SAXON COAL LIMITED

1976 EXPLORATION REPORT

Coal Licences: 2763 - 2812
N.T.S. Reference: 9311 - 9318

Operator: Denison Coal Limited

PR-SAXON 76 (1) A.

Geoff Jordan
January, 1977

Within this report International System (S.I.) weights and measures have been used throughout. British standards together with S.I. units have been stated in some instances for comparative purposes. Similarly, all maps and diagrams are prepared according to S.I. standards, except that degrees of dip rather than grads are used on geological maps.

STATEMENT OF QUALIFICATIONS

I, Geoffrey Robert Jordan, having completed a science degree course, majoring in geology, at the University of New South Wales, Sydney, Australia, at the beginning of 1971, have been engaged in coal exploration from that time to the present.

During this period I have carried out these investigations in Canada, Asia and Australia for several mining and geological consulting companies. This work has involved exploration on coal properties in British Columbia during the 1971, 1972, 1973, 1975 and 1976 field seasons and has included various forms of data collection, interpretation, project supervision and reporting to several private and governmental bodies.

I have been employed as a project geologist by Denison Coal Limited since March of 1975, principally responsible for exploration activities carried out on the Saxon coal properties.

The exploration project carried out by Denison Coal Limited on the Saxon property during the summer program of 1976 undertaken in the field, and the interpretation of data made off the property, came under my direct supervision.

Geoff Jordan, P. Geol.
Project Geologist

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1.0 SUMMARY

The Saxon property is located in the Province of British Columbia along the Rocky Mountain foothills coal belt from which all Western Canadian coking coal is produced. The property consists of 135.9 square kilometers of coal licenses situated just west of the border between the provinces of British Columbia and Alberta. The valley of the Narraway River, a major water course, cuts through the centre of the property and provides possible mine and plant sites and a potential transportation corridor as well as access to the coal reserves. The property is located approximately 153 kilometers from the Canadian National Railway at Bend, B.C. and about 131 kilometers from Grande Prairie, Alberta.

The following reserves have been outlined by exploration work to date:

		RESERVES IN PLACE (millions metric tons)	NET CLEAN COAL (millions metric tons)
SAXON EAST	South of Narraway (Indicated - includes portion below drainage to 500 metres cover)	162.1	57.4
	North of Narraway (Inferred - includes portion below drainage to 500 metres cover)	73.3	25.9
SAXON WEST	Eastern portion (Inferred - formerly defined as part of Saxon East; includes portion below drainage to 500 metres cover)	25.3	9.0

SAXON SOUTH	(Indicated - includes all coal to 500 metres cover, regardless of proposed method of extraction)	165.4	73.7
TOTAL INFERRED & INDICATED RESERVES		426.1	166.0

The table above includes coal reserves mineable by both surface and underground methods. The portion of these coal reserves mineable by surface methods, which are located in the Saxon South area, are tabulated below:

SURFACE MINEABLE RESERVES	SAXON SOUTH (Millions Metric tons)
Indicated in place	71.3
Net Clean Coal	40.1

In addition to the above inferred and indicated reserves, the portion of Saxon West, not included in the above reserve tables, is considered to have an exploration potential of about 220 million tonnes of coal in place.

In Saxon East and Saxon West net clean coal has been calculated on the basis of a 70% mining recovery for underground mining methods, an 85% geological confidence factor and a 70% preparation plant recovery factor. A further factor of 85% was applied to allow for premature termination of mining in any one district due to geological factors such as small scale faulting. This gives an overall mining recovery of 59.5%. These factors are applied where the mineable seams are in excess of 3 metres thickness. In Saxon South net clean coal for extensions to the pit area have been calculated on the same basis, but in the surface mining area a different set of parameters have been used which apply to the different mining method. For the area of surface mining, plant feed coal has been calculated by applying the following factors: 90% mining

Net clean coal = 35% of coal in place

SAXON

recovery, 85% geological confidence factor, the addition of 5% by weight for "out-of-seam" dilution, and a 70% plant recovery factor which includes the plant efficiency was used to calculate net clean coal. These calculations have been applied to the coal in place, which has been determined for seams Nos 1,2,3 and 4 where they are in excess of one metre thick and dipping less than 30° and where they are in excess of 1.5 metres thick and dipping in excess of 30°. For the surface mineable reserves a metric Plant Feed Ratio of 8.85/1 (cubic metres of overburden / metric ton of plant feed coal) has been calculated.

Based on analyses to date, the average quality of the clean coal from the Saxon South and Saxon East proposed mining areas is expected to be:

Ash	7.56%
Volatile Matter	22.37%
Total Moisture	0.81%
Fixed Carbon	69.26%
Sulphur	0.30 - 0.50%
F.S.I.	7 - 7½

(NOTE: Subject to revision after finalization of the Quality Section.)

From washability studies carried out during 1976 on 4 adit samples and 45 drill core samples, it appears that the coal will be cleaned at a specific gravity of 1.6 for the +28 mesh portion, 1.8 for the 28 x 100 mesh portion and froth floatation for 90 seconds on the -100 mesh portion. These cleaning parameters provide the above product at a preparation plant recovery of about 74% of raw coal uncorrected for core loss.

At the present time the 1976 adit and drill core samples are being subjected to extensive coke testing in the Department of Energy, Mines and Resources facilities in Edmonton, as well as testing laboratories in Germany, Japan and France. Only results from the 1970 - 1971 exploration program are currently available. These tests carried out

by the Department of Energy, Mines and Resources in Ottawa on the cleaned coal from four adit samples, showed that the Saxon coals are "premium medium volatile coking coals". In two cases, Saxon coals, blended in a 30/70 proportion with a standard high volatile coal, produced coke with physical characteristics equivalent to a similar blend using a premium low volatile American coal. Individual stability factors for the Saxon cokes ranged from 57.4 to 63.0 (Note preliminary coke test data is expected January 21 and will be incorporated in the final report).

On the basis of the 1970 - 1971 data a summary of the physical properties of the coke produced from the Saxon coals and their blends is tabulated below:

Average Fluidity	37.5 dd/m
Average Ruhr dilatation	31.8 %
Average Maximum Reflectance	1.35%
Mean Predicted Stability Factor	58.6

The Saxon East reserves are ideably suited for exploitation by hydraulic mining. The seams are 3.05 to 13.97 metres thick, dip 40 to 60 degrees, and are easily accessible from the valleys of the Narraway River and Saxon Creek.

The geological structure at Saxon South lends itself to the establishment of a major open pit mine with three significant lobes or centres of development which can easily be incorporated within the one overall operation. This mine would be located around the major anticline in this area.

2.0 INTRODUCTION

2.1 Program Objectives

The 1976 Saxon exploration program was designed to provide sufficient geological data from the Saxon property to allow a preliminary mining feasibility study to be prepared. From the beginning it was decided that most of the emphasis of the exploration program should be placed on the Saxon South area where earlier work had indicated a significant potential for open pit mining. In addition, the early phase of the program was designed to determine the most appropriate area for establishing underground coal reserves. On this basis the eastern edge of the Saxon West block and the original Saxon East area was selected for drilling and one adit was placed in Saxon East in addition to three in Saxon South. The various areas of the Saxon property examined in 1976 are shown on Drawing No. SXON 76-0726-R01.

This report includes not only the results of the current exploration program, but also incorporates the results of all previous exploration carried out on the property.

2.2 General Results

The major features of the current program are:

(1) The stratigraphy, structure, and reserve potential of the Saxon South block has been defined by detailed geological mapping, diamond drilling, adit driveage, trenching and other exploration techniques. The reserves in this area have been tested to an indicated category.

(2) Further diamond drilling, trenching, mapping and aditing of the mineable blocks in Saxon East has been carried out. This work has refined the knowledge of the stratigraphy and coal reserves of this area. In addition, the exploration in this area has allowed a modification of the interpretation of the geologic structure to be prepared.

(3) The Gates Member in Saxon West, identified by surface mapping during the 1975 program, was tested by diamond drilling and further mapping and correlated with known Gates Member sections in Saxon East. The results of this work indicated that exploration should be concentrated in Saxon East for the remainder of the 1976 program.

(4) In Saxon South and Saxon East significant coal reserves amenable to both surface mining and underground hydraulic mining methods have been defined during the 1976 exploration program.

Analytical data, geophysical logs and geological core descriptions collected during 1976 and previous exploration programs are included in summary form with this report. Complete copies of the detailed data are included in the final 1976 exploration report which is kept on file in the offices of Denison Coal.


