



**COAL PROPERTY EXAMINATIONS
PEACE RIVER COALFIELD**

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SAXON (931/1, 8)

The Saxon coal property of Denison Mines Limited is situated 160 kilometres south of Dawson Creek and immediately adjacent to the Alberta--British Columbia border. The property consists of 50 coal licences comprising 13 600 hectares of mountainous terrain.

Since obtaining the licences in 1970, Denison has performed exploration work on the property including 57 diamond-drill holes, 12 adits, and considerable geological mapping. The 1978 program consisted of 9 core holes and 13 rotary holes, all drilled in the Saxon East area where the coal measures dip 45 to 50 degrees southwest and are thought to be recoverable by underground hydraulic mining methods. Detailed geological mapping was also conducted in this area. The rotary drilling was used to delineate structure in a zone of deep glacial overburden.

The mineable coal reserves found to date on the Saxon property are entirely within the Gates member of the Commotion Formation. Denison has numbered the more significant coal horizons from 1 to 10 with the larger numbers corresponding to a higher stratigraphic level. Approximately one-third to one-half of these coal seams have mineable coal thicknesses at any one location. Aggregate coal thickness for these seams is in the order of 13 metres. The coal is of metallurgical grade.

Structurally, the Saxon property is a broad synclinorium trending northwest/southeast with the coal-bearing Gates member exposed on the flanks. Saxon East is the northeastern flank whose rocks dip at 45 degrees with some local thrust faulting present. Saxon South, with potential open-pit reserves, is on the southeastern flank and the rocks there exhibit stronger structural deformation. Saxon West is the area west of the Narraway River and little exploration work has been done in this area.

MONKMAN PASS (931/7, 8, 10, 15)

The Monkman Pass coal property is under licence to Canadian Superior Exploration Limited and McIntyre Mines Limited. The property includes 119 coal licences in 14 licence groups, in long linear belts trending northwest/southeast from Quintette Mountain in the north to Nekik Mountain in the south. The total licence area, comprising 6 800 hectares, is situated 115 kilometres south-southeast of Dawson Creek. Since 1976, Pacific Petroleum Ltd. has been operator of the Monkman Pass property by agreement with the above owners. Additional coal licences, adjoining the existing licences, were applied for in 1978.

The licences were granted in 1970 and exploration work was carried out in 1970, 1971, 1973, 1975, 1976, and 1977. This work included 23 core holes, geological mapping, and considerable trenching. The

exploration program in 1978 was the largest to date and included 30 core holes and 20 rotary holes in addition to two adits. One of these adits provided access to two different coal seams by way of a decline to a lower seam.

There are four coal seams (B1, B3, B4, and B9) of interest in the Gates member of the Commotion Formation. All Gates coal is given the prefix B and a number corresponding to its stratigraphic level. The Gething Formation has yielded one coal seam of economic interest to date (A2 seam). All coal is of metallurgical grade.

The most favourable potential mine area on the property is in the Duke and Duchess licence group. Cumulative thickness of the mineable Gates coal is in the order of 19 metres within 165 metres of stratigraphic section. The seams dip northeast at 18 to 20 degrees under a partial dip slope. Open-pit mining would be possible in the initial stages with later conversion to underground operations when strip ratios or hangingwall heights become too high. Coal reserves appear to be sufficient to support a mining operation with annual production in the range of 2.5 to 5 million tonnes. Most of the exploration work done to date has been in the Duke Mountain and Duchess Mountain area.

The property includes many other licences on which exploration activity has been minimal and consequently the evaluation of the coal potential is incomplete. Some of these licence groups are: Wapiti Dip Slope, Onion Syncline, Secus Dip Slope, Nekik Dip Slope, and Saxon Extension. In most of these areas the coal measures are dipping to the southwest at angles greater than 30 degrees. Six core holes completed in 1978 were on these licences.

DOWLING CREEK – SOUTH MOUNT GETHING (930/16)

Utah Mines Ltd. acquired the 21 coal licences belonging to Bow River Resources Ltd. and Rainier Energy Resources Inc. by an agreement made in May 1978 regarding the Dowling Creek coal property. Utah also applied for and was granted 24 new coal licences (South Mount Gething property) adjoining the western edge of the Dowling Creek licences. The property now comprises 11 750 hectares in 45 coal licences located between Gaylard and Dowling Creeks, approximately 25 kilometres west of Hudson Hope.

Dowling Creek licences were granted in 1971 and exploration was performed on the property in 1971, 1972, 1976, and 1977. During this period geological mapping and approximately 13 core holes were completed. The 1978 program drilled four core holes on the Dowling Creek portion and three core holes on the South Mount Gething portion of the licences. Geological mapping of the area was continued.

