

PR- SOKUNKA 71(3) ~~A4~~
NATIONAL TRUST CO. LTD. (AS TRUSTEE)

COALITION MINING LIMITED
SOKUNKA COAL PROJECT

~~GEOLDEX~~
~~WOLFFE TO~~

00645

APPENDIX F

DRILL HOLE DATA
DIAMOND DRILL HOLES C-23 TO C-35

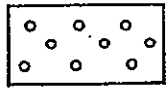
Reference for Graphic
Sections of Drill Hole Data

See reverse side

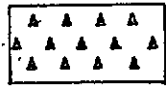
Prepared by CLIFFORD McELROY & ASSOCIATES PTY. LIMITED

DETAIL OF GETHING FORMATION

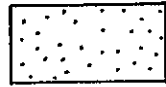
Scale 1" = 50'



CONGLOMERATE
pebble to granule



BRECCIA



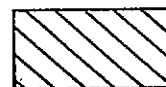
SANDSTONE



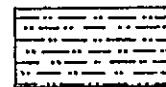
SILTSTONE



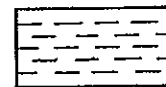
CLAYSTONE



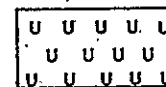
STONE COALY or
CLAYSTONE
CARBONACEOUS



MUDSTONE



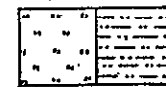
SHALE, SILTSHALE,
CLAYSHALE



SOIL, WEATHERED and
UNCONSOLIDATED
MATERIAL



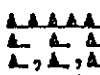
INTERBEDDED



LAMINITE



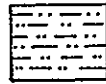
45° INCLINED STRATA



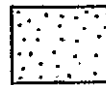
FAULT
established
probable
possible

TOTAL DRILL HOLE SECTIONS

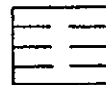
Scale 1" = 200'



HULLCROSS MEMBER



COMMOTION
FORMATION
GATES MEMBER



SUKUNKA MEMBER



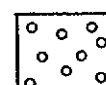
MOOSEBAR
FORMATION



UPPER GETHING
SEQUENCE



GETHING
FORMATION
LOWER GETHING
SEQUENCE



CADOMIN
FORMATION

COAL SEAMS

Scale 1" = 2'



COAL BRIGHT or UNDIFFERENTIATED
COAL MAINLY BRIGHT with MINOR DULL BANDS
COAL DULL and BRIGHT
COAL MAINLY DULL with MINOR BRIGHT BANDS
COAL DULL
COAL INTERLAYED with NON-COAL
NON-COAL INTERLAYED with COAL
COAL STONY
STONE COALY
COAL WEATHERED

REFERENCE FOR GRAPHIC SECTIONS
of
DRILL HOLE DATA

PREPARED BY CLIFFORD McELROY & ASSOCIATES PTY LIMITED

COALITION MINING LIMITED

SUKUNKA COAL PROJECT

January 1972

NOTES TO ACCOMPANY APPENDIX F

This appendix includes logs for all drill holes sunk on behalf of Coalition Mining Limited during the 1971 field season and for most of the drill holes completed during the two previous field seasons by Brameda Resources Ltd. The drill hole data are included in the following volumes:

<u>Volume No.</u>	<u>Drill Hole No.*</u>
6	D.D.H.'s C-1 to C-8
7	D.D.H.'s C-9 to C-22
8	D.D.H.'s C-23 to C-35
9	D.D.H.'s C-36 to C-41; CS-1 to CS-7.
10	D.D.H.'s CM-1 to CM-9; RDH R-1 to R-15
11	D.D.H. S-1 to S-50

*D.D.H. - Diamond Drill Hole; R.D.H. Rotary Drill Hole.

Data for the following drill holes are not included;

D.D.H. S-2 and D.D.H. S-29 - the core of these holes was not available for logging as it is stored by the Alberta Study Group of the Canadian Geological Survey in Calgary, Alberta:

D.D.H. S-3 - This hole is outside the area of immediate interest and was collared below the level of the Chamberlain Seam.

R.D.H. R-7 - This hole was abandoned in the overburden.

The data included for each drill hole, drilled on behalf of Coalition Mining Limited, are included in the following order:

Graphic section - Stratigraphic Log of Drill Hole.

Graphic section - Detail of Gething Formation.

Graphic section - Seam sections of Chamberlain and Skeeter Seams.

Analytical Data.

Written Stratigraphic Log.

Written Log of Gething Formation.

Accompanying each of Volume 6 to 11 is a Reference relating to the graphic sections.

Stratigraphic Logs are included for all drill holes, at a scale of 200 feet to 1 inch. The footages quoted in these logs are based on the drillers depth markers and are not corrected for core loss. The footages quoted are considered to be accurate to within 0.5 feet.

Detailed Logs of the Gething Formation for the interval from about 50 feet below to about 50 feet above the Chamberlain/Skeeter Seams have been corrected for core loss and are accurate to 0.01 feet. Observations of the coal and the adjacent strata, recovered in a stationary split inner tube, have enabled corrections for core loss to be applied to that part or parts of the core which were broken, disturbed and obviously not fully recovered during drilling. Graphic logs, at a scale of 50 feet to 1 inch have been constructed for this interval of the Gething Formation.

Graphic Sections of the Chamberlain and Skeeter Seams have been prepared at a scale of 2 feet to 1 inch. These logs and sections give details of the coal and the stone bands within the seams. Some analytical data has been included on the graphic sections.

The S-Series drill holes were completed during the 1969 and 1970 field seasons by Connors Drilling Limited for Bamedia Resources Limited. Stratigraphic sections and logs of these drill holes are accompanied by analytical data provided by Bamedia Resources Limited.

The R-Series drill holes were completed during the 1971 field season by Big Indian Drilling Ltd, using a reverse circulation method of rotary drilling. A graphic, stratigraphic log of each of these drill holes at a scale of 50 feet to 1 inch is included.

The C, CS and CM-Series diamond drill holes were completed during the 1971 field season by Connors Drilling Limited and Canadian Longyear Limited for Coalition Mining Limited.

In addition, D.D.H.'s S-14, S-17 and S-41 were deepened during the 1971 programme. A complete set of graphic sections, written logs and analytical data is included for these drill holes.

