PAN OCEAN OIL LTD.
BONNET PLUME PROJECT

REPORT ON GEOLOGY AND EXPLORATION OF THE BONNET PLUME BASIN YUKON TERRITORY

NTS 106-E
65° 30' N 135° W

COAL EXPLORATION LICENCES
129(formerly 93) 132 and 133(formerly 72 and 73)
and
134 - 149(formerly 77-92 and 150-154(formerly 94-98)

Prepared by : Pan Ocean Oil Ltd.
Coal Department

Pan Ocean Report No. 4-81
January, 1981

This report has been examined; declared acceptable as Representation Work under Section 32 and Schedule B of the Canada Mining Regulations and valued in the amount of $2,590,090.00

Chief, J.H. Laine

Date: March 4, 1981.

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SUMMARY

Pan Ocean Oil Ltd. controls 24 Coal Exploration Licences in the Bonnet Plume Basin located in the northern Yukon Territory. Exploration conducted from 1978 through 1980 consists of geological mapping, the drilling of 53 diamond drill holes for a total of 10,700 metres, and baseline environmental studies.

The exploration programmes have indicated that the Bonnet Plume Basin contains a coalfield of major proportions having measured, indicated and inferred in situ resources in excess of 650 million tonnes located in 7 widely separated areas (Table I). Sufficient quantity of coal is available to provide 10 to 15 million tonnes thermal coal per year for export in addition to the support of a proposed mine-mouth thermal power plant of 210 megawatts capacity.

The coal is a high quality thermal coal ranked as high volatile 'C' bituminous (ASTM classification). A weighted average (tonnage basis) proximate analysis of the coal on a clean coal basis[1] is:

Yield	76.9%
Moisture	5.2%
Ash	14.3%
Volatile Matter	33.0%
Fixed Carbon	47.4%
Calorific Value	10,016 BTU's/lb. (23.3 MJ/kg)
Sulphur	0.33%

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1 Clean coal basis means a reconstituted sample of 1/4" x 28 Mesh fraction at -1.90 s.g. and the 28 Mesh x 0 fraction on a raw basis.

TABLE I

SUMMARY OF RESOURCES

COMPANY: Pan Ocean Oil Ltd.
PROJECT: Bonnet Plume

January, 1980

Deposit Area	Measured	Indicated	Inferred	Subtotal	Total
Illtyd	120.93	29.21	33.50	183.64	183.64
Wernecke		104.65	28.93	133.58	317.22
Airstrip			18.40	18.40	335.62
Wind		60.83	43.80	104.63	440.25
West Illtyd			47.56	47.56	487.81
Garlic Ring		8.60	5.55	14.15	501.96
Spaceship			157.95	157.95	659.91
TOTAL	120.93	203.29	335.69	659.91	659.91

1.0 INTRODUCTION

During the summer of 1977 coal was discovered in the Bonnet Plume Basin by personnel of Pan Ocean Oil Ltd. Subsequently Pan Ocean acquired control over 24 Coal Exploration Licences covering a total of 387,308 hectares (957,024 acres) (Figure 1). The Licences are underlain by sedimentary rocks (Upper Bonnet Plume Formation) of Tertiary age containing lignitic coals in the north and sedimentary rocks (Lower Bonnet Plume Formation) of Cretaceous age containing bituminous coals in the south. Detailed investigations by Pan Ocean have been restricted to the southern area where the underlying rocks contain bituminous coals.

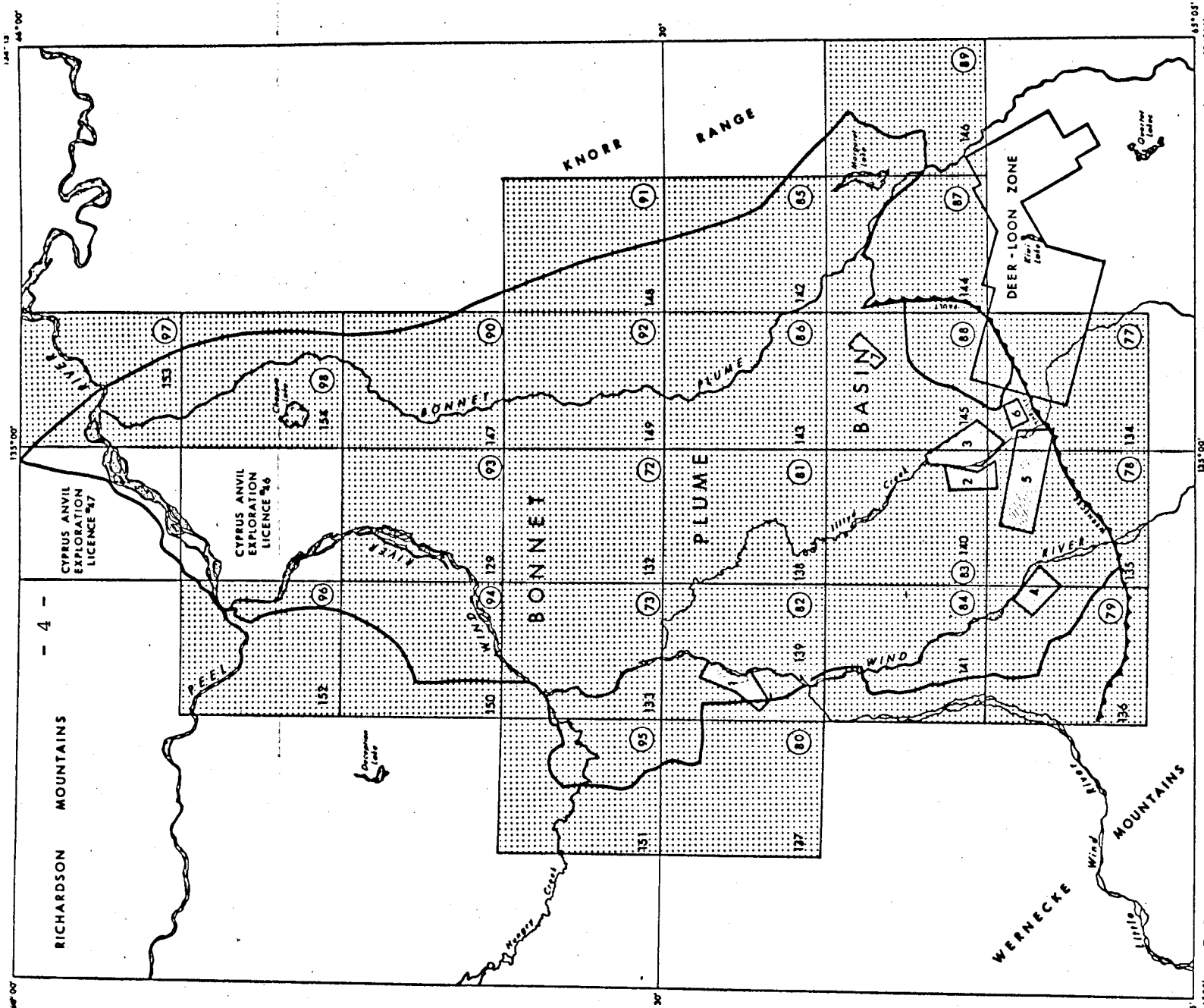


Figure 1

COAL OCCURRENCES

1 - WIND RIVER
2 - WEST ILLTYD
3 - ILLTYD
4 - AIRSTRIP
5 - WERNECKE
6 - SPACESHIP
7 - GARLIC RING

SYMBOLS

COAL OCCURRENCES

BONNET PLUME BASIN BOUNDARY

CANCELLED JAN., 1981 (96) COAL EXPLORATION LICENCE NO.

REISSUED JAN., 1981 141 COAL EXPLORATION LICENCE NO.

5,000 0 5,000 10000 20000

TO ACCOMPANY REPORT NO 4-81 BY DRC

REVISED SEPTEMBER, 1980 GEW

PAN OCEAN OIL LTD.
CALGARY ALBERTA

COAL OCCURRENCES OF THE BONNET PLUME BASIN

YUKON TERRITORY

DATE	SCALE	NTS	DRAWING NO.
LB/NOV., '77	1:	106 E	C-0069

2.0 LOCATION AND ACCESS

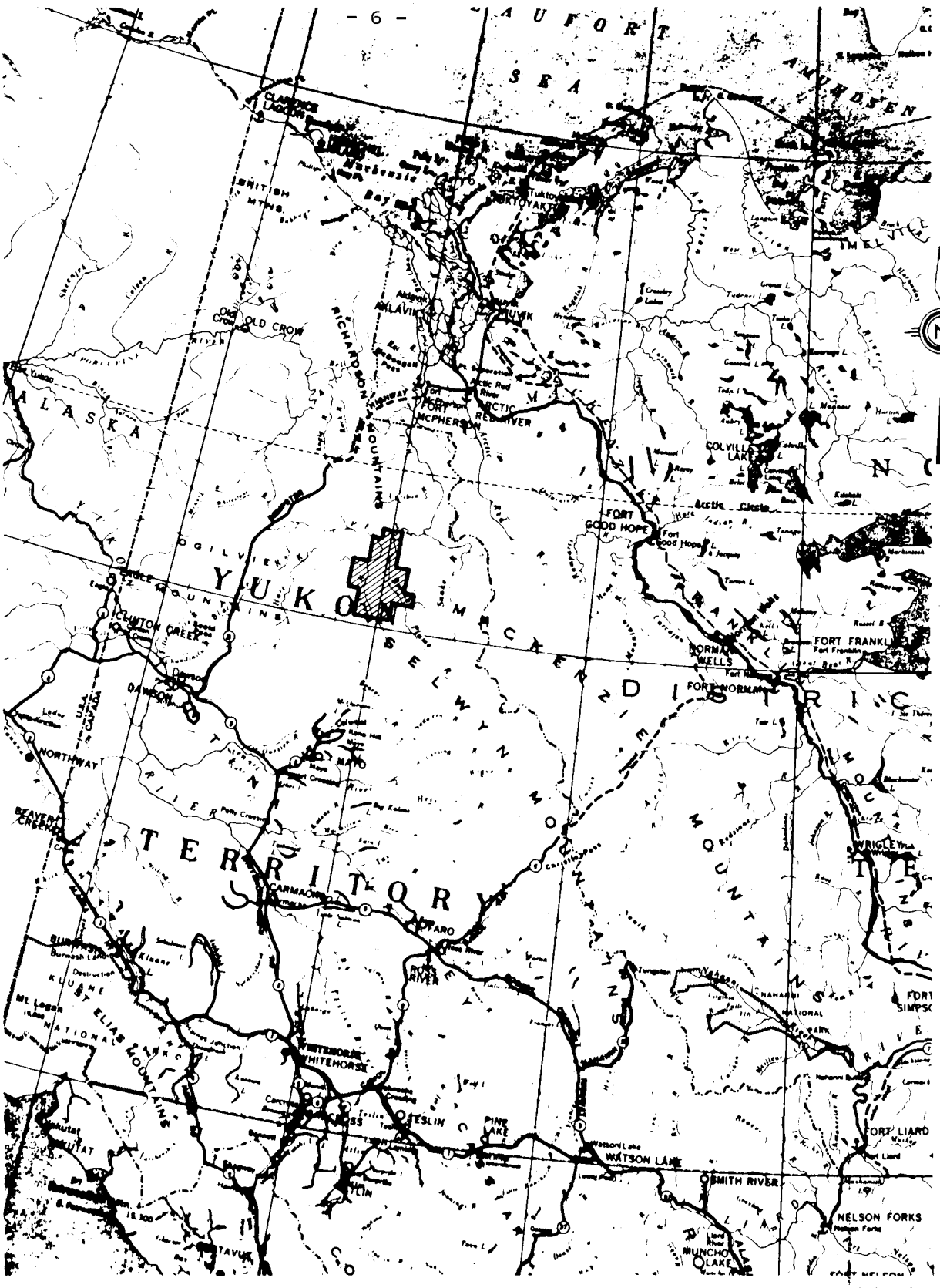
The Bonnet Plume Coal Basin is located in the northern Yukon Territory (Figure 2). It lies entirely within the Wind River map-area (NTS-106E). The centre of the basin is located by:

65°30' N Latitude
135°00' W Longitude

The area is approximately 210 kilometres (130 miles) north of Mayo, 240 kilometres (150 miles) northeast of Dawson City and 330 kilometres (205 miles) south of Inuvik (Plate I). Air transportation is available out of most centres; however, suitable service is provided out of Mayo which is the nearest town to the property, thus is the centre most often utilized. The Dempster Highway passes 130 kilometres (80 miles) to the west of the property. A winter road from Elsa (the townsite for United Keno Hill Mine), 48 kilometres (30 miles) north of Mayo, enters the west side of the property along the Wind River Valley. The distance along this road from Elsa to the property is approximatley 165 kilometres (100 miles). This road could be upgraded into an all weather road if mining proceeds.

3.0 PHYSIOGRAPHY

The Bonnet Plume Basin is bounded on the north by the Richardson Mountains, on the east by the Knorr Ranges, on the south by the Wernecke Mountains and on the west by rather ill-defined low rolling hills to the west of the Wind River (Plate II). The basin forms a depression which is relatively featureless, generally having local relief of less than 200 metres and lying between 300 metres above mean sea level at the northern end and 800 metres above sea level at the Wernecke Deposit Area at the southern end of the Basin. Much of the area is low-lying marshy terrain supporting stunted black spruce; some larch and birch; an assortment of mosses and grasses; willow and berry bushes.



TO ACCOMPANY REPORT NO 4-81 BY O.R.C.

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CALGARY ALBERTA

Figure 2

PROPERTY LOCATION

BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
JAN. 1981	1:1,584,000	106 E	A-1133

miles 25 0 25 miles

Two rivers traverse the property flowing from south to north; the Bonnet Plume River to the east and the Wind River in the west. Both rivers flow into the Peel River, a major river, which flows from west to east across the northern margin of the Basin. Three major tributaries feed the Wind River. They are from south to north; the Little Wind River, Illtyd Creek and Hungry Creek. All the streams are braided and often form valleys in excess of 2 kilometres wide.

Most outcrops of sedimentary rocks of Cretaceous age observed occur along the Wind River and its tributaries. The rocks form low relief hills over-looking the river. The interior of the Basin is a marshy area and is virtually devoid of rock outcrops.

4.0 EXPLORATION

4.1 History

The earliest account of exploration in the Bonnet Plume Basin is provided by Edourd de Sainville who travelled up the Peel River to the Bonnet Plume River in 1893. During this excursion he traversed between the Bonnet Plume River and the Wind River and recorded several occurrences of lignite. The earliest geological account of the Bonnet Plume Basin is provided by Camsell (1906) who explored the Wind River area in 1905. Camsell recognized the sedimentary rocks and assigned the rocks to the Cretaceous system.

In 1946 MacKay (1947) visited the known lignite occurrences along the Peel River as part of a larger programme to document the coal resources of Canada and in 1949 Bostock (1950) visited the area as part of a programme to assess the mineral resource potential of the Yukon Territory. Lignite resource estimates by Norris and Hopkins (1977) are reported to be in excess of 1.5 billion tons.

The geology of portions of the Bonnet Plume Basin has been studied by Bostock (1961), Hume (1954), Douglas and MacLean (1963) and Mountjoy (1963); however, the most comprehensive report on the geology of the Bonnet Plume Basin is provided by Norris and Hopkins Jr. (1977) from mapping carried out in 1962 augmented by visits in succeeding years until 1975. The stratigraphy and sedimentation of the Basin has been studied by Mountjoy (1967) and Long (1978) with palynological support provided by Rouse and Srivastava (1972) and Sweet (1978, 1979, 1980).

Interest in the area for economic potential commenced during World War II when C.R. Stelck mapped the Bonnet Plume Basin for Imperial Oil; when the area was considered as part of the Canol Project to identify possible sources of oil for use by the U.S. military. Since then the area has been explored by several oil companies interested in the oil potential; exploration consisted of geological mapping, gravity surveys and seismic surveys. No wells have been drilled in the licence area; however, one well was drilled along the Peel River 2000 metres east of the eastern boundary of Coal Licence #153 (formerly Licence 97).

Cyprus Anvil Mining Corporation acquired Coal Exploration Licences covering the lignite occurrences along the Peel River and carried out mapping on the Licences in 1977. Canadian Aran Petroleums Ltd. (Formerly Aran Oil and Gas Ltd.) acquired three Coal Exploration Licences in the northwestern central portion of the Basin (C.E.L. formerly Nos. 72, 73 and 93; now Nos. 129, 132 and 133); these have since been transferred to Pan Ocean Oil Ltd.

4.2 Exploration by Pan Ocean Oil Ltd. - 1977 to 1979

4.2.1 In 1977 bituminous coal was located in the Bonnet Plume Basin by personnel of Pan Ocean Oil Ltd. Subsequently Pan Ocean acquired 21 Coal Exploration Licences covering 339,144 hectares (838,014 acres).

4.2.2 In 1978 further reconnaissance mapping established 12 coal areas within the Basin. Two of the areas were drill tested and established indicated and inferred in situ coal resources of greater than 96 million tons. Four diamond drill holes were drilled for a total of 457 metres (1500 feet). In November 1978 three Licences held by Canadian Aran Petroleums Ltd. were transferred to Pan Ocean Oil Ltd. increasing Pan Ocean's control to 24 Licences encompassing 387,308 hectares (957,024 acres).

4.2.3 In 1979 a programme of follow-up mapping, further reconnaissance mapping and drill testing of five of the 12 coal areas was carried out. Twenty-three holes were drilled for a total 4420 metres (14,500 feet). The programme established measured, indicated and inferred in situ coal resources in excess of 380 million tonnes in four of the deposit areas. One of the areas - the Illtyd Creek Deposit - was sufficiently drill tested to establish measured resources of in excess of 120 million tonnes.

4.3 Exploration by Pan Ocean Oil Ltd. - 1980

4.3.1 Introduction: The 1980 programme was initiated to fulfill two requirements:

1. To locate and define sufficient coal resources to make available 10-15 million tonnes per annum for export and to support a mine-mouth power plant of 210 megawatt capacity over a period of 20 to 30 years.

2. To establish the limits of the Lower Bonnet Plume Formation so that no areas of potential coal resources are omitted in the event that exploration licences are converted to lease.

All known coal areas were drill tested. Seven of the twelve areas contain what are considered to be potential mineable resources. The programme commenced May 20 and was concluded September 16.

4.3.2 Mobilization: Mobilization of equipment and supplies to the Bonnet Plume Basin was carried out during late March and early April. A D-7E caterpillar bulldozer - provided by E. Caron Diamond Drilling - was left on site following completion of the 1979 programme and was used for air-strip preparation and to haul supplies. The bulldozer was demobilized along the Mayo winter road following completion of the mobilization. The airstrip was prepared on the frozen surface of Kiwi Lake. Two DC-3's owned and operated by Air North were utilized for mobilization of fuel, and drilling and camp supplies. The camp was established on the shore of Kiwi Lake as in previous years. Pamicon Development Ltd. of Vancouver organized and supervised the mobilization and also were responsible for managing the camp and logistical support for the entire operation.

4.3.3 Drilling: Drilling commenced May 21 and was completed September 14. Three drills were used; two of the drills were used for the duration of the programme and the third was mobilized to the property July 26 when released from a committment on a nearby property. Two of the drills were Super 38 diesel driven; the other was a hydraulic driven 38 equivalent. All three drills were skid-mounted, equipped to drill with wireline and recovered HQ and NQ core. The drilling contract was awarded to E. Caron Diamond Drilling of Whitehorse. Twenty-six holes were drilled for a total of 5823 metres (19,105 feet). All holes were surveyed and "tied-in" to the Department of Mines and Technical surveys Triangulation Station "TYD". The survey was carried out by Robert Allen and Company of Sechelt, B.C. Coordinates and elevations are tabulated in Appendix A.

4.3.4 On-Site Support: Support for on-site transportation of personnel, supplies and mobilization of drills between sites was provided by a Bell 204B helicopter supplemented on occassions, when warranted, by a Hughes 500D. The contract for the supply and operation of the helicopters was awarded to Trans North Turbo Air Ltd. of Whitehorse.

4.3.5 Camp Support: Transportation of personnel and supplies to camp was provided by Air North Ltd. of Whitehorse operating float-equipped Beaver and Otter aircraft out of their base in Mayo.

4.3.6 Demobilization: Demobilization of camp equipment, supplies and personnel was under the supervision of Pamicon Development Ltd. Demobilization commenced September 16 and was completed September 20. The demobilization was carried out mainly by a single Otter aircraft provided by Air North and in part by a DC-3 from the Bear River airstrip about 50 kilometres south of Kiwi Lake.

5.0 GEOLOGY

5.1 Introduction: This report covers the geology of the Bonnet Plume Basin as determined from regional mapping, airphoto interpretation and diamond drilling.

5.2 General: The Bonnet Plume Basin, as it exists today, is a structural and physiographic depression which is the culmination of a series of intermontane successor basins originating in the Middle Cretaceous and developed within a structural depression at the southern extremity of the Richardson Anticlinorium (Norris and Hopkins Jr. 1977).

Surface material within the Bonnet Plume Basin consists of recent alluvial and possible lacustrine deposits of glacial origin. Outcrops of mudstones, sandstones and shales containing lignite beds of Tertiary age; and conglomerates, sandstones and shales containing coal seams of Cretaceous age are found as outcrops within the Basin. These sediments were deposited under varying and recurring conditions (bog to turbulent) in a continental fluviatile sedimentary environment. The strata unconformably over-lie Proterozoic to Permian age strata. Fensters with rocks of pre-Cretaceous age within the Basin have been produced by faulting, and/or erosion.

The general geology of the southern portion of the Basin is depicted on Plates II to VI inclusive.

5.3 Stratigraphy: The stratigraphy of the Bonnet Plume Basin has been studied by Camsell (1906), Mountjoy (1967), Norris and Hopkins Jr. (1977) and Long (1978). Mountjoy applied the term Bonnet Plume Formation to the entire sequence of sedimentary rocks; Norris and Hopkins refined the sequence further to the Lower Bonnet Plume Formation and the Upper Bonnet Plume Formation separated by a 35 million year hiatus. The hiatus is in certain locals marked by the deposition of the Upper Bonnet Plume Formation directly on rocks of pre-Cretaceous age. Detailed palynological investigations by A.R. Sweet and stratigraphic studies by D.F. Long both of the Geological Survey of Canada are sheding new light on the age relationship of the strata within the sequence. Results of their work to date suggests, that the sedimentary rocks of the Lower Bonnet Plume Formation range from Albian to Maastrichtian age and that the bituminous coal seam horizons are of Campanian age. It appears that the Lower Bonnet Plume Formation may be gradational into the Upper Bonnet Plume Formation in places and that the hiatus separating the two Formations is much reduced (Sweet 1979 and 1980). Further palynological investigations are being conducted in order to arrive at a more detailed model of the age and correlation of the sedimentary rocks within the Basin.

Investigations by Pan Ocean have been restricted primarily to that area underlain by the Lower Bonnet Plume Formation in the southern half of the basin.

5.3.1 Upper Bonnet Plume Formation: This unit consists of unconsolidated sandstones, mudstones, conglomerates and lignites ranging in age from Late Cretaceous, Maastrichtian Epoch, to Tertiary, Paleocene Epoch, (Rouse and Srivastava, 1972). The formation may possibly range in age to the Eocene Epoch (Sweet, 1979). The area underlain by the Upper Bonnet Plume Formation has not been studied in detail during field investigations carried out by Pan Ocean personnel.

Based on the limited observations made of this unit during reconnaissance mapping it maybe in part separated from the Lower Bonnet Plume Formation by an unconformity and in places is deposited directly on rocks of pre-Cretaceous age.

Lignite resources contained in the Upper Bonnet Plume Formation have been assessed by Norris and Hopkins (1977) to be in excess of 1.5 billion tons in situ to a depth of 120 metres (400 feet).

5.3.2 Lower Bonnet Plume Formation: The Lower Bonnet Plume Formation is composed of conglomerates, sandstones, siltstones, shales and coal seams. The Formation has an estimated thickness greater than 1000 metres. The sediments are generally poorly cemented, but well indurated. The conglomerates and coarse sandstones often form resistant bluffs along the Wind River and its tributaries. The shales and mudstones generally break down rapidly upon exposure and are rarely seen in outcrop.

From limited stratigraphic information, three divisions within the Lower Bonnet Plume Formation can be discerned and are graphically illustrated on the generalized stratigraphic column (Figure 3). They are:

QUESTIONABLE ? NO DRILL INTERSECTIONS.
RYTHMIC DEPOSITION
FINER SEQUENCES (i.e. FINE TO MEDIUM GRAINED SANDSTONES TO COAL); DOMINANTLY SHALES MUDSTONES & SILTSTONES; GRADATIONAL FROM SANDSTONE TO DARK SHALES AND FREQUENTLY CARBONACEOUS & COALY SHALE
? GRADATIONAL TO UPPER BONNET PLUME.

RYTHMIC DEPOSITION
CONGLOMERATES (USUALLY SMALL PEBBLE) THROUGH SANDSTONES, SILTSTONES AND SHALES;
FREQUENTLY WITH CARBONACEOUS TO COALY SHALE AND WITH THIN COAL SEAMS DEVELOPED.
OFTEN WELL-COMPACTED BUT POORLY CEMENTED. COMPACTION DECREASES UPWARDS

MASSIVE, THICK, LARGE PEBBLE CONGLOMERATE UNIT

MEGA-CROSS-BEDDING

FACIES VARIATIONS TO COARSE SANDSTONE TO LARGE PEBBLE CONGLOMERATE

No 1 COAL SEAM HORIZON

No 2 COAL SEAM HORIZON

No 3 COAL SEAM HORIZON

No. 4 COAL SEAM HORIZON

RYTHMIC DEPOSITION
FROM COARSE CLASTICS
(i.e CONGLOMERATE), THROUGH
SANDSTONES, SILTSTONES
SHALES AND WELL-DEVELOPED
COAL SEAMS

No. 5 COAL SEAM HORIZON

GENERALLY FINE CLASTICS AND
GRAY SHALES, NON-RYTHMIC, MAY
CONTAIN THIN INTERVALS OF SMALL
TO MEDIUM PEBBLE CONGLOMERATE &
CONGLOMERATIC SANDSTONE. MAY CONTAIN
THIN DISCONTINUOUS CARBONACEOUS &
COALY SHALE BEDS

QUESTIONABLE ? NO DRILL INTERSECTIONS.
COARSE CLASTICS, BASAL CONGLOMERATE,
INTERVALS OF SHALE & SILTSTONES, LITHOLOGIES
NOT INTERSECTED BY DRILLING & POORLY DOCUMENTED.
ANGULAR UNCONFORMITY SEPARATING LOWER
BONNET PLUME FROM UNDERLYING PRE-CRETACEOUS.
THICKNESS UNKNOWN

K_{LBP}
P

20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560 580 600 620 640 660 680 700

Figure 3

m 20 10 0 20 40 60 80 100 m

TO ACCOMPANY REPORT No. 4-81 BY O.R.C

PAN OCEAN OIL LTD.
CALGARY ALBERTA

GENERALIZED STRATIGRAPHIC COLUMN
FOR PART OF THE
LOWER BONNET PLUME FORMATION

BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO
JANUARY, 1980	AS SHOWN	—	B-0855

A) Lower Unit: The upper portion of this unit is a predominantly fine-grained sequence consisting of shale, mudstone, siltstone and fine-grained sandstone with some interbeds of coarse sandstone and conglomeratic sandstone. This interval contains a few thin coal seams which in areas investigated to-date do not appear to have economic significance. Greenish and reddish mudstones frequently occur in this unit and rock types often display rusty reddish-brown weathering. The basal portion of this unit is an undetermined thickness (but greater than 200 metres) of rocks consisting of sandstones, conglomeratic sandstones and conglomerates with thin intervals of shale and siltstone. The basal contact of the Lower Unit is in unconformable contact with strata of Palaeozoic age.

B)

Middle Unit: Predominantly a rhythmic sequence of conglomerates grading into mudstones frequently capped by coal horizons. It is in this unit that the coal seams which are the focus of this report are developed. A persistent conglomerate member 90 to 110 metres thick forms the uppermost portion of this unit. A typical rhythmic sequence is illustrated below:

Coal

Mudstone

Siltstone

Sandstone

Conglomerate

Upper Unit: Predominantly a rhythmic sequence of sandstones

C) grading into mudstones frequently capped with carbonaceous to coaly shale which rarely contain thin coal seams. Conglomeratic sandstones and thin conglomerates are developed sporadically at the base of some of the sequences. A typical rhythmic sequence of this unit is similar to the one above without the development of coal at the top and rarely with a conglomerate at the base.

6.0 COAL

6.1 Geological Mapping: In 1977 six coal bearing areas were mapped within the Lower Bonnet Plume Formation. During follow-up reconnaissance mapping in 1978 this number was increased to twelve coal areas. These showings were described previously in Pan Ocean "Report on the Geology of the Bonnet Plume Basin" (McKinney 1979).

Mapping during the 1980 programme located a new coal area containing abundant coal float and a coal showing in a tributary of and to the south of Beaver Creek in Coal Exploration Licence 150 (formerly Licence 94). All the coal areas (thirteen) are indicated on the 1:50,000 scale geology plans of the Basin (Plates III to VI inclusive). All the coal areas have been drill tested.

6.2 Drilling: The presence of at least 5 coal horizons occuring in a 250 metres interval within the middle unit of the Lower Bonnet Plume Formation is indicated from drilling. All are considered to have economic potential. The coal horizons are numbered in sequence from youngest to oldest reflecting the order in which they were encountered by drilling. A stratigraphic correlation chart (Plate VII) graphically illustrates the suggested correlation of coal seam horizons between deposit areas.

6.2.1 No. 1 Seam Horizon: The No. 1 Seam Horizon occurs throughout the southern end of the Basin. The horizon varies from a maximum thickness of 8.0 metres in the Wernecke Deposit to 2.0 metres in the Garlic Ring Deposit. The horizon generally is capped by the persistent thick conglomerate member forming the upper most portion of the middle unit. A shale bed between the conglomerate and the coal is sometimes developed within the horizon and corresponds to a thinning of coal seam development within the horizon. The floor of the horizon is a medium dark gray mudstone which breaks down rapidly upon exposure. The horizon contains several shale and carbonaceous shale partings which collectively result in a weighted average (tonnage) raw ash content of 36.5 percent. Much of the ash results from adventitious material and is easily separated by gravity washing.

6.2.2 No. 2 Seam Horizon: The No. 2 Seam Horizon lies from 10 to 40 metres below the No. 1 Seam Horizon and is persistent throughout the southern end of the Basin. This horizon varies in thickness from a maximum of 10 metres in the Spaceship Deposit to 2.0 metres in the Garlic Ring Deposit. The roof of the horizon is variable, from conglomerate to coarse grained sandstone and is generally sound. The floor of the horizon is mudstone which breaks down rapidly upon exposure.

In the Wernecke, Spaceship and southern end of the Illtyd Deposits, the horizon splits into two seams - Seam 2A (upper) and Seam 2B (lower) - separated by carbonaceous mudstone, which increases in thickness from south to north. Seam 2B shales out rapidly north of hole BP-79-14 in the Illtyd Deposit. Only a single seam occurs in the Garlic Ring Deposit.

The horizon contains few shale and carbonaceous shale partings which collectively result in a weighted average (tonnage) raw ash content of 24 percent. Most of the ash is caused by adventitious material and is easily separated by gravity washing.

6.2.3 No. 3 Seam Horizon: Correlation of the No. 3 Seam Horizon throughout the property is difficult; however, a persistent coal horizon below the No. 2 Seam Horizon is present in several of the deposit areas. The No. 3 Seam Horizon lies from 10 to 50 metres below the No. 2 Seam Horizon and varies in thickness and character. In the Wernecke, West Illtyd and Spaceship Deposits the horizon consists of two seams having thicknesses averaging, 2.85 metres (upper) and 2.17 metres (lower), separated by an average 5.46 metres of mudstone. In the Airstrip and Wind River Deposits the horizon consists of one seam with an average thickness of 5.5 metres. In the Illtyd Deposit the horizon consists of one seam with an average thickness of 2.4 metres. The horizon is not present in the Garlic Ring Deposit.

The roof of the horizon varies within each deposit area from mudstone to conglomerate; the floor is nearly always carbonaceous mudstone and mudstone.

6.2.4 No. 4 Seam Horizon: Correlation of the No. 4 Seam Horizon throughout the property is dubious; however, a persistent horizon is present between the No. 3 and No. 5 Seam Horizons in all deposit areas except the Garlic Ring Deposit. The No. 4 Seam Horizon varies in thickness and character, attaining maximum development (5.45 metres) in the Airstrip, Wind River and Spaceship Deposits. The horizon appears to shale out in the northern part of the Illtyd Deposit.

The roof of the horizon is variable from mudstone to conglomerate and the floor is mudstone and/or carbonaceous mudstone.

6.2.5 No. 5 Seam Horizon: The No. 5 Seam Horizon is persistent through the Wind River, Wernecke, West Illtyd and Spaceship Deposits. Sufficient section has not been intersected by drilling in the Illtyd, Airstrip and Garlic Ring Deposits to show whether or not this horizon also occurs in these Deposits. Correlation of the horizon is facilitated by the presence of a volcanic ash band within the horizon. The horizon varies in thickness from a maximum of 9.0 metres in the Wind River Deposit to 2.3 metres in the West Illtyd Deposit.

The roof of the horizon is usually sound and varies from siltstone to conglomerate. The floor of the horizon is mudstone in the southern deposits. The floor is siltstone and sandstone in the Wind River Deposit.

7.0 RESOURCE BLOCK DESCRIPTION

The description and structure of the seven deposit areas and other areas investigated is based on drillhole information and geological mapping. Correlation of stratigraphy and coal horizons between deposit areas is aided by palynological analysis carried out by A.R. Sweet of the Geological Survey of Canada. To be noted are changes in coal horizon identification in the Wind River and Airstrip Deposits from a previous Pan Ocean Reports Nos. 25-79 and 1-80. The changes are based on palynologic evidence not previously available.

Graphic presentation of drillhole logs is illustrated by drillhole graphic log forms (Appendix C).

7.1 ILLTYD CREEK DEPOSIT (Plates VIII and IX)

The Illtyd Creek Deposit is an area extending along the east side of Illtyd Creek for a distance of 5000 metres and extending approximately 3000 metres to the east of that creek. The structure of the deposit is a broad syncline plunging to the east. Maximum dips of 20 degrees occur along the western outcrop trace and at the north end of the deposit. Generally flatter dips occur at depth to the south and east. The structure of the deposit is illustrated by the geological map (Plate VIII); three east-west cross sections and one north-south cross section (Plate IX).

No work was carried out on this deposit area in 1980. Information regarding the geology of the deposit, is contained in Pan Ocean Reports Nos. 25-79 and 1-80.

7.2 WERNECKE DEPOSIT (Plates VIII and X)

7.2.1 Description and Structure: The Wernecke Deposit occurs on the north flank of the Wernecke Mountains between Illtyd Creek on the east and the Wind River to the west. The area is bounded on the south by over-riding rocks of Proterozoic age along the Wernecke Thrust and to the north by rocks of Cambrian age having either an unconformable or faulted contact.

The basic structure of the Wernecke Deposit is a monocline dipping to the south at 25 to 35 degrees at the eastern end, decreasing in dip to 5 to 15 degrees at the western end. In the east the deposit has well defined outcrops having a strike length of 4500 metres and a partially obscured outcrops having a strike length of a further 4500 metres (Plate VIII and X) at its western end.

Outcrops occuring in the Wernecke Deposit primarily consist of conglomerates and sandstones with recessive zones representing siltstones, mudstones and coal horizons. The thick conglomerate capping the middle unit of the Lower Bonnet Plume Formation is the most prominant feature and defines the deposit along strike. Coal seams occurring stratigraphically below this conglomerate outcrop in a creek at the eastern end of the deposit.

7.2.1 Coal: Several coal occurrences were mapped in the Wernecke Deposit. Three seams occur in the creek mentioned above as outcrops. The upper two occurrences are the No. 1 and No. 2 Seam Horizons; the third is stratigraphically below the other two and is postulated to be the No. 3 Seam Horizon. Other occurrences are inferred by coal float brought to the surface in frost boils and may indicate underlying coal seams. Attempts were made to hand trench these showings; however the overburden was too thick and the seams remain concealed.

Three holes BP-78-1, WK-80-1 and WK-80-7, drilled along the strike length confirm the presence of all five coal seam horizons. Continuity of the Nos. 1 and 2 Seam Horizons is inferred from intersections in all three holes; Nos. 3 and 4 Seam Horizons are inferred from intersections in two holes. Although intersected in only one hole the No. 5 Seam Horizon is postulated to occur throughout the deposit. Non-intersection of the Nos. 3, 4 and 5 Seam Horizons in the holes was caused by stopping the hole above the horizons not because of nondevelopment of the horizons.

7.3 West Illtyd Deposit (Plates VIII and XI)

7.3.1 Description and Structure: The West Illtyd Deposit is located on the western side of Illtyd Creek and is structurally a continuation of the Illtyd Deposit. At the southern end it is separated from the Wernecke Deposit by a ridge of carbonates of Cambrian age. The deposit may tie onto the Wernecke Deposit to the southwest. To the west rocks of Cretaceous age are probably in unconformable contact with carbonates of Palaeozoic age forming the Illtyd Range.

The structure of the West Illtyd Deposit area is divided into two parts. The northern part is a broad syncline plunging to the east and is a down section continuation of the structure of the Illtyd Deposit. The southern part is a tight syncline plunging to the east. The two structures seemingly are connected by a tight, probably faulted, anticline around a carbonate high of Cambrian age. For the most part erosion has denuded the Lower Bonnet Plume from this anticline but Lower Bonnet Plume rocks are preserved along the west bank of Illtyd Creek on the eastern nose of this structure (Plates VIII & XI).

Outcrops in the West Illtyd Deposit primarily consist of conglomerate, conglomeratic sandstone and sandstone forming parallel ridges delineating the structures. Some coal occurring as float and/or wash is located in the recessive intervals between the ridges and along the west bank of Illtyd Creek.

7.3.2 Coal: Two holes, WI-80-16 and WI-80-19, have been drilled into the West Illtyd Deposit. Hole WI-80-16 tested the northern structure and Hole WI-80-19 tested the southern structure. Hole WI-80-16 intersected the Nos. 4 and 5 Seam Horizons and Hole WI-80-19 intersected the Nos. 3, 4 and 5 Seam Horizons.

The outcrop traces of the seams are projected from drilling and traced from ground and air photo mapping.

7.4 SPACESHIP DEPOSIT (Plates VIII and XI)

7.4.1 Description and Structure: The Spaceship Deposit is located on the east side of Illtyd Creek to the southeast of the Illtyd Deposit. The area is enclosed on three sides by carbonates of Cambrian/Devonian age and carbonates, argillites and quartzites of Aphebian age.

The structure of the Spaceship Deposit is poorly defined and is interpreted to be a west plunging syncline. The trend of the axis of the syncline coincides with the trend of the syncline axis in the southern part of the West Illtyd Deposit. Insufficient data exists to interpret a possible geological "tie in" to the Illtyd Deposit to the northwest; however, the two deposit areas are separated in part by steeply dipping rocks of the Lower Bonnet Plume Formation which contain coal seams (Plates VIII & XI).

7.4.2 Coal: A thick coal seam outcrops in the south bank of Spaceship Creek. This seam identified as the No. 2 Seam Horizon and confirmed in drill hole SC-80-22 located to the south of the exposure. Dips along the creek and in the drill hole are from 30 to 40 degrees to the south. Coal Seam horizons Nos. 2 to 5 were intersected in this hole. A second hole, SC-80-25, drilled approximately 1000 metres southwest of hole SC-80-22, intersected all five coal seam horizons. Dips in this hole are flat to 15 degrees. Coal horizons in the Spaceship Deposit area are among the best developed on the property; hole SC-80-25 intersected an aggregate thickness of 30 metres of coal in seams greater than 1.5 metres within a section of 230 metres.

A lack of outcrop and poor air photo definition of the structure makes coal resources difficult to determine; however, by projecting from drill holes and assuming a syncline structure, resources are inferred for an area of approximately 400 hectares.

7.5 GARLIC RING DEPOSIT (Plate XII)

7.5.1 Description and Structure: The Garlic Ring Deposit is located approximately 8 kilometres northeast of the Illtyd Deposit, midway between Illtyd Creek and the Bonnet Plume River. The deposit occurs in a low flat hill formed by resistant conglomerates of the Lower Bonnet Plume Formation on the west side and by conglomerates, siltstones and quartzites of Cambrian age on the east side.

The basic structure of the deposit is a northwest dipping monocline with dips varying from 25 to 35 degrees (Plate XII).

Outcrop in the area is limited to the north slope of the hill. Quartzites, siltstones, and a massive conglomerate of Cambrian age having matrix supported clasts of cobble to boulder size consisting of siltstone and quartzite, outcrops on the eastern end of the hill. Lying unconformably above, and/or in fault contact with the rocks of Cambrian age are typical Lower Bonnet Plume conglomerates and conglomeratic sandstones. These rocks form the western end of the hill.

7.5.2 Coal: Two coal outcrops were mapped in gullies between conglomerate ridges on the north slope. Both occurrences suggest seams are greater than 3.0 metres in thickness. Two holes, GR-80-21 and GR-80-24, were drilled into the deposit. GR-80-21 located on the hill above the exposures intersected the Nos. 1 and 2 Horizons. Hole GR-80-24 was drilled on the southern slope of the hill to check continuation of seams. Both the Nos. 1 and 2 Seam Horizons were intersected. The average thickness of coal intersected by these holes was 2.6 metres and 3.4 metres for the Nos. 1 and 2 Seam Horizons respectively. No other coal horizons were intersected and it appears that the lower seams have shaled out in this deposit.

To the north of the deposit the basin widens out into a broad flat area of low relief which is covered by surficial unconsolidated rock debris and inundated with small lakes. It is unknown whether the deposit extends to the north. To the south the deposit is projected across a valley to a low flat hill similar to the deposit hill. Gullies coinciding with possible seam traces were investigated; however, no outcrops or traces of coal were found.

7.6 AIRSTRIP DEPOSIT (Plate XIII)

7.6.1 Description and Structure: The Airstrip Deposit is located west of the Wind River approximately 6 kilometres due west of the Wernecke Deposit. The deposit is bounded to the north and east by the Wind River, and to the south and west by the projected outcrop trace of the No. 5 Seam Horizon.

The basic structure of the Airstrip Deposit is a west-northwest trending syncline. The syncline appears to plunge to the east-southeast. Observed dips along the Wind River progressively steepen to 30 to 40 degrees away from the synclinal axis (Plate XIII).

Outcrops along the Wind River consist of small pebble conglomerates, and medium grained to conglomeratic sandstones separated by recessive zones in which coal seams occur.

7.6.2 Coal: Based on palynological analysis two outcrops of coal on the north limb of the syncline are interpreted to be the Nos. 3 and 4 Seam Horizons. A coal occurrence traced along the Wind River for a distance of 2500 metres may be the No. 5 Seam Horizon. Three coal wash and/or float occurrences in gullies on the southern limb of the syncline were mapped. They probably represent the Nos. 2, 3 and 4 Seam Horizons.

Outcrops of sandstone, conglomerate and two coal occurrences were mapped along the creek 1000 metres west of the outcrops along the Wind River. The occurrences are on strike with the northern limb of the syncline and give control to projection of the axis of the syncline. Approximately 4000 metres west of this creek, coal wash and sandstone outcrop were located in another creek. These coal showings probably represent thin seams within predominately mudstone horizons below the No. 5 Seam Horizon.

Hole A-79-23 was collared in a small to medium pebble conglomerate overlying the No. 3 Seam Horizon and was terminated below the No. 4 Seam Horizon. A second hole A-80-2 (approximately 4500 metres west-northwest of hole A-79-23) was drilled to test the continuation of the deposit. No coal horizons were intersected due to the hole being collared in strata below the No. 5 Seam Horizon. It is postulated that the plunge of the syncline is greater than previously thought and that the seam horizons outcrop to the east of the hole.

WIND RIVER DEPOSIT (Plate XIV)

7.7.1 Description and Structure: The Wind River Deposit occurs on the west bank of the Wind River approximately 27 kilometres north of the Airstrip Deposit and 5500 metres south of the Wind River's confluence with Illtyd Creek. The deposit forms a ridge having local relief of up to 180 metres, extending along the River for a distance of approximately 6000 metres.

Outcrops within the deposit consist of conglomerates and medium grained to conglomeratic sandstones which form ridges along the flanks of the hills. Coal seams occur in recessive zones between the ridges.

The basic structure of the deposit is a gently dipping monocline with dips from 5 to 20 degrees to the northeast and east. The deposit is divided into two blocks; a northern block and southern block separated by an east-west fault against which the northern block has been displaced downwards relative to the southern block (Plate XIV).

7.7.2 Coal: Several coal outcrops occur along the west bank of the Wind River underlying a persistent conglomeratic sandstone ridge. The occurrences suggest a thick seam gently-dipping to the northeast which is correlated to the No. 4 Seam Horizon. Several other coal occurrences to the north of this occurrence along the west bank of the river are mapped as repeated occurrences of the No. 4 Seam Horizon. Up the hill from the river, coal wash was encountered underlying a medium to large pebble conglomerate ridge. The wash is derived from a seam (confirmed by drilling) correlated to the No. 3 Seam Horizon. Two coal float occurrences on the west slope of the most southerly hill, approximately 1700 metres west of the Wind River, are probably the No. 4 Seam Horizon. A coal outcrop located 150 metres west of the Wind River Winter Road to the west of the above mentioned float occurrences is probably the No. 5 Seam Horizon.

Three holes have been drilled along the length of the deposit. Hole W-79-1 intersected two coal horizons correlated to the Nos. 3 and 4 Seam Horizons. Holes W-79-6 and W-80-8 intersected two coal horizons correlated to the Nos. 4 and 4 Seam Horizons. Hole W-79-6 intersected two other seams between the Nos. 4 and 5 Seam Horizons which are considered local developments of limited areal extent.

7.8 OTHER AREAS

Several other areas of known coal occurrences or potential areas (i.e. those areas where there is either no surface outcrop information or limited surface outcrop information, but where the Lower Bonnet Plume Formation is postulated to occur) were investigated by drilling and are described briefly below.

7.8.1 Extension of Wernecke Deposit:- Hole WK-80-3/3A was drilled to check a possible synclinal structure on a trend with the Airstrip Deposit syncline to the east side of the Wind River. The hole intersected 73.0 metres of recent unconsolidated fluvial, and lacustrine deposits before entering the upper unit of the Lower Bonnet Plume Formation well above the thick conglomerate of the middle unit. The strata consists of a rhythmic sequence of small pebble conglomerates or conglomeratic sandstones, sandstones, siltstones and mudstones frequently capped with carbonaceous mudstones rarely having thin coal seams developed. The dips in the hole were 40 to 50 degrees and the interval intersected is probably a normal "up section" sequence above the Wernecke Deposit. The area has no economic potential.

7.8.2 Airstrip East:- Hole AE-80-6 was drilled to check an area on the east side of the Wind River immediately southwest of the Illtyd Range. Rocks of the Lower Bonnet Plume Formation outcrop along the river and coal float occuring below a conglomerate outcrop was located in a west flowing creek. After encountering considerable difficulties drilling through overburden the hole entered a dominantly mudstone sequence which is probably stratigraphically below the No. 5 Seam Horizon. The hole was abandoned at a depth of 122 metres when the drill rods became stuck. The area holds little or no economic potential.

7.8.3 Airstrip North:- Two holes AN-80-4 and AN-80-5 were drilled into this area to check for possible coal seams underlying an east-dipping Bonnet Plume Formation conglomerate capping a high ridge 13 kilometres northwest of the Airstrip Deposit. Hole AN-80-4 was drilled down slope to the east from the outcrop in an attempt to gain section; however, the hole was terminated at 38 metres in limestone of Cambrian/Devonian age. A second attempt to test the structure was made by drilling hole AN-80-5 on the conglomerate outcrop. The hole was terminated at a depth of 102 metres in quartzitic sandstone possibly Permain in Age. The area has no economic potential.

7.8.4 Extension of the Wind River Deposit:- Four holes were drilled in an attempt to extend the Wind River Deposit. Hole W-80-9 was drilled to the south of the deposit on a conglomeratic sandstone ridge believed to be Lower Bonnet Plume Formation strata. The hole intersected a disturbed sequence of Bonnet Plume strata to 69 metres and abruptly entered a quartzose siltstone and fine grained sandstone believed to be Permian in age. The hole was terminated at 76 metres. Any potential in this area is restricted to a narrow band between hole W-80-9 and the Wind River. The area is considered low priority.

Holes W-80-10, W-80-11 and W-80-12 were drilled to the northwest of the Wind River Deposit in a large area of Lower Bonnet Plume strata extending north to Hungry Creek. All holes intersected strata believed to be below the No. 5 Seam Horizon culminating in a thick conglomerate unit. Hole W-80-10 intersected a fault at 232 metres after drilling 200 metres of conglomerate and was terminated in limestone of Palaeozoic age.

The bulk of the area north of the Wind River Deposit to Hungry Creek is underlain by Lower Bonnet Plume Formation sediments stratigraphically below the No. 5 Seam Horizon. The area is large and isolated remnants of the coal bearing horizon may exist along the Wind River; however, the area is considered low priority.

7.8.5 East Wind River:- The East Wind River area is located on the east side of the Wind River opposite the Wind River Deposit and extends north and northeast to Illtyd Creek. The area is divided into two parts, separated by an unnamed west-flowing creek which could represent the surface expression of a fault. South of the creek is coal area 9 and north are coal areas 10 and 12.

7.8.5.1 Coal Area 9: The rocks mapped in coal area 9 are typical Lower Bonnet Plume Formation lithologies consisting of conglomerates, sandstones, shales and carbonaceous and coaly shale. A thick coarse pebble conglomerate outcrops along a north-flowing creek at the north edge of the deposit. Stratigraphically below this conglomerate are discontinuous ridges of conglomeratic sandstone and sandstone. Occassional outcrops of shale and carbonaceous and coaly shale are locally preserved adjacent to sandstone outcrops. No significant coal outcrops have been found; however, a clinker occurrence near the base of the section was found.

The structure of the deposit area is a monocline with strata dipping to the northeast at 5 to 15 degrees. The nature of the contact of the Lower Bonnet Plume Formation with the underlying carbonates in this area is not clear; sparse evidence prevents determination supporting an unconformable contact or a faulted contact.

Two holes (W-79-2 and W-79-4) were drilled to test this area. A carbonaceous to coaly shale horizon was intersected and is the source of the clinker. No economic significance is attached to this intersection. Both boreholes were probably collared below the No. 5 Seam Horizon.

7.8.5.2 Coal Area 10: The rocks mapped in coal area 10 consist of conglomerate, sandstone, shale, carbonaceous shale and coal and are considered typical of Lower Bonnet Plume Formation lithologies. Abundant coal wash and float found in two gullies was traced to the surface exposure of a significant coal horizon.

Two drill holes (W-79-3 and W-79-5) were drilled to test this horizon. The horizon is 4.58 metres thick in hole W-79-5 and contains several partings of shale and carbonaceous shale. Proximate analysis of the horizon for a clean coal is given below:

Yield	54.7%
Moisture	3.0%
Ash	15.4%
Volatiles	35.8%
Fixed Carbon	45.9%
Calorific Value	10,426 BTU's
Sulphur	0.69%

The same coal horizon was intersected in hole W-79-3 where it consists of carbonaceous and coaly shale and is of no economic importance. The areal extent of the horizon could be local and is therefore precluded from resource estimates at this time.

The structure of the area is an anticline with the axis trending northwest. Limestone of Cambrian age was intersected in both holes approximately 20 metres below the coal horizon. The contact appeared to be a faulted; however, an unconformity may also be suggested from the intersection of the limestone at the same stratigraphic position.

Further drilling in this area may define additional mineable resources.

7.8.5.3 Coal Area 12: The rocks mapped in coal area 12 are typical Lower Bonnet Plume Formation rocks consisting of sandstone, conglomerate, and conglomeratic sandstone. Two coal occurrences were mapped along the west bank of Illtyd Creek dipping to the east under the creek.

Hole EW-80-13 was drilled on the east side of Illtyd Creek to intersect the coal seam located in the west bank of the creek. The hole was abandoned at a depth of 72 metres in overburden. A second hole EW-80-15 was drilled from above a conglomerate outcrop approximately 2000 metres southeast along strike from hole EW-80-13. Hole EW-80-15 intersected Lower Bonnet Plume Formation strata above the coal bearing sequence. A coal horizon equivalent to the coal exposure on the west side of Illtyd Creek was intersected at 183 to 189 metres and consisted of carbonaceous mudstone containing thin coal seams.

The area has no economic significance.

7.8.6 Beaver Creek Area: Mapping during the 1980 field season located abundant coal float and a weathered coal outcrop along a tributary of and to the south of Beaver Creek. Conglomerate and sandstone identified as belonging to the Lower Bonnet Plume Formation overlies the occurrence to the south. The structure is a northeast-trending anticline with dips of 5 to 10 degrees on each limb. Hole BC-80-20 was drilled anom a conglomerate outcrop to test the anticlinal structure; coal was not intersected and the hole was terminated at a depth of 139 metres in a thick conglomerate unit similar to the Mount Deslauriers Conglomerate. The coal float located in the creek is identified by palynology as being high in the Lower Bonnet Plume Formation.

The area is considered to contain little economic potential and is of low priority.

7.8.7 Area northeast of the Illtyd Deposit: This area occurs midway between the Illtyd Deposit and the Garlic Ring Deposit. The area is a prominent flat hill with no outcrop exposures. Hole GR-80-23 was drilled to test this area; however, was abandoned for technical reasons in poorly consolidated pebbles and boulders of quartzite at a depth of 97 metres. The hill may contain Upper Bonnet Plume Formation deposits of Tertiary age; however, insufficient depth penetration precludes interpretation of the area. The area is considered low priority; however, the potential of the area can not be totally discounted at this time.

7.8.8 "WILDCAT" DRILLING: Two holes CA-80-17 and EB-80-18/18A were drilled in areas devoid of outcrop on a speculative basis. Hole CA-80-17 was drilled in the central part of the Basin midway between the Bonnet Plume and Wind Rivers on Licence 132 (formerly Licence 72). The area is flat lying and inundated with small lakes and marshy ground. The hole was abandoned for technical reasons at a depth of 80 metres in gravels, boulders and loose sand of fluvial, lacustrine or possible glacial deposits. Holes EB-80-18/18A were drilled on a possible buried synclinal structure (interpreted from aerial photographs) on the east side of the Bonnet Plume River. Hole 18 was abandoned for technical reasons at a depth of 24 metres and hole 18A at a depth of 33 metres in gravels and boulders of probable glacial origin.

The areas in the centre of the basin and to the east of the Bonnet Plume River have not been tested adequately to ascertain the possibility of coal deposit areas underlying the overburden and should still be considered as potential areas.

8.0 Coal Quality

The quality of coal seams occuring in the Bonnet Plume Basin has been determined from drill core. The core was sampled on the basis of coal lithology. Analyses of the coal was carried out by Birtley Coal and Minerals Testing of Calgary.

Results of analysis of coal seam horizons are tabulated beside graphic presentations of the seam horizons on drill hole graphic log forms (Appendix C).

8.1 The coal has been analysed as high volatile "C" Bituminous (ASTM classification) and is considered a good thermal coal. The weighted average (tonnage) proximate analysis of the coal on a raw coal basis and on a clean coal basis[1] is given below.

	Raw Coal	Clean Coal
Yield	100	76.9%
Moisture	6.3%	5.2%
Ash	27.2%	14.3%
Volatile Matter	29.4%	33.0%
Fixed Carbon	37.1%	47.4%
Calorific Value	N.A.	10,016 BTU's/lb.(23.3 MJ/kg)
Sulphur	0.26%	0.33%

8.2 Ash: The coal can be cleaned and blended to produce a product having a 15 percent ash content. The method of cleaning has not yet been determined, however, laboratory bench scale analysis indicates a 15 percent ash content can be maintained by reconstituting the 1/4" x 28M size fraction at -1.90 specific gravity and the 28 mesh x 0 size fraction on a raw basis.

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1 Whenever clean coal specifications are given in this report clean coal is a reconstituted sample of the 1/4" x 28 Mesh fraction at -1.90 specific gravity and the 28 Mesh x 0 fraction on a raw basis.

8.3 Calorific Value: The BTU's per pound is variable but by blending, the heat value can be maintained at approximately 9700 BTU's per pound.

8.4 Ash Fusion: Ash fusion temperatures are variable; however, the ash is considered high-melting. Initial deformation temperature under reducing conditions generally is greater than 2200°F and averages 2450°F.

8.5 Grindability: The grindability of the coal as defined by the Hardgrove Index varies from 36-55 with an average of 42.

8.6 Alkalinity: From limited analysis the sodium content of the Bonnet Plume coal generally is less than 0.9 percent. The base to acid ratio (B/A) is a rough indication of slagging potential. The B/A ratio =

$$\frac{CaO + MgO + Fe_2O_3 + Na_2O + k_2O}{SiO_2 + A^1{}_2O_3 + TiO_2 + P_2O_5}$$

$$\frac{4.5 + 1.14 + 8.36 + 0.79 + 0.75}{52.36 + 26.52 + 1.31 + 0.05}$$

$$= 0.19$$

The B/A ratio less than 0.5 indicates that the probability of slagging is remote.

8.7 Nitrogen Content: Ultimate analysis indicates that the nitrogen content is less than 0.8 percent and therefore meets most Utility Companies specifications.

8.8 Sulphur: The sulphur content of the Bonnet Plume coal is low at 0.33 percent. In rare cases sulphur exceeds one percent over narrow intervals within the seams.

8.9 Fuel Ratio: The fuel ratio of the Bonnet Plume coal is good at a maximum of 1.60 and an average of 1.43.

8.10 Average Raw Coal and Clean Coal Proximate Analysis for each seam for each deposit area is given in Table II.

9.0 Coal Resources

9.1 Exploration carried out to date has established measured, indicated and inferred in situ resources of in excess of 650 million tonnes in seven widely separated deposit areas (Table I and Plate II). In one area only - the Illtyd Deposit - has sufficient drilling been carried out to define measured in situ resources. The determination of resources for the Illtyd Deposit was reported in Pan Ocean Report No. 25-79 and only a summary of resources for this area will be incorporated in this report.

9.2 For all other areas, in situ resources were determined using the following assumptions, methods and parameters:

1) The structure of each deposit area is assumed to be as depicted, bearing in mind that the interpretation and continuity of the structure is based on knowledge of the geology from surface mapping, air photo mapping and limited drilling.

2) The areal extent of each of the seams in each deposit area is determined by planimetering the area within the seam outcrop or subcrop trace to a maximum depth of 300 metres. Where more than one hole intersects the deposit the sphere of influence of each hole extends to the mid-point between holes. The total areal extent of resource determination for each deposit area is illustrated by Plates VIII, XII, XIII and XIV.

TABLE II

AVERAGE RAW COAL AND CLEAN COAL
PROXIMATE ANALYSIS

Proximate Analysis	Seam	DEPOSIT AREA																					
		ILLTYD			WERNECKE			SPACESHIP			WEST ILLYTD			AIRSTRIP			WIND RIVER			GARLIC RING		
		Average Thk (m)	Raw	Clean	Average Thk (m)	Raw	Clean	Average Thk (m)	Raw	Clean	Average Thk (m)	Raw	Clean	Average Thk (m)	Raw	Clean	Average Thk (m)	Raw	Clean	Average Thk (m)	Raw	Clean
Yield %	1	6.85	100	61.45	3.21	100	65.9	6.42	100	75.1										2.56	100	83.4
R.M. %			6.1	5.0		4.1	5.3		7.0	4.5											6.3	4.8
Ash %			40.2	20.4		34.3	13.5		27.8	14.9											27.8	20.2
V.M. %			25.9	32.6		30.5	35.3		29.8	34.4											28.8	31.2
F.C. %			27.8	41.9		31.1	46.0		35.5	46.2											37.1	44.2
BTU's/lb			N.A.	9023		N.A.	10,198		N.A.	10,052											8091	9431
Sulphur%			0.21	0.35		0.25	0.39		0.24	0.32											0.32	N.A.
Yield %	2	3.66	100	79.8	8.52	100	78.1	8.49	100	82.9										3.28	100	74.7
R.M. %			7.1	5.3		5.4	6.0		7.4	5.2											5.6	4.4
Ash %			23.9	13.9		25.4	13.0		20.9	12.4											36.7	27.3
V.M. %			31.0	34.3		32.2	34.5		32.0	34.5											27.2	28.3
F.C. %			37.6	46.2		37.0	46.6		39.7	48.2											30.5	40.2
BTU's/lb			N.A.	9923		N.A.	10,027		N.A.	10,316											6912	8279
Sulphur%			0.26	0.33		0.30	0.35		0.26	0.31											0.30	N.A.
Yield %	3	2.40	100	59.2	3.43	100	83.39	*7.12	100	86.8	3.91	100	94.7	3.04	100	88.8	8.0	100	61.3			
R.M. %			5.1	4.9		6.2	6.7		7.9	4.7		7.6	6.4		7.6	4.6		6.1	4.4			
Ash %			40.7	19.7		25.9	16.2		19.3	13.3		13.1	10.5		20.5	14.3		39.0	18.1			
V.M. %			25.9	32.5		30.1	32.2		31.6	33.3		33.1	33.0		31.3	33.5		25.7	31.0			
F.C. %			28.2	42.7		37.9	45.1		41.1	48.7		46.2	50.2		40.6	47.4		29.2	45.6			
BTU's/lb			N.A.	9140		8373	9622		N.A.	10,223		9946	10,399		N.A.	10,202		N.A.	9743			
Sulphur%			0.21	0.35		0.33	0.33		0.28	0.30		0.25	0.34		0.29	0.40		0.39	0.40			
Yield %	4	3.25	100	93.9	2.92	100	95.4	5.45	100	92.4	2.76	100	93.4	4.89	100	74.4	4.75	100	68.0			
R.M. %			7.9	4.2		7.3	7.3		7.3	4.7		7.6	6.4		5.7	5.1		6.0	4.7			
Ash %			13.6	11.2		12.3	9.6		16.3	12.6		14.1	10.3		32.6	18.8		30.8	14.3			
V.M. %			33.6	35.6		34.3	33.9		32.5	32.8		32.6	33.2		25.9	30.1		27.5	32.6			
F.C. %			44.9	48.5		46.1	49.3		43.9	49.6		45.7	50.1		35.8	45.6		35.7	48.3			
BTU's/lb			N.A.	10,564		10,274	10,592		N.A.	10,452		9910	10,471		N.A.	9574		N.A.	10,167			
Sulphur%			0.23	0.22		0.37	0.33		0.32	0.24		0.39	0.39		0.21	0.34		0.28	0.40			
Yield %	5	2.28			2.72	100	70.61	1.93	100	92.3	4.10	100	69.8				9.19	100	73.6			
R.M. %						6.4	6.5		7.5	4.9		5.7	5.9					5.1	4.5			
Ash %						25.6	16.5		15.8	11.8		34.8	16.2					29.6	11.6			
V.M. %						27.0	29.5		30.6	30.5		25.4	30.2					26.8	31.9			
F.C. %						41.0	48.5		46.2	52.8		34.0	47.7					38.4	51.9			
BTU's/lb						N.A.	9723		N.A.	10,506		7221	9537					N.A.	10,556			
Sulphur%						0.25	0.27		0.26	0.28		0.24	0.35					0.19	0.47			

* NOTE: Combined 3, 3L & 3X

3) The thickness of each seam applied to the area of influence of a data point is the intersected thickness in the drill hole forming that data point. Seam intersections are tabulated in Table III.

4) A bulk density factor of 1.30 is applied to total volume to determine tonnage.

5) Measured Resources: Resources calculated from data points spaced at sufficient intervals so as to justify confidence in the character and continuity of the coal. Approximate centres of 1000 metres were selected for the Illtyd Deposit.

Indicated Resources: Resources calculated from one or more data points for which specific measurement and quality data are available for an area over which reasonable geological projections may be made from outcrop or drillhole control.

Inferred Resources Resources calculated from at least one data point from which specific measurement and quality data are available and from an assumed continuity of coal seams in an area for which a broad general knowledge of the geology of the area is known.

9.3) Total in situ resources for all deposit areas is summarized in Table IV. Details of calculations by seams are tabulated in tables found in Appendix B.

COMPANY: Pan Ocean Oil Ltd.
PROJECT: Bonnet Plume

TABLE III

DRILL HOLE - RAW DATA SUMMARY (Sheet 1 of 2)

January, 1980

HOLE	LOCATION	ELEVATION A.M.S.L. (m)	TOTAL DEPTH (m)	MARKER HORIZON: No. 1 Seam Horizon					MARKER HORIZON: No. 2 Seam Horizon					MARKER HORIZON: No. 3 Seam Horizon					MARKER HORIZON: No. 4 Seam Horizon					MARKER HORIZON: No. 5 Seam Horizon				
				DEPTH TO TOP (m)	ELEV. TO TOP (m)	DEPTH TO BASE (m)	ELEV. TO BASE (m)	THICK (m)	DEPTH TO TOP (m)	ELEV. TO TOP (m)	DEPTH TO BASE (m)	ELEV. TO BASE (m)	THICK. (m)	DEPTH TO TOP (m)	ELEV. TO TOP (m)	DEPTH TO BASE (m)	ELEV. TO BASE (m)	THICK (m)	DEPTH TO TOP (m)	ELEV. TO TOP (m)	DEPTH TO BASE (m)	ELEV. TO BASE (m)	THICK. (m)	DEPTH TO TOP (m)	ELEV. TO TOP (m)	DEPTH TO BASE (m)	ELEV. TO BASE (m)	THICK (m)
BP-78-1	10,730 N 39,532 E	717.94	116.74	63.97	654.15	69.44	648.50	5.65	103.68 108.45	614.26 609.49	106.98 113.19	610.96 604.75	3.30 4.74	-	-	-	-	-										
W-79-1	37,172 N 18,794 E	554.36	80.77	-	-	-	-	-	-	-	-	-	-	11.40	542.96	19.40	534.96	8.0	61.29	493.07	65.82	488.54	4.53					
W-79-6/6A	36,553 N 17,709 E	644.01	199.36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.12 22.06	636.89 621.95	12.40 24.16	631.61 619.85	5.28 2.10	87.48	556.53	96.31	547.70	8.84
W-79-3	35,242 N 22,332 E	636.52	71.32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
W-79-5	35,300 N 21,693 E	570.54	134.11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	69.42	501.12	72.57	497.97	3.15					
A-79-23	11,880 N 28,457 E	688.21	110.64	-	-	-	-	-	-	-	-	-	-	28.70	659.51	31.74	656.47	3.04	92.00	596.21	96.89	591.32	4.89					

TABLE III

COMPANY: Pan Ocean Oil Ltd.
PROJECT: Bonnet Plume

DRILL HOLE - RAW DATA SUMMARY (Sheet 2 of 2)

January, 1980

HOLE	LOCATION	ELEVATION A.M.S.L. (m)	TOTAL DEPTH (m)	MARKER HORIZON: No. 1 Seam Horizon					MARKER HORIZON: No. 2 Seam Horizon					MARKER HORIZON: No. 3 Seam Horizon					MARKER HORIZON: No. 4 Seam Horizon					MARKER HORIZON: No. 5 Seam Horizon				
				DEPTH TO TOP (m)	ELEV. TO TOP (m)	DEPTH TO BASE (m)	ELEV. TO BASE (m)	THICK (m)	DEPTH TO TOP (m)	ELEV. TO TOP (m)	DEPTH TO BASE (m)	ELEV. TO BASE (m)	THICK. (m)	DEPTH TO TOP (m)	ELEV. TO TOP (m)	DEPTH TO BASE (m)	ELEV. TO BASE (m)	THICK. (n)	DEPTH TO TOP (m)	ELEV. TO TOP (m)	DEPTH TO BASE (m)	ELEV. TO BASE (m)	THICK (m)	DEPTH TO TOP (m)	ELEV. TO TOP (m)	DEPTH TO BASE (m)	ELEV. TO BASE (m)	THICK. (m)
WK-80-1	12,601 N 35,688 E	717.63	304.80	27.13	690.50	28.51	689.12	1.38	65.89 70.19	651.74 647.44	69.87 73.73	647.76 643.90	3.98 3.54	149.01 151.95	568.62 565.68	150.30 154.10	567.33 563.53	1.29 2.15	241.83 246.57	475.80 471.06	243.98 247.62	473.65 470.01	2.15 1.05					
WK-80-7	13,528 N 33,810 E	583.88	355.70	66.25 68.27	517.63 515.61	66.82 71.15	517.06 512.73	0.57 2.88	100.30 105.07	483.58 478.81	104.38 109.30	479.50 474.58	4.08 4.23	167.66	416.22	171.07	412.81	3.41	245.66	338.22	247.78	336.10	2.12	325.40	258.48	328.12	255.76	2.72
W-80-8	39,662 N 18,937 E	524.49	331.32																8.72	515.77	13.41	511.08	4.69	85.20	439.29	94.89	429.69	9.60
WI-80-16	17,157 N 37,225 E	609.32	293.87																40.35 57.40		42.47 58.22		2.12 0.82	128.08		130.46		2.38
WI-80-19	13,937 N 38,134 E	696.98	261.21											43.20 48.20		45.11 50.20		1.91 2.00	107.46		110.50		3.04	153.40 172.00		156.20 174.54		2.80 2.34
GR-80-21	27,286 N 46,177 E	704.99	281.04																									
GR-80-24	26,130 N 45,358 E	707.07	203.30	156.05	551.02	158.45	548.62	2.40	196.22	510.85	198.79	508.28	2.57															
SC-80-22	13,469 N 42,724 E	709.83	309.98						39.76 47.77	670.07 662.06	45.83 53.33	664.00 656.50	6.07 5.56	97.99 107.17 129.81	612.84 602.66 580.02	101.80 108.80 131.08	608.03 601.03 578.75	4.81 1.63 1.27	193.83	516.00	201.20	508.63	7.37	255.47	454.36	258.64	451.19	3.17
SC-80-25	12,946 N 41,751	686.18	378.79	153.10	533.08	159.52	526.66	6.42	196.11 203.08	490.07 483.10	200.24 205.70	485.94 480.48	4.13 2.62	233.50 248.67 262.56	452.50 437.51 423.62	236.88 250.35 264.11	449.30 435.83 422.07	3.38 1.68 1.55	321.87	364.31	325.70	360.48	3.83	374.15 375.77	312.03 310.41	375.77 377.14	310.41 309.04	2.99

COMPANY: Pan Ocean Oil Ltd.
PROJECT: Bonnet Plume

TABLE IV
SUMMARY OF RESOURCES BY SEAM

January, 1980

Deposit Area	Seam	Average Thickness m	Area $m^2 \times 10^6$	Volume $m^3 \times 10^6$	TONNES (tonnage factor of 1.3) Measured $t \times 10^6$	Measured Seams $t \times 10^6$	Indicated $t \times 10^6$	Indicated Seams $t \times 10^6$	Inferred $t \times 10^6$	Inferred Seams $t \times 10^6$	Total $t \times 10^6$	Cumulative Total $t \times 10^6$
ILLTYD	1	6.85	8.89	61.5	63.87	63.87	16.04	16.04	-	-	79.91	79.91
	2	3.66	8.64	31.62	34.18	98.05	6.97	23.01	-	-	41.15	121.06
	3	2.40	9.33	22.39	22.88	120.93	6.20	29.21	-	-	29.08	150.14
	4	3.25	5.25	17.1	-	-	-	-	22.2	22.2	22.2	172.34
	5	2.28	3.81	8.69	-	-	-	-	11.3	33.5	11.3	183.64
WERNECKE	1	3.21	4.25	14.5	-	-	18.83	18.83	-	-	18.83	18.83
	2	8.52	4.82	41.05	-	-	53.40	72.23	-	-	53.40	72.23
	3	3.43	5.38	18.45	-	-	16.12	88.35	7.87	7.87	23.99	96.22
	4	2.92	5.52	16.12	-	-	13.18	101.53	7.76	15.63	20.94	117.16
	5	2.72	4.64	12.60	-	-	3.12	104.65	13.30	28.93	16.42	133.58
SPACESHIP	1	6.42	2.69	17.26	-	-	-	-	22.43	22.43	22.43	22.43
	2	8.99	4.44	39.90	-	-	-	-	51.90	74.33	51.90	74.33
	3,3L,3	7.12	4.44	31.59	-	-	-	-	41.07	115.40	41.07	115.40
	4	5.45	4.44	24.19	-	-	-	-	31.4	146.80	31.4	146.80
	5	1.93	4.44	8.58	-	-	-	-	11.15	157.95	11.15	157.95
AIRSTRIP	3	3.04	1.24	3.77	-	-	-	-	4.9	4.9	4.9	4.9
	4	4.89	2.12	10.40	-	-	-	-	13.5	18.4	13.5	18.4
WIND	3	8.0	0.42	3.35	-	-	4.35	4.35	-	-	4.35	4.35
	4	4.75	2.65	12.60	-	-	16.38	20.73	-	-	16.38	20.73
	5	9.19	7.02	64.50	-	-	40.10	60.83	43.8	43.8	83.90	104.63
GARLIC RING	1	2.56	1.93	4.94	-	-	3.64	3.64	2.68	2.68	6.32	6.32
	2	3.28	1.93	6.33	-	-	4.96	8.60	2.87	5.55	7.83	14.15
WEST ILLTYD	3	3.91	1.10	4.28	-	-	-	-	5.57	5.57	5.57	5.57
	4	2.76	3.12	8.61	-	-	-	-	11.20	16.77	11.20	16.77
	5	4.10	5.79	23.74	-	-	-	-	30.79	47.56	30.79	47.56
TOTAL					-	120.93	-	203.29		335.69		659.91

10.0 CONCLUSIONS AND RECOMMENDATIONS

10.1 Thermal Coal on-Site Power Generation: It is suggested that this deposit presents an attractive alternative to hydro power in the Yukon Territory and could supply the electrical needs of the Yukon as early as 1986. Not only are there sufficient resources for the Yukon's immediate use but the advantage of thermal coal generation is that the power station can be scaled up from a small source to any size required given sufficient coal reserves. The reserves appear to be in hand at least to support any station in size up to 2000 megawatts.

In addition to immediate requirements for electric power in the Yukon the medium and long term requirements could include:

1) generation of a large amount of power for export into the British columbia and/or Alaska grids.
2) generation of sufficient power to supply an often discussed base metals smelter to be located in the Yukon.
3) generation of electricity to power pumps for the Alaska Highway and Dempster pipelines.
4) generation of power for several potential mining ventures in the Yukon. Among these are:
   - Hudson Bay Mining and Smelting's Tom Silver/Lead/Zinc Deposit in the MacMillan Pass Area.
   - Pan Ocean's Jason Silver/Lead/Zinc Deposit in the MacMillan Pass Area.
   - Amax Exploration's MacTung Tungsten Deposit in the MacMillan Pass Area.
   - Placer Development Ltd. and Essex Mineral's Howards Pass Lead/ Zinc Deposit.
   - Cyprus Anvil Mining Corp.'s Grumm and Dy Silver/Lead/Zinc Deposits.
   - Several other small lead/zinc/silver and several small gold deposits which are being evaluated for possible production in the mid to late 1980's.

10.2 Thermal Coal for Export: Consideration is also being given to the export of 10 to 15 million tonnes per year to service the growing demand of Pacific Rim Nations. Ten to 15 million tonnes is that tonnage envisioned (from preliminary studies) as required to make an export project commercially viable. The possible export of coal was conceived as a project involving the construction of a coal slurry pipeline or railway to the coast and supplying captive ships to a foreign market.

10.3 Recommendations: In following through on the stated options above, two studes are currently underway:

10.3.1 Thermal Power Project: A pre-feasibility study on mining the Illtyd Deposit to provide sufficient tonnage to power a 210 megawatt on-site power station is being prepared on behalf of Pan Ocean Oil by Wright Engineers Limited of Vancouver. The study is due to be completed in late February.

10.3.2 Thermal Coal for Export: An in-house study to allow serious assessment of the export project should be caried out over the next 12 months. The report will involve the study of railway and pipeline transportation including the alternate sizes and carrying mediums of the pipeline to be used for transporting the optimum quantity of coal per year. Initial contact with potential customers to discuss and describe the project has been made and discussions should continue during the year.

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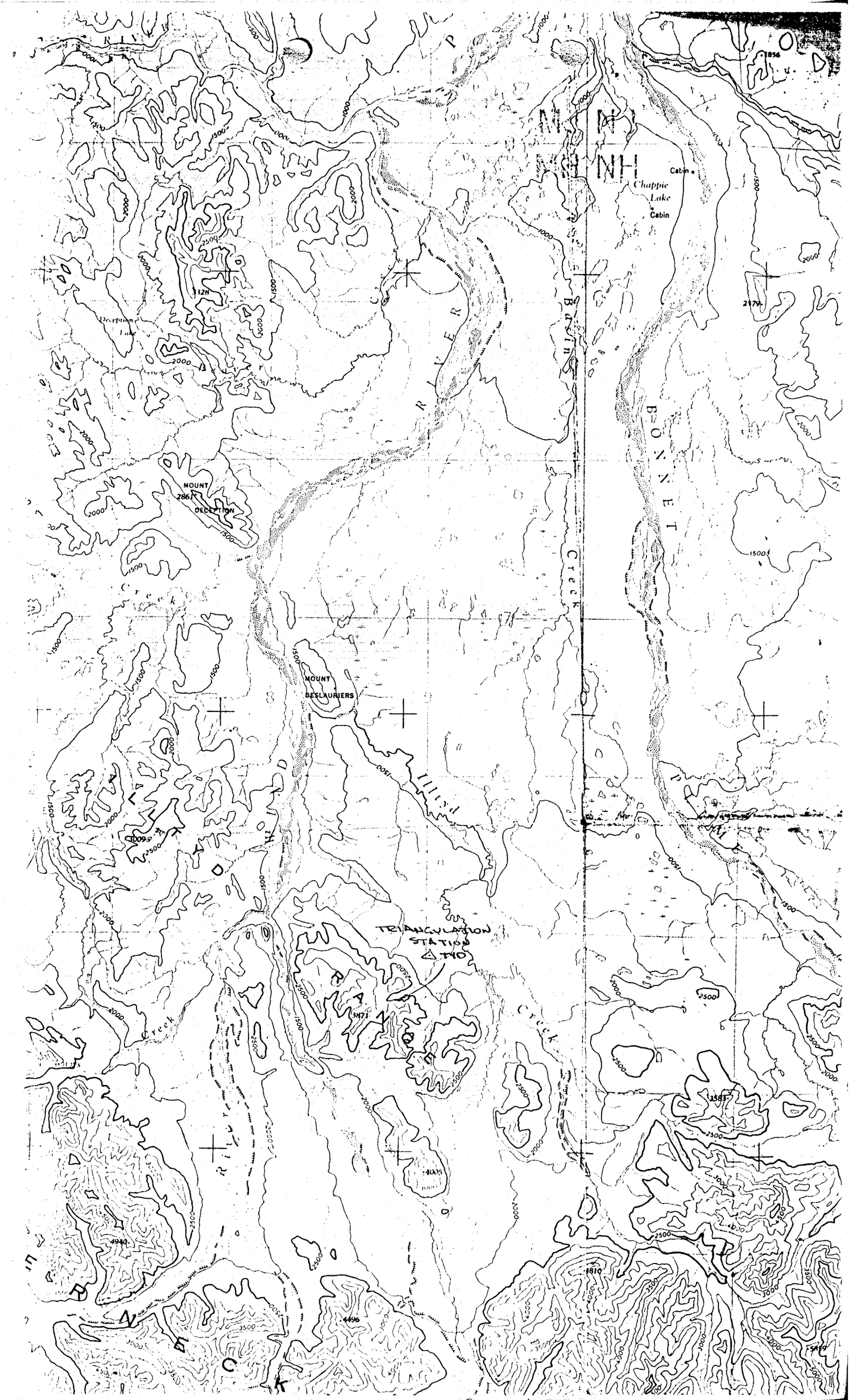
Cabin
Chappie
Lake
Cabin
MOUNT
DECEPTION
MOUNT
DESLAURIERS
TRIANGULATION
STATION
Deception
Lake
Creek
Creek
Creek

APPENDIX A

ROBERT ALLEN AND COMPANY
PROFESSIONAL LAND SURVEYORS

Our File:

Your File:

RECEIVED SEP 2 2 1980

N O T E S

1. *Coordinates are based on Triangulation Station "TYD" (Lat.: 65° 19' 50", Long.: 135° 17' 32") assumed as 25,000.00 (north) and 25,000.00 (east).*

2. *Bearings were derived from Solar Observations at traverse hub No. 18 and referred to the meridian through that station.*

3. *Elevations are geodetic and were derived from latest information from Ottawa for Triangulation Station "TYD". The given elevation is 1183.23 metres.*

4. *All coordinates and elevations are in metres.*

Box 607, Sechelt, B.C. VON 3AO 885-3237

DRILL HOLE NO.	NORTH COORD.	EAST COORD.	ELEVATION
78-1	10,729.69	39,532.03	717.94
78-2	15,835.23	38,963.77	649.18
78-3	18,640.31	38,148.41	601.80
78-4	18,339.49	38,674.24	598.80
79-1	37,171.84	18,794.20	554.36
79-2	32,269.23	21,577.67	672.66
79-3	35,242.12	22,332.12	636.52
79-4	32,893.20	22,671.02	617.54
79-5	35,300.02	21,692.69	570.54
79-6	36,552.71	17,708.58	644.01
79-7	19,325.53	38,247.33	604.03
79-8	16,779.34	38,301.92	632.08
79-9	17,700.16	38,102.84	602.61
79-10	17,731.00	38,582.50	616.27
79-11	16,803.77	38,754.32	614.96
79-12	15,004.88	39,768.50	646.47
79-13	15,945.43	39,477.74	642.19
79-14	16,349.74	38,827.55	640.84
79-15	17,030.89	39,775.32	616.93
79-16	14,561.05	40,297.32	647.49
79-16-A	14,560.20	40,297.89	647.38
79-17	18,913.28	39,156.24	587.83
79-18	16,322.83	38,530.97	637.39
79-19	17,175.83	37,877.62	612.25
79-20	18,161.99	37,907.47	604.51
79-21	19,856.12	38,717.69	578.55
79-22	16,576.83	40,364.64	649.34
79-23	11,880.06	28,456.91	688.21

DRILL HOLE NO.	NORTH COORD.	EAST COORD.	ELEVATION
80-1	12,600.50	35,688.48	717.73
80-2	13,392.71	24,189.50	648.25
80-3	10,159.99	32,817.06	599.92
80-4	22,721.82	18,605.67	700.30
80-5	22,408.01	18,190.50	804.43
80-6	20,432.27	23,490.83	639.57
80-7	13,527.52	33,810.16	583.88
80-8	39.661.90	18,936.56	524.49
80-9	33,770.98	17,437.20	574.38
80-10	40,506.67	17,263.81	447.86
80-11	47,389.12	14,742.91	524.98
80-12	44,242.09	13,702.99	462.98
80-13	42,599.88	25,916.13	455.95
80-14	51,908.98	19,144.24	400.02
80-15	41,506.89	27,271.06	474.55
80-16	17,156.58	37,225.15	609.32
80-17	57,326.36	34,328.58	377.67
80-18	44,444.10	48,052.88	482.31
80-18-A	44,433.75	48,058.09	482.30
80-19	13,936.68	38,133.63	696.98
80-20	61,736.97	15,273.57	547.52
80-21	27,285.85	46,177.02	704.99
80-22	13,468.72	42,724.19	709.83
80-23	21,247.93	42,317.11	806.08
80-24	26,129.59	45,358.33	707.07
Near 80-22 (80-25)	12,945.95	41,751.01	686.18
Near 78-1	10,748.04	38,965.52	789.35
Near 80-7 (80-26)	14,666.87	32,974.51	601.70
Near 79-23	11,080.01	27,758.15	589.53
Near Water Sta. on Illtyd	29,850.86	35,322.04	566.86

MISCELLANEOUS STATIONS	NORTH COORD.	EAST COORD.	ELEVATION
Trig. Sta. "TYD"	25,000.00	25,000.00	1183.23
Main Water Sta. on Illtyd	30,741.17	30,963.58	481.46
Cairn on Mt. Deception	57,656.51	13,647.09	874.57
1979 Traverse Hubs			
#1	15,727.93	38,984.03	656.58
#1-A	16,580.02	40,369.84	649.34
#2	14,738.14	39,285.54	624.26
#3	15,790.65	38,151.61	607.39
#4	17,229.48	39,625.95	620.26
#5	18,088.96	39,069.15	617.27
#6	18,192.24	39,076.29	616.55
#7	18,902.91	39,154.56	587.83
#8	19,326.13	38,247.59	604.03
#9	19,554.74	37,509.76	572.39
#10	18,918.01	37,298.81	577.71
#11	18,306.47	37,472.82	590.06
#12	17,272.82	37,736.92	619.64
#13	17,279.34	37,812.53	619.29
#14	15,004.18	39,766.00	646.37
#15	14,547.33	40,258.36	648.09
1980 Traverse Hubs			
#1	28,254.41	23,467.49	998.74
#2	28,204.92	23,262.89	998.44
#3	28,654.49	22,800.45	948.06
#4	29,259.64	21,878.22	898.18
#5	29,423.21	20,920.76	891.87
#6	34,197.81	19,327.83	476.82
#7	35,159.25	19,596.42	472.76
#8	36,531.14	17,770.33	641.13

MISCELLANEOUS STATIONS	NORTH COORD.	EAST COORD.	ELEVATION
1980 Traverse Hubs Cont.			
#9	35,884.81	19,648.08	469.38
#10	37,201.51	18,811.22	553.88
#11	38,267.83	19,580.82	460.58
#12	39,253.94	20,260.53	456.75
#13	39,698.52	18,928.60	523.54
#14	39,810.47	18,790.34	523.50
#15	40,517.82	17,250.48	450.82
#16	32,297.95	21,501.50	674.84
#17	29,219.67	20,724.64	863.10
#18	22,281.53	18,207.71	812.65
#19	16,810.61	26,752.11	1029.32
#19-A	16,810.78	26,766.28	1030.54
#19-B	23,735.17	17,907.34	750.45
#20	16,906.48	34,630.39	977.35
#21	14,207.85	29,390.06	1125.48
#22	12,813.83	39,559.52	909.32
#23	22,185.29	41,337.81	781.64
#24	24,755.24	45,038.93	751.28
#25	26,545.74	44,076.94	701.54
#26	26,993.30	44,435.36	685.28
#27	46,197.93	20,743.61	669.15
#27-A	27,107.86	44,827.63	690.91
#28	45,011.06	21,490.14	655.52
#29	55,109.84	16,510.34	756.81
#30	57,042.16	15,078.17	863.05
#31	57,443.36	34,320.58	376.10
#32	29,830.48	35,297.11	566.93
#33	10,435.97	37,773.63	810.67

MONUMENT RECORD

FILE CODE

TOPOGRAPHICAL SURVEY
SURVEYS AND MAPPING BRANCH
DEPARTMENT OF MINES AND TECHNICAL SURVEYS

MONUMENT JYD

MAP SHEET	106-E-6				
PROVINCE	Yukon	DATE	Oct. 1961		
FIELD OFFICER	A.C. Tuttle	LATITUDE	65 19 50.30		
TYPE OF SURVEY	Triangulation	LONGITUDE	135 17 32.23		
SOURCE	Topographic	DATUM	N.A. 1927		
MONUMENT TYPE	Signal	UTM NORTHINGS	7,245,144.0		
DATE PLANTED	1952	UTM EASTINGS	486,386.8		
FIELD BOOK NO.		ZONE	8		
AIR PHOTO NO.		ELEVATIONS	3882.0'		
THEODOLITE		LEVELLING METHOD	(Trig.)		

1 : 50,000	
1 : 250,000	✓

(FOR ADDITIONAL INFORMATION TURN

COMPANY: Pan Ocean Oil Ltd. DEPOSIT AREA: Garlic Ring

PROJECT: Bonnet Plume RESOURCE CALCULATION DATA SEAM: 1

BLOCK (Drill Hole)	(a) THICK (m)	(b) STRIKE LENGTH	(c) DIP LENGTH	(d) AREA OF BLOCK [(b)x(c)] $(m^2) \times 10^6$	(e) VOLUME OF COAL [(d)x(a)] $(m^3) \times 10^6$	(f) TONNAGE FACTOR (S.G.)	(g) IN SITU TONNES [(e)x(f)] t x 10^6
Indicated							
GR-80-21	2.81	1000	640	0.64	1.8	1.3	2.34
GR-80-24	2.40	1000	430	0.43	1.0	1.3	1.30
Inferred							
GR-80-24	2.40	2000	430	0.86	2.06	1.3	2.68

COMPANY: Pan Ocean Oil Ltd.
PROJECT: Bonnet Plume

RESOURCE CALCULATION DATA

DEPOSIT AREA: Garlic Ring
SEAM: 2

BLOCK (Drill Hole)	(a) THICK (m)	(b) STRIKE LENGTH	(c) DIP LENGTH	(d) AREA OF BLOCK [(b)x(c)] $(m^2) \times 10^6$	(e) VOLUME OF COAL [(d)x(a)] $(m^3) \times 10^6$	(f) TONNAGE FACTOR (S.G.)	(g) IN SITU TONNES [(e)x(f)] $t \times 10^6$
Indicated							
GR-80-21	4.23	1000	640	0.64	2.71	1.3	3.52
GR-80-24	2.57	1000	430	0.43	1.11	1.3	1.44
Inferred							
GR-80-24	2.57	2000	430	0.86	2.21	1.3	2.87

COMPANY: Pan Ocean Oil Ltd.
PROJECT: Bonnet Plume

RESOURCE CALCULATION DATA

DEPOSIT AREA: Spaceship
SEAM: 1

BLOCK (Drill Hole)	(a) THICK (m)	(b) PLANIMETER READING	(c) PLANIMETER FACTOR	(d) AREA OF BLOCK [(b)x(c)] (m^2)x 10^6	(e) VOLUME OF COAL [(d)x(a)] (m^3)x 10^6	(f) TONNAGE FACTOR (S.G.)	(g) IN SITU TONNES [(e)x(f)] t x 10^6
Inferred							
SC-80-25	6.42	1600	1680	2.69	17.26	1.3	22.43

COMPANY: Pan Ocean Oil Ltd.
PROJECT: Bonnet Plume

RESOURCE CALCULATION DATA

DEPOSIT AREA: Spaceship
SEAM: 2

BLOCK (Drill Hole)	(a) THICK (m)	(b) PLANIMETER READING	(c) PLANIMETER FACTOR	(d) AREA OF BLOCK [(b)x(c)] (m^2)x 10^6	(e) VOLUME OF COAL [(d)x(a)] (m^3)x 10^6	(f) TONNAGE FACTOR (S.G.)	(g) IN SITU TONNES [(e)x(f)] t x 10^6
Inferred							
SC-80-22	11.64	1212	1680	2.04	23.7	1.3	30.8
SC-80-25	6.75	1430	1680	2.40	16.2	1.3	21.1

COMPANY: Pan Ocean Oil Ltd.
PROJECT: Bonnet Plume

RESOURCE CALCULATION DATA

DEPOSIT AREA: Spaceship
SEAM: 3

BLOCK (Drill Hole)	(a) THICK (m)	(b) PLANIMETER READING	(c) PLANIMETER FACTOR	(d) AREA OF BLOCK [(b)x(c)] (m^2)x 10^6	(e) VOLUME OF COAL [(d)x(a)] (m^3)x 10^6	(f) TONNAGE FACTOR (S.G.)	(g) IN SITU TONNES [(e)x(f)] t x 10^6
Inferred							
SC-80-22	4.81	1212	1680	2.04	9.79	1.3	12.7
SC-80-25	3.38	1430	1680	2.40	8.12	1.3	10.6

COMPANY: Pan Ocean Oil Ltd. DEPOSIT AREA: Spaceship
PROJECT: Bonnet Plume RESOURCE CALCULATION DATA SEAM: 3L

BLOCK (Drill Hole)	(a) THICK (m)	(b) PLANIMETER READING	(c) PLANIMETER FACTOR	(d) AREA OF BLOCK [(b)x(c)] (m^2)x 10^6	(e) VOLUME OF COAL [(d)x(a)] (m^3)x 10^6	(f) TONNAGE FACTOR (S.G.)	(g) IN SITU TONNES [(e)x(f)] t x 10^6
Inferred							
SC-80-22	1.63	1212	1680	2.04	3.33	1.3	4.32
SC-80-25	1.68	1430	1680	2.40	4.03	1.3	5.24

COMPANY: Pan Ocean Oil Ltd.
PROJECT: Bonnet Plume

RESOURCE CALCULATION DATA

DEPOSIT AREA: Spaceship
SEAM: 3∝

BLOCK (Drill Hole)	(a) THICK (m)	(b) PLANIMETER READING	(c) PLANIMETER FACTOR	(d) AREA OF BLOCK [(b)x(c)] (m^2)x 10^6	(e) VOLUME OF COAL [(d)x(a)] (m^3)x 10^6	(f) TONNAGE FACTOR (S.G.)	(g) IN SITU TONNES [(e)x(f)] t x 10^6
Inferred							
SC-80-22	1.27	1212	1680	2.04	2.59	1.3	3.37
SC-80-25	1.55	1430	1680	2.40	3.72	1.3	4.84

COMPANY: Pan Ocean Oil Ltd.
PROJECT: Bonnet Plume

RESOURCE CALCULATION DATA

DEPOSIT AREA: Spaceship
SEAM: 4

BLOCK (Drill Hole)	(a) THICK (m)	(b) PLANIMETER READING	(c) PLANIMETER FACTOR	(d) AREA OF BLOCK, [(b)x(c)] (m^2)x 10^6	(e) VOLUME OF COAL [(d)x(a)] (m^3)x 10^6	(f) TONNAGE FACTOR (S.G.)	(g) IN SITU TONNES [(e)x(f)] t x 10^6
Inferred							
SC-80-22	7.37	1212	1680	2.04	15.0	1.3	19.5
SC-80-25	3.83	1430	1680	2.40	9.19	1.3	11.9

COMPANY: Pan Ocean Oil Ltd.
PROJECT: Bonnet Plume

RESOURCE CALCULATION DATA

DEPOSIT AREA: Spaceship
SEAM: 5

BLOCK (Drill Hole)	(a) THICK (m)	(b) PLANIMETER READING	(c) PLANIMETER FACTOR	(d) AREA OF BLOCK [(b)x(c)] (m^2)x 10^6	(e) VOLUME OF COAL [(d)x(a)] (m^3)x 10^6	(f) TONNAGE FACTOR (S.G.)	(g) IN SITU TONNES [(e)x(f)] t x 10^6
Inferred							
SC-80-22	2.30	1212	1680	2.04	4.69	1.3	6.10
SC-80-25	1.62	1430	1680	2.40	3.89	1.3	5.05

COMPANY: Pan Ocean Oil Ltd.
PROJECT: Bonnet Plume

RESOURCE CALCULATION DATA

DEPOSIT AREA: Airstrip
SEAM: 3

BLOCK (Drill Hole)	(a) THICK (m)	(b) PLANIMETER READING	(c) PLANIMETER FACTOR	(d) AREA OF BLOCK ' [(b)x(c)] $(m^2) \times 10^6$	(e) VOLUME OF COAL [(d)x(a)] $(m^3) \times 10^6$	(f) TONNAGE FACTOR (S.G.)	(g) IN SITU TONNES [(e)x(f)] $t \times 10^6$
Inferred							
A-79-23	3.04	740	1680	1.24	3.77	1.3	4.9

COMPANY: Pan Ocean Oil Ltd.
PROJECT: Bonnet Plume

RESOURCE CALCULATION DATA

DEPOSIT AREA: Airstrip
SEAM: 4

BLOCK (Drill Hole)	(a) THICK (m)	(b) PLANIMETER READING	(c) PLANIMETER FACTOR	(d) AREA OF BLOCK [(b)x(c)] $(m^2) \times 10^6$	(e) VOLUME OF COAL [(d)x(a)] $(m^3) \times 10^6$	(f) TONNAGE FACTOR (S.G.)	(g) IN SITU TONNES [(e)x(f)] $t \times 10^6$
Inferred							
A-79-23	4.89	1264	1680	2.12	10.4	1.3	13.5

COMPANY: Pan Ocean Oil Ltd. DEPOSIT AREA: West Illtyd
PROJECT: Bonnet Plume RESOURCE CALCULATION DATA SEAM: 3

BLOCK (Drill Hole)	(a) THICK (m)	(b) PLANIMETER READING	(c) PLANIMETER FACTOR	(d) AREA OF BLOCK [(b)x(c)] $(m^2) \times 10^6$	(e) VOLUME OF COAL [(d)x(a)] $(m^3) \times 10^6$	(f) TONNAGE FACTOR (S.G.)	(g) IN SITU TONNES [(e)x(f)] $t \times 10^6$
Inferred							
WI-80-19	3.91	652	1680	1.10	4.28	1.3	5.57

COMPANY: Pan Ocean Oil Ltd.
PROJECT: Bonnet Plume

RESOURCE CALCULATION DATA

DEPOSIT AREA: West Illtyd
SEAM: 4

BLOCK (Drill Hole)	(a) THICK (m)	(b) PLANIMETER READING	(c) PLANIMETER FACTOR	(d) AREA OF BLOCK [(b)x(c)] (m^2)x 10^6	(e) VOLUME OF COAL [(d)x(a)] (m^3)x 10^6	(f) TONNAGE FACTOR (S.G.)	(g) IN SITU TONNES [(e)x(f)] t x 10^6
Inferred							
WI-80-16	2.12	553	1680	0.93	1.97	1.3	2.56
WI-80-19	3.04	1301	1680	2.19	6.64	1.3	8.64

COMPANY: Pan Ocean Oil Ltd.
PROJECT: Bonnet Plume

RESOURCE CALCULATION DATA

DEPOSIT AREA: West Illtyd
SEAM: 5

BLOCK (Drill Hole)	(a) THICK (m)	(b) PLANIMETER READING	(c) PLANIMETER FACTOR	(d) AREA OF BLOCK [(b)x(c)] (m^2)x 10^6	(e) VOLUME OF COAL [(d)x(a)] (m^3)x 10^6	(f) TONNAGE FACTOR (S.G.)	(g) IN SITU TONNES [(e)x(f)] t x 10^6
Inferred							
WI-80-16	2.38	1460	1680	2.45	5.84	1.3	7.59
WI-80-19	5.34	1990	1680	3.34	17.9	1.3	23.2

COMPANY: Pan Ocean Oil Ltd. DEPOSIT AREA: Wind River
PROJECT: Bonnet Plume RESOURCE CALCULATION DATA SEAM: 3

BLOCK (Drill Hole)	(a) THICK (m)	(b) PLANIMETER READING	(c) PLANIMETER FACTOR	(d) AREA OF BLOCK [(b)x(c)] $(m^2)x\ 10^6$	(e) VOLUME OF COAL [(d)x(a)] $(m^3)x\ 10^6$	(f) TONNAGE FACTOR (S.G.)	(g) IN SITU TONNES [(e)x(f)] $t\ x\ 10^6$
Indicated							
W-79-1	8.0	249	1680	0.42	3.35	1.30	4.35

COMPANY: Pan Ocean Oil Ltd. DEPOSIT AREA: Wind River
PROJECT: Bonnet Plume RESOURCE CALCULATION DATA SEAM: 4

BLOCK (Drill Hole)	(a) THICK (m)	(b) PLANIMETER READING	(c) PLANIMETER FACTOR	(d) AREA OF BLOCK [(b)x(c)] $(m^2) \times 10^6$	(e) VOLUME OF COAL [(d)x(a)] $(m^3) \times 10^6$	(f) TONNAGE FACTOR (S.G.)	(g) IN SITU TONNES [(e)x(f)] $t \times 10^6$
Indicated							
W-79-1	4.53	998	1680	1.68	7.60	1.3	9.87
W-79-6	7.38	101	1680	0.17	1.25	1.3	1.63
W-80-8	4.69	476	1680	0.80	3.75	1.3	4.88

COMPANY: Pan Ocean Oil Ltd. DEPOSIT AREA: Wind River
PROJECT: Bonnet Plume RESOURCE CALCULATION DATA SEAM: 5

BLOCK (Drill Hole)	(a) THICK (m)	(b) PLANIMETER READING	(c) PLANIMETER READING	(d) AREA OF BLOCK [(b)x(c)] $(m^2) \times 10^6$	(e) VOLUME OF COAL [(d)x(a)] $(m^3) \times 10^6$	(f) TONNAGE FACTOR (S.G.)	(g) IN SITU TONNES [(e)x(f)] t x 10^6
Indicated							
W-79-6	8.84	1124	1680	1.89	16.7	1.3	21.7
W-80-8	9.60	877	1680	1.47	14.1	1.3	18.4
Inferred							
W-79-6	8.84	1155	1680	1.94	17.2	1.3	22.3
W-80-8	9.60	1024	1680	1.72	16.5	1.3	21.5

COMPANY: Pan Ocean Oil Ltd. DEPOSIT AREA: Wernecke
PROJECT: Bonnet Plume RESOURCE CALCULATION DATA SEAM: 1

BLOCK (Drill Hole)	(a) THICK (m)	(b) PLANIMETER READING	(c) PLANIMETER READING	(d) AREA OF BLOCK [(b)x(c)] (m^2)x 10^6	(e) VOLUME OF COAL [(d)x(a)] (m^3)x 10^6	(f) TONNAGE FACTOR (S.G.)	(g) IN SITU TONNES [(e)x(f)] t x 10^6
Indicated							
BP-78-1	5.65	952	1680	1.60	9.04	1.3	11.7
WK-80-1	1.38	1170	1680	1.97	2.71	1.3	3.53
WK-80-7	2.88	573	1680	0.96	2.77	1.3	3.60

COMPANY: Pan Ocean Oil Ltd. DEPOSIT AREA: Wernecke
PROJECT: Bonnet Plume RESOURCE CALCULATION DATA SEAM: 2

BLOCK (Drill Hole)	(a) THICK (m)	(b) PLANIMETER READING	(c) PLANIMETER READING	(d) AREA OF BLOCK [(b)x(c)] (m^2)x 10^6	(e) VOLUME OF COAL [(d)x(a)] (m^3)x 10^6	(f) TONNAGE FACTOR (S.G.)	(g) IN SITU TONNES [(e)x(f)] t x 10^6
Indicated							
BP-78-1	9.51	981	1680	1.65	15.7	1.3	20.4
WK-80-1	7.84	1216	1680	2.04	16.0	1.3	20.8
WK-80-7	8.31	670	1680	1.13	9.35	1.3	12.2

COMPANY: Pan Ocean Oil Ltd. DEPOSIT AREA: Wernecke
PROJECT: Bonnet Plume RESOURCE CALCULATION DATA SEAM: 3

BLOCK (Drill Hole)	(a) THICK (m)	(b) PLANIMETER READING	(c) PLANIMETER READING	(d) AREA OF BLOCK [(b)x(c)] (m^2)x 10^6	(e) VOLUME OF COAL [(d)x(a)] (m^3)x 10^6	(f) TONNAGE FACTOR (S.G.)	(g) IN SITU TONNES [(e)x(f)] t x 10^6
Indicated							
WK-80-1	3.44	1244	1680	2.09	7.19	1.3	9.35
WK-80-7	3.41	909	1680	1.53	5.21	1.3	6.77
Inferred							
WK-80-1	3.44	1047	1680	1.76	6.05	1.3	7.87

COMPANY: Pan Ocean Oil Ltd. DEPOSIT AREA: Wernecke
PROJECT: Bonnet Plume RESOURCE CALCULATION DATA SEAM: 4

BLOCK (Drill Hole)	(a) THICK (m)	(b) PLANIMETER READING	(c) PLANIMETER READING	(d) AREA OF BLOCK [(b)x(c)] (m^2)x 10^6	(e) VOLUME OF COAL [(d)x(a)] (m^3)x 10^6	(f) TONNAGE FACTOR (S.G.)	(g) IN SITU TONNES [(e)x(f)] t x 10^6
Indicated							
WK-80-1	3.20	1318	1680	2.21	7.09	1.3	9.21
WK-80-7	2.12	858	1680	1.44	3.06	1.3	3.97
Inferred							
WK-80-1	3.20	1111	1680	1.87	5.97	1.3	7.76

COMPANY: Pan Ocean Oil Ltd.
PROJECT: Bonnet Plume

RESOURCE CALCULATION DATA

DEPOSIT AREA: Wernecke
SEAM: 5

BLOCK (Drill Hole)	(a) THICK (m)	(b) PLANIMETER READING	(c) PLANIMETER READING	(d) AREA OF BLOCK [(b)x(c)] (m^2)x 10^6	(e) VOLUME OF COAL [(d)x(a)] (m^3)x 10^6	(f) TONNAGE FACTOR (S.G.)	(g) IN SITU TONNES [(e)x(f)] t x 10^6
Indicated							
WK-80-7	2.72	526	1680	0.88	2.40	1.3	3.12
Inferred							
WK-80-7	2.72	2240	1680	3.76	10.2	1.3	13.3

COMPANY: Pan Ocean Oil Ltd. DEPOSIT AREA: Illtyd
PROJECT: Bonnet Plume RESOURCE CALCULATION DATA SEAM: 4

BLOCK (Drill Hole)	(a) THICK (m)	(b) PLANIMETER READING	(c) PLANIMETER READING	(d) AREA OF BLOCK [(b)x(c)] $(m^2) \times 10^6$	(e) VOLUME OF COAL [(d)x(a)] $(m^3) \times 10^6$	(f) TONNAGE FACTOR (S.G.)	(g) IN SITU TONNES [(e)x(f)] t x 10^6
Inferred							
Average of BP-79-14 BP-79-13 WI-80-16 WK-80-7 WK-80-1 SC-80-25	3.25	3125	1680	5.25	17.1	1.3	22.2

COMPANY: Pan Ocean Oil Ltd.
PROJECT: Bonnet Plume

RESOURCE CALCULATION DATA

DEPOSIT AREA: Illtyd
SEAM: 5

BLOCK (Drill Hole)	(a) THICK (m)	(b) PLANIMETER READING	(c) PLANIMETER READING	(d) AREA OF BLOCK [(b)x(c)] (m^2)x 10^6	(e) VOLUME OF COAL [(d)x(a)] (m^3)x 10^6	(f) TONNAGE FACTOR (S.G.)	(g) IN SITU TONNES [(e)x(f)] t x 10^6
Inferred							
WI-80-16	2.28	2268	1680	3.81	8.69	1.3	11.3

APPENDIX C

LOCATION MAP

TN ↑

SCALE:

COORDINATES: 6,000 m W; 8,000 m N OF SE CORNER OF CL 78
ELEVATION: 542.5 m (APPROX.)
DIP: -90° BEARING: —
CORE SIZE: NQ + NQ CASING
BITS USED: J.K. SMIT COMBINATION; J.K. SMIT 75+100 SERIES DIAMOND
MUD USED: 151 GALLS. POLY 330, 77 BAGS GEL; 6 BAGS TROL; 30 GALLS. DIESEL
m. LEFT IN HOLE: 45.72 m.
DATE START: MAY 30, 1980 FINISH: JUNE 16/80
DRILLER: CARON DIAMOND DRILLING (DRILL 69-5) OVERALL RECOVERY: 86.93 %
TESTS: ACID TEST @ 346.56: 89°
SAMPLED BY: DATE: ANALYZED BY:

PAN OCEAN OIL LTD.
MINING DIVISION - COAL

DRILLHOLE NO. WK-80-3
SHEET 1 OF 2

LOGGED BY: O. CULLINGHAM DATE: JUNE 18, 1980
SIGNED:

GEOLOGICAL LOG — SCALE: 1:500

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
		37.6	OVERBURDEN - TRICONED MIXED FRAGMENTS OF LIMESTONE CHERT, QUARTZITE, DOMINANTLY LIMESTONE, PEBBLES AND BOULDERS, SOME CLAY ZONES
73.76		0.61	SANDSTONE - LIGHT BUFF
74.10		0.73	MUDSTONE - MEDIUM GRAY, SANDY
75.10		7.19	CONGLOMERATE AND CONGLOMERATIC SANDSTONE, MEDIUM GRAY, LIMONITE STAINING THROUGHOUT, FINE TO COARSE GRAINED MATRIX, CLASTS OF CHERT AND QUARTZ, POORLY SORTED
82.29		0.71	MUDSTONE - MEDIUM GRAY, SILTY
83.00		0.82	SANDSTONE - MEDIUM GRAY, MEDIUM GRAINED
83.82		3.58	MUDSTONE - MEDIUM TO MEDIUM DARK GRAY, IN PART CARBONACEOUS RARE SPLINTS AND PARTINGS OF COAL
87.40		1.55	MUDSTONE - MED. GRAY, SILTY, GRADATIONAL DOWNWARD TO FINE GRAIN SANDSTONE
88.95		4.88	SANDSTONE - MEDIUM GRAY, COARSENS DOWNWARDS FROM SILT TO MEDIUM GRAINED, CONTORTED BEDDING, RARE LAMINATIONS OF CARBONACEOUS MATERIAL, QUARTZ AND CHERT GRAINS 1:1
93.83		16.27	CONGLOMERATIC - MEDIUM TO DARK GRAY, WHITE TO DARK GRAY CLASTS OF CHERT AND QUARTZITE, MAINLY CLAST SUPPORTED, CONTAINS INTERBEDS AND/OR LENSES OF FINE GRAINED SANDSTONE.
110.10			
110.90			
111.86			
112.88			
114.05		21.44	MUDSTONE / THIN INTERBEDS OF LAMINATED SILTSTONE MEDIUM GRAY, IN PART MEDIUM DARK GRAY WITH SOME MAUVISH AND OLIVE GREEN HUES. THIN INTERBED OF CONGLOMERATE, INTERBED OF CARBONACEOUS SHALE.
117.95			
118.45			
128.70			
131.54		9.56	SANDSTONE AND CONGLOMERATIC SANDSTONE, MEDIUM GRAY, SALT AND PEPPER TEXTURE QUARTZ AND CHERT, RATIO 1:1, FINE GRAINED TO SMALL PEBBLE CONGLOMERATIC BEDS COARSEN DOWNWARDS. RARE CARBONACEOUS MATERIAL
132.47			
140.10		13.57	MUDSTONE - MOSTLY MEDIUM GRAY, BASAL 0.6 m A SLIGHT MAUVE HUE. ONE CARBONACEOUS PARTING.
153.02			
153.67		4.63	SANDY MUDSTONE TO SHALY MUDSTONE, MEDIUM OLIVE GRAY, SILT TO VERY FINE GRAINS COMPOSED OF QUARTZ AND CHERT, RATIO 3:1 GREENISH HUE MAY BE DUE TO GLAUCONITE
158.30		3.40	SANDSTONE - MEDIUM GRAY, GREENISH AT TOP OF UNIT, FINE GRAINED QUARTZ AND CHERT, RATIO 2:1
161.70		8.20	CONGLOMERATE - CHERT AND QUARTZ CLASTS OF WHITE TO DARK GRAY MATRIX IS MEDIUM TO COARSE GRAINED SANDSTONE POORLY CEMENTED.
168.90		2.27	SANDY MUDSTONE TO SANDSTONE
171.17		2.73	MUDSTONE - MEDIUM TO DARK GRAY. PARTLY CARBONACEOUS
173.90		1.96	SILTSTONE - MEDIUM GREY LAMINATED WITH MUDSTONE
175.86		4.94	SANDSTONE - CONGLOMERATIC SANDSTONE AND CONGLOMERATE BECOMES MORE CONGLOMERATIC BASALLY. THIN TO THICKLY BEDDED QUARTZ, ABOUT 1:1 RATIO, SMALL PEBBLES
180.80		4.21	SILTSTONE - MEDIUM GREY, BLOCKY, SHALY, SLUMP STRUCTURE AND SOFT SEDIMENT DEFORMATION.
185.01		30.79	MUDSTONE - MEDIUM GRAY TO MEDIUM DARK GREY. IN PART CARBONACEOUS WITH SPLINTS AND THIN PARTINGS OF COAL.
215.80		2.09	CARBONACEOUS MUDSTONE - MEDIUM DARK GREY TO DARK GREY, CONTAINS SPLINTS AND PARTINGS OF VITREOUS COAL
217.89		4.86	MUDSTONE TO SILTSTONE, MEDIUM GRAY TO MEDIUM DARK GREY, SLIGHTLY CARBONACEOUS, OCCASIONAL SPLINTS OF VITREOUS COAL
222.75		0.58	CARBONACEOUS MUDSTONE - CONTAINS FLECKS AND SPLINTS OF COAL
223.33		1.22	COAL HORIZON
224.55		3.00	MUDSTONE - MEDIUM TO MEDIUM DARK GREY SPLINTS AND PARTINGS OF COAL
227.55			MUDSTONE - MEDIUM OLIVE GRAY.
228.45			MUDSTONE TO SILTSTONE - MEDIUM GREY.
238.87		8.62	CONGLOMERATE - SMALL TO MEDIUM PEBBLES OF CHERT AND QUARTZITE

DETAILS OF COAL SEAMS — SCALE:

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC GRAV	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT: YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE I)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE II)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER

DRILLHOLE NO. WK-80-3 SHEET 2 OF 2

GEOLOGICAL LOG — SCALE: 1:500

DETAILS OF COAL SEAMS — SCALE:

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
248.90		1.41	MUDSTONE - MEDIUM GRAY, SILTY
		17.02	CARBONACEOUS TO COALY MUDSTONE
265.92			MUDSTONE - LIGHT GREY, GREENISH BASALLY
266.90		3.54	CARBONACEOUS AND COALY MUDSTONE
270.44		8.11	MUDSTONE, SILTSTONE, TO FINE GRAINED SS MEDIUM TO LIGHT GRAY
278.55		2.20	MUDSTONE - LIGHT GREY TO OFF-WHITE, TO LIGHT OLIVE GRAY
280.75		4.75	CARBONACEOUS AND COALY MUDSTONE WITH THIN COAL SEAMS, MEDIUM DARK TO DARK GREY.
285.5		6.80	MUDSTONE TO SILTSTONE TO VERY FINE GRAINED SILTSTONE. MEDIUM TO DARK GRAY.
292.30		11.90	CARBONACEOUS TO COALY MUDSTONE WITH THIN SEAMS OF COAL
304.20		8.70	MUDSTONE - SILTSTONE AND VERY FINE GRAINED SANDSTONE. MEDIUM GREY.
312.90		10.07	SANDSTONE - CONGLOMERATIC SANDSTONE AND CONGLOMERATE
322.97		5.15	MUDSTONE - MEDIUM GREY TO MEDIUM DARK GRAY
328.12		15.19	SANDSTONE - CONGLOMERATIC SANDSTONE AND CONGLOMERATE. INTERBEDDED.
343.61		5.38	MUDSTONE AND CARBONACEOUS MUDSTONE
348.69		12.30	MUDSTONE TO SILTSTONE - MEDIUM GREY.
360.99		4.56	SANDSTONE - MEDIUM GRAY.
365.55		1.99	CARBONACEOUS TO COALY MUDSTONE.
367.54		3.32	MUDSTONE - MEDIUM GRAY. RARE SPLINTS OF COAL
370.86		4.26	SANDSTONE - MEDIUM GREY, FINE GRAINED, SOME CONGLOMERATIC INTERVALS
375.21		2.19	CARBONACEOUS TO COALY MUDSTONE
377.31		3.89	MUDSTONE TO SILTSTONE, MEDIUM GREY
381.20		3.10	CARBONACEOUS TO COALY MUDSTONE
384.30		4.23	SILTY MUDSTONE TO SILTSTONE. MEDIUM GREY
388.53		9.23	CONGLOMERATE, SMALL TO MEDIUM PEBBLES.
397.76		5.64	CARBONACEOUS TO COALY MUDSTONE
403.40		5.40	MUDSTONE - MEDIUM GRAY.
408.80		3.31	SILTSTONE, MEDIUM GREY.
412.14		1.19	SANDSTONE, FINE GRAINED, MEDIUM GREY
413.30		9.24	CONGLOMERATE, SMALL TO MEDIUM PEBBLES
422.54		1.53	CARBONACEOUS TO COALY MUDSTONE
424.07		1.26	MUDSTONE, MEDIUM GREY.
425.33		1.09	SILTSTONE WITH FINE GRAINED SANDSTONE
426.42		1.82	SANDSTONE - FINE GRAINED, MEDIUM GREY.
428.24			TD - 428.24

| DETAILS OF COAL SEAMS | | |

LOCATION MAP

TN

SCALE:

COORDINATES: 7900 m W, 6900 m N, OF S.E. CORNER OF C.L. 84
ELEVATION: 685.8 m (APPROX)
DIP: -65° BEARING: 230°
CORE SIZE: HQ CASING HW 4.24 m
BITS USED: JK SMIT COMBINATION, JK SMIT SERIES 75 DIAMOND
MUD USED: 12 GALLONS POLYDRILL 330, 1 BAG GEL
m. LEFT IN HOLE: NIL m.
DATE START: JUNE 6, 1980 FINISH: JUNE 8, 1980
DRILLER: CARON DIAMOND DRILLING OVERALL RECOVERY: 93%
TESTS:
SAMPLED BY: NOT SAMPLED DATE: ANALYZED BY:

PAN OCEAN OIL LTD.
MINING DIVISION - COAL
LOGGED BY: O. CULLINGHAM DATE: JUNE 14, 1980
SIGNED:

DRILLHOLE NO. AN-80-4
SHEET 1 OF 1

GEOLOGICAL LOG — SCALE: 1:500

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
4.27		4.27	OVERBURDEN AND WEATHERED LIMESTONE, TRICONED
		34.44	LIMESTONE - LIGHT GRAY TO LIGHT OCHRE GRAY, IN PART WITH ROSE HUE DUE TO HEMATITE STAINING, LIMONITE STAINING ALONG FRACTURES
38.71			T.D. 38.71

DETAILS OF COAL SEAMS — SCALE:

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC GRAV	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT: YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE I)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE II)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER

LOCATION MAP

TN

SCALE:

COORDINATES: 8700m W; 6600m N OF S.E. CORNER OF CL 84
ELEVATION: APPROX. 762m AMSL
DIP: -90°
CORE SIZE: HQ
BEARING: —
CASING HW 3.66
BITS USED: J.K. SMIT COMBINATION
J.K. SMIT SERVES 75 DIAMOND
MUD USED: 28 GALLONS POLY 330, 3 BAGS GEL
m. LEFT IN HOLE: NIL m.
DATE START: JUNE 10/80
DRILLER: CARON DIAMOND DRILLING
TESTS: NIL
SAMPLED BY:
FINISH: JUNE 13/80
OVERALL RECOVERY: 89 %
DATE: ANALYZED BY:

PAN OCEAN OIL LTD.
MINING DIVISION - COAL

LOGGED BY: O. CULLINGHAM DATE: JUNE 16, 1980
SIGNED:

DRILLHOLE NO. AN-80-5
SHEET 1 OF 1

GEOLOGICAL LOG — SCALE: 1:500

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
1.83		1.83	OVERBURDEN - WEATHERED SANDSTONE.
4.70		2.87	CONGLOMERATE AND CONGLOMERATIC SANDSTONE - MEDIUM DARK GRAY, CHERT AND QUARTZ PEBBLES OF LOW SPHERICITY.
13.50		8.80	SANDSTONE AND CONGLOMERATE - FINES UPWARDS TO FINE GRAINED SANDSTONE MEDIUM GRAY TO MEDIUM BROWNISH GRAY WITH LIMONITE STAINING AND CARBONACEOUS MATERIALS IN SANDSTONE
17.33		3.83	SANDSTONE - MEDIUM GRAY BROWN, FINE GRAINED, PARTINGS OF CARBONACEOUS MATERIAL.
21.96		4.63	CONGLOMERATE - MEDIUM GRAY, SMALL TO MEDIUM PEBBLE OF CHERT AND QUARTZITE
22.20		0.24	CARBONACEOUS TO COALY SHALE
25.30		3.10	MUDSTONE AND BRECCIATED MUDSTONE, MEDIUM GRAY TO MEDIUM GRAY BROWN. FAULT?
48.45		23.15	SANDSTONE - MEDIUM GRAY BROWN TO MEDIUM GRAY, SILT TO FINE GRAINED, NOT TYPICAL BONNET PLUME, QUARTZ AND MINOR CHERT; CARBONACEOUS AND (?) BITUMEN ON FRACTURE FACES.
50.94		2.49	CONGLOMERATE - SMALL TO MEDIUM PEBBLE IN SILICEOUS FINE GRAINED MATRIX.
61.67		10.73	SANDSTONE - MEDIUM LIGHT BROWN, SILT TO VERY FINE GRAINED QUARTZ, WELL SORTED, ANGULAR, LIMONITE STAINED THROUGHOUT. MAY BE IN PART LIMONITE CEMENT.
63.55		1.88	SANDSTONE AND CONGLOMERATIC SANDSTONE - MEDIUM GRAY
65.00		1.45	SANDSTONE MEDIUM GRAY - BROWN, VERY FINE GRAINED
68.35		3.35	SANDSTONE - MEDIUM GRAY, VERY FINE GRAINED, QUARTZ AND CHERT ? IN PARTINGS OF CARBONACEOUS OR BITUMINOUS MATERIAL, CLASTS OF MUDSTONE.
		34.06	SANDSTONE - ABRUPT CHANGE TO LIGHT GRAY TO LIGHT BROWNISH GRAY, VERY FINE GRAINED, MODERATELY TO WELL SORTED QUARTZ. PROBABLY PERMIAN
102.41			TD - 102.41

DETAILS OF COAL SEAMS — SCALE:

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC. GRAV.	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE WEIGHT PERCENT								
YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE I)									
THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE II)									
THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III)									
THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER

LOCATION MAP

TN ↑

SCALE:

COORDINATES: 3500m W; 4250m N OF SE CORNER CL 84
ELEVATION: 591.31m amsl (APPROX)
DIP: -90° BEARING: —
CORE SIZE: NQ CASING HW 12.19 NW 42.67

BITS USED: J.K. SMIT COMBINATION, J.K. SMIT 100 SERIES DIAMOND
MUD USED: 79 GALLS POLY 330; 39 BAGS TROL 152 BAGS GEL; 6 CEMENT; 500 GALLS DIESEL
m. LEFT IN HOLE: NIL m.

DATE START: JUNE 14/80 FINISH: JUNE 25/80
DRILLER: CARON DIAMOND DRILLING OVERALL RECOVERY: 94.8 %
TESTS: —
SAMPLED BY: DATE: ANALYZED BY:

PAN OCEAN OIL LTD.
MINING DIVISION - COAL
LOGGED BY: D. GARRISON A. HARGRAVE DATE: JUNE 27, 1980
SIGNED:

DRILLHOLE NO. AE-80-6
SHEET 1 OF 1

GEOLOGICAL LOG — SCALE: 1:500

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
		49.78	OVERBURDEN - TRICONED AND PARTIALLY CORED. PEBBLES AND BOULDERS - DOMINANTLY LIMESTONE
49.78		24.22	MUDSTONE - MEDIUM TO DARK GRAY, IN PART CARBONACEOUS, FRIABLE TO BLOCKY, SHORT INTERVALS OF BLOCKY SILTY MUDSTONE FRACTURES @ 60° TO C A PREDOMINATE. FEW FRACTURES @ 25° TO 40° TO C A
74.00		3.38	SILTY MUDSTONE / SILTSTONE - LIGHT TO MEDIUM GRAY, LAMINATED, IN PART CRENULATED, SLIGHTLY CARBONACEOUS.
77.38		26.12	MUDSTONE - MEDIUM TO DARK GRAY, FRAGMENTAL TO BLOCKY, IN PART CARBONACEOUS. FRACTURES @ 60° TO C A / FEW @ 25° TO C A
		1.98	SANDSTONE - LIGHT TO MEDIUM GREY, BDG @ 65° TO C A
		9.27	MUDSTONE - MEDIUM TO DARK GRAY; FRAGMENTAL; IN PART SLIGHTLY CARBONACEOUS.
		4.03	SANDSTONE - MEDIUM GRAY, FINE TO MEDIUM GRAINED, BEDDING PERPENDICULAR TO C A
			MUDSTONE - VERY DARK GRAY, FRAGMENTAL FRACTURES @ 55° TO C A
122.22			HOLE ABANDONED 122.22m DUE TO BROKEN RODS AND DOWNHOLE SLOUGHING. UNABLE TO RETRIEVE RODS.

DETAILS OF COAL SEAMS — SCALE:

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC GRAV	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE WEIGHT PERCENT								
YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE I)									
THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE II)									
THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III)									
THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER

LOCATION MAP

TN

SCALE:

COORDINATES: 5,000 m W., 11,050 m N. OF S.E. CORNER OF C.L. 78
ELEVATION: APPROX. 541 m a.m.s.l.
DIP: -90° BEARING: -
CORE SIZE: HQ, NQ. CASING HW 3780 NW(HQ) 55.47
BITS USED: J.K SMIT COMBINATION, J.K.SMIT SERIES 75, 100 DIAMOND
MUD USED: 114 GALLS. POLY 330, 48 BAGS GEL
m. LEFT IN HOLE: 10 BAGS TROL. 15 GALLS DIESEL NIL m.
DATE START: JUNE 17/80 FINISH: JUNE 26/80
DRILLER: CARON DIAMOND DRILLING OVERALL RECOVERY: 87 %
TESTS: -
SAMPLED BY: O. CULLINGHAM DATE: JUNE 28/80 ANALYZED BY: BIRTLEY COAL & MINERALS TESTING

PAN OCEAN OIL LTD.
MINING DIVISION - COAL

LOGGED BY: O. CULLINGHAM DATE: JUNE 27, 1980
SIGNED:

DRILLHOLE NO. WK-80-7
SHEET 1 OF 2

GEOLOGICAL LOG — SCALE: 1:500

DETAILS OF COAL SEAMS — SCALE: 1:50

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
		47.85	OVERBURDEN - TRICONED, WEATHERED CONGLOMERATE EMBEDDED IN MUD AT BASE.
47.85 / 49.00		1.15	MUDSTONE - MEDIUM GRAY, FLECKS OF CARBONACEOUS MATERIAL.
		17.14	CONGLOMERATE - SMALL TO MEDIUM PEBBLES OF CHERT AND QUARTZITE, WHITE TO BLACK WITH OCCASIONAL GREEN.
66.14 / 66.25		0.11	MUDSTONE
		5.81	COAL - No. 1 SEAM HORIZON
72.04		8.98	MUDSTONE - MEDIUM TO MEDIUM DARK GRAY, IN PART CARBONACEOUS WITH RARE SPLINTS AND PARTINGS OF COAL
81.04		17.96	CONGLOMERATE - PEBBLES OF CHERT AND QUARTZITE, WHITE TO BLACK WITH OCCASIONAL GREEN. SMALL TO MEDIUM PEBBLE.
99.00 / 100.25		1.25	CARBONACEOUS MUDSTONE - WITH FLECKS, SPLINTS, AND PARTINGS OF COAL
		9.05	COAL - No. 2 SEAM HORIZON
109.30 / 110.80 / 111.50		18.10	MUDSTONE WITH SHORT INTERBEDS OF SILTSTONE - MEDIUM TO MEDIUM DARK GRAY. SOME CARBONACEOUS MATERIAL, FLECKS AND SPLINTS OF COAL.
120.75 / 123.80		2.15	SANDSTONE - MEDIUM LIGHT GRAY, SILT TO FINE GRAINED.
125.60 / 127.40		12.95	CONGLOMERATE - SMALL TO MEDIUM PEBBLES OF CHERT AND QUARTZITE, WHITE TO BLACK. CLAST SUPPORTED WITH INTERVALS OF FINE GRAINED SANDSTONE SUPPORTING MATRIX.
129.55 / 142.50		5.72	MUDSTONE - MEDIUM GRAY, IN PART SILTY. MINOR BIOTURBATION
148.22		9.46	CONGLOMERATIC SANDSTONE - VARIABLE FROM FINE SANDSTONE TO CONGLOMERATIC, POORLY SORTED CHERT AND QUARTZ, RATIO 3:2 TO 1:2. CONGLOMERATE IS GRANULE TO SMALL PEBBLE. ONE SHALY COAL INTERVAL.
157.68 / 161.53		3.85	MUDSTONE - MEDIUM GRAY, IN PART SILTY, BECOMES CARBONACEOUS BASALLY.
161.53 / 162.10		0.57	COAL - DULL TO VITREOUS
162.10 / 162.55		0.45	CARBONACEOUS MUDSTONE
162.55 / 167.66		5.25	MUDSTONE - MEDIUM TO MEDIUM DARK GRAY OCCASIONAL WOODY LAMINATED AREA OF SILTSTONE. CARBONACEOUS AND COAL FLECKS, SPLINTS AND PARTINGS THROUGHOUT.
167.66 / 171.07		3.32	COAL - No. 3 SEAM HORIZON
171.07 / 175.20		4.08	MUDSTONE - MEDIUM GRAY TO MEDIUM BROWNISH GRAY. MINOR CARBONACEOUS MATERIAL THROUGHOUT. MICACEOUS LIKE SHEEN ON FRACTURE FACES.
175.20 / 185.01		25.40	CONGLOMERATE AND CONGLOMERATIC SANDSTONE - MEDIUM GRAY, FINE TO GRANULE CONGLOMERATIC SANDSTONE TO SMALL AND IN PART MEDIUM PEBBLE CONGLOMERATE.
189.43 / 200.60		11.17	MUDSTONE AND CARBONACEOUS TO COALY MUDSTONE - MEDIUM BROWN GRAY TO MEDIUM DARK GRAY. CARBONACEOUS FLECKS AND SPLINTS THROUGHOUT.
209.39 / 214.65		5.26	SILTSTONE TO VERY FINE GRAINED SANDSTONE - GRADATIONAL DOWNWARD, MEDIUM GRAY.
214.65 / 228.08		13.43	CONGLOMERATE AND CONGLOMERATIC SANDSTONE - MEDIUM GRAY, FINE TO MEDIUM GRAINED CONGLOMERATIC SANDSTONE CONTAINING CLASTS OF GRANULE AND SMALL PEBBLE GRADATIONAL FROM ABOVE. CONGLOMERATE IS SMALL PEBBLE GRADING TO MEDIUM BASALLY.
228.08 / 243.08		15.00	SANDSTONE - MEDIUM GRAY, VERY FINE TO MEDIUM GRAINED QUARTZ AND CHERT 3:1. CONTAINS MINOR CARBONACEOUS MATERIAL
243.08 / 245.60		2.58	MUDSTONE - MEDIUM DARK GRAY TO DARK GRAY, GRADES BASALLY TO CARBONACEOUS MUDSTONE

No. 1 SEAM HORIZON

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION
66.14				ROOF - CONGLOMERATE OVERLYING 0.11 m MUDSTONE
66.25		0.16		COAL - MOSTLY VITREOUS
66.41		0.24		COAL - DULL TO BRIGHT, ABUNDANT LIMONITE STAINING, MINOR PYRITE, HYDROCARBONSTAINING
66.65		0.10		COAL - DULL TO VITREOUS, METALLIC LUSTRE
66.75		0.07		COAL - DULL TO VITREOUS
66.82		1.45	78	CARBONACEOUS TO COALY SHALE - DULL, CONTAINING SPLINTS AND THIN PARTINGS OF DULL TO VITREOUS COAL.
				0.47 m LOST CORE AT BASE OF INTERVAL.
68.27		0.33		COAL - MOSTLY BRIGHT, MINOR IRRIDESCENT PETROLEUM STAIN, MINOR MARCASITE DEPOSITS
68.60		0.08		CARBONACEOUS SHALE
68.68		0.08		COAL - VITREOUS
68.89		0.13		COAL - DULL, SHALY, VITREOUS SPLINTS
69.18		0.29		COAL - DULL TO BRIGHT, MINOR PYRITE AND RESIN
69.66		0.48	100	COAL - DULL TO BRIGHT, MINOR PYRITE AND RESIN, MINOR WHITE MINERAL DEPOSITION ON FRACTURE FACES
69.79		0.13		SHALY COAL - POSSIBLY HIGH DURAIN CONTENT
70.08		0.29		COAL - DULL TO BRIGHT, MINOR PYRITE, RESIN, IRRIDESCENT STAINING AND WHITE MINERAL
70.28		0.20		SHALE - CONTAINS FEW PARTINGS OF COAL.
		0.59	97	COAL - VITREOUS TO BRIGHT, MINOR PYRITE RESIN, AND WHITE MINERAL DEPOSITS, MINOR IRRIDESCENT PETROLEUM STAINING
70.87		0.13		CARBONACEOUS SHALE, SPLINTS OF COAL
71.00		0.15		COAL - DULL TO BRIGHT, THIN SHALE PARTINGS
71.15		0.17		CARBONACEOUS SHALE, THIN COAL PARTINGS
71.32		0.46		MUDSTONE - SLIGHTLY CARBONACEOUS, SHALY RARE THIN PARTINGS OF COAL.
71.78		0.11		COAL - DULL TO BRIGHT
71.89		0.09		CARBONACEOUS SHALE
72.04		0.07		SHALY COAL - POSSIBLY HIGH FUSAIN CONTENT
				FLOOR

No. 2 SEAM HORIZON

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION
100.25				ROOF - CARBONACEOUS MUDSTONE
100.50		0.08		COALY SHALE
		0.52		COAL - VITREOUS TO BRIGHT, MINOR DEPOSITS OF WHITE MINERAL ON FRACTURE FACES, MINOR PYRITE IN DISC SHAPED DEPOSITS, RARE THIN PARTINGS OF DULL CARBONACEOUS SHALE
101.02		0.22		COAL - DULL TO BRIGHT
101.24		0.06		CARBONACEOUS SHALE
101.30		0.18		COAL - DULL TO VITREOUS
101.48		1.78	99	COAL - DULL TO BRIGHT, MINOR PYRITE, RESIN, MINOR WHITE MINERAL DEPOSITS
103.26		0.14		COAL - DULL TO VITREOUS
103.40		0.10		CARBONACEOUS SHALE
103.50		0.86		COAL - VITREOUS TO PREDOMINANTLY BRIGHT, MINOR IRRIDESCENT PARTINGS OF CARBONACEOUS SHALE.
104.36		0.69	99	SHALE - DULL, CARBONACEOUS, CONTAINS SPLINTS AND THIN PARTINGS OF VITREOUS COAL. MINOR WHITE MINERAL DEPOSITS.
105.05		0.69		COAL - DULL TO BRIGHT, MINOR DISCS OF PYRITE, MINOR RESIN. CARBONACEOUS SHALE BANDS UP TO .09 m.
105.76		0.52		COAL - DULL TO VITREOUS WITH BRIGHT BANDS
106.28		0.08		CARBONACEOUS SHALE
106.36		0.17		COAL - BRIGHT
106.53		0.23		SHALY COAL - PARTINGS, SPLINTS AND FLECKS OF VITREOUS COAL. PART MAY BE HIGH IN ASH
106.76		0.44		COAL - VITREOUS TO BRIGHT
107.20		0.10	99	CARBONACEOUS TO COALY SHALE
107.30		0.42		COAL - VITREOUS TO BRIGHT, MINOR DISCS OF PYRITE AND/OR MARCASITE.
107.72		0.35		CARBONACEOUS SHALE - LIGHT TO DARK GRAY, SPLINTS AND PARTINGS OF VITREOUS COAL, WHITE MINERAL DEPOSITS
108.17		0.64		COAL - DULL TO BRIGHT, CONTAINS THIN BANDS UP TO 1 cm CARBONACEOUS SHALE, ABUNDANT WHITE MINERAL DEPOSITS, MINOR PYRITE.
108.81		0.49	99	COAL - DULL WITH VITREOUS AND BRIGHT BANDS. PARTINGS OF DULL COALY SHALE INCREASE BASALLY, POSSIBLY IN PART HIGH DURAIN CONTENT.
109.30				FLOOR - MUDSTONE

SAMPLE NUMBER	THICKNESS (m)	SIZE DIAMETER	SIZE WT %	SPEC GRAV	WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
NO.1		1/4×0	100.0	RAW	100.0	8.2	8.8	33.9	49.1	10429		0.45
		1/4×28	93.4	-1.30	12	7.3	3.7	34.7	54.3	11670		0.39
				-1.50	84.3	9.4	5.3	32.6	52.7	11281		0.31
				-1.70	12.1	7.2	22.7	29.5	40.6	8576		0.30
				-1.90	1.2	5.5	36.8	25.2	32.5	6777		0.31
				+1.90	1.2	3.2	63.5					
		28×0	6.6	RAW	100.0							
		1/4×28	93.4									
		28×0	6.6									
		1/4×0	100.0									
A0269	0.57	1/4×0	100.0	RAW	100.0	6.8	20.4	34.0	38.8	8988		0.41
		1/4×28	93.3	-1.30	3.2	8.2	4.3	37.0	50.5	11156		0.27
				-1.40	44.7	9.8	4.4	37.4	48.4	10924		0.37
				-1.50	14.7	7.8	11.4	33.9	46.9	10313		0.33
				-1.60	10.1	6.5	24.5	31.4	37.6	8459		0.29
				-1.70	5.4	5.8	33.1	29.7	31.4	7298		0.27
				-1.80	5.1	4.6	43.5	26.9	25.0	5722		0.25
				-1.90	4.5	4.1	49.8	25.9	20.2	4989		0.21
				+1.90	12.3	2.8	65.6					
		28×0	6.7	RAW	100.0							
		1/4×28	93.3									
		28×0	6.7									
		1/4×0	100.0									
A0270	1.81	1/4×0	100.0	RAW	100.0	6.9	22.6	33.1	37.4	8633		0.27
		1/4×28	92.8	-1.30	1.0	5.9	4.0	40.2	49.9	11636		0.36
				-1.40	41.4	8.1	4.4	37.6	49.9	11112		0.35
				-1.50	22.5	8.1	10.9	35.7	45.3	10189		0.31
				-1.60	6.1	6.8	22.2	31.8	39.2	8776		0.31
				-1.70	2.9	5.5	32.6	29.6	32.3	7352		0.29
				-1.80	3.7	4.5	42.6	27.4	25.5	6013		0.25
				-1.90	2.4	3.6	50.1	25.5	20.8	5021		0.24
				+1.90	20.0	2.1	71.4					
		28×0	7.2	RAW	100.0							
		1/4×28	92.8									
		28×0	7.2									
		1/4×0	100.0									
A0271	0.79	1/4×0	100.0	RAW	100.0	4.8	47.1	25.3	22.8	5105		0.20
		1/4×28	92.5	-1.30	1.0	7.2	5.3	35.2	52.3	11134		0.47
				-1.50	24.7	6.7	7.5	36.9	48.9	10794		0.46
				-1.70	5.9	5.5	29.8	29.3	35.4	7842		0.33
				-1.90	9.6	4.5	44.6	23.9	27.0	5732		0.22
				+1.90	58.8	2.2	66.9					
		28×0	7.5	RAW	100.0							
		1/4×28										
		28×0										
		1/4×0										
A0272	0.28	1/4×0	100.0	RAW	100.0	7.9	9.8	36.1	46.2	10351		0.36
		1/4×28	91.1	-1.30	0.3	6.2	2.9	40.0	50.9	11440		0.65
				-1.40	65.9	6.7	3.3	39.2	50.8	11334		0.32
				-1.50	9.9	6.6	7.4	35.6	50.4	10660		0.29
				-1.60	5.8	5.4	15.3	32.3	47.0	9835		0.27
				-1.70	11.2	7.1	21.7	29.1	42.1	8259		0.25
				-1.80	2.7	4.8	29.8	28.1	37.3	7610		0.29
				-1.90	1.0	4.7	37.9	27.2	30.2	6248		0.29
				+1.90	3.2	2.2	61.7					
		28×0	8.9	RAW	100.0							
		1/4×28	91.1									
		28×0	8.9									
		1/4×0	100.0									
A0273	1.78	1/4×0	100.0	RAW	100.0	4.6	47.2	24.1	24.1	5114		0.17
		1/4×28	91.8	-1.30	0.2	4.8	4.3	36.6	54.3	11816		0.46
				-1.40	4.2	6.7	4.5	37.1	51.7	11534		0.33
				-1.50	6.2	6.2	9.0	33.8	51.0	10832		0.24
				-1.60	4.3	6.0	17.4	29.7	46.9	9365		0.24
				-1.70	3.5	5.5	26.2	28.7	39.6	8087		0.38
				-1.80	6.0	4.8	35.0	25.1	35.1	6730		0.22
				-1.90	13.2	4.1	44.4	24.0	29.5	5660		0.25
				+1.90	62.6	2.7	60.9					
		28×0	8.2	RAW	100.0							
		1/4×28	91.8									
		28×0	8.2									
		1/4×0	100.0									
A0274	0.47	1/4×0	100.0	RAW	100.0	6.2	19.8	33.8	40.2	9179		0.26
		1/4×28	91.6	-1.30	0.9	6.5	2.9	43.7	46.9	12054		0.27
				-1.40	48.9	6.3	3.6	38.3	51.8	11714		0.30
				-1.50	18.3	6.4	8.7	34.7	50.2	10624		0.29
				-1.60	6.3	4.7	18.0	31.4	45.9	9633		0.25
				-1.70	3.6	4.7	36.3	30.3	38.7	8092		0.25
				-1.80	2.4	4.2	33.7	29.7	32.4	7188		0.25
				-1.90	2.5	3.7	43.3	25.5	27.5	5679		0.27
				+1.90	17.1	1.9	70.4					
		28×0	8.4	RAW	100.0							
		1/4×28	91.6									
		28×0	8.4									
		1/4×0	100.0									
A0275	1.83	1/4×0	100.0	RAW	100.0	5.7	26.4	31.2	36.7	8237		0.30
		1/4×28	92.0	-1.30	0.3	5.8	3.9	39.9	50.4	11584		0.41
				-1.40	33.9	7.2	4.2	36.9	51.7	11324		0.35
				-1.50	14.5	6.2	9.1	33.6	51.1	10776		0.31
				-1.60	8.3	5.1	20.3	32.5	42.1	9088		0.28
				-1.70	5.8	5.6	27.8	28.6	38.0	7975		0.26
				-1.80	5.7	4.6	37.3	25.4	32.7	6489		0.24
				-1.90	6.2	3.9	46.4	24.3	25.2	5349		0.23
				+1.90	25.3	2.5	62.5					
		28×0	8.0	RAW								
		1/4×28	92.0									
		28×0	8.0									
		1/4×0	100.0									
A0276	2.65	1/4×0	100.0	RAW	100.0	3.0	63.7	21.4	11.9			0.18
		1/4×28	88.2	-1.30	0.5	4.5	3.4	35.8	56.3	13090		0.47
				-1.50	8.4	7.4	6.5	35.3	50.8	12250		0.38
				-1.70	2.8	5.8	24.5	31.1	38.6	8336		0.38
				-1.90	9.1	4.6	42.8	23.8	28.8	5730		0.25
				+1.90	79.2	2.1	76.4					
		28×0	11.8	RAW	100.0							
		1/4×28	88.2									
		28×0	11.8									
		1/4×0	100.0									
A0277	0.45	1/4×0	100.0	RAW	100.0	6.8	24.2	30.0	39.0	8432		0.38
		1/4×28	92.1	-1.30	0.1	3.7	3.9	37.3	50.4	11863		0.42
				-1.40	24.3	7.9	4.4	36.6	54.1	11302		0.42
				-1.50	20.5	6.5	11.4	35.3	48.1	10405		0.41
				-1.60	9.6	5.4	20.8	30.4	41.7	8807		0.35
				-1.70	9.7	4.5	29.7	27.7	35.7	7391		0.33
				-1.80	12.5	4.4	38.6	24.1	29.3	5938		0.31
				-1.90	10.4	3.9	46.6	22.2	24.9	4928		0.22
				+1.90	12.9	2.6	59.2					
		28×0	7.9	RAW	100.0							
		1/4×28	92.1									
		28×0	7.9									
		1/4×0	100.0									

SAMPLE NUMBER	CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
NO.1								
	92.28	9.1	7.8	32.1	51.0	10899		0.31
	6.60	6.7	21.4	32.7	48.2	10300		0.99
	98.88	8.9	8.7	32.1	50.8	10 859		0.36
	43.33	3.2	8.2	4.3	37.0	50.5	11156	0.23
	47.9	9.7	4.4	37.4	48.5	10939		0.36
	62.6	9.3	6.0	36.6	48.2	10972		0.36
	72.7	8.9	8.6	35.8	46.7	10468		0.35
	78.1	8.7	10.3	35.4	45.6	10249		0.34
	83.2	8.4	12.3	34.9	44.4	9971		0.34
	87.7	8.2	14.3	34.4	43.1	9715		0.33
	100.0		20.6					
	100.0	5.8	19.4	34.4	40.4	9235		0.49
	81.82	8.2	14.3	34.4	43.1	9715		0.33
	6.7	5.8	19.4	34.4	40.4	9235		0.49
	8.52	8.0	14.7	34.4	42.9	9679		0.34
	100.0	6.9	22.6	33.1	37.4	8633		0.27
	0.1	5.9	4.0	40.2	49.9	11636		0.36
	42.4	8.1	4.4	37.7	49.9	11124		0.35
	64.9	8.1	6.6	37.0	48.3	10800		0.34
	71.0	8.0	8.0	36.5	47.5	10626		0.33
	73.9	8.0	8.9	36.3	46.9	10497		0.33
	77.6	7.7	10.6	35.9	45.9	10283		0.32
	80.0	7.6	11.7	35.5	45.1	10125		0.32
	100.0		23.7					
	100.0	6.0	20.1	46.1	27.8	9117		0.38
	74.24	7.6	11.7	35.5	45.1	10125		0.32
	7.2	6.0	20.1	46.1	27.8	9117		0.38
	81.44	7.5	12.4	36.4	43.6	10036		0.33
	100.0	4.8	4.7	25.3	22.8	5105		0.20
	1.0	7.2	5.3	35.2	52.3	11134		0.47
	25.7	6.7	7.4	36.8	49.0	10807		0.46
	31.6	6.5	11.6	35.4	46.5	10253		0.44
	41.2	6.0	19.3	32.7	42.0	9200		0.39
	47.3							
	100.0	4.8	36.0	28.0	31.2	6913		0.39
	38.11	6.0	19.3	32.7	42.0	9200		0.39
	7.5	4.8	36.0	28.0	31.2	6913		0.39
	45.61	5.8	22.1	31.9	40.2	8824		0.39
	100.0	7.9	9.8	36.1	46.2	10351		0.36
	0.3	6.2	2.9	40.0	50.9	11440		0.65
	66.2	6.7	3.3	39.2	50.8	11334		0.32
	76.1	6.7	3.8	38.7	50.8	11246		0.32
	81.9	6.6	4.6	38.3	50.5	11146		0.31
	93.1	6.7	6.7	37.2	49.5	10799		0.31
	95.8	6.6	7.3	36.9	49.1	10709		0.31
	96.8	6.6	7.7	36.8	48.9	10663		0.31
	100.0		9.4					
	100.0	6.9	12.1	35.4	45.6	10011		0.41
	88.18	6.6	7.7	36.8	48.9	10663		0.31
	8.9	6.9	12.1	35.4	45.6	10011		0.41
	97.08	6.6	8.1	36.7	48.6	10603		0.32
	100.0	4.6	47.2	24.1	24.1	5114		0.17
	0.2	4.8	4.3	36.6	54.3	11816		0.46
	4.4	6.6	4.5	37.1	51.8	11534		0.33
	10.6	6.4	7.1	35.2	51.3	11128		0.28
	14.7	6.3	10.0	33.6	50.1	10619		0.27
	18.2	6.1	13.1	32.7	48.1	10138		0.29
	24.2	5.8	18.5	30.8	44.9	9299		0.27
	37.4	5.2	27.7	28.4	39.5	8022		0.26
	100.0		48.5					
	100.0	4.6	40.9	25.2	29.3	6216		0.38
	34.33	5.2	27.7	28.4	39.5	8022		0.26
	8.20	4.6	40.9	25.2	29.3	6216		0.32
	42.53	5.1	30.3	27.8	37.5	7673		0.28
	100.0	6.5	2.9	43.7	46.9	12054		0.27
	49.8	6.3	3.6	38.4	51.7	11720		0.30
	68.1	6.3	5.0	37.4	51.3	11425		0.30
	74.4	6.2	6.1	36.9	50.9	11256		0.29
	78.0	6.1	7.5	36.6	50.3	11110		0.29
	80.6	6.1	8.2	36.4	49.8	10993		0.29
	82.9	6.0	9.3	36.1	49.1	10833		0.29
	100.0		19.4					
	100.0	5.8	17.3	33.8	43.1	9497		0.46
	75.93	6.0	9.3	36.1	49.1	10833		0.29
	8.40	5.8	17.3	33.8	43.1	9497		0.46
	84.33	6.0	10.1	35.9	48.5	10699		0.31
	100.0	5.7	26.4	31.2	36.7	8237		0.30
	0.3	5.8	3.9	39.9	50.4	11584		0.41
	34.2	7.2	4.2	36.9	51.7	11326		0.35
	48.7	6.9	5.7	35.9	51.5	11162		0.34
	57.0	6.6	7.8	35.4	50.1	10860		0.33
	62.8	6.5	9.6	34.8	49.0	10594		0.32
	68.5	6.4	11.9	34.0	47.7	10252		0.32
	76.7	6.2	14.8	33.2	45.8	9845		0.31
	100.0		26.9					
	100.0	5.4	22.0	32.5	40.1	8904		0.53
	66.72	6.2	14.8	33.2	45.8	9845		0.31
	8.0	5.4	22.0	32.5	40.1	8904		0.53
	76.72	5.1	15.6	33.1	45.2	9746		0.33
	100.0	3.0	63.7	21.4	11.9			0.18
	0.5	4.5	3.4	35.8	56.3	13090		0.47
	8.9	7.2	6.3	35.3	51.1	12297		0.39
	11.7	6.9	10.7	34.3	48.1	11349		0.38
	20.8	5.9	24.7	29.7	39.6	8890		0.33
	100.0		65.7					
	100.0	3.3	43.8	24.0	28.9	5915		0.55
	18.35	5.9	24.7	29.7	39.6	8890		0.33
	11.8	3.3	43.8	24.0	28.9	5915		0.55
	30.15	4.9	32.2	27.5	35.4	7725		0.42
	100.0	6.2	24.3	30.8	38.7	8528		0.86
	80.22	5.9	20.6	31.1	42.2	8849		0.3
	7.90	6.2	24.3	30.8	38.7	8528		0.86
	88.12	5.9	20.9	31.1	41.9	8820		0.41

CUMULATIVE SAMPLE VALUES (CASE I)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
0.57	98.88	8.9

DRILLHOLE NO. WK-80-7 SHEET 2 OF 2

GEOLOGICAL LOG — SCALE: 1:500

DEPTH (m)	THICKNESS (m)	DESCRIPTION
243.08	2.58	MUDSTONE
245.66	2.12	COAL - No. 4 SEAM HORIZON
247.78	6.02	MUDSTONE - MEDIUM DARK TO DARK GRAY, CARBONACEOUS AND IN PART COALY
253.80	1.31	MUD - SOFT, MEDIUM DARK BROWNISH GRAY, FAULT GOUGE?
255.11	13.06	MUDSTONE - MEDIUM DARK TO DARK GRAY, IN PART CARBONACEOUS TO COALY WITH THIN BANDS OF COAL.
268.17	3.74	SILTSTONE AND SILTY MUDSTONE - MEDIUM TO MEDIUM DARK GRAY, MINOR CARBONACEOUS MATERIAL
271.91	21.47	SANDSTONE, CONGLOMERATIC SANDSTONE AND CONGLOMERATE - MEDIUM GRAY, VERY FINE GRAINED SANDSTONE AT TOP, GRADATIONAL TO MEDIUM TO COARSE GRAINED SANDSTONE TO GRANULE AND SMALL PEBBLE CONGLOMERATE PETROLEUM RESIDUE THROUGHOUT, SLIGHT PETROLIFEROUS ODOR.
293.38	8.68	SANDSTONE - MEDIUM GRAY, VERY FINE GRAINED TO FINE GRAINED.
302.06	0.54	COAL - DULL TO VITREOUS
302.60	14.84	MUDSTONE, SILTSTONE AND VERY FINE GRAINED SANDSTONE - MEDIUM GRAY, IN PART CARBONACEOUS IN THE MUDSTONE. GRADATIONAL DOWNWARDS TO SILTSTONE.
317.44	1.68	CARBONACEOUS - DARK GRAY, MINOR COAL
319.12	5.79	SILTSTONE TO FINE GRAINED SANDSTONE - LIGHT TO MEDIUM GRAY, GRADATIONAL DOWNWARDS FROM SILTSTONE TO FINE GRAINED SANDSTONE
324.91	0.31	SHALE - MEDIUM GRAY, SLIGHTLY SILTY TO CARBONACEOUS
325.22	3.04	COAL - No. 5 SEAM HORIZON
328.26	28.33	MUDSTONE WITH THIN INTERBEDS OF SILTSTONE AND VERY FINE GRAINED SANDSTONE - MUDSTONE PREDOMINANTLY MEDIUM DARK GRAY TO MEDIUM DARK BROWNISH GRAY, BROWN COLORATION DUE TO HIGH TAR CONTENT. CONTAINS CARBONACEOUS PARTINGS AND THIN SEAMS OF COALY SHALE AND COAL
352.59	3.11	SANDSTONE TO GRANULE CONGLOMERATIC SANDSTONE - DARK GRAY BROWN DUE TO HIGH TAR CONTENT, INTERVAL COARSENS DOWNWARDS.
355.70		T.D. 355.70

DETAILS OF COAL SEAMS — SCALE: 1:50

No. 3 SEAM HORIZON

ROOF - CARBONACEOUS MUDSTONE, BLOCKY

DEPTH (m)	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)
167.66	1.17	100	COAL - DULL TO BRIGHT, MINOR PYRITE/MARCASITE, MINOR RESIN, MINOR WHITE MINERAL DEPOSITS		
168.11			CARBONACEOUS TO COALY SHALE		
168.19			COAL - DULL TO BRIGHT		
168.83	0.89		COAL - DULL TO BRIGHT, MINOR LIMONITE STAINING, MINOR PYRITE, RARE MINOR WHITE MINERAL DEPOSITS, RARE THIN BANDS OF CARBONACEOUS SHALE. BRIGHT COAL INCREASED BASALLY	A0279	2.85
169.72	0.05		MUDSTONE		
169.77	0.07		COAL		
169.84	0.87		COAL - BRIGHT TO VITREOUS, MINOR MARCASITE /PYRITE, MINOR HEMATITE STAINING.		
170.51	0.56	93	SHALY COAL - DULL TO BRIGHT, CARBONACEOUS SHALE BANDS UP TO 1cm INCREASING BASALLY. CARB SHALE IS 15% OF INTERVAL	A0280	0.56
171.07			FLOOR MUDSTONE		

No. 4 SEAM HORIZON

ROOF - MUDSTONE, CARBONACEOUS, MEDIUM DARK GRAY TO DARK GRAY.