YUKON
NORTHWEST TERRITORIES
BRITISH COLUMBIA
ALBERTA
PACIFIC OCEAN
UNITED STATES OF AMERICA
FORT NELSON
FORT ST JOHN
CHETWYND
DAWSON CREEK
GRANDE PRAIRIE
FORT McMURRAY
PRINCE RUPERT
PRINCE GEORGE
SAXON
WHITECOURT
EDMONTON
WOODWINSTER
BRULÉ
YELLOWHEAD PASS
JASPER
RED DEER
GOLDEN
BANFF
CALGARY
REVELSTOKE
KAMLOOPS
MEDICINE HAT
LETHBRIDGE
FORT MACLEOD
BRITANNIA BEACH
VANCOUVER
HOPE
VICTORIA
731 km
154 km
185 km
182 km
699 km
370 km
30 km
LEGEND
PROVINCIAL BOUNDARY
INTERNATIONAL BOUNDARY
GEOGRAPHICAL LOCATIONS
CAPITAL CITIES
RAILWAY LINES
MILEAGES BETWEEN POINTS
KILOMETERS BETWEEN POINTS
107 km
kilometers
50 0 50 100 150 200 250
miles
50 0 50 100 150
DENISON MINES LIMITED
CALGARY, ALBERTA
Location Map

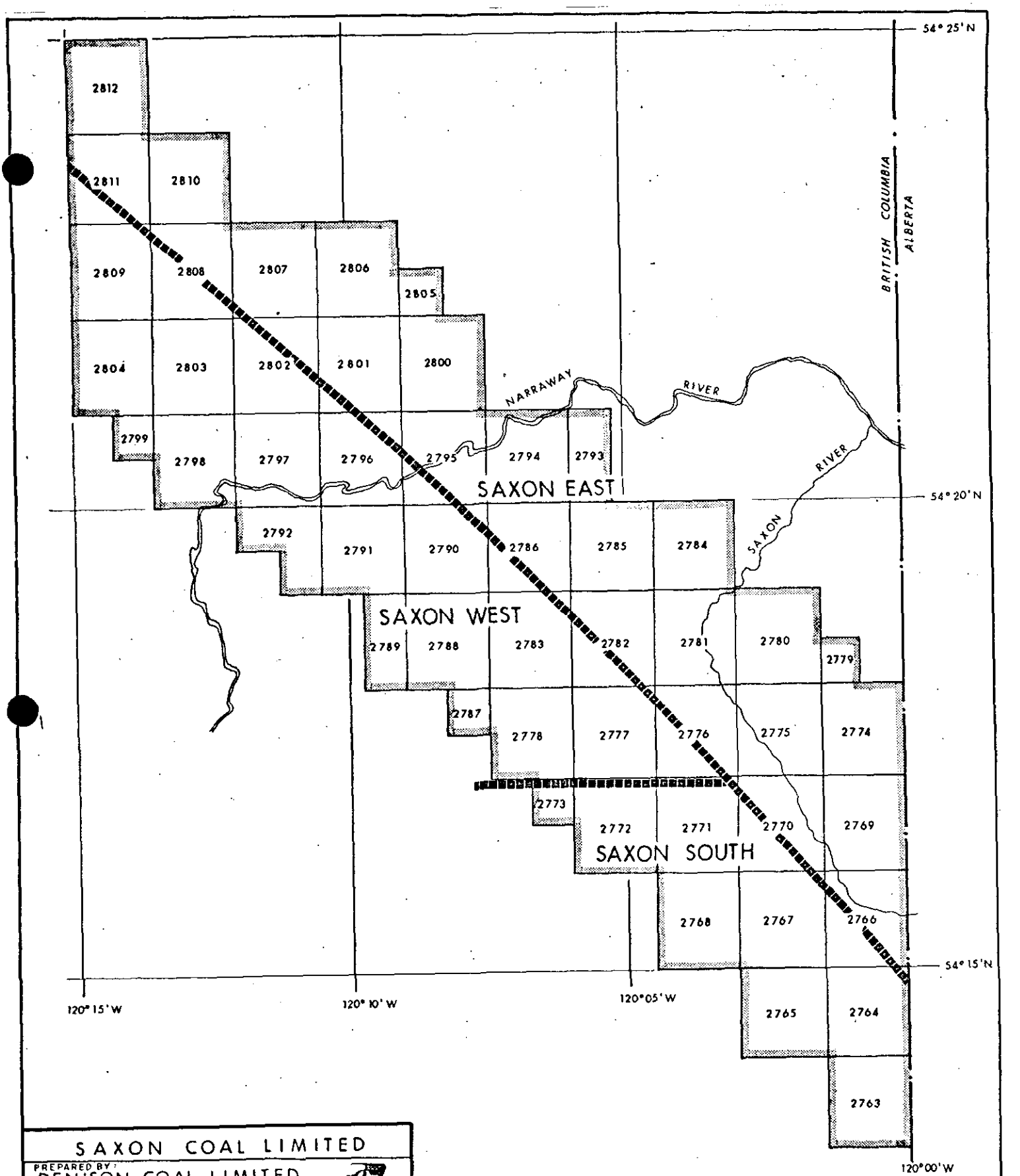
3.0 PROPERTY, LOCATION AND ACCESS

The current Saxon property coal licenses, covering an area of approximately 13,592 hectares, (33,585 acres) are shown on Figure No.2 and described in the attached schedule included as Appendix III.

The Eastern boundary of the property is coincident with the British Columbia/Alberta border, about 80 km. northwest of Grande Cache, Alberta. The property was located to cover exposures of the Lower Cretaceous Commotion and Gething Formations, which are the main coal bearing horizons in this part of the Rocky Mountain foothills coal belt.

The centre of the Saxon property is transected by the broad valley of the Narraway River. This valley forms the main transportation corridor for potential routes going both east and west from the property. To the west. the headwaters of the Narraway River meet those of Jarvis Creek at Gray Pass. A natural route to the west lies from Gray Pass, through Jarvis Creek , the McGregor River Valley, and Walker Creek, to Bend, B.C. The distance from the property to Bend, B.C. is 113 km. Other routes, both east and southeast, result in much longer total distances than the western route.

From Bend there are three alternative routes to the Pacific Coast: by Canadian National Railway to Vancouver (970 km.); by Canadian National Railway to Prince Rupert (905 km.) or by Canadian National Railway to Prince George, B.C., then by British Columbia Railway to Britannia Beach, B.C. (853 km.) These routes are shown on the map on the preceding page.



SAXON COAL LIMITED

PREPARED BY:
DENISON COAL LIMITED
CALGARY ALBERTA

SAXON RESERVE AREAS

1 0 1 2 MILES

DRAWN BY J.W.K.	DATE OCT., 75	SCALE 1: 100,000
APPROVED BY	DRAWING NO. SXON 75-0588-RO1	

4.0 SUMMARY OF EXPLORATION WORK

4.1 Description of Previous Exploration Programmes

On the basis of published regional geology that outlined Lower Cretaceous stratigraphy but did not document the existence of significant coal deposits, Denison Mines Limited acquired 53 coal licenses in the fall of 1970. After a brief preliminary examination, these licenses were drilled late in 1970 and the first major discoveries of potentially mineable coal resources were made.

This initial program was followed by more extensive drilling and limited geological mapping in 1971 and 1972. When possible, samples taken from this program were sent to a commercial laboratory for thorough testing of their chemical properties and cleaning characteristics. In addition, four adits were driven and large samples were taken, washed to approximately 7% ash, and shipped to Ottawa for extensive analysis of their coking potential. In 1974, the British Columbia Government repealed the Coal Act of 1960 under which the original coal licenses were issued, and therefore the licenses were replaced by new licenses under the Coal Act (1974).

The 1975 program consisted of helicopter supported geological mapping carried out by three geological teams. This exploration program included a re-evaluation of the Saxon East hydraulic mineable coal seams by detailed surface mapping. In addition, the first tentative identification of Gates Member strata in Saxon West was made, and the overall stratigraphy and structure of the Saxon South block was mapped. The mapping of the Saxon South block was highlighted by the discovery of numerous thick coal exposures which were to become the prime target

for the 1976 exploration program. At that time no positive correlation of those seams could be made with the coal seams which had been defined in Saxon East (see Denison Mines (B.C.) Limited 1975 Data Summary for Saxon Coal Limited). The geological mapping and the coal exposures in Saxon South were used to prepare an estimate of reserves for that area.

4.2 The 1976 Exploration Program

The aims of the 1976 Exploration Program have been detailed in section 2. and are summarized as follows:

1) To test the coal reserves, especially surface mineable coal in Saxon South.
2) To test the mining potential of Saxon West.
3) To further define the hydraulic mining reserves (in Saxon East).

To achieve these objectives a program of diamond drilling and geological mapping was carried out. Each phase of the program is described below.

4.2.1 Diamond Drilling

During the planning phase of the program it was decided that a sufficiently high geological confidence level could only be achieved by employing the full diamond core method of drill sampling. The following table summarizes the extent to which this method of testing in each of the Saxon areas was carried out during 1976.

SAXON SOUTH	14	DIAMOND DRILL HOLES
SAXON WEST	2	DIAMOND DRILL HOLES
SAXON EAST	4	DIAMOND DRILL HOLES
TOTAL	20	

The total footage drilled in this program was some 4421 meters. The location of the drill holes is shown on Map No. SXON 76-0726 - R01.