BORE NUMBER C-23

Grid Reference 35641.6N 94580E

Exploration Grid Reference K/4+1000'E

Date Commenced 19th Sept, 1971 Completed 4th Oct, 1971

Collar R.L. 6077.8 ft Standard Datum

Total Depth 1995.0 ft Electrically Logged Yes/~~No~~

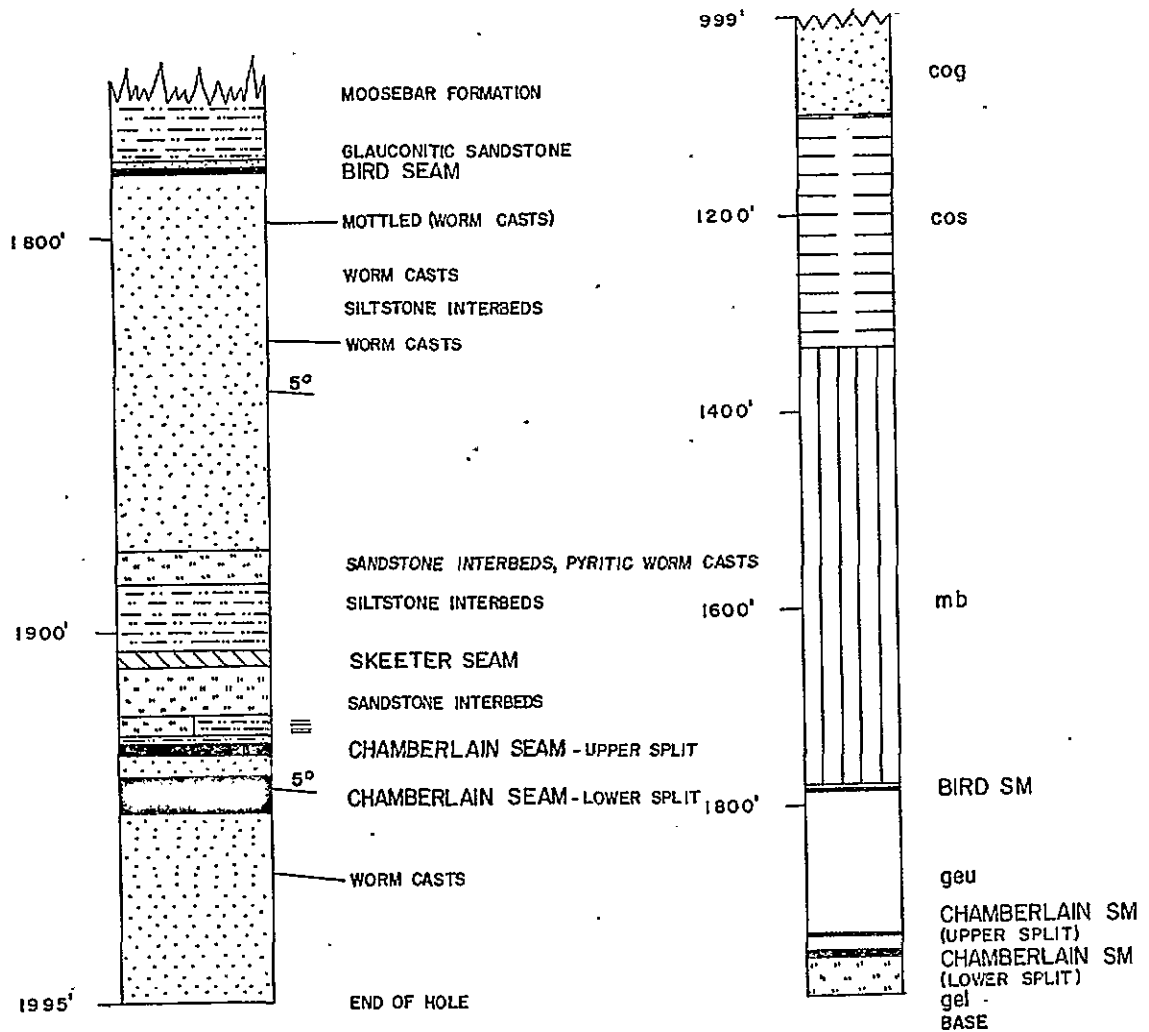
Drilled by Canadian Longyear Ltd

For Coalition Mining Limited

Logged by F. H. S. Tebbutt

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Chamberlain upper split	4144.3	4.20	65%	
Chamberlain lower split	4131.0	8.13	67%	



DETAIL OF GETHING
FORMATION
SCALE: 1" to 50'

SCALE: 1" to 200'

Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS
DDH C-23


DRAWN BY S.A.

DATE: January '72

PAGE 1 of 1

CHAMBERLAIN SEAM
UPPER SPLIT

ASH %
CUMULATIVE
FROM FLOOR

		WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
1929.28					2.8	
		4.20	-	2.8	8	
1933.48						

Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED
DRAWN BY pm DATE Jan '72

SEAM SECTIONS
DDH C-23

SCALE: 1" to 2'

CHAMBERLAIN SEAM
LOWER SPLIT

ASH %
CUMULATIVE
FROM FLOOR

		WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
1938.69					4.8	
		8.13	-	4.8	7	
1946.82						

Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED
DRAWN BY pm

SEAM SECTIONS
DDH C-23

DATE Jan '72

SCALE: 1' to 2'

PAGE 1 of 1

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

C A R G O
SUPERINTENDENTS
CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify

APPLICANT: COALITION MINING

REPORT ON: SUKUNKA SAMPLES NO. 138, 139
CORE NO. C23
CHAMBERLAIN SEAM (UPPER SPLIT) and (LOWER SPLIT)

REPORT NO. K71-1789

RECEIVED: 8. 11. 1971

REPORTED: 26. 11. 1971



This Laboratory is Registered by the
National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

M Bradley
A.R.A.C.I. Chief Chemist.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

[Signature]

INTRODUCTION:

Two coal samples designated CORE NO. C23 CHAMBERLAIN SEAM received on 8. 11. 1971 from Clifford McElroy & Associates.

METHOD:

The coal samples No. 138, 139 were hand crushed to $\frac{3}{4}$ " sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions and raw -30 mesh coal fractions were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative floats 1.60 SG fraction was prepared for samples No. 138, 139 and the analysis are given in this report.

NOTE:

Sample weights have not been adjusted to compensate for core loss.

RESULTS:

FIGURE 1 : gives the graphic log of the core

TABLES 1-2 : give the sizing, washability and analytical data for each coal sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 1

WASHABILITY DATA FOR SAMPLE NO. 138 (after hand crushing to $\frac{3}{4}$ ")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
F1.30 SG	1179	76.0	1.4	9	76.0	1.4	9
S1.30 - F1.35 SG	253	16.3	4.6	6	92.3	2.0	8½
S1.35 - F1.40 SG	88	5.7	9.4	2½	98.0	2.4	8
S1.40 - F1.45 SG	11	0.7	13.3	1½	98.7	2.5	8
S1.45 - F1.50 SG	11	0.7	16.2	1	99.4	2.6	8
S1.50 - F1.55 SG	2	0.1	20.1	1	99.5	2.6	8
S1.55 - F1.60 SG	1	0.1	30.6	1	99.6	2.6	8
S1.60 SG	6	0.4	57.7	0	100.0	2.8	8
-30 Mesh	93	5.7	1.4	9			

Total Weight of Sample = 1644 grams

True Specific Gravity = 1.247

SHEET THREE ATTACHED HERETO

TABLE 2

WASHABILITY DATA FOR SAMPLE NO. 139 (after hand crushing to
-¾")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
F1.30 SG	1521	48.9	2.2	8½	48.9	2.2	8½
S1.30 - F1.35 SG	1050	33.8	5.2	6½	82.7	3.4	8
S1.35 - F1.40 SG	348	11.2	9.1	3½	93.9	4.1	7½
S1.40 - F1.45 SG	124	4.0	13.3	1	97.9	4.5	7
S1.45 - F1.50 SG	39	1.3	15.7	1	99.2	4.6	7
S1.50 - F1.55 SG	15	0.5	18.7	1	99.7	4.7	7
S1.55 - F1.60 SG	4	0.1	25.6	1	99.8	4.7	7
S1.60 SG	7	0.2	40.4	0	100.0	4.8	7
-30 Mesh	262	7.8	3.7	8½			

Total Weight of Sample = 3370 grams

True Specific Gravity = 1.280

ANALYSIS OF FLOATS 1.60 SG FRACTION OF SAMPLE NO. 138

Yield %	99.6
Air Dried Moisture %	0.6
Ash %	2.6
Volatile Matter %	20.0
Fixed Carbon %	76.8
Total Sulphur %	0.39
C.S.NO.	8
Calorific Value	14910 BTU/LB

ANALYSIS OF FLOATS 1.60 SG FRACTION OF SAMPLE NO. 139

Yield %	99.8
Air Dried Moisture %	0.5
Ash %	4.7
Volatile Matter %	20.5
Fixed Carbon %	74.3
Total Sulphur %	0.35
C.S.NO.	8
Calorific Value	14640 BTU/LB

SYDNEY

26th November 1971.

