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 GEOLOGICAL BRANCH  
 ASSESSMENT REPORT

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THE  
 GEOLOGICAL  
 BRANCH  
 OF  
 THE  
 CANADIAN  
 DEPARTMENT  
 OF  
 ENERGY  
 AND  
 MINES



# Crows Nest Resources

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April 24, 1985

Ministry of Energy, Mines & Petroleum Resources  
617 Government Street  
Victoria, B.C.  
V8V 1X4

Attention: Mr. P. Hagen, Coal Administrator

Dear Mr. Hagen:

Enclosed please find our report on the Pine Pass project.

This report has been prepared by Mr. B. McKinstry, Staff Geologist, Crows Nest Resources. Mr. McKinstry, M.Sc., graduated in Geology from Carleton University in 1980. Prior to joining Crows Nest Resources Limited in 1981, Mr. McKinstry worked on a number of mineral exploration programs in northern Ontario, Northwest Territories, Manitoba and British Columbia.

Field work was organized and supervised by Mr. A. White, B.Sc., and Mr. D. Fietz, C.E.T, employees of Crows Nest Resources.

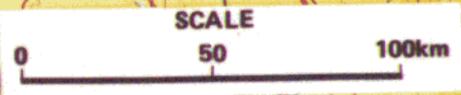
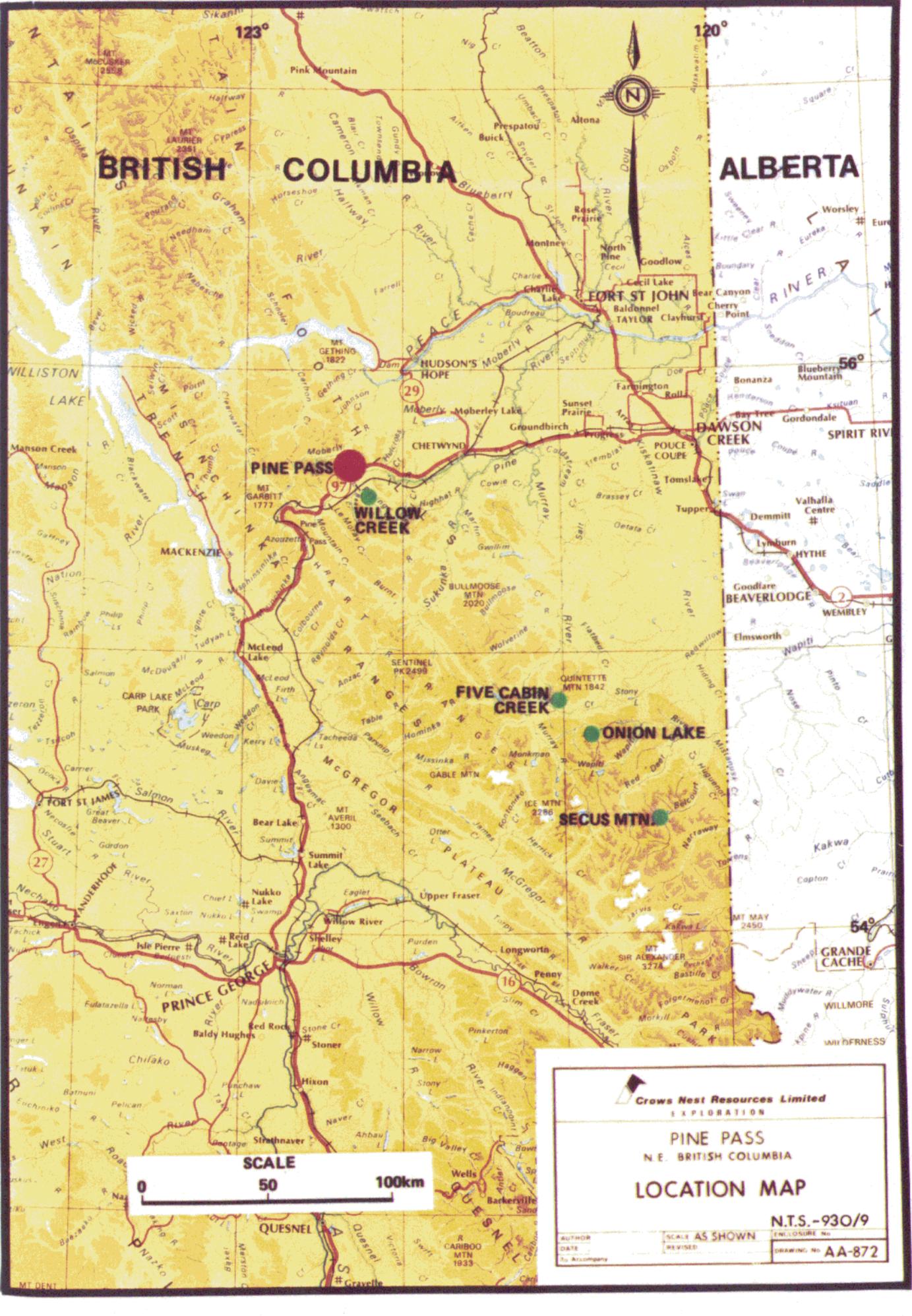
In my opinion, the above mentioned personnel are fully qualified by training and experience to have conducted the exploration program and to have prepared this report.

Yours truly

H.G. Rushton  
Vice President - Development

Enclosure





**Crows Nest Resources Limited**  
EXPLORATION

**PINE PASS**  
N.E. BRITISH COLUMBIA

**LOCATION MAP**

N.T.S.-930/9

DATE	SCALE AS SHOWN	ENCLOSURE No.
BY: [Signature]	REVISED	
BY: [Signature]		DRAWING No. AA-872

PINE PASS PROJECT

N.E. B.C.

COAL EXPLORATION 1984

Coal Licences:

COAL GROUP #369

{ 6253, 55857  
6259 - 68  
6276 & 7543

PEACE RIVER LAND DISTRICT,

NORTHEASTERN B.C.

B.C. COAL LICENCES HELD BY SHELL CANADA  
RESOURCES LIMITED; OPERATED BY CROWS NEST  
RESOURCES LIMITED

National Topographic Series: 93 0/9 (MOUNT HULCROSS)

Latitude and Longitude: 55° 37' NORTH LATITUDE

122° 20' WEST LONGITUDE

Author: B. McKINSTRY

Field Work: AUGUST - SEPTEMBER, 1984

(A. WHITE/D. FIETZ)

Submission Date: APRIL 23, 1985

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SUMMARY

The Pine Pass Licence Block consists of 15 coal licences within Group #369.

During August and September, 1984 five diamond drill holes were completed within the property for a total depth of 553m. The purpose of the drilling was to verify seam continuity and thickness from previous surface trenching or drilling. Results tended to confirm existing data. Of more importance, the results did not conflict with the 1983 structural geology reinterpretation of east dipping thrust faults within the coal bearing Gething Formation on the property. Coal samples from the drilling program were submitted for analysis and reconfirm the rank of the coal as medium volatile bituminous. Quality determinations indicate there may be relatively thick low raw-ash (less than 15%) thermal coal seams in localized open-pit mineable situations within the licence boundaries. The difficulty in seam correlation, thickness variability and complexity of geology necessitate considerable drilling in future to properly assess the economic potential of the property.

GEOLOGICAL MAPPING C.L. 6261-6267 + 6276  
DRILLING C.L. 6262-6263

## 1.0 INTRODUCTION

The Pine Pass property held by Shell Canada Resources Limited and operated by Crows Nest Resources Limited (a wholly owned subsidiary) consists of 15 coal licences covering 4,395 hectares. It is located 70 km west of Chetwynd along the John Hart Highway.

Field work in 1984 consisted of drilling five shallow core holes. The results substantiated the 1983 reinterpretation and increased the volume of reliable coal quality data. In particular, it appears that certain seams of mineable thickness contain less than 10% raw ash in areas of open pit potential. However, complex geological structure, seam continuity and correlation as well as a lack of marker units allows for difficult exploration on this property.

### 1.1 Coal Land Tenure

Shell Canada Resources Limited holds 15 coal licences (Group #369) covering 4,395 ha of land for the Pine Pass project in the Peace River Land District, Northeastern British Columbia (Appendix 1). The property is operated by Crows nest Resources Limited, a wholly owned subsidiary of Shell Canada Resources Limited

The following table, entitled "B.C. Coal Licences Tenure Standing" contains details (see Table 1).

TABLE 1

CROWS NEST RESOURCES LIMITEDPINE PASS PROSPECT: GROUP 369

Tenure Status as of May 21, 1985

<u>Licence</u>	<u>Hectares</u>	<u>Term</u>	<u>Base Date</u>	<u>Work Requirements/Credits (per hectare)</u>		
				<u>Previous Credits</u>	<u>Current Credits</u>	<u>Credits Forward</u>
6253	293	5	May 21/80	105.46	28.85	109.31
6255	293	5	May 21/80	105.46	28.85	109.31
6257	293	5	May 21/80	105.46	28.85	109.31
6259	293	5	May 21/80	105.46	28.85	109.31
6260	293	5	May 21/80	105.46	28.85	109.31
6261	293	5	May 21/80	105.46	28.85	109.31
6262	293	5	May 21/80	105.46	28.85	109.31
6263	293	5	May 21/80	105.46	28.85	109.31
6264	293	5	May 21/80	105.46	28.85	109.31
6265	293	5	May 21/80	105.46	28.85	109.31
6266	293	5	May 21/80	105.46	28.85	109.31
6267	293	5	May 21/80	105.46	28.85	109.31
6268	293	5	May 21/80	105.46	28.85	109.31
6276	293	5	May 21/80	105.46	28.85	109.31
7543	293	5	May 21/82	22.50	40.00	50.00
	<u>4395</u>					

Future Work Requirements

1985	NIL
1986	NIL
1987	181,560.38
1988	219,750.00
1989	219,750.00
1990	219,750.00

## 1.2 Location, Geography and Physiography

The Pine Pass property is located contiguously north and south of the Pine River, about 45 air kilometers west of Chetwynd and 55 air kilometers southwest of Hudson Hope. The property is centered approximately 55° 37' North Latitude and 122° 20' West Longitude on N.T.S. Topographic sheet 93 0/9.

The coal licences are situated on the eastern slope of Mount Bickford on the north side of the Pine River. The area is characterized by relatively low, rounded, northwest-southeast trending ridges and valleys dissected by the northeast-southwest 1.5 km wide Pine River Valley. The ridges are separated by valleys of creeks (Cleveland Creek, Fisher Creek and Noman Creek - in the north; and Willow Creek, Falling Creek and Beaudette Creek - in the south, all of which are tributaries of the Pine River.

Elevations throughout the licence area range from 655 m in the Pine River Valley, to 1570 in the northwest part of the Noman Creek area.

The area is forested by poplar and some birch in lower elevations; fir and spruce are predominant at higher elevations. In wet areas willows and devils club are common. The timberline is approximately 1300 m above sea level.

### 1.3 Access

The property is accessible by the paved all-weather Highway #97 (John Hart Highway) that connects Prince George to Dawson Creek via Chetwynd. The town of Chetwynd is about 70 road kilometers east of the property.

The British Columbia Railway line is located south of the Pine River and connects the project area with the Vancouver and Prince Rupert sea ports. The two deep sea ports are both about 1200 km from the licence block.

The project area is accessible on good dirt roads constructed during past and present programs of coal exploration, power line construction and logging operations.

In addition to the transportation facilities available, this property also contains power sources in the forms of natural gas and electricity. A natural gas pipeline operated by Westcoast Transmission Ltd. follows the John Hart Highway across the middle of the property. Two main B.C. Hydro power transmission lines traverse the property; one follows the Pine River valley, the other traverses from the north, along Fisher Creek then crosses the Noman Creek block to follow the Pine River to the southeast.

## 2.0 EXPLORATION

### 2.1 Summary of Previous Work

Initial coal exploration in the area was conducted from 1946 to 1951. The British Columbia Department of Lands and Forests carried out a coal exploration program that included geological mapping, trenching and diamond drilling. Results of the exploration programs were used to estimate reserves of mineable coal that might be available contiguous to a proposed route of the Pacific Great Eastern Railroad into the Peace River District. Most of this work was concentrated in the following three areas: (1) Hasler Creek; (2) Willow Creek; and (3) Noman Creek. Since then a number of programs have been conducted, in the area, by various companies and/or governmental agencies.

A comprehensive review of this data can be found in White & Fietz, 1983.

### 2.2 1984 Exploration Program

#### 2.2.1 Scope and Objectives

Upon completion of the 1983 report, a limited diamond drill exploration program was planned to substantiate the revised geological interpretation of White & Fietz, 1983 and provide additional coal quality data.

### 2.2.2 Exploration Program

In August and September, 1984 Mr. A. White and Mr. D. Fietz, Crows Nest Resources personnel, supervised the drilling of five diamond holes totalling 553 m in depth. Upon completion of drilling, the holes were logged using downhole geophysical tools (Appendix 3). The full length of each hole was cemented following the geophysical logging (Appendix 3). In addition, the core recovered was logged and sampled (Appendix 2). Subsequently, the coal samples were submitted to Loring Laboratories, Calgary, Alberta for assay (Appendix 4). Finally, the drill sites were surveyed (Appendix 7).