4.2.2 Trenching

The presence of surface seam exposures was used as much as possible to complement the drill core information and to provide as much detail of lateral seam variations as could be gained. The principal method of trench construction was by hand but a few critical trenches which were located below tree line and could not be trenched by hand were constructed by mechanized methods. The trenches constructed in each of the Saxon areas are tabulated below:

SAXON SOUTH	60 HAND TRENCHES
SAXON WEST	2 HAND TRENCHES
SAXON EAST	1 HAND TRENCH
AND	
	2 CAT TRENCHES

In general it was found that, in the portion of the Saxon property above tree line, hand trenches could be constructed more rapidly in a wider variety of locations than would have been possible by mechanized methods, and at a considerably lower cost. The construction of hand trenches as opposed to cat trenches is especially desirable, where possible, since the extent of environmental damage is negligible and reclamation is easily achieved. A location map of the trenches, SXON.76-0727-R01 is included in the map packet of this report.

4.2.3 Aditing

To allow bulk sampling, especially in the previously untested area of Saxon South, four adits, involving some 255 metres of total drivage, were constructed. The first of these adits, No.76-4-1, tested seam 4 in Saxon East and the remainder (Nos.76-4-2, 76-2-3 and 76-4-4) tested seam No.4 at two locations in Saxon South and seam No.2 at one location in the same area. Plans showing details of the adits, their location, coal quality and seam sections are included in the map packet as Map No. SXON.76-0713-R01.

4.2.4 Geological Mapping

To complement the 1975 Mapping program and to extend knowledge of the stratigraphy and structure of the property, further geological mapping of the Saxon South, East and West areas was carried out. The method employed was Denison Coal Limited's chain and compass modification of plane tabling; a method rapid enough to allow

significant areas of the property to be covered while maintaining a high level of accuracy.

This detailed mapping, especially of areas of the Rocky Mountain foothills above tree line, resolves many of the stratigraphic and structural probelms which are encountered, thus excluding the requirement for a "blanket coverage" approach to drill testing. This invariably means that drilling can be most effectively employed in a discretionary manner to solve geological problems which the mapping method is unable to resolve and to obtain coal samples. Using this approach to exploration leads to significant savings on drill testing and makes the requirement for a grid approach to drilling redundant.

All of the geological mapping carried out during 1976 is included at various scales in the map packet and summarized at 1:25,000 scale as Map No. SXON.75-0616-R02.

4.2.5 Testing and Analysis

An extensive program of geophysical borehole logging, coal core analysis, bulk coal sample testing and coke testing has been carried during 1976.

Geophysical logging using gamma ray, resistance, neutron, caliper and several density tools was carried out on seventeen of the twenty drill holes where access could be gained. This data has been extensively incorporated with geologists' detailed core logs to prepare the log summaries included in Appendix I as well as to determine seam thicknesses for reserve calculations and to prepare geological correlation diagrams.

The coal core and adit samples have been extensively tested by several Canadian coal laboratories and the results of this phase of the program are fully outlined in the Coal Quality section of this report.

4.2.6 Road and Drill Site Construction

In order to achieve the exploration in the Saxon South area a major access road to the area had to be constructed. As much care as possible was taken to ensure that this road

would be suitable for extensive use during future exploration programmes and that the necessary reclamation could be achieved as rapidly as possible. In addition, several short trails to drill locations and their drill sites were constructed. At the present time approximately half of the required slashing for reclamation and fire prevention along these trails has been completed.

At no time has a major road been constructed in the alpine areas of the property. In these areas it is the desire of both Denison Coal Limited and various government agencies involved that a minimum amount of damage to these areas be made while achieving the aims of the exploration program.

This principal was rigidly adhered to at all times.

4.2.7 Contractors

The following table summarizes the major contractors employed during the 1976 program and their area of responsibility:

TOMPKINS CONSTRUCTION	- drill site preparation
NORTH CANADIAN FOREST PRODUCTS	and road construction
MCCORD HELICOPTERS	- chartered aircraft
NAHANNI HELICOPTERS	
OKANAGAN HELICOPTERS	
WESTCAMP CONSTRUCTION CATERING	- catering and field
JIM CLAY RENTALS	camp rental
B.P.B. INSTRUMENTS LTD.	- geophysical logging
RENTWAY CANADA	- truck rental
AVIS RENTALS	
A & B CONTRACTING	- adit construction
TONTO DRILLING	- diamond drilling
WARNOCK HERSEY LABORATORIES	- coal core testing
CYCLONE ENGINEERING SALES LTD.	
BIRTLEY LABORATORIES	- adit sample testing
DEPARTMENT OF ENERGY MINES AND RESOURCES	- coke tests

Inaddition, numerous contracts were let for various field support and report preparation items.

4.2.8 Program Initiation and Supervision

Throughout the program overall supervision as well as data collection was undertaken by the staff of Denison Coal Limited with the assistance of personnel from Montan Consulting. Strict care and attention was paid to the sampling procedures for adits and drill cores, later delivered to the various laboratories for testing. All the operations of the various contractors was closely controlled by Denison staff so that they conformed to the aims of the program as planned prior the commencement of the field season. Ultimately, the staff of Denison Coal employed the information collected to determine the numerous geological conclusions described in the body of this report and outlined in the summary above. Personnel involved and their responsibilities are listed towards the end of this report.

5.0 STRATIGRAPHY

Within the Saxon property the Minnes Group (Nikanassin Formation) forms the base of the geological section, and a portion of the Shaftesbury Formation lies at the top of the sequence.

The intervening strata are a continuous and complete sequence from Cadomin Formation at the base to Commotion Formation at the top, with an overall thickness of some 652 metres. This stratigraphic sequence is illustrated on Table No. 1.

5.1 Minnes Group (Nikanassin Formation)

Although the Minnes Group is a coal-bearing sequence of strata, very little exploration work has been carried out to define the nature of this stratigraphic unit on the Saxon property. The numerous coal seams within the unit are presently considered too thin and contorted to be of economic significance. In addition, the rather monotonous nature of the group as a whole appears to mask the presence of marker beds which would assist in defining geologic structures.

The Minnes Group as a whole consists of thin-bedded, medium-grained brown sandstones, interlayered with dark grey to brown shales and mudstones. Numerous coal seams, usually less than 1 metre in thickness, appear to be present throughout the group. The group has a more arenaceous nature towards the centre where several thick massive sandstone units are observed.

An incomplete section of the Minnes Group is located on the Saxon property since this stratigraphic unit is considered to lie beyond the area of economic interest. Thus, the presence of the Minnes Group has been used to establish the boundary of the license area.

5.2 Cadomin Formation

The non-marine Cadomin Formation unconformably overlies the Minnes Group. Conglomerate, varying from granule to boulder, and coarse-grained sandstone constitute this formation. The conglomerate grains consist largely of multicoloured and well-rounded fragments of chert and quartzite, contained within a matrix of sand size material which appears to have a similar lithology. The coarse-grained sandstone phases within the Cadomin Formation appear to consist of the same material as that which forms the conglomerate matrix.

The thickness of this formation is extremely variable in the foothills region surrounding and including the Saxon property. An example of this variation is shown by comparing Cadomin Formation thicknesses from Mount Torrens, lying within the property in the south-east, and from Mount Belcourt, located nearby in a northerly direction. At Mount Torrens, Stott, in G.S.C. Bulletin No. 152 (1968), has reported a thickness of 9.5 metres for the Cadomin Formation thickness, while a thickness of 161.5 metres has been reported at Mount Belcourt.

The current exploration program on the Saxon property has established a thickness of 80 metres for the Cadomin Formation north of the Narraway River and 30 metres south of that point, giving an average value of 55 metres.

The Cadomin Formation is a distinct marker bed which has been extensively mapped to define the geologic structure at that stratigraphic level.

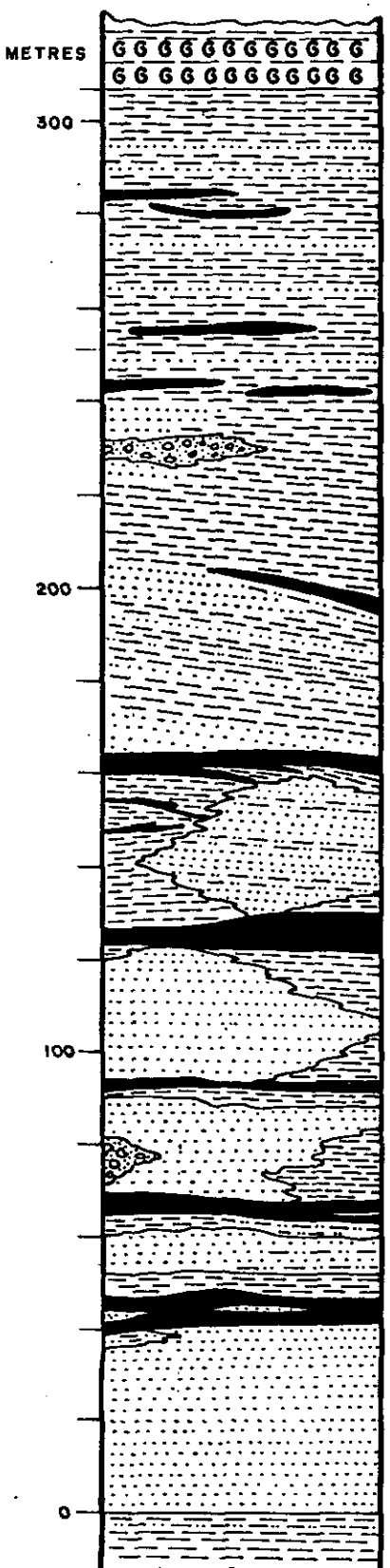
5.3 Gething Formation

Sedimentory rocks of the Gething Formation conformably overlie the Cadomin Formation. This essentially non-marine unit consists of brown coloured calcareous lithic sandstone ranging from fine to coarse grain size, interbedded with conglomerate, carbonaceous shale and coal seams. Along the foothills north of the Saxon property, the coal seams of the Gething Formation have attracted the attention of commercial interests. In the centre of the Saxon property, one drill hole (SD 7001) intersected the