K71-1789

COALITION MINING

SUKUNKA C23 -

CHAMBERLAIN SEAM

	SPL.	THICK	ASHT.	CANP
4				
	138	4.20	2.8	9
2				
0				
8				
6				
	137	8.12	4.8	7
4				
2				
0				

STRATIGRAPHIC LOG
SUKUNKA D.D.H. C-23

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
	No core to 999.0 ft.		
	SANDSTONE, grey, medium grained, quartz-lithic,	GATES MB.	1220.0
	SANDSTONE, as above, with silty interbeds and phases, 3 conglomerate bands between 1076' and 1079', Dip 0-5°.	SUKUNKA MB.	1550.0
	SANDSTONE, fine, silty interbeds and phases, worm casts, mud blebs. From 1336-1338.5' dip angle increases from 0 → 30° with mudstone bands at top and bottom containing rock chips - some calcite. Dip below this 0°.		1338.0
	MUDSTONE, dark grey. Increased dips and slight slickensiding in small zones at 1564', 1565-1570', mudstone band at 1583'-1585', white clay bands at 1732', 1744', 1780', 1788.5'.	MOOSEBAR FM.	1780.5
	SANDSTONE, glauconitic.	GETHING FM.	1782.0
	<u>COAL.</u>	BIRD SEAM	1783.5
	SANDSTONE, grey, medium grained becoming finer, quartz-lithic, mottled (worm casts) at 1797', silty interbeds 1804-1833', worm casts 1808-1824' and at 1832'.		

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
	Pebbles at 1827'. Dips 0-5°, but 1876' increasing to 35° with one heavy calcite vein at base on slickensides, abutting 0-5° dip beneath.		1880.0
	SILTSTONE, sandy phases and interbeds, pyritic worm casts.		1888.0
	MUDSTONE, dark grey, some silty and sandy interbeds towards top.		1905.0
	CLAYSTONE, carbonaceous with coaly bands at 1905' and from 1907-1910'.	SKEETER SM.	1910.0
	SILTSTONE, grey, sandy interbeds and phases.		1922.0
	LAMINITE, siltstone and mudstone.		1927.0
	MUDSTONE, dark grey.		1929.5
	<u>COAL.</u>	CHAMB. SM. upper split	1932.0
	SANDSTONE, silty interbeds and phases		1337.5
	<u>COAL.</u>	CHAMB. SM. lower split	1946.0
	SANDSTONE, grey, medium grained becoming finer, worm casts at 1962'.		1995.0
			<u>Base of Hole</u>

SUKUNKA D.D.H. C-23

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
Core not logged in detail - refer to Stratigraphic Log for particulars.		1829.09		
SANDSTONE, grey, medium grained at top, becoming fine grained 2.3' from top, occasional silty interbeds, worm casts at 3.3' from top. Bedding angle 85-90 ⁰ to core axis.	19.56	1848.65	19.18	
SANDSTONE, grey, fine grained, quartz-lithic, bedding angle 85-90 ⁰ to core axis.	23.84	1872.49	23.28	
SILTSTONE, grey, to very fine sandstone. Sandy phase (medium grained with silty interbeds) from 0.20' to 0.47' from top. Irregular coaly masses, some bounded by thin calcite coating from 0.45'-0.58' from top. Calcite vein parallel to bedding 0.50' from top. Mud blebs 3.8' from top. Calcite vein 0.02' from base. Base slickensided at 57 ⁰ to core axis.	4.91	1877.40	4.79	
SANDSTONE, grey, fine grained, quartz-lithic.	4.34	1881.74	4.24	
SILTSTONE, grey, mudstone interbeds (numerous), specks of pyrite.	0.65	1882.39	0.63	

SUKUNKA D.D.H. C-23

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, fine grained, quartz-lithic, numerous silty interbeds.	2.26	1884.65	2.21	
SILTSTONE, grey, numerous mudstone interbeds, pyritic worm casts.	3.90	1888.55	3.81	
MUDSTONE, dark grey.	0.40	1888.95	0.39	
CLAYSTONE, dark brownish grey, tending carbonaceous.	0.80	1889.75	0.78	
SANDSTONE, grey, fine to very fine grained, numerous carbonaceous claystone interbeds.	8.07	1897.82	7.88	
CLAYSTONE, dark brown, carbonaceous, coaly bands.	0.41	1898.23	0.40	
SANDSTONE, grey, very fine grained, claystone carbonaceous interbeds.	0.95	1899.18	0.93	
<u>COAL</u> , mainly dull with minor bright bands.	0.12	1899.30	0.12	
SANDSTONE, carbonaceous, very fine grained.	0.15	1899.45	0.15	
CLAYSTONE, dark brown, carbonaceous, coaly bands, core broken.	0.36	1899.81	0.35	

SUKUNKA D.D.H. C-23

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE, grey, carbonaceous with claystone carbonaceous phases, bedding angle 85° to 90° to core axis.	5.33	1905.14	5.20	
CLAYSHALE, carbonaceous, soft and easily broken.	0.47	1905.61	0.46	
SILTSTONE, carbonaceous, coaly bands towards base.	1.76	1907.37	1.72	
<u>COAL</u> , mainly dull with minor bright bands.	0.05	1907.42	0.05	
SILTSTONE, carbonaceous.	0.06	1907.48	0.06	
CLAYSHALE, carbonaceous, coaly wisps and thin bands, one calcite vein, soft phases.	2.02	1909.50	1.97	
SANDSTONE, grey, fine grained, quartz-lithic, worm casts, silty interbeds and phases. Bedding angle 85-90° to core axis.	11.75	1921.25	11.46	
LAMINITE, siltstone grey and mudstone grey and mudstone dark grey interbedded. Some fine sandy interbeds in upper half, more muddy towards base.	5.80	1927.05	5.66	
CLAYSTONE, dark brown, carbonaceous.	2.23	1929.28	2.18	

SUKUNKA D.D.H. C-23

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<p><u>COAL</u>, core extensively broken, coal types given only very broadly, bedding angle 85-90⁰, good cleat. mainly dull with minor bright bands.</p>	0.72	1930.00	0.54)
<p>dull and bright.</p>	0.92	1930.92	0.69)
<p>mainly dull with minor bright bands.</p>	0.55	1931.47	0.41)
<p>dull and bright.</p>	1.42	1932.89	1.06)
<p>mainly dull with minor bright bands.</p>	0.59	1933.48	0.44	) CHAMBERLAIN SEAM
<p><u>SILTSTONE</u>, grey, numerous mudstone interbeds and phases, carbonaceous at top, and in bottom 0.12'.</p>	5.21	1938.69	5.21	) upper split
<p><u>COAL</u>, bedding angle throughout 85-90⁰ to core axis, strongly developed cleat parallel to core axis. Coal types as follows -</p>				
<p>dull and bright.</p>	0.23	1938.92	0.17	) CHAMBERLAIN SEAM
<p>mainly dull with minor bright bands.</p>	0.15	1939.07	0.11	) lower split

SUKUNKA D.D.H. C-23

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull and bright.	0.13	1939.20	0.10)
)
mainly dull with minor bright bands.	0.66	1939.86	0.49)
)
bright and dull.	0.47	1940.33	0.35)
)
mainly dull with minor bright bands.	0.17	1940.50	0.13)
)
dull and bright, core badly broken towards base.	0.78	1941.28	0.58)
)
dull.	0.29	1941.57	0.22)
)
dull and bright.	0.27	1941.84	0.20)
)
mainly dull with minor bright bands.	0.46	1942.30	0.34)
)
dull.	0.35	1942.65	0.26)
)
dull and bright.	0.36	1943.01	0.27)
)
bright and dull.	0.34	1943.35	0.25)
)
CLAYSTONE, carbonaceous.	0.01	1943.36	0.01)