DEPTH (m)	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)
245.66	0.31	99	COAL - DULL TO VITREOUS, SILTY SHALE ROOF GRADES RAPIDLY INTO COAL.		
245.97	1.69	82	COAL - BRIGHT, RARE PARTINGS OF DULL COAL; HOMOGENEOUS INTERVAL; MINOR PYRITE DISC-SHAPED DEPOSITS IN BASAL PART.	A0281	2.12
247.66	0.12		SHALY COAL		
247.78			FLOOR - MUDSTONE		

No. 5 SEAM HORIZON

ROOF - SHALE, SLIGHTLY SILTY TO CARBONACEOUS

DEPTH (m)	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)
325.22	0.18		CARBONACEOUS TO COALY SHALE - FLECKS AND SPLINTS OF BRIGHT COAL MAY BE MORE COAL THAN SHALE	A0282	0.18
325.40	1.27		COAL - DULL TO VITREOUS WITH BANDS OF BRIGHT, FEW THIN BANDS, UP TO 2cm, OF CARBONACEOUS SHALE.	A0283	1.27
326.67	0.31	95	SOAPSTONE - LIGHT OLIVE GRAY, APHANITIC, WAXY, UPPER AND LOWER 1cm IS MUDSTONE	N.S.	
326.98	0.14		COAL - VITREOUS WITH BRIGHT SPLINTS		
327.12	0.23		COAL, CARBONACEOUS SHALE - CONTAINS PARTINGS OF COAL, MAY BE DURAIN.	A0284	0.37
327.35	0.77		COAL - MOSTLY VITREOUS TO BRIGHT, PARTED TO BANDED.		
328.12	0.14		LOST CORE - GRINDING	A0285	0.77
328.26			FLOOR - MUDSTONE		

WEIGHT PERCENT

SAMPLE NUMBER	SIZE DIAMETER	SIZE WT %	SPEC. GRAV.	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
	1/4×0	100.0	RAW	100.0	6.6	22.8	30.5	40.1	8786		0.30
	1/4×28	93.2	-1.30	0.2	5.6	2.9	41.1	50.4	11863		0.42
			-1.40	45.0	6.6	3.5	35.8	54.1	11300		0.42
			-1.50	17.1	5.1	11.0	35.8	48.1	10405		0.41
			-1.60	6.2	4.5	23.3	30.5	41.7	8807		0.35
			-1.70	5.1	4.1	32.5	27.7	35.7	7391		0.33
			-1.80	8.0	4.0	43.1	23.6	29.3	5938		0.31
			-1.90	4.8	3.1	49.8	22.2	29.4	4928		0.27
			+1.90	13.6	2.0	75.6					
	28×0	6.8	RAW	100.0							
	1/4×28	93.2									
	28×0	6.8									
	1/4×0	100.0									
	1/4×0	100.0	RAW	100.0	4.9	39.9	27.2	28.0	6491		0.36
	1/4×28	91.1	-1.30	1.5	6.7	3.1	36.6	53.6	11940		0.52
			-1.50	40.6	8.3	6.0	35.4	50.3	11231		0.52
			-1.70	8.5	5.6	27.4	29.6	37.4	8221		0.46
			-1.90	9.2	4.4	48.4	22.4	24.8	5247		0.34
			+1.90	40.2	1.9	75.5					
	28×0	8.9	RAW	100.0							
	1/4×28	91.1									
	28×0	8.9									
	1/4×0	100.0									
	1/4×0	100.0	RAW	100.0	7.2	11.8	33.2	47.8	10297		0.24
	1/4×28	92.6	-1.30	1.1	7.0	3.4	37.3	52.3	11756		0.25
			-1.40	65.3	7.6	4.2	36.5	51.7	11594		0.26
			-1.50	12.2	6.3	10.9	31.9	50.9	10423		0.31
			-1.60	8.3	6.8	20.0	28.3	44.9	9135		0.25
			-1.70	3.8	4.6	30.3	27.4	37.7	7716		0.23
			-1.80	1.9	4.2	38.5	25.0	32.3	6597		0.21
			-1.90	2.2	3.5	47.2	21.9	27.4	5364		0.23
			+1.90	5.2	2.6	66.3					
	28×0	7.4	RAW	100.0							
	1/4×28	92.6									
	28×0	7.4									
	1/4×0	100.0									
	1/4×0	100.0	RAW	100.0	3.9	63.0	16.3	16.8	—		0.21
	1/4×28	93.3	-1.30	0.4	3.4	3.9					
			-1.50	2.0	7.0	6.4					
			-1.70	0.6	5.5	23.9					
			-1.90	0.9	4.0	45.0					
			+1.90	96.1	4.0	66.6					
	28×0	6.7	RAW	100.0							
	1/4×28	93.3									
	28×0	6.7									
	1/4×0	100.0									
	1/4×0	100.0	RAW	100.0	6.3	30.1	24.2	39.4	7526		0.23
	1/4×28	92.1	-1.30	2.4	7.2	4.3	32.6	55.9	11518		0.40
			-1.40	19.3	7.0	4.7	32.7	55.6	11376		0.39
			-1.50	17.7	7.1	9.7	29.3	53.9	10602		0.26
			-1.60	11.6	6.7	17.8	25.7	49.8	9254		0.20
			-1.70	7.5	6.2	26.9	25.5	41.4	8008		0.21
			-1.80	6.2	5.5	37.1	21.7	35.7	6423		0.15
			-1.90	8.3	4.8	46.4	19.3	29.5	5280		0.17
			+1.90	27.0	2.8	66.9					
	28×0	7.9	RAW	100.0							
	1/4×28	92.1									
	28×0	7.9									
	1/4×0	100.0									
	1/4×0	100.0	RAW	100.0	5.7	42.0	22.5	29.8	6057		0.13
	1/4×28	93.5	-1.30	0.5	4.0	4.3	37.5	54.2	12043		0.41
			-1.50	11.3	6.4	7.8	35.8	50.0	11206		0.31
			-1.70	7.1	5.5	25.1	29.2	40.2	8476		0.15
			-1.90	37.4	6.6	42.5	20.3	30.6	5783		0.17
			+1.90	43.7	4.7	55.4					
	28×0	6.5	RAW	100.0							
	1/4×28	93.5									
	28×0	6.5									
	1/4×0	100.0									
	1/4×0	100.0	RAW	100.0	6.9	10.2	33.9	49.0	10829		0.33
	1/4×28	91.6	-1.30	2.9	6.4	2.8	37.9	52.9	12181		0.36
			-1.40	72.2	6.8	3.9	34.8	54.7	11836		0.38
			-1.50	9.1	5.9	11.1	30.8	52.2	10603		0.31
			-1.60	2.8	5.5	20.7	29.0	44.8	9246		0.27
			-1.70	2.7	4.5	36.1	24.5	34.9	6930		0.27
			-1.80	3.5	4.7	40.3	25.8	29.2	6184		0.22
			-1.90	3.6	4.7	46.4	21.2	27.7	5424		0.16
			+1.90	3.2	3.2	58.7					
	28×0	8.4	RAW	100.0							
	1/4×28	91.6									
	28×0	8.4									
	1/4×0	100.0									

CUMULATIVE WEIGHT PERCENT

YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
0.2	5.6	2.9	41.1	50.4	11863		0.42
45.2	6.6	3.5	35.8	54.1	11302		0.42
62.3	6.2	5.6	35.8	52.4	11056		0.42
68.5	6.0	7.2	35.3	51.5	10852		0.41
73.6	5.9	8.9	34.8	50.3	10612		0.41
81.6	5.7	12.3	33.7	48.3	10154		0.40
86.4	5.6	14.4	33.1	47.3	9864		0.39
100.0		22.7					
100.0	6.2	25.2	30.2	38.3	8426		0.45
80.52	5.6	14.4	33.1	47.3	9864		0.39
6.80	6.2	25.2	30.3	38.3	8426		0.45
87.32	5.6	15.2	32.9	46.6	9752		0.39
1.5	6.7	3.1	36.6	53.6	11940		0.52
42.1	8.2	5.9	35.4	50.4	11256		0.52
50.6	7.8	9.5	34.5	48.2	10746		0.51
59.8	7.3	15.5	32.6	44.6	9900		0.48
100.0		39.6					
100.0	4.4	39.0	25.8	30.8	6733		0.51
54.48	7.3	15.5	32.6	44.6	9900		0.48
8.90	4.4	39.0	25.8	30.8	6733		0.51
63.38	6.9	18.8	31.7	42.7	9455		0.48
1.1	7.0	3.4	37.3	52.3	11756		0.25
66.4	7.6	4.2	36.5	51.7	11596		0.26
78.6	7.4	5.2	35.8	51.6	11414		0.27
86.9	7.3	6.6	35.1	51.0	11196		0.27
90.7	7.2	7.6	34.8	50.4	11051		0.26
92.6	7.2	8.3	34.6	50.0	10959		0.26
94.8	7.1	9.2	34.3	49.5	10829		0.26
100.0		12.1					
100.0	7.0	11.9	32.7	48.4	10235		0.23
87.78	7.1	9.2	34.3	49.5	10829		0.26
7.40	7.0	11.9	32.7	48.4	10235		0.23
95.18	7.1	9.4	34.2	49.4	10763		0.26
0.4		3.9					
2.4		6.0					
3.0		9.6					
3.9		17.7					
100.0		64.7					
100.0	3.7	39.4	22.1	34.8	6523		0.36
2.4	7.2	4.3	32.6	55.9	11518		0.40
21.7	7.0	4.7	32.7	55.6	11391		0.30
39.4	7.1	6.9	31.2	54.9	11036		0.28
51.0	7.0	9.4	29.9	53.7	10631		0.26
58.5	6.9	11.6	29.4	52.1	10295		0.25
64.7	6.8	14.1	28.6	50.6	9924		0.24
73.0	6.5	17.8	27.6	48.2	9396		0.24
100.0		31.0					
100.0	6.4	24.2	27.2	42.2	8264		0.15
67.23	6.5	17.8	27.6	48.2	9396		0.24
7.90	6.4	24.2	27.2	42.2	8264		0.15
75.13	6.5	18.5	27.6	47.6	9277		0.23
0.5	4.0	4.3	37.5	54.2	12043		0.41
11.8	6.3	7.7	35.9	50.2	11241		0.31
18.9	6.0	14.2	33.4	46.4	10202		0.25
56.3	6.4	33.0	24.7	35.9	7266		0.20
100.0		42.8					
100.0	5.3	35.3	25.8	33.6	7187		0.10
52.64	6.4	33.0	24.7	35.9	7266		0.20
6.50	5.3	35.3	25.8	33.6	7187		0.10
59.14	6.3	33.3	24.8	35.7	7257		0.19
0.4		3.9					
2.4		6.0					
3.0		9.6					
3.9		17.7					
100.0		64.7					
100.0	3.7	39.4	22.1	34.8	6523		0.36
0.4		3.9					
2.4		6.0					
3.0		9.6					
3.9		17.7					
100.0		64.7					
100.0	3.7	39.4	22.1	34.8	6523		0.36
2.4	7.2	4.3	32.6	55.9	11518		0.40
21.7	7.0	4.7	32.7	55.6	11391		0.30
39.4	7.1	6.9	31.2	54.9	11036		0.28
51.0	7.0	9.4	29.9	53.7	10631		0.26
58.5	6.9	11.6	29.4	52.1	10295		0.25
64.7	6.8	14.1	28.6	50.6	9924		0.24
73.0	6.5	17.8	27.6	48.2	9396		0.24
100.0		31.0					
100.0	6.4	24.2	27.2	42.2	8264		0.15
67.23	6.5	17.8	27.6	48.2	9396		0.24
7.90	6.4	24.2	27.2	42.2	8264		0.15
75.13	6.5	18.5	27.6	47.6	9277		0.23

LOCATION MAP

TN

SCALE:

COORDINATES: X7900m W, Y 9600m N OF S.E. CORNER, CL 8.2
ELEVATION: APPROX. 457.2 m amsl
DIP: -90°
CORE SIZE: HQ & NQ
BEARING: NA
CASING HW 3.05 m NW 31.06m
BITS USED: J.K. SMIT COMBINATION, J.K. SMIT SERIES 75, 100
MUD USED: 97 GALS POLY, 330
m. LEFT IN HOLE: 0 m.

DATE START: JUNE 26/80
DRILLER: CARON DIAMOND DRILLING
TESTS: NONE
SAMPLED BY: O.R. CULLINGHAM
FINISH: JULY 4, 1980
OVERALL RECOVERY: 95.8 %
DATE: JULY 27/80 ANALYZED BY: BIRTLEY COAL AND MINERALS TESTING

PAN OCEAN OIL CO.
MINING DIVISION - COAL
LOGGED BY: G. GERMSCHEID DATE:
SIGNED:

DRILLHOLE NO. W-80-8
SHEET 1 OF 3

GEOLOGICAL LOG — SCALE: 1:500

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
1.83		1.83	OVERBURDEN - WEATHERED CONGLOMERATIC SANDSTONE
		6.02	CONGLOMERATE - CHERT AND QUARTZITE GRANULE TO SMALL PEBBLE, WHITE TO BLACK, WITH OCCASIONAL GREEN PEBBLE, POORLY SORTED SANDSTONE, MATRIX, MINOR CARBONACEOUS MATERIAL.
7.85		0.45	MUDSTONE - LIGHT GRAY TO OFF-WHITE
8.30		5.11	COAL HORIZON No. 4
13.41		9.69	MUDSTONE - CARBONACEOUS, DARK GRAY, MINOR LIMONITE STAIN, MORE CARBONACEOUS AT BASE OF INTERVAL
23.20		2.80	SILTSTONE - LIGHT GRAY, MINOR CARBONACEOUS MATERIAL, MINOR CLAST FRAGMENTS
26.00		0.52	SANDSTONE TO SILTSTONE
26.52		6.94	SANDSTONE - GRAY-BROWN, FINE TO MEDIUM GRAINED, LARGE AMOUNT OF IRON STAINING, MAJORITY OF GRAINS SILICEOUS.
33.46		1.74	SILTSTONE TO VERY FINE GRAINED SANDSTONE, LIGHT GRAY, LIMONITE STAIN.
35.20		4.05	MUDSTONE - LIGHT GRAY, HEMATITE AND LIMONITE STAINING.
39.25		4.09	SANDSTONE - LIGHT GRAY, SILICEOUS, CARBONACEOUS. BECOMES RED BROWN AT BASE (STAINING MAY BE A MARKER)
43.34		1.49	MUDSTONE - CARBONACEOUS, LIGHT GRAY TO DARK GRAY.
44.83		12.37	SANDSTONE - MEDIUM TO COARSE GRAINED, GRAY STAINING TO BLACK(OIL?) SILICEOUS POORLY SORTED GRAINS, FEW MUDSTONE CLASTS. FEW CONGLOMERATIC ZONES. CHERT WITH MUDSTONE INTERCLASTS. LOCAL LARGE PLANT FRAGMENTS.
57.20		1.04	SILTSTONE TO FINE GRAINED SANDSTONE, GRAY, IRON STAINING
58.24		0.28	COAL
58.52		2.48	MUDSTONE - DARK GRAY CARBONACEOUS, VITRAIN NEAR TOP, CARBONACEOUS MATERIAL DECREASING DOWNWARDS
61.00		2.30	SANDSTONE - VERY FINE TO FINE GRAINED, LIGHT GRAY SILICEOUS, IRON STAINING
63.30		15.23	SANDSTONE - COARSE TO VERY COARSE GRAINED, LIGHT GRAY, SILICEOUS, LIMONITE STAINING, COALY DETRITUS.
78.53		6.67	MUDSTONE - AND SILTSTONE - GRAY, MINOR CARBONACEOUS MATERIAL, FEW MUDSTONE CLASTS. IRON STAINING. MUDSTONE AT BASE RUBBLY, FEW SLICKENSIDES AND LOCAL GREEN AREAS.
85.20		9.60	COAL HORIZON No. 5
94.80		6.90	SANDSTONE - FINE TO MEDIUM GRAINED, GRAY BECOMING DARK GRAY BASALLY
101.70		0.13	MUDSTONE
101.83		0.30	COAL
102.13		11.62	MUDSTONE - LIGHT GREY TO WHITE, BECOMING LIGHT GRAY SILTSTONE TOWARDS BASE. CARBONACEOUS...AT BASE.
113.75		6.45	MUDSTONE - LIGHT GREY TO WHITE
120.20		0.30	COAL
120.50		1.50	MUDSTONE - LIGHT GRAY, CARBONACEOUS
122.00		0.25	COAL
122.25		19.09	MUDSTONE - GRAY TO DARK GRAY, MINOR BIOTURBATION, MORE CARBONACEOUS TOWARDS BASE.
141.34		2.64	SANDSTONE - SILICEOUS, FEW MUDSTONE INTRACLASTS, GRAY, CARBONACEOUS
143.98			MUDSTONE - MAINLY DARK GRAY, CARBONACEOUS TO THEN BECOMING TRANSITIONALLY LIGHTER TOWARDS BASE

DETAILS OF COAL SEAMS — SCALE: 1:50

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)
				No. 4 SEAM HORIZON		
				ROOF - CONGLOMERATE		
7.85				MUDSTONE - VERY LIGHT GRAY TO OFF-WHITE, IN PART CARBONACEOUS, POSSIBLE BRECCIA ZONE.		
		0.45	92			
8.30				COALY MUDSTONE - BLOCKY BROKEN, CONTOUR BANDS OF DURAIN TO 3cm	AO286	0.42
		0.42				
8.72				COAL - MAINLY VITREOUS AND BRIGHT, BLOCKY AND CONCHOIDAL FRACTURE	AO287	0.50
		0.50				
9.22				LOST CORE INTERVAL		
		0.23				
9.45				MUDSTONE - GRAY-WHITE CONTAINS COALY STRINGERS		
9.55		0.10		CARBONACEOUS MUDSTONE - CONTAINS BANDS OF VITRAIN AND CLARAIN TO 5mm		
9.80		0.25				
		0.60		COAL - VITREOUS TO BRIGHT, CLEATED, VITRAIN BANDS TO 5mm	AO288	0.35
10.40						
10.61		0.21		MUDSTONE - DARK GRAY		
10.74		0.13		DURAIN - WITH FEW VITRAIN BANDS		
		0.54		COAL - VITRAIN - CLARAIN MIXTURE, BRIGHT, CLEATED, BECOMING SILTY TOWARDS BASE		
11.28		0.22		CLARAIN - INTERLAMINATED WITH VITRAIN AND MUDSTONE		
11.50		0.10		MUDSTONE - LIGHT GRAY, CARBONACEOUS		
11.60		0.12		COAL - BRIGHT		
11.72		0.11		MUDSTONE - MEDIUM GRAY		
11.83		0.05		COAL - BRIGHT		
11.88		0.06		MUDSTONE - MEDIUM GRAY		
11.94		0.03		COAL - MAINLY BRIGHT, VITRAIN WITH FEW INTERLAMINATED MUDSTONE. IRON STAINING THROUGHOUT		
		0.56	100		AO289	0.56
12.50		0.13		MUDSTONE - CARBONACEOUS, DARK GRAY		
12.63				COAL - BRIGHT, AS ABOVE		
		0.45				
13.08						
13.20		0.12		MUDSTONE - LIGHT GRAY		
		0.21		COAL - BRIGHT, AS ABOVE		
13.41				FLOOR - CARBONACEOUS MUDSTONE		3.61
				No. 5 SEAM HORIZON		
85.20				ROOF - MUDSTONE AND SILTSTONE		
		0.92	94	COAL - INTERBEDDED VITRAIN, CLARAIN AND DURAIN	AO290	0.92
86.12						
86.48		0.36		MUDSTONE - DARK GRAY, MINOR CARB. MATERIAL	AO291	0.36
		1.27		COAL - HARD, BLOCKY, WHITE PRECIPITATE INTERLACING IN HAIRLINE FRACTURES 0.05m COALY SHALE	AO292	1.32
87.80						
		0.40		MUDSTONE, BENTONITE - WHITE VOLCANIC ASH UNIT (MARKER?)	N.S.	
88.20		0.10		MUDSTONE - DARK GRAY, WHITE CLAY CLASTS		
88.30		0.17		MUDSTONE, BENTONITE - WHITE		
88.47		0.80	96	COAL - BRIGHT IN PART, CLARAIN AND VITRAIN MIXTURE WHITE PRECIPITATE INTERLACINGS		
89.27		0.16		MUDSTONE - WITH SOME COAL INTERBEDS		
89.43		0.33		COAL - HARD, BLOCKY, CLARAIN - DURAIN WITH FEW VITRAIN LAMINATIONS		
89.77		0.14		MUDSTONE - GREY - WHITE, LIKE BENTONITE	AO293	2.73
89.91		0.89		COAL - MOSTLY VITRAIN WITH FEW CLARAIN AND DURAIN INTERBEDS		
90.80		0.06		SILTSTONE - GRAY		
90.86		0.33		COAL - VITRAIN, BRIGHT, CLEATED, PARTED CLARIN INTERBED.		
91.20		0.23		SILTSTONE - GRAY, BIOTURBATION	AO294	0.23
91.43		0.24		COAL - CLARAIN AND VITRTRAIN, LIMONITE STAIN		
91.67		0.10		MUDSTONE - DARK GRAY, CARBONACEOUS		
91.77		0.18		COAL - VITRAIN AND CLARAIN		
91.95		0.25	100	MUDSTONE - DARK GRAY, CARBONACEOUS		
92.20		0.28		COAL - VITRAIN AND CLARAIN		
92.48		0.06		MUDSTONE - CARBONACEOUS		
92.53		0.47		COAL - VITRAIN, CLEATED	AO295	2.36
93.00		0.07		COAL - DURAIN, POOR QUALITY		
93.07		0.72		COAL - INTERLAMINATED VITRAIN AND CLAIRN IRON STAINING TOWARDS BASE.		
93.79		0.19		MUDSTONE - DARK GRAY, CARBONACEOUS		
93.98		0.22		COALY MUDSTONE - 80% MUDSTONE/VITRAIN LAMINATED	AO296	0.58
94.20		0.17		MUDSTONE		
94.37		0.22		COAL - MOSTLY VITRAIN		
94.59		0.21		SHALY COAL - 20% SHALE/VITRAIN	AO297	0.43
94.80			100	FLOOR - SANDSTONE		

SIZE		WEIGHT PERCENT								CUMULATIVE WEIGHT PERCENT								CUMULATIVE SAMPLE VALUES (CASE I)								CUMULATIVE SAMPLE VALUES (CASE II)								CUMULATIVE SAMPLE VALUES (CASE III)								OTHER		
DIA-METER	WT %	SPEC GRAV	YIELD	PROXIMATE ANALYSIS				BTU	F.S.I.	S	YIELD	PROXIMATE ANALYSIS				BTU	F.S.I.	S	THICK-NESS (m)	YIELD	PROXIMATE ANALYSIS				BTU	F.S.I.	S	THICK-NESS (m)	YIELD	PROXIMATE ANALYSIS				BTU	F.S.I.	S	THICK-NESS (m)	YIELD	PROXIMATE ANALYSIS				BTU	F.S.I.	S	HGI	S.G.
				RM	ASH	VOL.	F.C.					RM	ASH	VOL.	F.C.						RM	ASH	VOL.	F.C.						RM	ASH	VOL.	F.C.						RM	ASH	VOL.	F.C.					
1/4×0	100.0	RAW	100.0	5.2	44.3	22.1	28.4	5618		0.23																																		1.80
1/4×28	94.6	-1.30	1.8	5.0	2.7						1.8		2.7																															
		-1.50	13.1	5.2	6.1						14.9		5.7																															
		-1.70	15.4	3.6	30.7						30.3		18.4																															
		-1.90	26.9	3.7	43.0						57.2	4.4	29.6	27.1	38.9	7990		0.40																											
		+1.90	42.8	2.3	66.3						100.0		45.5																															
28×0	5.4	RAW	100.0								100.0	5.2	44.3	22.1	28.4	5618		0.23																											
1/4×28	94.6										54.1	4.4	29.6	27.1	38.9	7990		0.40																											
28×0	5.4										5.4	5.2	44.3	22.1	28.4	5618		0.23																											
1/4×0	100.0										59.5	4.5	30.9	26.7	38.0	7775		0.38	5.11	63.1	4.6	20.4	29.8	45.3	9279		0.38																			
1/4×0	100.0	RAW	100.0	5.7	17.0	31.6	45.7	9567		0.39																																		1.47
1/4×28	94.7	-1.30	27.4	5.7	3.6						27.4		3.6																															
		-1.50	37.0	4.5	7.6						64.4		5.9																															
		-1.70	24.1	4.1	25.6						88.5		11.3																															
		-1.90	5.7	3.2	44.2						94.2	5.2	12.9	30.1	51.7	10255		0.41																											
		+1.90	5.8	2.5	65.4						100.0		16.3																															
28×0	5.3	RAW	100.0								100.0	5.6	16.2	30.0	48.2	9948		0.36																											
1/4×28	94.7										89.2	5.2	12.9	30.1	51.7	10,255		0.41																											
28×0	5.3										5.3	5.6	16.2	30.0	48.2	9948		0.36																											
1/4×0	100.0										94.5	5.2	13.1	30.1	51.5	10,238		0.41	4.69	63.4	4.6	19.6	30.1	45.9	9405		0.38																			
1/4×0	100.0	RAW	100.0	3.2	69.2	14.8	12.8			0.15																																		2.16
1/4×28	93.1	-1.30	1.0	6.2	4.0						1.0		4.0																															
		-1.50	2.9	4.3	8.4						3.9		7.3																															
		-1.70	2.4	3.7	28.7						6.3		15.4																															
		-1.90	6.8	3.4	50.0						13.1	4.3	32.9	26.5	36.3	74.52		0.42																											
		+1.90	86.9	2.3	75.1						100.0		69.6																															
28×0	6.9	RAW	100.0							0.19	100.0	2.9	73.8	12.3	11.0	-		0.19																											
1/4×28	93.1										12.2	4.3	32.9	26.5	36.3	74.52		0.42																											
28×0	6.9										6.9	2.9	73.8	12.3	11.0	-		0.19																											
1/4×0	100.0										19.1	3.8	47.7	21.4	27.2	4760		0.34	3.96	63.1	4.5	20.7	30.1	44.6	9248		0.38																			
1/4×0	100.0	RAW	100.0	3.9	38.3	25.7	32.1	6888		0.26																																		1.67
1/4×28	89.5	-1.30	15.6	4.2	3.3						15.6		3.3																															
		-1.40	22.2	3.9	5.6						37.8		4.7																															
		-1.50	8.7	4.0	14.0						46.5		6.4																															
		-1.60	4.9	3.4	25.0						51.4		8.2																															
		-1.70	4.6	3.2	35.3						56.0		10.4																															
		-1.80	4.6	3.1	43.9						60.6		12.9																															
		-1.90	3.0	3.5	51.3						63.6	4.7	14.5	32.0	48.8	10,099		0.40																											
		+1.90	36.4	2.7	75.6						100.0		36.9																															
28×0	10.5	RAW	100.0								100.0	3.5	49.1	20.8	26.6	5423		0.29																											
1/4×28	89.5										56.9	4.7	14.5	32.0	48.8	10,099		0.40																											
28×0	10.5										10.5	3.5	49.1	20.8	26.6	5423		0.29																											
1/4×0	100.0										67.4	4.5	20.0	30.3	45.3	9371		0.38	3.61	67.4	4.5	20.0	30.3	45.3	9371		0.38																			

LOCATION MAP

TN ↑

SCALE:

COORDINATES: X7900m W, Y 9600m N OF S.E. CORNER, CL 82
ELEVATION: APPROX 457.2 m a.m.s.l
DIP: -90°
CORE SIZE: HQ & NQ
BEARING: NA
CASING HW 3.05 m NW 31.06m
BITS USED: J.K. SMIT COMBINATION, J.K. SMIT SERIES 75, 100
MUD USED: 97 GALS POLY, 330
m. LEFT IN HOLE: 0 m.
DATE START: JUNE 26/80
DRILLER: CARON DIAMOND DRILLING
TESTS: NONE
SAMPLED BY: O.R. CULLINGHAM
FINISH: JULY 4, 1980
OVERALL RECOVERY: 95.8 %
DATE: JULY 27/80
ANALYZED BY: BIRTLEY COAL AND MINERALS TESTING

PAN OCEAN OIL CO.
MINING DIVISION - COAL
LOGGED BY: G. GERMSCHEID DATE:
SIGNED:

DRILLHOLE NO. W-80-8
SHEET 2 OF 3

GEOLOGICAL LOG — SCALE: 1:500

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
1.83		1.83	OVERBURDEN - WEATHERED CONGLOMERATIC SANDSTONE
		6.02	CONGLOMERATE - CHERT AND QUARTZITE, GRANULE TO SMALL PEBBLE, WHITE TO BLACK, WITH OCCASIONAL GREEN PEBBLE, POORLY SORTED SANDSTONE, MATRIX, MINOR CARBONACEOUS MATERIAL.
7.85		0.45	MUDSTONE - LIGHT GRAY TO OFF-WHITE
8.30			COAL HORIZON No. 4
		5.11	
13.41			MUDSTONE - CARBONACEOUS, DARK GRAY, MINOR LIMONITE STAIN, MORE CARBONACEOUS AT BASE OF INTERVAL.
		9.69	
23.20			
		2.80	SILTSTONE - LIGHT GRAY, MINOR CARBONACEOUS MATERIAL, MINOR CLAST FRAGMENTS
26.00		0.52	SANDSTONE TO SILTSTONE
26.52			SANDSTONE - GRAY - BROWN, FINE TO MEDIUM GRAINED, LARGE AMOUNT OF IRON STAINING. MAJORITY OF GRAINS SILICEOUS.
		6.94	
33.46			
35.20		1.74	SILTSTONE TO VERY FINE GRAINED SANDSTONE, LIGHT GRAY, LIMONITE STAIN.
		4.05	MUDSTONE - LIGHT GRAY, HEMATITE AND LIMONITE STAINING.
39.25			
		4.09	SANDSTONE - LIGHT GRAY, SILICEOUS, CARBONACEOUS. BECOMES RED BROWN AT BASE (STAINING MAY BE A MARKER)
43.34		1.49	MUDSTONE - CARBONACEOUS, LIGHT GRAY TO DARK GRAY.
44.83			SANDSTONE - MEDIUM TO COARSE GRAINED, GRAY STAINING TO BLACK (OIL?) SILICEOUS POORLY SORTED GRAINS, FEW MUDSTONE CLASTS. FEW CONGLOMERATIC ZONES: CHERT WITH MUDSTONE INTERCLASTS: LOCAL LARGE PLANT FRAGMENTS.
		12.37	
57.20		1.04	SILTSTONE TO FINE GRAINED SANDSTONE, GRAY IRON STAINING
58.24		0.28	COAL
58.52			MUDSTONE - DARK GRAY, CARBONACEOUS, VITRAIN NEAR TOP, CARBONACEOUS MATERIAL DECREASING DOWNWARDS
61.00		2.48	
63.30		2.30	SANDSTONE - VERY FINE TO FINE GRAINED, LIGHT GRAY SILICEOUS, IRON STAINING
			SANDSTONE - COARSE TO VERY COARSE GRAINED, LIGHT GRAY, SILICEOUS, LIMONITE STAINING, COALY DETRITUS.
		15.23	
78.53			MUDSTONE - AND SILTSTONE: GRAY, MINOR CARBONACEOUS MATERIAL, FEW MUDSTONE CLASTS. IRON STAINING. MUDSTONE AT BASE RUBBLY, FEW SLICKENSIDES AND LOCAL GREEN AREAS.
		6.67	
85.20			COAL HORIZON No. 5
		9.60	
94.80			SANDSTONE - FINE TO MEDIUM GRAINED, GRAY BECOMING DARK GRAY BASALLY
		6.90	
101.70		0.13	MUDSTONE
101.83		0.30	COAL
102.13			MUDSTONE - LIGHT GREY TO WHITE, BECOMING LIGHT GRAY SILTSTONE TOWARDS BASE. CARBONACEOUS AT BASE.
		11.62	
113.75			MUDSTONE - LIGHT GREY TO WHITE
		6.45	
120.30		0.30	COAL
120.60		1.50	MUDSTONE - LIGHT GRAY, CARBONACEOUS
122.00		0.25	COAL
122.25			MUDSTONE - GRAY TO DARK GRAY, MINOR BIOTURBATION, MORE CARBONACEOUS TOWARDS BASE.
		19.09	
141.34			
		2.64	SANDSTONE - SILICEOUS, FEW MUDSTONE INTRACLASTS, GRAY, CARBONACEOUS.
143.98			MUDSTONE - MAINLY DARK GRAY, CARBONACEOUS TO THEN BECOMING TRANSITIONALLY LIGHTER TOWARDS BASE.

DETAILS OF COAL SEAMS — SCALE: 1:50

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)
				No. 4 SEAM HORIZON		
				ROOF - CONGLOMERATE		
7.85		0.45	92	MUDSTONE - VERY LIGHT GRAY TO OFF-WHITE; IN PART CARBONACEOUS, POSSIBLE BRECCIA ZONE		
8.30		0.42		COALY MUDSTONE - BLOCKY BROKEN, CONTOUR BANDS OF DURAIN TO 3cm		
8.72		0.50		COAL - MAINLY VITREOUS AND BRIGHT, BLOCKY AND CONCHOIDAL FRACTURE.		
9.22		0.23		LOST CORE INTERVAL		
9.45		0.10		MUDSTONE - GRAY-WHITE CONTAINS COALY SHARDS		
9.55		0.25		CARBONACEOUS MUDSTONE - CONTAINS BANDS OF COAL AND MUDSTONE		
9.80		0.60		COAL - VITREOUS TO BRIGHT, CLEATED, VITRAIN BANDS TO 5mm		
10.40		0.21		MUDSTONE - DARK GRAY		
10.61		0.13		DURAIN - WITH FEW VITRAIN BANDS		
10.74		0.54		COAL - VITRAIN - CLARAIN MIXTURE, BRIGHT CLEATED, BECOMING SILTY TOWARDS BASE		
11.28		0.22		CLARAIN - INTERLAMINATED WITH VITRAIN AND MUDSTONE		
11.50		0.10		MUDSTONE - LIGHT GRAY, CARBONACEOUS		
11.60		0.12		COAL - BRIGHT		
11.72		0.17		MUDSTONE - MEDIUM GRAY		
11.89		0.05		COAL - BRIGHT		
11.94		0.03		MUDSTONE - MEDIUM GRAY		
		0.56	100	COAL - MAINLY BRIGHT, VITRAIN WITH FEW INTERLAMINATED MUDSTONE. IRON STAINING THROUGHOUT.		0.92
12.50		0.18		MUDSTONE - CARBONACEOUS, DARK GRAY		
12.63		0.45		COAL - BRIGHT, AS ABOVE		
13.08		0.12		MUDSTONE - LIGHT GRAY		
13.20		0.21		COAL - BRIGHT, AS ABOVE		
13.41				FLOOR - CARBONACEOUS MUDSTONE		0.58
				No. 5 SEAM HORIZON		1.32
				ROOF - MUDSTONE AND SILTSTONE	A0290	2.60
85.20		0.92	94	COAL - INTERBEDDED VITRAIN, CLARAIN AND DURAIN.	A0291	
86.12		0.36		MUDSTONE - DARK GRAY, MINOR CARB. MATERIAL	A0292	
86.48		0.08		COAL - HARD, BLOCKY, WHITE PRECIPITATE INTERLACING IN HAIRLINE FRACTURES 0.08m COALY SHALE		
		1.27				
87.80		0.40		MUDSTONE, BENTONITE - WHITE VOLCANIC ASH UNIT (MARKER?)		
88.20		0.10		MUDSTONE - DARK GRAY, WHITE CLAY CLASTS		
88.30		0.17		MUDSTONE, BENTONITE, WHITE		
88.47		0.80	96	COAL - BRIGHT IN PART, CLARIN AND VITRAIN MIXTURE WHITE PRECIPITATE INTERLACINGS		2.73
89.27		0.16		MUDSTONE - WITH SOME COAL INTERBEDS	A0293	0.23
89.43		0.33		COAL - HARD, BLOCKY, CLARAIN - DURAIN WITH FEW VITRAIN LAMINATIONS.		
89.77		0.14		MUDSTONE - GREY-WHITE, LIKE BENTONITE		
89.91		0.89		COAL - MOSTLY VITRAIN WITH FEW CLARAIN AND DURAIN INTERBEDS		
90.80		0.06		SILTSTONE - GRAY		
90.86		0.33		COAL - VITRAIN, BRIGHT, CLEATED, PARTED CLARIN INTERBED.	A0294	
91.20		0.23		SILTSTONE - GRAY, BIOTURBATION		
91.43		0.24		COAL - CLARAIN AND VITRTRAIN, LIMONITE STAIN		
91.67		0.10		MUDSTONE - DARK GRAY, CARBONACEOUS		
91.77		0.18		COAL - VITRAIN AND CLARAIN		
91.95		0.25	100	MUDSTONE - DARK GRAY, CARBONACEOUS		
92.20		0.28		COAL - VITRAIN AND CLARAIN		
92.48		0.05		MUDSTONE - CARBONACEOUS		
92.53		0.47		COAL - VITRAIN, CLEATED	A0295	2.36
93.00		0.07		COAL - DURAIN, POOR QUALITY		
93.07		0.72		COAL - INTERLAMINATED VITRAIN AND CLARIN IRON STAINING TOWARDS BASE.		
93.79		0.19		MUDSTONE - DARK GRAY, CARBONACEOUS		
93.98		0.22		COALY MUDSTONE - 80% MUDSTONE/VITRAIN LAMINATED.	A0296	0.58
94.20		0.17		MUDSTONE		
94.37		0.22		COAL - MOSTLY VITRAIN		
94.59		0.21		SHALY COAL - 20% SHALE / VITRAIN		
94.80			100	FLOOR - SANDSTONE	A0297	0.43

DEPTH (m)	SIZE DIAMETER	SIZE WT %	SPEC GRAV	WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
1.83	1/4×0	100.0	RAW	100.0	5.3	21.7	28.3	44.7	9181		0.33
7.85	1/4×28	94.8	-1.30	12.8	5.0	2.4					
8.30			-1.50	46.9	5.5	6.5					
			-1.70	16.3	2.7	28.0					
			-1.90	9.7	3.1	43.1					
			+1.90	14.3	2.6	59.5					
	28×0	5.2	RAW	100.0							
	1/4×28	94.8									
	28×0	5.2									
	1/4×0	100.0									
13.41	1/4×0	100.0	RAW	100.0	2.8	81.8	12.8	2.6			0.10
	1/4×28	92.1	-1.90	3.8	3.9	30.9					
			+1.90	96.2	4.5	82.5					
	28×0	7.9	RAW	100.0							
	1/4×28	92.1									
	28×0	7.9									
	1/4×0	100.0									
23.20	1/4×0	100.0	RAW	100.0	6.7	13.3	29.3	50.7	10595		0.26
26.00	1/4×28	92.0	-1.30	14.7	4.8	2.1					
26.52			-1.40	27.5	5.1	4.1					
			-1.50	38.9	4.2	9.7					
			-1.60	8.1	3.7	21.8					
			-1.70	3.2	3.1	34.9					
			-1.80	2.2	2.9	44.8					
			-1.90	1.4	2.1	55.7					
			+1.90	4.0	2.4	63.0					
	28×0	8.0	RAW	100.0							
	1/4×28										
	28×0										
	1/4×0										
33.46	1/4×0	100.0	RAW	100.0	4.5	26.9	28.8	39.8	8429		0.17
34.96	1/4×28	90.2	-1.30	15.7	6.1	2.7					
35.20			-1.40	23.5	5.7	4.8					
			-1.50	18.0	6.0	10.2					
			-1.60	8.4	4.9	21.6					
			-1.70	5.4	4.4	32.6					
			-1.80	4.1	3.8	40.7					
			-1.90	2.7	3.6	49.3					
			+1.90	22.2	2.5	72.9					
	28×0	9.8	RAW	100.0							
	1/4×28	90.2									
	28×0	9.8									
	1/4×0	100.0									
39.25	1/4×0	100.0	RAW	100.0	1.4	86.6	7.0	5.0			0.10
39.39	1/4×28	92.5	-1.90	3.3	1.0	19.9					
39.43			+1.90	96.7	5.0	89.6					
	28×0	7.5	RAW	100.0							
	1/4×28	92.5									
	28×0	7.5									
	1/4×0	100.0									
43.34	1/4×0	100.0	RAW	100.0	5.0	24.1	29.2	41.7	8963		0.23
43.83	1/4×28	92.8	-1.30	31.4	5.6	2.1					
44.83			-1.40	24.0	5.3	4.4					
			-1.50	8.6	4.5	12.3					
			-1.60	4.4	3.7	22.6					
			-1.70	1.8	3.7	31.6					
			-1.80	2.1	3.3	41.1					
			-1.90	7.4	3.0	51.8					
			+1.90	20.3	2.0	73.7					
	28×0	7.2	RAW	100.0							
	1/4×28	92.8									
	28×0	7.2									
	1/4×0	100.0									
57.20	1/4×0	100.0	RAW	100.0	2.1	73.1	12.9	11.9			0.27
57.32	1/4×28	88.7	-1.30	2.0	5.6	4.2					
58.52			-1.50	4.9	3.7	10.0					
			-1.70	6.1	3.1	35.7					
			-1.90	8.0	2.9	52.1					
			+1.90	79.0	3.4	81.9					
	28×0	11.3	RAW	100.0							
	1/4×28	88.7									
	28×0	11.3									
	1/4×0	100.0									
61.00	1/4×0	100.0	RAW	100.0	5.8	27.3	27.3	39.6	8091		0.48
63.30	1/4×28	87.7	-1.30	6.0	5.7	3.4					
			-1.50	33.9	4.3	12.9					
			-1.70	37.9	4.0	26.8					
			-1.90	10.1	4.1	42.7					
			+1.90	12.1	2.4	64.2					
	28×0	12.3	RAW	100.0							
	1/4×28	87.7									
	28×0	12.3									
	1/4×0	100.0									

DEPTH (m)	CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
1.83								
7.85	12.8		2.4					
8.30	59.7		5.6					
	76.0		10.4					
	85.7	5.6	14.3	31.6	49.0	10150		0.48
	100.0		20.6					
	100.0	5.3	21.8	27.7	45.2	9176		0.48
	81.2	5.1	14.3	31.6	49.0	10150		0.48
	5.2	5.3	21.8	27.7	45.2	9176		0.48
	86.4	5.1	14.8	31.4	48.8	10091		0.45
23.20	3.8	3.9	30.9	25.9	39.3	7864		0.39
26.00	100.0		80.5					
26.52	100.0	3.0	80.9	13.2	2.9	-		0.11
	3.50	3.9	30.9	25.9	39.3	7864		0.39
	7.9	3.0	80.9	13.2	2.9	-		0.11
	11.4	3.3	65.5	17.1	14.1	2414		0.20
33.46	14.7		2.1					
34.96	42.2		3.4					
35.20	81.1		6.4					
	89.2		7.9					
	92.4		8.8					
	94.6		9.6					
	96.0	5.0	10.5	30.0	54.5	10683		0.43
	100.0		12.4					
	100.0	7.3	15.3	27.7	49.7	9972		0.28
	88.3	5.0	10.5	30.0	54.5	10683		0.43
	8.0	7.3	15.3	27.7	49.7	9972		0.28
	96.3	5.2	10.9	29.8	54.1	10624		0.42
39.25	15.7		2.7					
39.39	39.2		4.0					
39.43	57.2		5.9					
	65.6		7.9					
	71.0		9.8					
	75.1		11.5					
	77.8	5.5	12.7	29.0	52.8	10299		0.53
	100.0		26.1					
	100.0	4.4	30.2	27.7	37.7	7948		0.17
	70.2	5.5	12.7	29.0	52.8	10299		0.53
	9.8	4.4	30.2	27.7	37.7	7948		0.17
	80.0	5.4	14.8	28.8	51.0	10011		0.49
43.34	3.3	4.6	19.9	27.7	47.8	9478		0.46
43.83	100.0		87.3					
44.83	100.0	1.6	82.6	7.7	8.1	-		0.12
	30.5	4.6	19.9	27.7	47.8	9478		0.46
	7.5	1.6	82.6	7.7	8.1	-		0.12
	10.5	2.5	64.5	13.5	19.6	2740		0.22
57.20	31.4		2.1					
57.32	55.4		3.1					
58.52	64.0		4.3					
61.00	68.4		5.5					
63.30	70.2		6.2					
	72.3		7.2					
	79.7	5.3	11.5	32.5	50.7	10612		0.37
	100.0		24.0					
	100.0	5.1	18.0	30.1	46.8	9735		0.33
	74.0	5.3	11.5	32.5	50.7	10612		0.37
	7.2	5.1	18.0	30.1	46.8	9735		0.33
	81.2	5.3	12.1	32.3	50.4	10534		0.37
78.53	2.0		4.2					
85.20	6.9		8.3					
	13.0		21.2					
	21.0	4.1	38.1	25.5	37.3	7837		0.60
	100.0		71.6					
	100.0	2.1	75.9	11.5	10.5	-		0.27
	18.6	4.1	33.1	25.5	37.3	7837		0.60
	11.3	2.1	75.9	11.5	10.5	-		0.27
	29.9	3.3	49.3	20.2	27.2	4878		0.48
94.80	6.0		3.4					
95.00	39.9		11.5					
95.20	77.8		18.9					
	87.9	5.0	21.2	28.2	45.6	8950		0.57
	100.0		26.8					
	100.0	5.5	28.3	24.2	42.0	8111		0.51
	77.1	5.0	21.2	28.2	45.6	8950		0.57
	12.3	5.5	28.3	24.2	42.0	8111		0.51
	89.4	5.1	22.2	27.7	45.1	8835		0.56

DEPTH (m)	THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
43.34	0.92	86.4	5.6	14.8	31.4	48.8	10091		0.48
57.20	0.92	86.4	5.6	14.8	31.4	48.8	10091		0.48
61.00	1.32	65.3	5.0	17.3	30.7	47.1	9714		0.47
63.30	0.58	81.0	5.1	13.4	30.2	51.3	10263		0.49
78.53	2.60	71.5	5.3	14.1	29.5	51.2	10135		0.46
85.20	2.73	69.3	5.2	14.4	29.4	51.0	10093		0.46
94.80	0.23	70.7	5.2	15.1	29.9	49.9	10013		0.44

DEPTH (m)	THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

DEPTH (m)	THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER

DEPTH (m)	H.G.I.	S.G.
1.83		
7.85		1.54
8.30		
23.20		
26.00		
26.52		
33.46		
35.20		
39.25		
43.34		
44.83		
57.20		2.40
58.24		
58.52		
61.00		
63.30		
78.53		
85.20		1.44
94.80		
101.70		
101.83		
102.13		
113.75		1.58
120.30		
120.60		
122.00		
122.25		
141.34		
143.98		

DEPTH (m)	H.G.I.	S.G.
85.20		2.45
94.80		1.74
101.70		
101.83		
102.13		
113.75		2.18
120.30		
120.60		
122.00		
122.25		
141.34		1.60
143.98		

NOTE: INCLUDES SHALE 878-884?

DRILLHOLE NO. W-80-8 SHEET 3 OF 3

GEOLOGICAL LOG – SCALE: 1:500

DETAILS OF COAL SEAMS – SCALE:

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
			MUDSTONE - CONT.
281.42			MUDSTONE - SILTSTONE, CALCAREOUS, SOME VERY FINE GRAINED CALCAREOUS SANDSTONE LAMINATIONS, INCREASING CARBONACEOUS MATERIAL TOWARD BASE. FOSSILIFEROUS ZONE FORAMINIFERA.
331.32			TD - 331.32

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC. GRAV.	WEIGHT PERCENT: YIELD	WEIGHT PERCENT: PROXIMATE ANALYSIS: RM	WEIGHT PERCENT: PROXIMATE ANALYSIS: ASH	WEIGHT PERCENT: PROXIMATE ANALYSIS: VOL.	WEIGHT PERCENT: PROXIMATE ANALYSIS: F.C.	WEIGHT PERCENT: BTU	WEIGHT PERCENT: F.S.I.	WEIGHT PERCENT: S	CUMULATIVE WEIGHT PERCENT: YIELD	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: RM	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: ASH	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: VOL.	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: F.C.	CUMULATIVE WEIGHT PERCENT: BTU	CUMULATIVE WEIGHT PERCENT: F.S.I.	CUMULATIVE WEIGHT PERCENT: S

CUMULATIVE SAMPLE VALUES (CASE I): THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE II): THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III): THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER

LOCATION MAP

TN

SCALE:

COORDINATES: 9400m W, 4000m N. OF S.E. CORNER OF CL 82
ELEVATION: APPROX 487.68m. amsl.
DIP: -90° BEARING: NA
CORE SIZE: HQ CASING HW 3.66 m. LEFT IN HOLE: HW3.66m.

DATE START: JUNE 27/80 FINISH: JULY 1/80
DRILLER: CARON DIAMOND DRILLING OVERALL RECOVERY: 72%
TESTS: NA
SAMPLED BY: NA DATE: ANALYZED BY:

PAN OCEAN OIL CO.
MINING DIVISION - COAL
LOGGED BY: O. CULLINGHAM DATE: JULY 1, 1980
SIGNED:

DRILLHOLE NO. W-80-9
SHEET 1 OF 1

GEOLOGICAL LOG — SCALE: 1:500

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
		3.65	OVERBURDEN - SILTSTONE TO VERY FINE GRAINED SANDSTONE; SLICKENSIDED ON FRACTURE SURFACES
3.65		1.45	SANDSTONE - MEDIUM GRAINED, TAR STAIN, SLICKENSIDES.
		4.35	MUDSTONE - MEDIUM GRAY, BROWN SANDY, LOCALIZED SILTSTONE AND SANDSTONE AT BASE, TAR STAINED.
9.45		5.45	SANDSTONE - MEDIUM DARK GRAY, MEDIUM GRAINED, MODERATLY SILICEOUS, MINOR CARBONACEOUS MATERIAL, TRACE OF TAR.
14.90		0.94	SANDSTONE - AS ABOVE, TAR THROUGHOUT HIGHLY FRACTURED.
15.84		3.01	CONGLOMERATE TO GRANULE CONGLOMERATIC SANDSTONE, MATRIX SUPPORTED, 20% PEBBLE, TAR STAINED
18.85		12.54	INTERBEDDED MUDSTONE TO SILTSTONE; MEDIUM DARK TO DARK GRAY, HIGHLY BROKEN WITH SLICKENSIDES ON FRACTURE SURFACES TRACE CARBONACEOUS MATERIAL.
31.39		3.13	SILTSTONE TO VERY FINE GRAINED SANDSTONE; MEDIUM GRAY, IN PART CALCAREOUS, SILICEOUS, SLICKENSIDES.
34.52		1.28	MUDSTONE - MEDIUM GRAY, IN PART SILTY, SLICKENSIDES.
35.80		2.60	SILTSTONE TO VERY FINE GRAINED SANDSTONE; MEDIUM GRAY, GRADATIONAL TO MUDSTONE
38.40		31.12	INTERBEDDED MUDSTONE AND SILTSTONE MEDIUM TO DARK GRAY, MASSIVE TO FINE CROSS LAMINATIONS; IN PART BIOTURBATED, POLISHED FRACTURE SURFACES IN MUDSTONES. MAINLY SILTSTONE IN UPPER PART GRADING DOWN TO MAINLY MUDSTONE PETROLIFEROUS ODOUR THROUGHOUT.
69.52		6.98	SILTSTONE TO VERY FINE GRAINED SANDSTONE; MEDIUM GRAY, TARRY, PETROLIFEROUS ODOUR. SILICEOUS BORDERING ON QUARTZOSE SANDSTONE. SIMILAR TO LOWERMOST UNIT IN HOLE AN-80-3. POSSIBLY PERMIAN.
76.50			TD-76.50

DETAILS OF COAL SEAMS — SCALE:

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC. GRAV	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE WEIGHT PERCENT	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE I)	THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE II)	THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III)	THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER

LOCATION MAP

TN

SCALE:

COORDINATES: 9300m W., 10,400m N. OF S.E. CORNER CL 82
ELEVATION: 3962m
DIP: -90°
CORE SIZE: HQ & NQ
BEARING: NA
CASING HW 3.66m m. LEFT IN HOLE: NIL m.
NW(HQ) 18.87m
BITS USED: J.K. SMIT COMBINATION, J.K. SMIT SERIES 75+100'
MUD USED: 109 GALS POLY 330, 6 BAGS GEL, 2 BAGS TROL.
DATE START: JULY 1, 1980
DRILLER: CARON DIAMOND DRILLING
TESTS: NA
SAMPLED BY: NA
FINISH: JULY 7, 1980
OVERALL RECOVERY: 95.8%
DATE: NA
ANALYZED BY:

PAN OCEAN OIL CO.
MINING DIVISION - COAL
LOGGED BY: G. GERMSCHEID DATE: JULY 8, 1980
SIGNED:

DRILLHOLE NO. W-80-10
SHEET 1 OF 1

GEOLOGICAL LOG — SCALE: 1: 500

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
		3.66	OVERBURDEN - TRICONED, NO CORE
3.66		5.19	CONGLOMERATE AND MEDIUM COARSE GRAINED SANDSTONE; 1mm TO 3mm ANGULAR GREY PEBBLES SILICEOUS MATRIX, CALCAREOUS PETROLIFEROUS. POORLY SORTED.
8.85			MUDSTONE AND SILTSTONE - LIGHT GRAY, MINOR LIMONITE STAINING.
18.86			CONGLOMERATE - ANGULAR PEBBLES MUDDY ARGILLACEOUS MATRIX.
19.81			MUDSTONE - WITH INTERBEDS OF FINE GRAINED SANDSTONE AND SILTSTONE MEDIUM DARK GRAY, FINE GRAINED SANDSTONE GRAINS LARGELY ARGILLACEOUS BIOTURBATION IN SANDSTONE AND SILTSTONE.
39.50			CONGLOMERATE - CYCLIC WITH SILTSTONE AND MUDSTONE INTERBEDDING TO 45.5m. HETEROGENEOUS GRAIN SIZES FROM CLAY TO BOULDERS, POORLY CEMENTED. CLASTS - SILTSTONE CHERT AND QUARTZ WITH FEW MUDSTONE INTERCLASTS, SUBANGULAR TO SUBROUNDED; CLASTS LARGER, MORE ANGULAR AND MORE HETEROGENEOUS THAN BONNET PLUME CONGLOMERATE. MATRIX - LIGHT GREY - BROWN MUDSTONE.
		193.13	
232.63		7.24	LIMESTONE - HIGHLY FRACTURED, PETROLIFEROUS ON FRACTURE FACES. LIMESTONE IS GREY-WHITE LIME-MUDSTONE.
239.88			TD - 239.88

DETAILS OF COAL SEAMS — SCALE:

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC GRAV	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE WEIGHT PERCENT	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE I)	THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE II)	THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III)	THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER

LOCATION MAP

TN ↑

SCALE:

COORDINATES: 1500 m. W., LICENSE LINE CL 95 & 80
ELEVATION: 4633
DIP: -90°
CORE SIZE: HQ & NQ
BEARING: NA
CASING HW 4.88 m NW 119.48 m
BITS USED: J.K. SMIT COMBINATION, J.K. SMIT SERIES 75+100
MUD USED: 6 BAGS GEL, 2 BAGS TROL, 105 GALS. POLY
m. LEFT IN HOLE: 0 m.
DATE START: JULY 6/80
DRILLER: CARON DIAMOND DRILLING
TESTS: NA
SAMPLED BY: NA
FINISH: JULY 14/80
OVERALL RECOVERY: 96%
DATE: NA
ANALYZED BY: NA

PAN OCEAN OIL LTD.
MINING DIVISION - COAL
LOGGED BY: G. GERMSCHEID DATE: JULY 15, 1980
SIGNED:

DRILLHOLE NO. W-80-11
SHEET 1 OF 2

GEOLOGICAL LOG — SCALE: 1:500

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
4.00		4.0	OVERBURDEN
		10.33	MUDSTONE - SILTSTONE, GREY, LIGHT GREY, BROWN GREY.
14.33		7.4	SANDSTONE - GREY BROWN, COARSE GR., CARBONACEOUS TRACES.
17.37		6.37	SILTSTONE - BROWN TO DARK GREY BROWN, MASSIVE
23.00		4.72	CONGLOMERATE - PEBBLES ROUNDED; ARGILACEOUS MATRIX.
27.72		2.38	SILTSTONE - DARK GREY BROWN, MASSIVE
32.00		1.5	CONGLOMERATE - AS ABOVE
33.50		2.88	MUDSTONE - BROWN - YELLOW - GREY, MASSIVE
36.38		15.52	SILTSTONE - GREY, BUFF, MASSIVE, COAL SHARDS
51.90		0.56	MUDSTONE - DARK GREY.
52.46		32.47	SILTSTONE - LIGHT GREY, COALY, LAMINATIONS
84.93		8.17	SILTSTONE - BUFF GREENISH GREY, GRADATIONAL TO VERY FINE GRAINED SANDSTONE.
93.10		3.13	SANDSTONE - GREY BROWN, BLACK, PETROLIFEROUS.
96.23		1.57	CONGLOMERATE - THIN COAL LAMINATIONS, PETROLIFEROUS
97.80		14.10	MUDSTONE - GREY, MASSIVE.
111.90		6.06	MUDSTONE - DARK GREY, BLACK, CARBONACEOUS
117.96		2.64	MUDSTONE - GREY, BROWN, BECOMING CARBONACEOUS TOWARD BASE.
120.52		0.13	COAL
120.65		9.81	MUDSTONE - AS ABOVE
130.46		0.07	COAL
130.53		49.14	MUDSTONE - LIGHT GREY, COALY ZONE.
179.67		8.29	MUDSTONE - GREY - BROWN, GREY - BLACK, PETROLIFEROUS, SILTSTONE INTERBED.
187.96		2.84	CONGLOMERATE - 80% CHERT, QUARTZ, SILTSTONE PEBBLES, OIL STAINS ON BROKEN SURFACE.
190.86		15.55	MUDSTONE - SILTSTONE, GREY TO GREY BROWN.
206.35		1.65	MUDSTONE - GREY TO BLACK
208.00		25.98	MUDSTONE - SILTSTONE, BROWN - GREY, COAL INTERBED.
233.98		1.15	CONGLOMERATE
235.62		13.90	MUDSTONE - GREY - BROWN, CARBONACEOUS, MASSIVE

DETAILS OF COAL SEAMS — SCALE:

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC GRAV	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT: YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE I)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE II)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER

DRILLHOLE NO. W-80-11 SHEET 2 OF 2

GEOLOGICAL LOG – SCALE: 1:500

DETAILS OF COAL SEAMS – SCALE:

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
			MUDSTONE (CONT.)
249.02			
		13.88	CONGLOMERATE- AS ABOVE
262.90			
		31.06	MUDSTONE- GREY- GREY BLACK
293.96			
		17.04	CONGLOMERATE
311.00			
		3.00	MUDSTONE
314.00			
		4.50	CONGLOMERATE
318.50			
		3.06	MUDSTONE
321.56			
		4.58	CONGLOMERATE
326.14			
			TD - 326.14

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC. GRAV.	WEIGHT PERCENT: YIELD	WEIGHT PERCENT: PROXIMATE ANALYSIS: RM	WEIGHT PERCENT: PROXIMATE ANALYSIS: ASH	WEIGHT PERCENT: PROXIMATE ANALYSIS: VOL.	WEIGHT PERCENT: PROXIMATE ANALYSIS: F.C.	WEIGHT PERCENT: BTU	WEIGHT PERCENT: F.S.I.	WEIGHT PERCENT: S	CUMULATIVE WEIGHT PERCENT: YIELD	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: RM	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: ASH	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: VOL.	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: F.C.	CUMULATIVE WEIGHT PERCENT: BTU	CUMULATIVE WEIGHT PERCENT: F.S.I.	CUMULATIVE WEIGHT PERCENT: S

CUMULATIVE SAMPLE VALUES (CASE I): THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE II): THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III): THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER

LOCATION MAP

TN

SCALE:

COORDINATES: 650 W, 3600 N OF SE. CORNER CL 95
ELEVATION: APPX. 481.6m amsl
DIP: -90° BEARING: NA
CORE SIZE: HQ, NQ CASING HW 3.66 m NW 57.91 m
BITS USED: J.K.SMIT COMBINATION, J.K SMIT SERIES 75
MUD USED: 72 GALS POLY 330
m. LEFT IN HOLE: HW 3.66m. NW 24.38
DATE START: JULY 7/80
DRILLER: CARON DIAMOND DRILLING
TESTS: NA
SAMPLED BY: NA
FINISH: JULY 13/80
OVERALL RECOVERY: 98. 7%
DATE: NA ANALYZED BY: NA

PAN OCEAN OIL LTD.
MINING DIVISION - COAL
LOGGED BY: G. GERMSCHEID DATE: JULY 15, 1980
SIGNED:

DRILLHOLE NO. W-80-12
SHEET 1 OF 2

GEOLOGICAL LOG — SCALE: 1:500

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
		3.50	OVERBURDEN
3.50		1.16	SANDSTONE - LIGHT GRAY, MEDIUM TO COARSE GRAIN, CARBONACEOUS.
4.66		6.04	SILTSTONE - DARK GRAY, NON- CALCAREOUS.
10.70		14.89	SANDSTONE - DARK GRAY, SILICEOUS, GRADING FROM FINE TO MEDIUM TO COARSE GRAINED. LIMONITE STAINING IN COARSE GRAINED. LOCAL MUDSTONE INTRACLASTS.
25.59		8.65	MUDSTONE - DARK GRAY, CARBONACEOUS, FEW THIN COAL LAMINATIONS
34.24		7.81	MUDSTONE - LIGHT GRAY, MASSIVE.
42.05		11.89	MUDSTONE - LIGHT GRAY, LOCAL SILTY ZONES, MASSIVE, TRACE OF CARBONACEOUS MATERIAL.
53.94		21.56	MUDSTONE - MAINLY DARK GRAY, CARBONACEOUS; MEDIUM GRAY LOCALLY.
75.50		8.62	SILTSTONE - LIGHT GRAY, SLUMP STRUCTURES, MINOR BIOTURBATION, NON-CALCAREOUS, FINE TO MEDIUM GRAINED LIGHT GRAY INTERBEDS, COALY LAMINATIONS.
84.12		2.89	MUDSTONE - DARK GRAY, MINOR CARBONACEOUS MATERIAL, NON-CALCAREOUS
87.01		13.24	SANDSTONE - GRAY, MEDIUM GRAINED, SILICEOUS. MINOR LIMONITE STAINING. TRACE COALY SHARDS. BECOMES MASSIVE AND COARSE GRAINED TOWARDS BASE. COALY INCLUSIONS AT 96.62-96.90
100.25		10.35	MUDSTONE - SILTSTONE, DARK GRAY, MASSIVE, CARBONACEOUS. MUDSTONE CONTAINS LOCAL SANDSTONE INTERBEDS.
110.60		2.60	SANDSTONE - FINE TO COARSE GRAINED WITH COALY SHARDS AND VERY THIN COAL LAMINATIONS.
113.20		1.60	MUDSTONE - DARK GRAY, CARBONACEOUS, LOCAL SILTSTONE.
114.80		9.05	SANDSTONE - VERY FINE GRAINED TO VERY COARSE GRAINED AT BASE.
123.85		2.02	MUDSTONE - DARK GRAY, CARBONACEOUS, NON-CALCAREOUS.
125.87		11.49	SILTSTONE, MUDSTONE AND SANDSTONE - LIGHT GRAY SILTSTONE, BIOTURBATION, LOCAL MUDSTONE WITH 20cm ZONE OF VERY FINE GRAINED SANDSTONE.
137.36		0.84	SANDSTONE - GRAY, FINE GRAINED POORLY SORTED ANGULAR CHERT.
138.20		59.30	MUDSTONE - LIGHT GRAY TO DARK GRAY, BIOTURBATION, LOCALLY DARK GRAY AND CARBONACEOUS - LOCAL GRADATIONS TO SILTSTONE, COALY SHARDS AT 185m.
197.50		3.90	CONGLOMERATE - PEBBLES FROM GRANULE TO 7cm, ROUNDED, MAINLY QUARTZ. BITUMEN ON SURFACE OF CORE.
201.40		13.16	MUDSTONE - DARK GRAY, MASSIVE, MINOR BIOTURBATION, MINOR CARBONACEOUS
214.40		0.42	CONGLOMERATE
214.56		7.27	MUDSTONE - DARK GRAY, AS ABOVE
222.25		12.48	CONGLOMERATE - PEBBLES 50 %, WELL ROUNDED LIGHT GRAY QUARTZ, SANDSTONE AND SILTSTONE, 1-7cm, FEW BLACK CHERT PEBBLES, MATRIX ARGILLACEOUS, LIGHT BROWN MUDSTONE PETROLIFEROUS
234.73		1.72	MUDSTONE - GRAY-BROWN
236.45		5.75	CONGLOMERATE
242.20			MUDSTONE - BROWN GREY TO GREY GREEN

DETAILS OF COAL SEAMS — SCALE:

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC GRAV	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE WEIGHT PERCENT

YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE I)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE II)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER

DRILLHOLE NO. W-80-12 SHEET 2 OF 2

GEOLOGICAL LOG – SCALE: 1:500

DETAILS OF COAL SEAMS – SCALE:

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
			MUDSTONE (CONT.)
		24.50	
266.70			
		3.04	CONGLOMERATE, AS ABOVE.
269.74			
		2.56	MUDSTONE - GREY, BROWN, GREEN
272.30			
			CONGLOMERATE - CHERT CLASTS, GRANULES TO PEBBLES
		8.00	
284.30			
			MUDSTONE - GREY, MASSIVE
		9.66	
293.96			
			CONGLOMERATE - AS ABOVE.
		37.35	
331.31			
			MUDSTONE - GREY
		6.10	
337.41			
			TD - 337.41

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC. GRAV.	WEIGHT PERCENT: YIELD	WEIGHT PERCENT: PROXIMATE ANALYSIS: RM	WEIGHT PERCENT: PROXIMATE ANALYSIS: ASH	WEIGHT PERCENT: PROXIMATE ANALYSIS: VOL.	WEIGHT PERCENT: PROXIMATE ANALYSIS: F.C.	WEIGHT PERCENT: BTU	WEIGHT PERCENT: F.S.I.	WEIGHT PERCENT: S	CUMULATIVE WEIGHT PERCENT: YIELD	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: RM	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: ASH	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: VOL.	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: F.C.	CUMULATIVE WEIGHT PERCENT: BTU	CUMULATIVE WEIGHT PERCENT: F.S.I.	CUMULATIVE WEIGHT PERCENT: S

CUMULATIVE SAMPLE VALUES (CASE I): THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE II): THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III): THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER

LOCATION MAP

TN ↑

SCALE:

COORDINATES: 7000 m N, 7000 m W S.E. CORNER
ELEVATION: 377.95 m (APPROX)
DIP: -90° BEARING: 33
CORE SIZE: HQ, NQ CASING HW -15.85 NW(HQ) 76.20m m LEFT IN HOLE: 0 m.
BITS USED: J.K. SMIT COMBINATION & 75 SERIES
MUD USED: 33 BAGS GEL, 6 BAGS TRC, 100g POLY TESTS:
DATE START: JULY 15, 1980 FINISH: JULY 26, 1980
DRILLER: E. CARON DIAMOND DRILLING OVERALL RECOVERY:
SAMPLED BY: DATE: ANALYZED BY:

PAN OCEAN OIL LTD.
MINERALS DIVISION - COAL
LOGGED BY: O.R. CULLINGHAM DATE: JULY 29, 1980
SIGNED:

DRILLHOLE NO. MD-80-14
SHEET 1 OF 2

GEOLOGICAL LOG — SCALE:

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
		20.42	OVERBURDEN
20.42		243.54	CONGLOMERATE, MEDIUM PEBBLE TO BOULDERS; POORLY SORTED; CLASTS SPHERICAL TO OBLATE, ROUNDED TO WELL-ROUNDED, FEWER BOULDERS TOWARD BASE. MATRIX PREDOMINANTLY MUDSTONE WITH SHORT INTERVALS OF SILTSTONE, POORLY CEMENTED. PROBABLY LOWEST CONGLOMERATE MEMBER K_1T_{LBP}

DETAILS OF COAL SEAMS — SCALE:

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC GRAV	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE WEIGHT PERCENT	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE I)	THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE II)	THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III)	THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER

DRILLHOLE NO. MD 80 14 SHEET 2 OF 2

GEOLOGICAL LOG – SCALE: 1: 500

DETAILS OF COAL SEAMS – SCALE:

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
			CONGLOMERATE, CONTINUED
263.96			END OF HOLE

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC. GRAV.	WEIGHT PERCENT: YIELD	WEIGHT PERCENT: PROXIMATE ANALYSIS: RM	WEIGHT PERCENT: PROXIMATE ANALYSIS: ASH	WEIGHT PERCENT: PROXIMATE ANALYSIS: VOL.	WEIGHT PERCENT: PROXIMATE ANALYSIS: F.C.	WEIGHT PERCENT: BTU	WEIGHT PERCENT: F.S.I.	WEIGHT PERCENT: S	CUMULATIVE WEIGHT PERCENT: YIELD	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: RM	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: ASH	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: VOL.	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: F.C.	CUMULATIVE WEIGHT PERCENT: BTU	CUMULATIVE WEIGHT PERCENT: F.S.I.	CUMULATIVE WEIGHT PERCENT: S

CUMULATIVE SAMPLE VALUES (CASE I)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	PROXIMATE ANALYSIS: ASH	PROXIMATE ANALYSIS: VOL.	PROXIMATE ANALYSIS: F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE II)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	PROXIMATE ANALYSIS: ASH	PROXIMATE ANALYSIS: VOL.	PROXIMATE ANALYSIS: F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	PROXIMATE ANALYSIS: ASH	PROXIMATE ANALYSIS: VOL.	PROXIMATE ANALYSIS: F.C.	BTU	F.S.I.	S

OTHER

LOCATION MAP

TN ↑

SCALE:

COORDINATES: 10,950 m W, 350 m N of S.E CORNER, CL 81
ELEVATION: 451 m
DIP: - 90°
CORE SIZE: HQ, NQ
BEARING: N/A
CASING 20.12
BITS USED: JK Smit SERIES 75 & 100, JK Smit Combination
MUD USED: 100 gal Poly, 98 bags Trol, 128 bags Gel, 4 bag Seal
m. LEFT IN HOLE: 0 m.
TESTS:
DATE START: JULY 22/80
DRILLER: E. CARON DIAMOND DRILLING
SAMPLED BY:
FINISH: AUG 2/80
OVERALL RECOVERY: 84 %
DATE: ANALYZED BY:

PAN OCEAN OIL LTD.
MINERALS DIVISION - COAL

LOGGED BY: GREG GERMSCHEID DATE: AUGUST 5/80
+ O.R. CULLINGHAM
SIGNED:

DRILLHOLE NO. EW-80-15
SHEET 1 OF 2

GEOLOGICAL LOG — SCALE: 1:500

DEPTH (m)	THICKNESS (m)	DESCRIPTION
		OVERBURDEN
37.49	37.49	
38.75	1.26	MUDSTONE DARK GRAY, MINOR COAL
39.92	0.83	COAL AND MUDSTONE
	12.01	MUDSTONE GRAY, MINOR CARBINACEOUS LAMINATIONS
51.44		
52.72	1.28	
	4.48	MUDSTONE GRAY, RED COLORATION AT 55.50 TO 56.00
57.20	0.75	SANDSTONE: LIGHT RED-ORANGE GRAY, FINE TO MEDIUM GRAINED
57.95		CONGLOMERATE: CLAST SUPPORTED, SMALL PEBBLES WITH AVERAGE SIZE 2-3 cm, ROUNDED TO SUBROUNDED MAINLY CHERT, BLACK, BUFF, GRAY, AND GREEN. MATRIX IS SANDY, ARGILLACEOUS. MINOR COAL DETRITUS MOST CLASTS LIGHT COLOR, NOT "TYPICAL" SPECKLED UPPER K_{gp} CONGLOMERATE.
	29.17	
87.12	5.84	SANDSTONE: GRADATIONAL FROM SILTSTONE AT TOP TO VERY FINE, FINE GRAINED, MEDIUM TO VERY COURSE AT BASE. GRAY, IRON STAINING, LOCAL COALY SHARDS
92.96	3.36	MUDSTONE: GRAY, MINOR COALY LAMINATIONS. POSSIBLE FOSSILIFEROUS ZONE SIMILAR TO W-80-8 AT 100 m.
96.32	9.44	SILTSTONE AND SANDSTONE, GRAY, COARSENS DOWNWARDS MINOR, CARBONACEOUS MATERIAL, FEW IRON STAINED MUDSTONE CLASTS.
105.76	3.94	MUDSTONE: GRAY, LOCAL ANGULAR BLACK CHERT GRANULES DECREASING TOWARD BASE
109.70	5.00	SANDSTONE: GRAY, SILTY AT TOP, COARSENS DOWNWARDS TO GRANULE SIZE, PEBBLY ZONES AT BASE.
114.70	80.30	MUDSTONE: GRAY, MINOR COAL ZONES, MINOR YELLOW CLASTS, MINOR IRON STAINING, SOME SILTSTONE AND SANDSTONE AT BASE.
201.00	14.49	SILTSTONE, SANDSTONE: GRAY, ARGILLACEOUS, FINE GRAINED SANDSTONE, MINOR BIOTURBATION MINOR BUFF CLAY PEBBLES IN SANDSTONE
215.49	3.34	SILTSTONE: SOME SANDSTONE, INTERBEDS, MEDIUM GRAY TO DARK GRAY
218.83	2.76	SANDSTONE: SALT & PEPPER, MEDIUM GRAINED, MINOR MUDBALLS MINOR COALY FLECKS FOR 12 cm IN CENTER OF UNIT
221.59	0.33	CARBONACEOUS MUDSTONE
221.92	2.72	MUDSTONE: MEDIUM TO DARK GRAY, MINOR SMALL MUDBALLS MINOR COALY MUDSTONE BANDS
224.64	21.33	MUDSTONE: MEDIUM TO DARK GRAY, SOME COALY INTERVALS OF STRINGERS AND FLECKS. MINOR BANDS OF COAL UP TO 3 cm.
245.94		

DETAILS OF COAL SEAMS — SCALE: 1:50

DEPTH (m)	THICKNESS (m)	RECOVERY %	DESCRIPTION
			ROOF: MUDSTONE, MASSIVE, GRAY
51.44			
51.55	0.11	0.09	COAL & MUDSTONE
51.62	0.07		MUDSTONE: LIGHT OLIVE GRAY
	0.62		COAL, DULL WITH VITREOUS PARTINGS, CONTAINS LIGHT BROWN OLIVE MUDSTONE BANDS
22.24			
	0.48		COAL DULL TO VITREOUS, SHALY IN UPPER PART
52.72			FLOOR: MUDSTONE

SAMPLE NUMBER | THICKNESS (m) | SIZE: DIAMETER, WT % | WEIGHT PERCENT: SPEC GRAV, YIELD, PROXIMATE ANALYSIS (RM, ASH, VOL., F.C.), BTU, F.S.I., S | CUMULATIVE WEIGHT PERCENT: YIELD, PROXIMATE ANALYSIS (RM, ASH, VOL., F.C.), BTU, F.S.I., S

NOT SAMPLED

CUMULATIVE SAMPLE VALUES (CASE I): THICKNESS (m), YIELD, PROXIMATE ANALYSIS (RM, ASH, VOL., F.C.), BTU, F.S.I., S

CUMULATIVE SAMPLE VALUES (CASE II): THICKNESS (m), YIELD, PROXIMATE ANALYSIS (RM, ASH, VOL., F.C.), BTU, F.S.I., S

CUMULATIVE SAMPLE VALUES (CASE III): THICKNESS (m), YIELD, PROXIMATE ANALYSIS (RM, ASH, VOL., F.C.), BTU, F.S.I., S

OTHER

DRILLHOLE NO. EW - 80 - 15 SHEET 2 OF 2

GEOLOGICAL LOG – SCALE: 1:500

DETAILS OF COAL SEAMS – SCALE:

DRILLHOLE NO. EW - 80 - 15 (SHEET 2)

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
247.13		1.16	SILTSTONE, LIGHT, MED. GREY
249.42		2.29	SANDSTONE, MED. GRAINED
250.29		0.87	MUDSTONE, DARK GREY
253.01		2.72	SANDY SILSTONE, LIGHT TO MED. GREY
256.36		3.35	SANDSTONE, MED. TO FINE GRAINED, LIGHT TO MED. GREY
258.90		2.60	SILTSTONE, CARBONACEOUS, LIGHT TO DARK GREY.
261.21		2.25	SANDSTONE, SALT AND PEPPER, MED. TO FINE GRAINED
			END OF HOLE

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC. GRAV.	WEIGHT PERCENT: YIELD	WEIGHT PERCENT: PROXIMATE ANALYSIS: RM	WEIGHT PERCENT: PROXIMATE ANALYSIS: ASH	WEIGHT PERCENT: PROXIMATE ANALYSIS: VOL.	WEIGHT PERCENT: PROXIMATE ANALYSIS: F.C.	WEIGHT PERCENT: BTU	WEIGHT PERCENT: F.S.I.	WEIGHT PERCENT: S	CUMULATIVE WEIGHT PERCENT: YIELD	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: RM	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: ASH	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: VOL.	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: F.C.	CUMULATIVE WEIGHT PERCENT: BTU	CUMULATIVE WEIGHT PERCENT: F.S.I.	CUMULATIVE WEIGHT PERCENT: S

CUMULATIVE SAMPLE VALUES (CASE I): THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE II): THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III): THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER

LOCATION MAP

TN

SCALE:

COORDINATES: 1250 mW, 400 mN of SE CORNER, CL. 83
ELEVATION: 293.87 m AMSL (APPROX.)
DIP: -90° BEARING: N/A
CORE SIZE: HQ,NQ CASING 3.66 m

BITS USED: J.K. SMIT COMBINATION J.K. SMIT SERIES 75 & 100
MUD USED: 73gal. POLY, 80 bags GEL, 3 bags TROL, 2 bags SEAL
m. LEFT IN HOLE: 0 m.

DATE START: JULY 27/80 FINISH: AUGUST 9/80
DRILLER: E. CARON DIAMOND DRILLING OVERALL RECOVERY: 91.12 %
TESTS:
SAMPLED BY: O. CULLINGHAM DATE: AUGUST 14/80 ANALYZED BY: BIRTLEY COAL SCIENCE & MINERALS TESTING

PAN OCEAN OIL LTD.
MINERALS DIVISION - COAL
LOGGED BY: O. CULLINGHAM DATE:
SIGNED:

DRILLHOLE NO. WT-80-16
SHEET 1 OF 2

GEOLOGICAL LOG — SCALE: 1:500

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
3.66		3.66	OVERBURDEN
		19.20	CONGLOMERATE - SMALL (WITH FEW MEDIUM) PEBBLE, CHERT AND QUARTZITE WHITE TO BLACK WITH RARE GREEN, SUB-ROUNDED TO WELL ROUNDED, TAR MATRIX. FEW THIN CROSS-BEDS OF COARSE - GRAINED SANDSTONE
14.02 - 14.55			CARBONACEOUS MUDSTONE WITH COAL SPLINTS.
14.55 - 15.24			PROBABLE FAULT ZONE. LIMONITE STAINED BRECCIA ZONE.
22.86		17.45	SANDSTONE - MEDIUM GRAY, VERY FINE GRAINED, COARSENING DOWNWARDS TO MEDIUM AND COARSE GRAINED IN PART GRANULE TO SMALL PEBBLE CONGLOMERATE AT BASE OF BEDS. SOME TAR STAINING. SOME BRECCIATED, BROKEN CORE.
40.35		2.67	COAL HORIZON NO. 4A
42.98		14.42	MUDSTONE - MEDIUM TO DARK GRAY, CARBONACEOUS AT TOP AND BASE OF INTERVAL. FEW THIN SILTSTONE INTERVALS.
57.40		0.82	COAL HORIZON NO. 4B
58.22		19.11	MUDSTONE - LIGHT BROWNISH GRAY TO OFF WHITE. FRAGMENTAL TO HACKLY, MINOR ROOT STRUCTURES. BECOMES MORE SILTY AND BLOCKY BASALLY WITH THIN ZONES OF SLUMP STRUCTURES.
77.33		1.19	CONGLOMERATIC SANDSTONE, COARSE GRAINED, MEDIUM GRAY.
78.52		1.35	CARBONACEOUS COALY MUDSTONE. PARTINGS OF COAL.
79.87		17.93	MUDSTONE - MEDIUM TO MEDIUM DARK GRAY; GRADATIONAL TO SILTSTONE AND FINE GRAINED SANDSTONE BASALLY.
97.80		4.92	CONGLOMERATIC SANDSTONE AND CONGLOMERATE. QUARTZITE AND CHERT PEBBLES, WHITE TO BLACK. MATRIX IS TARRY, GRAY-BROWN, MEDIUM TO COARSE GRAINED SANDSTONE.
102.72		0.68	COAL - DULL TO BRIGHT.
103.40		4.75	MUDSTONE - MEDIUM GRAY, MINOR COAL SHARDS. IN PART SILTY IN BASAL SECTION.
108.15		4.30	SILTSTONE - MEDIUM GRAY. CRENULATED BEDDING, BIOTURBATED.
112.45		6.65	SANDSTONE - MEDIUM GRAY, VERY FINE TO MEDIUM GRAINED. FEW LAMINATIONS OF CARBONACEOUS MATERIAL. LAMINAR TO THICKLY BEDDED.
119.10		0.63	MUDSTONE - MEDIUM GRAY.
119.73		8.35	SILTSTONE TO CONGLOMERATIC SANDSTONE. SILTSTONE IS GRAY, THINLY LAMINATED, IN PART BIOTURBATED. SANDSTONE IS FINE TO COARSE GRAINED, COARSENING DOWNWARDS TO GRANULE AND SMALL PEBBLE CONGLOMERATIC. RARE COAL PARTINGS. TARRY.
128.08		2.38	COAL SEAM NO. 5
130.40		11.56	MUDSTONE - MEDIUM TO DARK GREY. CARBONACEOUS AT TOP OF INTERVAL, GRADATIONAL DOWNWARDS TO SILTY MUDSTONE. CONTAINS PETROLEUM RESIDUE.
142.02		11.96	SILTSTONE TO CONGLOMERATIC SANDSTONE. MEDIUM DARK GRAY-BROWN. ABUNDANT PETROLEUM RESIDUE THROUGHOUT. CONGLOMERATE CLASTS MODERATELY SORTED, SALT AND PEPPER, SUB-ANGULAR TO SUB-ROUNDED.
153.98		1.71	CARBONACEOUS TO COALY TO SILTY MUDSTONE.
155.69		18.57	SILTSTONE TO SANDSTONE TO CONGLOMERATIC SANDSTONE AND CONGLOMERATE. ABUNDANT PETROLEUM RESIDUE THROUGHOUT.
174.26		22.95	MUDSTONE - MEDIUM DARK TO DARK GRAY. CONTAINS CARBONACEOUS AND COALY INTERVALS THROUGHOUT. BECOMES SILTY BASALLY.
197.21		11.09	SANDSTONE - MEDIUM GRAY, COARSENS DOWNWARDS FROM FINE GRAINED TO GRANULE CONGLOMERATIC; QUARTZ AND CHERT GRAINS, MODERATELY TO WELL SORTED, SALT AND PEPPER TEXTURE. BROWN TINT DUE TO ABUNDANT TAR.
205.30		20.70	MUDSTONE - LIGHT GRAY TO DARK GRAY. CONTAINS INTERVALS OF CARBONACEOUS AND COALY MUDSTONE WITH THIN COAL BANDS. POLISHED FRACTURE SURFACES ARE COMMON.
229.00		2.40	SANDSTONE - MEDIUM LIGHT GRAY, VERY FINE TO FINE GRAINED. ABUNDANT TAR.
231.40		2.38	MUDSTONE - MEDIUM GRAY. POLISHED FRACTURE SURFACES; TAR ON FRACTURE SURFACES.
233.78		3.87	SILTSTONE TO SANDSTONE - MEDIUM GRAY, SILT TO FINE GRAINED, COARSENING DOWNWARDS. PETROLEUM RESIDUE.
237.65		2.74	MUDSTONE - DARK GRAY TO BLACK. MANY COAL FRAGMENTS THROUGHOUT.
240.39		8.63	SILTSTONE - DARK GRAY, CONTAINS COAL FLECKS WHICH DECLINE IN ABUNDANCE BASALLY. CONTAINS SANDSTONE INTERBEDS.

DETAILS OF COAL SEAMS — SCALE: 1:50

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)
				NO.4 SEAM HORIZON SEAM 4A		
				ROOF - SANDSTONE		
40.35		0.26		COAL: DULL TO VITREOUS, FEW SPLINTS BRIGHT COAL.		
40.64		0.06		COALY MUDSTONE.		
40.72		0.86	52	LOST CORE.		
41.45		0.03		CARBONACEOUS TO COALY MUDSTONE	A0298	2.12
41.48		0.72		COAL: DULL TO VITREOUS, FEW THIN BANDS OF BRIGHT COAL.		
42.20		0.03	67	CARBONACEOUS MUDSTONE		
42.23		0.24		COAL: DULL TO VITREOUS, THIN BANDS OF BRIGHT COAL.		
42.47		0.51		LOST CORE.		
42.98				FLOOR: MUDSTONE.		
				SEAM 4B		
				ROOF: CARBONACEOUS MUDSTONE.		
57.40		0.82	100	COAL: DULL TO VITREOUS, THIN PARTINGS AND BANDS OF DULL CARBONACEOUS TO COALY MUDSTONE.	A0299	0.82
58.22				FLOOR: MUDSTONE.		
				NO.5 SEAM HORIZON		
				ROOF: SILTSTONE TO CONGLOMERATIC SANDSTONE.		
128.08		0.67	100	COAL: VITREOUS TO BRIGHT, THINLY BANDED.		
128.75		0.05		COAL: DULL TO VITREOUS		
128.80		0.20		MUDSTONE - DARK GRAY, CONTAINS COAL & CARBONACEOUS FRAGMENTS.		
129.00		0.05		SHALY COAL: DULL TO VITREOUS.		
129.05		0.48		COAL: DULL TO BRIGHT, BLOCKY AND IN PART CONCHOIDAL FRACTURE THINLY PARTED TO THINLY BANDED.		
129.53		0.04				
129.57		0.13				
129.70		0.21		DULL SHALY COAL	A0300	2.38
129.91		0.04	100	CARBONACEOUS SHALE; CONTAINS FRAGMENTS OF COAL		
129.95		0.20		COAL: DULL TO BRIGHT, PARTED TO THINLY BANDED.		
130.15		0.03				
130.18		0.04		GRAUPEN		
130.22		0.16		COAL: DULL TO BRIGHT (MOSTLY BRIGHT) - PARTED TO THINLY BANDED.		
130.38		0.05	64			
130.43		0.03				
130.46				COALY SHALE		
				COAL: DULL TO BRIGHT.		
				CARBONACEOUS MUDSTONE - COAL FLECKS & PARTINGS.		
				COAL: DULL TO VITREOUS		
				COAL: DULL TO VITREOUS		
				FLOOR: MUDSTONE.		

SIZE		WEIGHT PERCENT										CUMULATIVE WEIGHT PERCENT							
				PROXIMATE ANALYSIS								PROXIMATE ANALYSIS							
DIAMETER	WT %	SPEC GRAV	YIELD	RM	ASH	VOL.	F.C.	BTU	F.S.I.	S		YIELD	RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
1/4×0	100.0	RAW	100.0	7.8	15.5	32.4	44.3	9564		0.41									
1/4×28	93.6	-1.30	0.1	4.1	3.7							0.1		3.7					
		-1.40	60.8	8.1	3.8							60.9		3.8					
		-1.50	6.6	5.5	12.1							77.5		5.6					
		-1.60	4.7	4.3	23.9							82.2		6.6					
		-1.70	2.7	4.1	34.0							84.9		7.5					
		-1.80	3.1	3.7	42.8							88.0		8.7					
		-1.90	3.1	3.4	50.3							91.1	6.9	10.2	33.9	49.0	10311		0.37
		+1.90	8.9	2.2	69.7							100.0		15.5					
28×0	6.4	RAW										100.0	6.1	23.4	29.3	41.2	8787		1.00
1/4×28	93.6	-1.90										85.3	6.9	10.2	33.9	49.0	10311		0.37
28×0	6.4	RAW										6.4	6.1	23.4	29.3	41.2	8787		1.00
1/4×0	100.0	COMB										91.7	6.8	11.1	33.6	48.5	10205		0.41
1/4×0	100.0	RAW	100.0	8.8	15.4	32.4	43.4	9472		0.32									
1/4×28	96.2	-1.30	18.8	5.8	3.6							18.8		3.6					
		-1.50	62.6	7.0	4.5							81.4		4.3					
		-1.70	3.9	4.8	22.5							85.3		5.1					
		-1.90	2.1	4.0	40.0							87.4	7.1	6.2	35.0	51.7	10767		0.33
		+1.90	12.6	1.9	79.5							100.0							
28×0	3.8	RAW										100.0	6.6	24.6	30.3	38.5	8421		0.27
1/4×28	96.2	-1.90										84.1	7.1	6.2	35.0	51.7	10767		0.33
28×0	3.8	RAW										3.8	6.6	24.6	30.3	38.5	8421		0.27
1/4×0	100.0	COMB										87.9	7.1	7.0	34.8	51.1	10666		0.33
1/4×0	100.0	RAW	100.0	6.1	32.9	27.6	33.4	7433		0.30									
1/4×28	93.2	-1.30	1.0	5.5	3.3							0.1		3.3					
		-1.40	41.8	7.0	5.0							41.9		5.0					
		-1.50	9.7	5.1	12.3							51.6		6.4					
		-1.60	4.7	4.4	24.7							56.3		7.9					
		-1.70	4.0	3.7	36.0							60.3		9.8					
		-1.80	3.1	3.6	44.3							63.4		11.5					
		-1.90	4.4	3.3	51.9							67.8	6.1	14.3	32.3	47.3	9956		0.43
		+1.90	32.2	2.3	73.7							100.0		33.3					
28×0	6.8	RAW										100.0	6.0	28.0	28.5	37.5	8217		0.35
1/4×28		-1.90										83.2	6.1	14.3	32.3	47.3	9956		0.43
28×0		RAW										6.8	6.0	28.0	28.5	37.5	8217		0.35
1/4×0		COMB										70.0	6.1	15.6	31.9	46.4	9787		0.42

CUMULATIVE SAMPLE VALUES (CASE I)										CUMULATIVE SAMPLE VALUES (CASE II)										CUMULATIVE SAMPLE VALUES (CASE III)										OTHER		
		PROXIMATE ANALYSIS									PROXIMATE ANALYSIS										PROXIMATE ANALYSIS											
THICKNESS (m)	YIELD	RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	THICKNESS (m)	YIELD	RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	THICKNESS (m)	YIELD	RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	H.G.I.	S.G.				
2.12	91.7	6.8	11.1	33.6	48.5	10205		0.41																				1.49				
0.82	82.9	7.1	7.0	34.8	51.1	10666		0.33																				1.48				
2.38	70.0	6.1	15.6	31.9	46.4	9787		0.42																				1.64				

DRILLHOLE NO. WI - 80 - 16 SHEET 2 OF 2

GEOLOGICAL LOG — SCALE: 1:500

DETAILS OF COAL SEAMS — SCALE:

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
			SILTSTONE , CONT'D.
249.02		3.39	SANDSTONE - MEDIUM TO FINE GRAINED, SALT AND PEPPER APPEARANCE WITH MINOR GREEN CHERT GRAINS. BASAL REGION HAS COAL FLECKS.
252.41		3.21	SANDSTONE INTERWOVEN WITH COAL FRAGMENTS. MEDIUM GRAINED DARK BROWN TO BLACK COAL IN FRAGMENTS, STRINGERS AND FLECKS.
255.20		4.37	SILTSTONE - LIGHT TO MEDIUM GRAY. UNIT STARTS AND ENDS IN FRAGMENTAL CHERTY ZONES.
259.99		33.88	MUDSTONE - LARGE UNIT OF MUDSTONE. MEDIUM TO DARK GRAY-BROWN IN HUE. CARBONACEOUS FLECKS FOUND THROUGHOUT. 272.43 - 272.61 - ZONE SHOWING PETROLIFEROUS LIQUID WITHIN FRACTURES OF MUDSTONE. 284.12 - 285.49 - VERY COALY SECTION EXHIBITING FRAGMENTS, STRINGERS & FLECKS - AMBER ALSO PRESENT. 286.82 - 288.88 - LIGHT GRAY MUDSTONE - CHERTY AND CARBONIFEROUS THROUGHOUT UNIT.
293.87			END OF HOLE

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC GRAV.	WEIGHT PERCENT: YIELD	WEIGHT PERCENT: PROXIMATE ANALYSIS: RM	WEIGHT PERCENT: PROXIMATE ANALYSIS: ASH	WEIGHT PERCENT: PROXIMATE ANALYSIS: VOL.	WEIGHT PERCENT: PROXIMATE ANALYSIS: F.C.	WEIGHT PERCENT: BTU	WEIGHT PERCENT: F.S.I.	WEIGHT PERCENT: S	CUMULATIVE WEIGHT PERCENT: YIELD	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: RM	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: ASH	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: VOL.	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: F.C.	CUMULATIVE WEIGHT PERCENT: BTU	CUMULATIVE WEIGHT PERCENT: F.S.I.	CUMULATIVE WEIGHT PERCENT: S

CUMULATIVE SAMPLE VALUES (CASE I): THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE II): THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III): THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER

LOCATION MAP

TN

SCALE:

COORDINATES: 650m W, 11 350mN OF S.E. CORNER CL 78 — DATE START: AUGUST 10, 1980 — FINISH: AUGUST 18 1980

ELEVATION: 652.27m AMSL — BITS USED: JK SMIT COMBINATION, SER. 75+100 — DRILLER: E. CARON DIAMOND DRILLING — OVERALL RECOVERY: 91 %

DIP: - 90° — BEARING: — MUD USED: 139 GAL POLY, 14 BAGS TROL., 7 BAGS GEL — TESTS:

CORE SIZE: HQ, NQ — CASING H W 7.32m N W 76.81m — m. LEFT IN HOLE: 0 m. — SAMPLED BY: O. CULLINGHAM — DATE: AUGUST 24, 80 — ANALYZED BY: BIRTLY COAL & MINERALS TESTING

PAN OCEAN OIL LTD.
MINERALS DIVISION - COAL

DRILLHOLE NO. W1-80-19

SHEET 1 OF 2

LOGGED BY: O CULLINGHAM — DATE: AUGUST 20, 1980

SIGNED:

GEOLOGICAL LOG — SCALE: 1: 500

DETAILS OF COAL SEAMS — SCALE: 1: 50

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
			OVERBURDEN
7.32			
8.60		1.28	MUDSTONE - MEDIUM GRAY BROWN-BLOCKY TO FRAGMENTAL
		7.25	SANDSTONE TO CONGLOMERATE-COARSESENS DOWNWARD FROM FINE GRAINED SANDSTONE TO CONGLOMERATE ABRUPT LOWER CONTACT WITH COAL At. 80° TO CIA , CORE IS BLOCKY
15.85		3.90	MUDSTONE - MEDIUM GRAY TO BROWN - CARBONACEOUS TO COALY AT TOP , TOP 0.10 COAL DULL TO BRIGHT , BLOCKY
19.75			SANDSTONE CONGLOMERATE TO CONGLOMERATIC SANDSTONE - LAMINATED TO THINLY BEDDED , CONTAINS AREA OF BIOTURBATION AND SOFT SEDIMENT DEFORMATION , CONGLOMERATE , TYPICALLY BONNET PLUM CLASTS UP TO MEDIUM PEBBLE COMPOSED OF CHERT AND QUARTZITE THIN INTERBEDS OF MUDSTONE PRESENT
		17.50	
37.25			
		5.95	MUDSTONE - ABRUPT UPPER CONTACT WITH SANDSTONE -MEDIUM OCHERE , GRAY GRUDING DOWNWORD TO A DARK BROWNISH GRAY , DENSITY FLOW AND REWORKED STRUCTURES THRUOUT UNIT
43.20			COAL- No. 3 SEAM HORIZON CARBONACEOUS MUDSTONE PARTING OF 3.57m
		7.00	
50.20			MUDSTONE - MEDIUM OCHRE GRAY TO DARK BROWNISH GRAY GRADATIONALLY DOWNWORD , MUDSTONE BECOMES SILTY BASALLY AND SHOWS DENSITY FLOW AND REWORKED STRUCTURES , FRACTURES AT 40-45° TO C/A
		9.92	
60.12			SANDSTONE, CONGLOMERATIC SANDSTONE AND CONGLOMERATE - MEDIUM GRAY, SALT AND PEPPER , COURSE GRAINED TO MEDIUM PEBBLE CONGLOMERATE , CLASTS ARE TYPICALLY BONNET PLUME , CORE IS BLOCKY TO SOUND WITH MUDSTONE INTERBEDS
		11.30	
71.42			MUDSTONE AND SILTSTONE - MEDIUM TO DARK GREY MASSIVE AND IN PART RIPPLE LAMINATED - MUDSTONE: FRAGMENTAL TO BLOCKY AND FAIRLY STRUCTURELESS - SILTSTONES, SHOW CROSS LAMINATIONS, SLUMP STRUCTURES, BIOTURBATION AND WORM BURROWS - CONTAINS THIN BAND OF DULL TO VITREOUS COAL, COALY SHALE AND COALY MUDSTONE
		19.34	
90.76			SANDSTONE, CONGLOMERETIC SANDSTONE AND CONGLOMERATE- GENERALLY COURSENS DOWNWARD, MEDIUM TO COURSE GRAINED SANDSTONE TO SMALL PEBBLE CONGLOMERATE , TYPICAL BONNET PLUME CLASTS
		10.36	
101.12			MUDSTONE - MEDIUM TO DARK GRAY , IN PART SILTY SECTIONS SHOW SLUMP STRUCTURES , SHOWS ROUNDED MUD CLASTS INDICATING DENSITY FLOWS OR REWORKING
		6.34	
107.46		3.34	COAL - No. 4 SEAM HORIZON
110.80			MUDSTONE AND SILTSTONE- MEDIUM TO DARK GRAY CARBONACEOUS TO COALY MUDSTONE , THIN BANDS OF COAL UP TO 0.15m , MUDSTONE IS FAIRLY STRUCTURELESS THRU OUT UNIT , CORE IS BLOCKY TO SOUND , FRACTURING THROUGHOUT PREDOMINATELY AT 75°-85° TO C/A
		20.13	
130.63			SANDSTONE AND CONGLOMERATIC SANDSTONE - MEDIUM GREY, MEDIUM GRAINED TO SMALL PEBBLES
		21.89	
150.52		0.88	CARBONACEOUS TO COALY MUDSTONE
153.40		3.45	COAL No. 5 SEAM HORIZON SEAM 5A
156.85		6.25	MUDSTONE - MEDIUM GRAY TO MEDIUM DARK GRAY IN PART CARBONACEOUS
163.10			SILTSTONE TO VERY FINE GRAINED SANDSTONE , MEDIUM GRAY SHALY MASSIVE
		8.59	
171.69		2.85	COAL - No. 5 SEAM HORIZON SEAM 5B
174.54			MUDSTONE - MEDIUM GRAY, IN PART CARBONACEOUS AND DARK GRAY
		36.79	
211.33		2.79	SANDSTONE -MEDIUM GRAY - FINE TO MEDIUM GRAINED
214.12			MUDSTONE WITH THIN INTERBEDS OF SILTSTONE AND SANDSTONE -MEDIUM TO DARK GRAY COAL BANDS TO 0.15m
		17.09	

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)
				No. 3 SEAM HORIZON		
				ROOF - MUDSTONE		
43.20		1.91	92	COAL - DULL TO VITREOUS WITH BANDS OF BRIGHT COAL BLOCKY IN PART CONCHOIDAL FRACTURE. COAL BECOMES DULL WITH THIN SHALE PARTING AT BASE. RARE THIN CARBONACEOUS SHALE BANDS USUALLY LESS THAN 0.01m	A0301	1.91
45.11		0.61	80	CARBONACEOUS AND COALY SHALE- DULL CONTAINS PARTINGS OF COAL THROGHOUT		
45.72		1.05	100	MUDSTONE - IN PART CARBONACEOUS, IN PART BIOTURBATED. MINOR RESIN		
46.77		0.43		CARBONACEOUS TO COALY MUDSTONE CONTAIN SHARDS AND SPLINT OF COAL		
47.20		0.29		SHALY SILTSTONE - HARD BLOCKY MEDIUM GRAY BROWN		
47.49		0.71	76	CARBONACEOUS MUDSTONE - DARK GRAY, FRAGMENTAL CONTAINS ROUNDED CLASTS OF BEIGE MUDSTONE		
48.20		0.20		COAL - DULL, BLOCKY, LIGHTWEIGHT		
48.40		0.37		NO CORE		
48.77		0.38	100	COAL - DULL, BLOCKY, LIGHTWEIGHT POSSIBLY HIGH IN DURAIN		
49.15		0.70		COAL - VITREOUS TO BRIGHT, BLOCHY BANDED, IN PART CONCHOIDAL FRACTURE BECOMES DULL WITH	A0302	2.0
49.85		0.35	70	COAL - DULL TO VITREOUS, BLOCKY AND CONCHOIDAL FRACTURE		
50.20				FLOOR - MUDSTONE		
				No. 4 SEAM HORIZON		
			96	ROOF - MUDSTONE		
107.46		0.54		COAL - DULL LIGHTWEIGHT, DENSE, POSSIBLY HIGH IN DURAIN		
108.00		2.50	85	COAL - MOSTLY VITREOUS TO BRIGHT THINLY BANDED BLOCKY	A0303	3.04
110.50		0.30		COALY - MUDSTONE DARK GRAY PARTING AND BANDS OF VITREOUS COAL		
110.80				FLOOR - MUDSTONE		
				No. 5 SEAM HORIZON SEAM 5A		
			96	ROOF - CARBONACECEOUS TO COALY MUDSTONE		
153.40		1.32		COAL - VITREOUS TO BRIGHT, BLOCKY AND IN PART CONCHOIDAL FRACTURE. THINLY BANDED TO PARTED		
154.72		0.21		COAL - DULL LIGHWEIGHT, BLOCKY, DENSE POSSIBLE HIGH IN DURAIN		
154.93		0.03		MUDSTONE		
154.96		0.84		COAL - VITREOUS TO BRIGHT, PARTED TO BANDED, BLOCKY AND IN PART CONCHOIDAL FRACTURE RARE PARTINGS OF DULL SHALY COAL, LESS THAN 0.01m THICK	A0304	2.80
155.80		0.06		SHALY COAL - DULL MAYBE HIGH IN FUSAIN		
155.86		0.34	94	COAL - DULL TO BRIGHT, PARTED TO BANDED, BLOCKY. WHITE PRECIPITATE ON FRACTURE SURFACE		
156.20		0.05		COALY MUDSTONE		
156.25		0.07		COAL - DULL W. VITREOUS		
156.32		0.33		COALY MUDSTONE - DULL, BROKEN TO BLOCKY SPLINTS, PARTINGS AND THIN BANDS OF VITREOUS COAL	A0305	0.65
156.65		0.20		SHALY COAL - DULL CRUSHED. CONTAINS BANDS OF VITREOUS TO BRIGHT COAL UP TO 0.02 m		
156.85				FLOOR - MUDSTONE		

SIZE		WEIGHT PERCENT									CUMULATIVE WEIGHT PERCENT							
				PROXIMATE ANALYSIS							PROXIMATE ANALYSIS							
DIAMETER	WT %	SPEC GRAV	YIELD	RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	YIELD	RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
1/4×0	100.0	RAW	100.0	8.1	11.4	33.5	47.0	10102		0.22								
1/4×28	92.9	-1.40	69.4	8.1	3.7						69.4		3.7					
		-1.50	13.2	5.7	11.7						82.6		5.0					
		-1.60	6.1	4.2	23.5						88.7		6.3					
		-1.70	4.2	4.0	31.1						92.9		7.4					
		-1.80	1.9	3.5	40.4						94.8		8.0					
		-1.90	0.9	3.4	47.4						95.7	6.6	8.4	33.1	51.9	10,625		0.30
		+1.90	4.3	1.6	69.9						100.0		11.1					
28×0	7.1	RAW	100.0								100.0	6.8	17.2	34.0	42.0	9432		0.26
1/4×28	92.9										88.9	6.6	8.4	33.1	51.9	10,625		0.30
28×0	7.1										7.1	6.8	17.2	34.0	42.0	9,432		0.26
1/4×0	100.0										96.0	6.6	9.1	33.2	51.2	10,537		0.30
1/4×0	100.0	RAW	100.0	7.1	14.8	32.7	45.4	9797		0.27								
1/4×28	93.7	-1.30	1.1	5.0	2.4						1.1		2.4					
		-1.40	63.0	7.0	2.9						64.1		2.9					
		-1.50	10.5	4.9	12.0						74.6		4.2					
		-1.60	2.8	4.2	21.1						77.4		4.8					
		-1.70	2.8	3.8	32.4						80.2		5.7					
		-1.80	9.6	3.3	43.0						89.8		9.7					
		-1.90	3.2	3.1	46.7						93.0	6.2	11.2	32.9	49.7	10,353		0.38
		+1.90	7.0	2.0	69.3						100.0		15.1					
28×0	6.3	RAW	100.0								100.0	6.3	20.1	31.3	42.3	9011		0.27
1/4×28	93.7										87.1	6.2	11.2	32.9	49.7	10,353		0.38
28×0	6.3										6.3	6.3	20.1	31.3	42.3	9011		0.27
14×0	100.0										93.4	6.2	11.8	32.8	49.2	10,263		0.37
1/4×0	100.0	RAW	100.0	7.6	13.7	32.6	46.1	10013		0.38								
1/4×28	90.3	-1.30	0.4	5.2	3.1						0.4		3.1					
		-1.40	58.1	6.6	4.7						58.5		4.7					
		-1.50	16.8	5.3	10.3						75.3		5.9					
		-1.60	8.5	4.5	16.4						83.8		7.0					
		-1.70	4.4	4.2	25.2						88.2		7.9					
		-1.80	3.4	3.8	35.5						91.6		8.9					
		-1.90	1.6	3.7	42.1						93.2	6.2	9.5	33.3	51.0	10,631		0.38
		+1.90	6.8	2.4	64.5						100.0		13.2					
28×0	9.7	RAW	100.0								100.0	7.4	15.0	31.7	45.9	9831		0.46
1/4×28	90.3										84.2	6.2	9.5	33.3	51.0	10,631		0.38
28×0	9.7										9.7	7.4	15.0	31.7	45.9	9,831		0.46
1/4×0	100.0										93.9	6.3	10.1	33.1	50.5	10,548		0.39
1/4×0	100.0	RAW	100.0	6.5	23.0	29.6	40.9	8769		0.25								
1/4×28	92.8	-1.30	0.4	5.4	3.3						0.4		3.3					
		-1.40	35.4	7.3	4.3						35.8		4.3					
		-1.50	23.8	6.1	11.0						59.6		7.0					
		-1.60	7.4	4.7	21.4						67.0		8.6					
		-1.70	6.0	4.6	30.6						73.0		10.4					
		-1.80	6.0	3.7	38.7						79.0		12.5					
		-1.90	4.6	3.6	46.8						83.6	6.1	14.3	30.9	48.7	9535		0.32
		+1.90	16.4	2.2	66.5						100.0		23.0					
28×0	7.2	RAW	100.0								100.0	7.1	20.4	29.7	42.8	8938		0.26
1/4×28	92.8										77.6	6.1	14.3	30.9	48.7	9535		0.32
28×0	7.2										7.2	7.1	20.4	29.7	42.8	8938		0.26
1/4×0	100.0										84.8	6.2	14.8	30.8	48.2	9484		0.31
1/4×0	100.0	RAW	100.0	3.9	61.2	16.5	18.4			0.22								
1/4×28	89.2	-1.50	11.8	5.5	7.7						11.8		7.7					
		-1.70	5.5	4.0	27.8						17.3		14.1					
		-1.90	14.0	3.1	52.2						31.3		31.1					
		+1.90	68.7	2.0	78.4						100.0		63.6					
28×0	10.8	RAW	100.0								100.0	3.6	51.2	20.0	25.2			0.26
1/4×28	89.2																	
28×0	10.8																	
1/4×0	100.0																	

CUMULATIVE SAMPLE VALUES (CASE I)										CUMULATIVE SAMPLE VALUES (CASE II)										CUMULATIVE SAMPLE VALUES (CASE III)										OTHER		
		PROXIMATE ANALYSIS									PROXIMATE ANALYSIS										PROXIMATE ANALYSIS											
THICKNESS (m)	YIELD	RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	THICKNESS (m)	YIELD	RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	THICKNESS (m)	YIELD	RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	H.G.I.	S.G.				
																												1.45				
1.91	96.0	6.6	9.1	33.2	51.2	10,537		0.30																								
																												1.47				
2.0	93.4	6.2	11.8	32.8	49.2	10,263		0.37																								
																												1.48				
3.04	93.9	6.3	10.1	33.1	50.5	10,548		0.39																								
																												1.56				
2.80	84.8	6.2	14.8	30.8	48.2	9484		0.31																								

DRILLHOLE NO. W1-80-19 SHEET 2 OF 2

GEOLOGICAL LOG – SCALE: 1:500 | DETAILS OF COAL SEAMS – SCALE: 1:50

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
			MUDSTONE - CON'T
			CONGLOMERATE - MUD TO SILTSTONE CLASTS INBEDDED IN LIMY MUD MATRIX. POSSIBLY UNCONFOMITY /CD LS
261.21			E.O.H.

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)
				No. 5 SEAM HORIZON SEAM 5B		
171.69		0.09		ROOF-VERY FINE GRAINED SANDSTONE	A0306	1.00
171.78		0.04		COAL-VITREOUS, BLOCKY		
171.82		0.18		COALY MUDSTONE-DARK GRAY-BROWN		
172.00		0.18		MUDSTONE-DARK GRAY POLISHED FRACTURE		
172.18		0.02	98	COAL-VITREOUS, BLOCKY		
172.20		0.67		COALY MUDSTONE-DULL		
				COAL-VITREOUS, PARTED TO THINLY BANDED, BLOCKY AND IN PART CONCHOIDAL FRACTURE	A0307	
172.87		0.02		MUDSTONE-DARK GRAY, BLOCKY		
172.89		0.11		COAL-VITREOUS		
173.00		0.08		MUDSTONE-DARK BROWISH GRAY, BLOCKY		
173.08		0.22		VOLCANIC ASH-OFF-WHITE, TALCY TEXTURE HIGH IN BENTONITE		
173.30		0.19		COAL-VITREOUS WITH BRIGHT BANDS, BLOCKY AND IN PART CONCHOIDAL FRACTURE	A0308	0.19
173.49		0.41	95	MUDSTONE-DARK GRAY, BLOCKY, IN PART CARBONACEOUS, COAL SPLINTS AT BASE		
173.90		0.64		COAL-DULL TO BRIGHT, PARTED TO BANDED BLOCKY FRACTURE. FEW THIN PARTING DULL SHALY COAL	A0309	
174.54				FLOOR-CARBONACEOUS MUDSTONE	A0310	0.41
						0.44

SAMPLE NUMBER	SIZE DIA-METER	SIZE WT %	WEIGHT PERCENT SPEC. GRAV.	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
	1/4×0	100.0	RAW	100.0	3.3	68.5	13.0	15.2			0.15
	1/4×28	94.2	-1.70	20.4	4.8	16.6					
			-1.90	6.8	4.0	39.4					
			+1.90	72.8	1.3	86.5					
	28×0	5.8	RAW	100.0							
	1/4×28	94.2									
	28×0	5.8									
	1/4×0	100.0									
	1/4×0	100.0	RAW	100.0	6.1	30.4	25.3	38.2	7836		0.22
	1/4×28	93.5	-1.30	4.5	6.0	3.4					
			-1.50	45.6	5.3	6.8					
			-1.70	14.4	4.7	24.5					
			-1.90	6.5	3.5	44.2					
			+1.90	29.0	1.9	73.8					
	28×0	6.5	RAW	100.0							
	1/4×28	93.5									
	28×0	6.5									
	1/4×0	100.0									
	1/4×0	100.0	RAW	100.0	6.7	22.2	30.7	40.4	9121		0.43
	1/4×28	94.8	-1.50	59.1	5.5	9.3					
			-1.70	20.8	3.5	30.2					
			-1.90	10.7	3.1	46.5					
			+1.90	9.4	2.0	61.8					
	28×0	5.2	RAW	100.0							
	1/4×28	94.8									
	28×0	5.2									
	1/4×0	100.0									
	1/4×0	100.0	RAW	100.0	2.5	83.5	8.7	5.3			0.09
	1/4×28	94.5	-1.90	3.8	3.7	34.5					
			+1.90	96.2	2.0	85.8					
	28×0	5.5	RAW	100.0							
	1/4×28	94.5									
	28×0	5.5									
	1/4×0	100.0									
	1/4×0	100.0	RAW	100.0	5.2	40.6	22.6	31.6	6360		0.22
	1/4×28	93.2	-1.30	0.2	4.1	6.7					
			-1.50	20.3	5.8	8.4					
			-1.70	25.6	5.0	23.6					
			-1.90	14.8	4.4	42.2					
			+1.90	39.1	2.0	68.7					
	28×0	6.8	RAW	100.0							
	1/4×28	93.2									
	28×0	6.8									
	1/4×0	100.0									

CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
20.4		16.6					
22.2		22.3					
100.0		69.0					
100.0	3.5	56.2	15.5	24.8			0.24
4.5		3.4					
50.1		6.5					
64.5		10.5					
71.0	5.6	13.5	28.3	52.6	10,238		0.34
100.0		31.1					
100.0	5.8	24.8	25.6	43.8	8585		0.24
66.4	5.6	13.5	28.3	52.6	10,238		0.34
6.5	5.8	24.8	25.6	43.8	8,585		0.24
72.9	5.6	14.5	28.1	51.8	10,090		0.33
59.1		9.3					
79.9		14.7					
90.6	5.2	18.4	30.6	45.8	9802		0.33
100.0		22.6					
100.0	4.8	28.7	31.2	35.3	8055		0.28
85.9	5.2	18.4	30.6	45.8	9602		0.33
5.2	4.8	28.7	31.2	35.3	8055		0.28
91.1	5.2	19.0	30.6	45.2	9702		0.33
3.8	3.8	34.5	23.7	38.0	7881		0.36
100.0		83.9					
100.0	2.1	79.6	10.2	8.1			0.10
3.6	3.8	34.5	23.7	38.0	7881		0.36
5.5	2.1	79.6	10.2	8.1	N55		0.10
9.1	2.8	61.8	15.5	19.9	3113		0.20
0.2		6.7					
20.5		8.4					
46.1		16.8					
60.9	5.4	22.6	26.4	45.6	8798		0.34
100.0		40.9					
100.0	4.5	34.4	24.9	36.2	7159		0.24
56.7	5.4	22.6	26.4	45.6	8798		0.34
6.8	4.5	34.4	24.9	36.2	7159		0.24
63.6	5.3	23.9	26.2	44.8	8623		0.33

CUMULATIVE SAMPLE VALUES (CASE I) THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
1.0	72.9	5.6	14.5	28.1	51.8	10,090		0.33
1.49	60.5	5.5	15.4	28.6	50.5	10,015		0.33
1.90	49.4	5.4	17.2	28.1	49.3	9741		0.33
2.34	53.0	5.4	19.2	27.5	48.0	9403		0.33

CUMULATIVE SAMPLE VALUES (CASE II) THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III) THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER H.G.I.	S.G.
	1.62
	1.53
	2.38
	1.74

LOCATION MAP

TN ↑

SCALE:

COORDINATES: 12,700 m W. S.E. CORNER OF C.L. 94
12,850 m N.
ELEVATION: 490.73
DIP: 90° BEARING:
CORE SIZE: HQ CASING

BITS USED: J.K. SMIT COMBINATION
MUD USED: 68 GALS POLY 330; 13 BAGS GEL
m. LEFT IN HOLE: m.

DATE START: AUG. 14, 1980 FINISH: AUG. 22, 1980
DRILLER: CARON DIAMOND DRILLING OVERALL RECOVERY: 91%
TESTS:
SAMPLED BY: DATE: ANALYZED BY:

PAN OCEAN OIL LTD.
MINERALS DIVISION-COAL

LOGGED BY: O. CULLINGHAM DATE: AUG. 23, 1980
SIGNED:

DRILLHOLE NO. B.C.-80-20
SHEET 1 OF 1

GEOLOGICAL LOG — SCALE: 1:500

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
3.66		3.66	OVERBURDEN
5.18		1.52	CONGLOMERATE - MEDIUM TO LARGE PEBBLE
		8.42	SANDSTONE - MED. DARK BROWNISH GRAY, PETROLEUM RESIDUE; FINE-GRAINED COARSENS DOWNWARD TO MEDIUM GRAINED GRADATIONAL TO CONGLOMERATE
13.60			CONGLOMERATE, POORLY SORTED, SMALL PEBBLE TO COBBLE, OCCASIONAL BOULDERS, GRADATIONAL CHANGE IN CHARACTERISTICS AT ABOUT 55.0 m.
		125.69	
			CONGLOMERATE, MURE LARGE PEBBLE AND COBBLES. ABUNDANT GREEN CLASTS OF SILTY MUDSTONE. FINE TO MEDIUM GRAINED SANDSTONE MATRIX, BROWN COLORATION DUE TO PETROLIFEROUS RESIDUE. CHANGES CHARACTER GRADUALLY BETWEEN 100-108 m.
			CONGLOMERATE, HARDER, PREDOMINANTLY CHERT AND QUARTZITE WITH SOME SILTSTONE AND SANDSTONE PEBBLES. POORLY SORTED PEBBLES. MATRIX IS POORLY SORTED SANDSTONE
139.29			END OF HOLE

DETAILS OF COAL SEAMS — SCALE:

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC GRAV	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE WEIGHT PERCENT

YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE I)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE II)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER

LOCATION MAP

TN

SCALE:

COORDINATES: 3,950 mW, 11,150 m N } OF SE CORNER C.L. 88
ELEVATION: 704.99
DIP: -90°
CORE SIZE: HQ+NQ
BEARING:
CASING HW 9.14 m, NW 124.96 m
BITS USED: J.K. SMIT SERIES 75
MUD USED: 34 BAGS GEL; 102 GALS. POLY 330
m. LEFT IN HOLE: HW NIL m, NW 21.34 m
J.K SMIT COMBINATION
DRILLER: E.CARON DIAMOND DRILLING
TESTS: NIL
SAMPLED BY: O. CULLINGHAM
DATE START: AUGUST 16, 1980
FINISH: AUGUST 27, 1980
OVERALL RECOVERY: 90 %
DATE: AUGUST 29, 1980 ANALYZED BY: BIRTLEY COAL SCIENCE + MINERALS TESTING

PAN OCEAN OIL LTD.
MINERALS DIVISION - COAL

LOGGED BY: O. CULLINGHAM DATE: AUGUST 28, 1980
SIGNED:

DRILLHOLE NO. GR-80-21
SHEET 1 OF 2

GEOLOGICAL LOG — SCALE: 1:500
DETAILS OF COAL SEAMS — SCALE: 1:50

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
		9.75	OVERBURDEN - SOIL AND WEATHERED CONGLOMERATE
9.75		31.69	CONGLOMERATE - LARGE PEBBLE CONGLOMERATE WITH OCCASIONAL PEBBLES TO VERY LARGE. WHITE TO BLACK WITH FEW GREEN, CHERT AND QUARTZITE. MATRIX OF FINE TO COARSE GRAINED SANDSTONE, POORLY SORTED, MINOR TAR CONTENT. PEBBLES ARE ROUNDED TO WELL ROUNDED, ROLLER BLADE TO SUBPHERICAL IN SHAPE.
41.44		3.43	CARBONACEOUS TO COALY MUDSTONE: COAL AT TOP OF INTERVAL GRADATIONAL DOWNWARDS TO COALY MUDSTONE FRAGMENTAL
44.87		12.97	CONGLOMERATE - GRADATIONAL DOWNWARDS FROM GRANULE CONGLOMERATIC COARSE GRAINED SANDSTONE TO LARGE PEPPLE CONGLOMERATE IN A CYCLIC SEQUENCE
57.84		2.81	COAL: NO. 1 SEAM HORIZON
60.65		5.29	MUDSTONE - MEDIUM DARK GRAY, CARBONACEOUS. BECOMES SILTY BASALLY, FLATY TO FRAGMENTAL, SOME HACKLY WEATHERING. MINOR ROOF FRAGMENT
65.94		18.20	CONGLOMERATE - GRADATIONAL FROM ABOVE THROUGH SILTSTONE, FINE TO GRANULE CONGLOMERATIC SANDSTONE, PEPPLES MEDIUM WITH FEW LARGE SIZE, MODERATELY SORTED QUARTZ AND CHERT, WHITE THROUGH BLACK WITH FEW GREEN CHERT PEPPLES, ROUNDED TO WELL-ROUNDED. MATRIX IS MEDIUM TO COURSE GRAINED SANDSTONE WITH MINOR TAR.
84.14		10.47	MUDSTONE - MEDIUM DARK TO DARK GRAY, CARBONACEOUS WITH SPLINTS AND SHARDS OF COAL THROUGHOUT CORE IS BROKEN TO BLOCKY.
94.61		4.23	COAL: NO. 2 SEAM HORIZON
98.84		9.13	MUDSTONE - DARK GRAY TO DARK GRAY. CARBONACEOUS AT TOP, DECREASING IN CONTENT BASALLY. INCREASING SILT TOWARDS BASE. CORE IS SOFT, SHEARED, POLISHED FLAKY CORE AT TOP OF UNIT.
107.97		4.73	SILTSTONE TO MEDIUM GRAINED SANDSTONE, MEDIUM GRAY COARSENS DOWNWARDS
112.70		21.80	CONGLOMERATE - SMALL TO MEDIUM PEPPLE WITH FEW LARGE, MINOR TAR. SEE ABOVE DISCRIPTON.
134.50		20.92	MUDSTONE - MEDIUM GRAY TO MEDIUM GRAY-BROWN. STRUCTURELESS, POLISHED APPEARANCE THROUGHOUT, WEATHERS RAPIDLY TO HACKLY WEATHERING.
155.42		15.88	CONGLOMERATE - SMALL TO MEDIUM PEBBLE WITH RARE LARGE PEPPLES; WHITE TO BLACK QUARTZ AND CHERT WITH RARE GREEN CHERT. SEE PREVIOUS DESCRIPTION.
171.30		16.20	MUDSTONE - MEDIUM GRAY, IN PART GRAY AND SLIGHTLY CARBONACEOUS, POLISHED THROUGHOUT. BECOMES SILTY BASALLY.
187.50		11.53	CONGLOMERATE - SEE ABOVE. MINOR TAR STAINING
199.03		26.11	MUDSTONE AND SILTSTONE - MEDIUM GRAY. MUDSTONE POLISHED IN PART SILTSTONE IS RIPPLE LAMINATED, SLUMPED,
225.14			CONGLOMERATE - SMALL TO LARGE PEPPLE, FEW GREEN CHERT PEPPLES, POORLY SORTED

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)
				NO. 1 SEAM HORIZON		0.52
57.84		0.52	74	CONGLOMERATE		
58.36		0.47		COAL - DULL TO VITREOUS, FEW BANDS UP TO 1 CM OF DULL COALY SHALE	A0311	
58.83		0.22		NO CORE		
59.05				CARBONACEOUS MUDSTONE - DULL BLOCKY, SPLINTS & PARTINGS OF COAL.	A0312	0.22
				COAL - DULL TO BRIGHT, HARD, IN PART WITH IRIDESCENT COLORATION, BLOCKY AND CONCHOIDAL FRACTURE	A0313	1.60
60.65			100	FLOOR - MUDSTONE, MEDIUM DARK GRAY, CARBONACEOUS FLATY TO FRAGMENTAL		
				NO. 2 SEAM HORIZON		
94.61		0.16	91	ROOF - MUDSTONE - MEDIUM DARK GRAY, CARBONACEOUS, BLOCKY		
94.77		0.24		SHALY COAL - THINLY PARTED COAL WITH CARBONACEOUS SHALE 30% COAL 70%	A0314	0.47
95.01		0.07		COAL - MOSTLY VITREOUS WITH FEW LENSES OF DULL CARBONACEOUS SHALE		
95.08				SHALY COAL		
		0.93		COAL - DULL TO VITREOUS WITH BRIGHT BANDS TO 0.5 CM. BLOCKY AND IN PART CONCHOIDAL FRACTURE		
96.01		0.13		COAL - DULL, SOFT, FRIABLE, DIRTY		
96.14		0.79	93	COAL - DULL TO VITREOUS, SOFT, FRIABLE, PROBABLY SHEARED; POLISHED APPEARANCE THROUGHOUT. FLAKY TO PLATY FRACTURE	A0315	3.76
96.93				COAL - AS ABOVE, CONTAINS FEW THIN BANDS OF DULL CARBONACEOUS SHALE, MINOR TAR ON FRACTURE FACES AT BASE INTERVAL		
		1.52	62			
98.45		0.39		COAL - AS ABOVE, BECOMES INCREASINGLY SHALY AT BASE OF SEAM		
98.84			80	FLOOR - MUDSTONE, CARBONACEOUS FLAKY, SHEARED.		

WEIGHT PERCENT

SIZE DIA-METER	SIZE WT %	SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
1/4×0	100.0	RAW	100.0	7.3	52.9	23.9	15.9			0.20
1/4×28	78.7	-1.50	0.2	5.7	6.5					
		-1.70	6.9	10.7	18.5					
		-1.90	42.1	6.7	45.7					
		+1.90	50.8	2.6	73.4					
28×0	21.3	100.0								
1/4×28	78.7									
28×0	21.3									
1/4×0	100.0									
1/4×0	100.0	RAW	100.0	2.5	75.6	13.9	8.0			0.09
1/4×28	94.2	-1.50	0.2	4.8	8.2					
		-1.70	1.5	5.4	20.6					
		-1.90	3.4	4.2	40.3					
		+1.90	94.9	1.9	79.0					
28×0	5.8	100.0								
1/4×28	94.2									
28×0	5.8									
1/4×0	100.0									
1/4×0	100.0	RAW	100.0	5.9	24.1	30.5	39.5	8699		0.38
1/4×28	90.1	-1.30	0.2	4.3	4.0	50.4	41.3	11,868		
		-1.40	37.5	5.6	5.5	37.6	51.3	11,398		
		-1.50	18.2	4.7	13.5	33.6	48.2	10,393		
		-1.60	13.6	4.1	23.6	30.0	42.3	9,597		
		-1.70	8.7	3.6	32.3	26.5	37.6	7,572		
		-1.80	5.7	3.1	42.7	24.1	30.1	6,125		
		-1.90	3.4	2.8	50.1	23.4	23.7	5,080		
		+1.90	12.7	1.9	69.0					
28×0	9.9	100.0								
1/4×28	90.1									
28×0	9.9									
1/4×0	100.0									
1/4×0	100.0	RAW	100.0	5.4	32.6	28.4	33.6	7280		0.37
1/4×28	89.9	-1.50	29.7	5.2	10.1	32.8	51.9	10,700		
		-1.70	21.1	4.2	24.4	29.5	41.9	8,611		
		-1.90	25.5	3.3	40.3	26.6	29.8	6,102		
		+1.90	23.7	2.4	56.4					
28×0	10.1	100.0								
1/4×28	89.9									
28×0	10.1									
1/4×0	100.0									
1/4×0	100.0	RAW	100.0	4.8	41.0	27.3	26.9	6323		0.33
1/4×28	90.1	-1.30	0.2	4.1	4.6	49.9	41.4	11998		
		-1.40	5.4	5.0	6.0	35.2	53.8	11389		
		-1.50	16.8	5.8	11.4	32.3	50.5	10474		
		-1.60	14.2	5.3	19.6	30.1	45.0	9303		
		-1.70	10.1	4.9	29.0	27.7	38.4	8034		
		-1.80	8.6	4.0	38.9	25.1	32.0	6559		
		-1.90	7.0	3.3	47.0	23.5	26.2	5340		
		+1.90	37.7	2.8	69.1					
28×0	9.9	100.0								
1/4×28	90.1									
28×0	9.9									
1/4×0	100.0									

CUMULATIVE WEIGHT PERCENT

YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
0.2		6.5					
7.1		18.2					
49.2		41.7					
100.0		57.8					
100.0	8.8	40.2	30.6	20.4	5747		0.24
0.2		8.2					
1.7		19.1					
5.1		33.2					
100.0		76.7					
100.0	2.9	64.7	19.0	13.4			0.14
	4.3	4.0	50.4	41.3	11,868		
37.7	5.6	5.5	37.7	51.3	11,401		
55.9	5.3	8.1	36.3	50.3	11,073		
69.5	5.1	11.1	35.1	48.7	10,784		
78.2	4.9	13.5	34.2	47.5	10,426		
83.9	4.8	15.5	33.5	46.3	10,134		
87.3	4.7	16.8	33.1	45.4	9,937		
100.0		23.4					
100.0	4.9	27.8	31.0	36.3	8117		0.42
78.7	4.7	16.8	33.1	45.4	9937		
9.9	4.9	27.8	31.0	36.3	8117		
88.6	4.7	18.0	32.9	44.4	9733		
0.2	4.1	4.6	49.9	41.4	11998		
5.6	5.0	6.0	35.7	53.4	11411		
22.4	5.6	10.0	33.2	51.2	10,708		
36.6	5.5	13.7	32.0	48.8	10,163		
46.7	5.3	17.0	31.0	46.5	9703		
55.3	5.1	20.4	30.1	44.3	9214		
62.3	4.9	23.4	29.4	42.3	8778		
100.0		40.6					
100.0	5.0	40.9	24.6	29.5	6297		0.31
56.1	4.9	23.4	29.4	42.3	8778		
9.9	5.0	40.9	24.6	29.5	6297		
66.0	4.9	26.0	28.7	40.4	8406		
1.60	88.6	4.7	18.0	32.9	44.4	9733	

DRILLHOLE NO. GR-80-21 SHEET 2 OF 2

GEOLOGICAL LOG – SCALE: 1:500 | DETAILS OF COAL SEAMS – SCALE:

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
		55.90	CONGLOMERATE -(CON'T)
281.04			END OF HOLE

| DEPTH (m) | GRAPHIC LOG | THICKNESS (m) | RECOVERY % | DESCRIPTION | SAMPLE NUMBER | THICKNESS (m) | SIZE: DIAMETER | SIZE: WT % | WEIGHT PERCENT: SPEC. GRAV. | WEIGHT PERCENT: YIELD | WEIGHT PERCENT: PROXIMATE ANALYSIS: RM | WEIGHT PERCENT: PROXIMATE ANALYSIS: ASH | WEIGHT PERCENT: PROXIMATE ANALYSIS: VOL. | WEIGHT PERCENT: PROXIMATE ANALYSIS: F.C. | WEIGHT PERCENT: BTU | WEIGHT PERCENT: F.S.I. | WEIGHT PERCENT: S | CUMULATIVE WEIGHT PERCENT: YIELD | CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: RM | CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: ASH | CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: VOL. | CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: F.C. | CUMULATIVE WEIGHT PERCENT: BTU | CUMULATIVE WEIGHT PERCENT: F.S.I. | CUMULATIVE WEIGHT PERCENT: S | CUMULATIVE SAMPLE VALUES (CASE I): THICKNESS (m) | CUMULATIVE SAMPLE VALUES (CASE I): YIELD | CUMULATIVE SAMPLE VALUES (CASE I): PROXIMATE ANALYSIS: RM | CUMULATIVE SAMPLE VALUES (CASE I): PROXIMATE ANALYSIS: ASH | CUMULATIVE SAMPLE VALUES (CASE I): PROXIMATE ANALYSIS: VOL. | CUMULATIVE SAMPLE VALUES (CASE I): PROXIMATE ANALYSIS: F.C. | CUMULATIVE SAMPLE VALUES (CASE I): BTU | CUMULATIVE SAMPLE VALUES (CASE I): F.S.I. | CUMULATIVE SAMPLE VALUES (CASE I): S | CUMULATIVE SAMPLE VALUES (CASE II): THICKNESS (m) | CUMULATIVE SAMPLE VALUES (CASE II): YIELD | CUMULATIVE SAMPLE VALUES (CASE II): PROXIMATE ANALYSIS: RM | CUMULATIVE SAMPLE VALUES (CASE II): PROXIMATE ANALYSIS: ASH | CUMULATIVE SAMPLE VALUES (CASE II): PROXIMATE ANALYSIS: VOL. | CUMULATIVE SAMPLE VALUES (CASE II): PROXIMATE ANALYSIS: F.C. | CUMULATIVE SAMPLE VALUES (CASE II): BTU | CUMULATIVE SAMPLE VALUES (CASE II): F.S.I. | CUMULATIVE SAMPLE VALUES (CASE II): S | CUMULATIVE SAMPLE VALUES (CASE III): THICKNESS (m) | CUMULATIVE SAMPLE VALUES (CASE III): YIELD | CUMULATIVE SAMPLE VALUES (CASE III): PROXIMATE ANALYSIS: RM | CUMULATIVE SAMPLE VALUES (CASE III): PROXIMATE ANALYSIS: ASH | CUMULATIVE SAMPLE VALUES (CASE III): PROXIMATE ANALYSIS: VOL. | CUMULATIVE SAMPLE VALUES (CASE III): PROXIMATE ANALYSIS: F.C. | CUMULATIVE SAMPLE VALUES (CASE III): BTU | CUMULATIVE SAMPLE VALUES (CASE III): F.S.I. | CUMULATIVE SAMPLE VALUES (CASE III): S | OTHER |
|---|---|---|---

LOCATION MAP

TN

SCALE:

COORDINATES: 7,400 m W, 11,100m N of S.E. CORNER CL 77
ELEVATION: 709.83 m A.M.S.L.
DIP: -90°
CORE SIZE: HQ
BEARING:
CASING HW 7.31 NW 75.74
BITS USED: J.K.SMIT COMBINATION, J.K.SMIT SERIES 75 DIAMOND
MUD USED: 14BAGS MUD, 141 GAL. POLY 330
m. LEFT IN HOLE: 1.22 m. HW, 0 m. NW
DATE START: AUG, 16/80
DRILLER: E.CARON DIAMOND DRILLING
TESTS:
SAMPLED BY: O CULLINGHAM
FINISH: AUG, 30/80
OVERALL RECOVERY: 93 %
DATE: SEPT, 4
ANALYZED BY: BIRTLEY COAL & MINERALS TESTING

PAN OCEAN OIL LTD.
MINERALS DIVISION - COAL

LOGGED BY: O. CULLINGHAM DATE: SEPT. 2, 1980
SIGNED:

DRILLHOLE NO. SC-80-22
SHEET 1 OF 4

GEOLOGICAL LOG — SCALE: 1:500

DETAILS OF COAL SEAMS — SCALE: 1:50

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
1.22		1.22	OVERBURDEN
		16.70	SANDSTONE AND CONGLOMERATIC SANDSTONE - MEDIUM GRAY, MEDIUM TO TO COARSE GRAINED TO GRANULE CONGLOMERATIC, QUARTZ & CHERT (3:1), POOR TO MODERATELY SORTED. MINOR TAR, INTERVAL IS SLIGHTLY CARBONACEOUS LAMINATIONS AND SHARDS OF CARBONACEOUS AND COAL MATERAL
17.92			
		14.18	CONGLOMERATE - SMALL TO MEDIUM PEBBLE, QUARTZITE AND CHERT, WHITE TO BLACK WITH OCCASIONAL GREEN CHERT, ROLLER TO SUBSPHERICAL, ROUNDED. MINOR TAR, SOME INTERVALS OF ABUNDANT TAR. MATRIX OF FINE TO COARSE POORLY SORTED SANDSTONE.
32.10			
		3.00	SANDSTONE - MEDIUM GRAY, MEDIUM GRAINED, QUARTZ AND CHERT (4:1) MODERATE TO WELL SORTED.
35.10			
		4.66	CONGLOMERATE - SEE ABOVE DESCRIPTION. PEBBLES INCREASE TO LARGE PEBBLE CONGLOMERATE TOWARDS BASE. ABRUPT LOWER CONTACT
39.76			
		14.47	COAL HORIZON No. 2
54.23			
		8.99	MUDSTONE/MINOR SILTSTONE - MEDIUM GRAY BROWN TO MEDIUM GRAY, FRAGMENTAL TO BLOCKY, MUDSTONE IS HACKLY IN PART. MINOR CARBONACEOUS AND COAL FRAGMENTS THROUGHOUT. SILTSTONE SLUMPED, IN PART BIOTURBATED.
63.22			
		19.61	CONGLOMERATE - MEDIUM TO LARGE PEBBLE, RARE GREEN CHERT. MEDIUM TO COARSE GRAINED SS MATRIX. SS INTERBEDS.
82.83			
		3.34	MUDSTONE & SILTSTONE - MEDIUM GRAY.
86.17			
		10.82	CONGLOMERATE - SMALL TO MEDIUM PEBBLE SS INTERBED.
96.99			
		4.81	COAL HORIZON No. 3
101.80			
		5.37	MUDSTONE - MEDIUM TO DARK GRAY, SPLINTS & PARTINGS OF COAL
107.17			
		1.90	COAL
108.97			
		7.13	MUDSTONE/SILTSTONE - MEDIUM DARK TO MEDIUM GRAY, BECOMES PROGRESSIVELY SILTY DOWNWARDS.
116.10			
		10.88	SILTSTONE, SANDSTONE & CONGLOMERATE - COARSENS DOWNWARD TO GRANULE CONGLOMERATE.
126.98			
		2.77	MUDSTONE - MEDIUM DARK GRAY, IN PART CARBONACEOUS. COAL AT UPPER CONTACT
129.75			
		1.33	COAL
131.08			
		8.92	MUDSTONE - DARK GRAY, CARBONACEOUS & COALY.
140.00			
		15.08	SILTSTONE, SANDSTONE & CONGLOMERATE - GRADATIONAL TO SMALL PEBBLE CONGLOMERATE
155.08			
		8.51	MUDSTONE / INTERBEDS OF SILTSTONE - MEDIUM GRAY TO DARK GRAY.
163.59			
164.51		0.92	COAL
		3.74	MUDSTONE - MEDIUM GRAY, CONTAINS CARBONACEOUS MATERIAL.
168.25			
		15.65	SILTSTONE, SANDSTONE & CONGLOMERATE - MEDIUM GRAY. GRADATIONAL DOWNWARDS FROM SILTSTONE TO SANDSTONE.
183.90			
		6.13	MUDSTONE - MEDIUM TO MEDIUM DARK GRAY.
190.03			
		3.72	CONGLOMERATIC SS & CONGLOMERATE - MATRIX SUPPORTED AT TOP TO CLAST SUPPORTED AT BASE. GRANULE TO SMALL PEBBLE.
193.95			
		7.21	COAL HORIZON No. 4
200.96			
		24.74	MUDSTONE - MEDIUM DARK GRAY TO DARK GRAY. POLISHED THROUGHOUT UPPER 2.5 m
225.70			
		13.47	CONGLOMERATE - MED. PEBBLE WITH LARGE PEBBLES IN UPPER 2 m TAR MATRIX, CLAST SUPPORTED
239.17			
		6.90	CONGLOMERATIC SANDSTONE
246.07			

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION
				No. 2 SEAM HORIZON
39.76			93	CONGLOMERATE
		0.37		COAL - MOSTLY BRIGHT, HARD BLOCKY & CONCHOIDAL FRACTURE
40.13		0.10		NO CORE
40.23				COAL - MOSTLY VITREOUS TO BRIGHT, FEW THIN BANDS CARBONACEOUS SHALE. MINOR PYRITE.
		1.68	100	
41.81				COAL - MOSTLY VITREOUS TO BRIGHT, FEW THIN BANDS CARB. SHALE.
		1.28	100	
43.09		0.02		SHALY COAL
43.11		0.18		CARBONACEOUS TO COALY MUDSTONE
43.29		0.06		SHALY COAL
43.35		0.12		COAL - DULL TO VITREOUS
43.47				
		0.54		COAL - DULL TO VITREOUS
44.01				
		0.30	100	COAL - DULL TO VITREOUS, FEW BANDS CARBONACEOUS SHALE
44.30				
		0.68		COAL - MOSTLY BRIGHT
44.79				
		0.42		COAL - AS ABOVE
45.21		0.15		COAL - DULL, LIGHT WEIGHT, Fe STAINING
45.36		0.36		COAL - MOSTLY BRIGHT, FEW PARTINGS CARBONACEOUS SHALE
45.72		0.11		COAL - DULL TO VITREOUS, SOFT
45.83		0.12		SHALE - COAL, SOFT, DULL
45.95		0.18	100	CARBONACEOUS TO COALY MUDSTONE
46.13				MUDSTONE - DARK GREY, IN PART CARBONACEOUS
		1.64		
47.77			100	
		0.36		COAL - DULL TO VITREOUS. PARTINGS OF CARBONACEOUS SHALE.
48.13		0.04		CARBONACEOUS MUDSTONE
48.17		0.14		COAL - DULL TO VITREOUS
48.31		0.25		CARBONACEOUS MUDSTONE
48.56				
		0.68		COAL - VITREOUS TO BRIGHT
49.24		0.05		CARBONACEOUS SHALE - HARD, BANDED
49.31		0.02		COAL - BRIGHT, BANDED
		0.38		CARBONACEOUS MUDSTONE - HARD, BANDED
49.68				
		0.26		COAL - VITREOUS TO BRIGHT, FEW PARTINGS CARBONACEOUS MUDSTONE
49.95		0.05		COALY SHALE
50.00		0.02		COAL - BRIGHT
50.02		0.15		COAL - VITREOUS TO BRIGHT
50.17		0.05		SHALY COAL
50.22		0.07		COAL - DULL TO VITREOUS
50.50				SHALY COAL TO COALY SHALE
		0.35		
50.65				
		0.27		COAL - VITREOUS
50.92		0.08		COALY SHALE
51.00		0.08		COAL
51.08				COAL - VITREOUS TO BRIGHT
		1.48		
			100	
52.56				
		0.23		SHALY COAL - DULL TO VITREOUS
52.79				
		0.54		COAL - VITREOUS TO BRIGHT
53.33		0.05	100	SHALY COAL
53.38		0.10		COALY SHALE
53.48				
		0.45		MUDSTONE - DARK GRAY, CARBONACEOUS
53.93				
		0.20		CARBONACEOUS MUDSTONE
54.13		0.03		COAL
54.16		0.07		SHALY COAL
54.23				MUDSTONE

SAMPLE NUMBER	THICKNESS (m)	DIAMETER	WT %	SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
		1/4×0	100.0	RAW	100.0	8.4	10.0	35.3	46.3	10262		0.35
		1/4×28	91.8	-1.30	1.3	5.5	3.5					
				-1.40	74.4	7.5	3.6					
				-1.50	9.7	3.3	13.0					
				-1.60	4.2	2.9	22.0					
				-1.70	2.5	2.9	30.1					
				-1.80	1.6	2.9	36.1					
				-1.90	1.1	2.7	42.7					
				+1.90	5.2	1.6	65.0					
		28×0	8.2	RAW	100.0							0.45
		1/4×28	91.8	-1.90								
		28×0	8.2	RAW								
A0316	3.33	1/4×0	100.0	COMB.								0.34
		1/4×0	100.0	RAW	100.0	4.1	58.9	19.3	17.7			0.45
		1/4×28	91.9	-1.30	0.5	6.0	5.3					
				-1.40	3.9	4.8	6.2					
				-1.50	2.8	4.0	14.6					
				-1.60	1.7	4.2	25.4					
				-1.70	2.3	3.2	38.5					
				-1.80	6.7	2.8	47.1					
				-1.90	13.6	2.3	55.2					
				+1.90	68.5	3.1	69.2					
		28×0	8.1	RAW	100.0							0.63
		1/4×28	91.9	-1.90								
		28×0	8.1	RAW								0.63
	0.26	1/4×0	100.0	COMB.								0.36
		1/4×0	100.0	RAW	100.0	8.0	16.6	32.7	42.7	9307		0.17
		1/4×28	92.3	-1.30	2.1	4.7	3.8					
				-1.40	46.7	5.2	3.9					
				-1.50	19.0	4.9	11.4					
				-1.60	11.1	3.6	23.3					
A0317				-1.70	7.0	3.0	32.9					
				-1.80	3.5	2.7	39.8					
				-1.90	2.3	2.7	44.3					
				+1.90	8.3	1.9	59.9					
		28×0	7.7	RAW	100.0							0.77
		1/4×28	92.3	-1.90								
A0318	2.46	28×0	7.7	RAW								0.77
		1/4×0	100.0	COMB.								0.34
		1/4×0	100.0	RAW	100.0	2.5	62.7	16.8	18.0			0.27
		1/4×28	82.3	-1.30	1.0	5.8	3.5					
				-1.40	2.8	5.3	4.7					
				-1.50	3.1	4.7	11.7					
				-1.60	1.6	4.9	22.7					
				-1.70	3.0	4.1	36.5					
A0319	0.30			-1.80	4.2	3.4	45.6					
				-1.90	8.0	2.8	53.6					
				+1.90	76.3	2.0	75.3					
		28×0	17.7	RAW	100.0							0.29
		1/4×28	82.3	-1.90								
		28×0	17.7	RAW								
		1/4×0	100.0	COMB.								
		1/4×0	100.0	RAW	100.0	6.9	18.1	34.5	40.5	9331		0.25
		1/4×28	95.3	-1.30	9.3	4.4	3.3					
				-1.40	45.1	3.6	4.6					
				-1.50	17.7	3.8	14.7					
				-1.60	6.6	3.3	25.5					
				-1.70	2.3	3.8	34.6					
				-1.80	1.3	3.8	43.0					
				-1.90	2.1	3.1	48.7					
A0320	0.64			+1.90	13.6	1.7	60.8					
		28×0	4.7	RAW	100.0							0.35
A0321		1/4×28	95.3	-1.90								
		28×0	4.7	RAW								0.35
A0322	0.25	1/4×0	100.0	COMB.								0.37
		1/4×0	100.0	RAW	100.0	2.0	73.9	16.0	8.1			0.27
		1/4×28	96.7	-1.30	0.3	4.0	5.3					
				-1.40	0.3	6.0	6.6					
				-1.50	0.2	5.7	12.4					
				-1.60	0.3	5.0	20.6					
				-1.70	0.2	4.9	29.5					
				-1.80	0.4	5.0	38.5					
A0323	0.75			-1.90	0.3	3.8	47.4					
				+1.90	98.0	1.6	74.8					
		28×0	3.3	RAW	100.0							0.15
		1/4×28	96.7	-1.90								
		28×0	3.3	RAW								
A0324	0.38	1/4×0	100.0	COMB.								0.30
		1/4×0	100.0	RAW	100.0	6.9	25.7	30.3	37.1	8174		0.07
		1/4×28	94.7	-1.30	15.0	4.9	3.0					
				-1.40	30.8	4.9	3.9					
				-1.50	8.0	6.9	12.5					
				-1.60	7.8	6.1	20.4					
				-1.70	6.6	3.9	32.2					
				-1.80	4.8	2.8	40.6					
				-1.90	4.0	3.3	47.7					
				+1.90	23.0	2.0	70.3					
		28×0	5.3	RAW	100.0							0.26
		1/4×28	94.7	-1.90								
		28×0	5.3	RAW								0.26
		1/4×0	100.0	COMB.								0.30
		1/4×0	100.0	RAW	100.0	2.9	65.4	18.7	13.0			0.27
		1/4×28	96.4	-1.30	0.1	5.9	5.0					
				-1.40	1.1	5.5	6.7					
				-1.50	0.8	5.2	12.0					
				-1.60	0.7	4.8	21.7					
				-1.70	0.5	4.3	32.1					
				-1.80	2.4	3.7	42.2					
				-1.90	3.2	3.5	47.0					
				+1.90	9.1.2	2.9	68.5					
		28×0	3.6	RAW	100.0							0.15
		1/4×28	96.4	-1.90								
		28×0	3.6	RAW								
		1/4×0	100.0	COMB.								0.30

CUMULATIVE WEIGHT PERCENT

YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
1.3		3.5					
75.7		3.6					
85.4		4.7					
89.6		5.5					
92.1		6.1					
93.7		6.7					
94.8	6.5	6.8	35.3	51.4	10,945		0.32
100.0		10.1					
100.0	8.2	11.4	35.0	45.4	10082		0.45
87.03	6.5	6.8	35.3	51.4	10,945		0.32
8.2	8.2	11.4	35.0	45.4	10,082		0.54
95.2	6.7	7.2	35.3	50.9	10,871		0.34
0.5		5.3					
4.4		6.1					
7.2		9.4					
8.9		12.5					
11.2		17.8					
17.9		28.8					
31.5	3.40	39.8	24.5	32.3	6,640		0.28
100.0		60.1					
100.0	4.0	55.6	23.4	17.0	–		0.63
28.95	3.4	39.8	24.5	32.3	6,640		0.28
8.10	4.0	55.6	23.4	17.0	-		0.63
32.05	3.5	42.3	24.3	29.0	5188		0.36
2.1		3.8					
48.8		3.9					
67.8		6.0					
78.9		8.4					
85.9		10.4					
89.4		11.6					
91.7	5.3	12.7	32.5	49.5	10,235		0.30
100.0		16.3					
100.0	7.9	15.9	32.3	43.9	9527		0.77
86.64	5.3	12.7	31.5	49.5	10,235		0.30
7.70	7.9	15.9	32.3	43.9	9,527		0.77
92.34	5.5	13.0	32.5	49.0	10,176		0.34
1.0		3.5					
3.8		4.4					
6.9		7.7					
8.5		10.5					
11.5		17.3					
15.7		24.9					
23.7		34.6					
100.0		65.6					
100.0	3.5	44.4	22.2	29.9	5683		0.29
0.3		5.3					
0.6		6.0					
0.8		7.6					
1.1		11.1					
1.3		13.9					
1.7		19.7					
2.0	N.S.S.	23.9	N.S.S.	N.S.S	N.S.S.		NSS
100.0		73.8					
100.0	2.9	65.7	17.9	13.5			0.15
15.0		3.0					
45.8		3.6					
53.8		4.9					
61.6		6.9					
68.2		9.3					
73.0		11.4					
77.0	5.2	13.3	33.5	48.1	9936		0.30
100.0		26.4					
100.0	7.0	22.7	29.8	40.5	8510		0.26
72.9	5.2	13.3	33.5	48.1	9936		0.30
5.3	7.0	22.7	29.8	40.5	8510		0.26
78.2	5.3	14.0	38.3	47.6	9839		0.30
0.1		5.0					
1.2		6.6					
2.0		8.7					
2.7		12.1					
3.2		15.2					
5.6		26.8					
8.8	N.S.S.	34.1	N.S.S.	N.S.S.	N.S.S.		N.S.S.
100.0		65.5					
100.0	3.5	60.6	19.3	16.6			0.15

CUMULATIVE SAMPLE VALUES (CASE I)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

LOCATION MAP

TN ↑

SCALE:

COORDINATES:
ELEVATION:
DIP: BEARING:
CORE SIZE: CASING

BITS USED:
MUD USED:
m. LEFT IN HOLE: m.

