northwest. Uranium mineralization is found in the lower conglomerate unit of the Carrow Formation, observed in outcrop on the north bank of the South Oromocto River (grab samples assay up to 0.52% U_3O_8), and in 3 drill holes (best assay is 0.036% U_3O_8 over 1.2 m).

According to Bucknell (1976) the subaerial South Oromocto (flood) Basalt filled valleys and topographic lows in a high relief terrain developed during an earlier phase of acid volcanism (Rothea Porphyry). A calcareous regolith, and probably a palaeosol in part, developed on the basalt during a period of wathering under arid conditions [Carrow Formation, unit (iii)]. Uplift of acid volcanics, or a new phase of acid volcanism in a nearby, high-relief source region, provided detritus for the fanglomerates of the lower Carrow Formation [Unit (ii)]. The two "argillite" bands may represent ash-fall deposits. Graded bedding towards the top of the lower Carrow Formation and the gradual influx of rounded basement and reworked Carrow argillite fragments indicates the increasing effect of water action, a subdued rate of deposition and a tempered relief. Well developed fining-upward cycles suggest the onset of a meandering stream system which gave way to the thick overbank or mudflat deposits of the upper Carrow Formation [(Unit (i)]. The cycle recommended with a new phase of acid volcanism (Seelys Porphyry) succeeded by volcaniclastic conglomerates of the Kleef Formation.

Ruitenberg et al (1976) conclude that radiometic measurements near West Mill Settlement delineated an anomalous zone in the Pete Brook - South Oromocto River area. The host rocks are intensely altered volcanogenic sandstones and conglomerates of the Carrow Formation. Anomalous amounts of uranium occur in the chloritic altered zone and in sections rich in hematite and fluorite within the bleached zone. The erratic distribution of U/Th, U/K and Th/k ratios in the anomalous zone may reflect leaching and redistribution of radioactive elements.

It seems most likely that uranium ions were transported by sulphur-and fluorine-rich water moving through highly permeable beds. This is suggested by the disposition of the bleached and chloritized zones in coarse (high permeability) volcanogenic sedimentary rocks that overlie red shale (low permeability) immediately above a massive basalt unit. Similar siltstone overlies at least part of the altered zone. It is possible that the sulphur-and fluorine-rich water was associated with a nearby volcanic centre.

References:

Bucknell, W.R.
1976: Rio Canex, West Mill Settlement; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 470336.

Carroll, B.M.W.
1976: West Mill Settlement uranium: New Brunswick Department of Natural Resources, Mineral Resources Branch, Mineral Occurrence File, 21-G/10E-1.

Chandra, J.
1981: Reconnaissance ground investigation of the Hoyt (airborne) radiometric anomaly, Sunbry County; New Brunswick Department of Natural Resources, Mineral Resources Branch, Open File Report 79-16.

McNamara, H.C.
1978: West Mill Settlement; Rayrock Mines Ltd., Antoniuk, T.; New Brunswick Department of Natural Resources, Assessment File 472224.

McNamara, H.C.
1979: West Mill Settlement; Lockhart Exploration Services Ltd., Lockhart, A.W.; New Brunswick Department of Natural Resources, Assessment File 472432.

Ruitenberg, A.A., Ramachandra, B.L. and Watters, S.E.
1976: Uraniferous volcanogenic sedimentary rocks in the West Mill Settlement area; New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 76-1.

Shewman, R.W. and Bucknell, W.R.
1976: Rio Canex, West Mill Settlement; New Brunswick Department of Natural Resoruces, Assessment File 470176.

Uranium 21-G/10E

Kleef Brook 45 45°34'00"N 66°40'00"W

Work:

1979: - Canadian Nickel
- soil geochemistry surveys found a few isolated anomalies, 24-60 ppm, and several scintillometer anomalies up to 180 cps not coincident with the geochemical anomalies.

References:

MacGibbon, A.T.
1979: Canadian Nickel Company Limited, Kleef Brook; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 472442.

Uranium 21-G/10E

Associated minerals/metals: Mo, W, Sn

Shin Creek 46 45°33'12"N 66°38'15"W

Work:

1978: - McNamara - optioned to Billiton Exploration Canada Ltd., geological, geophysical, prospecting, J. Atkinson, diamond drilling.

1981: - Geological mapping, soil geochemistry, diamond drilling.

Geology: The Shin Creek claim group is underlain by volcanic and sedimentary rocks of Carboniferous Piskahagen Group. Effects of intense hydrothermal activity in this area are related to sub-volcanic intrusions. Although no major uranium mineralization zone is located in the claim block, uraniun minerals occur locally along prominent fracture zones in altered rocks.

During the drilling of these uranium bearing fracture zones, sections rich in Mo (0.26% Mo) were intersected. The molybdenite bearing sections occur in silicified porphyry and breccia similar to that of main ore zone in the Mount Pleasant area.