CHAMBERLAIN
SEAM
lower split

SUKUNKA D.D.H. C-23

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , mainly bright with minor dull bands.	0.56	1943.92	0.42)	
dull and bright.	0.31	1944.22	0.23)	
mainly bright with minor dull bands.	0.16	1944.39	0.12)	
dull and bright.	0.40	1944.79	0.30)	
bright.	0.15	1944.94	0.11)	
dull and bright.	0.32	1945.26	0.24)	CHAMBERLAIN SEAM
bright.	1.17	1946.43	0.87)	lower split
dull.	0.08	1946.49	0.06)	
dull and bright.	0.31	1946.82	0.23)	
SANDSTONE, grey, medium grained, quartz-lithic; irregular coaly masses near top, very few silty interbeds.	11.80	1958.62	11.24	

SUKUNKA D.D.H. C-23

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, medium grained, becoming finer towards base, a few coaly wisps in top 3' zone (0.95') of worm casts 5' from top. Bedding angle 85-90° to core axis. Worm casts also from 13.90' to 14.50' from top.	19.98	1978.60	19.02	
SANDSTONE, grey, fine grained, quartz-lithic.	13.77	1992.37	13.77	<u>Base of Hole</u>

BORE NUMBER C-24

Grid Reference 32803.1N 89831.7E
Exploration Grid Reference K/1+1000'E

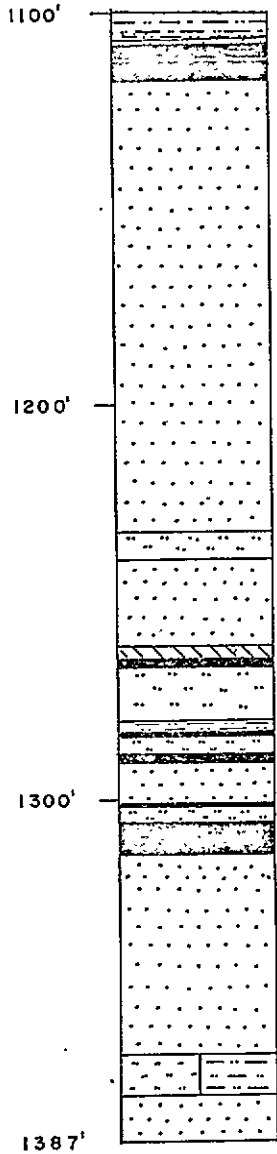
Date Commenced 20th Sept, 1971 Completed 29th Sept, 1971

Collar R.L. 4835.5 ft Standard Datum
Total Depth 1387.0 ft Electrically Logged ~~Yes~~/No
Drilled by Canadian Longyear Ltd
For Coalition Mining Limited
Logged by F. H. S. Tebbutt

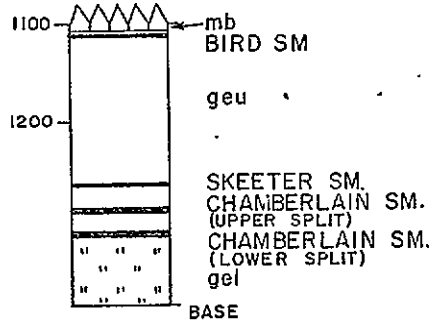
Angled Hole
Declination 60°
Azimuth 157°

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Chamberlain upper split	3717.2	2.82	30%	
Chamberlain lower split	3697.9	8.15	68%	



MOOSEBAR FORMATION
GLAUCONITIC SANDSTONE
BIRD SEAM



SILTSTONE PHASES
CARBONACEOUS CLAYSTONE INTERBEDS
COALY & SILTSTONE WISPS
SANDSTONE INTERBEDS, SHELL FOSSILS?
SKEETER SEAM
SANDSTONE INTERBEDS

CHAMBERLAIN SEAM - UPPER SPLIT
SILTSTONE INTERBEDS

CHAMBERLAIN SEAM - LOWER SPLIT

WORM CASTS

END OF HOLE

DETAIL OF GETHING
FORMATION
SCALE: 1" to 50'

SCALE: 1" to 200'

Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS
DDH C-24

DRAWN BY S.A.

DATE: January '72

PAGE 1 of 1


				ASH % CUMULATIVE FROM FLOOR		
CHAMBERLAIN SEAM UPPER SPLIT		WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
1288.53					11.6	
		2.82	-	11.6	4½	
1291.35						

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 for
 COALITION MINING LIMITED
 DRAWN BY pm DATE Jan '72

SEAM SECTIONS
 DDH C-24

CHAMBERLAIN SEAM
LOWER SPLIT

ASH %
CUMULATIVE
FROM FLOOR

		WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
1305.43					5.5	
		8.15	-	5.5	7	
1313.58						

Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED
DRAWN BY pm DATE Jan '72

SEAM SECTIONS
DDH C-24

SCALE: 1" to 2'

PAGE 1 of 1

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

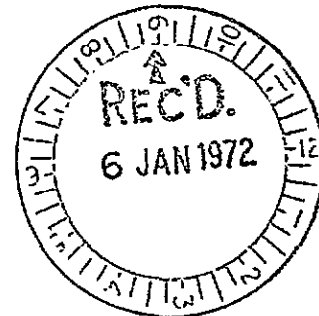
CARGO SUPERINTENDENTS

CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify



APPLICANT: COALITION MINING

REPORT ON: SUKUNKA SAMPLE NO. 192
CORE NO. C24
~~SKETTER SEAM~~ CHAMBERLAIN SEAM (UPPER SPLIT)

REPORT NO. K71-1846

RECEIVED: 17. 11. 1971

REPORTED: 31. 12. 1971



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Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

M. B. Bradley
A.R.A.C.I. Chief Chemist.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

L. W. Wainwright

INTRODUCTION:

One (1) Coal Sample designated CORE NO. C24 SKEETER SEAM was received on 17. 11. 1971 from Clifford McElroy & Associates.

METHOD:

The Coal Sample No. 192 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.60 specific gravity.

The float and sink fractions and raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

The analysis of Fl.60 SG fraction of Sample No. 192 is also given in this report.

NOTE:

Sample weight has not been adjusted to compensate for core loss.

RESULTS*

TABLE 1 : gives the sizing, washability and analytical data for the coal sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 1WASHABILITY DATA FOR SAMPLE NO. 192 (after hand crushing to $\frac{3}{4}$ ")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
Fl.60 SG	482	91.8	7.1	5	91.8	7.1	5
Sl.60 SG	43	8.2	63.0	1	100.0	11.7	4½
-30 Mesh RC	37	6.5	9.7	8			

Total Weight of Sample = 562 grams

True Specific Gravity = 1.361

Thickness = 2.82'

ANALYSIS OF Fl.60 SG FRACTION OF SAMPLE NO. 192

Yield %	91.8
Air Dried Moisture %	1.0
Ash %	7.1
Volatile Matter %	19.6
Fixed Carbon %	72.3
Total Sulphur %	0.54
C.S.NO.	5
Calorific Value	14170 BTU/LB
Phosphorus %	0.020

SYDNEY

31st December 1971

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

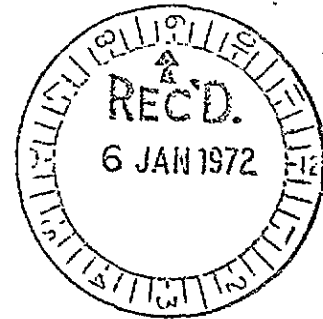
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19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify

APPLICANT: COALITION MINING



REPORT ON: SUKUNKA SAMPLE NO. 193
CORE NO. C24
CHAMBERLAIN SEAM (LOWER SPLIT)

REPORT NO. K71-1847

RECEIVED: 17. 11. 1971

REPORTED: 31. 12. 1971



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terms of registration.

