MAR 19680044: FORT VERMILION

Received date: Dec 31, 1968

Public release date: Jan 01, 1970

GEOLOGICAL REPORT

SULPHUR PROSPECTING PERMIT NO. 32

FORT VERMILION AREA

Township 101, Range 8, West of the 5th Meridian

SULPHUR PROSPECTING PERMIT NO. 32

Location

Permit No. 32 is in the vicinity of Twp. 101, Range 8, west of the 5th Meridian. (See Geological Map) It consists of approximately 33 sections or about 21,120 acres. Lodge No. 1

General Geology

In this area Devonian rocks are overlain unconformably by Cretaceous shale. Erosion has exposed the Devonian in the lower areas, while the hills are composed of Cretaceous shales. The Devonian has a gentle regional dip to the southwest, so the subcrop trend is roughly northwest.

The Grosmont dolomite, a porous rock unit, has its northwestern limit along a line trending northeasterly through Township 108, Range 7, West of the 5th Meridian. Its subcrop-outcrop edge trends northwesterly through Township 104, Range 4, West of the 5th Meridian.

Sulphur Occurrence

The original discovery of sulphur in this area was in Township 110, Range 5, West of the 5th Meridian (Sulphur Permit #18). This sulphur is probably the key to understanding sulphur deposits elsewhere in the area.

A trench in Lsd. 11-8-110-5 West of the 5th Meridian is thought to be the showing on which the original discovery is based.

This trench is about two feet wide, four feet deep, and 80 feet long and trends N 26 deg. W. The trench is on a bulldozed line about 500 feet long that appears to have been cut for geophysical purposes. The ground is a level bench that is a few feet higher than land to the

east and south. It is covered with small second-growth poplar and birch trees. The trench is on glacial drift consisting of clay with scattered small cables. The weighted average percentage grade of sulphur by volume in the trench is about 17%. The highest assay comes from a small pit, about 25 feet west of the main trench, where the ground is about 90% sulphur by volume. The sulphur occurs as flour-like, imperfect, stubby crystals, about 25 microns in length that are scattered through the clay.

A test hole drilled nearby struck a small amount of sour inflammable gas at about 35 to 50 feet. The gas could be heard bubbling up through the water at the bottom of the hole. This association of shallow gas (probably from the Grosmont) and native sulphur seems too close to be coincidental and therefore is assumed to have genetic significance. Hydrogen sulphide can be oxidized to elemental sulphur by atmospheric oxygen. Therefore precipitation of native sulphur in the soil and subsoil is a possibility if sour gas leaked to the surface from an imperfectly sealed trap.

Details of Permit 32

Permit No. 32 is tree covered, with small swampy areas. No anomalies were detected during an aerial reconnaissance of this permit. The Wabiskaw River, which cuts across the west edge of the permit, flows in a deep valley that contains large outcrops of Loon River shale. The permit is undoubtedly underlain by these Cretaceous shales, which detract from its value as a prospective sulphur bearing area.

Conclusions

Because of the lack of positive evidence for sulphur, and the heavy Cretaceous shale cover in this permit area, we chose to drop this permit.

Respectfully submitted,

[redacted]

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Professional Geologist, Alberta

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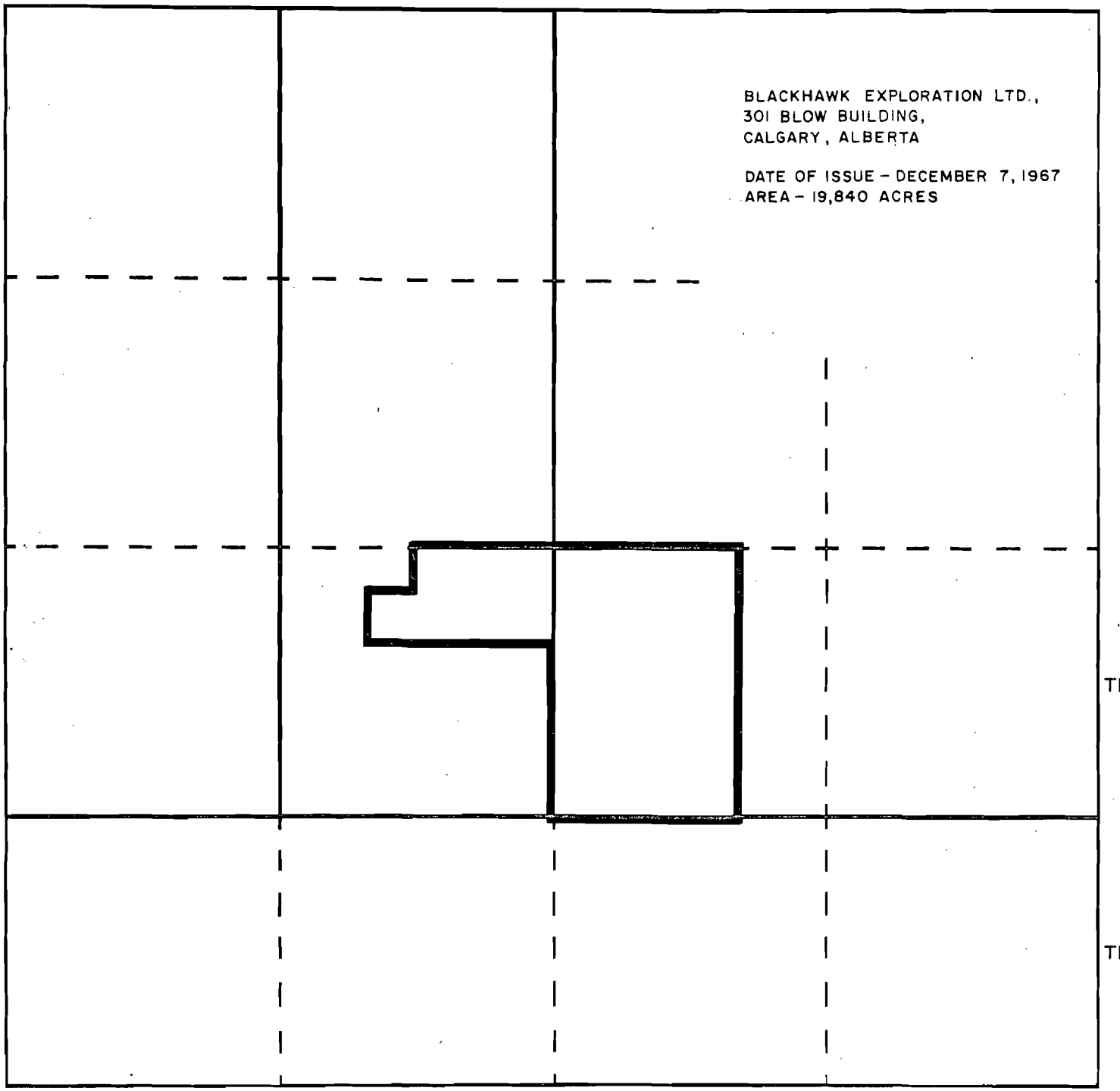

