MAR 19660008: EAST CENTRAL ALBERTA

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ECONOMIC MINERALS

FILE REPORT No.

POT-AF-OOS(1)

POTASH PROSPECTING PERMIT # 5

General

The economical production of potash over a large area of Saskatchewan recently widened the search for this mineral into Manitoba and North Dakota. The identical geological stratigraphic sequence and depositional environment that resulted in the deposition of potash in Saskatchewan is also present in a large portion of Alberta.

A detailed study of this portion of Alberta showed the presence of small irregular veinlets of potassium minerals in the Lesser Slave Lake area of North Central Alberta and a substantial quantity of carnallite (K Cl Mg Cl₂ $6 H_2 O$) and possibly sylvite (K Cl) in the Vermillion area in the East Central Plains of Alberta. Another indication of potash was noted in the Canadian Seaboard Ernestina Lake 10-13-60-4 W4 well. This indication occurred as deflections on the gamma ray neutron log over the following intervals, 2637 - 2644 feet, 2681 - 2688 feet, 3210-3220 feet and 3490-3500 feet at this location. It was on the basis of these deflections, which indicate the presence of potash minerals, that Potash Prospecting Permit # was obtained.

Geology

Potash deposits are found in the Prairie Evaporite section of the Middle Devonian Elk Point Basin. The potash minerals occur mainly in two forms - sylvite and carnallite. Sylvite is the more valuable mineral due to its more simple composition which requires less treatment.

Literature made available from the Alberta Conservation Board and the Dominion Government on the initial well VCO #15 in Lsd. 6, Sec. 12, Twp. 49, Rge. 6 W4 indicated the presence of potash minerals. Core descriptions mentions pinkish and greyish minerals which in all probability could be carnallite and sylvite. The cores from the well, containing the potash have been lost and dispersed since the well was drilled in 1944-1945. These cores were exposed for weeks to the atmosphere before being spot analyzed. However, the analyses do indicate traces of potassium chloride and magnesium chloride indicating the presence of sylvite and/or carnallite. It is possible to assume that due to the high solubility of sylvite, a true and accurate analysis was not obtained.

The potash minerals in the VCO #15 well are of the same composition and depositional sequence and depth as the potash at Unity, Saskatchewan. Carnallite is described twice in the sample descriptions of the Seaboard Ernestina Lake well. These occur in the Cold Lake and Lotsberg Salt sequences of the Elk Point, which are not present in Saskatchewan.

Two pronounced gamma ray and neutron deflections occur in the Prairie Evaporite section at 2637-2644 feet and 2681-2688 feet in this well, and could be an extension of the Unity and/or Vermilion deposit.

Conclusions

The writer believes that the deflections in the Ernestina well are due to carnallite. Several geologists and well log experts who have considerable experience in the potash deposits of Saskatchewan are in full agreement. This does not preclude the possibility of finding sylvite in the Ernestina Lake area of Alberta.

2.

Carnallite would not be economical to mine at this depth due to the high content of shale requiring considerable treatment and beneficiation to compete with the present production from Saskatchewan. It would require considerable drilling and coring of the salt section to determine the presence of a sufficiently large deposit to warrant the establishment of a mine and plant.

The writer believes that salt solution has taken place in this area of Alberta and that many of the Paleozoic "highs" can be attributed to this phenomena. These "highs" would then be the most favorable areas in which to explore for potash deposits as they would the areas of least solution. The Ernestina deposit occurs on a Paleozoic "high" which could be erosional or due to salt solution. If this "high" is due to undissolved salt, then it should be a more favorable area to explore for potash minerals. All evidence both from the well logs and samples indicates the carnallite is the only potash mineral present. The writer suggests that this occurrence of potash is not shallow enough for economical exploitation at this time.

There has been one well drilled in the general area which went into the Elk Point since the Permit was acquired. This well is a brine well drilled under section 20A of the Act and therefore can be held confidential for 5 years. The writer was unable to obtain any pertinent data on this well which would indicate the presence of sylvite in the area.