### 2.2.3 Exploration Costs

Expenditures for the 1984 geological field program are detailed in the following "Applications to Extend Term of Licence". During 1984, a total of \$130,080.65 was spent on the Noman Creek portion of the Pine Pass coal licences.

### 3.0 GEOLOGY

A review of the Pine Pass area geology as outlined in White & Fietz, 1983 follows:

#### 3.1 Regional Geology

The area under consideration lies within the Rocky Mountain Foothills and trends northwesterly along the front of the Rocky Mountains in Northeastern British Columbia. The strata outcropping in the Pine River Valley area are of Mesozoic age, from Middle Triassic to Upper Cretaceous, and were deposited on the shelf of a miogeosyncline. These formations thin eastwards across the Foothills and into the Plains.

Triassic strata are marine in origin and consist of limestone, calcareous shale, siltstone and sandstone. Jurassic sediments are primarily marine shales. The Lower Cretaceous sediments of sandstones, shales and coal measures marked the end of marine deposition.

The coal bearing beds of Lower Cretaceous age outcrop extensively along the foothills of Alberta and Northeastern British Columbia. These sediments have been assigned to the Blairmore, Bullhead and Fort St. John Groups. During the Columbian Orogeny, these sediments were folded, thrust and uplifted into faulted, elongate, plunging anticlines and synclines.

The intensity of deformation varies from one region to another. The Peace River and Pine River areas are characterized by relatively broad synclines between sharply faulted anticlines. The strata are exposed in a series of folds and thrust belts trending northwest-southeast.

Regional stratigraphic studies have been conducted by the Geological Survey of Canada and published by Stott, 1971 (Figure 2).

Several local stratigraphic and mapping projects have been completed within the area - both by the Geological Survey of Canada and by the British Columbia Ministry of Energy, Mines and Petroleum Resources. These are documented by Hughes (1964, 1967), McLearn and Kindle (1950), McKechnie (1955) and Spivak (1944). (Figure 3)

### 3.2 Stratigraphic Descriptions

#### 3.2.1 Bullhead Group

The Bullhead Group contains two formations: A basal conglomerate, the Cadomin Formation and the coal-bearing Gething Formation.

HUGHES

STOTT

FORT ST. JOHN GROUP

FORT ST. JOHN GROUP

		1964	1968		
CRASSIER GROUP		MOOSEBAR FM	MOOSEBAR FM	BULLHEAD GROUP	
		GETHING FM	GETHING FM		
		DRESSER FM	CADOMIN FM		
			UNCONFORMITY		
		BRENOT FM	BICKFORD FM		
		DISCONFORMITY			
BEAUDETTE GROUP		MONACH FM	MONACH FM	MINNES GROUP	
		BEATTIE PEAKS FM	BEATTIE PEAKS FM		
		MONTEITH FM	MONTEITH FM		

FIGURE 2

 <p><b>Crows Nest Resources Limited</b> EXPLORATION</p>		
<p>PINE PASS N.E. B.C.</p>		
<p><b>TABLE OF FORMATIONS</b></p>		
AUTHOR: D. Fitz	SCALE: N.T.S.	DRAWN BY: R.N.
DATE: 84-02	REVISED:	DRAWING No: AA-1064
To Accompany		

### 3.2.1.1 Cadomin Formation

The laterally extensive (Peace River to Blairmore, Alberta) Cadomin Formation forms a distinctive marker in Lower Cretaceous sediments. In its type region near Cadomin Alberta, it is typically a massive resistant unit of conglomeratic, light to medium-grey weathering sandstone. The resistant nature of the Cadomin makes it a good marker for geologic mapping, as it often forms ridges or stands in relief from other strata in the area.

An erosional unconformity at the base of the Cadomin Formation, separates it from the underlying Minnes Group. Although there are local angular relationships with the underlying beds the rocks on either side of the contact are generally structurally concordant (Stott, 1971).

### 3.2.1.2 Gething Formation

The Lower Cretaceous Gething Formation of the Bullhead Group is underlain by the Cadomin Formation and overlain by the Moosebar Formation. It is comprised of a thick sequence of predominantly non-marine fine-grained sediments and coal. Shales, siltstone, fine-grained sandstones and coal seams are the characteristic lithologies found in the formation.

In the Peace and Pine River areas the Gething Formation is 450 to 550 m thick. The section in the Peace River Canyon as measured by Stott (1969) is 550 m thick.

Numerous coal seams occur within the Gething Formation. Their best development appears to be in the Pine River and Hasler Creek areas. To the northwest and southeast along the foothills coal belt, the seams generally are thinner and more discontinuous. The coal of the Gething Formation seams is reported to be of low to medium volatile bituminous rank with fair to good coking characteristics.

### 3.2.2 Moosebar Formation

The Gething Formation is conformably overlain by the Moosebar Formation of the Fort St. John Group.

The predominantly marine sediments consist of dark grey mudstones and shales with minor beds of argillaceous sandstone and ironstone bands. Thin layers of bentonite can occasionally be found.

The upper contact of the Moosebar Formation is gradational from marine shales through a sequence of interbedded shales and sandstones (passage beds) into the basal sandstone member of the Gates Formation. The contact is placed within the passage beds at the base of the first thick succession of sandstone.

The lower contact, with the Gething Formation is abrupt and is easily picked on downhole geophysical logs. The contact is commonly marked by a one to two metre pebble conglomerate or sandstone. It is interpreted as representing the initial deposits of the transgressing Moosebar Sea, marking the end of a prolonged period of alluvial deposition in the area. This pebble conglomerate or pebble sandstone is the equivalent of the Bluesky Formation found in the plains and is therefore commonly called the Bluesky Conglomerate. The five metres above the conglomerate is generally siltier than the main body of the Moosebar and contains a glauconitic zone near the top.

The Moosebar Formation is generally recessive, with outcrops only exposed in road cuts and stream and river banks.

### 3.3 Project Geology

#### 3.3.1 Stratigraphy

The Noman Creek area is underlain by strata of the Cadomin, Gething and Moosebar Formations. Numerous thrust repeats and poor exposure on the property have made measurement of the complete Gething section impossible. It is inferred from other areas, however, that the Gething is approximately 500 m thick in the licence area. Exploration to date has concentrated on the upper 300 m of section.

The Cadomin Formation outcrops near Cleveland Creek at the west edge of the property. In 1983 an excellent exposure of Cadomin strata was mapped beneath the power line on coal licence 6263.

The Moosebar Formation outcrops along Fisher Creek. In addition, it has been exposed in various backhoe trenches. During 1983 the Moosebar was encountered in trenches TR83-11 and TR83-7 and in several "pot-holes" excavated in the logged out area on coal licence 6265. In addition, drill hole PP83-1 was collared in Moosebar shales and cored 22 m± of shale and mudstone, and 3 m± of Bluesky Conglomerate.

The Bluesky Conglomerate has been intersected in trenches PN-E-1-81, PN-E-5-81, PN-E-6-81 and 1983 trench TR83-8. On the Pine Pass Property the Bluesky is a one to two metre, hard, tightly packed pebble conglomerate with sharp upper and lower contacts.

During the 1984 drilling program 553 m± of Gething strata were cored. The strata encountered were generally non-descript siltstones, mudstones and fine-grained sandstones with several coal and coaly shale zones. These are described in more detail in section 4.1.

Within these non-descript Gething strata several tonstein bands occur. These fine-grained sediments are soft, light to medium grey and have a flakey texture. Probably of volcanic origin, they may be useful as marker beds within the Gething. One Tonstein in particular, a triple band in Seam E (Fisher Creek Tonstein) has been correlated over a large area in N.E. B.C. (Kilby, 1983), and may be present in PP83-02.

### 3.3.2 Structural Geology

A 1983 reinterpretation of the structural geology of the Noman Creek Block indicate a  $1\pm$  km wide band of coal-bearing strata. The main geological structures consist of broad synclines and relatively sharp anticlines. Folds are broken by three to four primary medium angle, east dipping reverse faults which have brought the coal-bearing strata to the surface. Minor reverse faults frequently splay from the major faults.

Although the east dipping reverse faults are a departure from the normal foothills structure of west dipping thrust faults, they provide the best fit to the data. It is hypothesized that the east dipping thrusts are minor structural features relating to the Fisher Creek Syncline, the axis of which is east of the sections. Major west dipping thrust faults bracket this small area within the foothills belt.

Results of the 1984 drilling program necessitated only minor modifications to the location of geological contacts and appear to reinforce the 1983 structural interpretation. Included in Appendix 6 are updated cross sections 16 + 00 and 30 + 00 with 1984 drilling results appended. In addition, the plan geology for claims 6262 and 6263 has been modified to reflect the new information (Appendix 5).

#### 4.0 COAL

##### 4.1 Coal Geology

In the area under consideration, only the Gething Formation contains economic coal seams. Coal seams have been reported in the Cadomin Formation but these are not thought to be economically feasible.

Past evaluations<sup>1</sup> and/or correlations of the coal seams keyed on two, lower coaly horizons . . . "78" and "76". Coal zones, during the 1983 re-evaluation, were re-correlated; these correlations were primarily based on geophysical log responses of the CNRL

- . rotary drill hole program: 1981
- . diamond drill hole program: 1983

Where possible, these subsurface responses were then correlated to earlier drill and/or trench data.

Twelve coaly/carbonaceous horizons were correlated and have been identified alphabetically from "A" (top) to "W" (bottom). The correlatable coal seams of the project area can be summarized. . .

ZONE DESIGNATION	TYPICAL TH. (m)	TYPICAL DEPTH BELOW Kgt-Kmb CONTACT (m)
A	0.4	50.0
C	0.7	60.0
E	1.7	70.0
G	0.7	80.0
I	0.9	85.0
K	3.4	95.0
M	2.2	140.0
O	0.8	170.0
Q	2.7	185.0
S	0.8	200.0
U	0.8	210.0
W	5.0	215.0

Much of the 1984 generated drill data (with accompanying geophysical logs) focussed on the lower 100 metres of potential coal-bearing strata. Horizons "O", "Q" and "W" appear to be the most laterally persistent and consistent;

One of the more significant realizations in the reinterpretation of the past exploration data concerns the characteristics of the coal seams within the project area. The coal exhibits extreme variability in terms of thickness, occurrence and quality. All seams contain partings of shaley coal or coaly shale of varying thickness and extent. The combined effect of such variability, coupled with

- . steep and/or rapidly changing dips
- . strata deformation due to faulting and folding cause many uncertainties in the correlation and/or evaluation of the project area.

This is particularly true with respect to surface trench exposures updip from seams intersected in holes PP84D-1, PP84D-2 and PP84D-3. This rapid variation in seam thickness and continuity may have a detrimental effect on any future mining scheme. Clearly, any area identified as having desirable open-pit characteristics should be intensely explored with a drilling rig prior to initiation of mining activity.

#### 4.2 Coal Quality

Based on results of coal core samples obtained from 1984 drill core (Appendix 4) the coal of the Noman Creek is ranked as a low to medium volatile bituminous coal. The FSI values for air-dried clean coal, <sup>+</sup> vary considerably ranging from 1 to 9.

<sup>+</sup> floated at - 1.60 S.G.

CONFIDENTIAL DATA HAS BEEN  
REMOVED FROM APPENDIX 4.

The 'non-coking' FSI values appear to be crudely correlated with seams having raw ash values less than 10%. These coals need to be analyzed petrographically to determine if maceral content is fusinite and semi-fusinite rich, suggesting an early 'burn' history for the peat swamps forming these coal seams.

## 5.0 CONCLUSIONS AND RECOMMENDATIONS

During 1983, the data base of the Noman Creek licence block was re-evaluated and re-interpreted, (White & Fietz, 1983). The review of data resulted in a modified set of geological maps, cross-sections and a revised structural style and seam nomenclature. A limited drilling program was initiated in 1984 to substantiate this new interpretation and provide additional coal quality data. Although the drilling has reinforced the new interpretation, it has become clear that much additional drilling is required to begin understanding the complexity of seam correlation and structural geology. The lack of recognizable marker horizons in the Gething, other than the tonstein bands in seam E, make the work that much more difficult. However, the presence of reasonably thick, low raw ash, medium volatile seams in potentially low ratio open-pit areas (i.e. seams Q and W in PP84D-5 as well as seams close to surface in PP84D-3, seam G in PP84D-1 and seam M in PP84D-4) warrants further exploration for the Noman Creek property. However, this must be tempered by the evidence which indicates that many of these "low raw ash" seams are non-coking.

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**Province of British Columbia**  
**Ministry of Energy, Mines and Petroleum Resources**

## APPLICATION TO EXTEND TERM OF LICENCE

I, Glenn C. Proudfoot (Name) agent for Shell Canada Resources Limited (Name)  
(same) (Address) P.O. Box 100 (Address)  
Calgary, Alberta  
 Valid FMC No. 207.568

hereby apply to the Minister to extend the term of Coal Licence(s) No(s). 6253, 6255, 6257, 6259, 6260, 6261, 6262, 6263, 6264, 6265, 6266, 6267, 6268, 6276, + 7543 for a further period of one year.