DATE START:
DRILLER:
TESTS:
SAMPLED BY:

FINISH:
OVERALL RECOVERY:
DATE: ANALYZED BY:

PAN OCEAN OIL LTD.
MINERALS DIVISION - COAL
LOGGED BY: DATE:
SIGNED:

DRILLHOLE NO. SC-80-22
SHEET 2 OF 4

GEOLOGICAL LOG — SCALE:

DETAILS OF COAL SEAMS — SCALE:

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
1.22		1.22	OVERBURDEN
		16.70	SANDSTONE AND CONGLOMERATIC SANDSTONE - MEDIUM GRAY, MEDIUM TO TO COARSE GRAINED TO GRANULE CONGLOMERATIC QUARTZ & CHERT CLASTS, POOR TO MOD. SORTED, CLAST SUPPORTED MODERATE TAR. INTERVAL IS SLIGHTLY CARBONACEOUS LAMINATIONS AND SHARDS OF CARBONACEOUS AND COAL MATERAL
17.92		14.18	CONGLOMERATE - SMALL TO MEDIUM PEBBLE, QUARTZITE AND CHERT, WHITE TO BLACK WITH OCCASIONAL GREEN CHERT, ROLLER TO SUBSPHERICAL, ROUNDED. MINOR TAR, SOME INTERVALS OF ABUNDANT TAR. MATRIX OF FINE TO COARSE POORLY SORTED SANDSTONE.
32.10		3.00	SANDSTONE - MEDIUM GRAY, MEDIUM GRAINED, QUARTZ AND CHERT (4:1/) MODERATE TO WELL SORTED.
35.10		4.66	CONGLOMERATE - SEE ABOVE DESCRIPTION. PEBBLES INCREASE TO LARGE PEBBLE CONGLOMERATE TOWARDS BASE. ABRUPT LOWER CONTACT
39.76		14.47	COAL HORIZON No. 2
54.23		8.99	MUDSTONE/MINOR SILTSTONE - MEDIUM GRAY BROWN TO MEDIUM GRAY, FRAGMENTAL TO BLOCKY, MUDSTONE IS HACKLY IN PART. MINOR CARBONACEOUS AND COAL FRAGMENTS THROUGHOUT. SILTSTONE SLUMPED, IN PART BIOTURBATED.
63.22		19.61	CONGLOMERATE - MEDIUM TO LARGE PEBBLE, RARE GREEN CHERT. MEDIUM TO COARSE GRAINED SS MATRIX. SS INTERBEDS.
82.83		3.34	MUDSTONE & SILTSTONE - MEDIUM GRAY.
86.17		10.82	CONGLOMERATE - SMALL TO MEDIUM PEBBLE SS INTERBED.
96.99		4.81	COAL HORIZON No. 3
101.80		5.37	MUDSTONE - MEDIUM TO DARK GRAY, SPLINTS & PARTINGS OF COAL
107.17		1.90	COAL
108.97		7.13	MUDSTONE/SILTSTONE - MEDIUM DARK TO MEDIUM GRAY, BECOMES PROGRESSIVELY SILTY DOWNWARDS.
116.30		10.88	SILTSTONE, SANDSTONE & CONGLOMERATE - COARSENS DOWNWARD TO GRANULE CONGLOMERATE
126.98		2.77	MUDSTONE - MEDIUM DARK GRAY, IN PART CARBONACEOUS. COAL AT UPPER CONTACT
129.75		1.33	COAL
131.08		8.92	MUDSTONE - DARK GRAY, CARBONACEOUS & COALY.
140.00		15.08	SILTSTONE, SANDSTONE & CONGLOMERATE - GRADATIONAL TO SMALL PEBBLE CONGLOMERATE
155.08		8.51	MUDSTONE / INTERBEDS OF SILTSTONE - MEDIUM GRAY TO DARK GRAY.
163.59		0.92	COAL
164.51		3.74	MUDSTONE - MEDIUM GRAY, CONTAINS CARBONACEOUS MATERIAL
168.25		15.65	SILTSTONE, SANDSTONE & CONGLOMERATE - MEDIUM GRAY. GRADATIONAL DOWNWARDS FROM SILTSTONE TO SANDSTONE.
183.90		6.13	MUDSTONE - MEDIUM TO MEDIUM DARK GRAY.
190.03		3.72	CONGLOMERATIC SS & CONGLOMERATE - MATRIX SUPPORTED AT TOP TO CLAST SUPPORTED AT BASE. GRANULE TO SMALL PEBBLE
193.95		7.21	COAL HORIZON No. 4
200.96		24.74	MUDSTONE - MEDIUM DARK GRAY TO DARK GRAY. POLISHED THROUGHOUT UPPER 2.5 m
225.70		13.47	CONGLOMERATE - MED. PEBBLE WITH LARGE PEBBLES IN UPPER 2 m TAR MATRIX, CLAST SUPORTED
239.17		6.90	CONGLOMERATIC SANDSTONE
246.07			

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION
			93	No. 2 SEAM HORIZON
39.76		0.37		CONGLOMERATE
40.13		0.10		COAL - MOSTLY BRIGHT, HARD BLOCKY & CONCHOIDAL FRACTURE
40.23				NO CORE
		1.68	100	COAL - MOSTLY VITREOUS TO BRIGHT, FEW THIN BANDS CARBONACEOUS SHALE, MINOR PYRITE
41.81				
		1.28	100	COAL - MOSTLY VITREOUS TO BRIGHT, FEW THIN BANDS CARB SHALE
43.09		0.02		SHALY COAL
43.11		0.18		CARBONACEOUS TO COALY MUDSTONE
43.29		0.06		SHALY COAL
43.35		0.12		COAL - DULL TO VITREOUS
43.47		0.54		COAL - DULL TO VITREOUS
44.01		0.30	100	COAL - DULL TO VITREOUS, FEW BANDS CARBONACEOUS SHALE
44.30		0.48		COAL - MOSTLY BRIGHT
44.79		0.42		COAL - AS ABOVE
45.21		0.13		COAL - DULL, LIGHT WEIGHT, Fe STAINING
45.36		0.36	100	COAL - MOSTLY BRIGHT, FEW PARTINGS CARBONACEOUS SHALE
45.72		0.11		COAL - DULL TO VITREOUS, SOFT
45.83		0.12		SHALE - COAL, SOFT, DULL
45.95		0.18		CARBONACEOUS TO COALY MUDSTONE
46.13		1.64	100	MUDSTONE - DARK GREY, IN PART CARBONACEOUS
47.77		0.36		COAL - DULL TO VITREOUS. PARTINGS OF CARBONACEOUS SHALE
48.13		0.04		CARBONACEOUS MUDSTONE
48.17		0.14		COAL - DULL TO VITREOUS
48.31		0.25		CARBONACEOUS MUDSTONE
48.56		0.68	100	COAL - VITREOUS TO BRIGHT
49.24		0.05		CARBONACEOUS SHALE - HARD, BANDED
49.29		0.02		COAL - BRIGHT, BANDED
49.31		0.38		CARBONACEOUS MUDSTONE - HARD, BANDED
49.68		0.26		COAL - VITREOUS TO BRIGHT, FEW PARTING CARBONACEOUS MUDSTONE
49.95		0.05		COALY SHALE
50.00		0.09		SHALY COAL
50.09		0.17	100	COAL - VITREOUS TO BRIGHT
50.26		0.04		SHALY COAL
50.30		0.07		COAL - DULL TO VITREOUS
		0.35		SHALY COAL TO COALY SHALE
50.65		0.27		COAL - VITREOUS
50.92		0.08		COALY SHALE
51.00		0.08		COAL
51.08		1.48	100	COAL - VITREOUS TO BRIGHT
52.56		0.23		SHALY COAL - DULL TO VITREOUS
52.79		0.54	100	COAL - VITREOUS TO BRIGHT
53.33		0.05		SHALY COAL
53.38		0.10		COALY SHALE
53.48		0.45		MUDSTONE - DARK GRAY, CARBONACEOUS
53.93		0.20		CARBONACEOUS MUDSTONE
54.13		0.03		COAL
54.16		0.07		COAL
54.23				MUDSTONE

SAMPLE NUMBER	THICKNESS (m)
A0332	0.62
A0334	1.91
A0335	0.77
A0336	0.34
A0337	1.48

SIZE			WEIGHT PERCENT									CUMULATIVE WEIGHT PERCENT								CUMULATIVE SAMPLE VALUES (CASE I)								CUMULATIVE SAMPLE VALUES (CASE II)								CUMULATIVE SAMPLE VALUES (CASE III)								OTHER
DIA-METER	WT %	SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	THICK-NESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	THICK-NESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	THICK-NESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	
1/4×0	100.0	RAW	100.0	7.0	29.0	30.2	33.8	7592		0.17																																			
1/4×28	96.1	-1.30	9.4	7.8	3.5						9.4		3.5																																
		-1.40	29.6	5.0	4.5						39.0		4.3																																
		-1.50	9.6	4.8	10.9						48.6		5.6																																
		-1.60	5.1	4.5	21.0						53.7		7.0																																
		-1.70	3.7	4.2	31.3						57.4		8.6																																
		-1.80	5.4	3.3	41.2						62.8		11.4																																
		-1.90	3.0	3.2	48.8						65.8	5.2	13.1	34.0	47.7	10,130		0.30																												46
		+1.90	34.2	2.9	62.9						100.0		30.1																																
28×0	3.9	RAW	100.0								100.0	7.2	23.2	30.8	38.8	8408		0.2																												
1/4×28	96.1	-1.90									63.23	5.2	13.1	34.0	47.7	10,130		0.30																												
28×0	3.9	RAW									3.9	7.2	23.2	30.8	38.8	8408		0.23																												
1/4×0	100.0	COMB									67.13	5.3	13.7	33.8	47.2	10,030		0.30	3.65	75.4	5.1	14.3	34.0	46.7	10,024		0.30																				
1/4×0	100.0	RAW	100.0	4.0	51.8	24.0	20.2			0.31																																		
1/4×28	97.2	-1.30	0.3	5.4	6.3						0.3		6.3																																
		-1.40	1.2	5.4	7.0						1.5		6.9																																
		-1.50	2.7	4.6	17.1						4.2		13.4																																
		-1.60	4.9	3.7	26.6						9.1		20.5																																
		-1.70	8.8	3.4	35.8						17.9		28.0																																
		-1.80	12.1	2.8	44.6						30.0		34.7																																
		-1.90	19.4	2.6	52.1						49.4	N.S.S.	41.5	N.S.S.	N.S.S.	N.S.S.		N.S.S.																												
		+1.90	50.6	2.3	62.3						1000		52.0																																
28×0	2.8	RAW	100.0								100.0	4.7	45.3	25.0	25.0	5646		025																												
1/4×28	97.2	-1.90																																										
28×0	2.8	RAW																																										
1/4×0	100.0	COMB.																	3.03	77.1	5.1	14.4	34.1	46.7	10,023		0.30																				
1/4×0	100.0	RAW	100.0	7.6	18.7	33.4	40.3	9118		0.23																																		
1/4×28	94.4	-1.30	4.8	5.9	2.9						4.8		2.9																																
		-1.40	45.3	6.0	3.6						50.1		3.5																																
		-1.50	11.6	5.9	13.6						61.7		5.4																																
		-1.60	11.2	3.4	24.7						72.9		8.4																																
		-1.70	6.3	3.1	32.1						79.2		10.3																																
		-1.80	4.2	3.0	40.1						83.4		11.8																																
		-1.90	5.1	2.7	47.2						88.5	5.0	13.8	34.5	46.9	10,115		0.31																												42
		+1.90	11.5	2.1	61.0						100.0		19.2																																
28×0	5.6	RAW	100.0								100.0	7.9	16.2	33.7	42.2	9456		0.40																												
1/4×28	94.4	-1.90									83.54	5.0	13.8	34.5	46.9	10,115		0.31																												
28×0	5.6	RAW									5.6	7.9	16.2	33.7	42.2	9456		0.40																												
1/4×0	100.0	COMB									89.1	5.2	14.0	34.5	46.6	10,074		0.32	2.68	87.2	5.1	14.4	34.1	46.7	10,023		0.30																				
1/4×0	100.0	RAW	100.0	7.0	22.5	30.8	39.7	8660		0.28																																		
1/4×28	95.5	-1.30	9.2	7.5	2.7						9.2		2.7																																
		-1.40	33.6	5.2	3.6						42.8		3.4																																
		-1.50	11.9	4.0	14.7						54.7		5.9																																
		-1.60	9.9	3.8	24.2						64.6		8.7																																
		-1.70	8.0	3.4	33.4						72.6		11.4																																
		-1.80	5.0	3.2	41.0						77.6		13.3																																
		-1.90	4.1	3.2	46.8						81.7	4.8	15.0	33.1	47.1	9938	-	0.23																												41
		+1.90	18.3	2.4	63.0						100.0		23.7																																
28×0	4.5	RAW	100.0								100.0	6.7	19.9	31.8	41.6	8966		0.29																												
1/4×28	95.5	-1.90									78.02	4.8	15.0	33.1	47.1	9938		0.23																												
28×0	4.5	RAW									4.5	6.7	19.9	31.8	41.6	8966		0.29																												
1/4×0	100.0	COMB.									82.5	4.9	15.3	33.0	46.8	9885		0.23	0.77	82.5	4.9	15.3	33.0	46.8	9885		0.23																				

GEOLOGICAL LOG — SCALE: 1:500

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
247.70			SANDSTONE - MED. GRAY, FINE GRAINED.
250.15			SILTSTONE - MEDIUM GRAY
		4.54	CONGLOMERATIC SANDSTONE - MEDIUM GRAY, MEDIUM GRAINED TO SMALL PEBBLE CONGLOMERATE.
254.69			
255.47		0.78	MUDSTONE - MEDIUM DARK GRAY, POLISHED APPEARANCE
258.61		3.14	COAL No. 5 SEAM HORIZON
258.64		5.01	CARBONACEOUS AND COALY MUDSTONE
263.65			MUDSTONE - MEDIUM DARK GRAY TO MEDIUM GRAY, BROWN, POLISHED IN PART 265-267 m POSSIBLY VOLCANIC ASH - BENTONITIC
		36.95	
300.60			CONGLOMERATE - MEDIUM TO LARGE PEBBLE. NO GREEN PEBBLES NOTED.
		9.38	
309.98			E.O.H.

DETAILS OF COAL SEAMS — SCALE: 1:50

No.3 SEAM HORIZON

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)
				CONGLOMERATE		
96.99				COAL - MOSTLY VITREOUS TO BRIGHT		
		2.04	88			
99.03				NO CORE	A0328	4.81
99.36		0.33				
				COAL - MOSTLY VITREOUS TO BRIGHT		
		2.44	100			
101.80				MUDSTONE		
				MUDSTONE		
107.17				COAL - MOSTLY BRIGHT		
		1.31	99		A0329	1.63
108.48		0.03		NO CORE		
108.51		0.29		COAL - VITREOUS TO BRIGHT		
108.80		0.06		MUDSTONE		
108.86		0.11		SHALY COAL		
108.97			77	MUDSTONE / SILTSTONE		
				MUDSTONE		
129.75		0.06	94	COALY MUDSTONE		
129.81				COAL - MOSTLY VITREOUS & BRIGHT		
		1.22			A0330	1.27
			93			
131.03				COAL - THINLY PARTED		
131.08		0.05		MUDSTONE		
				MUDSTONE		
163.59				COAL - DULL TO BRIGHT		
		0.92			A0331	0.92
164.51			90			

SIZE DIAMETER	SIZE WT %	SPEC. GRAV.	WEIGHT PERCENT YIELD	PROX. RM	PROX. ASH	PROX. VOL.	PROX. F.C.	BTU	F.S.I.	S	CUM. WT. PERCENT YIELD	CUM. PROX. RM	CUM. PROX. ASH	CUM. PROX. VOL.	CUM. PROX. F.C.	CUM. BTU	CUM. F.S.I.	CUM. S
1/4×0	100.0	RAW	100.0	8.1	20.0	30.6	41.3	8835		0.17								
1/4×28	93.4	-1.30	0.9	6.1	3.5						0.9		3.5					
		-1.40	40.7	6.6	4.2						41.6		4.2					
		-1.50	20.9	5.6	10.1						62.5		6.2					
		-1.60	6.8	4.2	20.5						69.3		7.6					
		-1.70	5.7	3.6	30.0						75.0		9.6					
		-1.80	5.3	3.2	39.2						80.3		11.2					
		-1.90	4.6	3.1	46.0						84.9	5.2	13.1	32.4	49.3	10,155		0.25
		+1.90	15.1	2.1	63.4						100.0		20.7					
28×0	6.6	RAW	100.0								100.0	8.0	17.6	31.6	42.8	9145		0.50
1/4×28	93.4	-1.90									79.3	5.2	13.1	32.4	49.3	10,155		0.25
28×0	6.6	RAW									6.6	8.0	17.6	31.6	48.8	9,145		0.50
1/4×0	100.0	COMB									85.9	5.4	13.5	32.3	48.8	10,077		0.27
1/4×0	100.0	RAW	100.0	7.9	11.0	34.9	46.2	10264		0.24								
1/4×28	95.0	-1.30	2.3	6.9	2.9						2.3		2.9					
		-1.40	61.1	4.0	4.0						63.4		4.0					
		-1.50	16.3	3.5	10.5						79.7		5.3					
		-1.60	8.6	3.4	20.0						88.3		6.7					
		-1.70	4.1	3.0	30.3						92.4		7.8					
		-1.80	1.9	3.4	37.9						94.3		8.4					
		-1.90	1.4	2.6	46.8						95.7	4.4	8.9	35.9	50.8	10,855		0.23
		+1.90	4.3	1.8	64.2						100.0		11.3					
28×0	5.0	RAW	100.0								100.0	7.2	12.9	34.5	45.4	9969		0.27
1/4×28	95.0	-1.90									90.92	4.4	8.9	35.9	50.8	10,855		0.23
28×0	5.0	RAW									5.0	7.2	12.9	34.5	45.4	9,969		0.27
1/4×0	100.0	COMB									95.9	4.6	9.1	35.8	50.5	10,809		0.23
1/4×0	100.0	RAW	100.0	8.0	14.6	33.3	44.1	9713		0.27								
1/4×28	94.3	-1.30	2.0	6.8	2.9						2.0		2.9					
		-1.40	56.1	4.9	3.4						58.3		3.4					
		-1.50	15.2	4.1	9.0						73.5		4.5					
		-1.60	5.7	4.2	19.8						79.2		5.6					
		-1.70	6.1	3.8	29.7						85.3		7.4					
		-1.80	2.6	3.3	41.2						87.9		8.4					
		-1.90	3.1	3.2	49.3						91.0	4.8	9.8	34.6	50.8	10,770	-	0.27
		+1.90	9.0	2.3	64.1						100.0		14.6					
28×0	5.7	RAW	100.0								100.0	6.9	19.2	33.1	40.8	9169		0.32
1/4×28	94.3	-1.90									85.81	4.8	9.8	34.6	50.8	10,770		0.27
28×0	5.7	RAW									5.7	6.9	19.2	33.1	40.8	9,169		0.32
1/4×0	100.0	COMB									91.5	4.9	10.4	34.5	50.2	10,670		0.27
1/4×0	100.0	RAW	100.0	7.8	11.8	32.4	48.7	10359		0.36								
1/4×28	92.9	-1.30	5.5	7.8	2.8						5.5		2.8					
		-1.40	63.8	5.4	3.2						69.3		3.2					
		-1.50	15.0	4.6	11.8						84.3		4.7					
		-1.60	5.6	4.2	25.1						89.9		6.0					
		-1.70	3.4	3.8	34.4						93.3		7.0					
		-1.80	1.2	3.5	40.7						94.5		7.4					
		-1.90	0.9	3.2	44.5						95.4	5.1	7.8	33.2	54.0	10,962		0.36
		+1.90	4.6	2.3	66.5						100.0		10.5					
28×0	7.1	RAW	100.0								100.0	6.7	17.8	31.4	44.1	9527		0.36
1/4×28	92.9	-1.90									88.63	5.1	7.8	33.2	54.0	10,962		0.36
28×0	7.1	RAW									7.1	6.7	17.8	31.4	44.1	9,527		0.36
1/4×0	100.0	COMB									95.7	5.2	8.5	33.1	53.3	10,856		0.36

CUMULATIVE SAMPLE VALUES (CASE I)

THICKNESS (m)	YIELD	PROX. RM	PROX. ASH	PROX. VOL.	PROX. F.C.	BTU	F.S.I.	S
4.81	85.9	5.4	13.5	32.3	48.8	10,077		0.27
1.63	95.9	4.6	9.1	35.8	50.5	10,809		0.23
1.27	91.5	4.9	10.4	34.5	50.2	10,670		0.27
0.92	95.7	5.2	8.5	33.1	53.3	10,856		0.36

CUMULATIVE SAMPLE VALUES (CASE II)

THICKNESS (m)	YIELD	PROX. RM	PROX. ASH	PROX. VOL.	PROX. F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III)

THICKNESS (m)	YIELD	PROX. RM	PROX. ASH	PROX. VOL.	PROX. F.C.	BTU	F.S.I.	S

OTHER — ASH FUSION (°F)

H.G.I.	S.G.	I.D.T. OR	S.T	H.T.	F.T.
42					
39					
43					
43					

DRILLHOLE NO SC-80-22

GEOLOGICAL LOG — SCALE:

DETAILS OF COAL SEAMS — SCALE: 1:50

No. 4 SEAM HORIZON

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)
193.83				CONGLOMERATIC SS & CONGLOMERATE		
193.91		0.08		COALY MUDSTONE		
194.04		0.13	64	COAL		
194.16		0.12		LOST CORE		
		0.65	100	COAL - DULL TO VITREOUS		
194.81						
194.88		0.07		COAL		
		0.91	67	COAL - DULL TO VITREOUS	A0334	3.70
195.79		0.50		LOST CORE		
196.29						
		1.02	100	COAL - VITREOUS TO BRIGHT		
197.31						
		1.02	88	COAL - AS ABOVE		
198.33		0.15		LOST CORE		
198.48						
198.50		0.95	69	COAL	A0335	3.67
199.43		0.42		LOST CORE		
199.85		0.63	60	COAL - DULL TO VITREOUS		
200.48		0.43		LOST CORE		
200.91		0.29		COAL - VITREOUS TO BRIGHT		
201.20				MUDSTONE		
			95			

SIZE DIAMETER	SIZE WT %	SPEC. GRAV.	WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
1/4×0	100.0	RAW	100.0	7.3	16.9	32.4	43.4	9558		0.35
1/4×28	87.4	-1.30	3.2	6.5	4.0					
		-1.40	48.9	5.3	5.5					
		-1.50	22.4	4.4	12.3					
		-1.60	6.2	3.9	23.3					
		-1.70	4.5	3.8	31.0					
		-1.80	2.9	3.3	40.1					
		-1.40	3.0	3.2	47.3					
		+1.90	8.9	2.2	63.8					
28×0	12.6	RAW	1000							
1/4×28	87.4	-1.90								
28×0	12.6	RAW								
1/4×0	100.0	COMB								
1/4×0	100.0	RAW	100.0	7.1	12.6	33.6	46.7	10213		0.28
1/4×28	88.2	-1.30	1.7	4.9	3.4					
		-1.40	57.9	4.6	3.7					
		-1.50	20.8	3.8	10.1					
		-1.60	6.9	3.4	20.5					
		-1.70	3.0	3.7	30.3					
		-1.80	2.1	3.6	37.9					
		-1.90	1.4	3.2	47.6					
		+1.90	6.2	2.0	71.0					
28×0	11.8	RAW	100.0							
1/4×28	88.2	-1.90								
28×0	11.8	RAW								
1/4×0	100.0	COMB								

CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
3.2		4.0					
52.1		5.4					
74.5		7.5					
80.7		8.6					
85.2		9.8					
88.1		10.8					
91.1	4.8	12.0	33.2	50.0	10,468		0.36
1000		16.6					
1000	73	15.0	33.2	44.5	9875		0.44
79.62	4.8	12.0	33.2	50.0	10,468		0.36
12.6	7.3	15.0	33.2	44.5	9875		0.44
92.2	5.1	12.4	33.2	49.3	10,387		0.37
1.7		3.4					
59.6		3.7					
80.4		5.3					
87.3		6.5					
90.3		7.3					
92.4		8.0					
93.8	4.6	8.6	34.5	52.3	11,192		0.27
100.0		12.5					
100.0	6.6	18.0	33.4	42.0	9492		0.29
82.7	4.6	8.6	34.5	52.3	11,192		0.27
11.8	6.6	18.0	33.4	42.0	9492		0.29
94.5	4.9	9.8	34.4	51.0	10,980		0.27

CUMULATIVE SAMPLE VALUES (CASE I) THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
7.37	93.3	5.0	11.1	33.8	50.2	10,686		0.32

CUMULATIVE SAMPLE VALUES (CASE II) THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III) THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER ASH FUSION (°F) H.G.I.	S.G.	IDT RO	ST	HT	FT
48					
46					

No. 5 SEAM HORIZON

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)
255.47				MUDSTONE		
		0.27		COAL - VITREOUS TO BRIGHT		
		0.05		MUDSTONE BAND		
		1.44	90	COAL - VITREOUS TO BRIGHT	A0332	2.30
257.23		0.33		NO CORE		
257.56		0.21		COAL		
257.77		0.04		MUDSTONE		
257.81		0.13	78	COALY MUDSTONE		
257.94		0.22		COAL	A0333	0.87
258.16		0.22		SHALY COAL		
258.38		0.08		MUDSTONE		
258.46		0.18	89	COAL - SOFT		
258.64		0.08		MUDSTONE		
258.72		0.06		NO CORE		
258.78						
		0.85	95	MUDSTONE		
259.63		0.09		MUDDY COAL		
259.72						
		1.01		MUDSTONE		
260.73		0.24	76	COAL		
260.97		0.28		MUDSTONE		
261.25		0.03		COAL		
261.28		0.37		MUDSTONE		
261.65		0.31		SHALY COAL		
261.96		0.52	100	MUDSTONE		
262.48		0.40		COAL		
262.82		0.23		MUDSTONE		
263.05		0.60	97	COALY MUDSTONE		
263.65				MUDSTONE		

SIZE DIAMETER	SIZE WT %	SPEC. GRAV.	WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
1/4×0	100.0	RAW	100.0	7.0	19.3	29.3	44.4	9182		0.24
1/4×28	93.6	-1.30	1.6	6.0	2.9					
		-1.40	43.2	5.1	4.3					
		-1.50	19.7	4.3	11.1					
		-1.60	8.5	4.2	19.5					
		-1.70	6.6	3.8	30.8					
		-1.80	4.5	3.4	37.7					
		-1.90	3.7	3.3	43.8					
		+1.90	12.2	1.9	66.4					
28×0	6.4	RAW	100.0							
1/4×28	93.6	-1.90								
28×0	6.4	RAW								
1/4×0	100.0	COMB								
1/4×0	100.0	RAW	100.0	4.9	46.5	21.4	27.2	5379		0.28
1/4×28	82.3	-1.30	0.5	5.5	6.2					
		-1.40	4.2	5.4	7.2					
		-1.50	9.5	5.3	13.6					
		-1.60	12.0	5.4	21.4					
		-1.70	10.9	4.8	31.0					
		-1.80	7.7	4.1	40.2					
		-1.90	6.3	3.9	48.4					
		+1.90	48.9	3.0	71.6					
28×0	17.7	RAW	100.0							
1/4×28		-1.90								
28×0		RAW								
1/4×0		COMB								

CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
1.6		2.9					
44.8		4.3					
64.5		6.3					
73.0		7.9					
79.6		9.8					
84.1		11.3					
87.8	4.7	12.6	29.7	53.0	10,425		0.26
100.0		19.2					
100.0	6.8	17.5	30.1	45.6	9817		0.24
82.2	4.7	12.6	29.7	53.0	10,425		0.26
6.4	6.8	17.5	30.1	45.6	9817		0.24
88.6	4.9	13.0	29.7	52.5	10,381		0.26
0.5		6.2					
4.7		7.1					
14.2		11.4					
26.2		16.0					
37.1		20.4					
44.8		23.8					
51.1	N.S.S.	26.8	N.S.S.	N.S.S.	N.S.S.		N.S.S.
100.0		48.7					
100.0	5.3	41.0	23.8	29.9	6497		0.27
42.1	N.S.S.	26.8	N.S.S.	N.S.S.	N.S.S.		N.S.S.
17.7	5.3	41.0	23.8	29.9	6497		0.27
59.8	-	31.0	-	-	-		-

CUMULATIVE SAMPLE VALUES (CASE I) THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
3.17	80.7	-	16.7	-	-	-		-

CUMULATIVE SAMPLE VALUES (CASE II) THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III) THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER ASH FUSION (°F) H.G.I.	S.G.	IDT RO	ST	HT	FT
48					

LOCATION MAP

TN

SCALE:

COORDINATES: 4,950 m W., 9,650 m N. OF SE. CORNER CL. 88
ELEVATION: APPROX. 650 m A.M.S.L.
DIP: -90° BEARING: N.A.
CORE SIZE: NQ & BQ CASING HW 140.2 NW 30.68 BW 49.38

BITS USED: J.K. SMIT COMBINATION & TRICONES
MUD USED: 21 BAGS TROL, 68 BAGS QEL, 39 GALS POLY 330, 1 BAG QUICK SEAL
m. LEFT IN HOLE: NIL m.

DATE START: AUGUST 28, 1980 FINISH: SEPTEMBER 7, 1980
DRILLER: E. CARON DIAMOND DRILLING OVERALL RECOVERY: 81%
TESTS: NIL
SAMPLED BY: O. CULLINGHAM DATE: SEPTEMBER 7, 80 ANALYZED BY: BIRTLY COAL & MINERALS TESTING

PAN OCEAN OIL LTD.
MINERALS DIVISION - COAL
LOGGED BY: O. CULLINGHAM DATE: SEPTEMBER 7, 1980
SIGNED:

DRILLHOLE NO. GR-80-24
SHEET 1 OF 1

GEOLOGICAL LOG — SCALE: 1:500

DEPTH (m)	THICKNESS (m)	DESCRIPTION
	34.14	OVERBURDEN - RUBBLE, BOULDERS & PEBBLES OF QUARTZITE, CHERT & MINOR LIMESTONE, RARE LIMESTONE BELOW 20m.
34.14	5.79	SANDSTONE & CONGLOMERATIC SANDSTONE - Fe STAINED, COARSE GRAINED TO GRANULE CONGLOMERATIC
39.93	99.06	CONGLOMERATE - LARGE PEBBLE, WHITE TO BLACK WITH SOME GREEN, QUARTZITE & CHERT, BLADE, ROLLER & SUBSPHERICAL WELL ROUNDED PEBBLES. FEW CROSS BEDS & INTERBEDS OF SANDSTONE. BEDDING @ 50° TO 55° TO C/A.
138.99	1.86	MUDSTONE - IN PART SILTY.
140.85	14.03	CONGLOMERATE - AS FOR 39.93 - 138.99
154.88	3.57	No. 1 SEAM HORIZON
158.45	9.25	MUDSTONE - MEDIUM DARK GRAY, IN PART CARBONACEOUS, STRUCTURELESS, BEDDING @ 50° TO 55° TO C/A
167.70	19.75	CONGLOMERATE - SMALL TO MEDIUM PEBBLE, WHITE TO BLACK QUARTZ & CHERT, RARE GREEN CHERT PEBBLES, FEW THIN INTERBEDS OF SANDSTONE. BEDDING 50° TO 55° TO C/A.
187.45	8.79	MUDSTONE/SILTSTONE INTERBEDS - MEDIUM TO MEDIUM DARK GRAY, SILTSTONE IS LAMINATED @ 50° TO C/A.
196.22	2.57	No. 2 SEAM HORIZON
198.79	4.51	MUDSTONE - DARK GRAY, IN PART CARBONACEOUS.
203.30		T.D. 203.30 m

DETAILS OF COAL SEAMS — SCALE: 1:50

DEPTH (m)	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)
			No. 1 SEAM HORIZON		0.57
			ROOF - CONGLOMERATE GOOD		
154.88	0.15		COAL - DULL TO VITREOUS, SOFT.	A0336	
155.03	0.15	56	CARBONACEOUS TO COALY MUDSTONE		
155.18	0.27		LOST CORE		
155.45	0.60		MUDSTONE - DULL, BLOCKY, CARBONACEOUS, MINOR COAL AT TOP	A0337	0.60
156.05	0.54	93	COAL - VITREOUS TO BRIGHT HARD, BLOCKY.		
156.59	0.08		LOST CORE		
156.67	0.55	90	COAL - DULL TO BRIGHT, CARBONACEOUS MUDSTONE PARTINGS AT BASE		
157.16	0.06		LOST CORE	A0338	0.76
157.22	0.76	84	COAL - DULL TO BRIGHT, FEW PARTINGS OF CARBONACEOUS MUDSTONE 0.05 m PARTING MUDSTONE IN CENTRE		
157.28					
157.58					
157.63					
158.04	0.15		LOST CORE		
158.19	0.15		COAL - VITREOUS		
158.34	0.11		SHALY COAL - DULL		
158.45		85	FLOOR - CARBONACEOUS MUDSTONE & MUDSTONE, POOR		0.45
			No. 2 SEAM HORIZON		
196.22		95	ROOF - MUDSTONE, FAIR		
	2.57	96	COAL - DULL TO VITREOUS, FEW BANDS OF BRIGHT COAL, THIN PARTINGS LESS THAN 2cm OF CARBONACEOUS MUDSTONE. COAL IS LIGHT IN WEIGHT & HAS A DULL DENSE SHEEN.	A0339	2.57
198.79		100	FLOOR - MUDSTONE, POOR		

SIZE		WEIGHT PERCENT										CUMULATIVE WEIGHT PERCENT							
DIAMETER	WT %	SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S		YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
1/4×0	100.0	RAW	100.0	2.9	61.3	18.6	17.2			0.25									
1/4×28	79.6	-1.30	0.3	5.2	3.0							0.3		3.0					
		-1.40	5.1	4.2	4.0							5.4		3.9					
		-1.50	1.9	4.2	10.8							7.3		5.7					
		-1.60	2.2	3.9	24.3							9.5		10.0					
		-1.70	3.5	3.1	37.0							13.0		17.3					
		-1.80	5.7	2.9	44.6							18.7		25.6					
		-1.90	12.0	2.6	53.4							30.7		36.5					
		+1.90	69.3	2.1	75.2							100.0		63.3					
28×0	20.4	RAW	100.0									100.0	3.6	49.5	22.2	24.7			0.33
1/4×28	79.6	-1.90																	
28×0	20.4	RAW																	
1/4×0	100.0	COMB.																	
1/4×0	100.0	RAW	100.0	3.2	72.0	14.9	9.9			0.11									
1/4×28	93.4	-1.30																	
		-1.40	0.3	4.7	6.5							0.3		6.5					
		-1.50	0.1	3.3	12.1							0.4		7.9					
		-1.60	0.1	4.4	20.4							0.5		10.4					
		-1.70	0.1	4.5	26.8							0.6		13.1					
		-1.80	1.3	3.4	41.9							1.9		32.8					
		-1.90	3.4	3.5	49.4							5.3		43.5					
		+1.90	94.7	1.4	74.8							100.0		73.1					
28×0	6.6	RAW	100.0									100.0	3.4	68.6	14.7	13.3			0.14
1/4×28	93.4	-1.90																	
28×0	6.6	RAW																	
1/4×0	100.0	COMB.																	
1/4×0	100.0	RAW	100.0	6.6	29.9	27.8	35.7	7733		0.29									
1/4×28	93.9	-1.30	1.1	4.2	4.1							1.1		4.1					
		-1.40	26.7	4.7	5.6							27.8		5.5					
		-1.50	18.2	4.2	14.5							46.0		9.1					
		-1.60	10.2	3.8	25.3							56.2		12.0					
		-1.70	10.5	3.4	35.7							66.7		15.8					
		-1.80	6.1	3.2	42.4							72.8		18.0					
		-1.90	6.3	2.9	51.4							79.1	4.8	20.6	30.2	44.5	9314		0.32
		+1.90	20.9	2.1	69.3							100.0		30.8					
28×0	6.1	RAW	100.0									100.0	6.7	35.3	29.2	38.8	8285		0.30
1/4×28	93.9	-1.90										74.3	4.8	20.6	30.2	44.5	9314		0.32
28×0	6.1	RAW										6.1	6.7	35.3	29.2	38.8	8285		0.30
1/4×0	100.0	COMB.										80.4	4.9	21.7	30.1	44.1	9236		0.32
1/4×0	100.0	RAW	100.0	6.2	33.9	27.0	32.9	7306		0.28									
1/4×28	95.7	-1.30	0.5	4.0	6.4							0.5		6.4					
		-1.40	9.5	4.1	8.5							10.0		8.4					
		-1.50	15.0	3.6	13.4							25.0		11.4					
		-1.60	14.5	3.5	23.3							39.5		15.8					
		-1.70	17.3	2.9	33.6							56.8		21.2					
		-1.80	13.1	2.7	41.8							69.9		25.1					
		-1.90	9.9	2.4	49.8							79.8	4.0	28.1	28.0	40.3	8223		0.35
		+1.90	20.2	1.8	63.6							100.0		35.3					
28×0	4.3	RAW										100.0	6.1	30.3	27.9	35.7	7609		0.33
1/4×28	95.7	-1.90										76.4	4.0	28.1	28.0	40.3	8223		0.35
28×0	4.3	RAW										4.3	6.1	30.3	27.9	35.7	7609		0.33
1/4×0	100.0	COMB.										80.7	4.1	28.2	28.0	40.1	8190		0.35

CUMULATIVE SAMPLE VALUES (CASE I)									
THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
24	80.4	4.9	21.7	30.1	44.1	9236		0.32

CUMULATIVE SAMPLE VALUES (CASE II)									
THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III)									
THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
2.57	80.7	4.1	28.2	28.0	40.1	8190		0.35

OTHER						
ASH FUSION (°F)						
H.G.I.	S.G	I.D.T. OR	S.T.	H.T	F.T.	
41						
38						

LOCATION MAP

TN

SCALE:

COORDINATES: 10,650 m N, 8,300 m W } SE CORNER CL 77
ELEVATION: 686.18 m amsl
DIP: 90° BEARING: NA
CORE SIZE: HQ,NQ+BQ CASING HW 36.6 m NW 76.5 BW 325.2

BITS USED: JK SMIT COMBINATION
MUD USED: 168 GALS POLY DRIL, 81 BAGS GEL; 15 BAGS QUICK TROL; 2 QUICK SEAL
LEFT IN HOLE: HW NIL m. BW 164.59 m NW NIL m

DATE START: AUGUST 30, 1980 FINISH: SEPTEMBER 14, 1980
DRILLER: E. CARON DIAMOND DRILLING OVERALL RECOVERY: 93%
TESTS:
SAMPLED BY: O. CULLINGHAM DATE: SEPT., 1980 ANALYZED BY: BIRTLEY COAL & MINERALS TESTING

PAN OCEAN OIL LTD.
MINERALS DIVISION - COAL

DRILLHOLE NO. SC-80-25
SHEET 1 OF 5

LOGGED BY: O. CULLINGHAM DATE: SEPTEMBER 15, 1980
SIGNED:

GEOLOGICAL LOG — SCALE: 1:500

DETAILS OF COAL SEAMS — SCALE: 1:50

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
0		72.54	OVERBURDEN - PEBBLES & BOULDERS, PREDOMINATELY QUARTZITE WITH CHERT; MINOR LIMESTONE & SCHIST. FEW THIN INTERVALS SANDSTONE
			PROBABLY WEATHERED CONGLOMERATE; HAS APPEARANCE OF DISSAGREGATED CONGLOMERATE
72.54			CONGLOMERATE, LARGE PEBBLE; WHITE TO BLACK WITH FEW GREEN. QUARTZITE & CHERT, BLADE, ROLLER & PREDOMINATELY SUB SPHERICAL; WELL ROUNDED; MODERATELY WELL-SORTED. FEW THIN SANDSTONE INTERBEDS & CROSS BEDS
151.26		8.39	NO. 1 SEAM HORIZON
159.65		5.98	MUDSTONE - MEDIUM TO DARK BROWNISH GRAY, FRAGMENTAL TO BLOCKY, MINOR CARBONACEOUS MATERIAL.
165.5		1.90	SANDSTONE - VERY FINE TO MEDIUM GRAINED.
167.4		28.36	CONGLOMERATE - MEDIUM TO LARGE PEBBLE, WELL SORTED; RARE GREEN CHERT PEBBLES, QUARTZITE & CHERT PREDOMINATE
195.56		0.55	MUDSTONE/SANDSTONE
196.11		9.64	NO. 2 SEAM HORIZON
205.75		5.78	MUDSTONE, MEDIUM TO DARK GRAY CARBONACEOUS AT TOP OF INTERVAL; SILTY AT BASE
211.53		1.46	SANDSTONE - VERY FINE TO MEDIUM GRAY, SALT & PEPPER.
212.99		20.51	CONGLOMERATE - MEDIUM TO LARGE PEBBLE; MODERATELY WELL SORTED; FEW THIN INTERBEDS OF SANDSTONE
233.5		3.83	NO. 3 SEAM HORIZON
237.33		11.34	MUDSTONE - SEE SHEET 4

No. 1 SEAM HORIZON

DEPTH (m)	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)
			ROOF - CONGLOMERATE - GOOD		
151.26					
151.60	0.34	100%	COAL - VITREOUS TO BRIGHT		
	0.45		MUDSTONE - CARBONACEOUS TO COALY		
152.05				AO340	1.31
	0.52	100%	COAL - VITREOUS TO BRIGHT, RARE PARTINGS CARBONACEOUS MUDSTONE.		
152.57					
152.62	0.53		MUDSTONE - DULL; CARBONACEOUS, 0.05 SHALY COAL AT TOP	AO341	0.53
153.10					
	1.50	100%	COAL - VITREOUS & BRIGHT, MINOR PYRITE THROUGHOUT		
154.60					
	0.94	100%	COAL - VITREOUS & BRIGHT, FEW PARTINGS DULL, SHALY COAL.	AO342	2.44
155.54					
	0.53	100%	COAL - DULL TO VITREOUS		
156.07					
156.19	0.12		SHALY COAL - DULL, DENSE		
	0.35		COAL - VITREOUS TO BRIGHT		
156.54					
156.67	0.13	100%	MUDSTONE		
	0.96		COAL - VITREOUS TO BRIGHT.	AO343	
157.63					
	0.33		COAL - VITREOUS TO BRIGHT		
157.96					
158.04	0.08		MUDSTONE - DULL; CARBONACEOUS		
158.27	0.23		COAL - VITREOUS TO BRIGHT		
158.49	0.22		COALY MUDSTONE; MUDSTONE; AND SHALY COAL	AO344	
158.62	0.08				
158.87		100%			
	0.37		COAL - DULL TO BRIGHT		
159.04					
159.19	0.15		COALY MUDSTONE	AO345	
	0.13		COAL - VITREOUS TO BRIGHT		
	0.08				
159.52	0.12		FLOOR - MUDSTONE POOR		

No. 2 SEAM HORIZON

DEPTH (m)	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)
			ROOF - CONGLOMERATE		
195.56			INTERMEDIATE ROOF - SANDSTONE & MUDSTONE		
196.11					
	1.17		COAL - BRIGHT, BANDED; BLOCKY & CONCHOIDAL FRACTURE 0.03 m MUDSTONE PARTING AT 196.18 TO 196.21		
197.28					
197.42	0.14		SHALY COAL		
	1.14	100%	COAL - BRIGHT, BANDED; BANDED AT 85° TO CIA.		
198.56					
	0.34		COALY MUDSTONE & SHALEY COAL		
198.90					
	0.83		COAL - BRIGHT, BANDED; BLOCKY & CONCHOIDAL FRACTURE 0.03 MUDSTONE BAND AT 199.73 TO 199.76		
199.73	0.03				
199.76					
	0.48	100%			
200.24					
	0.41		COALY MUDSTONE		
200.65					
200.77	0.12		COAL - BRIGHT		
	0.30		COALY MUDSTONE		
201.07					
	0.29		MUDSTONE; CARBONACEOUS		
201.36					
	0.30		COAL - VITREOUS & BRIGHT		
201.66		100%			
	0.48		MUDSTONE - DARK GRAY BLOCKY		
202.14					
	0.43		COAL - MOSTLY BRIGHT, 0.06 MUDSTONE & COALY MUDSTONE		
202.57					
202.77	0.20		MUDSTONE - DARK GRAY, DULL		
	0.31		COALY MUDSTONE TO SHALY COAL		
203.08					
	0.26		COAL - BRIGHT		
203.34					
203.45	0.11		COALY MUDSTONE		
	0.36		COAL - MOSTLY BRIGHT, TWO MUDSTONE BANDS OF 0.02 m & 0.04 m		
203.81					
203.91	0.14		SHALEY COAL - DULL		
	0.30		COAL - MOSTLY BRIGHT		
204.25					
	0.28		SHALEY COAL & COALY MUDSTONE; CONTAINS 0.14 m BRIGHT COAL		
204.53	0.04				
	0.42	100%	COAL - BRIGHT		
204.95					
	0.25		COAL/SHALY COAL - DULL TO VITREOUS		
205.20					
	0.20		COAL - VITREOUS TO BRIGHT		
205.40					
	0.19		COAL - DULL TO VITREOUS		
205.59					
205.70	0.11		COALY MUDSTONE		
205.75	0.05		FLOOR - MUDSTONE POOR		

SAMPLE NUMBER	DIA-METER	WT %	SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
	1/4×0	100.0	RAW	100.0	4.7	51.1	22.5	21.7			0.25
	1/4×28	92.1	-1.30	0.9	4.6	3.8	40.6	51.0	11,807		0.28
			-1.40	11.2	3.7	5.1	37.1	54.1	11,459		0.32
			-1.50	8.8	4.1	9.6	33.0	53.3	10,685		0.29
			-1.60	5.9	3.9	14.9	31.0	50.2	10,208		0.23
			-1.70	3.0	4.0	26.0	29.1	40.9	8,386		0.31
			-1.80	2.3	3.4	35.4	26.7	34.5	7,328		0.28
			-1.90	4.5	3.5	45.5	23.3	27.7	5,159		0.52
			+1.90	63.4	1.7	71.5	-	-	-		-
	28×0	7.9	RAW								
AO340	1/4×28	92.1	-1.90								
	28×0	7.9	RAW								
	1/4×0	100.0	COMB								
AO341	1/4×0	100.0	RAW	100.0	2.7	79.3	14.1	3.9			0.12
	1/4×28	91.5	-1.30	0.1	5.6	9.4					
			-1.40	0.2	5.2	6.2					
			-1.50	0.1	5.5	9.1					
			-1.60	0.1	5.1	20.0					
			-1.70	0.1	4.4	31.5					
			-1.80	0.5	3.4	44.4					
			-1.90	0.9	2.6	54.0					
			+1.90	98.0	1.7	81.3					
	28×0	8.5	RAW								
	1/4×28	91.5	-1.90								
	28×0	8.5	RAW								
	1/4×0	100.0	COMB								
	1/4×0	100.0	RAW	100.0	7.9	19.7	31.5	40.9	8924		0.33
	1/4×28	94.0	-1.30	1.6	7.2	3.6	36.3	52.9	11,596		0.30
			-1.40	52.2	4.6	4.3	37.1	54.0	11,851		0.31
			-1.50	13.2	4.6	10.6	33.8	51.0	10,629		0.34
			-1.60	5.7	3.8	22.6	32.6	41.0	8,833		0.44
			-1.70	4.1	3.6	31.9	24.3	35.2	7,706		0.46
			-1.80	3.6	3.4	39.7	26.2	30.7	6,204		0.46
			-1.90	4.2	3.7	46.4	23.2	26.7	5,350		0.58
			+1.90	15.4	1.8	67.2	-	-	-		-
	28×0	6.0	RAW								
	1/4×28	94.0	-1.90								
	28×0	6.0	RAW								
	1/4×0	100.0	COMB								
	1/4×0	100.0	RAW	100.0	6.3	38.8	27.3	27.6	6230		0.21
	1/4×28	94.8	-1.30	1.6	5.2	4.3	39.7	50.8	11,746		0.35
			-1.40	20.7	5.1	4.7	37.8	52.4	11,389		0.39
			-1.50	7.1	4.9	10.1	36.1	48.9	10,591		0.38
			-1.60	4.3	4.4	22.1	32.2	41.3	8,916		0.28
			-1.70	6.0	4.1	32.4	29.4	34.1	7,496		0.23
			-1.80	7.5	3.5	41.1	26.1	29.3	6,080		0.18
			-1.90	11.2	3.0	50.0	23.8	23.2	4,852		0.14
			+1.90	41.6	2.3	65.3	-	-	-		-
	28×0	5.2	RAW								
	1/4×28	94.8	-1.90								
	28×0	5.2	RAW								
	1/4×0	100.0	COMB								
	1/4×0	100.0	RAW	100.0	7.8	20.8	32.2	39.2	8881		0.18
	1/4×28	94.9	-1.30	1.9	7.5	4.2	36.7	51.6	11,124		0.28
			-1.40	54.8	4.3	4.6	38.5	52.6	11,436		0.28
			-1.50	12.3	4.3	13.1	36.3	46.3	10,332		0.26
			-1.60	4.6	3.9	23.4	33.2	39.5	8,653		0.24
			-1.70	3.4	3.6	34.7	28.9	32.8	7,137		0.19
			-1.80	2.5	3.4	43.5	26.3	26.8	5,973		0.16
			-1.90	4.2	2.9	51.6	23.2	22.3	4,658		0.13
			+1.90	16.3	2.2	71.1	-	-			-
	28×0	5.1	RAW								
	1/4×28	94.9	-1.90								
	28×0	5.1	RAW								
	1/4×0	100.0	COMB								
	1/4×0	100.0	RAW	100.0	3.3	66.1	16.8	13.8			0.10
	1/4×28	95.7	-1.30	0.6	5.8	3.6	35.4	55.2	11,576		0.32
			-1.40	2.4	4.8	5.9	34.5	54.5	11,253		0.35
			-1.50	2.2	4.8	11.6	33.5	50.1	10,520		0.33
			-1.60	1.6	4.4	29.4	29.8	36.4	7,841		0.24
			-1.70	2.2	3.7	40.1	26.9	29.3	6,898		0.19
			-1.80	1.9	3.7	48.6	22.8	24.9	4,995		0.15
			-1.90	4.6	2.9	55.9	20.3	20.9	4,019		0.13
			+1.90	84.5	2.3	73.4	-	-	-		-
	28×0	4.3	RAW								
	1/4×28	95.7	-1.90								
	28×0	4.3	RAW								
	1/4×0	100.0	COMB								
	1/4×0	100.0	RAW	100.0	5.4	31.7	29.5	33.4	7588		0.23
	1/4×28	94.7	-1.30	0.1	5.2	3.3	43.5	48.0	11,922		0.28
			-1.40	30.4	4.8	9.5	37.5	52.2	11,270		0.30
			-1.50	13.1	4.2	14.1	36.1	45.6	10,515		0.30
			-1.60	6.7	3.7	24.9	32.9	38.5	8,904		0.24
			-1.70	9.9	3.3	36.9	28.5	31.3	7,278		0.19
			-1.80	5.7	2.8	44.4	25.5	27.3	6,255		0.16
			-1.90	5.5	2.7	52.1	23.0	22.2	5,062		0.13
			+1.90	28.6	1.9	65.8	-	-	-		-
	28×0	5.3	RAW								
	1/4×28	94.7	-1.90								
	28×0	5.3	RAW								
	1/4×0	100.0	COMB								

CUMULATIVE WEIGHT PERCENT

YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
0.9	4.6	3.8	40.6	51.0	11,807		0.28
12.1	3.8	5.0	37.4	53.9	11,485		0.32
20.9	3.9	6.9	35.5	53.6	11,148		0.29
26.8	3.9	8.7	34.5	52.9	10,941		0.28
29.8	3.9	10.4	34.0	51.7	10,684		0.28
32.1	3.9	12.2	33.5	50.4	10,443		0.28
36.6	3.8	16.3	32.2	47.6	9,794		0.31
100.0	2.5	51.3	-	-	-		-
100.0	4.6	48.1	23.0	24.3			0.39
33.7	3.8	16.3	32.2	47.6	9794		0.31
7.9	4.6	48.1	23.0	24.3	-		0.39
41.6	4.0	22.3	30.5	43.2	7934		0.33
0.1		9.4					
0.3		7.3					
0.4		7.7					
0.5		10.2					
0.6		13.7					
1.1		27.7					
2.0		39.5					
100.0	1.7	80.5	-	-	-		-
100.0	2.9	75.7	15.2	6.2			0.39
6.95	69.4	4.5	14.9	34.4	46.2	10,052	0.32
1.6	7.2	3.6	36.3	52.9	11,596		0.30
53.8	4.7	4.3	37.1	54.0	11,843		0.31
67.0	4.7	5.5	36.4	53.4	11,604		0.32
72.7	4.6	6.9	36.1	52.4	11,367		0.33
76.9	4.5	8.2	35.8	51.5	11,190		0.33
80.4	4.5	9.6	35.3	50.6	10,967		0.34
84.6	4.5	11.4	34.7	49.4	10,688		0.35
100.0	4.0	20.0	-	-	-		-
100.0	7.6	19.4	32.0	41.0	9034		0.76
79.5	4.5	11.4	34.7	49.4	10,688		0.35
6.0	7.6	19.4	32.0	41.0	9,034		0.76
85.5	4.7	12.0	34.5	48.8	10,572		0.38
1.6	5.2	4.3	39.7	50.8	11,746		0.35
22.3	5.1	4.7	37.9	52.3	11,415		0.39
29.4	5.1	6.0	37.5	51.5	11,216		0.39
33.7	5.0	8.0	36.8	50.2	10,922		0.37
39.7	4.8	11.7	35.7	47.7	10,404		0.35
47.2	4.6	16.4	34.2	44.8	9,717		0.32
58.6	4.3	22.8	32.2	40.7	8,784		0.29
100.0	3.5	40.5	-	-	-		-
100.0	6.6	35.1	27.5	30.8	6748		0.34
55.4	4.3	22.8	32.2	40.7	8,784		0.29
5.2	6.6	35.1	27.5	30.8	6,748		0.34
60.6	4.5	23.9	31.8	39.9	8,609		0.29
3.98	68.7	4.4	17.2	34.3	44.2	9655	0.27
1.9	7.5	4.2	36.7	51.6	11,124		0.28
56.7	4.4	4.6	38.4	52.6	11,426		0.28
69.0	4.4	6.1	38.1	51.5	11,231		0.28
73.6	4.4	7.2	37.8	50.7	11,070		0.27
77.0	4.3	8.4	37.4	49.9	10,896		0.27
79.5	4.3	9.5	37.0	49.2	10,741		0.27
83.7	4.2	11.6	36.3	47.8	10,436		0.26
100.0	3.9	21.3	-	-	-		-
100.0	7.7	19.5	32.3	40.5	9533		0.31
79.4	4.2	11.6	36.3	47.8	10,436		0.26
8.1	7.7	19.5	32.3	40.5	9,533		0.31
84.5	4.4	12.1	36.1	47.4	10,382		0.26
2.85	71.9	4.3	14.9	35.1	45.6	10,005	0.26
0.6	5.8	3.6	35.4	55.2	11,576		0.32
3.0	5.0	5.4	34.7	54.6	11,318		0.34
5.2	4.9	8.0	34.2	52.7	10,980		0.34
6.8	4.8	13.1	33.2	48.9	10,242		0.32
9.0	4.5	19.7	31.6	44.0	9,424		0.28
10.9	4.4	24.7	30.1	40.8	8,652		0.26
15.5	3.9	34.0	27.2	34.9	7,277		0.22
100.0	2.6	67.3	-	-	-		-
100.0	3.5	61.8	17.9	16.8			0.63
14.8	3.9	34.0	27.2	34.9	7,277		0.22
4.3	3.5	61.8	17.9	16.8	-		0.63
19.1	3.8	40.3	25.1	30.8	5,642		0.31
1.25	55.7	4.2	20.6	33.2	42.2	9,273	0.26
0.1	5.2	3.3	43.5	48.0	11,922		0.28
30.5	4.8	5.5	37.5	52.2	11,272		0.30
43.6	4.6	8.1	37.1	50.2	11,045		0.30
50.3	4.5	10.3	36.5	48.7	10,760		0.29
60.2	4.3	14.7	35.2	45.8	10,187		0.28
65.9	4.2	17.3	34.4	44.2	9,847		0.27
71.4	4.1	19.9	33.5	42.5	9,478		0.25
100.0	3.7	33.1	-	-	-		-
100.0	5.7	27.3	31.3	35.7	8117		0.25
67.6	4.2	17.3	34.4	44.2	9,847		0.25
5.3	5.7	27.3	31.3	35.7	8,117		0.25
72.9	4.3	18.0	34.2	43.6	9,721		0.25
0.85	72.9	4.3	18.0	34.2	43.6	9,721	0.25

CUMULATIVE SAMPLE VALUES (CASE I)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
8.26	64.9	4.5	15.7	34.0	45.9	9837		0.32
6.95	69.4	4.5	14.9	34.4	46.2	10,052		0.32
6.42	75.1	4.5	14.9	34.4	46.2	10,052		0.32
3.98	68.7	4.4	17.2	34.3	44.2	9655		0.27
2.85	71.9	4.3	14.9	35.1	45.6	10,005		0.26
1.25	55.7	4.2	20.6	33.2	42.2	9,273		0.26
0.85	72.9	4.3	18.0	34.2	43.6	9,721		0.25

CUMULATIVE SAMPLE VALUES (CASE II)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER

LOCATION MAP

TN

SCALE:

COORDINATES:
ELEVATION:
DIP: BEARING:
CORE SIZE: CASING

BITS USED:
MUD USED:
m. LEFT IN HOLE: m.

DATE START:
DRILLER:
TESTS:
SAMPLED BY:

FINISH:
OVERALL RECOVERY:
DATE: ANALYZED BY:

PAN OCEAN OIL LTD.
MINERALS DIVISION - COAL

LOGGED BY: DATE:
SIGNED:

DRILLHOLE NO. SC-80-25
SHEET 2 OF 5

GEOLOGICAL LOG — SCALE: 1:500

DETAILS OF COAL SEAMS — SCALE: 1:50

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
		72.54	OVERBURDEN - PEPPLES & BOULDERS, PREDOMINATELY QUARTZITE WITH CHERT, MINOR LIMESTONE & SCHIST. FEW THIN INTERVALS SANDSTONE
			PROBABLY WEATHERED CONGLOMERATE; HAS APPEARANCE OF DISSAGREGATED CONGLOMERATE
72.54			CONGLOMERATE; LARGE PEBBLE; WHITE TO BLACK WITH FEW GREEN, QUARTZITE & CHERT, BLADE, ROLLER & PREDOMINATELY SUB SPHERICAL; WELL ROUNDED; MODERATELY WELL-SORTED. FEW THIN SANDSTONE OUTERBEDS & CROSS BEDS
151.26		8.39	NO. 1 SEAM HORIZON
159.65		5.98	MUDSTONE - MEDIUM TO DARK BROWNISH GRAY, FRAGMENTAL TO BLOCKY, MINOR CARBONACEOUS MATERIAL
165.5		1.90	SANDSTONE - VERY FINE TO MEDIUM GRAINED
167.4		28.16	CONGLOMERATE - MEDIUM TO LARGE PEPPLE, WELL SORTED, RARE GREEN CHERT PEPPLES, QUARTZITE & CHERT PREDOMINATE
195.56		0.55	MUDSTONE/SANDSTONE
196.11		9.64	NO. 2 SEAM HORIZON
205.75		5.78	MUDSTONE, MEDIUM TO DARK GRAY, CARBONACEOUS AT TOP OF INTERVAL, SILTY AT BASE
211.53		1.46	SANDSTONE - VERY FINE TO MEDIUM GRAY, SALT & PEPPER
212.99		20.51	CONGLOMERATE - MEDIUM TO LARGE PEPPLE, MODERATELY WELL SORTED; FEW THIN INTERBEDS OF SANDSTONE
233.5		3.83	NO. 3 SEAM HORIZON
237.33		11.34	MUDSTONE - SEE SHEET 2

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)
				No. 1 SEAM HORIZON		
				ROOF - CONGLOMERATE - GOOD		
151.26						
151.60		0.34	100%	COAL - VITREOUS TO BRIGHT		
		0.45		MUDSTONE - CARBONACEOUS TO COALY		
152.05		0.52	100%	COAL - VITREOUS TO BRIGHT; RARE PARTINGS CARBONACEOUS MUDSTONE.		
152.57						
152.62		0.53		MUDSTONE - DULL; CARBONACEOUS, 0.05 SHALY COAL AT TOP		
153.10		1.50	100%	COAL - VITREOUS & BRIGHT, MINOR PYRITE THROUGHOUT		
154.60		0.94	100%	COAL - VITREOUS & BRIGHT, FEW PARTINGS DULL, SHALY COAL		
155.54		0.53	100%	COAL - DULL TO VITREOUS		
156.07		0.12		SHALY COAL - DULL - DENSE		
156.19		0.35		COAL - VITREOUS TO BRIGHT		
156.54		0.13	100%	MUDSTONE		
156.67		0.96		COAL - VITREOUS TO BRIGHT		2.45
157.63		0.33		COAL - VITREOUS TO BRIGHT		
157.96		0.08		MUDSTONE - DULL, CARBONACEOUS		
158.04		0.23		COAL - VITREOUS TO BRIGHT		
158.27		0.22		COALY MUDSTONE, MUDSTONE, AND SHALY COAL		
158.49		0.08				
158.57		0.37	100%	COAL - DULL TO BRIGHT		
159.04		0.15		COALY MUDSTONE		
159.19		0.13		COAL - VITREOUS TO BRIGHT		
159.52		0.08				
				FLOOR - MUDSTONE FLOOR		0.34
				No. 2 SEAM HORIZON		
				ROOF - CONGLOMERATE		
195.56				INTERMEDIATE ROOF - SANDSTONE & MUDSTONE	A0347	1.24
196.11		1.17		COAL - BRIGHT, BANDED, BLOCKY & CONCHOIDAL FRACTURE 0.03 m MUDSTONE PARTING AT 196.16 TO 196.21	A0348	
197.28		0.14		SHALY COAL		
197.42		1.14	100%	COAL - BRIGHT, BANDED, BANDED AT 85° TO CIA		0.83
198.56		0.34		COALY MUDSTONE & SHALEY COAL	A0349	
198.90		0.83		COAL - BRIGHT, BANDED; BLOCKY & CONCHOIDAL FRACTURE 0.03 MUDSTONE BAND AT 199.73 TO 199.76		
199.73		0.03			A0350	0.29
199.76		0.48	100%			
200.24		0.41		COALY MUDSTONE		
200.65		0.12		COAL - BRIGHT	A0351	
200.77		0.30		COALY MUDSTONE		
201.07		0.29		MUDSTONE; CARBONACEOUS		
201.36		0.30	100%	COAL - VITREOUS & BRIGHT	A0352	0.30
201.66		0.48		MUDSTONE - DARK GRAY BLOCKY		
202.14		0.43		COAL - MOSTLY BRIGHT, 0.06 MUDSTONE & COALY MUDSTONE	A0353	
202.57		0.20		MUDSTONE - DARK GRAY, DULL		
202.77		0.31	100%	COALY MUDSTONE TO SHALY COAL		
203.08		0.26		COAL - BRIGHT		
203.34		0.11		COALY MUDSTONE		
203.45		0.36		COAL - MOSTLY BRIGHT, TWO MUDSTONE BANDS OF 0.02 m & 0.04 m		0.48
203.81		0.14		SHALEY COAL - DULL	A0354	
203.91		0.30		COAL - MOSTLY BRIGHT		
204.25		0.08				
204.33		0.14		SHALEY COAL & COALY MUDSTONE, CONTAINS 0.14 m BRIGHT COAL		
204.53		0.08	100%			
		0.42		COAL - BRIGHT		
204.95		0.25		COAL/SHALY COAL - DULL TO VITREOUS		
205.20		0.20		COAL - VITREOUS TO BRIGHT		0.45
205.40		0.19		COAL - DULL TO VITREOUS		
205.59		0.11		COAL - BRIGHT		
205.70		0.05		COALY MUDSTONE		
205.75				FLOOR - MUDSTONE POOR		

SIZE DIAMETER	SIZE WT %	SPEC GRAV	WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
1/4×0	100.0	RAW	100.0	8.0	13.1	34.5	44.4	10005		0.29
1/4×28	94.7	-1.30	73	7.0	30	38.7	51.3	11597		0.41
		-1.40	52.3	5.1	3.9	37.4	53.6	11790		0.32
		-1.50	19.0	3.7	14.0	34.4	47.9	10288		0.27
		-1.60	7.7	2.7	22.5	32.8	42.0	9,130		0.25
		-1.70	3.4	3.1	30.7	30.6	35.6	7,620		0.21
		-1.80	2.1	2.6	44.3	29.4	30.2	6,916		0.23
		-1.90	2.0	2.6	69.0	27.5	25.6	5,928		0.30
		+1.90	6.2	1.5	13.1	-	-	-		-
28×0	5.3	RAW	100.0							
1/4×28	94.7	-1.90								
28×0	5.3	RAW								
1/4×0	100.0	COMB								0.16
1/4×0	100.0	RAW	100.0	4.6	48.7	25.7	21.0			
1/4×28	96.4	-1.30	0.1	5.9	5.6	N.S.S.	N.S.S.	N.S.S.		0.28
		-1.40	0.8	5.7	8.4	34.6	51.3	10,746		0.38
		-1.50	1.9	4.8	15.1	31.7	48.4	10,250		0.31
		-1.60	2.4	4.3	26.2	27.6	41.9	8,408		0.24
		-1.70	24.5	3.9	34.7	25.4	36.0	7,192		0.18
		-1.80	27.1	3.3	41.1	23.4	32.2	6,113		0.15
		-1.90	13.0	3.0	47.5	22.0	27.5	5,222		0.12
		+1.90	30.2	1.1	74.3	-	-	-		-
28×0	3.6	RAW	100.0							
1/4×28	96.4	-1.90								
28×0	3.6	RAW								
1/4×0	100.0	COMB								0.17
1/4×0	100.0	RAW	100.0	8.2	10.9	34.7	46.2	10217		0.25
1/4×28	94.9	-1.30	6.2	6.6	3.5	38.5	51.4	11,737		0.28
		-1.40	61.8	3.5	4.7	38.3	53.5	11,522		0.25
		-1.50	12.8	3.6	12.2	34.4	50.2	10,606		0.21
		-1.60	7.0	3.3	21.5	31.8	43.4	9,051		0.20
		-1.70	4.1	3.1	30.6	31.4	34.9	7,948		0.18
		-1.80	1.8	3.2	36.5	30.0	30.3	6,746		0.15
		-1.90	0.9	2.8	41.9	29.3	26.0	6,035		0.12
		+1.90	5.4	1.4	64.4	-	-	-		-
28×0	5.1	RAW								
1/4×28	94.9	-1.90								
28×0	5.1	RAW								
1/4×0	100.0	COMB								0.15
1/4×0	100.0	RAW	100.0	3.4	64.1	16.3	16.2			
1/4×28	92.7	-1.30	1.1	7.1	3.4	34.2	55.3	11,601		0.27
		-1.40	7.7	4.2	4.0	33.5	58.3	11,870		0.25
		-1.50	3.1	4.6	15.6	30.9	48.9	9,822		0.22
		-1.60	2.9	3.8	29.4	27.8	39.0	7,979		0.17
		-1.70	4.0	3.0	37.4	25.7	33.9	6,970		0.16
		-1.80	4.5	2.6	46.7	22.8	27.9	5401		0.13
		-190	5.7	2.4	55.1	19.7	22.8	4195		0.11
		+1.90	71.0	1.6	79.9	-	-	-		-
28×0	7.3	RAW	100.0							
1/4×28	92.7	-1.90								
28×0	7.3	RAW								
1/4×0	100.0	COMB								0.15
1/4×0	100.0	RAW	100.0	2.1	80.9	10.2	6.8	N.S.S.		0.10
1/4×28	95.5	-1.30	0.1	5.7	4.9	N.S.S.	N.S.S.	N.S.S.		N.S.S.
		-1.40	1.6	5.1	7.4	32.0	55.5	11,105		0.35
		-1.50	1.1	4.8	13.3	30.5	51.4	10,175		0.31
		-1.60	0.5	4.5	24.1	27.6	43.8	8,594		0.26
		-1.70	0.5	3.9	32.8	25.4	37.9	7,793		0.21
		-1.80	0.8	3.2	47.2	21.2	28.4	5,252		0.16
		-1.90	1.3	2.9	54.9	19.6	22.6	4,102		0.13
		+1.90	94.1	1.0	85.5	-	-	-		-
28×0	4.5	RAW								
1/4×28	95.5	-1.90								
28×0	4.5	RAW								
1/4×0	100.0	COMB								0.27
1/4×0	100.0	RAW	100.0	7.2	11.1	35.2	46.5	10736		
1/4×28	95.5	-1.30	100	5.9	3.2	39.3	51.6	12,239		0.28
		-1.40	55.4	4.5	5.0	37.2	53.3	11,405		0.28
		-1.50	16.4	6.6	11.9	32.8	48.7	10,623		0.28
		-1.60	5.0	4.9	24.8	30.4	39.9	8,453		0.23
		-1.70	3.8	3.6	32.8	28.4	35.2	7,871		0.20
		-1.80	1.9	3.5	42.2	25.4	28.9	5,913		0.16
		-1.90	2.3	3.3	48.5	21.9	26.3	5,018		0.14
		+1.90	5.2	2.6	55.0	-	-	-		-
28×0	4.5	RAW								
1/4×28	95.5	-1.90								
28×0	4.5	RAW								
1/4×0	100.0	COMB								0.29
1/4×0	100.0	RAW	100.0	2.2	74.0	16.4	7.4	-		0.08
1/4×28	95.2	-1.30	0.1	5.6	5.8	35.9	52.7	N.S.S.		N.S.S.
		-1.40	0.2	6.2	5.1	34.6	54.1	11,252		0.31
		-1.50	0.2	5.7	14.1	31.9	48.3	9,886		0.28
		-1.60	0.2	5.0	23.1	28.4	43.5	8,727		0.27
		-1.70	0.2	4.6	31.6	25.8	38.0	7,466		0.21
		-1.80	0.7	4.1	40.3	23.1	32.5	6,033		0.14
		-190	1.6	3.6	48.5	20.6	27.3	4,647		0.10
		+190	96.8	1.9	75.2	-	-	-		-
28×0	4.8	RAW	100.0							
1/4×28	95.2	-1.90								
28×0	4.8	RAW								
1/4×0	100.0	COMB								0.26
1/4×0	100.0	RAW	100.0	6.0	23.7	32.2	38.1	8616		
1/4×28	95.1	-1.30	2.8	5.3	3.5	38.0	53.2	12,002		0.37
		-1.40	43.6	5.1	4.1	37.1	53.7	11,849		0.35
		-1.50	8.0	4.7	10.1	35.3	49.9	10,836		0.32
		-1.60	4.4	4.4	21.5	32.4	41.7	8,971		0.25
		-1.70	5.4	3.5	33.5	30.1	32.9	7,773		0.20
		-1.80	6.8	3.2	39.8	28.6	28.4	6,286		0.17
		-1.90	6.3	2.9	47.7	25.9	23.5	5143		0.13
		+1.90	22.7	2.0	60.1	-	-	-		-
28×0	4.9	RAW	100.0							
1/4×28	95.1	-1.90								
28×0	4.9	RAW								
1/4×0	100.0	COMB								0.30

CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
7.3	7.0	3.0	38.7	51.3	11,597		0.41
59.6	5.3	3.8	37.6	53.3	11,766		0.33
78.6	4.9	6.3	36.8	52.0	11,409		0.32
86.3	4.7	7.7	36.4	51.1	11,206		0.31
89.7	4.7	8.6	36.2	50.5	11,070		0.31
91.8	4.6	9.2	36.1	50.1	10,975		0.30
93.8	4.6	10.0	35.9	49.5	10,867		0.30
100.0	4.4	13.7	-	-	-		-
100.0	7.2	13.6	34.7	44.5	9917		0.43
88.8	4.6	10.0	35.9	49.5	10,867		0.30
5.3	7.2	13.6	34.7	44.5	9917		0.43
94.1	4.7	10.2	35.8	49.2	10813		0.31
0.1	5.9	5.6	N.S.S.	N.S.S.	N.S.S.		0.28
0.9	5.7	8.1	34.6	51.3	10,746		0.37
2.8	5.1	12.8	32.6	49.3	10,409		0.33
5.2	4.7	19.0	30.3	45.9	9,485		0.29
29.7	4.0	32.0	26.3	37.7	7593		0.20
56.8	3.7	36.3	24.9	35.1	6887		0.18
69.8	3.6	38.4	24.4	33.7	6577		0.17
100.0	2.8	49.2	-	-	-		-
100.0	4.2	50.2	24.9	20.7	-		0.18
67.3	3.6	38.4	24.4	33.7	6577		0.17
3.6	4.2	50.2	24.9	20.7	-		0.18
70.9	3.6	39.0	24.4	33.0	6243		0.17
6.2	6.6	3.5	38.5	51.4	11,737		0.28
68.0	3.8	4.6	38.3	53.3	11,541		0.25
80.8	3.8	5.8	37.6	52.8	11,393		0.25
87.8	3.7	7.0	37.2	52.1	11,206		0.24
91.9	3.7	8.1	36.9	51.3	11,061		0.24
93.7	3.7	8.6	36.8	50.9	10,978		0.24
94.6	3.7	9.0	36.7	50.7	10,931		0.24
100.0	3.5	12.0	-	-	-		-
100.0	7.8	11.2	34.9	46.1	10183		0.28
89.8	3.7	9.0	36.7	50.7	10,931		0.24
5.1	7.8	11.2	34.9	46.1	10183		0.28
94.9	3.9	9.1	36.6	50.4	10890		0.24
1.1	7.1	3.4	34.2	55.3	11,601		0.27
8.8	4.6	3.9	33.6	57.9	11,836		0.25
11.9	4.6	7.0	32.9	55.6	11,311		0.24
14.8	4.4	11.4	31.9	52.3	10,658		0.23
16.9	4.1	16.9	30.6	48.4	9,873		0.21
18.1	3.8	22.7	29.1	44.4	9,009		0.20
29.0	3.5	29.0	27.2	40.2	8,063		0.18
100.0	2.2	65.1	-	-	-		-
100.0	6.3	60.9	17.4	18.1	-		0.14
26.9	3.5	29.0	27.2	40.2	8063		0.18
7.3	6.3	60.9	17.4	18.1	-		0.14
34.2	4.1	35.8	25.1	35.5	6341		0.17
1.7	7.1	3.4	34.2	55.3	11,601		0.27
8.8	4.6	3.9	33.6	57.9	11,836		0.25
11.9	4.6	7.0	32.9	55.6	11,311		0.24
14.8	4.4	11.4	31.9	52.3	10,658		0.23
16.9	4.1	16.9	30.6	48.4	9,873		0.21
18.1	3.8	22.7	29.1	44.4	9,009		0.20
29.0	3.5	29.0	27.2	40.2	8,063		0.18
100.0	2.2	65.1	-	-	-		-
100.0	6.3	60.9	17.4	18.1	-		0.14
34.2	4.1	35.8	25.1	35.5	6341		0.17
N.S.S.	N.S.S.	N.S.S.	N.S.S.	N.S.S.	N.S.S.		N.S.S.
1.7	5.1	7.3	32.0	55.5	11,105		0.35
2.8	5.0	9.6	31.4	53.8	10,726		0.33
3.3	4.9	11.8	30.8	52.3	10,392		0.32
3.8	4.8	14.6	30.1	50.3	10,041		0.31
4.6	4.5	20.3	28.5	46.4	9190		0.28
5.9	4.1	27.9	26.5	41.1	8049		0.25
100.0	1.2	82.1	-	-	-		-
1000	2.6	74.2	12.6	10.6			0.12
5.63	4.1	27.9	26.5	41.1	8049		0.25
4.5	2.6	74.2	12.6	10.6	-		0.12
10.1	3.4	48.5	20.3	27.6	4475		0.19
10.0	5.9	3.2	39.3	51.6	12,239		0.28
65.4	4.7	4.7	37.5	53.0	11,532		0.28
81.8	5.1	6.2	36.6	52.2	11,351		0.28
86.8	5.1	7.2	36.2	51.5	11,183		0.28
90.6	5.0	8.3	35.9	50.8	11,044		0.27
92.5	5.0	9.0	35.7	50.3	10,938		0.27
94.8	4.9	10.0	35.3	49.7	10,795		0.27
100.0	4.8	12.3	-	-	-		-
100.0	6.4	11.6	34.5	47.5	10588		0.29
90.5	4.9	10.0	35.3	49.7	10,795		0.27
4.5	6.4	11.6	34.5	47.5	10,588		0.29
95.0	5.0	10.1	35.3	49.6	10785		0.27
N.S.S.	5.6	5.8	35.9	52.7	N.S.S.		N.S.S.
0.3	6.0	5.3	35.0	53.6	11,252		0.31
0.5	5.9	8.8	33.8	51.5	10,705		0.30
0.7	5.6	12.9	32.2	49.2	10,140		0.29
0.9	5.4	17.1	30.8	46.7	9545		0.27
1.6	4.8	27.2	27.4	40.5	8008		0.21
3.2	4.2	37.9	24.0	33.9	6327		0.16
100.0	2.0	74.0	-	-	-		-
100.0	2.4	72.5	16.0	9.1	-		0.08
3.05	4.2	37.9	24.0	33.9	6327		0.16
4.8	2.4	72.5	16.0	9.1	-		0.08
7.8	3.1	59.1	19.1	18.7	2457		0.11
2.8	5.3	3.5	38.0	53.2	12,002		0.37
46.4	5.1	4.1	37.1	53.7	11,858		0.35
54.4	5.0	5.0	36.9	53.1	11,708		0.35
58.8	5.0	6.2	36.5	52.3	11,503		0.34
64.2	4.7	8.5	36.0	50.6	11,189		0.33
71.0	4.7	11.5	35.3	48.5	10,719		0.31
77.3	4.6	14.4	34.5	46.5	10,265		0.30
1000	4.0	24.8	-	-	-		-
100.0	5.9	22.2	32.7	39.2	8724		0.27
73.5	4.6	14.4	34.5	46.5	10,265		0.30
4.9	5.9	22.2	32.7	39.2	8,724		0.27
78.4	4.7	14.9	34.4	46.0	10169		0.30

CUMULATIVE SAMPLE VALUES (CASE I)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
2.45	94.1	4.7	10.2	35.8	49.2	10813		0.31
2.79	91.3	4.6	12.9	34.7	47.7	10380		0.30
4.13	92.5	4.4	11.6	35.4	48.6	10553		0.28
4.96	82.8	4.3	13.3	34.7	47.7	10264		0.27
5.25	78.8	4.3	13.5	34.6	47.6	10,223		0.27
5.55	79.7	4.3	13.3	34.6	47.7	10,259		0.27
6.03	74.0	4.3	13.7	34.5	47.4	10,194		0.27
6.46	74.3	4.4	13.8	34.5	47.3	10,192		0.27

CUMULATIVE SAMPLE VALUES (CASE II)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
3.56	70.1	4.4	17.8	32.9	44.9	9620		0.27

CUMULATIVE SAMPLE VALUES (CASE III)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER

LOCATION MAP

TN

SCALE:

COORDINATES:
ELEVATION:
DIP: BEARING:
CORE SIZE: CASING

BITS USED:
MUD USED:
m. LEFT IN HOLE: m.

DATE START: FINISH:
DRILLER: OVERALL RECOVERY:
TESTS:
SAMPLED BY: DATE: ANALYZED BY:

PAN OCEAN OIL LTD.
MINERALS DIVISION - COAL

LOGGED BY: DATE:
SIGNED:

DRILLHOLE NO. SC-80-25
SHEET 3 OF 5

GEOLOGICAL LOG — SCALE: 1:500

DETAILS OF COAL SEAMS — SCALE: 1:50

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
			OVERBURDEN - PEPPLES & BOULDERS, PREDOMINATELY QUARTZITE WITH CHERT, MINOR LIMESTONE & SCHIST. FEW THIN INTERVALS SANDSTONE
72.54		72.54	
			PROBABLY WEATHERED CONGLOMERATE; HAS APPEARANCE OF DISSAGREGATED CONGLOMERATE
72.54			
			CONGLOMERATE; LARGE PEBBLE; WHITE TO BLACK WITH FEW GREEN, QUARTZITE & CHERT, BLADE, ROLLER & PREDOMINATELY SUB SPHERICAL; WELL ROUNDED; MODERATELY WELL-SORTED. FEW THIN SANDSTONE OUTERBEDS & CROSS BEDS
		78.72	
151.26			
		6.39	NO. 1 SEAM HORIZON
159.65			
		5.98	MUDSTONE - MEDIUM TO DARK BROWNISH GRAY, FRAGMENTAL TO BLOCKY, MINOR CARBONACEOUS MATERIAL
165.5			
		1.90	SANDSTONE - VERY FINE TO MEDIUM GRAINED
167.4			
		28.16	CONGLOMERATE - MEDIUM TO LARGE PEBBLE, WELL SORTED, RARE GREEN CHERT PEBBLES, QUARTZITE & CHERT PREDOMINATE
195.56			
196.11		0.55	MUDSTONE / SANDSTONE
		9.64	NO. 2 SEAM HORIZON
205.75			
		5.78	MUDSTONE, MEDIUM TO DARK GRAY, CARBONACEOUS AT TOP OF INTERVAL, SILTY AT BASE
211.53			
212.99		1.46	SANDSTONE - VERY FINE TO MEDIUM GRAY, SALT & PEPPER
		20.51	CONGLOMERATE - MEDIUM TO LARGE PEBBLE, MODERATELY WELL SORTED; FEW THIN INTERBEDS OF SANDSTONE
233.5			
237.33		3.83	NO. 3 SEAM HORIZON
		11.34	MUDSTONE - SEE SHEET 2

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION
				No. 1 SEAM HORIZON
151.26				ROOF - CONGLOMERATE - GOOD
		0.34	100%	COAL - VITREOUS TO BRIGHT
151.60		0.45		MUDSTONE - CARBONACEOUS TO COALY
152.05		0.52	100%	COAL - VITREOUS TO BRIGHT, RARE PARTINGS CARBONACEOUS MUDSTONE.
152.57				
152.62		0.53		MUDSTONE - DULL; CARBONACEOUS, 0.05 SHALY COAL AT TOP
153.10		1.50	100%	COAL - VITREOUS & BRIGHT, MINOR PYRITE THROUGHOUT
154.60		0.94	100%	COAL - VITREOUS & BRIGHT, FEW PARTINGS DULL, SHALY COAL.
155.54		0.53	100%	COAL - DULL TO VITREOUS
156.07		0.12		SHALY COAL - DULL, + PEBBLE
156.19		0.35		COAL - VITREOUS TO BRIGHT
156.54		0.13	100%	MUDSTONE
156.67		0.96		COAL - VITREOUS TO BRIGHT
157.63		0.33		COAL - VITREOUS TO BRIGHT
157.96		0.08		MUDSTONE - DULL; CARBONACEOUS
158.04		0.23		COAL - VITREOUS TO BRIGHT
158.27		0.22		COALY MUDSTONE, MUDSTONE, AND SHALY COAL
158.49		0.08		
158.57		0.37	100%	COAL - DULL TO BRIGHT
159.04		0.15		COALY MUDSTONE
159.19		0.33		COAL - VITREOUS TO BRIGHT
159.52		0.08		
				FLOOR - MUDSTONE FLOOR
				No. 2 SEAM HORIZON
195.56				ROOF - CONGLOMERATE
196.11		1.17		INTERMEDIATE ROOF - SANDSTONE & MUDSTONE
				COAL - BRIGHT, BANDED, BLOCKY & CONCHOIDAL FRACTURE 0.03 m MUDSTONE PARTING AT 196.18 TO 196.21
197.28		0.14		SHALY COAL
197.42		1.14	100%	COAL - BRIGHT, BANDED; BANDED AT 85° TO C/A
198.56		0.34		COALY MUDSTONE & SHALEY COAL
198.90		0.83		COAL - BRIGHT, BANDED, BLOCKY & CONCHOIDAL FRACTURE 0.03 MUDSTONE BAND AT 199.73 TO 199.76
199.73		0.03		
199.76		0.48	100%	
200.24		0.41		COALY MUDSTONE
200.65		0.12		COAL - BRIGHT
200.77		0.30		COALY MUDSTONE
201.07		0.29		MUDSTONE ; CARBONACEOUS
201.36		0.30		COAL - VITREOUS & BRIGHT
201.66		0.48	100%	MUDSTONE - DARK GRAY BLOCKY
202.14		0.43		COAL - MOSTLY BRIGHT, 0.06 MUDSTONE & COALY MUDSTONE
202.57		0.20		MUDSTONE - DARK GRAY, DULL
202.77		0.31	100%	COALY MUDSTONE TO SHALY COAL
203.08		0.26		COAL - BRIGHT
203.34		0.11		COALY MUDSTONE
203.45		0.36		COAL - MOSTLY BRIGHT, TWO MUDSTONE BANDS OF 0.02 m & 0.04 m
203.81		0.14		SHALEY COAL - DULL
203.91		0.30		COAL - MOSTLY BRIGHT
204.25		0.08		SHALEY COAL & COALY MUDSTONE, CONTAINS 0.14 m BRIGHT COAL
204.33		0.14		
204.53		0.08	100%	
204.95		0.42		COAL - BRIGHT
205.20		0.25		COAL/SHALY COAL - DULL TO VITREOUS
205.40		0.20		COAL - VITREOUS TO BRIGHT
205.59		0.19		COAL - DULL TO VITREOUS
205.72		0.11		COALY MUDSTONE
205.75		0.06		FLOOR - MUDSTONE POOR

SAMPLE NUMBER	THICKNESS (m)	DIAMETER	WT %
A0355	0.51		
A0356	2.62		

WEIGHT PERCENT / CUMULATIVE WEIGHT PERCENT

SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
1/4×0 100.0 RAW	100.0	3.2	62.7	19.4	14.7	–		0.10
1/4×28 96.2 -1.30	0.1	5.8	5.4	N.S.S.	N.S.S.	N.S.S.	N.S.S.	
-1.40	0.2	6.0	6.7	33.5	53.8	10,975	0.36	
-1.50	1.7	4.7	11.9	29.6	53.8	10,384	0.26	
-1.60	1.2	4.4	20.3	28.7	46.6	9,105	0.25	
-1.70	3.8	3.4	33.8	26.9	35.9	7,422	0.20	
-1.80	7.1	3.0	42.4	24.9	29.7	5,902	0.15	
-1.90	10.6	2.7	49.6	22.3	25.4	4,823	0.12	
+1.90	75.3	1.9	70.4	–	–	–	–	
28×0 3.8 RAW	100.0							
1/4×28 96.2 -1.90								
28×0 3.8 RAW								
1/4×0 100.0 COMB								
1/4×0 100.0 RAW	100.0	6.8	27.4	29.4	36.4	8046		0.27
1/4×28 93.9 -1.30	2.6	5.2	2.7	39.9	52.2	12,168		0.33
-1.40	35.1	4.9	3.8	37.2	54.1	11,793		0.33
-1.50	12.1	4.2	11.8	34.0	50.0	10,373		0.26
-1.60	7.9	3.5	22.9	31.4	42.2	8,901		0.20
-1.70	6.4	3.2	33.4	27.8	35.6	7,365		0.16
-1.80	6.1	2.7	42.1	26.1	29.1	6,030		0.07
-1.90	5.3	3.4	49.4	22.8	24.4	4,906		0.09
+1.90	24.5	2.1	69.6	–	–	–	–	
28×0 6.1	100.0							
1/4×28 93.9 -1.90								
28×0 6.1 RAW								
1/4×0 100.0 COMB								

CUMULATIVE WEIGHT PERCENT

YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
0.1	5.8	5.4	N.S.S.	N.S.S.	N.S.S.	N.S.S.	
0.3	5.9	6.3	33.5	53.8	10,975	0.36	
2.0	4.9	11.1	30.2	53.8	10,472	0.28	
3.2	4.7	14.5	29.6	51.1	9,960	0.27	
7.0	4.0	25.0	28.1	42.8	8582	0.23	
14.1	3.5	33.8	26.5	36.2	7233	0.19	
24.7	3.2	40.6	24.7	31.6	6198	0.16	
100.0	2.2	63.0	–	–	–		
100.0	3.2	58.9	22.0	15.9	–	0.14	
23.8	3.2	40.6	24.7	31.6	6198	0.16	
3.8	3.2	58.9	22.0	15.9	–	0.14	
27.6	3.2	43.1	24.3	29.4	5345	0.16	
2.6	5.2	2.7	39.9	52.2	12,168	0.33	
32.7	4.9	3.7	37.4	54.0	11,819	0.33	
49.8	4.7	5.7	36.6	53.0	11,468	0.31	
57.7	4.6	8.0	35.9	51.5	11,116	0.30	
64.1	4.4	10.6	35.0	49.9	10,742	0.28	
70.2	4.3	13.3	34.3	48.1	10,332	0.27	
75.5	4.2	15.8	33.5	46.5	9951	0.27	
100.0	3.7	29.0	–	–	–	–	
100.0	6.7	24.6	30.7	38.0	8373	0.25	
70.9	4.2	15.8	33.5	46.5	9951	0.27	
6.1	6.7	24.6	30.7	38.0	8373	0.25	
77.0	4.4	16.5	33.3	45.8	9826	0.27	

CUMULATIVE SAMPLE VALUES (CASE I)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
6.97	70.9	4.3	14.6	34.2	46.8	10,055		0.27
9.59	72.6	4.3	15.2	34.0	46.5	9989		0.27

CUMULATIVE SAMPLE VALUES (CASE II)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
3.13	68.9	4.3	18.2	32.7	44.7	9534		0.26
2.62	77.0	4.4	16.5	33.3	45.8	9826		0.27

CUMULATIVE SAMPLE VALUES (CASE III)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER

GEOLOGICAL LOG – SCALE: 1:500 | DETAILS OF COAL SEAMS – SCALE: 1:50

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
237.33			
		11.34	MUDSTONE - MEDIUM TO DARK GRAY; CARBONACEOUS THROUGHOUT; FEW THIN COAL BANDS.
248.67		1.68	NO. 3 SEAM HORIZON
250.35			MUDSTONE & SILTSTONE - GRADATIONAL FROM CARBONACEOUS MUDSTONE TO SILTSTONE BEDDING AT 80° TO 85° TO CIA
		10.45	
260.80		0.80	SANDSTONE - MEDIUM GR. QUARTZITE / CHERT [1:1]
261.30		1.26	CONGLOMERATE - MEDIUM TO LARGE PEBBLE; 0.36m CARB. MUDSTONE AT BASE
262.56		1.55	COAL
264.11			MUDSTONE / SILTSTONE - MEDIUM TO DARK GRAY, GRADATIONAL DOWNWARDS FROM MUDSTONE TO SILTSTONE
		5.81	
269.92			SANDSTONE - MEDIUM GRAY, MEDIUM TO COURSE TO GRANULE CONGLOMERATE
		7.16	
277.08			CONGLOMERATE - SMALL TO MEDIUM PEBBLE; WHITE TO BLACK QUARTZITE & CHERT, RARE GREEN CHERT, BLADE, ROLLER & PREDOMINANTLY SUB-SPHERICAL, WELL-ROUNDED, MODERATELY WELL-SORTED. 280.93 - 285.90 CONGLOMERATE SANDSTONE - MEDIUM TO COARSE - GRAINED.
		16.11	
293.19			MUDSTONE - IN PART CARBONACEOUS; THEN COAL SANDS & COAL CHARDS; FEW INTERVALS SILTSTONE
		8.55	
301.74		0.84	COAL
302.58		1.31	MUDSTONE - MEDIUM DARK GRAY, SILTY BASALLY
303.89			SANDSTONE - MEDIUM GRAY, FINE GRAINED, COARSENS BASALLY TO GRANULE CONGLOMERATIC; GRADATIONAL TO CONGLOMERATE BELOW.
		11.41	
315.30		1.01	CONGLOMERATE
316.31		5.56	MUDSTONE - MEDIUM TO DARK GRAY; IN PART CARBONACEOUS
321.87		4.49	COAL - NO. 4 SEAM HORIZON
326.36			MUDSTONE - MEDIUM DARK TO DARK GREY; CARBONACEOUS AT TOP.
		19.64	
346.00			CONGLOMERATE & CONGLOMERATIC SANDSTONE - MEDIUM GREY, GRANULE TO SMALL PEBBLE CONGLOMERATE.
		25.23	
371.23		2.92	SANDSTONE - MEDIUM GREY, MEDIUM GRAINED
374.15		2.99	COAL - NO. 5 SEAM HORIZON
377.14		1.65	MUDSTONE - MEDIUM DARK TO DARK GREY
378.79			END OF HOLE

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)
				No. 3 SEAM HORIZON		
233.50				ROOF - CONGLOMERATE GOOD		
		0.28		COAL - VITREOUS TO BRIGHT		
233.78						
233.82		0.04		MUDSTONE & SHALY COAL		
		0.03		COAL - VITREOUS TO BRIGHT		
234.19						
		0.16		CARBONACEOUS MUDSTONE		
234.35		0.08		COAL - VITREOUS, BRIGHT		
234.43		0.13		MUDSTONE & SHALY COAL		
234.56		0.24		COAL - DULL TO VITREOUS		
				COAL - VITREOUS TO BRIGHT		
234.80						
		0.38		COAL - DULL TO VITREOUS; SOFT AT TOP	A0357	3.38
235.80						
		0.69	98%	COAL - BRIGHT		
235.20						
236.03		0.14		MUDSTONE / SHALY COAL		
236.15		0.12		COAL - SOFT, FRIABLE, BRIGHT		
		0.02				
		0.53		COAL - BRIGHT		
236.70						
		0.13		NO CORE		
236.83		0.05				
236.88		0.53		MUDSTONE - 0.05 COAL AT TOP WITH 0.05 SHALY COAL BASAL 0.02 BENTONITIC VOLCANIC?	A0358	0.45
237.53		0.10		COAL - DULL TO VITREOUS		
237.55				FLOOR - MUDSTONE - POOR		
248.67				ROOF - MUDSTONE - POOR		
		0.25		SHALY COAL / COALY MUDSTONE - FULL PARTINGS OF BRIGHT COAL		
248.92				COAL - BRIGHT; CONCHOIDAL FRACTURE		
		1.43	100%		A0359	1.68
250.35				FLOOR - CARBONACEOUS MUDSTONE POOR		
262.35				ROOF - MUDSTONE - CARBONACEOUS & COALY; POOR; OVERLAIN BY CONGLOMERATE		
		0.25				
262.56				COAL - BRIGHT, BLOCKY TO CONCHOIDAL FRACTURE		
		1.55	100%		A0360	1.55
264.11				FLOOR - MUDSTONE - POOR		
301.74				ROOF - MUDSTONE - POOR		
		0.58	100%	COAL - BRIGHT, BLOCKY & CONCHOIDAL FRACTURE	A0361	0.84
302.32		0.26		COAL & SHALEY COAL - DULL TO VITREOUS		
302.58				No. 4 SEAM HORIZON		
321.87				ROOF - MUDSTONE - POOR		
		0.64		COAL - DULL TO VITREOUS, PARTED & THINLY BANDED; BLOCKY.		
322.51		0.31		COAL - BRIGHT; THINLY BANDED		
322.82		0.34	86%	COAL - VITREOUS TO BRIGHT; BLOCKY; 0.02 AT TOP IS SOFT & GROUND		
323.16		0.25		COAL / SHALY COAL - DULL TO VITREOUS		
323.41		0.11		NO CORE		
323.52		0.25		COAL - BRIGHT, THINLY BANDED	A0362	3.83
323.77		0.31		COAL / SHALY COAL - DULL TO VITREOUS		
324.08				COAL - MOSTLY BRIGHT; BANDED & IN PART PARTED, BLOCKY & IN PART CONCHOIDAL FRACTURE.		
		1.10	91%			
325.18		0.02				
325.21		0.13				
325.34		0.19	33%	COAL - BRIGHT; CONCHOIDAL & BLOCKY FRACTURE, 0.26 NO CORE		
325.53		0.17				
325.70		0.66	20%	NO CORE		
326.36				FLOOR - MUDSTONE - POOR		

WEIGHT PERCENT

SIZE DIAMETER	SIZE WT %	SPEC. GRAV.	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
1/4×0	100.0	RAW	100.0	8.0	23.1	29.9	39.0	8362		0.41
1/4×28	91.0	-1.30	1.4	7.1	3.5	34.2	55.2	11,632		0.31
		-1.40	38.0	4.7	4.0	36.4	54.9	11,869		0.35
		-1.50	16.4	2.9	10.8	34.6	51.7	10,651		0.38
		-1.60	6.4	3.0	21.7	31.0	44.3	9,111		0.42
		-1.70	4.2	3.0	31.0	27.9	38.1	7,754		0.51
		-1.80	5.0	2.3	39.7	25.6	32.4	6,392		0.51
		-1.90	7.1	2.3	47.6	22.7	27.4	5,261		0.46
		+1.90	21.5	1.4	60.0	-	-	-		-
28×0	9.0	RAW								
1/4×28	91.0	- 1.90								
28×0	9.0	RAW								
1/4×0	100.0	COMB								
1/4×0	100.0	RAW	100.0							
1/4×28	92.7	-1.30	0.2	5.7	3.3					
		-1.40	3.0	4.0	14.2					
		-1.50	4.5	4.0	19.6					
		-1.60	3.4	3.7	28.3					
		-1.70	3.4	3.5	37.8					
		-1.80	3.0	3.2	49.0					
		-1.90	2.9	3.1	54.9					
		+1.90	79.6	1.8	83.8					
28×0	7.3	RAW								
1/4×28	92.7	- 1.90								
28×0	7.3	RAW								
1/4×0	100.0	COMB								
1/4×0	100.0	RAW	100.0	7.5	17.5	33.0	42.0	9274		0.24
1/4×28	94.1	-1.30	3.0	7.4	3.3	34.5	54.8	11,832		0.25
		-1.40	51.3	4.3	4.7	35.6	55.4	17,475		0.28
		-1.50	14.2	4.0	12.3	33.7	50.0	10,437		0.25
		-1.60	5.3	3.7	23.8	30.9	41.6	8,688		0.22
		-1.70	5.9	3.5	35.2	26.1	35.2	7,353		0.21
		-1.80	5.9	2.9	45.6	23.1	28.4	5,608		0.17
		-1.90	5.6	3.2	52.0	20.0	24.8	4,672		0.13
		+1.90	8.8	2.1	64.1	-	-	-		-
28×0	5.9	RAW								
1/4×28	94.1	- 1.90								
28×0	5.9	RAW								
1/4×0	100.0	COMB								
1/4×0	100.0	RAW	100.0	7.9	19.3	32.6	40.2	9065		0.30
1/4×28	95.0	-1.30	9.5	6.7	2.5	37.1	53.7	11,776		0.41
		-1.40	48.0	4.2	3.6	36.9	55.3	11,662		0.37
		-1.50	10.1	3.1	13.0	33.6	50.3	10,379		0.44
		-1.60	4.4	3.3	23.0	31.4	42.3	8,979		0.38
		-1.70	4.1	2.8	34.9	27.5	34.8	7,331		0.28
		-1.80	3.3	2.8	43.5	24.1	29.6	5,938		0.29
		-1.90	6.7	2.7	49.7	21.6	26.0	4,973		0.25
		+1.90	13.9	1.5	69.3	-	-	-		-
28×0	4.9	RAW								
1/4×28	95.1	-1.90								
28×0	4.9	RAW								
1/4×28	100.0	COMB								
1/4×0	100.0	RAW	100.0	7.4	23.3	29.3	40.0	8766		0.32
1/4×28	95.7	-1.30	7.2	7.2	3.1	38.5	51.2	11,799		0.39
		-1.40	41.3	5.0	4.6	35.0	55.4	11,402		0.35
		-1.50	14.7	3.9	14.9	31.9	49.3	10,168		0.36
		-1.60	5.2	4.0	27.2	28.6	40.2	8,182		0.32
		-1.70	5.0	3.6	37.5	25.3	33.6	7,191		0.23
		-1.80	5.6	3.2	48.6	21.6	26.6	5,036		0.18
		-1.90	5.9	3.3	55.1	19.0	22.6	4,062		0.18
		+1.90	15.1	2.3	65.9	-	-	-		-
28×0	4.3	RAW								
1/4×28		-1.90								
28×0		RAW								
1/4×0		COMB								
1/4×0	100.0	RAW	100	7.5	18.7	31.8	42.0	9255		0.31
1/4×28	91.4	-1.30	1.3	6.6	3.5	35.8	54.1	11,669		0.32
		-1.40	41.1	4.8	4.4	35.2	55.6	11,690		0.28
		-1.50	21.2	3.8	9.9	32.8	53.5	10,694		0.32
		-1.60	8.2	3.3	21.5	31.3	43.9	9,205		0.30
		-1.70	6.7	3.0	30.6	27.6	38.8	7,979		0.20
		-1.80	6.5	2.7	39.6	25.0	32.7	6,354		0.22
		-1.90	5.1	2.5	47.5	22.9	27.1	5,288		0.14
		+1.90	9.9	1.9	63.2	-	-	-		-
28×0	8.6	RAW								
1/4×28		-1.90								
28×0		RAW								
1/4×0		COMB								

CUMULATIVE WEIGHT PERCENT

YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
1.4	7.1	3.5	34.2	55.2	11,632		0.31
39.4	4.8	4.0	36.3	54.9	11,861		0.35
55.8	4.2	6.0	35.8	54.0	11,505		0.36
62.2	4.1	7.6	35.3	53.0	11,259		0.36
66.4	4.0	9.1	34.9	52.0	11,037		0.37
71.4	3.9	11.2	34.2	50.7	10,712		0.38
78.5	3.8	14.5	33.2	48.6	10,219		0.39
100.0	3.3	24.3	-	-	-		-
100.0	7.6	24.1	31.2	37.1	8223		0.51
71.4	3.8	14.5	33.2	48.6	10,219		0.39
9.0	7.6	24.1	31.2	37.1	8,223		0.51
80.4	4.2	15.6	33.0	47.3	9,996		0.40
0.2		3.3					
3.2		13.5					
7.7		17.1					
11.1		20.5					
14.5		24.6					
17.5		28.8					
20.4		32.5					
1000	2.2	73.3	-	-	-		-
100.0	3.0	70.1	13.5	13.4			0.14
3.0	7.4	3.3	34.5	54.8	11,832		0.25
54.3	4.5	4.6	35.5	55.4	11,495		0.28
68.5	4.4	6.2	35.2	54.3	11,275		0.27
73.8	4.3	7.5	34.9	53.4	11,090		0.27
79.7	4.3	9.5	34.2	52.0	10,813		0.26
85.6	4.2	12.0	33.4	50.4	10,454		0.26
91.2	4.1	14.5	32.6	48.8	10,099		0.25
1000	3.9	18.8	-	-	-		-
1000	7.8	17.3	32.6	42.3	9368		0.24
85.8	4.1	14.5	32.6	48.8	10,099		0.25
5.9	7.8	17.3	32.6	42.3	9,368		0.24
91.7	4.3	14.7	32.6	48.4	10,052		0.25
9.5	6.7	2.5	37.1	53.7	11,776		0.41
57.5	4.6	3.4	36.9	55.0	11,681		0.38
67.6	4.4	4.8	36.4	54.3	11,486		0.39
72.0	4.3	6.0	36.1	53.6	11,333		0.39
76.1	4.2	7.5	35.7	52.6	11,117		0.38
79.4	4.2	9.0	35.2	51.6	10,902		0.38
86.1	4.1	12.2	34.1	49.6	10,441		0.37
100.0	3.7	20.1	-	-	-		-
100.0	7.5	19.3	31.8	41.4	8997		0.32
81.8	4.1	12.2	34.1	49.6	10,441		0.37
4.9	7.5	19.3	31.8	41.4	8,997		0.32
86.7	4.3	12.6	34.0	49.1	10,359		0.37
100.0	7.4	23.3	29.3	40.0	8766		0.32
7.2	7.2	3.1	38.5	51.2	11,799		0.39
48.5	5.3	4.4	35.5	54.8	11,460		0.36
63.2	5.0	6.8	34.7	53.5	11,160		0.36
68.4	4.9	8.4	34.2	52.5	10,934		0.35
73.4	4.8	10.4	33.6	51.2	10,679		0.35
79.0	4.7	13.1	32.8	49.5	10,279		0.33
84.9	4.6	16.0	31.8	47.6	9,847		0.32
100.0	4.3	23.5	-	-	-		-
100.0	7.2	20.3	29.8	42.7	9156		0.30
81.3	4.6	16.0	31.8	47.6	9,847		0.32
4.3	7.2	20.3	29.8	42.7	9,156		0.30
85.6	4.7	16.2	31.7	47.4	9,812		0.32
100.0	7.5	23.5	29.8	39.2	8766		0.32
7.2	7.2	3.1	38.5	51.2	11,799		0.39
48.5	5.3	4.4	35.5	54.8	11,460		0.36
63.2	5.0	6.8	34.7	53.5	11,160		0.36
68.4	4.9	8.4	34.2	52.5	10,934		0.35
73.4	4.8	10.4	33.6	51.2	10,679		0.35
79.0	4.7	13.1	32.8	49.5	10,279		0.33
84.9	4.6	16.0	31.8	47.6	9,847		0.32
100.0	4.3	23.5	-	-	-		-
100.0	7.2	20.3	29.8	42.7	9156		0.30
81.3	4.6	16.0	31.8	47.6	9,847		0.32
4.3	7.2	20.3	29.8	42.7	9,156		0.30
85.6	4.7	16.2	31.7	47.4	9,812		0.32
100	7.5	18.7	31.8	42.0	9255		0.31
1.3	6.6	3.5	35.8	54.1	11,669		0.32
42.4	4.9	4.4	35.2	55.6	11,689		0.28
63.6	4.5	6.2	34.4	54.9	11,358		0.29
71.8	4.4	8.0	34.1	53.6	11,112		0.29
78.5	4.3	9.9	33.5	52.4	10,844		0.29
85.0	4.1	12.2	32.9	50.9	10,501		0.28
90.1	4.0	14.2	32.3	49.5	10,206		0.27
100.0	3.8	19.0	-	-	-		-
100.0	6.8	23.1	30.7	39.4	8,656		0.25
82.35	4.0	14.2	32.3	49.5	10,206		0.27
8.6	6.8	23.1	30.7	39.4	8,656		0.25
91.0	4.3	15.0	32.2	48.5	10,059		0.27

CUMULATIVE SAMPLE VALUES (CASE I)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
3.38	80.4	4.2	15.6	33.0	47.3	9,996		0.40
1.68	91.7	4.3	14.7	32.6	48.4	10,052		0.25
1.55	86.7	4.3	12.6	34.0	49.1	10,359		0.37
0.84	85.6	4.7	16.2	31.7	47.4	9,812		0.32
3.83	91.0	4.3	15.0	32.2	48.5	10,059		0.27

CUMULATIVE SAMPLE VALUES (CASE II)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER

GEOLOGICAL LOG – SCALE:

DETAILS OF COAL SEAMS – SCALE: 1:50

DRILLHOLE NO. SC-80-25 SHEET 5 OF 5

DEPTH (m) | GRAPHIC LOG | THICKNESS (m) | DESCRIPTION

DEPTH (m) | GRAPHIC LOG | THICKNESS (m) | RECOVERY % | DESCRIPTION | SAMPLE NUMBER | THICKNESS (m) | SIZE (DIAMETER, WT %) | WEIGHT PERCENT (SPEC. GRAV., YIELD, PROXIMATE ANALYSIS: RM, ASH, VOL., F.C., BTU, F.S.I., S) | CUMULATIVE WEIGHT PERCENT (YIELD, PROXIMATE ANALYSIS: RM, ASH, VOL., F.C., BTU, F.S.I., S)

CUMULATIVE SAMPLE VALUES (CASE I): THICKNESS (m), YIELD, PROXIMATE ANALYSIS: RM, ASH, VOL., F.C., BTU, F.S.I., S

CUMULATIVE SAMPLE VALUES (CASE II): THICKNESS (m), YIELD, PROXIMATE ANALYSIS: RM, ASH, VOL., F.C., BTU, F.S.I., S

CUMULATIVE SAMPLE VALUES (CASE III): THICKNESS (m), YIELD, PROXIMATE ANALYSIS: RM, ASH, VOL., F.C., BTU, F.S.I., S

OTHER

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)	SIZE: DIAMETER	SIZE: WT %	SPEC. GRAV.	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
				No. 5 SEAM HORIZON													
							1/4×0	100.0	RAW	100.0	8.0	11.5	32.1	48.4	10413		0.29
							1/4×28	94.4	-1.30	18.6	6.6	2.8	34.6	56.0	12,041		0.27
									-1.40	46.5	4.6	4.9	33.4	57.1	11,339		0.33
									-1.50	15.1	4.2	12.0	28.7	55.1	10,608		0.34
									-1.60	5.5	4.4	22.1	26.7	46.8	8,820		0.25
									-1.70	4.2	4.1	31.4	24.5	40.0	7751		0.26
									-1.80	2.3	3.7	41.1	23.1	32.1	6069		0.19
									-1.90	4.3	3.5	45.8	21.7	29.0	5398		0.13
									+1.90	3.5	2.6	57.6	–	–	–		–
375.15				ROOF - SANDSTONE													
		1.62	100%	COAL - VITREOUS TO BRIGHT	AO363	1.62	28×0	5.6		100.0							
							1/4×28	94.4	-1.90								
							28×0	5.6	RAW								
							1/4×0	100.0	COMB								
376.27		0.07		CARBONACEOUS MUDSTONE													
376.34		0.07		COAL - BRIGHT WITH BANDS													
376.41		0.07		CARBONACEOUS MUDSTONE													
376.51		0.10		COAL													
376.61		0.10		CARBONACEOUS MUDSTONE													
376.82		0.15	100%	COAL	AO364	1.37	1/4×0	100.0	RAW	100.0	4.5	51.2	20.7	23.6			0.18
376.47		0.23		COAL			1/4×28	88.7	-1.30	0.8	5.5	6.6	34.7	53.2	11,272		0.45
376.70		0.20		CARBONACEOUS MUDSTONE					-1.40	8.1	4.7	6.1	34.2	55.0	11,636		0.45
376.90		0.24	94%	COAL					-1.50	10.7	4.3	14.6	31.7	49.4	10,333		0.39
377.14				MUDSTONE					-1.60	9.6	4.1	23.0	27.5	45.4	9,290		0.32
									-1.70	7.7	3.9	32.6	24.6	38.9	7329		0.27
									-1.80	4.2	3.7	43.5	22.3	30.5	6386		0.22
									-1.90	5.6	3.4	51.1	19.5	26.0	5218		0.18
									+1.90	53.3	2.2	75.0	–	–	–		–
							28×0	11.3	RAW	100.0							
							1/4×28	88.7	-1.90								
							28×0	11.3	RAW								
							1/4×0	100.0	COMB								

	CUMULATIVE WEIGHT PERCENT: YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
	0.29							
	18.6	6.6	2.8	34.6	56.0	12,041		0.27
	65.1	5.2	4.3	33.7	56.8	11,540		0.31
	80.2	5.0	5.7	32.8	56.5	11,364		0.32
	85.7	5.0	6.8	32.4	55.9	11,201		0.31
	89.9	4.9	7.9	32.0	55.1	11,040		0.31
	92.2	4.9	8.8	31.8	54.5	10,916		0.31
	96.5	4.8	10.4	31.4	53.4	10,670		0.30
	100.0	4.7	12.1	–	–	–		–
	100.0	7.4	12.8	30.5	49.3	10238		0.24
	91.1	4.8	10.4	31.4	53.4	10,670		0.30
	5.6	7.4	12.8	30.5	49.3	10,238		0.24
	96.7	5.0	10.5	31.4	53.2	10,645		0.30
	0.18							
	0.45	0.8	5.5	6.6	34.7	53.2	11,272	0.45
	0.45	8.9	4.8	6.1	34.2	54.8	11,603	0.45
	0.39	19.6	4.5	10.8	32.9	51.9	10,910	0.42
	0.32	29.2	4.4	14.8	31.1	49.7	10,377	0.39
	0.27	36.9	4.3	18.5	29.7	47.5	9,741	0.36
	0.22	41.1	4.2	21.1	29.0	45.7	9,398	0.35
	0.18	46.7	4.1	24.7	27.8	43.4	8,897	0.33
	–	100.0	3.1	51.5	–	–	–	–
		100.0	4.4	51.5	19.8	24.3		0.20
		41.4	4.1	24.7	27.8	43.4	8,897	0.33
		11.3	4.4	51.5	19.8	24.3	–	0.20
		52.7	4.2	30.4	26.1	39.3	6990	0.30

CASE I: THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
1.62	96.7	5.0	10.5	31.4	53.2	10,645		0.30
2.99	76.5	4.7	16.8	29.7	48.8	9492		0.30

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X
ELEVATION:
DIP: 90° BEARING
CORE SIZE: HQ CASING: 24'

BITS USED: JK SMIT
MUD USED: 12 BAGS / 24 HRS
FT. LEFT IN HOLE 24 FT.

DATE START: 30 JUNE, 1978 FINISH 5 JULY, 1978
DRILLER: CARON DIAMOND DRILLING OVERALL RECOVERY 81.7%
TESTS: NIL
SAMPLED BY: J.S. MCKINNEY DATE 6 JULY, 1978 ANALYZED BY: BIRTLEY

BOREHOLE NO. BP-78-1
PAN OCEAN OIL LTD. (PAGE 1)
MINING DIVISION – COAL

LOGGED BY: J.S. MCKINNEY DATE 6 JULY, 1978

SIGNED James S. McKinney

GEOLOGICAL LOG – SCALE: 1:500

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	THICKNESS	DESCRIPTION
	±7.50	OVERBURDEN - A FEW LIMESTONE, QUARTZITE AND CHERT PEBBLES IN MUD
7.5	17.50	CONGLOMERATE - WEATHERED, POOR RECOVERY OF LOOSE PEBBLES OF CHERT, QUARTZITE AND QUARTZ
25.0	18.74	CONGLOMERATE - 20-30mm PEBBLES OF BLACK CHERT (10%), GREY & BUFF QUARTZITE (20%), BLACK SLATEY CHERT(50%) VERY BRITTLE, GREEN MUDSTONE (1%). GRIT IN MATRIX, BLACK MUDSTONE (5%), QUARTZ (5%). ZONES 20-50 mm PEBBLES AT 72 m, 86m, 101m, 116m, 127m. THESE AVERAGE 0.15-0.30m THICK. PYRITE IN BASAL 100mm.
43.74	0.15	COAL - BRIGHT
43.89	1.90	SILTSTONE - GREY, SANDY IN PLACES. DIPS 25-35° CROSS-BEDDED.
45.79	1.00	GRIT BAND AT 45.6m.
46.79	0.65	CONGLOMERATE - 10mm PEBBLES
47.44	10.31	SANDSTONE - GREY, GRITTY, CROSS-BEDDED CONGLOMERATE - AS ABOVE, 10-20mm PEBBLES
57.75	0.15	SANDSTONE - GREY, COARSE GRAINED
57.90	5.89	CONGLOMERATE - VERY COARSE AT 63.09m. 10-20mm PEBBLES. PREDOMINATLY BLACK CHERT. PYRITE IN MATRIX.
63.79	8.49	NO. 1 SEAM HORIZON
72.28	4.98	MUDSTONE - SILTSTONE - GREY, BECOMMING FINE SANDSTONE AT BASE WITH SLUMP STRUCTURES.
77.26	16.04	CONGLOMERATE - AS ABOVE
93.30	2.45	SANDSTONE - GREY, FINE GRAINED, CROSS-BEDDED. SOME THIN (<1mm) CARBONACEOUS BANDS
95.75	6.67	CONGLOMERATE - AS ABOVE
102.42	1.26	SANDSTONE - GREY MEDIUM GRAINED TO GRITTY
103.68	9.51	NO. 2 SEAM HORIZON
113.19	0.78	SHALE - CARBONACEOUS GRADING INTO
113.97	2.77	MUDSTONE - GREY
116.74	E.O.H.	

No. 1 SEAM HORIZON

DEPTH	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
63.79	5.89	ROOF CONGLOMERATE GOOD		
		CARBONACEOUS SHALE 50mm		
	1.81	BRIGHT COAL 250 mm	7814	1.81
		DULL COAL 800mm		
65.60	0.70	COAL - BRIGHT		
	0.45	COAL - DULL SHALEY		
	0.73	COAL - BRIGHT		
	0.35	COAL - DULL	7815	3.84
	1.61	COAL - BRIGHT		
69.44	2.84	SHALE - CARBONACEOUS COALY IN PLACES	7816	2.84
	4.98	FLOOR - MUDSTONE - SILTSTONE, GREY		

No. 2 SEAM HORIZON

DEPTH	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
103.68	1.26	SANDSTONE - GOOD		
	0.65	COAL - BRIGHT, THINBANDED SOME RESIN MINOR DULL		
	0.25	COAL DULL		
	0.67	COAL - BRIGHT	7817	3.30
	0.44	COAL - DULL		
	1.10	COAL - BRIGHT		
106.98	0.15	SHALE - CARBONACEOUS		
	0.33	COAL - BRIGHT AND DULL THICK BANDED		
	0.96	SHALE - CARBONACEOUS DIP 30°	7818	1.69
108.67	0.22	COAL - DULL		
	1.88	COAL - BRIGHT & DULL THICK BANDED		
	0.26	COAL - DULL		
	2.30	COAL - BRIGHT WITH MINOR DULL BANDS	7819	4.52
113.19		FLOOR - OKAY - SHALE CARBONACEOUS		

SIZE DIAMETER	SIZE WT %	SPEC GRAV	WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	CUMULATIVE SAMPLE VALUES THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	OTHER
+28	94.9	-1.50	14.4	4.4	7.5	36.6	51.5	11398	-	-	14.4	4.4	7.5	36.6	51.5	11398	-	-										
		-1.60	3.1	2.9	24.1	32.2	40.8	9006	-	-	17.5	4.1	10.4	35.8	49.6	10974	-	-										
		-1.70	3.0	3.6	35.4	25.6	35.4	7214	-	-	20.5	4.1	14.1	34.3	47.5	10423	-	-										
		+1.70	79.5	2.0	76.5	-	-	-	-	-	100.0	2.4	63.7	-	-	-	-	-										
-28m	5.1	RAW	100.0	-	-	-	-	-	-	-	RAW	3.1	53.9	23.6	19.4	-	-	0.27										
1/4×0	100.0	RAW	-	2.1	64.5	20.7	12.7	-	-	0.12	CALC	2.4	63.2	-	-	-	-	-										
+28	94.9	-1.70	20.5	-	-	-	-	-	-	-	19.5	4.1	14.1	34.3	47.5	10423	-	-										
-28	5.1	RAW	100.0	-	-	-	-	-	-	-	5.1	3.1	53.9	23.6	19.4	4340*	-	-										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	24.6	3.8	22.4	32.1	41.7	9161	-	-	1.81	24.6	3.8	22.4	32.1	41.7	9161			
+28	95.2	-1.50	58.7	4.2	6.1	38.6	51.1	11501	-	-	58.7	4.2	6.1	38.6	51.1	11501	-	-										
		-1.60	3.4	3.2	18.4	36.0	42.4	9815	-	-	62.1	4.2	6.8	30.5	50.6	11408	-	-										
		-1.70	3.2	3.8	29.8	29.5	36.9	7991	-	-	65.3	4.1	7.9	38.0	50.0	11241	-	-										
		+1.70	34.7	1.9	60.4	-	-	-	-	-	100.0	3.4	26.1	-	-	-	-	-										
- 28	4.8	RAW	100.0	-	-	-	-	-	-	-	RAW	4.2	20.5	32.9	42.4	9334	-	0.29										
1/4×0	100.0	RAW	100.0	3.4	26.6	34.3	35.7	8398	-	0.23	CALC	3.4	20.8	-	-	-	-	-										
+28	95.2	-1.70	65.3	-	-	-	-	-	-	-	62.2	4.1	7.9	38.0	50.0	11241	-	-										
-28	4.8	RAW	100.0	-	-	-	-	-	-	-	4.8	4.2	20.5	32.9	42.4	9334	-	-										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	67.0	4.1	8.8	37.6	49.5	11104	-	-	5.65	53.4	4.1	10.8	36.8	48.3	10817			
+28	95.0	-1.50	9.8	4.3	7.1	36.1	52.5	11348	-	-	9.8	4.3	7.1	36.1	52.5	11348	-	-										
		-1.60	2.0	2.7	22.4	33.0	41.9	9434	-	-	11.8	4.0	9.7	35.6	50.7	11022	-	-										
		-1.70	1.8	2.4	34.1	29.0	34.5	7550	-	-	13.6	3.8	12.9	34.7	48.6	10562	-	-										
		+1.70	86.4	1.5	80.5	-	-	-	-	-	100.0	1.8	71.3	-	-	-	-	-										
-28	5.0	RAW	100.0	-	-	-	-	-	-	-	RAW	3.0	57.5	18.9	20.6	-	-	0.22										
1/4×0	100.0	RAW	100.0	2.1	71.1	14.6	12.2	-	-	0.15	CALC	1.9	70.6	-	-	-	-	-										
+28	95.0	-1.70	13.6	-	-	-	-	-	-	-	12.9	3.8	12.9	34.7	48.6	10562	-	-										
-28	5.0	RAW	100.0	-	-	-	-	-	-	-	5.0	3.0	57.5	18.9	20.6	3720*	-	-										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	17.9	3.6	25.4	30.3	40.6	8650	-	-	8.49	41.5	4.0	12.9	35.9	47.2	10504			
+28	96.2	-1.50	85.3	5.7	5.3	38.7	50.3	11453	-	-	85.3	5.7	5.3	38.7	50.3	11453	-	-										
		-1.60	2.9	4.8	20.5	33.5	41.2	9272	-	-	88.2	5.7	5.8	38.5	50.0	11381	-	-										
		-1.70	3.1	3.7	30.0	30.9	35.4	7986	-	-	91.3	5.6	6.6	38.3	49.5	11266	-	-										
		+1.70	8.7	2.1	53.6	-	-	-	-	-	100.0	5.3	10.7	-	-	-	-	-										
-28	3.8	RAW	100.0	-	-	-	-	-	-	-	RAW	5.9	11.1	38.9	44.1	10577	-	0.39										
1/4×0	100.0	RAW	100.0	5.4	10.8	38.6	45.2	10574	-	0.33	CALC	5.3	10.7	-	-	-	-	-										
+ 28	96.2	-1.70	91.3	-	-	-	-	-	-	-	87.8	5.6	6.6	38.3	49.5	11266	-	-										
- 28	3.8	RAW	100.0	-	-	-	-	-	-	-	3.8	5.9	11.1	38.9	44.1	10557	-	-										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	91.6	5.6	6.8	38.3	49.3	11237	-	-	3.30	91.6	5.6	6.8	38.3	49.3	11237			
+28	95.6	-1.50	9.7	4.4	7.2	33.9	54.5	11372	-	-	9.7	4.4	7.2	33.9	54.5	11372	-	-										
		-1.60	1.8	3.7	17.6	30.6	48.1	9849	-	-	11.5	4.3	8.8	33.4	53.5	11134	-	-										
		-1.70	1.3	3.5	31.2	26.4	38.9	7813	-	-	12.8	4.2	11.1	32.6	52.0	10796	-	-										
		+1.70	87.2	1.8	79.1	-	-	-	-	-	100.0	1.8	79.7	-	-	-	-	-										
-28	4.4	RAW	100.0	-	-	-	-	-	-	-	RAW	3.0	61.5	19.2	16.3	-	-	0.18										
1/4×0	100.0	RAW	100.0	2.2	70.7	17.7	9.4	-	-	0.12	CALC	1.9	78.9	-	-	-	-	-										
+28	95.6	-1.70	12.8	-	-	-	-	-	-	-	12.2	4.2	11.1	32.6	52.0	10796	-	-										
-28	4.4	RAW	100.0	-	-	-	-	-	-	-	4.4	3.0	61.5	19.2	16.3	3220*	-	-										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	16.6	3.9	24.5	29.2	42.5	8788	-	-	4.99	66.2	5.5	8.3	37.5	48.7	11029			
+28	95.4	-1.50	59.7	4.9	6.0	35.9	53.2	11449	-	-	59.7	4.9	6.0	35.9	53.2	11449	-	-										
		- 1.60	4.9	4.4	17.1	34.4	44.1	9850	-	-	64.6	4.9	6.8	35.8	52.5	11328	-	-										
		-1.70	6.7	2.8	28.0	31.8	37.4	8393	-	-	71.3	4.7	8.8	35.4	51.1	11052	-	-										
		+ 1.70	28.7	2.1	54.3	-	-	-	-	-	100.0	3.9	21.9	-	-	-	-	-										
-28	4.6	RAW	100.0	-	-	-	-	-	-	-	RAW	5.8	17.5	34.6	42.1	9793	-	0.37										
1/4×0	100.0	RAW	100.0	5.1	22.4	32.9	39.6	8879	-	0.27	CALC	4.0	21.7	-	-	-	-	-										
+28	95.4	-1.70	71.3	-	-	-	-	-	-	-	68.0	4.7	8.8	35.4	51.1	11052	-	-										
-28	4.6	RAW	100.0	-	-	-	-	-	-	-	4.6	5.8	17.5	34.6	42.1	9793	-	-										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	72.6	4.8	9.4	35.4	50.4	10972	-	-	9.51	69.2	5.1	8.9	36.5	49.6	11000			

87.4% RECOVERY
5.65 m COAL RECOVERED
4.94 m

99% RECOVERY
9.51 m COAL RECOVERED
9.40 m

* FROM ASH / BTU CURVE

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X

ELEVATION:

DIP BEARING

CORE SIZE CASING

BITS USED

MUD USED

FT. LEFT IN HOLE FT.

DATE START FINISH

DRILLER OVERALL RECOVERY

TESTS

SAMPLED BY DATE ANALYZED BY

BOREHOLE NO. BP-78-1 (PAGE 2)

PAN OCEAN OIL LTD.

MINING DIVISION – COAL

LOGGED BY DATE

SIGNED James S. McKinney

GEOLOGICAL LOG – SCALE:

DETAILS OF COAL SEAMS – SCALE:

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
			SEE BP-78-1 (PAGE 1)

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
			No. 1 SEAM HORIZON		
		5.89	ROOF CONGLOMERATE GOOD		
63.79			CARBONACEOUS SHALE 50 mm		
		1.81	BRIGHT COAL 250 mm DULL COAL 800 mm	7814	1.81
65.60		0.70	COAL-BRIGHT		
		0.45	COAL-DULL SHALEY		
		0.73	COAL-BRIGHT		
		0.35	COAL-DULL	7815	3.84
		1.61	COAL-BRIGHT		
69.44		2.84	SHALE-CARBONACEOUS COALY IN PLACES	7816	2.84
		4.98	FLOOR-MUDSTONE-SILTSTONE, GREY		
			No. 2 SEAM HORIZON		
		1.26	SANDSTONE - GOOD		
103.68		0.65	COAL-BRIGHT, THINBANDED SOME RESIN MINOR DULL		
		0.25	COAL DULL		
		0.67	COAL-BRIGHT	7817	3.30
		0.44	COAL-DULL		
		1.10	COAL-BRIGHT		
106.98		0.15	SHALE-CARBONACEOUS		
		0.33	COAL-BRIGHT AND DULL THICK BANDED		
		0.96	SHALE-CARBONACEOUS DIP 30°	7818	1.69
108.67		0.22	COAL-DULL		
		1.88	COAL-BRIGHT & DULL THICK BANDED		
		0.26	COAL-DULL		
		2.30	COAL-BRIGHT WITH MINOR DULL BANDS	7819	4.52
113.19			FLOOR-OKAY-SHALE CARBONACEOUS		

SIZE DIAMETER	SIZE WT %	SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C	BTU	F.S.I.	S
		-1.70	-	-	-	-	-	-	-	-
+28	95.2	-1.80	2.5	2.0	31.3	27.4	39.3	8305	-	-
		-1.90	1.8	2.0	47.1	22.7	28.2	5894	-	-
		+1.90	75.2	1.6	79.4	13.9	5.1	-	-	-
+28	94.9	-1.80	23.0	-	-	-	-	-	-	-
-28	5.1	RAW	100.0	-	-	-	-	-	-	-
1/4×0	-	COMB	-	-	-	-	-	-	-	-
+28	94.9	1.90	24.8	-	-	-	-	-	-	-
-28	5.1	RAW	100.0	-	-	-	-	-	-	-
1/4×0	-	COMB	-	-	-	-	-	-	-	-
ULTIMATE ANALYSIS & ASH FUSION										
+28	-	-1.70	-	-	-	-	-	-	-	-
-28	-	RAW	-	-	-	-	-	-	-	-
		-1.70	-	-	-	-	-	-	-	-
		-1.80	3.0	2.4	28.4	29.8	39.4	8341	-	-
+28	95.2	-1.90	2.3	2.0	44.4	25.0	28.6	6087	-	-
		+1.90	29.5	1.7	66.1	19.7	12.5	-	-	-
+28	95.2	-1.80	68.3	-	-	-	-	-	-	-
-28	4.8	RAW	100.0	-	-	-	-	-	-	-
1/4×0	-	COMB	-	-	-	-	-	-	-	-
+28	95.2	-1.90	70.6	-	-	-	-	-	-	-
-28	4.8	RAW	100.0	-	-	-	-	-	-	-
1/4×0	-	COMB	-	-	-	-	-	-	-	-
ULTIMATE ANALYSIS & ASH FUSION										
+28	-	-1.70	-	-	-	-	-	-	-	-
-28	-	RAW	-	-	-	-	-	-	-	-
		-1.70	-	-	-	-	-	-	-	-
		-1.80	2.9	2.5	27.6	29.1	40.8	8693	-	-
+28	95.0	-1.90	1.3	2.3	47.1	23.5	27.1	6014	-	-
		+1.90	82.2	3.3	81.3	9.7	5.7	-	-	-
+28	95.0	-1.80	16.5	-	-	-	-	-	-	-
-28	5.0	RAW	100.0	-	-	-	-	-	-	-
1/4×0	-	COMB	-	-	-	-	-	-	-	-
+28	95.0	-1.90	17.8	-	-	-	-	-	-	-
-28	5.0	RAW	100.0	-	-	-	-	-	-	-
1/4×0	-	COMB	-	-	-	-	-	-	-	-
ULTIMATE ANALYSIS & ASH FUSION										
+28	-	1.70	-	-	-	-	-	-	-	-
-28	-	RAW	-	-	-	-	-	-	-	-
		-1.70	-	-	-	-	-	-	-	-
+28	96.2	-1.80	1.5	1.8	28.9	30.5	38.8	8343	-	-
		-1.90	1.2	1.4	45.0	25.7	27.9	5866	-	-
		+1.90	6.0	1.3	63.3	21.1	14.3	-	-	-
+28	96.2	-1.80	92.8	-	-	-	-	-	-	-
-28	3.8	RAW	100.0	-	-	-	-	-	-	-
1/4×0	-	COMB	-	-	-	-	-	-	-	-
+28	96.2	-1.90	94.0	-	-	-	-	-	-	-
-28	3.8	RAW	100.0	-	-	-	-	-	-	-
1/4×0	-	COMB	-	-	-	-	-	-	-	-
ULTIMATE ANALYSIS & ASH FUSION										
+28	-	-1.70	-	-	-	-	-	-	-	-
-28	-	RAW	-	-	-	-	-	-	-	-
		-1.70 -1.80 -1.90	TOTAL FLOAT AT -1.70, ALL MATERIAL SANK AT -1.80 AND -1.90							
+28	95.6	+1.90	87.2	1.2	79.7	13.4	5.7	-	-	-
ULTIMATE ANALYSIS & ASH FUSION										
+28	-	-1.70	-	-	-	-	-	-	-	-
-28	-	RAW	-	-	-	-	-	-	-	-
1/4×0		COMB	AT -1.70	-	-	-	-	-	-	-
		-1.70	-	-	-	-	-	-	-	-
		-1.80	5.1	2.6	26.1	30.2	41.1	8630	-	-
+28	95.4	-1.90	2.4	2.1	43.6	25.0	29.3	6319	-	-
		+1.90	21.2	1.7	63.9	20.5	13.9	-	-	-
+28	95.4	-1.80	76.4	-	-	-	-	-	-	-
-28	4.6	RAW	100.0	-	-	-	-	-	-	-
1/4×0	-	COMB	-	-	-	-	-	-	-	-
+28	95.4	-1.90	78.8	-	-	-	-	-	-	-
-28	4.6	RAW	100.0	-	-	-	-	-	-	-
1/4×0	-	COMB	-	-	-	-	-	-	-	-
ULTIMATE ANALYSIS & ASH FUSION										
+28	-	-1.70	-	-	-	-	-	-	-	-
-28	-	RAW	-	-	-	-	-	-	-	-

CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
20.5	4.1	14.1	34.3	47.5	10423	-	-
23.0	3.9	15.0	33.6	46.6	10192	-	-
24.8	3.7	18.2	32.8	45.3	9980	-	-
100.0	2.1	64.2	18.6	15.1	-	-	-
21.8	3.9	16.0	33.6	46.6	10192	-	-
5.1	3.1	53.9	23.6	19.4	4340*	-	-
26.9	3.8	23.2	31.7	41.4	9082	-	-
23.5	3.7	18.2	32.8	45.3	9980	-	-
5.1	3.1	53.9	23.6	19.4	4340*	-	-
28.6	3.6	24.6	31.1	40.7	8974	-	-
	H_2O	C	H	N	S	ASH	0
-	5.8	60.5	4.6	0.61	0.32	13.5	14.7
-	3.1	28.9	2.7	0.36	0.27	53.9	11.3
65.3	4.1	7.9	38.0	50.0	11241	-	-
68.3	4.0	8.8	37.6	49.5	11113	-	-
70.6	4.0	10.0	37.3	48.9	10949	-	-
100.0	3.3	26.5	32.1	38.1	-	-	-
65.0	4.0	8.8	37.6	49.5	11113	-	-
4.8	4.2	20.5	32.9	42.4	9334	-	-
69.8	4.0	9.6	37.3	49.0	10990	-	-
67.2	4.0	10.0	37.3	48.9	10949	-	-
4.8	4.2	20.5	32.9	42.4	9334	-	-
72.0	4.0	10.7	37.0	48.5	10841	-	-
	H_2O	C	H	N	S	ASH	0
-	6.21	64.3	4.9	0.76	0.27	7.48	16.1
-	4.19	55.0	4.24	0.59	0.29	20.5	15.1
13.6	3.8	12.9	34.7	48.6	10562	-	-
16.5	3.6	15.5	33.7	47.2	10233	-	-
17.8	3.5	17.8	33.0	45.8	9925	-	-
100.0	3.3	70.0	13.8	12.8	-	-	-
15.7	3.6	15.5	33.7	47.2	10233	-	-
5.0	3.0	57.5	18.9	20.6	3720*	-	-
20.7	3.0	25.6	30.1	40.8	8659	-	-
16.9	3.5	17.8	33.0	45.8	9925	-	-
5.0	3.0	57.5	18.9	20.6	3720*	-	-
21.9	3.4	28.9	29.8	40.0	8508	-	-
	H_2O	C	H	N	S	ASH	0
-	5.79	60.6	4.49	0.70	0.32	12.43	15.7
-	3.03	27.4	2.49	0.39	0.22	57.5	8.92
91.3	5.6	6.6	38.3	49.5	11266	-	-
92.8	5.5	7.0	38.1	49.3	11219	-	-
94.0	5.5	7.5	38.0	49.1	11150	-	-
100.0	5.2	10.8	37.0	47.0	-	-	-
89.3	5.5	7.0	38.1	49.3	11219	-	-
3.8	5.9	11.1	38.9	44.1	10557	-	-
93.1	5.5	7.2	38.1	49.1	11192	-	-
90.4	5.5	7.5	38.0	49.1	11150	-	-
3.8	5.9	11.1	38.9	44.1	10557	-	-
94.2	5.5	7.7	38.0	48.9	11126	-	-
	H_2O	C	H	N	S	ASH	0
-	6.69	65.3	4.96	0.67	0.40	6.38	15.6
-	5.93	62.2	4.68	0.62	0.39	11.09	15.1
12.8	4.2	11.1	32.6	52.0	10796	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
100.0	1.6	70.9	15.9	11.6	-	-	-
	H_2O	C	H	N	S	ASH	0
-	5.50	63.15	4.38	0.62	0.40	10.56	15.4
-	5.80	56.63	4.27	0.56	0.37	17.54	14.8
16.6	3.9	24.5	29.2	42.5	8788	-	-
71.3	4.7	8.8	35.4	51.1	11052	-	-
76.4	4.6	10.0	35.1	50.4	10890	-	-
78.8	4.5	11.0	34.8	49.8	10751	-	-
100.0	3.9	22.2	31.7	42.2	8472	-	-
72.9	4.6	10.0	35.1	50.4	10890	-	-
4.6	5.8	17.5	34.6	42.1	9793	-	-
77.5	4.7	10.5	35.1	49.9	10824	-	-
75.2	4.5	11.0	34.8	49.8	10751	-	-
4.6	5.8	17.5	34.6	42.1	9793	-	-
79.8	4.6	11.4	34.8	49.4	10695	-	-
	H_2O	C	H	N	S	ASH	0
-	6.09	63.63	4.67	0.68	0.36	8.51	16.1
-	5.80	56.63	4.27	0.56	0.37	17.54	14.8

CUMULATIVE SAMPLE VALUES THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	OTHER
1.81	26.9	3.8	23.2	31.7	41.4	9082	-	-	
1.81	28.6	3.6	24.6	31.1	40.7	8974	-	-	
OXIDIZING I.D.T.	S.T.	HT	FT	REDUCING IDT	ST	HT	FT		
2440	2580	2620	2640	2310	2400	2450	2560		
+2750	-	-	-	+2750	-	-	-		
5.65	56.1	4.0	11.7	36.4	47.8	10696	-	-	
5.65	58.1	3.9	12.9	36.1	47.3	10547	-	-	
OXIDIZING I.D.T.	S.T.	HT	FT	REDUCING I.D.T.	S.T.	HT	FT		HARDGROVE 47
2440	2460	2490	2510	2360	2420	2440	2480		
2640	2680	2700	2740	2500	2550	2600	2660		
8.49	44.2	3.8	13.9	35.4	46.7	10377	-	-	
8.49	46.0	3.9	15.4	35.1	46.1	10222			
OXIDIZING I.D.T.	S.T.	HT	FT	REDUCING I.D.T.	S.T.	HT	FT		
2380	2460	2540	2570	2200	2320	2360	2490		
2620	2750	+2750	-	2560	2640	2680	2740		
3.3	93.1	5.5	7.2	38.1	49.1	11192	-	-	
3.3	94.2	5.5	7.7	38.0	48.9	11126			
OXIDIZING I.D.T.	S.T.	HT	FT	REDUCING I.D.T.	S.T.	HT	FT		
2420	2450	2470	2510	2380	2400	2440	2460		HARDGROVE 45
2400	2470	2520	2590	2220	2290	2340	2480		
OXIDIZING I.D.T.	S.T.	HT	FT	REDUCING I.D.T.	S.T.	HT	FT		
2420	2460	2480	2520	2380	2420	2440	2460		
2680	2750	2750+	-	2480	2520	2540	2550		
4.99	67.2	5.4	8.6	37.4	48.5	10991	COMB	-1.80	
4.99	67.9	5.4	9.1	37.3	48.4	10932	COMB	-1.90	
9.51	72.1	5.0	9.6	36.2	49.2	10906	-	-	
9.51	73.6	5.0	10.3	36.0	48.9	10810	-	-	
OXIDIZING I.D.T.	S.T.	HT	FT	REDUCING I.D.T.	S.T.	HT	FT		
2420	2500	2540	2620	2320	2440	2470	2560		
2680	2750	+2750	-	2480	2520	2540	2550		

*FROM ASH/BTU CURVE

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X
ELEVATION:
DIP: 90° BEARING
CORE SIZE: HQ CASING: 10

BITS USED: J.K. SMIT 100'S
MUD USED: 12 bags (50lb) / day
FT. LEFT IN HOLE: NIL FT.