Present information obtained from the VCO #15 and Ernestina Lake wells suggests the presence of a potash deposit which in all probability consists mainly of carnallite. A deposit consisting mainly of this mineral would not be economical to mine at this depth.

3.

ENCLOSURES

- (1) Cross-Section of Potash Producing Areas
- (2) Structure Contours on Top of Paleozoic

References

- (1) Potash in Saskatchewan- Department of Mines, Saskatchewan
- (2) Tompkins, R. (1955)
- (3) A.S.P.G. Atlas (1965)
- (4) Schlumberger Alger 1965

732/1+2+7

POTASH PROSPECTING PERMIT No.5









		Ls, gr, agr, v'sl sity in pt, foss
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3000 3400 35000 3700		Dol, bf, v f x, gran, foss Chara cast Sh, grn, imy, Sarcella Chara Dol, it brn, f x, in-x, por, anhy com Dol, brn, f x, gran, arg, v imy, arg pt Dol, brn, f x, gran, arg, v imy, arg pt Dol, brn, f x, gran, arg, v imy, arg pt Dol, brn, f x, gran, arg, v imy, arg pt Dol, brn, v f x, gr is incl Dol, bf, t x, imy/bf, dns, v do <u>l is, tr</u> foss Ls, bf, dns dol, foss Rare large smooth ost Tr sait casts Dol, bf, w f x, y imy, dol, is sait Ls, bf, f x, gran doi, anhy incl Sh, grn, doi, imy, hd, indurated Dol, bf, v shy, grdg/dol, marl Sh, gr, grn, dol Dol, bf, v shy, grdg/dol, marl Sh, gr, grn, dol Dol, bf, dns, arg, dol, sitst, lamy, Dol, bf, dol, sitst, lamy, Dol, bf, dns, arg, dol, sitst, lam, Salt, trnsp, v pure, red sh incl
3000 3400 35000 3700		Dol, bf, v f x, gran, foss Chara cast Sh, grn, imy, Sarcella Chara Dol, it brn, f x, jnra, por, anhy com Dol, brn, f x, gran, arg, v imy, arg pt Dol, brn, f x, gran, arg, v imy, arg pt Dol, brn, f x, gran, arg, v imy, arg pt Dol, brn, f x, gran, arg, v imy, arg pt Dol, brn, f x, gran, arg, v imy, arg pt Dol, brn, v f x, gr is incl Dol, bf, f x, imy/bf, dns, v dol is, it rs alt casts Dol, bf, arg, anny incl Dol, bf, arg, anny incl Dol, bf, arg, anny incl Sh, gr, grn, dol Dol, bf, v shy, grdg/dol, marl Sh, gr, grn, dol Dol, bf, dns, arg, dol, sitst, iamy, Dol, bf, arg, sity in pt, grdg/dol sh Gr grn, sity sh Dol, gr grn, sity sh Dol, gr grn, dol sh Sh, gr, grn, dol sh Salt, trnsp. v pure, red sh incl Ls, bf, f x, in-x por, silty in pt Col, anhy incl
3000 3400 30000 3700 38000 3700 3800000000		Dol, bf, v f x, gran, foss Chara cast Sh, grn, imy, Sarcella Ghara Dol, it brn, f x, in-x, por, anhy com Dol, brn, f x, gran, arg, v imy, arg pt Dol, brn, f x, gran, arg, v imy, arg pt Dol, brn, f x, gran, arg, v imy, arg pt Dol, brn, v f x, gr is incl Dol, bf, f x, imy/bf, dns, v dol is, tr To sit casts To sit casts To sit casts Dol, bf, arg, anhy incl Sh, grn, dol, imy, hd, indurated - Dol, bf, v shy, grdg/dol, marl Sh, gr, grn, dol Dol, bf, v shy, grdg/dol, marl Sh, gr, grn, dol Dol, br, red, v shy Dol, bf, dns, arg, dol, sitst, iamy, - Dol, bf, dns, arg, dol, sitst, iamy, - Dol, bf, dns, arg, dol sitst, iamy, - Dol, a dol sh, mar, bf Brick red, anhy, mott
3000 3400 30000 3700 38000 3700 3800000000		Dol, bf, v f x, gran, foss Chara cast Sh, grn, imy, Sarcella Ghara Dol, it brn, f x, in-x, por, anhy com Dol, brn, f x, gran, arg, v imy, arg pt Dol, brn, f x, gran, arg, v imy, arg pt Dol, brn, f x, gran, arg, v imy, arg pt Dol, brn, v f x, gr is incl Dol, bf, f x, imy/bf, dns, v dol is, tr To sit casts To salt casts To salt casts Dol, bf, arg, anhy incl Sh, grn, dol, imy, hd, indurated Dol, bf, v shy, grdg/dol, marl Sh, gr, grn, dol Dol, bf, dns, arg, dol, sitst, lamy, p Dol, bf, dns, arg, dol, sitst, lamy, p Dol, bf, dns, arg, dol, sitst, lamy, p Dol, bf, dns, arg, dol sitst, lamy, p Dol, brich red, grn, sity sh Dol, gr, bf/mar, v shy, sity Grdg/marl, sh in pt, anhy incl Mott, to gr, grn, dol sh Salt, trnsp. v pure, red sh incl Ls, bf, f x, in-x por, sillty in pt Dol, a dol sh, mar, bf Brick red, anhy, mott Much dk gr sh Anhy, w/tanao