TABLE OF FORMATIONS

SERIES	GROUP	FORMATION		LITHOLOGY	UNIT THICKNESS (METRES)
Lower Cretaceous	Fort St. John		Shaftesbury	Dark grey marine shales, sideritic concretions, some sandstone grading to silty dark grey marine shale, sideritic concretions, siltstone and sandstone in lower part, minor conglomerate.	+450
		Commotion	Boulder Creek	Fine-grained, well sorted, non-marine sandstone, mudstone and carbonaceous shale, conglomerate, few thin coal seams.	115
			Hulcross	Dark grey marine shale in the north grading to extremely fossiliferous shaly beds interlayered with sandstone and thin coal seams in the south.	15
			Gates	Fine-grained marine and non-marine sandstones; conglomerate, coal, shale and mudstone.	365
			Moosebar	Dark grey marine shale with sideritic concretions, glauconitic sandstones and pebbles at base.	67
	Bullhead		Gething	Fine to coarse brown calcareous sandstone, coal, carbonaceous shale, and conglomerate.	70
			Cadomin	Massive conglomerate containing chert and quartite pebbles.	55
	Minnes Group		Nikanassin	Thin-bedded grey and brown shales and brown sandstones, containing numerous thin coal seams.	

GENERALIZED STRATIGRAPHIC SECTION
Gates Member – Commotion Formation



UNIT	LITHOLOGY
HULCROSS MEMBER	marine shale characterized by shelly beds.
SEAM NO. 10 TO HULCROSS INTERSEAM STRATA	predominantly mudstone with numerous thin sandstone beds and several thin coal seams. One conglomerate bed present in the north of the property.
SEAM NO. 10	present in the southern part of the property but lenses out towards the north.
SEAM NO. 5-10 INTERSEAM STRATA	claystone unit interbedded with sandstone, siltstone, and numerous thin coal seams. Some conglomerate present at the centre to the south side of the property.
SEAM NO. 5	appears to split and lens at several locations through the property.
SEAM NO. 4-5 INTERSEAM STRATA	unit characterized by sandstone and siltstone to the south; claystone, shale and thin coal seams to the north side of the property.
SEAM NO. 4	thickness increases rapidly near the centre of and to the south of the property.
SEAM NO. 3 INTERSEAM STRATA	unit characterized by sandstone with claystone to the south side of the property.
SEAM NO. 3	present at the north and south but absent near the centre of the property.
SEAM NO. 2-3 INTERSEAM STRATA	sandstone unit characterized by claystone at top and south side of the property; conglomerate to the north.
SEAM NO. 2	present throughout the property but characterized by a thick rock band in the south.
SEAM NO. 1-2 INTERSEAM STRATA	sandstone unit characterized by mudstone at top and base.
SEAM NO. 1	thickens to the north where several splits are present.
BASAL GATES SANDSTONE	usually homogenous unit of medium to coarse grained, lithic sandstone.
MOOSEBAR FORMATION	marine mudstone with thin siltstone interbed near top.

Gething Formation and located no coal seams in excess of 0.5m thickness. One coal seam of economic thickness has been located on the surface beyond the northern end of the property. No information is presently available regarding its quality and continuity.

The Gething Formation has an average thickness of 70 metres on the Saxon property.

5.4 Moosebar Formation

On the Saxon property, the Moosebar Formation consists of a monotonous sequence of dark grey marine shale containing numerous sideritic concretions. The formation appears to conformably overlie the Gething Formation, although a thin glauconitic pebble-conglomerate is located at the base. This glauconitic unit is thought to be the equivalent of the Bleusky Formation located in the same stratigraphic position in central Alberta.

As in most other parts of the foothills, the boundary between the top of the marine Moosebar Formation and the overlying, predominantly non-marine, Gates Member of the Commotion Formation is indistinct. A gradual increase in the sandstone interbeds is observed.

The top of the Moosebar Formation is taken to be the appearance of the first prominent sandstone unit which has a thickness of approximately 2 metres on the property.

The average thickness of the Moosebar Formation on the Saxon property is 67 metres. This distinct unit has greatly assisted the definition of the structure of the property.

5.5 Commotion Formation

The Commotion Formation is subdivided into three members: the Gates Member, the Hulcross Member and the Boulder Creek Member.

5.5.1 Gates Member

A) General Stratigraphy

The section of the stratigraphy with the greatest economic potention on the Saxon property is the Gates Member of the Commotion Formation.

This mainly non-marine unit consists of sandstone, conglomerate, coal, shale and mudstone and has an average thickness of 365 metres within the Saxon property. Contained within the total thickness of Gates Member section are six potentially economic coal seams which have an average total thickness of 18 metres. The seams are labelled 1 to 5 and No. 10, as shown on the Saxon correlation diagram (Drawing No. 76-0698-R01). Three of these seams, Nos. 1,2 and 4, form the bulk of the coal-bearing section and together with No. 3 seam at Saxon South are the only ones included at present within mining reserve categories.

B) Details of Seam Stratigraphy

As a result of detailed logging of drill cores, geophysical logging and trench logging it has been possible to establish a positive correlation between the coal seams encountered in Saxon East with those in Saxon South. This correlation is especially apparent when the seam characteristics of No. 4 seam are examined; a rock band approximately 10 cm thick is consistently found approximately 30 cm from the top while two thick rock bands, each often as thick as 50 cm, are commonly located approximately 1 metre from the base of the seam. The rock band near the top of the seam is especially characteristic in outcrop, where it is usually found to have a metallic blue sheen after weathering has taken place. In addition, it has been found that the fine-grained sandstone which immediately overlies the No. 4 seam is especially abundant in fossil flora.

Another seam characteristic which has aided the seam correlation is found to occur at seam No. 1. The base of this seam is distinguished by an abrupt change from coal to the coarse-grained sandstone forming the seam floor. This feature was found to be unique: for all other seams the floor material was found to be composed of mudstone, carbonaceous claystone or silty mudstone with a somewhat gradual reduction in the presence of coaly matter in these rock types.

The coal seam correlation in the northern part of the property was further strengthened by the results gained from D.D.H. 7616. Previously D.D.H. 7202 had been correlated tentatively with D.D.H. 7003 in a manner which indicated that seams No. 1 & 2 had not been intersected in the former drill hole (c.f. 1975 Data Summary for Saxon Coal Limited). A thick conglomerate unit intersected at the base of D.D.H. 7202 had been interpreted in the field to be part of either the Gething or Cadomin Formations but later correlation placed it in the Lower Gates. In hole 7202 drilling was terminated at that horizon before the full section was penetrated. The same Gates Member conglomerate was intersected in D.D.H. 7616 and drilling was continued to intersect two coal seams underlying the conglomerate. Subsequent comparison of the seam characteristics, detailed core logging, and geophysical logs, has established that the original tentative correlation was correct and has, at the same time, established the relationship between the strata of Saxon West and the sequence at Saxon East on a firm basis.

