

INFORMATION SOURCES

MacLean, M.E. and White, G.V. (1991): Feldspathic Mineral Occurrences in British Columbia; *B.C. Ministry of Energy, Mines and Petroleum Resources*, Open File 1991-10

McVey, H. (1988): A Study of Markets for British Columbia's Nepheline Syenite and Feldspathic Minerals, Report prepared under the Canada/British Columbia Mineral Development Agreement

G.V. White (1988): Hellroaring Creek Pegmatite; *B.C. Ministry of Energy, Mines and Petroleum Resources*, Exploration in British Columbia 1987, pages B108-115

G.V. White (1988): Lumby Pegmatite; *B.C. Ministry of Energy, Mines and Petroleum Resources*, Exploration in British Columbia 1987, pages B116-124

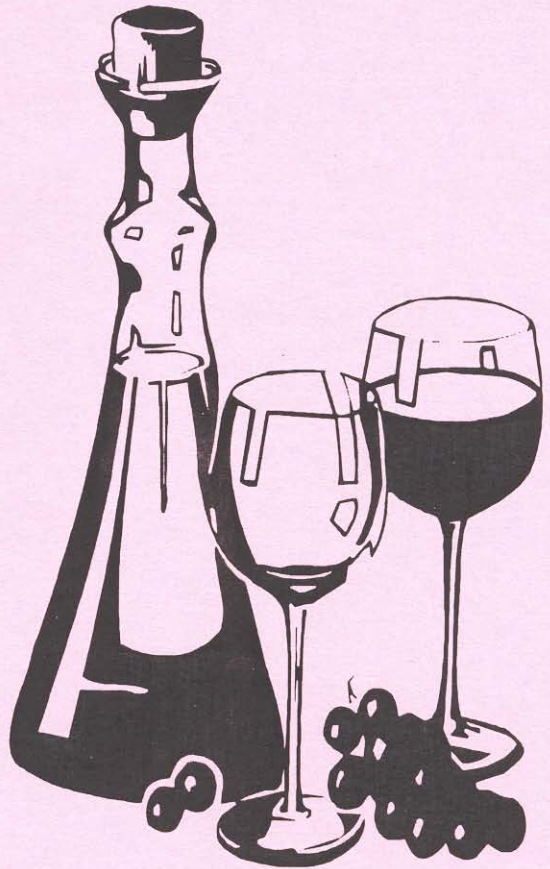
G.V. White (1989): Feldspar And Nepheline syenite Potential In British Columbia; *B.C. Ministry of Energy, Mines and Petroleum Resources*, Geological Fieldwork 1988, Paper 1989-1, pages 483-487

BC 

Ministry of Energy, Mines and
Petroleum Resources
Geological Survey Branch



FELDSPAR AND NEPHELINE SYENITE



INVENTORY/RESOURCES

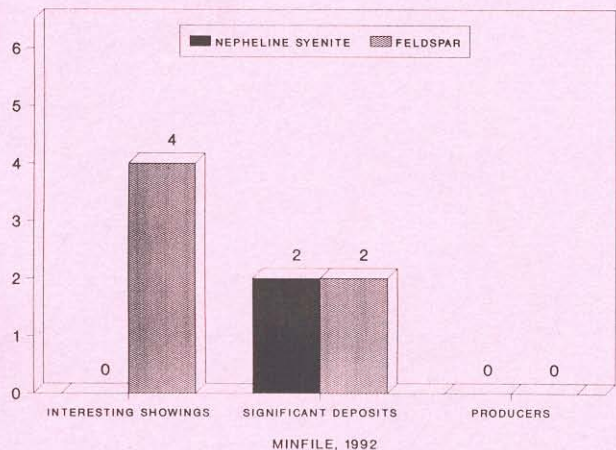
- Feldspar and nepheline syenite are important constituents used in the production of glass and ceramics. In British Columbia, both are found in deposits which have economic potential.
- Feldspars are commonly found in igneous rocks.
- Feldspathic material occurs in economic concentrations in nepheline syenite, phonolite, pegmatite, aplit, leucocratic granite and feldspathic sand.
- Nepheline syenites also contain the commercially important mineral nepheline.
- British Columbia has 22 documented occurrences of feldspar and 16 of nepheline syenite.
- Large deposits of nepheline syenite are rare worldwide, but at least one occurs in British Columbia.