DATE START 7 JULY, 1978 FINISH 10 JULY, 1978
DRILLER: CARON DIAMOND DRILLING OVERALL RECOVERY 79.1%
TESTS NONE
SAMPLED BY: J. S. McKINNEY DATE 10 JULY, 1978 ANALYZED BY: BIRTLEY

BOREHOLE NO. BP - 78 - 2
PAN OCEAN OIL LTD. (PAGE 1)
MINING DIVISION – COAL

LOGGED BY: J. S. McKINNEY DATE 10 JULY, 1978

SIGNED James S. McKinney

GEOLOGICAL LOG – SCALE: 1 : 500

DETAILS OF COAL SEAMS – SCALE: 1 : 100

DEPTH	THICKNESS	DESCRIPTION
	12.8	OVERBURDEN - NO RECOVERY
12.8	10.67	CONGLOMERATE - 10-20mm PEBBLES OF CHERT QUARTZITE AND QUARTZ, POROUS. THIN SANDSTONE BEDS SCATTERED THROUGHOUT.
23.47	7.27	NO. 1 SEAM HORIZON
30.74	9.40	MUDSTONE - SILTSTONE, CARBONACEOUS AT TOP, GRADING DOWNWARD INTO GREY SILTSTONE.
39.78	13.25	SANDSTONE - GREY MEDIUM GRAINED SOME SLUMP STRUCTURE. MINOR THIN GRITS AND MUDSTONES SCATTERED THROUGHOUT.
53.03	5.70	GRIT - GREY SUB-ROUNDED
58.73	2.85	MUDSTONE, SANDSTONE, GRIT - CROSS-BEDDED
61.58	8.43	NO. 2 SEAM HORIZON
70.01	11.75	MUDSTONE - GREY SCATTERED COALY SHALE AND COALY MATERIAL. 0.76m CONGLOMERATE NEAR BASE
81.76	3.36	NO. 3 SEAM HORIZON
85.12	3.88	MUDSTONE, GREY, GRADING INTO SILTSTONE
89.00		END OF HOLE

No. 1 SEAM HORIZON

DEPTH	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
		ROOF - GOOD CONGLOMERATE SHALEY LAYER GROUND		1.53
23.47	0.08	SHALE - CARBONACEOUS	7821	
	0.53	COAL - MOSTLY BRIGHT		
	0.32	COAL - BRIGHT		
	0.57	SHALE - CARBONACEOUS		
25.00	0.30	COAL - BRIGHT		
	0.35	COAL - DULL AND SHALEY		
	1.13	COAL - BRIGHT	7822	1.84
26.84	0.58	COAL - DULL SHALEY		
	0.20	COAL - BRIGHT		
	0.57	COAL - DULL SHALEY		
	0.86	COAL - BRIGHT	7823	2.83
	0.20	COAL - DULL SHALEY		
	0.33	COAL - BRIGHT		
29.67	0.77	SHALE - CARBONACEOUS		
	0.23	COAL - BRIGHT	7824	
30.74		FLOOR - MUDSTONE - SILTSTONE CARBONACEOUS AT TOP		1.07

No. 2 SEAM HORIZON

DEPTH	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
		ROOF - FAIR - MUDSTONE, SANDSTONE AND GRIT		1.97
61.58	0.56	COAL - MOSTLY BRIGHT	7825	
	0.66	COAL - DULL		
	0.75	COAL - BRIGHT		
63.55	0.40	SHALE - CARBONACEOUS		
	1.10	COAL - BRIGHT WITH CARBONACEOUS SHALE STRINGERS	7826	1.52
65.07	1.77	SHALE - CARBONACEOUS	N.A.	1.77
66.84		COAL - BRIGHT WITH OCCASIONAL THIN DULL COAL AND CARBONACEOUS SHALE STRINGERS	7827	3.17
	0.35	COAL - DULL		
	0.80	COAL - BRIGHT		
70.01				

SIZE DIAMETER	SIZE WT %	SPEC GRAV	WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
+28	96.2	-1.50	26.9	6.6	9.4	34.9	49.1	10435	-	-	26.9	6.6	9.4	34.9	49.1	10435	-	-
		-1.60	6.7	3.8	24.6	34.7	36.9	8647	-	-	33.6	6.0	12.4	34.7	46.7	10078	-	-
		-1.70	4.7	3.4	34.3	33.2	33.2	7175	-	-	38.3	5.7	15.1	34.2	45.0	9722	-	-
		+1.70	61.7	2.9	*71.4	-	-	-	-	-	100.0	4.0	49.8	-	-	-	-	-
-28	3.8	RAW	100.0	-	-	-	-	-	-	-	RAW	6.0	49.3	23.7	21.0	-	-	0.33
1/4×0	100.0	RAW	100.0	6.2	49.5	23.8	20.5	-	-	0.14	CALC	4.0	49.8	-	-	-	-	-
+28	96.2	-1.70	38.3	-	-	-	-	-	-	-	36.8	5.7	15.1	34.2	45.0	9722	-	-
-28	3.8	RAW	100.0	-	-	-	-	-	-	-	3.8	6.0	49.3	23.7	21.0	5000*	-	-
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	40.6	5.7	18.3	33.2	42.8	9280	-	-
+28	96.6	-1.50	83.2	7.7	6.0	36.0	50.3	10705	-	-	83.2	7.7	6.0	36.0	50.3	10705	-	-
		-1.60	3.1	3.7	21.5	35.7	39.1	8976	-	-	86.3	7.7	6.6	36.0	49.9	10642	-	-
		-1.70	1.6	3.4	32.7	30.0	33.9	7439	-	-	87.9	7.5	7.0	35.9	49.6	10585	-	-
		+1.70	12.1	2.2	70.0	-	-	-	-	-	100.0	6.8	19.7	-	-	-	-	-
-28	3.4	RAW	100.0	-	-	-	-	-	-	-	RAW	8.2	17.9	34.8	39.1	9366	-	0.38
1/4×0	100.0	RAW	100.0	8.4	14.3	34.9	42.4	9371	-	0.24	CALC	6.9	19.6	-	-	-	-	-
+28	96.6	-1.70	87.9	-	-	-	-	-	-	-	84.9	7.5	7.0	35.9	49.6	10585	-	-
- 28	3.4	RAW	100.0	-	-	-	-	-	-	-	3.4	8.2	17.9	34.8	39.1	9366	-	-
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	88.3	7.5	7.4	35.9	49.2	10538	-	-
+28	94.3	-1.50	33.3	6.4	7.7	38.5	47.4	10778	-	-	33.3	6.4	7.7	38.5	47.4	10778	-	-
		-1.60	11.1	6.4	14.8	32.9	45.9	9643	-	-	44.4	6.4	9.5	37.1	47.0	10494	-	-
		-1.70	8.0	4.7	30.0	28.2	37.1	7723	-	-	52.4	6.1	12.6	35.7	45.5	10071	-	-
		+1.70	47.6	2.7	64.9	-	-	-	-	-	100.0	4.5	37.5	-	-	-	-	-
- 28	5.7	RAW	100.0	-	-	-	-	-	-	-	RAW	5.4	41.3	26.0	27.3	5891	-	0.29
1/4×0	100.0	RAW	100.0	6.0	36.8	27.0	30.2	6450	-	0.27	CALC	4.6	42.3	-	-	-	-	-
+28	94.3	-1.70	52.4	-	-	-	-	-	-	-	49.4	6.1	12.6	35.7	45.5	10071	-	-
- 28	5.7	RAW	100.0	-	-	-	-	-	-	-	5.7	5.4	41.3	26.0	27.3	5891	-	-
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	55.1	6.0	15.6	34.7	43.7	9638	-	-
+28	95.3	-1.50	11.2	9.6	10.3	34.9	50.2	10654	-	-	11.2	4.6	10.3	34.9	50.2	10654	-	-
		-1.60	6.0	4.5	25.1	32.4	38.0	8663	-	-	17.2	4.6	15.5	34.0	45.9	9959	-	-
		-1.70	8.2	3.0	36.2	28.0	32.8	7082	-	-	25.4	4.1	22.1	32.1	41.7	9030	-	-
		+1.70	74.6	2.1	70.0	-	-	-	-	-	100.0	2.6	57.9	-	-	-	-	-
- 28	4.7	RAW	100.0	-	-	-	-	-	-	-	RAW	4.4	53.8	23.4	18.4	-	-	0.29
1/4×0	100.0	RAW	100.0	4.0	57.0	19.8	-	-	-	0.20	CALC	2.7	57.7	-	-	-	-	-
+28	95.3	-1.70	25.4	-	-	-	-	-	-	-	24.2	4.1	22.1	32.1	41.7	9030	-	-
-28	4.7	RAW	100.0	-	-	-	-	-	-	-	4.7	4.4	53.8	23.4	18.4	4340*	-	-
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	28.9	4.2	27.3	30.7	37.8	8267	-	-
+28	96.5	-1.50	87.3	7.3	5.2	36.0	51.5	10987	-	-	87.3	7.3	5.2	36.0	51.5	10987	-	-
		-1.60	4.2	4.6	21.1	32.8	41.5	9154	-	-	91.5	7.2	5.9	35.9	51.0	10903	-	-
		-1.70	3.0	3.7	29.6	32.0	34.7	7986	-	-	94.5	7.1	6.7	35.7	50.5	10810	-	-
		+1.70	5.5	2.6	46.4	-	-	-	-	-	100.0	6.8	8.9	-	-	-	-	-
- 28	3.5	RAW	100.0	-	-	-	-	-	-	-	RAW	8.8	11.9	38.3	41.0	9982	-	0.35
1/4×0	100.0	RAW	100.0	9.1	8.6	37.3	45.0	10080	-	-	CALC	6.7	9.0	-	-	-	-	-
+ 28	96.5	-1.70	94.5	-	-	-	-	-	-	-	91.2	7.1	6.7	35.7	50.5	10810	-	-
- 28	3.5	RAW	100.0	-	-	-	-	-	-	-	3.5	8.8	11.9	38.3	41.0	9982	-	-
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	94.7	7.2	6.9	35.8	50.1	10779	-	-
+28	95.7	-1.50	48.3	6.7	6.8	38.6	47.9	10996	-	-	48.3	6.7	6.8	38.6	47.9	10996	-	-
		-1.60	6.5	4.4	20.9	32.3	42.4	9180	-	-	54.8	6.4	8.5	37.9	47.3	10780	-	-
		-1.70	4.8	2.9	32.2	28.2	36.7	7615	-	-	59.6	6.1	10.4	37.1	46.4	10526	-	-
		+1.70	40.4	1.5	73.0	-	-	-	-	-	100.0	4.3	35.7	-	-	-	-	-
- 28	4.3	RAW	100.0	-	-	-	-	-	-	-	RAW	6.0	32.0	26.9	35.1	7382	-	0.33
1/4×0	100.0	RAW	100.0	5.9	34.5	28.2	31.4	6941	-	0.22	CALC	4.4	35.5	-	-	-	-	-
+28	95.7	-1.70	59.6	-	-	-	-	-	-	-	57.0	6.1	10.4	37.1	46.4	10526	-	-
- 28	4.3	RAW	100.0	-	-	-	-	-	-	-	4.3	6.0	32.0	26.9	35.1	7382	-	-
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	61.3	6.1	11.9	36.4	45.6	10305	-	-
1/4×0	100.0	RAW	0.0	-	100.0	-	-	-	-	-	0.00	0	0	0	0	0		
+28	96.1	-1.50	57.0	6.0	6.9	40.2	46.9	11020	-	-	57.0	6.0	6.9	40.2	46.9	11020	-	-
		-1.60	4.6	3.7	22.0	31.4	42.9	9127	-	-	61.6	5.8	8.0	39.5	46.6	10878	-	-
		-1.70	5.7	4.5	30.0	30.3	35.2	7758	-	-	67.3	5.7	9.9	38.8	45.6	10614	-	-
		+1.70	32.7	2.3	58.7	-	-	-	-	-	100.0	4.6	25.8	-	-	-	-	-
- 28	3.9	RAW	100.0	-	-	-	-	-	-	-	RAW	7.1	24.5	29.6	38.8	8247	-	0.26
1/4×0	100.0	RAW	100.0	6.9	25.4	31.6	36.1	8017	-	-	CALC	4.7	25.8	-	-	-	-	-
+28	96.1	-1.70	67.3	-	-	-	-	-	-	-	64.7	5.7	9.9	38.8	45.6	10614	-	-
- 28	3.9	RAW	100.0	-	-	-	-	-	-	-	3.9	7.1	24.5	29.6	38.8	8247	-	-
1/4×0	100.0	COMP	-	-	-	-	-	-	-	-	68.6	5.8	10.7	38.2	45.2	10479	-	-

CUMULATIVE SAMPLE VALUES

THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
1.53	40.6	5.7	18.3	33.2	42.8	9280	-	-
3.37	66.6	7.0	10.4	35.2	47.4	10190	-	-
6.20	61.4	6.6	12.6	34.9	45.9	9963	-	-
7.27	56.6	6.4	13.6	34.6	45.3	9836	-	-
1.97	94.7	7.2	6.9	35.8	50.1	10779	-	-
3.49	80.2	6.8	8.6	36.0	48.6	10621	-	-
5.26	53.2	6.8	8.6	36.0	48.6	10621	-	-
8.43	59.0	6.4	9.5	37.0	47.1	10559	-	-

OTHER

7.27m COAL 6.87m RECOVERED 94.5% RECOVERY

8.43m COAL 8.36m RECOVERED 99% RECOVERY

*FROM ASH/BTU CURVE

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X

ELEVATION:

DIP BEARING

CORE SIZE CASING

BITS USED

MUD USED

FT. LEFT IN HOLE FT.

DATE START FINISH

DRILLER OVERALL RECOVERY

TESTS

SAMPLED BY: R.J. MAZUR DATE 11 JULY, 1978 ANALYZED BY: BIRTLEY

BOREHOLE NO. BP-78-2
PAN OCEAN OIL LTD. (PAGE 2)
MINING DIVISION – COAL

LOGGED BY: R.J. MAZUR DATE 11 JULY, 1978

SIGNED *James S. McKinney*

GEOLOGICAL LOG – SCALE:

DETAILS OF COAL SEAMS – SCALE:

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
			SEE PAGE 1

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
			No. 3 SEAM HORIZON		1.07
			ROOF - POOR MUDSTONE	7828	
81.76		0.24	COAL - BRIGHT		0.61
		0.190	COAL - DULL		
		0.37	COAL - BRIGHT		
82.83		0.61	MUDSTONE, GREY		N.A.
83.44		0.23	COAL - BRIGHT	7829	0.23
83.67		0.99	MUDSTONE, GREY		N.A.
84.66		0.46	COAL - DULL & BRIGHT	7830	0.99
85.12			FLOOR - MUDSTONE		0.46

	SIZE		WEIGHT PERCENT									CUMULATIVE WEIGHT PERCENT								CUMULATIVE SAMPLE VALUES									OTHER
	DIAMETER	WT %	SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C	BTU	F.S.I.	S	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S			
	+28	90.3	-1.50	64.0	4.0	9.8	37.0	49.2	10708	-	-	64.0	4.0	9.8	37.0	49.2	10708	-	-												
			-1.60	13.3	3.8	24.6	31.9	39.7	8701	-	-	77.3	4.0	12.4	36.1	47.6	10363	-	-												
			-1.70	9.0	3.4	35.7	27.3	33.6	7073	-	-	86.3	3.9	14.8	35.2	46.1	10020	-	-												
			+1.70	13.7	2.5	55.9	-	-	-	-	-	100.0	3.7	20.4	-	-	-	-	-												
	-28	9.7	RAW	100.0	-	-	-	-	-	-	-	RAW	3.7	25.9	34.1	36.3	8542	-	0.45												
	1/4×0	100.0	RAW	100.0	3.7	20.9	32.0	43.4	9186	-	0.43	CALC	3.7	20.9	-	-	-	-	-												
	+28	90.3	-1.70	86.3	-	-	-	-	-	-	-	77.9	3.9	14.8	35.2	46.1	10020	-	-												
	-28	9.7	RAW	100.0	-	-	-	-	-	-	-	9.7	3.7	25.9	34.1	36.3	8542	-	-												
	1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	87.6	3.9	16.0	35.1	45.0	9856	-	-	1.07	87.6	3.9	16.0	35.1	45.0	9856					
	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	-	-	1.68	55.8	3.9	16.0	35.1	45.0	9856					
	+28	92.5	-1.50	64.5	4.5	9.2	37.8	48.5	10899	-	-	64.5	4.5	9.2	37.8	48.5	10899	-	-												
			-1.60	15.1	4.3	27.0	31.5	37.2	8372	-	-	79.6	4.5	12.6	36.6	46.4	10419	-	-												
			-1.70	7.0	4.3	34.2	29.0	32.5	7257	-	-	86.6	4.5	14.3	36.0	45.2	10164	-	-												
			+1.70	13.4	2.1	74.0	-	-	-	-	-	100.0	4.1	23.3	-	-	-	-	-												
	-28	7.5	RAW	100.0	-	-	-	-	-	-	-	RAW	6.4	22.0	34.6	37.0	8753	-	0.50												
	1/4×0	100.0	RAW	100.0	5.5	21.8	31.1	41.6	8876	-	0.47	CALC	4.3	22.3	-	-	-	-	-												
	+28	92.5	-1.70	86.6	-	-	-	-	-	-	-	80.1	4.5	14.3	36.0	45.2	10164	-	-												
	-28	7.5	RAW	100.0	-	-	-	-	-	-	-	7.5	6.4	22.0	34.6	37.0	8753	-	-												
	1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	87.6	4.7	15.0	35.8	44.5	10043	-	-	1.91	59.6	4.0	15.8	35.2	44.9	9889					
	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	-	-	2.90	39.3	4.0	15.8	35.2	44.9	9889					
	+28	91.0	-1.50	43.1	3.7	6.7	35.5	54.1	11361	-	-	43.1	3.7	6.7	35.5	54.1	11361	-	-												
			-1.60	13.0	4.5	22.1	30.9	42.5	8904	-	-	56.1	3.9	10.3	34.4	51.4	10792	-	-												
			-1.70	11.5	4.0	31.7	26.8	37.5	7518	-	-	67.6	3.9	13.9	33.1	49.1	10235	-	-												
			+1.70	32.4	2.5	56.5	-	-	-	-	-	100.0	3.5	27.7	-	-	-	-	-												
	-28	9.0	RAW	100.0	-	-	-	-	-	-	-	RAW	5.7	24.3	34.3	35.7	8421	-	0.35												
	1/4×0	100.0	RAW	100.0	5.9	27.3	27.8	39.0	7899	-	0.29	CALC	3.7	27.4	-	-	-	-	-												
	+28	91.0	-1.70	67.6	-	-	-	-	-	-	-	61.5	3.9	13.9	33.1	49.1	10235	-	-												
	-28	9.0	RAW	100.0	-	-	-	-	-	-	-	9.0	5.7	24.3	34.3	35.7	8421	-	-												
	1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	70.5	4.1	15.2	33.3	47.4	10003	-	-	3.36	43.5	4.1	15.7	34.8	45.4	9914					

RECOVERY UNCERTAIN

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X
ELEVATION:
DIP BEARING
CORE SIZE CASING

BITS USED
MUD USED
FT. LEFT IN HOLE FT.

DATE START FINISH
DRILLER OVERALL RECOVERY
TESTS
SAMPLED BY DATE ANALYZED BY

BOREHOLE NO. BP-78-2 (PAGE 3)

PAN OCEAN OIL LTD.

MINING DIVISION – COAL

LOGGED BY DATE

SIGNED James S. McKinney

GEOLOGICAL LOG – SCALE:

DETAILS OF COAL SEAMS – SCALE:

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
			SEE BP-78-2 (PAGE 1)

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
			NO. 1 SEAM HORIZON		1.53
23.47			ROOF - GOOD CONGLOMERATE SHALEY LAYER GROUND	7821	
		0.08	SHALE - CARBONACEOUS		
		0.53	COAL - MOSTLY BRIGHT		
		0.32	COAL - BRIGHT		
		0.57	SHALE - CARBONACEOUS		1.84
25.00		0.30	COAL - BRIGHT		
		0.35	COAL - DULL AND SHALEY		
		1.13	COAL - BRIGHT	7822	
26.84		0.58	COAL - DULL SHALEY		
		0.20	COAL - BRIGHT		
		0.57	COAL - DULL SHALEY		
		0.86	COAL - BRIGHT	7823	2.83
		0.20	COAL - DULL SHALEY		
29.67		0.33	COAL - BRIGHT		
		0.77	SHALE - CARBONACEOUS		
		0.23	COAL - BRIGHT		1.07
30.74			FLOOR - MUDSTONE - SILTSTONE CARBONACEOUS AT TOP	7824	

SIZE

DIAMETER	WT %
+28	96.2
+28	96.2
-28	3.8
+28	96.2
-28	3.8
ULTIMATE ANALYSIS & ASH FUSION	
+28	-
-28	-
+28	96.6
-28	3.4
1/4×0	-
+28	96.6
-28	3.4
1/4×0	-
ULTIMATE ANALYSIS & ASH FUSION	
+28	-
-28	-
+28	94.3
-28	5.7
1/4×0	-
+28	94.3
-28	5.7
1/4×0	-
ULTIMATE ANALYSIS & ASH FUSION	
+28	-
-28	-
+28	95.3
+28	95.3
-28	4.7
1/4×0	-
+28	95.3
-28	4.7
1/4×0	-
ULTIMATE ANALYSIS & ASH FUSION	
+28	-
-28	-

WEIGHT PERCENT

SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
-1.70	-	-	-	-	-	-	-	-
-1.80	3.6	2.7	31.9	28.4	37.0	7793	-	-
-1.90	1.9	2.8	46.6	24.6	26.0	6009	-	-
+1.90	56.3	4.3	73.5	14.1	8.1	-	-	-
-1.80	41.9	-	-	-	-	-	-	-
RAW	100.0	-	-	-	-	-	-	-
-1.90	43.8	-	-	-	-	-	-	-
RAW	100.0	-	-	-	-	-	-	-
ULTIMATE ANALYSIS & ASH FUSION								
-1.70	-	-	-	-	-	-	-	-
RAW	-	-	-	-	-	-	-	-
-1.70	-	-	-	-	-	-	-	-
-1.80	0.9	2.6	32.5	29.0	35.9	7667	-	-
-1.90	0.4	2.5	45.4	25.0	27.1	6197	-	-
+1.90	10.8	2.4	73.8	15.9	7.9	-	-	-
-1.80	88.8	-	-	-	-	-	-	-
RAW	100.0	-	-	-	-	-	-	-
COMB	-	-	-	-	-	-	-	-
-1.90	89.2	-	-	-	-	-	-	-
RAW	100.0	-	-	-	-	-	-	-
COMB	-	-	-	-	-	-	-	-
ULTIMATE ANALYSIS & ASH FUSION								
-1.70	-	-	-	-	-	-	-	-
RAW	-	-	-	-	-	-	-	-
-1.70	-	-	-	-	-	-	-	-
-1.80	4.2	2.7	32.6	29.5	35.2	7758	-	-
-1.90	3.3	2.4	47.3	25.8	24.5	5609	-	-
+1.90	40.1	2.2	70.0	17.3	10.5	-	-	-
-1.80	56.6	-	-	-	-	-	-	-
RAW	100.0	-	-	-	-	-	-	-
COMB	-	-	-	-	-	-	-	-
-1.90	59.9	-	-	-	-	-	-	-
RAW	100.0	-	-	-	-	-	-	-
COMB	-	-	-	-	-	-	-	-
ULTIMATE ANALYSIS & ASH FUSION								
-1.70	-	-	-	-	-	-	-	-
RAW	-	-	-	-	-	-	-	-
-1.70	-	3.0	33.8	28.0	35.2	7597	-	-
-1.80	8.8	3.1	49.2	22.9	24.8	5231	-	-
-1.90	3.8	2.4	73.8	14.7	9.1	-	-	-
+1.90	62.0	-	-	-	-	-	-	-
-1.80	34.2	-	-	-	-	-	-	-
RAW	100.0	-	-	-	-	-	-	-
COMB	-	-	-	-	-	-	-	-
-1.90	38.0	-	-	-	-	-	-	-
RAW	100.0	-	-	-	-	-	-	-
COMB	-	-	-	-	-	-	-	-
ULTIMATE ANALYSIS & ASH FUSION								
-1.70	-	-	-	-	-	-	-	-
RAW	-	-	-	-	-	-	-	-

CUMULATIVE WEIGHT PERCENT

YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
38.3	5.7	15.1	34.2	45.0	9722	-	-
41.9	5.4	16.5	33.7	44.3	9556	-	-
43.8	5.3	17.9	33.3	43.5	9402	-	-
100.0	4.8	49.2	22.5	23.6	-	-	-
40.3	5.4	16.5	33.7	44.3	9556	-	-
3.8	6.0	49.3	23.7	21.0	5000*	-	-
42.1	5.3	17.9	33.3	43.5	9402	-	-
3.8	6.0	49.3	23.7	21.0	5000 *	-	-
	H_2O	C	H	N	S	ASH	O
-	6.99	56.8	4.36	0.68	0.36	14.6	16.2
-	6.02	29.9	2.74	0.34	0.33	49.3	11.4
87.9	7.5	7.0	35.9	49.6	10585	-	-
88.8	7.5	7.3	35.8	49.5	10555	-	-
89.2	7.4	7.4	35.8	49.4	10535	-	-
100.0	6.9	14.6	33.6	44.9	-	-	-
85.7	7.5	7.3	35.8	49.5	10555	-	-
3.4	8.2	17.9	34.8	39.1	9366	-	-
89.1	7.5	7.7	35.8	49.1	10509	-	-
86.2	7.4	7.4	35.8	49.4	10535	-	-
3.4	8.2	17.9	34.8	39.1	9366	-	-
89.6	7.4	7.8	35.8	49.0	10490	-	-
	H_2O	C	H	N	S	ASH	O
-	8.09	61.98	4.80	0.71	0.36	6.69	17.4
-	8.15	54.07	4.21	0.66	0.38	17.91	14.6
52.4	6.1	12.6	35.7	45.5	10071	-	-
56.6	5.9	14.1	35.2	44.7	9899	-	-
59.9	5.7	15.9	34.7	43.6	9663	-	-
100.0	4.3	37.6	27.7	30.3	-	-	-
52.8	5.9	14.1	35.2	44.7	9899	-	-
5.7	5.4	41.3	26.0	27.3	5891	-	-
58.5	5.9	16.8	34.3	43.0	9508	-	-
56.5	5.7	15.9	34.7	43.6	9663	-	-
5.7	5.4	41.3	26.0	27.3	5891	-	-
62.2	5.7	18.2	33.9	42.1	9317	-	-
	H_2O	C	H	N	S	ASH	O
-	7.19	58.45	4.50	0.71	0.37	12.13	16.7
-	5.38	36.29	3.16	0.46	0.29	41.28	13.1
25.4	4.1	22.1	32.1	41.7	9030	-	-
34.2	3.8	25.1	31.1	40.0	8661	-	-
38.0	3.8	27.5	30.2	38.5	8318	-	-
100.0	2.9	56.2	20.6	20.3	-	-	-
32.6	3.8	25.1	31.1	40.0	8661	-	-
4.7	4.4	53.8	23.4	18.4	4340*	-	-
37.3	3.9	28.7	30.1	37.3	8116	-	-
36.2	3.8	27.5	30.2	38.5	8318	-	-
4.7	4.4	53.8	23.4	18.4	4340 *	-	-
40.9	3.9	30.5	29.4	36.2	7861	-	-
	H_2O	C	H	N	S	ASH	O
-	5.83	52.31	4.03	0.69	0.36	21.32	15.5
-	4.42	28.27	2.62	0.41	0.29	53.78	10.2

CUMULATIVE SAMPLE VALUES

THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
1.53	44.1	5.5	19.3	32.8	42.3	9163	-	-
1.53	45.9	5.4	20.5	32.5	41.6	9038	-	-
OXIDIZING				REDUCING				
IDT	ST	HT	FT	IDT	ST	HT	FT	
2420	2500	2540	2610	2360	2440	2480	2560	
+2750	-	-	-	+2750				
3.37	68.7	6.9	11.1	34.9	47.1	10117		
3.37	69.8	6.8	11.6	34.8	46.8	10056		
OXIDIZING				REDUCING				
IDT	ST	HT	FT	IDT	ST	HT	FT	
2340	2400	2440	2460	2140	2240	2300	2340	HARDGROVE 39
2220	2460	2520	2560	2100	2180	2260	2380	
6.2	64.0	6.5	13.5	34.7	45.4	9863		
6.20	66.3	6.3	14.4	34.4	44.8	9770		
OXIDIZING				REDUCING				
IDT	ST	HT	FT	IDT	ST	HT	FT	
2400	2560	2580	2600	2290	2420	2460	2560	HARDGROVE 35
+2750	-	-	-	+2750	-	-	-	
7.27	60.1	6.3	14.9	34.2	44.6	9703		
7.27	62.6	6.1	16.0	33.9	44.0	9559		
OXIDIZING				REDUCING				
IDT	ST	HT	FT	IDT	ST	HT	FT	
2580	2720	2740	+2750	2460	2620	2650	2720	
+2750	-	-	-	2700	+2750	-	-	

OTHER

* FROM ASH / BTU CURVE

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X
ELEVATION: BITS USED
DIP BEARING MUD USED
CORE SIZE CASING FT. LEFT IN HOLE FT.

DATE START FINISH
DRILLER OVERALL RECOVERY
TESTS
SAMPLED BY: J. S. McKINNEY DATE : JULY 10, 1978 ANALYZED BY

BOREHOLE NO. BP-78-2
PAN OCEAN OIL LTD. (PAGE 4)
MINING DIVISION – COAL

LOGGED BY : J. S. McKINNEY DATE : JULY 10, 1978

SIGNED James S. McKinney

GEOLOGICAL LOG – SCALE:

DETAILS OF COAL SEAMS – SCALE:

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
			SEE BP-78-2 (PAGE 1)

NO. 2 SEAM HORIZON

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
			ROOF - FAIR - MUDSTONE, SANDSTONE AND GRIT		1.97
61.58		0.56	COAL - MOSTLY BRIGHT	7825	
		0.66	COAL - DULL		
		0.75	COAL - BRIGHT		
63.55		0.40	SHALE - CARBONACEOUS		
		1.10	COAL - BRIGHT WITH CARBONACEOUS SHALE STRINGERS	7826	1.52
65.07			SHALE - CARBONACEOUS		
		1.77		N.A.	
66.84			COAL - BRIGHT WITH OCCASIONAL THIN DULL COAL AND CARBONACEOUS SHALE STRINGERS		1.77
		0.35	COAL - DULL	7827	
		0.80	COAL - BRIGHT		3.17
70.01					

SIZE

DIAMETER	WT %
+28	96.5
1/4 × 0	100.0
+28	95.7
+28	95.7
-28	4.3
1/4 × 0	100.0
+28	95.7
-28	4.3
1/4 × 0	100.0
1/4 × 0	100.0
+28	96.1
+28	96.1
-28	3.9
1/4 × 0	100.0
+28	96.1
-28	3.9
1/4 × 0	100.0

WEIGHT PERCENT

	SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
+28	-1.70	-	-	-	-	-	-	-	-
	-1.80	INSUFFICENT		SAMPLE	-	-	-	-	-
	-1.90	-	-	-	-	-	-	-	-
	+1.90	5.5	2.6	46.4	-	-	-	-	-
1/4 × 0	COMB	-	-	-	-	-	-	-	-
ULTIMATE ANALYSIS & ASH FUSION									
+28	-1.70	-	-	-	-	-	-	-	-
-28	RAW	-	-	-	-	-	-	-	-
+28	-1.70	-	-	-	-	-	-	-	-
	-1.80	3.1	2.3	26.7	30.7	40.3	8668	-	-
	-1.90	1.4	2.5	40.4	21.8	35.3	6967	-	-
	+1.90	35.9	1.8	78.1	13.7	6.4	-	-	-
+28	-1.80	62.7	-	-	-	-	-	-	-
-28	RAW	100.0	-	-	-	-	-	-	-
1/4 × 0	COMB	-	-	-	-	-	-	-	-
+28	-1.90	64.1	-	-	-	-	-	-	-
-28	RAW	100.0	-	-	-	-	-	-	-
1/4 × 0	COMB	-	-	-	-	-	-	-	-
ULTIMATE ANALYSIS & ASH FUSION									
+28	-1.70	-	-	-	-	-	-	-	-
-28	RAW	-	-	-	-	-	-	-	-
1/4 × 0	RAW	0.0	-	100.0	-	-	-	-	-
+28	-1.70	-	-	-	-	-	-	-	-
	-1.80	3.9	2.7	26.6	29.4	41.3	8749	-	-
	-1.90	2.0	2.8	40.4	24.9	31.9	6580	-	-
	+1.90	26.8	2.1	65.2	20.2	12.5	-	-	-
+28	-1.80	71.2	-	-	-	-	-	-	-
-28	RAW	100.0	-	-	-	-	-	-	-
1/4 × 0	COMB	-	-	-	-	-	-	-	-
+28	-1.90	73.2	-	-	-	-	-	-	-
-28	RAW	100.0	-	-	-	-	-	-	-
1/4 × 0	COMB	-	-	-	-	-	-	-	-
ULTIMATE ANALYSIS & ASH FUSION									
+28	-1.70	-	-	-	-	-	-	-	-
-28	RAW	-	-	-	-	-	-	-	-

CUMULATIVE WEIGHT PERCENT

	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
+28	94.5	7.1	6.7	35.7	50.5	10810	-	-
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	100.0	6.8	8.9	-	-	-	-	-
1/4 × 0	94.7	7.2	6.9	35.8	50.1	10779	-	-
ULTIMATE ANALYSIS & ASH FUSION		H_2O	C	H	N	S	ASH	O
+28	-	7.85	62.23	4.74	0.66	0.36	6.35	
-28	-	8.83	58.16	4.44	0.61	0.35	11.85	15.8
+28	59.6	6.1	10.4	37.1	46.4	10526	-	-
	62.7	5.9	11.2	36.8	46.1	10434	-	-
	64.1	5.8	11.8	36.5	45.9	10358	-	-
	100.0	4.4	35.6	28.3	31.7	6639	-	-
+28	60.0	5.9	11.2	36.8	46.1	10434	-	-
-28	4.3	6.0	32.0	26.9	35.1	7382	-	-
1/4 × 0	64.3	5.9	12.6	36.1	45.4	10230	-	-
+28	61.3	5.8	11.8	36.5	45.9	10358	-	-
-28	4.3	6.0	32.0	26.9	35.1	7382	-	-
1/4 × 0	65.6	5.8	13.1	35.9	45.2	10163	-	-
ULTIMATE ANALYSIS & ASH FUSION		H_2O	C	H	N	S	ASH	O
+28	-	6.96	60.88	4.42	0.63	0.36	10.04	16.7
-28	-	6.03	44.60	3.48	0.51	0.33	31.99	13.1
1/4 × 0	0.0	0.00	0	0	0	0	-	-
		-	-	-	-	-	-	-
+28	67.3	5.7	9.9	38.8	45.6	10614	-	-
	71.2	5.5	10.8	38.3	45.4	10511	-	-
	73.2	5.5	11.6	37.9	45.0	10404	-	-
	100.0	4.6	26.0	33.2	36.3	7616	-	-
+28	68.4	5.5	10.8	38.3	45.4	10511	-	-
-28	3.9	7.1	24.5	29.6	38.8	8247	-	-
1/4 × 0	72.3	5.6	11.5	37.8	45.0	10389	-	-
+28	70.4	5.5	11.6	37.9	45.0	10404	-	-
-28	3.9	7.1	24.5	29.6	38.8	8247	-	-
1/4 × 0	74.3	5.6	12.3	37.5	44.7	10291	-	-
ULTIMATE ANALYSIS & ASH FUSION		H O	C	H	N	S	ASH	O
+28	-	6.95	61.02	4.59	0.69	0.34	9.41	17.0
-28	-	7.08	49.52	3.85	0.59	0.26	24.46	14.2

CUMULATIVE SAMPLE VALUES

THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
1.97	94.7	7.2	6.9	35.8	50.1	10779	-	-
OXIDIZING				REDUCING				
IDT	ST	HT	FT	IDT	ST	HT	FT	
2440	2460	2480	2520	2280	2340	2390	2450	HARDGROVE 42
2420	2480	2560	2520	1920	2080	2130	2200	
3.49	81.5	6.8	8.9	35.9	48.5	10590		
3.49	82.0	6.7	9.1	35.8	48.4	10564		
OXIDIZING				REDUCING				
IDT	ST	HT	FT	IDT	ST	HT	FT	
2390	2460	2480	2530	2110	2160	2200	2290	
2740	+2750	-	-	2560	2650	2680	2730	
5.26	54.0	6.8	8.9	35.9	48.5	10590	at -1.80	
5.26	54.4	6.7	9.1	35.8	48.4	10564	at -1.90	
8.43	60.9	6.2	10.0	36.8	46.9	10500		
8.43	61.9	6.2	10.5	36.6	46.7	10441		
OXIDIZING				REDUCING				
IDT	ST	HT	FT	IDT	ST	HT	FT	
2560	2580	2610	2630	2200	2480	2500	2550	HARDGROVE 41
+2750	-	-	-	2640	2660	2680	2710	

OTHER

060055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X
ELEVATION:
DIP: 90° BEARING: 0
CORE SIZE: HQ CASING 48
BITS USED SMITH
MUD USED QUICK GEL
FT. LEFT IN HOLE NIL FT.

DATE START 29 JULY, 1978 FINISH: 6 AUGUST, 1978
DRILLER: CARON DIAMOND DRILLING OVERALL RECOVERY 86.2%
TESTS: NONE
SAMPLED BY: J.S. McKINNEY DATE: 15 SEPT., 1978 ANALYZED BY: BIRTLEY

BOREHOLE NO. BP-78-3
PAN OCEAN OIL LTD. (PAGE 1)
MINING DIVISION – COAL

LOGGED BY: R.F. McINTYRE DATE 6 AUGUST, 1978
SIGNED James S. McKinney

GEOLOGICAL LOG – SCALE: 1:500

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
		10.40	OVERBURDEN - ASSORTED PEBBLES IN MUD
10.4			
10.7		0.30	MUDSTONE - GREY
		4.20	OVERBURDEN ? NO RECOVERY
14.9			
		1.70	MUDSTONE - GREY
16.6			
17.0		0.40	SANDSTONE - FINE GRAINED BUFF TO GREY
			CONGLOMERATE - BLACK AND BUFF CHERT PEBBLE CONGLOMERATE WITH QUARTZITE AND QUARTZ PEBBLES. USUAL SIZE OF PEBBLES 25-50mm, POORLY CEMENTED. HIGH POROSITY, SEE WRITTEN LOG.
			SANDSTONE BEDS 0.1 TO 0.5m THICK AT 21.2, 29.0, 35.8, 88.8 AND 91.4m. MUDSTONE 0.1 TO 0.2m THICK AT 49.0, 52.4, 52.9, 87.3 AND 91.8m. DIPS APPEAR TO BE 10-15 DEGREES.
		74.80	
91.8			NO. 1 SEAM HORIZON
		8.70	
100.5			MUDSTONE - GREY
		7.90	
108.4			
110.3		1.90	CONGLOMERATE - AS ABOVE
113.1		2.80	SANDSTONE - GREY
115.2		2.10	CONGLOMERATE - AS ABOVE
117.1		1.90	SANDSTONE - GREY
119.22		2.40	CONGLOMERATE - AS ABOVE
121.65		2.43	COAL - NO. 2 SEAM HORIZON ?
			SANDSTONE - GREY, FINE GRAINED
		5.80	
129.7			
130.2		0.50	CONGLOMERATE - AS ABOVE
	E.O.H.		

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
			No. 1 SEAM HORIZON		0.27
		0.30	ROOF - GOOD CONGLOMERATE SILTSTONE	78311	2.63
91.80			COAL - THIN BANDED MOSTLY DULL W/1mm BRIGHT STRINGERS		
92.07		0.31			
92.38			GRINDING - COAL & SH.?	N.A.	
		1.41	SHALE AND COALY SHALE		1.55
93.79					
		0.91	MUDSTONE ROOF - POOR		
94.70					
94.95			COAL - BRIGHT	78312	
95.30			COAL - DULL W/SOME BRIGHT		
95.50			COAL - BRIGHT		
95.70			MUDSTONE		
			SHALEY COAL		0.40
96.50					
			COAL - BRIGHT	78313	
96.90			SHALE - CARBONACEOUS	78314	
97.50			COAL - MOSTLY DULL, THICK BANDED SHALEY COAL IN PLACES		0.60
				78315	
100.50			FLOOR - POOR MUDSTONE, COALY SHALE AND SILTSTONE		
					3.00
			No. 2 SEAM HORIZON ?		1.33
119.22			CONGLOMERATE ROOF - GOOD		
		0.60	COAL - BRIGHT AND DULL THICK BANDED	78321	
119.82					
		0.73	COAL - BRIGHT		
120.55					0.70
		0.70	COAL - BRIGHT AND DULL THICK BANDED	78322	
121.25					
		0.40	COALY SHALE		
121.65			FLOOR - POOR - MUDSTONE	78323	
					0.40

SAMPLE NUMBER	SIZE DIAMETER	SIZE WT %	SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S
78311	+28	91.2	-1.70	81.8	4.8	17.6	31.0	46.6	9574	-	-
			-1.80	8.9	3.3	45.5	24.2	27.0	5826	-	-
			-1.90	5.8	3.2	52.7	21.4	22.7	5032	-	-
			+1.90	3.5	2.6	66.0	17.7	13.7	-	-	-
	-28	8.8	RAW	-	-	-	-	-	-	-	-
	1/4×0	100.0	RAW	100.0	8.2	63.1	28.5	40.4	8382	-	0.49
	+28	91.2	-1.70	81.8	-	-	-	-	-	-	-
	-28	8.8	RAW	100.0	-	-	-	-	-	-	-
	1/4×0	100.0	COMB	-	-	-	-	-	-	-	-
78312	+28	92.6	-1.70	34.0	6.8	13.6	34.8	44.8	9875	-	-
			-1.80	3.5	3.7	44.5	23.9	27.9	6007	-	-
			-1.90	7.9	3.3	53.4	20.6	22.7	4928	-	-
			+1.90	54.6	3.9	73.7	13.4	9.0	-	-	-
	-28	7.4	RAW	-	-	-	-	-	-	-	-
	1/4×0	100.0	RAW	100.0	7.1	50.1	21.0	21.8	4901	-	0.18
	+28	92.6	-1.70	34.0	-	-	-	-	-	-	-
	-28	7.4	RAW	100.0	-	-	-	-	-	-	-
	1/4×0	100.0	COMB	-	-	-	-	-	-	-	-
78313	+28	93.4	-1.70	98.2	6.4	5.7	37.3	50.6	10884	-	-
			+1.70	1.8	2.7	49.9	20.5	26.9	5505	-	-
	-28	6.6	RAW	-	-	-	-	-	-	-	-
	1/4×0	100.0	RAW	100.1	10.2	6.6	35.5	47.7	10394	-	0.29
78314	+28	93.4	-1.70	98.2	-	-	-	-	-	-	-
	-28	6.6	RAW	100.0	-	-	-	-	-	-	-
	1/4×0	100.0	COMB	-	-	-	-	-	-	-	-
78315	+28	94.3	-1.70	2.8	5.3	10.8	36.6	47.3	10445	-	-
			-1.80	0.3	4.4	44.3	24.9	26.4	5970	-	-
			-1.90	0.6	3.7	54.9	21.7	19.7	4711	-	-
			+1.90	96.3	4.1	80.7	12.3	2.9	-	-	-
	-28	5.7	RAW	-	-	-	-	-	-	-	-
	1/4×0	100.0	RAW	100.0	6.5	76.4	12.7	4.4	-	-	0.09
	+28	94.3	-1.70	2.8	-	-	-	-	-	-	-
	-28	5.7	RAW	100.0	-	-	-	-	-	-	-
	1/4×0	100.0	COMB	-	-	-	-	-	-	-	-
	+28	94.5	-1.70	52.3	6.9	17.1	33.4	42.6	9340	-	-
			-1.80	10.9	3.6	45.5	25.0	25.9	5863	-	-
			-1.90	15.0	3.4	51.8	23.6	21.2	5152	-	-
			+1.90	21.8	2.6	75.4	14.7	7.3	-	-	-
	-28	5.5	RAW	-	-	-	-	-	-	-	-
	1/4×0	100.0	RAW	100.0	7.8	39.0	25.9	27.3	6126	-	0.20
	+28	44.5	-1.70	52.3	-	-	-	-	-	-	-
	-28	5.5	RAW	100.0	-	-	-	-	-	-	-
	1/4×0	100.0	COMB	-	-	-	-	-	-	-	-
	+28	93.5	-1.70	93.8	6.9	13.6	34.1	45.4	9686	-	-
			-1.80	2.3	3.2	40.5	26.3	30.0	6616	-	-
			-1.90	1.3	3.1	46.8	24.3	25.8	5813	-	-
			+1.90	2.6	1.9	66.6	20.4	11.1	-	-	-
	-28	6.5	RAW	-	-	-	-	-	-	-	-
	1/4×0	100.0	RAW	100.0	9.9	15.7	32.2	42.2	9110	-	0.33
	+28	93.5	-1.70	93.8	-	-	-	-	-	-	-
	-28	6.5	RAW	100.0	-	-	-	-	-	-	-
	1/4×0	100.0	COMB	-	-	-	-	-	-	-	-
78321	+28	92.8	-1.70	51.0	5.2	15.4	32.2	47.2	9637	-	-
			-1.80	13.7	3.8	40.8	24.7	30.7	6492	-	-
			-1.90	11.9	3.1	47.6	23.4	25.9	5705	-	-
			+1.90	23.4	2.0	66.3	19.6	12.1	-	-	-
	-28	7.2	RAW	-	-	-	-	-	-	-	-
	1/4×0	100.0	RAW	100.0	7.6	33.4	25.8	33.2	7048	-	0.24
78322	+28	92.8	-1.70	51.0	-	-	-	-	-	-	-
	-28	7.2	RAW	100.0	-	-	-	-	-	-	-
	1/4×0	100.0	COMB	-	-	-	-	-	-	-	-
78323	+28	89.5	-1.70	35.0	4.8	17.8	31.9	45.5	9593	-	-
			-1.80	7.7	2.8	46.5	23.7	27.0	6014	-	-
			-1.90	11.0	2.7	54.9	19.6	22.8	4762	-	-
			+1.90	46.3	2.1	78.3	12.6	7.0	-	-	-
	-28	10.5	RAW	-	-	-	-	-	-	-	-
	1/4×0	100.0	RAW	100.0	-	-	-	-	-	-	-
	+28	89.5	-1.70	35.0	-	-	-	-	-	-	-
	-28	10.5	RAW	100.0	-	-	-	-	-	-	-
	1/4×0	100.0	COMB	-	-	-	-	-	-	-	-

CUMULATIVE WEIGHT PERCENT	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
	81.8	4.8	17.6	31.0	46.6	9574	-	-
	90.7	4.7	20.3	30.3	44.7	9206	-	-
	96.5	4.6	22.3	29.8	43.4	8955	-	-
	100.0	4.5	23.8	29.4	42.3	-	-	-
	RAW	6.8	20.6	27.0	45.6	9164	-	-
	CALC	4.7	23.5	29.2	42.5	-	-	-
	74.6	4.8	17.6	31.0	46.6	9574	-	-
	8.8	6.8	20.6	27.0	45.6	9164	-	-
	83.4	5.0	17.9	30.6	46.5	9530	-	-
	34.0	6.8	13.6	34.8	44.8	9875	-	-
	37.5	6.5	16.5	33.8	43.2	9514	-	-
	45.4	6.0	22.9	31.5	39.7	8716	-	-
	100.0	4.8	50.6	21.6	22.9	-	-	-
	RAW	6.7	48.2	20.7	24.4	5159	-	-
	CALC	4.9	50.4	21.5	23.0	-	-	-
	31.5	6.8	13.6	34.8	44.8	9875	-	-
	7.4	6.7	48.2	20.7	24.4	5159	-	-
	38.9	6.8	20.2	32.1	41.0	8978	-	-
	98.2	6.4	5.7	37.3	50.6	10884	-	-
	100.0	6.3	6.5	37.0	50.2	10787	-	-
	RAW	8.7	8.7	34.6	48.0	10467	-	-
	CALC	6.5	6.7	36.8	50.1	10765	-	-
	91.7	6.4	5.7	37.3	50.6	10884	-	-
	6.6	8.7	8.7	34.6	48.0	10467	-	-
	98.3	6.6	5.9	37.1	50.4	10856	-	-
	2.8	5.3	10.8	36.6	47.3	10445	-	-
	3.1	5.2	14.0	35.5	45.3	10011	-	-
	3.7	4.9	20.7	33.2	41.1	9152	-	-
	100.0	4.1	78.5	13.1	4.3	-	-	-
	RAW	6.0	70.8	14.2	9.0	-	-	-
	CALC	4.2	78.1	13.2	4.6	-	-	-
	2.6	5.3	10.8	36.6	47.3	10445	-	-
	5.7	6.0	70.8	14.2	9.0	2680*	-	-
	8.3	5.8	52.0	21.2	21.0	5112	-	-
	52.3	6.9	17.1	33.4	42.6	9340	-	-
	63.2	6.3	22.0	31.9	39.7	8740	-	-
	78.2	5.8	27.7	30.4	36.2	8052	-	-
	100.0	5.1	38.1	26.9	29.9	-	-	-
	RAW	7.6	33.1	27.6	31.7	7036	-	-
	CALC	5.2	37.8	26.9	30.0	-	-	-
	49.4	6.9	17.1	33.4	42.6	9340	-	-
	5.5	7.6	33.1	27.6	31.7	7036	-	-
	54.9	7.0	18.7	32.8	41.5	9109	-	-
	93.8	6.9	13.6	34.1	45.4	9686	-	-
	96.1	6.8	14.2	33.9	45.1	9613	-	-
	97.4	6.7	14.7	33.8	44.8	9561	-	-
	100.0	6.6	16.0	33.4	43.9	9313	-	-
	RAW	8.4	17.8	31.1	42.7	9063	-	-
	CALC	6.7	16.1	33.3	43.9	9297	-	-
	87.7	6.9	13.6	34.1	45.4	9686	-	-
	6.5	8.4	17.8	31.1	42.7	9063	-	-
	94.2	7.0	13.9	33.9	45.2	9643	-	-
	51.0	5.2	15.4	32.2	47.2	9637	-	-
	64.7	4.9	20.8	30.6	43.7	8971	-	-
	76.6	4.6	25.0	29.5	40.9	8464	-	-
	100.0	4.0	34.6	27.2	34.2	-	-	-
	RAW	7.1	30.6	25.9	37.0	7367	-	-
	CALC	4.2	34.3	27.1	34.4	-	-	-
	47.3	6.9	13.6	34.1	45.4	9686	-	-
	7.2	7.1	30.6	25.9	37.0	7367	-	-
	54.5	6.9	15.9	33.0	44.3	9380	-	-
	35.0	4.8	17.8	31.9	45.5	9593	-	-
	42.7	4.4	23.9	30.4	42.2	8948	-	-
	53.7	4.1	29.5	28.2	38.2	8090	-	-
	100.0	3.2	52.1	20.9	23.8	-	-	-
	RAW	4.9	50.9	18.9	25.3	5056	-	-
	CALC	3.4	52.0	20.7	23.9	-	-	-
	31.3	4.8	17.8	31.9	45.5	9593	-	-
	10.5	7.1	30.6	25.9	37.0	7367	-	-
	41.8	5.4	21.0	30.4	43.4	9034	-	-

CUMULATIVE SAMPLE VALUES THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	OTHER
1.55	38.9	6.8	20.2	32.1	41.0	8978			99 % RECOVERY
1.95	51.2	6.7	14.6	34.1	44.7	9719			5.55m COAL 5.51m RECOVERY
2.55	41.0	6.7	16.3	33.5	43.6	9499			
5.55	48.5	6.9	17.8	33.1	42.3	9260			
1.33	94.2	7.0	13.9	33.9	45.2	9643			92 % RECOVERY
2.03	80.5	7.0	14.4	33.7	45.0	9582			2.43m COAL 2.24m RECOVERY
2.43	74.1	6.8	15.0	33.4	44.8	9531			

* FROM ASH/BTU CURVE

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X DATE START FINISH

ELEVATION: BITS USED DRILLER OVERALL RECOVERY

DIP BEARING MUD USED TESTS

CORE SIZE CASING FT. LEFT IN HOLE FT. SAMPLED BY DATE ANALYZED BY

BOREHOLE NO. BP-78-3 (PAGE 2)

PAN OCEAN OIL LTD.

MINING DIVISION – COAL

LOGGED BY DATE

SIGNED James S McKinney

GEOLOGICAL LOG – SCALE:

DETAILS OF COAL SEAMS – SCALE:

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
			SEE BP-78-3 (PAGE 1)

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
			No. 1 SEAM HORIZON		
		0.30	ROOF - GOOD CONGLOMERATE SILTSTONE		
91.80					
92.07		0.31	COAL - THIN BANDED MOSTLY DULL W/1mm BRIGHT STRINGERS		1.55
92.38			GRINDING - COAL & SH.?		
		1.41	SHALE AND COALY SHALE		
93.79					
		0.91	MUDSTONE ROOF - POOR		
94.70				78312	0.40
94.95			COAL - BRIGHT COAL - DULL W/SOME BRIGHT		
95.30			COAL - BRIGHT		
95.50			MUDSTONE		
95.70			SHALEY COAL	78313	
96.50			COAL - BRIGHT		
96.90			SHALE - CARBONACEOUS	78314	0.60
97.50			COAL - MOSTLY DULL, THICK BANDED SHALEY COAL IN PLACES		
				78315	
					3.00
100.50			FLOOR - POOR MUDSTONE; COALY SHALE AND SILTSTONE		
			No. 2 SEAM HORIZON?		
			CONGLOMERATE ROOF - GOOD		
119.22		0.60	COAL - BRIGHT AND DULL THICK BANDED	78321	
119.82		0.73	COAL - BRIGHT		1.33
120.55		0.70	COAL - BRIGHT AND DULL THICK BANDED	78322	0.70
121.25		0.40	COALY SHALE		
121.65			FLOOR - POOR - MUDSTONE	78323	
					0.40

SIZE / WEIGHT PERCENT

DIAMETER	WT %	SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
+28	92.6	-1.80	37.5	-	-	-	-	-	-	-
-28	7.4	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-
+28	92.6	-1.90	45.4	-	-	-	-	-	-	-
-28	7.4	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-
ULTIMATE ANALYSIS & ASH FUSION										
+28	-	-1.70	-	-	-	-	-	-	-	-
-28	-	RAW	-	-	-	-	-	-	-	-
1/4×0		COMB	AT -1.70+RAW -28	-	-	-	-	-	-	-
ULTIMATE ANALYSIS & ASH FUSION										
+28	-	-1.70	-	-	-	-	-	-	-	-
-28	-	RAW	-	-	-	-	-	-	-	-
+28	94.3	-1.80	3.1	-	-	-	-	-	-	-
-28	5.7	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-
+28	94.3	-1.90	3.7	-	-	-	-	-	-	-
-28	5.7	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-
ULTIMATE ANALYSIS & ASH FUSION										
+28	-	-1.70	-	-	-	-	-	-	-	-
-28	-	RAW	-	-	-	-	-	-	-	-
+28	94.5	-1.80	63.2	-	-	-	-	-	-	-
-28	5.5	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-
+28	94.5	-1.90	78.2	-	-	-	-	-	-	-
-28	5.5	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-
ULTIMATE ANALYSIS & ASH FUSION										
+28	-	-1.70	-	-	-	-	-	-	-	-
-28	-	RAW	-	-	-	-	-	-	-	-
+28	93.5	-1.80	96.1	-	-	-	-	-	-	-
-28	6.5	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-
+28	93.5	-1.90	97.4	-	-	-	-	-	-	-
-28	6.5	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-
ULTIMATE ANALYSIS & ASH FUSION										
+28	-	-1.70	-	-	-	-	-	-	-	-
-28	-	RAW	-	-	-	-	-	-	-	-
+28	92.8	-1.80	64.7	-	-	-	-	-	-	-
-28	7.2	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-
+28	92.8	-1.90	76.6	-	-	-	-	-	-	-
-28	7.2	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-
ULTIMATE ANALYSIS & ASH FUSION										
+28	-	-1.70	-	-	-	-	-	-	-	-
-28	-	RAW	-	-	-	-	-	-	-	-
+28	89.5	-1.80	42.7	-	-	-	-	-	-	-
-28	10.5	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-
+28	89.5	-1.90	53.7	-	-	-	-	-	-	-
-28	10.5	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-
ULTIMATE ANALYSIS & ASH FUSION										
+28	-	-1.70	-	-	-	-	-	-	-	-
-28	-	RAW	-	-	-	-	-	-	-	-

CUMULATIVE WEIGHT PERCENT

YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
34.7	6.5	16.5	33.8	43.2	9514	-	-
7.4	6.7	48.2	20.7	24.4	5159	-	-
42.1	6.5	22.1	31.5	39.9	8748	-	-
42.0	6.0	22.9	31.5	39.7	8716	-	-
7.4	6.7	48.2	20.7	24.4	5159	-	-
49.4	6.1	26.7	29.9	37.4	8183	-	-
	H_2O	C	H	N	S	ASH	O
-	6.84	58.17	4.51	0.77	0.40	13.63	15.7
-	6.72	31.48	2.88	0.47	0.19	48.23	10.0
98.3	6.6	5.9	37.1	50.4	10856	-	-
-	-	-	-	-	-	-	-
	H_2O	C	H	N	S	ASH	O
-	6.44	64.51	4.82	0.92	0.32	5.74	17.3
-	8.66	62.45	4.71	0.80	0.25	8.71	14.4
2.9	5.2	14.0	35.5	45.3	10011	-	-
5.7	6.0	70.8	14.2	9.0	2680*	-	-
8.6	5.7	51.6	21.4	21.2	5152	-	-
3.5	4.9	20.7	33.2	41.1	9152	-	-
5.7	6.0	70.8	14.2	9.0	2680*	-	-
9.2	5.6	51.7	21.4	21.2	5142	-	-
	H_2O	C	H	N	S	ASH	O
-	5.34	61.84	4.59	0.90	0.29	10.76	16.3
-	6.02	12.26	2.13	0.26	0.15	70.76	8.42
-	59.7	6.3	22.0	31.9	39.7	8740	-
-	5.5	7.6	33.1	27.6	31.7	7036	-
-	65.2	6.4	22.9	31.5	39.0	8596	-
-	73.9	5.8	27.7	30.4	36.2	8052	-
-	5.5	7.6	33.1	27.6	31.7	7036	-
-	79.4	5.9	28.1	30.2	35.9	7981	-
	H_2O	C	H	N	S	ASH	O
-	6.86	55.54	4.34	0.86	0.42	17.07	14.9
-	7.64	42.61	3.57	0.56	0.25	33.12	12.3
-	89.9	6.8	14.2	33.9	45.1	9613	-
-	6.5	8.4	17.8	31.1	42.7	9063	-
-	96.4	6.9	14.4	33.7	44.9	9576	-
-	91.1	6.7	14.7	33.8	44.8	9561	-
-	6.5	8.4	17.8	31.1	42.7	9063	-
-	97.6	6.8	14.9	33.6	44.7	9528	-
	H_2O	C	H	N	S	ASH	O
-	6.88	57.75	4.43	0.74	0.44	13.63	16.1
-	8.35	53.61	4.25	0.73	0.32	17.79	15.0
-	60.0	4.9	20.8	30.6	43.7	8971	-
-	7.2	7.1	30.6	25.9	37.0	7367	-
-	67.2	5.1	21.9	30.1	43.0	8799	-
-	71.1	4.6	25.0	29.5	40.9	8464	-
-	7.2	7.1	30.6	25.9	37.0	7367	-
-	78.3	4.8	25.5	29.2	40.5	8363	-
	H_2O	C	H	N	S	ASH	O
-	5.18	59.03	4.09	0.76	0.35	15.35	15.2
-	7.09	45.89	3.32	0.71	0.27	29.98	12.7
-	38.2	4.4	23.9	30.4	42.2	8948	-
-	10.5	7.1	30.6	25.9	37.0	7367	-
-	48.7	5.0	25.3	29.4	41.0	8607	-
-	48.1	4.1	29.5	28.2	38.2	8090	-
-	10.5	7.1	30.6	25.9	37.2	7367	-
-	58.6	4.6	29.7	27.8	38.0	7460	-
	H_2O	C	H	N	S	ASH	O
-	4.79	57.51	4.06	0.74	0.40	17.82	14.7
-	4.90	31.85	2.53	0.55	0.23	50.91	9.1

CUMULATIVE SAMPLE VALUES / OTHER

THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	OTHER
1.55	42.1	6.5	22.1	31.5	39.9	8748	-	-	
1.55	49.4	6.1	26.7	29.9	37.4	8183	-	-	
OXIDIZING IDT	ST	HT	FT	REDUCING IDT	ST	HT	FT		
2280	2350	2400	2440	2220	2270	2300	2360		HARDGROVE 39
2690	+2750	-	-	2600	2690	2720	+2750		
1.95	53.6	6.5	16.0	33.6	43.8	9540	AT -1.80		
1.95	59.4	6.3	19.6	32.3	41.8	9089	AT -1.90		
OXIDIZING IDT	ST	HT	FT	REDUCING IDT	ST	HT	FT		
2200	2230	2240	2280	1890	1920	1980	2030		HARDGROVE 37
2160	2230	2310	2400	1980	2040	2110	2170		
2.55	43.0	6.5	17.7	33.0	42.8	9334	-	-	
2.55	47.6	6.2	21.1	31.8	40.9	8910	-	-	
OXIDIZING IDT	ST	HT	FT	REDUCING IDT	ST	HT	FT		
2230	2270	2300	2350	2120	2160	2200	2220		HARDGROVE 38
+2750	-	-	-	+2750	-	-	-		
5.55	55.0	6.4	21.0	32.0	40.4	8861	-	-	
5.55	64.8	6.0	25.7	30.8	37.6	8294	-	-	
OXIDIZING IDT	ST	HT	FT	REDUCING IDT	ST	HT	FT		
2320	2440	2500	2520	2220	2270	2290	2320		HARDGROVE 38
2740	+2750	-	-	2570	2690	2720	2730		
1.33	96.4	6.9	14.4	33.7	44.9	9576	-	-	
1.33	97.6	6.6	14.9	33.6	44.7	9528			
OXIDIZING IDT	ST	HT	FT	REDUCING IDT	ST	HT	FT		
+2750	-	-	-	2650	+2750	-	-		HARDGROVE 39
2660	2700	2720	2760	2480	2540	2560	2580		
2.03	86.3	6.4	16.4	32.7	44.4	9367	-	-	
2.03	90.9	6.2	18.0	32.3	43.5	9182	-	-	
OXIDIZING IDT	ST	HT	FT	REDUCING IDT	ST	HT	FT		
2620	2680	2700	2710	2400	2480	2560	2640		HARDGROVE 39
2710	+2750	-	-	2540	2610	2640	2700		
2.43	80.1	6.3	17.3	32.4	44.0	9291	-	-	
2.43	85.6	6.0	19.4	31.8	42.8	9044	-	-	
OXIDIZING IDT	ST	HT	FT	REDUCING IDT	ST	HT	FT		
2300	2490	2530	2580	2260	2360	2420	2500		HARDGROVE 38
2650	+2750	-	-	2590	2720	+2750	-		

* FROM ASH/BTU CURVE

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y 8100 m W X 7100 m N OF S.E. CORNER CL 82 DATE START MAY 27, 1979 FINISH MAY 30, 1979
ELEVATION: APPROX. 469.4 m BITS USED J.K. SMIT SERIES 200 COMBINATION DRILLER CARON DRILLING OVERALL RECOVERY 92.5%
DIP -90° BEARING NA MUD USED 16 BAGS GEL, 17 BAGS TROL TESTS GAMMA RAY/SP/RESISTIVITY LOG
CORE SIZE H.Q. CASING 3.66 m LEFT IN HOLE NIL m. SAMPLED BY O. CULLINGHAM DATE JUNE 2 ANALYZED BY BIRTLEY COAL & MINERALS TESTING SIGNED

BOREHOLE NO. W-79-1
PAN OCEAN OIL LTD.
MINING DIVISION – COAL

LOGGED BY O. CULLINGHAM DATE

GEOLOGICAL LOG – SCALE: 1:500

DEPTH	THICKNESS	DESCRIPTION
	3.65	OVERBURDEN - WEATHERED CONGLOMERATE CONTAINING CHERT FRAGMENTS BOULDERS AND PEBBLES, MINOR SANDSTONE AND COAL
3.65	7.93	CONGLOMERATE COARSENING DOWNWARD FROM GRANULES TO PEBBLES
11.40	8.45	NO. 1 SEAM HORIZON
19.85	3.06	MUDSTONE, VERY SOFT, LIGHT GRAY-BROWN SILTY NEAR BASE
22.91	13.24	SANDSTONE - FINE TO COARSE GRAINED, COARSENING DOWNWARD. LIGHT TO MEDIUM GRAY TO SALT AND PEPPER. WELL SORTED SUBANGULAR TO SUBROUNDED QUARTZ AND CHERT GRAINS. IN PLACES CROSS BEDDED. CONTAINS CARBENACEOUS MATERIAL WHICH CROSSES BEDDING. BROKEN SURFACE IS A DARK GRAY BROWN.
36.15	3.31	MUDSTONE - SOFT TO VERY SOFT, MEDIUM GRAY. SILTY AT BASE.
39.46	21.86	CONGLOMERATE - POOR TO FAIR SORTING.
61.29	4.62	NO. 2 SEAM HORIZON
65.82	1.71	MUDSTONE - LIGHT GRAY, TAN COLOR BANDING PERPENDICULAR TO CORE AXIS
67.65	13.12	SANDSTONE - LIGHT TO MEDIUM GRAY TO SALT AND PEPPER, FINE TO MEDIUM GRAINED, WELL SORTED ANGULAR TO SUBANGULAR QUARTZ AND CHERT GRAINS. SILICA CEMENT, HARD. THINLY BEDDED AND CROSS BEDDED NEAR BASE GET RARE COALIFIED PLANT FRAGMENTS
80.77		TOTAL DEPTH

DETAILS OF COAL SEAMS – SCALE: 1:100

No. 1 SEAM HORIZON

ROOF - CONGLOMERATE / SANDSTONE GOOD

DEPTH	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
11.40	0.96	BRIGHT COAL 18cm; CARBONACEOUS MUDSTONE 22 cm; COAL HARD, DULL TO BRIGHT 30cm; MUDSTONE CARBONACEOUS 26 cm	A0001	0.96
12.36	0.94	COAL - DULL 22 cm; SHALY COAL 13cm 9cm 1st CORE	A0002	1.35
13.71	0.41	COALY MUDSTONE 20cm N.R. 21cm		
	1.35	COAL - BRIGHT, BANDED, COALY SHALE PARTINGS TOWARD BASE 124 cm	A0003	1.79
		CARBONACEOUS MUDSTONE 11cm		
15.50	0.44	COAL - DULL TO BRIGHT 44 cm		
	0.10	MUDSTONE 10 cm		
	1.15	COAL BRIGHT, CLEAN & BANDED 115cm	A0004	2.56
	0.31	NO RECOVERY 31 cm		
	0.04	CARBONACEOUS MUDSTONE 4 cm		
	0.96	COAL, DULL TO BRIGHT, THINLY BANDED WITH CARBONACEOUS MUDSTONE 96 cm		
18.06		MUDSTONE 18 cm		
		COAL BRIGHT BANDED 28 cm		
		LOST CORE 7 cm		
	1.34	COAL 6 cm	A0005	1.34
		COALY MUDSTONE 22cm		
19.40		COAL, BRIGHT BANDED 53 cm		
		FLOOR - SHALE, SOFT, POOR		

No. 2 SEAM HORIZON

ROOF - GRAULE TO PEBBLE CONGLOMERATE HARD, GOOD

DEPTH	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
61.29	0.76	COAL, MOSTLY BRIGHT, THIN DULL PARTINGS AND BANDS 76cm	A0006	2.01
62.05	0.35	CARBONACEOUS MUDSTONE 35cm		
62.40	0.51	COAL, HARD AND BRIGHT 51 cm		
62.91	0.11	CARBONACEOUS MUDSTONE 11cm		
62.30	0.28	SHALEY COAL 28cm DULL		
	0.20	COAL BRIGHT 20cm		
	0.02	CARBONACEOUS MUDSTONE 2cm	A0007	2.07
	1.82	COAL BRIGHT 182 cm		
		NO CORE 3 cm		
65.37	0.48	CARBONACEOUS MUDSTONE 25cm; COAL AND SHALEY COAL 20 cm	A0008	0.45
65.82		FLOOR - SHALE, POOR.		

SIZE DIA-METER	SIZE WT %	SPEC GRAV	WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	CUMULATIVE SAMPLE VALUES THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	OTHER HGI
		-1.90	44.5	2.9	33.1	28.9	35.1	7972	-	0.51	44.5	2.9	33.1	28.9	35.1	7972	-	0.51									
0×1/4	100%	+1.90	55.5	1.3	74.5	-	-	-	-	-	100.0	2.0	56.1	-	-	-	-	-	8.00	61.3	4.4	18.8	31.0	45.6	9743			43
		RAW	-	-	-	-	-	-	-	-	100.0	1.5	56.1	24.7	17.7	4721	-	0.53										
		-1.90	57.3	2.8	31.7	26.0	39.5	8370	-	1.03	57.3	2.8	31.7	26.0	39.5	8370	-	1.03									
0×1/4	100%	+1.90	42.7	1.6	70.7	-	-	-	-	-	100.0	2.3	48.3	-	-	-	-	-	7.04	63.6	4.5	17.4	31.3	46.6	9911			47
		RAW	-	-	-	-	-	-	-	-	100.0	4.5	47.4	20.9	27.2	5626	-	0.75										
		-1.90	69.9	5.0	12.8	33.0	49.2	10409	-	0.39	69.9	5.0	12.8	33.0	49.2	10409	-	0.39									
0×1/4	100%	+1.90	30.1	1.8	71.9	-	-	-	-	-	100.0	4.0	30.6	-	-	-	-	-	5.69	65.2	4.9	14.5	32.4	48.1	10233			48
		RAW	-	-	-	-	-	-	-	-	100.0	8.3	30.1	27.7	33.9	7417	-	0.24										
		-1.90	67.9	5.6	12.8	32.8	48.8	10446	-	0.46	67.9	5.6	12.8	32.8	48.8	10446	-	0.46									
0×1/4	100%	+1.90	32.1	1.8	69.0	-	-	-	-	-	100.0	4.4	30.8	-	-	-	-	-	3.90	63.0	4.9	15.4	32.1	47.5	10143			43
		RAW	-	-	-	-	-	-	-	-	100.0	7.5	30.1	28.7	33.7	7623	-	0.34										
		-1.90	53.8	3.3	21.7	30.4	44.6	9415	-	0.39	53.8	3.3	21.7	30.4	44.6	9415	-	0.39									
0×1/4	100%	+1.90	46.2	1.2	78.4	-	-	-	-	-	100.0	2.3	47.9	-	-	-	-	-	1.34	53.8	3.3	21.7	30.4	44.6	9415			43
		RAW	-	-	-	-	-	-	-	-	100.0	5.4	47.0	23.1	24.5	5471	-	0.20										
		-1.90	58.1	4.3	17.3	31.6	46.8	9736	-	0.39	58.1	4.3	17.3	31.6	46.8	9736	-	0.39									
0×1/4	100%	+1.90	41.9	2.0	74.3	-	-	-	-	-	100.0	3.3	41.2	-	-	-	-	-	2.01	58.1	4.3	17.3	31.6	46.8	9736			44
		RAW	-	-	-	-	-	-	-	-	100.0	6.2	40.6	23.9	29.3	6094	-	0.20										
		-1.90	87.7	5.4	9.3	34.8	50.5	10930	-	0.40	87.7	5.4	9.3	34.8	50.5	10930	-	0.40									
0×1/4	100%	+1.90	12.3	1.6	70.3	-	-	-	-	-	100.0	4.9	16.8	-	-	-	-	-	4.08	73.1	4.9	12.4	33.5	49.0	10462			43
		RAW	-	-	-	-	-	-	-	-	100.0	8.6	15.9	31.7	43.8	9638	-	0.35										
		-1.90	20.7	3.3	18.0	31.9	46.8	10130	-	0.46	20.7	3.3	18.0	31.9	46.8	10130	-	0.46									
0×1/4	100%	+1.90	79.3	2.1	79.7	-	-	-	-	-	100.0	2.3	66.9	-	-	-	-	-	4.53	67.9	4.9	12.6	33.5	48.9	10452			51
		RAW	-	-	-	-	-	-	-	-	100.0	3.8	65.0	15.4	15.8	-	-	0.22										

GEW

062055

LOCATION MAP

TN

SCALE:

COORDINATES: Y 2300 m N X 5200 m W of SE corner of CL 82 DATE START MAY 29, 1979 FINISH JUNE 3, 1979
ELEVATION: BITS USED J.K. SMIT SERIES 200 COMBINATION DRILLER E. CARON DIAMOND DRILLING OVERALL RECOVERY 98 %
DIP BEARING MUD USED 34 BAGS GEL, 23 BAGS TROL TESTS GAMMA/SP/RESISTIVITY (OPEN HOLE)
CORE SIZE HQ CASING 8.53m HW FT LEFT IN HOLE —— FT. SAMPLED BY DATE ANALYZED BY

BOREHOLE NO. W-79-2
PAN OCEAN OIL LTD.
MINING DIVISION – COAL

LOGGED BY O. CULLINGHAM DATE JUNE 5, 1979
SIGNED

GEOLOGICAL LOG – SCALE: 1:500

DETAILS OF COAL SEAMS – SCALE:

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
		4.35	OVERBURDEN - CONGLOMERATE AND SANDSTONE RUBBLE
4.35		0.43	CARBONACEOUS MUDSTONE AND WEATHERED COAL - DULL, EARTHY
4.78		0.22	CONGLOMERATE RUBBLE
5.00		0.50	CARBONACEOUS SHALE
5.50		3.05	SHALE - MEDIUM GRAY BUFF, GRADATIONAL TO SILTSTONE AND SANDSTONE DOWNWARDS
8.55		4.25	SANDSTONE - MEDIUM GRAY BUFF TO MEDIUM GRAY BROWN, GRADATIONAL FROM FINE TO MEDIUM GRAINED, SALT AND PEPPER TEXTURE CHERT AND QUARTZ
12.80		8.62	SANDSTONE - MEDIUM GRAY, SALT AND PEPPER TEXTURE, MEDIUM TO COARSE COARSE GRAINED WITH SHORT INTERVALS OF GRANULE CONGLOMERATE AND CONGLOMERATIC SANDSTONE, CHERT AND QUARTZ, BEDDING @ 75° TO C/A
21.42			
22.80		1.38	CONGLOMERATIC SANDSTONE - MEDIUM GRAY, PEBBLES OF WHITE TO BLACK CHERT AND QUARTZITE, PEBBLES TO 2cm, ROUNDED TO SUBROUNDED, BLADE TO ROLLER, MEDIUM TO COARSE GRAINED SANDSTONE, CHERT AND QUARTZ
23.67		0.87	SHALE - MEDIUM TO DARK GRAY, ABUNDANT WOODY FRAGMENTS, BLOKY, CONTACT BELOW @ 75° TO C/A
		9.71	CONGLOMERATE - WHITE TO BLACK, FINE TO COARSE PEBBLE CONGLOMERATE, CHERT AND QUARTZITE, RUDIMENTARY ALIGNMENT OF PEBBLES PERPENDICULAR TO C/A. BITUMEN IN VUGS AND AROUND PEBBLES. SANDSTONE MATRIX OF MEDIUM TO COARSE GRAINS. SHORT INTERVALS OF SANDSTONE AND SHALE.
33.38			
36.74		3.36	SHALE - MEDIUM TO DARK GRAY, FRAGMENTAL TO BLOCKY, IN PART CARBONACOUS THIN BANDS COALY SHALE
		19.37	SANDSTONE - MEDIUM GRAY TO MEDIUM GRAY BROWN, MEDIUM TO COARSE GRAINED, CHERT AND QUARTZ BEDS GRADATIONAL INTO CONGLOMERATE BROKEN AND WEATHERED @ 44.20 TO 47.24 POSSIBLE FAULT
56.11		3.37	SILTSTONE - MEDIUM GRAY, FINELY CROSSBEDDED
59.48		9.22	SHALE AND CARBONACEOUS SHALE - MEDIUM DARK GRAY 10% CARBONACEOUS MATERIAL AND COALY SPLINTS THROUGHOUT. SANDSTONE @ 62.38 TO 62.50
68.70		4.30	SILTSTONE - MEDIUM GRAY, MASSIVE, 10% CARBON OR COALIFIED PLANT FRAGMENTS
73.00		14.30	SANDSTONE - MEDIUM GRAY TO MEDIUM GRAY BROWN, BEDS ARE GRADATIONAL FROM FINE TO PEBBLE CONGLOMERATE DOWNWARDS, CROSSBEDDED, BEDDING @ 75° TO C/A. FESTOON CROSSBEDDING @ 75.46 TO 75.90.
87.30		20.81	SHALE WITH CARBONACEOUS SHALE AND SHALY COAL - MEDIUM DARK GRAY TO DARK GRAY, SILTY, 15% CARBONACEOUS FLECKS, BITUMAN IN CAVITIES AND LINING FRACTURES. IN PART PETROLIFEOUS, SHORT INTERVALS OF SHALY COAL PROBABLE INTERVAL OF BURNT COAL SEAM
108.11		23.44	SANDSTONE / INTERBEDS OF SILTSTONE AND CONGLOMERATIC SANDSTONE - MEDIUM GRAY TO MEDIUM BROWNISH GRAY, BROWN COLOUR DUE TO HIGH CONCENTRATION OF RESIDUAL PETROLEUM, MEDIUM TO COARSE GRAINED, SHORT INTERVALS OF CONGLOMERATE, CLASTS ARE SUBANGULAR TO ROUNDED, DLADE TO ROLLER, CHERT, QUARTZITE, SHALE AND LIMESTONE 117.1 TO 117.25 MUDSTONE CONTAINING PYRITIZED WOOD FRAGMENTS.
131.55		4.09	MUDSTONE - DARK GRAY, MASSIVE, BLOCKY WHEN BROKEN. 134.0 TO 135.2 CARBONACEOUS WITH PARTINGS OF SHALY COAL AND COAL.
135.64			TOTAL DEPTH 134.64

DETAILS OF COAL SEAMS																																						
DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS	SIZE		WEIGHT PERCENT									CUMULATIVE WEIGHT PERCENT								CUMULATIVE SAMPLE VALUES								OTHER						
						DIAMETER	WT %	SPEC GRAV	YIELD	PROXIMATE ANALYSIS				BTU	F.S.I.	S	YIELD	PROXIMATE ANALYSIS				BTU	F.S.I.	S	THICKNESS	YIELD	PROXIMATE ANALYSIS				BTU	F.S.I.	S						
										RM	ASH	VOL.	F.C.					RM	ASH	VOL.	F.C.						RM	ASH	VOL.	F.C.									

062055

LOCATION MAP

TN

SCALE:

COORDINATES: Y 5300 m N X 4100 m W of SE corner of CL 82
ELEVATION: APPROX. 560.83 m BITS USED J.K SMIT SERIE 200 COMBINATION
DIP 90° BEARING MUD USED 14 BAGS GEL, 16 BAGS TROL
CORE SIZE H.Q. CASING 2.44 m LEFT IN HOLE 0.61 m

DATE START JUNE 1, 1979 FINISH JUNE 3, 1979
DRILLER CARON DIAMOND DRILLING OVERALL RECOVERY 93%
TESTS GAMMA, SP
SAMPLED BY DATE ANALYZED BY

BOREHOLE NO. W-79-3
PAN OCEAN OIL LTD.
MINING DIVISION – COAL

LOGGED BY O.CULLINGHAM DATE JUNE 5, 1979
SIGNED

GEOLOGICAL LOG – SCALE: 1:500

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
0		2.43	OVERBURDEN - RUBBLE MEDIUM TO COARSE GRAINED, CHERT/QUARTZ SANDSTONE
2.43		13.41	SANDSTONE - MEDIUM GRAY, THICKLY TO MASIVALY BEDDED, MEDIUM TO COARSE GRAINED, MODERATELY SORTED, MAINLY QUARTZ AND CHERT, ABUNDENT LIMONITE GRAINS AND SOFT RED CLASTS OF PEBBLE SIZE. MINOR CARBONACEOUS PARTINGS AND SPLINTS.
15.84		11.30	SANDSTONE - MEDIUM GRAY, FINE TO VERY FINE GRAINED QUARTZ, CHERT, CROSSBEDDED, FESTOON CROSSBEDDING. FROM 19.08 TO 20.53 SANDSTONE BECOMES COARSE GRAINED, ABUNDANT LIMONITE STAINING AT BASE OF INTERVAL IN VUGS OR OPEN PORE SPACE FROM 21.90 TO 22.05 SHALE PARTED TO BLOKY, 1 cm THICK COAL WEDGE. PLANT FRAGMENTS AND IMPRESIONS. FROM 20.05 TO 22.70 SPLINTS OF CARBONACEOUS MATERIAL PARALLEL TO BEDDING THROUGHOUT.
27.14		19.98	INTERBEDDED SHALE AND SILTSTONE AND THIN COAL BANDS - MEDIUM TO DARK GRAY. SILTY INTERVALS ARE SOUND AND SHALE INTERVALS ARE MORE FRACTURED, BLOCKY AND CARBONACEOUS, ABUNDANT PLANT FRAGMENTS. THE COAL IS MAINLY BRIGHT.
47.12		2.73	SANDSTONE - MEDIUM GRAY BROWN, HARD, MEDIUM GRAINED, THICKLY BEDDED.
49.85		2.50	SHALE, CARBONACEOUS SHALE - DARK GRAY. COALIFIED PLANT REMINANTS.
52.35		0.52	CONGLOMERATIC SHALE - MEDIUM GRAY GRADIATIONAL FROM ABOVE
52.87		2.13	CONGLOMERATIC SILTSTONE - LIGHT GRAY. CLASTS OF QUARTCITE, SILTSTONE AND MINOR SILTSTONE SHALE
55.00		1.85	SHALE - MEDIUM LIGHT GRAY. ABRUPTLY INTO RED MUDSTONE
56.85		1.25	MUDSTONE - HEMATITIC RED. 5% SOFT CLASTS OF MUDSTONE
58.10		3.20	SHALE - MEDIUM GRAY, PLANT FRAGMENTS.
61.30		10.02	LIMESTONE - VERY LIGHT GRAY TO CREAM COLOUR, PUROSIC TEXTURE. FAULT CONTACT AT TOP OF LIMESTONE
71.32			TOTAL DEPTH

DETAILS OF COAL SEAMS – SCALE:

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC GRAV	WEIGHT PERCENT: YIELD	WEIGHT PERCENT: PROXIMATE ANALYSIS: RM	WEIGHT PERCENT: PROXIMATE ANALYSIS: ASH	WEIGHT PERCENT: PROXIMATE ANALYSIS: VOL	WEIGHT PERCENT: PROXIMATE ANALYSIS: F.C	WEIGHT PERCENT: BTU	WEIGHT PERCENT: F.S.I.	WEIGHT PERCENT: S	CUMULATIVE WEIGHT PERCENT: YIELD	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: RM	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: ASH	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: VOL	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: F.C	CUMULATIVE WEIGHT PERCENT: BTU	CUMULATIVE WEIGHT PERCENT: F.S.I.	CUMULATIVE WEIGHT PERCENT: S	CUMULATIVE SAMPLE VALUES: THICKNESS	CUMULATIVE SAMPLE VALUES: YIELD	CUMULATIVE SAMPLE VALUES: PROXIMATE ANALYSIS: RM	CUMULATIVE SAMPLE VALUES: PROXIMATE ANALYSIS: ASH	CUMULATIVE SAMPLE VALUES: PROXIMATE ANALYSIS: VOL	CUMULATIVE SAMPLE VALUES: PROXIMATE ANALYSIS: F.C	CUMULATIVE SAMPLE VALUES: BTU	CUMULATIVE SAMPLE VALUES: F.S.I.	CUMULATIVE SAMPLE VALUES: S	OTHER		

002055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y 3100 m N, X 4100 m W of SE corner of CL 82
ELEVATION: APPROX. 541.02 m
DIP: -90° BEARING:
CORE SIZE: HQ & NQ CASING: 5.48 m
BITS USED: J.K. SMIT SERIES 200 COMBINATION
MUD USED: 33 BAGS GEL, 23 BAGS TROL
m LEFT IN HOLE: NIL m
DATE START: JUNE 4, 1979 FINISH: JUNE 8, 1979
DRILLER: CARON DIAMOND DRILLING OVERALL RECOVERY: 79.5 %
TESTS: GAMMA LOG
SAMPLED BY: DATE: ANALYZED BY:

BOREHOLE NO. W-79-4
PAN OCEAN OIL LTD.
MINING DIVISION – COAL

LOGGED BY: D.HOPE DATE: JUNE 9, 1979
SIGNED:

GEOLOGICAL LOG – SCALE: 1:500

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
		8.10	OVERBURDEN - COBBLES OF CHERT AND QUARTZITE, PIECES OF CHERT PEBBLE CONGLOMERATE, GENERALLY UNCONSOLIDATE.
8.10		10.36	SANDSTONE - SALT AND PEPPER COLOUR, COARSENING DOWNWARD CYCLES FROM FINE GRAINED THROUGH TO PEBBLE CONGLOMERATE. WELL SORTED, GRAINS OF QUARTZ AND CHERT. FINELY CROSS-LAMINATED AT TOP AND BELOW IS MASSIVE. RARE CARBONACEOUS SPLINTS THROUGHOUT
18.46		7.42	CONGLOMERATE - SALT AND PEPPER FRESH SURFACE. MASSIVE BEDDED. MODERATELY SORTED. PEBBLES OF QUARTZITE AND CHERT, BLACK, GRAY AND GREEN. MATRIX IS COARSE GRAINED SANDSTONE. CARBONACEOUS SPLINTS THROUGHOUT.
25.88		1.41	MUDSTONE - DARK GRAY. SOFT SANDY CARBONACEOUS MUDSTONE
27.29		19.04	SANDSTONE - MEDIUM GRAY WEATHERING. SALT AND PEPPER FRESH SURFACE. THINLY BEDDED (BEDS 2-8 cm THICK) FINING DOWNWARD SEQUENCES. WELL SORTED QUARTZ AND CHERT. CARBONACEOUS AND HEMATITIC STAINS THROUGHOUT. UNIT IS CONGLOMERATIC AT TOP AND BECOMES PROGRESSIVELY FINER TOWARDS BASE MATRIX, AT TOP, HAS ABOUT 5% CLAY.
46.33		7.81	SHALE - MEDIUM GRAY WEATHERING - EVIDENCE OF GRINDING AT 49.37 & 50.60
54.14		3.77	SHALE AND SILTSTONE - INTERBEDDED EACH OTHER. SILTSTONE HAS PINPOINT POROSITY AND CONTAINS ASPHALT AT 55.09-55.18 AND 55.44-55.63
57.91		18.29	SANDSTONE - MEDIUM BROWN WEATHERING. SALT AND PEPPER COLOUR FRESH SURFACE. COARSENING DOWNWARD FROM FINE GRAINED. WELL SORTED. CARBONACEOUS PARTINGS AND SPLINTS THROUGHOUT UNIT. MASSIVE BEDDING. DISCONTINOUS CARBONACEOUS STRINGS FROM 66.56 TO 66.77. COAL - DULL, BADLY BROKEN AND CRUSHED GRINDING AT 68.52, 71.21-71.79, 73.40 AND 75.48. FROM 66.03 TO 72.36 HEAVY HEMATITIC STAINING ON WEATHERED AND FRACTURE SURFACES
76.20		1.52	CONGLOMERATIC SANDSTONE - VERY CARBONACEOUS. ABUNDANT HEMATITE
77.80		44.73	SHALE AND SILTSTONE - MEDIUM GRAY WEATHERING. MASSIVE BEDDED UNIT OF SHALE AND SILTY SHALE, RARE SANDSTONES AND COALY HORIZOUTS. FROM 91.21 TO 91.48 LIGHT GRAY WEATHERING SILTSTONE. FROM 100.99 TO 108.39 CARBONACEOUS SHALE HORIZOUT, BADLY BROKEN, FRACTURE SURFACES ARE COALY AND BRIGHT-LIKE SLICKENSIDES
122.53			TOTAL DEPTH

DETAILS OF COAL SEAMS – SCALE:

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC GRAV	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT: YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	BTU	F.S.I	S	CUMULATIVE SAMPLE VALUES: THICKNESS	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	BTU	F.S.I.	S	OTHER		

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y 5300 m N X 4100 m N of SE corner of CL82
ELEVATION: APPROX. 495.3 m BITS USED: JK SMIT SERIES 200 COMBINATION
DIP: 90° BEARING: MUD USED: 26 BAGS GEL 22 BAGS TROL
CORE SIZE: HQ CASING: 11.58 m m LEFT IN HOLE: NIL m
DATE START: JUNE 4, 1979 DRILLER: CARON DIAMOND DRILLING
FINISH: JUNE 7, 1979 OVERALL RECOVERY: 94.5%
TESTS: GAMMA LOG
SAMPLED BY: O. CULLINGHAM DATE: JUNE 9, 1979 ANALYZED BY:

BOREHOLE NO. W-79-5
PAN OCEAN OIL LTD.
MINING DIVISION – COAL

LOGGED BY: O. CULLINGHAM & D. HOPE DATE: JUNE 9, 1979
SIGNED:

GEOLOGICAL LOG – SCALE: 1:500

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
		10.97	OVERBURDEN - BROKEN ROCK, PEBBLES AND BOULDERS
10.97		2.78	SANDSTONE - MEDIUM GRAY, MEDIUM GRAINED, WELL SORTED, ANGULAR TO SUBANGULAR, QUARTZ AND CHERT, CLEAN SAND, SOME CARBONACEOUS MATERIAL NEAR BASE OF INTERVAL.
13.75			
14.58		1.03	CONGLOMERATE - GRANULE TO PEBBLE, BLACK, GREEN AND GRAY CHERT AND QUARTZITE, COARSE GRAINED SANDSTONE MATRIX.
		5.23	SANDSTONE - AS FOR ABOVE, BEDDING @ 40° TO C/A.
19.81			
20.42		0.61	SANDSTONE - AS FOR ABOVE EXCEPT FINE GRAIN, CONTAINS ABUNDANT CARBONACEOUS MATERIAL, BEDDING @ 50° TO C/A.
		4.51	SANDSTONE - MEDIUM GRAY, MEDIUM TO COARSE GRAINED WITH INTERMITTENT DEVELOPMENT OF GRANULE TO PEBBLE CONGLOMERATE, CONTAINS PARTINGS OF CARBONACEOUS MATERIAL; PARTINGS @ 60° TO C/A IN PART WITH HEMATITE STAINING.
24.89			
26.30		1.41	SANDSTONE - FINE GRAINED, CHERT AND QUARTZ, OCCASIONAL BLOCKS OF CARBONACEOUS MATERIAL, CONTACT WITH ABOVE @ 60° TO C/A
		43.12	SANDSTONE - MEDIUM LIGHT GRAY, THICKLY TO MASSIVELY BEDDED, GENERALLY THE BEDS COARSEN DOWNWARDS FROM FINE GRAINED TO COARSE AND FREQUENTLY TO CONGLOMERATIC. ANGULAR TO SUB-ANGULAR GRAINS OF CHERT AND QUARTZ, MODERAT TO WELL SORTED, CARBONACEOUS SPLINTS, BLOCKS AND PARTINGS THROUGHOUT AND BECOMING MORE CONCENTRATED TOWARDS BASE. BEDDING @ 55° TO C/A
69.42		7.38	COAL AND SHALY COAL / COALY SHALE
76.80		3.05	SHALE AND MUDSTONE
79.85		1.45	COAL AND SHALY COAL
81.30		2.43	SHALE - MEDIUM LIGHT GRAY, FRAGMENTAL TO PARTED; PARTINGS @ 65° TO C/A
83.73		0.75	COALY SHALE - DULL TO VITREOUS COAL PARTINGS
84.48		2.99	SHALE - MEDIUM GRAY, PARTED TO THINLY BEDDED, SILTY DOWNWARDS BEDDING @ 65° TO C/A
87.47		3.99	SANDSTONE - MEDIUM GRAY, MEDIUM GRAINED, THICK TO MASSIVE BEDDED, CARBONACEOUS CLASTS THROUGHOUT CHERT AND QUARTZ GRAINS, 20% RESIDUAL PETROLEUM, STRONG ASPHALT ODOUR.
91.46		12.78	SHALE - MEDIUM TO DARK GRAY, BREAKS DOWN RAPIDLY TO RHOMBIC FRAGMENTS, THIN PARTINGS OF DULL SHALY COAL @ 55° TO C/A
104.24			FAULT CONTACT - SHEAR @ 30° TO C/A
		29.87	LIMESTONE - LIGHT GRAY, MASSIVELY BEDDED, APPEARS CRYSTALLIZED, 5% VUGS AT TOP OF INTERVAL, PETROLEUM RESIDUE ON FRACTURE FACES AND IN OPEN VUGS, WHEN HEATED RELEASES A HEAVY TAR,
			NOTE - HIGH GAMMA COUNTS FROM PROBE AT THE CONTACT AND @ 127.41 m
134.11			TOTAL DEPTH

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS	SIZE DIAMETER	SIZE WT %
			ROOF - SANDSTONE, HARD, MEDIUM TO COARSE GRAINED				
69.42		1.39	COALY SHALE SHALY COAL COAL - DULL TO BRIGHT, MINOR PYRITE, PARTED TO BANDED COALY SHALE	A0009	1.39	0×1/4	100%
70.81		0.48	COAL - VITREOUS TO BRIGHT CARBONACEOUS SHALE COAL - VITREOUS TO BRIGHT	A0010	0.48	0×1/4	100%
71.29		1.28	SHALE - MEDIUM TO DARK GRAY CARBONACEOUS COAL - MOSTLY VITREOUS TO BRIGHT WITH DULL SHALY COAL PARTINGS AND BANDS.	A0011	1.28	0×1/4	100%
72.57		0.68	SHALE - MEDIUM GRAY TO BUFF, CARBONACEOUS SOME RESIN <5%	NOT SAMPLED			
73.25		0.20	CLAY - LIGHT BUFF TO VERY LIGHT GRAY, FRIABLE				
73.45		0.42	COAL - VITREOUS TO BRIGHT, PARTED TO BANDED, 1% PYRITE	A0012	0.55	0×1/4	100%
73.87		0.13	COAL - DULL TO VITREOUS PARTINGS INPART SHALY				
74.00		1.16	SHALE - MEDIUM GRAY, INPART CARBONACEOUS, CONTAINS WOODY FRAGMENTS, SOFT				
75.16		0.14	COAL - PARTED, VITREOUS				
75.30		0.17	CLAY - LIGHT GRAY, FRAGMENTAL TO FRIABLE, EASILY CRUSHED				
75.47		0.93	SHALE - MEDIUM GRAY, CARBONACEOUS AND COALIFIED WOOD FRAGMENTS CALCITE VEINLETS				
76.40		0.28	COAL - BRIGHT TO VITREOUS, PARTED TO BANDED, CALCITE VEINLETS				
76.68		0.12	COAL - DULL, PARTED, SOME VITREOUS CALCITE PARTINGS AND VEINLETS				
76.80		1.20	SHALE - DARK GRAY, PARTED TO FRAGMENTAL, CARBONACEOUS FLECKS				
78.00		1.85	MUDSTONE - MEDIUM LIGHT GRAY, BREAKS DOWN RAPIDLY TO FRAGMENT SIZE RHOMBS CARBONACEOUS PLANT FRAGMENTS THROUGHOUT				
79.85		1.45	COAL AND SHALY COAL - DULL TO VITREOUS, BANDS OF BRIGHT COAL, BANDS AND PARTINGS OF DULL CARBONACEOUS SHALE BANDS @ 65° TO C/A	A0013	1.45	0×1/4	100%
81.30		2.43	SHALE - MEDIUM LIGHT GRAY, PARTED TO FRAGMENTAL				
83.73		0.75	COALY SHALE - DULL, MINOR VITREOUS COAL PARTINGS				
84.48			SHALE - MEDIUM GRAY, BECOMES SILTY DOWNWARDS, CARBONACEOUS SPLINTS AND FLECKS				

WEIGHT PERCENT

SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S
-1.90	74.5	3.4	14.6	39.7	42.3	10489	-	0.91
+1.90	25.5	2.4	70.3	-	-	-	-	-
RAW	-	-	-	-	-	-	-	-
-1.90	2.8	4.8	14.9	32.7	47.6	10358	-	0.60
+1.90	97.2	0.8	79.8	-	-	-	-	-
RAW	-	-	-	-	-	-	-	-
-1.90	82.7	2.2	14.7	33.0	50.1	10615	-	0.51
+1.90	17.3	2.5	68.8	-	-	-	-	-
RAW	-	-	-	-	-	-	-	-
-1.90	72.7	3.9	19.1	33.1	43.7	9766	-	0.59
+1.90	27.3	3.3	69.8	-	-	-	-	-
RAW	-	-	-	-	-	-	-	-
-1.90	59.2	4.5	13.4	30.8	51.3	10399	-	0.60
+1.90	40.8	2.6	78.0	-	-	-	-	-
RAW	-	-	-	-	-	-	-	-

CUMULATIVE WEIGHT PERCENT

YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
74.5	3.4	14.6	39.7	42.3	10489	-	0.91
100.0	3.2	28.8	-	-	-	-	-
100.0	2.5	30.3	32.5	34.7	8664	-	0.72
2.8	4.8	14.9	32.7	47.6	10358	-	0.60
100.0	1.0	80.0	-	-	-	-	-
100.0	0.6	78.5	18.6	2.3	-	-	0.13
82.7	2.2	14.7	33.0	50.1	10615	-	0.51
100.0	2.3	27.3	-	-	-	-	-
100.0	3.1	24.4	30.6	41.9	9361	-	0.38
72.7	3.9	19.1	33.3	43.7	9766	-	0.59
100.0	3.7	33.0	-	-	-	-	-
100.0	2.0	33.0	29.6	35.4	8198	-	0.43
59.2	4.5	13.4	30.9	51.3	10399	-	0.60
100.0	3.7	39.8	-	-	-	-	-
100.0	3.2	41.9	24.3	30.6	6652	-	0.31

CUMULATIVE SAMPLE VALUES

THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
3.15	66.9	2.8	14.7	36.3	46.3	10551		
1.76	60.9	2.3	14.7	33.1	50.1	10611		
1.28	82.7	2.2	14.7	33.0	50.1	10615		
0.55	72.7	3.9	19.1	33.3	43.7	9766		
4.58	54.7	3.0	15.4	35.8	45.9	10,426		
(INCLUDES SAMPLES A0009 - A0012 INCL.)								
1.45	59.2	4.5	13.4	30.8	51.3	10399		

OTHER

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y 6500 m N, X 9100 m W of S.E. corner of CL 82
ELEVATION: APPROX. 564 m
DIP: 90° BEARING: -
CORE SIZE: HE TO 103.93 CASING: 6.71m
BITS USED: J.K. SMIT COMBINATION
MUD USED: 99 BAGS QUICK GEL, 82 BAGS TROL
m LEFT IN HOLE: NIL m
4 HQ RODS; 1 HQ CORE BARREL & BIT
DATE START: JUNE 8, 1979 FINISH: JUNE 11, 1979
DRILLER: CARON DIAMOND DRILLING OVERALL RECOVERY: 97 %
TESTS: GAMMA RAY
SAMPLED BY: O. CULLINGHAM DATE: JUNE 20 ANALYZED BY: BIRTLEY COAL AND MINERALS TESTING

BOREHOLE NO. W-79-6
PAN OCEAN OIL LTD. (PAGE 1)
MINING DIVISION – COAL

LOGGED BY: O. CULLINGHAM, D. HOPE DATE: JUNE 20, 1979
SIGNED:

GEOLOGICAL LOG – SCALE: 1:500

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
2.39		2.39	OVERBURDEN
		4.73	CONGLOMERATIC SANDSTONE - MEDIUM GRAY, MEDIUM BEDDED MORE CONGLOMERITIC BASALLY. SUBANGULAR PEBBLES IN MEDIUM AND COARSE GROUND SANDSTONE
7.12		5.28	No.2 SEAM HORIZON
12.40			
12.60		2.34	MUDSTONE - LIGHT BROWN, VERY SOFT. FLECKED WITH COAL AND CARBONACEOUS
12.80			SANDSTONE
15.14		4.08	SHALE - CARBONACEOUS, DARK GRAY WEATHERING, SOFT AND MALLEABLE WITH FINGERS. IN PARTS SILTY.
19.22		1.41	SANDSTONE - LIGHT GRAY, MEDIUM TO FINE COARSE DOWNWARD.
20.63		1.24	SHALE - TRAVSITINE ZONE. INTRUSENT THE COAL CANTENT DOWNWARD
21.87		2.41	No. 3 SEAM HORIZON
22.06		0.39	MUDSTONE - VERY CARBONACEOUS.
24.47		7.86	SANDSTONE - MEDIUM GRAY WEATHERING FINELY CROSS LAMINATED. VERY FINE TO MEDIUM GRAINED. WELL SORTED. CEMENTED WITH SILICA. FRIABLE CARBONACEOUS CROSSBANDS.
24.71			
25.30			
33.16		3.69	SANDSTONE - COARSENING DOWNWARDS FROM MEDIUM TO COARSE GRAINED. CONGLOMERITIC AT BASE. LIGHT GRAY. GRADING TO THIN CONGLOMERITIC.
36.85		1.67	MUDSTONE AND CARBONACEOUS SHALE - DULL AND MEDIUM BROWN.
38.52		1.39	No. 4 SEAM HORIZON
39.91		0.78	SHALE - DARK GRAY CARBONACEOUS SPLINTS OF COAL
40.64		3.08	MUDSTONE - SHALE - MEDIUM GRAY, VERY SOFT AT TOP, BECOMES PROGRESSIVELY HARDER, SILTY AT BASE.
43.72		0.32	SANDSTONE - LIGHT GRAY. FINE TO MEDIUM GRAINED. CROSS LAMINATIONS
44.54		10.93	SANDSTONE - SALT AND PEPPER FRESH SURFACE. LIGHT GRAY TO RUSTY WEATHERING FINE TO MEDIUM GRAINED, WELL SORTED, LOW SPLEINITY, QUARTZ AND CHERT GRAINS. DOMINANTELY MASSIVE BEDDED. SLIGHTLY MUDDY, SLIGHTLY CARBONACEOUS, HARD SILICA CEMENT.
55.47		7.92	CONGLOMERATIC SANDSTONE - ROUNDED TO SUBROUNDED PEBBLES OF QUARTZ AND CHERT IN A MEDIUM TO COARSE GRAINED MATRIX. PEBBLES / cm AND SMALLER (AVERAGE IS 0.5 cm). SALT AND PEPPER FRESH. OCAISIONAL IRONSTONE CONCRETIONS.
63.39		1.23	MUDSTONE - VERY CARBONACEOUS, SOFT AND FRIABLE.
64.62		1.42	COALY SHALE - AT TOP MEDIUM HARD CRUMBLY COAL.
66.04		7.83	MUDSTONE - MEDIUM GRAY WEATHERING, VERY SOFT. RARE LIMONITIC STAINING
73.87		6.98	SANDSTONE - SLIGHT GRAY WEATHERING, SALT AND PEPPER, MASSIVE BEDDED. MEDIUM TO COARSE GRAINED. NEAR BASE BECOMES LIMONITIC STAINS. FROM 79.67 TO 80.03 FINELY CROSS LAMINATED CARBONACEOUS
80.85		6.63	SHALE - MEDIUM TO DARK GRAY, BECOMES CARBONACEOUS AND COALY DOWNWARDS. SEVERAL BRIGHT COAL BANDS UP TO 5 cm THICK
87.48		9.57	No. 5 SEAM HORIZON
97.05		4.14	SANDSTONE - MEDIUM GRAY GRADATIONAL COARSENING DOWNWARDS FROM SILTY SANDSTONE AT TOP TO FINE AT BASE. CARBONACEOUS CROSS LAMINATED 2-3 mm THICK.
101.19		2.44	SANDSTONE - MEDIUM GRAINED, BEDDED, LIGHT GRAY, CLEAN AND HARD. DOWNWARD BECOMES GRANULAR.
103.63			

NOTE - RODS BROKE IN HOLE a 90 m, ALL ATTEMPTS TO RETRIVE RODS FAILED; WEDGED a 88.15 m AND CONTINUED AS HOLE W-79-6A

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS	SIZE DIAMETER	SIZE WT %
			No.2 SEAM HORIZON				
		4.73	GOOD ROOF - CONGLOMERATIC SANDSTONE				
7.12		0.18	SHALY COAL - DULL, VITREOUS PARTINGS				
7.30		0.51	DULL TO VITREOUS COAL, BANDS OF SHALY COAL AND COALY SHALE.	A0014	0.92		
7.81		0.23	CARBONACEOUS SHALE				
8.04		0.42	VITREOUS TO BRIGHT COAL, IRON STAINING				
8.46		0.04	NO CORE				
8.53		1.15	VITREOUS TO BRIGHT COAL. PARTED AND BANDED.			0×1/4	100%
9.68		0.02	NO CORE				
9.75		1.07	VITREOUS TO BRIGHT, PARTED TO BANDED COAL.	A0015	3.23	0×1/4	100%
10.82		0.27	COAL AND SHALY COAL.				
11.09		0.18	LOST CORE				
11.27		0.15	MUDSTONE - MEDIUM GRAY				
11.42		0.10	SHALY COAL, DULL, SOME BRIGHT.				
11.52		0.78	DULL TO BRIGHT COAL PARTED TO BANDED	A0016	1.13	0×1/4	100%
12.30		0.10	DULL COAL, BANDED				
12.40		0.06	POOR FLOOR - CARBONACEOUS SHALE				
12.60		0.20	NO CORE				
12.80		2.34	MUDSTONE, VERY SOFT				
			No.3 SEAM HORIZON				
		1.24	POOR ROOF - SHALE AND CARBONACEOUS SHALE				
22.06		0.21					
		1.40	MOSTLY BRIGHT COAL, SOME THIN INTERRELATIONS OF DULL COAL	A0017	2.10	0×1/4	100%
23.46		0.32	DULL COAL - SHALE AT TOP AND BASE				
23.78		0.38	DULL TO VITREOUS COAL			0×1/4	100%
24.16		0.21	CARBONACEOUS & COALY SHALE	A0018	0.31		
24.47		0.24	POOR FLOOR - MUDDY SANDSTONE AND MUDSTONE				
24.67		0.59					
			No.4 SEAM HORIZON				
38.52		0.28	BAD ROOF SHALE				
38.62		0.10	DENSE COAL, METALIC SHEEN				
		1.00	MOSTLY BRIGHT COAL FEW PARTINGS OF DULL SHALEY COAL	A0019	1.39	0×1/4	100%
39.62		0.29	DULL TO VITREOUS COAL, PARTINGS OF SHALE				
39.91		0.73	BAD FLOOR - CARBONACEOUS SOFT SHALE				
40.64		3.08					
			No. 5 SEAM HORIZON				
		6.63	BAD ROOF FRAGMENTED SHALE				
87.48		0.72	HARD AND MOSTLY BRIGHT COAL, FEW DULL PARTINGS OF SHALY COAL				
88.20		0.26	SHALE WITH SPLINTS OF COAL	A0020	1.52		
88.46		0.54	MOSTLY BRIGHT AND HARD COAL, BANDED			0×1/4	100%
89.00		0.60	SHALE AND MUDSTONE, CARBONACEOUS				
89.60		0.11	COAL DULL BANDED	A0021	1.15		
89.91		0.44	MUDSTONE - TEXTURAL APPERANCE OF REWORKED MUD			0×1/4	100%
90.15		0.77	MOSTLY BRIGHT COAL, CONCOIDAL FRACTURE, LIGHT % OF VITRAIN.	A0022	0.77		
90.92		0.42	CARBONACEOUS SHALE, TAR OR PETROLEUM RESIDUE.	A0023	0.42	0×1/4	100%
91.34		3.07	COAL - DULL TO BRIGHT WITH SHORT INTERVALS OF CARBONACEOUS AND COALY SHALE.	A0024	3.07		
94.41		1.90	COAL - MOSTLY BRIGHT WITH 0.17 cm OF DULL CARBONACEOUS SHALE AT TOP OF INTERVAL.	A0025	1.91	0×1/4	100%
96.31		0.41	SHALE - FRAGMENTAL TO FRIABLE				
96.73		0.14	COAL - DULL TO BRIGHT	A0026	0.73		
96.87		0.18					
97.05			FLOOR - SANDSTONE, GOOD				

SAMPLE NUMBER	SPEC GRAV	WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	CUMULATIVE SAMPLE VALUES THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	OTHER HGI
A0014	-1.90	60.9	4.9	11.9	32.8	50.4	10039	-	0.41	60.9	4.9	11.9	32.8	50.4	10039	-	0.41	0.92	60.9	4.9	11.9	32.8	50.4	10039			39
	+1.90	39.1	2.7	62.4	-	-	-	-	-	100.0	4.0	31.7	-	-	-	-	-										
	RAW	-	-	-	-	-	-	-	-	100.0	2.0	32.0	29.1	36.9	7553	-	0.26										
A0015	-1.90	91.1	4.2	8.8	35.0	52.0	10541	-	0.43	91.1	4.2	8.8	35.0	52.0	10541	-	0.43	4.15	84.4	4.3	7.6	34.6	51.7	10460			41
	+1.90	8.9	2.4	69.3	-	-	-	-	-	100.0	4.0	14.2	-	-	-	-	-										
	RAW	-	-	-	-	-	-	-	-	100.0	4.0	14.8	34.5	46.7	9892	-	0.23										
A0016	-1.90	58.7	5.4	10.7	34.6	49.3	10508	-	0.34	58.7	5.4	10.7	34.6	49.3	10508	-	0.34	5.28	78.9	4.5	9.6	34.6	51.4	10468			40
	+1.90	41.3	1.7	86.0	-	-	-	-	-	100.0	3.9	41.8	-	-	-	-	-										
	RAW	-	-	-	-	-	-	-	-	100.0	3.1	39.9	25.2	31.8	6686	-	0.22										
A0017	-1.90	89.6	3.2	13.1	33.3	50.4	10568	-	0.51	89.6	3.2	13.1	33.3	50.4	10568	-	0.51	2.10	89.6	3.2	13.1	33.3	50.4	10568			39
	+1.90	10.4	1.9	72.1	-	-	-	-	-	100.0	3.1	19.2	-	-	-	-	-										
	RAW	-	-	-	-	-	-	-	-	100.0	5.3	19.0	32.2	43.5	9664	-	0.32										
A0018	-1.90	11.6	7.4	17.9	23.1	51.6	9273	-	0.48	11.6	7.4	17.9	23.1	51.6	9273	-	0.48	2.41	79.6	3.3	13.2	33.2	50.4	10543			
	+1.90	88.4	2.8	84.1	-	-	-	-	-	100.0	3.4	76.4	-	-	-	-	-										
	RAW	-	-	-	-	-	-	-	-	100.0	1.6	78.5	11.1	8.8	-	-	0.15										
A0019	-1.90	79.4	2.9	12.4	33.0	51.7	10630	-	0.48	79.4	2.9	12.4	33.0	51.7	10630	-	0.48	1.39	79.4	2.9	12.4	33.0	51.7	10630			39
	+1.90	20.6	3.5	71.2	-	-	-	-	-	100.0	3.0	24.5	-	-	-	-	-										
	RAW	-	-	-	-	-	-	-	-	100.0	4.8	25.6	29.4	40.2	8834	-	0.32										
A0020	-1.90	80.0	3.9	10.0	32.6	53.5	10811	-	0.53	80.0	3.9	10.0	32.6	53.5	10811	-	0.53	8.84	76.3	3.9	8.7	33.6	53.6	11012			44
	+1.90	20.0	3.2	69.3	-	-	-	-	-	100.0	3.8	21.9	-	-	-	-	-										
	RAW	-	-	-	-	-	-	-	-	100.0	5.5	21.1	29.5	43.9	9300	-	0.19										
A0021	-1.90	28.9	5.8	21.3	25.7	47.2	9033	-	0.59	28.9	5.8	21.3	25.7	47.2	9033	-	0.59	7.32	75.5	3.9	8.5	33.8	53.6	11056			47
	+1.90	71.1	4.1	82.6	-	-	-	-	-	100.0	4.6	64.9	-	-	-	-	-										
	RAW	-	-	-	-	-	-	-	-	100.0	4.4	66.2	16.6	12.8	2441	-	0.12										
A0022	-1.90	97.3	3.8	4.4	34.6	57.2	11571	-	0.45	97.3	3.8	4.4	34.6	57.2	11571	-	0.45	6.17	84.2	3.7	7.7	34.4	54.1	11185			38
	+1.90	2.7	3.7	73.1	-	-	-	-	-	100.0	3.8	6.3	-	-	-	-	-										
	RAW	-	-	-	-	-	-	-	-	100.0	6.3	5.6	34.8	53.3	11402	-	0.15										
A0023	-1.90	10.3	6.0	26.5	27.2	40.3	8521	-	0.37	10.3	6.0	26.5	27.2	40.3	8521	-	0.37	5.40	82.4	3.7	8.2	34.3	53.5	11120			-
	+1.96	89.7	4.3	76.3	-	-	-	-	-	100.0	4.5	71.2	-	-	-	-	-										
	RAW	-	-	-	-	-	-	-	-	100.0	4.3	71.8	20.5	3.4	-	-	0.10										
A0024	-1.90	91.9	3.9	9.2	33.9	53.0	10952	-	0.58	91.9	3.9	9.2	33.9	53.0	10952	-	0.58	4.98	88.4	3.7	8.0	34.4	53.7	11146			44
	+1.90	8.1	2.6	69.5	-	-	-	-	-	100.0	3.8	14.1	-	-	-	-	-										
	RAW	-	-	-	-	-	-	-	-	100.0	5.7	13.5	31.0	49.8	10472	-	0.15										
A0025	-1.90	83.0	3.5	6.1	35.4	55.0	11492	-	0.33	83.0	3.5	6.1	35.4	55.0	11492	-	0.33	1.91	83.0	3.5	6.1	35.4	55.0	11492			45
	+1.90	17.0	2.3	71.0	-	-	-	-	-	100.0	3.3	17.2	-	-	-	-	-										
	RAW	-	-	-	-	-	-	-	-	100.0	6.2	17.4	31.2	45.2	9654	-	0.21										
A0026	-1.90	22.2	4.8	23.2	28.7	43.3	9182	-	0.42	22.2	4.8	23.2	28.7	43.3	9182	-	0.42					EXCLUDED					36
	+1.90	77.8	1.6	90.5	-	-	-	-	-	100.0	2.3	75.6	-	-	-	-	-										
	RAW	-	-	-	-	-	-	-	-	100.0	2.1	78.0	11.4	8.5	-	-	0.11										

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X

ELEVATION: BITS USED:

DIP: BEARING: MUD USED:

CORE SIZE: CASING: m LEFT IN HOLE: m

DATE START: FINISH:

DRILLER: OVERALL RECOVERY:

TESTS:

SAMPLED BY: DATE: ANALYZED BY:

BOREHOLE NO. W-79-6
PAN OCEAN OIL LTD. (PAGE 2)
MINING DIVISION – COAL

LOGGED BY: DATE:

SIGNED:

GEOLOGICAL LOG – SCALE:

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION

DETAILS OF COAL SEAMS – SCALE:

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC GRAV	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	BTU	F.S.I.	S

CUMULATIVE WEIGHT PERCENT

YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES

	THICKNESS	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
		No. 5 SEAM HORIZON							
A0020					EXCLUDED				
A0021					EXCLUDED				
A0022	6.17	84.2	3.7	7.7	34.4	54.1	11185		
A0023	5.40	82.4	3.7	8.2	34.3	53.5	11120		
A0024	4.98	88.4	3.7	8.0	34.4	53.7	11146		
A0025	1.91	83.0	3.5	6.1	35.4	55.0	11492		
A0026					EXCLUDED				

OTHER

	THICKNESS	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
		No. 5 SEAM HORIZON							
A0020					EXCLUDED				
A0021					EXCLUDED				
A0022					EXCLUDED				
A0023					EXCLUDED				
A0024	3.07	91.9	3.9	9.2	33.9	53.0	10952		
A0025	3.70	90.3	3.8	8.7	34.1	53.3	11036		
A0026					EXCLUDED				

LOCATION MAP

TN

SCALE:

COORDINATES: Y 6500 m.N. X 9100m W of S.E. corner of CL 82
ELEVATION: APPROX 564 m BITS USED: J.K. SMIT COMBINATION
DIP: 90° BEARING: - MUD USED: AS FOR W-79-6
CORE SIZE: NQ CASING: 85.3 m NW m LEFT IN HOLE: NIL m
DATE START: JUNE 14, 1979 FINISH: JUNE 20, 1979
DRILLER: CARON DIAMOND DRILLING OVERALL RECOVERY: 93%
TESTS: GAMMA LOG
SAMPLED BY: O. CULLINGHAM DATE: JUNE 20 ANALYZED BY:

BOREHOLE NO. W-79-6A
PAN OCEAN OIL LTD. (PAGE 3)
MINING DIVISION – COAL

LOGGED BY: O.CULLINGHAM D. HOPE DATE: JUNE 20, 1979
SIGNED:

GEOLOGICAL LOG – SCALE: 1:500

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
			TOP OF WEDGE
88.15		8.80	No. 5 SEAM HORIZON
96.95		0.43	SHALE - LIGHT GRAY, SILTY AND SOFT
97.38		4.15	SANDSTONE - MEDIUM GRAY, VERY FINE TO FINE GRAINED, FINELY CROSS-LAMINATED WITH CARBONACEOUS STRINGERS OF MUDSTONE
101.53		2.40	SANDSTONE - LIGHT GRAY, SALT AND PEPPER, MEDIUM TO COARSE GRAINED. COARSENING DOWNWARD
103.93		3.09	SHALE - MEDIUM TO DARK GRAY. FEW THIN CARBONACEOUS AND COALY INTERVALS.
107.02		0.94	COAL SEAM HORIZON
107.96		1.94	SHALE - MEDIUM TO DARK GRAY. CARBONACEOUS PLANT FRAGMENTS
109.90		0.25	COAL
110.95		13.90	SHALE, MUDSTONE, SILTSTONE - INTERBEDDED EACH OTHER. SILTSTONE INCREASES IN FREQUENCY DOWNWARDS. MEDIUM GRAY TO MEDIUM GRAY BROWN. PETROLEUM RESIDUE AND CARBONACEOUS FLECKS AND PLANT FRAGMENTS THROUGHOUT. FROM 113.03 TO 113.16 DULL COAL WITH SOME VITREOUS PARTINGS FROM 118.62 TO 119.28 ESPECIALLY PETROLIFEROUS INTERVAL
124.06		1.68	SANDSTONE - MEDIUM GRAY BROWN, VERY FINE TO FINE GRAINED
125.73		1.08	SHALE - MEDIUM GRAY WITH CARBONACEOUS PLANT FRAGMENTS
126.81		8.36	SANDSTONE - MEDIUM GRAY, FINE TO COARSE GRAINED DOWNWARD. INTERVALS OF SHALE AND GRANULE CONGLOMERATE. SPLINTS AND PARTINGS OF COAL FRAGMENTS. APPROXIMETLY 20% POROSITY FILLED WITH PETROLEUM RESIDUE
135.17		6.85	SHALE AND SANDSTONE - INTERBEDDED, GRADING FROM MEDIUM GRAY SLATE AND SILTSTONE TO FINE GRAINED SANDSTONE STRONG PETROLIFEROUS ODOUR.
142.02		2.46	SANDSTONE - LIGHT GRAY TO MEDIUM BROWN. COARSING GRAINED DOWNWARD
144.47		11.11	SANDSTONE - MEDIUM GRAY TO DARK GRAY BROWN. BRADING FROM TO CONGLOMERATIC DOWNWARD. GRAINS OF QUARTZ AND CHERT AND GRANULAS AND PEBBLES ARE SUBANGULAR TO SUBROUNDED. MASSIVE BEDDING, THIN BEDS OF SILTSTONE AND CONGLOMERATE AT BASE.
155.58		5.18	SILTSTONE - DARK GRAY, RUSTY WEATHERING, SANDY AND CROSSBEDDED AT TOP, FINING DOWNWARD.
160.76		5.70	SILTSTONE - MEDIUM GRAY, SLIGHT SANDY, MASSIVE BEDDING. FROM 165.40 TO 165.55 CARBONACEOUS SHALE WITH COAL SPLINTS.
166.46		4.40	MUDSTONE - GREEN TO DARK GRAY, SOFT, MASSIVE BEDDED, THIN BEDS OF FINE GRAINED SANDSTONE.
170.86		2.80	SANDSTONE - MEDIUM TO DARK GRAY, FINE GRAINED, ANGULAR GRAINS OF QUARTZ AND CHERT. FINELY LAMINATED.
173.66		10.97	MUDSTONE - GREEN TO DARK GRAY, SOFT TOWARD BASE, SAND INCRESING AND CARBON CONTENT DECRESING.
184.63		5.37	SANDSTONE - GREEN WEATHERING AND FRESH SURFACE. VERY FINE TO FINE GRAINED. MASSIVE BEDDED
190.00		2.84	MUDSTONE - GREEN, SOFT. DISAGREGATED AT BASE.
192.84		3.14	SILTSTONE TO SANDSTONE - GREEN TO MEDIUM GRAY. COARSENING FROM SILTSTONE TO CONGLOMERATIC SANDSTONE AT BASE
195.98			SANDSTONE TO SILTSTONE - MEDIUM GRAY, MASSIVE BEDDED, FINE GRAINED AND MORE CARBONACEOUS DOWNWARD.
199.64			TOTAL DEPTH

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS	SIZE DIAMETER	SIZE WT %	WEIGHT PERCENT SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S
		3.09	BAD ROOF SHALE													
107.02		0.94	MOSTLY BRIGHT HARD AND BANDED COAL	A0042	0.94	0×1/4	100%	-1.90	87.2	3.3	16.5	35.1	45.1	10532	-	0.93
								+1.90	12.8	1.4	69.3	-	-	-	-	-
								RAW	-	-	-	-	-	-	-	-
107.96		1.94	SHALE - MEDIUM TO DARK GRAY WITH CARBONACEOUS PLANT FRAGMENTS													
109.90		0.25	DULL TO VITREOUS COAL													
110.25		13.90	BAD FLOOR SHALE													

DEPTH	CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE SAMPLE VALUES THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	OTHER
107.02	87.2	3.3	16.5	35.1	45.1	10532	-	0.93	0.94	87.2	3.3	16.5	35.1	45.1	10532			40
	100.0	3.4	10.2	-	-	-	-	-										
	100.0	4.6	22.6	33.1	39.7	9724	-	0.78										

062059

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y 3100 m N, X 200 m W. of S.E. corner of CL 83
ELEVATION: 555.93 m
DIP -90° BEARING -
CORE SIZE HQ to 51.82 m, NQ to 159.11 m
CASING HW 4.88 m, NW a 2.35 m
BITS USED J.K. SMIT COMBINATION
MUD USED 171 BAGS GEL; 59 BAGS TROLL, 1 1/2 BAGS QUICK SEAL.
m LEFT IN HOLE 4.88 m of HW m, 79.25 m of NW

DATE START JUNE 9, 1979 FINISH JUNE 18, 1979
DRILLER CARON DIAMOND DRILLING OVERALL RECOVERY 71 %
TESTS GAMMA LOG
SAMPLED BY O CULLINGHAM DATE JUNE 18 ANALYZED BY BIRTLEY COAL & MINERALS TESTING

BOREHOLE NO. BP-79-7
PAN OCEAN OIL LTD.
MINING DIVISION – COAL

LOGGED BY O. CULLINGHAM D. HOPE DATE JUNE 19, 1979
SIGNED

GEOLOGICAL LOG – SCALE: 1:500

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
		7.70	OVERBURDEN - RUBBLE. PEBBLES AND COBBLES OF CHERT AND QUARTZITE. PEBBLES ARE BLACK, WHITE, BLACK WITH QUARTZ VEINS.
7.90		0.53	CONGLOMERATE - FINE TO COARSE, PEBBLES IN COARSE SANDSTONE MATRIX.
8.23		19.20	CONGLOMERATE - RUBBLE OF CONGLOMERATE AND MEDIUM TO COARSE GRAINED CONGLOMERATE SANDSTONE. (NOTE: MOST OF INTERVAL TRI CONED, VERY LITTLE RECOVERY.)
27.43		1.77	SHALE - MEDIUM GRAY. MINOR PARTINGS OF CARBONACEOUS SHALE.
29.20		6.58	NO. 1 SEAM HORIZON
35.78		8.11	SHALE - MEDIUM DARK GRAY, WEATHERED LIGHT GRAY TO WHITISH. CONTAINS MINOR SPLINTS, PARTINGS, WEDGES AND FLECKS OF COAL AND CARBONACEOUS MATERIAL.
43.89		10.33	SANDSTONE - GRAY WEATHERING, FINE TO MEDIUM GRAINED DOMINENTLY MASSIVE BEDDED. ZONES OF CROSS BEDDED GRANULAR SANDSTONE AT 45.61-45.79 AND 46.33-47.00
54.22		1.29	NO. 2 SEAM HORIZON
55.51		3.44	MUDSTONE TO SHALE - MEDIUM GRAY. SOFT MUDSTONE AT TOP, GRADING THROUGH TO SHALE AND SILTY SHALE TOWARDS BASE
59.00		2.84	SANDSTONE - MEDIUM GRAY, VERY FINE TO FINE GRAINED THICK CROSS LAMINATED. CARBONACEOUS LAMINATIONS UP TO 5cm
61.84		10.92	SANDSTONE - MEDIUM GRAY, COARSE GRANULAR GRAINED, QUARTZ AND BLACK CHERT GRAINS. TAR FOUND TO 64.62 IN 10-15% EVIDENCE OF GRINDING IN UNIT
72.76		4.51	SHALE - DARK GRAY, HARD, SILTY AND CARBONACEOUS. MASSIVE BEDDING FROM 74.70-74.98 MEDIUM GRAY, FINE GRAINED SANDSTONE.
77.27		4.29	COAL HORIZON - VITREOUS TO BRIGHT BANDS OF COAL WITHIN PREDOMINENTLY CARBONACEOUS TO COALY SHALE INTERVAL NO. 3
81.56		4.90	MUDSTONE - MEDIUM GRAY BROWN, SOFT, SILTY, BECOMES MORE SILTY DOWNWARDS
86.46		4.88	SANDSTONE - MEDIUM GRAY, VERY FINE GRAINED. CROSS LAMINATED; THIN DARK CARBONACEOUS LAMINAE.
91.34		6.72	CONGLOMERATE - PEBBLES OF GRAY, BLACK AND GREEN CHERT AND QUATZITE. SORTING MODERATE TO POOR. MATRIX IS MEDIUM GRAINED SANDSTONE. DIRTY AND MASSIVE CONGLOMERATE
98.04		0.81	COALY SHALE - DULL TO BRIGHT, SOFT, GRINDING.
102.72		3.53	MUDSTONE - MEDIUM GRAY BROWN. BASAL 0.4m BECOMES SILTY. SOFT (FRIABLE) MUDSTONE.
104.96		2.27	SANDSTONE - VERY FINE TO MEDIUM GRAINED, COARSENING DOWNWARDS. MEDIUM GRAY CROSS BEDDING.
117.51		12.84	CONGLOMERATE - LIGHT GRAY, MASSIVE BEDDED, PEBBLES OF BLACK, GREEN AND GRAY CHERT AND QUARTZITE. MODERATELY WELL CEMENTED. CONTAINS TAR, INCREASING AMOUNT DOWNWARD. SANDSTONE FROM 116.20 TO 116.86, MEDIUM GRAINED
118.20		0.69	MUDSTONE - MEDIUM GRAY, SOFT.
123.75		5.55	SANDSTONE - MEDIUM TO DARK GRAY, FINE TO COARSE GRAINED, COARSENING DOWNWARD. CROSS AND MASSIVE BEDDED. CONTAINS TAR.
126.60		2.85	GONGLOMERATIC SANDSTONE - QUARTZ AND CHERT GRAINS MODERATE SORTING AND CEMENTED WITH SILICA.
128.11		1.51	NO. 4 SEAM HORIZON
129.96		1.85	SHALE - MEDIUM GRAY BROWN, CARBONACEOUS TO COALY.
142.00		12.04	SANDSTONE - LIGHT GRAY, FINE TO COARSE GRAINED - COARSENING DOWNWARD. CROSS BEDDED. WELL SORTED QUARTZ AND CHERT GRAINS. CARBONACEOUS PARTINGS AND SPLINTS THROUGHOUT.
159.11		17.10	MUDSTONE AND SHALE - MEDIUM TO DARK GRAY. BECOMES SILTY TOWARDS BASE. COAL FROM 143.20 TO 143.65 AND 145.38 TO 146.00

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
			No. 1 SEAM HORIZON		
		1.77	BAD ROOF SHALE		
29.20		0.32	SHALY COAL AND COALY SHALE		
29.52		0.25	COAL - DULL, PARTINGS OF COALY SHALE	A0027	0.86
29.77		0.03	CARBONACEOUS TO COALY SHALE		
29.84			COAL - DULL TO VITREOUS, WITH COALY SHALE		
30.06		0.35	SHALE - MEDIUM DARK GRAY, COAL PARTINGS		
30.41		0.45	CARBONACEOUS SHALE - DULL, FRIABLE	A0028	0.80
30.86		0.27	COAL - DULL TO BRIGHT, BANDED	A0029	0.27
31.13		0.40	SHALE - MEDIUM DARK GRAY		
31.53		0.65	NO CORE RECOVERED	A0030	1.05
32.18		0.12	COAL - DULL TO VITREOUS		
32.30		0.22	COALY SHALE - DULL, BLOCKY		
32.52		0.70	COAL - MOSTLY BRIGHT, BANDED CONCOIDAL FRACTURE	A0031	1.04
33.22		0.70	SHALE - MEDIUM DARK GRAY BREAKS DOWN	A0032	0.92
33.92		0.22			
34.14		0.99	COAL - DULL TO VITREOUS, BRIGHT PARTINGS AND SPLINTS. HIGH FUSAIN	A0033	1.64
35.28		0.38			
35.66		0.08	SHALE		
35.78		0.04	COAL		
36.46		0.68	FLOOR - SHALE, DARK GRAY IN PART CARBONACEOUS, FRAGMENTAL.		
			No. 2 SEAM HORIZON		
		10.33	GOOD ROOF SANDSTONE		
54.22		1.29	DIRTY, HEAVY AND FRESH COAL FROM 54.90 TO 55.12. BLACK CARBONACEOUS SHALE	A0034	1.29
55.51		3.34	BAD FLOOR SOFT MUDSTONE		
			No. 4 SEAM HORIZON		
		2.85	GOOD ROOF CONGLOMERITIC SANDSTONE		
126.60		1.51	COAL - MOSTLY BRIGHT PARTINGS OF DULL CARBONACEOUS TO COALY SHALE	A0039	1.51
128.11		1.85	BAD FLOOR SHALE		
			No. 3 SEAM HORIZON		
			ROOF SHALE, DARK GRAY, SILTY TO IMPURE CARBONACEOUS		
77.27		0.21	COAL - DULL, SHALEY		
77.48		0.52	SHALE - DARK GRAY	A0035	0.93
78.00		0.20	CARBONACEOUS & COALY SHALE		
78.20		0.24	COAL DULL TO BRIGHT	A0036	0.24
78.44		0.1	CARBONACEOUS TO COALY SHALE		
78.74		0.21	COAL - VITREOUS TO BRIGHT		
78.95		0.14	SHALE - MEDIUM DARK GRAY	A0037	1.42
79.14		0.05	COAL - DULL TO VITREOUS		
79.86		0.72	NO CORE		
80.12		0.26	CARBONACEOUS SHALE		
80.92		0.80	SHALE - MEDIUM TO DARK GRAY		
81.12		0.20	SHALE - AS ABOVE		
81.56		0.44	COAL - DULL TO BRIGHT, CONTAINS SHALE BANDS 81.26 TO 81.28	A0038	0.44
			FLOOR - MEDIUM GRAY, BROWN SLIGHTLY SILTY		

SIZE DIAMETER	SIZE WT %	SAMPLE	SPEC GRAV	WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S
0×1/4	100%		-1.90	36.2	5.6	33.7	25.4	35.3	7055	-	0.51	36.2	5.6	33.7	25.4	35.3	7055	-	0.51
			+1.90	63.8	3.3	76.8	-	-	-	-	-	100.0	4.2	61.2	-	-	-	-	-
			RAW	-	-	-	-	-	-	-	-	100.0	3.8	60.1	16.2	19.9	3436	-	0.17
0×1/4	100%		-1.90	15.3	7.9	29.5	26.0	36.6	7194	-	0.30	15.3	7.9	29.5	26.0	36.6	7194	-	0.30
			+1.90	84.7	3.7	80.0	-	-	-	-	-	100.0	4.4	72.3	-	-	-	-	-
			RAW	-	-	-	-	-	-	-	-	100.0	2.8	74.4	12.1	10.7	-	-	0.13
0×1/4	100%		-1.90	73.3	6.6	18.1	33.9	41.4	9114	-	0.38	73.3	6.6	18.1	33.9	41.4	9114	-	0.38
			+1.90	26.7	3.3	67.3	-	-	-	-	-	100.0	5.7	31.3	-	-	-	-	-
			RAW	-	-	-	-	-	-	-	-	100.0	5.2	31.0	30.5	33.3	7547	-	0.29
0×1/4	100%		-1.90	2.6	6.8	17.2	35.8	40.2	9140	-	0.38	2.6	6.8	17.2	35.8	40.2	9140	-	0.38
			+1.90	97.4	3.4	83.0	-	-	-	-	-	100 0	3.5	81.3	-	-	-	-	-
			RAW	-	-	-	-	-	-	-	-	100.0	1.9	83.0	10.7	4.4	-	-	0.13
0×1/4	100%		-1.90	68.2	6.6	9.3	35.3	48.8	10215	-	0.36	68.2	6.6	9.3	35.3	48.8	10215	-	0.36
			+1.90	31.8	5.3	70.4	-	-	-	-	-	100.0	6.2	28.8	-	-	-	-	-
			RAW	-	-	-	-	-	-	-	-	100.0	6.8	27.4	29.9	35.9	7953	-	0.25
0×1/4	100%		-1.90	5.2	4.6	35.6	26.3	33.5	6668	-	0.32	5.2	4.6	35.6	26.3	33.5	6668	-	0.32
			+1.90	94.8	2.7	81.4	-	-	-	-	-	100.0	2.8	79.0	-	-	-	-	-
			RAW	-	-	-	-	-	-	-	-	100.0	5.2	77.8	12.8	4.2	-	-	0.13
0×1/4	100%		-1.90	71.7	4.0	20.9	34.5	40.6	9060	-	0.39	71.7	4.0	20.9	34.5	40.6	9060	-	0.39
			+1.90	28.3	1.6	72.3	-	-	-	-	-	100.0	3.3	35.5	-	-	-	-	-
			RAW	-	-	-	-	-	-	-	-	100.0	6.5	33.6	29.7	30.2	7143	-	0.28
		A0027																	
		A0028																	
		A0029																	
		A0030																	
		A0031																	
		A0032																	
		A0033																	
0×1/4	100%		-1.90	62.8	4.6	16.2	33.1	46.1	9277	-	0.44	62.8	4.6	16.2	33.1	46.1	9277	-	0.44
			+1.90	37.2	1.6	72.0	-	-	-	-	-	100 0	3.5	37.0	-	-	-	-	-
			RAW	-	-	-	-	-	-	-	-	100.0	7.4	34.6	26.4	31.6	6436	-	0.19
0×1/4	100%		-1.90	70.0	4.1	10.4	35.4	50.1	10349	-	0.44	70.0	4.1	10.4	35.4	50.1	10349	-	0.44
			+1.90	30.0	1.4	80.6	-	-	-	-	-	100 .0	3.3	31.5	-	-	-	-	-
			RAW	-	-	-	-	-	-	-	-	100 .0	7.9	31.9	27.5	32.7	7366	-	0.2
0×1/4	100%		-1.90	11.6	6.1	37.9	24.4	31.6	5918	-	0.51	11.6	6.1	37.9	24.4	31.6	5918	-	0.51
			+1.90	88.4	1.9	72.1	-	-	-	-	-	100.0	2.4	68.2	-	-	-	-	-
			RAW	-	-	-	-	-	-	-	-	100.0	2.9	68.8	16.6	11.7	-	-	0.13
0×1/4	100%		-1.90	41.1	4.5	15.1	33.2	47.2	9535	-	0.51	41.1	4.5	15.1	33.2	47.2	9535	-	0.51
			+1.90	58.9	1.2	75.1	-	-	-	-	-	100.0	2.6	50.5	-	-	-	-	-
			RAW	-	-	-	-	-	-	-	-	100.0	4.1	49.1	24.5	22.3	5073	-	0.15
0×1/4	100%		-1.90	43.3	7.5	26.1	33.3	33.1	7943	-	0.34	43.3	7.5	26.1	33.3	33.1	7943	-	0.34
			+1.90	56.6	2.6	70.8	-	-	-	-	-	100.0	4.7	51.4	-	-	-	-	-
			RAW	-	-	-	-	-	-	-	-	100.0	3.9	51.5	22.4	22.2	4733	-	0.15
0×1/4	100%		-1.90	58.5	4.3	13.7	32.8	49.2	9978	-	0.57	58.5	4.3	13.7	32.8	49.2	9978	-	0.57
			+1.90	41.5	1.9	71.4	-	-	-	-	-	100.0	3.3	37.7	-	-	-	-	-
			RAW	-	-	-	-	-	-	-	-	100.0	5.7	37.4	26.8	30.1	6527	-	0.32
		A0036																	
		A0037																	

CUMULATIVE SAMPLE VALUES THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	OTHER H.G.I.
3.70	33.8	6.5	16.6	32.6	44.1	9229			44
3.16	33.4	6.7	13.4	33.9	45.7	9631			-
2.36	39.5	6.6	11.3	35.1	46.9	9950			41
2.09	35.2	6.6	9.5	35.4	48.4	10175			-
1.04	68.2	6.6	9.3	35.3	48.8	10215			39
				EXCLUDED					-
				EXCLUDED					36
				EXCLUDED					
				EXCLUDED					
				EXCLUDED					
3.60	53.6	4.9	17.0	34.5	43.4	9424			
2.56	47.8	4.0	21.4	34.1	40.3	8966			
1.64	71.7	4.0	20.9	34.5	40.6	9060			
1.29	62.8	4.6	16.2	33.1	46.1	9277			44
1.51	70.0	4.1	10.4	35.4	50.1	10349			39
0.93	11.6	6.1	37.9	24.4	31.6	5918			-
1.17	17.7	5.4	27.1	28.6	39.1	7645			39
2.59	31.8	7.0	8.4	32.2	34.6	7868			-
				EXCLUDED					
0.24	41.4	4.5	15.1	33.2	47.2	9535			
1.66	42.9	7.0	24.5	33.2	35.0	8163			

CBW

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y 800 m N X 550 m. W. of S.E. corner of CL 83
ELEVATION: 584.78 m
DIP: -90° BEARING: -
CORE SIZE: HQ to 133.5 m CASING: HW 10.36 m NW 133.5 m
NQ to 159.72 m

BITS USED: J.K. SMIT COMBINATION
MUD USED: 168 BAGS GEL; 7 BAGS SEAL
92 BAGS TROL; ¼ BAG CELLEX
m LEFT IN HOLE: NIL m

DATE START: JUNE 20, 1979 FINISH: JUNE 28, 1979
DRILLER: CARON DIAMOND DRILLING OVERALL RECOVERY: 79.2 %
TESTS: GAMMA LOG
SAMPLED BY: O. CULLINGHAM DATE: JUNE 29
J. VILLAMILLE
ANALYZED BY: BIRTLEY COAL & MINERALS TESTING

BOREHOLE NO. BP-79-8
PAN OCEAN OIL LTD.
MINING DIVISION – COAL

LOGGED BY: O. CULLINGHAM D. HOPE, J. VILAMILLE DATE: JUNE 29, 1979
SIGNED:

GEOLOGICAL LOG – SCALE: 1:500

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
		88.68	CONGLOMERATE - MEDIUM GRAY WEATHERING, POORLY SORTED, PEBBLES AND COBBLES OF CHERT, QUARTZ AND QUARTZITE. AVERAGE 20-30 mm LARGEST IS GREATER THAN 70mm. MATRIX IS MEDIUM TO COARSE GRAINED SALT AND PEPPER SANDSTONE. SATURATED WITH TAR.
88.68		7.99	No. 1 SEAM HORIZON
96.67		5.71	SHALE - MEDIUM GRAY, CUBIC WEATHERING. SILTY NEAR BASE
102.41		1.17	LIGHT GRAY, VERY FINE TO FINE GRAINED, GRADATIONAL TO SANDSTONE BELOW
104.58		8.26	MEDIUM GRAY WEATHERING, COARSE GRAINED TO CONGLOMERATIC - COARSENING DOWNWARD. CHIPS AND SPLINTS OF COAL THROUGHOUT, INCREASING ABUNDANCE TOWARD BASE. CROSSBEDDING AT 55° TO CORE AXIS
113.83		3.08	No. 2 SEAM HORIZON
116.91		5.68	MEDIUM GRAY, MASSIVE BEDDED, CUBIC WEATHERING, CONTAINS COALY SPLINTS. BECOMES SILTY TOWARD BASE
122.59		4.04	SANDSTONE - VERY FINE TO FINE GRAINED - COARSENING DOWNWARD. BECOMES MORE CARBONACEOUS TOWARD BARE. CROSS - BEDDED AT 70° TO CORE AXIS
126.63		6.48	MEDIUM GRAY WEATHERING, THICKLY CROSSBEDDED AT 45° TO CORE AXIS. COARSE GRAINED TO CONGLOMERATE. COARSENING DOWNWARD. CHIPS AND SPLINTS OF COAL THROUGHOUT BECOMING MORE ABUNDANT TOWARD BASE.
132.97		4.80	No. 3 SEAM HORIZON
137.77		3.89	DARK GRAY, CARBONACEOUS AT TOP, MEDIUM GRAY, LESS CARBONACEOUS AT BASE - GRADATIONAL, CUBIC WEATHERING
141.66		4.77	SILTSTONE - LIGHT TO MEDIUM GRAY, MASSIVE BEDDED 144.12 - 144.70 FINELY CROSS-LAMINATED AT 70° TO CORE AXIS
146.43		0.62	COALY SHALE AND COAL
147.15		5.25	SHALE - MEDIUM TO DARK GRAY, CARBONACEOUS TO COALY, ABUNDANT SPLINTS OF COAL THROUGHOUT
152.40		1.84	SILTSTONE - TRANSITION ZONE FROM CARBONACEOUS SHALE TO CONGLOMERATE
154.24		4.97	CONGLOMERATE - 0.5 cm to 3.0 cm DIAMETER PEBBLES OF CHERT AND QUARTZITE. MATRIX OF MEDIUM TO COARSE SALT AND PEPPER SANDSTONE
159.21			TOTAL DEPTH

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
			No. 1 SEAM HORIZON		
		88.68	GOOD ROOF CONGLOMERATE		
88.68		0.67	COAL - DULL TO VITREOUS, SPLINTS AND BANDS OF BRIGHT COAL	A0061	0.67
89.35		0.74	CARBONACEOUS SHALE - DARK GRAY SPLINTS OF BRIGHT COAL	A0062	0.74
90.09		1.14	COAL - DULL TO VITREOUS, BANDED MINOR THIN BANDS OF SHALE.	A0063	1.14
91.23		0.51	CARBONACEOUS TO COALY SHALE	A0064	0.51
91.74		1.17	COAL - MOSTLY BRIGHT, BANDED CONCOIDAL FRACTURE, WHITE WISPS OCCUR BETWEEN BANDS	A0065	1.17
92.91		0.52	CARBONACEOUS SHALE - THIN BANDS OF SHALE AND BRIGHT COAL	A0066	0.52
93.48		0.11			
93.59		1.23	COAL - MOSTLY BRIGHT, PARTED TO BANDED, SPLINTS OF DULL COAL MINOR PYRITE AND RESIN	A0067	1.23
94.66		0.50	CARBONACEOUS AND COALY SHALE BANDS OF BRIGHT COAL	A0068	0.50
95.16		0.25	COAL - BRIGHT	A0069	0.25
95.41		0.45	COALY SHALE WITH BANDS OF BRIGHT COAL	A0070	0.45
95.86		0.50	COAL - DULL TO VITREOUS	A0071	0.81
96.36		0.31	NO CORE		
96.67		5.71	BAD FLOOR SHALE		
			No. 2 SEAM HORIZON		
		8.26	GOOD ROOF SANDSTONE		
113.83		0.46	COAL - MOSTLY BRIGHT, IRIDESCENT COLOURED STAINS		
114.29		0.36	COAL - DULL TO VITREOUS, LIGHT WEIGHT.	A0072	1.08
114.65		0.26	NO CORE		
114.91		0.99	COAL - MOSTLY BRIGHT, PARTED TO THINLY BANDED, IRIDESCENT COLOURATION	A0073	0.99
115.90		0.23	SHALE - CARBONACEOUS TO COALY	A0074	0.23
116.13		0.44	SHALEY COAL - DULL, BLOCKY	A0075	0.44
116.57		0.34	SHALE - CARBONACEOUS TO COALY	A0076	0.34
116.91		5.68	BAD FLOOR SHALE		
			No. 3 SEAM HORIZON		
		4.77	GOOD ROOF SANDSTONE		
132.97		0.55	COALY SHALE AND COAL, DULL TO VITREOUS	A0077	0.55
133.52		0.36	SHALE - MEDIUM LIGHT GRAY, BLOCKY		
133.88		0.64	NO CORE	A0078	0.90
134.42		0.79	COAL - VITREOUS TO BRIGHT AT TOP AND DULL LIGHT IN WEIGHT AT BASE	A0079	1.52
135.21		0.73	NO CORE		
185.94		0.33	COAL - BRIGHT	A0080	0.52
136.46		0.20	CARBONACEOUS TO COALY SHALE		
136.66		0.62	COAL - BRIGHT		
137.28		0.49	COAL - DULL TO VITREOUS, CARBONACEOUS SHALE FOR 0.09 m, AT BASE.	A0081	1.31
137.77		3.89	NO CORE		
			BAD FLOOR CARBONACEOUS SHALE		
146.43		0.72	COAL - GRADATIONAL, DOWNWARD FROM COALY SHALE TO DULL COAL	A0082	0.72
147.15		5.25	BAD FLOOR SHALE		