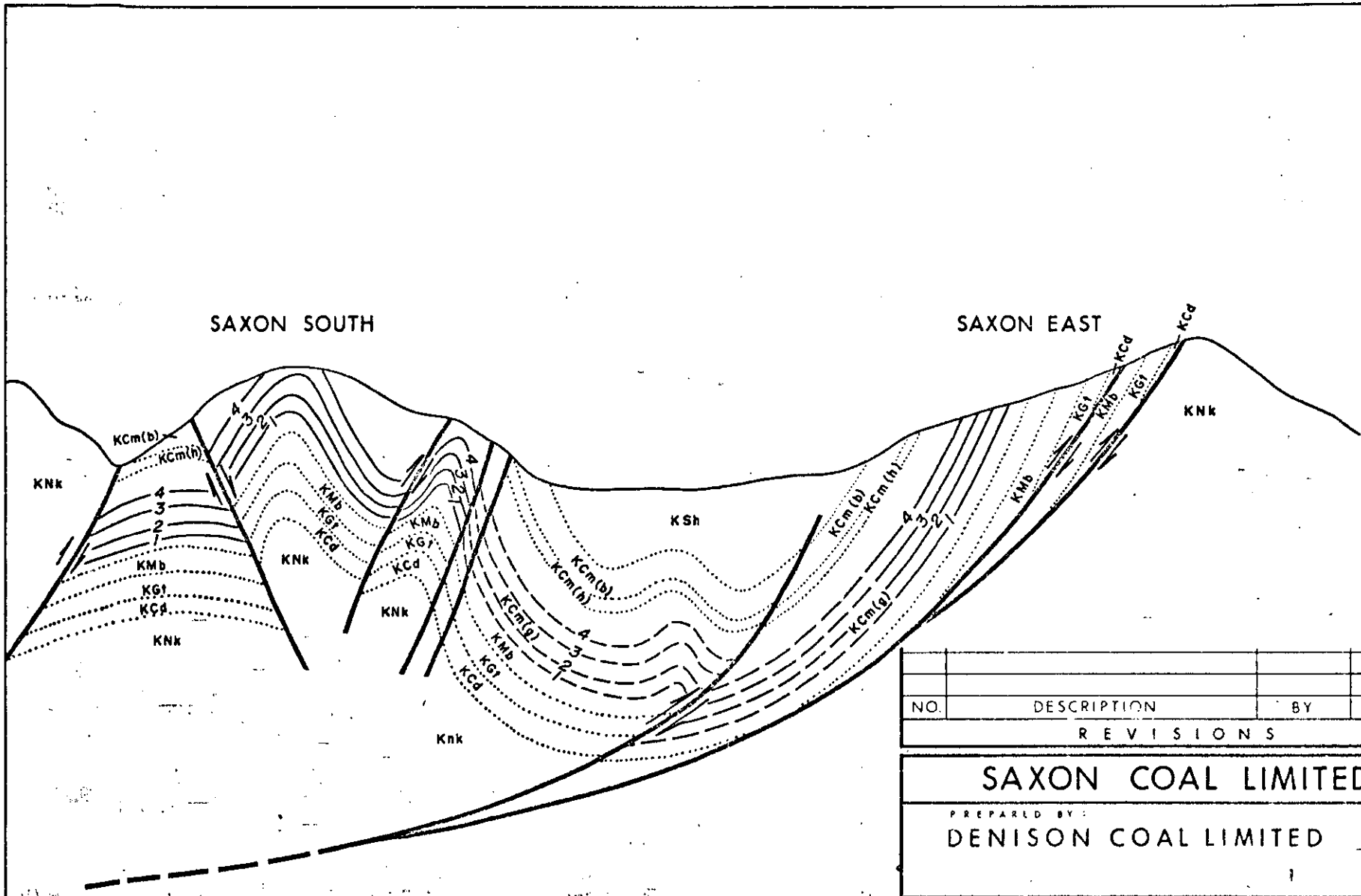
The preceeding observations are illustrated in a general manner on the Saxon Correlation Chart, Drawing No. SXON 76-0698-R01, and in detail on the various trench and drill core correlation diagrams included in the map packet and listed in the Table of Contents.

It should be noted that all seam correlation and stratigraphic correlation diagrams have been corrected to true thickness intervals for the 1976 data, while data from previous programs included in the stratigraphic correlation is presented as core intervals. The use of true thickness data allows the most meaningful comparison of the data possible; correction of old logs to true thickness was not carried out because of time limitations and the lack of access to some of the earlier cores, which would have had to be investigated to carry out this procedure with the same degree of confidence that applies to this years work. In any case, it is found that most of the pre-1976 drill holes were made at an angle almost perpendicular to the dip of the bedding and their sections thus approximate true thickness intervals.

C) Seam Thickness Variation

One of the major aims of the 1976 program at Saxon was to establish the lateral continuity of the economic coal seams. On the basis of previous work there was some possibility that the coal seams at Saxon would be found to thicken and thin or in fact lens out over very short lateral distances. This suggestion was found to be invalid especially where drilling has been concentrated in the proposed mining areas. The Correlation Diagram and Seam Correlation Charts clearly show that only gradual variations of seam thickness occur between trenches, drill holes and adit Sections.

In only one case (seam No. 4 in D.D.H. 7613) was a rapid change in seam thickness observed. In this section a sequence of thin coal and rock material over the expected thickness and at the correct stratigraphic level was identified by the geophysical logs. Investigation of the core of this section shows the presence of numerous coal bands contained within tectonically disturbed and slickensided mudstone and carbonaceous claystone.



NO.	DESCRIPTION	BY	DATE

REVISIONS

SAXON COAL LIMITED

PREPARED BY:
DENISON COAL LIMITED

SCHEMATIC CROSS SECTION THROUGH SAXON PROPERTY VIEWED TOWARDS THE NORTH

DRAWN BY: D. W.	DATE: JAN. '77	SCALE: —
PREP'D BY: G. J.	DATE: JAN. '77	FIG. 1
APPR'D BY: G. J.	DATE: JAN. '77	

This geological feature is interpreted to be a very local structure; being either a washout which became the locus for later tectonic movement or small-scale faulting at the seam level. The surrounding adits and drill holes tend to verify this interpretation since they show no marked tendency towards a thinning of the coal seam in this area.

In the Saxon South area, where a sufficiently well distributed number of data points are available, isopach maps have been prepared which clearly illustrate the lateral variations of coal mining sections as well as "in seam" dilution. Variations of seam thickness in Saxon East, where an insufficient spread of data points occur to allow isopach maps to be prepared, are documented on the reserve maps for that area. The isopach maps and reserve maps are included in the map packet and are listed in the table of contents.

It should be especially noted for seam No. 4 in the Saxon South area, for which the greatest number of data points is available, that the coal seam is thickest along the axis of the main anticline in that area and thins somewhat on the limbs of that structure. It is believed that this may be the result of tectonic thickening of the seam during folding and it may be found that a similar pattern exists for the other seams, when further data becomes available.

D) Gates Member Interseam Sediments

Time Limitations have not allowed a detailed study of the Gates Member interseam strata to be made to show the facies variations of these small units through the various parts of the Saxon Property. However general observations of the nature of these units are complete and are presented within the preceeding text figure. A thorough study of the variation of these units is a necessary and valuable guide to both diamond drilling and surface mapping. It is presently intended to carry out such a study prior to the commencement of further field work.

5.5.2 Hulcross Member

The major stratigraphic problem in the Saxon property concerns the identification of marker horizons which allow precise coal seam correlation.

Within the Rocky Mountain foothills, the dark grey marine siltstones and shales of the Hulcross Member and the marine shales of the Moosebar Formation are usually readily identifiable and clearly establish the top and base of the Gates Member respectively. These markers assist in the interpretation of geological structures and seam correlations. However, on the Saxon property, while the Moosebar Formation has always been readily observed, the development of the Hulcross Member has been retarded to such an extent that this unit has often remained unobserved or has been miscorrelated with similar thin shaley units. Therefore, for practical local correlation purposes, the Hulcross Member has been defined as that shaley unit, some 15 metres thick, often characterized by an abundance of shelly fossils and lying approximately 365 metres above the top of the Moosebar Formation. This correlation is shown on the Saxon Stratigraphic Correlation Drawing No. 76-0698-R01.

The Hulcross Member conformably overlies the Gates Member and is similarly overlain by the Boulder Creek Member.

5.5.3. Boulder Creek Member

The Boulder Creek Member consists of fine-to-medium-grained, well sorted, mon-marine sandstone, containing phases and inter-beds of mudstone, carbonaceous shale and conglomerate. A few thin and discontinuous coal seams were intersected in this unit, but these seams have proven to be of no economic significance.

Most of the Boulder Creek strata are considerably more resistant to erosion than the overlying beds of the Shaftesbury Formation. Thus, these older strata are largely responsible for the development of the series of ridges trending along the eastern side of the Saxon property.

The upper 25 metres of Boulder Creek Member Strata in D.D.H. 7602 consisted of carbonaceous claystone, mudstone and some siltstone containing numerous thin coal bands. The contact between the Boulder Creek Member and the overlying Shaftesbury Formation is thus placed at the contact between the predominantly marine and non-marine strata.

The Boulder Creek Member has a thickness of approximately 115 metres on the Saxon property.

5.6 Shaftesbury Formation

The youngest stratigraphic unit on the Saxon property, conformably overlying the Boulder Creek Member, is the Shaftesbury Formation.

The Shaftesbury Formation consists of dark gray marine shale containing sideritic concretions and some sandstone phases. These lithologies grade in the lower half to silty dark gray marine shale and siltstone, with sandstone and minor conglomerate near the base.

Erosion has left only an incomplete section of this formation near the south central part of the Saxon property. In this area, a section containing 450 metres of the Shaftesbury Formation can be observed.

6.0 STRUCTURE

6.1 General Structure

On a large scale, the structure of the Saxon property appears to be that of a large and complex synclinorium trending northwest and plunging from both the southern and northern ends to the centre of the property. The central portion of the property is thus a folded and faulted series of the Lower Cretaceous strata surrounded by older Lower Cretaceous rocks within the margins of the property. The 1:5000 geology maps and their cross sections, Drawing Nos. SXON 76-0706-R01 and SXON 76-0689-R01 show the overall structural style. The geology of the area is summarized on the included 1:25000 map (Drawing No. SXON 75-0616-R02). A thrust fault has removed portions of the western limb of the principal synclimorium, placing non-economic Minnes Group strata over the Lower Cretaceous formations. A section showing the general structure is included as the following text figure.