2. Property name PINE PASS (GROUP No. 369)

3. I am allowing the following Coal Licence(s) No(s). to forfeit

4. I have performed, or caused to be performed, during the period MAY 21 1984 to MAY 20 1985, work to the value of at least \$ 130,080.<sup>65</sup> on the location of coal licence(s) as follows:

**CATEGORY OF WORK**

Category of Work	Licence(s) No(s).	Apportioned Cost
Geological mapping	<u>6261-6267, 6276</u>	<u>12,428.<sup>04</sup></u>
Surveys: Geophysical		
Geochemical		
Other		
Road construction		
Surface work		
Underground work		
Drilling	<u>6262 + 6263</u>	<u>70,052.<sup>18</sup></u>
Logging, sampling, and testing	<u>6262 + 6263</u>	<u>24,084.<sup>18</sup></u>
Reclamation		
Other work (specify)		
Off-property costs		<u>23,516.<sup>25</sup></u>

5. I wish to apply \$ 11,720.<sup>00</sup> of this value of work on Coal Licence(s) No(s). 7543 and \$ 118,360.<sup>65</sup> of this value on Coal licence Nos. 6253, 6255, 6257, 6259, 6260-6268 and 6276.

6. I wish to pay cash in lieu of work in the amount of \$ \_\_\_\_\_ on Coal Licence(s) No(s).

7. The work performed on the location(s) is detailed in the attached report entitled 1984 Geological Assessment Report - Pine Pass

April 23, 1985  
(Date)

R. H.  
(Signature)

Supervisor Land  
(Position)

**GEOLOGICAL MAPPING**

Yes  No

Area (Hectares) Scale Duration

Reconnaissance .....  
Detail: Surface 2285 ..... 1: 2000 ..... August 7 - Sept 11, 1984  
Underground .....  
Other\* (specify) .....  
Total Cost \$ 12,428.<sup>04</sup>

**GEOPHYSICAL/GEOCHEMICAL SURVEYS**

Yes  No

Method .....  
Grid .....  
Topographic .....  
Other\* (specify) .....  
Total Cost \$ .....

**ROAD CONSTRUCTION**

Yes  No

Length ..... Width .....  
On Licence(s) No.(s) .....  
Access to .....  
Total Cost \$ .....

**SURFACE WORK**

Yes  No

Length Width Depth Cost

Trenching .....  
Seam Tracing .....  
Crosscutting .....  
Other\* (specify) .....  
Total Cost \$ .....

**UNDERGROUND WORK**

Yes  No

No. of Adits Maximum Length No. of Holes Total Metres Cost

Test Adits .....  
Other workings\* .....  
Total Cost \$ .....

**DRILLING**

Yes  No

Hole Size No. of Holes Total Metres Cost

Core: Diamond .....  
Wireline NQ ..... 5 ..... 553 ..... 70,052.<sup>18</sup>  
Rotary: Conventional .....  
Reverse circulation .....  
Other\* (specify) .....  
Contractor TOMTO DRILLING LTD. .....  
Where is the core stored? CHATLEY LAKE, B.C. .....  
Total Cost \$ .....

**LOGGING, SAMPLING, AND TESTING**

Yes  No

Lithology: Drill samples  Core samples  Bulk samples   
Logs: Gamma-neutron  Density

Other\* (specify) .....  
Testing: Proximate analysis  FSI  Washability   
Carbonization  Petrographic  Plasticity   
Other\* (specify) .....  
Total Cost \$ 24,084.<sup>18</sup>

**RECLAMATION**

Yes  No

Details HAND RESEEDING OF DRILL SITES ..... Total Cost \$ Nil

**OTHER WORK (Specify details)**

Yes  No

.....  
Total Cost \$ .....

**OFF-PROPERTY COSTS**

Yes  No

Details REPORT GENERATION ..... Total Cost \$ 23,516.<sup>25</sup>

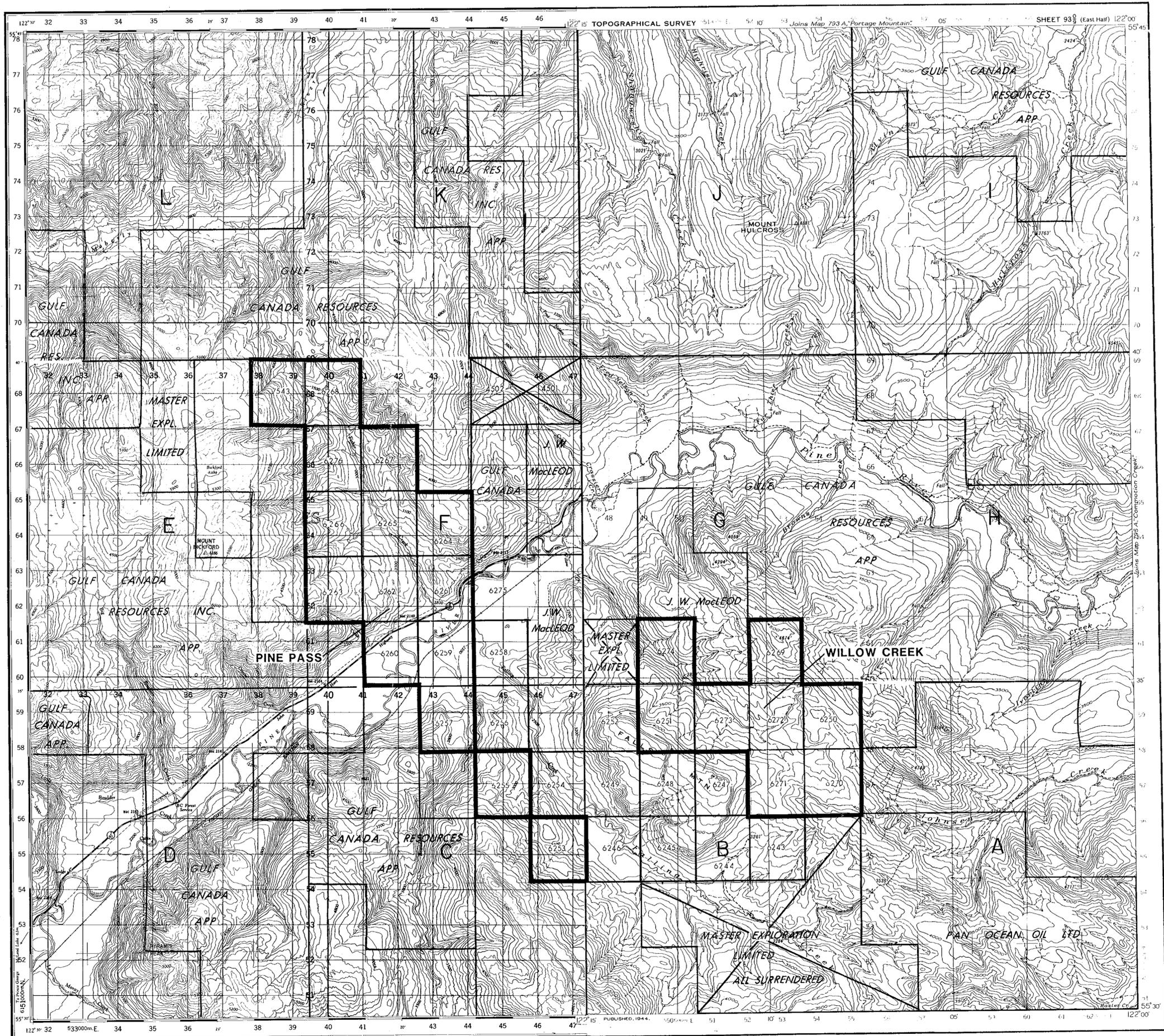
Total Expenditures \$ 130,080.<sup>65</sup>

April 23, 1985  
(Date)

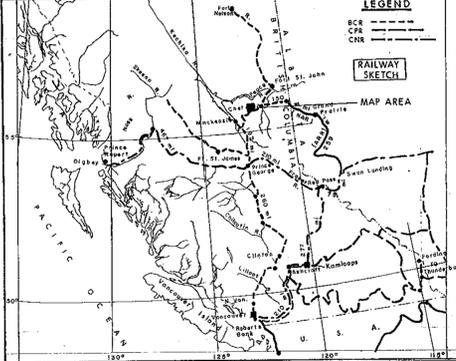
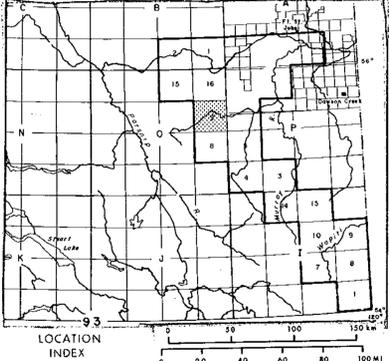
  
(Signature)

Manager, Geology  
(Position)

\*A full explanation of other work is to be included.



179.98  
180.02  
180.06  
180.10  
180.13  
180.17  
180.21  
180.25  
180.29  
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180.37  
180.41  
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180.64  
180.67  
180.71  
180.75  
180.79  
180.83  
180.87  
180.90  
180.94  
180.98  
181.02  
181.06  
181.10



**MOUNT HULCROSS**  
PEACE RIVER DISTRICT  
BRITISH COLUMBIA

SCALE 1:50,000  
1.25 inches to 1 mile approximately

Approximate magnetic declination, 29°32' East.

Copies may be obtained from the Map Distribution Office, Department of Mines and Technical Surveys, Ottawa.

INDEX TO ADJOINING SHEETS

9300	9301	9302	9303
9304	9305	9306	9307
9308	9309	9310	9311
9312	9313	9314	9315

93 9 WEST

**Crows Nest Resources Limited**  
EXPLORATION

MOUNT HULCROSS PROS. PR. PINE PASS 84(1)A '72  
NORTHEASTERN B.C.  
PEACE RIVER LAND DISTRICT

**COAL LAND DISPOSITION MAP**

SHELL - CNRL. LICENCES: PINE PASS  
NTS 93-0-9 BLK. B,C,F,G  
MAP 1 of 1 NTS 930/9

AUTHOR: WHITE/FIETZ	SCALE: 1:50,000	ENCLOSURE No:
DATE: FEB. 1979	REVISED: JULY, 1984	DRAWING No: RM5H30
To Accompany		

592

592

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-01

LOG DATE 84/08/24  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
.00	4.60	4.60	OB					TRICONED NO CORE RECOVERED.		
4.60	9.68	5.08	SLST				MINOR SANDSTONE	GRADES TO MUDSTONE AT BASE: CALCAREOUS, DARK GREY WITH OCCASIONAL LIGHT GREY SANDSTONE BANDS. BROKEN. MINOR IRON STAINING; CARBONACEOUS DEBRIS THROUGHOUT . COALY DEBRIS AT 5.9M ( < 0.10M)	73	7.00
9.68	12.52	2.84	COAL	G	1	88.00		RECOVERY 2.50/2.84. BRIGHT, RELATIVELY HARD. OF THE RECOVERED INTERVAL, TOP 0.3M AND BOTTOM 0.3M BROKEN TO PULVERIZED. 0.04M MUDSTONE AT 0.25M FROM TOP OF RECOVERED INTERVAL. SMALL (.15M) OOLITIC BAND WITHIN COAL AT 1.0M ABOVE BASE OF INTERVAL. SEPARATION WITH ROOF:V:FAIR;P:FAIR. SEPARATION WITH FLOOR:V:FAIR;P:GOOD.	62	8.50
12.52	21.00	8.48	MDST				CARBONACEOUS	DARK GREY TO BLACK. CALCAREOUS, WITH MINOR THIN SILTSTONE BANDS, MINOR THIN COALY LENSES THROUGHOUT ESPECIALLY IN UPPER 1.5M OF INTERVAL. THIN WISPS OF CALCITE AT 14.0-15.3M. BOTTOM CONTACT VY GRADATIONAL (SLST).	70	13.80
21.00	22.35	1.35	SLST					MEDIUM GREY, FINELY LAMINATED.	65	21.30

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-01

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TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
								CALCAREOUS. MINOR CARBONACEOUS DEBRIS.	60	22.50
22.35	22.80	.45	MDST				CARBONACEOUS	BLACK, DULL.		
22.80	24.20	1.40	COAL	I	2	100.00		REC: 1.40M/1.40M. BRIGHT, BROKEN TO GROUND TO PULVERIZED. 0.05M MUDSTONE AT 0.3M FROM TOP. 0.02M TONSTEIN AT 0.78M FROM TOP. TONSTEIN IS MEDIUM GREY SOFT, FLAKEY WHEN WET. SEPARATION WITH ROOF V: FAIR; P: FAIR. SEPARATION WITH FLOOR V: POOR; P: POOR.		
24.20	25.32	1.12	MDST		3	100.00	COALY/CARBONACEOUS	CONTAINS THIN COAL INTERBEDS. VERY BROKEN TO PULVERIZED. DULL WITH VERY MINOR BRIGHT BANDS. (FOOTWALL SAMPLE)		
25.32	28.68	3.36	SLST				FINE GRAINED SANDSTONE	DARK GREY, STICK CORE. CALCAREOUS. MINOR CARBONACEOUS MATERIAL. BOTTOM CONTACT GRADATIONAL WITH MUDSTONE.	60	25.70
									70	28.40
28.68	30.00	1.32	MDST		4	100.00	COALY TO CARBONACEOUS	BLACK, BROKEN. DULL TO BRIGHT (VERY MINOR). BOTTOM 0.3M OF INTERVAL COAL.		
30.00	31.30	1.30	SS				SLST	MEDIUM TO DARK GREY. MINOR SILTY INTERBEDS. CALCAREOUS. MUDSTONE RIP-UPS TO 5MM COMMON. SLIGHTLY	78	30.50