SIZE DIAMETER	SIZE WT %	SPEC GRAV	WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE SAMPLE VALUES THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	OTHER
0×1/4	100%	-1.90	83.9	4.9	23.0	30.8	41.3	8336	-	0.51	83.9	4.9	23.0	30.8	41.3	8336	-	0.51										
		+1.90	16.1	3.0	61.8	-	-	-	-	-	100.0	4.6	29.2	-	-	-	-	-					EXCLUDED					
		RAW	-	-	-	-	-	-	-	-	100.0	8.3	29.0	28.3	34.4	7568	-	0.25										
0×1/4	100%	-1.90	5.1	7.3	35.5	25.5	31.7	6488	-	0.29	5.1	7.3	35.5	25.5	31.7	6488	-	0.29										
		+1.90	94.9	2.3	79.7	-	-	-	-	-	100.0	2.6	77.5	-	-	-	-	-					EXCLUDED					
		RAW	-	-	-	-	-	-	-	-	100.0	3.5	76.6	13.8	6.1	-	-	0.06										
0×1/4	100%	-1.90	87.5	4.1	26.5	31.5	37.9	8160	-	0.37	87.5	4.1	26.5	31.5	37.9	8160	-	0.37	0.27	87.5	4.1	26.5	31.5	37.9	8160			
		+1.90	12.5	2.7	66.6	-	-	-	-	-	100.0	4.0	10.5	-	-	-	-	-										
		RAW	-	-	-	-	-	-	-	-	100.0	6.9	31.0	28.5	33.6	7461	-	0.15										
0×1/4	100%	-1.90	8.7	6.1	36.9	18.8	38.2	6434	-	0.30	8.7	6.1	36.9	18.8	38.2	6434	-	0.30	0.78	35.9	4.4	28.1	29.4	37.9	7887			
		+1.90	91.3	3.2	72.4	-	-	-	-	-	100.0	3.5	69.3	-	-	-	-	-										
		RAW	-	-	-	-	-	-	-	-	100.0	5.4	67.9	15.8	10.9	-	-	0.10										
0×1/4	100%	-1.90	90.6	4.3	9.3	37.7	48.7	10485	-	0.35	90.6	4.3	9.3	37.7	48.7	10485	-	0.35	1.95	68.7	4.3	13.2	35.9	46.4	9941			
		+1.90	9.4	2.3	68.9	-	-	-	-	-	100.0	4.2	14.9	-	-	-	-	-										
		RAW	-	-	-	-	-	-	-	-	100.0	9.1	12.9	34.9	43.1	9613	-	0.17										
0×1/4	100%	-1.90	9.7	5.8	36.3	27.1	30.8	6625	-	0.27	9.7	5.8	36.3	27.1	30.8	6625	-	0.27	2.47	56.3	4.3	14.0	35.6	45.8	9820			
		+1.90	90.3	2.9	78.3	-	-	-	-	-	100.0	3.2	74.3	-	-	-	-	-										
		RAW	-	-	-	-	-	-	-	-	100.0	4.9	72.9	14.5	7.7	-	-	0.08										
0×1/4	100%	-1.90	80.3	4.0	19.1	35.3	41.6	9264	-	0.24	80.3	4.0	19.1	35.3	41.6	9264	-	0.24	3.70	64.2	4.2	16.1	35.5	44.1	9589			
		+1.90	19.7	1.9	71.9	-	-	-	-	-	100.0	3.6	29.5	-	-	-	-	-										
		RAW	-	-	-	-	-	-	-	-	100.0	7.8	27.1	30.9	34.2	7828	-	0.19										
0×1/4	100%	-1.90	87.2	3.4	29.6	31.5	35.5	7786	-	0.34	87.2	3.4	29.6	31.5	35.5	7786	-	0.34										
		+1.90	12.8	1.7	68.9	-	-	-	-	-	100.0	3.2	34.6	-	-	-	-	-					EXCLUDED					
		RAW	-	-	-	-	-	-	-	-	100.0	6.2	33.6	29.5	30.7	7105	-	0.23										
0×1/4	100%	-1.90	91.2	2.7	25.7	33.9	37.7	8529	-	0.32	91.2	2.7	25.7	33.9	37.7	8529	-	0.32										
		+1.90	8.8	1.8	64.6	-	-	-	-	-	100.0	2.6	29.2	-	-	-	-	-					EXCLUDED					
		RAW	-	-	-	-	-	-	-	-	100.0	6.5	27.3	32.4	33.8	7950	-	0.27										
0×1/4	100%	-1.90	21.1	5.1	24.1	30.9	39.9	8273	-	0.36	21.1	5.1	24.1	30.9	39.9	8273	-	0.36										
		+1.90	78.9	1.4	76.3	-	-	-	-	-	100.0	2.2	65.3	-	-	-	-	-					EXCLUDED					
		RAW	-	-	-	-	-	-	-	-	100.0	3.2	64.8	18.8	13.2	2810	-	0.11										
0×1/4	100%	-1.90	73.1	3.9	30.5	30.4	35.2	7740	-	0.33	73.1	3.9	30.5	30.4	35.2	7740	-	0.33										
		+1.90	26.9	2.4	66.8	-	-	-	-	-	100.0	3.5	40.3	-	-	-	-	-					CUMULATIVE - TOTAL SEAM					
		RAW	-	-	-	-	-	-	-	-	100.0	6.7	37.4	26.3	29.6	6446	-	0.21	7.99	63.72	4.1	22.0	33.2	40.6	8772			
0×1/4	100%	-1.90	97.1	5.3	10.5	34.2	50.0	10019	-	0.42	97.1	5.3	10.5	34.2	50.0	10019	-	0.42	1.08	97.1	5.3	10.5	34.2	50.0	10019			
		+1.90	2.9	3.1	57.2	-	-	-	-	-	100.0	5.2	11.9	-	-	-	-	-										
		RAW	-	-	-	-	-	-	-	-	100.0	9.8	11.8	32.4	46.0	9695	-	0.27										
0×1/4	100%	-1.90	96.1	5.7	7.2	37.5	49.6	10420	-	0.34	96.1	5.7	7.2	37.5	49.6	10420	-	0.34	2.07	96.6	5.4	8.9	35.7	49.8	10209			
		+1.90	3.9	3.1	52.6	-	-	-	-	-	100.0	5.6	9.0	-	-	-	-	-										
		RAW	-	-	-	-	-	-	-	-	100.0	8.7	8.5	36.2	46.6	10243	-	0.32										
0×1/4	100%	-1.90	14.0	7.4	25.5	28.8	38.3	7871	-	0.27	14.0	7.4	25.5	28.8	38.3	7871	-	0.27	2.30	88.3	5.5	9.1	35.7	49.7	10172			
		+1.90	86.0	2.3	67.7	-	-	-	-	-	100.0	3.0	61.8	-	-	-	-	-										
		RAW	-	-	-	-	-	-	-	-	100.0	3.5	61.7	20.7	14.1	3242	-	0.10										
0×1/4	100%	-1.90	38.0	5.9	34.5	25.3	34.3	6282	-	0.25	38.0	5.9	34.5	25.3	34.3	6282	-	0.25	2.74	80.2	5.6	11.2	34.8	48.4	9876			
		+1.90	62.0	2.5	63.1	-	-	-	-	-	100.0	3.8	52.2	-	-	-	-	-										
		RAW	-	-	-	-	-	-	-	-	100.0	4.7	51.4	21.6	22.3	4650	-	0.10										
0×1/4	100%	-1.90	33.1	5.1	45.2	20.2	29.5	5470	-	0.27	33.1	5.1	45.2	20.2	29.5	5470	-	0.27	3.08	75.1	5.6	12.8	34.2	37.6	9662			
		+1.90	66.9	2.2	70.7	-	-	-	-	-	100.0	3.2	62.3	-	-	-	-	-										
		RAW	-	-	-	-	-	-	-	-	100.0	4.4	61.3	15.6	18.7	3182	-	0.13										
0×1/4	100%	-1.90	30.0	5.2	36.3	25.3	33.2	6775	-	0.32	30.0	5.2	36.3	25.3	33.2	6775	-	0.32										
		+1.90	70.0	1.2	81.6	-	-	-	-	-	100.0	2.4	68.0	-	-	-	-	-					EXCLUDED					
		RAW	-	-	-	-	-	-	-	-	100.0	3.6	67.4	14.3	14.7	2359	-	0.15										
0×1/4	100%	-1.90	1.9	8.4	16.6	32.8	42.2	9076	-	0.34	1.9	8.4	16.6	32.8	42.2	9076	-	0.34										
		+1.90	98.1	1.2	90.1	-	-	-	-	-	100.0	1.3	88.7	-	-	-	-	-					EXCLUDED					
		RAW	-	-	-	-	-	-	-	-	100.0	1.3	89.4	6.8	2.5	-	-	0.06										
0×1/4	100%	-1.90	39.7	5.6	16.9	33.3	44.2	9408	-	0.30	89.7	5.6	16.9	33.3	44.2	9408	-	0.03	1.52	39.7	5.6	16.9	33.3	44.2	9408			
		+1.90	60.3	1.6	78.9	-	-	-	-	-	100.0	3.2	54.3	-	-	-	-	-										
		RAW	-	-	-	-	-	-	-	-	100.0	3.7	56.4	20.2	19.7	4011	-	0.17										
0×1/4	100%	-1.90	68.6	5.9	15.2	33.6	45.3	9435	-	0.32	68.6	5.9	15.2	33.6	45.3	9435	-	0.32	2.04	47.0	5.7	16.2	33.4	44.6	9418			
		+1.90	31.4	2.3	63.8	-	-	-	-	-	100.0	4.8	30.5	-	-	-	-	-										
		RAW	-	-	-	-	-	-	-	-	100.0	5.5	32.8	28.2	33.5	7179	-	0.15										
		-1.90	69.7	5.7	11.0	36.8	46.5	10190	-	0.32	69.7	5.7	11.0	36.8	46.5	10190	-	0.32	3.35	55.9	5.7	13.7	35.0	45.5	9794			
		+1.90	30.3	2.0	65.3	-	-	-	-	-	100.0	4.6	27.4	-	-	-	-	-										
		RAW	-	-	-	-	-	-	-	-	100.0	6.1	26.6	30.9	36.4	7929	-	0.20										
0×1/4	100%	-1.90	48.2	5.8	17.0	32.8	44.4	9368	-	0.40	48.2	5.8	17.0	32.8	44.4	9368	-	0.40	0.72	48.2	5.8	17.0	32.8	44.4	9368			
		+1.90	51.8	1.8	71.4	-	-	-	-	-	100.0	3.7	45.2	-	-	-	-	-										
		RAW	-	-	-	-	-	-	-	-	100.0	4.6	45.1	25.1	25.2	5418	-	0.20										

LW

062095

LOCATION MAP

TN

SCALE:

COORDINATES: Y 1780 m W. X 720 m W. FROM S.E. CORNER OF CL 83
ELEVATION: 555.24 m BITS USED: J.K. SMIT COMBINATION
DIP: -90 BEARING: – MUD USED: 25 GALS. POLYDRILL NO. 325, 10 GALS. POLYPOWER NO. 357
CORE SIZE: HQ CASING: 25.6 HW m LEFT IN HOLE: NIL m

DATE START: JUNE 20, 1979. FINISH: JUNE 26, 1979.
DRILLER: CARON DIAMOND DRILLING LTD. OVERALL RECOVERY: 82.5%
TESTS: GAMMA RAY
SAMPLED BY: O. CULLINGHAM DATE: JUNE 27, 1979 ANALYZED BY: BIRTLEY COAL & MINERALS TESTING

BOREHOLE NO. BP-79-9
PAN OCEAN OIL LTD. (PAGE 1)
MINING DIVISION – COAL

LOGGED BY: D. HOPE, O. CULLINGHAM DATE: JUNE 30, 1979.
SIGNED: D. HOPE

GEOLOGICAL LOG – SCALE: 1:500

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
		27.52	OVERBURDEN: COBBLE SIZED PIECES OF CONGLOMERATE AND SANDSTONE.
27.52		0.97	SHALE: CARBONACEOUS - CONTAINS BITUMEN.
28.49		1.51	SILTSTONE: LIGHT GRAY - MASSIVE BEDDED, RARE PLANT FRAGMENTS.
30.00		0.40	SHALE: CARBONACEOUS - CONTAINS BITUMEN.
30.40		3.08	SILTSTONE: LIGHT GRAY, MASSIVE BEDDED 32.20-33.48 FINELY CROSS LAMINATED (1-2 MM) WITH DARKER CARBONACE BANDS.
33.48		19.80	CONGLOMERATIC SANDSTONE: PEBBLE AVERAGE 30MM, LARGEST 50MM, POORLY SORTED, ROUNDED, LOW SPHERICITY CLASTS OF BLACK, GRAY, GREEN CHERT AND GRAY QUARTZITE. MATRIX IS FINE TO MEDIUM, ANGULAR, WELL SORTED SANDSTONE, QUARTZ AND CHERT. APPROXIMATELY 15% CLAY.
43.28		0.35	MUDSTONE: LIGHT GRAY BROWN, CONTAINS CARBONACEOUS CHIPS
43.73		0.77	SHALE: CARBONACEOUS, DARK GRAY TO BLACK.
44.50		2.42	SILTSTONE: LIGHT GRAY BROWN, SILT CONTENT INCREASES TO BASE.
46.92		87.90	CONGLOMERATE: MEDIUM GRAY WEATHERING, MASSIVE BEDDED, POORLY SORTED, ROUNDED TO SUBROUNDED, LOW SPHERICITY PEBBLES AND COBBLES OF BLACK, GRAY, GREEN CHERT AND GRAY AND WHITE QUARTZITE. VEINING IN PEBBLES COMMON. BIMODAL DISTRIBUTION; 0.5 CM AND 3.0 TO 5.0 CM DIAMETER. SOME CLASTS GREATER THAN 7.0 CM DIAMETER. MATRIX MEDIUM TO COARSES GRAINED, SALT AND PEPPER SANDSTONE. POOR TO MODERARATELY WELL CEMENTED.
134.82		9.86	NO. 1 SEAM HORIZON
144.68		1.00	MUDSTONE: SOFT, LIGHT BROWN TO LIGHT GRAY WEATHERING.
145.68		2.72	SHALE: CARBONACEOUS, MASSIVE BEDDED. SLICKEN SIDES AT 146.20
148.40		6.40	SANDSTONE: PEBBLY, MEDIUM TO MASSIVE BEDDED, CROSS-BEDDED AT 55° TO CORE AXIS. SLIGHTLY CARBONACEOUS IN UPPER HALF.
154.80		0.93	CONGLOMERATE, LIGHT GRAY WEATHERING, MASSIVE BEDDED, AVERAGE PEBBLE SIZE 10 MM, LARGEST 50 MM, POORLY SORTED, ROUNDED TO SUBROUNDED, MODERATE SPHERICITY, GRAY AND BLACK CHERT AND GRAY QUARTZITE.
155.73			

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC GRAV	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	BTU	F.S.I.	S
			NO. 1 SEAM HORIZON													
134.82		87.90	ROOF: CONGLOMERATE - GOOD													
135.37		0.55	COAL AND SHALEY COAL	A0043	1.24	0×1/4	100%	-1.90	51.9	4.5	20.7	30.9	43.9	9027	-	0.30
135.65		0.29	SHALEY COAL					+1.90	48.1	2.0	70.7	-	-	-	-	-
136.06		0.41	COAL: 0.04M SHALEY COAL					RAW	-	-	-	-	-	-	-	-
136.84		0.78	SHALE, SLIGHTLY CARBONACEOUS SLICKEN SIDES ON CONTACT	A0044	0.78	0×1/4	100%	-1.90	2.0	5.1	22.0	30.2	42.7	8796	-	0.30
137.06		0.22	COAL					+1.90	98.0	1.7	89.0	-	-	-	-	-
137.45		0.39	SHALE: CARBONACEOUS TO COALY	A0045	0.90	0×1/4	100%	RAW	-	-	-	-	-	-	-	-
137.74		0.29	COAL					-1.90	36.2	3.6	24.3	31.6	40.5	8556	-	0.30
138.24		0.50	SHALE: MINOR CARBONACEOUS AND COAL	A0046	0.50	0×1/4	100%	+1.90	63.8	2.3	78.2	-	-	-	-	-
139.30		1.06	COAL AND SHALEY COAL	A0047	2.05	0×1/4	100%	RAW	-	-	-	-	-	-	-	-
140.29		0.99	COAL: MOSTLY BRIGHT, CONCOIDAL FRACTURE.					-1.90	2.3	7.4	26.2	28.4	30.8	7852	-	0.27
140.81		0.52	SHALE: DULL CARBONACEOUS TO COALY	A0048	0.52	0×1/4	100%	+1.90	97.7	3.1	81.1	-	-	-	-	-
142.23		1.42	SHALEY COAL DULL TO VITREOUS WITH A FEW THIN BANDS OF BRIGHT COAL.	A0049	1.42	0×1/4	100%	RAW	-	-	-	-	-	-	-	-
142.54		0.31	COALY SHALE TO SHALEY COAL					-1.90	78.4	5.4	17.9	33.9	42.8	9276	-	0.48
142.94		0.40	COAL: DULL TO VITREOUS TO BRIGHT	A0050	0.82	0×1/4	100%	+1.90	21.6	2.5	70.5	-	-	-	-	-
143.05		0.11	SHALEY COAL AND COALY SHALE					RAW	-	-	-	-	-	-	-	-
143.71		0.66	SHALE WITH 0.19 M OF SHALEY COAL	A0051	0.66	0×1/4	100%	-1.90	3.4	5.0	31.9	28.9	34.2	7369	-	0.29
144.68		0.97	COALY SHALE AND SHALEY COAL 0.25M TOTAL OF COAL.	A0052	0.97	0×1/4	100%	+1.90	96.6	2.5	78.9	-	-	-	-	-
		1.00	FLOOR: MUDSTONE AND SHALE - POOR CUBIC WEATHERING.					RAW	-	-	-	-	-	-	-	-
								-1.90	76.2	4.5	18.6	34.2	42.7	9291	-	0.38
								+1.90	23.8	1.9	72.0	-	-	-	-	-
								RAW	-	-	-	-	-	-	-	-
								-1.90	83.6	4.3	31.3	29.0	35.4	7707	-	0.38
								+1.90	16.4	1.8	63.6	-	-	-	-	-
								RAW	-	-	-	-	-	-	-	-
								-1.90	24.1	4.7	30.5	28.8	36.0	7552	-	0.40
								+1.90	75.9	1.8	76.8	-	-	-	-	-
								RAW	-	-	-	-	-	-	-	-
								-1.90	56.8	4.8	29.5	30.0	35.7	7601	-	0.42
								+1.90	43.2	1.9	71.7	-	-	-	-	-
								RAW	-	-	-	-	-	-	-	-

CUMULATIVE WEIGHT PERCENT	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	BTU	F.S.I.	S
	51.9	4.5	20.7	30.9	43.9	9027	-	0.30
	100.0							
	100.0	5.4	43.7	22.7	28.2	5433	-	0.19
	2.0	5.1	22.0	30.2	42.7	8796	-	0.30
	100.0							
	100.0	2.1	87.4	7.8	2.7	-	-	0.06
	36.2	3.6	24.3	31.6	40.5	8556	-	0.30
	100.0							
	100.0	5.6	56.1	20.5	17.8	3817	-	0.14
	2.3	7.4	26.2	28.4	30.8	7852	-	0.27
	100.0							
	100.0	4.2	79.2	12.6	4.0	-	-	0.10
	78.4	5.4	17.9	33.9	42.8	9276	-	0.48
	100.0							
	100.0	7.6	27.6	29.2	35.6	7675	-	0.15
	3.4	5.0	31.9	28.9	34.2	7369	-	0.29
	100.0							
	100.0	4.7	75.9	13.6	5.8	-	-	0.10
	76.2	4.5	18.6	34.2	42.7	9291	-	0.38
	100.0							
	100.0	5.4	30.7	30.6	33.3	7724	-	0.21
	83.6	4.3	31.3	29.0	35.4	7707	-	0.38
	100.0							
	100.0	5.4	34.9	28.0	31.7	7277	-	0.25
	24.1	4.7	30.5	28.8	36.0	7552	-	0.40
	100.0							
	100.0	3.1	65.4	16.9	14.6	2725	-	0.11
	56.8	4.8	29.5	30.0	35.7	7601	-	0.42
	100.0							
	100.0	4.7	46.9	24.5	23.9	5378	-	0.25

CUMULATIVE SAMPLE VALUES	THICKNESS	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	OTHER: GI
					EXCLUDED					41
					EXCLUDED					
					EXCLUDED					
					EXCLUDED					
	1.76	78.4	5.4	17.9	33.9	42.8	9276			
	2.28	61.2	5.3	18.1	33.8	42.6	9251			
	3.70	67.0	5.0	18.3	33.9	42.6	9268			
					EXCLUDED					
					EXCLUDED					
	9.86	51.7	CUMULATIVE - 4.7	22.3	TOTAL 32.2	SEAM 40.7	8744			

062055

LOCATION MAP

TN ↑

SCALE: 1:500

COORDINATES: Y X

ELEVATION:

DIP: BEARING:

CORE SIZE: CASING:

BITS USED:

MUD USED:

m LEFT IN HOLE: m

DATE START: FINISH:

DRILLER: OVERALL RECOVERY:

TESTS:

SAMPLED BY: DATE: ANALYZED BY:

LOGGED BY: DATE:

SIGNED:

BOREHOLE NO. BP-79-9
PAN OCEAN OIL LTD. (PAGE 2)
MINING DIVISION – COAL

GEOLOGICAL LOG – SCALE: 1:500

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
			CONTINUED FROM PAGE 1
155.73		3.47	No. 2 SEAM HORIZON
159.20		1.12	DARK GRAY TO BLACK, CARBONACEOUS, CONTAINS SPLINTS AND BANDS OF COAL
160.32		4.47	SHALE - MEDIUM GRAY WEATHERING, MASSIVE BEDDED, CUBIC WEATHERING
164.79		1.02	SANDSTONE - MEDIUM GRAY, MASSIVE BEDDED, SALT AND PEPPER
165.81		2.73	SANDSTONE - MEDIUM GRAY, MEDIUM GRAINED, CROSS-BEDDED AT 60° TO AXIS, WELL SORTED, ANGULAR, QUARTZ AND CHERT
168.54		0.41	SILTSTONE - LIGHT GRAY, MASSIVE BEDDED
168.95		8.25	SILTSTONE - MEDIUM GRAY, SHALEY CARBONACEOUS NEAR TOP, GRADES TO SANDY AND CLEANER TOWARD BASE. CROSS LAMINATIONS 65° TO CORE AXIS
177.20		1.40	SANDSTONE - CROSSBEDDED 55° TO CORE AXIS, FINE TO COARSE GRAINED INTERBEDS
178.60		4.52	No. 3 SEAM HORIZON
183.12		3.34	SHALE - MEDIUM GRAY, CUBIC WEATHERING, CARBONACEOUS
186.46		4.21	SILTSTONE - GRAY, WEATHERING, SHALEY AT TOP, SANDY AT BASE, GRADATIONAL, MASSIVE BEDDED
190.65		3.51	SANDSTONE - FINE TO COARSE GRAINED, COARSENING DOWNWARD, IN PART CROSS-BEDDED 50° TO CORE AXIS
194.16		2.74	CONGLOMERATE - LIGHT GRAY, MODERATELY WELL SORTED, MASSIVE BEDDED, GREEN, BLACK, GRAY CHERT, GRAY QUARTZITE, AND OCCASIONAL BANDED SILTSTONE PEBBLES. 1-2 cm DIAMETER, LARGEST 3.5 cm
196.90			TOTAL DEPTH

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
			No. 2 Seam Horizon		
		0.93	GOOD ROOF CONGLOMERATE		
155.73		2.38	COAL - MOSTLY BRIGHT TO VITREOUS, WELL BANDED, CONCOIDAL FRACTURE, 0.12m LOST CORE	A0053	2.38
158.12		0.51	SHALE, COALY SHALE AND DULL COAL	A0054	0.51
158.63		0.16	COAL - BRIGHT		
158.79		0.41	SHALEY COAL AND COALY SHALE	A0055	0.57
159.20			FLOOR - SHALE - POOR, CUBIC FRACTURING		
			No. 3 Seam Horizon		
		1.40	ROOF - SANDSTONE, GOOD		
178.60		0.97	SHALEY COAL, COALY SHALE, CARBONACEOUS SHALE AND 0.18m TOTAL OF COAL	A0056	0.97
179.57		0.88	COAL - BRIGHT, WELL BANDED, CONCHOIDAL FRACTURE	A0057	0.88
180.45		0.17	SHALE - COALY	A0058	1.73
		0.27	COALY - BRIGHT BANDED BLOCK		
		0.18	MUDSTONE		
		0.60	COAL - DULL TO BRIGHT, PARTINGS OF CARBONACEOUS SHALE		
181.62		0.56	COALY SHALE, CARBONACEOUS SHALE AND COAL		
182.18		0.67	SHALE - SLIGHTLY CARBONACEOUS	A0059	0.67
182.85		0.27	COAL - DULL TO VITREOUS, THINLY BANDED	A0060	0.29
183.12			FLOOR - CUBIC FRACTURING SHALE - POOR		

SIZE DIAMETER	SIZE WT %		SPEC GRAV	WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	CUMULATIVE SAMPLE VALUES THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	OTHER
0×1/4	100%	-1.90		95.2	5.2	9.8	35.4	49.6	10322	-	0.40	95.2	5.2	9.8	35.4	49.6	10322	-	0.40	2.38	95.2	5.2	9.8	35.4	49.6	10322			
		+1.90		4.8	1.9	63.3	-	-	-	-	-	100.0																	
		RAW		-	-	-	-	-	-	-	-	100.0	8.9	11.2	34.3	45.6	5600	-	0.27										
0×1/4	100%	-1.90		63.2	4.2	30.6	27.6	37.6	7248	-	0.38	63.2	4.2	30.6	27.6	37.6	7248	-	0.38	2.89	89.5	5.0	12.3	34.4	48.1	9939			
		+1.90		36.8	2.2	62.2	-	-	-	-	-	100.0																	
		RAW		-	-	-	-	-	-	-	-	100.0	5.5	41.8	25.3	27.4	5640	-	0.17										
0×1/4	100%	-1.90		94.0	4.7	14.4	32.5	48.4	9742	-	0.49	94.0	4.7	14.4	32.5	48.4	9742	-	0.49	3.46	90.2	5.0	12.7	34.1	48.1	9905			
		+1.90		6.0	2.1	54.9	-	-	-	-	-	100.0																	
		RAW		-	-	-	-	-	-	-	-	100.0	6.5	16.4	33.1	44.0	9400	-	0.23										
0×1/4	100%	-1.90		23.6	4.1	28.3	29.9	37.7	7791	-	0.43	23.6	4.1	28.3	29.9	37.7	7791	-	0.43	3.58	54.4	4.7	17.0	34.0	44.1	9385			
		+1.90		76.4	1.6	75.0	-	-	-	-	-	100.0								(INCLUDES SAMPLES A0056-A0058 INCL.)									
		RAW		-	-	-	-	-	-	-	-	100.0	3.2	63.0	18.4	15.4	3075	-	0.12										
0×1/4	100%	-1.90		82.6	4.8	9.4	36.2	49.6	10519	-	0.37	82.6	4.8	9.4	36.2	49.6	10519	-	0.37	0.88	82.6	4.8	9.4	36.2	49.6	10519			
		+1.90		17.4	1.7	62.1	-	-	-	-	-	100.0																	
		RAW		-	-	-	-	-	-	-	-	100.0	6.8	18.7	33.1	41.4	9045	-	0.25										
0×1/4	100%	-1.90		57.5	4.9	20.1	33.3	41.7	8925	-	0.39	57.5	4.9	20.1	33.3	41.7	8925	-	0.39	2.61	65.9	4.8	15.5	34.5	45.0	9597			
		+1.90		42.5	1.3	71.6	-	-	-	-	-	100.0																	
		RAW		-	-	-	-	-	-	-	-	100.0	5.8	41.9	26.4	25.9	5601	-	0.17										
0×1/4	100%	-1.90		1.9	5.7	20.7	32.5	41.1	8926	-	0.38	1.9	5.7	20.7	32.5	41.1	8926	-	0.38					EXCLUDED					
		+1.90		98.1	1.2	89.4	-	-	-	-	-	100.0																	
		RAW		-	-	-	-	-	-	-	-	100.0	2.2	86.8	8.4	2.6	-	-	0.06										
0×1/4	100%	-1.90		64.8	5.5	21.8	34.5	38.2	8797	-	0.49	64.8	5.5	21.8	34.5	38.2	8797	-	0.49					EXCLUDED					
		+1.90		35.2	2.7	74.3	-	-	-	-	-	100.0																	
		RAW		-	-	-	-	-	-	-	-	100.0	5.6	40.7	25.9	27.8	6218	-	0.29										

LW

063055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y 1860 m N X 240 m W of SE corner of CL 83
ELEVATION: 567.93 m BITS USED J.K. SMIT COMBINATION
DIP -90 BEARING - MUD USED 234 bags
CORE SIZE NQ CASING HW 15.24 m LEFT IN HOLE NIL m
NW 120.40

DATE START JUNE 26, 79 FINISH JULY 6, 79
DRILLER CARON DIAMOND DRILLING OVERALL RECOVERY 93%
TESTS GAMMA RAY: ACID TEST @ 290 m
SAMPLED BY J.VILLAMIL & O.CULLINGHAM DATE JULY 9, 79 ANALYZED BY BIRTLEY COAL & MINERALS TESTING SIGNED

BOREHOLE NO. BP-79-10
PAN OCEAN OIL LTD. (PAGE 1)
MINING DIVISION – COAL

LOGGED BY J.VILLAMIL DATE JULY 8, 79

GEOLOGICAL LOG – SCALE: 1:500

DETAILS OF COAL SEAMS – SCALE:

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
		50.19	OVERBURDEN
50.19		0.22	COAL - DULL, BANDED, SOFT AND CHERTY. MINOR RESIN SPOTS.
50.41		1.93	CARBONACEOUS SHALE - MEDIUM GRAY BROWNISH. SILTSTONE TIE AT BASE
52.34		1.46	SANDSTONE - MEDIUM GRAY, GRADING FROM FINE TO COARSE GRAINED
53.80		0.61	SILTSTONE - MEDIUM TO DARK GRAY LAYERS OF SHALE AND S.S INTERBEDDED
54.41		1.79	SANDSTONE - SALT AND PEPPER COLOURED GRADING FROM FINE TO CONGLOMERATE
56.20		1.22	CARBONACEOUS SHALE & COAL - VITEREOUS TO BRIGHT. BANDED
57.42		4.83	MUDSTONE - LIGHT TO MEDIUM GRAY BROWNISH. FRAGMENTED SOFT. CONTAINS MINOR SPLINTS AND FRAGMENTS OF DULL COAL.
62.25		2.14	SHALE - CARBONACEOUS AT TOP, MEDIUM GRAY. FRAGMENTAL
64.39		3.70	SILTSTONE & MUDSTONE - LIGHT TO MEDIUM GRAY BROWNISH. FRAGMENTED TO BLOCKY. SPLINTS OF BRIGHT COAL THROUGHOUT.
68.09		3.00	SANDSTONE - VERY FINE TO FINE GRAINED. MEDIUM GRAY BANDED, CROSS BEDDED. THIN BANDS AND SPLINTS OF DULL COAL AT BASE
71.09		1.40	CONGLOMERATIC SANDSTONE - LIGHT GRAY ORANGEISH DUE TO IRON OXIDES
72.49		2.19	SANDSTONE - LIGHT GRAY. MEDIUM TO COARSE GRAINED. GRAINS OF QUARTZ, CHERT AND QUARTZITE
74.68	?	15.24	SANDSTONE & CONGLOMERATE - MEDIUM TO COARSE SANDSTONE AND PEBBLE SIZE CONGLOMERATE GENERAL COMPOSITION IS: 55% CHERT (BLACK, GRAY AND GREEN) 45% QUARTZ (CLEAR AND MILKY) TRACES OF SILTY SHALE
89.92	? TRICONED	10.66	SANDSTONE - FINE TO MEDIUM GRAINED 50% QUARTZ (CLEAR AND MILKY) 50% CHERT (DOMINANTELY BLACK)
100.58	?	3.05	SANDSTONE & SHALE - FINE TO MEDIUM GRAINED. 42% QUARTZ, 42% BLACK CHERT AND 16% OF COMB. SHALE
103.63	?	6.10	SANDSTONE & SHALE - FINE GRAINED, DECEMENTED 80% CLEAR QUARTZ 15% BLACK CHERT 5% CARB. TO COALY SHALE
109.73	?	6.09	SANDSTONE - FINE GRAINED 35% QUARTZ (CLEAR AND MILKY) 65% CHERT (DOMINATELY BLACK)
115.82	?	4.58	SANDSTONE - FINE GRAINED 70% QUARTZ (MAINLY CLEAR, SOME MILKY) 30% CHERT (MAINLY BLACK, SOME GRAY)
120.40	core wash	1.21	FRAGMENTS OF QUARTZ, SILTSTONE AND SHALE
121.61		1.28	CARBONACEOUS SHALE AND MUDSTONE - MEDIUM GRAY BROWN
122.89		4.46	SANDSTONE - LIGHT TO MEDIUM GRAY. FINE TO CONGLOMERATIC, GRADING GRAIN SIZE COARSENING DOWNWARD. QUARTZ AND CHERT GRAINS AND SMALL PEBBLES
127.35		4.81	SILTY AND CARBONACEOUS SHALE - MEDIUM TO DARK GRAY BROWNISH. COAL FRAGMENTS TROUGHOUT. BECOMES SOFT AT BASE FROM HARD AT TOP.
132.16		1.37	SILTSTONE - LIGHT GRAY FINELY STRATIFIED COAL CONCRETIONS
133.89		1.67	SANDSTONE - LIGHT GRAY. FINE GRAINED, CROSSBEDDED.
135.56		4.67	CONGLOMERATIC SANDSTONE - SALT AND PEPPER TEXTURE. UNSTRATIFIED ALTERING LAYERS OF COARSE SANDSTONE AND SANDSTONE MATRIX SUPPORT CONGLOMERATES
140.23		6.53	CONGLOMERATE - MEDIUM GRAY MATTED. CLAST SUPPORTED, POLYGENETIC AND POLYMODAL SMALL TO LARGE PEBBLES OF QUARTZ, QUAREITE AND BLACK CHERT, POOR SORTED COARSE SANDSTONE MATRIX
146.76		0.47	CARBONACEOUS SHALE & DULL TO VITEROUS COAL
147.23		2.06	SILTSTONE - LIGHT GRAY, FINE LAMINATED, GRADING TO SANDSTONE
149.29		87.92	CONGLOMERATE - MEDIUM TO LIGHT GRAY. LARGE TO VERY LARGE PEBBLES OF MILKY QUARTZ (10%), CLEAR QUARTZ (15%) QUAREITE (60%) BLACK CHERT (5%)
162.50			

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC GRAV	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	BTU	F.S.I.	S

CUMULATIVE WEIGHT PERCENT: YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES: THICKNESS	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL	F.C.	BTU	F.S.I.	S	OTHER

GEW

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X
ELEVATION:
DIP BEARING
CORE SIZE CASING

BITS USED
MUD USED
m. LEFT IN HOLE m.

DATE START
DRILLER
TESTS
SAMPLED BY

FINISH
OVERALL RECOVERY
DATE ANALYZED BY

BOREHOLE NO. BP-79-10
PAN OCEAN OIL LTD. (PAGE 2)
MINING DIVISION – COAL

LOGGED BY DATE
SIGNED

GEOLOGICAL LOG – SCALE: 1:500

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
162.50			CONGLOMERATE (CONT) - LARGEST PEBBLES ARE GRAY COLOURED QUARTZITE ALL PEBBLES ARE INTO A POLYMODAL SANDSTONE MEDIUM TO COARSE GRAINED MATRIX. ABUNDANT TAR THROUGHOUT MAINLY IN PARTS WITH POROSITY BETWEEN 15-25%. MOST OF PEBBLES ARE SUBROUNDED, POOR SORTED AND MEDIUM SPHERICITY. CONGLOMERATE IS NOT STRATIFIED BUT SOME INTERVALS ARE DISTINGUISHABLE AT: 165.40-165.80 LIGHT GRAY, FINE GRAINED SANDSTONE 175.58-176.93 SMALL PEBBLE CONGLOMERATE SOME MATRIX. ABUNDENT TAR AT BASE 180.95-181.02 CARBONACEOUS SHALE. 207.60-208.32 SMALL SIZED COBBLE CONGLOMERATE 235.05-237.34 SMALL PEBBLES CONGLOMERATE 10% OF THE PEBBLES ARE OF GREENISH CHERT
		87.93	
237.46		8.27	NO. 1 SEAM HORIZON
245.73		6.51	SHALE - MEDIUM GRAY, FRAGMENTAL AND CARBONACEOUS WITH SPLINTS OF BRIGHT COAL THROUGHOUT. THIN INTERVALS OF BRIGHT COAL (NO MORE THAN 2-3cm)
252.24		1.49	SANDSTONE - MEDIUM GRAY, FINE TO MEDIUM GRAINED
253.76		5.93	CONGLOMERATE - LIGHT TO MEDIUM GRAY, SMALL TO MEDIUM SIZED PEBBLES OF GRAY QUARTZITE (50%), BLACK CHERT (20%); QUARTZ (25%) AND GRAY CHERT (5%). POORLY SORTED. MATRIX IS COARSE TO GRANULAR SANDSTONE.
259.69		3.18	NO. 2 SEAM HORIZON
262.87		4.68	SHALE & MUDSTONE - MEDIUM GRAY BROWNISH, FRAGMENTAL, SOFT AND SPLINTS OF BRIGHT COAL THROUGHOUT.
267.55		6.04	SANDSTONE - LIGHT TO MEDIUM GRAY, GRADING DOWNWARD FROM FINE TO COARSE GRAINED. CROSS-BEDDED SPLINTS OF DULL COAL AT BASE
273.59		6.16	SHALE - MEDIUM TO DARK GRAY, CARBONACEOUS AND SILTY. FISSILE BREAKS ALONG BEDDING. SPLINTS AND BANDS OF BRIGHT COAL THROUGHOUT.
279.75		3.22	NO. 3 SEAM HORIZON
282.97		3.32	MUDSTONE - LIGHT TO MEDIUM BROWNISH. CARBONACEOUS SHALE AT TOP SPLINTS OF BRIGHT COAL AT BASE.
286.29		1.86	SILTSTONE - LIGHT GRAY. SLUMP STRUCTURES
288.15		3.16	SHALE - MEDIUM TO DARK GRAY. FRAGMENTAL AND FISSILE. INTERVAL OF SILTY SHALE MAINLY AT BASE
291.31			TOTAL DEPTH

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
			No. 1 SEAM HORIZON		
237.46		87.92	GOOD ROOF CONGLOMERATE		
237.84		0.38	CARBONACEOUS TO COALY SHALE	A-0104	0.38
238.53		0.69	BRIGHT COAL - BANDS OF DULL TO VITEROUS COAL	A-0105	1.22
239.06		0.53	DULL COAL - WOOD STRUCTURES AND 2% RESIN		
239.32		0.26	CARBONACEOUS TO COALY SHALE	A-0106	0.26
239.67		0.35	DULL COAL - PARTED AND BANDED		
240.32		0.65	BRIGHT COAL - PARTED TO FINELY BANDED. BANDS OF DULL COAL.	A-0107	1.35
240.67		0.35	DULL TO VITREOUS COAL		
242.06		1.39	BRIGHT COAL - PARTED AND BANDED. BREAKS WITH STRATIFICATION PLANES. CONCOIDAL FRACTURE.	A-0108	1.39
242.61		0.55	COALY SHALE - FRAGMENTAL LAMINATED AND FISSILE	A-0109	0.55
243.02		0.41	BRIGHT COAL - MINOR RESIN		
243.64		0.62	DULL TO VITREOUS COAL - SPLINTERS OF BRIGHT COAL THROUGHOUT	A-0110	1.93
244.54		0.90	VITREOUS TO BRIGHT COAL - CONCOIDAL FRACTURE.		
244.98		0.44	CARBONACEOUS TO COALY SHALE	A-0111	0.44
245.73		0.75	DULL TO VITREOUS COAL - THIN BANDS OF SHALE. MINOR RESIN	A-0112	0.75
		6.51	BAD FLOOR SHALE		
			No. 2 SEAM HORIZON		
259.69		5.93	GOOD ROOF CONGLOMERATE		
261.42		1.73	BRIGHT COAL - CONCOIDAL FRACTURE BLOCKY, HARD RARE WOOD STRUCTURES AND THIN LENSES OF CARBONACEOUS SHALE	A-0113	1.73
261.73		0.31	COALY SHALE - DARK GRAY TO BLACK	A-0114	0.31
262.05		0.32	DULL TO VITREOUS COAL		
262.87		0.82	VITREOUS TO BRIGHT COAL - BANDED AND PARTED. THIN BANDS OF DULL COAL.	A-0115	1.14
		4.68	BAD SHALE FLOOR		
			No. 3 SEAM HORIZON		
279.75		6.16	BAD ROOF SHALE		
280.64		0.89	DULL COAL - PARTED AND BANDED SPLINTS AND PARTINGS OF BRIGHT COAL		
281.08		0.44	VITREOUS TO BRIGHT COAL		
281.61		0.53	DULL TO VITREOUS - WISPS OF WHITE MATERIAL INTERBANDED	A-0116	3.22
282.17		0.56	VITREOUS TO BRIGHT COAL - CONCOIDAL FRACTURE.		
282.97		0.80	DULL COAL - VITREOUS, BANDED WOOD STRUCTURES THROUGHOUT		
		3.32	BAD FLOOR MUDSTONE		

SIZE DIAMETER	SIZE WT %	WEIGHT PERCENT	SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
0x1/4	100%	-1.90	10.1	4.0	22.3	31.7	42.0	8999	-	0.34
		+1.90	89.9	1.9	78.3	-	-	-	-	-
		RAW	-	-	-	-	-	-	-	-
0x1/4	100%	-1.90	70.3	5.4	16.6	31.7	46.3	9271	-	0.40
		+1.90	29.7	2.3	65.2	-	-	-	-	-
		RAW	-	-	-	-	-	-	-	-
0x1/4	100%	-1.90	6.8	4.5	25.6	30.4	39.5	8343	-	0.37
		+1.90	93.2	2.0	83.8	-	-	-	-	-
		RAW	-	-	-	-	-	-	-	-
0x1/4	100%	-1.90	67.7	4.6	21.7	32.6	41.1	8803	-	0.46
		+1.90	32.3	2.6	69.2	-	-	-	-	-
		RAW	-	-	-	-	-	-	-	-
0x1/4	100%	-1.90	89.4	5.3	8.0	37.6	49.1	10693	-	0.36
		+1.90	10.6	2.4	67.9	-	-	-	-	-
		RAW	-	-	-	-	-	-	-	-
0x1/4	100%	-1.90	40	3.8	37.8	27.4	31.0	6626	-	0.29
		+1.90	96.0	2.5	80.2	-	-	-	-	-
		RAW	-	-	-	-	-	-	-	-
0x1/4	100%	-1.90	78.9	4.0	19.5	35.6	40.9	9243	-	0.34
		+1.90	21.1	2.0	71.4	-	-	-	-	-
		RAW	-	-	-	-	-	-	-	-
0x1/4	100%	-1.90	16.7	2.7	44.6	25.4	27.3	5653	-	0.30
		+1.90	83.3	1.6	76.3	-	-	-	-	-
		RAW	-	-	-	-	-	-	-	-
0x1/4	100%	-1.90	65.9	3.3	24.4	32.6	39.7	8463	-	0.42
		+1.90	34.1	1.8	69.0	-	-	-	-	-
		RAW	-	-	-	-	-	-	-	-
0x1/4	100%	-1.90	95.8	4.6	7.7	37.8	49.9	10601	-	0.34
		+1.90	4.2	2.9	51.0	-	-	-	-	-
		RAW	-	-	-	-	-	-	-	-
0x1/4	100%	-1.90	10.1	2.4	31.9	28.8	36.9	7405	-	0.30
		+1.90	89.9	1.7	69.4	-	-	-	-	-
		RAW	-	-	-	-	-	-	-	-
0x1/4	100%	-1.90	85.9	3.3	21.3	32.0	43.4	8791	-	0.34
		+1.90	14.1	2.4	58.6	-	-	-	-	-
		RAW	-	-	-	-	-	-	-	-
0x1/4	100%	-1.90	64.7	3.6	20.2	33.6	42.6	9028	-	0.35
		+1.90	35.3	1.7	68.9	-	-	-	-	-
		RAW	-	-	-	-	-	-	-	-

CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
10.1	4.0	22.3	31.7	42.0	8999	-	0.34
100.0	2.1	72.6	-	-	-	-	-
100.0	3.0	73.0	13.7	10.3	-	-	0.13
70.3	5.4	16.6	31.7	46.3	9271	-	0.40
100.0	4.5	31.0	-	-	-	-	-
100.0	6.8	30.7	28.1	34.4	7161	-	0.21
6.8	4.5	25.6	30.4	39.5	8343	-	0.37
100.0	2.2	79.8	-	-	-	-	-
100.0	2.5	80.6	11.4	5.5	-	-	0.10
67.7	4.6	21.7	32.6	41.1	8803	-	0.46
100.0	4.0	37.0	-	-	-	-	-
100.0	6.8	36.7	26.9	29.6	6497	-	0.23
89.4	5.3	8.0	37.6	49.1	10693	-	0.36
100.0	5.0	14.4	-	-	-	-	-
100.0	8.7	13.2	35.5	42.6	9672	-	0.19
4.0	3.8	37.8	27.4	31.0	6626	-	0.29
100.0	2.6	78.5	-	-	-	-	-
100.0	4.4	77.3	13.5	4.8	-	-	0.08
78.9	4.0	19.5	35.6	40.9	9243	-	0.34
100.0	3.6	30.5	-	-	-	-	-
100.0	8.0	28.8	29.7	33.5	7548	-	0.23
16.7	2.7	44.6	25.4	27.3	5653	-	0.30
100.0	1.8	71.0	-	-	-	-	-
100.0	3.2	70.8	17.1	8.9	-	-	0.15
65.9	3.3	24.4	32.6	39.7	8463	-	0.42
100.0	2.8	39.6	-	-	-	-	-
100.0	5.9	38.7	27.6	27.8	6223	-	0.32
95.8	4.6	7.7	37.8	49.9	10601	-	0.34
100.0	4.5	9.5	-	-	-	-	-
100.0	8.7	8.7	36.2	46.4	10153	-	0.40
10.1	2.4	31.9	28.8	36.9	7405	-	0.30
100.0	1.8	65.6	-	-	-	-	-
100.0	3.3	65.1	19.0	12.6	-	-	0.10
85.9	3.3	21.3	32.0	43.4	8791	-	0.34
100.0	3.2	26.6	-	-	-	-	-
100.0	6.6	28.5	30.4	37.2	7764	-	0.29
64.7	3.6	20.2	33.6	42.6	9028	-	0.35
100.0	3.0	37.4	-	-	-	-	-
100.0	5.5	37.3	28.0	29.2	6476	-	0.19

CUMULATIVE SAMPLE VALUES THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
				EXCLUDED				
0.7	70.3	5.4	16.6	31.7	46.3	9271		
0.96	53.1	5.3	16.9	31.6	46.0	9238		
2.31	61.6	4.8	19.9	32.2	42.8	8959		
3.70	72.0	5.0	14.4	34.7	45.7	9767		
				EXCLUDED				
5.63	74.4	4.6	16.2	35.0	44.0	9576		
6.07	70.2	4.6	16.7	34.8	43.7	9508		
6.82	69.7	4.5	17.5	34.6	43.2	9400		
7.89	65.2	4.6	17.6 (INCLUDES A0109)	34.4	43.5	9379		
3.18	83.9	4.1	12.9	35.6	47.4	9899		
1.45	69.7	3.3	21.7	31.4	43.2	8748		
1.14	85.9	3.3	21.3	32.0	43.4	8791		
3.22	64.7	3.6	20.2	33.6	42.6	9028		

OTHER

GEW

065035

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y 1860 m N X 60 m W of SE corner of CL 83
ELEVATION: 566.77 m BITS USED: J.K. SMIT Combination
DIP: -90° BEARING ——— MUD USED 20.5 gals #325 (POLYDRILL) 16 gals #357 (POLYPOWDER)
CORE SIZE: HQ CASING: HW 9.14 m FT LEFT IN HOLE NIL m.

DATE START: JUNE 29, 1979 FINISH: JULY 4, 1979
DRILLER: CARON DIAMOND DRILLING OVERALL RECOVERY: 71 %
TESTS: GAMMA RAY
SAMPLED BY: O. CULLINGHAM DATE: JULY 5, 1979 ANALYZED BY: BIRTLEY COAL + MINERALS TESTING

BOREHOLE NO. BP-79-11
PAN OCEAN OIL LTD. (PAGE 1)
MINING DIVISION – COAL

LOGGED BY: D. HOPE, O. CULLINGHAM DATE: JULY 7, 1979
SIGNED

GEOLOGICAL LOG – SCALE: 1:500

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
	?	10.67	TRICONE SAMPLES: OVERBURDEN OR MORE PROBABLE, CONGLOMERATE AS BELOW
10.67		10.13	MEDIUM GRAY, MASSIVE BEDDED, PEBBLES (ave. 10-30mm) AND COBBLES (LARGEST 75mm) OF GRAY, GREEN, BLACK CHERT AND GRAY QUARTZITE. VEINING IN PEBBLES COMMON. POORLY SORTED, WELL ROUNDED, LOW SPHERICITY MATRIX IS SALT AND PEPPER MEDIUM TO COARSE GRAINED SAND. GOOD POROSITY, TAR THROUGHOUT.
20.80		1.40	SILTY TO SANDY MUDSTONE - COARSES DOWNWARD TO CONGLO. BELOW
22.20			MEDIUM GRAY, MASSIVE BEDDED, PEBBLES (ave. 10-30mm) AND COBBLES (largest 75mm) OF GRAY, GREEN AND BLACK CHERT AND GRAY QUARTZITE. VEINING IN CLASTS COMMON. POORLY SORTED, WELL ROUNDED, LOW SPHERICITY. MATRIX IS MEDIUM TO COARSE SALT AND PEPPER SAND. TAR CONTENT DECREASES WITH DEPTH.
			SLICKENSIDES AT 53.40 m
			FINE GRAINED SANDSTONE, THINLY TO MEDIUM BEDDED PERPENDICULAR TO CORE AXIS AT 65.58 TO 66.20 m AND 82.43 TO 82.93 m.
		105.22	
127.42		0.63	MEDIUM GRAY, MEDIUM GRAINED, WELL SORTED, ANGULAR, MODERATE SPHERICITY, QUARTZ AND CHERT. THINLY BEDDED PERPEND. TO CORE AXIS.
128.10		5.41	INTERBEDS OF ABOVE SANDSTONE AND CONGLOMERATE NEAR TOP THINLY CROSS-BEDDED AT 70° TO CORE AXIS, TOWARD BASE BEDDING IS PERPENDICULAR TO CORE AXIS.
133.51		8.15	NO. 1 SEAM HORIZON
141.66			

CONTINUED ON PAGE 2

DETAILS OF COAL SEAMS – SCALE: 1:100

NO. 1 SEAM HORIZON

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
			ROOF - SANDSTONE AND CONGLOMERATE GOOD		
133.51		0.62	COAL: DULL TO VITREOUS TO BRIGHT, PARTED TO BANDED 0.03m NO CORE	A0083	0.62
134.13		0.23	COALY SHALE 0.23m	A0084	0.59
		0.36	NO CORE		
134.72		0.25	COAL AND COALY SHALE	A0085	0.92
		0.13	COAL		
		0.20	SHALY COAL		
135.64		0.34	NO CORE		
		0.58	CARBONACEOUS SHALE	A0086	1.02
		0.32	SHALY COAL		
136.66		0.12	COALY SHALE		
		1.40	COAL MOSTLY BRIGHT, PARTED TO BANDED LIGHT WEIGHT 0.06m (LOST CORE)	A0087	1.40
138.06		0.58	CARBONACEOUS SHALE 0.01m (LOST CORE)	A0088	0.58
138.64		0.95	COAL, DULL TO VITREOUS TO BRIGHT. (0.06m) COALY SHALE (0.10m) CARBONACEOUS SHALE	A0089	0.95
139.59		1.00	COAL: VITREOUS BRIGHT, PARTED TO THINLY BANDED.	A0090	1.00
140.59		1.07	COAL, COALY SHALE AND CARBONACEOUS SHALE	A0091	1.07
141.66			FLOOR - POOR, MUDSTONE		

SIZE DIAMETER	SIZE WT %		SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S
0×1/4	100%	-1.90		77.3	5.8	13.2	33.5	47.5	9755	-	0.52
		+1.90		22.7	2.4	63.6	-	-	-	-	-
		RAW		-	-	-	-	-	-	-	-
0×1/4	100%	-1.90		42.5	4.3	39.8	29.5	26.4	6186	-	0.29
		+1.90		57.5	1.9	70.2	-	-	-	-	-
		RAW		-	-	-	-	-	-	-	-
0×1/4	100%	-1.90		59.5	5.1	38.9	26.9	29.1	6154	-	0.30
		+1.90		40.5	2.2	74.8	-	-	-	-	-
		RAW		-	-	-	-	-	-	-	-
0×1/4	100%	-1.90		12.2	4.4	35.2	26.4	34.0	6972	-	0.34
		+1.90		87.8	3.7	77.0	-	-	-	-	-
		RAW		-	-	-	-	-	-	-	-
0×1/4	100%	-1.90		91.1	6.1	8.5	37.5	47.9	10491	-	0.32
		+1.90		8.9	1.9	65.2	-	-	-	-	-
		RAW		-	-	-	-	-	-	-	-
0×1/4	100%	-1.90		10.9	4.1	38.3	26.1	31.5	6480	-	0.28
		+1.90		89.1	2.6	77.6	-	-	-	-	-
		RAW		-	-	-	-	-	-	-	-
0×1/4	100%	-1.90		73.1	5.1	25.8	31.7	37.4	8122	-	0.37
		+1.90		26.9	2.1	68.5	-	-	-	-	-
		RAW		-	-	-	-	-	-	-	-
0×1/4	100%	-1.90		92.7	5.7	19.6	33.8	40.9	8951	-	0.37
		+1.90		7.3	2.5	61.0	-	-	-	-	-
		RAW		-	-	-	-	-	-	-	-
0×1/4	100%	-1.90		50.1	4.1	35.5	28.9	31.5	6977	-	0.29
		+1.90		49.9	2.5	71.4	-	-	-	-	-
		RAW		-	-	-	-	-	-	-	-

CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S
77.3	5.8	13.2	33.5	47.5	9755	-	0.54
100.0	5.0	24.6	-	-	-	-	-
100.0	9.3	23.1	25.6	42.0	8100	-	0.46
42.5	4.3	39.8	29.5	26.4	6186	-	0.29
100.0	2.9	57.3	-	-	-	-	-
100.0	5.6	55.0	22.5	16.9	3974	-	0.15
59.5	5.1	38.9	26.9	29.1	6154	-	0.30
100.0	3.9	53.4	-	-	-	-	-
100.0	7.9	52.1	21.5	18.5	4116	-	0.17
12.2	4.4	35.2	26.4	34.0	6972	-	0.34
100.0	3.8	71.9	-	-	-	-	-
100.0	7.1	69.8	14.8	8.3	-	-	0.08
91.1	6.1	8.5	37.5	47.9	10491	-	0.32
100.0	5.7	13.5	-	-	-	-	-
100.0	10.4	12.9	34.9	41.8	9495	-	0.25
10.9	4.1	38.3	26.1	31.5	6480	-	0.28
100.0	2.8	73.3	-	-	-	-	-
100.0	5.0	72.9	15.2	6.9	-	-	0.08
73.1	5.1	25.8	31.7	37.4	8122	-	0.37
100.0	4.3	37.3	-	-	-	-	-
100.0	8.1	34.8	28.4	28.7	6553	-	0.25
92.7	5.7	19.6	33.8	40.9	8951	-	0.37
100.0	5.5	22.6	-	-	-	-	-
100.0	9.1	22.3	32.8	35.8	8317	-	0.30
50.1	4.1	35.5	28.9	31.5	6977	-	0.29
100.0	3.3	53.4	-	-	-	-	-
100.0	5.8	51.6	22.3	20.3	4467	-	0.17

CUMULATIVE SAMPLE VALUES THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S
					EXCLUDED			
					EXCLUDED			
					EXCLUDED			
					EXCLUDED			
1.40	91.1	6.1	8.5	37.5	47.9	10491		
1.98	67.6	6.0	9.9	36.9	47.1	10301		
2.93	69.3	5.6	15.3	35.1	43.8	9557		
3.70	74.2	5.6	16.4	34.8	43.0	9399		
8.15	60.1	5.4	22.5	32.6	39.5	8561		

OTHER

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X
ELEVATION:
DIP BEARING
CORE SIZE CASING

BITS USED
MUD USED
FT LEFT IN HOLE FT.

DATE START FINISH
DRILLER
TESTS
SAMPLED BY DATE ANALYZED BY

BOREHOLE NO. BP-79-11
PAN OCEAN OIL LTD. (PAGE 2)
MINING DIVISION – COAL

LOGGED BY DATE: JULY 7, 1979
SIGNED

GEOLOGICAL LOG – SCALE: 1 : 500

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
			CONTINUED - FROM PAGE 1
141.66		6.26	MUDSTONE - MEDIUM BROWN TO MEDIUM GRAY, VERY SOFT, MASSIVE BEDDED CUBIC WEATHERING. COAL SPLINTS IN LOWER HALF OF UNIT. 143.20 - 143.41 - COALY SHALE
147.92		8.27	SANDSTONE - FINE TO COARSE GRAINED. COARSENING DOWNWARD ANGULAR, MODERATE SPHERICITY, WELL SORTED QUARTZ AND CHERT GRAINS CROSS BEDDING AT 70° TO CORE AXIS CONGLOMERATIC NEAR BASE.
156.19		0.79	SANDY SILTSTONE - MEDIUM GRAY, MASSIVE BEDDED, CARBONACEOUS TOWARD BASE
156.98		4.35	NO. 2 SEAM HORIZON
161.33		4.79	MUDSTONE - LIGHT BROWN, VERY SOFT, RARE COAL SPLINTS, WEATHERING.
166.12		1.52	SILTSTONE - MED. GRAY - SHALEY TO SANDY COARSENING DOWNWARD
167.64		6.84	SANDSTONE - LIGHT GRAY TO SALT AND PEPPER, FINE GRAINED TO CONGLOMERATIC COARSENING DOWNWARD. CROSS-BEDDING TO 50° TO CORE AXIS. RARE COAL SPLINTS SHARP CONTACT WITH COAL BELOW
174.18		5.46	NO. 3 SEAM HORIZON
179.64		6.10	MUDSTONE - MEDIUM BROWN, VERY SOFT. CARBONACEOUS NEAR TOP, GRADING TO V.F. GRAINED SS AT BASE OF HOLE. 181.18 TO 181.28 SLICKENSIDES
185.74			END OF HOLE

NO. 2 SEAM HORIZON

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
			ROOF - GOOD SILTSTONE AND SANDSTONE		
156.98		2.13	COAL - MOSTLY BRIGHT, BANDED A FEW THIN INTERVALS OF VITREOUS COAL 0.05m (LOST CORE)	A0092	2.13
159.11		0.45	SHALE, SHALY COAL, AND COAL		
159.56		0.88	COAL - DULL TO VITREOUS, PARTED TO BANDED, THIN BANDS OF SHALY COAL	A0093	1.50
160.61		0.17	NO CORE		
		0.60	COAL - DULL TO VITREOUS, PARTED TO BANDED. MINOR CARB. SHALE	A0094	0.72
161.33		0.12	COALY SHALE PLUS SHALY COAL		
			FLOOR - POOR, MUDSTONE		

SIZE		WEIGHT PERCENT										CUMULATIVE WEIGHT PERCENT								CUMULATIVE SAMPLE VALUES								OTHER		
DIAMETER	WT %	SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VO	F.C	BTU	F.S.I.	S		YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S			
0×1/4	100%	-1.90	97.4	6.5	8.8	37.1	47.6	10324	-	0.36		97.4	6.5	8.8	37.1	47.6	10324	-	0.36	2.13	97.4	6.5	8.8	37.1	47.6	10324				
		+1.90	2.3	3.0	58.5	-	-	-	-	-		100.0	6.4	10.0	-	-	-	-	-											
		RAW	-	-	-	-	-	-	-	-		100.0	10.5	10.1	35.8	43.6	9789	-	0.33											
0×1/4	100%	-1.90	47.8	5.7	18.6	35.2	40.5	9528	-	0.65		47.8	5.7	18.6	35.2	40.5	9528	-	0.65	3.63	76.9	6.2	11.3	36.6	45.7	10119				
		+1.90	52.2	2.0	69.1	-	-	-	-	-		100.0	3.4	44.5	-	-	-	-	-											
		RAW	-	-	-	-	-	-	-	-		100.0	6.1	43.5	26.7	23.7	5583	-	0.32											
0×1/4	100%	-1.90	65.0	6.4	24.5	29.5	39.6	8305	-	0.40		65.0	6.4	24.5	29.5	39.6	8305	-	0.40	4.35	74.9	6.3	13.2	35.5	44.8	9859				
		+1.90	35.0	2.3	70.0	-	-	-	-	-		100.0	1.1	40.4	-	-	-	-	-											
		RAW	-	-	-	-	-	-	-	-		100.0	7.2	39.4	25.1	28.3	6336	-	0.21											

																				A0092		2.13	97.4	6.5	8.8	37.1	47.6	10324			
																				A0093		3.63	76.9	6.2	11.3	36.6	45.7	10119			
																				A0094 (0.07) THK		3.70	76.6	6.3	11.5	36.5	45.6	10090			

NO. 3 SEAM HORIZON

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
			ROOF - GOOD SANDSTONE		
174.18		0.30	CARBONACEOUS COALY SHALE		
		0.30	CARBONACEOUS SHALE	A0095	0.82
175.00		0.22	CARBONACEOUS TO COALY SHALE		
175.25		0.25	COAL - DULL TO BRIGHT, BANDED	A0096	0.25
		0.75	CARBONACEOUS TO COALY SHALE 0.06m SHALY COAL	A0097	0.75
176.00		0.90	COAL - DULL TO BRIGHT, MOSTLY BANDED OR PARTED (0.08m COALY SHALE)	A0098	0.90
176.90		0.37	SHALE AND CARBONACEOUS SHALE	A0099	0.37
177.27		0.97	COAL - BRIGHT, PARTED TO BANDED (0.28m SHALY COAL AND CARBONACEOUS SHALE)	A0100	0.97
178.24		0.62	CARBONACEOUS SHALE - CONTAINS PLANT FRAGMENTS & IMPRESSIONS	A0101	0.62
178.86		0.30	COAL AND COALY SHALE	A0102	0.30
179.16		0.48	CARBONACEOUS SHALE	A0103	0.48
179.64			FLOOR - POOR, MUDSTONE		

SIZE		WEIGHT PERCENT										CUMULATIVE WEIGHT PERCENT								CUMULATIVE SAMPLE VALUES								OTHER		
DIAMETER	WT %	SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VO	F.C	BTU	F.S.I.	S		YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S			
0×1/4	100%	-1.90	11.7	5.2	30.2	18.4	46.2	7717	-	0.34		11.7	5.2	30.2	18.4	46.2	7717	-	0.34											
		+1.90	88.3	2.0	83.4	-	-	-	-	-		100.0	2.4	77.2	-	-	-	-	-											
		RAW	-	-	-	-	-	-	-	-		100.0	3.0	77.0	12.2	7.8	-	-	0.17											
0×1/4	100%	-1.90	81.7	8.9	5.6	31.7	53.8	10526	-	0.36		81.7	8.9	5.6	31.7	53.8	10526	-	0.36	0.25	81.7	8.9	5.6	31.7	53.8	10526				
		+1.90	18.3	2.6	77.1	-	-	-	-	-		100.0	7.7	18.7	-	-	-	-	-											
		RAW	-	-	-	-	-	-	-	-		100.0	9.4	19.3	28.2	43.1	8628	-	0.29											
0×1/4	100%	-1.90	13.0	3.1	31.9	28.5	36.5	7632	-	0.27		13.0	3.1	31.9	28.5	36.5	7632	-	0.27	1.00	30.1	7.0	14.0	30.6	48.2	9590				
		+1.90	87.0	1.6	79.1	-	-	-	-	-		100.0	1.8	73.0	-	-	-	-	-											
		RAW	-	-	-	-	-	-	-	-		100.0	3.4	72.9	13.8	9.9	-	-	0.11											
0×1/4	100%	-1.90	68.4	3.9	17.8	34.8	43.5	9493	-	0.33		68.4	3.9	17.8	34.8	43.5	9493	-	0.33	1.90	48.2	4.9	16.5	33.4	45.0	9525				
		+1.90	31.6	1.4	68.0	-	-	-	-	-		100.0	3.1	33.7	-	-	-	-	-											
		RAW	-	-	-	-	-	-	-	-		100.0	7.2	31.8	29.8	31.2	7067	-	0.27											
0×1/4	100%	-1.90	4.1	3.4	38.9	26.0	31.7	6132	-	0.24		4.1	3.4	38.9	26.0	31.7	6132	-	0.24	2.27	41.0	4.9	16.9	33.3	44.8	9470				
		+1.90	95.9	1.4	69.9	-	-	-	-	-		100.0	1.5	68.7	-	-	-	-	-											
		RAW	-	-	-	-	-	-	-	-		100.0	3.5	67.8	18.0	10.7	-	-	0.10											
0×1/4	100%	-1.90	84.7	5.0	11.1	36.5	47.4	10125	-	0.36		84.7	5.0	11.1	36.5	47.4	10125	-	0.36	3.24	54.1	4.9	14.2	34.8	46.0	9776				
		+1.90	15.3	1.7	62.5	-	-	-	-	-		100.0	4.5	19.0	-	-	-	-	-											
		RAW	-	-	-	-	-	-	-	-		100.0	8.6	18.5	33.8	39.1	8767	-	0.27											
0×1/4	100%	-1.90	13.4	3.2	34.9	30.1	31.8	6968	-	0.29		13.4	3.2	34.9	30.1	31.8	6968	-	0.29											
		+1.90	86.6	1.2	77.9	-	-	-	-	-		100.0	1.5	72.2	-	-	-	-	-											
		RAW	-	-	-	-	-	-	-	-		100.0	2.3	72.0	18.4	7.3	-	-	0.10											
0×1/4	100%	-1.90	77.7	3.9	19.7	34.7	41.7	9292	-	0.36		77.7	3.9	19.7	34.7	41.7	9292	-	0.36											
		+1.90	22.3	1.9	67.3	-	-	-	-	-		100.0	3.4	30.3	-	-	-	-	-											
		RAW	-	-	-	-	-	-	-	-		100.0	6.3	30.0	30.9	32.8	7601	-	0.27											
0×1/4	100%	-1.90	37.5	3.4	33.2	28.4	35.0	7451	-	0.32		37.5	3.4	33.2	28.4	35.0	7451	-	0.37											
		+1.90	62.5	2.0	67.0	-	-	-	-	-		100.0	2.6	54.4	-	-	-	-	-											
		RAW	-	-	-	-	-	-	-	-		100.0	4.8	53.8	21.4	20.0	4267	-	0.17											

																				A0098		2.24	64.8	4.5	14.2	35.6	45.5	9815			
																				A0099		1.34	62.4	4.9	11.6	36.3	47.1	10052			
																				A0100		0.97	84.7	5.0	11.1	36.5	47.4	10125			

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y 13,770 m N X 10,950 m W of S.E. corner of C.L. 77
ELEVATION: 597.59 m
DIP 90° BEARING
CORE SIZE NQ CASING 12.19 HW, 58.22 NW
BITS USED J.K. SMIT COMBINATION
MUD USED 295 BAGS GEL, 153 BAGS TROL
m LEFT IN HOLE NONE m
DATE START JULY 5/79 FINISH JULY 21/79
DRILLER CARON DIAMOND DRILLING LTD. OVERALL RECOVERY 72 %
TESTS NONE
SAMPLED BY D. HOPE DATE AUG. 3/79 ANALYZED BY BIRTLEY COAL & MINERALS TESTING SIGNED

BOREHOLE NO. BP-79-12A
PAN OCEAN OIL LTD. (PAGE 1)
MINING DIVISION – COAL

LOGGED BY D.HOPE DATE AUG. 2/79

GEOLOGICAL LOG – SCALE: 1:500

DEPTH	THICKNESS	DESCRIPTION
	30.48	TRICONE SAMPLES OVERBURDEN - MEDIUM GRAINED SIZE CHIPS OF CHERT, QUARZZ AND QUARTZITE.
30.48	12.80	NO SAMPLES
43.28	16.76	OVERBURDEN - CORE IS LOOSE PEBBLES AND COBBLES OF QUARTZ, QUARTZITE, CHERT, SANDSTONE AND SHALE, APPROXIMATELY 20% LIMESTONE CLASTS.
60.04	9.45	TRICONE SAMPLES OVERBURDEN - MEDIUM SIZED CHIPS OF QUARTZ, QUARTZITE, CHERT AND SHALE.
69.49	22.56	CONGLOMERATE - LOOSE COBBLES AND PEBBLES OF CHERT AND QUARTZITE OCCASSIONAL QUARTZ VEINING IN COBBLES.
92.05	16.15	CONGLOMERATE - MEDIUM SIZE CHIPS OF CLEAR QUARTZ AND QUARTZITE; MILKY THROUGH BLACK AND GREEN CHERT. TRICONE SAMPLES
108.20		NO SAMPLES - BELIVED TO BE CONGLOMERATE
110.34	8.24	No. 1 SEAM HORIZON
118.58	9.27	SHALE - MEDIUM GRAY CUBIC WEATHERING. RARE SPLINTS OF COAL NEAR TOP, BECOMES SILTY TOWARD BASE.
127.85	21.85	SANDSTONE - LIGHT GRAY WEATHERING, THICK TO MASSIVE BEDDED. VARIABLE FROM MEDIUM GRAINED TO FINE PEBBLED CONGLOMERATE GRADATIONAL
149.70		CONTINUED ON SHEET 2

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
		No. 1 SEAM HORIZON		
		ROOF - CONGLOMERATE RUBBLE - DECEMENTED		
110.34		0.23 COAL AND SHALY COAL RECOVERED - RUBBLY	A0177	2.06
111.86	0.14	COAL - DULL TO BRIGHT		
112.07	0.06	SHALE AND COALY SHALE		
112.13	0.27	COAL - VITREOUS TO BRIGHT		
112.40	0.10			
112.50	0.50	LOST CORE		
113.08	0.61	COAL - DULL TO VITREOUS 0.07 SHALE AT BASE		
113.69	0.72	COAL - BRIGHT	A0178	3.42
114.41	0.19	LOST CORE		
114.60	0.58	COAL - VITREOUS TO BRIGHT 0.05 CARB. SHALE AT TOP		
115.18	0.64	LOST CORE		
115.82	0.11	COAL - DULL		
115.93	0.48	SHALE - CARBONACEOUS		
116.41	0.29	COAL AND SHALY COAL		
116.70	0.41	COAL - DULL TO VITREOUS		
117.10	0.28	COALY SHALE	A0179	2.45
117.39	0.26	COAL VITREOUS		
117.45	0.50	LOST CORE		
117.95	0.32	COALY SHALE		
118.27	0.31	SHALE - DARK GRAY, SL. CARB		
118.58		FLOOR - SHALE AND CARBONACEOUS SHALE - POOR		

SAMPLE NUMBER	THICKNESS	SIZE DIAMETER	SIZE WT %	SPEC GRAV	WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S
		1/4×28	92.8	-1.90	33.9	4.0	17.5	33.7	44.8	9604	-	0.23	33.9	4.0	17.5	33.7	44.8	9604	-	0.23
				+1.90	66.1	1.8	76.6	-	-	-	-	-	100.0	2.5	56.6	-	-	-	-	-
		28×0	7.2	RAW	100.0	4.4	45.8	24.2	25.6	5443	-	0.23	100.0	4.4	45.8	24.2	25.6	5443	-	0.23
		1/4×0	100.0	RAW	100.0	4.0	55.4	21.6	19.0	4105	-	0.12	CALC.	2.7	55.3	-	-	-	-	-
A0177	2.06	1/4×28	92.8	-1.90	33.9	-	-	-	-	-	-	-	31.4	4.0	17.5	33.7	44.8	9604	-	0.23
		28×0	7.2	RAW	100.0	-	-	-	-	-	-	-	7.2	4.4	45.8	24.2	25.6	5443	-	0.23
		1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	38.6	4.0	23.2	31.7	40.9	8861	-	0.23
		1/4×28	92.5	-1.90	88.0	5.3	6.5	37.5	50.7	11073	-	0.22	88.0	5.3	6.5	37.5	50.7	11073	-	0.22
				+1.90	12.0	1.6	65.2	-	-	-	-	-	100.0	4.9	13.5	-	-	-	-	-
		28×0	7.5	RAW	100.0	8.6	12.8	33.7	44.9	9689	-	0.30	100.0	8.6	12.8	33.7	44.9	9689	-	0.30
A0178	3.42	1/4×0	100.0	RAW	100.0	9.2	12.5	34.6	43.7	9659	-	0.20	CALC.	5.2	13.4	-	-	-	-	-
		1/4×28	92.5	-1.90	88.0	-	-	-	-	-	-	-	81.4	5.3	6.5	37.5	50.7	11073	-	0.22
		28×0	7.5	RAW	100.0	-	-	-	-	-	-	-	7.5	8.6	12.8	33.7	44.9	9689	-	0.30
		1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	88.9	5.5	7.3	37.0	49.9	10987	-	0.23
		1/4×28	91.8	-1.90	56.5	4.6	19.3	33.7	42.4	9274	-	0.33	56.5	4.6	19.3	33.7	42.4	9274	-	0.30
A0179	2.45			+1.90	43.5	1.8	70.1	-	-	-	-	-	100.0	3.4	41.4	-	-	-	-	-
		28×0	8.2	RAW	100.0	6.5	28.6	30.9	34.0	7667	-	0.43	100.0	6.5	28.6	30.9	34.0	7667	-	0.43
		1/4×0	100.0	RAW	100.0	6.0	38.4	27.4	28.2	6251	-	0.22	CALC.	3.6	40.3	-	-	-	-	-
		1/4×28	91.8	-1.90	-	-	-	-	-	-	-	-	50.4	4.6	19.3	33.7	42.4	9274	-	0.33
		28×0	8.2	RAW	100.0	-	-	-	-	-	-	-	8.2	6.5	28.6	30.9	34.0	7661	-	0.43
		1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	58.6	4.8	21.0	33.1	40.8	9068	-	0.34

CUMULATIVE SAMPLE VALUES

	THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S
A0177		2.06	38.6	4.0	23.2	31.7	40.7	8861	
A0178		5.48	69.9	5.1	10.5	35.9	48.0	10546	
A0179	0.28 THK	5.76	69.4	5.1	11.0	35.7	47.7	10485	
A0178		3.42	88.9	5.5	7.3	37.0	49.9	10987	
A0179	0.28 THK	3.70	86.6	5.4	8.0	36.8	49.4	10888	
		7.93	66.4	5.0	13.4	35.1	46.0	10143	
		5.87	76.2	5.2	11.6	35.7	46.9	10371	
		2.45	58.6	4.8	21.0	33.1	40.8	9068	

OTHER

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X

ELEVATION:

DIP BEARING

CORE SIZE CASING

BITS USED

MUD USED

FT. LEFT IN HOLE FT.

DATE START FINISH

DRILLER

TESTS OVERALL RECOVERY

SAMPLED BY DATE ANALYZED BY

LOGGED BY DATE

SIGNED

BOREHOLE NO. BP.-79-12 A
PAN OCEAN OIL LTD. (PAGE 2)
MINING DIVISION – COAL

GEOLOGICAL LOG – SCALE: 1:500

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	THICKNESS	DESCRIPTION
		CONTINUED FROM SHEET 1
149.70		
	5.02	INTERBEDDED SANDSTONE AND SILTSTONE - LIGHT GRAY WEATHERING CROSSLAMINATED TO THINLY FESTOON CROSS-BEDDED
154.72		
155.03	0.31	CONGLOMERATE
	8.34	No. 2 SEAM HORIZON
163.37		
	3.72	SHALE - DARK TO MEDIUM GRAY, CARBONACEOUS AT TOP NON-CARBONACEOUS AND SILTY AT BASE, GRADATIONAL
167.09		
168.38	1.29	SILTSTONE - LIGHT GRAY WEATHERING
169.08	0.70	SANDSTONE - LIGHT GRAY FINE TO MEDIUM GRAY COARSENING DOWN
	17.70	CONGLOMERATE - FINE PEBBLE CONGLOMERATE OF QUARTZITE AND CHERT FINES DOWNWARD TO CONGLOMERATIC SANDSTONE AT BASE
186.78		
	2.19	No. 3 SEAM HORIZON
188.97		
190.25	1.28	SHALE - MEDIUM TO DARK GRAY CUBIC WEATHERING
191.02	0.77	CONGLOMERATIC SANDSTONE
	10.13	CONGLOMERATIC - FINE PEBBLE CONGLOMERATE OF QUARTZITE AND CHERT
201.15		
	3.07	INTERBEDDED SANDSTONE AND SILTSTONE, FESTOON CROSSBEDDING
204.22		
	4.00	SANDSTONE - COARSE TO FINE GRAINED SANDSTONE, FINES DOWNWARD
208.22		
208.60	0.39	MUDSTONE
209.09	0.49	SILTSTONE - LIGHT GRAY
		END OF HOLE

No. 2 SEAM HORIZON

ROOF - SANDSTONE AND CONGLOMERITIC SANDSTONE GOOD

DEPTH	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
155.03	0.67	COAL - VITREOUS, HARD		
155.70	0.36	COAL - DULL		
156.06	0.55	COAL - DULL TO VITREOUS	A0180	2.55
156.61	0.27	COAL - BRIGHT		
156.88	0.70	LOST CORE		
157.58	0.61	SHALY COAL		
158.19	0.31	COAL - VITREOUS TO BRIGHT		
158.50	0.16	COALY SHALE	A0181	1.52
158.66	0.19	COAL - BRIGHT		
158.85	0.25	LOST CORE		
159.10	1.31	SHALE (SEAM 2B)	A0182	1.31
160.41	0.16	SHALY COAL		
160.57	0.22	SHALE	A0183	0.38
160.79	0.22	COAL - DULL		
161.01	0.66	COAL - BRIGHT		
161.67	0.15	SHALE, COALY SHALE AND COAL		
161.82	0.16			
161.98	0.07		A0184	2.58
162.05	0.10			
162.15	0.64	COAL - BRIGHT		
162.79	0.17	COALY - SHALE		
162.96	0.32	COAL - BRIGHT		
163.28	0.09	LOST CORE		
163.37		FLOOR - SHALE AND CARBONACEOUS SHALE		

No. 3 SEAM HORIZON

ROOF - SMALL PEBBLE CONGLOMERATE TO CONGLOMERATIC SANDSTONE GOOD

DEPTH	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
186.78	0.26	COAL - VITREOUS		
187.04	0.41	SHALY COAL 0.04 LOST CORE		
187.45	0.43	SHALY COAL		
187.88	0.18	LOST CORE		
188.06	0.21	COAL - DULL TO VITREOUS	A0185	2.19
188.27	0.20	SHALY COAL		
188.47	0.16	COAL - DULL TO VITREOUS		
188.63	0.12	SHALY COALL		
188.75	0.22	COAL - DULL TO VITREOUS		
188.97		FLOOR - SHALE AND CARBONACEOUS SHALE		

SIZE DIAMETER	SIZE WT %	SPEC GRAV	WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C.	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C.	BTU	F.S.I.	S	CUMULATIVE SAMPLE VALUES THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C.	BTU	F.S.I.	S	OTHER
1/4×28	91.8	-1.90	92.8	5.7	7.9	36.0	50.4	10833	-	0.30	92.8	5.7	7.9	36.0	50.4	10833	-	0.30										
		+1.90	7.2	1.6	59.1	-	-	-	-	-	100.0	5.4	11.6	-	-	-	-	-										
28×0	8.2	RAW	100.0	8.4	11.7	34.1	45.8	9961	-	0.37	100.0	8.4	11.7	34.1	45.8	9961	-	0.37										
1/4×0	100.0	RAW	100.0	8.8	11.5	34.5	45.2	9937	-	0.29	CALC.	5.6	11.6	-	-	-	-	-										
1/4×28	91.8	-1.90	92.8	-	-	-	-	-	-	-	85.1	5.7	7.9	36.0	50.4	10833	-	0.30										
28×0	8.2	RAW	100.0	-	-	-	-	-	-	-	8.2	8.4	11.7	34.1	45.8	9961	-	0.37										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	93.3	5.9	8.3	35.7	49.8	10818	-	0.31	2.55	93.3	5.9	8.3	35.7	49.8	10818			
1/4×28	91.4	-1.90	71.6	4.6	20.5	32.2	42.7	9183	-	0.20	71.6	4.6	20.5	32.2	42.7	9183	-	0.20										
		+1.90	28.4	2.1	67.4	-	-	-	-	-	100.0	3.9	33.8	-	-	-	-	-										
28×0	8.6	RAW	100.0	5.7	29.2	28.5	36.6	7734	-	0.19	100.0	5.7	29.2	28.5	36.6	7734	-	0.19										
1/4×0	100.0	RAW	100.0	6.0	31.8	28.4	33.8	7497	-	0.16	CALC.	4.0	33.4	-	-	-	-	-										
1/4×28	91.4	-1.90	71.6	-	-	-	-	-	-	-	65.4	4.6	20.5	32.2	42.7	9183	-	0.20										
28×0	8.6	RAW	100.0	-	-	-	-	-	-	-	8.6	5.7	29.2	28.5	36.6	7734	-	0.19										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	74.0	4.7	21.7	31.6	41.8	9075	-	0.20	4.07	86.0	5.5	12.6	34.3	47.2	10258			
1/4×28	89.5	-1.90	4.8	3.8	27.5	25.9	42.8	8188	-	0.24	4.8	3.8	27.5	25.9	42.8	8188	-	0.24										
		+1.90	95.2	2.1	82.0	-	-	-	-	-	100.0	2.2	79.3	-	-	-	-	-										
28×0	10.5	RAW	100.0	2.7	72.9	12.6	11.8	-	-	0.06	100.8	2.7	72.9	12.6	11.8	-	-	0.06										
1/4×0	100.0	RAW	100.0	2.4	79.1	10.4	8.1	-	-	0.08	CALC	2.2	78.6	-	-	-	-	-										
1/4×28	89.5	-1.90	4.8	-	-	-	-	-	-	-	4.3	3.8	27.5	25.9	42.8	8188	-	0.24										
28×0	10.5	RAW	100.0	-	-	-	-	-	-	-	10.5	2.7	72.9	12.6	11.8	-	-	0.06										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	14.8	3.0	56.3	17.4	23.1	3090	-	0.20	5.38	68.7	5.3	14.8	33.4	45.9	9882			
1/4×28	87.2	-1.90	33.8	3.6	32.6	27.8	36.0	7460	-	0.15	33.8	3.6	32.6	27.8	36.0	7460	-	0.15										
		+1.90	66.2	1.7	75.5	-	-	-	-	-	100.0	2.3	61.0	-	-	-	-	-										
28×0	12.8	RAW	100.0	4.0	51.9	20.8	23.3	4607	-	0.12	100.0	4.0	51.9	20.8	23.3	4607	-	0.12										
1/4×0	100.0	RAW	100.0	3.6	59.3	18.3	18.8	-	-	0.10	CALC.	2.5	53.3	-	-	-	-	-										
1/4×28	87.2	-1.90	33.8	-	-	-	-	-	-	-	29.5	3.6	32.6	27.8	36.0	7460	-	0.15										
28×0	12.8	RAW	100.0	-	-	-	-	-	-	-	12.8	4.0	51.9	20.8	23.3	4607	-	0.12										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	42.3	3.7	38.8	25.5	31.8	6628	-	0.14	5.76	66.9	5.3	15.8	33.1	45.3	9747			
1/4×28	89.2	-1.90	65.5	4.7	11.0	35.3	49.0	10493	-	0.21	65.5	4.7	11.0	35.3	49.0	10493	-	0.21										
		+1.90	34.5	1.4	71.4	-	-	-	-	-	100.0	3.6	31.8	-	-	-	-	-										
28×0	10.8	RAW	100.0	7.1	27.4	28.4	37.1	7792	-	0.17	100.0	7.1	27.4	28.4	37.1	7792	-	0.17										
1/4×0	100.0	RAW	100.0	6.9	30.0	28.0	35.1	7362	-	0.16	CALC.	4.0	31.3	-	-	-	-	-										
1/4×28	89.2	-1.90	65.5	-	-	-	-	-	-	-	58.4	4.7	11.0	35.3	49.0	10493	-	0.21										
28×0	10.8	RAW	100.0	-	-	-	-	-	-	-	10.8	7.1	27.4	28.4	37.1	7792	-	0.17										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	69.2	5.0	14.5	33.7	46.4	9997	-	0.20	8.34	67.6	5.2	15.4	33.3	45.7	9826			
																			6.65	79.5	5.3	13.2	34.1	46.9	10170			
																					(EXCLUDES A0182 + A0183)							
1/4×28	87.1	-1.90	61.2	3.6	22.8	30.7	42.9	8877	-	0.27	61.2	3.6	22.8	30.7	42.9	8877	-	0.27										
		+1.90	38.8	1.3	72.1	-	-	-	-	-	100.0	2.7	41.9	-	-	-	-	-										
28×0	12.9	RAW	100.0	5.0	40.1	24.5	30.4	6177	-	0.20	100.0	5.0	40.1	24.5	30.4	6177	-	0.20										
1/4×0	100.0	RAW	100.0	4.9	41.2	24.8	29.1	6064		0.18	CALC.	3.0	41.5	-	-	-	-	-										
1/4×28	87.1	-1.90	61.2	-	-	-	-	-	-	-	53.3	3.6	22.8	30.7	42.9	8877	-	0.27										
28×0	12.9	RAW	100.0	-	-	-	-	-	-	-	12.9	5.0	40.1	24.5	30.4	6177	-	0.20										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	66.2	3.9	26.2	29.5	40.4	8350	-	0.26	2.19	66.2	3.9	26.2	29.5	40.4	8350			

A0180		2.55	93.3	5.9	8.3	35.7	49.8	10818	
A0181	1.15 THK	3.70	87.3	5.5	11.8	34.6	47.6	10358	
A0182						EXCLUDED			
A0183						EXCLUDED			
A0184						EXCLUDED			

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y12,820 m N X10,950 m W of S.E. Corner of CL 77
ELEVATION: 593.1 m BITS USED: J.K. SMIT Combination
DIP: 90° BEARING MUD USED: 45 gals poly 325, 10 gals poly 357
CORE SIZE: HQ CASING: PW 13.11 m HW 29.26 m m LEFT IN HOLE: 13.11 4.27 m
DATE START: JULY 6, 1979 FINISH: JULY 13, 1979
DRILLER: CARON DIAMOND DRILLING OVERALL RECOVERY: 95 %
TESTS: NONE
SAMPLED BY: D. HOPE
DATE: JULY 14, 1979 ANALYZED BY BIRTLEY COAL & MINERALS TESTING SIGNED

BOREHOLE NO. BP-79-13
PAN OCEAN OIL LTD. (PAGE 1)
MINING DIVISION – COAL

LOGGED BY: D. HOPE, O. CULLINGHAM DATE: JULY 17, 1979

GEOLOGICAL LOG – SCALE: 1:500

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
			CONGLOMERATE - LIGHT GRAY WEATHERING, POORLY SORTED, ROUNDED TO SUB-ROUNDED, MODERATE SPHERICITY CLASTS OF GRAY, BLACK AND GREEN CHERT AND WHITE AND HUFF QUARTZITE. AVERAGE SIZE 10-30mm, SOME CLASTS OVER 80mm DIAMETER. GOOD POROSITY AND PERMEABILITY, FAR THROUGHOUT MATRIX IS MEDIUM TO COARSE GRAINED SALT AND PEPPER SANDSTONE.
125.05		6.67	NO. 1 SEAM HORIZON
131.72		8.76	SHALE - CARBONACEOUS WITH COAL SPLINTS AT TOP - GRADES TO NON-CARBONACEOUS SILTSTONE BELOW
140.48		0.84	SILTSTONE - CROSS LAMINATED AT 70° CORE AXIS
141.32		15.83	SANDSTONE - LIGHT GRAY: INTERBEDS OF MEDIUM TO COARSE GRAINED TO CONGLOMERATIC PEBBLES UP TO 30mm DIAMETER. GENERALLY COARSENS DOWNWARD. CROSS-BEDDING AT 60° TO CORE AXIS. WELL SORTED, ROUNDED TO SUB-ROUNDED, MODERATE TO HIGH SPHERICITY. THICK BEDDED. CONTACT AT BASE IS AT 25° TO CORE AXIS.
157.15		1.07	SILTSTONE - SHALEY TO SANDY
158.22			CONTINUED ON PAGE 2

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
			ROOF - CONGLOMERATE GOOD		
125.05		0.18	COAL - VITREOUS WITH BRIGHT PANELS		
125.23		0.05	COALY SHALE		
125.28		0.32	COAL - DULL TO VITREOUS	A0117	0.55
125.60		0.22	CARBONACEOUS COALY SHALE		
125.82		0.20	CARBONACEOUS SHALE		
126.02		0.16	COALY SHALE		
126.18		0.14	COAL - BRIGHT		
126.32		0.85	SHALEY COAL WITH CARBONACEOUS SHALE AND SHALE	A0118	0.72
127.17		0.25	CARBONACEOUS SHALE		
127.42		0.21	COAL - DULL TO VITREOUS		
127.33		1.29	COAL - MOSTLY BRIGHT, WITH CONCOIDAL FRACTURE, MINOR THIN BANDS OF SHALEY COAL (0.01m LOST CORE)	A0119	1.10
128.93		0.10	COAL - MOSTLY BRIGHT		
129.03		0.05	CARBONACEOUS SHALE		
129.08		0.37	COAL - MOSTLY BRIGHT	A0120	1.61
129.45		0.46	CARBONACEOUS TO COALY SHALE		
129.91		0.35	COAL - DULL TO VITRE	A0121	0.42
130.26		0.19	COAL - BRIGHT		
130.45		0.60	COAL - BRIGHT, BANDED, CONCOIDAL BLOCKY FRACTURE	A0122	0.46
131.05		0.23	COAL - DULL BANDED		
131.28		0.05	COALY SHALE	A0123	
131.33		0.28	COAL - VITREOUS TO BRIGHT		
131.61		0.11	CARBONACEOUS TO COALY SHALE	A0124	
131.72			FLOOR - SHALE POOR	A0125	0.35
				A0126	0.79
				A0127	0.23
					0.33
					0.11

SIZE DIAMETER	SIZE WT %	SPEC GRAV	WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE SAMPLE VALUES THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	OTHER
1/4×28	92.0	-1.90	68.3	4.7	22.8	29.9	42.6	8749	-	0.26	68.3	4.7	22.8	29.9	42.6	8749	-	0.26										
		+1.90	31.7	2.9	56.7	-	-	-	-	-	100.0	4.3	33.5	-	-	-	-	-										
28×0	8.0	RAW	100.0	4.6	30.0	26.7	38.7	7712	-	0.34	100.0	4.6	30.0	26.7	38.7	7712	-	0.34										
1/4×0	100.0	RAW	100.0	3.8	34.3	28.1	33.8	6998	-	0.20	CALC.	4.3	33.2	-	-	-	-	-										
1/4×28	92.0	-1.90	68.3	-	-	-	-	-	-	-	62.8	4.7	22.8	29.9	42.6	8749	-	0.26										
28×0	8.0	RAW	100.0	-	-	-	-	-	-	-	8.0	4.6	30.0	26.7	38.8	7712	-	0.34										
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	70.8	4.6	23.6	29.5	42.1	8729	-	0.27	6.56	65.4	4.4	19.1	33.1	43.1	9355			
1/4×28	92.9	-1.90	24.5	4.3	18.8	32.6	44.3	9330	-	0.23	24.5	4.3	18.8	32.6	44.3	9330	-	0.23										
		+1.90	75.5	2.1	68.7	-	-	-	-	-	100.0	2.6	56.5	-	-	-	-	-										
28×0	7.1	RAW	100.0	5.2	48.5	22.4	23.9	4950	-	0.16	100.0	5.2	48.5	22.4	23.9	4950	-	0.16										
1/4×0	100.0	RAW	100.0	4.5	55.2	21.7	18.6	4035	-	0.10	CALC.	2.8	55.9	-	-	-	-	-										
1/4×28	92.9	-1.90	24.5	-	-	-	-	-	-	-	22.7	4.3	18.8	32.6	44.3	9330	-	0.23										
28×0	7.1	RAW	100.0	-	-	-	-	-	-	-	7.1	5.2	48.5	22.4	23.9	4950	-	0.16										
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	29.8	4.5	26.9	29.8	38.7	8223	-	0.21	6.10	64.9	4.4	18.6	33.5	43.2	9418			
1/4×28	93.5	-1.90	42.2	3.7	27.4	31.2	37.7	8233	-	0.19	42.2	3.7	27.4	31.2	37.7	8233	-	0.19										
		+1.90	57.8	1.9	75.4	-	-	-	-	-	100.0	2.6	55.1	-	-	-	-	-										
28×0	6.5	RAW	100.0	4.5	50.4	22.8	22.3	4773	-	0.14	100.0	4.5	50.4	22.8	22.3	4773	-	0.10										
1/4×0	100.0	RAW	100.0	3.7	54.1	22.8	19.4	4334	-	0.10	CALC.	2.7	54.8	-	-	-	-	-										
1/4×28	93.5	-1.90	42.2	-	-	-	-	-	-	-	39.4	3.7	27.4	31.2	37.7	8233	-	0.19										
28×0	6.5	RAW	100.0	-	-	-	-	-	-	-	6.5	4.5	50.4	22.8	22.3	4773	-	0.10										
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	45.9	3.8	31.2	29.7	35.1	7750	-	0.18	5.29	69.7	4.4	18.1	33.7	43.5	9488			
1/4×28	92.5	-1.90	84.4	4.5	12.0	35.5	48.0	10274	-	0.22	84.4	4.5	12.0	35.5	48.0	10274	-	0.22										
		+1.90	15.6	2.0	66.2	-	-	-	-	-	100.0	4.1	20.5	-	-	-	-	-										
28×0	7.5	RAW	100.0	7.1	18.2	32.6	42.1	9071	-	0.20	100.0	7.1	18.2	32.6	42.1	9071	-	0.20										
1/4×0	100.0	RAW	100.0	6.8	19.3	32.5	41.4	9002	-	0.18	CALC.	4.3	20.3	-	-	-	-	-										
1/4×28	92.5	-1.90	84.4	-	-	-	-	-	-	-	78.0	4.5	12.0	35.5	48.0	10274	-	0.22										
28×0	7.5	RAW	100.0	-	-	-	-	-	-	-	7.5	7.1	18.2	32.6	42.1	9071	-	0.20										
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	85.5	4.7	12.8	35.1	47.2	10210	-	0.22	4.19	76.0	4.5	16.1	34.3	44.8	9763			
1/4×28	93.1	-1.90	74.2	5.3	9.7	36.5	48.5	10574	-	0.23	74.2	5.3	9.7	36.5	48.5	10574	-	0.23										
		+1.90	25.8	1.6	73.7	-	-	-	-	-	100.0	4.3	26.2	-	-	-	-	-										
28×0	6.9	RAW	100.0	7.2	19.5	33.5	54.2	8794	-	0.20	100.0	7.2	19.5	33.5	54.2	8794	-	0.20										
1/4×0	100.0	RAW	100.0	6.3	25.1	31.5	37.1	8185	-	0.20	CALC.	4.5	25.7	-	-	-	-	-										
1/4×28	93.1	-1.90	74.2	-	-	-	-	-	-	-	69.0	5.3	9.7	36.5	48.5	10574	-	0.23										
28×0	6.9	RAW	100.0	-	-	-	-	-	-	-	6.9	7.2	19.5	33.5	54.2	8794	-	0.20										
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	75.9	5.4	10.8	36.1	49.1	10457	-	0.23	2.58	70.1	4.4	18.6	33.8	43.0	9423			
1/4×28	94.5	-1.90	27.2	3.6	39.1	25.9	31.4	6505	-	0.17	27.2	3.6	39.1	25.9	31.4	6505	-	0.17										
		+1.90	72.8	2.1	66.0	-	-	-	-	-	100.0	2.5	58.7	-	-	-	-	-										
28×0	5.5	RAW	100.0	4.6	50.7	22.7	22.0	4695	-	0.13	100.0	4.6	50.7	22.7	22.0	4695	-	0.13										
1/4×0	100.0	RAW	100.0	3.5	58.0	19.8	18.7	3762	-	0.09	CALC.	2.6	58.6	-	-	-	-	-										
1/4×28	94.5	-1.90	27.2	-	-	-	-	-	-	-	25.7	3.6	39.1	25.9	31.4	6505	-	0.17										
28×0	5.5	RAW	100.0	-	-	-	-	-	-	-	5.5	4.6	50.7	22.7	22.0	4695	-	0.13										
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	31.2	3.7	41.5	25.2	29.3	6212	-	0.16	2.16	69.0	4.2	20.2	33.3	41.7	9202			
1/4×28	92.9	-1.90	57.6	3.5	33.6	28.3	34.6	7172	-	0.28	57.6	3.5	33.6	28.3	34.6	7172	-	0.28										
		+1.90	42.4	1.9	64.4	-	-	-	-	-	100.0	2.8	46.7	-	-	-	-	-										
28×0	7.1	RAW	100.0	6.2	36.9	27.4	29.5	6321	-	0.24	100.0	6.2	36.9	27.4	29.5	6321	-	0.24										
1/4×0	100.0	RAW	100.0	4.8	45.4	23.7	26.1	5392	-	0.19	100.0	3.0	46.0	-	-	-	-	-										
1/4×28	92.9	-1.90	57.6	-	-	-	-	-	-	-	53.5	3.5	33.6	28.3	34.6	7172	-	0.28										
28×0	7.1	RAW	100.0	-	-	-	-	-	-	-	7.1	6.2	36.9	27.4	29.5	6321	-	0.24										
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	60.6	3.8	34.2	28.1	33.6	7106	-	0.28	1.70	79.2	4.2	18.0	34.2	43.0	9521			
1/4×28	93.2	-1.90	90.5	4.4	8.7	37.7	49.2	10800	-	0.28	90.5	4.4	8.7	37.7	49.2	10800	-	0.28										
		+1.90	9.5	1.9	66.8	-	-	-	-	-	100.0	4.2	14.2	-	-	-	-	-										
28×0	6.8	RAW	100.0	8.0	13.3	35.2	43.5	9750	-	0.26	100.0	8.0	13.3	35.2	43.5	9750	-	0.26										
1/4×0	100.0	RAW	100.0	7.6	13.7	34.1	44.6	9716	-	0.24	CALC.	4.5	14.4	-	-	-	-	-										
1/4×28	93.2	-1.90	90.5	-	-	-	-	-	-	-	84.3	4.4	8.7	37.7	49.2	10800	-	0.28										
28×0	6.8	RAW	100.0	-	-	-	-	-	-	-	6.8	8.0	13.3	35.2	43.5	9750	-	0.26										
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	91.1	4.6	9.2	37.3	48.4	10760	-	0.28	1.35	84.0	4.3	15.0	35.3	44.8	9972			
1/4×28	94.7	-1.90	80.0	3.5	40.0	27.2	29.3	6394	-	0.20	80.0	3.5	40.0	27.2	29.3	6394	-	0.20										
		+1.90	20.0	2.1	61.3	-	-	-	-	-	100.0	3.2	44.3	-	-	-	-	-										
28×0	5.3	RAW	100.0	5.3	37.8	27.6	29.3	6485	-	0.20	100.0	5.3	37.8	27.6	29.3	6485	-	0.20										
1/4×0	100.0	RAW	100.0	4.4	43.8	25.7	26.1	5704	-	0.16	CALC	3.3	44.0	-	-	-	-	-										
1/4×28	94.7	-1.90	80.0	-	-	-	-	-	-	-	75.7	3.5	40.0	27.2	29.3	6394	-	0.20										
28×0	5.3	RAW	100.0	-	-	-	-	-	-	-	5.3	5.3	37.8	27.6	29.3	6485	-	0.20										
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	81.0	3.6	39.7	27.2	29.3	6499	-	0.20	0.56	74.1	3.9	25.1	32.0	38.6	8607			
1/4×28	93.7	-1.90	67.2	4.3	11.5	36.5	47.7	10519	-	0.37	67.2	4.3	11.5	36.5	47.7	10519	-	0.37										
		+1.90	32.8	1.3	73.4	-	-	-	-	-	100.0	3.3	31.8	-	-	-	-	-										
28×0	6.3	RAW	100.0	5.3	27.8	32.0	34.9	7895	-	0.34	100.0	5.3	27.8	32.0	34.9	7895	-	0.34										
1/4×0	100.0	RAW	100.0	4.3	31.8	30.8	33.1	7586	-	0.27	CALC	3.4	31.5	-	-	-	-	-										
1/4×28	93.7	-1.90	67.2	-	-	-	-	-	-	-	63.0	4.3	11.5	36.5	47.7	10519	-	0.37										
28×0	6.3	RAW	100.0	-	-	-	-	-	-	-	6.3	5.3	27.8	32.0	34.9	7895	-	0.34										
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	69.3	4.3	13.2	36.0	46.2	10326	-	0.37	0.33	69.3	4.3	13.2	36.0	46.2	10326			
1/4×28	87.7	-1.90	16.3	4.6	12.8	35.1	47.5	10214	-	0.41	16.3	4.6	12.8	35.1	47.5	10214	-	0.14										
		+1.90	83.7	1.3	70.2	-	-	-	-	-	100.0	1.8	60.8	-	-	-	-	-										
28×0	12.3	RAW	100.0	3.7	45.3	24.9	26.1	-	-	0.34	100.0	3.7	45.3	24.9	26.1	-	-	0.34										
1/4×0	100.0	RAW	100.0	2.1	59.1	19.1	19.7	-	-	0.17	CALC	2.0	58.9	-	-	-	-	-										
1/4×28	87.7	-1.90	16.3	-	-	-	-	-	-	-	14.3	4.6	12.8	35.1	47.5	10214	-	0.14										
28×0	12.3	RAW	100.0	-	-	-	-	-	-	-	12.3	3.7	45.3	24.9	26.1	-	-	0.34										
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	26.6	4.1	26.0	30.9	38.7	6132	-	0.23										

EXCLUDED

LB

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X

ELEVATION:

DIP: BEARING:

CORE SIZE: CASING:

BITS USED:

MUD USED:

m LEFT IN HOLE: m

DATE START: FINISH:

DRILLER: OVERALL RECOVERY:

TESTS:

SAMPLED BY: DATE: ANALYZED BY:

BOREHOLE NO. BP-79-13
PAN OCEAN OIL LTD. (PAGE 2)
MINING DIVISION – COAL

LOGGED BY: DATE:

SIGNED:

GEOLOGICAL LOG – SCALE:

DETAILS OF COAL SEAMS – SCALE:

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC GRAV	WEIGHT PERCENT: YIELD	WEIGHT PERCENT: PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	WEIGHT PERCENT: BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT: YIELD	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	CUMULATIVE WEIGHT PERCENT: BTU	F.S.I.	S

NO. 1 SEAM HORIZON

SAMPLE NUMBER		THICKNESS	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	BTU	F.S.I.	S
A0117				EXCLUDED						
A0118				EXCLUDED						
A0119		1.10	45.9	3.8	31.2	29.7	35.1	7750		
A0120		2.71	69.4	4.4	17.7	33.6	43.9	9549		
A0121		3.13	70.2	4.5	16.7	34.0	44.7	9681		
A0122		3.59	65.2	4.5	18.2	33.4	43.7	9468		
A0123		3.94	64.8	4.4	19.5	33.0	42.9	9272		
A0124		4.73	69.2	4.5	17.2	33.9	44.1	9599		
A0125	(.13) THK	4.86	69.5	4.4	17.9	33.7	43.6	9502		
A0126				EXCLUDED						
A0127				EXCLUDED						

SAMPLE NUMBER		THICKNESS	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	BTU	F.S.I.	S
A0117				EXCLUDED						
A0118				EXCLUDED						
A0119				EXCLUDED						
A0120		1.61	85.5	4.7	12.8	35.1	47.2	10210		
A0121		2.03	83.5	4.8	12.4	35.2	47.5	10256		
A0122		2.49	73.8	4.7	14.6	34.5	46.1	9940		
A0123		2.84	72.2	4.6	16.7	33.8	44.8	9647		
A0124		3.63	76.3	4.6	14.7	34.7	45.7	9936		
A0125	(0.07) THK	3.70	76.4	4.6	15.2	34.5	45.4	9867		
A0126				EXCLUDED						
A0127				EXCLUDED						

OTHER

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X
ELEVATION:
DIP: BEARING:
CORE SIZE: CASING:

BITS USED:
MUD USED:
m LEFT IN HOLE: m

DATE START:
DRILLER:
TESTS:
SAMPLED BY:

FINISH:
OVERALL RECOVERY:
DATE: ANALYZED BY:

BOREHOLE NO. BP-79-13
PAN OCEAN OIL LTD. (PAGE 3)
MINING DIVISION – COAL

LOGGED BY: DATE:
SIGNED:

GEOLOGICAL LOG – SCALE:

DETAILS OF COAL SEAMS – SCALE:

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS	SIZE DIAMETER	SIZE WT %	WEIGHT PERCENT SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	CUMULATIVE SAMPLE VALUES THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	OTHER
158.22		0.89	No. 2 SEAM HORIZON ROOF - SILTSTONE, POOR COAL - BRIGHT TO VITREOUS	A0128	1.41	1/4×28	93.6	-1.90	97.6	4.6	8.9	36.2	50.3	10712	-	0.28	97.6	4.6	8.9	36.2	50.3	10712	-	0.28										
159.11		0.52						+1.90	2.4	2.1	54.8	-	-	-	-	-	100.0	4.5	10.0	-	-	-	-	-										
159.63		0.05	COAL - DULL TO BRIGHT			28×0	6.4	RAW	100.0	8.0	11.6	35.3	45.1	9950	-	0.26	100.0	8.0	11.6	35.3	45.1	9950	-	0.26										
159.68		0.09	- SHALE 0.07m			1/4×0	100.0	RAW	100.0	8.0	9.9	36.1	46.0	10160	-	0.24	CALC.	4.7	10.1	-	-	-	-	-										
159.77		0.07				1/4×28	93.6	-1.90	97.6	-	-	-	-	-	-	-	91.3	4.6	8.9	36.2	50.3	10712	-	0.28										
159.85		0.15				28×0	6.4	RAW	100.0	-	-	-	-	-	-	-	6.4	8.0	11.6	35.3	45.1	9950	-	0.26										
160.00		0.54	CARBONACEOUS SHALE			1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	97.7	4.8	9.1	36.1	49.7	10724	-	0.28	1.41	90.7	3.9	11.0	37.9	46.8	10627			
160.54		0.20	COAL - VITREOUS TO BRIGHT																															
160.74		0.09	COAL - DULL TO BRIGHT																															
160.83		0.29	COAL - VITREOUS TO BRIGHT			1/4×28	93.8	-1.90	61.0	3.5	24.3	32.5	39.7	8709	-	0.19	61.0	3.5	24.3	32.5	39.7	8709	-	0.19										
160.87		0.11	COAL - DULL TO VITREOUS					+1.90	39.0	1.6	66.9	-	-	-	-	-	100.0	2.8	40.9	-	-	-	-	-										
160.98						28×0	6.2	RAW	100.0	5.9	34.0	28.4	31.7	7005	-	0.16	100.0	5.9	34.0	28.4	31.7	7005	-	0.16										
			FLOOR - SHALE - POOR			1/4×0	100.0	RAW	100.0	5.1	40.0	27.2	27.7	6217	-	0.13	CALC.	3.0	40.5	-	-	-	-	-										
						1/4×28	93.8	-1.90	61.0	-	-	-	-	-	-	-	57.2	3.5	24.3	32.5	39.7	8709	-	0.19										
				A0129	0.37	28×0	6.2	RAW	100.0	-	-	-	-	-	-	-	6.2	5.9	34.0	28.4	31.7	7005	-	0.16										
						1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	57.4	3.5	24.3	32.4	39.6	8795	-	0.19	1.78	83.7	3.8	12.8	37.1	45.7	10366			
						1/4×28	94.4	-1.90	11.4	2.9	27.3	31.2	38.6	8324	-	0.19	11.4	2.9	27.3	31.2	38.6	8324	-	0.19										
								+1.90	88.6	1.4	71.2	-	-	-	-	-	100.0	1.6	66.2	-	-	-	-	-										
						28×0	5.6	RAW	100.0	3.6	61.1	19.5	15.8	-	-	0.09	100.0	3.6	61.1	19.5	15.8	-	-	0.09										
						1/4×0	100.0	RAW	100.0	3.2	65.7	18.9	12.2	-	-	0.05	CALC.	1.7	65.9	-	-	-	-	-										
						1/4×28	94.4	-1.90	11.4	-	-	-	-	-	-	-	10.7	2.9	27.3	31.2	38.6	8324	-	0.19										
				A0130	0.34	28×0	5.6	RAW	100.0	-	-	-	-	-	-	-	5.6	3.6	61.1	19.5	15.8	-	-	0.09										
						1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	16.3	3.1	40.6	26.5	29.6	5142	-	0.16	2.12	72.9	3.8	13.8	36.7	45.1	10178			
						1/4×28	93.1	-1.90	90.5	3.7	11.1	35.1	49.9	10694	-	0.21	90.5	3.7	11.1	35.1	49.9	10694	-	0.21										
				A0131	0.64			+1.90	9.5	1.0	71.7	-	-	-	-	-	100.0	3.4	16.9	-	-	-	-	-										
						28×0	6.9	RAW	100.0	7.5	13.3	33.5	45.7	9787	-	0.19	100.0	7.5	13.3	33.5	45.7	9787	-	0.19										
						1/4×0	100.0	RAW	100.0	7.0	16.3	33.6	43.1	9519	-	0.19	CALC.	3.7	16.6	-	-	-	-	-										
						1/4×28	93.1	-1.90	90.5	-	-	-	-	-	-	-	84.2	3.7	11.1	35.1	49.9	10694	-	0.21										
						28×0	6.9	RAW	9.5	-	-	-	-	-	-	-	6.9	7.5	13.3	33.5	45.7	9787	-	0.19										
						1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	91.1	3.9	11.4	34.8	49.3	10660	-	0.21	2.76	77.1	3.8	13.2	36.2	46.3	10310			
165.60		0.26	ROOF - SHALE - POOR COAL - DULL TO VITREOUS																															
165.86		0.34	COAL - VITREOUS TO BRIGHT			1/4×28	93.0	-1.90	79.7	3.5	17.4	33.9	45.2	9721	-	0.20	79.7	3.5	17.4	33.9	45.2	9721	-	0.20										
166.20		0.19	SHALE AND SHALEY COAL					+1.90	20.3	1.3	64.9	-	-	-	-	-	100.1	3.0	27.0	-	-	-	-	-										
166.39		0.34	COAL - BRIGHT			28×0	7.0	RAW	100.0	6.7	22.5	32.6	38.2	8475	-	0.18	100.0	6.7	22.5	32.6	38.2	8475	-	0.18										
166.73		0.44	COAL - BRIGHT			1/4×0	100.0	RAW	100.0	6.3	25.9	31.0	36.8	8083	-	0.17	CALC.	3.3	26.7	-	-	-	-	-										
167.17		0.16	COAL - DULL TO VITREOUS			1/4×28	93.0	-1.90	79.7	-	-	-	-	-	-	-	74.1	3.5	17.4	33.9	45.2	9721	-	0.20										
167.33		0.11	SHALE			28×0	7.0	RAW	100.0	-	-	-	-	-	-	-	7.0	6.7	22.5	32.6	38.2	8475	-	0.18										
167.49		0.19	SHALE COAL - VITREOUS TO BRIGHT			1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	81.1	3.7	18.1	33.7	44.1	9626	-	0.20	3.36	77.8	3.8	14.1	35.7	45.9	10183			
167.68		0.11																															
167.73		0.32	COAL - MOSTLY BRIGHT			1/4×28	93.8	-1.90	63.8	3.9	31.7	27.8	36.6	7501	-	0.15	63.8	3.9	31.7	27.8	36.6	7501	-	0.15										
168.05		0.06	SHALE CARBONACES					+1.90	36.2	1.3	68.3	-	-	-	-	-	100.0	3.0	45.0	-	-	-	-	-										
168.11		0.14	LOSE CORE			28×0	6.2	RAW	100.0	5.9	35.4	26.1	32.6	6686	-	0.27	100.0	5.9	35.4	26.1	32.6	6686	-	0.27										
168.25			FLOOR - SHALE - POOR			1/4×0	100.0	RAW	100.0	3.3	45.0	25.7	26.0	5707	-	0.09	CALC.	3.2	44.4	-	-	-	-	-										
						1/4×28	93.8	-1.90	63.8	-	-	-	-	-	-	-	59.8	3.9	31.7	27.8	36.6	7501	-	0.15										
				A0132	0.60	28×0	6.2	RAW	100.0	-	-	-	-	-	-	-	6.2	5.9	35.4	26.1	32.6	6686	-	0.27										
						1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	66.0	4.0	32.2	27.5	36.0	7486	-	0.16	3.55	77.2	3.8	14.9	35.3	45.4	10059			
						1/4×28	93.4	-1.90	90.1	3.7	10.3	38.5	47.5	10709	-	0.25	90.1	3.7	10.3	38.5	47.5	10709	-	0.25										
				A0133	0.19			+1.90	9.9	1.4	67.9	-	-	-	-	-	100.0	3.5	16.0	-	-	-	-	-										
						28×0	6.6	RAW	100.0	7.5	15.8	34.2	42.5	9420	-	0.23	100.0	7.5	15.8	34.2	42.5	9420	-	0.23										
						1/4×0	100.0	RAW	100.0	7.5	15.5	34.4	42.6	9567	-	0.24	CALC.	3.8	16.0	-	-	-	-	-										
				A0134	0.34	1/4×28	93.4	-1.90	90.1	-	-	-	-	-	-	-	84.1	3.7	10.3	38.5	47.5	10709	-	0.25										
						28×0	6.6	RAW	100.0	-	-	-	-	-	-	-	6.6	7.5	15.8	34.5	42.5	9420	-	0.23										
						1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	90.7	3.9	11.0	37.9	46.8	10627	-	0.25	3.89	78.4	3.8	14.5	35.6	45.5	10117			
						1/4×28	95.0	-1.90	94.9	3.4	13.6	35.2	47.8	10203	-	0.27	94.9	3.4	13.6	35.2	47.8	10203	-	0.27										
				A0135	0.60			+1.90	5.1	2.1	62.0	-	-	-	-	-	100.0	3.3	16.1	-	-	-	-	-										
						28×0	5.0	RAW	100.0	7.9	14.8	33.5	43.8	9524	-	0.23	100.0	7.9	14.8	33.5	43.8	9524	-	0.23										
						1/4×0	100.0	RAW	100.0	7.9	15.2	34.0	42.9	9601	-	0.24	CALC.	3.2	18.4	-	-	-	-	-										
				A0136		1/4×28	95.0	-1.90	94.9	-	-	-	-	-	-	-	90.1	3.4	13.6	35.2	47.8	10203	-	0.27										
						28×0	5.0	RAW	100.0	-	-	-	-	-	-	-	5.0	7.9	14.8	33.5	43.8	9524	-	0.23										
						1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	95.1	3.6	13.7	35.0	47.3	10221	-	0.27	4.49	80.6	3.7	14.4	35.5	45.8	10133			
						1/4×28	93.1	-1.90	45.0	2.4	30.8	28.6	38.2	7882	-	0.19	45.0	2.4	30.8	28.6	38.2	7882	-	0.19										
				A0137	0.40			+1.90	55.0	1.3	70.9	-	-	-	-	-	100.0	1.8	52.9	-	-	-	-	-										
						28×0	6.9	RAW	100.0	5.1	39.4	27.4	28.1	6262	-	0.16	100.0	5.1	39.4	27.4	28.1	6262	-	0.16										
						1/4×0	100.0	RAW	100.0	4.2	51.1	22.7	22.0	4705	-	0.12	CALC.	2.0	52.0	-	-	-	-	-										
						1/4×28	93.1	-1.90	45.0	-	-	-	-	-	-	-	41.9	2.4	30.8	28.6	38.2	7882	-	0.19										
					0.52	28×0	6.9	RAW	100.0	-	-	-	-	-	-	-	6.9	5.1	39.4	27.4	28.1	6262	-	0.16										
						1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	48.8	2.7	33.0	28.2	35.5	7558	-	0.19	4.89	78.0	3.7	15.3	35.1	45.3	10001			
						1/4×28	92.4	-1.90	83.8	5.5	10.7	35.7	48.1	10436	-	0.25	83.8	5.5	10.7	35.7	48.1	10436	-	0.25										
								+1.90	16.2	2.4	68.1	-	-	-	-	-	100.0	5.0	20.0	-	-	-	-	-										
						28×0	7.6	RAW	100.0	6.1	19.0	33.0	41.9	9209	-	0.23	100.0	6.1	19.0	33.0	41.9	9209	-	0.23										
						1/4×0	100.0	RAW	100.0	6.3	20.0	33.3	40.4	9054	-	0.22	CALC.	5.1	19.9	-	-	-	-	-										
						1/4×28	92.4	-1.90	83.8	-	-	-	-	-	-	-	77.4	5.5	10.7	35.7	48.1	10436	-	0.25										
						28×0	7.6	RAW	100.0	-	-	-	-	-	-	-	7.6	6.1	19.0	33.0	41.9	9209	-	0.23										
						1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	85.0	5.5	11.5	35.4	47.4	10409	-	0.25	5.41	78.7	3.9	14.9	35.1	45.5	10044			

062053

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X

ELEVATION:

DIP: BEARING:

CORE SIZE: CASING:

BITS USED:

MUD USED:

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BOREHOLE NO. BP-79-13
PAN OCEAN OIL LTD. (PAGE 4)
MINING DIVISION – COAL

LOGGED BY: DATE:

SIGNED:

GEOLOGICAL LOG – SCALE:

DETAILS OF COAL SEAMS – SCALE:

NO.3 SEAM HORIZON

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
180.44			ROOF: POOR, SHALE
180.57		0.45	COAL: DULL TO BRIGHT
180.77		0.09	SHALE
180.86		0.17	COALY SHALE
180.98		0.18	SHALE: CARBONACEOUS
181.15		0.17	COAL: VITREOUS TO BRIGHT
181.35		0.26	SHALE
181.50		0.21	SHALEY COAL
181.76		0.09	SHALEY COAL
181.97		0.15	COAL: BRIGHT
182.06		0.28	COAL: VITREOUS TO BRIGHT
182.21		0.14	COAL: DULL TO VITREOUS
182.49			SHALE: POOR FLOOR
182.63			

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
180.44			ROOF: POOR, SHALE		
180.57		0.45	COAL: DULL TO BRIGHT	A0138	0.45
180.77		0.09	SHALE	A0139	0.44
180.86		0.17	COALY SHALE		
180.98		0.18	SHALE: CARBONACEOUS	A0140	0.17
181.15		0.17	COAL: VITREOUS TO BRIGHT	A0141	0.56
181.35		0.26	SHALE		
181.50		0.21	SHALEY COAL		
181.76		0.09	SHALEY COAL	A0142	0.57
181.97		0.15	COAL: BRIGHT		
182.06		0.28	COAL: VITREOUS TO BRIGHT		
182.21		0.14	COAL: DULL TO VITREOUS		
182.49			SHALE: POOR FLOOR		
182.63					

SIZE DIAMETER	SIZE WT %	WEIGHT PERCENT SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE SAMPLE VALUES THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	OTHER
1/4×28	93.2	-1.90	96.9	4.6	17.5	33.8	44.1	9630	-	0.36	96.9	4.6	17.5	33.8	44.1	9630	-	0.36										
		+1.90	3.1	2.7	58.4	-	-	-	-	-	100.0	4.5	18.7	-	-	-	-	-										
28×0	6.8	RAW	100.0	7.2	18.0	33.7	41.1	9048	-	0.33	100.0	7.2	18.0	33.7	41.1	9048	-	0.33										
1/4×0	100.0	RAW	100.0	7.2	18.8	33.1	40.9	9178	-	0.35	CALC.	4.7	18.6	-	-	-	-	-										
1/4×28	93.2	-1.90	96.9	-	-	-	-	-	-	-	90.3	4.6	17.5	33.8	44.1	9630	-	0.36										
28×0	6.8	RAW	100.0	-	-	-	-	-	-	-	6.8	7.2	18.0	33.7	41.1	9048	-	0.33										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	97.1	4.7	17.5	33.7	43.7	9663	-	0.36	0.45	97.1	4.7	17.5	33.7	43.7	9663			
1/4×28	93.1	-1.90	14.3	4.0	29.3	29.6	37.1	8030	-	0.17	14.3	4.0	29.3	29.6	37.1	8030	-	0.17										
		+1.90	85.7	1.6	81.0	-	-	-	-	-	100.0	1.9	73.6	-	-	-	-	-										
28×0	6.9	RAW	100.0	3.7	62.9	17.3	16.1	-	-	0.39	100.0	3.7	62.9	17.3	16.1	-	-	0.39										
1/4×0	100.0	RAW	100.0	2.9	72.4	14.5	10.2	-	-	0.12	CALC.	2.0	72.9	-	-	-	-	-										
1/4×28	93.1	-1.90	14.3	-	-	-	-	-	-	-	13.3	4.0	29.3	29.6	37.1	8030	-	0.17										
28×0	6.9	RAW	100.0	-	-	-	-	-	-	-	6.9	3.7	62.9	17.3	16.1	-	-	0.39										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	20.2	3.9	40.2	25.6	30.2	5522	-	0.25	0.89	50.0	4.5	21.3	32.3	41.4	8963			
1/4×28	93.0	-1.90	77.2	4.3	21.4	32.2	42.1	9023	-	0.44	77.2	4.3	21.4	32.2	42.1	9023	-	0.44										
		+1.90	22.8	2.3	70.7	-	-	-	-	-	100.0	3.4	32.6	-	-	-	-	-										
28×0	7.0	RAW	100.0	6.0	29.2	29.6	35.2	7542	-	0.37	100.0	6.0	29.2	29.6	35.2	7542	-	0.37										
1/4×0	100.0	RAW	100.0	4.2	32.6	28.9	34.3	7378	-	0.19	CALC.	3.6	32.4	-	-	-	-	-										
1/4×28	93.0	-1.90	77.2	-	-	-	-	-	-	-	71.7	4.3	21.4	32.2	42.1	9023	-	0.44										
28×0	7.0	RAW	100.0	-	-	-	-	-	-	-	7.0	6.0	29.2	29.6	35.2	7542	-	0.37										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	78.7	4.4	22.3	31.8	41.2	8940	-	0.43	1.06	62.2	4.5	21.5	32.2	41.3	8958			
1/4×28	92.4	-1.90	23.6	3.6	30.9	27.4	38.1	7626	-	0.09	23.6	3.6	30.9	27.4	38.1	7626	-	0.09										
		1.90	76.4	1.8	78.7	-	-	-	-	-	100.0	2.2	67.4	-	-	-	-	-										
28×0	7.6	RAW	100.0	4.3	54.1	20.5	21.1	4272	-	0.15	100.0	4.3	54.1	20.5	21.1	4272	-	0.15										
1/4×0	100.0	RAW	100.0	3.0	65.6	17.3	14.1	-	-	0.12	CALC.	2.4	66.4	-	-	-	-	-										
1/4×28	92.4	-1.90	23.6	-	-	-	-	-	-	-	21.8	3.6	30.9	27.4	38.1	7626	-	0.09										
28×0	7.6	RAW	100.0	-	-	-	-	-	-	-	7.6	4.3	54.1	20.5	21.1	4272	-	0.15										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	29.4	3.7	37.7	25.3	33.1	6736	-	0.11	1.62	50.8	4.3	24.7	30.8	39.7	8514			
1/4×28	93.3	-1.90	89.5	3.7	19.8	32.5	44.0	9303	-	0.26	89.5	3.7	19.8	32.5	44.0	9303	-	0.26										
		+1.90	10.5	2.2	61.9	-	-	-	-	-	100.0	3.5	24.2	-	-	-	-	-										
28×0	6.7	RAW	100.0	6.9	20.3	33.3	39.5	8762	-	0.25	100.0	6.9	20.3	33.3	39.5	8762	-	0.25										
1/4×0	100.0	RAW	100.0	6.7	24.7	30.4	38.2	8228	-	0.29	CALC.	3.7	23.9	-	-	-	-	-										
1/4×28	93.3	-1.90	89.5	-	-	-	-	-	-	-	83.5	3.7	19.8	32.5	44.0	9303	-	0.26										
28×0	6.7	RAW	100.0	-	-	-	-	-	-	-	6.7	6.9	20.3	33.3	39.5	8762	-	0.25										
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	90.2	3.9	19.8	32.6	43.4	9328	-	0.26	2.19	61.1	4.1	22.8	31.5	41.1	8826			

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X DATE START FINISH

ELEVATION: BITS USED DRILLER OVERALL RECOVERY

DIP BEARING MUD USED TESTS LOGGED BY DATE

CORE SIZE CASING m LEFT IN HOLE SAMPLED BY DATE ANALYZED BY SIGNED

BOREHOLE NO. BP - 79 - 13

PAN OCEAN OIL LTD. (PAGE 5)

MINING DIVISION – COAL

GEOLOGICAL LOG – SCALE: 1:500

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
			CONTINUED FROM PAGE 1
158.22		2.76	No. 2 SEAM HORIZON : No. 2A SEAM
160.98		3.81	SHALE - MEDIUM TO DARK GRAY, CUBIC WEATHERING, RARE SPLINTS OF VITREOUS COAL
164.79		0.81	CARBONACEOUS SHALE WITH SPLINTS OF COAL
165.60		2.65	No. 2 SEAM HORIZON : No. 2B SEAM
168.25		1.18	SHALE CARBONACEOUS
169.43		6.24	SILTSTONE - LIGHT TO MEDIUM GRAY, THINLY BEDDED, VARIES FROM SLIGHTLY SANDY TO SLIGHTLY SHALEY
175.67		3.13	SHALE - GRAY TO MEDIUM GRAY-BROWN SILTY TOWARD BASE
178.80		1.23	SILTSTONE - SANDY CROSS BEDDED, CROSS LAMINATED.
180.03		0.41	SHALE - CARBONACEOUS
180.44		2.19	No. 3 SEAM HORIZON
182.63		2.72	SHALE - MEDIUM TO DARK GRAY. CARBONACEOUS WITH COALY SPLINTS
185.35		1.21	SILTSTONE – MEDIUM GRAY HARD THINLY BEDDED
186.56		4.35	SANDSTONE - LIGHT GRAY MEDIUM GRAINED TO CONGLOMERATIC, COARSENS DOWDWARD, POORLY SORTED, ANGULAR LOW SPHERICITY GRAINS OF QUARTZ AND BLACK CHERT
190.91		3.05	CONGLOMERATE - LIGHT GRAY, POORLY SORTED, MASSIVE BEDDED. 10-30mm PEBBLES OF BLACK, GRAY & GREEN CHERT + LIGHT + DARK GRAY QUARTZITE
193.96		8.79	SANDSTONE - LIGHT GRAY, FINE GRAINED, WELL SORTED, SUBANGULAR TO SUBROUNDED, LOW SPHERICITY GRAINS OF QUARTZ AND BLACK CHERT. THINLY BEDDED AT 70° TO CORE AXIS GRADES TO SILSTONE BELOW
207.75		1.16	SILTSTONE – MEDIUM GRAY, MASSIVE, GRADES TO SILTY SHALE TOWARD BASE
208.81		0.10	SHALE - BLACK, CARBONACEOUS
208.91		2.22	No. 4 SEAM HORIZON : No. 4A SEAM
206.23		0.46	MUDSTONE - MEDIUM BROWN, SOFT, CUBIC WEATHERING
207.06		2.39	SHALE - MEDIUM TO DARK GRAY, SILTY IN PLACES, SLIGHTY CARBONACEOUS
209.45		1.42	No. 4 SEAM HORIZON : No. 4B SEAM
210.87		4.57	MUDSTONE - MEDIUM, BROWN, MEDIUM SOFT, SILTY, NON-CARBONACEOUS, MASSIVE BEDDED
215.80			

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
			NO. 4 SEAM HORIZON		
			NO. 4A SEAM		
			ROOF : SILTSTONE AND SHALE		
204.01		0.09	COAL: DULL TO VITREOUS	A0143	0.37
204.10		0.28	COAL: VITREOUS TO BRIGHT		
204.38		1.26	COAL: MOSTLY BRIGHT	A0144	1.85
205.64		0.10	LOST CORE		
205.74		0.49	COAL: MOSTY BRIGHT		
206.23			FLOOR : SHALE POOR		
			NO. 4B SEAM		
			ROOF : SHALE, POOR		
209.45		0.25	COAL: VITREOUS TO BRIGHT	A0145	0.52
209.70		0.27	DULL SHALEY COAL		
209.97		0.39	COAL: VITREOUS TO BRIGHT	A0146	0.90
210.36		0.26	COAL: BRIGHT		
210.62		0.25	COAL: BRIGHT		
210.87			FLOOR : SHALE, POOR		

SIZE

DIAMETER	WT %
1/4×28	94.0
28×0	6.0
1/4×0	100.0
1/4×28	94.0
28×0	6.0
1/4×0	100.0
1/4×28	93.3
28×0	6.7
1/4×0	100.0
1/4×28	92.7
28×0	7.3
1/4×0	100.0
1/4×28	92.9
28×0	7.1
1/4×0	100.0

WEIGHT PERCENT

SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S
-1.90	82.7	4.2	13.9	34.3	47.6	10137	-	0.21
+1.90	17.3	1.4	69.4	-	-		-	-
RAW	100.0	5.9	23.2	31.1	39.8	8495	-	0.17
RAW	100.0	5.8	23.0	31.2	40.0	8507	-	0.23
-1.90	82.7	-	-	-	-	-	-	-
RAW	100.0	-	-	-	-	-	-	-
COMB	-	-	-	-	-	-	-	-
-1.90	96.9	3.5	8.2	36.6	51.7	11047	-	0.18
+1.90	3.1	2.0	58.5	-	-	-	-	-
RAW	100.0	6.7	14.4	34.0	44.9	9729	-	0.22
RAW	100.0	6.9	10.0	34.4	48.7	10374	-	0.22
-1.90	96.9	-	-	-	-	-	-	-
RAW	3.1	-	-	-	-	-	-	-
COMB	-	-	-	-	-	-	-	-
-1.90	92.2	3.4	29.9	29.1	37.6	7917	-	0.20
+1.90	7.8	2.0	61.7	-	-	-	-	-
RAW	100.0	5.9	29.8	29.1	35.2	7677	-	0.15
RAW	100.0	6.2	31.4	27.4	35.0	7299	-	0.27
-1.90	92.2	-	-	-	-	-	-	-
RAW	100.0	-	-	-	-	-	-	-
COMB	-	-	-	-	-	-	-	-
-1.90	91.0	3.9	8.0	37.2	50.9	11041	-	0.22
+1.90	9.0	1.4	71.5	-	-	-	-	-
RAW	100.0	7.4	13.8	34.3	44.5	9657	-	0.20
RAW	100.0	7.6	13.1	34.6	44.7	9822	-	0.23
-1.90	91.0	-	-	-	-	-	-	-
RAW	100.0	-	-	-	-	-	-	-
COMB	-	-	-	-	-	-	-	-

CUMULATIVE WEIGHT PERCENT

YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S
82.7	4.2	13.9	34.3	47.6	10137	-	0.21
100.0	3.7	23.5	-	-	-	-	-
100.0	5.9	23.2	31.1	39.8	8495	-	0.17
CALC.	3.8	23.5	-	-	-	-	-
77.7	4.2	13.9	34.3	47.6	10137	-	0.21
6.0	5.9	23.2	31.1	39.8	8495	-	0.17
83.7	4.3	14.8	33.9	46.8	10071	-	0.21
96.9	3.5	8.2	36.6	51.7	11047	-	0.18
100.0	3.4	9.8	-	-	-	-	-
100.0	6.7	14.4	34.0	44.9	9729	-	0.22
CALC.	3.6	10.1	-	-	-	-	-
90.4	3.5	8.2	36.6	51.7	11047	-	0.18
6.7	6.7	14.4	34.0	44.9	9729	-	0.22
97.1	3.7	8.9	36.2	50.8	10979	-	0.18
92.2	3.4	29.9	29.1	37.6	7917	-	0.20
100.0	3.3	32.4	-	-	-	-	-
100.0	5.9	29.8	29.1	35.2	7677	-	0.15
CALC.	3.5	32.2	-	-	-	-	-
85.4	3.4	29.9	29.1	37.6	7917	-	0.20
7.3	5.4	29.8	29.1	35.2	7677	-	0.15
92.7	3.6	29.8	29.1	37.2	7982	-	0.20
91.0	3.9	8.0	37.2	50.9	11041	-	0.22
100.0	3.7	13.7	-	-	-	-	-
100.0	7.4	13.8	34.3	44.5	9657	-	0.20
CALC	4.0	13.7	-	-	-	-	-
84.5	3.9	8.0	37.2	50.9	11041	-	0.22
7.1	7.4	13.8	34.3	44.5	9657	-	0.20
91.6	4.1	8.8	36.8	50.0	10946	-	0.22

CUMULATIVE SAMPLE VALUES

THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S
0.37	83.7	4.3	14.8	33.9	46.8	10071		
2.22	94.8	3.7	9.7	35.8	50.2	10845		
0.52	92.7	3.6	29.8	29.1	37.2	7982		
1.42	92.0	3.9	16.5	33.9	45.2	9852		

OTHER

062055

LOCATION MAP

TN ↑

SCALE:

BOREHOLE NO. BP-79-14
PAN OCEAN OIL LTD. (PAGE 1)
MINING DIVISION – COAL

COORDINATES: Y 460 m N X 025 W of SE. corner of CL 83
ELEVATION: 591.77 BITS USED: J.K. SMIT COMBINATION
DIP: 90° BEARING: MUD USED: 55 GALS POLY 325, 30 GALS POLY 357
CORE SIZE: HQ CASING: HW 3.65 m LEFT IN HOLE: 0.61 m

DATE START: JULY 14, 1979 FINISH: JULY 21, 1979
DRILLER: CARON DIAMOND DRILLING OVERALL RECOVERY: 91.74%
TESTS:
SAMPLED BY: D. HOPE DATE: JULY 26, 79 ANALYZED BY: BIRTLEY COAL & MINERALS TESTING SIGNED:

LOGGED BY: D. HOPE DATE: JULY 26, 1979

GEOLOGICAL LOG – SCALE: 1:500

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	THICKNESS	DESCRIPTION
3.50	3.50	OVERBURDEN: LIKE CONGLOMERATE AS BELOW
	82.50	CONGLOMERATE: LIGHT GRAY WEATHERING, POORLY SORTED (0.5 cm TO 8.0 cm CLASTS), ROUNDED TO SUB-ROUNDED LOW SPHERICITY CLASTS OF WHITE, GRAY, BLACK AND GREEN CHERT AND LIGHT GRAY QUARTZITE. QUARTZ VEINING IN PEBBLES IS COMMON. MATRIX IS MEDIUM TO COARSE GRAINED SANDSTONE.
86.00	2.42	SANDSTONE - GRAY FINE GRAINED, POORLY SORTED, MUDDY
88.42	8.20	No. 1 SEAM HORIZON
96.62	4.08	MUDSTONE - SOFT, CUBIC WEATHERING, RARE SPLINTS OF COAL AT TOP
100.70	2.73	SILTSTONE - SHALEY, RARE TINY COAL SPLINTS
103.43	3.02	SILTSTONE/SANDSTONE INTERBEDS. LOW ANGLE CROSS LAMINATIONS
106.45	10.24	SANDSTONE - MEDIUM GRAINED TO CONGLOMERATIC, COARSENING DOWNWARD
116.69	3.62	No. 2 SEAM HORIZON SEAM 2A
120.31	8.27	SILTSTONE - SHALEY TO SANDY, THIN TO MEDIUM BEDDED, SOFT DEFORMATION STRUCTURES. RARE COAL SPLINTS
128.58	4.42	No. 2 SEAM HORIZON SEAM 2B
133.00	8.80	SHALE - MEDIUM TO DARK GRAY, CUBIC WEATHERING, IN PLACES SLIGHTLY SILTY, RARE CARBONACEOUS ZONES
141.80	2.97	No. 3 SEAM HORIZON
144.77	0.76	SILTSTONE - SHALEY TO SANDY - COARSENING DOWNWARD
	3.60	SANDSTONE - VERY FINE TO MEDIUM GRAINED, VARIABLE, GRADATIONAL
149.13		

CONTINUED ON PAGE 2

DEPTH	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
88.42		No. 1 SEAM HORIZON		
88.49	0.07	ROOF - SANDSTONE, GOOD		
88.85	0.36	LOST CORE		
89.00	0.11	COAL - DULL, COATED WITH ASH		
89.04	0.04	COAL - DULL		
89.39	0.07	LOST CORE	A0147	1.19
89.61	0.32	COAL - BRIGHT		
90.20	0.22	COAL - DULL		
90.53	0.59	COAL - DULL TO VITREOUS		
90.72	0.33	SHALE - THIN SPLINTS OF COAL NEAR BASE	A0148	1.11
91.01	0.29	SHALEY COAL		
91.13	0.12	COALY SHALE	A0149	0.41
91.45	0.32	COAL - VITREOUS TO BRIGHT		
91.58	0.13	COAL - RUBBLY	A0150	0.53
91.66	0.08	SHALE - DARK GRAY WEATHERING		
92.05	0.39	COAL - VITREOUS TO BRIGHT	A0151	0.67
92.23	0.18	SHALE - DARK GRAY		
92.33	0.10	COAL - RUBBLY	A0152	0.43
92.53	0.20	COAL - VITREOUS TO BRIGHT		
92.76	0.23	SHALE - DARK GRAY, HARD CUBIC FRACTURING	A0153	0.50
93.26	0.50	COAL - VITREOUS TO BRIGHT	A0154	0.31
93.57	0.31	COAL - SHALE		
93.79	0.22	SHALE - COAL	A0155	0.93
93.95	0.16	SHALEY COAL		
94.50	0.55	COAL - BRIGHT	A0156	0.39
94.89	0.39	SHALEY COAL		
95.10	0.21	SHALE - CARBONACEOUS TO COALY		
95.40	0.30	COAL - VITREOUS TO BRIGHT		
95.50	0.10	SHALE - DARK GRAY	A0157	1.73
96.23	0.06	SHALE - CARBONACEOUS TO COALY		
96.62	0.67	SHALE - SLIGHTLY CARBONACEOUS, RARE COAL		
	0.39	FLOOR - MUDSTONE, POOR SPLINTS		

SIZE		WEIGHT PERCENT									CUMULATIVE WEIGHT PERCENT								CUMULATIVE SAMPLE VALUES								OTHER		
DIAMETER	WT %	SPEC GRAV	YIELD	PROXIMATE ANALYSIS				BTU	F.S.I.	S	YIELD	PROXIMATE ANALYSIS				BTU	F.S.I.	S	THICKNESS	YIELD	PROXIMATE ANALYSIS				BTU	F.S.I.	S			
				RM	ASH	VOL.	F.C.					RM	ASH	VOL.	F.C.						RM	ASH	VOL.	F.C.						
1/4×28	68.3	-1.90	75.5	5.1	17.2	31.3	46.4	9493	-	0.33	75.5	5.1	17.2	31.3	46.4	9493	-	0.33											
		+1.90	24.5	2.2	57.7	-	-	-	-	-	100.0	4.4	27.1	-	-	-	-	-											
28×0	31.7	RAW	100.0	5.5	41.9	22.6	30.0	5880	-	0.22	100.0	5.5	41.9	22.6	30.0	5880	-	0.22											
1/4×0	100.0	RAW	100.0	6.3	30.7	27.2	35.8	7345	-	0.28	CALC.	4.7	31.8	-	-	-	-	-											
1/4×28	68.3	-1.90	75.5	-	-	-	-	-	-	-	51.5	5.1	17.2	31.3	46.4	9493	-	0.33											
28×0	31.7	RAW	100.0	-	-	-	-	-	-	-	31.7	5.5	41.9	22.6	30.0	5880	-	0.22											
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	83.2	5.2	27.0	27.8	39.8	8146	-	0.29	1.19	83.2	5.2	27.0	27.8	39.8	8146				
1/4×28	92.5	-1.90	31.2	4.0	24.4	30.8	40.8	8565	-	0.16	31.2	4.0	24.4	30.8	40.8	8565	-	0.16											
		+1.90	68.8	2.0	78.0	-	-	-	-	-	100.0	2.6	61.3	-	-	-	-	-											
28×0	7.5	RAW	100.0	4.8	56.6	19.7	18.9	-	-	0.15	100.0	4.8	56.6	19.7	18.9	-	-	0.15											
1/4×0	100.0	RAW	100.0	4.6	60.7	19.2	15.5	-	-	0.09	CALC	2.8	60.9	-	-	-	-	-											
1/4×28	92.5	-1.90	31.2	-	-	-	-	-	-	-	28.8	4.0	24.4	30.8	40.8	8565	-	0.16											
28×0	7.5	RAW	100.0	-	-	-	-	-	-	-	7.5	4.8	56.6	19.7	18.9	-	-	0.15											
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	36.3	4.1	32.0	28.1	35.5	6621	-	0.16	2.30	60.5	4.8	28.4	27.8	38.5	7704				
1/4×28	93.6	-1.90	93.8	6.3	14.1	35.2	44.4	9824	-	0.26	93.8	6.3	14.1	35.2	44.4	9824	-	0.26											
		+1.90	6.2	3.6	59.6	-	-	-	-	-	100.0	6.1	16.9	-	-	-	-	-											
28×0	6.4	RAW	100.0	7.4	19.6	32.5	40.5	8843	-	0.22	100.0	7.4	19.6	32.5	40.5	8843	-	0.22											
1/4×0	100.0	RAW	100.0	8.1	17.2	33.6	41.1	9193	-	0.23	CALC.	6.2	17.0	-	-	-	-	-											
1/4×28	93.6	-1.90	93.8	-	-	-	-	-	-	-	87.8	6.3	14.1	35.2	44.4	9824	-	0.26											
28×0	6.4	RAW	100.0	-	-	-	-	-	-	-	6.4	7.4	19.6	32.5	40.5	8843	-	0.22											
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	94.2	6.3	14.5	34.9	44.0	9840	-	0.26	2.71	65.6	5.1	25.4	29.4	39.4	8168				
1/4×28	91.5	-1.90	34.2	4.1	22.2	31.8	41.9	8844	-	0.22	34.2	4.1	22.2	31.8	41.9	8844	-	0.22											
		+1.90	65.8	2.6	72.3	-	-	-	-	-	100.0	3.1	55.2	-	-	-	-	-											
28×0	8.5	RAW	100.0	6.0	46.6	22.0	25.4	5136	-	0.19	100.0	6.0	46.6	22.0	25.4	5136	-	0.19											
1/4×0	100.0	RAW	100.0	5.7	53.5	19.2	21.6	4136	-	0.13	CALC.	3.3	54.5	-	-	-	-	-											
1/4×28	91.5	-1.90	34.2	-	-	-	-	-	-	-	31.3	4.1	22.2	31.8	41.9	8844	-	0.22											
28×0	8.5	RAW	100.0	-	-	-	-	-	-	-	8.5	6.0	46.6	22.0	25.4	5136	-	0.19											
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	39.8	4.5	29.1	29.0	37.2	7884	-	0.21	3.24	61.4	5.1	25.8	29.3	39.4	8138				
1/4×28	94.1	-1.90	95.8	3.0	8.8	39.3	48.9	10921	-	0.21	95.8	3.0	8.8	39.3	48.9	10921	-	0.21											
		+1.90	4.2	2.5	66.7	-	-	-	-	-	100.0	3.0	11.2	-	-	-	-	-											
28×0	5.9	RAW	100.0	8.1	11.9	34.9	45.1	9980	-	0.21	100.0	8.1	11.9	34.9	45.1	9980	-	0.21											
1/4×0	100.0	RAW	100.0	8.4	10.9	36.3	44.4	10061	-	0.22	CALC.	3.3	11.2	-	-	-	-	-											
1/4×28	94.1	-1.90	-	-	-	-	-	-	-	-	90.1	3.0	8.8	39.3	48.9	10921	-	0.21											
28×0	5.9	RAW	-	-	-	-	-	-	-	-	5.9	8.1	11.9	34.9	45.1	9980	-	0.21											
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	96.0	3.3	9.2	38.6	48.3	10875	-	0.21	3.91	67.3	4.6	21.7	31.6	41.6	8806				
1/4×28	93.9	-1.90	79.4	3.1	9.9	37.8	49.2	10763	-	0.21	79.4	3.1	9.9	37.8	49.2	10763	-	0.21											
		+1.90	20.6	2.4	68.5	-	-	-	-	-	100.0	3.0	22.0	-	-	-	-	-											
28×0	6.1	RAW	100.0	7.6	17.3	32.5	42.6	9288	-	0.18	100.0	7.6	17.3	32.5	42.6	9288	-	0.18											
1/4×0	100.0	RAW	100.0	7.5	20.2	32.1	40.2	8912	-	0.20	CALC.	3.3	21.7	-	-	-	-	-											
1/4×28	93.9	-1.90	79.4	-	-	-	-	-	-	-	74.5	3.1	9.9	37.8	49.2	10763	-	0.21											
28×0	6.1	RAW	100.0	-	-	-	-	-	-	-	6.1	7.6	17.3	32.5	42.6	9288	-	0.18											
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	80.6	3.4	11.1	36.9	48.0	10612	-	0.21	4.34	68.6	4.5	20.5	32.2	42.3	9016				
1/4×28	94.5	-1.90	5.2	3.5	38.5	27.1	30.9	6600	-	0.16	5.2	3.5	38.5	27.1	30.9	6600	-	0.16											
		+1.90	94.8	1.8	77.6	-	-	-	-	-	100.0	1.9	75.6	-	-	-	-	-											
28×0	5.5	RAW	100.0	4.3	67.3	16.6	11.8	-	-	0.06	100.0	4.3	67.3	16.6	11.8	-	-	0.06											
1/4×0	100.0	RAW	100.0	3.5	74.2	15.0	7.3	-	-	0.05	CALC.	2.0	75.1	-	-	-	-	-											
1/4×28	94.5	-1.90	5.2	-	-	-	-	-	-	-	4.9	3.5	38.5	27.1	30.9	6600	-	0.16											
28×0	5.5	RAW	100.0	-	-	-	-	-	-	-	5.5	4.3	67.3	16.6	11.8	-	-	0.06											
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	10.4	3.9	55.1	21.0	19.8	2870	-	0.15	4.84	67.6	4.5	21.1	32.0	41.9	8911				
1/4×28	92.5	-1.90	95.3	3.9	14.5	38.0	43.6	10060	-	0.31	95.3	3.9	14.5	38.0	43.6	10060	-	0.31											
		+1.90	4.7	2.4	62.3	-	-	-	-	-	100.0	3.8	16.7	-	-	-	-	-											
28×0	7.5	RAW	100.0	7.0	16.2	35.6	41.2	9505	-	0.38	100.0	7.0	16.2	35.6	41.2	9505	-	0.38											
1/4×0	100.0	RAW	100.0	7.3	16.5	35.6	40.6	9468	-	0.37	CALC.	4.0	16.7	-	-	-	-	-											
1/4×28	92.5	-1.90	95.3	-	-	-	-	-	-	-	88.1	3.9	14.5	38.0	43.6	10060	-	0.31											
28×0	7.5	RAW	100.0	-	-	-	-	-	-	-	7.5	7.0	16.2	35.6	41.2	9505	-	0.38											
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	95.6	4.1	14.7	37.6	43.2	10082	-	0.32	5.15	64.6	4.4	20.5	32.5	42.0	9015				
1/4×28	93.5	-1.90	83.0	3.5	29.6	31.1	35.8	7882	-	0.24	83.0	3.5	29.6	31.1	35.8	7882	-	0.24											
		+1.90	17.0	2.0	62.1	-	-	-	-	-	100.0	3.2	35.1	-	-	-	-	-											
28×0	6.5	RAW	100.0	6.6	29.3	29.5	34.6	7566	-	0.35	100.0	6.6	29.3	29.5	34.6	7566	-	0.35											
1/4×0	100.0	RAW	100.0	6.3	34.4	28.5	30.8	6897	-	0.23	CALC.	3.4	34.7	-	-	-	-	-											
1/4×28	93.5	-1.90	83.0	-	-	-	-	-	-	-	77.6	3.5	29.6	31.1	35.8	7882	-	0.34											
28×0	6.5	RAW	100.0	-	-	-	-	-	-	-	6.5	6.6	29.3	29.5	34.6	7566	-	0.35											
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	78.1	3.4	29.6	31.1	35.8	7978	-	0.34	6.08	66.6	4.2	22.1	32.2	40.9	8829				
1/4×28	93.6	-1.90	94.7	4.2	6.4	39.1	50.3	11185	-	0.28	94.7	4.2	6.4	39.1	50.3	11185	-	0.28											
		+1.90	5.3	1.7	65.8	-	-	-	-	-	100.0	4.0	9.5	-	-	-	-	-											
28×0	6.4	RAW	100.0	7.5	10.1	35.9	46.5	10257	-	0.28	100.0	7.5	10.1	35.9	46.5	10257	-	0.28											
1/4×0	100.0	RAW	100.0	8.5	10.1	36.1	45.3	10172	-	0.26	CALC.	4.2	9.5	-	-	-	-	-											
1/4×28	93.6	-1.90	94.7	-	-	-	-	-	-	-	88.6	4.2	6.4	39.1	50.3	11185	-	0.28											
28×0	6.4	RAW	100.0	-	-	-	-	-	-	-	6.4	7.5	10.1	35.9	46.5	10257	-	0.28											
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	95.0	4.4	6.8	38.7	49.8	11174	-	0.28	6.47	68.3	4.2	20.8	32.8	45.7	9021				
1/4×28	93.5	-1.90	46.3	2.8	28.3	31.2	37.7	8302	-	0.30	46.3	2.8	28.3	31.2	37.7	8302	-	0.30											
		+1.90	53.7	1.6	74.9	-	-	-	-	-	100.0	2.2	53.3	-	-	-	-	-											
28×0	6.5	RAW	100.0	5.3	42.6	25.2	26.9	5797	-	0.37	100.0	5.3	42.6	25.2	26.9	5797	-	0.37											
1/4×0	100.0	RAW	100.0	4.7	52.7	14.5	28.1	4399	-	0.20	CALC.	2.4	52.6	-	-	-	-	-											
1/4×28	93.5	-1.90	46.3	-	-	-	-	-	-	-	40.2	2.8	28.3	31.2	37.7	8302	-	0.30											
28×0	6.5	RAW	100.0	-	-	-	-	-	-	-	6.5	5.3	42.6	25.2	26.9	5797	-	0.37											
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	46.7	3.1	31.6	29.7	35.1	7811	-	0.31	8.20	63.8	4.1	22.5	32.3	44.0	8834				

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X
ELEVATION:
DIP: BEARING:
CORE SIZE: CASING:
BITS USED:
MUD USED:
m LEFT IN HOLE: m
DATE START: FINISH:
DRILLER: OVERALL RECOVERY:
TESTS:
SAMPLED BY: DATE: ANALYZED BY:

BOREHOLE NO. BP-79-14
PAN OCEAN OIL LTD. (PAGE 2)
MINING DIVISION – COAL

LOGGED BY: DATE:
SIGNED:

GEOLOGICAL LOG – SCALE:

DETAILS OF COAL SEAMS – SCALE:

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS	SIZE DIAMETER	SIZE WT %	WEIGHT PERCENT SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

NO. 1 SEAM HORIZON

SAMPLE NUMBER	THICKNESS	CUMULATIVE SAMPLE VALUES THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	OTHER
A0150	(0.47) THK	3.70	70.8	3.6	17.7	35.1	43.0	9618			
A0151		3.23	75.3	3.6	16.8	35.6	43.5	9751			
A0152		2.56	69.9	3.7	19.5	34.5	41.8	9348			
A0153		2.13	67.8	3.8	21.6	34.0	40.3	9045			
A0154		1.63	85.4	3.8	20.3	34.5	41.1	9275			
A0155		1.32	83.0	3.7	21.8	33.6	40.5	9057			
A0156		0.39	95.0	4.4	6.8	38.7	49.8	11174			
A0147		1.19	83.2	5.2	27.0	27.8	39.8	8146			
A0148		2.30	60.5	4.8	28.4	27.8	38.5	7704			
A0149		2.71	65.6	5.1	25.4	29.4	39.7	8168			
A0150		3.24	61.4	5.1	25.8	29.3	39.4	8138			
A0151	(0.46) THK	3.70	65.7	4.7	22.7	31.0	41.0	8635			

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X

ELEVATION:

DIP: BEARING:

CORE SIZE: CASING:

BITS USED: J.K. SMIT

MUD USED: 55 POLY 325, 30 POLY 357 GALS.

m LEFT IN HOLE: m

DATE START: FINISH:

DRILLER: OVERALL RECOVERY:

TESTS:

SAMPLED BY: DATE: ANALYZED BY:

BOREHOLE NO. BP-79-14
PAN OCEAN OIL LTD. (PAGE 3)
MINING DIVISION – COAL

LOGGED BY: DATE:

SIGNED:

GEOLOGICAL LOG – SCALE: 1:500

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
			CONTINUED FROM PAGE NO. 1
149.13		11.50	CONGLOMERATE: MEDIUM WELL SORTED, 0.5 CM TO 2.0 CM CLASTS OF GRAY QUARTZITE AND BLACK, GRAY AND GREEN CHERT, ROUNDED TO SUBROUNDED, LOW SPHERICITY GRAINS. MATRIX IS MEDIUM GRAINED SALT AND PEPPLE.
160.63		0.38	SILTSTONE: MEDIUM GRAY, HARD, CUBIC TO BLOCKY FRACTURING.
161.01		10.12	SANDSTONE: SALT AND PEPPER, MEDIUM TO COARSE GRAINED, CONGLOMERATIC NEAR BASE. CROSS-BEDDING UP TO 60° TO CORE AXIS.
171.13		1.68	NO. 4 SEAM HORIZON SEAM 4A
172.81		1.57	SHALE: CARBONACEOUS AT TOP, NON-CARBONACEOUS AT BASE.
174.38		2.10	SILTSTONE: LIGHT GRAY WEATHERING, MASSIVE BEDDED
176.48		2.83	SANDSTONE: FINE TO MEDIUM GRAINED, SMALL SCALE FESTOON CROSS-BEDDING.
179.31		1.77	NO. 4 SEAM HORIZON SEAM 4B
181.08		3.50	SHALE: THIN SPLINTS OF COAL AND CARBONACEOUS ZONES THROUGHOUT, BECOMES SILTY TOWARDS BASE.
184.58		6.53	SANDSTONE: VERY FINE TO MEDIUM GRAINED, COARSENS DOWNWARD, SMALL PEBBLES NEAR BASE, FESTOON CROSS-BEDDING IN FINER UPPER HALF. CROSS-BEDDING AT 60° TO CORE AXIS IN COARSE LOWER HALF.
191.11			

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
			No.2 SEAM HORIZON SEAM 2A		
			ROOF-SANDSTONE, GOOD		
116.69		0.30	COAL-BRIGHT		
116.99		0.20	COAL-DULL, SLIGHTLY SHALEY	A0158	0.88
117.19		0.14	COAL-BRIGHT		
117.33		0.17	COAL-DULL TO VITREOUS		
117.50		0.43	COAL-BRIGHT, LIGHT, HARD		
117.93		0.05	LOST CORE	A0159	1.02
117.98		0.26	COAL-BRIGHT, LIGHT, HARD		
118.24		0.16	SHALEY COAL		
118.40		0.19	COAL-VITREOUS TO BRIGHT		
118.59		0.54	SHALE-CARBONACEOUS TO COALY	A0160	0.54
119.06		0.38	COAL-VITREOUS TO BRIGHT		
119.44		0.04	LOST CORE	A0161	0.77
119.48		0.18	COAL-VITREOUS TO BRIGHT		
119.66		0.17	COAL-DULL, SLIGHTLY SHALEY		
119.83		0.30	SHALEY COAL	A0162	0.48
120.13		0.18	SHALEY CARBONACEOUS TO COALY		
120.31			FLOOR-SILTSTONE, FAIRLY SOLID IN PLACES		
			No.2 SEAM HORIZON SEAM 2B		
			ROOF-SILTSTONE, POOR		
128.58		0.12	COAL-DULL TO VITREOUS	A0163	0.27
128.70		0.15	COAL-DULL TO BRIGHT		
128.85		0.42	COALY SHALE	A0164	0.42
129.27		0.28	COAL-MOSTLY BRIGHT		
129.55		0.35	SHALEY COAL	A0165	1.01
129.90		0.21	COAL-BRIGHT		
130.11	130.15	0.04	LOST CORE		
130.28		0.13	COAL-BRIGHT TO DULL	A0166	0.32
130.60		0.32	SHALE-DARK GRAY		
130.90	131.00	0.30	COAL-BRIGHT	A0167	0.68
131.13		0.10	SHALE-DARK GRAY		
131.28		0.15	COAL-BRIGHT		
131.51		0.23	COAL-VITREOUS TO BRIGHT		
131.67		0.16	SHALE-DARK GRAY	A0168	0.66
131.80		0.13	LOST CORE		
131.94		0.14	SHALE-DARK GRAY		
132.08		0.14	SHALE-LIGHT GRAY SILICEOUS		
		0.36	COALY SHALE		
132.44		0.50	COAL-DULL, SHALEY	A0169	1.06
132.94		0.06	SHALE-CARBONACEOUS TO COALY		
133.00			LOST CORE		
			FLOOR-SHALE, POOR		

SIZE DIAMETER	SIZE WT %	WEIGHT PERCENT SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE SAMPLE VALUES THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	OTHER
1/4×28	93.0	-1.90	93.5	3.1	11.6	35.9	49.4	10570	-	0.36	93.5	3.1	11.6	35.9	49.4	10570	-	0.36										
		+1.90	6.5	1.4	67.2	-	-	-	-	-	100.0	3.0	15.2	-	-	-	-	-										
28×0	7.0	RAW	100.0	7.4	14.9	34.7	43.0	9478	-	0.39	100.0	7.4	14.9	34.7	43.0	9478	-	0.39										
1/4×0	100.0	RAW	100.0	8.0	14.2	33.1	44.7	9509	-	0.38	CALC.	3.3	15.2	-	-	-	-	-										
1/4×28	93.0	-1.90	93.5	-	-	-	-	-	-	-	86.9	3.1	11.6	35.9	49.4	10570	-	0.36										
28×0	7.0	RAW	100.0	-	-	-	-	-	-	-	7.0	7.4	14.9	34.7	43.0	9478	-	0.39										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	93.9	3.4	12.1	35.7	48.3	10393	-	0.36	0.81	93.9	3.4	12.1	35.7	48.3	10393			
1/4×28	93.4	-1.90	95.4	3.9	7.5	38.8	49.8	10838	-	0.23	95.4	3.9	7.5	38.8	49.8	10838	-	0.23										
		+1.90	4.6	1.7	63.7	-	-	-	-	-	100.0	3.8	10.0	-	-	-	-	-										
28×0	6.6	RAW	100.0	8.3	10.8	35.3	45.6	9787	-	0.22	100.0	8.3	10.8	35.8	45.6	9787	-	0.22										
1/4×0	100.0	RAW	100.0	8.9	10.3	35.4	45.4	9813	-	0.20	CALC.	4.1	10.0	-	-	-	-	-										
1/4×28	93.4	-1.90	95.4	-	-	-	-	-	-	-	89.1	3.9	7.5	38.8	49.8	10838	-	0.23										
28×0	6.6	RAW	100.0	-	-	-	-	-	-	-	6.6	8.3	10.8	35.3	45.6	9787	-	0.22										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	95.7	4.2	7.9	38.3	49.2	10790	-	0.23	1.83	94.9	3.8	9.7	37.1	48.8	10616			
1/4×28	92.7	-1.90	33.0	2.7	25.1	32.2	40.0	8699	-	0.09	33.0	2.7	25.1	32.2	40.0	8699	-	0.09										
		+1.90	67.0	1.8	71.2	-	-	-	-	-	100.0	2.1	56.0	-	-	-	-	-										
28×0	7.3	RAW	100.0	4.5	44.8	23.9	26.8	5594	-	0.13	100.0	4.5	44.8	23.9	26.8	5594	-	0.13										
1/4×0	100.0	RAW	100.0	4.1	54.4	21.8	19.7	4245	-	0.10	CALC.	2.3	55.2	-	-	-	-	-										
1/4×28	92.7	-1.90	33.0	-	-	-	-	-	-	-	30.6	2.7	25.1	32.2	40.0	8699	-	0.09										
28×0	7.3	RAW	100.0	-	-	-	-	-	-	-	7.3	4.5	44.8	23.9	26.8	5594	-	0.13										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	37.9	3.0	30.7	29.8	36.2	7912	-	0.10	2.37	81.9	3.7	11.9	36.3	47.4	10331			
1/4×28	92.7	-1.90	92.7	3.2	9.7	35.6	51.5	10710	-	0.25	92.7	3.2	9.7	35.6	51.5	10710	-	0.25										
		+1.90	7.3	5.6	67.8	-	-	-	-	-	100.0	3.4	13.9	-	-	-	-	-										
28×0	7.3	RAW	100.0	8.5	13.9	32.9	44.7	9391	-	0.20	100.0	8.5	13.9	32.9	44.7	9391	-	0.20										
1/4×0	100.0	RAW	100.0	8.6	13.6	32.9	44.9	9478	-	0.20	CALC.	3.8	13.9	-	-	-	-	-										
1/4×28	92.7	-1.90	92.7	-	-	-	-	-	-	-	85.9	3.2	9.7	35.6	51.5	10710	-	0.25										
28×0	7.3	RAW	100.0	-	-	-	-	-	-	-	7.3	8.5	13.9	32.9	44.7	9478	-	0.20										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	93.2	3.6	10.4	35.1	50.2	10578	-	0.25	3.14	84.6	3.7	11.5	36.0	48.2	10397			
1/4×28	92.7	-1.90	57.9	3.5	26.7	30.2	39.6	8579	-	0.31	57.9	3.5	26.7	30.2	39.6	8579	-	0.31										
		+1.90	42.1	2.3	70.5	-	-	-	-	-	100.0	3.0	45.1	-	-	-	-	-										
28×0	7.3	RAW	100.0	5.8	35.0	25.3	33.9	7268	-	0.29	100.0	5.8	35.0	25.3	33.9	7268	-	0.29										
1/4×0	100.0	RAW	100.0	5.7	43.8	23.2	27.3	5703	-	0.24	CALC.	3.2	44.4	-	-	-	-	-										
1/4×28	92.7	-1.90	57.9	-	-	-	-	-	-	-	53.7	3.5	26.7	30.2	39.6	8579	-	0.31										
28×0	7.3	RAW	100.0	-	-	-	-	-	-	-	7.3	5.8	35.0	25.3	33.9	7268	-	0.29										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	61.0	3.7	28.2	29.3	38.5	8434		0.31	3.62	81.5	3.7	13.1	35.3	47.2	10202			
1/4×28	93.1	-1.90	71.9	3.8	19.2	33.3	43.7	9505	-	0.16	71.9	3.8	19.2	33.3	43.7	9505	-	0.16										
		+1.90	28.1	1.6	72.5	-	-	-	-	-	100.0	3.2	34.2	-	-	-	-	-										
28×0	6.9	RAW	100.0	3.9	27.5	31.4	37.2	8151	-	0.16	100.0	3.9	27.5	31.4	37.2	8151	-	0.16										
1/4×0	100.0	RAW	100.0	5.8	33.9	27.7	32.6	7128	-	0.15	CALC.	3.2	33.7	-	-	-	-	-										
1/4×28	93.1	-1.90	71.9	-	-	-	-	-	-	-	66.9	3.8	19.2	33.3	43.7	9505	-	0.16										
28×0	6.9	RAW	100.0	-	-	-	-	-	-	-	6.9	3.9	27.5	31.4	37.2	8151	-	0.16										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	73.8	3.8	19.9	33.1	43.0	9471	-	0.16	0.27	73.8	3.8	19.9	33.1	43.0	9471			
1/4×28	90.7	-1.90	69.1	3.5	29.8	29.2	37.5	8111	-	0.14	69.1	3.5	29.8	29.2	37.5	8111	-	0.14										
		+1.90	30.9	2.3	71.6	-	-	-	-	-	100.0	3.1	42.7	-	-	-	-	-										
28×0	9.3	RAW	100.0	5.6	35.7	27.4	31.3	6937	-	0.14	100.0	5.6	35.7	27.4	31.3	6937	-	0.14										
1/4×0	100.0	RAW	100.0	5.5	41.5	24.4	38.6	6052	-	0.13	CALC.	3.1	42.0	-	-	-	-	-										
1/4×28	90.7	-1.90	69.1	-	-	-	-	-	-	-	62.7	3.5	29.8	29.2	37.5	8111	-	0.14										
28×0	9.3	RAW	RAW	-	-	-	-	-	-	-	9.3	3.6	35.7	27.4	31.3	6937	-	0.14										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	72.0	3.5	30.5	28.9	36.6	8051	-	0.14	0.69	72.7	3.6	26.2	30.5	39.1	8615			
1/4×28	93.0	-1.90	77.0	3.1	13.4	36.4	47.1	10310	-	0.21	77.0	3.1	13.4	36.4	47.1	10310	-	0.21										
		+1.90	23.0	1.8	63.1	-	-	-	-	-	100.0	2.8	24.8	-	-	-	-	-										
28×0	7.0	RAW	100.0	6.4	22.0	34.5	37.1	8589	-	0.18	100.0	6.4	22.0	34.5	37.1	8589	-	0.18										
1/4×0	100.0	RAW	100.0	6.6	24.4	32.2	36.8	8134	-	0.20	CALC.	3.0	24.6	-	-	-	-	-										
1/4×28	93.0	-1.90	77.0	-	-	-	-	-	-	-	71.6	3.1	13.4	36.4	47.1	10310	-	0.21										
28×0	7.0	RAW	100.0	-	-	-	-	-	-	-	7.0	6.4	22.0	34.5	37.1	8589	-	0.18										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	78.6	3.3	14.8	36.0	45.4	10117	-	0.21	1.70	76.2	3.4	19.2	33.9	42.9	9535			
1/4×28	93.9	-1.90	5.8	3.8	19.5	33.3	43.4	9382	-	0.27	5.8	3.8	19.5	33.3	43.4	9382	-	0.27										
		+1.90	94.2	1.6	70.7	-	-	-	-	-	100.0	1.7	67.7	-	-	-	-	-										
28×0	6.1	RAW	100.0	3.3	60.6	18.9	17.2	-	-	0.09	100.0	3.3	60.6	18.9	17.2	-	-	0.09										
1/4×0	100.0	RAW	100.0	3.0	66.6	17.8	12.6	-	-	0.06	CALC.	1.8	67.3	-	-	-	-	-										
1/4×28	93.9	-1.90	5.8								5.4	3.8	19.5	33.3	43.4	9382	-	0.27										
28×0	6.1	RAW	100.0								6.1	3.3	60.6	18.9	17.2	-	-	0.09										
1/4×0	100.0	COMB	-								11.5	3.5	39.8	26.1	30.4	4832	-	0.25	2.02	63.3	3.4	19.9	33.6	42.5	9366			
1/4×28	91.6	-1.90	75.0	4.2	10.1	36.7	49.0	10635	-	0.22	75.0	4.2	10.1	36.7	49.0	10635	-	0.22										
		+1.90	25.0	1.8	62.7	-	-	-	-	-	100.0	3.6	23.2	-	-	-	-	-										
28×0	8.4	RAW	100.0	6.1	21.6	34.4	37.9	8654	-	0.16	100.0	6.1	21.6	34.4	37.9	8654	-	0.16										
1/4×0	100.0	RAW	100.0	6.5	22.4	33.4	37.7	8416	-	0.21	CALC.	3.8	24.9	-	-	-	-	-										
1/4×28	91.6	-1.90	75.0	-	-	-	-	-	-	-	68.7	4.2	10.1	36.7	49.0	10635	-	0.22										
28×0	8.4	RAW	100.0	-	-	-	-	-	-	-	8.4	6.1	21.6	34.4	37.9	8654	-	0.16										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	77.1	4.4	11.8	36.3	47.3	10431	-	0.21	2.70	66.0	3.7	17.6	34.7	43.8	9665			
1/4×28	93.9	-1.90	3.8	2.8	36.0	28.2	33.0	6956	-	0.19	3.8	2.8	36.0	28.2	33.0	6956	-	0.19										
		+1.90	96.2	1.1	79.8	-	-	-	-	-	100.0	1.2	78.1	-	-	-	-	-										
28×0	6.1	RAW	100.0	2.3	71.1	17.1	9.5	-	-	0.05	100.0	2.3	71.1	17.1	9.5	-	-	0.05										
1/4×0	100.0	RAW	100.0	1.8	77.4	15.5	5.3	-	-	0.04	CALC.	1.3	77.7	-	-	-	-	-										
1/4×28	93.9	-1.90	3.8	-	-	-	-	-	-	-	35.7	2.8	36.0	28.2	33.0	6956	-	0.19										
28×0	6.1	RAW	100.0	-	-	-	-	-	-	-	6.1	2.3	71.1	17.1	9.5	-	-	0.05										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	41.8	2.7	40.3	26.8	30.1	6197	-	0.17	3.36	61.9	3.5	20.6	33.4	42.0	9218			
1/4×28	93.4	-1.90	41.3	3.2	34.1	29.2	33.5	7459	-	0.23	41.3	3.2	34.1	29.2	33.5	7459	-	0.23										
		+1.90	58.7	2.0	74.4	-	-	-	-	-	100.0	2.5	57.8	-	-	-	-	-										
28×0	6.6	RAW	100.0	5.1	48.4	22.7	23.8	5016	-	0.18	100.0	5.1	48.4	22.7	23.8	5016	-	0.18										
1/4×0	100.0	RAW	100.0	4.6	56.2	20.4	18.8	3915	-	0.11	CALC.	2.7	57.2	-	-	-	-	-										
1/4×28	93.4	-1.90	41.3	-	-	-	-	-	-	-	38.6	3.2	34.1	29.2	33.5	7459	-	0.23										
28×0	6.6	RAW	100.0	-	-	-	-	-	-	-	6.6	5.1	48.4	22.7	23.8	5016	-	0.18										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	45.2	3.4	37.1	27.8	31.4	7032	-	0.23	4.42	58.0	3.5	23.6	32.3	40.1	8819			
																			5.84	76.0	3.7	13.9	35.5	46.4	10103			
																					(SAMPLES A0158 TO A0167 INCL.)							