6.2 Definition of Saxon Areas

Each of the areas, Saxon East, Saxon West and Saxon South, have been defined by structural features which separate them. Saxon East and Saxon West are separated by a south westerly dipping thrust or reverse fault which produces a repetition of the coal-bearing strata. All of the strata lying east of the fault are considered to be in the Saxon East area and the strata on the west side lie within either the Saxon West or Saxon South areas. Saxon South is separated from Saxon West by a further thrust fault lying on the western side of the former fault.

In the northern part of the Saxon property the fault forming the boundary between Saxon East and Saxon West is located near the centre of the northwestern property boundary and strikes in a southeasterly direction parallel to the strike of the beds. South of the Narraway River, the trend of this fault swings in a more southerly direction where it can no longer be traced in the tree covered Saxon valley. From that point Saxon East continues to be defined by the southeasterly trending alpine ridges to the southern end of the property.

The fault separating Saxon West and Saxon South has its northern limit against the western exposures of the Nikanassin Formation immediately south of the Narraway River. The fault trends southeasterly to continue beyond the southern end of the property at a point close to the centre of the southern property boundary (B.C. border).

6.3 Saxon South

In general, Saxon South consists of a large northwesterly trending anticline. In detail there are several northwesterly plunging synclines and anticlines separated by several extremely steeply dipping reverse faults. The trend of the fold axes is quite variable along strike and in places significant folds die out over remarkably short distances. Reference to the Saxon South geology map (Drawing No. SXON 76-0700-R01) and the cross sections (Drawing No. SXON 76-0689-R01) illustrates the internal structure of that portion of the property.

6.4 Saxon West

The internal structure of Saxon West is poorly understood because most of this area lies within the densely vegetated and poorly exposed portion of the property located in the

central Saxon valley. However, one fault repeated portion, formed in a manner identical to that which separates Saxon East from Saxon West, has been identified on the east side of the Saxon West area. On the west side of this fault the strata are folded into two parallel anticlines, separated by a syncline trending southeasterly north of the Narraway River.

6.5 Saxon East

In general, Saxon East consists of a series of uniformly dipping strata which trend southeasterly along the eastern property boundary. The dip of the strata varies from 35 degrees at the northern end of the property to 60 degrees at the southern end of the property.

In the same style as fault repeated strata located in the northern part of the Saxon property, similar smaller fault repeats have been reported and mapped in Saxon East south of the Narraway River. In general, the faults in this part of the property are located in the older Lower Cretaceous strata and usually affect only the Cadomin and Gething Formations. At the southern end of the property, however, adjacent to the British Columbia - Alberta provincial boundary, one of these structures is of sufficient magnitude to thrust strata of the Gething Formation over the Gates Member.

6.6 Fault Orientation

With a few exceptions, the nature of the thrust faulting in the Saxon East area can be described according to a single pattern. The faults are commonly encountered in the well exposed eastern ridge, and in this area they are steeply dipping from 50^{o} to approximately 70^{o}. It has also been observed that the bedding in this area dips in the order of 35^{o} to 50^{o}. The angular relationship between the faults and bedding is thus in the range of 10^{o} to 20^{o}. It should be

noted that in many areas of flat dipping strata within the Rocky Mountain foothills north of the Saxon property, a similar relationship between thrust faulting and bedding is observed. In these areas, of course, the thrust faults have a shallow overall dip. At this time, it is not known whether the attitude of the thrust faults has been caused by their generation at a high angle or whether folding of the strata postdated faulting.

One of the exceptions to the above mentioned pattern of faulting lies within Saxon East, south of the Narraway River. A loss of the stratigraphic section was observed in drill hole S.D. 7001 and a large faulted section occurred towards the base of drill hole S.D. 7620. Small scale structures in the drill core indicated that this loss of section was due to thrust faulting. Investigation of surface data and consideration of this loss of section suggest that thrust faulting must have taken place at a lower dip angle than the dip of the strata. Although this interpetation was further tested in 1976, additional work will be necessary to fully document this feature for mining purposes.

Another exception to the general pattern occurs at Saxon South where the faulting is reverse in style dipping between 70^{o} and 90^{o} independently of the dip of the strata. In addition, the direction of dip may be either easterly or westerly. At the present time no particular mechanism has been developed to explain the orientation of these structures.

6.7 Effects of Structure on Mining

The internal folding and faulting of the Saxon syncline has generated the various potential mining districts. The imbricate thrust sheets of the Gates Member in Saxon East have generated areas suitable for mining by hydraulic methods. In addition, folding and faulting has generated a broad anticline of exposed Gates Member strata in Saxon South where coal seams near the surface may be mined by open pit methods.

7.0 RESERVES

The following table summarizes coal reserves on the Saxon property. For underground mining in Saxon East, three seams (Nos. 1, 2 and 4) in excess of 3 metres thickness are included to a depth of 500 metres of cover. For surface mining in Saxon South, four seams (Nos. 1, 2, 3, and 4) in excess of one metre thickness have been included. More comprehensive tables of reserves are shown on the following pages. The precise reserve calculations and details of the methods of calculation for Saxon East, South and West are included in appendix IV.

RESERVES FOR UNDERGROUND MINING

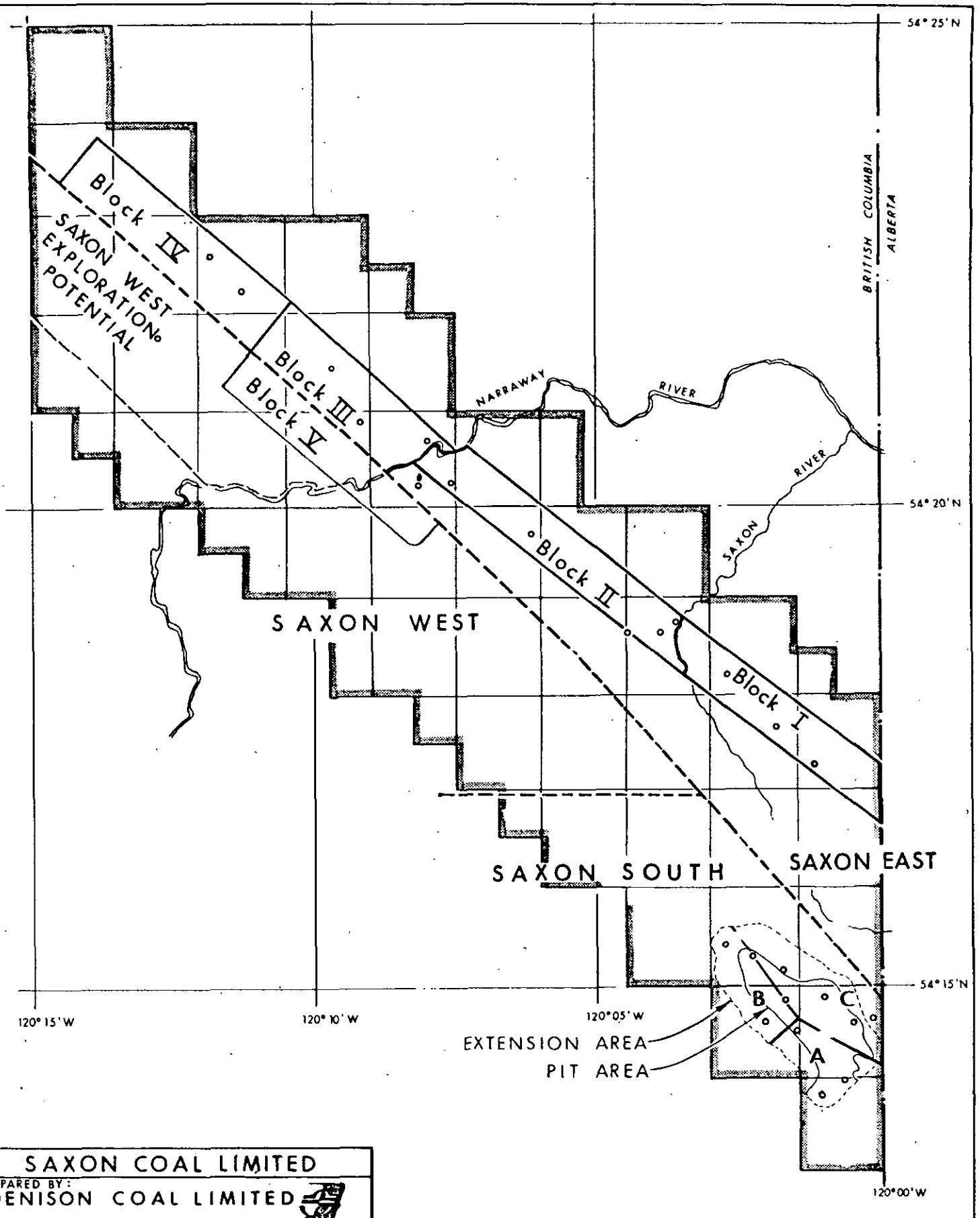
TABLE NO. 2

			MILLIONS METRIC TONS (IN PLACE)	MILLIONS METRIC TONS (NET CLEAN COAL)
SAXON EAST (North of Narraway River)	Inferred Reserves	Above Drainage and Below Drainage	73.3	25.9
SAXON EAST (South of Narraway River)	Indicated Reserves	Above Drainage	137.3	48.6
		Below Drainage	24.8	8.8
SAXON SOUTH	Indicated Reserves (beyond pit area)		94.1	33.6
SAXON WEST	Inferred Reserves (eastern portion)		25.3	9.0
		TOTAL	354.8	125.9

RESERVES FOR SURFACE MINING METHODS

SAXON SOUTH	Indicated Reserves (pit area)	71.3	40.1

In addition to the above inferred and indicated reserves, the Saxon West area has a calculated exploration potential of 220 million tons of coal in place.