M. J. Bradley
A.R.A.C.I. Chief Chemist

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

[Signature]

INTRODUCTION:

One (1) Coal Sample designated CORE NO. C24 CHAMBERLAIN SEAM was received on 17. 11. 1971 from Clifford McElroy & Associates.

METHOD:

The Coal Sample No. 193 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 193 and the analysis are given in this report.

NOTE:

The sample weight has not been adjusted to compensate for core loss.

RESULTS:

TABLE 1 : gives the sizing, washability and analytical data for the sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 1WASHABILITY DATA FOR SAMPLE NO. 193 (after hand crushing to $\frac{3}{4}$ ")

FRACTION	INDIVIDUAL				CUMULATIVE		
	WEIGHT	WT.%	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
F1.30 SG	1468	45.3	2.4	9	45.3	2.4	9
S1.30 - F1.35 SG	1071	33.0	4.8	7½	78.3	3.4	8½
S1.35 - F1.40 SG	433	13.4	10.1	2	91.7	4.4	7½
S1.40 - F1.45 SG	130	4.0	13.3	1	95.7	4.8	7
S1.45 - F1.50 SG	88	2.7	14.6	1	98.4	5.0	7
S1.50 - F1.55 SG	14	0.4	17.1	1	98.8	5.1	7
S1.55 - F1.60 SG	16	0.4	24.2	1	99.2	5.2	7
S1.60 SG	21	0.8	46.3	0	100.0	5.5	7
-30 Mesh RC	276	7.8	5.1	8½			

Total Weight of Sample = 3517 grams

True Specific Gravity = 1.310

Thickness = 8.15'

ANALYSIS OF F1.60 SG FRACTION OF SAMPLE NO. 193

Yield %	99.2
Air Dried Moisture %	1.0
Ash %	5.3
Volatile Matter %	21.9
Fixed Carbon %	71.8
Total Sulphur %	0.39
C.S.NO.	7½
Calorific Value	14300 BTU/LB
Phosphorus %	0.011

SYDNEY

31st December 1971

STRATIGRAPHIC LOG
SUKUNKA D.D.H. C-24

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
	No core to 1105.0 ft.		
	MUDSTONE, dark grey, claystone (white) .5' above base.	MOOSEBAR FM.	1106.0
	SANDSTONE, glauconitic.	GETHING FM.	1108.5
	<u>COAL</u> , mudstone split (1.5') top 1111.0'.	BIRD SEAM	1117.9
	SANDSTONE, grey, fine grained, quartz lithic.		1232.0
	SILTSTONE, grey.		1239.0
	SANDSTONE, grey, fine grained, quartz lithic, silty phases at top, clay- stone carbonaceous interbeds 1247'- 1252' followed by silty and coaly wisps.		1262.0
	CLAYSTONE, carbonaceous, sandy interbeds, some evidence of possible shell fossils.		1264.0
	<u>COAL</u> , (0.1') siltstone band 0.6'? from top, below which core missing to 1265.5'.	SKEETER SM.	1265.5
	SILTSTONE, grey, sandy interbeds.		1280.0

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
	MUDSTONE, dark grey.		1283.0
	<u>COAL.</u>)		1283.5
)		
	SILTSTONE, grey.)	CHAMB. SM.	1289.0
	)	upper split	
	<u>COAL.</u>)		1290.5
	SANDSTONE, silty interbeds.		1302.0
	SILTSTONE, grey, grading to mudstone at base.		1306.0
	<u>COAL.</u>	CHAMB. SM. lower split	1314.0
	SANDSTONE, grey, medium grained becoming fine to base, quartz- lithic, worm casts 1333'.		1365.0
	SILTSTONE AND MUDSTONE INTERBEDS, granules at base.		1375.0
	SANDSTONE, grey, fine grained, quartz-lithic.		1387.0
			<u>Base of Hole</u>

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
Core not logged in detail - refer to Stratigraphic Log for particulars.		1226.24		
SANDSTONE, grey, fine grained, quartz-lithic, silty interbeds and phases, some coaly wisps and calcite veins parallel with bedding, bedding angle 80° to core axis.	19.20	1245.44	19.22	
SANDSTONE, as above.	1.60	1247.04	1.60	
SILTSTONE, grey, grading to mudstone dark grey at base.	3.75	1250.79	3.76	
SANDSTONE, grey, medium grained at top, becoming fine grained 2.80' from top, quartz-lithic, claystone carbonaceous interbeds and coaly wisps in fine grained section, the claystone carbonaceous interbeds concentrating to a phase (0.75') 1.08' from base.	12.65	1263.44	12.66	
<u>COAL</u> , mainly dull with minor bright bands.	2.19	1265.63	0.25	
CLAYSTONE, brown, carbonaceous.	0.14	1265.77	0.14	
SILTSTONE, grey, sandy interbeds, current bedding and slumping	8.56	1274.33	8.77	

SUKUNKA D.D.H. C-24

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE, grey, with mudstone dark grey interbeds, becoming phases towards base. Bedding angle 84° from core axis.	8.47	1282.80	8.67	
<u>COAL</u> , dull and bright, core broken.	1.45	1284.25	0.59	
MUDSTONE, dark grey.	1.19	1285.44	1.19	
SILTSTONE, grey, mudstone darker grey interbeds.	3.09	1288.53	3.09	
<u>COAL</u> , mainly dull with minor bright bands, core broken.	1.59	1290.12	0.53)
dull, and bright, core broken.	0.42	1290.54	0.14)
core broken and mixed. Most fragments dull with bright bands.	0.81	1291.35	0.27)
CLAYSTONE, brown, carbonaceous, some calcite veins, coaly wisps, listric surfaces.	0.85	1292.20	0.85)
SANDSTONE, grey, fine grained, quartz-lithic, claystone carbonaceous interbeds and coaly wisps.	9.17	1301.37	9.17)

CHAMBERLAIN SEAM
upper split

SUKUNKA D.D.H. C-24

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
CLAYSTONE, brownish grey, some silty interbeds.	3.67	1305.04	3.67	
CLAYSTONE, brown, carbonaceous, fine calcite veins at top and bottom.	0.39	1305.43	0.39	
<u>COAL</u> , dull and bright, fracture plane 34° to core axis.	1.71	1307.14	1.36)
bright.	0.09	1307.23	0.07)
mainly dull with minor bright bands, fracture plane 15° to core axis.	0.28	1307.51	0.22)
dull and bright.	0.56	1308.07	0.44	) CHAMBERLAIN SEAM
mainly dull with minor bright bands, fracture plane 15° to core axis.	0.51	1308.58	0.40	) lower split
dull and bright, fracture planes at 15° to core axis.	1.19	1309.77	0.94)
dull.	0.16	1309.93	0.13)

SUKUNKA D.D.H. C-24

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull and bright.	0.92	1310.85	0.73)	
mainly dull with minor bright bands.	0.34	1311.19	0.27)	
bright.	0.49	1311.68	0.39)	
mainly bright with minor bands, fracture at 12° to core axis.	0.30	1311.98	0.24)	
dull.	0.24	1312.22	0.19)	CHAMBERLAIN SEAM
dull and bright.	0.47	1312.69	0.37)	
mainly dull with minor bright bands, fracture at 12° to core axis.	0.33	1313.02	0.26)	
dull and bright.	0.32	1313.34	0.25)	
core broken to small fragments, mostly bright.	0.24	1313.58	0.19)	
SANDSTONE, grey, medium grained, quartz-lithic, tending carbonaceous at top and with coaly wisps near top. Bedding angle 83° to core axis.	11.95	1325.53	11.80	