## PINE PASS CORE DESCRIPTION

02/28/85

-----  
DRILL HOLE # PP84D-01  
-----LOG DATE 84/08/24  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----
								COALY IN UPPER 0.10M. BOTTOM MARKED BY 0.05M CALCITE BAND.		
31.30	32.00	.70	MDST				VERY COALY	BLACK, BROKEN, DULL.		
32.00	37.64	5.64	MDST				SILTY	DARK GREY TO BLACK. CARBONACEOUS. CALCAREOUS IN SILTIER ZONES. GRAIN SIZE INCREASES TOWARDS BOTTOM OF INTERVAL.	72	35.00
									66	36.50
									66	37.10
37.64	38.14	.50	COAL	K	5	100.00		REC:0.50/0.50M. BRIGHT HARD BANDED. APPEARS CLEAN. TONSTEIN (0.02M) AT 0.10M FROM TOP OF INTERVAL. CONTAINS FINE COALY WISPS. TOP CONTACT SHARP, BOTTOM CONTACT IRREGULAR. (TONSTEIN SAMPLE SENT TO W.KILBY B.C.M.E.M.P.R) COAL SEAM SEPARATION WITH ROOF:V:POOR;P:POOR.		
38.14	38.21	.07	TNST	K	5	100.00		(TONSTEIN SAMPLE #2 SENT TO W.KILBY B.C.M.E.M.P.R)		
38.21	38.38	.17	COAL	K	5	65.00		REC:0.11/0.17M;BRIGHT,HARD.		
38.38	38.54	.16	TNST	K	5	100.00		COALY DEBRIS THROUGHOUT. BOTTOM 0.04M CONTAINS MUCH MIXED-IN COAL. (TONSTEIN SAMPLE #3 SENT TO		

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-01

LOG DATE 84/08/24  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
								W.KILBY.B.C.M.E.M.P.R)		
38.54	38.88	.34	COAL	K	5	76.00		REC:0.26/0.34M ;BRIGHT,APPEARS CLEAN.		
38.88	39.22	.34	MDST	K	5	100.00	VERY CARBONACEOUS / COALY	REC:0.34/0.34M;BLACK,BROKEN		
39.22	39.38	.16	SH	K	5	100.00	COALY	REC:0.16/0.16M.		
39.38	39.68	.30	MDST	K	5	100.00	CARBONACEOUS	REC:0.30M;DULL		
39.68	40.34	.66	COAL	K	6	98.00		REC:0.65. GROUND TO PULVERIZED. BRIGHT. SEPARATION WITH ROOF V:VERY POOR P:VERY POOR. SEPARATION WITH FLOOR V:POOR;P:POOR.		
40.34	41.76	1.42	SH		7	77.00	COALY	REC:1.1M. PERCENT COAL HIGHLY VARIABLE. BLACK. DULL TO MINOR BRIGHT ZONES BROKEN TO PULVERIZED.		
41.76	44.67	2.91	MDST				SILTY TO SANDY	BLACK.VERY CARBONACEOUS. UNIT BECOMES SILTY/SANDY @ 42.8M. @ 43.1 - 44.0M, HIGHLY FRACTURED AND BROKEN. ABUNDANT CALCITE (ALMOST CRYSTALLINE IN SOME INTERVALS). POSSIBLE FAULT ZONE! TOWARDS BASE, UNIT GRADES TO SILTY MUDSTONE. COARSER GRAINED SECTIONS ARE CALCAREOUS.	55	42.00
									63	42.90
									71	44.20

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-01

LOG DATE 84/08/24  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----
44.67	51.60	6.93	SS					MEDIUM GREY. PRIMARILY MEDIUM GRAINED WITH MINOR FINE GRAINED UNITS. CALCAREOUS. COMMON RIP UP CLASTS @ 45.7-45.9M, @ 46.6-46.7M. MINOR CALCITE LENSES BECOMING MORE ABUNDANT FROM 49.8-51.3M. MINOR COALY BLEBS AND WISPS THROUGHOUT.	73	44.80
									68	46.70
									65	51.10
51.60	60.90	9.30	SLST				INTERBEDDED SANDSTONE	GRADES TO MUDSTONE AT BASE OF INTERVAL. MEDIUM GREY. STICK TO SEMI-STICK CORE. CALCAREOUS. MINOR CALCITE LENSES IN UPPER 2M OF INTERVAL. NO CARBONACEOUS MATERIAL NOTED.	68	53.00
									57	55.80
									80	57.40
									73	59.40
									73	60.70
60.90	65.57	4.67	MDST				CARBONACEOUS	COALY IN PLACES. SLIGHTLY SILTY 64.5-65.6M. TONSTEIN (62.0-62.15M). SOFT, FLAKEY WHEN WET. SHARP UPPER CONTACT, INDISTINCT LOWER CONTACT. (TONSTEIN SAMPLE #4 SENT TO W.KILBY B.C.M.E.M.P.R)		
								TONSTEIN (62.95-63.05) IS MEDIUM GREY, SOFT, INDISTINCT (MIXED WITH MDST). (TONSTEIN SAMPLE #5 SENT TO W.KILBY B.C.M.E.M.P.R)		

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-01

LOG DATE 84/08/24  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
---	---	---	---	---	---	---	---	---	---	---
65.57	66.04	.47	SH				COALY			
66.04	66.35	.31	COAL	M	8	100.00		REC:0.31M. HARD, BRIGHT WITH 1CM TONSTEIN AT 0.15M FROM TOP.		
66.35	66.50	.15	SH				COALY	REC:0.08M. DARK GREY TO BLACK, PULVERIZED.		
66.50	67.20	.70	LC					GEOPHYSICAL LOGS INDICATE COAL.		
67.20	67.48	.28	SH			54.00	COALY	REC:0.15M. BLACK. ABUNDANT COAL LENSES.		
67.48	69.40	1.92	SLST					DARK GREY. CARBONACEOUS. COARSENING DOWNWARDS. VERY SLIGHTLY CALCAREOUS.		
69.40	70.40	1.00	MDST				COALY/CARBONACEOUS	CARBONACEOUS. FREQUENT COAL WISPS AND BLEBS.	68	70.60
70.40	75.20	4.80	SLST					CONTAINS MINOR FINE GRAINED SANDSTONE LENSES. COARSENS DOWN SECTION. GRADATIONAL INTO NEXT UNIT.	68	72.60
75.20	78.52	3.32	SS					DARK GREY. MEDIUM TO FINE GRAINED. CALCAREOUS. MINOR SILTSTONE INTERBEDS.	68	76.00
								STICK CORE.	63	77.00
78.52	84.10	5.58	MDST					BLACK. BROKEN. CARBONACEOUS TO COALY. BECOMES SILTY TOWARDS	67	79.20

PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-01

LOG DATE 84/08/24  
 EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
								BASE. TD. DEPTHS CORRECTED TO MATCH GEOPHYSICAL LOGS.	60	82.20

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-02

LOG DATE 84/08/24  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
---	---	---	---	---	---	---	---	---	---	---
.00	7.60	7.60	OB					TRICONED - NO CORE...CASING SET BUT LATER EXTENDED TO 10.14M.		
7.60	18.40	10.80	SS					FINE GRAINED. MEDIUM TO DARK GREY. INTERBEDDED SLST. HIGHLY FRACTURED TO*	55	7.70
								BROKEN. CALCAREOUS THROUGHOUT. OCCASIONAL CALCITE VEINLETS.	64	10.50
									59	12.20
									59	14.00
									62	16.00
									54	17.00
									58	18.00
18.40	21.40	3.00	MDST					BLACK. BROKEN. SLIGHTLY CALCAREOUS. CARBONACEOUS. CC FILLING IN HAIRLINE FRACTURES. BEDDING APPEARS TO BE VERY CLOSE TO THAT OF CORE AXIS. POSSIBLE FAULT ZONE!		
21.40	34.50	13.10	SLST				INTERBEDDED SS/MDST	DARK TO MEDIUM GREY. CALCAREOUS. COMMON HAIRLINE FRACTURES (<2 MM) INFILLED WITH CALCITE. BEDDING VARIES FROM NEAR 0 DEG AT TOP TO APPROX. 45 DEG NEAR BOTTOM. CONTINUATION OF POSSIBLE FAULT	7	22.20
									12	22.90
									25	25.50

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-02

LOG DATE 84/08/24  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINDR LITHOLOGY	REMARKS	C.B.A.	DEPTH
---	---	-----	-----	-----	-----	-----	-----	-----	-----	-----
								ZONE.		
									22	29.10
									32	30.50
									37	31.50
									40	32.20
									45	33.00
									47	34.00
34.50	36.95	2.45	MDST				SILTY	DARK GREY. CALCAREOUS. BROKEN. MINOR IRON STAINING. MINOR	55	35.80
								CALCITE VEINING. GRADATIONAL CONTACTS AT TOP AND BOTTOM.	52	36.70
36.95	38.10	1.15	SH					CARBONACEOUS, BLACK, BROKEN.		
38.10	38.14	.04	TNST					DARK GREY. FLAKEY, SOFT. CONTAINS COALY DEBRIS. (TONSTEIN SAMPLE #1 SENT TO W.KILBY B.C.M.E.M.P.R)		
38.14	38.40	.26	SH					BLACK, BROKEN, CARBONACEOUS.		
38.40	38.50	.10	TNST					MEDIUM TO DARK GREY. SOFT, FLAKEY. (TONSTEIN SAMPLE #PP84D02 #2 SENT TO W		

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-02

LOG DATE 84/08/24  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
38.40	38.50	.10	TNST					KILBY B.C.M.E.M.P.R)		
38.50	39.70	1.20	SH					BLACK, BROKEN, CARBONACEOUS.	78	39.00
39.70	39.83	.13	TNST					MEDIUM GREY. SOFT, FLAKEY. SHARP CONTACTS. (SAMPLE PP84D-02-#3 SENT TO W. KILBY B.C.M.E.M.P.R.)		
39.83	40.16	.33	MDST				CARBONACEOUS TO COALY	BLACK, BROKEN.		
40.16	41.68	1.52	COAL	M	1	33.00		REC:0.5M. BROKEN TO CRUSHED. BRIGHT TO DULL. DIRTY.		
41.68	44.64	2.96	MDST			71.00		REC:2.1M. DARK GREY TO BLACK. CARBONACEOUS WITH FREQUENT COAL WISPS. MOSTLY BROKEN. INTERVAL 42.2 - 42.8 LOST CORE? (GEOPHYSICAL RESPONSE NOT RECOGNIZABLE IN CORE).	73	42.10
									61	43.80
									63	44.50
44.64	44.76	.12	COAL			83.00	SHALEY	REC:0.1M.		
44.76	45.36	.60	SH			92.00	COALY TO CARBONACEOUS	REC:0.55M. DARK GREY TO BLACK. BROKEN.	72	45.20
45.36	46.04	.68	COAL		2	88.00		REC:0.6M. DULL TO BRIGHT. BROKEN TO PULVERIZED. HIGHER ASH @ 45.48-45.60M MINOR PYRITE IN ZONE 45.60 TO		

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-02

LOG DATE 84/08/24  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
								BASE.		
46.04	46.35	.31	SH				COALY	BLACK, FREQUENT COAL WISPS AND BLEBS.		
46.35	46.70	.35	SLST					DARK GREY. CALCAREOUS. CARBONACEOUS		
46.70	50.45	3.75	MDST				SHALEY	DARK GREY TO BLACK. BROKEN TO STICK. SLIGHTLY SILTY AT MID INTERVAL. SLIGHTLY CARBONACEOUS WITH OCCASIONAL COALY WISPS. SLICKENSIDED AT 50.1M.		
50.45	50.70	.25	COAL			60.00	SHALEY	REC:0.15M. DULL. BROKEN TO PULVERIZED.		
50.70	52.25	1.55	SLST				MINOR INTERBEDDED SS/MDST	MEDIUM TO DARK GREY. CALCAREOUS. MINOR HAIRLINE FRACTURES INFILLED WITH CALCITE.	55	52.00
52.25	53.65	1.40	MDST			68.00		REC:0.95M. CARBONACEOUS TO COALY. BLACK, BROKEN.		
53.65	58.25	4.60	SS				SILTSTONE	MEDIUM GREY. STICK TO BROKEN. COMMON < 1 MM THICK CALCITE VEINING. MORE COARSE GRAINED AT TOP. CALCAREOUS. SLIGHTLY CARBONACEOUS. SMALL SLICKENSIDED SURFACE AT 55.5M. MUDDY ZONE AT 57.75 - 58.10M.	53	53.80
									66	55.20
									66	57.00
									60	57.40