SAXON COAL LIMITED

PREPARED BY:
DENISON COAL LIMITED
CALGARY ALBERTA

627

BLOCK AREAS

1 0 1 2 MILES

DRAWN BY: J.W.K. DATE: Jan '77

APPROVED BY:

The Plant feed ratio calculated for raw coal to which mining and geological factors have been applied is 8.85/1 cublic metres/metric ton or 11.75 cu. yd./long ton. This ratio excludes coal with less than 15 metres cover (oxidized) and does not include smaller seams above No. 4 seam.

7.1 Definition of Reserve Areas

The property has been divided into three parts for ease of discussion within this report (see Figure No. 3).

Saxon East: That area bordered in the east and south by the property boundary and the British Columbia/ Alberta provincial boundary respectively. This area encompasses the northwest, southeast third of the property.

Saxon West: That area bordered to the east and west by Saxon East and the property's western boundary respectively, excluding the southwestern sector of the property. This area encompasses most of the remaining two thirds of the property.

Saxon South: The remaining southermost portion of the property bounded on the north and east by Saxon West, and on the south and west by the property boundaries.

7.2 Basis for Reserve Calculation

Since the amount and type of information varies from one area to another, a number of parameters were applied to the reserve calculations and these are explained as follows:

7.2.1 Saxon East Area

In Saxon East information from twelve drill holes, five adits and three trenches is available from which seam thicknesses and coal quality have been determined. An analysis of

SAXON EAST INDICATED RESERVES (PLANIMETRY METHOD) TABLE NO. 3

PORTION BELOW BASE OF FLUME LINE TO 500 METRE DEPTH

SEAM	BLOCK	AREA (SQ.M. x 10^6)	AVERAGE DIP SECANT	AVERAGE SEAM THICKNESS(M.)	VOLUME (Cu.M. x 10^6)	SPECIFIC GRAVITY	COAL IN PLACE METRIC TONS x 10^6	NET CLEAN $_6$
1	(oxidized	-	-	-	-	-	-	-
1	(unoxidized)	0.25	1.156	8.18	2.02	1.45	2.93	1.22
11	(oxidized)	0.02	1.346	4.31	0.08	1.45	0.11	0.05
11	(unoxidized)	1.42	1.346	4.64	6.61	1.45	9.58	3.99
11	(oxidized)	0.01	1.346	2.94	0.03	1.45	0.05	0.02
11	(unoxidized)	0.90	1.346	2.95	2.65	1.45	3.84	1.60
11	(oxidized)	0.02	1.346	6.02	0.10	1.45	0.15	0.06
11	(unoxidized)	1.02	1.346	5.67	5.80	1.45	8.42	3.51
				$\bar{X} = 5.40$				
TOTAL	(OXIDIZED)				0.21		0.31	0.13
	(UNOXIDIZED)				17.08		24.77	10.32

PORTION ABOVE BASE OF FLUME LINE

1	(oxidized)	0.10	1.346	9.98	0.98	1.45	1.42	0.59
1	(unoxidized)	3.74	1.346	10.52	39.31	1.45	57.00	23.74
1	(unoxidized) (flume-500M)	0.26	1.346	13.69	3.59	1.45	5.21	2.17
11	(oxidized)	0.12	1.346	5.59	0.69	1.45	1.00	0.42
11	(unoxidized)	3.70	1.346	5.46	20.22	1.45	29.32	12.21
11	(oxidized)	0.10	1.346	3.83	0.40	1.45	0.57	0.24
11	(unoxidized)	3.63	1.346	4.11	14.96	1.45	21.70	9.04
11	(unoxidized) (flume-500M)	0.23	1.346	4.51	1.02	1.45	1.48	0.62
11	(oxidized)	0.13	1.346	4.51	0.56	1.45	0.82	0.34
11	(unoxidized)	3.40	1.346	4.40	14.98	1.45	21.72	9.05
11	(unoxidized) (flume-500M)	0.15	1.346	4.00	0.61	1.45	0.88	0.37
TOTAL	(OXIDIZED)				2.63		3.81	1.59
	(UNOXIDIZED)				89.48		129.75	54.04
	(UNOXIDIZED) (FLUME-500M)				5.22		7.57	3.16
	(UNOXIDIZED)				94.70		137.32	57.20
GRAND TOTAL	(OXIDIZED)				2.84		4.12	1.72
	(UNOXIDIZED)				111.78		162.09	67.52

A further factor of 85% can be applied to the net clean coal grand total to allow for geologically related mining problems. Thus allowance can be made for termination of mining due to such geological problems. The application of this factor would give the following:

Below base of flume line	unoxidized	8.77×10^6 metric tons
Above base of flume line	unoxidized	48.61×10^6 metric tons
Grand total above and below flume line	unoxidized	57.38×10^6 metric tons

SAXON EAST INFERRED RESERVES (PLANIMETRY METHOD) TABLE NO. 4

SEAM	BLOCK	AREA (SQ.M. x 10^6)	AVERAGE DIP SECANT	AVERAGE SEAM THICKNESS(M.)	VOLUME (Cu.M. x 10^6)	SPECIFIC GRAVITY	COAL IN PLACE METRIC TONS	NET CLEAN x 10^6
IV	(oxidized)	0.21	1.219	3.32	0.68	1.45	0.99	0.41
IV	(unoxidized)	4.14	1.188	3.02	12.50	1.45	18.12	7.55
III	(oxidized)	0.04	1.346	3.99	0.17	1.45	0.25	0.11
III	(unoxidized)	0.98	1.258	4.01	3.91	1.45	5.67	2.36
III	(oxidized)	0.16	1.335	5.81	0.95	1.45	1.38	0.57
III	(unoxidized)	6.45	1.223	5.27	34.01		49.46	20.60
GRAND TOTAL	(OXIDIZED)				1.80		2.62	1.09
	(UNOXIDIZED)				50.42		73.25	30.51

A further factor of 85% can be applied to the net clean coal grand total to allow for geologically related mining problems. Thus allowance can be made for termination of mining due to such geological problems. The application of this factor would give the following:

OXIDIZED - 0.92×10^6 metric tons

UNOXIDIZED - 25.94×10^6 metric tons

SAXON WEST INFERRED RESERVES (PLANIMETRY METHOD) TABLE NO. 5

SEAM	BLOCK	AREA (SQ.M. x 10^6)	AVERAGE DIP SECANT	AVERAGE SEAM THICKNESS(M.)	VOLUME (Cu.M. x 10^6)	SPECIFIC GRAVITY	COAL IN PLACE METRIC TONS x 10^6	NET CLEAN 10^6
V(oxidized)		0.01	1.051	7.31	0.09	1.45	0.13	0.06
V(unoxidized)		3.32	1.074	5.40	17.47	1.45	25.33	10.55

A further factor of 85% can be applied to the net clean coal total to allow for geologically related mining problems. Thus allowance can be made for termination of mining due to such geological problems. The application of this factor would give the following:

OXIDIZED - 0.05 x 10^6 metric tons

UNOXIDIZED - 8.97 x 10^6 metric tons

the drill hole data was made firstly to establish true seam thicknesses from cored intervals and geophysical logs and secondly to determine the portions of the seam intersections with an acceptable wash yield which would represent seam mining sections. A summary of this analysis is given in Appendix V. Graphic logs, used to determine the mining sections for drill holes, adit and trenches, are included as Appendices I and II.

The seam thicknesses included in the reserve calculation are taken only from seam Nos. 1, 2 and 4 where the thickness is in excess of three metres and where expected seam wash yields could be shown to be approximately 70% at a reasonable ash value. In some instances, where poor core recoveries were encountered, the yield was recalculated from the sink/float data assuming that the lost core was mostly coal. This is usually found to be valid: the top quality coal in the Rocky Mountain foothills strata is often ground and flushed away in the drilling process.