SUKUNKA D.D.H. C-24

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, becoming brownish grey, medium grained becoming fine grained, quartz-lithic. Worm casts from 5.4' to 8.8' from top. Bedding angle 76 ⁰ to core axis. Current bedded.	19.32	1344.85	19.08	
SANDSTONE, grey, fine grained, quartz-lithic, current bedded.	19.32	1364.17	19.08	
SANDSTONE, as above.	0.71	1364.88	0.70	
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey interbedded. Sandy interbeds and phases, mud blebs at base. Bedding angle 80 ⁰ to core axis.	10.39	1375.27	10.26	
SANDSTONE, grey, fine grained, quartz lithic, some thin silty interbeds..	8.31	1383.58	8.21	
SANDSTONE, grey, fine grained, quartz-lithic. Bedding angle 80 ⁰ to core axis.	3.42	1387.00	3.38	
				<u>Base of Hole</u>

BORE NUMBER C-25

Grid Reference 33656.7N 91112.0E

Exploration Grid Reference K/2 + 1000'E

Date Commenced 30th Sept, 1971 Completed 6th Oct, 1971

Collar R.L. 4978.4 ft Standard Datum

Total Depth 1377.0 ft Electrically Logged Yes/~~No~~

Drilled by Canadian Longyear Ltd

For Coalition Mining Limited

Logged by F.H.S. Tebbutt

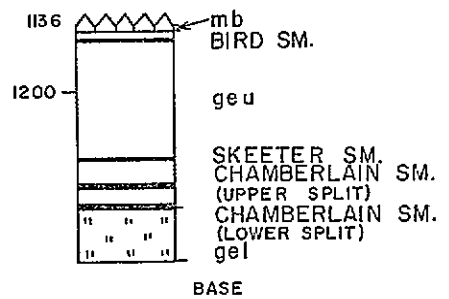
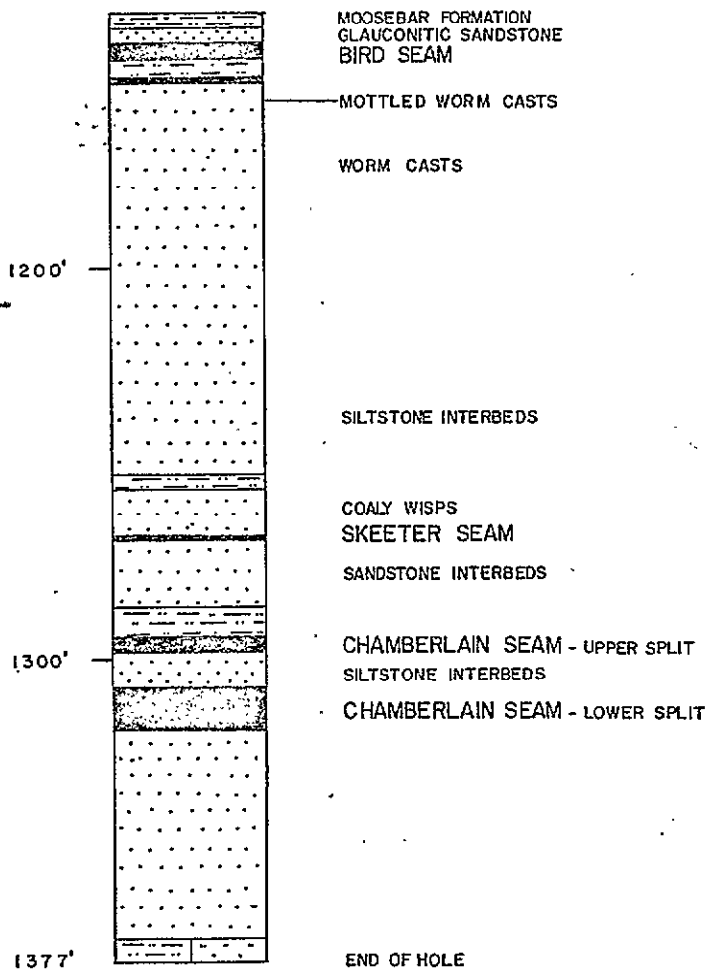
Angled Hole

Declination -60°

Azimuth 100°

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Chamberlain Upper Split	3854.3	3.61	93%	
Chamberlain Lower Split	3837.2	10.29	84%	



DETAIL OF GETHING
FORMATION
SCALE: 1" to 50'

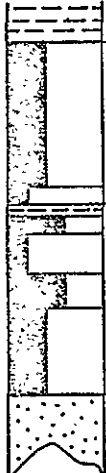
SCALE: 1" to 200'

Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS
DDH C - 25

CHAMBERLAIN SEAM
UPPER SPLIT

ASH %
CUMULATIVE
FROM FLOOR

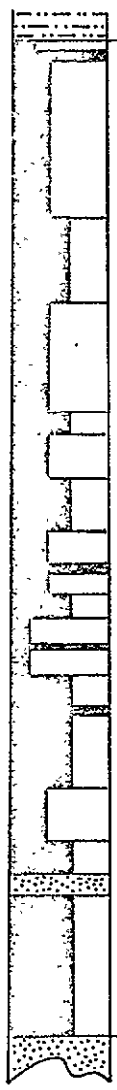
		WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
1294.40					16.3	
		3.61	-	16.3	4	
1298.01						

Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY LTD.
for
COALITION MINING LIMITED
DRAWN BY pm DATE Jan '72

SEAM SECTIONS
DDH C-25

SCALE: 1" to 2'

PAGE 1 of 1

				ASH % CUMULATIVE FROM FLOOR		
CHAMBERLAIN SEAM LOWER SPLIT		WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
1307.51					7.5	
		10.29	-	7.5	6½	
1317.80						

Prepared by:

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for

COALITION MINING LIMITED

DRAWN BY pm

DATE Jan '72

SCALE: 1" to 2'

SEAM SECTIONS

DDH C-25

PAGE 1 of 1

Telegrams and Cables:
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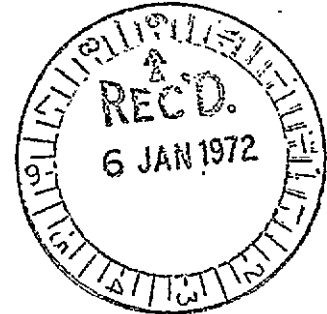
Telephone: 241 1105

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19 BRIDGE ST.,
SYDNEY, 2000

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APPLICANT: COALITION MINING

REPORT ON: SUKUNKA SAMPLES NO. 194-196
CORE NO. C25
~~SKEETER SEAM ?~~ CHAMBERLAIN SEAM (UPPER SPLIT)

REPORT NO. K71-1848

RECEIVED: 17. 11. 1971

REPORTED: 31. 12. 1971



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been performed in accordance with the
terms of registration.

M. Bradley
A.R.A.C.I. Chief Chemist

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

L. W. ...

INTRODUCTION: One (1) Coal Sample designated CORE NO. C25 SKEETER SEAM ? was received on 17. 11. 1971 from Clifford McElroy & Associates.

METHOD: The Coal Sample No. 194-196 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 194-196 and the analysis are given in this report.

NOTE: The sample weight has not been adjusted to compensate for core loss.