Note: See West Mill Settlment.

References:

McNamara, H.C.
1980: New Brunswick Department of Natural Resources, Mineral Resources, Open File Report 80-4, p. 66.

McNamara, H.C.
1981: New Brunswick Department of Natural Resources, Mineral Resources, Open File Report 81-25, p. 88.

McNamara, H.C.
1982: New Brunswick Department of Natural Resources, Mineral Resources, Open File Report 82-31, p. 90 and 116.

McNamara, H.C.
1980: Shin Creek; New Brunswick Department of Natural Resources, Mineral Resources, Assessment Report 472601.

McNamara, H.C.
1981: Shin Creek; New Brunswick Department of Natural Resources, Mineral Resources, Assessment Report 472765.

Uranium 21-G/10W

Oromocto Lake 47 45°33'00"N 66°55'00"W

Work:

1978:
- Cominco Ltd., Kipling, R.W.
- geology, geochemistry (soils, radon gas, lake and stream water, lake and stream sediment), radon cup detectors, diamond drilling, down-hole geophysical logging (gamma-ray, neutron-neutron, SP, resistivity).
- 5 areas anomalous in radon were indicated, with some correlation with soil uranium anomalies; some stream water and sediment uranium anomalies are within the area of radon anomalies as well. 860 m of diamond drilling was carried out in 13 holes; no mineralization intersected.

1979:
- Comino Ltd., Kipling, R.W.
- drilling (9 holes, 2 425 m), down-hole geophysical logging (gamma ray, neutron-neutron, SP, resistivity), trenching, seismic survey to map the Mississippian volcanics and overlying Pennsylvanian sediments (unsuccessfully). No mineralization discovered.

Geology: The area lies on the southwest margin of the New Brunswick Carboniferous Platform, mostly overlain by Pennsylvanian clastic continental sediments of the Pictou Group and covering the unconformable contact between these sediments and the underlying Upper Mississippian Piskahegan Group redbeds and volcanics and remnants of Hopewell Group redbeds. Granophyric intrusions are present near the south side of the property.

References:

Kipling, R.W.
1979: Cominco Limited, Oromocto Lake; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 472444.

Kipling, R.W.
1979: Cominco Limited, Oromocto Lake; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 472563.

Uranium 21-G/11E

Cherry Hill (Harvey Station) 48 45°44'00"N 67°01'00"W

Work:

1970-72:
- BP Oil Ltd.
- 1 group of 3 groups of claims staked in the area after preliminary reconnaissance surveying.
- 2 DDH were spotted to intersect a fault zone carrying 1 ppb U in H_2O and a soil-radon anomaly. No assays were reported and no mineralization was apparent.

Geology: Rhyolitic tuff of the Harvey Formation at Cherry Hill contains minor uranium occurrences. The volcanic rocks lie unconformably above pre-Carboniferous black slate, argillite and greywacke and are overlain by red shale, conglomerate and sandstone of the Windsor Group, of which the Harvey Formation is a subdivision. The northern boundary of the Harvey Formation is a major northeast-trending fault (Spring Hill Fault) lying about 270 m north of Cherry Hill. The Harvey Formation forms the lower part of the northwest limb of a major syncline plunging to the northeast.

References:

Phillipson, A.D.
1972: BP Oil Limited, Assessment work report, drilling project on the Cherry Hill claims group, Harvey Station, York County, New Brunswick; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 470178.

Uranium

21-G/11E

Harvey Station 49

45°34'00"-45°44'00"N
66°56'00"-67°09'00"W

Work:

----: - Geological Survey of Canada
- geological reconnaissance and sampling.

1954-58: - N. B. Uranium Metals and Mining Ltd.
- Technical Mines Consultants Ltd.

- Riocanex
- geological and scintillometer prospecting, trenching and diamond drilling (879 m) at uranium prospects in York Mills and Manners Sutton. Best assays were 0.14% U_3O_8 over 0.5 m, several of 0.03-0.85% U_3O_8 over 1.0-1.5 m in 4 holes.

1978: - Noranda
- uranium in well waters varied from 1-8 ppb in sedimentary terrain, and 1-148 ppb in volcanic terrain. Similarly, high uranium values in stream sediments (up to 9.8 ppm) are related to the volcanics. A few scattered radon anomalies were located. Three holes were drilled (610 m) and logged with down-hole geophysical probes. Rock types were predominantly sandstone, siltstone, mudstone, conglomerate and tuffs; all lithologies apparently lack the reducing capacity required to fix uranium.