Once the location and thickness of the mining section was determined, a series of structure contour maps for each of the economic seams was prepared. These contour maps extend to a 500 metre overburden depth limit and include an "above drainage" portion above a four degree flume line drawn from the proposed mining entry to the seams. In one instance this flume line lies slightly below the 500 metre overburden line. Reserve calculations for the portions above and below drainage (the flume line) have been made separately, as is shown on Table No. 2, as an aid to engineering. The prepared structure contour maps for reserve calculation terminate at a line drawn where the seams are fifteen metres vertically below the topographic surface. The portion of the seam between this line and the surface outcrop is excluded from the calculations to allow for oxidized coal. To determine raw coal tonnage a specific gravity of 1.45 was applied. Calculation of reserves

was then made using the contour map planimetry method which is fully described in Appendix IV and the summary table of reserves by mining blocks is presented on the previous page.

To check the results of this calculation a series of cross sections through the same area and spaced at 500 metre intervals was prepared. Using the same parameters and seam thicknesses described above, the reserves were again calculated by the cross section method. A detailed description of this method and comparison tables of the results of the calculation is included in Appendix IV. The reserve maps, for Saxon East, Drawing No. 76-0723-R01, are included in the map packet.

7.2.2 Saxon South Area

In Saxon South the surface mining potential has been considered as well as the additional potential for underground mining, and separate reserve figures for both portions of the area are included in Table No. 2. For the open pit reserves calculation, the geological staff of Denison Coal Limited worked in close conjunction with the staff of Montreal Engineering Limited to determine the reserves and a pit limit which fulfilled the economic constraint of an overall maximum plant feed ratio of 9.0/1.

Geologic mapping has established in Saxon South the presence of four seams which are considered to be of economic thickness. Isopach maps of these four seams based on drill core intervals, adit sections, and hand trenches, were prepared. Reserve calculations have been made for these seams where the mining section of each seam is in excess of 1.5 metres for dips greater than 30^{0}, and 1 metre or more for dips less than 30^{0}.

To estimate the reserves, calculation by the cross section method described above was carried out using sections spaced 200 metres apart. To check these reserve calculations, structure contour maps of the seams were prepared and seam volumes were

determined by the planimetry method. The same allowance for oxidation as had been used in Saxon East was applied. A comparitive table of results of the calculation of reserves in Saxon South are shown. The results obtained by planimetry are included in Appendix No. IV. The reserve maps, Drawing No. SXON 76-0722-R01, are enclosed in the map packet.

NOTE: It is believed that significant portions of seams Nos. 5 and 10 may also be mined by surface methods. Since these seams lie above the mineable seams in Saxon South, they are presently included within the overburden portion of the reserve calculations.

If it can be shown that even relatively small tonnages of these seams can be mined, a significant reduction of the overburden ratio may be obtained. Further exploration of these seams would be required to resolve this issue.

7.2.3 Saxon West Area

In the Saxon West area, an exploration potential has been calculated on the basis of the mapped surface outcrop area of the coal bearing Gates Member and from a regional knowledge of total Gates coal thicknesses together with the three drill holes located in the area in adjacent localities. These calculations are included in Appendix No. IV.

9. CONCLUSIONS

All information gathered from exploration programs to date shows excellent coking coal is available at Saxon.

Coal reserves of 40.1 million metric clean tons which could be mined by open pit methods, have been located in the Saxon South area. These reserves are shown to have an overall metric plant feed ratio of 8.85/1. Beyond the immediate pit area for Saxon South net clean coal reserves of 33.6 million metric tons have been calculated giving a total indicated clean coal reserve for that area of 73.7 million metric tons.

In Saxon East the additional exploration has raised the reserves south of the Narraway River to an indicated category. In this area a total of 162.1 million metric tons in place has been calculated of which 57.4 million metric tons could be mined and processed as clean coal.

North of the Narraway River the coal reserves of Saxon East are considered to fall into an inferred category. 73.3 million metric tons of coal in place yielding 25.9 million metric tons of clean coal have been calculated.

Additional drilling and surface mapping has shown that the portion of property lying immediately west of the Saxon East block which was formerly considered to be part of Saxon East should, in fact, be placed in Saxon West. Such an interpretation of the geology was applied during 1976 and inferred reserves for that portion of Saxon West was determined. These inferred reserves total 25.3 million metric tons in place which could yield 9.0 million metric tons of clean coal. An exploration potential of 220 million metric tons has been tentatively applied to the remainder of Saxon West.

The exploration carried out during 1976 has firmly established the geological correlation of the Gates Member strata throughout the Saxon property and shown that the major economic coal seams have developed with marked continuity through much of it.

Further exploration, especially by hand trenching, diamond drilling and detailed geological mapping, will allow the coal reserves under the various reserve categories to be brought to a proven reserve category.

10. EXPLORATION PROGRAM PERSONNEL

During the 1976 Exploration Program for Saxon Coal Limited technical supervision and data analysis was carried out by the staff of Denison Coal Limited with assistance from personnel from Montan Consulting. The professional staff involved are listed below:

DENISON COAL LIMITED

Mr. ALAN A. JOHNSON	-	CHIEF GEOLOGIST
Mr. GEOFF. JORDAN	-	PROJECT GEOLOGIST
Mr. ED. SANTIAGO	-	SENIOR GEOLOGIST
Mr. TED WATCHUK	-	GEOLOGIST
Mr. HANS PALLOKS	-	"
Mr. IVAN DALAS	-	"
Ms. GEORGIA HOFFMAN	-	"
Mr. CHARLES MANKOWSKI	-	"
Mr. MATTHEW DUFORD	-	"
Ms. ALICE BIENIA	-	"

Extremely valuable assistance was also provided by a team of technically qualified geological assistants.

MONTAN CONSULTING

Mr. KARL ENGELS	-	CONSULTANT GEOLOGIST

The efforts of these people to aid in the successful completion of this program and the preparation of this report is gratefully acknowledged. The advice and assistance of members of the various British Columbia government agencies, especially the British Columbia Department of Mines and Petroleum Resources and the British Columbia Forest Service is also acknowledged with thanks.

APPENDIX III

CURRENT SCHEDULE OF COAL LICENCES

SAXON PROPERTY

SAXON

Licence No.	Date Issued	Acres	Land Description		
			Series	Block	Units
2763	Oct 16/74	748	93-I-1	I	61, 62, 71, 72
2764	"	748	93-I-1	I	81, 82, 91, 92
2765	"	748	93-I-1	I	83, 84, 93, 94
2766	"	747	93-I-8	A	1, 2, 11, 12
2767	"	747	93-I-8	A	3, 4, 13, 14
2768	"	747	93-I-8	A	5, 6, 15, 16
2769	"	747	93-I-8	A	21, 22, 31, 32
2770	"	747	93-I-8	A	23, 24, 33, 34
2771	"	747	93-I-8	A	25, 26, 35, 36
2772	"	747	93-I-8	A	27, 28, 37, 38
2773	"	187	93-I-8	A	39
2774	"	747	93-I-8	A	41, 42, 51, 52
2775	"	747	93-I-8	A	43, 44, 53, 54
2776	"	747	93-I-8	A	45, 46, 55, 56
2777	"	747	93-I-8	A	47, 48, 57, 58
2778	"	747	93-I-8	A	49, 50, 59, 60
2779	"	187	93-I-8	A	62
2780	"	746	93-I-8	A	63, 64, 73, 74
2781	"	746	93-I-8	A	65, 66, 75, 76
2782	"	746	93-I-8	A	67, 68, 77, 78
2783	"	746	93-I-8	A	69, 70, 79, 80
2784	"	746	93-I-8	A	85, 86, 95, 96
2785	"	746	93-I-8	A	87, 88, 97, 98
2786	"	746	93-I-8	A	89, 90, 99, 100
2787	"	187	93-I-8	B	51
2788	"	746	93-I-8	B	61, 62, 71, 72
2789	"	373	93-I-8	B	63, 73
2790	"	746	93-I-8	B	81, 82, 91, 92
2791	"	746	93-I-8	B	83, 84, 93, 94
2792	"	560	93-I-8	B	85, 95, 96
2793	"	373	93-I-8	H	8, 18
2794	"	746	93-I-8	H	9, 10, 19, 20
2795	"	746	93-I-8	G	1, 2, 11, 12
2796	"	746	93-I-8	G	3, 4, 13, 14

Licence No.	Date Issued	Acres	Land Description		
			Series	Block	Units
2797	Oct 16/74	746	93-I-8	G	5, 6, 15, 16
2798	"	746	93-I-8	G	7, 8, 17, 18
2799	"	187	93-I-8	G	19
2800	"	746	93-I-8	G	21, 22, 31, 32
2801	"	746	93-I-8	G	23, 24, 33, 34
2802	"	746	93-I-8	G	25, 26, 35, 36
2803	"	746	93-I-8	G	27, 28, 37, 38
2804	"	746	93-I-8	G	29, 30, 39, 40
2805	"	187	93-I-8	G	42
2806	"	745	93-I-8	G	43, 44, 53, 54
2807	"	745	93-I-8	G	45, 46, 55, 56
2808	"	745	93-I-8	G	47, 48, 57, 58
2809	"	745	93-I-8	G	49, 50, 59, 60
2810	"	745	93-I-8	G	67, 68, 77, 78
2811	"	745	93-I-8	G	69, 70, 79, 80
2812	"	746	93-I-8	G	89, 90, 99, 100
		33,585			