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-02

LOG DATE 84/08/24  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
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58.25	62.20	3.95	SLST				MUDSTONE	DARK GREY, BROKEN. CARBONACEOUS WITH MINOR COALY BLEBS. CC VEINING COMMON. CALCAREOUS THROUGHOUT.	47	61.00
62.20	66.20	4.00	MDST				COALY	BLACK. COMMON COALY WISPS AND BLEBS. SLIGHTLY SILTY. SILTIER ZONES ARE CALCAREOUS. VERY BROKEN CORE.	63	63.10
									57	64.40
									54	65.20
66.20	68.70	2.50	SLST				FINE GRAINED SANDSTONE	MEDIUM-DARK GREY. FINELY BEDDED. CALCAREOUS THIN CALCITE INFILLED FRACTURES COMMON. FINING DOWNWARDS UNIT.	57	66.80
									50	68.50
									48	69.20
									53	69.90
									50	70.80
68.70	71.20	2.50	MDST				SILTSTONE	FINING DOWNWARDS SEQUENCE. DARK GREY TO BLACK. CARBONACEOUS. OCCASIONAL COALY LENSES. FINE CALCITE WISPS THROUGHOUT.		
71.20	77.00	5.80	SS					FINE TO MEDIUM GRAINED. SILTY ON TOP 1.0M. MEDIUM GREY. ABUNDANT CC-FILLED FRACTURES, (INDICATIONS OF	52	72.10
									70	73.50

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-02

LOG DATE 84/08/24  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
								MINOR BRECCIATION). CALCAREOUS		
								THROUGHOUT. MUDSTONE RIP-UP CLASTS EVIDENT AT 1.0M FROM BASE OF INTERVAL.	58	74.10
								SHARP BOTTOM CONTACT.	60	75.40
77.00	78.30	1.30	MDST				SILTSTONE	TOP 0.25M DARK GREY TO BLACK MUDSTONE. SOMEWHAT COALY. MIDDLE IS GREY, SILTY MUDSTONE. BOTTOM 0.3M IS DARK GREY TO BLACK SHALEY MUDSTONE.		
78.30	86.40	8.10	SS					MOSTLY FINE GRAINED. SLIGHTLY COARSER GRAINED @ MID-INTERVAL	54	79.20
								AND SILTIER TOWARDS EITHER END. FINELY LAMINATED. COMMON SILTSTONE	52	82.20
								INTERBEDS. CC-FILLED FRACTURES THROUGHOUT. CALCAREOUS. BROKEN TO STICK.	49	83.00
								OCCASSIONAL MDST RIP UP CLASTS.	60	83.30
									65	85.40
									57	85.80
86.40	88.32	1.92	SLST				MUDSTONE	DARK GREY TO BLACK. INCREASINGLY CARBONACEOUS TOWARDS BASE OF UNIT. SLIGHTLY CALCAREOUS.	65	87.50
88.32	89.16	.84	COAL	0	3	83.00		REC:0.7M. CLEAN, BRIGHT, HARD. BROKEN TO STICK. PYRITIC NODULES AT 0.3M FROM		

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-02

LOG DATE 84/08/24  
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TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
88.32	89.16	.84	COAL	0	3	83.00		TOP OF INTERVAL. SEPARATION WITH ROOF V:POOR;P:FAIR. SEPARATION WITH FLOOR:V:POOR; P:POOR.		
89.16	89.50	.34	MDST					VERY CARBONACEOUS TO COALY, DARK GREY TO BLACK		
89.50	89.84	.34	SLST					MEDIUM GREY. GRADATIONAL. BOTTOM CONTACT		
89.84	91.10	1.26	SH					BLACK. SILTY AT TOP, CARBONACEOUS AT BASE.		
91.10	98.20	7.10	SLST				INTERBEDDED SS/MDST	INTERVAL IS A FINING DOWNWARDS SEQUENCE. MOSTLY DARK GREY-BLACK.	63	91.90
								COARSER GRAINED ZONES ARE MEDIUM GREY. CALCAREOUS THROUGHOUT. CARBONACEOUS WITH MINOR COALY BLEBS. FINE CC-FILLED FRACTURES AND VEINLETS COMMON.	63	94.20
									64	95.00
98.20	99.50	1.30	MDST					BLACK, DULL, CARBONACEOUS. MINOR CALCITE VEINING.		
99.50	102.40	2.90	SLST					DARK GREY, CALCAREOUS. STICK TO SLIGHTLY BROKEN. MINOR CALCITE VEINING.	62	100.30
									64	101.80
102.40	108.15	5.75	MDST					DARK GREY TO BLACK, WITH OCCASIONAL LIGHTER GREY,		

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-02

LOG DATE 84/08/24  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
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								SLIGHTLY CALCAREOUS SILTY ZONES. VERY CARBONACEOUS TO COALY @ 102.8-103.6M AND 107.5-107.7M.		
108.15	110.00	1.85	SLST					DARK GREY. GRADES TO MUDSTONE AT BASE. STICK TO SLIGHTLY BROKEN. HARD, CARBONACEOUS IN BOTTOM 0.3M OF INTERVAL. 0.8M COARSER GRAINED ZONE @ .1M ABOVE BOTTOM CONTACT.		
(4) 110.00	111.34	1.34	COAL	S	4	81.00		REC:1.08M. BRIGHT,BROKEN. SLIGHTLY HIGHER ASH BAND .6-.7M FROM TOP OF RECOVERED INTERVAL. SEPARATION WITH ROOF V:POOR;P:FAIR. SEPARATION WITH FLOOR V:FAIR:P:POOR.		
111.34	114.68	3.34	MDST					BLACK,DULL,CARBONACEOUS. SLIGHTLY CALCAREOUS THROUGHOUT WITH CALCITE WISPS COMMON IN UPPER 1M APPROX.	63	111.60
									60	112.20
									55	113.00
(5) 114.68	115.80	1.12	COAL	U	5	100.00		REC:1.18M. VERY BROKEN TO PULVERIZED,(HARD TO GET ACCURATE MEASUREMENT). BRIGHT WITH MDST PARTING (.03M) @ .42M FROM TOP. HIGH ASH COAL (.02M) @ .60M FROM TOP. HIGH ASH COAL		

## PINE PASS CORE DESCRIPTION

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TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
								(0.02M) @ .73M FROM TOP. DIRTY COAL (.05M) @ .95M FROM TOP. SEPARATION WITH ROOF V:FAIR:P:FAIR. SEPARATION WITH FLOOR V:POOR:P:POOR.		
115.80	115.98	.18	MDST		5	78.00	COALY	REC:0.14M. BLACK. CONTAINS 2 SMALL CALCITE VEINS. BOTTOM .06M VERY COALY SEPARATION WITH FLOOR V:GOOD;P:GOOD		
115.98	119.60	3.62	SLST				SANDSTONE	MEDIUM AND DARK GREY. STICK TO BROKEN. CALCAREOUS. SLIGHTLY CARBONACEOUS IN UPPER 2M OF INTERVAL.	61	116.40
									50	117.10
									80	118.40
									68	119.70
119.60	122.05	2.45	SLST				MUDSTONE	DARK GREY TO BLACK. CARBONACEOUS THROUGHOUT.COALY IN LOWER .3M. SLIGHTLY CALCAREOUS. BOTTOM .30M IS MUDSTONE ONLY.	61	120.40
									60	121.20
122.05	122.40	.35	SLST					DARK GREY TO BLACK.		
122.40	131.60	9.20	SS				SILTSTONE	MEDIUM GREY WITH DARK GREY SILTY INTERBEDS. STICK TO SLIGHTLY BROKEN. CALCAREOUS THROUGHOUT. SLIGHTLY CARBONACEOUS. SOFT	65	122.80
									67	123.50

## PINE PASS CORE DESCRIPTION

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DRILL HOLE # PP84D-02

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TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
								SEDIMENT DEFORMATION FEATURES COMMON. OCCASIONAL LIGHT BIOTURBATION. CALCITE INFILLED FRACTURES COMMON IN BOTTOM .2M OF INTERVAL. MINOR BRECCIATION AND FAULT OFFSETS IN LOWER .5M. BOTTOM .15M OF INTERVAL. SILTSTONE ONLY.	72	125.00
									66	126.10
									71	126.90
									65	128.80
									66	131.00
131.60	131.74	.14	COAL	W	6	85.00		BRIGHT, BROKEN. SEPARATION WITH ROOF V:GOOD:P:GOOD.		
131.74	131.98	.24	MDST	W	6	71.00	COALY/CARBONACEOUS	REC:0.17M BLACK, DULL.		
131.98	132.38	.40	COAL	W	6	90.00		REC:0.36M. BRIGHT. SEPARATION WITH FLOOR V:POOR P:FAIR. CRUSHED-PULVERIZED.		
132.38	133.56	1.18	MDST			88.00	COALY	REC:1.04M. BLACK. COALY BANDS AND WISPS COMMON. .03M COAL @ .12M FROM TOP.	74	133.20
133.56	134.50	.94	COAL	W	7	100.00		REC:0.94M. BRIGHT WITH DULL BANDS. RELATIVELY HARD. STICK TO BROKEN. SEPARATION WITH ROOF V:POOR:P:FAIR. SEPARATION WITH FLOOR V:POOR:P:FAIR.		
134.50	134.92	.42	SLST	W	8		SANDSTONE	REC:0.42M. DARK GREY. VERY CARBONACEOUS IN UPPER .06M.	73	134.70

## PINE PASS CORE DESCRIPTION

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LOG DATE 84/08/24  
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TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
134.92	136.07	1.15	COAL	W	10	39.00		REC:0.45M. BRIGHT. BROKEN TO PULVERIZED. SEPARATION WITH ROOF V:GOOD;P:GOOD		
136.10	139.72	3.62	COAL	W	10	93.00		REC:3.36M. BRIGHT WITH MINOR DULL BANDS. STICK TO PULVERIZED,HARD. LOWER .2M CONTAINS HIGHER ASH. SEPARATION WITH FLOOR V:GOOD:P:GOOD		
139.72	140.40	.68	MDST					BLACK CARBONACEOUS,SILTY TOWARDS BASE.		
140.40	146.90	6.50	SLST					DARK GREY. MINOR FINE GRAINED SANDSTONE AND MUDSTONE INTERBEDS. CALCAREOUS IN COARSER GRAINED ZONES. BIOTURBATION COMMON THROUGHOUT. SLICKENSIDED @ 142.9M. CC-INFILLED FRACTURES COMMON FROM 142.2M TO 143.9M. DRILLERS MARKER BLOCKS DIFFER FROM GEOPHYSICAL LOG BY .6M.	68	140.50
									65	142.60
									67	143.30
									70	144.90
								GEOPHYSICAL LOG DEPTHS USED.	70	146.80
								TD @ 146.9. MARKER BLOCKS AS MARKED BY THE DRILLERS DIFFERED FROM LOGS. DEPTHS ON MARKER BLOCKS GENERALLY .1M DEEPER THAN LITHOLOGIES ON LOGS. DEPTHS USED IN THIS DESCRIPTION ARE GEOPHYSICAL PICKS.		

## PINE PASS CORE DESCRIPTION

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DRILL HOLE # PP84D-03

LOG DATE 30/08/84  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
.00	6.10	6.10	OB					TRICONE.NO CORE		
6.10	9.70	3.60	SLST				SS	SANDSTONE FINE GRAINED. MEDIUM TO DARK GREY. MOSTLY STICK. CALCAREOUS.	70	7.90
								SLIGHTLY CARBONACEOUS. FINER GRAINED, MUDDIER UNIT @ 7.5M - 8.4M.	71	8.30
									68	9.70
									6	69.00
9.70	13.00	3.30	SS					MEDIUM GREY. FINE TO MEDIUM GRAINED. CALCAREOUS. VERY MINOR CARB DEBRIS.	72	10.20
								MINOR FINE CC-FILLED FRACTURE INFILLING. BROKEN ZONE @ 10.6-10.7M.	69	11.10
								OTHERWISE STICK CORE.	76	12.30
13.00	24.32	11.32	SLST				MDST	SILTSTONE:MEDIUM GREY. MUDSTONE:DARK GREY. SILTY ZONES ARE CALCAREOUS.	85	14.60
								BROKEN TO STICK. VERY SLIGHTLY CARBONACEOUS. OCCASIONAL SMALL FINE GRAINED	72	15.70
								SANDSTONE INTERBEDS. COALY SHALE ZONE @ 21.6M-21.8M.	73	17.10
								INTERVAL BECOMES SHALY IN LOWER .5M.	75	18.00
									76	20.50

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-03

LOG DATE 30/08/84  
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TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
									77	21.20
									77	23.30
									77	24.00
24.32	27.18	2.86	COAL		1	70.60		REC:2.02. BRIGHT,CLEAN. STICK TO PULVERIZED. HARD. FINELY BANDED. SEP.WITH ROOF V;FAIR P;GOOD. SEP.WITH FLOOR V;FAIR P;FAIR.		
27.18	27.30	.12	MDST		2	100.00		CARBONACEOUS TO COALY. BLACK. CONTAINS MINOR FINE DISSEMINATED PYRITE. REC;0.12M		
27.30	27.56	.26	COAL			7.60		BRIGHT. SEP.WITH FLOOR V;? P;? REC;0.02.		
27.56	32.40	4.84	SLST				MDST	DARK GREY TO BLACK. CARBONACEOUS TO COALY IN SOME INTERVALS. SLIGHTLY CARBONACEOUS IN SILTSTONE. BROKEN. BOTTOM CONTACT GRADATIONAL.	68	28.80
									72	29.30
									72	30.30
									78	32.50
32.40	34.55	2.15	MDST					CARBONACEOUS MUDSTONE TO COALY MUDSTONE. BROKEN. COALY WISPS/BLEBS COMMON.	76	33.40

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-03

LOG DATE 30/08/84  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
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32.40	34.55	2.15	MDST					POSSIBLE (MINOR) COAL ZONES THAT HAVE BEEN GROUND;		
34.55	36.10	1.55	SS					FINE GRAINED. MEDIUM TO DARK GREY. ABUNDANT BIOTURBATION.	77	34.80
								SOFT SEDIMENT DEFORMATION. CALCAREOUS, SLIGHTLY CARBONACEOUS. HARD; 'STICK'	74	36.00
									76	36.10
36.10	36.50	.40	SLST					DARK GREY, CALCAREOUS. BROKEN. MINOR CALCITE. FRACTURE INFILLING. MUDSTONE @ BASE.		
36.50	38.00	1.50	COAL		3	53.30		REC; 0.8M. GROUND-PULVERIZED. BRIGHT-DULL (MINOR). PTG @ 36.8M MAY HAVE BEEN RECOGNIZED. SEP. WITH ROOF V; ? P; ? SEP. WITH FLOOR V; ? P; ?		
38.00	38.38	.38	MDST					CARBONACEOUS TO COALY. DARK GREY TO BLACK. COALY WISPS/BLEBS COMMON. DULL. BROKEN. .02M GROUND COALY ZONE @ .07M FROM BASE OF INTERVAL.		
38.38	38.60	.22	SH			13.63	COAL	GROUND TO PULVERIZED. DULL. REC; 0.03M		
38.60	39.55	.95	MDST					CARBONACEOUS TO COALY MUDSTONE. DARK GREY TO BLACK. BROKEN. CONTAINS COALY BLEBS.		