All of the coal occurs within the Gething Formation. The Gates member is of marine origin in this part of the coalfield and is therefore non-coal bearing. The type section of the Gething Formation occurs in the Peace River Canyon at the north end of the property just below the W.A.C. Bennett Dam. Over 17 different coal horizons have been recognized and named in the canyon area by various workers. Most of these coal occurrences are less than 1 metre thick and appear to be lenticular over short distances. The most promising seams are located within the top hundred metres of the formation which is regarded to be 600 metres thick

in the canyon area. Of these upper coals, the Trojan seam appears to be the best developed with reported thicknesses of 1.2 to 2.5 metres.

The Dowling Creek—South Mount Gething property is an anticline/syncline structure striking north/south with a southerly plunge. The anticlinal axis is centred over the South Mount Gething portion of the property and exposes Gething and Cadomin rocks within its core. The adjacent syncline to the east (Dowling Creek) has shallow-dipping limbs and contains rocks of the Fort St. John Group in the axial zone. The coal-bearing Gething Formation is encountered at depth except at the north end of the property where it is exposed at surface due to the synclinal plunge to the south. The exploration objective is to find coal of underground mineable thickness that occurs at surface and can be traced down into the syncline. This requires some deep drill testing and one of the 1978 holes exceeded 600 metres in depth. The results of this season's program are being evaluated.

MOUNT SPIEKER (93P/3)

The Mount Spieker coal property of Brameda Resources Ltd. is located between Bullmoose and Perry Creeks approximately 100 kilometres southwest of Dawson Creek. This property is currently optioned to Ranger Oil Ltd. and consists of 36 coal licences (3 100 hectares) of which three licences, issued in 1978, are in Ranger's name.

Original licences were granted in 1970, but the area received little exploration work other than reconnaissance mapping until 1975. During the field seasons of 1975, 1976, and 1977, 15 core holes, coal trenching, and detailed geological mapping were carried out. The 1978 program included 18 core holes and three adits for bulk sampling purposes.

Both the Gething Formation and the Gates member of the Commotion Formation contain coals of mineable thickness in the Mount Spieker area. The Gates member in particular has four significant coal horizons labelled A, B, C, and D respectively, with the D seam being stratigraphically the highest. Cumulative coal thickness for these seams is approximately 12 metres and occurs within 85 metres of stratigraphic section. Only the upper 150 metres of the Gates member is coal bearing, the lower 180 metres being barren. The Moosebar Formation which lies between the Gates member and the Gething Formation includes 100 metres of marine shale. The best developed coal within the Gething Formation is the Bird seam, which is situated just below the Moosebar contact, and is split into two discrete coal seams separated by 10 to 50 feet of rock. Aggregate coal thickness for the Bird seams is about 3 metres. The Skeeter and Chamberlain seams, located 18 metres below the Bird horizon, are not well developed. The Skeeter seam is the better of the two and achieves a mineable thickness on a very local basis only. The stratigraphically lower 'middle coals' of the Gething Formation have only been penetrated by a few drill holes and are relatively unexplored. All of the coal is of metallurgical grade.

Work to date has indicated four potential mining areas. The first is the Mount Spieker block where Gates seams A and B have underground mining possibilities. The rocks exhibit shallow dips with an occasional gentle roll. The block is relatively free of faults except for a major westerly dipping thrust which marks the

eastern boundary of this mining block. The Bird block, which encompasses the saddle area of Mount Spieker, has underground mining potential for the Bird horizon. A third underground mining prospect is the syncline area on the west side of Mount Spieker. The Gates coals may be recoverable in discrete panels of undeformed rock whose limits are defined by local structures present in the area. Lastly, there is the EB1 open-pit area where the Gates A, B, C, and D seams are recoverable by surface mining methods. All of the above-mentioned potential mining blocks are adjacent to one another. There are some remaining areas within the property which are still unevaluated, namely the West Bird and South Bird areas.

Ranger Oil envisions an eventual mining operation of 1 to 2 million tonnes per year where the excellent coking but relatively high sulphur coals of the Gething Formation may be blended with the low sulphur Gates coal.

SUKUNKA (93P/3, 4, 5)

The Sukunka coal property of B P Canada Limited is located between the Sukunka River and Bullmoose Creek, roughly 50 kilometres south of Chetwynd. The property incorporates three former properties of Brameda Resources Ltd., namely the Coalition–Sukunka, Chamberlain, and Bullmoose licence groups. B P Canada bought these licences from Brameda in early 1977. Brameda has retained certain rights to surface mineable coal in the Bullmoose portion of the property and Brascan Resources Limited still has a 12.5-per-cent interest in the Coalition–Sukunka portion. The amalgamated properties are now given the Sukunka name and include 61 coal licences comprising 16 565 hectares.