RESULTS: TABLE 1 : gives the sizing, washability and analytical data for the sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 1WASHABILITY DATA FOR SAMPLE NO. 194,195,196 (after hand crushing to $\frac{3}{4}$ ")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
Fl.30 SG	509	24.1	2.3	8	24.1	2.3	8
S1.30 - Fl.35 SG	683	32.4	5.4	4½	56.5	4.1	6
S1.35 - Fl.40 SG	247	11.7	10.2	2½	68.2	5.1	5½
S1.40 - Fl.45 SG	145	6.9	15.3	2½	75.1	6.1	5
S1.45 - Fl.50 SG	144	6.8	20.6	1	81.9	7.3	5
S1.50 - Fl.55 SG	25	1.2	22.9	1	83.1	7.5	5
S1.55 - Fl.60 SG	55	2.6	30.9	1	85.7	8.2	4½
S1.60 SG	300	14.3	67.0	0	100.0	16.6	4
-30 Mesh RC	147	6.5	10.6	5½			

Total Weight of Sample = 2255 grams

True Specific Gravity = 1.381

Thickness = 3.61'

ANALYSIS OF FLOATS 1.60 SG FRACTION OF SAMPLE NO. 194-196

Yield %	85.7
Air Dried Moisture %	1.0
Ash %	8.2
Volatile Matter %	18.9
Fixed Carbon %	71.9
Total Sulphur %	0.45
C.S.NO.	5½
Calorific Value	14180 BTU/LB
Phosphorus %	0.019

SYDNEY

31st December 1971

Telegrams and Cables:
"Visor", Sydney

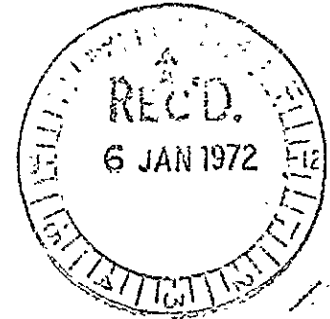
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19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify



APPLICANT: COALITION MINING

REPORT ON: SUKUNKA SAMPLE NO. 197, 198, 199
CORE NO. C25
CHAMBERLAIN SEAM (LOWER SPLIT)

REPORT NO. K71-1849

RECEIVED: 17. 11. 1971

REPORTED: 31. 12. 1971



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National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

A. Bradley
A.R.A.C.I. Chief Chemist.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

L. W. ...

INTRODUCTION:

One (1) Coal Sample designated CORE NO. C25 CHAMBERLAIN SEAM was received on 17. 11. 1971 from Clifford McElroy & Associates.

METHOD:

The Coal Sample No. 197-199 was hand crushed to $\frac{3}{4}$ " sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 197-199 and the analysis are given in this report.

NOTE:

The sample weight has not been adjusted to compensate for core loss.

RESULTS:

TABLE 1 : gives the sizing, washability and analytical data for the sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 1

WASHABILITY DATA FOR SAMPLE NO. 197,198,199 (after hand crushing to $\frac{3}{4}$ ")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
F1.30 SG	1909	38.5	2.1	9	38.5	2.1	9
S1.30 - F1.35 SG	1999	40.3	4.8	6½	78.8	3.5	8
S1.35 - F1.40 SG	524	10.6	9.4	2½	89.4	4.2	7
S1.40 - F1.45 SG	182	3.7	13.4	1	93.1	4.5	7
S1.45 - F1.50 SG	89	1.2	18.0	1	94.3	4.7	7
S1.50 - F1.55 SG	50	1.0	19.2	1	95.3	4.9	7
S1.55 - F1.60 SG	34	0.7	20.6	1	96.0	5.0	7
S1.60 SG	199	4.0	66.3	1	100.0	7.4	6½
-30 Mesh RC	498	9.1	8.0	8½			

Total Weight of Sample = 5484 grams

True Specific Gravity = 1.304

Thickness = 10.29'

ANALYSIS OF F1.60 SG FRACTION OF SAMPLE NO. 197-199

Yield %	96.0
Air Dried Moisture %	1.0
Ash %	5.1
Volatile Matter %	21.6
Fixed Carbon %	72.3
Total Sulphur %	0.33
C.S.NO.	7½
Calorific Value	14440 BTU/LB
Phosphorus %	0.031

SYDNEY

31st December 1971

STRATIGRAPHIC LOG
SUKUNKA D.D.H. C-25

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
	No core to 1136.0 ft.		
	MUDSTONE, dark grey, white clay bands at 1138' and 1139'.	MOOSEBAR FM.	1139.0
	SANDSTONE, glauconitic.	GETHING FM.	1143.0
	<u>COAL.</u>	BIRD SEAM	1146.0
	MUDSTONE, dark grey, silty interbeds.		1152.0
	<u>COAL.</u>		1153.0
	SANDSTONE, grey, mottled (worm casts) 1158'. Worm casts 1172' to 1178'. Silty interbeds from 1234' to base.		1253.0
	MUDSTONE, dark grey, silty interbeds.		1256.5
	SANDSTONE, coaly wisps, becoming claystone (carbonaceous) interbeds at base.		1269.0
	<u>COAL.</u>	SKEETER SM.	1269.5
	SILTSTONE, sandy interbeds.		1287.0
	MUDSTONE, dark grey.		1294.5
	<u>COAL.</u>	CHAMB. SM. upper split	1298.0

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
	SANDSTONE, silty interbeds.		1307.5
	<u>COAL.</u>	CHAMB. SM. lower split	1318.0
	SANDSTONE, grey, medium grained becoming finer.		1371.0
	SILTSTONE AND MUDSTONE INTERBEDS.		1377.0
			<u>Base of Hole</u>

SUKUNKA D.D.H. C-25

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
Core not logged in detail - refer to Stratigraphic Log for particulars.		1213.57		
SANDSTONE, grey, fine grained, quartz-lithic, bedding angle 65° to core axis.	19.71	1233.28	19.53	
SANDSTONE, grey, fine to very fine grained, quartz-lithic, silty interbeds and phases. Bedding angle 75° to core axis. A few coaly wisps and irregular coaly masses.	19.53	1252.81	19.32	
SILTSTONE, grey, mudstone interbeds and phases.	4.23	1257.04	4.18	
SANDSTONE, grey, fine grained, quartz-lithic; coaly wisps, carbonaceous claystone wisps and interbeds - these being concentrated from 2.15' from base to the base. Bedding angle 75° to core axis.	12.13	1269.17	12.00	
<u>COAL</u> , mainly dull with minor bright bands, core broken.	1.45	1270.62	0.43	
CLAYSTONE, carbonaceous, core broken.	0.12	1270.74	0.12	
SILTSTONE, grey.	1.25	1271.99	1.25	

SUKUNKA D.D.H. C-25

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, brownish grey, very fine grained, quartz-lithic, current bedded.	0.93	1272.92	0.93	
SANDSTONE, as above, numerous silty interbeds and phases.	14.00	1286.92	13.79	
MUDSTONE, dark grey, some silty interbeds.	5.09	1292.01	5.01	
MUDSTONE, dark grey. Bedding angle 75° to core axis.	1.91	1293.92	1.88	
CLAYSTONE, carbonaceous.	0.48	1294.40	0.47	
<u>COAL</u> , a joint plane at 25° to core axis recurs throughout the seam. mainly dull with minor bright bands. Bedding plane at 70° to core axis.	1.47	1295.87	1.58)
dull, to stony with minor bright bands.	0.17	1296.04	0.18)
CLAYSTONE, carbonaceous.	0.15	1296.19	0.15)