3000 3400 35000 3700		Dol, bf, v f x, gran, foss Chara cast Sh, grn, imy, Sarcella Ghara Dol, it brn, f x, in-x, por, anhy com Dol, brn, f x, gran, arg, v imy, arg pt Dol, brn, f x, gran, arg, v imy, arg pt Dol, brn, f x, gran, arg, v imy, arg pt Dol, brn, v f x, gr is incl Dol, bf, f x, imy/bf, dns, v dol is, tr To sit casts To salt casts To salt casts Dol, bf, arg, anhy incl Sh, grn, dol, imy, hd, indurated Dol, bf, v shy, grdg/dol, marl Sh, gr, grn, dol Dol, bf, dns, arg, dol, sitst, lamy, p Dol, bf, dns, arg, dol, sitst, lamy, p Dol, bf, dns, arg, dol, sitst, lamy, p Dol, bf, dns, arg, dol sitst, lamy, p Dol, brich red, grn, sity sh Dol, gr, bf/mar, v shy, sity Grdg/marl, sh in pt, anhy incl Mott, to gr, grn, dol sh Salt, trnsp. v pure, red sh incl Ls, bf, f x, in-x por, sillty in pt Dol, a dol sh, mar, bf Brick red, anhy, mott Much dk gr sh Anhy, w/tanao
3000 3400 30000 3700 38000 3700 3800000000		Dol, bf, v f x, gran, foss Chara cast Sh, grn, imy, Sarcella Chara Dol, it brn, f x, jrn-x, por, anhy com Dol, brn, f x, gran, arg, v imy, arg pt Dol, brn, f x, gran, arg, v imy, arg pt Dol, brn, f x, gran, arg, v imy, arg pt Dol, brn, v f x, gr is incl Dol, bf, t x, imy/bf, dns, v dol is, tr Tol, bf, f x, imy/bf, dns, v dol is, tr To sait casts Tol, bf, w f x, y imy, dol, is sait Sh, grn, dol, imy, hd, indurated Dol, bf, v shy, grdg/dol, marl Sh, gr, grn, dol Dol, bf, v shy, grdg/dol, marl Sh, gr, grn, dol Dol, bf, dns, arg, dol, sitst, iamy, pol, bf, dns, arg, dol sitst, iamy, for dol Dol, brn, red, v shy Dol, bf, v shy, grdg/dol, marl Sh, gr, grn, dol Dol, br, red, v shy Dol, bf, dns, arg, dol, sitst, iamy, pol, bf, dns, arg, dol sitst, iamy, for dol sh Gr grn, sity sh Dol, gr, bf/mar, v shy, sity Grdg/marl, sh in pt, grdg/dol sh Sait, trnsp. v pure, red sh incl Ls, bf, f x, in-x por, silty in pt Gol, a dol sh, mar, bf Brick red, anhy, mott Much dk gr sh Anhy w/trnsp Dol, gr, v f x, suc, anhy Red mott sh incl, much dk gr
3000 3400 30000 3700 38000 3700 3800000000		Dol, bf, v f x, gran, foss Chara cast Sh, grn, imy, Sarcella Ghara Dol, it brn, f x, in-x, por, anhy com Dol, brn, f x, gran, arg, v imy, arg pt Dol, brn, f x, gran, arg, v imy, arg pt Dol, brn, v f x, gr is incl Dol, bf, f x, imy/bf, dns, v dol is, tr To sit casts To salt casts To salt casts Dol, bf, v shy, imy, dol, is salt Ls, bf, f x, gran dol, anhy incl Dol, bf, v shy, grdg/dol, marl Sh, gr, grn dol Dol, bf, v shy, grdg/dol, marl Sh, gr, grn, dol Dol, bf, dns, arg, dol, sitst, iamy, - Dol, br, red, v shy Dol, br, dns, arg, dol sitst, iamy, - Dol, br, dns, arg, dol, sitst, iamy, - Dol, br, ch, ed, y shy Dol, br, dns, arg, dol, sitst, iamy, - Dol, br, dns, arg, dol, sitst, iamy, - Dol, br, ch, red, y shy Bol, gr, bf/mar, v shy, sity Grdg/mari, sh in pt, anhy incl Mott, to gr, gr, n, dol sh Salt, trnsp. v pure, red sh incl Ls, bf, f x, in-x por, silty in pt Gol, a dol sh, mar, bf Brick red, anhy, mott Much dk gr sh Anhy w/trnsp Dol, gr, v f x, suc, anhy Red mott sh incl, much dk gr.