## PINE PASS CORE DESCRIPTION

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DRILL HOLE # PP84D-03

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TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A. DEPTH
39.55	41.80	2.25	SLST				SS	FINE GRAINED. MEDIUM TO DARK GREY. MOSTLY BROKEN. CALCAREOUS; BROKEN TO 'STICK'. NO CARBONACEOUS MATERIAL EVIDENT.	66 39.80 75 41.40 73 41.90
41.80	42.22	.42	SH					BLACK. CARBONACEOUS TO COALY.	
42.22	43.02	.80	COAL		4	72.50		REC:0.58M. HARD,DULL,CLEAN. 'GRAPHITE-LIKE' IN LUSTRE. PULVERIZED IN UPPER 0.08M...BALANCE IS BROKEN. SEP.WITH ROOF V;POOR P;POOR. SEP.WITH FLOOR V;FAIR P;GOOD.	
43.02	46.45	3.43	SS				SLST	MEDIUM TO DARK GREY. CALCAREOUS, CARBONACEOUS. SOFT SEDIMENT DEFORMATION MINOR BIOTURBATION. BOTTOM CONTACT GRADATIONAL.	80 43.80 78 44.40 80 46.00
46.45	47.48	1.03	SH					BLACK. CARBONACEOUS TO COALY. SLIGHTLY SILTY TO BASE OF INTERVAL.	
47.48	47.62	.14	COAL		5	57.10		BRIGHT. HARD,BROKEN. SEP.WITH ROOF V;POOR P;FAIR. REC;0.08M	
47.62	47.66	.04	TNST		5	100.00		MEDIUM GREY,SOFT,FLAKEY. .015M TONSTEIN, .01M COAL,.015	

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-03

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TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
								TONSTEIN. COALY WISPS IN TONSTEINS.		
47.66	47.94	.28	COAL		5	60.70		REC;0.17M. BRIGHT,HARD,BROKEN. HIGHER ASH TO BASE.		
47.94	47.98	.04	TNST		5	100.00		MEDIUM GREY,SOFT,FLAKEY. CONTAINS COAL WISPS AND BLEBS		
47.98	48.10	.12	COAL		5	50.00		REC;0.06M. HARD,BRIGHT TO DULL,'STICK'.		
48.10	48.30	.20	TNST		5	65.00		REC;0.13. MEDIUM GREY. SOFT,FLAKEY. CONTAINS COAL BLEBS AND .02M COAL INTERBED @ MID-INTERVAL.		
48.30	48.60	.30	COAL		5			LOST CORE		
48.60	49.26	.66	SH					BLACK. CARBONACEOUS TO COALY. BROKEN. REC;0.50M		
49.26	49.92	.66	COAL		6	67.00		REC;0.44M. BRIGHT,'STICK' (@TOP) TO PULVERIZED (@BASE). DIRTY WITH MUDSTONE PTGS IN LOWER .15M OF RECOVERED INTERVAL.		
49.92	50.02	.10	TNST					REC;0.1M. SOFT,MEDIUM-DARK GREY. FLAKEY. CONTAINS .02M MUDSTONE INTERVAL @ MID-INTERVAL.		

## PINE PASS CORE DESCRIPTION

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DRILL HOLE # PP84D-03

LOG DATE 30/08/84  
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TOP ---	BASE ---	THICKNESS ---	MAJOR ---	SEAM ---	SAMPLE# -----	REC % -----	MINOR LITHOLOGY -----	REMARKS -----	C.B.A. -----	DEPTH -----
50.02	50.16	.14	SH					(COALY SHALE...?) LOST CORE		
50.16	51.90	1.74	SH					BLACK. CARBONACEOUS. COMMON COAL BLEBS/WISPS.	72	51.00
51.90	59.10	7.20	SLST				SS	FINE-GRAINED. MINOR MUDSTONE INTERBEDS. MEDIUM-DARK GREY. 'STICK' CORE, HARD. CALCAREOUS.	77	54.00
									74	57.20
									77	57.40
									78	58.30
59.10	60.70	1.60	SS					FINE-MEDIUM GRAINED, MEDIUM GREY. FINELY LAMINATED. 'STICK'. CALCAREOUS.	83	59.20
								SMALL SLICKENSIDED SURFACE @ 60.3M	82	60.00
60.70	69.34	8.64	MDST					DARK GREY TO BLACK. MASSIVE. 'STICK' CORE. HARD. SILTY INTERVALS IN TOP 1M (.64.0M - 67.6M). NO CARBONACEOUS MATERIAL EVIDENT. SILTIER ZONES ARE SLIGHTLY CALCAREOUS.		
69.34	70.22	.86	SLST					DARK GREY. MASSIVE, 'STICK'. SLIGHTLY CARBONACEOUS. BOTTOM .05M VERY CARBONACEOUS TO COALY.		

## PINE PASS CORE DESCRIPTION

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TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
70.22	70.38	.16	COAL			93.70		BROKEN. BRIGHT. REC;0.15M. SEP.WITH ROOF V;POOR P;POOR.		
70.38	70.92	.54	SH			81.50		CARBONACEOUS (@TOP) TO COALY (@BASE). ABUNDANT COALY BLEBS; 1CM TONSTEIN+ BAND @ .31M FROM TOP OF INTERVAL RECOVERED. REC;.44M		
70.92	71.20	.28	COAL			10.70		COAL (?). BRIGHT,PULVERIZED. REC;0.03M		
71.20	71.35	.15	COAL			100.00	SHALE	BLACK. BROKEN,DULL. REC;0.15M.		
71.35	71.50	.15	COAL		7	100.00		REC.O.15M. BRIGHT,PULVERIZED TO BROKEN. SEP.WITH FLOOR V;POOR P;POOR		
71.50	72.80	1.30	MDST					BLACK. CARBONACEOUS @ TOP AND BOTTOM. SILTY @ MID INTERVAL	73	71.90
72.80	72.96	.16	COAL			12.50		REC;0.02M		
72.96	73.35	.39	MDST					CARBONACEOUS TO COALY. BLACK. BROKEN.		
73.35	79.90	6.55	SLST				MDST	CARBONACEOUS TO COALY IN SOME INTERVALS. SILTY ZONES ARE CALCAREOUS. VERY MINOR WISPS OF CALCITE. COALY ZONE @ 76.9 -77.4M. CORE MOSTLY 'STICK' TO SLIGHTLY BROKEN.	71	75.00
									87	78.10
									83	78.80

## PINE PASS CORE DESCRIPTION

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DRILL HOLE # PP84D-03

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TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
79.90	84.80	4.90	SS				SILTSTONE	VERY FINE TO MEDIUM GRAINED. MEDIUM TO DARK GREY WITH SMALL LIGHT GREY ZONES; 'STICK' TO SLIGHTLY BROKEN; LIGHT BIOTURBATION THROUGHOUT; MINOR CARBONACEOUS DEBRIS; CALCAREOUS.	81	80.50
									76	82.00
									75	83.50
84.80	86.40	1.60	MDST					CARBONACEOUS. DARK GREY. SLIGHTLY SILTY. MASSIVE. STICK-TO SLIGHTLY BROKEN. SLIGHTLY BROKEN		
86.40	87.30	.90	SLST					MEDIUM TO DARK GREY. BROKEN. FINELY BANDED. CALCAREOUS. HARD; NO CARBONACEOUS MATERIAL EVIDENT.		
87.30	89.35	2.05	MDST					CARBONACEOUS. BLACK. BROKEN. BOTTOM 0.3M GROUND TO PULVERIZED		
89.35	93.90	4.55	SLST					DARK GREY, CARBONACEOUS. BROKEN WITH SOME 'STICK'. BROKEN TO PULVERIZED ZONE (89.7 - 89.8M). CALCITE INFILLING COMMON 92.0 - 92.2M AND LOWER .1M SMALL BROKEN ZONE @ 93.0M. SMALL SLICKENSIDED SURFACE @ 91.25M. CARBONACEOUS.	77	90.00
									75	91.50
									81	92.80
93.90	97.30	3.40	SS				SILTSTONE	SILTY (@TOP) TO SANDSTONE (@BASE). MEDIUM-DARK GREY. OCCASIONAL CALCITE	74	95.80

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-03

LOG DATE 30/08/84  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
93.90	97.30	3.40	SS				SILTSTONE	INFILLED FRACTURES IN LOWER .5M. CALCAREOUS. 'STICK' TO SLIGHTLY BROKEN SMALL SLICKENSIDED SURFACE @ 97.2M	76	96.50
97.30	99.80	1.50	SLST				MUDSTONE	DARK GREY. BROKEN. SLIGHTLY CARBONACEOUS. CALCAREOUS. GROUND TO VERY BROKEN 98.1 - 98.3M. SANDY ZONE @ 99.0 - 99.30M.	77	99.00
99.80	102.20	2.40	MDST					CARBONACEOUS TO COALY. BLACK. BROKEN. THIN COAL INTERBEDS AND BLEBS COMMON. COALY ZONE 100.6 - 101.06M		
102.20	105.20	3.00	SLST					DARK GREY. CARBONACEOUS. BROKEN. GROUND ZONE @ 103.6-103.9M. ABUNDANT CC WISPS 103.0 TO TOTAL DEPTH. BEDDING INDISTINCT BUT APPEARS TO BE APPROX. 50 DEG. @ 104.2M. OCCASIONAL MINOR SLICKENSIDED SURFACE...MAY BE IN CLOSE PROXIMITY TO FAULT ZONE.TD @ 105.2		

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-04

LOG DATE 09/02/84

EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
								20.0-22.0M. NO CARBONACEOUS MATERIAL NOTED.		
								COMMON CALCITE-INFILLED FRACTURES. SMALL SLICKENSIDED SURFACES @ 20.8, 20.95 AND 22.25M. CORE IS BROKEN TO STICK. CALCAREOUS.	53	22.20
22.80	29.80	7.00	SLST					CARBONACEOUS TO COALY. MINOR MUDSTONE ZONE. DARK GREY, VERY BROKEN.	55	23.00
								VERY SLIGHTLY CALCAREOUS IN UPPER 2M. BOTTOM 3M VERY BROKEN. SLICKENSIDED SURFACES COMMON. SMALL COALY ZONES/SMEARS...PROBABLE FAULT ZONE.	54	23.80
									28	27.40
									40	28.50
29.80	32.88	3.08	COAL	M		12.00	SLST	LOST CORE...RECOVERED ONLY .37M. SLST IS DARK GREY, CARBONACEOUS. BROKEN. NOT CALCAREOUS. SLICKENSIDED SURFACES @ LOW < TO CORE AXIS. APPROX. 12 DEGREES TO CORE AXIS.		
32.88	33.35	.47	MDST	M		31.91		SILTY, CARBONACEOUS-COALY. DARK GREY-BLACK. BROKEN-VY BROKEN.		
								COMMON SLICKENSIDED SURFACES. REC .15M		
33.35	35.01	1.66	COAL	M	1	24.10		VERY POOR RECOVERY. ONLY .4M		
35.01	37.80	2.79	MDST					SILTY, DARK GREY-BLACK CARBONACEOUS-COALY WITH	37	1.00