CBW

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X

ELEVATION:

DIP: BEARING:

CORE SIZE: CASING:

BITS USED:

MUD USED:

m LEFT IN HOLE: m

DATE START: FINISH:

DRILLER: OVERALL RECOVERY:

TESTS:

SAMPLED BY: DATE: ANALYZED BY:

BOREHOLE NO. BP-79-14

PAN OCEAN OIL LTD. (PAGE 4)

MINING DIVISION – COAL

LOGGED BY: DATE:

SIGNED:

GEOLOGICAL LOG – SCALE:

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
141.80			No. 3 SEAM HORIZON		
			ROOF - SHALE POOR	A0170	0.38
142.18		0.38	SHALEY COAL		
		0.74	SHALE - MEDIUM GRAY, CUBIC FRACTURING		
142.92		0.26	SHALE - CARBONACEOUS WITH COAL		
143.18		1.29	SHALE - DARK GRAY RARE COAL SPLINTS AND PARTINGS	A0171	2.29
144.47		0.13	SHALEY COAL		
144.60		0.05	COAL, BRIGHT		
144.65		0.06	SOOTY SHALE		
144.71		0.06	SHALEY COAL		
144.77			FLOOR - SILTSTONE, POOR	A0172	0.30
171.13			No. 4 SEAM HORIZON SEAM 4A		
			ROOF - SANDSTONE, GOOD		
171.30		0.17	COAL - VITREOUS, BANDED		
171.71		0.41	COAL - VITREOUS TO BRIGHT		
171.82		0.11	COAL - BRIGHT, HARD, GLASSY		
		0.86	COAL - VITREOUS TO BRIGHT, BANDED	A0173	1.69
172.68		0.07	COAL - DULL TO VITREOUS		
172.75		0.06	LOST CORE		
172.81			FLOOR - SHALE, POOR		
179.31			No. 4 SEAM HORIZON SEAM 4B		
			ROOF - SANDSTONE, GOOD	A0174	0.52
179.51		0.20	COAL - BRIGHT		
179.71		0.29	COAL - DULL TO VITREOUS		
179.83		0.03	COAL - VITREOUS TO BRIGHT		
179.99		0.03	SOOTY SHALE		
180.11		0.12	SHALEY COAL	A0175	0.28
180.23		0.14	COAL - VITREOUS TO BRIGHT		
180.39		0.05	LOST CORE		
180.44		0.64	COAL - BRIGHT	A0176	0.97
181.08			FLOOR - SHALE, POOR		

SIZE		WEIGHT PERCENT									CUMULATIVE WEIGHT PERCENT								CUMULATIVE SAMPLE VALUES									OTHER		
DIAMETER	WT %	SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S			
1/4×28	93.0	-1.90	88.4	2.4	17.7	33.2	46.7	9822	-	0.33	88.4	2.4	17.7	33.2	46.7	9822	-	0.33												
		+1.90	11.6	2.4	63.3	-	-	-	-	-	100.0	2.4	23.0	-	-	-	-	-												
28×0	7.0	RAW	100.0	6.7	20.8	32.6	39.9	8755	-	0.28	100.0	6.7	20.8	32.6	39.9	8755	-	0.28												
1/4×0	100.0	RAW	100.0	7.3	21.7	30.9	40.1	8619	-	0.28	CALC.	2.7	22.8	-	-	-	-	-												
1/4×28	93.0	-1.90	88.4	-	-	-	-	-	-	-	82.2	2.4	17.7	33.2	46.7	9822	-	0.33												
28×0	7.0	RAW	100.0	-	-	-	-	-	-	-	7.0	6.7	20.8	32.6	39.9	8755	-	0.28												
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	89.2	2.7	18.2	33.0	45.3	9713	-	0.33	0.38	89.2	2.7	18.2	33.0	45.3	9713					
1/4×28	91.0	-1.90	8.8	3.3	35.8	26.4	34.5	7141	-	0.30	8.8	3.3	35.8	26.4	34.5	7141	-	0.30												
		+1.90	91.2	1.0	84.0	-	-	-	-	-	100.0	1.2	79.8	-	-	-	-	-												
28×0	9.0	RAW	100.0	3.5	72.3	16.2	8.0	-	-	0.14	100.0	3.5	72.3	16.2	8.0	-	-	0.14												
1/4×0	100.0	RAW	100.0	2.9	78.1	10.9	8.1	-	-	0.08	CALC.	1.4	79.1	-	-	-	-	-												
1/4×28	91.0	-1.90	8.8	-	-	-	-	-	-	-	8.0	3.3	35.8	26.4	34.5	7141	-	0.30												
28×0	9.0	RAW	100.0	-	-	-	-	-	-	-	9.0	3.5	72.3	16.2	8.0	-	-	0.14												
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	17.0	3.4	55.6	20.8	20.0	3352	-	0.28	2.67	27.2	3.0	38.1	26.4	31.7	6312					
1/4×28	92.0	-1.90	72.3	3.4	14.0	34.6	48.0	10181	-	0.36	72.3	3.4	14.0	34.6	48.0	10181	-	0.36												
		+1.90	27.7	2.0	71.5	-	-	-	-	-	100.0	3.0	29.9	-	-	-	-	-												
28×0	8.0	RAW	100.0	6.5	23.8	33.9	35.8	8339	-	0.31	100.0	6.5	23.8	33.9	35.8	8339	-	0.31												
1/4×0	100.0	RAW	100.0	6.7	29.2	27.4	36.7	7755	-	0.27	CALC.	3.3	29.4	-	-	-	-	-												
1/4×28	92.0	-1.90	72.3	-	-	-	-	-	-	-	66.5	3.4	14.0	34.6	48.0	10181	-	0.36												
28×0	8.0	RAW	100.0	-	-	-	-	-	-	-	8.0	6.5	23.8	33.9	35.8	8339	-	0.31												
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	74.5	3.7	15.8	34.4	45.7	9932	-	0.35	2.97	32.0	3.2	32.9	28.3	35.0	7162					
1/4×28	93.0	-1.90	97.0	4.0	7.4	38.0	50.6	11041	-	0.23	97.0	4.0	7.4	38.0	50.6	11041	-	0.23												
		+1.90	3.0	2.3	52.9	-	-	-	-	-	100.0	3.9	8.7	-	-	-	-	-												
28×0	7.0	RAW	100.0	8.3	13.0	33.1	45.6	9735	-	0.21	100.0	8.3	13.0	33.1	45.6	9735	-	0.21												
1/4×0	100.0	RAW	100.0	9.2	8.4	35.0	47.4	10339	-	0.21	CALC.	4.2	9.0	-	-	-	-	-												
1/4×28	93.0	-1.90	97.0	-	-	-	-	-	-	-	90.2	4.0	7.4	38.0	50.6	11041	-	0.23												
28×0	7.0	RAW	100.0	-	-	-	-	-	-	-	7.0	8.3	13.0	33.1	45.6	9735	-	0.21												
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	97.2	4.3	8.1	37.3	49.9	10955	-	0.23	1.69	97.2	4.3	8.1	37.3	49.9	10955					
1/4×28	93.7	-1.90	97.7	3.5	20.1	32.8	43.6	9328	-	0.40	97.7	3.5	20.1	32.8	43.6	9328	-	0.40												
		+1.90	2.3	3.0	50.8	-	-	-	-	-	100.0	3.5	20.8	-	-	-	-	-												
28×0	6.3	RAW	100.0	7.9	20.0	31.1	41.0	8866	-	0.36	100.0	7.9	20.0	31.1	41.0	8866	-	0.36												
1/4×0	100.0	RAW	100.0	8.5	19.6	31.7	40.2	8788	-	0.36	CALC.	3.8	20.7	-	-	-	-	-												
1/4×28	93.7	-1.90	97.7	-	-	-	-	-	-	-	91.5	3.5	20.1	32.8	43.6	9328	-	0.40												
28×0	6.3	RAW	100.0	-	-	-	-	-	-	-	6.3	7.9	20.0	31.1	41.0	8866	-	0.36												
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	97.8	3.7	20.0	32.5	43.2	9361	-	0.40	0.52	97.8	3.7	20.0	32.5	43.2	9361					
1/4×28	92.7	-1.90	56.4	4.0	26.6	29.1	40.3	8301	-	0.22	56.4	4.0	26.6	29.1	40.3	8301	-	0.22												
		+1.90	43.6	1.9	61.2	-	-	-	-	-	100.0	3.1	41.7	-	-	-	-	-												
28×0	7.3	RAW	100.0	6.2	35.6	25.1	33.1	6679	-	0.20	100.0	6.2	35.6	25.1	33.1	6679	-	0.20												
1/4×0	100.0	RAW	100.0	6.3	40.5	24.8	28.4	5995	-	0.16	CALC.	3.3	41.2	-	-	-	-	-												
1/4×28	92.7	-1.90	56.4	-	-	-	-	-	-	-	52.3	4.0	26.6	29.1	40.3	8301	-	0.22												
28×0	7.3	RAW	100.0	-	-	-	-	-	-	-	7.3	6.2	35.6	25.1	33.1	6679	-	0.20												
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	59.6	4.2	28.2	28.3	39.0	8108	-	0.22	0.80	84.4	3.8	22.0	31.4	42.1	9051					
1/4×28	94.0	-1.90	97.3	5.7	4.4	37.7	52.2	11308	-	0.23	97.3	5.7	4.4	37.7	52.2	11308	-	0.23												
		+1.90	2.7	2.0	58.6	-	-	-	-	-	100.0	5.6	5.8	-	-	-	-	-												
28×0	6.0	RAW	100.0	8.8	8.0	36.0	47.2	10400	-	0.22	100.0	8.8	8.0	36.0	47.2	10400	-	0.22												
1/4×0	100.0	RAW	100.0	9.6	5.8	36.8	47.8	10645	-	0.24	CALC.	5.8	5.9	-	-	-	-	-												
1/4×28	94.0	-1.90	97.3	-	-	-	-	-	-	-	91.7	5.7	4.4	37.7	52.2	11308	-	0.23												
28×0	6.0	RAW	100.0	-	-	-	-	-	-	-	6.0	8.8	8.0	36.0	47.2	10400	-	0.22												
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	97.7	5.8	4.7	37.5	51.7	11318	-	0.23	1.77	91.2	4.9	11.9	34.9	47.7	10374					

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y 1040 m N X 10,640 m W of SE corner of CL 88
ELEVATION:
DIP: -90° BEARING: -
CORE SIZE: NQ CASING: HW 1.22 m m LEFT IN HOLE: HW NIL m
NW 96.62 m NW 94.49 m

BITS USED: J.K. SMIT COMBINATION
MUD USED: 70 GALLONS POLYDRILL: 40 GALS. POLYPOWDER
DRILLER: CARON DIAMOND DRILLING
SAMPLED BY: O. CULLINGHAM

DATE START: JULY 22, 1979
FINISH: JULY 29, 1979
OVERALL RECOVERY: 95.47%
TESTS: NONE
DATE: AUGUST 13/79 ANALYZED BY: BIRTLEY COAL & MINERALS TESTING
SIGNED:

BOREHOLE NO. BP-79-15
PAN OCEAN OIL LTD. (PAGE 1)
MINING DIVISION - COAL

LOGGED BY: O. CULLINGHAM DATE: AUGUST 1, 1979

GEOLOGICAL LOG - SCALE: 1:500

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
		33.53	OVERBURDEN: TRICONE SAMPLES ASSORTMENT OF ROCK CHIPS; CHERT, QUARTZITE, SILTSTONE, LIMESTONE AND SHALE IMBEDDED IN CLAY.
33.53		15.24	SILTSTONE AND SANDSTONE: WEATHERED FRAGMENTS OF SILTSTONE, SANDSTONE AND MINOR SHALE. (TRICONE SAMPLES)
78.77		9.14	MUDSTONE: MEDIUM LIGHT GRAY, FEW FRAGMENTS OF SILTSTONE AND SANDSTONE. (TRICONE SAMPLES)
57.91		6.10	SILTSTONE CARBONACEOUS SHALE AND SANDSTONE; FRAGMENTS OF ABOVE, MAY IN PART BE CONGLOMERATE. APPROX. 5% COAL FRAGMENTS. (TRICONED)
64.01		3.05	MUDSTONE: MEDIUM LIGHT GRAY (TRICONED)
67.06		9.14	SILTSTONE, SANDSTONE TO GRANULE CONGLOMERATIC; UP TO 5% COAL FRAGMENTS. (TRICONED)
76.20		20.42	MUDSTONE: MEDIUM LIGHT GRAY. SLIGHTLY SILTY TO SANDY. (TRICONED)
96.62		4.84	MUDSTONE: MEDIUM TO DARK GRAY BROWN
01.46		2.78	SILTSTONE / SANDSTONE: MEDIUM GRAY, SILT TO VERY FINE GRAINED SANDSTONE.
104.24		3.41	SANDSTONE AND IN PART CONGLOMERATIC SANDSTONE.
107.65		5.95	MUDSTONE: MEDIUM TO DARK GRAY BROWN, BECOMES SILTY BASALLY GRADATIONAL TO CONGLOMERATE BELOW
113.60		104.45	CONGLOMERATE: MASSIVE, MEDIUM TO VERY LARGE PEBBLE CONGLOMERATE, OCCASIONAL COBBLES AND POORLY SORTED, THIN BEDS OF MEDIUM AND COURSE GRAINED SANDSTONE. CLASTS ARE WHITE THROUGH BLACK CHERT AND QUARTZITE WITH FEW PEBBLES OF GREEN CHERT. PEBBLES ARE WELL ROUNDED AND ARE BLADE, ROLL AND SEMI SPHERICAL. BEDS USUALLY SHOW SOME DEGREE OF COURSEING DOWNWARDS.
162.5			

DETAILS OF COAL SEAMS - SCALE: 1:100

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
			NO. 1 SEAM HORIZON		
			ROOF: CONGLOMERATE, GOOD		
218.05		0.12	COAL - VITREOUS TO BRIGHT		
218.17		0.11	SHALE - CARBONACEOUS		
218.28		0.22	COAL - VITREOUS		
218.50		0.04	LOST CORE		
218.54		0.15	COAL - VITREOUS		
218.69		0.22	SHALE - CARBONACEOUS TO COALY	AO 197	1.50
218.91		0.09	COAL - DULL TO VITREOUS		
219.00		0.55	SHALE - CARBONACEOUS		
219.55		0.34	COAL - DULL TO VITREOUS		
219.89		0.17	COALY SHALE		
220.06		0.01	LOST CORE		
220.07		0.30	COAL - DULL TO VITREOUS		
220.37		0.34	SHALE - CARBONACEOUS	AO 198	2.20
220.71		0.68	COAL - VITREOUS TO BRIGHT		
221.39		0.09	SHALE - CARBONACEOUS		
221.48		0.07	COAL - DULL TO BRIGHT		
221.55		0.01	LOST CORE		
221.56		0.09	COAL - BRIGHT		
221.65		0.03	SHALE - CARBONACEOUS		
221.68		0.41	COAL - VITREOUS TO BRIGHT		
222.09		0.03	SHALE - COALY		
222.12		0.25	COAL - VITREOUS TO BRIGHT		
222.37		0.20	SHALE - CARBONACEOUS		
222.57		0.09	COAL - DULL TO VITREOUS TO BRIGHT		
222.66		0.14	SHALE - COALY		
222.80		0.01	LOST CORE	AO 199	2.91
222.81		0.11	SHALE		
222.92		0.19	COAL - VITREOUS		
223.11		0.20			
223.48		1.18	COAL - VITREOUS TO BRIGHT		
224.66		0.44	SHALEY COAL	AO 200	0.44
225.10		0.58	SHALE - CARBONACEOUS TO COALY	AO 201	0.58
225.68			FLOOR: MUDSTONE, POOR		
			NO. 2 SEAM HORIZON		
			ROOF: SANDSTONE TO CONGLOMERATE GOOD		
249.32		0.18	COAL - VITREOUS TO BRIGHT		
249.50		0.15	COAL - DULL TO VITREOUS		
249.65		0.60	COAL - VITREOUS TO BRIGHT		
250.25		0.03	SHALE - CARBONACEOUS TO COALY		
250.28		0.19	LOST CORE		
250.47		0.64	COAL - VITREOUS TO BRIGHT	AO 202	3.25
251.11		0.09	SHALEY COAL		
251.20		0.19	COAL - DULL TO BRIGHT		
251.39		0.15	SHALE - CARBONACEOUS TO COALY		
251.54		0.45	COAL - VITREOUS TO BRIGHT		
251.99		0.08	LOST CORE		
252.07		0.50	COAL - VITREOUS TO BRIGHT		
252.57			FLOOR - MUDSTONE AND SILTSTONE POOR		

DEPTH	SIZE DIAMETER	SIZE WT %	SPEC GRAV	WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	CUMULATIVE SAMPLE VALUES THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	OTHER
	1/4×28	91.1	-1.90	30.8	5.2	23.3	29.8	41.7	8413	-	0.33	30.8	5.2	23.3	29.8	41.7	8413	-	0.33										
			+1.90	69.2	2.9	76.6	-	-	-	-	-	100.0	3.6	60.2	-	-	-	-	-										
	28×0	8.9	RAW	100.0	5.0	45.1	21.4	28.5	5430	-	0.31	100.0	5.0	45.1	21.4	28.5	5430	-	0.31										
	1/4×0	100.0	RAW	100.0	3.9	58.5	19.5	18.1	-	-	0.13	CALC.	3.7	58.9	-	-	-	-	-										
	1/4×28	91.1	-1.90	30.8	-	-	-	-	-	-	-	28.0	5.2	23.3	29.8	41.7	8413	-	0.33										
	28×0	8.9	RAW	100.0	-	-	-	-	-	-	-	8.9	5.0	45.1	21.4	28.5	5430	-	0.31										
	1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	36.9	5.1	28.4	27.8	38.6	7809	-	0.33	1.50	36.9	5.1	28.4	27.8	38.6	7809			
	1/4×28	93.6	-1.90	61.1	5.6	18.0	32.2	44.2	9418	-	0.46	61.1	5.6	18.0	32.2	44.2	9418	-	0.46										
			+1.90	38.9	2.9	76.1	-	-	-	-	-	100.0	4.5	40.6	-	-	-	-	-										
	28×0	6.4	RAW	100.0	5.1	34.4	26.3	34.2	7024	-	0.23	100.0	5.1	34.4	26.3	34.2	7024	-	0.23										
	1/4×0	100.0	RAW	100.0	4.7	40.1	26.1	29.1	6205	-	0.24	CALC.	4.5	40.2	-	-	-	-	-										
	1/4×28	93.6	-1.90	61.1	-	-	-	-	-	-	-	57.2	5.6	18.0	32.2	44.2	9418	-	0.46										
	28×0	6.4	RAW	100.0	-	-	-	-	-	-	-	6.4	5.1	34.4	26.3	34.2	7024	-	0.23										
	1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	63.6	5.5	19.5	29.4	43.2	9288	-	0.44	3.70	52.7	5.3	22.0	28.9	41.9	8868			
	1/4×28	94.1	-1.90	73.2	4.6	17.9	34.0	43.5	9478	-	0.35	73.2	4.6	17.9	34.0	43.5	9478	-	0.35										
			+1.90	26.8	2.4	70.7	-	-	-	-	-	100.0	4.0	32.0	-	-	-	-	-										
	28×0	5.9	RAW	100.0	5.0	27.3	30.8	36.9	8168	-	0.26	100.0	5.0	27.3	30.8	36.9	8168	-	0.26										
	1/4×0	100.0	RAW	100.0	4.7	30.9	30.2	34.2	7495	-	0.25	CALC.	4.0	31.7	-	-	-	-	-										
	1/4×28	94.1	-1.90	73.2	-	-	-	-	-	-	-	68.9	4.6	17.9	34.0	43.5	9478	-	0.35										
	28×0	5.9	RAW	100.0	-	-	-	-	-	-	-	5.9	5.0	27.3	30.8	36.9	8168	-	0.26										
	1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	74.8	4.6	18.7	33.7	42.9	9461	-	0.34	6.61	62.4	4.9	20.2	31.4	42.4	9180			
	1/4×28	96.0	-1.90	61.8	4.3	17.9	35.2	42.6	9500	-	0.46	61.8	4.3	17.9	35.2	42.6	9500	-	0.46										
			+1.90	38.2	1.7	70.6	-	-	-	-	-	100.0	3.3	38.0	-	-	-	-	-										
	28×0	4.0	RAW	100.0	4.0	36.0	29.2	30.8	6909	-	0.36	100.0	4.0	36.0	29.2	30.8	6909	-	0.36										
	1/4×0	100.0	RAW	100.0	3.3	38.1	29.0	29.6	6682	-	0.38	CALC	3.3	37.9	-	-	-	-	-										
	1/4×28	96.0	-1.90	61.8	-	-	-	-	-	-	-	59.3	4.3	17.9	35.2	42.6	9500	-	0.46										
	28×0	4.0	RAW	100.0	-	-	-	-	-	-	-	4.0	4.0	36.0	29.2	30.8	6909	-	0.36										
	1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	63.3	4.2	18.9	34.8	41.9	9442	-	0.45	7.05	62.5	4.9	20.1	31.6	42.3	9197			
	1/4×28	93.5	-1.90	27.0	4.3	25.1	30.4	40.2	8597	-	0.27	27.0	4.3	25.1	30.4	40.2	8597	-	0.27										
			+1.90	73.0	1.5	74.4	-	-	-	-	-	100.0	2.3	61.0	-	-	-	-	-										
	28×0	6.5	RAW	100.0	3.5	46.7	26.5	23.3	5429	-	0.08	100.0	3.5	46.7	26.5	23.3	5429	-	0.08										
	1/4×0	100.0	RAW	100.0	2.4	60.1	21.7	15.8	-	-	0.21	CALC	2.4	60.1	-	-	-	-	-										
	1/4×28	93.5	-1.90	27.0	-	-	-	-	-	-	-	25.2	4.3	25.1	30.4	40.2	8597	-	0.27										
	28×0	6.5	RAW	100.0	-	-	-	-	-	-	-	6.5	3.5	46.7	26.5	23.3	5429	-	0.08										
	1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	31.7	4.1	28.8	29.7	39.2	8143	-	0.23	7.63	60.1	4.8	20.5	31.5	42.2	9155			
	1/4×28	93.6	-1.90	83.1	6.0	12.7	34.2	47.1	10038	-	0.40	83.1	6.0	12.7	34.2	47.1	10038	-	0.40										
			+1.90	16.9	1.9	66.2	-	-	-	-	-	100.0	5.3	21.7	-	-	-	-	-										
	28×0	6.4	RAW	100.0	5.7	21.0	32.1	41.2	8884	-	0.42	100.0	5.7	21.0	32.1	41.2	8884	-	0.42										
	1/4×0	100.0	RAW	100.0	5.5	21.7	32.7	40.1	8826		0.41	CALC	5.3	21.6	-	-	-	-	-										
	1/4×28	93.6	-1.90	83.1	-	-	-	-	-	-	-	77.8	6.0	12.7	34.2	47.1	10038	-	0.40										
	28×0	6.4	RAW	100.0	-	-	-	-	-	-	-	6.4	5.7	21.0	32.1	41.2	8884	-	0.42										
	1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	84.2	5.9	13.3	34.0	46.6	10048	-	0.40	3.25	84.2	5.9	13.3	34.0	46.6	10048			

A0197		EXCLUDED									
A0198 (0.79) THK	3.70	72.4	4.7	18.8	32.8	42.9	9428				
A0199	2.91	74.8	4.6	18.7	33.7	42.9	9461				
A0200		EXCLUDED									
A0201		EXCLUDED									

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X
ELEVATION:
DIP: BEARING:
CORE SIZE: CASING:
BITS USED:
MUD USED:
m LEFT IN HOLE: m
DATE START:
DRILLER:
TESTS:
SAMPLED BY:
FINISH:
OVERALL RECOVERY:
DATE: ANALYZED BY:

BOREHOLE NO. BP-79-15
PAN OCEAN OIL LTD. (PAGE 2)
MINING DIVISION – COAL

LOGGED BY: DATE:
SIGNED:

GEOLOGICAL LOG – SCALE: 1:500

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
162.5			
218.05		7.63	NO. 1 SEAM HORIZON
225.68		6.71	MUDSTONE; MEDIUM GRAY BROWN, IN PART CARBONACEOUS, SILTY, BASALLY,
232.39		2.00	SANDSTONE; FINE GRAINED.
234.39		14.93	SANDSTONE, CONGLOMERATIC SANDSTONE AND CONGLOMERTE; MEDIUM GRAY, MEDIUM COARSE AND GRANULE CONGLOMERATIC, SHORT INTERVALS OF SMALL AND MEDIUM PEBBLE CONGLOMERATE.
249.32		3.25	NO. 2 SEAM HORIZON
252.57		12.91	MUDSTONE AND SILTSTONE; MEDIUM GRAY TO MEDIUM BROWNISH GRAY, SOME CARBONACEOUS PLANT FRAGMENTS AND PLANT IMPRESSIONS.
265.48		4.44	NO. 3 SEAM HORIZON
269.27		5.66	SHALE; MEDIUM TO MEDIUM DARK GRAY; IN PART CARBONACEOUS.
274.93			END OF HOLE

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
			NO. 3 SEAM HORIZON		
			ROOF; MUDSTONE AND SILTSTONE POOR		
264.83		0.65	SHALE – CARBONACEOUS TO COALY		
265.48		0.29	COAL – MOSTLY BRIGHT		
265.77		0.02	CARBONACEOUS SHALE		
265.79		0.08	COAL – SILTY TO DIRTY		
265.87		0.09	SHALE – CARBONACEOUS		
265.96		0.04	COAL		
266.00		0.20	SHALE – CARBONACEOUS TO COALY		
266.20		0.41	COAL – VITREOUS		
266.61		0.22	SHALE – CARBONACEOUS		
266.83		0.59	COAL – VITREOUS TO BRIGHT		
267.41		0.08	SHALE – CARBONACEOUS	AO 203	3.32
267.49		0.39	COAL – VITREOUS TO BRIGHT		
267.83		0.28	SHALE – CARBONACEOUS		
268.15		0.14	SHALE – LIGHT GRAY		
268.35		0.11	COAL – VITREOUS TO BRIGHT		
268.41		0.05	SHALE – CARBONACEOUS		
268.46		0.34	COAL – VITREOUS		
268.80		0.35	SHALE – CARBONACEOUS		
269.15		0.12	SHALEY COAL		
269.27			FLOOR – SHALE, POOR		

SIZE DIAMETER	SIZE WT %	SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S
1/4×28	93.2	-1.90	48.6	4.9	16.2	33.7	45.2	9807	-	0.36
		+1.90	51.4	1.7	73.3	-	-	-	-	-
28×0	6.8	RAW	100.0	4.1	40.0	27.0	28.9	6307	-	0.23
1/4×0	100.0	RAW	100.0	3.8	43.3	26.3	26.6	5866	-	0.23
1/4×28	93.2	-1.90	48.6	-	-	-	-	-	-	-
28×0	6.8	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-

CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S
48.6	4.9	16.2	33.7	45.2	9807	-	0.36
100.0	3.3	45.5	-	-	-	-	-
100.0	4.1	40.0	27.0	78.9	6307	-	0.23
CALC.	3.3	45.1	-	-	-	-	-
45.3	4.9	16.2	33.7	45.2	9807	-	0.36
6.8	4.1	40.0	27.0	28.9	6307	-	0.23
52.1	4.8	18.8	32.9	43.3	9511	-	0.34

CUMULATIVE SAMPLE VALUES THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S
3.32	52.1	4.8	18.8	32.9	43.3	9511		

OTHER

062055

LOCATION MAP

TN

SCALE:

BOREHOLE NO. BP-79-16A
PAN OCEAN OIL LTD. (PAGE 1)
MINING DIVISION – COAL

COORDINATES: Y 12,340 m N. X 10,190 m W. OF S.E. CORNER OF CL 77.
ELEVATION: 598.65 m BITS USED J.K. SMIT NO.3 COMBINATION
DIP - 90° BEARING - MUD USED 199 BAGS OIL: 122 BAGS TROL.
CORE SIZE NQ CASING N.W. 12.19 m LEFT IN HOLE NIL m
N.W. 30.48

DATE START JULY 27, 1979 FINISH AUGUST 5, 1979
DRILLER CARON DRILLMOND DRILLING OVERALL RECOVERY 79%
TESTS
SAMPLED BY O. CULLINGHAM DATE AUGUST 5/79 ANALYZED BY BIRTLEY COAL & MINERALS TESTING SIGNED

LOGGED BY O. CULLINGHAM DATE AUGUST 5, 1979

GEOLOGICAL LOG – SCALE: 1:500

DEPTH	THICKNESS	DESCRIPTION
	30.18	OVERBURDEN: TRICONED TO 15.54; CHIPS OF QUARTZ AND CHERTS; LIMONITE STAINING; SOME FRAGMENTS OF SILTSTONE AND GRAY SHALE. 15.54-30.18 PEBBLES AND COBBLES OF QUARTZITE, CHERT AND LIMESTONE; FEW CHUNKS, PROBABLY BOULDERS, OF GRAPHITIC SCHIST.
30.18	7.01	MUDSTONE & SANDY MUDSTONE: MEDIUM GRAY TO MEDIUM GRAY BROWN; IN PART SANDY.
37.19	4.06	CARBONACEOUS TO COALY SHALE: THIN COALY SHALE AND SHALEY COAL STRINGERS.
41.25	2.51	MUDSTONE: LIGHT GRAY TO LIGHT GRAY GREEN.
43.76	8.74	SANDSTONE: GRADATIONAL FROM VERY FINE GRAINED TO GRANULE CONGLOMERATIC.
52.50	0.60	CARBONACEOUS AND COALY SHALE:
53.10	12.30	MUDSTONE: MEDIUM GRAY, SHORT INTERVALS OF SILTSTONE AND VERY FINE GRAINED SANDSTONE
65.40	0.74	CARBONACEOUS AND COALY SHALE / COAL STRINGERS.
66.14	6.10	MUDSTONE/SILTSTONE: MEDIUM GRAY, GRADATIONAL TO SANDSTONE BELOW.
72.24	7.62	SANDSTONE: SILTSTONE TO MEDIUM GRAINED TO GRANULE CONGLOMERATIC AT BASE.
79.86	0.10	MUDSTONE: MEDIUM GRAY.
79.96	1.79	COAL, CARBONACEOUS AND COALY SHALE.
81.75	8.21	MUDSTONE: MEDIUM GRAY, CONTAINS SPLINTS OF VITREOUS AND BRIGHT COAL
89.96	1.20	CARBONACEOUS TO COALY SHALE AND COAL:
91.16	2.62	MUDSTONE: MEDIUM TO MEDIUM DARK GRAY.
93.78	1.32	CARBONACEOUS TO COALY SHALE AND COAL:
95.10	1.32	MUDSTONE: MEDIUM GRAY.
96.62	9.83	SANDSTONE: FINE GRAINED TO GRANULE CONGLOMERATIC, GRADATIONAL FROM ABOVE; SHORT INTERVALS OF MEDIUM PEBBLE CONGLOMERATE AT BASE OF BEDS.
106.45	9.98	MUDSTONE: MEDIUM GRAY, CONTAINS, SHORT INTERVALS OF SANDSTONE - MINOR COAL AND CARBONACEOUS AND COALY SHALE.
116.43	13.72	SANDSTONE; VERY FINE GRAINED TO SMALL PEBBLE CONGLOMERATIC, BEDS COARSEN DOWNWARDS.
130.15	6.85	MUDSTONE: MEDIUM GRAY AND MEDIUM GRAY GREEN.
137.00	7.48	SILTSTONE AND VERY FINE GRAINED SANDSTONE
144.48	8.62	SANDSTONE: MEDIUM GRAINED WITH SHORT INTERVALS OF COARSE TO GRANULE CONGLOMERATIC.
153.10	12.10	MUDSTONE, CARBONACEOUS MUDSTONE AND THIN COAL BANDS:

DETAILS OF COAL SEAMS – SCALE:

DEPTH	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS	SIZE DIAMETER	SIZE WT %	SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C.	BTU	F.S.I.	S
		ROOF - SANDSTONE MEDIUM GRAINED TO GRANULE CONGLOMERATE GOOD			1/4×28	88.0	-1.90 +1.90	84.1 15.9	5.0 3.5	17.8 78.6	33.7 -	43.5 -	9441 -	- -	0.34 -
					28×0	12.0	RAW	100.0	7.5	27.0	27.5	38.0	7771	-	0.34
79.86 79.96		COAL - VITREOUS TO BRIGHT SHALY IN ROOF AND FLOOR			1/4×0	100.0	RAW	100.0	8.7	25.7	28.9	36.7	7920	-	0.28
	1.59		A0186	1.59	1/4×28	88.0	-1.90	84.1	-	-	-	-	-	-	-
					28×0	12.0	RAW	100.0	-	-	-	-	-	-	-
81.55 81.75		FLOOR - MUDSTONE MEDIUM GREY; BLOCKY			1/4×0	100.0	COMB	-	-	-	-	-	-	-	-

DEPTH	CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
	84.1 100.0	5.0 4.8	17.8 27.5	33.7 -	43.5 -	9441 -	- -	0.34 -
	100.0	7.5	27.0	27.5	38.0	7771	-	0.34
	CALC.	5.1	27.4	-	-	-	-	-
	74.0	5.0	17.8	33.7	43.5	9441	-	0.34
	12.0	7.5	27.0	27.5	38.0	7771	-	0.34
	86.0	5.3	19.6	32.4	42.4	9208	-	0.34

CUMULATIVE SAMPLE VALUES THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
1.59	86.0	5.3	19.6	32.4	42.4	9208		

OTHER

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X

ELEVATION:

DIP: BEARING:

CORE SIZE: CASING:

BITS USED:

MUD USED:

m LEFT IN HOLE: m

DATE START: FINISH:

DRILLER: OVERALL RECOVERY:

TESTS:

SAMPLED BY: DATE: ANALYZED BY:

BOREHOLE NO. BP-79-16A

PAN OCEAN OIL LTD. (PAGE 2)

MINING DIVISION – COAL

LOGGED BY: O. CULLINGHAM DATE: AUGUST 5, 1979

SIGNED:

GEOLOGICAL LOG – SCALE: 1: 500

DETAILS OF COAL SEAMS – SCALE:

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
65.20			
		19.81	SANDSTONE: GRADATIONAL FROM ABOVE THROUGHT SILTSTONE TO VERY FINE GRAINED SANDSTONE TO MEDIUM GRAINED AND SMALL TO MEDIUM PEBBLE CONGLOMERATIC.
185.01			
		4.58	CONGLOMERATE; MEDIUM PEBBLE CONGLOMERATE; QUARTZITE AND CHERT.
189.59			
		4.11	MUDSTONE: MEDIUM DARK GRAY BROWN TO BROWNISH GRAY.
193.70			
		8.14	CONGLOMERATE: MEDIUM PEBBLE CONGLOMERATE WITH FEW SHORT INTERVALS OF LARGE PEBBLE CONGLOMERATE.
211.84			END OF HOLE

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC GRAV	WEIGHT PERCENT: YIELD	WEIGHT PERCENT: PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	WEIGHT PERCENT: BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT: YIELD	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	CUMULATIVE WEIGHT PERCENT: BTU	F.S.I.	S	CUMULATIVE SAMPLE VALUES: THICKNESS	CUMULATIVE SAMPLE VALUES: YIELD	CUMULATIVE SAMPLE VALUES: PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	CUMULATIVE SAMPLE VALUES: BTU	F.S.I.	S	OTHER		

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y 375 m N X 325 m W of S.E. corner of CL 83
ELEVATION: 539.53 m BITS USED: J.K. SMIT COMBINATION
DIP: -90° BEARING: NA MUD USED: 145 gallons POLYDRILL; 105 gallons POLYPOWDER
CORE SIZE: NQ CASING: HW 2.8 m NW 82.3 m m LEFT IN HOLE: NIL NIL m

DATE START: JULY 30/79 FINISH: AUGUST 17/79
DRILLER: CARON DIAMOND DRILLING OVERALL RECOVERY: 97%
TESTS: GAMMA LOG 300m; DIP TESTS @ 120 m - 89° & @ 360 m - 83.5°
SAMPLED BY: O. CULLINGHAM DATE: AUGUST 26/79 ANALYZED BY: BIRTLEY COAL + MINERALS TESTING

BOREHOLE NO. BP-79-17
PAN OCEAN OIL LTD. (PAGE 1 OF 4)
MINING DIVISION – COAL

LOGGED BY: O. CULLINGHAM, D. HOPE DATE: AUGUST 26/79
SIGNED:

GEOLOGICAL LOG – SCALE: 1:500

DETAILS OF COAL SEAMS – SCALE:

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
			NO SAMPLE
27.43			TRICONE SAMPLES - SANDSTONE, FINE TO MEDIUM GRAINED, QUARTZ AND CHERT WITH APPROXIMATELY 10% SHALE.
33.35		6.08	SANDSTONE - MEDIUM GRAY TO MEDIUM GRAY BROWN, FINE TO COARSE GRAINED COARSENING DOWNWARD. BEDDING @ 78° TO CORE AXIS.
39.61		4.34	CARBONACEOUS TO COALY MUDSTONE AND COAL
43.95		2.34	MUDSTONE - SOFT, CONTAINS COAL MATERIAL THROUGHOUT
46.29		2.51	CARBONACEOUS MUDSTONE
48.80		2.30	MUDSTONE
51.10		1.42	COAL AND COALY MUDSTONE
52.52		8.20	MUDSTONE - MEDIUM BROWNISH GRAY, SOFT IN PART WITH MUDDY TEXTURE.
60.72		7.38	SANDSTONE - MEDIUM TO MEDIUM DARK GRAY, FINE TO MEDIUM GRAINED, GRADATIONAL DOWNWARD.
68.10		1.52	MUDSTONE - MEDIUM BROWISH GRAY
69.62		0.14	CARBONACEOUS TO COALY MUDSTONE
69.76		0.74	MUDSTONE - MEDIUM GRAY GREEN
70.50		3.26	MUDSTONE - MEDIUM GRAY GREEN GRADES TO MEDIUM BROWNISH GRAY
73.76		0.94	MUDSTONE - LIGHT GRAY, SOFT, SANDY.
74.70		13.00	SANDSTONE - MEDIUM GRAY, FINE GRAINED TO CONGLOMERATIC GRADATION DOWNWARD.
87.70		1.11	MUDSTONE - MEDIUM BROWNISH GRAY
88.81		0.87	COAL AND COALY SHALE
89.68		4.84	MUDSTONE - MEDIUM TO MEDIUM LIGHT GRAY.
94.52		13.33	SANDSTONE - MEDIUM GRAY, FINE GRAINED TO SMALL PEBBLE CONGLOMERATIC, GRADATIONAL
107.85		5.25	MUDSTONE - MEDIUM GRAY BROWN, SOFT FRAGMENTAL TO BLOCKY
113.10		15.00	SANDSTONE - MEDIUM GRAY, FINE TO MEDIUM GRAINED WITH SHORT INTERVALS OF COARSE GRANULE CONGLOMERATIC
128.10		2.82	MUDSTONE - MEDIUM GRAY BROWN, FRAGMENTAL.
130.92		1.21	CARBONACEOUS AND COALY MUDSTONE
132.13		6.15	MUDSTONE - MEDIUM GRAY-BROWN, SOFT FRAGMENTAL, IN PART SANDY.
138.28		2.17	SILTSTONE - MEDIUM GRAY, CROSS-BEDDED, SLUMPS.
140.45		4.58	MUDSTONE - MEDIUM GRAY BROWN, SOFT FRAGMENTAL TO BLOCKY
145.03		9.50	SANDSTONE - MEDIUM GRAY, MEDIUM TO COARSE GRAINED WITH SHORT INTERVALS OF GRANULE CONGLOMERATIC
154.53		22.62	SILTSTONE AND MUDSTONE - MEDIUM GRAY-BROWN TO MEDIUM GRAY. SHORT INTERVALS OF CARBONACEOUS AND COALY MUDSTONE. MUDSTONES ARE FRAGMENTAL AND SOFT. SILTSTONES ARE GENERALLY MODERATLY HARD AND SOUND.
160.00			(CONTINUED ON PAGE 2)

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC GRAV	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT: YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL	F.C.	BTU	F.S.I.	S	CUMULATIVE SAMPLE VALUES: THICKNESS	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	OTHER

062055

LOCATION MAP

TN

SCALE:

COORDINATES: Y X
ELEVATION:
DIP: BEARING:
CORE SIZE: CASING:
BITS USED:
MUD USED:
m LEFT IN HOLE: m

DATE START:
DRILLER:
TESTS:
SAMPLED BY:

FINISH:
OVERALL RECOVERY:
DATE: ANALYZED BY:

BOREHOLE NO. BP-79-17
PAN OCEAN OIL LTD. (PAGE 2)
MINING DIVISION - COAL

LOGGED BY: DATE:
SIGNED:

GEOLOGICAL LOG - SCALE: 1:500

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
160.00			(CONTINUED FROM PAGE 1)
177.15		2.35	SANDSTONE- FINE TO MEDIUM GRADATIONAL DOWNWARD
179.50		4.60	MUDSTONE - MEDIUM GRAY BROWN, CARBONACEOUS AT TOP BECOMING LESS DOWN SECTION.
184.10		5.27	SANDSTONE- MEDIUM GRAY, GRADES DOWNWARD TO MEDIUM GRAINED GRADATIONAL FROM MUDSTONE
189.37		8.30	SHALE - MEDIUM BROWNISH GRAY, CUBIC WEATHERING
197.67		2.13	SANDSTONE-MEDIUM GRAY, SILT TO FINE GRAINED.
199.80		5.20	SHALE - MEDIUM LIGHT GRAY TO GREENISH GRAY. FRAGMENTAL TO BLOCKY. CUBIC FRACTURING.
205.00		1.76	SANDSTONE - MEDIUM GRAY, SILT TO FINE GRAINED
206.76		1.15	SHALE - MEDIUM DARK GRAY
207.91		1.59	SANDSTONE - MEDIUM GRAY, FINE GRAINED CROSS-BEDDED.
209.50		7.88	CONGLOMERATE - MEDIUM TO VERY LARGE PEBBLE CONGLOMERATE. POORLY PEBBLE CONGLOMERATE. POORLY SORTED CHERT AND QUARTZITE
217.38		2.84	SHALE AND SANDSTONE - MEDIUM GRAY.
220.22		2.89	CONGLOMERATE - AS ABOVE
223.11			RODS BROKE AT 75.59 m. ALL ATTEMPTS TO RETRIVE RODS FAILED AND THE HOLE WAS WEDGED AT 82.30 m AND 79-17A COMMENCED.

DETAILS OF COAL SEAMS - SCALE:

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC GRAV	WEIGHT PERCENT: YIELD	WEIGHT PERCENT: PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT: YIELD	CUMULATIVE WEIGHT PERCENT: PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	CUMULATIVE SAMPLE VALUES: THICKNESS	YIELD	CUMULATIVE SAMPLE VALUES: PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	OTHER		

062035

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y 375 m N X 325 m W of SE. corner of CL 83
ELEVATION: 539.53 m BITS USED: J.K. SMIT COMBINATION
DIP: -90° BEARING: N.A. MUD USED: 145 gallons POLYDRILL, 105 gallons POLYPOWDER
CORE SIZE: NQ CASING: HW 2.8 m, NW 82.3 m m LEFT IN HOLE: NIL, NIL m

DATE START: JULY 30/79 FINISH: AUGUST 17/79
DRILLER: CARON DIAMOND DRILLING OVERALL RECOVERY: 97%
TESTS: GAMMA LOG 300m, DIP TESTS @ 120m -89°& @ 360m -83.5°
SAMPLED BY: O.CULLINGHAM DATE: AUGUST 26/79 ANALYZED BY: BIRTLEY COAL + MINERALS TESTING

BOREHOLE NO. BP-79-17A
PAN OCEAN OIL LTD. (PAGE 3)
MINING DIVISION - COAL

LOGGED BY: O.CULLINGHAM, D. HOPE DATE: AUGUST 26/79 SIGNED:

GEOLOGICAL LOG - SCALE: 1:500

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
			HOLE BP-79-17A COMMENCED BY WEDGING AT 82.30m IN HOLE BP-79-17 GRAPHIC LOG FOR HOLE BP-79-17A COMMENCES AT TOP OF THICK CONGLOMERATE.
210			CONGLOMERATE - MASSIVE, CROSSBEDDED, LARGE PEBBLE CONGLOMERATE, LARGE PEBBLE CONGLOMERATE, PEBBLES ARE WELL ROUNDED, BLADE, ROLLER AND SEMI-SPHERICAL, CHERT AND QUARTZITE FROM WHITE THROUGH BLACK, FEW GREEN. LENSES AND CROSS-BEDS OF SANDSTONE AND SILTY SHALE.
217.95			
221.10			
223.33			
225.05			
238.10			
238.90			
244.50			
245.40		93.20	
286.00			
303.20		8.00	No. 1 SEAM HORIZON
311.20		6.05	CARBONACEOUS TO COALY SHALE-MEDIUM TO DARK GRAY, DULL, CONTAINS SPLINTS, BANDS AND STRINGERS OF COAL TO 0.05m THICK.
317.25		4.92	SANDSTONE - GRADATIONAL DOWNWARDS FROM VERY FINE GRAINED TO CONGLOMERATIC.
322.17		5.43	CONGLOMERATE - SMALL TO MEDIUM PEBBLE, WELL ROUNDED, BLADE, ROLLER AND SEMI-SPHERICAL, CHERT AND QUARTZITE
327.60		4.28	SANDSTONE - MEDIUM GRAINED TO CONGLOMERATIC.
331.88		2.17	No. 2 SEAM HORIZON
334.05		3.27	SHALE - MEDIUM GRAY, FRAGMENTAL
337.32		7.53	SANDSTONE - VERY FINE TO CONGLOMERATIC COARSENS DOWNWARD, CROSS-BEDDED.
344.85		5.15	SHALE - MEDIUM DARK TO DARK GRAY, IN PART CARBONACEOUS
350.00		3.02	SHALEY SANDSTONE/SANDY SHALE - LAMINATED, CROSS-BEDDED
353.02		3.08	No. 3 SEAM HORIZON
356.10		4.30	SHALE/CARBONACEOUS AND COALY INTERVALS
360.40		1.40	SHALEY SILTSTONE/SILTY SHALE - LAMINATED, CROSS-BEDDED
361.80			

DETAILS OF COAL SEAMS - SCALE: 1:100

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
			No. 1 SEAM HORIZON		
			ROOF CONGLOMERATE, GOOD		
303.20		0.68	CARBONACEOUS AND COALY SHALE THIN COAL BANDS AT TOP	A0204	0.68
303.88		0.30	COAL - DULL TO VITREOUS/PARTINGS AND BANDS OF SHALEY COAL, CARBONACEOUS AND COALY SHALE AND SHALE.	A0205	2.21
		0.73			
		0.23			
		0.39			
		0.19			
		0.37	COAL - VITREOUS AND BRIGHT	A0206	0.67
306.09		0.67	SHALE - MEDIUM GRAY		
306.76		0.23	COAL AND CARBONACEOUS AND COALY SHALE		
307.22		0.23		A0207	1.24
		0.78	COAL - VITREOUS AND BRIGHT		
308.00		0.63	SHALE - DULL, FRAGMENTAL	A0208	0.63
308.63		1.27	COAL - MOSTLY VITREOUS AND BRIGHT, CONTAINS FEW PARTINGS OF COALY SHALE.		
309.86		0.24	CARBONACEOUS AND COALY SHALE/ SHALY COAL	A0209	2.27
310.22		0.12			
310.61		0.39			
310.90		0.29	COAL - DULL TO VITREOUS		
311.20		0.30	CARBONACEOUS SHALE - 0.10 COAL AT BASE	A0210	0.30
			FLOOR - CARBONACEOUS SHALE, POOR		

SIZE		WEIGHT PERCENT									CUMULATIVE WEIGHT PERCENT								CUMULATIVE SAMPLE VALUES									OTHER		
DIAMETER	WT %	SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C.	BTU	F.S.I.	S	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C.	BTU	F.S.I.	S	THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C.	BTU	F.S.I.	S			
1/4×28	92.0	-1.90	12.2	3.1	28.4	29.0	39.5	8142	-	0.44	12.2	3.1	28.4	29.0	39.5	8142	-	0.44												
		+1.90	87.8	1.4	85.7	-	-	-	-	-	100.0	1.6	78.7	-	-	-	-	-												
28×0	8.0	RAW	100.0	2.7	74.5	11.6	11.2	-	-	0.13	100.0	2.7	74.5	11.6	11.2	-	-	0.13												
1/4×0	100.0	RAW	100.0	2.2	78.1	10.7	9.0	-	-	0.12	CALC.	1.7	78.4	-	-	-	-	-												
1/4×28	92.0	-1.90	12.2	-	-	-	-	-	-	-	11.2	3.1	28.4	29.0	39.5	8142	-	0.44												
28×0	8.0	RAW	100.0	-	-	-	-	-	-	-	8.0	2.7	74.5	11.6	11.2	-	-	0.13												
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	19.2	2.9	46.0	22.3	28.6	5116	-	0.31	7.70	45.8	3.8	23.7	29.7	42.3	8752					
1/4×28	93.0	-1.90	58.2	3.3	21.8	31.3	43.6	8972	-	0.35	58.2	3.3	21.8	31.3	43.6	8972	-	0.35												
		+1.90	41.8	1.4	72.6	-	-	-	-	-	100.0	2.5	43.0	-	-	-	-	-												
28×0	7.0	RAW	100.0	6.3	35.6	25.3	32.8	6640	-	0.18	100.0	6.3	35.6	25.3	32.8	6640	-	0.18												
1/4×0	100.0	RAW	100.0	4.6	42.6	24.9	27.9	5826	-	0.24	CALC.	2.8	42.5	-	-	-	-	-												
1/4×28	93.0	- 1.90	58.2	-	-	-	-	-	-	-	54.1	3.3	21.8	31.3	43.6	8972	-	0.35												
28×0	7.0	RAW	100.0	-	-	-	-	-	-	-	7.0	6.3	35.6	25.3	32.8	6640	-	0.18												
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	61.1	3.6	24.5	30.1	41.4	8606	-	0.33	7.02	48.3	3.9	22.8	30.0	42.8	8892					
1/4×28	96.6	-1.90	2.2	5.3	32.6	27.2	34.9	7533	-	0.42	2.2	5.3	32.6	27.2	34.9	7533	-	0.42												
		+1.90	97.8	3.0	82.6	-	-	-	-	-	100.0	3.0	81.5	-	-	-	-	-												
28×0	3.4	RAW	100.0	3.0	75.0	12.8	9.2	-	-	0.17	100.0	3.0	75.0	12.8	9.2	-	-	0.17												
1/4×0	100.0	RAW	100.0	3.1	81.3	9.5	6.1	-	-	0.17	CALC.	3.0	81.3	-	-	-	-	-												
1/4×28	96.6	- 1.90	2.2	-	-	-	-	-	-	-	2.1	5.3	32.6	27.2	34.9	7533	-	0.42												
28×0	3.4	RAW	100.0	-	-	-	-	-	-	-	3.4	3.0	75.0	12.8	9.2	-	-	0.17												
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	5.5	3.8	52.8	20.3	22.6	4026	-	0.39	4.81	42.5	4.1	21.8	30.0	43.8	9080					
1/4×28	94.5	-1.90	65.5	4.3	11.0	28.9	55.8	10525	-	0.34	65.5	4.3	11.0	28.9	55.8	10525	-	0.34												
		+1.90	34.5	2.6	73.9	-	-	-	-	-	100.0	3.7	32.7	-	-	-	-	-												
28×0	5.5	RAW	100.0	4.6	36.2	26.6	32.6	6941	-	0.17	100.0	4.6	36.2	26.6	32.6	6941	-	0.17												
1/4×0	100.0	RAW	100.0	4.5	32.2	23.9	38.4	7450	-	0.20	CALC.	3.7	32.9	-	-	-	-	-												
1/4×28	94.5	- 1.90	65.5	-	-	-	-	-	-	-	61.9	4.3	11.0	28.9	55.8	10525	-	0.34												
28×0	5.5	RAW	100.0	-	-	-	-	-	-	-	5.5	4.6	36.2	26.6	32.6	6941	-	0.17												
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	67.4	4.3	13.1	28.7	53.7	10309	-	0.33	4.14	48.5	4.1	21.2	30.2	44.2	9173					
1/4×28	95.8	-1.90	2.0	4.5	34.5	27.7	33.3	7078	-	0.39	2.0	4.5	34.5	27.7	33.3	7078	-	0.39												
		+1.90	98.0	3.0	82.9	-	-	-	-	-	100.0	4.9	49.8	-	-	-	-	-												
28×0	4.2	RAW	100.0	3.7	79.7	12.9	3.7	-	-	0.06	100.0	3.7	79.7	12.9	3.7	-	-	0.06												
1/4×0	100.0	RAW	100.0	3.1	81.6	12.1	3.2	-	-	0.10	CALC.	4.8	51.0	-	-	-	-	-												
1/4×28	95.8	- 1.90	2.0	-	-	-	-	-	-	-	1.9	4.5	34.5	27.7	33.3	7078	-	0.39												
28×0	4.2	RAW	100.0	-	-	-	-	-	-	-	4.2	3.7	79.7	12.9	3.7	-	-	0.06												
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	6.1	3.9	63.6	18.1	14.2	2608	-	0.33	2.90	40.4	4.0	27.0	31.5	37.5	8365					
1/4×28	94.3	-1.90	47.0	4.0	23.4	32.7	39.9	8827	-	0.44	47.0	4.0	23.4	32.7	39.9	8827	-	0.44												
		+1.90	53.0	5.8	73.3	-	-	-	-	-	100.0	4.9	49.8	-	-	-	-	-												
28×0	5.7	RAW	100.0	4.1	44.0	25.5	26.4	5719	-	0.25	100.0	4.1	44.0	25.5	26.4	5719	-	0.25												
1/4×0	100.0	RAW	100.0	3.3	49.4	23.4	23.9	5054	-	0.24	CALC.	4.8	49.5	-	-	-	-	-												
1/4×28	94.3	-1.90	47.0	-	-	-	-	-	-	-	44.3	4.0	23.4	32.7	39.9	8827	-	0.44												
28×0	5.7	RAW	100.0	-	-	-	-	-	-	-	5.7	4.1	44.0	25.5	26.4	5719	-	0.25												
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	50.0	4.0	25.8	31.8	38.3	8560	-	0.42	2.27	50.0	4.0	25.8	31.8	38.3	8560					
1/4×28	97.4	-1.90	15.4	4.4	39.9	26.1	29.6	6312	-	0.42	15.4	4.4	39.9	26.1	29.6	6312	-	0.42												
		+1.90	84.6	1.7	76.5	-	-	-	-	-	100.0	2.1	70.9	-	-	-	-	-												
28×0	2.6	RAW	100.0	2.5	68.2	16.0	13.3	-	-	0.23	100.0	2.5	68.2	16.0	13.3	-	-	0.23												
1/4×0	100.0	RAW	100.0	2.1	70.8	16.4	10.7	-	-	0.19	CALC.	2.1	70.8	-	-	-	-	-												
1/4×28	97.4	- 1.90	15.4	-	-	-	-	-	-	-	15.0	4.4	39.9	26.1	29.6	6312	-	0.42												
28×0	2.6	RAW	100.0	-	-	-	-	-	-	-	2.6	2.5	68.2	16.0	13.3	-	-	0.23												
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	17.6	4.1	42.4	25.1	28.1	5841	-	0.39	EXCLUDED											

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X

ELEVATION: BITS USED:

DIP: BEARING: MUD USED:

CORE SIZE: CASING: m LEFT IN HOLE: m

DATE START: FINISH:

DRILLER: OVERALL RECOVERY:

TESTS:

SAMPLED BY: DATE: ANALYZED BY:

BOREHOLE NO. BP-79-17A
PAN OCEAN OIL LTD. (PAGE 4)
MINING DIVISION – COAL

LOGGED BY: DATE:

SIGNED:

GEOLOGICAL LOG – SCALE:

DETAILS OF COAL SEAMS – SCALE:

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
331.88		1.18	No. 2 SEAM HORIZON ROOF-SANDSTONE AND CONGLOMERATIC SANDSTONE, GOOD COAL-BRIGHT, BANDED, CONCHOIDAL AND BLOCKY FRACTURE
333.06		0.21	CARBONACEOUS AND COALY SHALE
		0.63	COAL-MOSTLY BRIGHT, BECOMES SHALY IN BASAL 0.15m
334.05		0.15	FLOOR-SHALE, FRAGMENTAL, POOR
353.02		0.15	No. 3 SEAM HORIZON ROOF-LAMINATED SHALE AND SANDSTONE, PLATY CARBONACEOUS AND COALY SHALE
353.45		0.28	0.15m COAL AT TOP
		0.57	COAL-MOSTLY BRIGHT, FEW BANDS OF DULL CARBONACEOUS SHALE
354.02		1.06	
355.08		0.14	MUDSTONE-MEDIUM BROWN CARBONACEOUS
		0.52	COAL-BRIGHT, PARTINGS OF DULL COALY SHALE IN DENSE BASALTY
356.10		0.36	
		0.85	FLOOR-CARBONACEOUS SHALE, COAL STRINGERS
356.95		0.34	
		1.10	
358.39		0.25	
358.64			

SAMPLE NUMBER	THICKNESS	SIZE DIAMETER	SIZE WT %	WEIGHT PERCENT: SPEC GRAV	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	BTU	F.S.I.	S
A0211	2.17	1/4×28	95.6	-1.90	73.2	3.5	14.5	33.6	48.4	9958	-	0.50
				+1.90	26.8	1.4	75.2	-	-	-	-	-
		28×0	4.4	RAW	100.0	5.6	23.2	30.7	40.5	8550	-	0.33
		1/4×0	100.0	RAW	100.0	4.7	30.1	38.7	36.5	7696	-	0.33
		1/4×28	95.6	-1.90	73.2	-	-	-	-	-	-	-
		28×0	4.4	RAW	100.0	-	-	-	-	-	-	-
		1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-
A0212	0.43	1/4×28	97.2	-1.90	17.0	3.1	32.9	29.5	34.5	7832	-	0.76
				+1.90	83.0	1.5	77.1	-	-	-	-	-
		28×0	2.8	RAW	100.0	2.8	58.3	20.2	18.7	-	-	0.44
		1/4×0	100.0	RAW	100.0	1.9	69.0	17.9	11.2	-	-	0.33
		1/4×28	97.2	-1.90	17.0	-	-	-	-	-	-	-
		28×0	2.8	RAW	100.0	-	-	-	-	-	-	-
		1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-
A0213	2.65	1/4×28	94.6	-1.90	63.6	4.1	18.9	30.9	46.1	9329	-	0.44
				+1.90	36.4	1.7	71.9	-	-	-	-	-
		28×0	5.4	RAW	100.0	4.8	33.9	28.9	32.4	7132	-	0.31
		1/4×0	100.0	RAW	100.0	4.0	38.1	27.6	30.3	6584	-	0.23
		1/4×28	94.6	-1.90	63.6	-	-	-	-	-	-	-
		28×0	5.4	RAW	100.0	-	-	-	-	-	-	-
		1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-

CUMULATIVE WEIGHT PERCENT	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	BTU	F.S.I	S
	73.2	3.5	14.5	33.6	48.4	9958	-	0.50
	100.0	2.9	30.8	-	-	-	-	-
	100.0	5.6	23.2	30.7	40.5	8550	-	0.33
	CALC.	3.0	30.5	-	-	-	-	-
	70.0	3.5	14.5	33.6	48.4	9958	-	0.50
	4.4	5.6	23.2	30.7	40.5	8550	-	0.33
	74.4	3.6	15.3	33.3	47.6	9925	-	0.49
	17.0	3.1	32.9	29.5	34.5	7832	-	0.76
	100.0	1.8	69.6	-	-	-	-	-
	100.0	2.8	58.3	20.2	18.7	-	-	0.44
	CALC.	1.8	69.3	-	-	-	-	-
	16.5	3.1	32.9	29.5	34.5	7832	-	0.76
	2.8	2.8	58.3	20.2	18.7	-	-	0.44
	19.3	3.0	36.2	28.2	32.4	6888	-	0.71
	63.6	4.1	18.9	30.9	46.1	9329	-	0.44
	100.0	3.2	38.2	-	-	-	-	-
	100.0	4.8	33.9	28.9	32.4	7132	-	0.31
	CALC.	3.3	38.0	-	-	-	-	-
	60.2	4.1	18.8	30.9	46.1	9329	-	0.44
	5.4	4.8	33.9	28.9	32.4	7132	-	0.31
	65.6	4.1	20.2	30.7	44.8	9215	-	0.43

CUMULATIVE SAMPLE VALUES: THICKNESS	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	BTU	F.S.I.	S
2.17	74.4	3.6	15.3	33.3	47.6	9925		
3.08	59.1	4.0	20.9	30.5	44.2	9108		
2.65	65.6	4.1	20.2	30.7	44.8	9215		

OTHER

No. 1 SEAM HORIZON

A0204		EXCLUDED							
A0205 (179) THK		3.70	53.1	3.9	20.1	29.3	46.2	9244	
A0206		1.91	45.6	4.2	14.7	28.3	52.3	10043	
A0207		1.24	67.4	4.3	13.1	28.7	53.7	10309	
A0208		EXCLUDED							
A0209		EXCLUDED							
A0210		EXCLUDED							

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y 325 m W. X 375 m N. OF S.E. CORNER OF CL 83
ELEVATION: 588.34 m BITS USED: J. K. SMIT COMBINATION
DIP: 90° BEARING: N/A MUD USED: 79 BAGS MUD, 34 BAGS TROL.
CORE SIZE: HQ CASING: HW 6.10 m LEFT IN HOLE: NIL. 1 GAL. m 325

DATE START: AUGUST 6, 1979 FINISH: AUGUST 9, 1979
DRILLER: CARON DIAMOND DRILLING OVERALL RECOVERY: 56.3%
TESTS: GAMMA
SAMPLED BY: D. HOPE

BOREHOLE NO. BP-79-18
PAN OCEAN OIL LTD. (PAGE 1)
MINING DIVISION – COAL

LOGGED BY: D. HOPE DATE: AUGUST 10, 1979.

DATE: AUGUST 11/79 ANALYZED BY: BIRTLY COAL & MINERALS TESTING SIGNED:

GEOLOGICAL LOG – SCALE: 1:500

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	THICKNESS	DESCRIPTION
	17.07	CONGLOMERATE: BADLY BROKEN AND DISAGGREGATED CORE, PEBBLES AND COBBLES OF CHERT AND QUARTZITE. TAR SATURATED
17.07	1.83	MUDSTONE AND CAVINGS
18.90	3.05	CONGLOMERATE: AS ABOVE
21.95	10.05	NO. 1 SEAM HORIZON
32.00	0.24	SHALE: CARBONACEOUS WITH SPLINTS AND FLECKS OF COAL
32.24	8.17	MUDSTONE: MEDIUM GRAY TO GRAY-BROWN, SOFT, CARBONACEOUS IN PART, MASSIVE BEDDED, CUBIC WEATHERING.
40.41	1.87	SILTSTONE: LIGHT GRAY THINLY BEDDING TO LAMINATED.
42.28		SANDSTONE: LIGHT GRAY TO SALT AND PEPPER, FINE GRAINED, GRADING DOWNWARD TO COARSE GRAINED AND CONGLOMERATIC AT BASE. CROSS BEDDED UP TO 65° TO AXIS.
58.52	3.66	NO. 2 SEAM HORIZON
62.18	2.52	SILTSTONE-WITH THIN INTERBEDS OF SANDSTONE-SHALE
64.70	0.85	MUDSTONE-MEDIUM BROWN, HARD, MASSIVE
65.55	12.01	SHALE-DARK GRAY, CARBONACEOUS ZONES THROUGHOUT, CUBIC WEATHERING. SANDY SHALE ZONE @ 69.19-71.22.
77.56	4.43	NO. 3 SEAM HORIZON
81.99	1.15	SHALE-DARK GRAY, CARBONACEOUS, COAL FLECKS
83.15	3.81	SHALE-MEDIUM TO DARK GRAY, HARD, BLOCKY.
86.96		TOTAL DEPTH

NO. 1 SEAM HORIZON

ROOF: CONGLOMERATE, POOR

DEPTH	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
21.95	0.07	TAR AND CAVINGS EXCLUDED		
22.02	0.36	LOST CORE		
22.38	0.33	COAL: DULL		
22.71	0.76	COAL: DULL		
23.47	0.08	COAL: DULL		
23.55	0.10	SHALE: CARBONACEOUS	AO 187	2.79
23.65	0.43	LOST CORE		
24.08	0.07	SHALE: CARBONACEOUS		
24.15	0.45	COAL: DULL TO VITREOUS		
24.60	0.09	LOST CORE		
24.69	0.13	COAL: DULL TO VITREOUS		
24.82	0.09	LOST CORE		
24.91	0.08	COAL: DULL TO VITREOUS		
24.99	0.09	SHALEY COAL		
25.08	0.87	SHALE: MEDIUM TO DARK GRAY	AO188	0.87
26.04	0.48	COAL: DULL TO VITREOUS		
26.52	0.30	COAL: VITREOUS		
26.82	0.06	SHALE: CARBONACEOUS	AO 189	1.33
26.88	0.21	COAL: DULL TO VITREOUS		
27.08	0.28	COAL: MOSTLY VITREOUS		
27.37	0.34	SHALE: CARBONACEOUS		
27.71	0.33	LOST CORE		
28.04	0.07	SHALE: CARBONACEOUS		
28.11	0.21	COAL: DULL TO BRIGHT		
28.32	0.08	SHALEY COAL	AO 190	1.67
28.40	0.08	SHALE: CARBONACEOUS		
28.48	0.05	SHALEY COAL		
28.53	0.10	SHALE: CARBONACEOUS		
28.63	0.14	COAL: DULL TO BRIGHT		
28.77	0.58	SHALE: CARBONACEOUS		
29.35	0.09	LOST CORE		
29.44	0.18	SHALE: CARBONACEOUS		
29.62	0.21	COAL: DULL, SOFT		
29.83	0.12	COAL: DULL TO VITREOUS		
29.95	0.13	SHALE: CARBONACEOUS		
30.08	0.09	COAL: VITREOUS TO BRIGHT	AO 191	2.24
30.17	0.09	SHALEY COAL		
30.26	0.13	SHALEY COAL		
30.39	0.16	LOST CORE		
30.55	0.18	SHALE: CARBONACEOUS		
30.73	0.20	COAL: VITREOUS TO BRIGHT		
30.93	0.33	SHALE: CARBONACEOUS	AO 192	0.53
31.26	0.20	LOST CORE		
31.46		FLOOR: MUDSTONE AND SHALE POOR		

NO. 2 SEAM HORIZON

ROOF-SANDSTONE, GOOD

DEPTH	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
58.52	0.18	COAL-DULL TO VITREOUS LOWER		
	0.12	0.12m NO CORE		
59.03	0.21	COAL-DULL TO VITREOUS		
	0.87	COAL-BRIGHT, BANDED	A0193	1.95
59.90	0.45	NO CORE		
60.35	0.12	COAL-BRIGHT		
60.47	0.26	SHALE-CARBONACEOUS		
60.73	0.23	NO CORE		
60.96	0.50	COAL-DULL TO VITREOUS	A0194	1.71
61.46	0.21	SHALY COAL		
61.67	0.51	NO CORE		
62.18		FLOOR-SHALE, POOR		

SIZE DIAMETER	SIZE WT %	SPEC GRAV	WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE SAMPLE VALUES THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	OTHER
1/4×28	84.1	-1.90	70.8	5.5	22.8	33.4	38.3	7516	-	0.52	70.8	5.5	22.8	33.4	38.3	7516	-	0.52										
		+1.90	29.2	2.2	74.9	-	-	-	-	-	100.0	4.5	38.0	-	-	-	-	-										
28×0	15.9	RAW	100.0	8.7	34.9	29.5	26.9	5684	-	1.21	100.0	8.7	34.9	29.5	26.9	5684	-	1.21										
1/4×0	100.0	RAW	100.0	6.7	37.9	28.4	27.5	5582	-	0.52	CALC.	5.2	37.5	-	-	-	-	-										
1/4×28	84.1	-1.90	70.8	-	-	-	-	-	-	-	59.5	5.5	22.8	33.4	38.3	7516	-	0.52										
28×0	15.9	RAW	100.0	-	-	-	-	-	-	-	15.9	8.7	34.9	29.5	26.9	5684	-	1.21										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	75.4	6.1	26.4	32.2	34.9	7065		0.67	3.22	75.4	6.1	26.4	32.2	34.9	7065			
1/4×28	90.7	-1.90	3.2	3.5	29.0	25.3	42.2	7825	-	0.26	3.2	3.5	29.0	25.3	42.2	7825	-	0.26										
		+1.90	96.3	2.0	80.9	-	-	-	-	-	100.0	2.0	79.2	-	-	-	-	-										
28×0	9.3	RAW	100.0	3.7	74.9	13.1	8.3	-	-	0.10	100.0	3.7	74.9	13.1	8.3	-	-	0.10										
1/4×0	100.0	RAW	100.0	3.3	78.7	12.5	5.5	-	-	0.08	CALC.	2.2	78.8	-	-	-	-	-										
1/4×28	90.7	-1.90	3.2	-	-	-	-	-	-	-	2.9	3.5	29.0	25.3	42.2	7825	-	0.26										
28×0	9.3	RAW	100.0	-	-	-	-	-	-	-	9.3	3.7	74.9	13.1	8.3	-	-	0.10										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	12.2	3.6	64.4	15.8	16.0	1878	-	0.22	4.09	61.9	5.9	27.9	31.5	34.1	6847			
1/4×28	93.3	-1.90	85.7	3.5	9.8	37.6	49.1	10686	-	0.40	85.7	3.5	9.8	37.6	49.1	10686	-	0.40										
		+1.90	14.3	1.5	77.5	-	-	-	-	-	100.0	3.2	19.5	-	-	-	-	-										
28×0	6.7	RAW	100.0	5.4	21.4	33.6	39.6	8910	-	0.33	100.0	5.4	21.4	33.6	39.6	8910	-	0.33										
1/4×0	100.0	RAW	100.0	6.0	19.9	33.8	40.3	8968	-	0.24	CALC.	3.3	19.6	-	-	-	-	-										
1/4×28	93.3	-1.90	85.7	-	-	-	-	-	-	-	79.9	3.5	9.8	37.6	49.1	10686	-	0.40										
28×0	6.7	RAW	100.0	-	-	-	-	-	-	-	6.7	5.4	21.4	33.6	39.6	8910	-	0.33										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	86.6	3.6	11.1	37.1	48.0	10578	-	0.39	5.42	68.0	5.2	22.7	33.2	38.4	8013			
1/4×28	92.1	-1.90	50.4	3.3	27.1	30.3	39.3	8254	-	0.48	50.4	3.3	27.1	30.3	39.3	8250	-	0.48										
		+1.90	49.6	2.2	73.5	-	-	-	-	-	100.0	2.7	50.1	-	-	-	-	-										
28×0	7.9	RAW	100.0	5.1	44.0	23.6	27.3	5501	-	0.40	100.0	5.1	44.0	23.6	27.3	5501	-	0.40										
1/4×0	100.0	RAW	100.0	4.9	48.3	22.8	24.0	4958	-	0.23	CALC.	2.9	49.6	-	-	-	-	-										
1/4×28	92.1	-1.90	50.4	-	-	-	-	-	-	-	46.4	3.3	27.1	30.3	39.3	8250	-	0.48										
28×0	7.9	RAW	100.0	-	-	-	-	-	-	-	7.9	5.1	44.0	23.6	27.3	5501	-	0.40										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	54.3	3.5	30.6	28.9	36.8	7773	-	0.47	7.09	64.7	4.9	24.2	32.4	38.1	7965			
1/4×28	91.7	-1.90	63.1	3.5	24.6	32.7	39.2	8497	-	0.40	63.1	3.5	24.6	32.7	39.2	8497	-	0.40										
		+1.90	36.9	2.4	67.9	-	-	-	-	-	100.0	3.1	40.6	-	-	-	-	-										
28×0	8.3	RAW	100.0	4.9	33.5	29.7	31.9	7177	-	0.36	100.0	4.9	33.5	29.7	31.9	7177	-	0.36										
1/4×0	100.3	RAW	100.0	4.7	39.1	27.7	28.5	5886	-	0.33	CALC.	3.2	40.0	-	-	-	-	-										
1/4×28	91.7	-1.90	63.1	-	-	-	-	-	-	-	5.9	3.5	24.6	32.7	39.2	8497	-	0.40										
28×0	8.3	RAW	100.0	-	-	-	-	-	-	-	8.3	4.9	33.5	29.7	31.9	7177	-	0.36										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	66.2	3.6	26.0	32.2	37.9	8372	-	0.39	9.33	65.1	4.5	24.6	32.3	38.0	8065			
1/4×28	93.1	-1.90	71.1	5.6	22.0	31.8	40.6	8829	-	0.31	71.1	5.6	22.0	31.8	40.6	8829	-	0.31										
		+1.90	28.9	1.9	63.7	-	-	-	-	-	100.0	4.5	34.0	-	-	-	-	-										
28×0	6.9	RAW	100.0	5.3	24.1	29.5	41.1	8632	-	0.43	100.0	5.3	24.1	29.5	41.1	8632	-	0.43										
1/4×0	100.0	RAW	100.0	4.5	33.8	29.2	32.5	7229	-	0.41	CALC.	4.6	33.2	-	-	-	-	-										
1/4×28	93.1	-1.90	71.1	-	-	-	-	-	-	-	66.2	5.6	22.0	31.8	40.6	8829	-	0.31										
28×0	6.9	RAW	100.0	-	-	-	-	-	-	-	6.9	5.3	24.1	29.5	41.1	8632	-	0.43										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	73.1	5.5	22.1	31.5	40.6	8905	-	0.32	9.86	65.5	4.6	24.5	32.3	38.2	8115			
1/4×28	93.2	-1.90	92.0	5.9	8.0	36.0	50.1	10592	-	0.33	92.0	5.9	8.0	36.0	50.1	10592	-	0.33										
		+1.90	8.0	2.1	69.7	-	-	-	-	-	100.0	5.6	12.9	-	-	-	-	-										
28×0	6.8	RAW	100.0	6.2	15.4	34.1	44.3	9575	-	0.39	100.0	6.2	15.4	34.1	44.3	9575	-	0.39										
1/4×0	100.0	RAW	100.0	6.6	13.4	34.7	45.3	9764	-	0.56	CALC.	5.6	13.0	-	-	-	-	-										
1/4×28	93.2	-1.90	92.0	-	-	-	-	-	-	-	35.7	5.9	8.0	36.0	50.1	10592	-	0.33										
28×0	6.8	RAW	100.0	-	-	-	-	-	-	-	6.8	6.2	15.4	34.1	44.3	9575	-	0.39										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	92.5	5.9	8.5	35.8	49.6	10607	-	0.33	1.95	92.5	5.9	8.5	35.8	49.6	10607			
1/4×28	92.6	-1.90	46.2	4.2	20.6	25.1	50.1	9089	-	0.25	46.2	4.2	20.6	25.1	50.1	9089	-	0.25										
		+1.90	53.8	1.5	76.4	-	-	-	-	-	100.0	2.7	50.6	-	-	-	-	-										
28×0	7.4	RAW	100.0	4.1	42.4	25.0	28.5	5963	-	0.18	100.0	4.1	42.4	25.0	28.5	5963	-	0.18										
1/4×0	100.0	RAW	100.0	3.5	49.0	23.0	24.5	5054	-	0.20	CALC.	2.8	50.0	-	-	-	-	-										
1/4×28	92.6	-1.90	46.2	-	-	-	-	-	-	-	42.8	4.2	20.6	25.1	50.1	9089	-	0.25										
28×0	7.4	RAW	100.0	-	-	-	-	-	-	-	7.4	4.1	42.4	25.0	28.5	5963	-	0.18										
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	50.2	4.1	23.7	25.0	46.9	8733	-	0.24	3.66	72.7	5.3	13.4	32.3	48.7	10002			

A0187											EXCLUDED	
A0188											EXCLUDED	
A0189	3.00	68.6	3.5	19.6	33.4	43.0	9342					
A0190	1.67	54.3	3.5	30.6	28.9	36.8	7773					
A0191											EXCLUDED	
A0192											EXCLUDED	

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X

ELEVATION: BITS USED:

DIP: BEARING: MUD USED:

CORE SIZE: CASING: m LEFT IN HOLE: m

DATE START: FINISH:

DRILLER: OVERALL RECOVERY:

TESTS:

SAMPLED BY: DATE: ANALYZED BY:

BOREHOLE NO. BP-79-18
PAN OCEAN OIL LTD. (PAGE 2)
MINING DIVISION – COAL

LOGGED BY: DATE:

SIGNED:

GEOLOGICAL LOG – SCALE: 1:500

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
			NO. 3 SEAM HORIZON

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
			ROOF: SHALE, POOR		
77.56		0.16	COAL: VITREOUS TO BRIGHT		
77.90		0.18	COAL: AS ABOVE		
		0.26	COALY SHALE		
		0.18	COAL: BRIGHT BANDED		
78.45		0.11	SHALEY COAL		
78.64		0.19	LOST CORE		
		0.20	COAL: DULL TO BRIGHT	AO 195	2.60
		0.13	SHALEY COAL		
		0.18	COAL: DULL TO VITREOUS		
79.30		0.20	COALY SHALE		
		0.86	LOST CORE		
80.16		0.47	COAL: MOSTLY BRIGHT		
80.63		0.14	LOST CORE		
80.77		0.27	COALY SHALE	AO 196	1.83
81.30		0.26	COAL: VITREOUS SOFT		
		0.69	LOST CORE		
81.99			FLOOR: SHALE, POOR		

SAMPLE NUMBER	SIZE DIAMETER	SIZE WT %	SPEC GRAV	WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S
	1/4×28	93.0	-1.90	56.8	5.0	15.5	33.8	45.7	9805	-	0.39
			+1.90	43.2	1.9	68.4	-	-	-	-	-
	28×0	7.0	RAW	100.0	5.1	34.4	29.9	30.6	6998	-	0.30
	1/4×0	100.0	RAW	100.0	4.4	38.3	26.3	31.0	6493	-	0.31
	1/4×28	93.0	-1.90	56.8	-	-	-	-	-	-	-
AO 195	28×0	7.0	RAW	100.0	-	-	-	-	-	-	-
	1/4×0	100.0	COMB	-	-	-	-	-	-	-	-
	1/4×28	93.5	-1.90	56.7	5.0	9.1	34.6	51.3	10638	-	0.30
			+1.90	43.3	1.8	70.4	-	-	-	-	-
AO 196	28×0	6.5	RAW	100.0	4.9	33.7	29.9	31.5	7065	-	0.22
	1/4×0	100.0	RAW	100.0	5.2	34.0	28.0	32.8	7028	-	0.21
	1/4×28	93.5	-1.90	56.7	-	-	-	-	-	-	-
	28×0	6.5	RAW	100.0	-	-	-	-	-	-	-
	1/4×0	100.0	COMB	-	-	-	-	-	-	-	-

CUMULATIVE WEIGHT PERCENT	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
	56.8	5.0	15.5	33.8	45.7	9805	-	0.39
	100.0	3.7	38.3	-	-	-	-	-
	100.0	5.1	34.4	29.9	30.6	6998	-	0.30
	CALC.	3.8	38.0	-	-	-	-	-
	52.8	5.0	15.5	33.8	45.7	9805	-	0.39
	7.0	5.1	34.4	29.9	30.6	6998	-	0.30
	59.8	5.0	17.7	33.3	43.9	9565	-	0.38
	56.7	5.0	9.1	34.6	51.3	10628	-	0.30
	100.0	3.6	35.6	-	-	-	-	-
	100.0	4.9	33.7	29.9	31.5	7065	-	0.22
	CALC	3.7	35.5	-	-	-	-	-
	53.0	5.0	9.1	34.6	51.3	10628	-	0.30
	6.5	4.9	33.7	29.9	31.5	7065	-	0.22
	59.5	4.9	8.5	34.1	49.1	10337	-	0.29

CUMULATIVE SAMPLE VALUES	THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
	2.60	59.8	5.0	17.7	33.3	43.9	9565		
	4.43	59.6	4.9	13.9	33.6	46.0	9882		

A0195	THK 1.87	3.70	59.6	4.9	13.1	33.6	46.4	9945		
A0196		1.83	59.5	4.9	8.5	34.1	49.1	10337		

OTHER

060055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y 1270 m N X 955 m W of S.E. corner of CL 83
ELEVATION: 564.80 m BITS USED: J.K. SMIT COMBINATION
DIP: 90° BEARING: N/A MUD USED:
CORE SIZE: HQ CASING: 3.05 HW m LEFT IN HOLE: 0 m
DATE START: AUGUST 10/79 FINISH: AUGUST 13/79
DRILLER: CARON DIAMOND DRILLING OVERALL RECOVERY: 85.07
TESTS:
SAMPLED BY: LOGGED BY: O. CULLINGHAM, D. HOPE DATE: AUGUST 15/79
DATE: AUGUST 15/79 ANALYZED BY: BIRTLEY COAL + MINERALS TESTING SIGNED:

BOREHOLE NO. BP-79-19
PAN OCEAN OIL LTD. (PAGE 1)
MINING DIVISION – COAL

GEOLOGICAL LOG – SCALE: 1:500

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
			OVERBURDEN - DISAGGREGATED CONGLOMERATE
			SEE BELOW
7.92			CONGLOMERATE - LIGHT GRAY, MASSIVE BEDDED, PEBBLE TO COBBLE CONGLOMERATE POORLY SORTED, ROUNDED, LOW SPHERICITY, CLASTS OF QUARTZ AND CHERT, WITH SOME QUARTZ VEINING IN A MATRIX OF MEDIUM TO COARSE GRAINED SALT AND PEPPER SANDSTONE, GOOD POROSITY, TAR SATURATED
58.36		8.44	No 1 SEAM HORIZON
66.80		6.08	SHALE - MEDIUM GRAY, SLIGHTLY CARBONACEOUS IN PART. CONTAINS PLANT FRAGMENTS AND IMPRINTS.
72.88		11.64	SANDSTONE/CONGLOMERATIC SANDSTONE - FINE GRAINED TO CONGLOMERATIC COARSENS DOWNWARD. QUARTZ AND CHERT COMPOSITIONS.
84.52		2.96	No. 2 SEAM HORIZON
87.48		1.52	SHALE - MEDIUM GRAY. GRADATIONAL TO SILTSTONE BELOW
89.00		12.02	SANDSTONE / CONGLOMERATIC SANDSTONE - SILTSTONE TO CONGLOMERATIC SANDSTONE, GRADATIONAL DOWNWARD.
101.02		5.31	SHALE - MEDIUM GRAY IN PART CARBONACEOUS, FLECKS AND SPLINTS OF COAL THROUGHOUT
106.33		3.34	No. 3 SEAM HORIZON
109.67		4.49	SHALE - DARK TO MEDIUM GRAY, LIGHTENS DOWNWARD.
114.16			

DETAILS OF COAL SEAMS – SCALE: 1:100

No. 1 SEAM HORIZON

DEPTH	THICKNESS	DESCRIPTION
		ROOF - CONGLOMERATE, GOOD
58.36	0.10	COAL - DULL TO VITREOUS
58.46	0.08	COAL - DULL TO VITREOUS - LOST CORE
58.54	0.06	COAL - DULL TO VITREOUS
58.60	0.03	SHALEY COAL
58.63	0.52	COAL - DULL TO VITREOUS
59.15	0.35	SHALE - CARBONACEOUS TO COALY
59.50	0.15	COAL - VITREOUS
59.65	0.26	SHALE - CARBONACEOUS TO COALY
59.91	0.66	SHALE - MEDIUM GRAY, BLOCKY
60.57	0.55	SHALE - CARBONACEOUS
61.12	0.13	COAL - DULL TO VITREOUS
61.25	0.12	SHALE - CARBONACEOUS TO COALY
61.37	0.20	COAL - VITREOUS
61.57	0.22	COAL - VITREOUS TO BRIGHT
61.79	0.05	SHALE - CARBONACEOUS
61.84	0.09	SHALEY COAL
61.93	0.04	COAL - DULL TO VITREOUS
62.04	0.14	SHALE - CARBONACEOUS
62.18	0.10	COAL - VITREOUS TO BRIGHT
62.38	0.66	SHALE - DARK GRAY, DULL, BLOCKY
63.04	0.70	COAL - VITREOUS AND BRIGHT
63.74	0.87	LOST CORE
64.61	0.01	COAL - VITREOUS AND BRIGHT
64.62	0.44	SHALE - CARBONACEOUS
65.06	0.29	COAL - DULL TO VITREOUS
65.35	0.45	SHALE - CARBONACEOUS
65.80	0.16	COAL - DULL TO VITREOUS
65.96	0.16	SHALE - CARBONACEOUS
66.12	0.06	COAL - DULL TO BRIGHT
66.18	0.52	SHALE - CARBONACEOUS TO COALY
66.70	0.10	FLOOR - SHALE, POOR
66.80		

NOT SAMPLED FOR ANALYSIS

(SAMPLED FOR PALYNOLOGY AND PETROGRAPHY)

No. 2 SEAM HORIZON

DEPTH	THICKNESS	DESCRIPTION
		ROOF - SANDSTONE, GOOD
84.52	1.31	COAL - MOSTLY VITREOUS TO BRIGHT, PARTED TO BANDED, BLOCKY 0.03 CARBONACEOUS SHALE AT BASE
85.83	0.12	NO CORE
85.95	0.18	SHALE - CARBONACEOUS
86.13	0.39	SHALEY COAL
86.52	0.53	COAL - VITREOUS TO BRIGHT, BASAL 0.04 IS CARBONACEOUS SHALE
87.05	0.43	NO CORE
87.48		FLOOR - SHALE IS POOR

NOT SAMPLED FOR ANALYSIS

(SAMPLED FOR PALYNOLOGY AND PETROGRAPHY)

	SAMPLE NUMBER	THICKNESS	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC GRAV	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT: YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE SAMPLE VALUES: THICKNESS	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	BTU	F.S.I.	S	OTHER
NOT				SAMPLED																											
FOR																															
ANALYSIS																															
(SAMPLED						FOR																									
							PALYNOLOGY					AND					PETROGRAPHY)															

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X
ELEVATION:
DIP: BEARING:
CORE SIZE: CASING:

BITS USED:
MUD USED:
m LEFT IN HOLE: m

DATE START:
DRILLER:
TESTS:
SAMPLED BY:

FINISH:
OVERALL RECOVERY:
DATE: ANALYZED BY:

BOREHOLE NO. BP-79-19
PAN OCEAN OIL LTD. (PAGE 2)
MINING DIVISION – COAL

LOGGED BY: DATE:
SIGNED:

GEOLOGICAL LOG – SCALE:

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
			No. 3 SEAM HORIZON
106.33			ROOF-SHALE, POOR
106.52		0.19	COAL-DULL TO VITREOUS
106.62		0.10	SHALE
106.97		0.35	SHALEY COAL
107.27		0.30	SHALE-CARBONACEOUS TO COAL
107.35		0.08	SHALEY COAL
107.68		0.33	COAL-VITREOUS TO BRIGHT
		0.26	COAL-DULL TO VITREOUS
107.94		0.66	SHALEY COAL
108.60		0.62	SHALE
108.72		0.08	COAL VITREOUS
108.80		0.01	LOST CORE
108.81		0.31	COAL-DULL TO BRIGHT
109.12		0.55	SHALEY COAL
109.67			FLOOR-SHALEY, POOR

NOT SAMPLED FOR ANALYSIS
(SAMPLED FOR PALYNOLOGY AND PETROGRAPHY)

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC GRAV	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT: YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE SAMPLE VALUES: THICKNESS	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	BTU	F.S.I.	S	OTHER

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y 2240 m N X 930 m W. of S.E. corner of CL 83
ELEVATION: 556.29 BITS USED: J.K. SMIT COMBINATION
DIP: -90° BEARING: - MUD USED: 55 GALS POLY 325, 10 GALS POLY 357
CORE SIZE: HQ CASING: HW-3.66 m m LEFT IN HOLE: NIL m
SAMPLED BY: O. CULLINGHAM

DATE START: AUG. 17, 1979 FINISH: AUG. 20, 1979
DRILLER: CARON DIAMOND DRILLING OVERALL RECOVERY: 91%
TESTS:
DATE: AUG., 1979 ANALYZED BY: BIRTLEY COAL + MINERALS TESTING

BOREHOLE NO. BP-79-20
PAN OCEAN OIL LTD. (PAGE 1)
MINING DIVISION – COAL

LOGGED BY: D. HOPE, O. CULLINGHAM DATE: AUG. 1979
SIGNED:

GEOLOGICAL LOG – SCALE: 1:500 | DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
		75.28	CONGLOMERATE - THICK TO MASSIVELY BEDDED, POORLY SORTED, ROUNDED, LOW TO MODERATE SPHERICITY; QUARTZ AND CHERT PEBBLES; SOME QUARTZ VEINING IN CHERT PEBBLES; RARE SANDSTONE INTERBEDS. SATURATED WITH TAR.
75.28		9.22	No. 1 SEAM HORIZON
84.50		5.86	SHALE - DARK GRAY; IN PART CARBONACEOUS
90.36		5.09	SANDSTONE/CONGLOMERATE - GRADATIONAL SEQUENCE OF BEDS OF SANDSTONE TO CONGLOMERATE
95.45		1.17	SHALE - MEDIUM GRAY, BLOCKY
96.62		1.52	CONGLOMERATIC SANDSTONE
98.14		2.32	No. 2 SEAM HORIZON
100.46		4.18	SHALE - MEDIUM TO DARK GRAY; SILTY BASALLY
104.64		1.14	SILTSTONE/SHALE - MEDIUM TO DARK GRAY; PARTED
105.78		15.22	SANDSTONE - GRADATIONAL FROM SILTSTONE TO A FINE PEBBLE CONGLOMERATE. CROSS-BEDDED.
121.00		0.89	SHALE - MEDIUM TO DARK GRAY
121.89		3.83	No. 3 SEAM HORIZON
125.72		1.81	SHALE - CARBONACEOUS AT TOP; MEDIUM TO DARK GRAY
		1.09	SILTSTONE - LIGHT GRAY; FESTOON CROSS-BEDDING
		3.05	SILTSTONE/SHALE - MEDIUM TO LIGHT GRAY
131.67			

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
			No. 1 SEAM HORIZON		
			ROOF CONGLOMERATE; GOOD		
75.28		0.27	CARBONACEOUS SHALE		
75.55		0.48	COAL - VITREOUS; SPLINTS AND PARTINGS, BRIGHT COAL		
		0.37	CARBONACEOUS AND COALY SHALE	A0220	1.49
		0.42	COAL - VITREOUS; SPLINTS AND PARTINGS OF BRIGHT COAL		
97.04		0.22	CARBONACEOUS TO COALY SHALE; SHALY COAL		
		1.53	SHALE - SOFT, FRAGMENTAL, IN PART CARBONACEOUS (NOT SAMPLED)		
78.57		0.72	COAL - DULL TO VITREOUS PARTINGS AND BANDS OF BRIGHT COAL		
79.29		0.57	CARBONACEOUS TO COALY SHALE	A0221	2.35
79.86		1.06	COAL - VITREOUS AND BRIGHT. CONTAINS 0.14 m BAND OF HARD BLOCKY SHALE		
80.92		0.58	SHALE - DULL, FRAGMENTAL TO BLOCKY, SLIGHTLY CARBONACEOUS	A0222	0.58
81.50		0.90	COAL DULL TO BRIGHT, BANDED		
82.40		0.26	SHALE - DULL, HARD, BLOCKY		
82.66		0.67	COAL - DULL TO BRIGHT; MINOR CARBONACEOUS SHALE PARTINGS	A0223	3.00
83.33		0.46	CARBONACEOUS TO COALY SHALE		
83.79		0.61	COAL - VITREOUS AND BRIGHT		
84.40		0.10	CARBONACEOUS AND COALY SHALE		
84.50			FLOOR - CARBONACEOUS TO DARK GRAY SHALE; POOR.		
			No. 2 SEAM HORIZON		
			ROOF - CONGLOMERATIC SANDSTONE; PARTIALLY DECEMENTED; POOR		
98.14		0.98	COAL - DULL TO VITREOUS		
99.12		0.71	CARBONACEOUS TO COALY SHALE AND SHALY COAL	A0224	2.32
99.83		0.63	COAL - VITREOUS AND BRIGHT		
100.46			FLOOR SHALE - SOFT, MEDIUM TO DARK GRAY POOR		
			No. 3 SEAM HORIZON		
			ROOF SHALE - DARK GRAY, CARBONACEOUS		
121.89		0.36	CARBONACEOUS AND COALY SHALE	A0225	0.36
122.25		1.30	COAL - VITREOUS AND BRIGHT; ONE 0.12 BAND OF SHALY COAL		
123.55		0.16	SHALE - MEDIUM GRAY BROWN	A0226	2.56
		1.10	COAL - DULL TO BRIGHT; PARTINGS OF DULL SHALY COAL AND COALY SHALE		
124.81		0.58	SHALE - DULL, FRAGMENTAL, SOFT; MEDIUM GRAY BROWN	A0227	0.58
125.39		0.33	COAL - DULL TO VITREOUS	A0228	0.33
125.72			FLOOR - SHALE, POOR		

DEPTH	SIZE DIAMETER	SIZE WT %	SPEC GRAV	WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	CUMULATIVE SAMPLE VALUES THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	OTHER
75.28	1/4×28	92.7	-1.90	42.8	7.2	28.0	26.8	38.0	9568	-	0.35	42.8	7.2	28.0	26.8	38.0	9568	-	0.35										
			+1.90	57.2	2.5	79.8	-	-	-	-	-	100.0	4.5	57.6	-	-	-	-	-										
	28×0	7.3	RAW	100.0	4.7	53.7	19.0	22.6	4301	-	0.15	100.0	4.7	53.7	19.0	22.6	4301	-	0.15										
	1/4×0	100.0	RAW	100.0	4.5	57.1	18.4	20.0	3822	-	0.13	CALC	4.5	57.3	-	-	-	-	-										
	1/4×28	92.7	-1.90	42.8	-	-	-	-	-	-	-	39.7	7.2	28.0	26.8	38.0	9568	-	0.35										
	28×0	7.3	RAW	100.0	-	-	-	-	-	-	-	7.3	4.7	53.7	19.0	22.6	4301	-	0.15										
97.04	1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	47.0	6.8	30.7	26.0	36.5	9096	-	0.32	1.49	47.0	6.8	30.7	26.0	36.5	9096			
	1/4×28	93.8	-1.90	61.2	7.5	17.4	32.3	42.8	9179	-	0.47	61.2	7.5	17.4	32.3	42.8	9179	-	0.47										
			+1.90	38.8	3.3	73.9	-	-	-	-	-	100.0	5.9	39.3	-	-	-	-	-										
	28×0	6.2	RAW	100.0	6.3	36.8	26.1	30.8	6579	-	0.21	100.0	6.3	36.8	26.1	30.8	6579	-	0.21										
78.57	1/4×0	100.0	RAW	100.0	6.7	39.1	25.8	28.4	6188	-	0.36	CALC.	5.9	39.1	-	-	-	-	-										
	1/4×28	93.8	-1.90	61.2	-	-	-	-	-	-	-	57.4	7.5	17.4	32.3	42.8	9179	-	0.47										
79.29	28×0	6.2	RAW	100.0	-	-	-	-	-	-	-	6.2	6.3	36.8	26.1	30.8	6579	-	0.21										
79.86	1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	63.6	7.3	19.0	31.7	41.8	9055	-	0.44	3.84	57.1	7.1	22.7	29.8	40.1	9068			
	1/4×28	96.0	-1.90	7.5	6.1	34.7	26.1	33.1	7028	-	0.40	7.5	6.1	34.7	26.1	33.1	7028	-	0.40										
			+1.90	92.5	3.8	78.6	-	-	-	-	-	100.0	4.0	75.3	-	-	-	-	-										
80.92	28×0	4.0	RAW	100.0	5.0	69.4	14.6	11.0	-	-	0.13	100.0	5.0	69.4	14.6	11.0	-	-	0.13										
81.50	1/4×0	100.0	RAW	100.0	3.9	75.5	14.5	6.1	-	-	0.12	CALC.	4.0	75.1	-	-	-	-	-										
	1/4×28	96.0	-1.90	7.5	-	-	-	-	-	-	-	7.2	6.1	34.7	26.1	33.1	7028	-	0.40										
82.40	28×0	4.0	RAW	100.0	-	-	-	-	-	-	-	4.0	5.0	69.4	14.6	11.0	-	-	0.13										
82.66	1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	11.2	5.7	45.5	22.5	26.1	4923	-	0.30	4.42	51.1	7.1	23.3	29.6	39.7	8948			
	1/4×28	93.6	-1.90	70.5	6.7	23.4	31.7	38.2	8530	-	0.48	70.5	6.7	23.4	31.7	38.2	8530	-	0.48										
			+1.90	29.5	3.1	69.6	-	-	-	-	-	100.0	5.6	37.0	-	-	-	-	-										
83.33	28×0	6.4	RAW	100.0	6.5	32.0	30.3	31.2	7287	-	0.33	100.0	6.5	32.0	30.3	31.2	7287	-	0.33										
83.79	1/4×0	100.0	RAW	100.0	6.4	36.7	28.4	28.5	6545	-	0.38	CALC	5.7	36.7	-	-	-	-	-										
84.40	1/4×28	93.6	-1.90	70.5	-	-	-	-	-	-	-	66.0	6.7	23.4	31.7	38.2	8530	-	0.48										
84.50	28×0	6.4	RAW	100.0	-	-	-	-	-	-	-	6.4	6.5	32.0	30.3	31.2	7287	-	0.33										
	1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	72.4	6.6	24.1	31.5	37.6	8516	-	0.47	7.42	59.7	6.8	23.7	30.5	38.6	8736			
98.14	1/4×28	94.7	-1.90	30.5	5.9	33.3	27.6	33.2	7191	-	0.39	30.5	5.9	33.3	27.6	33.2	7191	-	0.39										
			+1.90	69.5	2.9	71.8	-	-	-	-	-	100.0	3.8	60.1	-	-	-	-	-										
	28×0	5.3	RAW	100.0	4.1	54.7	21.2	20.0	4195	-	0.20	100.0	4.1	54.7	21.2	20.0	4195	-	0.20										
	1/4×0	100.0	RAW	100.0	3.3	59.5	20.4	16.8	-	-	0.17	CALC.	3.8	59.8	-	-	-	-	-										
	1/4×28	94.7	-1.90	30.5	-	-	-	-	-	-	-	28.9	5.9	33.3	27.6	33.2	7191	-	0.39										
	28×0	5.3	RAW	100.0	-	-	-	-	-	-	-	5.3	4.1	54.7	21.2	20.0	4195	-	0.20										
	1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	34.2	5.6	35.7	26.8	31.7	6946	-	0.36	0.36	34.2	5.6	35.7	26.8	31.7	6946			
121.89	1/4×28	93.4	-1.90	66.2	7.3	17.1	31.6	44.0	9314	-	0.41	66.2	7.3	17.1	31.6	44.0	9314	-	0.41										
			+1.90	33.8	2.0	71.7	-	-	-	-	-	100.0	5.5	35.5	-	-	-	-	-										
122.25	28×0	6.6	RAW	100.0	6.4	34.8	28.2	30.6	6842	-	0.25	100.0	6.4	34.8	28.2	30.6	6842	-	0.25										
	1/4×0	100.0	RAW	100.0	7.1	35.2	26.8	30.9	6558	-	0.22	CALC.	5.6	35.4	-	-	-	-	-										
	1/4×28	93.4	-1.90	66.2	-	-	-	-	-	-	-	61.8	7.3	17.1	31.6	44.0	9314	-	0.41										
	28×0	6.6	RAW	100.0	-	-	-	-	-	-	-	6.6	6.4	34.8	28.2	30.6	6842	-	0.25										
123.55	1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	68.4	7.2	18.6	31.3	42.8	9195	-	0.39	2.92	64.1	7.0	19.7	31.0	42.0	9047			
	1/4×28	84.1	-1.90	1.0	7.2	17.6	31.4	43.2	9280	-	0.36	1.0	7.2	17.6	31.4	43.2	9280	-	0.36										
			+1.90	99.0	2.2	89.8	-	-	-	-	-	100.0	2.2	89.1	-	-	-	-	-										
124.81	28×0	15.9	RAW	100.0	2.4	89.1	6.2	2.3	-	-	0.09	100.0	2.4	89.1	6.2	2.3	-	-	0.09										
	1/4×0	100.0	RAW	100.0	2.4	89.2	6.9	1.5	-	-	0.10	CALC.	2.2	89.1	-	-	-	-	-										
125.39	1/4×28	84.1	-1.90	1.0	-	-	-	-	-	-	-	0.8	7.2	17.6	31.4	43.2	9280	-	0.36										
	28×0	15.9	RAW	100.0	-	-	-	-	-	-	-	15.9	2.4	89.1	6.2	2.3	-	-	0.09										
125.72	1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	16.7	2.6	79.7	9.5	7.6	1313	-	0.09	3.50	56.3	6.8	22.6	29.9	40.3	8667			
	1/4×28	87.4	-1.90	65.7	6.8	22.4	30.8	40.0	8760	-	0.61	65.7	6.8	22.4	30.8	40.0	8760	-	0.61										
			+1.90	34.3	3.7	70.5	-	-	-	-	-	100.0	5.7	38.9	-	-	-	-	-										
	28×0	12.6	RAW	100.0	4.2	46.2	24.9	24.7	5464	-	0.31	100.0	4.2	46.2	24.9	24.7	5464	-	0.31										
	1/4×0	100.0	RAW	100.0	3.5	39.6	8.7	28.2	6462	-	0.42	CALC.	5.5	39.8	-	-	-	-	-										
	1/4×28	87.4	-1.90	65.7	-	-	-	-	-	-	-	57.4	6.8	22.4	30.8	40.0	8760	-	0.61										
	28×0	12.6	RAW	100.0	-	-	-	-	-	-	-	12.6	4.2	46.2	24.9	24.7	5464	-	0.31										
	1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-	70.0	6.3	25.2	30.1	38.1	8459	-	0.56	3.83	57.4	6.8	22.9	29.9	40.1	8645			

LW

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X

ELEVATION:

DIP: BEARING:

CORE SIZE: CASING:

BITS USED:

MUD USED:

m LEFT IN HOLE: m

DATE START: FINISH:

DRILLER: OVERALL RECOVERY:

TESTS:

SAMPLED BY: DATE: ANALYZED BY:

BOREHOLE NO. BP-79-20
PAN OCEAN OIL LTD. (PAGE 2)
MINING DIVISION – COAL

LOGGED BY: DATE:

SIGNED:

GEOLOGICAL LOG – SCALE:

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION

DETAILS OF COAL SEAMS – SCALE:

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC GRAV	WEIGHT PERCENT: YIELD	WEIGHT PERCENT: PROXIMATE ANALYSIS: RM	ASH	VOL	F.C	WEIGHT PERCENT: BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT: YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	CUMULATIVE SAMPLE VALUES: THICKNESS	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	OTHER

No. 1 SEAM HORIZON

	THICKNESS	YIELD	RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
A0220	EXCLUDED								
A0221	2.35	63.6	7.3	19.0	31.7	41.8	9055		
A0222	2.93	53.2	7.2	20.1	31.3	41.1	8882		
A0223 (0.77) THK	3.70	57.2	7.0	21.1	31.3	40.2	8786		

No. 1 SEAM HORIZON

	THICKNESS	YIELD	RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
A0220	EXCLUDED								
A0221 (0.12) THK	3.70	62.5	6.6	24.5	31.2	37.4	8432		
A0222	3.58	62.4	6.5	24.7	31.2	37.2	8411		
A0223	3.00	72.4	6.6	24.1	31.5	37.6	8516		

No. 3 SEAM HORIZON

	THICKNESS	YIELD	RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
A0225	EXCLUDED								
A0226	2.56	68.4	7.2	18.6	31.3	42.8	9195		
A0227	3.14	58.8	6.9	21.8	30.1	40.9	8781		
A0228	3.47	59.9	6.8	22.1	30.1	40.6	8745		

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y 3850 m N. X 045m W. OF S.E. CORNER OF CL 83
ELEVATION: 530.59 m BITS USED: J.K. SMIT COMBINATION
DIP: 90° BEARING: MUD USED: 75 GALS. POLY 325; 50 GALS. POLY 357
CORE SIZE: NQ CASING: 9.75 m LEFT IN HOLE: 0 m
DATE START: AUGUST 23, 1979 FINISH: AUGUST 27, 1979
DRILLER: CARON DIAMOND DRILLING OVERALL RECOVERY: 86 %
TESTS:
SAMPLED BY: D. HOPE DATE: AUGUST 1979 ANALYZED BY: BIRTLEY COAL & MINERALS TESTING SIGNED:

BOREHOLE NO. BP-79-21
PAN OCEAN OIL LTD. (PAGE 1)
MINING DIVISION – COAL

LOGGED BY: D. HOPE DATE: AUGUST 28, 1979

GEOLOGICAL LOG – SCALE: 1:500

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
		21.39	OVERBURDEN: BROKEN DISAGGREGATED CORE, SOFT SANDY MUD, PIECE OF LARGE BOULDERS OF QUARTZITE, CHERT, CARBONATE AND SHALE.
21.39			SHALE TO CONGLOMERATE: GRADATIONAL SEQUENCE OF INTERBEDS OF SHALE TO COBBLE CONGLOMERATE, HEAVILY TAR STAINED. (44.81-44.98) COAL: DULL TO VITREOUS, SHALEY.
47.98		69.97	CONGLOMERATE: POORLY SORTED, PEBBLES TO COBBLES, QUARTZITE AND CHERT, SALT AND PEPPER MEDIUM TO COURSE GRAINED SANDSTONE MATRIX. GOOD POROSITY, TAR SATURATED
117.95		4.05	SHALE: LIGHT TO MEDIUM GRAY-BROWN, CUBIC WEATHERING
122.00		4.21	NO. 1 SEAM HORIZON
126.21		8.38	SHALE: MEDIUM TO DARK GRAY-BROWN, CARBONACEOUS NEAR TOP, SILTY AT BASE
134.95		5.60	SANDSTONE: VERY FINE GRAINED TO PEBBLE CONGLOMERATE, COARSENS DOWNWARD
140.27		4.13	CONGLOMERATE: FINE TO MEDIUM PEBBLE CONGLOMERATE, MODERATELY WELL SORTED.
144.40		2.01	NO. 2 SEAM HORIZON
146.41		3.59	SHALE: CARBONACEOUS NEAR TOP, SILTY AT BASE.
150.00		7.15	SANDSTONE: FINE TO COARSE GRAINED, COARSENING DOWNWARD. CARBONACEOUS PARTINGS THROUGHOUT
157.15			CONTINUED ON PAGE 2

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
			NO. 1 SEAM HORIZON		
			ROOF: SHALE, POOR		
122.00					
122.57		0.57	COALY SHALE	AO 214	1.08
122.64		0.07	COAL: DULL TO VITREOUS		
123.08		0.44	SHALE: CARBONACEOUS		
123.29		0.21	COAL: DULL TO VITREOUS		
123.57		0.28	SHALEY COAL		
123.92		0.35	COAL: MOSTLY BRIGHT	AO 215	1.54
		0.70	COAL: DULL TO BRIGHT		
124.62					
124.85		0.23	SHALE: CARBONACEOUS		
125.42		0.57	SHALEY COAL	AO 216	1.59
125.54		0.12	SHALE: CARBONACEOUS		
125.73		0.19	SHALE: CARBONACEOUS		
125.93		0.19	COAL: DULL TO VITREOUS		
126.21		0.29	SHALEY COAL		
			FLOOR: SHALE, POOR		
			NO. 2 SEAM HORIZON		
144.40			ROOF: CONGLOMERATE GOOD		
145.48		1.08	COAL: DULL TO VITREOUS	AO 217	2.01
145.59		0.11	COAL: AS ABOVE		
145.77		0.18	COALY SHALE		
145.94		0.17	SHALEY COAL		
146.41		0.47	COAL: DULL TO VITREOUS		
			FLOOR: SHALE, SOFT, POOR		

SAMPLE NUMBER	SIZE DIAMETER	SIZE WT %	SPEC GRAV	WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	CUMULATIVE SAMPLE VALUES THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	OTHER
	1/4×28	91.6	-1.90	13.6	6.7	29.4	28.6	35.3	7753	-	0.36	13.6	6.7	29.4	28.6	35.3	7753	-	0.36										
			+1.90	86.4	2.5	80.9	-	-	-	-	-	100.0	3.1	73.9	-	-	-	-	-										
	28×0	8.4	RAW	100.0	3.5	67.0	15.7	13.8	-	-	0.16	100.0	3.5	67.0	15.7	13.8	-	-	0.16										
	1/4×0	100.0	RAW	100.0	2.6	74.0	13.7	9.5	-	-	0.12	CALC	3.1	73.3	-	-	-	-	-										
	1/4×28	91.6	-1.90	13.6	-	-	-	-	-	-	-	12.4	6.7	29.4	28.6	35.3	7753	-	0.36										
	28×0	8.4	RAW	100.0	-	-	-	-	-	-	-	8.4	3.5	67.0	15.7	13.8	-	-	0.16										
	1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	20.8	5.4	39.2	25.2	29.6	5820	-	0.28	1.08	20.8	5.4	39.2	25.2	29.6	5820			
AO 214	1/4×28	93.4	-1.90	82.7	7.6	22.7	31.1	38.6	8276	-	0.33	82.7	7.6	22.7	31.1	38.6	8276	-	0.33										
			+1.90	17.3	3.6	68.8	-	-	-	-	-	100.0	6.9	30.7	-	-	-	-	-										
	28×0	6.6	RAW	100.0	6.5	29.6	30.1	33.8	7620	-	0.19	100.0	6.5	29.6	30.1	33.8	7620	-	0.19										
	1/4×0	100.0	RAW	100.0	6.8	31.3	30.0	31.9	7453	-	0.23	CALC	6.9	30.6	-	-	-	-	-										
AO 215	1/4×28	93.4	-1.90	82.7	-	-	-	-	-	-	-	77.2	7.6	22.7	31.1	38.6	8276	-	0.33										
	28×0	6.6	RAW	100.0	-	-	-	-	-	-	-	6.6	6.5	29.6	30.1	33.8	7620	-	0.19										
	1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	83.8	7.5	23.1	31.0	38.2	8323	-	0.32	2.62	57.8	7.1	25.4	30.1	36.9	7951			
AO 216	1/4×28	92.8	-1.90	29.3	6.4	32.5	28.2	32.9	7327	-	0.19	29.3	6.4	32.5	28.2	32.9	7327	-	0.19										
			+1.90	70.7	2.6	78.7	-	-	-	-	-	100.0	3.7	65.2	-	-	-	-	-										
	28×0	7.2	RAW	100.0	3.8	62.8	18.7	14.7	-	-	0.29	100.0	3.8	62.8	18.7	14.7	-	-	0.29										
	1/4×0	100.0	RAW	100.0	3.5	65.7	19.2	11.6	-	-	0.15	CALC	3.7	65.0	-	-	-	-	-										
	1/4×28	92.8	-1.90	29.3	-	-	-	-	-	-	-	27.2	6.4	32.5	28.2	32.9	7327	-	0.19										
	28×0	7.2	RAW	100.0	-	-	-	-	-	-	-	7.2	3.2	62.8	18.7	14.7	-	-	0.29										
	1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	34.4	5.8	36.6	26.9	30.4	6425	-	0.21	4.12	48.9	6.8	28.4	29.2	35.1	7546			
A0214																				EXCLUDED									
A0215																				1.54	83.8	7.5	23.1	31.0	38.2	8323			
A0216																				3.13	58.7	6.9	27.1	29.7	35.8	7758			
	1/4×28	93.3	-1.90	76.7	7.5	22.7	28.9	40.9	8309	-	0.36	76.7	7.5	22.7	28.9	40.9	8309	-	0.36										
			+1.90	23.3	2.7	70.2	-	-	-	-	-	100.0	6.4	33.8	-	-	-	-	-										
	28×0	6.7	RAW	100.0	7.0	31.1	27.0	34.9	7274	-	0.31	100.0	7.0	31.1	27.0	34.9	7274	-	0.31										
	1/4×0	100.0	RAW	100.0	7.0	33.9	26.2	32.9	6803	-	0.25	CALC	6.4	33.6	-	-	-	-	-										
	1/4×28	93.3	-1.90	76.7	-	-	-	-	-	-	-	71.6	7.5	22.7	28.9	40.9	8309	-	0.36										
	28×0	6.7	RAW	100.0	-	-	-	-	-	-	-	6.7	7.0	31.1	27.0	34.9	7274	-	0.31										
	1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	78.3	7.4	23.3	28.7	40.4	8318	-	0.36	2.01	78.3	7.4	23.3	28.7	40.4	8318			

CONTINUED ON PAGE 2

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X
ELEVATION:
DIP: BEARING:
CORE SIZE: CASING:

BITS USED:
MUD USED:
m LEFT IN HOLE: m

DATE START: FINISH:
DRILLER: OVERALL RECOVERY:
TESTS:
SAMPLED BY: DATE: ANALYZED BY:

BOREHOLE NO. BP-79-21
PAN OCEAN OIL LTD. (PAGE 2)
MINING DIVISION – COAL

LOGGED BY: DATE:
SIGNED:

GEOLOGICAL LOG – SCALE: 1:500

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
			CONTINUED FROM PAGE 1
157.15		7.37	SHALE: DARK GRAY, HARD, BLOCKY, CARBONACEOUS AT TOP, SILTY AND LAMINATED TO THINLY BEDDED AT BASE.
164.52		2.63	NO. 3 SEAM HORIZON
167.15		0.82	COAL — SHALE - CARBONACEOUS
168.41			
168.93		7.19	SHALE/SILTSTONE: MEDIUM BROWN TO DARK GRAY, CARBONACEOUS AT TOP GRADES TO SILTSTONE AT BASE (0.52 m) COAL IN UNIT (SHOWN)
174.34			END OF HOLE

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
			NO. 3 SEAM HORIZON		
164.52			ROOF: SHALE, BLOCKY, MODERATELY GOOD		
164.64		0.12	COAL: VITREOUS		
164.97		0.33	SHALEY COAL		
165.08		0.11	COAL: DULL TO VITREOUS		
165.20		0.12	COAL: DULL		
165.37		0.17	SHALEY COAL		
165.58		0.09	COAL: DULL TO VITREOUS		
165.97		0.30	SHALEY COAL	AO 218	2.63
166.22		0.25	COAL: VITREOUS TO BRIGHT		
166.37			SHALE: MEDIUM GRAY-BROWN		
166.49			COAL: DULL		
166.72			SHALEY COAL		
167.15			SHALEY COAL		
		1.26	SHALE: SLIGHTLY CARBONACEOUS		
168.41		0.52	COAL: DULL, SOFT PLATY	AO 219	0.52
168.93			FLOOR: SHALE, SOFT; POOR		

SIZE		WEIGHT PERCENT									CUMULATIVE WEIGHT PERCENT								CUMULATIVE SAMPLE VALUES								OTHER		
DIAMETER	WT %	SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S			
1/4×28	93.6	-1.90	54.6	6.7	27.2	28.7	37.4	7843	-	0.43	54.6	6.7	27.2	28.7	37.4	7843	-	0.43												
		+1.90	45.4	2.5	70.1	-	-	-	-	-	100.0	4.8	46.7	-	-	-	-	-												
28×0	6.4	RAW	100.0	5.9	41.0	26.4	26.7	5992	-	0.22	100.0	5.9	41.0	26.4	26.7	5992	-	0.22												
1/4×0	100.0	RAW	100.0	5.5	46.2	24.3	24.0	5258	-	0.21	CALC.	4.9	46.3	-	-	-	-	-												
1/4×28	93.6	-1.90	54.6	-	-	-	-	-	-	-	51.1	6.7	27.2	28.7	37.4	7843	-	0.43												
28×0	6.4	RAW	100.0	-	-	-	-	-	-	-	6.4	5.9	41.0	26.4	26.7	5992	-	0.22												
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	57.5	6.6	28.5	28.4	36.3	7752	-	0.41	2.63	57.5	6.6	28.5	28.4	36.3	7752					
1/4×28	91.7	-1.90	46.0	6.8	26.2	30.2	36.8	8233	-	0.58	46.0	6.8	26.2	30.2	36.8	8233	-	0.58												
		+1.90	54.0	3.8	71.0	-	-	-	-	-	100.0	5.2	50.4	-	-	-	-	-												
28×0	8.3	RAW	100.0	4.2	53.7	21.7	20.4	4324	-	0.33	100.0	4.2	53.7	21.7	20.4	4324	-	0.33												
1/4×0	100.0	RAW	100.0	5.0	50.7	21.9	22.4	4683	-	0.42	CALC.	5.2	50.7	-	-	-	-	-												
1/4×28	91.7	-1.90	46.0	-	-	-	-	-	-	-	42.2	6.8	26.2	30.2	36.8	8233	-	0.58												
28×0	8.3	RAW	100.0	-	-	-	-	-	-	-	8.3	4.2	53.7	21.7	20.4	4324	-	0.33												
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	50.5	6.3	29.1	29.2	35.0	7903	-	0.54	3.15	56.3	6.5	28.5	28.5	36.1	7774					

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y 10,050m W X 650m N of SE. corner of CL 88
ELEVATION: 600.47m BITS USED: J.K. SMIT COMBINATION
DIP: 90° BEARING: MUD USED:
CORE SIZE: NQ CASING: HW 9.75m NW 29.26m m LEFT IN HOLE: NIL m
DATE START: AUG 28/1979 FINISH: SEPT 18/1979
DRILLER: E. CARON DIAMOND DRILLING OVERALL RECOVERY: 89%
TESTS: GAMMA LOG
SAMPLED BY: O. CULLINGHAM DATE: OCT 9/79 ANALYZED BY: BIRTLEY COAL + MINERALS TESTING SIGNED:

BOREHOLE NO. BP-79-22/22A
PAN OCEAN OIL LTD. (PAGE 1)
MINING DIVISION – COAL

LOGGED BY: O. CULLINGHAM DATE:

GEOLOGICAL LOG – SCALE: 1:500

DEPTH	THICKNESS	DESCRIPTION
	60.37	OVERBURDEN - PROBABLE GLACIAL SANDS AND CLAYS; COBBLES AND BOULDERS OF VARIOUS LITHOLOGIES NEAR SURFACE. INTERVALS OF COBBLES AND BOULDERS AND UNCONSOLIDATED SANDS AND CLAYS.
60.37	2.11	SANDSTONE - MEDIUM TO COARSE GRAINED; POORLY CEMENTED
62.48	17.38	SHALE - MEDIUM TO DARK GREY, SOFT - IN PART WITH SOFT PLASTICINE TEXTURE. CONTAINS THIN CARBONACEOUS AND COALY SECTIONS.
79.86	6.09	SHALE - MEDIUM GRAY, MASSIVE BEDDED, SILTY AND SANDY BASALLY
85.95	6.55	SANDSTONE, CONGLOMERATIC SANDSTONE AND CONGLOMERATE, MEDIUM GRAY BROWN TO MEDIUM GRAY, IN PART RUBBLY.
92.50	6.50	SHALE - MEDIUM TO MEDIUM-DARK GRAY, RELATIVELY COMPETENT; THIN CARBONACEOUS AND COALY SECTIONS; BECOMES SILTY AND SANDY BASALLY.
99.00	7.00	SANDSTONE, CONGLOMERATIC SANDSTONE AND CONGLOMERATE. GRADATIONAL FROM UNIT ABOVE TO CONGLOMERATE AND BACK TO SANDSTONE AT BASE.
106.00		CONTINUED ON PAGE 2

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
		No. 1 SEAM HORIZON		
		ROOF - GOOD, CONGLOMERATE		
191.63	0.53	DOMINANTLY COAL AND SHALEY	A0237	0.53
192.16	0.66	CARBONACEOUS SHALE	A0238	0.66
192.82	3.26	COAL - DOMINANTLY VITREOUS TO BRIGHT, BLOCKY TO CONCOIDAL FRACTURE, MINOR DULL COAL AND RARE SHALEY COAL AND COALY SHALE. 0.05m LOST CORE.	A0239	3.26
196.08	0.79	CARBONACEOUS SHALE	A0240	0.79
196.87	1.73	DOMINANTLY COAL, DULL TO BRIGHT RARE CARBONACEOUS TO COALY SHALE	A0241	1.73
198.60		FLOOR - MODERATE, RELATIVELY COMPETENT SHALE		
		No. 2 SEAM HORIZON		
		ROOF - GOOD, CONGLOMERATE		
221.84	0.31	COAL - BRIGHT		
222.15	0.05	COAL - DULL		
222.20	1.13	COAL - MOSTLY BRIGHT		
223.33	0.66	ALTERNATING, COAL SHALEY COAL AND CARBONACEOUS SHALE	A0242	2.72
223.99	0.57	COAL - MOSTLY BRIGHT		
224.56		FLOOR - POOR, SHALE - FRACTURES ALONG BEDDING		

SIZE DIAMETER	SIZE WT %	SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C.	BTU	F.S.I.	S
1/4×28	95.2	-1.90	66.5	5.1	22.5	30.5	41.9	8622	-	
		+1.90	33.5	2.8	61.7	-	-	-	-	-
28×0	4.8	RAW	100.0	7.1	29.6	27.1	36.2	7270	-	-
1/4×0	100.0	RAW	100.0	4.6	35.3	27.0	33.1	6873	-	-
1/4×28	95.2	-1.90	66.5	-	-	-	-	-	-	-
28×0	4.8	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-
1/4×28	95.2	-1.90	1.3	5.6	35.3	24.6	34.5	6779	-	
		+1.90	98.7	2.1	79.0	-	-	-	-	-
28×0	4.8	RAW	100.0	3.5	74.3	12.9	9.3	-	-	-
1/4×0	100.0	RAW	100.0	2.4	78.0	13.3	6.3	-	-	-
1/4×28	95.2	-1.90	1.3	-	-	-	-	-	-	-
28×0	4.8	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-
1/4×28	94.5	-1.90	78.5	6.1	12.9	33.2	47.8	9962	-	
		+1.90	21.5	1.9	67.9	-	-	-	-	-
28×0	5.5	RAW	100.0	8.0	21.1	30.7	40.2	8540	-	
1/4×0	100.0	RAW	100.0	8.2	24.0	29.9	37.9	8724	-	
1/4×28	94.5	-1.90	78.5	-	-	-	-	-	-	-
28×0	5.5	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-
1/4×28	94.9	-1.90	2.2	3.9	38.9	23.0	34.2	6416	-	
		+1.90	97.8	1.9	78.7	-	-	-	-	-
28×0	5.1	RAW	100.0	2.9	72.6	16.1	8.4	-	-	-
1/4×0	100.0	RAW	100.0	2.2	77.3	13.7	6.8	-	-	-
1/4×28	94.9	-1.90	2.2	-	-	-	-	-	-	-
28×0	5.1	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-
1/4×28	94.9	-1.90	73.8	6.1	18.4	33.5	42.0	9362	-	
		+1.90	26.2	2.4	65.2	-	-	-	-	-
28×0	5.1	RAW	100.0	7.5	28.5	29.9	34.1	7563	-	
1/4×0	100.0	RAW	100.0	7.8	29.6	29.0	34.6	7366	-	
1/4×28	94.9	-1.90	73.8	-	-	-	-	-	-	-
28×0	5.1	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-
1/4×28	94.3	-1.90	83.1	6.9	12.0	33.4	47.7	10163	-	
		+1.90	16.9	2.7	73.2	-	-	-	-	-
28×0	5.7	RAW	100.0	7.5	23.0	30.9	38.6	8499	-	
1/4×0	100.0	RAW	100.0	7.9	22.7	30.1	39.3	8308	-	
1/4×28	94.3	-1.90	83.1	-	-	-	-	-	-	-
28×0	5.7	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-

CUMULATIVE WEIGHT PERCENT YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
66.5	5.1	22.5	30.5	41.9	8622	-	0.25
100.0	4.3	35.6	-	-	-	-	-
100.0	7.1	29.6	27.1	36.2	7270	-	0.21
CALC.	4.4	35.3	-	-	-	-	-
63.3	5.1	22.5	30.5	41.9	8622	-	0.25
4.8	7.1	29.6	27.1	36.2	7270	-	0.21
68.1	5.2	23.1	30.1	41.3	8587	-	0.25
1.3	5.6	35.3	24.6	34.5	6779	-	0.23
100.0	2.1	78.4	-	-	-	-	-
100.0	3.5	74.3	12.9	9.3	-	-	0.07
CALC.	2.2	78.2	-	-	-	-	-
1.2	5.1	35.3	24.6	34.5	6779	-	0.23
4.8	3.5	74.3	12.9	9.3	-	-	0.07
6.0	3.9	63.1	16.2	16.5	2032	-	0.10
78.5	6.1	12.9	33.2	47.8	9962	-	0.31
100.0	5.2	24.7	-	-	-	-	-
100.0	8.0	21.1	30.7	40.2	8540	-	0.27
CALC.	5.3	24.5	-	-	-	-	-
74.2	6.1	12.9	33.2	47.8	9962	-	0.31
5.5	8.0	21.1	30.7	40.2	8540	-	0.27
79.7	6.2	13.6	32.9	47.1	9929	-	0.31
2.2	3.9	38.9	23.0	34.2	6416	-	0.29
100.0	1.9	77.8	-	-	-	-	-
100.0	2.9	72.6	16.1	8.4	-	-	0.07
CALC	1.9	77.5	-	-	-	-	-
2.1	3.9	38.9	23.0	34.2	6416	-	0.29
5.1	2.9	72.6	16.1	8.4	-	-	0.07
7.2	3.1	60.5	18.5	17.5	2383	-	0.13
73.8	6.1	18.4	33.5	42.0	9362	-	0.46
100.0	5.1	33.7	-	-	-	-	-
100.0	7.5	28.5	29.9	34.1	7563	-	0.25
CALC.	5.2	33.4	-	-	-	-	-
70.0	6.1	18.4	33.5	42.0	9362	-	0.46
5.1	7.5	28.5	29.9	34.1	7563	-	0.25
75.1	6.1	19.2	33.2	41.3	9370	-	0.45
83.1	6.9	12.0	33.4	47.7	10163	-	0.42
100.0	6.2	22.3	-	-	-	-	-
100.0	7.5	23.0	30.9	38.6	8499	-	0.38
CALC.	6.3	22.3	-	-	-	-	-
78.4	6.9	12.0	33.4	47.7	10163	-	0.42
5.7	7.5	23.0	30.9	38.6	8499	-	0.38
84.1	6.9	12.8	33.2	47.0	10134	-	0.42

CUMULATIVE SAMPLE VALUES THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
0.53	68.1	5.2	23.1	30.1	41.3	8587		
1.19	33.6	5.0	27.0	28.7	38.8	7938		
4.45	67.3	6.0	15.4	32.3	46.0	9663		
5.24	58.3	5.9	16.2	32.0	45.4	9527		
6.97	62.4	6.0	17.1	32.4	44.2	9480		
2.72	84.1	6.9	12.8	33.2	47.0	10134		

OTHER

LW

062055

LOCATION MAP

TN ↑

SCALE:

COORDINATES: Y X

ELEVATION: BITS USED:

DIP: BEARING: MUD USED:

CORE SIZE: CASING: m LEFT IN HOLE: m

DATE START: FINISH:

DRILLER: OVERALL RECOVERY:

TESTS:

SAMPLED BY: DATE: ANALYZED BY:

BOREHOLE NO. BP-79-22A

PAN OCEAN OIL LTD. PAGE 2

MINING DIVISION – COAL

LOGGED BY: DATE:

SIGNED:

GEOLOGICAL LOG – SCALE: 1:500

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION
106.00			CONTINUED FROM SHEET 1
		85.63	CONGLOMERATE - MASSIVE, LARGE PEBBLE; CONTAINS THIN INTERVALS OF SANDSTONE AND SHALE NEAR TOP OF UNIT; TYPICAL OF THE THICK CONGLOMERATE ABOVE THE No. 1 SEAM HORIZON
191.63		6.97	No. 1 SEAM HORIZON
198.60		4.70	SHALE - MEDIUM BROWNISH-GRAY TO MEDIUM GRAY, CARBONACEOUS AT TOP, SILTY AT BASE
203.30		1.45	SANDSTONE - MEDIUM GRAY, CROSS-BEDDED
204.75		10.51	CONGLOMERATE - SMALL TO MEDIUM PEBBLE; CHERT AND QUARTZITE, CONTAINS SHORT INTERVALS OF SANDSTONE
215.26		2.82	SANDSTONE - VERY FINE TO FINE GRAINED, CROSS-BEDDED CARBONACEOUS LAMINAE
218.08		3.76	SHALE/SANDSTONE TO CONGLOMERATE GRADATIONAL
221.84		2.72	No. 2 SEAM HORIZON
224.56		9.84	SHALE - MEDIUM GRAY, SILTY AND SANDY SECTIONS THROUGHOUT, CROSS-BEDDING IN UPPER SECTIONS
234.40		3.13	No. 3 SEAM HORIZON
237.53		2.35	SHALE - MEDIUM TO DARK GRAY, CARBONACEOUS TO SILTY BASALLY
239.88		3.52	SANDSTONE - MEDIUM LIGHT GRAY, MEDIUM GRAINED, GRADATIONAL FROM ABOVE UNIT
243.40		5.62	CONGLOMERATE - MEDIUM PEBBLE WITH OCCASIONAL LARGE PEBBLES
249.02			

DEPTH	GRAPHIC LOG	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
			No. 3 SEAM HORIZON		
234.40		0.14	ROOF - POOR, SHALE - FRAGMENTAL WEATHERING		
234.54		0.29	CARBONACEOUS SHALE		
234.77		0.28	DOMINANTLY COAL, WITH RARE THIN THIN BEDS OF CARBONACEOUS TO COALY SHALE		
235.05		0.66			
235.71		0.69		A0243	1.98
236.40		0.12			
236.52		0.08	CARBONACEOUS SHALE 0.03m LOST CORE	NOT	SAMPLED
		0.32			
237.19		0.04			
237.53		0.34	COAL - DULL TO BRIGHT	A0244	0.34
			FLOOR - SHALE - POOR, BLOCKY FRACTURE		

SIZE		WEIGHT PERCENT									CUMULATIVE WEIGHT PERCENT							
DIA-METER	WT %	SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
1/4×28	93.7	-1.90	84.5	5.9	15.9	33.5	44.7	9621	-		84.5	5.9	15.9	33.5	44.7	9621	-	
		+1.90	15.5	1.8	66.0	-	-	-	-	-	100.0	5.3	23.7	-	-	-	-	-
28×0	6.3	RAW	100.0	6.5	23.0	32.6	37.9	8553	-		100.0	6.5	23.0	32.6	37.9	8553	-	
1/4×0	100.0	RAW	100.0	7.0	23.0	31.6	38.4	8482	-		CALC.	5.4	23.7	-	-	-	-	-
1/4×28	93.7	-1.90	84.5	-	-	-	-	-	-	-	79.2	5.9	15.9	33.5	44.7	9621	-	
28×0	6.3	RAW	100.0	-	-	-	-	-	-	-	6.3	6.5	23.0	32.6	37.9	8553	-	
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	85.5	5.9	16.4	33.4	44.1	9628		
1/4×28	94.7	-1.90	67.5	4.1	32.8	27.8	35.3	7524	-		67.5	4.1	32.8	27.8	35.3	7524	-	
		+1.90	32.5	2.2	68.3	-	-	-	-	-	100.0	3.5	44.3	-	-	-	-	-
28×0	5.3	RAW	100.0	4.8	38.2	26.5	30.5	6615	-		100.0	4.8	38.2	26.5	30.5	6615	-	
1/4×0	100.0	RAW	100.0	3.6	43.7	24.7	28.0	5881	-		CALC.	3.6	44.0	-	-	-	-	-
1/4×28	94.7	-1.90	67.5	-	-	-	-	-	-	-	63.9	4.1	32.8	27.8	35.3	7524	-	
28×0	5.3	RAW	100.0	-	-	-	-	-	-	-	5.3	4.8	38.2	26.5	30.5	6615	-	
1/4×0	100.0	COMB	-	-	-	-	-	-	-	-	69.2	4.1	33.2	27.6	34.8	7539	-	

CUMULATIVE SAMPLE VALUES										OTHER		
THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S			
1.98	85.5	5.9	16.4	33.4	44.1	9628					
2.32	83.1	5.6	18.4	32.6	42.9	9373					

062055

LOCATION MAP

TN

SCALE:

COORDINATES: Y 8,300 m N. X 9,400 m W. of S.E. corner of CL 78
ELEVATION: APPROX. 570 m BITS USED: J.K. SMIT COMBINATION
DIP: 90° BEARING: MUD USED:
CORE SIZE: HQ & NQ CASING: m LEFT IN HOLE: NIL m
DATE START: SEPT, 9, 79 FINISH: SEPT. 11, 79
DRILLER: E. CARRON DIAMOND DRILLING OVERALL RECOVERY: 97 %
TESTS:
SAMPLED BY: O. CULLINGHAM DATE: OCT. 2, 1979 ANALYZED BY: BIRTLEY COAL & MINERALS TESTING SIGNED:

BOREHOLE NO. A-79-23
PAN OCEAN OIL LTD.
MINING DIVISION – COAL

LOGGED BY: O. CULLINGHAM DATE: SEPT. 11, 79

GEOLOGICAL LOG – SCALE: 1:500

DETAILS OF COAL SEAMS – SCALE: 1:100

DEPTH	THICKNESS	DESCRIPTION
	10.5	OVERBURDEN - COBBLES AND BOULDERS OF SANDSTONE AND CONGLOMERATE IMBEDDED IN CLAY AND SAND
10.5	9.86	CONGLOMERATE - SMALL TO MEDIUM PEBBLE CONGLOMERATE, FINING DOWNWARD CHERT AND QUARTZITE.
20.36	8.34	SHALE - BLOCKY, MEDIUM GRAY, BECOMES DARKER DOWNWARDS AND IN PART CARBONACEOUS.
28.70	5.56	No. 1 SEAM HORIZON
34.26	3.78	SHALE - MEDIUM GRAY, BECOMES SILTY AND SANDY BASALEY - GRADATIONAL WITH SANDSTONE BELOW.
38.04	9.86	SANDSTONE - MEDIUM GRAY, GRADATIONAL FROM VERY FINE GRAINED TO GRANULE CONGLOMERATIC AT BASE. MEDIUM TO THICK TO MASSIVE BEDDED. CROSS-BEDDED.
47.90	0.40	SHALE - MEDIUM GRAY BREAKS WITH BLOCKY FRACTURE
48.30	0.31	SANDSTONE - MEDIUM LIGHT GRAY, VERY FINE GRAINED.
48.61	0.41	SHALE - MEDIUM GRAY, BLOCKY FRACTURE.
49.06	13.41	SANDSTONE - MEDIUM GRAY, THIN TO THICKLY BEDDED, CROSS-BEDDED, VERY FINE TO COARSE TO IN PART SMALL PEBBLE CONGLOMERATIC
62.43	2.37	SHALE - MEDIUM GRAY, BLOCKY, IN FART SILTY.
64.80	21.80	SANDSTONE - CONGLOMERATIC SANDSTONE AND CONGLOMERATE, MEDIUM GRAY, THIN TO MASSIVELY BEDDED. DOMINANTLY MEDIUM TO COARSE GRAINED SANDSTONE. ABUNDANT CARBON TRASH THROUGHOUT IN PARTINGS AND FILAMENTS.
86.60	5.47	SHALE - MEDIUM TO MEDIUM DARK GRAY, SILTY AT TOP, BECOMES CARBONACEOUS BASALLY
92.00	4.87	No. 2 SEAM HORIZON
96.89	1.63	SHALE - CARBONACEOUS AT TOP, SILTY TO SANDY BASALLY.
98.52	8.18	SANDSTONE - MEDIUM GRAY, VERY FINE GRAINED AT TOP, GRADATIONAL TO MEDIUM AND IS PART COARSE GRAINED DOWNWARDS. QUARTS AND CHERT GRAINS.
106.70	3.94	CONGLOMERATE - MEDIUM TO LARGE PEBBLE CONGLOMERATE MINOR TAR IN MATRIX
110.64		

No. 1 SEAM HORIZON

DEPTH	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
		ROOF - POOR, BLOCKY SHALE		3.04
28.70	0.13			
	0.16			
	0.46	COAL - DOMINANTLY BRIGHT, WITH SOME DULL TO VITREOUS. RARE DULL COAL	A0229	
29.57	0.12			
	2.17	0.12 m LOST CORE 0.16 m SHALEY COAL		
31.74	0.43	CARBONACEOUS SHALE, GRADES TO COALY SHALE AND COAL BASALTY.	A0230	1.17
32.17	0.20			
	0.33			
	0.15			
32.91	0.05			
	0.25	CARBONACEOUS AND COALY SHALE	A0231	0.93
	0.08			
	0.60			
33.84	0.36	DULL TO BRIGHT COAL		
34.20	0.08	CARBONACEOUS AND COALY SHALE	A0232	0.36
34.26		FLOOR, - POOR, SHALE - FRAGMENTAL		

DIAMETER	WT %	SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S
1/4×28	92.5	-1.90	87.9	4.5	12.5	34.1	48.9	10406	-	0.41
		+1.90	12.1	1.7	77.9	-	-	-	-	-
28×0	7.5	RAW	100.0	6.6	27.7	29.3	36.4	7901	-	0.33
1/4×0	100.0	RAW	100.0	7.6	20.5	31.3	40.6	8967	-	0.29
1/4×28	92.5	-1.90	87.9	-	-	-	-	-	-	-
28×0	7.5	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-
1/4×28	90.7	-1.90	24.9	3.1	30.3	28.8	37.8	8248	-	0.40
		+1.90	75.1	1.7	78.4	-	-	-	-	-
28×0	9.3	RAW	100.0	3.8	57.5	18.7	20.0	-	-	0.23
1/4×0	100.0	RAW	100.0	3.4	65.1	16.8	14.7	-	-	0.18
1/4×28	90.7	-1.90	24.9	-	-	-	-	-	-	-
28×0	9.3	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-
1/4×28	91.8	-1.90	15.4	3.9	31.9	27.1	37.1	7605	-	0.36
		+1.90	84.6	1.6	81.7	-	-	-	-	-
28×0	8.2	RAW	100.0	3.5	65.6	15.3	15.6	-	-	0.22
1/4×0	100.0	RAW	100.0	2.8	73.1	12.8	11.3	-	-	0.14
1/4×28	91.8	-1.90	15.4	-	-	-	-	-	-	-
28×0	8.2	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-
1/4×28	92.6	-1.90	86.0	3.7	19.4	32.5	44.4	9670	-	0.36
		+1.90	14.0	2.0	66.9	-	-	-	-	-
28×0	7.4	RAW	100.0	6.2	20.6	31.9	41.3	8974	-	0.32
1/4×0	100.0	RAW	100.0	4.0	25.5	30.8	39.7	8560	-	0.33
1/4×28	92.6	-1.90	86.0	-	-	-	-	-	-	-
28×0	7.4	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-

DIAMETER	WT %	SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL	F.C	BTU	F.S.I.	S
1/4×28	93.3	-1.90	76.3	5.6	19.2	30.8	44.4	9420	-	0.36
		+1.90	23.7	2.0	69.3	-	-	-	-	-
28×0	6.7	RAW	100.0	6.2	30.3	27.1	36.4	7699	-	0.23
1/4×0	100.0	RAW	100.0	6.5	30.2	26.4	36.9	7686	-	0.25
1/4×28	93.3	-1.90	76.3	-	-	-	-	-	-	-
28×0	6.7	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-
1/4×28	93.2	-1.90	79.1	5.4	10.6	31.2	52.8	10536	-	0.36
		+1.90	20.9	0.8	81.3	-	-	-	-	-
28×0	6.8	RAW	100.0	6.7	23.2	28.5	41.6	8534	-	0.23
1/4×0	100.0	RAW	100.0	7.1	24.9	28.2	39.8	8274	-	0.15
1/4×28	93.2	-1.90	79.1	-	-	-	-	-	-	-
28×0	6.8	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-
1/4×28	93.8	-1.90	71.0	4.7	14.8	30.9	49.6	10075	-	0.35
		+1.90	29.0	1.0	80.0	-	-	-	-	-
28×0	6.2	RAW	100.0	4.8	35.1	26.0	34.1	6905	-	0.15
1/4×0	100.0	RAW	100.0	3.9	33.7	26.5	35.9	7329	-	0.24
1/4×28	93.8	-1.90	71.0	-	-	-	-	-	-	-
28×0	6.2	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-
1/4×28	92.7	-1.90	54.3	3.6	30.5	28.4	37.5	8336	-	0.28
		+1.90	45.7	1.9	72.5	-	-	-	-	-
28×0	7.3	RAW	100.0	3.8	38.6	21.9	35.7	6660	-	0.27
1/4×0	100.0	RAW	100.0	3.1	49.4	20.8	26.7	5122	-	0.20
1/4×28	92.7	-1.90	54.3	-	-	-	-	-	-	-
28×0	7.3	RAW	100.0	-	-	-	-	-	-	-
1/4×0	100.0	COMB.	-	-	-	-	-	-	-	-

No. 2 SEAM HORIZON

DEPTH	THICKNESS	DESCRIPTION	SAMPLE NUMBER	THICKNESS
		ROOF - POOR, SHALE, BLOCKY		2.13
92.00	0.70	COAL - MOSTLY VITREOUS AND BRIGHT	A0233	
92.70	0.20	SHALEY COAL		
92.90	0.40	COAL - MOSTLY BRIGHT		
93.30	0.27	NO CORE		1.27
93.57	0.43	COAL - VITREOUS TO BRIGHT	A0234	
94.00	0.13	SHALEY COAL		
94.13	0.13	CARBONACEOUS SHALE		
94.26	1.14	COAL - VITREOUS TO BRIGHT WITH THIN BANDS OF DULL SHALEY COAL	A0235	0.66
95.40	0.11	SHALE - MEDIUM GRAY		
	0.55	COAL - VITREOUS TO BRIGHT		
96.06	0.14	COAL / SHALEY COAL		
	0.42	NO CORE	A0236	0.89
96.02	0.27	COAL / SHALEY COAL		
96.89		FLOOR - POOR, SHALE, BLOCKY AT TOP, CARBONACEOUS		

CUMULATIVE WEIGHT PERCENT									
YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
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87.9	4.5	12.5	34.1	48.9	10406	-	0.41
100.0	4.2	20.4	-	-	-	-	-
100.0	6.6	27.7	29.3	36.4	7901	-	0.33
CALC.	4.4	20.9	-	-	-	-	-
81.3	4.5	12.5	34.1	48.9	10406	-	0.41
7.5	6.6	27.7	29.3	36.4	7901	-	0.33
88.8	4.6	14.3	33.5	47.4	10202	-	0.40
24.9	3.1	30.3	28.8	37.8	8248	-	0.40
100.0	1.9	74.0	-	-	-	-	-
100.0	3.8	57.5	18.7	20.0	-	-	0.23
CALC.	2.1	72.4	-	-	-	-	-
22.6	3.1	30.3	28.8	37.8	8248	-	0.40
9.3	3.8	57.5	18.7	20.0	-	-	0.23
31.9	3.3	39.4	25.4	31.8	5579	-	0.35
15.4	3.9	31.9	27.1	37.1	7605	-	0.36
100.0	1.9	74.0	-	-	-	-	-
100.0	3.5	65.6	15.3	15.6	-	-	0.22
CALC.	2.0	73.3	-	-	-	-	-
14.1	3.9	31.9	27.1	37.1	7605	-	0.36
8.2	3.5	65.6	15.3	15.6	-	-	0.22
22.3	3.7	43.4	23.0	29.7	5093	-	0.31
86.0	3.7	19.4	32.5	44.4	9670	-	0.36
100.0	3.5	26.1	-	-	-	-	-
100.0	6.2	20.6	31.9	41.3	8974	-	0.32
CALC.	3.7	25.7	-	-	-	-	-
79.6	3.7	19.4	32.5	44.4	9670	-	0.36
7.4	6.2	20.6	31.9	41.3	8974	-	0.32
87.0	3.9	19.4	32.4	43.9	9672	-	0.36

CUMULATIVE WEIGHT PERCENT									
YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
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76.3	5.6	19.2	30.8	44.4	9420	-	0.36
100.0	4.7	31.0	-	-	-	-	-
100.0	6.2	30.3	27.1	36.4	7699	-	0.23
CALC.	4.8	30.9	-	-	-	-	-
71.2	5.6	19.2	30.8	44.4	9420	-	0.36
6.7	6.2	30.3	27.1	36.4	7699	-	0.23
77.9	5.6	20.2	30.4	43.6	9351	-	0.36
79.1	5.4	10.6	31.2	52.8	10536	-	0.36
100.0	4.4	25.4	-	-	-	-	-
100.0	6.7	23.2	28.5	41.6	8534	-	0.23
CALC.	4.6	25.2	-	-	-	-	-
73.7	5.4	10.6	31.2	52.8	10536	-	0.36
6.8	6.7	23.2	28.5	41.6	8534	-	0.23
80.5	5.5	11.8	30.9	51.6	10424	-	0.35
71.0	4.7	14.8	30.9	49.6	10075	-	0.35
100.0	3.6	33.7	-	-	-	-	-
100.0	4.8	35.1	26.0	34.1	6905	-	0.15
CALC.	3.7	33.8	-	-	-	-	-
66.6	4.7	14.8	30.9	49.6	10075	-	0.35
6.2	4.8	35.1	26.0	34.1	6905	-	0.15
72.8	4.7	16.5	30.4	48.2	9895	-	0.33
54.3	3.6	30.5	28.4	37.5	8336	-	0.28
100.0	2.8	49.7	-	-	-	-	-
100.0	3.8	38.6	21.9	35.7	6660	-	0.27
CALC.	2.9	48.9	-	-	-	-	-
50.3	3.6	30.5	28.4	37.5	8336	-	0.28
7.3	3.8	38.6	21.9	35.7	6660	-	0.27
57.6	3.6	31.5	27.5	37.2	8209	-	0.28

CUMULATIVE SAMPLE VALUES									
THICKNESS	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
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3.04	88.8	4.6	14.3	33.5	47.4	10202		
4.21	72.9	4.4	17.3	32.5	45.5	9640		
5.14	63.8	4.3	19.0	31.9	44.5	9352		
5.50	65.3	4.3	19.0	31.9	44.4	9380		
2.13	77.9	5.6	20.2	30.4	43.6	9351		
3.40	78.8	5.5	17.0	30.5	46.6	9760		
4.06	77.8	5.4	16.9	30.5	46.8	9780		
4.89	74.4	5.1	18.8	30.1	45.6	9574		

OTHER

LOCATION MAP

TN

SCALE:

COORDINATES: 3,000 m W, 10,300 m N } OF S.E. CORNER C.L. 78
ELEVATION: 685.8
DIP: -90° BEARING: N/A
CORE SIZE: HQ TO 146.3, NQ TO 304.8 CASING: HW 5.49, NW 146.3
BITS USED: J.K. SMIT COMBINATION, J.K. SMIT 75 & 100 SERIES DIAMOND
MUD USED: POLY 330
m. LEFT IN HOLE: NIL m.
DRILLER: CARON DIAMOND DRILLING
TESTS:
SAMPLED BY: O. CULLINGHAM, D. HOPE
DATE START: MAY 22, 1980
FINISH: MAY 30, 1980
OVERALL RECOVERY: 90 %
DATE: MAY 30, 1980 ANALYZED BY: BIRTLEY COAL & MINERALS TESTING

PAN OCEAN OIL LTD.
MINING DIVISION - COAL

LOGGED BY: O.R. CULLINGHAM D.C. HOPE DATE: MAY 30, 1980
SIGNED:

DRILLHOLE NO. WK-80-1
SHEET 1 OF 3

GEOLOGICAL LOG — SCALE: 1:500

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
3.65		3.65	OVERBURDEN - TRICONED
		16.16	CONGLOMERATE - RUBBLY, DISAGGREGATED, QTZ. & CHT. PEBBLES, POORLY CEMENTED; MATRIX COARSE GRAINED SANDSTONE.
19.81		5.09	MUDSTONE - MEDIUM TO DARK GRAY, GRADES BASALLY TO CARBONACEOUS MUDSTONE.
24.90		6.55	No. 1 SEAM HORIZON
31.45		2.17	MUDSTONE - GRADATIONAL BASALLY TO SILTSTONE. DARK TO MEDIUM GRAY
33.62		32.27	CONGLOMERATE - SMALL TO MEDIUM PEBBLE, WELL ROUNDED CONTAINS CROSSBEDS OF SANDSTONE. BEDDING AT 65° TO C.A.
65.89		9.11	No. 2 SEAM HORIZON
75.00		1.76	MUDSTONE - FRAGMENTAL, MEDIUM TO DARK GRAY
76.76		1.04	SANDSTONE - FINE TO MEDIUM GRAINED, BROWN GRAY
77.80		17.37	CONGLOMERATE - SMALL TO MEDIUM PEBBLE, WELL ROUNDED, WHITE THROUGH BLACK WITH VERY FEW GREEN CLASTS, CROSSBEDS OF SANDSTONE.
95.17		0.58	SANDSTONE
		0.32	CONGLOMERATE
		0.80	SANDSTONE
		0.29	COAL
100.00		26.14	CONGLOMERATE - SMALL TO MEDIUM PEBBLE, WELL ROUNDED.
123.30		1.35	MUDSTONE - MEDIUM TO DARK GRAY
124.65		0.67	CONGLOMERATE - TRACES OF COAL
125.32		15.23	SANDSTONE - MEDIUM TO COARSE GRAINED, LIGHT GRAY WITH CROSSBEDDING AND CARBONACEOUS BANDS THROUGHOUT
140.55		0.92	MUDSTONE - DARK GRAY
141.47		4.52	SANDSTONE - MEDIUM TO COARSE GRAINED, FAIRLY WELL SORTED, CONGLOMERATIC COALY BANDS.
145.99		3.02	MUDSTONE - MEDIUM TO DARK GRAY, INCREASING COAL FLECKS DOWNWARDS, IRREGULAR FRACTURING
		5.09	No. 3 SEAM HORIZON
154.10		8.05	MUDSTONE - MED. GRAY, IN PART CARB. WITH STRINGERS & SPLINTS.
162.15		4.58	SANDSTONE - MEDIUM GRAY, MEDIUM GRAINED.
166.73		13.67	CONGLOMERATIC SANDSTONE - AND CONGLOMERATE, INCREASING IN CONGLOMERATE BASALLY.
180.40		6.49	CONGLOMERATE - QUARTZITE & CHERT PEBBLES.
186.89		6.96	MUDSTONE - LIGHT TO DARK GRAY
193.85		0.32	SHALE - COAL SPLINTS, DARK GREEN
194.17		4.20	MUDSTONE - LIGHT GRAY, TWO THIN COAL SEAMS
198.37		6.16	SILTSTONE TO SANDSTONE - MEDIUM GRAY SILTSTONE GRADING INTO CONGLOMERATIC SANDSTONE
204.53		14.11	CONGLOMERATIC SANDSTONE - MEDIUM GRAY, SMALL PEBBLE CONGLOMERATE
218.64		16.57	SANDSTONE - SALT & PEPPER, MEDIUM GRAINED.
235.21		6.62	SILTSTONE - MEDIUM GRAY, GRADES BASALLY INTO DARK GRAY
241.83			

DETAILS OF COAL SEAMS — SCALE: 1:50

No. 1 SEAM HORIZON

DEPTH (m)	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)
			ROOF - CARBONACEOUS MUDSTONE, SOFT, GRADATIONAL		
24.90	0.10		COAL & SHALY COAL - DULL TO VITREOUS WITH BRIGHT BANDS	A0251	0.38
25.28	0.22	80			
	0.06				
	0.62		MUDSTONE - MODERATELY HARD IN PART CARBONACEOUS		
	0.61				
26.51	0.24		SHALY COAL - DULL/VITREOUS PTGS.		
	0.14		COAL - VITREOUS		
27.13	0.24		MUDSTONE - IN PART CARBONACEOUS		
	0.47		COAL - VITREOUS	A0252	0.62
	0.20		MUDSTONE		
	0.57	96	COAL - DULL TO VITREOUS WITH BRIGHT BANDS OF DULL SHALY COAL		
	0.01				
28.51	0.11				
28.84	0.33		SHALE - MEDIUM GRAY, BLOCKY.		
	0.16		COAL & SHALE - COAL IS DULL TO VITREOUS, PLATY TO BLOCKY FRACTURE, SHALE IS MODERATELY HARD BLOCKY & IN PART CARB.	A0253	0.39
	0.13				
	0.17				
	0.15				
	0.11				
29.67	0.71		SILTSTONE - HARD, BLOCKY, CONTAINS THIN LENSES AND BANDS OF COAL	A0254	1.38
30.38	0.92	100	CARBONACEOUS SHALE - DULL, CONTAINS LENSES PARTINGS & BANDS OF COAL	A0255	1.38
31.45	0.15		COAL - VITREOUS TO BRIGHT	A0256	0.53
			FLOOR - SHALE AND SILTY SHALE		

No. 2 SEAM HORIZON

(SEE SHEET 2 OF 3)

DEPTH (m)	THICKNESS (m)	RECOVERY %	DESCRIPTION
	0.25	99	ROOF - CONGLOMERATE
65.89			COAL - PARTED, DULL/VITREOUS PARTINGS
66.14	1.28		COAL - DULL TO VITREOUS, PARTED, 0.09 m SHALY COAL BAND.
	0.09	100	
	0.49		
	1.63		COAL - BRIGHT, PARTED TO BANDED, IN PART IRRIDESCENT
69.87	0.24		COAL - VITREOUS, 0.03 CARB. SHALE PARTINGS AT TOP.
	0.32	100	CARBONACEOUS SHALE
70.19	0.30		COAL - VITREOUS TO BRIGHT
	0.33		COAL - SHALY COAL & COALY SHALE DULL/VITREOUS PARTINGS
	0.02		
	0.12		
	0.06		COAL - VITREOUS TO BRIGHT, OCCASSIONAL THIN BANDS OF SHALY COAL & COALY SHALE
	1.14	93	
	0.19		COAL AND SHALY COAL
	0.14		
	0.41		COAL - VITREOUS TO BRIGHT
	0.13		CARBONACEOUS SHALE
	0.26	82	COAL - VITREOUS TO BRIGHT
78.36	0.37		COAL/BURNT COAL? - APPEARS AS OFF WHITE LOOKING MATERIAL
73.73	0.33		NO CORE
	0.24		SHALE - M. TO DK. GRAY, BLOCKY.
	0.10		
	0.10		CARBONACEOUS AND COALY SHALE - DULL/SPLINTS, PARTINGS & BANDS OF VITREOUS & BRIGHT COAL.
	0.50	90	
75.00			FLOOR - MUDSTONE, GRADATIONAL FROM ABOVE

SIZE

DIAMETER	WT %
1/4×0	100
1/4×28	78.1
28×0	21.9
1/4×0	100
1/4×28	91.3
28×0	8.7
1/4×0	100
1/4×28	90.6
28×0	9.4
1/4×0	100.0
1/4×28	89.0
28×0	11.0
1/4×0	100.0
1/4×28	89.0
28×0	11.0
1/4×0	100.0
1/4×28	90.4
28×0	9.6
1/4×0	100.0

WEIGHT PERCENT

SPEC GRAV	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
RAW	100.0	6.7	21.3	30.3	41.7	8797	-	0.26
-1.30	0.7	2.7	3.0	-	-	-	-	
-1.50	67.2	7.0	5.4	-	-	-	-	
-1.70	5.8	5.4	26.5	-	-	-	-	
-1.90	4.7	4.5	45.4	-	-	-	-	
+1.90	21.6	2.7	66.2	-	-	-	-	
RAW	100.0							
-1.90								
RAW								
COMB.								
RAW	100.0	3.0	63.4	16.5	17.1	-	-	0.15
-1.30	1.2	7.2	2.8					
-1.40	15.3	6.5	3.4					
-1.50	1.0	6.8	10.7					
-1.60	0.6	7.4	21.9					
-1.70	0.7	5.5	34.9					
-1.80	4.6	5.0	44.3					
-1.90	16.1	3.5	50.9					
+1.90	60.5	1.1	88.8					
RAW	100.0							
RAW								
COMB.								
RAW	100.0	5.4	30.4	30.0	34.2	7865	-	0.30
-1.30	3.4	6.7	2.9					
-1.40	53.3	7.0	3.3					
-1.50	3.4	5.3	15.2					
-1.60	2.8	4.8	26.9					
-1.70	3.6	4.0	37.3					
-1.80	3.1	3.6	44.8					
-1.90	2.4	3.5	15.6					
+1.90	28.0	1.3	84.7					
RAW	100.0							
-1.90								
RAW								
COMB.								
RAW	100.0	0.6	93.0	5.2	1.2	-	-	0.09
-1.30	0.2	2.8	3.4					
-1.40	1.2	6.2	5.0					
-1.50	0.7	5.8	14.9					
-1.60	0.8	5.0	24.9					
-1.70	0.8	4.5	34.8					
-1.80	0.5	3.9	43.1					
-1.90	0.5	3.5	51.3					
+1.90	95.3	0.5	95.4					
RAW	100.0							
-1.90								
RAW								
COMB.								
RAW	100.0	3.1	60.4	17.7	18.8	-	-	0.26
-1.30	0.2	3.6	3.8					
-1.40	32.1	9.5	4.0					
-1.50	3.6	6.1	11.9					
-1.60	1.5	5.6	24.8					
-1.70	1.1	4.9	32.9					
-1.80	1.3	3.9	44.0					
-1.90	0.8	3.6	49.0					
+1.90	59.4	0.6	94.2					
RAW	100.0							
-1.90								
RAW								
COMB.								

CUMULATIVE WEIGHT PERCENT

YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
0.7		3.0					
67.9		5.4					
73.7		7.0					
78.4	7.0	7.3	32.7	53.0	10,290		0.25
100		21.6					
100	3.4	21.7	24.7	50.2	9185		0.53
61.23	7.0	7.3	32.7	53.0	10,290		0.53
21.9	3.4	21.7	24.7	50.2	9185		0.53
83.1	6.1	11.1	30.6	52.3	9999		0.32
1.2		2.8					
16.5		3.4					
17.5		3.8					
18.1		4.4					
18.8		5.5					
23.4		13.1					
39.5		28.5					
100.0		65.0					
100.0	2.3	60.4	16.6	20.7			0.24
3.4		2.9					
56.7		3.3					
60.1		4.0					
62.9		5.0					
66.5		6.7					
69.6		8.4					
72.0	6.8	9.7	34.9	48.4	10311		0.40
100.0		30.8					
100.0	3.7	41.9	25.8	28.6	6451		0.39
65.2	6.8	9.9	34.9	48.4	10311		0.40
9.4	3.7	41.9	25.8	28.6	6451		0.39
74.6	6.4	13.9	33.8	45.9	9825		0.40
0.2		3.4					
1.4		4.8					
2.1		8.1					
2.9		12.0					
3.7		17.5					
4.2		20.6					
4.7	4.6	23.8	31.7	39.9	9126		0.42
100.0		92.0					
100.0	0.7	87.8	6.4	5.1	-		0.11
41.8	4.6	23.8	31.7	39.9	9126		0.42
11.0	0.7	87.8	6.4	5.1	-		0.11
52.8	3.8	37.1	26.4	32.7	7225		0.36
0.2		3.8					
32.3		4.0					
35.9		4.8					
37.4		5.6					
38.5		6.4					
39.8		7.6					
40.6	8.1	8.4	35.5	48.0	8488		0.41
100.0		59.4					
100.0	1.9	66.6	15.2	16.3			0.23
36.7	8.1	8.4	35.5	48.0	8488		0.41
96	1.9	66.6	15.2	16.3	-		0.23
46.3	6.8	20.5	31.3	41.4	6712		0.37

CUMULATIVE SAMPLE VALUES (CASE I)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
1.38	74.6	6.4	13.9	33.8	45.9	9825		0.40
1.71	70.4	6.0	17.3	32.7	44.0	9449		0.40
2.54	62.5	6.2	18.0	32.4	43.4	8786		0.39

CUMULATIVE SAMPLE VALUES (CASE II)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER

ASH FUSION (°F)

HGI	S.G.	IDT O R	ST.	HT	FT
	1.54	2800+	-	-	-
		2760	2800+	-	-
	2.03				
N.S.S.	1.62	2800+	-	-	-
		2750	2800+	-	-
	1.31				
	1.96	2660	2760	2800+	-
		2560	2680	2720	2780

LOCATION MAP

TN ↑

SCALE:

COORDINATES: 3,000 mW, 10,300 mN } OF S.E. CORNER C.L. 78
ELEVATION: 685.8
DIP: -90° BEARING: N/A
CORE SIZE: HQ TO 146.3, NQ TO 304.8 CASING HW 5.49, NW 146.3
BITS USED: J.K. SMIT COMBINATION, J.K. SMIT 75 & 100 SERIES DIAMOND
MUD USED: POLY 330
m. LEFT IN HOLE: NIL m.
DATE START: MAY 22, 1980
DRILLER: CARON DIAMOND DRILLING
TESTS:
SAMPLED BY: O. CULLINGHAM, D. HOPE
DATE: MAY 30, 1980
FINISH: MAY 30, 1980
OVERALL RECOVERY: 90 %
ANALYZED BY: BIRTLEY COAL & MINERALS TESTING

PAN OCEAN OIL LTD.
MINING DIVISION - COAL

LOGGED BY: O.R. CULLINGHAM, D.C. HOPE DATE: MAY 30, 1980
SIGNED:

DRILLHOLE NO. WK-80-1
SHEET 2 OF 3

GEOLOGICAL LOG — SCALE: 1:500

DEPTH (m)	THICKNESS (m)	DESCRIPTION
3.65	3.65	OVERBURDEN - TRICONED
	16.16	CONGLOMERATE - RUBBLY, DISAGGREGATED, QTZ. & CHT. PEBBLES, POORLY CEMENTED, MATRIX COARSE GRAINED SANDSTONE
19.81	5.09	MUDSTONE - MEDIUM TO DARK GRAY, GRADES BASALLY TO CARBONACEOUS MUDSTONE
24.90	6.55	No. 1 SEAM HORIZON
31.45	2.17	MUDSTONE - GRADATIONAL BASALLY TO SILTSTONE, DARK TO MEDIUM GRAY
33.62	32.27	CONGLOMERATE - SMALL TO MEDIUM PEBBLE, WELL ROUNDED CONTAINS CROSSBEDS OF SANDSTONE. BEDDING AT 65° TO CA
65.89	9.11	No. 2 SEAM HORIZON
75.00	1.76	MUDSTONE - FRAGMENTAL, MEDIUM TO DARK GRAY
76.76	1.04	SANDSTONE - FINE TO MEDIUM GRAINED, BROWN, GRAY
77.80	17.37	CONGLOMERATE - SMALL TO MEDIUM PEBBLE, WELL ROUNDED, WHITE THROUGH BLACK WITH VERY FEW GREEN CLASTS, CROSSBEDS OF SANDSTONE
95.17	0.58	SANDSTONE
	0.33	CONGLOMERATE
	0.80	SANDSTONE
	0.29	COAL
100.00	26.14	CONGLOMERATE - SMALL TO MEDIUM PEBBLE, WELL ROUNDED
123.30	1.35	MUDSTONE - MEDIUM TO DARK GRAY
124.65	0.67	CONGLOMERATE - TRACES OF COAL
125.32	15.23	SANDSTONE - MEDIUM TO COARSE GRAINED, LIGHT GRAY WITH CROSSBEDDING AND CARBONACEOUS BANDS THROUGHOUT
140.55	0.92	MUDSTONE - DARK GRAY
141.47	4.52	SANDSTONE - MEDIUM TO COARSE GRAINED, FAIRLY WELL SORTED, CONGLOMERATIC COALY BANDS.
145.99	3.02	MUDSTONE - MEDIUM TO DARK GRAY, INCREASING COAL FLECKS DOWNWARDS, IRREGULAR FRACTURING
	5.09	No. 3 SEAM HORIZON
154.10	8.05	MUDSTONE - MED. GRAY, IN PART CARB, WITH STRINGERS & SPLINTS
162.15	4.58	SANDSTONE, - MEDIUM GRAY, MEDIUM GRAINED.
166.73	13.67	CONGLOMERATIC SANDSTONE - AND CONGLOMERATE, INCREASING IN CONGLOMERATE BASALLY.
180.40	6.49	CONGLOMERATE - QUARTZITE & CHERT PEBBLES.
186.89	6.96	MUDSTONE - LIGHT TO DARK GRAY
193.85	0.32	SHALE - COAL SPLINTS, DARK GREEN
194.17	4.20	MUDSTONE - LIGHT GRAY, TWO THIN COAL SEAMS
198.37	6.16	SILTSTONE TO SANDSTONE - MEDIUM GRAY SILTSTONE GRADING INTO CONGLOMERATIC SANDSTONE
200.00	4.53	CONGLOMERATIC SANDSTONE - MEDIUM GRAY, SMALL PEBBLE CONGLOMERATE
204.53	14.11	
218.64	16.57	SANDSTONE - SALT & PEPPER, MEDIUM GRAINED.
235.21	6.62	SILTSTONE - MEDIUM GRAY, GRADES BASALLY INTO DARK GRAY
241.83		

DETAILS OF COAL SEAMS — SCALE: 1:50

No. 1 SEAM HORIZON

DEPTH (m)	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)
			ROOF - CARBONACEOUS MUDSTONE, SOFT, GRADATIONAL		
24.90	0.10		COAL & SHALY COAL - DULL TO VITREOUS WITH BRIGHT BANDS		
25.28	0.22	80			
	0.06		MUDSTONE - MODERATELY HARD IN PART CARBONACEOUS		
	0.62				
	0.61				
26.51	0.24		SHALY COAL - DULL/VITREOUS PTGS		
	0.14		COAL - VITREOUS		
27.13	0.24		MUDSTONE - IN PART CARBONACEOUS		
	0.47		COAL - VITREOUS		
	0.20		MUDSTONE		
	0.57	96	COAL - DULL TO VITREOUS WITH BRIGHT BANDS OF DULL SHALY COAL		
	0.03				
28.51	0.11				
	0.33		SHALE - MEDIUM GRAY, BLOCKY		
28.84	0.16		COAL & SHALE - COAL IS DULL TO VITREOUS, PLATY TO BLOCKY FRACTURE, SHALE IS MODERATELY HARD BLOCKY & IN PART CARB.		
	0.13				
	0.17				
	0.15				
29.67	0.11				
	0.71		SILTSTONE - HARD, BLOCKY, CONTAINS THIN LENSES AND BANDS OF COAL		
30.38	0.92	100	CARBONACEOUS SHALE - DULL, CONTAINS LENSES PARTINGS & BANDS OF COAL		
	0.15		COAL - VITREOUS TO BRIGHT		
31.45			FLOOR - SHALE AND SILTY SHALE		

No. 2 SEAM HORIZON

DEPTH (m)	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)
			ROOF - CONGLOMERATE		
65.89	0.25	99	COAL - PARTED, DULL/VITREOUS PARTINGS	A0256	0.25
66.14	1.28		COAL - DULL TO VITREOUS, PARTED, 0.09 m SHALY COAL BAND		
	0.09	100			
	0.49				
	1.63		COAL - BRIGHT, PARTED TO BANDED, IN PART IRIDESCENT	A0257	3.73
69.87	0.24		COAL - VITREOUS, 0.03 CARB. SHALE PARTINGS AT TOP		
	0.32	100	CARBONACEOUS SHALE	A0258	0.32
70.19	0.30		COAL - VITREOUS TO BRIGHT		
	0.33		COAL - SHALY COAL & COALY SHALE DULL/VITREOUS PARTINGS		
	0.09				
	0.12				
	0.06				
	1.14	93	COAL - VITREOUS TO BRIGHT, OCCASSIONAL THIN BANDS OF SHALY COAL & COALY SHALE	A0259	3.17
	0.19		COAL AND SHALY COAL		
	0.14				
	0.41		COAL - VITREOUS TO BRIGHT		
	0.13		CARBONACEOUS SHALE		
73.36	0.26	82	COAL - VITREOUS TO BRIGHT		
	0.37		COAL/BURNT COAL? - APPEARS AS OFF WHITE LOOKING MATERIAL		
73.73	0.33		NO CORE	A0260	
	0.24		SHALE - M. TO DK. GRAY, BLOCKY.		
	0.10		CARBONACEOUS AND COALY SHALE - DULL/SPLINTS, PARTINGS & BANDS OF VITREOUS & BRIGHT COAL.		
	0.10				
	0.50	90			
75.00			FLOOR - MUDSTONE, GRADATIONAL FROM ABOVE.		0.35

SIZE		WEIGHT PERCENT									CUMULATIVE WEIGHT PERCENT								CUMULATIVE SAMPLE VALUES (CASE I)								CUMULATIVE SAMPLE VALUES (CASE II)								CUMULATIVE SAMPLE VALUES (CASE III)								OTHER						
				PROXIMATE ANALYSIS								PROXIMATE ANALYSIS							THICK-NESS (m)		PROXIMATE ANALYSIS							THICK-NESS (m)		PROXIMATE ANALYSIS							THICK-NESS (m)		PROXIMATE ANALYSIS												
DIA-METER	WT %	SPEC GRAV	YIELD	RM	ASH	VOL.	F.C.	BTU	F.S.I.	S	YIELD	RM	ASH	VOL.	F.C.	BTU	F.S.I.	S		YIELD	RM	ASH	VOL.	F.C.	BTU	F.S.I.	S		YIELD	RM	ASH	VOL.	F.C.	BTU	F.S.I.	S		YIELD	RM	ASH	VOL.	F.C.	BTU	F.S.I.	S							
1/4×0	100.0	RAW	100.0	9.2	10.3	43.7	36.8	7554		0.32																																							
1/4×28	76.1	-1.30	0.9	3.5	3.8						0.9		3.8																																				
		-1.50	21.4	8.1	4.1						22.3		4.1																																			
		-1.70	70.5	8.8	6.6						92.8		6.0																																			
		-1.90	2.1	7.7	37.9						94.9	9.1	6.7	43.0	41.2	8770		0.35																																
		+1.90	5.1	3.5	53.3						100.0		9.1																																				
28×0	23.9	RAW	100.0								100.0	7.0	17.6	44.3	31.1	6609		0.30																																
1/4×28	76.1	-1.90									72.2	9.1	6.7	43.0	41.2	8770		0.35																																
28×0	23.9	RAW									23.9	7.0	17.6	44.3	31.1	6609		0.30																																
1/4×0	100.0	COMB.									96.1	8.6	9.4	43.3	38.7	8233		0.34	0.25	96.1	8.6	9.4	43.3	38.7	8233		0.34																								
1/4×0	100.0	RAW	100.0	5.8	17.7	34.6	41.9	9086		0.36																																							
1/4×28	92.0	-1.30	2.5	9.1	4.1						2.5		4.1																																				
		-1.40	49.3	7.7	4.3						51.8		4.3																																			
		-1.50	11.4	6.9	8.5						63.2		5.0																																			
		-1.60	8.0	5.8	16.3						71.2		6.3																																			
		-1.70	5.0	4.8	26.2						76.2		7.6																																			
		-1.80	4.1	4.4	35.9						80.3		9.1																																			
		-1.90	4.6	3.4	44.4						84.9	7.3	11.0	33.7	48.0	9996		0.31																																
		+1.90	15.1	2.6	61.0						100.0		18.5																																				
28×0	8.0	RAW	100.0								100.0	4.8	18.4	35.6	41.2	9042		0.36																																
1/4×28	92.0	-1.90									78.1	7.3	11.0	33.7	48.0	9996		0.31																																
28×0	8.0	RAW									8.0	4.8	18.4	35.6	41.2	9042		0.36																																
1/4×0	100.0	COMB.									86.1	7.1	11.7	33.9	47.4	9907		0.31	3.98	86.7	7.2	11.5	34.5	46.8	9790		0.21																								
1/4×0	100.0	RAW	100.0	2.5	68.5	19.8	9.2			0.26																																							
1/4×28	91.9	-1.30	0.1	1.9	4.8						0.1		4.8																																				
		-1.40	0.5	7.2	5.2						0.6		5.1																																			
		-1.50	0.3	7.5	9.7						0.9		6.7																																			
		-1.60	0.6	6.9	19.6						1.5		11.8																																			
		-1.70	0.6	6.0	30.3						2.1		17.1																																			
		-1.80	0.7	5.5	36.6						2.8		22.0																																			
		-1.90	1.4	4.9	44.9						4.2	5.2	29.6	26.6	38.6	7692		0.27																																
		+1.90	95.8	4.4	68.2						100.0		66.6																																				
28×0	8.1	RAW	100.0								100.0	2.8	58.8	20.8	17.6			0.17																																
1/4×28	91.9	-1.90									38.6	5.2	29.6	26.6	38.6	7692		0.27																																
28×0	8.1	RAW									8.1	2.8	58.8	20.8	17.6	-		0.17																																
1/4×0	100.0	COMB.									46.7	4.8	34.7	25.6	35.0	6358		0.25	4.30	83.7	7.1	12.5	34.2	46.3	9648		0.31																								
1/4×0	100.0	RAW	100.0	5.8	26.1	31.6	36.5	8105		0.32																																							
1/4×28	93.4	-1.30	0.3	8.0	4.2						0.3		4.2																																				
		-1.40	35.6	8.5	4.5						35.9		4.5																																			
		-1.50	13.1	7.6	9.8						49.0		5.9																																			
		-1.60	7.8	6.1	19.1						56.8		7.7																																			
		-1.70	6.9	6.4	29.3						63.7		10.1																																			
		-1.80	7.4	5.4	37.2						71.1		12.9																																			
		-1.90	7.9	4.4	45.6						79.0	6.9	16.2	32.9	44.0	9414		0.30																																
		+1.90	21.0	2.9	62.1						100.0		25.8																																				
28×0	6.6	RAW	100.0								100.0	5.3	23.0	33.2	38.5	8621		0.37																																
1/4×28	93.4	-1.90									73.8	6.9	16.2	32.9	44.0	9414		0.30																																
28×0	6.6	RAW									6.6	5.3	23.0	33.2	38.5	8621		0.33																																
1/4×0	100.0	COMB.									80.4	6.8	16.8	32.9	43.6	9349		0.31	7.47	82.3	7.0	14.3	33.7	45.2	9524		0.31																								
1/4×0	100.0	RAW	100.0	3.7	49.5	25.0	21.8			0.15																																							
1/4×28	70.3	-1.30	0.5	4.2	3.1						0.5		3.1																																				
		-1.50	38.1	6.4	3.7						38.6		3.7																																			
		-1.70	2.6	5.6	19.5						41.2		4.7																																			
		-1.90	4.7	3.3	54.2						45.9	6.5	9.8	33.8	49.9	10445		0.25																																
		+1.90	54.1	1.3	82.7						100.0		49.2																																				
28×0	29.7	RAW	100.0								100.0	2.4	49.6	22.5	25.5			0.21																																
1/4×28	70.3	-1.90									32.3	6.5	9.8	33.8	49.9	10445		0.25																																
28×0	29.7	RAW									29.7	2.4	49.6	22.5	25.5	-		0.21																																
1/4×0	100.0	COMB.									62.0	4.5	28.9	26.4	38.2	5442		0.23	7.84	81.4	6.9	14.8	33.5	44.9	9377		0.31																								

OTHER						
1.32	2490	2590	2620	2680		
	2230	2340	2390	2580		
47	1.52	2540	2600	2620	2650	
		2440	2520	2540	2570	
	2.22					
43	1.60	2800+	-	-	-	
		2620	2730	2800+	-	
	1.93	2560	2670	2690	2710	
		2390	2530	2580	2690	

DRILLHOLE NO. WK-80-1 SHEET 3 OF 3

GEOLOGICAL LOG — SCALE: 1:500

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
241.83		6.19	No. 4 SEAM HORIZON
248.02		27.08	SHALE - LIGHT TO MEDIUM GRAY, POLISHED SURFACES THROUGH OUT - APPEARANCE OF POORLY DEVELOPED SLICKENSIDES.
275.10		10.20	CONGLOMERATIC SANDSTONE - LIGHT TO MEDIUM GRAY, PEBBLES OF CHERT & QUARTZITE, OCCASSIONAL POLISHED SURFACES ALONG FRACTURES
285.30		0.70	MUDSTONE - MEDIUM TO DARK GRAY
286.00		18.80	SANDSTONE - MEDIUM GRAINED, SALT AND PEPPER, FRACTURES AT 30-45° TO C.A. TO DEPTH OF 298.00, FRACTURES AT 0-45° TO C.A. TO DEPTH OF 300.83. 303.58-304.80 BEDDING ESSENTIALLY VERTICAL
304.80			T.D. 304.80

DETAILS OF COAL SEAMS — SCALE: 1:50

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)
				No. 3 SEAM HORIZON		
				SEAM 3A		
				ROOF - MUDSTONE, M. TO DK. GRAY		
149.01		0.50	95	COAL - VITREOUS TO BRIGHT, OCCASSIONAL THIN PARTINGS SHALY COAL.		
		0.19		CARBONACEOUS MUDSTONE	A0261	1.29
		0.13		COAL - VITREOUS TO BRIGHT.		
		0.13				
		0.34		COAL - VITREOUS TO BRIGHT		
150.30				CARBONACEOUS MUDSTONE AND SHALE - MEDIUM TO DARK GRAY.		
		1.65	92			
				SEAM 3B		
151.95		0.10		COAL - VITREOUS TO BRIGHT PLATY TO BLOCKY FRACTURE IN UPPER PART, BLOCKY TO CONCHOIDAL FRACTURE IN LOWER PART		
		0.02				
		0.69				
		0.24			A0262	2.15
		1.10		COAL - VITREOUS TO BRIGHT.		
154.10				FLOOR - MUDSTONE, M. TO DK. GRAY, MOD. SOUND		

SAMPLE NUMBER	THICKNESS (m)	DIAMETER	WT %	SPEC. GRAV.	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
		1/4×0	100.0	RAW	100.0	5.2	40.0	25.1	29.7	6610		0.22
		1/4×28	89.2	-1.30	1.0	7.5	3.9					
				-1.40	24.4	9.9	4.1					
				-1.50	13.4	8.2	14.1					
				-1.60	9.3	6.0	25.7					
				-1.70	7.4	6.2	36.3					
				-1.80	8.4	4.3	43.8					
				-1.90	3.8	4.4	51.6					
				+1.90	32.3	2.3	81.9					
A0261	1.29	28×0	10.8	RAW	100.0							
		1/4×28	89.2	-1.90								
		28×0	10.8	RAW								
		1/4×0	100.0	COMB.								
		1/4×0	100.0	RAW	100.0	6.7	17.6	33.1	42.6	9408		0.40
		1/4×28	90.9	-1.30	1.7	7.3	3.3					
				-1.40	47.0	9.5	4.3					
				-1.50	20.5	7.4	10.6					
				-1.60	6.1	6.3	22.0					
				-1.70	4.7	5.6	32.7					
				-1.80	4.8	4.9	40.5					
				-1.90	5.0	4.0	49.4					
				+1.90	10.2	2.6	68.0					
A0262	2.15	28×0	9.1	RAW	100.0							
		1/4×28	90.9	-1.90								
		28×0	9.1	RAW								
		1/4×0	100.0	COMB								
				No. 4 SEAM HORIZON								
				SEAM 4A								
				ROOF - SILTSTONE MEDIUM GRAY GRADATIONAL TO SHALE DOWNWARDS								
241.83		0.85	92	COAL - VITREOUS TO BRIGHT								
		0.25										
		1.05		COAL - VITREOUS TO BRIGHT	A0263	2.15						
243.98				SILTSTONE - MEDIUM GRAY, MODERATELY HARD								
		0.77	84									
				SEAM 4B								
244.75		0.16		SHALY COAL								
		0.38		CARBONACEOUS TO COALY SHALE	A0264	0.73						
		0.19		COAL - VITREOUS TO BRIGHT								
245.48		0.49										
		0.60		CARBONACEOUS MUDSTONE								
246.57		0.72		COAL - DULL, SOFT, IN PART / CRUSHED APPEARANCE	A0265	1.05						
		0.14	77	COALY SHALE								
		0.19		COAL - DULL, SOFT, SHALY								
247.62		0.40		CARBONACEOUS SHALE & COALY SHALE								
248.02				FLOOR - LIGHT TO MEDIUM GRAY SHALE, SOFT, CRUMBLY	A0266	0.40						

1/4×0	100.0	RAW	100.0	7.9	8.5	35.7	47.9	10785		0.39
1/4×28	90.4	-1.30	2.4	6.6	3.2					
		-1.40	73.6	9.4	3.8					
		-1.50	14.0	8.8	8.3					
		-1.60	2.6	6.4	17.7					
		-1.70	1.6	5.4	32.4					
		-1.80	1.7	4.4	42.2					
		-1.90	1.4	3.7	49.2					
		+1.90	2.7	2.7	63.1					
28×0	9.6	RAW	100.0							
1/4×28	90.4	-1.90								
28×0	9.6	RAW								
1/4×0	100.0	COMB								
1/4×0	100.0	RAW	100.0	4.4	43.8	22.0	29.8	-		0.35
1/4×28	83.3	-1.30	2.5	6.9	4.1				1/2	
		-1.40	29.9	8.6	4.7					
		-1.50	8.3	7.4	11.2					
		-1.60	3.4	6.7	21.6					
		-1.70	3.0	5.7	34.6					
		-1.80	4.4	5.0	43.8					
		-1.90	6.2	4.6	52.0					
		+1.90	42.3	3.2	76.7					
28×0	16.7	RAW	100.0							
1/4×28	83.3	-1.90								
28×0	16.7	RAW								
1/4×0	100.0	COMB								
1/4×0	100.0	RAW	100.0	6.2	20.5	32.1	41.2	9211		0.41
1/4×28	55.2	-1.30	2.9	6.6	2.8					
		-1.50	51.3	6.6	5.3					
		-1.70	24.3	4.6	23.4					
		-1.90	5.8	3.9	41.8					
		+1.90	15.7	2.3	69.9					
28×0	44.8	RAW	100.0							
1/4×28	55.2	-1.90								
28×0	44.8	RAW								
1/4×0	100.0	COMB								
1/4×0	100.0	RAW	100.0	4.0	44.7	23.7	27.6	6195		0.35
1/4×28	43.0	-1.30	1.1	3.5	3.5					
		-1.50	9.0	6.2	5.5					
		-1.70	14.4	4.0	34.6					
		-1.90	33.9	3.3	49.9					
		+1.90	41.6	2.8	76.4					
28×0	57.0	RAW	100.0							
1/4×28	43.0	-1.90								
28×0	57.0	RAW								
1/4×0	100.0	COMB								

CUMULATIVE WEIGHT PERCENT

YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
1.0		3.9					
25.4		4.1					
38.8		7.5					
48.1		11.1					
55.5		14.4					
63.9		18.3					
67.7	7.0	20.2	29.6	43.2	9061		0.29
100.0		40.1					
100.0	4.7	36.7	27.4	31.2	7161		0.34
60.4	7.0	20.2	29.6	43.2	9061		0.29
10.8	4.7	36.7	27.4	31.2	7161		0.34
71.2	6.7	22.7	29.3	41.4	8773		0.30
1.7		3.3					
48.7		4.3					
69.2		6.1					
75.3		7.4					
80.0		8.9					
84.8		10.7					
89.8	7.3	12.9	33.5	46.3	10001		0.29
100.0		18.5					
100.0	5.1	16.4	31.5	47.0	9759		0.43
81.6	7.3	12.9	33.5	46.3	10001		0.29
9.1	5.1	16.4	31.5	47.0	9759		0.43
90.7	7.1	13.3	33.1	46.4	9977		0.36
2.4		3.2					
76.0		3.8					
90.0		4.5					
92.6		4.9					
94.2		5.3					
95.9		6.0					
97.3	8.2	6.6	34.4	50.8	10807		0.29
100.0		8.1					
100.0	6.0	11.5	31.9	50.6	10901		0.49
87.9	8.2	6.6	34.4	50.8	10807		0.29
9.6	6.0	11.5	31.9	50.6	10901		0.49
97.5	7.98	7.1	34.2	50.8	10816		0.31
2.5		4.1					
32.4		4.7					
40.7		6.0					
44.1		7.2					
47.1		8.9					
51.5		11.9					
57.7	6.9	16.2	31.6	45.3	9973		0.37
100.0		41.8					
100.0	2.9	51.0	18.9	27.2	-		0.38
48.1	6.9	16.2	31.6	45.3	9973		0.37
16.7	2.9	51.0	18.9	27.2	-		0.38
64.8	5.9	25.2	28.3	40.6	7403		0.37
2.9		2.8					
54.2		5.2					
78.5		10.8					
84.3	6.0	12.9	33.3	47.8	10207		0.46
100.0		21.9					
100.0	5.5	18.0	32.3	44.2	9701		0.39
46.5	6.0	12.9	33.3	47.8	10207		0.46
44.8	5.5	18.0	32.3	44.2	9701		0.39
91.3	5.8	15.4	32.8	46.0	9959		0.43
1.1		3.5					
10.1		5.3					
24.5		22.5					
58.4	-	38.4	-	-	-	-	-
100.0		54.2					
100.0	3.6	36.1	25.3	35.0	7715		0.37

CUMULATIVE SAMPLE VALUES (CASE I)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S
1.29	71.2	6.7	22.7	29.3	41.4	8773		0.30
2.15	90.7	7.1	13.3	33.3	46.4	9977		0.30
0.73	64.8	5.9	25.2	28.3	40.6	7403		0.37
1.05	91.3	5.8	15.4	32.8	46.0	9959		0.43
2.15	97.5	7.98	7.1	34.2	50.8	10816		0.31

CUMULATIVE SAMPLE VALUES (CASE II)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III)

THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER

.38	1.71	2720	2760	2780	2800+							
		2510	2640	2700	2770							
.41	1.49	2780	2800+	-	-							
		2560	2670	2730	2800+							
.45	1.42	2400	2460	2480	2590							
		2400	2450	2470	2540							
1.76		2740	2800+	-	-							
		2540	2660	2740	2800+							
1.53		2780	2800+	-	-							
		2650	2740	2800+	-							
1.78												

LOCATION MAP

TN

SCALE:

COORDINATES: 2700 m W, 11,300 m N OF SE. CORNER OF CL. 79
ELEVATION: APPROX. 609.6 m
DIP: -90° BEARING: ——
CORE SIZE: HQ CASING PW 4.88m HW 39.97
BITS USED: J.K. SMIT - COMBINATION J.K. SMIT - 75 + 100 SERIES DIAMOND
MUD USED: 103 GALLONS POLYDULL 330
m. LEFT IN HOLE: 4.88 m. OF PW 35.97 m. OF HW
DATE START: MAY 26, 1980 FINISH: JUNE 5, 1980
DRILLER: CARON DIAMOND DRILLING OVERALL RECOVERY: 96 %
TESTS: NIL
SAMPLED BY: O. CULLINGHAM DATE: JUNE 9/80 ANALYZED BY: BIRTLEY COAL AND MINERALS TESTING

PAN OCEAN OIL LTD.
MINING DIVISION - COAL

LOGGED BY: O. CULLINGHAM DATE: JUNE 6, 1980
SIGNED:

DRILLHOLE NO. A-80-2
SHEET 1 OF 2

GEOLOGICAL LOG — SCALE: 1:500

DETAILS OF COAL SEAMS — SCALE:

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	DESCRIPTION
		34.74	OVERBURDEN - NO RECOVERY TRICONED: BOULDERS, PEBBLES AND CLAY.
34.74		7.33	SANDSTONE - MEDIUM GRAY, MEDIUM TO COARSE GRAINED, IN PART CONGLOMERATIC, CONTAINS COAL SPLINTS.
42.07		1.82	MUDSTONE - MEDIUM TO DARK GRAY, BECOMES SANDY BASALLY.
43.89		2.81	SANDSTONE - MEDIUM GRAY, VERY FINE TO FINE GRAINED.
46.70		17.06	SANDSTONE AND CONGLOMERATIC SANDSTONE - MEDIUM GRAY, MEDIUM GRAINED GRADATIONAL TO COARSE GRAINED BASALLY. BASAL CONTACT: FAULT CONTACT.
63.76		3.74	MUDSTONE - MEDIUM TO DARK GRAY, SOFT, FRAGMENTAL.
67.50		3.10	SANDSTONE - MEDIUM BUFF GRAY, SHALY, FINE TO VERY FINE GRAINED.
69.60		2.72	MUDSTONE - MEDIUM DARK GRAY TO MEDIUM OLIVE GRAY.
70.32		1.00	SANDSTONE - MEDIUM GRAY FINE GRAINED.
71.32		3.53	MUDSTONE - MEDIUM TO DARK GRAY, FRAGMENTAL
74.85		0.50	SANDSTONE - MEDIUM GREENISH GRAY SILT TO VERY FINE GRAINED.
75.35		9.65	MUDSTONE - MEDIUM OLIVE GRAY, IN PART SANDY, SOFT AND FRAGMENTAL.
86.00		9.00	INTERBEDDED MUDSTONE WITH VERY FINE GRAINED SANDSTONE MEDIUM GRAY TO MEDIUM DARK GRAY. MUDSTONE IS SOFT AND FRAGMENTAL. CONTAINS COAL SPLINTS. SANDSTONE IS MICROMICACEOUS MARINE?
95.00		35.19	MUDSTONE / THIN INTERBEDS OF SANDSTONE, OLIVE GREEN HUE FOR MOST PART WITH MEDIUM DARK GRAY MUDSTONE CONTAINING OCCASIONAL CARBONACEOUS COALY FRAGMENTS. LESS GREEN BASALLY. PROBABLY A MARINE INCURSION.
123.50			
124.50			
126.62			
127.04			
130.19			
132.50			
133.03			
138.96			
139.24			
140.00			
142.40			
150.20			
156.20			
160.03			
160.57			
163.70			
166.77			
167.05			
180.46		89.74	MUDSTONE / THIN BEDS OF SANDSTONE, MEDIUM GRAY TO MEDIUM DARK GRAY. SOME CARBONACEOUS MUDSTONE AND COAL.
183.30			
218.09			
218.64			
219.93		7.54	SANDSTONE - MEDIUM GRAY, GRADATIONAL DOWNWARDS FROM SANDY MUDSTONE TO MEDIUM AND COARSE GRAINED SANDSTONE
227.47		23.42	MUDSTONE - MEDIUM DARK GRAY, IN PART CARBONACEOUS, IN PART SILTY. (MORE CHARACTERISTIC OF BONNET PLUME MUDSTONES)
245.60			

DEPTH (m)	GRAPHIC LOG	THICKNESS (m)	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)	SIZE: DIAMETER	SIZE: WT %	WEIGHT PERCENT: SPEC GRAV	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE WEIGHT PERCENT	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE I)	THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE II)	THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

CUMULATIVE SAMPLE VALUES (CASE III)	THICKNESS (m)	YIELD	PROXIMATE ANALYSIS: RM	ASH	VOL.	F.C.	BTU	F.S.I.	S

OTHER

DRILLHOLE NO.-A-80-2 SHEET 2 OF 2

GEOLOGICAL LOG — SCALE: 1:500

DEPTH (m)	THICKNESS (m)	DESCRIPTION
245.60		
250.89	4.86	COAL HORIZON - CARBONACEOUS TO COALY SHALE/COAL BANDS DARK GRAY, FRAGMENTAL TO BLOCKY, COAL FLECKS, SPLINTS PARTINGS AND BANDS THROUGHOUT.
255.15	3.78	MUDSTONE - MEDIUM DARK GRAY, FRAGMENTAL TO BLOCKY, IN PART CARBONACEOUS, IN PART WITH COAL FLECKS.
259.53	1.57	CARBONACEOUS TO COALY SHALE/COAL BANDS.
261.10	11.90	MUDSTONE - MEDIUM GRAY, FRAGMENTAL TO BLOCKY.
273.0	2.84	CARBONACEOUS TO COALY SHALE
275.84		TD - 275.84 - CASING DISAPPEARED DOWN HOLE; EXCESSIVE CAVE; UNABLE TO RETRIVE, ABANDONED.

DETAILS OF COAL SEAMS — SCALE: 1:50

DEPTH (m)	THICKNESS	RECOVERY %	DESCRIPTION	SAMPLE NUMBER	THICKNESS (m)
			MUDSTONE		
250.89	0.45	96	COAL - DULL TO BRIGHT, PARTED PLATY TO BLOCKY, BANDS OF DULL CARBONACEOUS SHALE.	A0267	0.45
251.34	0.44		COALY SHALE.		
251.78	0.10		COAL - DULL TO VITREOUS.		
251.88	0.18		COALY SHALY.		
252.06	0.37		COALY SHALE - CONTAINS PARTINGS OF VITREOUS COAL THROUGHOUT.		
252.43	1.11		COALY SHALE.		
253.54	0.34	95	SHALEY COAL - DULL TO BRIGHT, PARTED TO THINLY BANDED.		
253.88	0.15				
254.03			COAL - VITREOUS TO BRIGHT, CARBONACEOUS TO COALY SHALE.		
254.14	1.61				
255.75	3.78	98	MUDSTONE.		
259.53	0.12	99	SHALY COAL - VITREOUS COAL/CARBONACEOUS SHALE		
259.65	1.03		CARBONACEOUS COALY SHALE - DARK GRAY, CONTAINS PARTINGS OF COAL THROUGHOUT.		
260.68	0.21		COAL - VITREOUS TO BRIGHT	A0268	0.21
260.89	0.11		COALY SHALE		
261.10			MUD STONE		

SIZE			WEIGHT PERCENT										CUMULATIVE WEIGHT PERCENT									
DIAMETER	WT %		SPEC. GRAV.	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S		YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S		
1/4×0	100.0		RAW	100.0	3.8	53.3	21.4	21.5			1.53											
1/4×28	89.8		-1.30	7.3	5.2	2.7							7.3		2.7							
			-1.40	6.2	5.5	6.6							13.5		4.5							
			-1.50	5.6	4.4	17.3							19.1		8.2							
			-1.60	4.1	4.4	27.4							23.2		11.6							
			-1.70	6.4	3.7	37.8							29.6		17.3							
			-1.80	4.6	3.2	45.9							34.2		21.1							
			-1.90	5.2	3.0	54.5							39.4		25.5							
			+1.90	60.6	3.3	73.7							100.0		54.7							
28×0	10.2		RAW	100.0									100.0	3.4	50.6	21.9	24.1				1.44	
1/4×28																						
28×0																						
1/4×0																						
1/4×0	100.0		RAW	100.0	4.6	34.1	28.2	33.1	8116		0.78											
1/4×28	91.9		-1.30	17.4	5.2	3.4							17.4		3.4							
			-1.50	40.1	5.3	9.2							57.5		7.4							
			-1.70	7.5	3.6	31.0							65.0		10.2							
			-1.90	4.3	3.0	58.2							69.3	5.6	13.1	35.2	46.1	11042		0.76		
			+1.90	30.7	2.2	81.9							100.0		34.3							
28×0	8.1		100.0										100.0	4.0	30.4	26.7	38.9	8946		0.90		
1/4×28	91.9		-1.90										63.7	5.6	13.1	35.2	46.1	11042		0.76		
28×0	8.1		RAW										8.1	4.0	30.4	26.7	38.9	8946		0.90		
1/4×0	100.0		COMB.										71.8	5.4	15.1	34.2	45.3	10806		0.78	0.21	21.8
1/4×0	100.0		COMB.										71.8	5.4	15.1	34.2	45.3	10806		0.78		

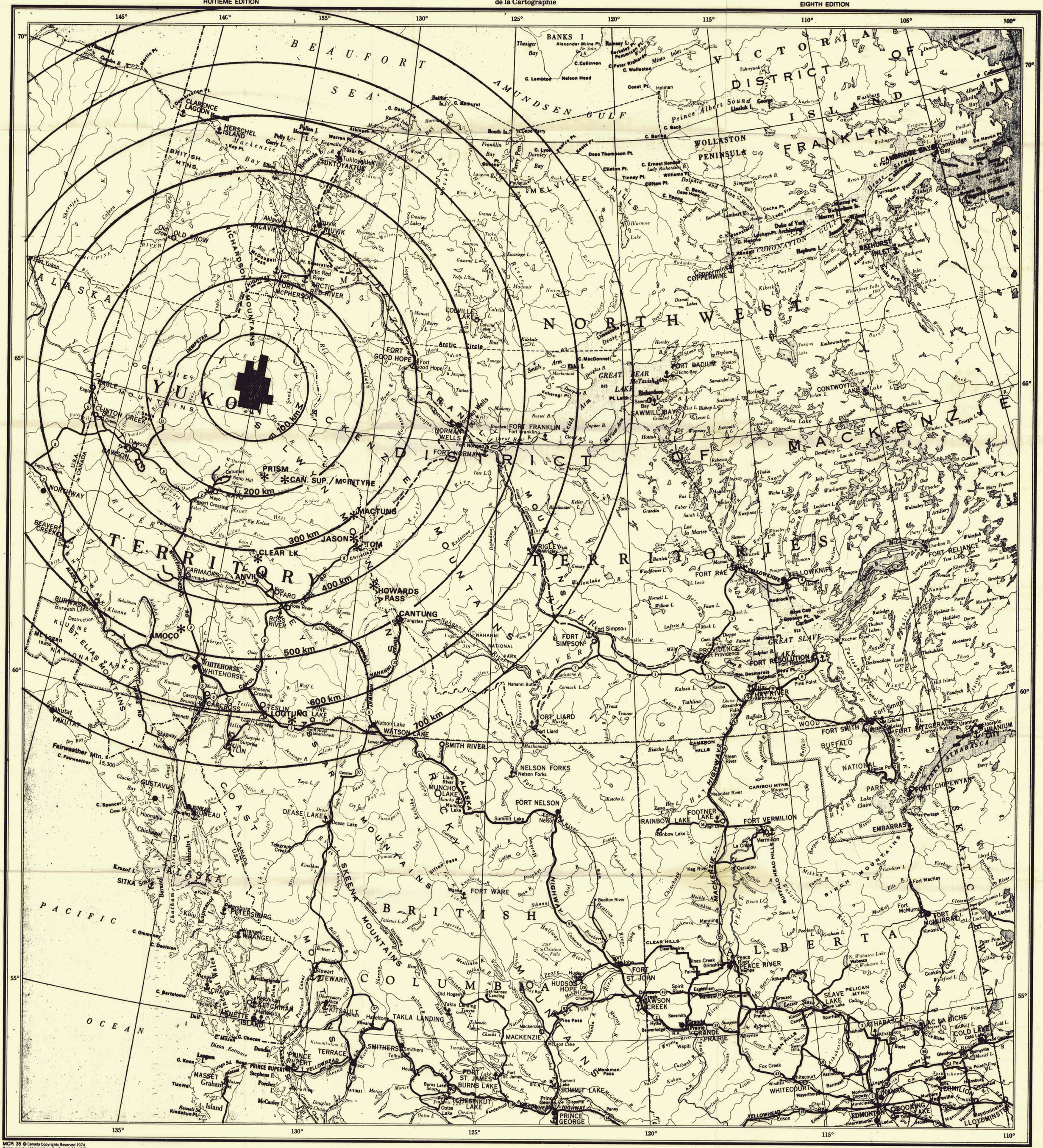
CUMULATIVE SAMPLE VALUES (CASE I)											CUMULATIVE SAMPLE VALUES (CASE II)											CUMULATIVE SAMPLE VALUES (CASE III)											OTHER											
THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S			THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S			THICKNESS (m)	YIELD	PROXIMATE ANALYSIS RM	ASH	VOL.	F.C.	BTU	F.S.I.	S			H.G.I	S.G.											
																																			1.87											
																																			1.61											
0.21	21.8	5.41	15.1	34.2	45.3	10806		0.78																																							

CANADA

Department of Energy, Mines and Resources, Surveys and Mapping Branch
Ministère de l'Énergie, des Mines et des Ressources, Direction des Levés et de la Cartographie

HUITIÈME ÉDITION

EIGHTH EDITION


BEAUFORT SEA
AMUNDSEN GULF
VICTORIA ISLAND
DISTRICT OF FRANKLIN
BANKS I
WOLLASTON PENINSULA
MELVILLE HILLS
CORONATION GULF
BATHURST INLET
NORTHWEST TERRITORIES
DISTRICT OF MACKENZIE
YUKON TERRITORY
BRITISH COLUMBIA
ALBERTA
ALASKA
PACIFIC OCEAN
MACKENZIE MOUNTAINS
OGILVIE MOUNTAINS
RICHARDSON MOUNTAINS
SELWYN MOUNTAINS
CASSIAR MOUNTAINS
COLUMBIA MOUNTAINS
ROCKY MOUNTAINS
CLINTON-COLDEN
CLARENCE LAGOON
HERSCHEL ISLAND
Mackenzie Bay
BRITISH MTNS.
OLD CROW
Old Crow
PORCUPINE RIVER
Fort Yukon
ALASKA HIGHWAY
Aklavik
INUVIK
Tuktoyaktuk
FUKTOYAKTUK
Paulatuk (abandoned)
Cape Parry
Franklin Bay
Darnley Bay
Dolphin and Union Strait
Cape Lyon
Cape Krusenstern
Cape Bexley
Cape Young
Cape Barrow
Cape Bathurst
Cape Berkley
Cape Peter Richardson
Cape Wollaston
Cape Collinson
Cape Lambton
Nelson Head
Thesiger Bay
Alexander Milne Pt.
Ramsay I.
Berkeley Pt.
Pommicon Pt.
Parker Pt.
Minto Inlet
Coast Pt.
Holman
Prince Albert Sound
Victoria I.
Cape Krusenstern
Cape Back
Cape Barrow
Cape Peel
Cape Kendall
Lady Richardson B.
Williams Pt.
Clifton Pt.
Tinney Pt.
Clinton Pt.
Does Thompson Pt.
Cape Lyon
Cape Parry
Kent Peninsula
Turnagain Pt.
Simpson Bay
Forsyth B.
Byron B.
Cache Pt.
Lady Franklin Pt.
Murray Pt.
Richardson Is.
Wilmot Is.
Duke of York Archipelago
Lochert Pt.
Pine Pt.
Hope B.
Buchan B.
Bathurst Inlet
Port Epworth
Kater Pt.
Daniel Moore Pt.
Gray Bay
Deerton Pt.
Hepburn L.
Kikerk L.
Willberforce Falls 160'
Hood R.
Gordon B.
Albert Edward Bay
Denmark B.
Collinson Inlet
Tahiryuak L.
Kuglorynuk R.
Washburn L.
Lineluk I.
George
Tahoe L.
Ferguson Lake
Padliat Inlet
Kitigu L.
Greiner L.
Wellington B.
Cambridge Bay
De Haven Pt.
Stromness B.
Peterson B.
Pt. Haldane
Queen Maud Gulf
Campbell B.
Chesterfield Inlet
Ellice R.
Back R.
Thelon R.
Baillie Is.
Cape Bathurst
Booth Is.
Cape Parry
Liverpool Bay
Harrowby Bay
Russell Inlet
McKinley B.
Atkinson Pt.
Warren Pt.
Kugmallit B.
Toker Pt.
Pullen I.
Hooper I.
Polly L.
Carry L.
Richards I.
Phillips B.
Kay Pt.
Ellice R.
Shingle Pt.
Babbage R.
Blow R.
Colvin R.
Sheenjek R.
Porcupine R.
Black R.
Salmon Fork
Eagle R.
Rock R.
Wright Mts.
Circle
Fort Yukon
Old Crow
Crossley Lakes
Hyndman L.
Wolverine R.
Anderson R.
Horton R.
Horton
Langton B.
West R.
Granet L.
Tadzizet L.
Tsoko L.
Simpson Pt.
Ewaniega L.
Gassend L.
Tedji L.
Aubry L.
Manuel L.
Rorey L.
Colville Lake
Colville L.
Ides Bois
Kilekale L.
Arctic Red River
Fort McPherson
ARCTIC RED RIVER
Peel R.
Rat R.
McDougall Pass
Pt. Separation
Middle Channel
Outer Channel
Aklavik Channel
Kugmallit Channel
Mackenzie R.
Liard R.
Fort Liard
Maxhamish L.
Petitot R.
Kotaneelee R.
Muskeg R.
Laird R.
Trout R.
Trout L.
Trainor L.
Kakisa L.
Kakisa R.
Tathlina L.
Mackenzie Butte
Cormack L.
Nahanni Butte
Fort Simpson
Simpson Is.
Rabbitskin R.
Mills L.
Laferte R.
Mink L.
Fawn L.
Willow L.
Hornell L.
Horn R.
Birch L.
Caen L.
Dieppe
Falaise L.
Cadotte L.
Moraine Pt.
Sulphur B.
Deep B.
Pine Pt.
Fort Resolution
Pine Point
Hay River
Enterprise
Louise Alexandra Falls 105'
Buffalo L.
Buffalo R.
Tsu L.
Tathul R.
Little Buffalo R.
Fort Smith
Slave R.
Smith Arm
Douglas B.
Mackintosh B.
Deerpass B.
Kokeragi Pt.
Sawmill Bay
Grouard L.
Russel B.
Jupiter B.
Great Bear R.
Fort Franklin
Fort Norman
NORMAN WELLS
Keith Arm
McTavish Arm
Richardson
Eldorado
Echo Bay
Contwoyto L.
Contwoyto Lake
Point Lake
Rocknest L.
Redrock L.
Scotstoun L.
Samandré L.
Wentzel L.
Hepburn L.
Sloan R.
Hornby B.
Takiyuq Lake
Kathawachaga L.
Wilberforce Falls 160'
Hood R.
Burnside R.
Western R.
Back R.
Nose L.
Lac de Gras
Courageous L.
Thonokied L.
Desteffany L.
Aylmer L.
Clinton-Colden L.
Sifton L.
Moraine L.
Mary Frances L.
Colden L.
Artillery L.
Campbell L.
Walmsley L.
Fletcher L.
Parry Falls 130'
Whitefish L.
Lynx L.
Howard L.
Tent L.
Eileen L.
Noman L.
Nonacho L.
Porter L.
Manchester L.
Hjalmar L.
Halliday
Doran
Alcantara L.
Thekulthili L.
Thoa L.
Abitau L.
Vandyck L.
Hill Island L.
Lady Grey L.
Deskenaotaia L.
Rutledge L.
Thubun Lakes
Rocher River
Fort Providence
Providence
Fort Resolution
Great Slave Lake
Pine Pt.
Sulphur B.
Gypsum Pt.
Caribou Is.
Cape Desmarais
Cape Hearne
Cape Kendall
Cape Young
Cape Bexley
Cape Hooper
Cape Krusenstern
Cape Barrow
Cape Peel
Cape Kendall
Cape Lyon
Cape Parry
Cape Bathurst
Cape Berkley
Cape Peter Richardson
Cape Wollaston
Cape Collinson
Cape Lambton
Nelson Head
Thesiger Bay
Alexander Milne Pt.
Ramsay I.
Berkeley Pt.
Pommicon Pt.
Parker Pt.
Minto Inlet
Coast Pt.
Holman
Prince Albert Sound
Victoria I.
Cape Krusenstern
Cape Back
Cape Barrow
Cape Peel
Cape Kendall

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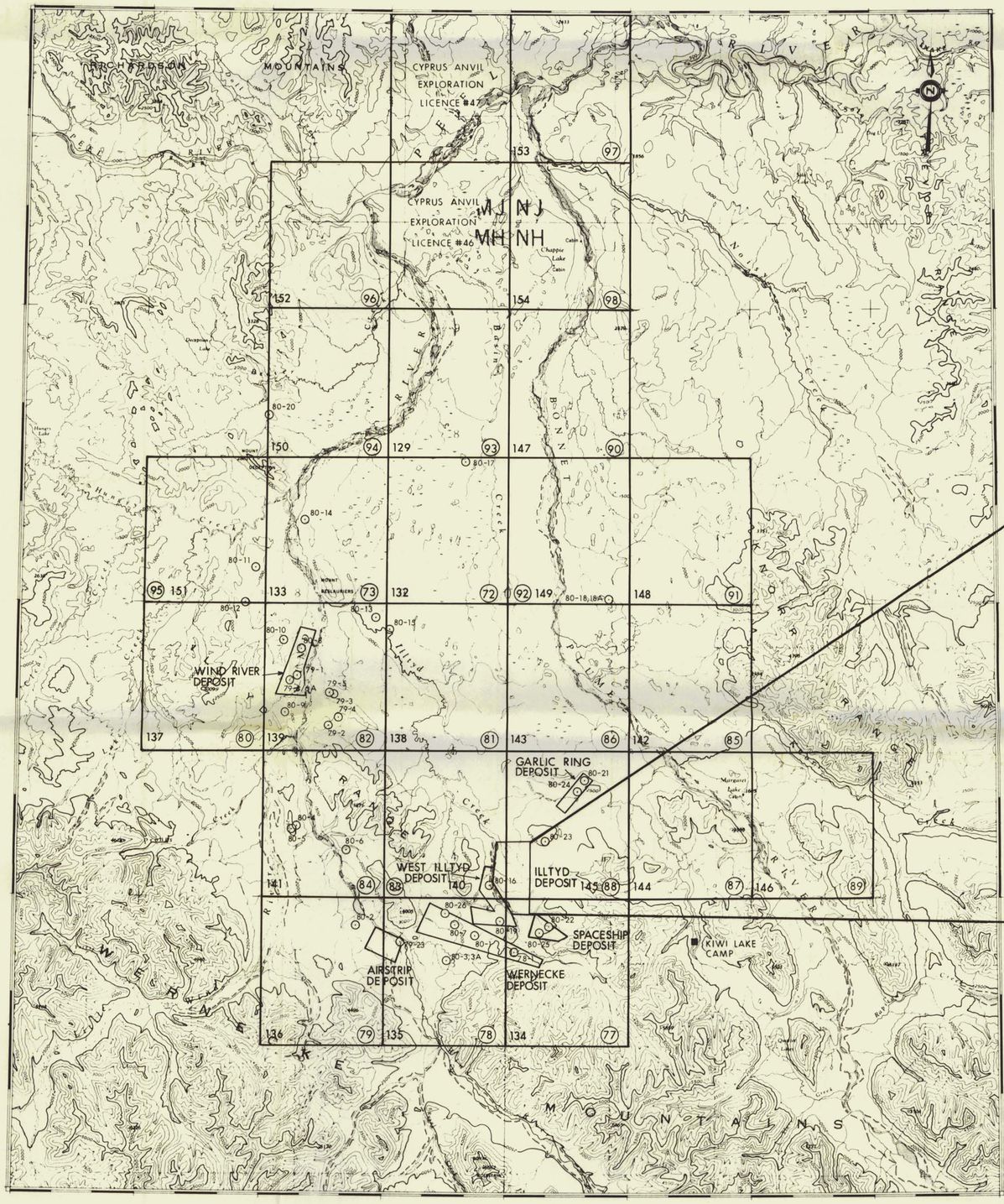
MOUNTAINS
CYPRUS ANVIL EXPLORATION LICENCE #47
CYPRUS ANVIL EXPLORATION LICENCE #46
MJ NJ
MH NH
RIVER
Basin
Creek
153
97
152
96
154
98
150
94
129
93
147
90
151
95
133
73
132
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149
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135
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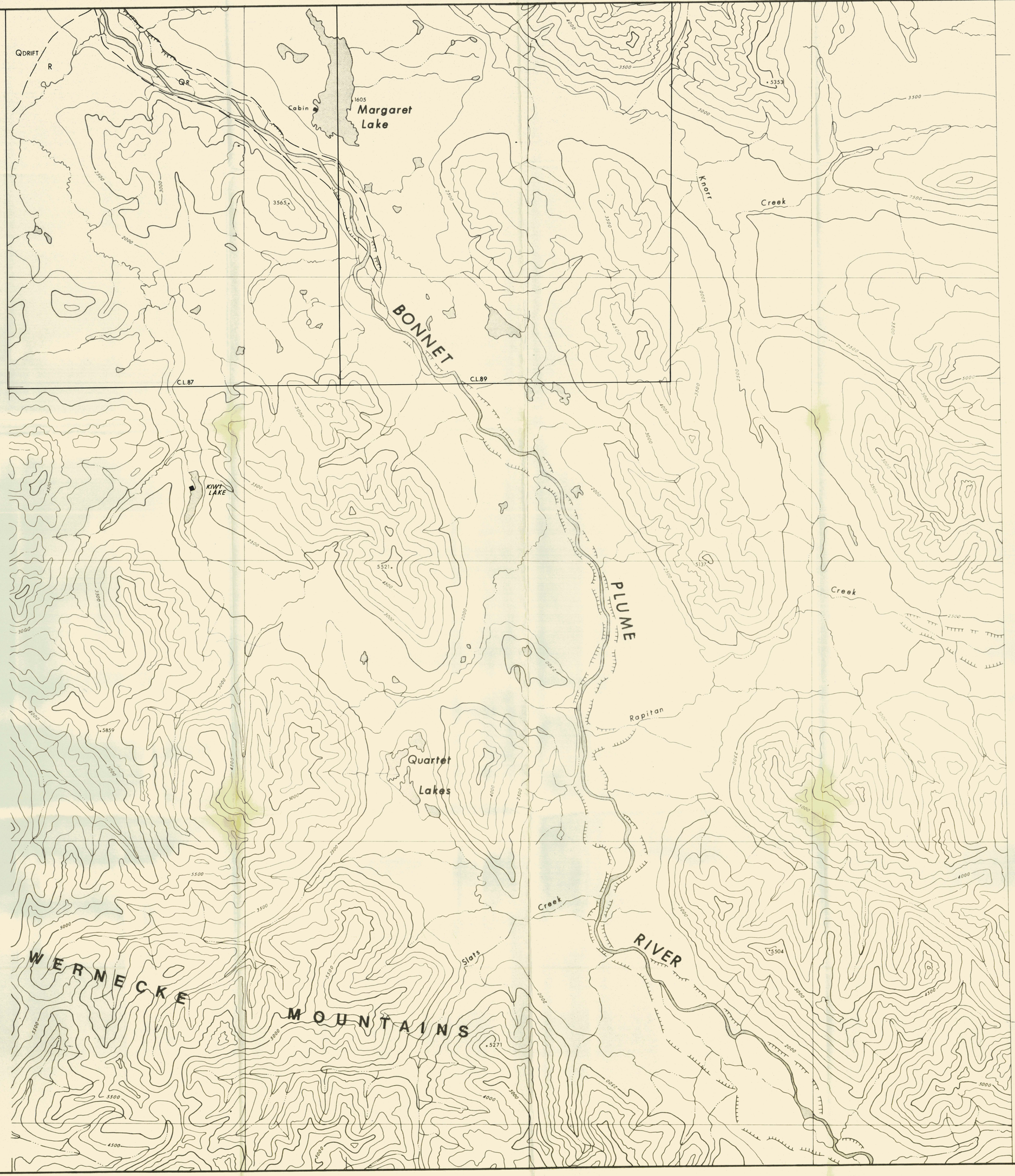
134
77
80-20
80-17
80-14
80-11
80-12
80-13
80-10
80-15
80-18,18A
WIND RIVER DEPOSIT
79-1
79-2A
79-5
79-3
79-4
80-9
79-2
GARLIC RING DEPOSIT
80-21
80-24
80-23
80-4
80-5
80-6
WEST ILLTYD DEPOSIT
80-16
ILLTYD DEPOSIT
80-26
80-22
80-25
80-27
80-28
80-3,3A
79-23
AIRSTRIP DEPOSIT
WERNECKE DEPOSIT
KIWI LAKE CAMP
80-2
Chappie Lake Cabin
Margaret Lake
Mount Bellburdies
Mount Hundere
Mount Wooley
Mount Wilson
Mount Hayes
Mount Hoole
Mount Hoole
Mount Hoole





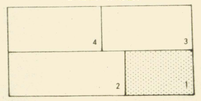
LEGEND

QDRIFT	RECENT DRIFT COVERED
QR	RECENT RIVER DEPOSIT
TUBP	TERTIARY UPPER BONNET PLUME FORMATION
KLBP	CRETACEOUS LOWER BONNET PLUME FORMATION
P	PERMIAN
CHR	CARBONIFEROUS (HART RIVER)
€D	CAMBRIAN / DEVONIAN
P€	PRECAMBRIAN
R	UNDIVIDED PRE-BONNET PLUME FORMATION
	DIP LESS THAN 25°
	DIP 25 - 49°
	DIP 50 - 74°
	DIP GREATER THAN 75°
	ANTICLINE
	SYNCLINE
	THRUST FAULT
	MAJOR FAULT
	MINOR FAULTS AND LINEAMENTS
	ROCK CONTACT
	BEDDING TRACE
X	COAL OUTCROP
⊕	COAL WASH OR FLOAT
O 79-21	SURFACE BORE HOLE AND NUMBER
C.L. 77	COAL EXPLORATION LICENCE NUMBER
C-8	COAL OCCURRENCE AREA AND NUMBER

km 0 1 2 3 4 5 km

Plate III

SHEET INDEX



TO ACCOMPANY REPORT NO 4-81 BY O.R.C.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

GEOLOGY OF THE BONNET PLUME BASIN

BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
DEC., 1980	1: 50 000	106 E	E - 1121

DRAWING NO. E-1122



LEGEND

QDRIFT	RECENT DRIFT COVERED
QR	RECENT RIVER DEPOSIT
TUBP	TERTIARY UPPER BONNET PLUME FORMATION
KLBP	CRETACEOUS LOWER BONNET PLUME FORMATION
P	PERMIAN
CHR	CARBONIFEROUS (HART RIVER)
€D	CAMBRIAN / DEVONIAN
P€	PRECAMBRIAN
?R	UNDIVIDED PRE-BONNET PLUME FORMATION
	DIP LESS THAN 25°
	DIP 25 - 49°
	DIP 50 - 74°
	DIP GREATER THAN 75°
	ANTICLINE
	SYNCLINE
	THRUST FAULT
	MAJOR FAULT
	MINOR FAULTS AND LINEAMENTS
	ROCK CONTACT
	BEDDING TRACE
X	COAL OUTCROP
⊕	COAL WASH OR FLOAT
⊙ 79-21	SURFACE BORE HOLE AND NUMBER
C.L. 77	COAL EXPLORATION LICENCE NUMBER
(C-8)	COAL OCCURRENCE AREA AND NUMBER

Km 0 1 2 3 4 5 Km

Plate IV
INDEX SHEET

4-81 BY ORC

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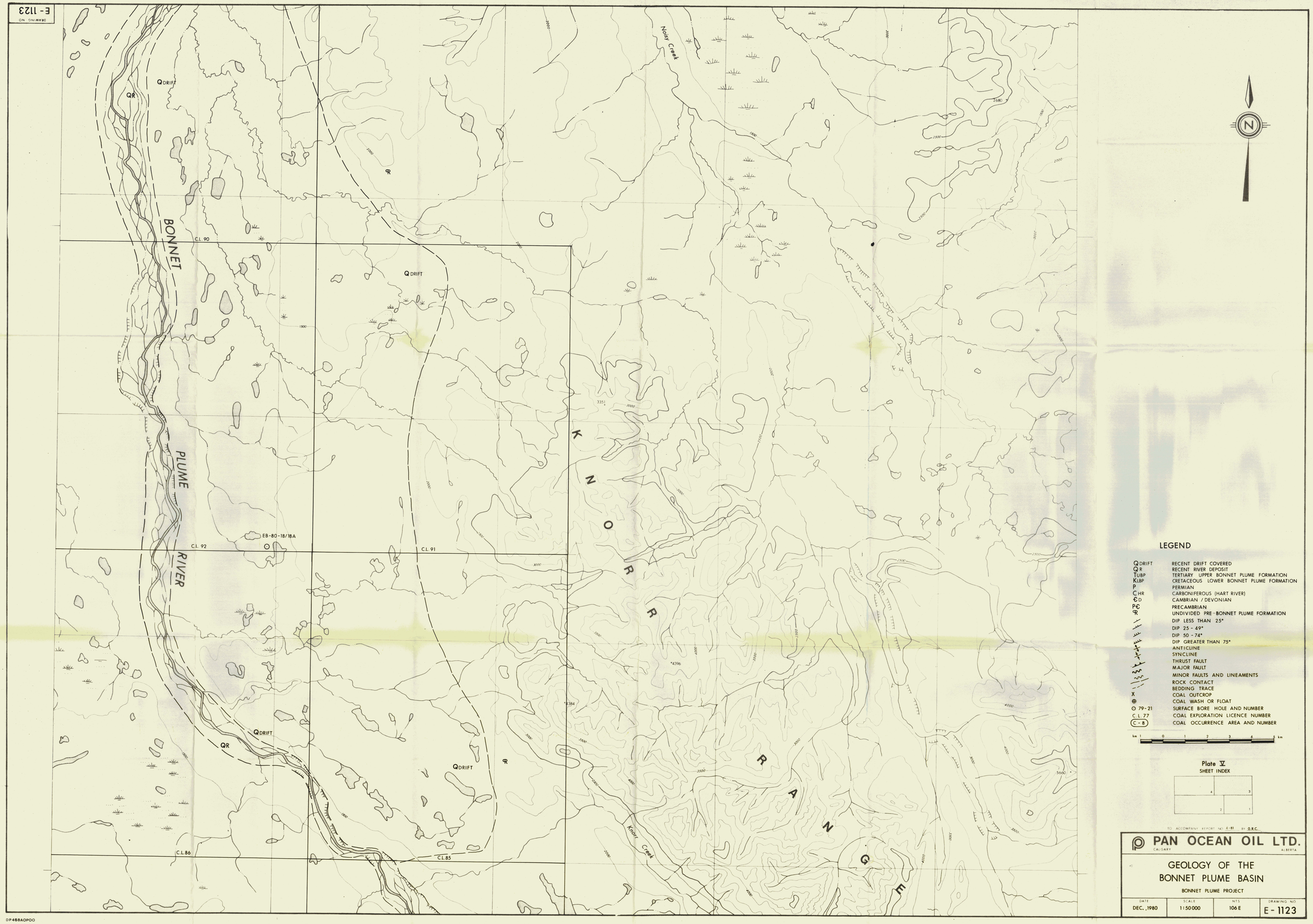
CALGARY ALBERTA

GEOLOGY OF THE BONNET PLUME BASIN

BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
DEC., 1980	1:50,000	106E	E-1122

DP468A0P00



E-1123
DRAWING NO
BONNET PLUME RIVER
Noisy Creek
Knorr Creek
KNORR RANGE
QDRIFT
QR
C.L. 90
C.L. 91
C.L. 92
C.L. 85
C.L. 86
EB-80-18/18A
3351
4396
4384
5660
N
LEGEND
QDRIFT RECENT DRIFT COVERED
QR RECENT RIVER DEPOSIT
TUBP TERTIARY UPPER BONNET PLUME FORMATION
KLBP CRETACEOUS LOWER BONNET PLUME FORMATION
P PERMIAN
CHR CARBONIFEROUS (HART RIVER)
€D CAMBRIAN / DEVONIAN
P€ PRECAMBRIAN
ℛ UNDIVIDED PRE-BONNET PLUME FORMATION
DIP LESS THAN 25°
DIP 25 - 49°
DIP 50 - 74°
DIP GREATER THAN 75°
ANTICLINE
SYNCLINE
THRUST FAULT
MAJOR FAULT
MINOR FAULTS AND LINEAMENTS
ROCK CONTACT
BEDDING TRACE
X COAL OUTCROP
⊕ COAL WASH OR FLOAT
⊙ 79-21 SURFACE BORE HOLE AND NUMBER
C.L. 77 COAL EXPLORATION LICENCE NUMBER
C-8 COAL OCCURRENCE AREA AND NUMBER
km 1 0 1 2 3 4 5 km
Plate V
SHEET INDEX
4
3
2
1
TO ACCOMPANY REPORT NO 4-81 BY O.R.C.
PAN OCEAN OIL LTD.
CALGARY ALBERTA
GEOLOGY OF THE
BONNET PLUME BASIN
BONNET PLUME PROJECT
DATE DEC., 1980
SCALE 1:50000
NTS 106 E
DRAWING NO E-1123
DP468AOPOO

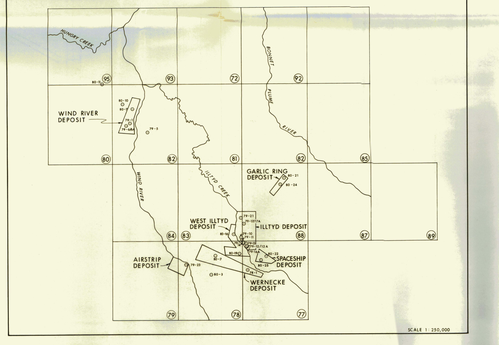

E-1124
Hungry Lake
Beaver
Creek
Hungry
Creek
Clear
Creek
Lake
Basin
Creek
RIVER
MOUNT DESLAURIERS
MOUNT DECEPTION
ILLTYD RANGE
WIND
MOUNT DESLAURIERS TYPE?
BE-80-20
TUBP
KLBP
€D
QDRIFT
QR
P
C.L. 94
C.L. 93
C.L. 95
C.L. 73
C.L. 72
C.L. 80
C.L. 82
C.L. 81
CA-80-17
MD-80-14
W-80-12
W-80-11
W-80-10
W-80-8
W-80-9
W-79-1
W-79-6
W-79-5
W-79-3
W-79-4
W-79-2
EW-80-13
EW-80-15
WIND RIVER DEPOSIT
COALY SHALE
CLINKER
C-8
C-9
C-10
C-12
LEGEND
QDRIFT RECENT DRIFT COVERED
QR RECENT RIVER DEPOSIT
TUBP TERTIARY UPPER BONNET PLUME FORMATION
KLBP CRETACEOUS LOWER BONNET PLUME FORMATION
P PERMIAN
CHR CARBONIFEROUS (HART RIVER)
€D CAMBRIAN / DEVONIAN
P€ PRECAMBRIAN
R UNDIVIDED PRE-BONNET PLUME FORMATION
DIP LESS THAN 25°
DIP 25 - 49°
DIP 50 - 74°
DIP GREATER THAN 75°
ANTICLINE
SYNCLINE
THRUST FAULT
MAJOR FAULT
MINOR FAULTS AND LINEAMENTS
ROCK CONTACT
BEDDING TRACE
X COAL OUTCROP
⊕ COAL WASH OR FLOAT
⊙ 79-21 SURFACE BORE HOLE AND NUMBER
C.L. 77 COAL EXPLORATION LICENCE NUMBER
C-8 COAL OCCURRENCE AREA AND NUMBER
Km 1 0 1 2 3 4 5 Km
Plate VI
INDEX SHEET
PAN OCEAN OIL LTD.
GEOLOGY OF THE BONNET PLUME BASIN
BONNET PLUME PROJECT
DEC., 1980
1:50,000
106E
E-1124

WIND RIVER DEPOSIT — GARLIC RING DEPOSIT — WEST ILLTYD DEPOSIT — ILLTYD DEPOSIT — SPACESHIP DEPOSIT — WERNECKE DEPOSIT — AIRSTRIP DEPOSIT

DATUM BASE THICK CONGLOMERATE

W-80-12 W-80-10 W-80-8 W-79-1 W-79-6/6A W-79-5 GR-80-21 GR-80-24 W1-80-16 W1-80-19 BP-79-21 BP-79-17/71 BP-79-10 BP-79-11 BP-79-14 BP-79-13 BP-79-12A BP-79-16A SC-80-22 SC-80-25 BP-78-1 WK-80-1 WK-80-7 WK-80-3 A-79-23

CORRELATED DRILL HOLE LOCATION PLAN



SCALE 1: 250,000

VERTICAL SCALE 1:1000

LEGEND

- OVERBURDEN
- CONGLOMERATE
- CONGLOMERATIC SANDSTONE
- SANDSTONE
- COAL
- MUDSTONE
- CARBONACEOUS TO COALY MUDSTONE
- SILTSTONE
- LIMESTONE

Plate VII

TO ACCOMPANY REPORT NO. A-81 BY D.R.C.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

STRATIGRAPHIC CORRELATION CHART

BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
JAN., 1981	———	106 E	1125

M.A.P.

DRAWING NO. E-1126

WERNECKE DEPOSIT

SPACESHIP DEPOSIT

SPACESHIP MOUNTAIN

WK-80-1

WK-80-3/3A

SC-80-22

SC-80-25

8P-78-1

SUBCROP TRACE No. 4 SEAM

SUBCROP TRACE No. 3 SEAM

SUBCROP TRACE No. 2 SEAM

SUBCROP TRACE No. 1 SEAM

SUBCROP TRACE No. 1 SEAR HORIZON

ILLTYD CREEK

WERNECKE THRUST

WIND RIVER

KLBP

€D

HG

CONGLOMERATIC SANDSTONE

CONGLOMERATE

SANDSTONE

COAL, SHALE

SILTSTONE

LIMESTONE

TALUS

CARBONATES & CARBONACEOUS SILTSTONE

LEGEND

- AREA OF RESOURCE DETERMINATION
- SANDSTONE
- CONGLOMERATIC SANDSTONE
- CONGLOMERATE
- W-80-1 DRILL HOLE
- BEDDING
- CONTACT
- FAULT
- THRUST FAULT
- COAL OCCURRENCE OUTCROP, FLOAT OR WASH
- K_{LBP} CRETACEOUS, LOWER BONNET PLUME FORMATION

NOTE : FOR CROSS-SECTIONS 'A'-'A', 'B'-'B', 'C'-'C', SEE DRAWING NO. D-1128

FOR CROSS-SECTION 'E'-'E', 'D'-'D', SEE DRAWING NO. X-1129

FOR CROSS-SECTIONS 'X'-'X', 'G'-'G', 'I'-'I', 'W'-'W', SEE DRAWING NO. X-1127

km 25 0 25 50 75 1.0 125km

Plate VIII

TO ACCOMPANY REPORT NO. 4-81 BY O.R.C.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

GEOLOGY

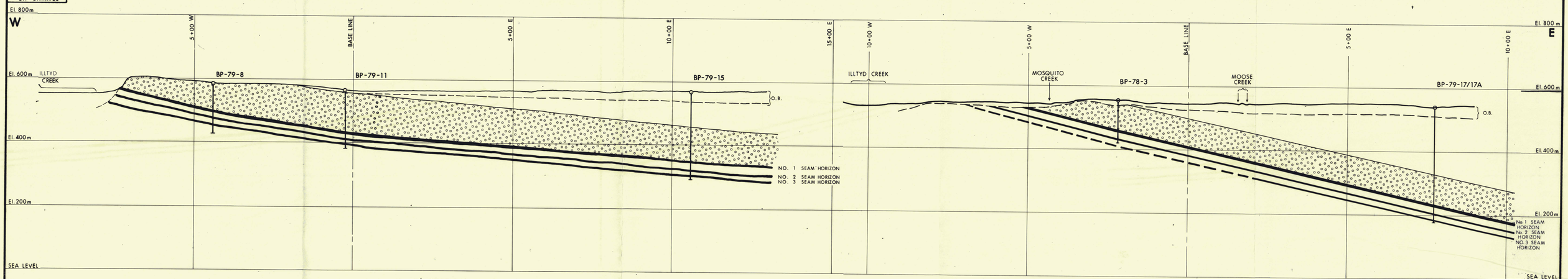
WERNECKE, WEST ILLTYD, ILLTYD AND SPACESHIP DEPOSITS
(SOUTH SHEET)
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
DEC, 1980	1:12,500	106 E	E-1126

D.A.

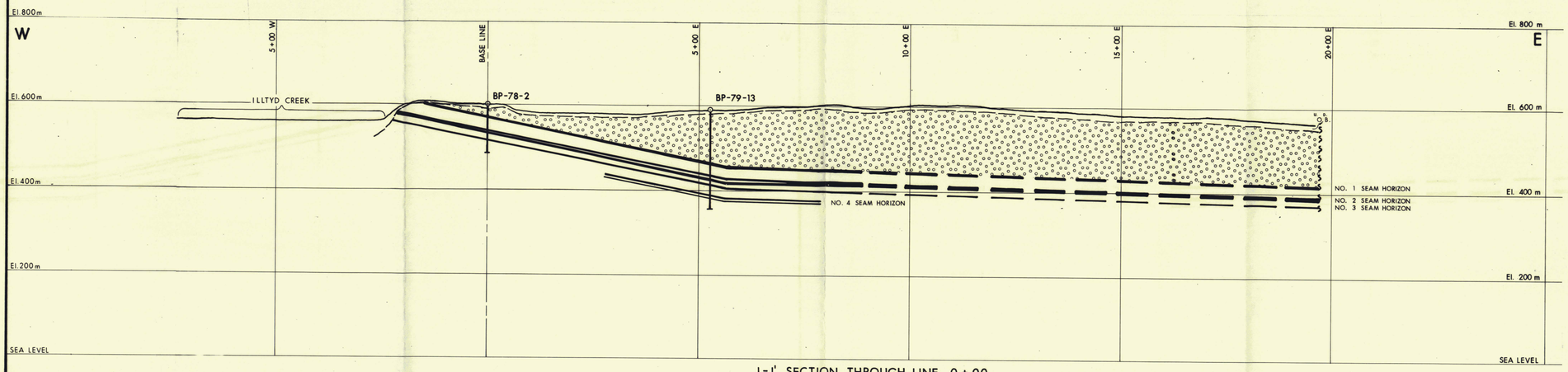
DP468A0P00

DRAWING NO. X-1127

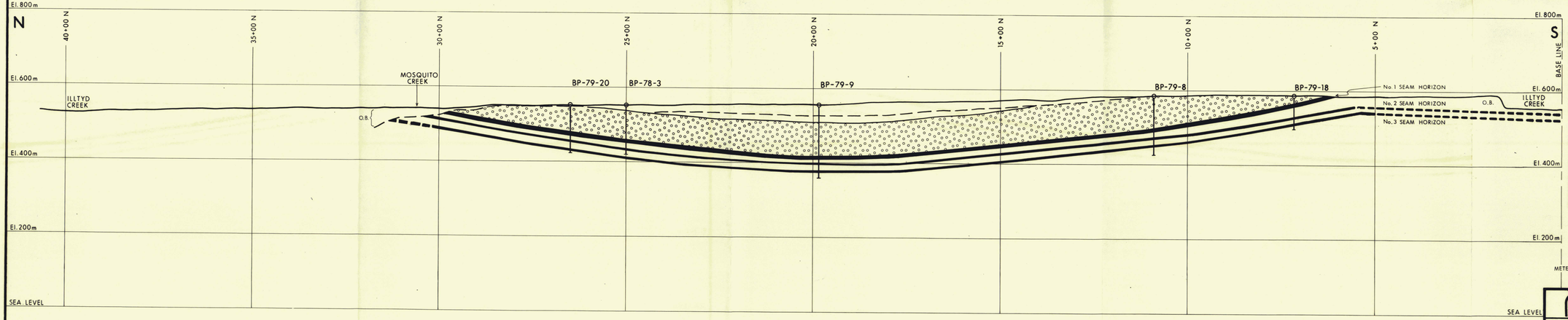


G - G' SECTION THROUGH LINE 10+00 N

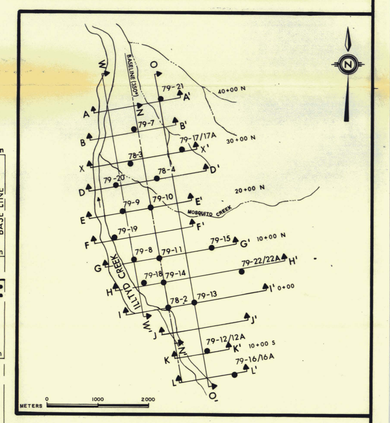
X - X' SECTION THROUGH LINE 30+00 N



I - I' SECTION THROUGH LINE 0 + 00



W-W' SECTION THROUGH LINE 5+00 W



LEGEND

- O.B. OVERBURDEN
- CONGLOMERATE
- UNDIFFERENTIATED LITHOLOGY
- MEASURED COAL RESERVE
- INDICATED COAL RESERVE

Plate IX

METERS 100 0 100 200 300 400 500

TO ACCOMPANY REPORT NO. 4-81 BY O.R.C.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

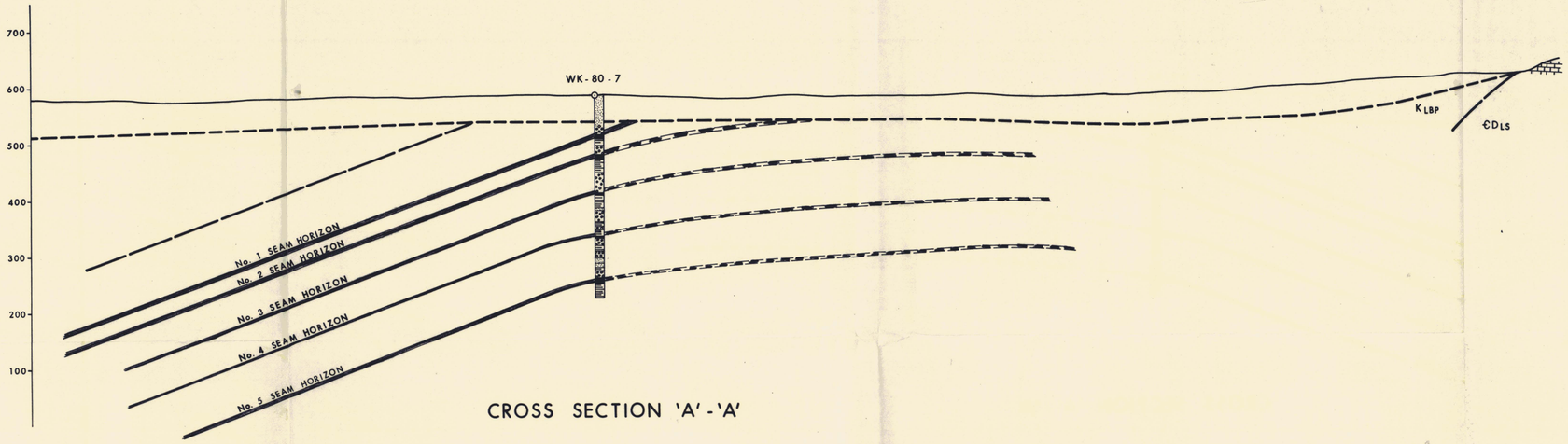
ILLTYD CREEK DEPOSIT (BLOCK 'B')

BONNET PLUME PROJECT

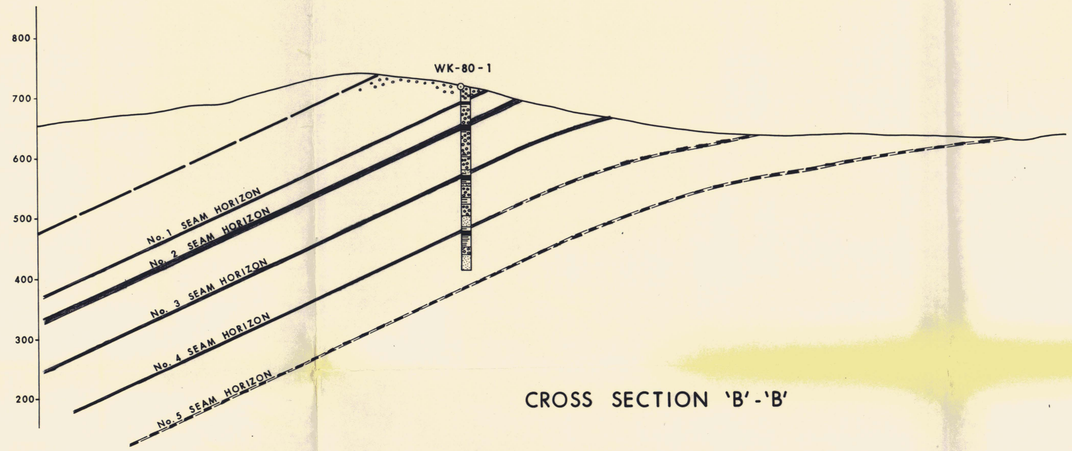
DATE	SCALE	NTS	DRAWING NO.
JAN., 1981	1:5000	106 E	X-1127

K.B.B.
DP441B1P00

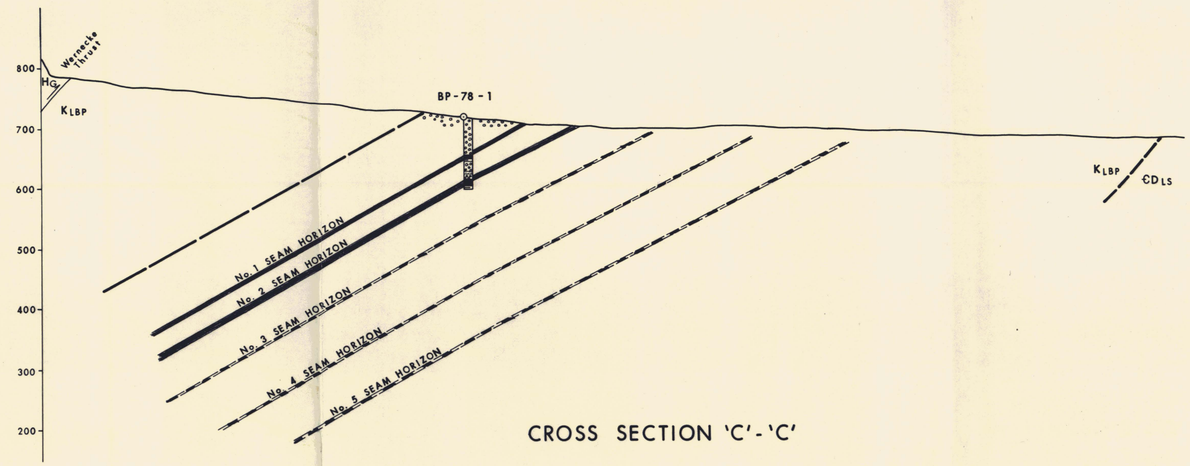
DRAWING NO. D-



CROSS SECTION 'A'-'A'



CROSS SECTION 'B'-'B'



CROSS SECTION 'C'-'C'

LEGEND

- SANDSTONE
- CONGLOMERATIC SANDSTONE
- CONGLOMERATE
- BP-78-1 DRILL HOLE
- CONTACT

Plate X

NOTE: TO ACCOMPANY DRAWING NO. E-1126

m 100 50 0 100 200 300 400 m

TO ACCOMPANY REPORT NO. 4-81 BY ORC

PAN OCEAN OIL LTD.
CALGARY ALBERTA

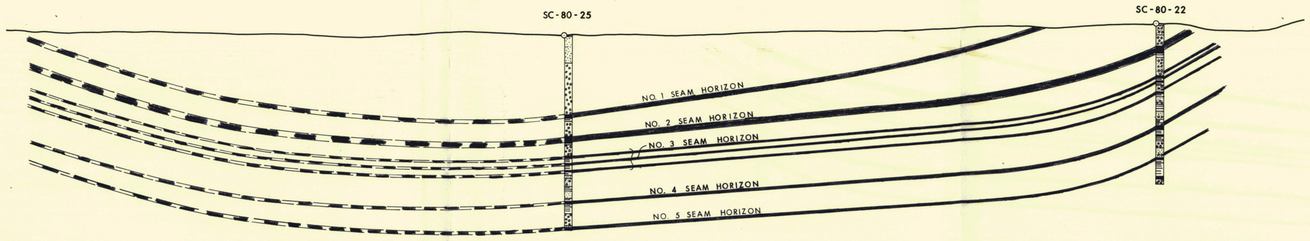
CROSS SECTIONS
WERNECKE DEPOSIT
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
DEC., 1980	1:5000	106 E	D-1128

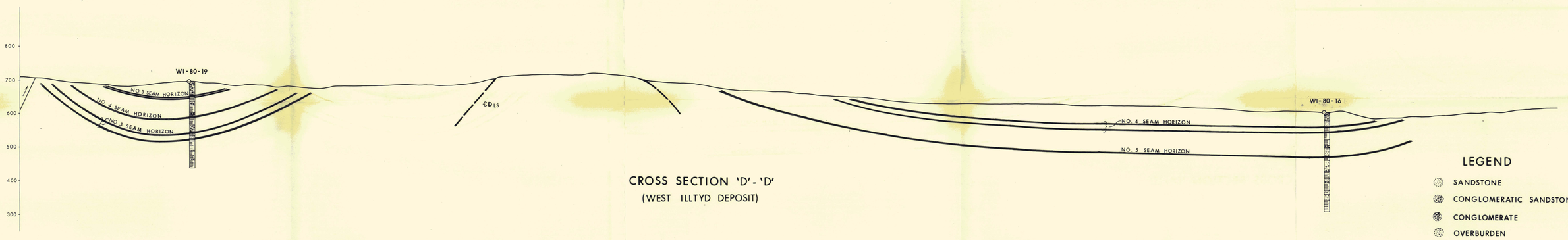
DP555 A1 P00

M.A.P.

DRAWING NO
X-1129



CROSS SECTION 'E'-'E'
(SPACESHIP DEPOSIT)



CROSS SECTION 'D'-'D'
(WEST ILLTYD DEPOSIT)

LEGEND

- SANDSTONE
- CONGLOMERATIC SANDSTONE
- CONGLOMERATE
- OVERBURDEN
- BP-78-1 DRILL HOLE
- CONTACT

Plate XI

NOTE: TO ACCOMPANY DRAWING NO. E-1126

m 100 50 0 100 200 300 400 m

TO ACCOMPANY REPORT NO. 4-81 BY O.R.C.

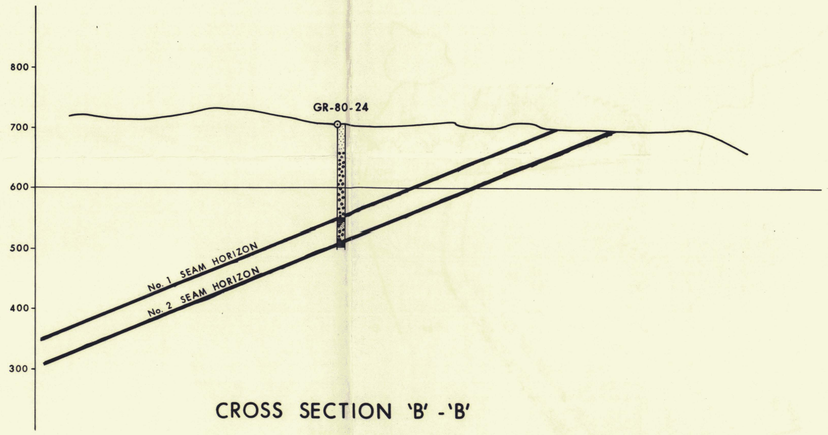
PAN OCEAN OIL LTD.
CALGARY ALBERTA

CROSS SECTIONS
WEST ILLTYD & SPACESHIP DEPOSITS
BONNET PLUME PROJECT

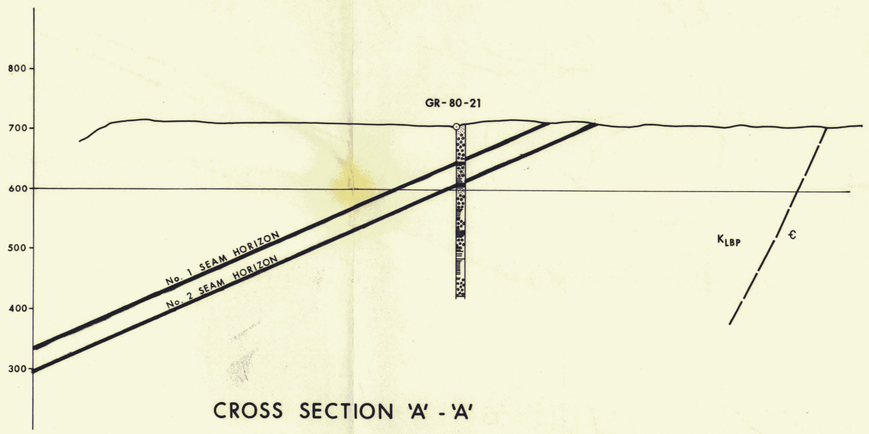
DATE	SCALE	NTS	DRAWING NO.
DEC., 1980	1:5000	106 E	X-1129

M. A. P.
DP441B1P00

DRAWING NO. D-1130

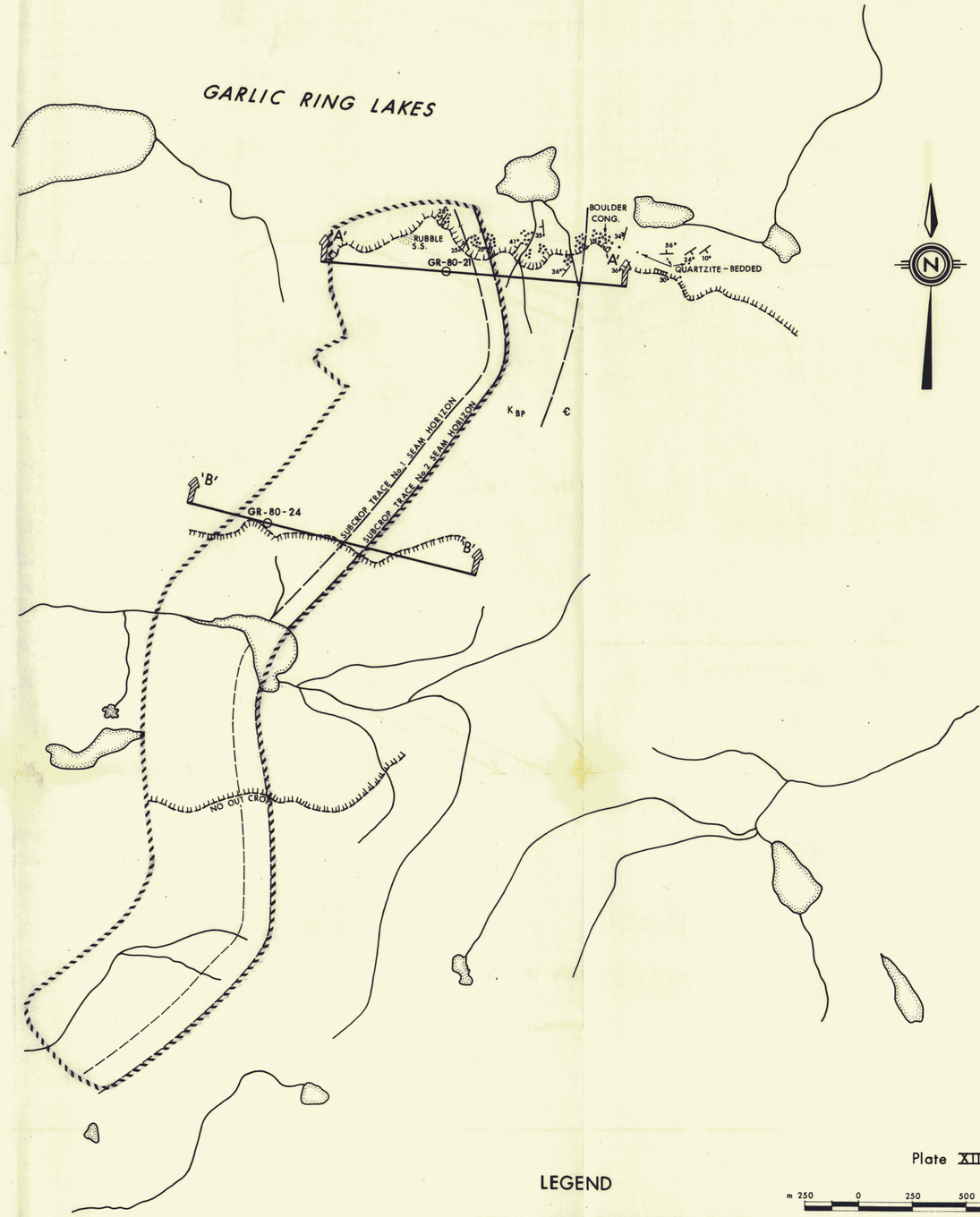


CROSS SECTION 'B' - 'B'



CROSS SECTION 'A' - 'A'

m 100 50 0 100 200 300 m
SCALE 1:5,000



LEGEND

- AREA OF RESOURCE DETERMINATION
- SANDSTONE
- CONGLOMERATIC SANDSTONE
- CONGLOMERATE
- GR-80-23 — DRILL HOLE
- 110° — BEDDING
- CONTACT

Plate XII

m 250 0 250 500 750 1000 m

TO ACCOMPANY REPORT NO. 4-81 BY O.R.C.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

GEOLOGY
CROSS SECTIONS
GARLIC RING DEPOSIT
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
DEC., 1980	1:12,500	106 E	D-1130

DP555 A1 P00

M.A.P.

DRAWING NO
X- 1131

WIND RIVER

WIND RIVER WINTER ROAD

SUBCROP TRACE No. 3 SEAM HORIZON

SUBCROP TRACE No. 4 SEAM HORIZON

RIDGE FORMING SANDSTONE

A-80-2

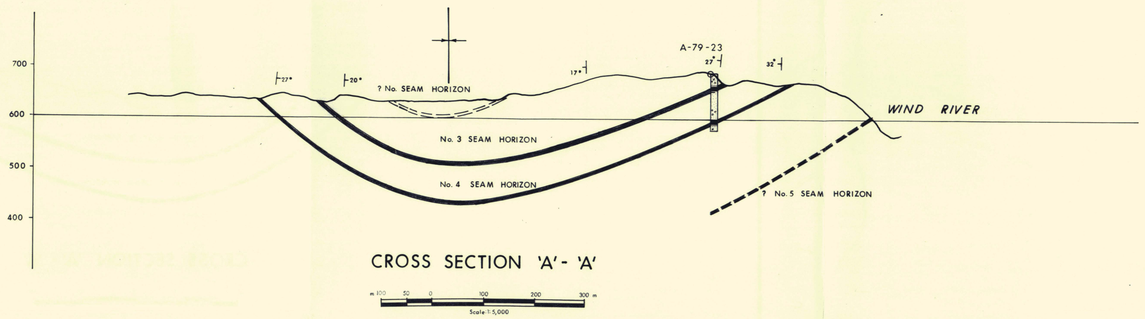
A-79-23

A

A'

LEGEND

- COAL OCCURRENCE OUTCROP, FLOAT OR WASH
- SANDSTONE
- CONGLOMERATIC SANDSTONE
- CONGLOMERATE
- A-79-23 DRILL HOLE
- 110° BEDDING
- CONTACT
- AREA OF RESOURCE DETERMINATION



CROSS SECTION 'A'- 'A'

Scale 1:5,000

Plate XIII

TO ACCOMPANY REPORT NO 4-81 BY O.R.C.

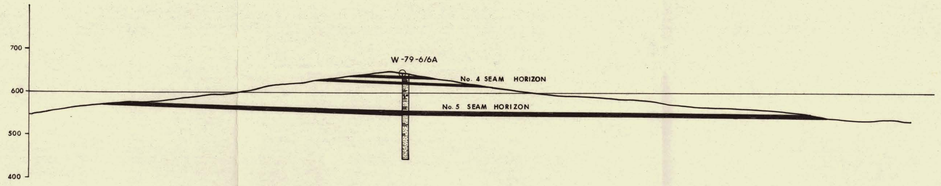
PAN OCEAN OIL LTD.
CALGARY ALBERTA

GEOLOGY
CROSS SECTION
AIRSTRIP DEPOSIT RESERVE AREA
BONNET PLUME PROJECT

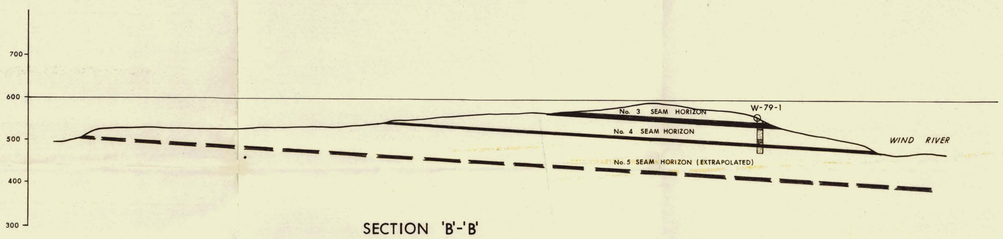
DATE	SCALE	NTS	DRAWING NO.
DEC., 1980	1:12,500	106 E	X- 1131

K.B.B.
DP441B1P00

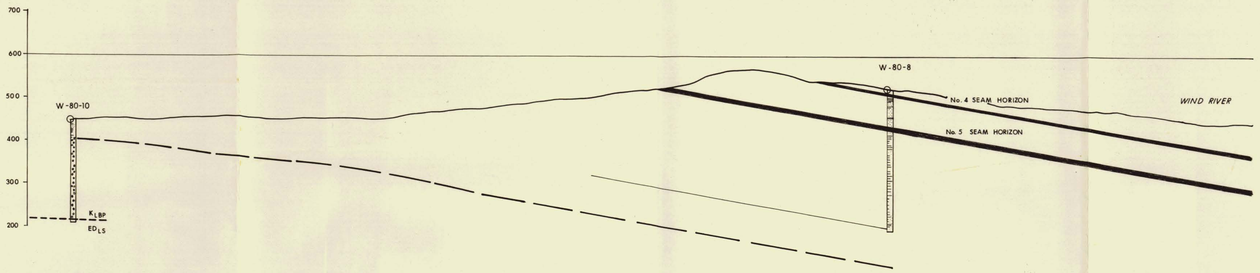
DRAWING NO. E-1132



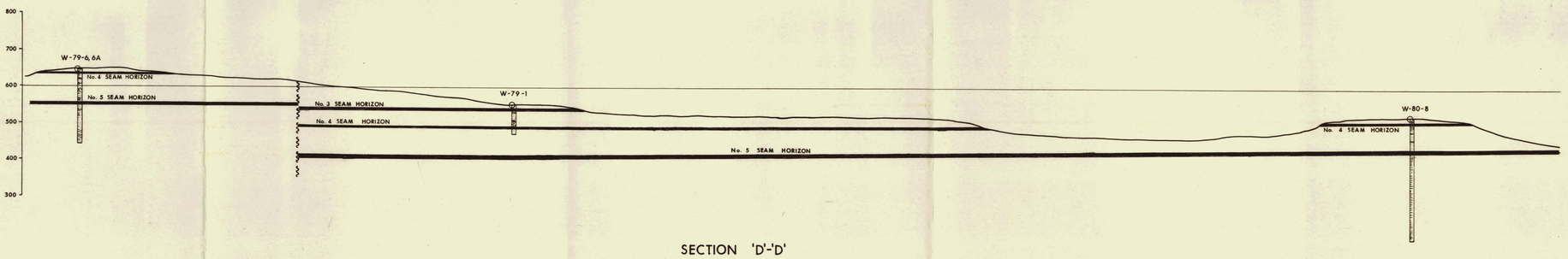
SECTION 'A' - 'A'



SECTION 'B'-'B'

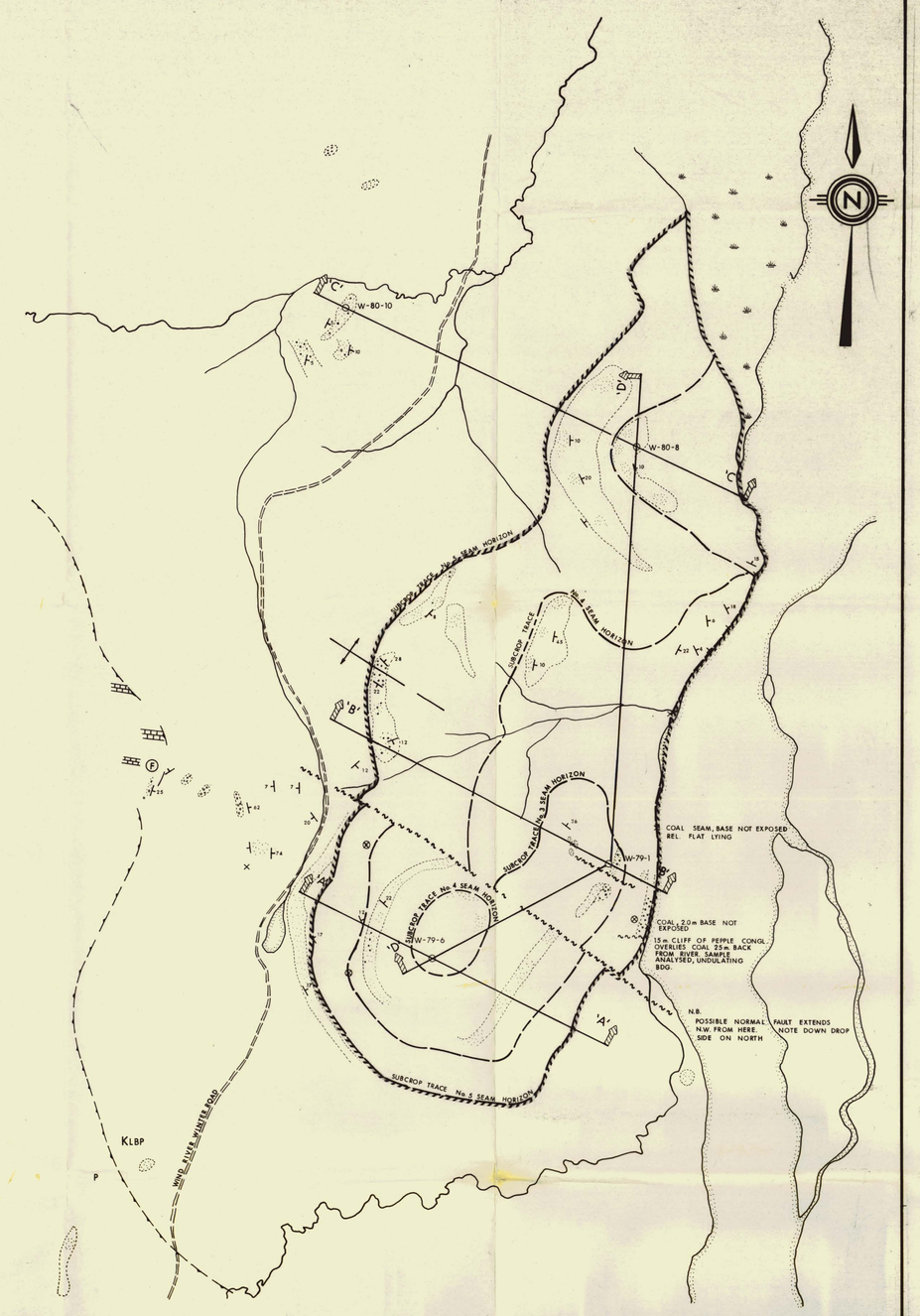


SECTION 'C'-'C'



SECTION 'D'-'D'





LEGEND

- SANDSTONE
- CONGLOMERATIC SANDSTONE
- CONGLOMERATE
- W-79-1 DRILL HOLE
- BEDDING
- CONTACT
- AREA OF RESOURCE DETERMINATION
- FAULT
- THRUST FAULT
- COAL OCCURRENCE OUTCROP, FLOAT OR WASH
- KLBP CRETACEOUS, LOWER BONNET PLUME FORMATION

250 125 0 250 500 750 1000 1250 m

Plate XIV

TO ACCOMPANY REPORT NO. 4-81 BY O.R.C.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

GEOLOGY

WIND RIVER DEPOSIT AREA

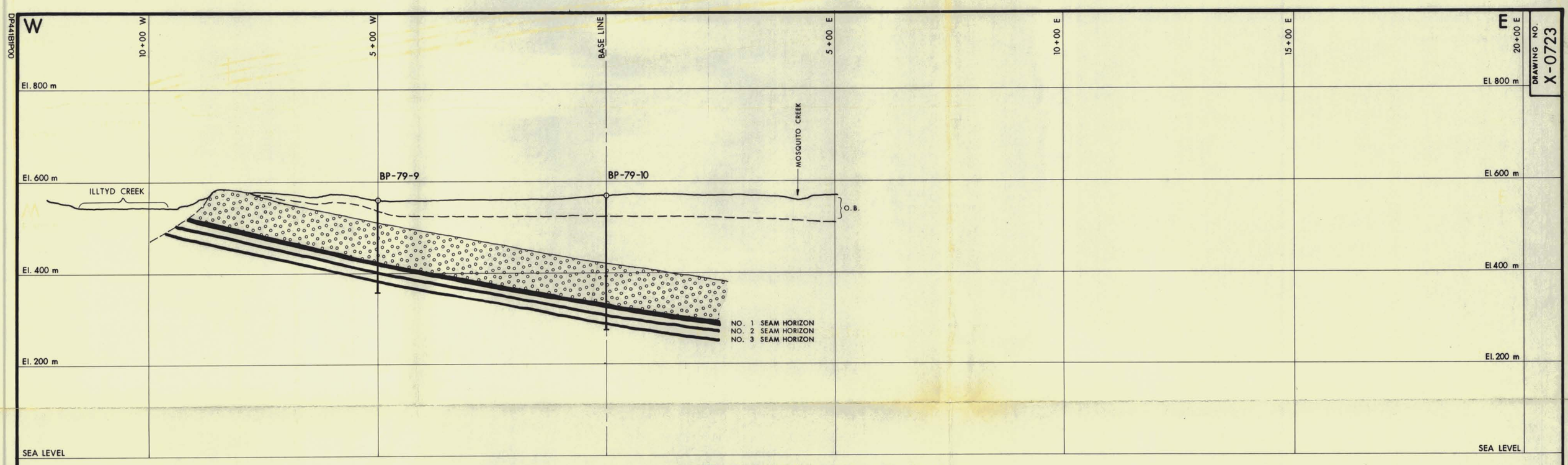
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
DEC., 1980	1:12,500	106 E	E-1132

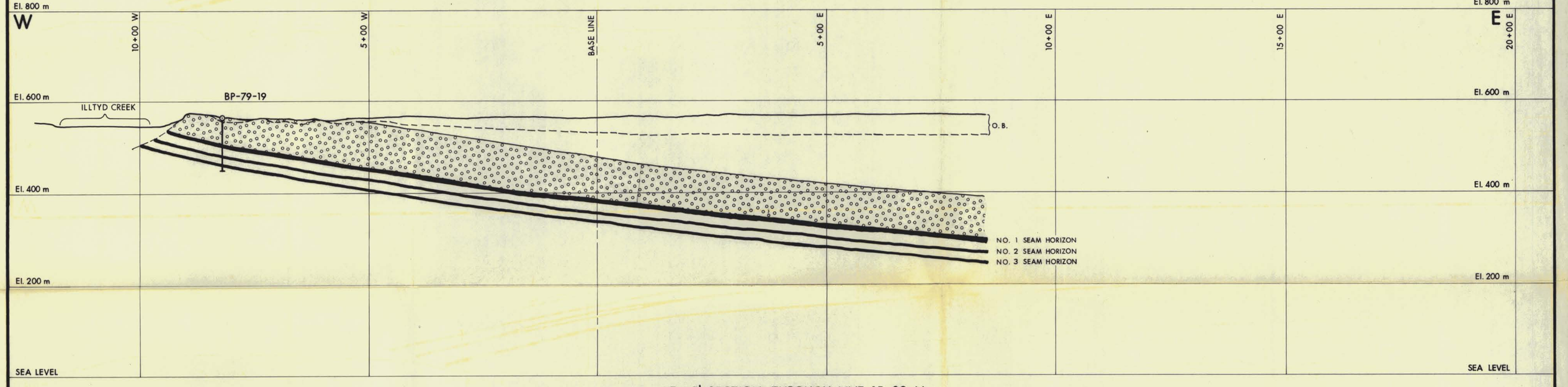
K.B.B

DP468AOP00

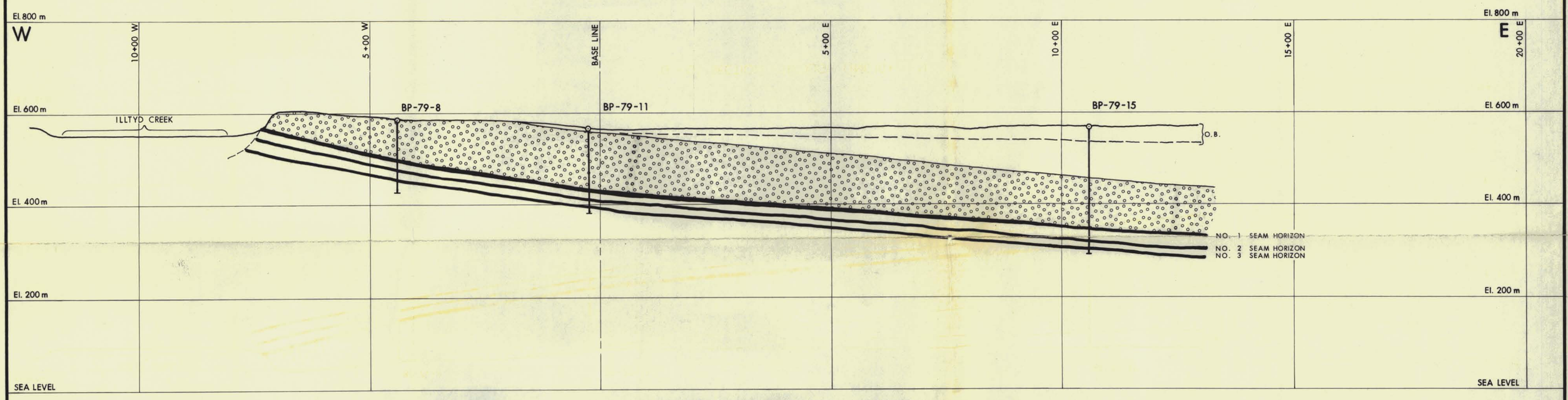
DP441B1P00



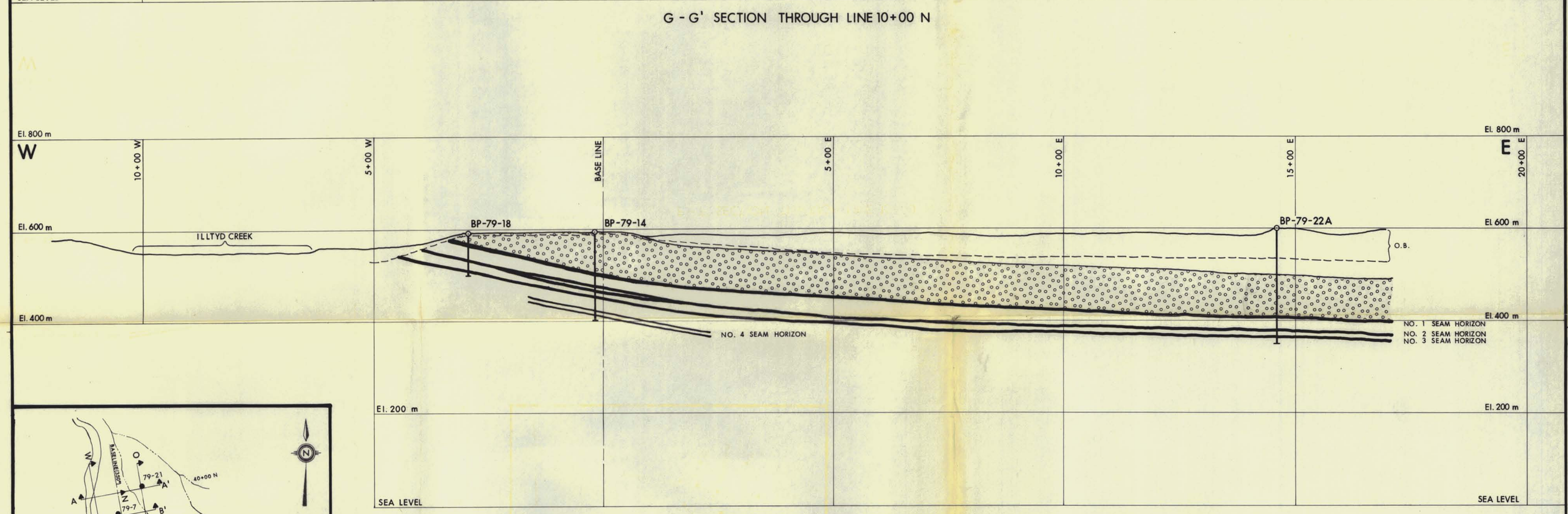
E - E' SECTION THROUGH LINE 20+00 N



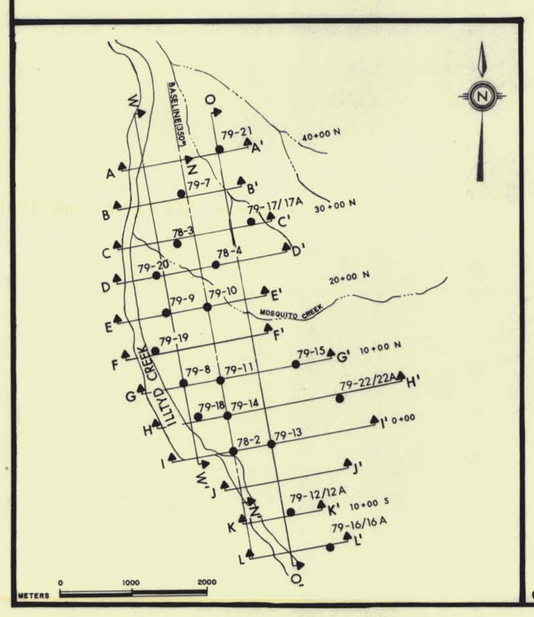
F - F' SECTION THROUGH LINE 15+00 N



G - G' SECTION THROUGH LINE 10+00 N



H - H' SECTION THROUGH LINE 5+00 N



CBW

LEGEND

- O.B. OVERBURDEN
- CONGLOMERATE
- UNDIFFERENTIATED LITHOLOGY
- MEASURED COAL RESERVE
- INDICATED COAL RESERVE

METERS 100 0 100 200 300 400 500

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C. D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

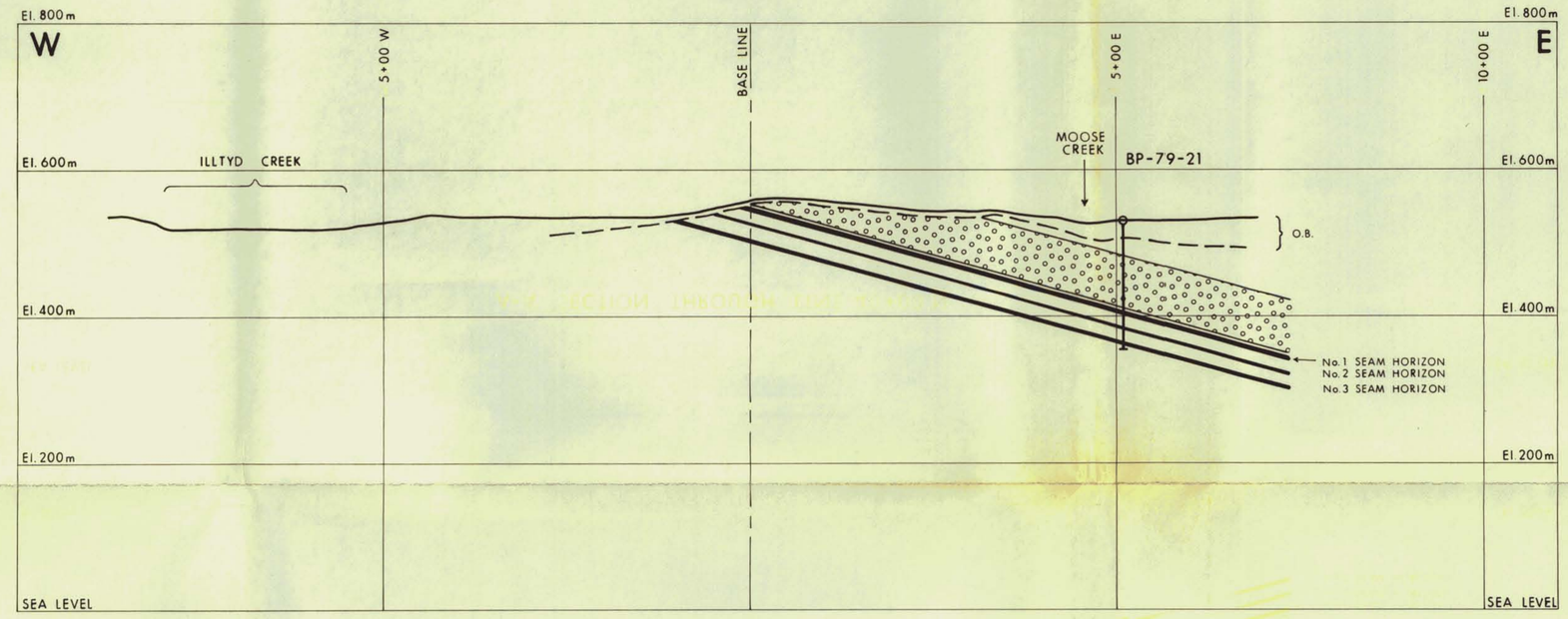
ILLTYD CREEK DEPOSIT (BLOCK 'B')

BONNET PLUME PROJECT

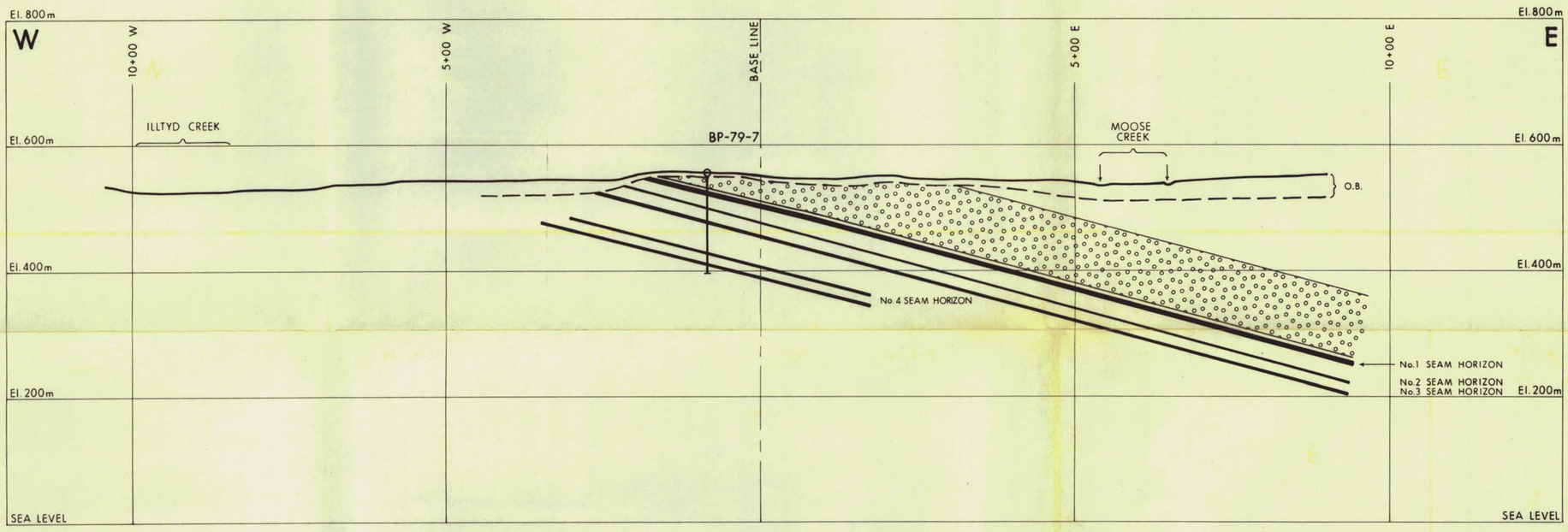
DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106 E	X-0723

0.2655

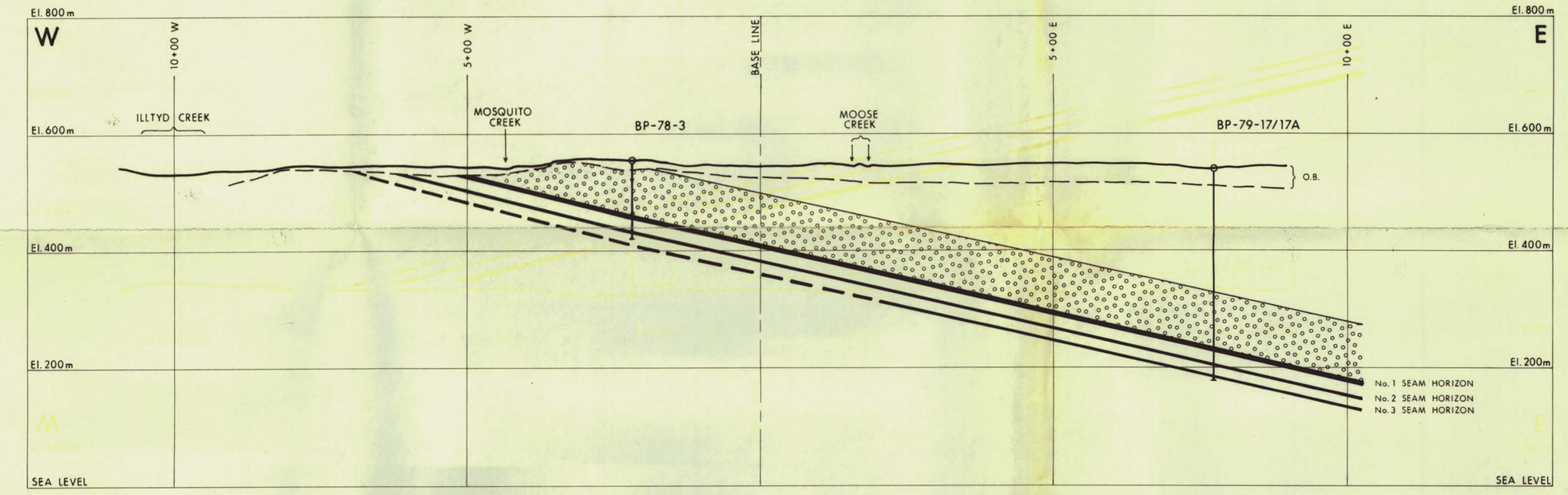
DRAWING NO. X-0724



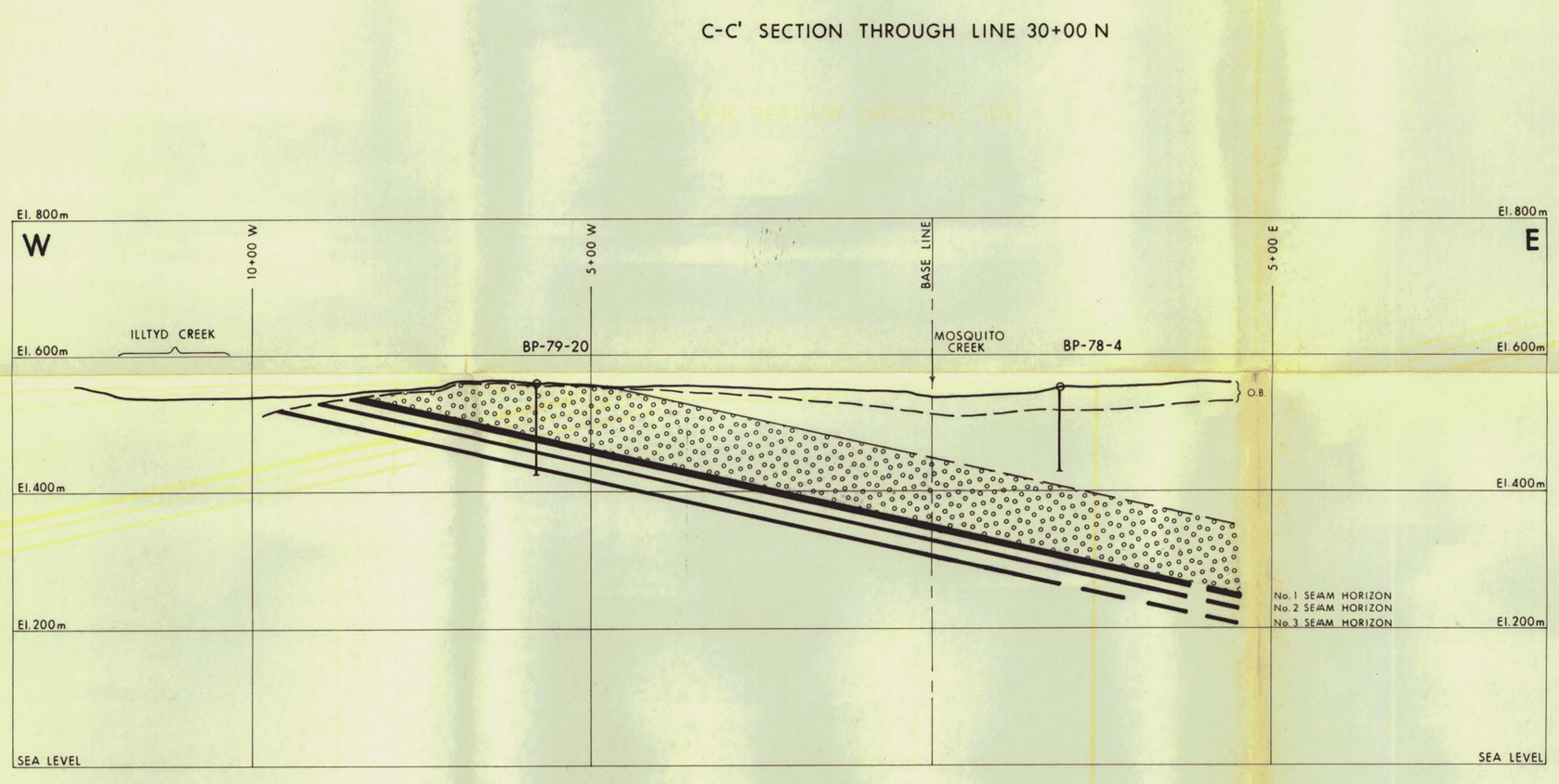
A-A' SECTION THROUGH LINE 40+00 N



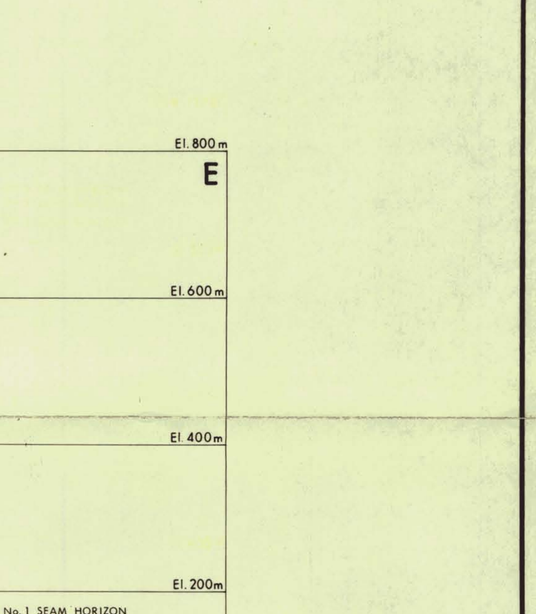
B-B' SECTION THROUGH LINE 35+00 N



C-C' SECTION THROUGH LINE 30+00 N



D-D' SECTION THROUGH LINE 25+00 N



METERS 100 0 100 200 300 400 500

TO ACCOMPANY REPORT NO 25-79 BY O.R.C., D.C.H.