Geology: The strongest radioactivity is associated with patches of red stain visible for 3 metres along fractures trending north 15°, 80° east in rhyolite (Gross, 1957). A sample submitted to the Geological Survey of Canada assaying 0.02% U_3O_8 equivalent was reported to be from an outcrop on Highway 3 about 1.6 km northeast of Harvey Station. Gross found traces of radioactivity in many places in the Harvey Formation. In most places radioactivity is associated with minor structural breaks where the volcanic rocks are altered to clay minerals, soft green platy minerals or fine-grained white mica, and where quartz, fluorite, pyrite or hematite have been introduced.

The Mississippian Harvey Formation is a zone of Windsor-age rocks that comprise rhyolite flows, rhyolite breccia, tuffs and agglomerate about 0.8 km wide extending northeast from the vicinity of York Mills, through Manners Sutton, to beyond the village of Harvey Station and Harvey Mountain. The volcanic rocks of the Harvey Formation are believed to lie unconformably above the pre-Carboniferous black slate, argillite and sandstone of the Windsor Group. The Harvey Formation forms the lower part of the northwest limb of a large northeast plunging syncline. Volcanic rocks have been found in the Windsor Group near the axis of the syncline and a prominent band is exposed on the southeast limb of this structure.

References:

Cooper, P.
1978: Noranda Exploration Limited, Harvey Station; New Brunswick Department of Natural Resources, Mineral Resources Branch, Assessment File 472213.

Gross, G.A.
1957: Uranium deposits of Gaspe, N.B. and N.S.; Geological Survey of Canada, Paper 57-2.

Uranium 21-G/10W + 11E

Associated minerals/metals: Pyrite, Arsenopyrite, F

Manners Sutton (Harvey Station) 50 45°39'30"-45°42'30"N 66°58'00"-67°07'30"W

Work:

1956: - N. B. Uranium Metals and Mining Ltd.; Newell, J.M.
- geological mapping 1" = 1320'

1958: - Rio Canex
- geological and scintillometer prospecting, trending and diamond drilling (879 m) at uranium prospects in York Mills and Manners Sutton areas. Best assays were 0.14% U_3O_8 over 0.5 m, several of 0.03-0.085% U_3O_8 over 1.0-1.5 m in 4 holes.

1979: - Seru Nucleaire Canada Ltee.; Schimann, K.
- geochemistry (soils, stream sediments), radiometrics, geology surveys. Anomalous radiometric zones were detected at the York Mills and Manners Sutton showings and at the base of Cherry Hill. Stream geochemistry defined 3 anomalous zones, 2 of which were caused by organic scavenging, and soil geochemistry revealed anomalous contents at the Manners Sutton showing and near wells in which highly anomalous uranium levels were measured (up to 558 ppb). Drilling to bedrock with a winkie drill intersected pink to grey rhyolites.

1980: - Seru Nucleaire Canada Ltee.; Beaudin, J.
- geology, radiometrics, VLF; stream, soil and well geochemistry. Two new radiometric anomalies were located, related to hematitic alteration around fractures in ash flow or ash fall tuffs below the Cherry Hill-Harvey Mountain Formation contact, or in rhyolite above the contact. Stream geochemistry delineated 4 relatively anomalous regions, and uranium values up to 420 ppb were found in wells near (interpreted) faults between York Mills and Little Settlement. Six short holes were drilled into pink acid volcanics; the highest assay of 8100 ppm U over 5 cm corresponds to a scintillometer reading of 1750 cps.

Geology: Harvey Formation felsic volcanics underlie the area, unconformably overlying Silurian metasediments, and covered by Mississippian and Pennsylvanian continental clastic sediments. The Harvey Formation is subdivided into a lower, predominantly sedimentary member (red siltstone and volcanigenic sediments, interbedded with ash fall tuffs and ignimbritic flows), and an upper volcanic member, mainly ignimbrites. Above the Harvey Formation is a poorly sorted brown conglomerate, a series of reddish-orange sandstones, siltstones, and rhyolitic-pebble-conglomerates, covered by conglomerate and grey-green sandstone of the Riversdale and Pictou Groups.

The Manners Sutton showing consists of several fractured linear zones (fault zones?) containing veins of pitchblende accompanied by pyrite, fluorite, arsenopyrite and intense alteration of the surrounding thin-banded rhyolite. Fluorite is present as a matrix in rhyolite breccia and locally in fracture fillings associated with the volcancis. Rock geochemistry indicated that mercury and perhaps arsenic could be used as uranium tracers. One radioactive showing also contained thorium.

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Uranium — 21-G/11E

York Mills (Harvey Station) 51 — 45°40'08"N 67°05'48"W

Work:

1956:
- N.B. Uranium Metals and Mining Ltd.
- geological mapping 1" = 20' and 1" = 1320'
- Trenching and diamond drilling (4 holes).