The Sukunka property was one of the first areas licensed and its early success helped generate interest in coal throughout northeastern British Columbia. Original licences were obtained in 1970, but exploration began a year earlier when Brameda drilled eight core holes on the coal occurrences reported by local residents. Since then a considerable amount of drilling, mapping, and adit work has been conducted on the property. Trial underground mining began in 1972 and has continued intermittently.

The 1978 program included 28 rotary holes and 8 core holes. Two of the core holes were deep tests, spudding in at the lower Gates member and drilling down to middle Gething rocks. The rotary rig was mainly used to test the middle and lower coals of the Gething Formation. Underground exploration continued in the south Chamberlain window with one continuous miner and one shuttlecar in operation.

The coal seams of prime interest all occur within the Gething Formation. The uppermost is the Bird seam occurring immediately below the Moosebar formational contact. The Bird seam achieves thicknesses of up to 3 metres on parts of the property. Approximately 40 metres below the Bird seam lies the Chamberlain coal horizon, the most important coal zone. The Chamberlain seam attains a thickness of 5 metres at some locations on the property. At other locations the zone splits into two separate seams, the uppermost called the Skeeter seam, the lower seam retaining the Chamberlain designation. Although both splits have mineable coal thicknesses at some locations, the Chamberlain split is more continuous than the Skeeter. The interval between both seams varies from 0 to 7 metres and this proximity may complicate the underground recovery of both seams in some areas. Approximately 130 metres further down section are the

middle coals. These seams, as well as the lower coals further down section, are currently being evaluated. All coals of the Sukunka property are considered metallurgical grade, particularly the Chamberlain seam which is regarded as a premium coking coal.

Structurally the property is cut by a number of thrust faults which define the boundaries of three mining plates. Most of the coal is recoverable by underground mining methods only. Current underground work in the Chamberlain horizon has indicated specific information on roof support, seam character, and floor regularity. The results of this underground exploration will determine the mining system needed for full-scale production. It will also have a direct bearing on the time frame and production rates of the eventual mining operation. Coal reserves are sufficient to support an operation in excess of 3 million tonnes per year, provided that the necessary underground mining rates can be achieved.

BURNT RIVER (93P/4, 5)

The Burnt River coal property of Brameda Resources Ltd. is situated 35 kilometres south of Chetwynd. The property includes 39 coal licences situated between Mink Creek and the Sukunka River. Eleven of these coal licences were issued in 1978. Total area of the property is 10 000 hectares.

Since original licences were granted in 1970, the Burnt River property received little attention other than reconnaissance mapping during the 1970–76 period. Detailed mapping in 1977 located a flat-lying 9.8-metre coal outcrop which initiated a four-core-hole drill program. The 1978 program has continued the drilling using a Winkie portable drill and a track-mounted diamond drill using NQ rods. The Winkie is used for shallow tests such as coal crop-line determinations and spotting favourable drill sites for the larger drill. Altogether 885 metres (31 core holes) of Winkie drilling and 1 815 metres (20 core holes) of NQ were completed this summer. Detailed geological mapping was also performed.

The area covered by the Burnt River property exhibits very strong structural deformation. The area is also totally forested. These two factors and little surface control have impeded the understanding of the deposit. The geological interpretation resulting from this year's work is considerably different than previous interpretations. A number of high-angle thrusts have been delineated from airphoto interpretation. Thick conglomerate units within the Boulder Creek Formation and the Gates member have been recognized and differentiated from those conglomerates occurring within the Cadomin Formation. However, the stratigraphy within formations and the correlation of drill holes within the property is not yet fully understood.

The Gething Formation contains most of the major coals. The Gates member, although coal bearing, appears to have no coals greater than 1 metre thick. Examination of the geophysical logs of Pacific Birch c-31-K, a natural gas exploratory hole located at the north end of the Burnt River licences, shows the Gething Formation to be 350 metres in stratigraphic thickness. Within the Gething Formation the logs reveal six coal seams having thicknesses greater than 1.5 metres of which five seams occur within the top 115 metres of the formation. A 7-metre coal encountered 45 metres below the top of the Gething Formation in the gas hole probably correlates to the 9.8-metre coal seen in outcrop. It is interesting to note

the geophysical log of the Pacific Birch hole also indicated numerous coal horizons within the Minnes Group which underlies the Cadomin Formation. At least five of these coal horizons exceed 1.5 metres in thickness. The Minnes Group has been mapped on the Burnt River property.

Brameda's 1978 program is designed to evaluate the open-pit coal potential of the property. The complex geological structure prevalent through the licences can be handled from a mining point of view provided the coals are thick enough and the strip ratios favourable. A coal seam has been encountered with a 20-metre local thickness. Several other seams are also being evaluated. All the coal is of high quality thermal grade.