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-04

LOG DATE 09/02/84  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
								OCCASIONAL 2MM COAL BANDS. VERY BROKEN. REC 1.75M.	50	37.50
37.80	38.40	.60	SLST					MEDIUM TO DARK GREY. HARD. CARBONACEOUS. MOSTLY MASSIVE. ABUNDANT CALCITE VEINING. IRREGULAR SLICKENSIDED SURFACES COMMON.		
38.40	39.60	1.20	COAL				SHALE	PULVERIZED (EXTREME). MOSTLY DARK GREY MUDSTONE. .05M COALY MATERIAL @ BASE REC;0.4M		
39.60	44.40	4.80	SS					LIGHT GREY.MOSTLY MEDIUM GRAINED. ABUNDANT-FREQUENT CALCITE FRACTURE INFILLING. OCCASIONAL CARBONACEOUS MATERIAL THROUGHOUT. BECOMING MORE COMMON TO BASE. MUDSTONE RIP-UP CLASTS IN LOWER .2M. CALCAREOUS THROUGHOUT. BROKEN THROUGHOUT. VERY BROKEN IN UPPER 0.5M	40	41.50
									30	42.50
									35	43.00
									40	44.30
44.40	44.70	.30	SLST					DARK GREY, HARD, SLIGHTLY CARBONACEOUS. OCCASIONAL CALCITE WISPS/BANDS IN 46.0-47.2M.	60	45.00
									60	45.90
								CALCAREOUS.	60	46.50
									58	47.00
									60	47.50

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-Q4

LOG DATE 09/02/84  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJDR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
44.70	44.80	.10	COAL		2	100.00		REC 0.1M FSI SAMPLE ONLY.		
44.80	48.00	3.20	SLST					AS AT 44.4M .		
48.00	49.10	1.10	MDST					COALY, DARK GREY TO BLACK. BROKEN. ABUNDANT SMALL COALY BANDS. REC; 0.32M		
49.10	50.00	.90	SLST					CARBONACEOUS, DARK GREY, BROKEN. TOP .03M CONTAINS SMALL COAL BANDS.	70	49.50
50.00	51.95	1.95	SS					LIGHT-MEDIUM GREY, FINE GRAINED FINELY BEDDED. STICK TO SLIGHTLY BROKEN.	58	50.40
								VERY MINOR CARBONACEOUS DEBRIS OCCASIONAL CALCITE VEINING. CALCAREOUS.	65	51.40
									66	51.90
51.95	54.50	2.55	SLST				SANDSTONE	FINE GRAINED, DARK TO MEDIUM GREY. STICK. SOFT SEDIMENT DEFORMATION AND	64	53.30
								BIOTURBATION COMMON. MINOR CALCITE WISPS. FINE MUDSTONE ZONES @ 51.95-52.2M	63	53.60
								AND 54.15-54.5M. VERY SLIGHT CARBONACEOUS MATERIAL.	62	54.10
54.50	55.65	1.15	SS					LIGHT GREY, MEDIUM GRAINED. FINELY BEDDED. STICK. HARD. CALCAREOUS	63	54.70
								NO CARBONACEOUS MATERIAL EVIDENT.	66	55.60

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-04

LOG DATE 09/02/84  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
55.65	56.30	.65	MDST					COALY, BLACK, MASSIVE. MORE COALY IN LOWER .3M (APPROX. 50% COAL BANDS). BROKEN IN LOWER 0.3M.		
56.30	57.28	.98	SLST					DARK GREY, CALCAREOUS. CARBONACEOUS. STICK-SLIGHTLY BROKEN. BOTTOM .45M IS FINEGRAINED SANDSTONE.		
57.28	59.77	2.49	MDST					DARK GREY-BLACK. STICK-BROKEN' CALCAREOUS (SLIGHTLY). CARBONACEOUS. COALY BLEBS COMMON IN LOWER 2M VERY BROKEN ZONE 58.8 - 59.1M	64	57.70
									65	59.40
									63	59.70
59.77	62.40	2.63	SLST					MEDIUM-DARK GREY. STICK TO SLIGHTLY. BROKEN. CALCAREOUS. MINOR SANDSTONE AND MUDSTONE INTERBEDS. SLIGHTLY CARBONACEOUS. ABUNDANT WISPY CALCITE @ 60.0 -60.2M	60	60.00
									54	60.50
									65	61.00
									65	62.40
62.40	65.10	2.70	MDST					DARK GREY. SLIGHTLY SILTY IN SOME INTERVALS. STICK. BOTTOM CONTACT VERY GRADATIONAL. VERY SLIGHTLY CARBONACEOUS. SILTY ZONES ARE CALCAREOUS.	66	63.20
									63	64.70

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-04

LOG DATE 09/02/84  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
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								MINOR COALY DEBRIS @ 97.18 AND 98.1M.		
								COMMON CALCITE FRACTURE INFILLING. CALCAREOUS THROUGHOUT. OCCASIONAL 3M (APPROX.) RIP-UP CLASTS. END OF HOLE. TD @ 99.1	45	99.00

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-04

LOG DATE 09/02/84  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
65.10	65.70	.60	SLST					MEDIUM-DARK GREY, CALCAREOUS. STICK. MINOR BIOTURBATION. HARD. VERY MINOR CARBONACEOUS DEBRIS. BOTTOM CONTACT GRADATIONAL.	61	65.20
65.70	75.80	10.10	SS					MOSTLY MEDIUM GRAINED WITH MINOR FINE GRAINED INTERVAL TO BASE. LIGHT TO MEDIUM GREY WITH MINOR DARK GREY INTERVALS IN THE FINER GRAINED ZONE. VARIES FROM FINELY LAMINATED TO .4M THICK MASSIVE ZONES. CALCAREOUS THROUGHOUT BIOTURBATION THROUGHOUT. STICK TO BROKEN. @ 66.8 - 67.2M...MASSIVE. @ 67.6 - 69.0M...FINELY LAMINATED. CALCITE FILLED GOUGE ZONE @ 69.8M. ABUNDANT WISPY CARBONACEOUS DEBRIS @ 70.0-71.4M. @ 71.4 - 74.5M... FINE GRAINED TO SILTY ZONE.	68 62 49 54 61 55 60 62	66.40 68.00 70.00 70.20 71.80 73.30 74.00 75.20
75.80	77.10	1.30	MDST					DARK GREY, SILTY (@ TOP) TO COALY (@ BASE). MOSTLY STICK. BROKEN @ 76.85 - 77.1M. MINOR CARBONACEOUS DEBRIS THROUGHOUT.		
77.10	81.50	4.40	SLST				SANDSTONE	DARK GREY, STICK TO SLIGHTLY BROKEN. VERY MINOR CARBONACEOUS DEBRIS	65	79.00

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-04

LOG DATE 09/02/84  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
77.10	81.50	4.40	SLST				SANDSTONE	DISTINCT FINING UPWARDS SEQUENCE... FINE GRAINED SANDSTONE @ BASE TO SILTY MUDSTONE @ TOP.	61	80.00
									65	81.00
81.50	87.78	6.28	SLST				MUDSTONE	MINOR FINE GRAINED SANDSTONE INTERBEDS. MOSTLY DARK GREY WITH MINOR BLACK ZONES. MOSTLY STICK. CALCAREOUS. NO CARBONACEOUS MATERIAL NOTED EXCEPT FOR 83.95-84.0M. BOTTOM 2M.. NEARLY MASSIVE.	63	82.80
									62	83.60
									63	85.00
									67	85.70
87.78	88.22	.44	COAL		3	54.50		REC; 0.24M. BRIGHT, SHEARED. BROKEN. SEP. WITH ROOF V; FAIR P; GOOD		
88.22	88.82	.60	COAL		3	83.30	SHALE	REC; 0.50M. BLACK, BROKEN. THIN COAL BANDS INTERBEDDED. SEP. WITH FOOR V; FAIR P; GOOD		
88.82	96.20	7.38	SS					MEDIUM-DARK GREY, CALCAREOUS. HARD. 88.82-92.75M... MASSIVE. 92.75-96.2M... FINELY BEDDED. STICK. MINOR CALCITE FRACTURE INFILLING.	66	92.80
									68	94.00
									60	95.20
96.20	99.10	2.90	SS					MEDIUM GRAINED, MEDIUM GREY. FINELY BEDDED. BROKEN-STICK. COARSE GRAINED ZONE @ 97.5-98.2M. CONTAINS	55	96.00
									60	97.00

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-04

LOG DATE 09/02/84  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJDR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
.00	8.20	8.20	OB					TRICONE NO CORE! NOTE: APPARENT DEFLECTION @ 8.8 - 9.0M DUE TO BTM OF CASING @ 8.8M		
8.20	13.30	5.10	SLST					DARK GREY. BROKEN. CARBONACEOUS. ABUNDANT FINE WISPS OF CALCITE. VY BROKEN: 12.3 - 12.8M. OCCASIONAL 1-2MM COALY BANDS.	56	8.60
									60	10.00
									60	11.00
									54	12.90
13.30	13.80	.50	SS					FINE GRAINED, DARK GREY. CALCAREOUS, SLIGHTLY CARBONACEOUS. FINELY LAMINATED BROKEN. IRONSTAINING THROUGHOUT.		
13.80	19.90	6.10	SLST					DARK GREY. MINOR/FINE MUDSTONE ZONE. CARBONACEOUS. OCCASIONAL FINE CALCITE INFILLED FRACTURES. BROKEN...VERY BROKEN @ 16.35-16.6M AND 19.2-19.9M. SMALL 5CM MUDSTONE/COAL ZONE @ 18.65-18.10M. SLICKENSIDED ZONE @ 19.4-19.5M CALCAREOUS THROUGHOUT.	60	15.00
									62	16.00
									60	17.00
									47	18.80
19.90	22.80	2.90	SS					FINE-MEDIUM GRAIN, MEDIUM AND DARK GREY. FINELY BEDDED. MINOR SOFT SEDIMENT DEFORMATION FEATURES @	52	20.40
									52	21.20

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-05

LOG DATE 09/02/84  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
.00	4.50	4.50	OB					TRICONE TO 4.5M...NO CORE		
4.50	5.40	.90	SLST					DARK GREY. BROKEN. FINE SANDSTONE INTERBEDS COMMON. CALCAREOUS		
5.40	7.10	1.70	SS					LIGHT GREY. FINE TO MEDIUM GRAINED. BROKEN. CALCITE INFILLED FRACTURES COMMON. LIMONITE STAINING ON SOME FRACTURES...02M OF RIP-UP CLASTS @ 6.35M	52	6.50
7.10	8.60	1.50	MDST					BLACK. SHALEY. BROKEN. SMALL SILTY BANDS. BOTTOM 0.3M VERY BROKEN... ABUNDANT COALY DEBRIS.		
8.60	9.27	.67	SS					LIGHT GREY. FINE GRAINED. CALCAREOUS. CONTACT TOP AND BOTTOM...SHARP.	66	9.10
9.27	11.26	1.99	MDST					CARBONACEOUS TO COALY. BLACK. SILTY @ TOP...VERY CARBONACEOUS @ BASE. INCREASING COMMON COALY WISPS TO BASE. MOSTLY BROKEN		
11.26	12.26	1.00	COAL					SEP. WITH ROOF V; POOR P; POOR, REC;0.78M CRUSHED TO BROKEN. MOSTLY BRIGHT, MINOR DULL. HIGHER ASH UNIT IN LOWER 0.2M OF RECOVERED INTERVAL		
12.26	12.36	.10	COAL		1	80.00	SHALE	BLACK. COMMON COALY WISPS AND BLEBS REC; 0.08M		
12.36	12.84	.48	COAL		1	62.50		BRIGHT. CLEAN. BROKEN. GOOD		

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-05

LOG DATE 09/02/84  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
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								CLEAT. SEP. WITH FLOOR V; POOR P; GOOD		
12.84	18.70	5.86	SS					FINE TO MEDIUM GRAINED WITH MINOR COARSE GRAINED ZONES. VERY CARBONACEOUS CALCAREOUS. MOSTLY BROKEN. @ 12.84 - 13.0M..	70	14.00
									57	15.10
									65	16.00
									70	16.90
									68	18.70
18.70	31.80	13.10	SLST				SANDSTONE	INTERBEDDED. DARK GREY (SILTSTONE) INTERBEDDED WITH 0.09 - 0.05M INTERBEDS OF MEDIUM TO DARK GREY. FINE GRAINED SANDSTONE. OCCASIONAL BIOTURBATION. CALCAREOUS THROUGHOUT. BROKEN-STICK. OCCASIONAL FINE CALCITE INFILLED FRACTURES. NO CARBONACEOUS MATERIAL NOTED. MAY BE A MASSIVE DEPOSIT (??)	68	19.80
									70	20.80
									76	22.00
									66	23.00
									68	25.00
									63	26.00
									64	27.00
									52	29.10
									67	31.00

## PINE PASS CORE DESCRIPTION

02/28/85

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DRILL HOLE # PP84D-05  
-----LOG DATE 09/02/84  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
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									67	32.00
31.80	32.68	.88	SS					MEDIUM GREY. MEDIUM TO COARSE GRAINED. CARBONACEOUS WISP IN LOWER 0.2M. STICK-BROKEN. OCCASIONAL CALCITE INFILLED FRACTURES. CALCAREOUS. TOP AND BOTTOM CONTACT SHARP.		
32.68	33.54	.86	COAL			34.90	SHALE	BLACK, DULL, STICK-BROKEN. COMMON COALY WISPS. MINOR FINE DISSEMINATED PYRITE REC; 0.3M		
33.54	34.40	.86	COAL	M	2	58.10		REC; 0.5M. BRIGHT. HARD. MOSTLY BROKEN.  SEP. WITH ROOF V; POOR P; FAIR, SEP. WITH FLOOR V; POOR P; POOR		
34.40	35.18	.78	MDST					COALY TO CARBONACEOUS. .03M VERY COALY, BLACK, DULL. MINOR COALY WISPS.		
35.18	37.80	2.62	SLST				SANDSTONE	FINE GRAINED. MOSTLY DARK GREY WITH SOME MEDIUM GREY. CALCAREOUS. STICK-BROKEN. MINOR CALCITE INFILLED FRACTURES. BOTTOM CONTACT ABRUPT.	61	35.80
								SANDIER ZONE @ 36.0 - 36.4M AND 37.4 TO BOTTOM.	62	36.50
									57	37.80
37.80	38.60	.80	COAL			18.75		REC; 0.15M BRIGHT, HARD. MINOR VERY THIN PYRITE BANDS.		