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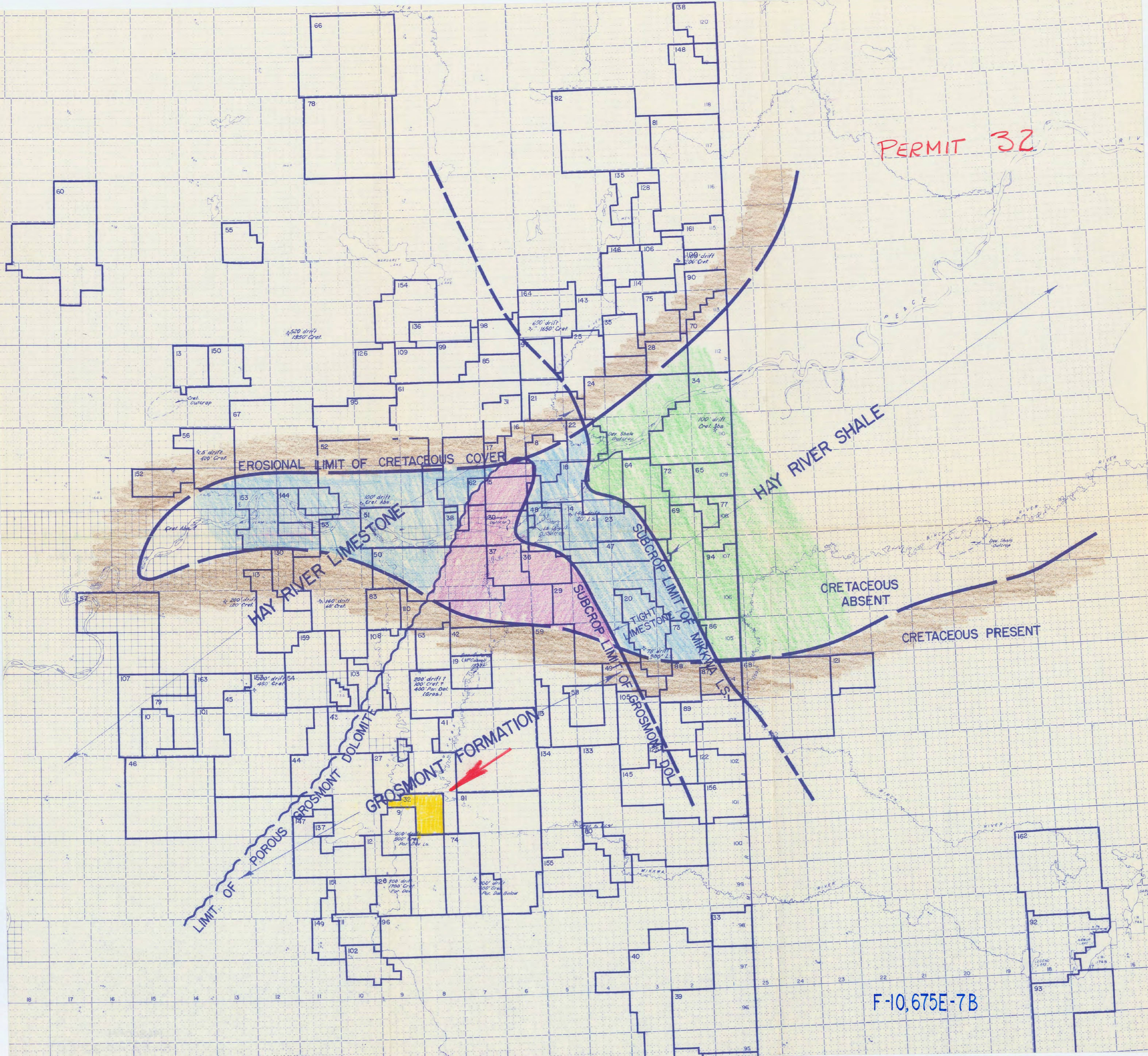
PERMIT 32
EROSIONAL LIMIT OF CRETACEOUS COVER
HAY RIVER LIMESTONE
HAY RIVER SHALE
SUBCROP LIMIT OF MIKKWA LS.
SUBCROP LIMIT OF GROSMONT DOL.
TIGHT LIMESTONE
GROSMONT FORMATION
LIMIT OF POROUS GROSMONT DOLOMITE
CRETACEOUS ABSENT
CRETACEOUS PRESENT
F-10,675E-7B