4000 CAMBRIAN 4100" salt w/g! sl 1 4200 Gr, bf Grn, f Foss f tex sh Glau com, fo ss frg gr,grn 4300 Inbd It gr ss, sltst, grn, mar, f tex sh, hi, mic, glau Sh,gr,grn,mar,f tex,f mic,slt,ss-W/glau ş Brn, gr 4400 Sitst, ss, it gr,f mic, glau, mar, grn Hi mic Cf tex sh Sh, f tex, vcl, sitst, rare <u>Lingula</u> Much gr, spi f tex sh Sitst, much mic, glau, grdg/ss, it gr **** ÷ Sh,gr,grn,f tex w/sltst lam,vcl Tr dol,much lt gr,hl,mic_sh Glau,sltst,ss 4500 3 ***** Sh,grn,f tex,spl w/m/crs ss,lam Mar sh,glau,f g,mic,ss,lam ±.... 2 **** -. . . . 4600 111 Anhy com -----Inbd gr, bf, sitst, f/m ss, glau, mic) Sh,grn,mar,spi,f mic,sli,ss,iam Much vcl sh,sdy dol Mostly.grn,gr,mar,tr.glau ***** 4700 1 Rare Lingula . 4800 h f/m g,glau ss calc, qtzic, m g ss Much THE T Tr Vel sh, crs, fitg ss ... ; PRE_CAMBRIAN? 4840'? 4900 T.D. Schi 4935! T.D. Drir 4841! 5000 CHALLENGER PETROLEUMS LTD CHALLENGER CHARGRAND CROWN #1 LSD8_12-53-4-W4 ALBERTA, CANADA LOG NO 366 5-00 1432-43'. 60 min. Blew 60 MCF in 10 min, 84 MCF in 30 min, 103 MCF in 60 min. Rec 2/3 bbl drilling mud,oil-cut. 1573-1592'. 50 min. Blew at rate of 3000 MCFPO after 3 min. Rec 1/3 bbl drillipg mud. 1586-96'. 60 min. Rec 7 bbls sait water 1667-1701. 60 min. Blew 358 MCF gas after 30 mins-initial blow 146 MCF gas. Rec 2.1 bbls oll-cut drilling mud. 1830-43'. 60 min. Initial blow 3000 MCFPD gas decr. in 30 min. to 534 MCFPD with fine spray muddy water. Rec .35 bbls sait water. DST DST 5200 DST DST DST 5300 5400