O.B. OVERBURDEN
CONGLOMERATE
UNDIFFERENTIATED LITHOLOGY
MEASURED COAL RESERVE
INDICATED COAL RESERVE

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ILLTYD CREEK DEPOSIT (BLOCK 'B')

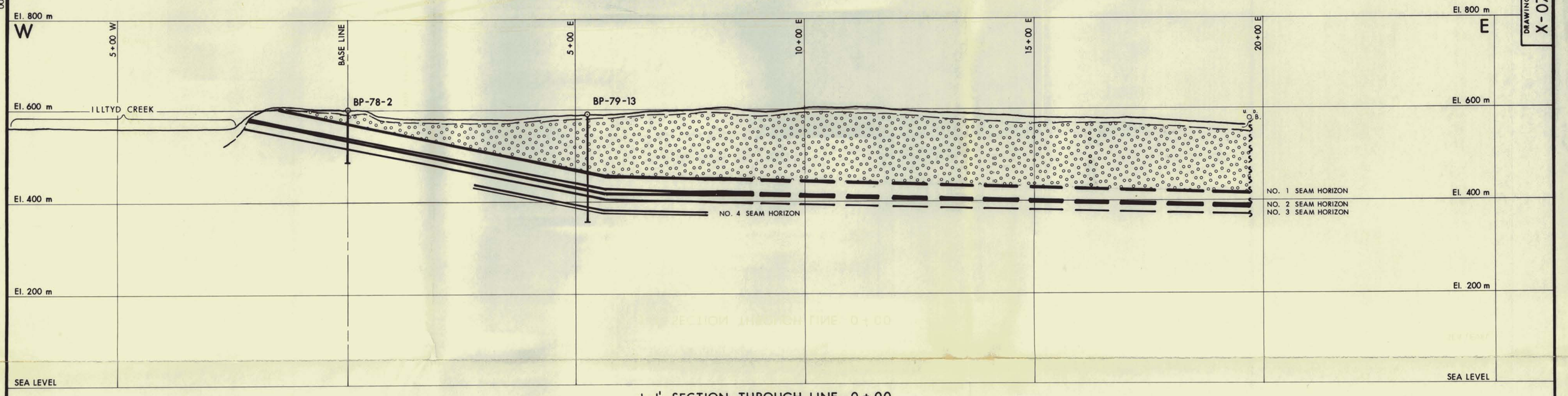
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCT; 1979	1:5000	106 E	X-0724

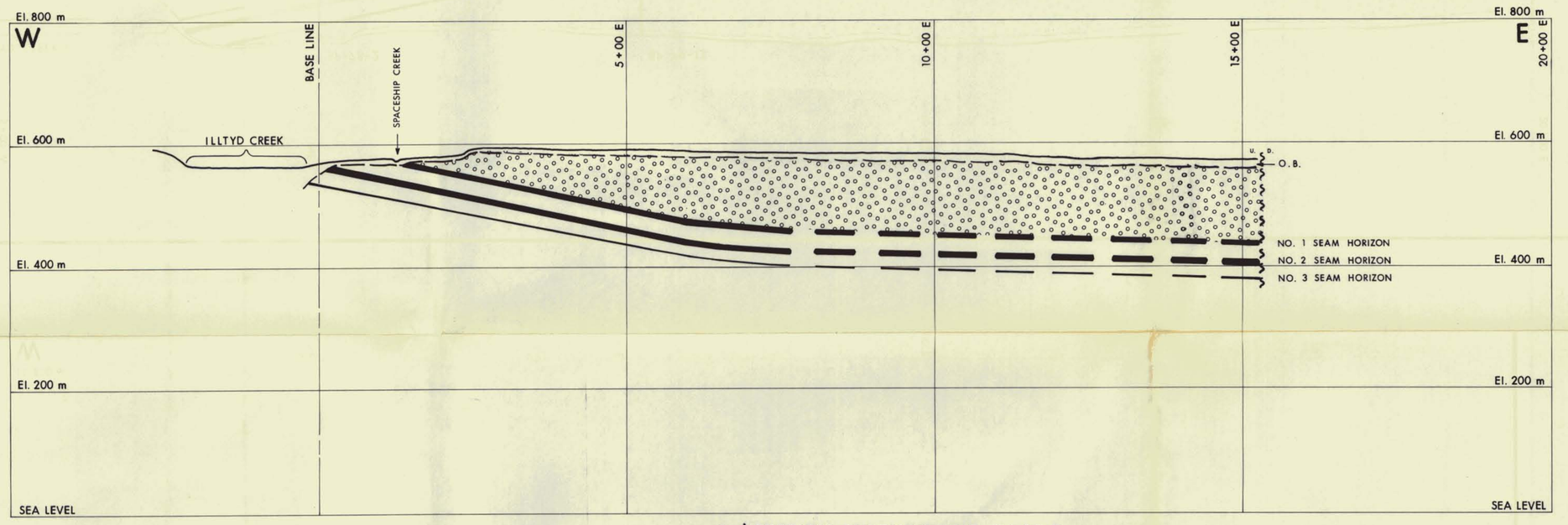
LW

DP41BIPO0

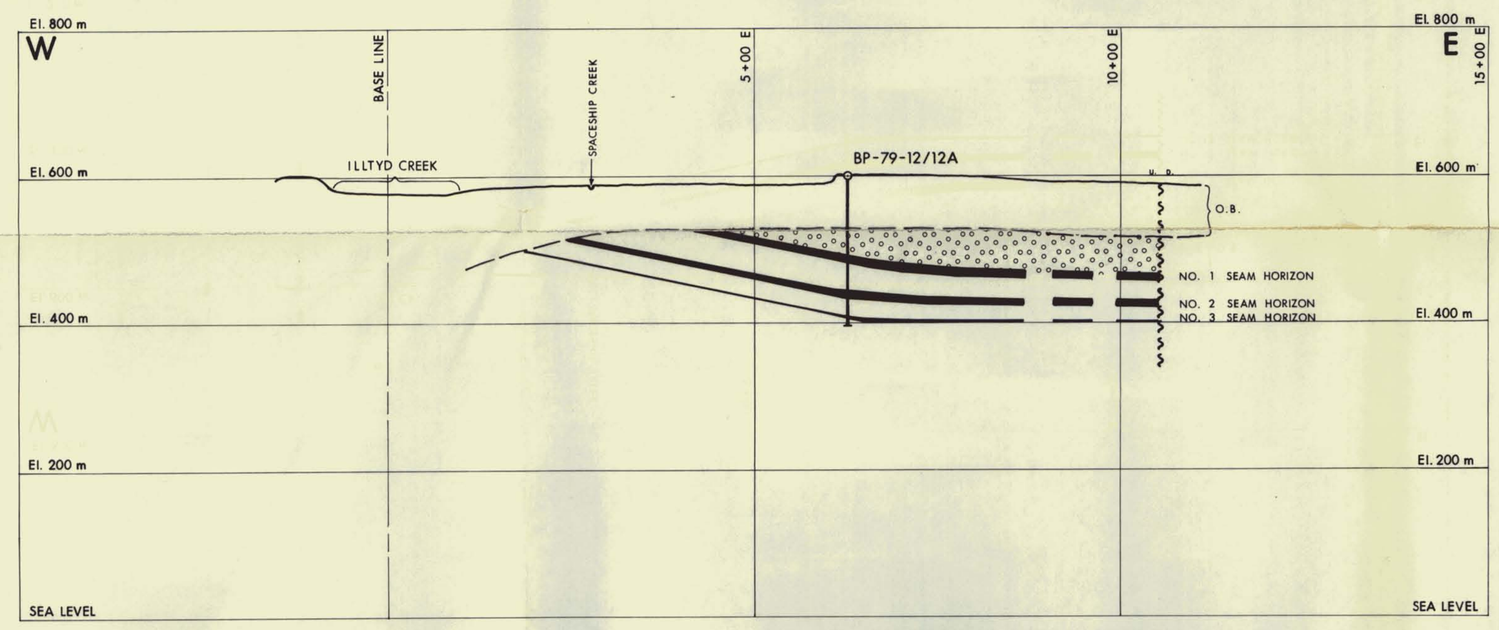
DRAWING NO. X-0725



I-I' SECTION THROUGH LINE 0+00



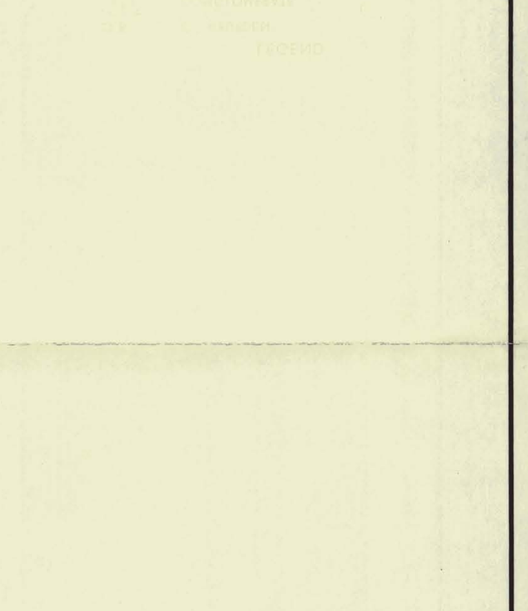
J-J' SECTION THROUGH LINE 5+00 S



K-K' SECTION THROUGH LINE 10+00 S

LEGEND

- O.B. OVERBURDEN
- CONGLOMERATE
- UNDIFFERENTIATED LITHOLOGY
- MEASURED COAL RESERVE
- INDICATED COAL RESERVE



L-L' SECTION THROUGH LINE 15+00 S

METERS 100 0 100 200 300 400 500

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C, D.C.H.

PAN OCEAN OIL LTD.

CALGARY ALBERTA

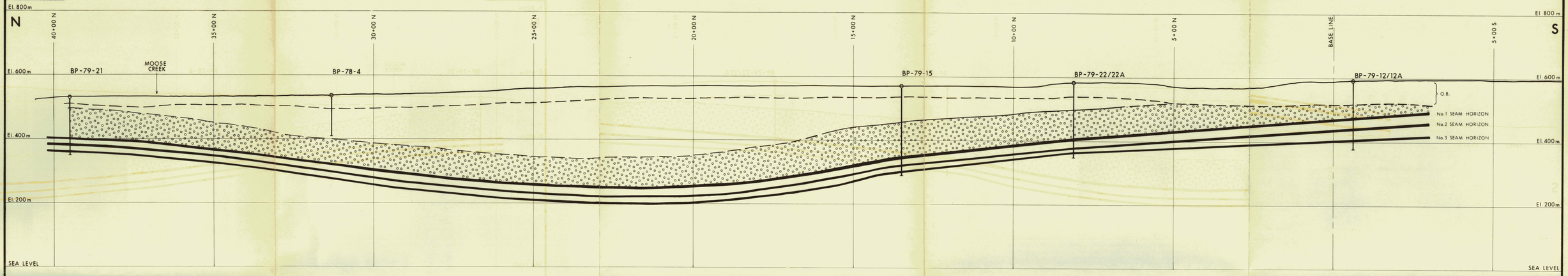
ILLTYD CREEK DEPOSIT (BLOCK 'B')

BONNET PLUME PROJECT

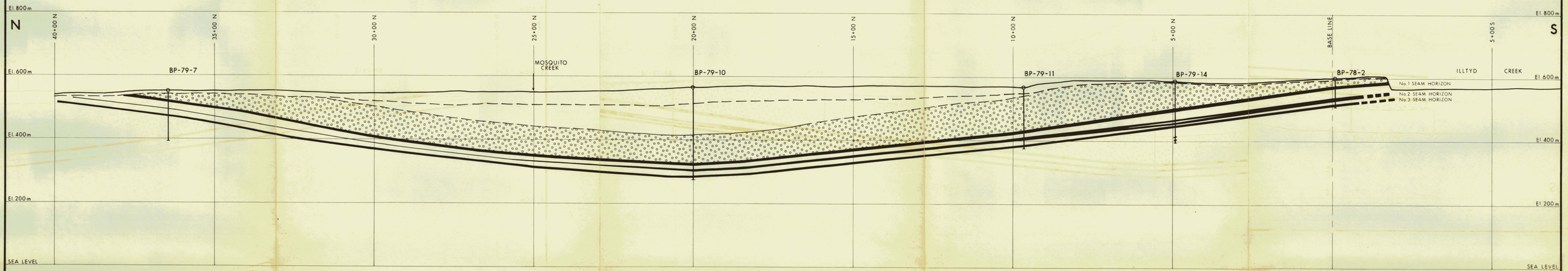
DATE	SCALE	NTS	DRAWING NO.
NOVEMBER, 1979	1:5000	106 E	X-0725

CBW

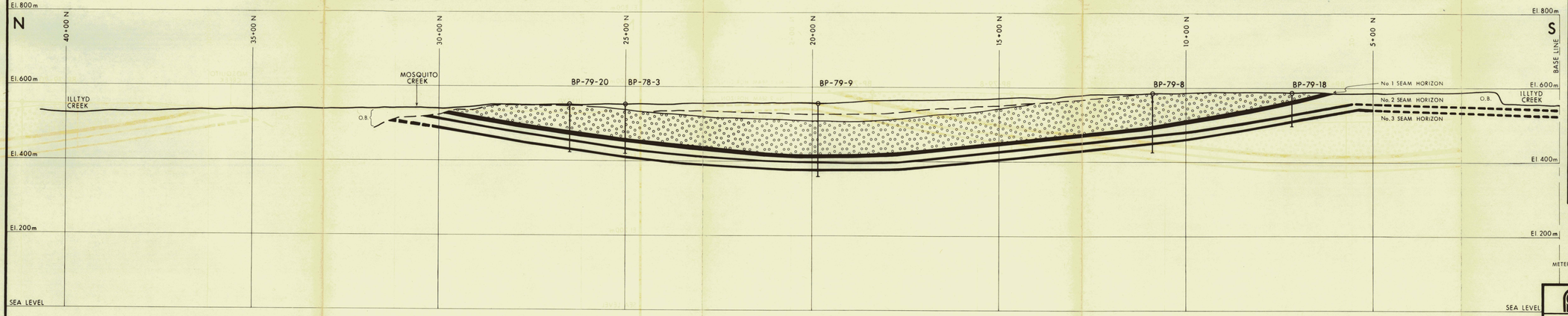
DRAWING NO. X-0726



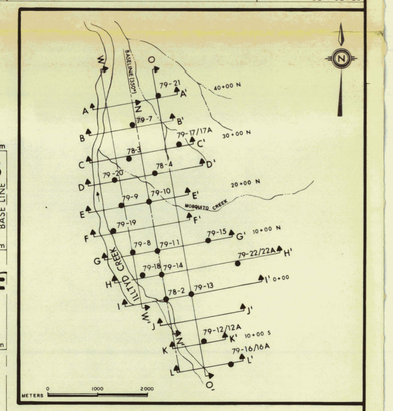
O-O' SECTION THROUGH LINE 5+00 E



N-N' SECTION THROUGH BASELINE



W-W' SECTION THROUGH LINE 5+00 W



LEGEND

- O.B. OVERBURDEN
- CONGLOMERATE
- UNDIFFERENTIATED LITHOLOGY
- MEASURED COAL RESERVE
- INDICATED COAL RESERVE

METERS 100 0 100 200 300 400 500

TO ACCOMPANY REPORT NO. 25-79 BY ORC D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ILLTYD CREEK DEPOSIT (BLOCK 'B')

BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOV, 1979	1:5000	106 E	X-0726

LW
DP441B1P00

BP-79-21
1404.38m

BP-79-7
520.15m

BP-79-17/17A
228.33m

BP-78-3
453.06m

BP-78-4
1306.36m
ESTIMATED

BP-79-20
471.79m

BP-79-9
410.56m

BP-79-10
322.20m

BP-79-19
498.0m

BP-79-8
488.11m

BP-79-11
425.11m

BP-79-18
556.34m

BP-79-14
495.15m

BP-79-15
342.53m

BP-79-22/22A
401.87m

BP-79-13
461.38m

BP-78-2
569.26m

BP-79-12/12A
479.01m

BP-79-16/16A
NOT INTERSECTED

APPROXIMATE SUBCROP TRACE OF BASE NO. 1 SEAM HORIZON

APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO. 1 SEAM HORIZON

TWIN LAKES CREEK

MISHIAP CREEK

ILLTYD CREEK

4000 m N
3000 m N
2000 m N
1000 m N
0000
1000 m S
1000 m W
1000 m E
2000 m E

35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 N
5+00 N
0+00
5+00 S
10+00 S

LEGEND

- DEFINED
- APPROXIMATE
- ASSUMED TRACE BELOW ILLTYD CREEK

NOTE:
DATUM SEA LEVEL IN METERS
(HOLE 78-2 ASSUMED TO BE 600m ASL)
CONTOUR INTERVAL 10m

METERS 100 0 100 200 300 400 500

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

STRUCTURE CONTOURS
BASE NO. 1 SEAM HORIZON

ILLTYD CREEK DEPOSIT (BLOCK 'B')

BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOVEMBER, 1979	1:5000	106 E	E-0728

LW

BP-79-21
615.82m

BP-79-7
499.58m

BP-79-17/17A
794.52m

BP-78-3
568.09m

BP-78-4
288.0m
ESTIMATED

BP-79-20
544.17m

BP-79-9
303.96m

BP-79-10
691.94m

BP-79-19
522.98m

BP-79-15
315.64m

BP-79-8
532.13m

BP-79-11
594.56m

BP-79-22/22A
624.09m

BP-79-18
473.85m

BP-79-14
541.23m

BP-79-13
575.15m

BP-78-2
470.0m

BP-79-12/12A
-565.78m

BP-79-16/16A
NOT INTERSECTED

APPROXIMATE 300m OVERBURDEN CONTOUR BASE No.2 SEAM HORIZON

APPROXIMATE SUBCROP TRACE BASE NO. 2 SEAM HORIZON

TWIN LAKES CREEK

MUSKAP CREEK

ILLTYD CREEK

35+00 N

30+00 N

25+00 N

20+00 N

5+00 N

0+00

5+00 S

10+00 S

4000 m N

3000 m N

2000 m N

1000 m N

1000 m W

2000 m E

1000 m E

1000 m S

LEGEND

- DEFINED
- APPROXIMATE
- ASSUMED TRACE BELOW ILLTYD CREEK

NOTE:
DATUM SEA LEVEL IN METERS
CONTOUR INTERVAL 10m
(HOLE 78-2 ASSUMED TO BE 600m ASL)

100 0 100 200 300 400 500

TO ACCOMPANY REPORT NO 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

STRUCTURE CONTOURS
BASE NO. 2 SEAM HORIZON
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOVEMBER, 1979	1:5000	106 E	E-0729

LW

BP-79-21
361.44 m

BP-79-7
474.37 m

BP-79-17/17A
183.43 m

BP-78-3
405.26 m
ESTIMATED

BP-78-4
273.0 m
ESTIMATED

BP-79-20
430.57 m

BP-79-9
372.12 m

BP-79-10
284.96 m

BP-79-19
455.13 m

BP-79-15
298.94 m

BP-79-8
447.01 m

BP-79-11
387.13 m

BP-79-22/22A
362.94 m

BP-79-18
506.34 m

BP-79-14
447.00 m

BP-79-13
410.47 m

BP-78-2
514.78 m

BP-79-12/12A
408.62 m

BP-79-16/16A
NOT INTERSECTED

APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO.3 SEAM HORIZON

APPROXIMATE SUBCROP TRACE BASE NO.3 SEAM HORIZON

TWIN LAKES CREEK

MISHAP CREEK

MOSQUITO CREEK

ILLTYD CREEK

35+00 N

30+00 N

25+00 N

20+00 N

15+00 N

10+00 S

5+00 S

0+00

4000 m N

3000 m N

2000 m N

1000 m N

1000 m S

1000 m E

2000 m E

1000 m W

LEGEND

DEFINED

APPROXIMATE

ASSUMED TRACE BELOW ILLTYD CREEK

NOTE:
DATUM SEA LEVEL IN METRES
CONTOUR INTERVAL 10 m
(HOLE 78-2 ASSUMED TO BE 600m ASL)

100m 0 100 200 300 400 500m

TO ACCOMPANY REPORT NO 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

STRUCTURE CONTOURS
BASE NO. 3 SEAM HORIZON

ILLTYD CREEK DEPOSIT (BLOCK 'B')

BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOVEMBER, 1979	1:5000	106 E	E-0730

CBW

BP 79-21
4.21m

BP 79-7
6.58m

BP 79-17/17A
8.00m

BP 78-3
8.70m

BP 78-4
NOT INTERSECTED

BP 79-20
9.22m

BP 79-9
9.86m

BP 79-10
8.27m

BP 79-19
8.44m

BP 79-15
7.63m

BP 79-8
8.99m

BP 79-11
8.15m

BP 79-22A
6.97m

BP 79-14
8.20m

BP 79-18
10.05m

BP 79-13
6.67m

BP 78-2
7.27m

BP 79-12A
8.24m

BP 79-16A
NOT INTERSECTED

APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO. 1 SEAM HORIZON

APPROXIMATE SUBCROP TRACE BASE NO. 1 SEAM HORIZON

U D

LEGEND

DEFINED
APPROXIMATE
ASSUMED TRACE BELOW ILLTYD CREEK

NOTE
CONTOUR INTERVAL 1m

100 0 100 200 300 400 500

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C. & D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ISOPACH PLAN
NO. 1 SEAM HORIZON
ILLTYD CREEK DEPOSIT
(BLOCK 'B')

BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106 E	E-0740

LB

BP 79-21
2.01m

BP 79-7
1.27m

2

BP 79-17/17A
2.17m

BP 78-3
2.43m

BP 78-4
NOT INTERSECTED

BP 79-20
2.32m

3

BP 79-9
3.47m

BP 79-10
3.18m

BP 79-19
2.96m

APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO. 2 SEAM HORIZON

4

BP 79-15
3.25m

BP 79-8
3.08m

BP 79-11
4.35m

APPROXIMATE SUBCROP TRACE BASE NO. 2 SEAM HORIZON

BP 79-22A
2.72m

BP 79-18
3.67m

BP 79-14
16.31m
8.45m

BP 79-13
10.03m
4.22m

BP 78-2
8.43m
7.77m

BP 79-12A
8.34m
1.69m

BP 79-16A

NOTE
CONTOUR INTERVAL 1m
ISOPACH PLAN OF PARTING SEPARATING SEAM 2A FROM 2B

LEGEND
DEFINED
APPROXIMATE
ASSUMED TRACE BELOW ILLTYD CREEK

METERS 100 0 100 200 300 400 500

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C. & D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ISOPACH PLAN NO. 2 SEAM HORIZON
ILLTYD CREEK DEPOSIT
(BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106 E	E-0741

LB

BP 79-21
2.63m

BP 79-7
4.29m

BP 79-17/17A
3.08m

BP 78-3
NOT INTERSECTED

BP 78-4
NOT INTERSECTED

BP 79-20
3.83m

BP 79-9
4.52m

BP 79-10
3.22m

BP 79-19
3.34m

BP 79-15
4.44m

BP 79-8
4.80m

BP 79-11
5.46m

BP 79-22A
3.13m

BP 79-18
4.43m

BP 79-14
2.97m

BP 79-13
2.19m

BP 78-2
3.36m

BP 79-12A
2.19m

BP 79-16A
NOT INTERSECTED

APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO. 3 SEAM HORIZON

APPROX. SUBCROP TRACE BASE NO. 3 SEAM HORIZON

LEGEND

DEFINED

APPROXIMATE

ASSUMED TRACE BELOW ILLTYD CREEK

METERS 100 0 100 200 300 400 500

NOTE
CONTOUR INTERVAL 1m

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C. & D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ISOPACH PLAN
NO. 3 SEAM HORIZON
ILLTYD CREEK DEPOSIT
(BLOCK 'B')

BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106E	E-0742

BP 79-21
3.13 m

BP 79-7
3.6 m

BP 79-17/17A
7.02 m

BP 78-3
5.80 m

BP 78-4
NOT INTERSECTED

BP 79-20
7.42 m

BP 79-9
9.86 m

BP 79-10
7.89 m

BP 79-19
6.87 m

BP 79-8
7.99 m

BP 79-11
8.15 m

BP 79-15
7.05 m

BP 79-22A
6.97 m

BP 79-14
6.47 m

BP 79-18
9.09 m

BP 79-13
6.56 m

BP 78-2
7.27 m

BP 79-12A
7.95 m

BP 79-16A
NOT INTERSECTED

3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0

APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO. 1 SEAM HORIZON

APPROXIMATE SUBCROP TRACE BASE NO. 1 SEAM HORIZON

U D

CREEK

ILLTYD

TWIN LAKES CREEK

35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 N
5+00 N
0+00
5+00 S
10+00 S
15+00 S

LEGEND

DEFINED
APPROXIMATE
ASSUMED TRACE BELOW ILLTYD CREEK

NOTE:
CONTOUR INTERVAL 0.5m

100m 0 100 200 300 400 500m

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C.D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ISOPACH PLAN MINEABLE THICKNESS NO. 1 SEAM

ILLTYD CREEK DEPOSIT
(BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106 E	E-0743

C.B.W.

BP 79-21
2.01 m

BP 79-7
1.29 m

1.5

2.0

BP 79-17/17A
2.17 m

BP 78-3
2.43 m

2.5

BP 78-4
NOT INTERSECTED

BP 79-20
2.32 m

3.0

BP 79-9
3.47 m

BP 79-10
3.18 m

APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO.2 SEAM HORIZON

BP 79-19
2.49 m

2.5

3.0

3.5

BP 79-15
3.25 m

BP 79-8
2.74 m

BP 79-11
4.35 m

4.0

4.5

BP 79-22A
2.72 m

APPROXIMATE SUBCROP TRACE BASE NO. 2 SEAM HORIZON

BP 79-18
3.15 m

BP 79-14
5.84 m

5.0

5.5

BP 79-13
5.41 m

BP 78-2
6.66 m

6.0

6.5

U

D

BP 79-12A
6.65 m

BP 79-16A
NOT INTERSECTED

LEGEND

DEFINED

APPROXIMATE

ASSUMED TRACE BELOW ILLTYD CREEK

100m 0 100 200 300 400 500m

NOTE
CONTOUR INTERVAL 0.5 m

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C. & D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ISOPACH PLAN
MINEABLE THICKNESS NO. 2 SEAM
ILLTYD CREEK DEPOSIT
(BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106E	E-0744

C.B.W

BP 79-21
2.63 m

BP 79-7
1.14 m

1.5

2.0

BP 79-17/17A
3.08 m

BP 78-3
NOT INTERSECTED

2.5

3.0

BP 78-4
NOT INTERSECTED

BP 79-20
3.47 m

3.5

BP 79-9
3.58 m

BP 79-10
3.22 m

APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO. 3 SEAM HORIZON

3.0

BP 79-19
3.34 m

2.5

BP 79-15
3.32 m

BP 79-8
2.86 m

BP 79-11
2.24 m

2.0

1.5

1.0

0.5

3.0

3.5

APPROXIMATE SUBCROP BASE NO. 3 SEAM HORIZON

BP 79-18
3.74 m

BP 79-14
0.0

BP 79-22A
1.98 m

2.0

BP 79-13
2.19 m

BP 78-2
1.91 m

U

D

LEGEND

DEFINED

APPROXIMATE

ASSUMED TRACE BELOW ILLTYD CREEK

BP 79-12A
2.19 m

BP 79-16A
NOT INTERSECTED

NOTE
CONTOUR INTERVAL 0.5 m

100m 0 100 200 300 400 500m

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C. & D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ISOPACH PLAN
MINEABLE THICKNESS NO. 3 SEAM
ILLTYD CREEK DEPOSIT
(BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106 E	E-0745

C. B. W.

BP 79-21
29.98:1

BP 79-7
6.24:1

BP 78-3
12.18:1

BP 79-17/17A

BP 78-4
NOT INTERSECTED

BP 79-20
7.80:1

BP 79-9
10.52:1

BP 79-10
23.15:1

BP 79-19
6.53:1

BP 79-15
23.79:1

BP 79-8
8.54:1

BP 79-11
12.79:1

BP 79-22 A
21.15:1

BP 79-14
10.51:1

BP 79-18
1.86:1

BP 79-13
14.66:1

BP 78-2
2.48:1

BP 79-12 A
10.68:1

BP 79-16 A
NOT INTERSECTED

APPROXIMATE 300m OVERBURDEN CONTOUR BASE No.1 SEAM HORIZON

APPROXIMATE SUBCROP TRACE BASE No.1 SEAM HORIZON

TWIN LAKES CREEK

MISHAG CREEK

ILLTYD CREEK

LEGEND

DEFINED

APPROXIMATE

ASSUMED TRACE BELOW ILLTYD CREEK

NOTE:
CONTOUR INTERVAL 1:1

100m 0 100 200 300 400 500m

TO ACCOMPANY REPORT No. 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ROCK (WASTE) TO COAL RATIO
m^3 TO TONNES
BASE No. 1 SEAM HORIZON
ILLTYD CREEK DEPOSIT (BLOCK B)
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106 E	E-0746

BP 79-21
24.14:1

BP 79-7
7.96:1

BP 78-3
10.66:1

BP 78-4
NOT INTERSECTED

BP 79-20
7.16:1

BP 79-9
8.42:1

BP 79-10
17.50:1

BP 79-17/17A
27.19:1

BP 79-19
6.38:1

BP 79-15
18.09:1

BP 79-8
7.59:1

BP 79-11
9.16:1

BP 79-22A
17.06:1

BP 79-18
3.11:1

BP 79-14
6.89:1

BP 79-13
9.75:1

BP 78-2
3.00:1

BP 79-12A
7.75:1

BP 79-16A
NOT INTERSECTED

APPROXIMATE 300m OVERBURDEN CONTOUR BASE No. 2 SEAM HORIZON

APPROXIMATE SUBCROP TRACE BASE No. 2 SEAM HORIZON

TWIN LAKES CREEK

MUSKAG CREEK

ILLTYD CREEK

4000 m N

3000 m N

2000 m N

1000 m N

1000 m E

2000 m E

35+00 N

30+00 N

25+00 N

20+00 N

15+00 N

10+00 N

5+00 S

0+00

10+00 S

LEGEND

DEFINED

APPROXIMATE

ASSUMED TRACE BELOW ILLTYD CREEK

NOTE:
CONTOUR INTERVAL 1:1

100m 0 100 200 300 400 500m

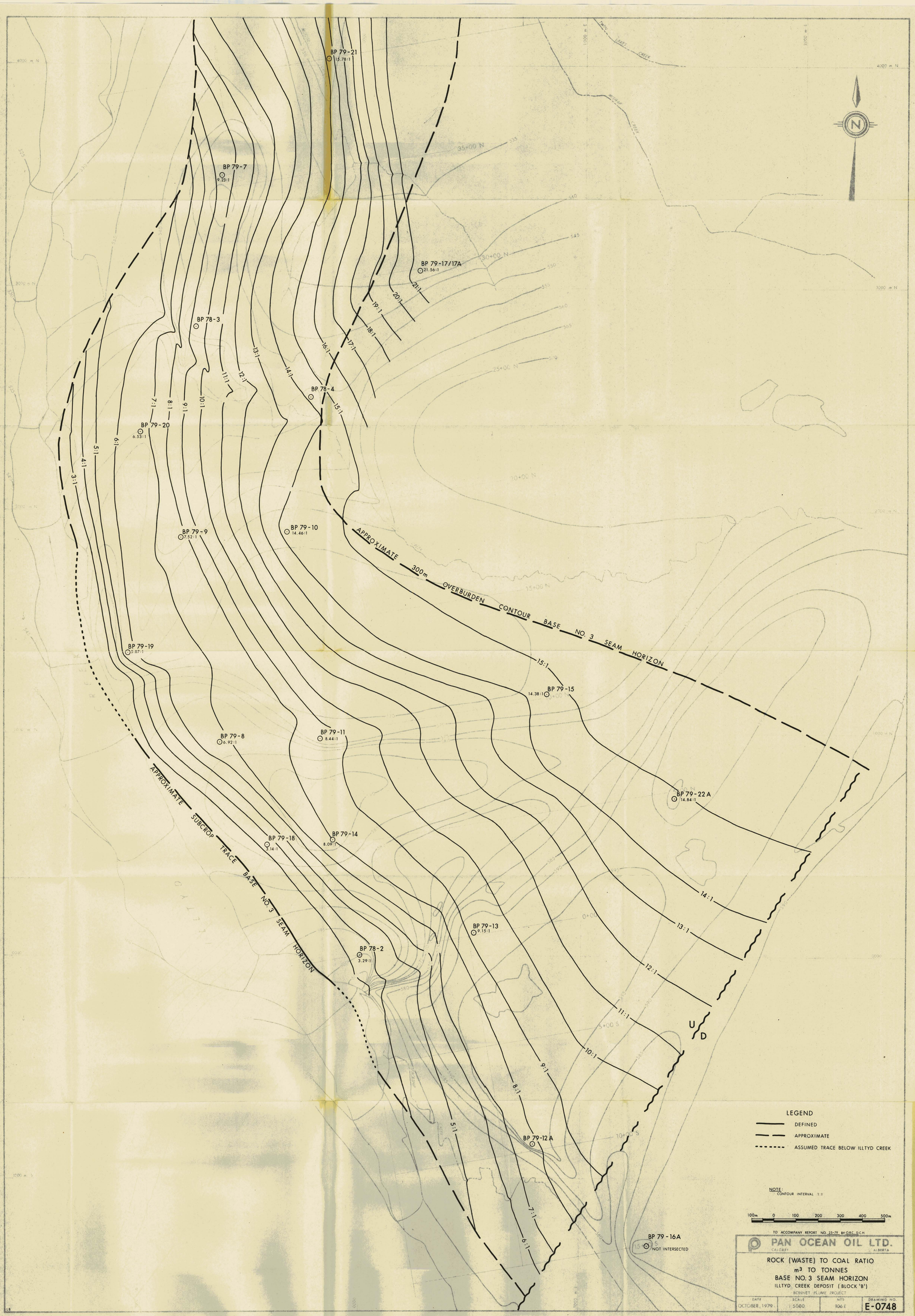
TO ACCOMPANY REPORT No. 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ROCK (WASTE) TO COAL RATIO
m^3 TO TONNES
BASE No. 2 SEAM HORIZON
ILLTYD CREEK DEPOSIT (BLOCK B)
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106E	E-0747

GEW


BP 79-21
15.78:1
BP 79-7
9.23:1
BP 78-3
BP 79-20
6.53:1
BP 79-9
7.52:1
BP 79-10
14.46:1
BP 79-17/17A
21.56:1
BP 78-4
BP 79-19
5.87:1
BP 79-15
14.38:1
BP 79-8
6.92:1
BP 79-11
8.44:1
BP 79-22A
14.84:1
BP 79-18
3.14:1
BP 79-14
8.09:1
BP 79-13
9.15:1
BP 78-2
3.29:1
BP 79-12A
BP 79-16A
NOT INTERSECTED
APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO. 3 SEAM HORIZON
APPROXIMATE SUBCROP TRACE BASE NO. 3 SEAM HORIZON
3:1
4:1
5:1
6:1
7:1
8:1
9:1
10:1
11:1
12:1
13:1
14:1
15:1
16:1
17:1
18:1
19:1
20:1
21:1
35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 S
5+00 S
0+00
4000 m N
3000 m N
2000 m N
1000 m N
1000 m E
2000 m E
TWIN LAKES CREEK
MISHAB CREEK
ILLTYD CREEK
U
D
N
LEGEND
DEFINED
APPROXIMATE
ASSUMED TRACE BELOW ILLTYD CREEK
NOTE:
CONTOUR INTERVAL 1:1
100m 0 100 200 300 400 500m
TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.C.H.
PAN OCEAN OIL LTD.
CALGARY ALBERTA
ROCK (WASTE) TO COAL RATIO
m³ TO TONNES
BASE NO. 3 SEAM HORIZON
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT
DATE OCTOBER, 1979
SCALE 1:5000
NTS 106 E
DRAWING NO. E-0748
LB

BP 79-21
THK. 313m

BP 79-7
THK. 360 m

BP 79-17/17A
THK. 702m

BP 78-3
THK. 580m

BP 78-4
100m

BP 79-20
THK. 742 m

BP 79-9
THK. 986m

BP 79-10
THK. 789m

BP 79-19
THK. 687m

BP 79-15
10+00 N
THK. 705m

BP 79-8
THK. 799m

BP 79-11
THK. 815m

BP 79-18
THK. 909m

BP 79-14
THK. 647m

BP 79-22A
THK. 697m

BP 79-13
THK. 656m

BP 78-2
THK. 727m

BP 79-12A
THK. 795m

BP 79-16A
15+00 S

35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 N
5+00 N
0+00
5+00 S
10+00 S
15+00 S

MOOSE CREEK
TWIN LAKES CREEK
MISHAP CREEK
MOSQUITO CREEK
SPACESHIP CREEK
ILLTYD CREEK

BASE LINE 3305

APPROXIMATE 300m 15+00 N OVERBURDEN CONTOUR BASE NO. 1 SEAM HORIZON

APPROXIMATE SUBCROP TRACE BASE NO. 1 SEAM HORIZON

HATCHED AREA DENOTES INDICATED RESERVE AREA

DASHED LINE IS INTERNAL TRIANGLE CONSTRUCTION LINE FOR AREA CALCULATIONS

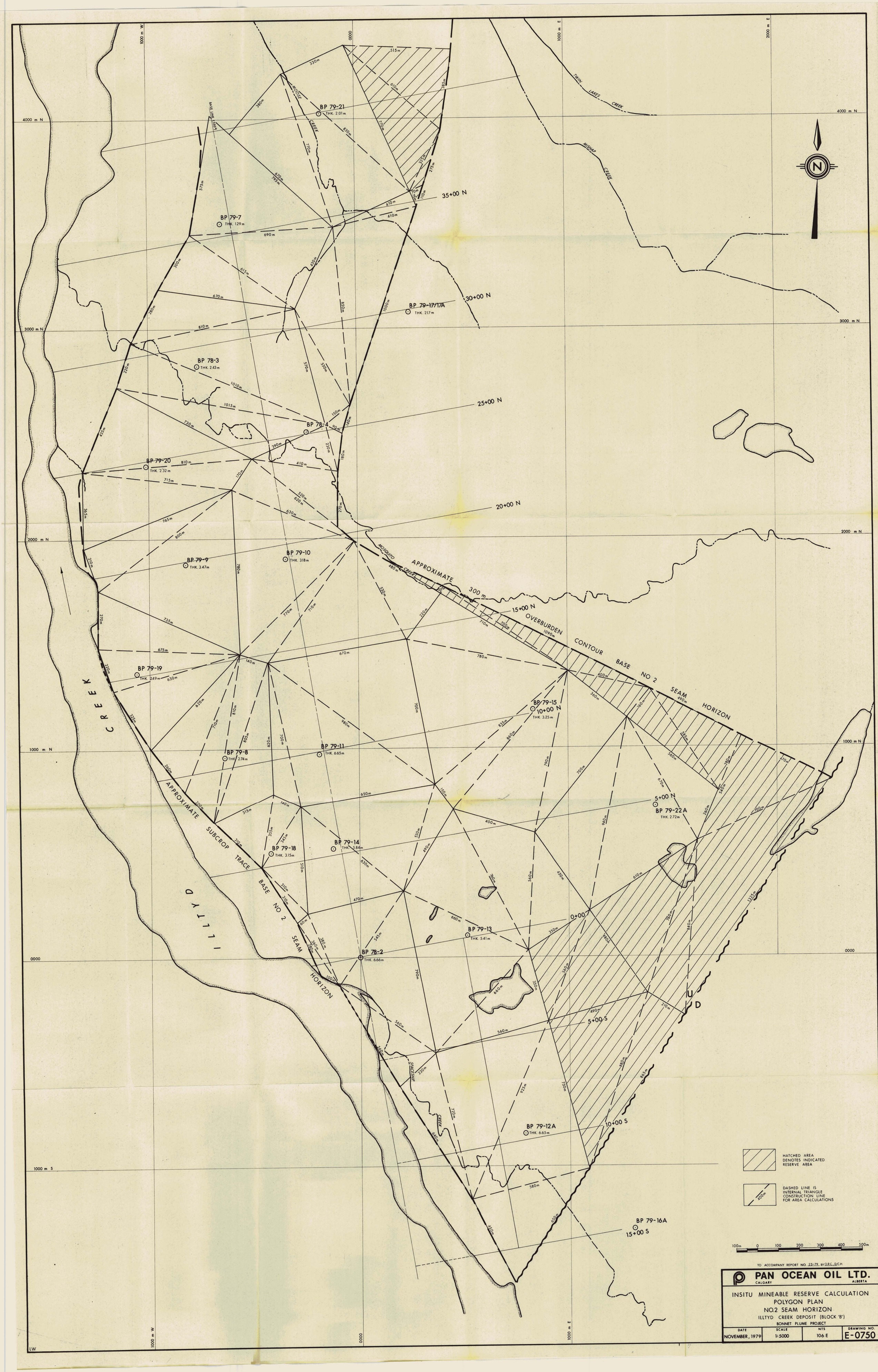
METERS 100 0 100 200 300 400 500

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

INSITU MINEABLE RESERVE CALCULATION
POLYGON PLAN
NO. 1 SEAM HORIZON
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOVEMBER, 1979	1:5000	106 E	E-0749


1000 m W
0000
1000 m E
2000 m E
4000 m N
3000 m N
2000 m N
1000 m N
1000 m S
LW
BASE LINE
MOOSE CREEK
TWIN LAKES CREEK
MISHAP CREEK
MOSQUITO CREEK
ILLTYD CREEK
APPROXIMATE 300 m OVERBURDEN CONTOUR
APPROXIMATE SUBCROP TRACE BASE NO 2 SEAM HORIZON
SPACESHIP CREEK
BP 79-21 THK. 2.01m
BP 79-7 THK. 1.29m
BP 79-17/17A THK. 2.17m
BP 78-3 THK. 2.43m
BP 78-4
BP 79-20 THK. 2.32m
BP 79-9 THK. 3.47m
BP 79-10 THK. 3.18m
BP 79-19 THK. 2.49m
BP 79-15 10+00 N THK. 3.25m
BP 79-11 THK. 6.65m
BP 79-8 THK. 2.74m
BP 79-22A 5+00 N THK. 2.72m
BP 79-18 THK. 3.15m
BP 79-14 THK. 5.84m
BP 79-13 THK. 5.41m
BP 78-2 THK. 6.66m
BP 79-12A THK. 6.65m
BP 79-16A 15+00 S
35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 S
5+00 S
0+00
HATCHED AREA DENOTES INDICATED RESERVE AREA
DASHED LINE IS INTERNAL TRIANGLE CONSTRUCTION LINE FOR AREA CALCULATIONS
100m 0 100 200 300 400 500m
TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.C.H.
PAN OCEAN OIL LTD.
CALGARY ALBERTA
INSITU MINEABLE RESERVE CALCULATION
POLYGON PLAN
NO.2 SEAM HORIZON
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT
DATE NOVEMBER, 1979
SCALE 1:5000
NTS 106 E
DRAWING NO. E-0750


BP 79-21
THK 2.63 m
BP 79-7
THK 1.14 m
BP 78-3
THK 3.01 m
BP 78-4
BP 79-20
THK 3.47 m
BP 79-9
THK 3.58 m
BP 79-10
THK 3.22 m
BP 79-17/17A
THK 3.08 m
BP 79-19
THK 3.34 m
BP 79-8
THK 2.86 m
BP 79-11
THK 3.24 m
BP 79-18
THK 3.74 m
BP 79-14
THK 0.0 m
BP 79-15
10+00 N
THK 3.32 m
BP 79-22A
5+00 N
THK 1.98 m
BP 79-13
THK 2.19 m
BP 78-2
THK 1.91 m
BP 79-12A
THK 2.19 m
BP 79-16A
15+00 S
35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 N
5+00 N
0+00
5+00 S
10+00 S
15+00 S
TWIN LAKES CREEK
MISHAP CREEK
MOOSE CREEK
MOSQUITO CREEK
ILLTYD CREEK
APPROXIMATE 300m OVERBURDEN CONTOUR
APPROXIMATE SUBCROP TRACE BASE NO. 3 SEAM HORIZON
BASE NO. 3 SEAM HORIZON
BASE LINE (350°)
SPACESHIP CREEK
4000 m N
3000 m N
2000 m N
1000 m N
0000
1000 m S
1000 m W
1000 m E
2000 m E
HATCHED AREA DENOTES INDICATED RESERVE AREA
DASHED LINE IS INTERNAL TRIANGLE CONSTRUCTION LINE FOR AREA CALCULATIONS
100m 0 100 200 300 400 500m
TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.C.H.
PAN OCEAN OIL LTD.
CALGARY ALBERTA
INSITU MINEABLE RESERVE CALCULATION
POLYGON PLAN
NO. 3 SEAM HORIZON
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT
DATE NOVEMBER, 1979
SCALE 1:5000
NTS 106 E
DRAWING NO. E-0751
CBW

1000 m W
0000
1000 m E
2000 m E
4000 m N
3000 m N
2000 m N
1000 m N
0000
1000 m S
1000 m W
0000
1000 m E
LW

BP 79-21
THK. 3.13 m

BP 79-7
THK. 3.60 m

BP 78-3
THK. 3.0 m

BP 78-4
NOT INTERSECTED

BP 79-20
THK. 3.70 m

BP 79-9
THK. 3.40 m

BP 79-10
THK. 3.70 m

BP 79-19
THK. 2.96 m

BP 79-8
THK. 3.70 m

BP 79-11
THK. 3.70 m

BP 79-18
THK. 3.0 m

BP 79-14
THK. 3.70 m

BP 79-17/17A
THK. 3.70 m

BP 79-15
10+00 N
THK. 3.70 m

BP 79-22A
5+00 N
THK. 3.26 m

BP 79-13
THK. 3.70 m

BP 78-2
THK. 3.70 m

BP 79-12A
THK. 3.7 m

BP 79-16A
15+00 S

35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 N
5+00 N
0+00
5+00 S
10+00 S
15+00 S

BASE LINE (1309)

MOOSE CREEK

TWIN LAKES CREEK

MISHAP CREEK

MOSQUITO CREEK

SPACESHIP CREEK

ILLTYD CREEK

APPROXIMATE SUBCROP TRACE BASE NO.1 SEAM HORIZON

APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO. 1 SEAM HORIZON

U/D

HATCHED AREA DENOTES INDICATED RESERVE AREA

DASHED LINE IS INTERNAL TRIANGLE CONSTRUCTION LINE FOR AREA CALCULATIONS

METERS 100 0 100 200 300 400 500

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C. D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

UNDERGROUND MINEABLE RESERVE CALCULATION
POLYGON PLAN
NO.1 SEAM
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOVEMBER, 1979	1:5000	106 E	E-0752

BP 79-21
THK. 2.01m

BP 79-7
THK. 1.29m

BP 79-17/17A
THK. 2.17m

BP 78-3
THK. 2.43m

BP 78-4
NOT INTERSECTED

BP 79-20
THK. 2.32m

BP 79-9
THK. 3.47m

BP 79-10
THK. 3.18m

BP 79-19
THK. 2.49m

BP 79-8
THK. 2.74m

BP 79-11
THK. 3.70m

BP 79-15
THK. 3.25m

BP 79-18
THK. 3.15m

BP 79-14
THK. 3.62m

BP 79-22A
THK. 2.72m

BP 79-13
THK. 2.76m

BP 78-2
THK. 3.49m

BP 79-12A
THK. 3.70m

BP 79-16A
NOT INTERSECTED

35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 N
5+00 N
0+00
5+00 S
10+00 S
15+00 S

4000 m N
3000 m N
2000 m N
1000 m N
0000
1000 m S

1000 m W
0000
1000 m E
2000 m E

TWIN LAKES CREEK
MISHAP CREEK
MOOSE CREEK
BASE LINE
MOSQUITO CREEK
SPACESHIP CREEK
ILLTYD CREEK

APPROXIMATE 300 m OVERBURDEN CONTOUR
APPROXIMATE SUBCROP TRACE BASE NO 2 SEAM HORIZON

HATCHED AREA DENOTES INDICATED RESERVE AREA

DASHED LINE IS INTERNAL TRIANGLE CONSTRUCTION LINE FOR AREA CALCULATIONS

100m 0 100 200 300 400 500m

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

UNDERGROUND MINEABLE RESERVE CALCULATION
POLYGON PLAN
NO. 2 SEAM
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOVEMBER, 1979	1:5000	106 E	E-0753

BP 79-21
THK. 2.63 m

BP 79-7
THK. 0.94 m

BP 79-17/17A
THK. 2.65 m

BP 78-3
THK. 2.21 m (ESTIMATED)

BP 78-4
NOT INTERSECTED

BP 79-20
THK. 3.47 m

BP 79-9
THK. 2.61 m

BP 79-10
THK. 3.22 m

BP 79-19
THK. 3.34 m

BP 79-8
THK. 2.86 m

BP 79-11
THK. 2.24 m

BP 79-15
10+00 N
THK. 3.32 m

BP 79-18
THK. 3.70 m

BP 79-14
THK. 0.00 m

5+00 N
BP 79-22A
THK. 1.98 m

BP 79-13
THK. 2.19 m

BP 78-2
THK. 1.07 m

BP 79-12A
THK. 2.19 m

BP 79-16A
NOT INTERSECTED

35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 N
5+00 N
0+00
5+00 S
10+00 S
15+00 S

4000 m N
3000 m N
2000 m N
1000 m N
1000 m S
1000 m W
0000
1000 m E
2000 m E

TWIN LAKES CREEK
MISHAP CREEK
MOOSE CREEK
MOSQUITO CREEK
ILLTYD CREEK

APPROXIMATE 300m OVERBURDEN CONTOUR

APPROXIMATE SUBCROP TRACE BASE NO. 3 SEAM HORIZON

APPROXIMATE BASE NO. 3 SEAM HORIZON

HATCHED AREA DENOTES INDICATED RESERVE AREA

DASHED LINE IS INTERNAL TRIANGLE CONSTRUCTION LINE FOR AREA CALCULATIONS

METERS 100 0 100 200 300 400 500

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C. D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

UNDERGROUND MINEABLE RESERVE CALCULATION
POLYGON PLAN
NO.3 SEAM
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOVEMBER, 1979	1:5000	106 E	E-0754

CBW

BP 79-21
THK. 313m

BP 79-7
THK. 360 m

BP 78-3
THK. 580m

BP 78-4
NOT INTERSECTED

BP 79-20
THK. 742 m

BP 79-9
THK. 986m

BP 79-10
THK. 789m

BP 79-19
THK. 687m

BP 79-8
THK. 799m

BP 79-11
THK. 815m

BP 79-18
THK. 909m

BP 79-14
THK. 647m

BP 79-17/17A
THK. 702m

BP 79-15
10+00 N
THK. 705m

BP 79-22A
5+00 N
THK. 697m

BP 79-13
THK. 656m

BP 78-2
THK. 727m

BP 79-12A
THK. 793m

BP 79-16A
NOT INTERSECTED
15+00 S

35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 N
5+00 N
0+00
5+00 S
10+00 S
15+00 S

4000 m N
3000 m N
2000 m N
1000 m N
0000
1000 m S

1000 m W
0000
1000 m E
2000 m E

BASE LINE 3305

MOOSE CREEK

TWIN LAKES CREEK

MISHAP CREEK

MOSQUITO CREEK

SPACESHIP CREEK

ILLTYD CREEK

APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO. 1 SEAM HORIZON

APPROXIMATE SUBCROP TRACE BASE NO. 1 SEAM HORIZON

U/D

HATCHED AREA DENOTES INDICATED RESERVE AREA

DASHED LINE IS INTERNAL TRIANGLE CONSTRUCTION LINE FOR AREA CALCULATIONS

METERS 100 0 100 200 300 400 500

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

SELECTED STRIPPING RATIO
RESERVE CALCULATION PLAN
NO. 1 SEAM HORIZON
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOVEMBER, 1979	1:5000	106 E	E-0755

BP 79-21
THK. 2.01m

BP 79-7
THK. 1.29m

BP 79-17/17A
THK. 2.17m

BP 78-3
THK. 2.43m

BP 78-4
NOT INTERSECTED

BP 79-20
THK. 2.32m

BP 79-9
THK. 3.47m

BP 79-10
THK. 3.18m

BP 79-19
THK. 2.49m

BP 79-15
10+00 N
THK. 3.25m

BP 79-8
THK. 2.74m

BP 79-11
THK. 4.35m

BP 79-18
THK. 3.15m

BP 79-14
THK. 5.84m

BP 79-22A
5+00 N
THK. 2.72m

BP 79-13
THK. 5.41m

BP 78-2
THK. 6.66m

BP 79-12A
THK. 6.65m
10+00 S

BP 79-16A
NOT INTERSECTED
15+00 S

BASE LINE (350°)

MOOSE CREEK

TWIN LAKES CREEK

MISHAP CREEK

MOSQUITO CREEK

ILLTYD CREEK

APPROXIMATE 300 m OVERBURDEN CONTOUR

BASE NO 2 SEAM HORIZON

APPROXIMATE SUBCROP TRACE BASE NO 2 SEAM HORIZON

SPACESHIP CREEK

35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 N
5+00 N
0+00
5+00 S
10+00 S
15+00 S

4000 m N
3000 m N
2000 m N
1000 m N
1000 m S
0000

1000 m W
0000
1000 m E
2000 m E

6:1
8:1
4:1

HATCHED AREA DENOTES INDICATED RESERVE AREA

DASHED LINE IS INTERNAL TRIANGLE CONSTRUCTION LINE FOR AREA CALCULATIONS

100m 0 100 200 300 400 500m

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

SELECTED STRIPPING RATIO
RESERVE CALCULATION PLAN
NO.2 SEAM HORIZON
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOVEMBER, 1979	1:5000	106 E	E-0756

BP 79-21
THK 2.63 m

BP 79-7
THK 1.14 m

BP 78-3
THK 3.01 m (ESTIMATED)

BP 78-4
NOT INTERSECTED

BP 79-20
THK 3.47 m

BP 79-17/17A
THK 3.08 m

BP 79-9
THK 3.58 m

BP 79-10
THK 3.22 m

BP 79-19
THK 3.34 m

BP 79-8
THK 2.86 m

BP 79-11
THK 3.24 m

BP 79-15
10+00 N
THK 3.32 m

BP 79-22A
5+00 N
THK 2.98 m

BP 79-18
THK 3.74 m

BP 79-14
THK 0.0 m

BP 79-13
THK 2.19 m

BP 78-2
THK 11.91 m

BP 79-12A
THK 2.19 m

BP 79-16A
NOT INTERSECTED
15+00 S

MOOSE CREEK

TWIN LAKES CREEK

MISHAP CREEK

MOSQUITO CREEK

ILLTYD CREEK

BASE LINE (350')

APPROXIMATE 300m OVERBURDEN CONTOUR

APPROXIMATE SUBCROP TRACE BASE NO. 3 SEAM HORIZON

SPACESHIP

HATCHED AREA DENOTES INDICATED RESERVE AREA

DASHED LINE IS INTERNAL TRIANGLE CONSTRUCTION LINE FOR AREA CALCULATIONS

METERS 100 0 100 200 300 400 500

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

SELECTED STRIPPING RATIO
RESERVE CALCULATION PLAN
NO. 3 SEAM HORIZON
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOVEMBER, 1979	1:5000	106 E	E-0757

CBW

BP 79-21
8,323 BTU/lb

8,500

BP 79-7
9,229 BTU/lb

9,000

9,200

BP 79-17/17A
9,244 BTU/lb

9,100

BP 78-3
9,109 BTU/lb

BP 78-4
NOT INTERSECTED

9,000

BP 79-20
8,786 BTU/lb

8,900

BP 79-10
9,767 BTU/lb

9,700

BP 79-9
9,268 BTU/lb

APPROXIMATE 300m OVERBURDEN CONTOUR

BASE NO.1 SEAM HORIZON

BP 79-19
NOT ANALYSED

9,500

BP 79-15
9,428 BTU/lb

9,400

9,500

BP 79-8
9,589 BTU/lb

BP 79-11
9,399 BTU/lb

BP 79-22A
9,929 BTU/lb

APPROXIMATE SUBCROP TRACE BASE NO.1 SEAM HORIZON

BP 79-18
9,342 BTU/lb

BP 79-14
9618 BTU/lb

BP 79-13
9,867 BTU/lb

BP 78-2
10,006 BTU/lb

10,000

10,500

BP 79-12A
10,888 BTU/lb

BP 79-16A
NOT INTERSECTED

ILLTYD CREEK

SPACEWIP CREEK

U
D

LEGEND

DEFINED

APPROXIMATE

ASSUMED TRACE BELOW ILLTYD CREEK

NOTE:
CONTOUR INTERVAL 100 BTU/lb

100m 0 100 200 300 400 500m

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ISOTHERM PLAN NO.1 SEAM

BASED ON UNDERGROUND MINEABLE THICKNESS

ILLTYD CREEK DEPOSIT (BLOCK 'B')

BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106 E	E-0758

LW

BP 79-21
8,318 BTU/lb

8,500

9,000

BP 79-7
9,277 BTU/lb

9,500

9,300

BP 79-17/17A
9,925 BTU/lb

BP 78-3
9,531 BTU/lb

BP 78-4
NOT INTERSECTED

BP 79-20
9,570 BTU/lb

9,800

9,600

BP 79-9
9,905 BTU/lb

BP 79-10
9,899 BTU/lb

APPROXIMATE 300 m OVERBURDEN CONTOUR BASE No. 2 SEAM HORIZON

10,000

BP 79-19
NOT ANALYSED

BP 79-15
10,048 BTU/lb

BP 79-8
9,876 BTU/lb

BP 79-11
10,090 BTU/lb

10,000

BP 79-22A
10,134 BTU/lb

APPROXIMATE SUBCROP TRACE BASE No. 2 SEAM HORIZON

BP 79-18
10,002 BTU/lb

BP 79-14
10,202 BTU/lb

10,200

10,300

BP 79-13
10,310 BTU/lb

BP 78-2
10,564 BTU/lb

10,300

BP 79-12A
10,358 BTU/lb

BP 79-16A
NOT INTERSECTED

NOTE:
CONTOUR INTERVAL 100 BTU/lb

LEGEND

DEFINED
APPROXIMATE
ASSUMED TRACE BELOW ILLTYD CREEK

100m 0 100 200 300 400 500m

TO ACCOMPANY REPORT NO. 25-79 BY ORC., DC.H

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ISOTHERM PLAN NO.2 SEAM

BASED ON UNDERGROUND MINEABLE THICKNESS

ILLTYD CREEK DEPOSIT (BLOCK 'B')

BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106 E	E-0759

BP 79-21
7,752 BTU/lb

8,000

BP 79-7
8,163 BTU/lb

8,500

BP 79-17/17A
9,215 BTU/lb

9,000

BP 78-3
NOT INTERSECTED

BP 78-4
NOT INTERSECTED

BP 79-20
9,195 BTU/lb

9,100

BP 79-10
9,028 BTU/lb

BP 79-9
9,597 BTU/lb

APPROXIMATE 300m OVERBUREN CONTOUR BASE NO. 3 SEAM HORIZON

BP 79-19
NOT ANALYSED

9,500

BP 79-15
9,511 BTU/lb

BP 79-8
9,794 BTU/lb

BP 79-11
9,815 BTU/lb

BP 79-22A
9,628 BTU/lb

APPROXIMATE SUBCROP TRACE BASE NO. 3 SEAM HORIZON

9,800

BP 79-18
9,945 BTU/lb

BP 79-14

BP 78-2
9,856 BTU/lb

BP 79-13
8,826 BTU/lb

BP 79-12A
8,350 BTU/lb

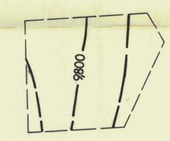
BP 79-16A

ILLTYD CREEK

U D

LEGEND

- DEFINED
- APPROXIMATE
- ASSUMED TRACE BELOW ILLTYD CREEK



NOTE:
NO.3 SEAM HORIZON
SHALED OUT AT BP-79-14
POLYGON DENOTES AREA OF INFLUENCE

NOTE:
CONTOUR INTERVAL 100 BTU/lb

100m 0 100 200 300 400 500m

TO ACCOMPANY REPORT NO 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ISOTHERM PLAN NO. 3 SEAM
BASE ON UNDERGROUND MINEABLE THICKNESS
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106 E	E-0760

LW

1000 m W
0000
1000 m E
2000 m E
4000 m N
3000 m N
2000 m N
1000 m N
1000 m S

MOOSE CREEK
BASE LINE (350°)
TWIN LAKES CREEK
MISHAP CREEK
MOSQUITO CREEK
SPACESHIP CREEK
ILLTYD CREEK

BP 79-21 ⊙ 27.1%
BP 79-7 ⊙ 17.0%
BP 79-17/17A ⊙ 20.1%
BP 78-3 ⊙ 18.7%
BP 78-4 ⊙ NOT INTERSECTED
BP 79-20 ⊙ 21.1%
BP 79-9 ⊙ 18.3%
BP 79-10 ⊙ 14.4%
BP 79-19 ⊙ 17.2% (ESTIMATED)
BP 79-15 ⊙ 18.8%
BP 79-8 ⊙ 16.1%
BP 79-11 ⊙ 16.4%
BP 79-18 ⊙ 19.6%
BP 79-14 ⊙ 17.7%
BP 79-22A ⊙ 13.6%
BP 79-13 ⊙ 15.2%
BP 78-2 ⊙ 12.0%
BP 79-12A ⊙ 8.0%
BP 79-16A ⊙ NOT INTERSECTED

35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 N
5+00 N
0+00
5+00 S
10+00 S
15+00 S

27% 26% 25% 24% 23% 22% 21% 20% 19% 18%
23% 20% 19% 18% 17% 16% 15%
19%
18% 19% 18%
19% 18% 17% 16% 15% 14% 13% 12% 11% 10% 9% 8%

APPROXIMATE 300m OVERBURDEN CONTOUR BASE No. 1 SEAM HORIZON
APPROXIMATE SUBCROP TRACE BASE No.1 SEAM HORIZON

U D

LEGEND

DEFINED
APPROXIMATE
ASSUMED TRACE BELOW ILLTYD CREEK
CONTOUR INTERVAL 1.0%

METERS 100 0 100 200 300 400 500

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ISOASH PLAN
(BASED ON UNDERGROUND MINING THICKNESS)
No. 1 SEAM HORIZON
ILLTYD CREEK DEPOSIT (BLOCK B)
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOVEMBER, 1979	1:5000	106 E	E-0761

1000 m W
0000
1000 m E
2000 m E
4000 m N
3000 m N
2000 m N
1000 m N
0000
1000 m S

MOOSE CREEK
BASE LINE 1350°N
TWIN LAKES CREEK
MISHAP CREEK
MOSQUITO CREEK
ILLTYD CREEK

23%
22%
21%
20%
19%
18%
17%
16%
15%
14%
13%
12%
11%
10%

BP 79-21 ⊙ 23.3%
BP 79-7 ⊙ 16.2%
BP 79-17/17A ⊙ 15.3%
BP 78-3 ⊙ 15.0%
BP 78-4 ⊙ NOT INTERSECTED
BP 79-20 ⊙ 14.7%
BP 79-9 ⊙ 12.7%
BP 79-10 ⊙ 12.9%
BP 79-19 ⊙ 11.9% ESTIMATED
BP 79-8 ⊙ 11.2%
BP 79-11 ⊙ 11.5%
BP 79-18 ⊙ 13.4%
BP 79-14 ⊙ 13.1%
BP 79-15 ⊙ 10+00 N 13.3%
BP 79-13 ⊙ 13.2%
BP 78-2 ⊙ 9.2%
BP 79-22A ⊙ 5+00 N 12.8%
BP 79-12A ⊙ 11.8%
BP 79-16A ⊙ NOT INTERSECTED 15+00 S

35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 N
5+00 N
0+00
5+00 S
10+00 S
15+00 S

APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO. 2 SEAM HORIZON

APPROXIMATE SUBCROP TRACE BASE NO. 2 SEAM HORIZON

SPACESHIP CREEK

LEGEND

- DEFINED
- APPROXIMATE
- ASSUMED TRACE BELOW ILLTYD CREEK

NOTE:
CONTOUR INTERVAL 1.0%

100m 0 100 200 300 400 500m

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ISOASH PLAN
(BASED ON UNDERGROUND MINING THICKNESS)
NO. 2 SEAM HORIZON
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOVEMBER, 1979	1:5000	106 E	E-0762

LW

1000 m W | 0000 | 1000 m E | 2000 m E

4000 m N

3000 m N

2000 m N

1000 m N

0000

1000 m S

LW

BASE LINE 1350N

MOOSE CREEK

TWIN LAKES CREEK

MISHAP CREEK

MOSQUITO CREEK

ILLTYD CREEK

SPACESHIP CREEK

BP 79-21 ⊙ 28.5%

BP 79-7 ⊙ 24.5%

BP 79-17/17A ⊙ 20.2%

BP 78-3 ⊙ 15.8% ESTIMATED

BP 78-4 ⊙ NOT INTERSECTED

BP 79-20 ⊙ 18.6%

BP 79-9 ⊙ 15.5%

BP 79-10 ⊙ 20.2%

BP 79-19 ⊙ 14.6% ESTIMATED

BP 79-15 ⊙ 10+00 N 18.8%

BP 79-8 ⊙ 13.7%

BP 79-11 ⊙ 14.2%

BP 79-18 ⊙ 13.1%

BP 79-14 ⊙ N/A

5+00 N ⊙ BP 79-22A 16.4%

BP 79-13 ⊙ 22.8%

BP 78-2 ⊙ 16.0%

BP 79-12A ⊙ 26.2%

BP 79-16A ⊙ NOT INTERSECTED

35+00 N

30+00 N

25+00 N

20+00 N

15+00 N

10+00 N

5+00 N

0+00

5+00 S

10+00 S

15+00 S

28% 27% 26% 25% 24% 23% 22% 21% 20% 19% 18% 17% 16% 15% 14% 13%

APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO.3 SEAM HORIZON

APPROXIMATE SUBCROP TRACE BASE NO.3 SEAM HORIZON

U D

N

LEGEND

- DEFINED
- APPROXIMATE
- ASSUMED TRACE BELOW ILLTYD CREEK

15%

NOTE:
NO.3 SEAM HORIZON
SHALED OUT AT BP-79-14
POLYGON DENOTES AREA OF INFLUENCE
CONTOUR INTERVAL 1.0%

100m 0 100 200 300 400 500m

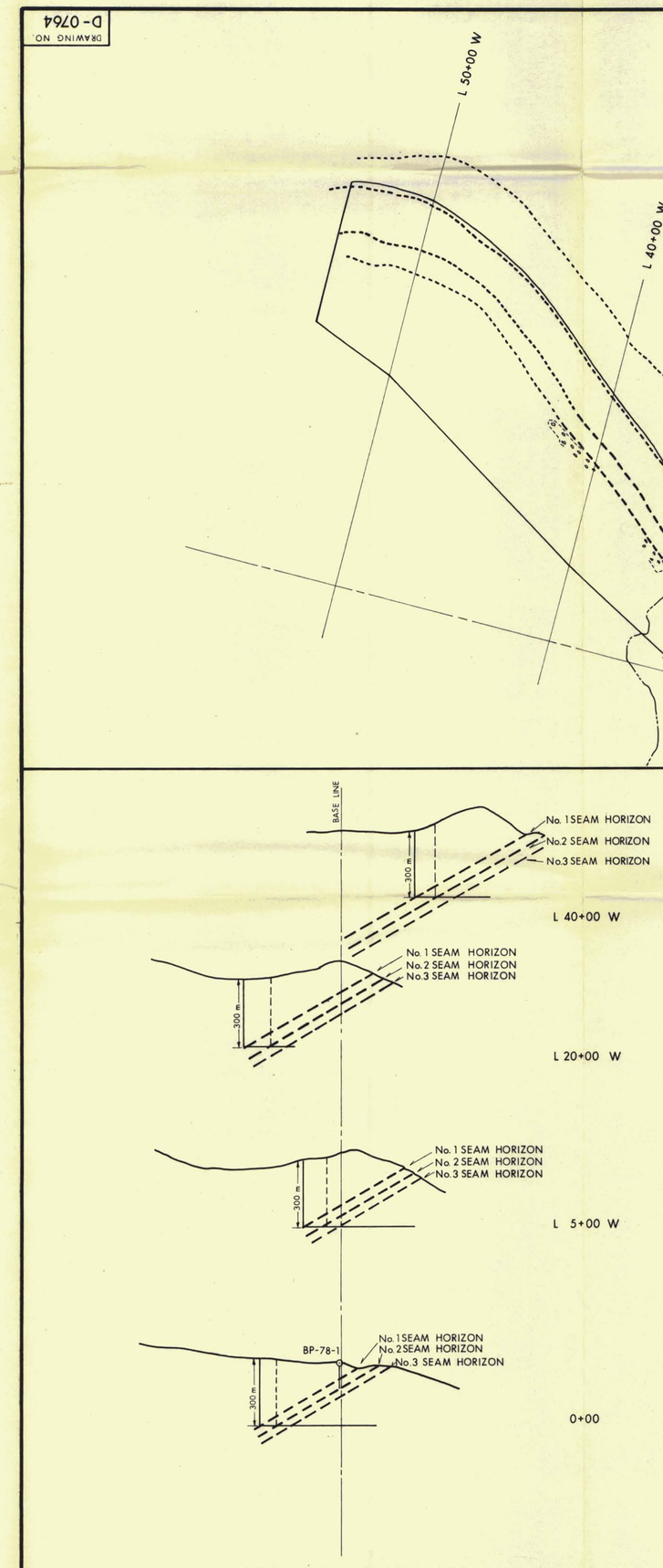
TO ACCOMPANY REPORT NO. 25-79 BY O.R.C. & D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ISOASH PLAN
(BASED ON UNDERGROUND MINING THICKNESS)
NO.3 SEAM HORIZON
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT

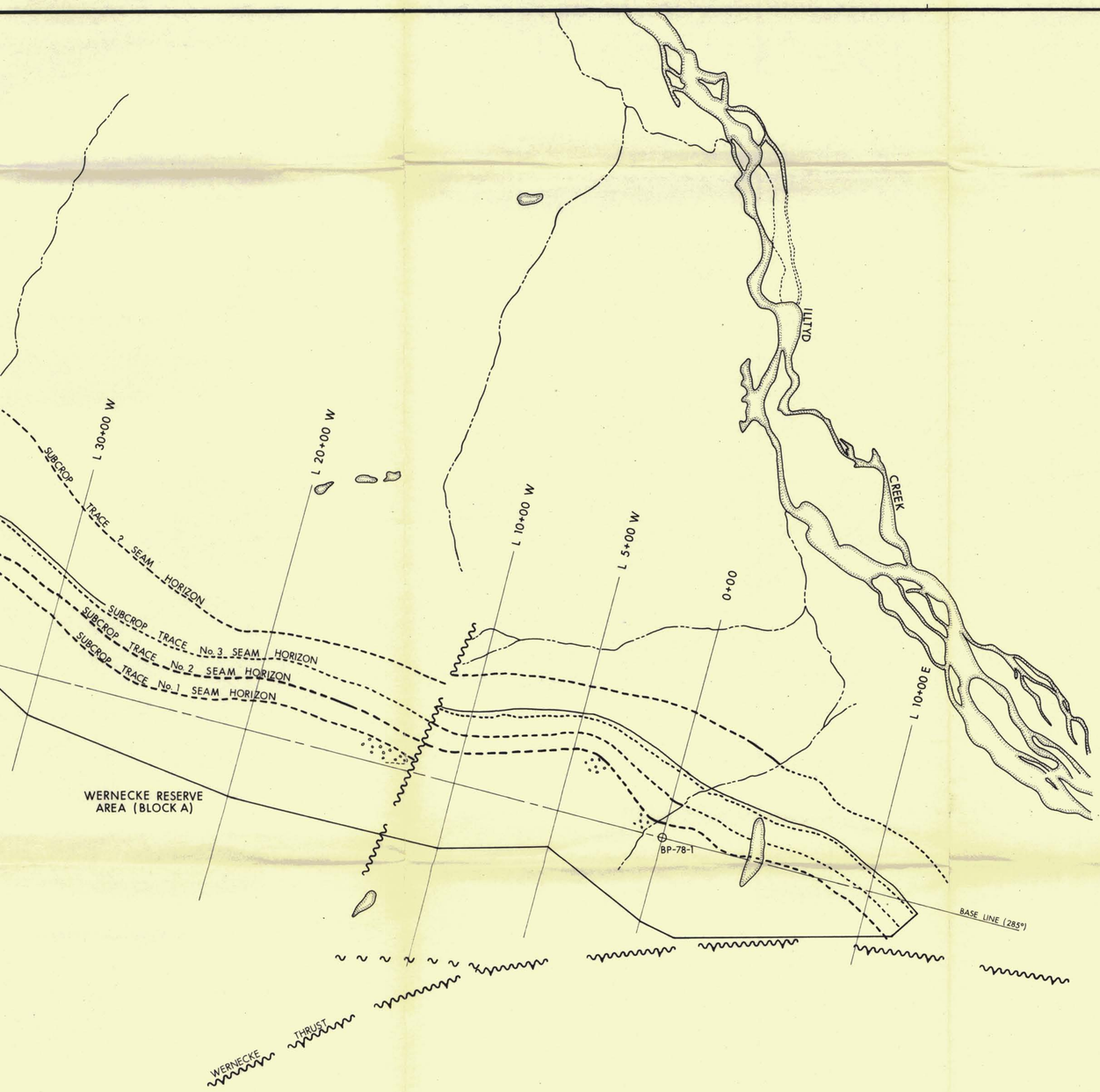
DATE	SCALE	NTS	DRAWING NO.
NOVEMBER, 1979	1:5000	106 E	E-0763

DRAWING NO. D-0764



SECTIONS ALONG STRIKE LENGTH

GEW



LEGEND

- COAL OUTCROP
- INDICATED COAL
- INFERRED COAL
- CONGLOMERATE
- FAULT
- STREAM

meters 200 100 0 200 400 meters

TO ACCOMPANY REPORT No. 25-79 BY O.R.C., D.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

WERNECKE DEPOSIT RESERVE AREA (BLOCK 'A')

BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOV, 1979	1:12,500	106 E	D-0764

DRAWING NO. D-0765

WIND RIVER

WIND RIVER WINTER ROAD

APPROXIMATE SUBCROP TRACE NO.3 SEAM HORIZON

TOP OF RIDGE FORMING SANDSTONE

APPROXIMATE SUBCROP TRACE NO.2 SEAM HORIZON

APPROXIMATE SUBCROP TRACE NO.1 SEAM HORIZON

AIRSTRIP / DEPOSIT RESERVE AREA (BLOCK 'C')

A-79-23

A

A'

BP-79-23

NO.1 SEAM

NO.2 SEAM

NO.3 SEAM

SECTION THROUGH SYNCLINE

LEGEND

- INDICATED COAL
- INFERRED COAL
- X COAL OCCURRENCE
- SANDSTONE
- STREAM
- A-79-23 ⊙ DRILL HOLE

.25 0 .25 .5 .75 1 km

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

AIRSTRIP DEPOSIT RESERVE AREA
(BLOCK 'C')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOV. 1979	1:12,500	106 E	D-0765

LW

NORTHERN BLOCK

SOUTHERN BLOCK

SUBCROP TRACE No.2 SEAM

SUBCROP TRACE No.1 SEAM

SUBCROP TRACE No.4 SEAM

SUBCROP TRACE No.3 SEAM

SUBCROP TRACE No.5 SEAM

W-79-1

W-79-6/6A

A

A'

RIVER

WIND

WIND RIVER WINTER ROAD

N

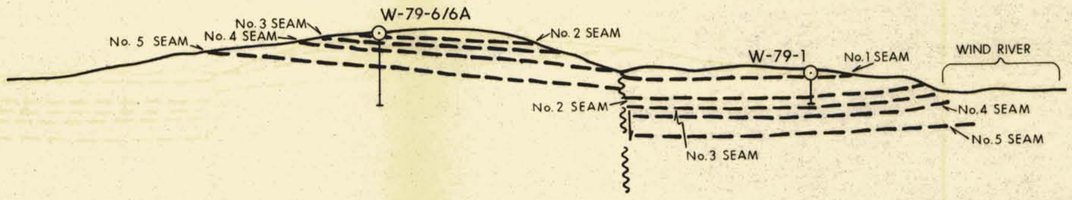
LEGEND

- × COAL OCCURRENCE
- INDICATED COAL
- INFERRED COAL
- CONGLOMERATE
- SANDSTONE
- FAULT
- STREAM

km .5 0 .25 .5km

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.H.

SECTION A-A'



GEW

PAN OCEAN OIL LTD.
CALGARY ALBERTA

WIND RIVER DEPOSIT RESERVE AREA
(BLOCK 'D')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOV, 1979	1:12,500	106 E	C-0766

1000 m W

0000

1000 m E

2000 m E

4000 m N

3000 m N

2000 m N

1000 m N

0000

1000 m S

BASE LINE (350°)

MOOSE CREEK

TWIN LAKES CREEK

MISHAP CREEK

MOSQUITO CREEK

ILLTYD CREEK

BP 79-21

BP 79-7

BP 79-17/17A

BP 78-3

BP 78-4
NOT COMPLETED

BP 79-20

BP 79-9

BP 79-10

BP 79-19

BP 79-15

BP 79-8

BP 79-11

BP 79-18

BP 79-14

BP 79-22A

BP 79-13

BP 78-2

BP 79-12A

BP 79-16A
NOT COMPLETED

35+00 N

30+00 N

25+00 N

20+00 N

15+00 N

10+00 N

5+00 N

0+00

5+00 S

10+00 S

15+00 S

N

HORIZONTAL m 100 0 100 200 300 400 500 m

VERTICAL 40 0 40 80 120 160 200
1 - 80

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

LITHOFACIES FENCE DIAGRAM
ILLTYD CREEK (BLOCK B)

BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOVEMBER, 1979	HOR 1:5000 VERT. 1:2000	106 E	E-0767

GEW

BP 79-21
123.08
126.21
3.13; 58.7, 6.9, 21.7, 29.7, 35.8; 7,759

BP 79-7
32.18
35.78
3.60, 53.60, 4.9, 17.0, 34.5, 43.4; 9,424

BP 79 17/17A
304.30
308.00
3.70, 53.1, 3.9, 20.1, 29.3, 46.2; 9,244

BP 78-3
97.50
100.50
3.00, 54.9, 7.0, 18.7, 32.8, 41.5; 9,109

BP 78-4
NOT DRILLED

BP 79-20
78.57
82.27
3.70, 57.2, 7.0, 21.1, 31.3, 40.2; 8,786

BP 79-9
138.53
142.23
3.70, 67.0, 5.0, 18.3, 33.9, 42.6; 9,268

BP 79-10
238.36
242.06
3.70, 72.0, 5.0, 14.4, 34.7, 45.7; 9,767

BP 79-19
63.74
66.70
2.96

BP 79-15
220.96
224.66
3.70, 72.4, 4.7, 18.8, 32.8, 42.9; 9,428

BP 79-8
90.96
94.66
3.70, 64.2, 4.2, 16.1, 35.5, 44.1; 9,589

BP 79-11
136.66
140.36
3.70, 74.2, 5.6, 16.4, 34.8, 43.0; 9,399

BP 79-22A
192.82
196.08
3.26, 79.7, 6.2, 13.6, 32.9, 47.1; 9,929

BP 79-18
26.04
29.04
3.00, 68.6, 3.5, 196, 33.4, 43.0; 9,342

BP 79-14
91.19
94.89
3.70, 70.8, 3.6, 17.7, 35.1, 43.0; 9,618

BP 79-13
127.42
131.12
3.70, 76.4, 4.6, 15.2, 34.5, 45.4; 8,867

BP 78-2
25.00
28.70
3.70, 75.8, 6.7, 12.0, 35.0, 46.1; 10,006

BP 79-12A
112.13
115.83
3.70, 86.6, 5.4, 8.0, 36.8, 49.4; 10,888

BP 79-16A
NOT DRILLED

MOOSE CREEK
TWIN LAKES CREEK
MISHAP CREEK
MOSQUITO CREEK
ILLTYD CREEK
SPACESHIP CREEK
BASE LINE (3500)
APPROXIMATE SUBCROP TRACE BASE NO. 1 SEAM HORIZON
APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO. 1 SEAM HORIZON

35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 N
5+00 N
0+00
5+00 S
10+00 S
15+00 S

4000 m N
3000 m N
2000 m N
1000 m N
1000 m S
1000 m W
0000
1000 m E
2000 m E

LEGEND

- COAL
- SHALY COAL
- COALY SHALE
- CARBONACEOUS SHALE
- SHALE (DARK GRAY, MEDIUM GRAY, LIGHT GRAY)
- SILTSTONE
- SANDSTONE
- CONGLOMERATE

BP 78-2 DRILL HOLE & NUMBER

DEPTH IN METRES	THICKNESS (m.)	YIELD (%)	RESIDUAL MOISTURE (%)	ASH (%)	VOLATILES (%)	FIXED CARBON (%)	SPECIFIC ENERGY (BTU/S/lb)
25.00 – 28.70	3.70	75.8	6.7	12.0	35.0	46.1	10,006

NOTE: ANALYSES DETERMINED FOR: 1/4" × 28m @ ~1.90 s.g.
28m × 0 @ RAW BASIS

m 100 0 100 200 300 400 500 m

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

GRAPHIC LOG AND ANALYTICAL DATA
SELECTED UNDERGROUND MINEABLE INTERVAL
NO. 1 SEAM
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106 E	E-0768

LW

BP 79-21
144.40
146.41
2.01, 78.3, 7.4, 23.3, 28.7, 40.4, 8,318

BP 79-7
54.22
55.51
1.29, 4.6, 16.2, 33.1, 46.1, 9,277

BP 79 17/17A
331.88
334.05
2.17, 74.4, 3.6, 15.3, 33.3, 17.6, 9,925

BP 78-3
119.22
121.65
2.43, 74.1, 6.8, 15.0, 33.4, 44.8, 9,531

BP 78-4
NOT DRILLED

BP 79-20
98.14
100.46
2.32, 73.6, 7.8, 14.7, 32.1, 45.2, 9,570

BP 79-9
155.73
159.20
3.47, 90.2, 5.0, 12.7, 34.1
48.1, 9,905

BP 79-10
259.69
262.87
3.18, 83.9, 4.1, 12.9, 35.6, 47.4, 9,899

BP 79-19
84.52
87.01
2.49

BP 79-15
249.52
252.57
3.25, 84.20, 5.9, 13.3, 34.0, 46.7, 10,048

BP 79-8
113.83
116.57
2.74, 80.2, 5.6, 11.2
34.8, 48.4, 9,876

BP 79-11
156.98
160.68
3.70, 76.6, 6.3, 11.5, 36.5, 45.6, 10,090

BP 79-22A
221.84
224.56
2.72, 84.1, 6.9, 12.8, 33.2, 47.0, 10,134

BP 79-18
58.52
61.67
3.15, 72.7
5.3, 13.4
32.3, 48.7
10,002

BP 79-14
116.69
120.31
3.62, 81.5, 3.7, 13.1, 35.3, 47.2, 10,202

BP 79-13
158.22
160.98
2.76, 77.1, 3.8, 13.2, 36.2, 46.3, 10,310

BP 78-2
61.58
65.07
3.49, 82.0, 6.7, 9.1, 35.8, 48.4, 10,564

BP 79-12A
155.03
158.73
3.70, 87.3, 5.5, 11.8, 34.6, 47.6
10,358

BP 79-16A
NOT DRILLED

LEGEND

- COAL
- SHALY COAL
- COALY SHALE
- CARBONACEOUS SHALE
- SHALE (DARK GRAY, MEDIUM GRAY, LIGHT GRAY)
- SILTSTONE
- SANDSTONE
- CONGLOMERATE

BP 78-2 DRILL HOLE & NUMBER

DEPTH IN METRES	THICKNESS (m.)	YIELD (%)	RESIDUAL MOISTURE (%)	ASH (%)	VOLATILES (%)	FIXED CARBON (%)	SPECIFIC ENERGY (BTU'S/lb)
61.58 – 65.07	3.49	82.0	6.7	9.1	35.8	48.4	10,564

NOTE: ANALYSES DETERMINED FOR: 1/4" × 28m @ -1.90 s.g.
28m × 0 @ RAW BASIS

m 100 0 100 200 300 400 500m

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

GRAPHIC LOG AND ANALYTICAL DATA
SELECTED UNDERGROUND MINEABLE INTERVAL
NO. 2 SEAM
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106 E	E-0769

BP 79-21
164.52
167.15
2.63, 57.5, 6.6, 28.5, 36.3, 7,752

BP 79-7
78.20
79.14
0.94, 42.9, 7.0, 24.5, 33.2, 35.0, 8,163

BP 79 17/17A
353.45
356.10
2.65, 65.6, 4.1, 20.2, 30.7, 44.8, 9,215

BP 78-3
NOT DRILLED

BP 78-4
NOT DRILLED

BP 79-20
122.25
124.81
2.56, 68.4, 7.2, 18.6, 31.3, 42.8, 9,195

BP 79-9
179.57
182.18
2.61, 65.9, 4.8, 15.5, 34.5, 45.0, 9,597

BP 79-10
279.75
282.97
3.22, 64.7, 3.6, 20.2, 33.6, 42.6, 9,028

BP 79-19
106.33
109.67
3.34

BP 79-15
265.48
268.80
3.32, 52.1, 4.8, 18.8, 32.9, 43.3, 9,511

BP 79-8
134.42
137.28
2.86, 55.9, 5.7, 13.7, 35.0, 45.5, 9,974

BP 79-11
176.00
178.24
2.24, 64.8, 4.5, 14.2, 35.6, 45.5, 9,815

BP 79-22A
234.54
236.52
1.98, 85.5, 5.9, 16.4, 33.4, 44.1, 9,628

BP 79-18
78.29
81.99
3.70, 59.6, 4.9, 13.1, 33.6, 46.4, 9,945

BP 79-14
141.80
144.77
2.97, 32.0, 3.2, 32.9, 28.3, 35.0, 7,162

BP 79-13
180.44
182.63
2.19, 61.1, 4.1, 22.8, 31.5, 41.1, 8,826

BP 78-2
81.76
82.83
1.07, 87.6, 3.9, 16.0, 35.1, 45.0, 9,856

BP 79-12A
186.78
188.97
2.19, 66.2, 3.9, 26.2, 29.5, 40.4, 8,350

BP 79-16A
NOT DRILLED

BASE LINE (135°)

MOOSE CREEK

TWIN LAKES CREEK

MISHAP CREEK

MOSQUITO CREEK

SPACESHIP CREEK

ILLTYD CREEK

APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO. 3 SEAM HORIZON

APPROXIMATE SUBCROP BASE NO. 3 SEAM HORIZON

UD

35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 N
5+00 N
0+00
5+00 S
10+00 S
15+00 S

4000 m N
3000 m N
2000 m N
1000 m N
0000
1000 m S

1000 m W
0000
1000 m E
2000 m E

LW

LEGEND

- COAL
- SHALY COAL
- COALY SHALE
- CARBONACEOUS SHALE
- SHALE (DARK GRAY, MEDIUM GRAY, LIGHT GRAY)
- SILTSTONE
- SANDSTONE
- CONGLOMERATE

BP 78-2 DRILL HOLE & NUMBER

DEPTH IN METRES: 81.76 – 82.83

THICKNESS (m)	YIELD (%)	RESIDUAL ASH MOISTURE (%)	VOLATILES (%)	FIXED CARBON (%)	SPECIFIC ENERGY (BTUS/lb)
1.07,	87.6,	3.9,	16.0,	35.1,	45.0,	9,856

NOTE: ANALYSIS DETERMINED FOR: 1/4" × 28m @ -1.90 s.g.
28m × 0 @ RAW BASIS

m 100 0 100 200 300 400 500 m

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C. D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

GRAPHIC LOG AND ANALYTICAL DATA
SELECTED UNDERGROUND MINEABLE INTERVAL
NO. 3 SEAM
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106 E	E-0770

BP 79-21
7,758 BTU/lb

8,000

8,500

BP 79-7
9,424 BTU/lb

9,000

9,000

BP 79-17/17A
8,892 BTU/lb

8,500

BP 78-3
8,291 BTU/lb

BP 78-4
NOT INTERSECTED

BP 79-20
8,736 BTU/lb

BP 79-9
8,744 BTU/lb

BP 79-10
9,379 BTU/lb

APPROXIMATE 300 m OVERBURDEN CONTOUR BASE No. 1 SEAM HORIZON

9,500

APPROXIMATE SUBCROP TRACE BASE No. 1 SEAM HORIZON

BP 79-19
NOT ANALYSED

9,000

BP 79-15
9,197 BTU/lb

BP 79-8
8,772 BTU/lb

BP 79-11
8,561 BTU/lb

8,500

9,000

BP 79-22A
9,480 BTU/lb

8,000

BP 79-18
8,065 BTU/lb

BP 79-14
9,021 BTU/lb

BP 79-13
9,355 BTU/lb

BP 78-2
9,559 BTU/lb

9,500

10,000

BP 79-12A
10,143 BTU/lb

BP 79-16A
NOT INTERSECTED

LEGEND

- DEFINED
- APPROXIMATE
- ASSUMED TRACE BELOW ILLTYD CREEK

NOTE:
CONTOUR INTERVAL 100 BTU/lb

m 100 0 100 200 300 400 500 m

TO ACCOMPANY REPORT No. 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ISOTHERM PLAN
BASED ON OPEN PIT MINEABLE THICKNESS NO. 1 SEAM
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106 E	E-0771

GEW

BP 79-21
8,318 BTU/lb

8,500

9,000

BP 79-7
9,277 BTU/lb

9,500

BP 79-17/17A
9,925 BTU/lb

BP 78-3
9,044 BTU/lb

9,500

BP 78-4
NOT INTERSECTED

BP 79-20
9,570 BTU/lb

BP 79-9
9,905 BTU/lb

BP 79-10
9,899 BTU/lb

APPROXIMATE 300 m OVERBURDEN CONTOUR BASE NO 2 SEAM HORIZON

BP 79-19
NOT ANALYSED

BP 79-15
10,048 BTU/lb

BP 79-8
9,876 BTU/lb

BP 79-11
9,859 BTU/lb

10,000

BP 79-22 A
10,134 BTU/lb

APPROXIMATE SUBCROP TRACE BASE NO 2 SEAM HORIZON

BP 79-18
10,002 BTU/lb

BP 79-14
10,103 BTU/lb

BP 79-13
10,044 BTU/lb

BP 78-2
10,441 BTU/lb

10,300

BP 79-12 A
10,170 BTU/lb

BP 79-16A
NOT INTERSECTED

ILLTYD CREEK

SPACESHIP CREEK

U
D

LEGEND

DEFINED

APPROXIMATE

ASSUMED TRACE BELOW ILLTYD CREEK

NOTE:
CONTOUR INTERVAL 100 BTU/lb

m 100 0 100 200 300 400 500m

TO ACCOMPANY REPORT NO. 25-79 BY ORC, DCH.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ISOTHERM PLAN
BASED ON OPEN PIT MINEABLE THICKNESS NO. 2 SEAM
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106 E	E-0772

LW

BP 79-21
7,752 BTU/lb

8,000

BP 79-7
8,163 BTU/lb

8,500

BP 79-17/17A
9,108 BTU/lb

9,000

BP 78-3
NOT INTERSECTED

BP 78-4
NOT INTERSECTED

BP 79-20
8,745 BTU/lb

9,000

BP 79-10
9,028 BTU/lb

BP 79-9
9,385 BTU/lb

APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO. 3 SEAM HORIZON

BP 79-19

9,500

BP 79-15
9,511 BTU/lb

9,700

BP 79-8
9,794 BTU/lb

BP 79-11
9,776 BTU/lb

9,500

APPROXIMATE SUBCROP TRACE BASE NO. 3 SEAM HORIZON

9,800

BP 79-22 A
9,628 BTU/lb

BP 79-18
9,882 BTU/lb

BP 79-14
N/A

9,000

BP 79-13
8,826 BTU/lb

BP 78-2
9,889 BTU/lb

U
D

NOTE:
NO. 3 SEAM SHALED OUT AT BP-79-14
POLYGON DENOTES AREA OF INFLUENCE

BP 79-12A
8,350 BTU/lb

9,000

8,500

BP 79-16A
NOT INTERSECTED

LEGEND

DEFINED

APPROXIMATE

ASSUMED TRACE BELOW ILLTYD CREEK

NOTE:
CONTOUR INTERVAL 100 BTU/lb

m 100 0 100 200 300 400 500 m

TO ACCOMPANY REPORT No. 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ISOTHERM PLAN
BASED ON OPEN PIT MINEABLE THICKNESS NO. 3 SEAM
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106 E	E-0773

CBW

BP 79-21
27.4 %

BP 79-7
17.0%

BP 79-17/17A
22.8 %

BP 78-3
25.8 %

BP 78-4
NOT DRILLED

BP 79-20
23.7%

BP 79-9
22.3%

BP 79-10
17.6 %

APPROXIMATE 300m OVERBURDEN CONTOUR TO BASE OF NO.1 SEAM HORIZON

BP 79-19
NOT SAMPLED FOR ANALYSIS

BP 79-15
20.1 %

BP 79-8
22.0 %

BP 79-11
22.5 %

APPROXIMATE SUBCROP TRACE BASE NO.1 SEAM HORIZON

BP 79-22A
17.1 %

BP 79-18
24.6%

BP 79-14
20.8%

BP 79-13
19.1 %

BP 78-2
16.0 %

U

D

BP 79-12A
13.4 %

BP 79-16A
NOT DRILLED

LEGEND

DEFINED

APPROXIMATE

ASSUMED TRACE BELOW ILLTYD CREEK

NOTE:

CONTOUR INTERVAL 1.0 %

ASH VALUES DETERMINED FOR COMPOSITE OF; 1/4"×28 m FRACTION AT - 1.90 sg. 28 m×0 RAW

m 100 0 100 200 300 400 500 m

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ISOASH PLAN

BASED ON OPEN PIT SELECTED SEAM THICKNESS

NO. 1 SEAM

ILLTYD CREEK DEPOSIT (BLOCK B)

JANUARY, 1980 | SCALE 1:5000 | DRAWING E-0840

GEW

BP 79-21
23.3%

BP 79-7
16.2%

BP 79-17/17A
15.3%

BP 78-3
19.4%

BP 78-4
NOT DRILLED

BP 79-20
14.7%

BP 79-9
12.7%

BP 79-10
12.9%

BP 79-19
NOT SAMPLED FOR ANALYSIS

BP 79-15
13.3%

BP 79-8
11.2%

BP 79-11
13.2%

BP 79-22A
12.8%

BP 79-18
13.4%

BP 79-14
13.9%

BP 79-13
14.9%

BP 78-2
11.2%

BP 79-12A
13.2%

BP 79-16A
NOT DRILLED

APPROXIMATE 300 m OVERBURDEN CONTOUR TO BASE OF NO. 2 SEAM HORIZON

APPROXIMATE SUBCROP TRACE BASE NO. 2 SEAM HORIZON

U
D

LEGEND

DEFINED

APPROXIMATE

ASSUMED TRACE BELOW ILLTYD CREEK

NOTE:
CONTOUR INTERVAL 1.0%

ASH VALUES DETERMINED FOR COMPOSITE OF: 1/4" × 28m FRACTION AT -190 s.g.
28m × 0 RAW

m 100 0 100 200 300 400 500 m

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.

ISOASH PLAN
BASED ON OPEN PIT SELECTED SEAM THICKNESS
NO. 2 SEAM
ILLTYD CREEK DEPOSIT (BLOCK 'B')

JAN, 1980 | SCALE 1:5000 | DRAWN BY LW | E-0841

LW

BP 79-21
28.5%

BP 79-7
24.5%

BP 79-17/17A
20.9%

BP 78-3
NOT DRILLED

BP 78-4
NOT DRILLED

BP 79-20
22.1%

BP 79-10
20.2%

BP 79-9
17.0%

APPROXIMATE 300 m OVERBURDEN CONTOUR TO BASE NO. 3 SEAM HORIZON

BP 79-19
NOT SAMPLED FOR ANALYSIS

BP 79-15
18.8%

BP 79-8
13.7%

BP 79-11
14.2%

APPROXIMATE SUBCROP TRACE BASE NO.3 SEAM HORIZON

BP 79-22A
16.4%

BP 79-18
13.9%

BP 79-14
SEAM SHALED OUT

BP 79-13
22.8%

BP 78-2
21.1% (DETERMINED ON A RAW BASIS)

U
D

BP 79-12A
26.2%

BP 79-16A
NOT DRILLED

BP-79-14

NOTE:
NO.3 SEAM SHALED OUT AT BP-79-14
POLYGON DENOTES AREA OF INFLUENCE

LEGEND

DEFINED

APPROXIMATE

ASSUMED TRACE BELOW ILLTYD CREEK

NOTE:
CONTOUR INTERVAL 1.0%

ASH VALUES DETERMINED FOR COMPOSITE OF; 1/4" × 28 m FRACTION AT -190 s.g. 28 m × 0 RAW

m 100 0 100 200 300 400 500 m

TO ACCOMPANY REPORT NO. 28-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.

ISOASH PLAN
BASED ON OPEN PIT SELECTED SEAM THICKNESS
NO. 3 SEAM
ILLTYD CREEK DEPOSIT (BLOCK 'B')

DATE	SCALE	DRAWING NO.
JAN; 1980	1:5000	E-0842

LW

CANADA

Department of Energy, Mines and Resources, Surveys and Mapping Branch
Ministère de l'Énergie, des Mines et des Ressources, Direction des Levés et de la Cartographie

HUITIÈME ÉDITION

EIGHTH EDITION

TRANSPORTATION FACILITIES
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1974
NORTHWESTERN CANADA
NORD-OUEST DU CANADA

SCALE 1:3,168,000 ÉCHELLE

Miles 25 0 25 50 75 100 125 150 Milles

Kilometres 50 0 50 100 150 200 Kilomètres

Produced by the Surveys and Mapping Branch
Department of Energy, Mines and Resources, 1974

Établie par la Direction des Levés et de la cartographie
Ministère de l'Énergie, des Mines et des Ressources, 1974

LEGEND - LÉGENDE

- RAILWAY - CHEMIN DE FER
- MOTOR ROAD - CHEMIN POUR VÉHICULE À MOTEUR
- WINTER ROAD - CHEMIN D'HIVER
- HIGHWAY NUMBER - NUMÉRO DE LA ROUTE (28)
- FERRY - TRAVERSIER (Fy)
- SHIPPING SERVICE - SERVICE DE MESSAGERIE
- AIRPORT - AÉROPORT
- AIRFIELD - CHAMP D'ATTERRISSAGE
- SEAPLANE ANCHORAGE - MOUILLAGE D'HYDRAVIONS

AIR DISTANCES BETWEEN MAIN CENTRES (in statute miles)
DISTANCES AÉRIENNES ENTRE CENTRES PRINCIPAUX (en milles terrestres)

Edmonton (Intl) - Fort McMurray	249	Edmonton (Intl) - Grande Prairie	250
Fort McMurray - Fort Smith	234	Grande Prairie - Fort St John	103
Fort Smith - Hay River	142	Fort St John - Fort Nelson	192
Hay River - Fort Simpson	192	Fort Nelson - Watson Lake	236
Fort Simpson - Wrigley	122	Watson Lake - Whitehorse	217
Wrigley - Norman Wells	175	Whitehorse - Dawson	264
Norman Wells - Inuvik	277		
		Grande Prairie - Prince George	176
Fort Smith - Fort Resolution	99	Prince George - Smithers	193
Fort Resolution - Yellowknife	93	Smithers - Terrace	61
Yellowknife - Cambridge Bay	528	Terrace - Prince Rupert	76

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CARTER MAPPING LIMITED
510 - 5 Street S.W., Calgary, Alberta
T2P 1N8 264-1230

BP-79-21
1404.38m

BP-79-7
520.15m

BP-79-17/17A
228.33m

BP-78-3
453.06m

BP-78-4
1306.36m
ESTIMATED

BP-79-20
471.79m

BP-79-9
410.56m

BP-79-10
322.20m

BP-79-19
498.0m

BP-79-8
488.11m

BP-79-11
425.11m

BP-79-18
556.34m

BP-79-14
495.15m

BP-79-15
342.53m

BP-79-22/22A
401.87m

BP-79-13
461.38m

BP-78-2
569.26m

BP-79-12/12A
479.01m

BP-79-16/16A
NOT INTERSECTED

APPROXIMATE SUBCROP TRACE OF BASE NO. 1 SEAM HORIZON

APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO. 1 SEAM HORIZON

TWIN LAKES CREEK

MISHIAP CREEK

ILLTYD CREEK

4000 m N
3000 m N
2000 m N
1000 m N
0000
1000 m S
1000 m W
1000 m E
2000 m E

35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 N
5+00 N
0+00
5+00 S
10+00 S

LEGEND

- DEFINED
- APPROXIMATE
- ASSUMED TRACE BELOW ILLTYD CREEK

NOTE:
DATUM SEA LEVEL IN METERS
(HOLE 78-2 ASSUMED TO BE 600m ASL)
CONTOUR INTERVAL 10m

METERS 100 0 100 200 300 400 500

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

STRUCTURE CONTOURS
BASE NO. 1 SEAM HORIZON

ILLTYD CREEK DEPOSIT (BLOCK 'B')

BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOVEMBER, 1979	1:5000	106 E	E-0728

LW

BP-79-21
615.82m

BP-79-7
499.58m

BP-79-17/17A
794.52m

BP-78-3
568.09m

BP-78-4
288.0m
ESTIMATED

BP-79-20
544.17m

BP-79-9
303.96m

BP-79-10
691.94m

BP-79-19
522.98m

BP-79-15
315.64m

BP-79-8
532.13m

BP-79-11
594.56m

BP-79-22/22A
624.09m

BP-79-18
473.85m

BP-79-14
541.23m

BP-79-13
575.15m

BP-78-2
470.0m

BP-79-12/12A
-565.78m

BP-79-16/16A
NOT INTERSECTED

APPROXIMATE 300m OVERBURDEN CONTOUR BASE No.2 SEAM HORIZON

APPROXIMATE SUBCROP TRACE BASE NO. 2 SEAM HORIZON

TWIN LAKES CREEK

MUSKAP CREEK

ILLTYD CREEK

35+00 N

30+00 N

25+00 N

20+00 N

5+00 N

0+00

5+00 S

10+00 S

4000 m N

3000 m N

2000 m N

1000 m N

1000 m W

2000 m E

1000 m E

1000 m S

LEGEND

- DEFINED
- APPROXIMATE
- ASSUMED TRACE BELOW ILLTYD CREEK

NOTE:
DATUM SEA LEVEL IN METERS
CONTOUR INTERVAL 10m
(HOLE 78-2 ASSUMED TO BE 600m ASL)

100 0 100 200 300 400 500

TO ACCOMPANY REPORT NO 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

STRUCTURE CONTOURS
BASE NO. 2 SEAM HORIZON
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOVEMBER, 1979	1:5000	106 E	E-0729

LW

BP-79-21
361.44 m

BP-79-7
474.37 m

BP-79-17/17A
183.43 m

BP-78-3
405.26 m
ESTIMATED

BP-78-4
273.0 m
ESTIMATED

BP-79-20
430.57 m

BP-79-9
372.12 m

BP-79-10
284.96 m

BP-79-19
455.13 m

BP-79-15
298.94 m

BP-79-8
447.01 m

BP-79-11
387.13 m

BP-79-22/22A
362.94 m

BP-79-18
506.34 m

BP-79-14
447.00 m

BP-79-13
410.47 m

BP-78-2
514.78 m

BP-79-12/12A
408.62 m

BP-79-16/16A
NOT INTERSECTED

APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO.3 SEAM HORIZON

APPROXIMATE SUBCROP TRACE BASE NO.3 SEAM HORIZON

TWIN LAKES CREEK

MISHAP CREEK

MOSQUITO CREEK

ILLTYD CREEK

35+00 N

30+00 N

25+00 N

20+00 N

15+00 N

10+00 S

5+00 S

0+00

4000 m N

3000 m N

2000 m N

1000 m N

1000 m S

1000 m E

2000 m E

1000 m W

LEGEND

DEFINED

APPROXIMATE

ASSUMED TRACE BELOW ILLTYD CREEK

NOTE:
DATUM SEA LEVEL IN METRES
CONTOUR INTERVAL 10 m
(HOLE 78-2 ASSUMED TO BE 600m ASL)

100m 0 100 200 300 400 500m

TO ACCOMPANY REPORT NO 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

STRUCTURE CONTOURS
BASE NO. 3 SEAM HORIZON

ILLTYD CREEK DEPOSIT (BLOCK 'B')

BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOVEMBER, 1979	1:5000	106 E	E-0730

CBW

BP 79-21
4.21m

BP 79-7
6.58m

BP 79-17/17A
8.00m

BP 78-3
8.70m

BP 78-4
NOT INTERSECTED

BP 79-20
9.22m

BP 79-9
9.86m

BP 79-10
8.27m

BP 79-19
8.44m

BP 79-15
7.63m

BP 79-8
8.99m

BP 79-11
8.15m

BP 79-22A
6.97m

BP 79-14
8.20m

BP 79-18
10.05m

BP 79-13
6.67m

BP 78-2
7.27m

BP 79-12A
8.24m

BP 79-16A
NOT INTERSECTED

APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO. 1 SEAM HORIZON

APPROXIMATE SUBCROP TRACE BASE NO. 1 SEAM HORIZON

U D

LEGEND

DEFINED
APPROXIMATE
ASSUMED TRACE BELOW ILLTYD CREEK

NOTE
CONTOUR INTERVAL 1m

100 0 100 200 300 400 500

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C. & D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ISOPACH PLAN
NO. 1 SEAM HORIZON
ILLTYD CREEK DEPOSIT
(BLOCK 'B')

BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106 E	E-0740

LB

BP 79-21
2.01m

BP 79-7
1.27m

2

BP 79-17/17A
2.17m

BP 78-3
2.43m

BP 78-4
NOT INTERSECTED

BP 79-20
2.32m

3

BP 79-9
3.47m

BP 79-10
3.18m

BP 79-19
2.96m

APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO. 2 SEAM HORIZON

4

BP 79-15
3.25m

BP 79-8
3.08m

BP 79-11
4.35m

APPROXIMATE SUBCROP TRACE BASE NO. 2 SEAM HORIZON

BP 79-22A
2.72m

BP 79-18
3.67m

BP 79-14
16.31m
8.45m

BP 79-13
10.03m
4.22m

BP 78-2
8.43m
7.77m

BP 79-12A
8.34m
1.69m

BP 79-16A

NOTE
CONTOUR INTERVAL 1m
ISOPACH PLAN OF PARTING SEPARATING SEAM 2A FROM 2B

LEGEND
DEFINED
APPROXIMATE
ASSUMED TRACE BELOW ILLTYD CREEK

METERS 100 0 100 200 300 400 500

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C. & D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ISOPACH PLAN NO. 2 SEAM HORIZON
ILLTYD CREEK DEPOSIT
(BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106 E	E-0741

LB

BP 79-21
2.63m

BP 79-7
4.29m

BP 79-17/17A
3.08m

BP 78-3
NOT INTERSECTED

BP 78-4
NOT INTERSECTED

BP 79-20
3.83m

BP 79-9
4.52m

BP 79-10
3.22m

BP 79-19
3.34m

BP 79-15
4.44m

BP 79-8
4.80m

BP 79-11
5.46m

BP 79-22A
3.13m

BP 79-18
4.43m

BP 79-14
2.97m

BP 79-13
2.19m

BP 78-2
3.36m

BP 79-12A
2.19m

BP 79-16A
NOT INTERSECTED

APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO. 3 SEAM HORIZON

APPROX. SUBCROP TRACE BASE NO. 3 SEAM HORIZON

LEGEND

DEFINED

APPROXIMATE

ASSUMED TRACE BELOW ILLTYD CREEK

METERS 100 0 100 200 300 400 500

NOTE
CONTOUR INTERVAL 1m

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C. & D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ISOPACH PLAN
NO. 3 SEAM HORIZON
ILLTYD CREEK DEPOSIT
(BLOCK 'B')

BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106E	E-0742

BP 79-21
3.13 m

BP 79-7
3.6 m

BP 79-17/17A
7.02 m

BP 78-3
5.80 m

BP 78-4
NOT INTERSECTED

BP 79-20
7.42 m

BP 79-9
9.86 m

BP 79-10
7.89 m

BP 79-19
6.87 m

BP 79-8
7.99 m

BP 79-11
8.15 m

BP 79-15
7.05 m

BP 79-22A
6.97 m

BP 79-14
6.47 m

BP 79-18
9.09 m

BP 79-13
6.56 m

BP 78-2
7.27 m

BP 79-12A
7.95 m

BP 79-16A
NOT INTERSECTED

3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0

APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO. 1 SEAM HORIZON

APPROXIMATE SUBCROP TRACE BASE NO. 1 SEAM HORIZON

U D

CREEK

ILLTYD

TWIN LAKES CREEK

35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 N
5+00 N
0+00
5+00 S
10+00 S
15+00 S

LEGEND

DEFINED
APPROXIMATE
ASSUMED TRACE BELOW ILLTYD CREEK

NOTE:
CONTOUR INTERVAL 0.5m

100m 0 100 200 300 400 500m

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C.D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ISOPACH PLAN MINEABLE THICKNESS NO. 1 SEAM

ILLTYD CREEK DEPOSIT
(BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106 E	E-0743

C.B.W.

BP 79-21
2.01 m

BP 79-7
1.29 m

1.5

2.0

BP 79-17/17A
2.17 m

BP 78-3
2.43 m

2.5

BP 78-4
NOT INTERSECTED

BP 79-20
2.32 m

3.0

BP 79-9
3.47 m

BP 79-10
3.18 m

APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO.2 SEAM HORIZON

BP 79-19
2.49 m

2.5

3.0

3.5

BP 79-15
3.25 m

BP 79-8
2.74 m

BP 79-11
4.35 m

4.0

4.5

BP 79-22A
2.72 m

APPROXIMATE SUBCROP TRACE BASE NO. 2 SEAM HORIZON

BP 79-18
3.15 m

BP 79-14
5.84 m

5.0

5.5

BP 79-13
5.41 m

BP 78-2
6.66 m

6.0

6.5

U

D

BP 79-12A
6.65 m

BP 79-16A
NOT INTERSECTED

LEGEND

DEFINED

APPROXIMATE

ASSUMED TRACE BELOW ILLTYD CREEK

100m 0 100 200 300 400 500m

NOTE
CONTOUR INTERVAL 0.5 m

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C. & D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ISOPACH PLAN
MINEABLE THICKNESS NO. 2 SEAM
ILLTYD CREEK DEPOSIT
(BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106E	E-0744

C.B.W

BP 79-21
2.63 m

BP 79-7
1.14 m

1.5

2.0

BP 79-17/17A
3.08 m

BP 78-3
NOT INTERSECTED

2.5

3.0

BP 78-4
NOT INTERSECTED

BP 79-20
3.47 m

3.5

BP 79-9
3.58 m

BP 79-10
3.22 m

APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO. 3 SEAM HORIZON

3.0

BP 79-19
3.34 m

2.5

BP 79-15
3.32 m

BP 79-8
2.86 m

BP 79-11
2.24 m

2.0

1.5

1.0

0.5

3.0

3.5

APPROXIMATE SUBCROP BASE NO. 3 SEAM HORIZON

BP 79-18
3.74 m

BP 79-14
0.0

BP 79-22A
1.98 m

2.0

BP 79-13
2.19 m

BP 78-2
1.91 m

U

D

LEGEND

DEFINED

APPROXIMATE

ASSUMED TRACE BELOW ILLTYD CREEK

BP 79-12A
2.19 m

BP 79-16A
NOT INTERSECTED

NOTE
CONTOUR INTERVAL 0.5 m

100m 0 100 200 300 400 500m

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C. & D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ISOPACH PLAN
MINEABLE THICKNESS NO. 3 SEAM
ILLTYD CREEK DEPOSIT
(BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106 E	E-0745

C. B. W.

BP 79-21
29.98:1

BP 79-7
6.24:1

BP 78-3
12.18:1

BP 79-17/17A

BP 78-4
NOT INTERSECTED

BP 79-20
7.80:1

BP 79-9
10.52:1

BP 79-10
23.15:1

BP 79-19
6.53:1

BP 79-15
23.79:1

BP 79-8
8.54:1

BP 79-11
12.79:1

BP 79-22 A
21.15:1

BP 79-14
10.51:1

BP 79-18
1.86:1

BP 79-13
14.66:1

BP 78-2
2.48:1

BP 79-12 A
10.68:1

BP 79-16 A
NOT INTERSECTED

APPROXIMATE 300m OVERBURDEN CONTOUR BASE No.1 SEAM HORIZON

APPROXIMATE SUBCROP TRACE BASE No.1 SEAM HORIZON

TWIN LAKES CREEK

MISHAG CREEK

ILLTYD CREEK

LEGEND

DEFINED

APPROXIMATE

ASSUMED TRACE BELOW ILLTYD CREEK

NOTE:
CONTOUR INTERVAL 1:1

100m 0 100 200 300 400 500m

TO ACCOMPANY REPORT No. 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ROCK (WASTE) TO COAL RATIO
m^3 TO TONNES
BASE No. 1 SEAM HORIZON
ILLTYD CREEK DEPOSIT (BLOCK B)
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106 E	E-0746

BP 79-21
24.14:1

BP 79-7
7.96:1

BP 78-3
10.66:1

BP 78-4
NOT INTERSECTED

BP 79-20
7.16:1

BP 79-9
8.42:1

BP 79-10
17.50:1

BP 79-17/17A
27.19:1

BP 79-19
6.38:1

BP 79-15
18.09:1

BP 79-8
7.59:1

BP 79-11
9.16:1

BP 79-22A
17.06:1

BP 79-18
3.11:1

BP 79-14
6.89:1

BP 79-13
9.75:1

BP 78-2
3.00:1

BP 79-12A
7.75:1

BP 79-16A
NOT INTERSECTED

APPROXIMATE 300m OVERBURDEN CONTOUR BASE No. 2 SEAM HORIZON

APPROXIMATE SUBCROP TRACE BASE No. 2 SEAM HORIZON

TWIN LAKES CREEK

MUSKAG CREEK

ILLTYD CREEK

4000 m N

3000 m N

2000 m N

1000 m N

1000 m E

2000 m E

35+00 N

30+00 N

25+00 N

20+00 N

15+00 N

10+00 N

5+00 S

0+00

10+00 S

LEGEND

DEFINED

APPROXIMATE

ASSUMED TRACE BELOW ILLTYD CREEK

NOTE:
CONTOUR INTERVAL 1:1

100m 0 100 200 300 400 500m

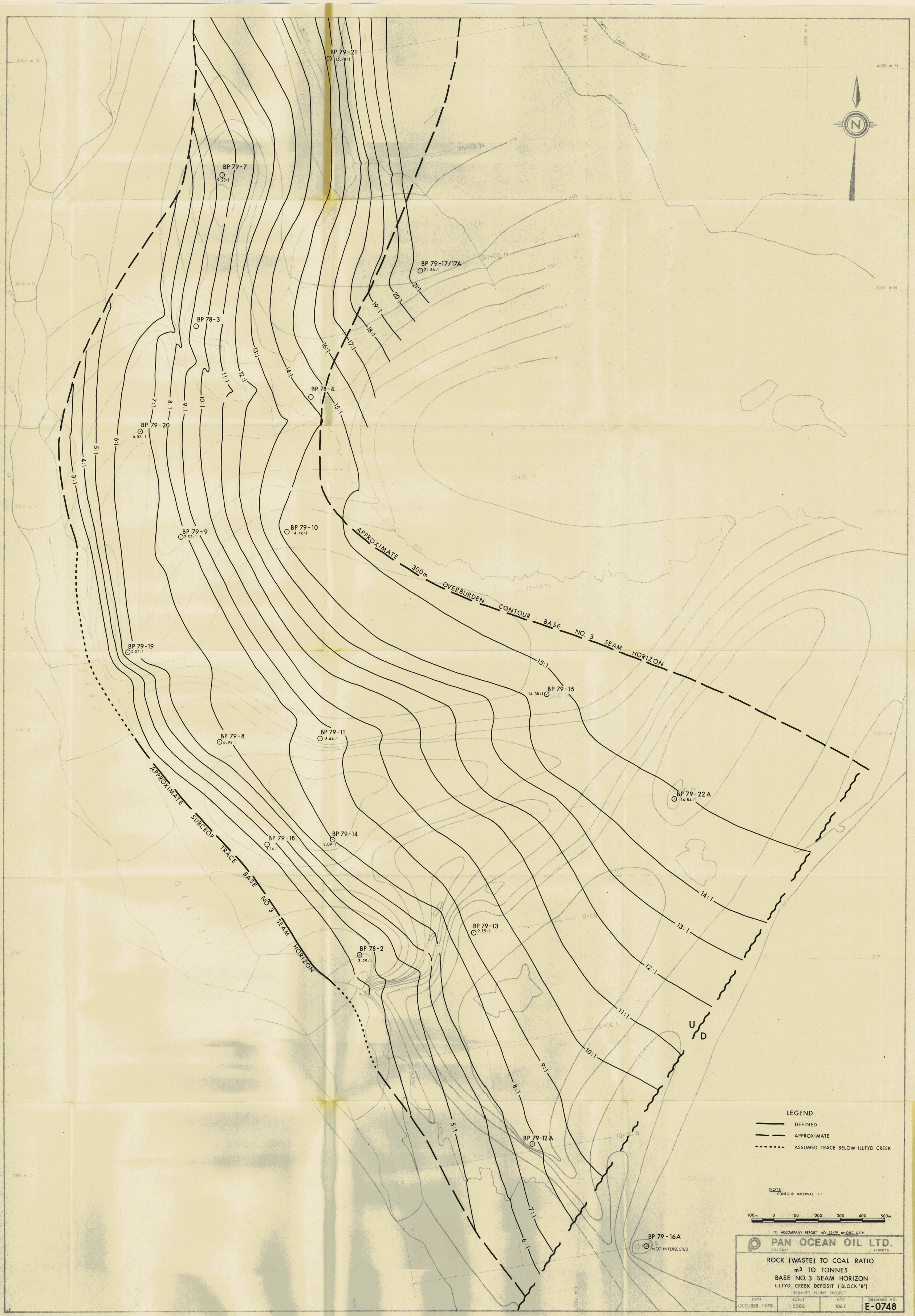
TO ACCOMPANY REPORT No. 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

ROCK (WASTE) TO COAL RATIO
m^3 TO TONNES
BASE No. 2 SEAM HORIZON
ILLTYD CREEK DEPOSIT (BLOCK B)
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
OCTOBER, 1979	1:5000	106E	E-0747

GEW


BP 79-21
15.78:1
BP 79-7
9.23:1
BP 78-3
BP 79-20
6.53:1
BP 79-9
7.52:1
BP 79-10
14.46:1
BP 79-17/17A
21.56:1
BP 78-4
BP 79-19
5.87:1
BP 79-15
14.38:1
BP 79-8
6.92:1
BP 79-11
8.44:1
BP 79-22A
14.84:1
BP 79-18
3.14:1
BP 79-14
8.09:1
BP 79-13
9.15:1
BP 78-2
3.29:1
BP 79-12A
BP 79-16A
NOT INTERSECTED
APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO. 3 SEAM HORIZON
APPROXIMATE SUBCROP TRACE BASE NO. 3 SEAM HORIZON
3:1
4:1
5:1
6:1
7:1
8:1
9:1
10:1
11:1
12:1
13:1
14:1
15:1
16:1
17:1
18:1
19:1
20:1
21:1
35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 S
5+00 S
0+00
4000 m N
3000 m N
2000 m N
1000 m N
1000 m E
2000 m E
TWIN LAKES CREEK
MISHAB CREEK
ILLTYD CREEK
U
D
N
LEGEND
DEFINED
APPROXIMATE
ASSUMED TRACE BELOW ILLTYD CREEK
NOTE:
CONTOUR INTERVAL 1:1
100m 0 100 200 300 400 500m
TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.C.H.
PAN OCEAN OIL LTD.
CALGARY ALBERTA
ROCK (WASTE) TO COAL RATIO
m³ TO TONNES
BASE NO. 3 SEAM HORIZON
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT
DATE OCTOBER, 1979
SCALE 1:5000
NTS 106 E
DRAWING NO. E-0748
LB

BP 79-21
THK. 313m

BP 79-7
THK. 360 m

BP 79-17/17A
THK. 702m

BP 78-3
THK. 580m

BP 78-4
100m

BP 79-20
THK. 742 m

BP 79-9
THK. 986m

BP 79-10
THK. 789m

BP 79-19
THK. 687m

BP 79-15
10+00 N
THK. 705m

BP 79-8
THK. 799m

BP 79-11
THK. 815m

BP 79-18
THK. 909m

BP 79-14
THK. 647m

BP 79-22A
THK. 697m

BP 79-13
THK. 656m

BP 78-2
THK. 727m

BP 79-12A
THK. 795m

BP 79-16A
15+00 S

35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 N
5+00 N
0+00
5+00 S
10+00 S
15+00 S

MOOSE CREEK
TWIN LAKES CREEK
MISHAP CREEK
MOSQUITO CREEK
SPACESHIP CREEK
ILLTYD CREEK

BASE LINE 3305

APPROXIMATE 300m 15+00 N OVERBURDEN CONTOUR BASE NO. 1 SEAM HORIZON

APPROXIMATE SUBCROP TRACE BASE NO. 1 SEAM HORIZON

HATCHED AREA DENOTES INDICATED RESERVE AREA

DASHED LINE IS INTERNAL TRIANGLE CONSTRUCTION LINE FOR AREA CALCULATIONS

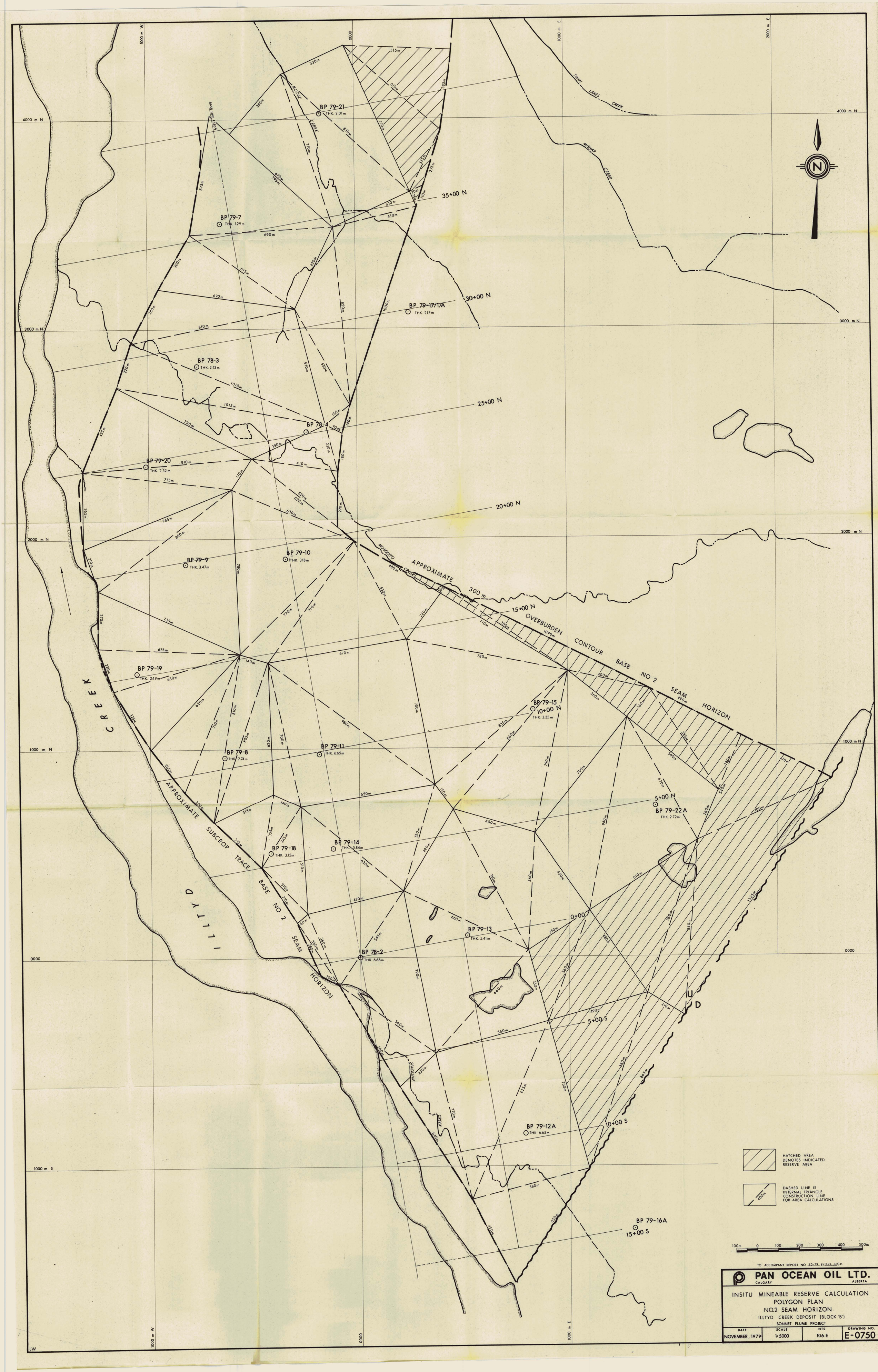
METERS 100 0 100 200 300 400 500

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

INSITU MINEABLE RESERVE CALCULATION
POLYGON PLAN
NO. 1 SEAM HORIZON
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOVEMBER, 1979	1:5000	106 E	E-0749


1000 m W
0000
1000 m E
2000 m E
4000 m N
3000 m N
2000 m N
1000 m N
1000 m S
LW
BASE LINE
MOOSE CREEK
TWIN LAKES CREEK
MISHAP CREEK
MOSQUITO CREEK
ILLTYD CREEK
APPROXIMATE 300 m OVERBURDEN CONTOUR
APPROXIMATE SUBCROP TRACE BASE NO 2 SEAM HORIZON
SPACESHIP CREEK
BP 79-21 THK. 2.01m
BP 79-7 THK. 1.29m
BP 79-17/17A THK. 2.17m
BP 78-3 THK. 2.43m
BP 78-4
BP 79-20 THK. 2.32m
BP 79-9 THK. 3.47m
BP 79-10 THK. 3.18m
BP 79-19 THK. 2.49m
BP 79-15 10+00 N THK. 3.25m
BP 79-11 THK. 6.65m
BP 79-8 THK. 2.74m
BP 79-22A 5+00 N THK. 2.72m
BP 79-18 THK. 3.15m
BP 79-14 THK. 5.84m
BP 79-13 THK. 5.41m
BP 78-2 THK. 6.66m
BP 79-12A THK. 6.65m
BP 79-16A 15+00 S
35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 S
5+00 S
0+00
HATCHED AREA DENOTES INDICATED RESERVE AREA
DASHED LINE IS INTERNAL TRIANGLE CONSTRUCTION LINE FOR AREA CALCULATIONS
100m 0 100 200 300 400 500m
TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.C.H.
PAN OCEAN OIL LTD.
CALGARY ALBERTA
INSITU MINEABLE RESERVE CALCULATION
POLYGON PLAN
NO.2 SEAM HORIZON
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT
DATE NOVEMBER, 1979
SCALE 1:5000
NTS 106 E
DRAWING NO. E-0750


BP 79-21
THK 2.63 m
BP 79-7
THK 1.14 m
BP 78-3
THK 3.01 m
BP 78-4
BP 79-20
THK 3.47 m
BP 79-9
THK 3.58 m
BP 79-10
THK 3.22 m
BP 79-17/17A
THK 3.08 m
BP 79-19
THK 3.34 m
BP 79-8
THK 2.86 m
BP 79-11
THK 3.24 m
BP 79-18
THK 3.74 m
BP 79-14
THK 0.0 m
BP 79-15
10+00 N
THK 3.32 m
BP 79-22A
5+00 N
THK 1.98 m
BP 79-13
THK 2.19 m
BP 78-2
THK 1.91 m
BP 79-12A
THK 2.19 m
BP 79-16A
15+00 S
35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 N
5+00 N
0+00
5+00 S
10+00 S
15+00 S
TWIN LAKES CREEK
MISHAP CREEK
MOOSE CREEK
MOSQUITO CREEK
ILLTYD CREEK
APPROXIMATE 300m OVERBURDEN CONTOUR
APPROXIMATE SUBCROP TRACE BASE NO. 3 SEAM HORIZON
BASE NO. 3 SEAM HORIZON
BASE LINE (350°)
SPACESHIP CREEK
4000 m N
3000 m N
2000 m N
1000 m N
0000
1000 m S
1000 m W
1000 m E
2000 m E
HATCHED AREA DENOTES INDICATED RESERVE AREA
DASHED LINE IS INTERNAL TRIANGLE CONSTRUCTION LINE FOR AREA CALCULATIONS
100m 0 100 200 300 400 500m
TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.C.H.
PAN OCEAN OIL LTD.
CALGARY ALBERTA
INSITU MINEABLE RESERVE CALCULATION
POLYGON PLAN
NO. 3 SEAM HORIZON
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT
DATE NOVEMBER, 1979
SCALE 1:5000
NTS 106 E
DRAWING NO. E-0751
CBW

1000 m W
0000
1000 m E
2000 m E
4000 m N
3000 m N
2000 m N
1000 m N
0000
1000 m S
1000 m W
0000
1000 m E
LW

BP 79-21
THK. 3.13 m

BP 79-7
THK. 3.60 m

BP 78-3
THK. 3.0 m

BP 78-4
NOT INTERSECTED

BP 79-20
THK. 3.70 m

BP 79-9
THK. 3.40 m

BP 79-10
THK. 3.70 m

BP 79-19
THK. 2.96 m

BP 79-8
THK. 3.70 m

BP 79-11
THK. 3.70 m

BP 79-18
THK. 3.0 m

BP 79-14
THK. 3.70 m

BP 79-17/17A
THK. 3.70 m

BP 79-15
10+00 N
THK. 3.70 m

BP 79-22A
5+00 N
THK. 3.26 m

BP 79-13
THK. 3.70 m

BP 78-2
THK. 3.70 m

BP 79-12A
THK. 3.7 m

BP 79-16A
15+00 S

35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 N
5+00 N
0+00
5+00 S
10+00 S
15+00 S

BASE LINE (1309)

MOOSE CREEK

TWIN LAKES CREEK

MISHAP CREEK

MOSQUITO CREEK

SPACESHIP CREEK

ILLTYD CREEK

APPROXIMATE SUBCROP TRACE BASE NO.1 SEAM HORIZON

APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO. 1 SEAM HORIZON

U/D

HATCHED AREA DENOTES INDICATED RESERVE AREA

DASHED LINE IS INTERNAL TRIANGLE CONSTRUCTION LINE FOR AREA CALCULATIONS

METERS 100 0 100 200 300 400 500

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C. D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

UNDERGROUND MINEABLE RESERVE CALCULATION
POLYGON PLAN
NO.1 SEAM
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOVEMBER, 1979	1:5000	106 E	E-0752

BP 79-21
THK. 2.01m

BP 79-7
THK. 1.29m

BP 79-17/17A
THK. 2.17m

BP 78-3
THK. 2.43m

BP 78-4
NOT INTERSECTED

BP 79-20
THK. 2.32m

BP 79-9
THK. 3.47m

BP 79-10
THK. 3.18m

BP 79-19
THK. 2.49m

BP 79-8
THK. 2.74m

BP 79-11
THK. 3.70m

BP 79-15
THK. 3.25m

BP 79-18
THK. 3.15m

BP 79-14
THK. 3.62m

BP 79-22A
THK. 2.72m

BP 79-13
THK. 2.76m

BP 78-2
THK. 3.49m

BP 79-12A
THK. 3.70m

BP 79-16A
NOT INTERSECTED

35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 N
5+00 N
0+00
5+00 S
10+00 S
15+00 S

4000 m N
3000 m N
2000 m N
1000 m N
0000
1000 m S

1000 m W
0000
1000 m E
2000 m E

TWIN LAKES CREEK
MISHAP CREEK
MOOSE CREEK
BASE LINE
MOSQUITO CREEK
SPACESHIP CREEK
ILLTYD CREEK

APPROXIMATE 300 m OVERBURDEN CONTOUR
APPROXIMATE SUBCROP TRACE BASE NO 2 SEAM HORIZON

HATCHED AREA DENOTES INDICATED RESERVE AREA

DASHED LINE IS INTERNAL TRIANGLE CONSTRUCTION LINE FOR AREA CALCULATIONS

100m 0 100 200 300 400 500m

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

UNDERGROUND MINEABLE RESERVE CALCULATION
POLYGON PLAN
NO. 2 SEAM
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOVEMBER, 1979	1:5000	106 E	E-0753

BP 79-21
THK. 2.63 m

BP 79-7
THK. 0.94 m

BP 79-17/17A
THK. 2.65 m

BP 78-3
THK. 2.21 m (ESTIMATED)

BP 78-4
NOT INTERSECTED

BP 79-20
THK. 3.47 m

BP 79-9
THK. 2.61 m

BP 79-10
THK. 3.22 m

BP 79-19
THK. 3.34 m

BP 79-8
THK. 2.86 m

BP 79-11
THK. 2.24 m

BP 79-15
10+00 N
THK. 3.32 m

BP 79-18
THK. 3.70 m

BP 79-14
THK. 0.00 m

5+00 N
BP 79-22A
THK. 1.98 m

BP 79-13
THK. 2.19 m

BP 78-2
THK. 1.07 m

BP 79-12A
THK. 2.19 m

BP 79-16A
NOT INTERSECTED

35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 N
5+00 N
0+00
5+00 S
10+00 S
15+00 S

4000 m N
3000 m N
2000 m N
1000 m N
1000 m S
1000 m W
0000
1000 m E
2000 m E

TWIN LAKES CREEK
MISHAP CREEK
MOOSE CREEK
MOSQUITO CREEK
ILLTYD CREEK

APPROXIMATE 300m OVERBURDEN CONTOUR

APPROXIMATE SUBCROP TRACE BASE NO. 3 SEAM HORIZON

APPROXIMATE BASE NO. 3 SEAM HORIZON

HATCHED AREA DENOTES INDICATED RESERVE AREA

DASHED LINE IS INTERNAL TRIANGLE CONSTRUCTION LINE FOR AREA CALCULATIONS

METERS 100 0 100 200 300 400 500

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C. D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

UNDERGROUND MINEABLE RESERVE CALCULATION
POLYGON PLAN
NO.3 SEAM
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOVEMBER, 1979	1:5000	106 E	E-0754

CBW

BP 79-21
THK. 313m

BP 79-7
THK. 360 m

BP 78-3
THK. 580m

BP 78-4
NOT INTERSECTED

BP 79-20
THK. 742 m

BP 79-9
THK. 986m

BP 79-10
THK. 789m

BP 79-19
THK. 687m

BP 79-8
THK. 799m

BP 79-11
THK. 815m

BP 79-18
THK. 909m

BP 79-14
THK. 647m

BP 79-17/17A
THK. 702m

BP 79-15
10+00 N
THK. 705m

BP 79-22A
5+00 N
THK. 697m

BP 79-13
THK. 656m

BP 78-2
THK. 727m

BP 79-12A
THK. 793m

BP 79-16A
NOT INTERSECTED
15+00 S

35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 N
5+00 N
0+00
5+00 S
10+00 S
15+00 S

4000 m N
3000 m N
2000 m N
1000 m N
0000
1000 m S

1000 m W
0000
1000 m E
2000 m E

BASE LINE 3305

MOOSE CREEK

TWIN LAKES CREEK

MISHAP CREEK

MOSQUITO CREEK

SPACESHIP CREEK

ILLTYD CREEK

APPROXIMATE 300m OVERBURDEN CONTOUR BASE NO. 1 SEAM HORIZON

APPROXIMATE SUBCROP TRACE BASE NO. 1 SEAM HORIZON

U/D

HATCHED AREA DENOTES INDICATED RESERVE AREA

DASHED LINE IS INTERNAL TRIANGLE CONSTRUCTION LINE FOR AREA CALCULATIONS

METERS 100 0 100 200 300 400 500

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

SELECTED STRIPPING RATIO
RESERVE CALCULATION PLAN
NO. 1 SEAM HORIZON
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOVEMBER, 1979	1:5000	106 E	E-0755

BP 79-21
THK. 2.01m

BP 79-7
THK. 1.29m

BP 79-17/17A
THK. 2.17m

BP 78-3
THK. 2.43m

BP 78-4
NOT INTERSECTED

BP 79-20
THK. 2.32m

BP 79-9
THK. 3.47m

BP 79-10
THK. 3.18m

BP 79-19
THK. 2.49m

BP 79-15
10+00 N
THK. 3.25m

BP 79-8
THK. 2.74m

BP 79-11
THK. 4.35m

BP 79-18
THK. 3.15m

BP 79-14
THK. 5.84m

BP 79-22A
5+00 N
THK. 2.72m

BP 79-13
THK. 5.41m

BP 78-2
THK. 6.66m

BP 79-12A
THK. 6.65m
10+00 S

BP 79-16A
NOT INTERSECTED
15+00 S

BASE LINE (350°)

MOOSE CREEK

TWIN LAKES CREEK

MISHAP CREEK

MOSQUITO CREEK

ILLTYD CREEK

APPROXIMATE 300 m OVERBURDEN CONTOUR

BASE NO 2 SEAM HORIZON

APPROXIMATE SUBCROP TRACE BASE NO 2 SEAM HORIZON

SPACESHIP CREEK

35+00 N
30+00 N
25+00 N
20+00 N
15+00 N
10+00 N
5+00 N
0+00
5+00 S
10+00 S
15+00 S

4000 m N
3000 m N
2000 m N
1000 m N
1000 m S
0000

1000 m W
0000
1000 m E
2000 m E

6:1
8:1
4:1

HATCHED AREA DENOTES INDICATED RESERVE AREA

DASHED LINE IS INTERNAL TRIANGLE CONSTRUCTION LINE FOR AREA CALCULATIONS

100m 0 100 200 300 400 500m

TO ACCOMPANY REPORT NO. 25-79 BY O.R.C., D.C.H.

PAN OCEAN OIL LTD.
CALGARY ALBERTA

SELECTED STRIPPING RATIO
RESERVE CALCULATION PLAN
NO.2 SEAM HORIZON
ILLTYD CREEK DEPOSIT (BLOCK 'B')
BONNET PLUME PROJECT

DATE	SCALE	NTS	DRAWING NO.
NOVEMBER, 1979	1:5000	106 E	E-0756