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-05

LOG DATE 09/02/84  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
38.60	39.20	1.20	MDST				SILTSTONE	DARK GREY, STICK. CARBONACEOUS. SLIGHTLY CALCAREOUS. COMMON FINE WISPY CALCITE IN UPPER .04M. GRADATIONAL CONTACT AT BASE	65	38.70
39.20	41.18	1.98	SS				SILTSTONE	MEDIUM-DARK GREY. FINE GRAINED SANDSTONE INTERBEDS WITH SILTSTONE. MUDSTONE BAND @ 39.9-40.0M. CALCAREOUS. CALCITE INFILLED FRACTURES. CARBONACEOUS. BOTTOM CONTACT GRADATIONAL.	67 52 60	39.90 40.80 41.10
41.18	41.60	.42	SLST				MUDSTONE	COALY, BLACK. COALY DEBRIS-WISPS INCREASE TO BASE. SILTSTONE CONTACT DECREASES		
41.60	42.40	.80	COAL			92.50	MUDSTONE	REC; 0.74M. BLACK, BROKEN TO PULVERIZED. .1M CLEAN COAL @ TOP. APPEARS BRIGHT AND HARD. BALANCE IS MAINLY MUDSTONE WITH ABUNDANT SCATTERED COALY DEBRIS.		
42.40	43.84	1.44	SLST				SANDSTONE	DARK GREY WITH MEDIUM GREY FINE GRAINED SANDSTONE INTERBEDS. STICK. CALCAREOUS, CARBONACEOUS. OCCASIONAL CALCITE BANDS TO 2MM THICK.	60 64	43.00 43.70
43.84	44.58	.74	COAL		3	48.60		REC; 0.36M. BRIGHT, HARD, BROKEN. MINOR DISSEMINATED PYRITE.		

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-05

LOG DATE 00/00/42  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
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								SHARP UPPER/LOWER CONTACT. SEP. WITH ROOF V; GOOD P; GOOD. SEP. WITH FLOOR  V; GOOD P; GOOD.		
44.58	45.33	.75	MDST					SILTY, DARK GREY-BLACK. SLIGHTLY CALCAREOUS. CARBONACEOUS. SMALL COALY BLEBS @ BASE. MOSTLY STICK. SLIGHTLY BROKEN	64	45.00
45.33	49.40	4.07	SLST				SANDSTONE	FINE GRAINED. MEDIUM-DARK GREY. STICK. CALCAREOUS. SLIGHTLY MOTTLED. COMMON BIOTURBATION (ESPECIALLY IN TOP 2 M). OCCASIONAL CALCITE INFILLED FRACTURES.	60 58	46.90 49.40
49.40	50.30	.90	MDST					CARBONACEOUS, BLACK, STICK. COMMON WISPY CALCITE PARALLEL TO BEDDING.		
50.30	50.80	.30	MDST					HARD, DENSE, DARK GREY. VERY CALCAREOUS. BRECCIATED WITH CALCITE INFILLING		
50.80	51.60	.80	MDST					BLACK, CARBONACEOUS. CALCITE WISPS PARALLEL TO BEDDING. CALCAREOUS.		
51.60	52.52	.92	COAL	0	4	63.00		REC; 0.58M. BRIGHT, HARD, BROKEN SEP. WITH ROOF V; GOOD P; GOOD  SEP. WITH FLOOR V; GOOD P; GOOD		

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-05

LOG DATE 09/02/84  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
52.52	59.10	6.58	SLST				MUDSTONE	DARK GREY WITH MINOR MEDIUM GREY. FINE GRAINED SANDSTONE BANDS @ 55.-55.3M AND 57.1-57.45M. COALY SHALE INTERBED 58.0-58.1M. STICK-SLIGHTLY BROKEN. OCCASIONAL FINE CALCITE INFILLED FRACTURES. CALCAREOUS. SLIGHTLY CARBY. LIGHT BIOTURBATION.	60	52.70
									66	54.50
									58	55.60
									59	58.40
59.10	60.70	1.60	MDST					BLACK, CARBONACEOUS, STICK. WISPY CALCITE THROUGHOUT.	65	60.30
④ 60.70	62.90	2.20	COAL	Q	5	55.00		REC; 1.21M BRIGHT. BROKEN TO PULVERIZED. SEP. WITH ROOF V; FAIR P; FAIR SEP. WITH FLOOR V; GOOD P; EXCELLENT.		
62.90	67.60	4.70	MDST					SILTY, CARBONACEOUS. NOT CALCAREOUS. STICK-BROKEN. VERY MINOR FINE GRAINED SANDSTONE BANDS TO 5 MM THICK.	63	63.30
									61	65.80
									59	67.00
67.60	68.12	.52	COAL			48.10		BRIGHT. BROKEN. SEP. WITH ROOF V; FAIR P; GOOD. SEP. WITH FLOOR V; GOOD: P; GOOD		
68.12	72.05	3.93	SLST				MUDSTONE	DARK GREY, CALCAREOUS. CARBONACEOUS. STICK-BROKEN.	70	68.40

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-05

LOG DATE 09/02/84  
EXAMINED BY A. WHITE

TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
								OCCASIONAL LIGHT BIOTURBATION. MINOR WISPS OF CALCITE. MINOR SLICKENSIDING @ 69.0	64	69.60
									63	70.20
									67	71.10
72.50	72.62	.57	MDST					CARBONACEOUS. BLACK. STICK. MASSIVE		
72.62	72.76	.14	COAL	U	6	42.80		REC; 0.06M. HARD, BRIGHT, BROKEN SEP. WITH ROOF V; FAIR P; GOOD		
72.76	72.94	.18	COAL	U	6	50.00	MUDSTONE	REC; 0.09M. BLACK, DULL.		
72.94	74.64	1.70	COAL	U	6	57.00		BRIGHT TO DULL. MOSTLY PULVERIZED. REC; 0.97M		
74.64	74.74	.10	COAL	U	6	40.00	MUDSTONE	REC; 0.04M.. BLACK, DULL.		
74.74	75.40	.66	COAL	U	6	50.00		BRIGHT, HARD, STICK. REC; 0.33M. SEP. WITH ROOF V; POOR P; GOOD.		
75.40	79.00	3.60	MDST					CARBONACEOUS, BLACK, STICK. SLIGHTLY BROKEN. SILTY ZONE @ 78.3-78.8M. OCCASIONAL COALY BLEBS. COAL IN UPPER 0.4M. (APPROX.)	69	75.50
									65	77.20
									64	78.40
									66	79.50

## PINE PASS CORE DESCRIPTION

02/28/85

DRILL HOLE # PP84D-05

LOG DATE 09/02/84  
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TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
79.00	79.50	.50	COAL			42.00		REC; 0.21M. DULL WITH BRIGHT. HARD, BROKEN. SEP. WITH ROOF V; POOR P; FAIR		
79.50	79.80	.30	MDST			86.70		REC; 0.26M; DULL. BLACK. VERY CARBONACEOUS		
79.80	80.20	.40	COAL			30.00		REC; 0.12M. BRIGHT. BROKEN TO PULVERIZED. SEP; WITH FLOOR V; FAIR P; FAIR		
80.20	80.70	.50	MDST					CARBONACEOUS TO COALY, BLACK. DULL. COAL BLEBS COMMON. INCREASE SILT TO BOTTOM OF SECTION.		
80.70	85.30	4.60	SS					MEDIUM GREY, FINE GRAINED. CARBONACEOUS-COALY IN SOME INTERVALS. CALCAREOUS THROUGHOUT. GRADATIONAL CONTACT TOP AND BOTTOM. HARD.. MOSTLY STICK. ABUNDANT FINE CROSS BEDDING @ 83.6-84.1M. ABUNDANT 1-2MM MUD RIP-UP CLASTS	80	80.40
									63	82.20
									58	83.50
									77	84.00
85.30	87.25	1.95	SLST				SANDSTONE	FINE GRAINED, DARK GREY, MOTTLED STICK. CALCAREOUS. CARBONACEOUS. OCCASIONAL SOFT SEDIMENT DEFORMATION. LIGHT BIOTURBATION. GRADATIONAL CONTACT @ TOP AND BOTTOM.	72	86.20
									78	86.60
87.25	88.28	1.03	MDST					COALY, BLACK, STICK-SLIGHTLY		

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TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
								BROKEN. COALY BLEBS COMMON. SILTY IN TOP .5M		
88.28	89.08	.80	COAL	W	7	72.50		HARD,STICK,DULL WITH BRIGHT BANDS. REC;0.58M. SEP. WITH ROOF V;POOR P;FAIR. SEP. WITH FLOOR V;POOR P;FAIR.		
89.08	89.70	.62	COAL	W	8	83.90	SHALE	BLACK,DULL,VERY COALY IN UPPER .12M AND BOTTOM .2M OF RECOVERED INTERVAL. CONTAINS SMALL COAL BANDS IN LOWER 0.2M. REC;0.52M.		
89.70	92.04	2.34	COAL	W	9	22.20		CLEAN,BRIGHT,BROKEN. SLIGHTLY SLICKENSIDED. SEP. WITH ROOF V;POOR P;POOR SEP. WITH FLOOR V;POOR P;POOR. REC;0.52M.		
92.04	92.64	.60	MDST	W	10	75.00		COALY,BLACK,DULL. ABUNDANT COALY WISPS-BLEBS. BOTTOM .05M...VERY COALY. REC; 0.45M.		
92.64	93.02	.38	COAL	W	10	39.50		COAL REC;0.15M. BRIGHT,BROKEN SEP.WITH FLOOR V;FAIR P;FAIR.		
93.02	98.00	4.98	SLST					DARK GREY,CALCAREOUS. SLIGHTLY CARBONACEOUS. STICK,HARD. SLIGHTLY COARSER GRAINED @ 96.7-97.3. FINE GRAINED TO MUDDY @ 97.3-98.0M. OCCASIONAL FINE WISPY CALCITE.	66	95.50
									65	97.00

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TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
98.00	99.95	1.95	SS					MEDIUM GREY, FINE GRAINED, HARD CALCAREOUS. ABUNDANT CALCITE INFILLED FRACTURES. SOMEWHAT VUGGY IN SOME OF FRACTURE INFILLED ZONES. SLICKENSIDED SURFACES. BRECCIATED @ 98.8-99.0M.		
99.95	102.80	2.85	MDST					SILTY IN UPPER 2M. DARK GREY TO BLACK. DULL, CARBONACEOUS. STICK CORE.	57	101.00
									55	102.80
102.80	103.10	.30	COAL			70.00		DULL WITH BRIGHT BANDS, BROKEN SEP. WITH ROOF V; POOR P; POOR. REC; 0.21M		
103.10	104.86	.76	MDST			27.60	SS	COALY, STICK, BLACK, DULL. .21M SS PARTING DARK GREY, FINE GRAINED. CALCITE FILLED FRACTURE.		
104.86	105.14	.28	COAL			100.00		REC; 0.28M BRIGHT, BROKEN. FINE PYRITE SMEAR @ BASE. SEP. WITH FLOOR V; POOR P; FAIR.		
105.14	110.50	5.36	SLST				SANDSTONE	FINE GRAINED. DARK-MEDIUM GREY (SS) HARD. STICK. CALCAREOUS. ABUNDANT WISPY CALCITE AND CALCITE INFILLED FRACTURES. SLICKENSIDED @ 107.7M. SMALL COALY BAND 105.8-106.0M.	53	105.40
									42	108.90

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TOP	BASE	THICKNESS	MAJOR	SEAM	SAMPLE#	REC %	MINOR LITHOLOGY	REMARKS	C.B.A.	DEPTH
								CARBONACEOUS WITH OCCASIONAL COALY BLEB. BEDDING VARIABLE ESPECIALLY IN LOWER 2.5M.		
110.50	112.68	2.18	MDST					SILTY, CARBONACEOUS. DARK GREY- BLACK. CALCAREOUS, DULL. ABUNDANT WISPY CC. SMALL SLICKENSIDE @ 111.4M. MOSTLY STICK. BROKEN IN LOWER 0.3M		
112.68	114.00	1.32	COAL		11	77.30		REC; 0.2M MOSTLY BRIGHT. BROKEN TO PULVERIZED. SLICKENSIDES COMMON. SEP. WITH ROOF V; POOR TO FAIR P; FAIR SEP. WITH FLOOR V; POOR P; FAIR		
114.00	117.40	3.40	MDST					BLACK, CARBONACEOUS-COALY. SILTY FROM 116.5-116.9M. SLICKENSIDED @ 114.7M AND @ 115.2-115.7M. WISPY CALCITE COMMON THROUGHOUT. EOH. TD @ 117.4	70	116.00
									66	117.20