RESULTS OF FIRING TESTS FOR GLAZE POTENTIAL

| | COLOUR | SURFACE |
|---|--------------------------------------|--------------|
| TEST #1: FIRED AT 1250°C FOR 3-4 HOURS | | |
| Trident Mountain (nepheline syenite) | white, translucent, glassy, no spots | smooth |
| Lumby (pegmatite) | white, glassy, no spots | smooth |
| Hellroaring Creek (pegmatite) | (1) white, opaque, no spots | smooth |
| | (2) white, opaque, glassy, no spots | smooth |
| Scuzzy Creek (feldspathic sand) | (1) white, opaque, few spots | rough gritty |
| | (2) white, opaque, no spots | rough |

RESERVES

- There are 100 million tonnes of feldspar reserves documented in British Columbia.
- The Hellroaring Creek pegmatite deposit, southwest of Kimberly, covers an area measuring 500 by 1000 metres. It has recently been evaluated as a source of commercial grade feldspar and was seeking development permits through the Mine Development Assessment Process.
- Four large feldspathic sand deposits, are located along Scuzzy Creek, north of Hope. Tests indicate that these deposits contain material that meets glass manufacturers' requirements.
- The Lumby pegmatite, near Vernon, outcrops in two zones, 700 by 300 metres each. Indicated (probable) reserves are 100 million tonnes of material grading 50% feldspar, 18% silica and 3% mica (White, 1988).



PRODUCTION

- Presently, there is no production of feldspar or nepheline syenite in British Columbia.

- The Trident Mountain nepheline syenite belt, northeast of Revelstoke, extends over the length of at least 7 kilometres and is up to 1000 metres wide.

USES

- Alumina and alkali content are the most important factors in feldspathic materials.
- In terms of relative proportions of alumina, nepheline syenite contains the highest, followed by soda feldspar and potash feldspar.
- Feldspathic minerals impart strength, toughness and durability to the final product.
- In ceramics, clays and silica are the main constituents together with lesser amounts of feldspathic minerals, fluorspar and many other possible additions.
- Ceramics containing feldspathic minerals include whiteware (bathroom and kitchen fixtures), walls and floor tiles, pottery, porcelain, enamels and glazes.
- Products containing feldspar in the glass industry include container glass, fiberglass, specialty glass and flat glass.
- In western North America, glass industries mainly use feldspathic sands which vary considerably in composition and are low in alumina.

CONSUMPTION OF FELDSPATHIC MATERIAL IN POTENTIAL BRITISH COLUMBIA MARKETS

Western Provinces, Pacific Northwest and Northern California

| | Material | Tonnages Consumed (metric tonnes) | Alumina Contained |
|-----------------|-------------------|--------------------------------------|-------------------|
| Container Glass | Feldspathic sand | 573 340 | 31 790 |
| | Nepheline syenite | 10 980 | 2 520 |
| Fibreglass: | Feldspathic sand | 907 180 | 5 440 |
| | Nepheline syenite | 9 800 | 2 260 |
| Ceramics: | Nepheline syenite | 1 810 | 420 |
| | Feldspar | 1 360 | 320 |
| | | | |
| Total Alumina: | | | 42 750 |

MARKETS AND OPPORTUNITIES

- Western Canada imports feldspathic sand from Idaho and nepheline syenite from Ontario.
- A market study identified a ready market of 20 000 tonnes, and potentially up to 50 000 tonnes, of feldspar per year and a possible overseas market for British Columbia nepheline syenite.
- Transportation costs are the limiting factor for feldspathic materials. A British Columbia supplier to western Canada and the Pacific northwest markets would enjoy a marked freight advantage.
- Sampling and diamond drilling by Lumberton Mines in 1986 indicates that Hellroaring Creek pegmatite contains a considerable amount of glass and ceramic grade feldspar with full liberation at 50 mesh.
- Low iron content and acceptable potassium and alumina content indicate that the Lumby pegmatite has good potential to produce a high-quality feldspar with liberation at 20 mesh.
- Large indicated volumes of available feldspathic sand and relatively easy access give the Scuzzy Creek site good potential to produce material for the glass industry.
- The Trident Mountain nepheline syenite deposit produces a glass grade product reaching 85% brightness in laboratory scale tests.

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