Geology: Radioactive material is in a shear zone that passes through light grey to blotchy purple rhyolite tuff. The shear zone is about 4.6 m wide, strikes northeast and dips 70° southeast. Chip samples taken across the shear zone in a southwest-trending trench assayed 0.020 to 0.036% U_3O_8 equivalent for a width of 3.7 m. Results of diamond drilling suggest that radioactive material may be distributed along this shear zone for a length of 107 m. The highest assay from the drill core was 0.08% U_3O_8 but most of the drill core from this zone showed less than 0.05%. The rhyolite tuff exposed in the trenches is altered. White clay-like material and minor amounts of brown limonite are present there as well. Small cavities 3 to 4 mm in diameter are lined with buff coloured clay. Deep red or purple patches are common but they do not seem to bear any special relationship to the radioactive material. Dark purple to black, fine-grained fluorite with a dull to earthy lustre is distributed on fracture planes, in cavities and as minor replacement masses.

Uranospinite and saleite were identified in analyses by the Geological Survey of Canada. Another occurrence of radioactive material is exposed at York Mills, northwest of the junction of the Mill Road and Deadwater Brook. Green volcanic breccia exposed in a 9 m long trench exhibits a fracture that strikes north 20° east and dips 75° south. The volcanic breccia is silicified along this fracture and calcite, blue-black fluorite and clay materials or zeolite minerals have been introduced. A number of deep orange-red patches up to 0.3 m in diameter on altered granite boulders yield several times background count on a Geiger counter.

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Uranium 21-G/7E + 10E

Associated minerals/metals: Sn, W

Duck Lake (Juvenile Mountain) 52 45°30'00"N 66°40'20"W

Work:

1981-82:
- Uranerz Exploration and Mining Ltd., Brack, W.
- airborne VLF, magnetometer, follow-up of airborne survey by ground scintillometer and radiometric VLF-EM, magnetmeter, I.P. surveys, geological mapping, radiometric boulder surveying, geochemistry and trenching.

1983:
- Uranerz Exploration and Mining Ltd., Brack, W.
- scintillometer survey, lake sediment sampling, till and stream sediment sampling; geological mapping.
- exploration work in the Duck Lake area has delineated a radioactive boulder field approximately 1.6 km long with their sources to the north. The mineralized boulders are confined to the area underlain by the Intermediate Flows unit between an upper and a lower fanglomerate units of the Carrow Formation of Mississippian age. Mineralization occur in three separate bands within the Intermediate Flow unit. Assays obtained from the trench sampling and lithogeochemical sampling vary from 109.5 ppm to 1527 ppm (U_3O_8) in widths varying from 0.9 m to 1.5 m.
- roughly northeast and northwest trending faults truncate the lithological units but do not appear to directly control the localization of mineralization. The northeast trending faults parallel strike-slip faults with right lateral movement in the immediate vicinity south of the property.
- The mineralized boulders are altered and possess a massive appearance in contrast to the more vesicular-amygdaloidal boulders in the Intermediate Flow unit. The radioactive rocks generally show pink to pale red hematite alteration.

Geology: The Duck Lake group is located within the Carboniferous volcanic belt along the southern boundary between the Carboniferous sediments of the Central Basin to the northeast and the deformed Ordovician-Silurian sediments of the Magaguadavic-St. Croix Zone (Ruitenberg and Fyffe, 1982) to the south and west.

The oldest rocks in the area are interbedded slates, argillites and quartzites of pre-Carboniferous age. They were deformed, altered, intruded and eroded during the Lower to Middle Devonian Acadian Orogeny prior to deposition of the Mississippian units.

Mississippian age rocks overlie the pre-Carboniferous basement complex with pronounced angular unconformity. They form a related sequence of interbedded ash-flow tuffs with lesser amounts of red bed sediments and basalt which have been assigned to the Piskahegan Group in the Mount Pleasant-Duck Lake area. These ash-flow tuffs and associated sediments and basalts which form the Mount Pleasant Appendage and its extension to the northeast - the Hoyt Appendage are considered to represent an ancient caldera floor over a centre of volcanic activity.

The Piskahegan Group consists of Seelys Porphyry which is partly underlain and partly interbedded by the Carrow Formation which in turn are underlain by a series of mafic flows.

The Carrow Formation in the Duck Lake area comprise two fanglomerate units (the upper and the lower) with an Intermediate Flow member of largely mafic composition. The unranium mineralization is restricted to this Intermediate Flow Member.

The flows within this unit are predominantly vesicular to amygdaloidal with the occasional massive flow being present. The flows vary in colour from grey to grey-green and dark brown to purple. The most common minerals in the amygdules are quartz, calcite and chlorite with hematite, specular hematite, iron carbonate and less commonly epidote. In some of these rocks the amygdules and/or vesicules constitute 30-40% of the rock.

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