CHAMBERLAIN SEAM
upper split

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull and bright.	0.20	1296.39	0.22)	
dull, bottom 0.12' vertical cleat not developed.	0.40	1296.79	0.43)	
dull and bright, bedding plane at 70° to core axis.	0.32	1297.11	0.35)	CHAMBER SEAM
core fragmented and mixed. Mostly dull with minor bright bands.	0.90	1298.01	0.97)	upper
SANDSTONE, grey, medium to very fine grained, quartz-lithic, silty interbeds and some coaly partings. Bedding angle 70° to core axis.	7.91	1305.92	7.91	
MUDSTONE, dark grey.	1.59	1307.51	1.59	
<u>COAL</u> , dull.	0.09	1307.60	0.09)	
bright.	0.05	1307.65	0.05)	CHAMBER SEAM
dull to smut.	0.02	1307.67	0.02)	lower s
bright.	0.05	1307.72	0.05)	

SUKUNKA D.D.H. C-25

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , mainly dull with minor bright bands.	1.61	1309.33	1.56)
dull and bright.	0.93	1310.26	0.91)
mainly dull with minor bright bands.	0.18	1310.44	0.17)
<u>COAL</u> , mainly dull with minor bright bands.	0.96	1311.40	0.93)
dull and bright.	0.24	1311.64	0.23)
dull.	0.22	1311.86	0.21)
mainly dull with minor bright bands.	0.21	1312.07	0.20)
dull and bright.	0.57	1312.64	0.55)
mainly dull with minor bright bands.	0.31	1312.95	0.30)
bright.	0.10	1313.05	0.10)
mainly dull with minor bright bands.	0.22	1313.27	0.21)
dull and bright.	0.23	1313.50	0.22)

CHAMBERLAIN SEAM

lower split

SUKUNKA D.D.H. C-25

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull.	0.26	1313.76	0.25)	
bright.	0.09	1313.85	0.09)	
dull.	0.24	1314.09	0.23)	
dull and bright.	0.32	1314.41	0.31)	
bright.	0.10	1314.51	0.10)	
dull and bright.	0.76	1315.27	0.74)	
mainly dull with minor bright bands, core splits readily into thin pieces along bedding (70° to core axis).	0.54	1315.81	0.52)	CHAMBERLAIN SEAM lower split
dull and bright.	0.36	1316.17	0.35)	
SANDSTONE, black and carbonaceous at top, grey in bottom half, fine grained, quartz-lithic, coaly wisps.	0.18	1316.35	0.18)	
<u>COAL</u> , core badly broken, but fragments suggest dull and bright with possibly zones of bright, and bright with)	

SUKUNKA D.D.H. C-25

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
minor dull bands. Many bright fines.	1.45	1317.80	0.83	) CHAMBERLAIN SEAM
SANDSTONE, grey, medium grained, quartz-lithic, coaly wisps at top and some fine silty interbeds. Bedding angle 70° to core axis.	12.65	1330.45	12.26	lower split
SANDSTONE, grey, medium grained becoming finer to base, quartz-lithic. Bedding angle 70° to core axis.	19.70	1350.15	19.09	
SANDSTONE, grey, fine grained, quartz-lithic.	20.07	1370.22	19.55	
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey interbedded, sandy interbeds and phases.	6.59	1376.81	6.59	<u>Base of Hole</u>

BORE NUMBER C-26/26a

Grid Reference 40041.0 N 93242.1 E
Exploration Grid Reference I + 450'N / 5 + 150'E

Date Commenced 9th Oct., 1971 Completed 14th Oct., 1971

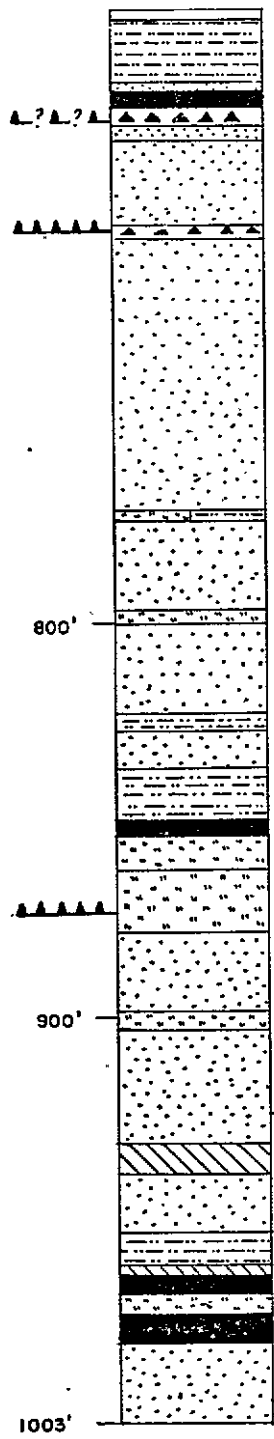
Collar R.L. 4731.3 ft. Standard Datum
Total Depth 1003.82 ft. Electrically Logged Yes/No

Drilled by Canadian Longyear Ltd.
For Coalition Mining Limited

Logged by F.H.S. Tebbutt
D.D.H. C-26 abandoned due to jammed rods at 925 ft. and re-drilled as C-26a from 866 ft., after wedging.

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Chamberlain - upper split - upper plate	3877.8 ft.	4.19	61%	
Chamberlain - upper split - lower plate	3761.1 ft.	4.24	64%	
Chamberlain - lower split - lower plate	3748.2 ft.	7.49	54%	



MOOSEBAR FORMATION

GLAUCONITIC SANDSTONE
BIRD SEAM
BRECCIATED SILTSTONE

MOTTLED (WORM CASTS)

SANDSTONE BRECCIA
MOTTLED (WORM CASTS)
WORM CASTS

WORM CASTS

CLAYSTONE AT BASE

COALY WISPS
SHELL FOSSILS

SILTSTONE INTERBEDS

CLAYSTONE BANDS \approx 0.3' - CHAMBERLAIN SEAM - UPPER PLATE
CORE BROKEN. SANDSTONE INTERBEDS
CORE BROKEN. SLICKENSIDES

SILTSTONE PHASE AT CENTRE
SANDSTONE INTERBEDS

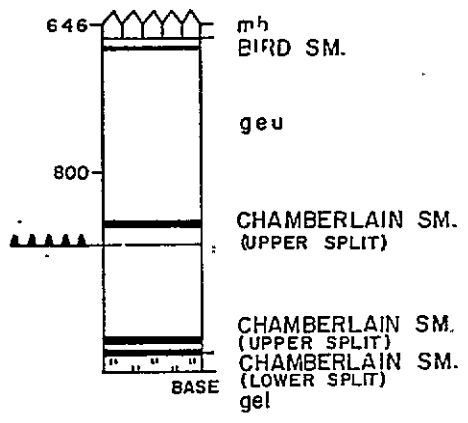
COALY WISPS
SHELL FOSSILS
BRECCIATION
SILTSTONE PHASES

SILTSTONE PHASES

SILTSTONE INTERBEDS
UPPER SPLIT, LOWER PLATE CHAMBERLAIN SEAM

LOWER SPLIT CHAMBERLAIN SEAM

SMALL BRECCIA ZONE
END OF HOLE



DETAIL OF GETHING FORMATION
SCALE 1" to 50'

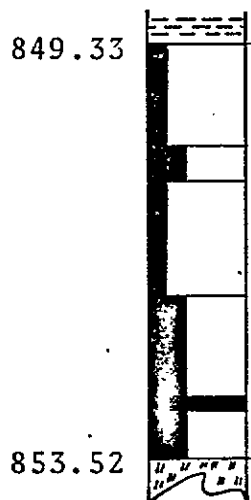
SCALE : 1" to 200'

Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS
DDH G-26

ASH %
CUMULATIVE
FROM FLOOR

CHAMBERLAIN SEAM
UPPER PLATE/UPPER SPLIT



	WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
				11.4	
4.19	-	11.4	3½		

Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.

SEAM SECTIONS

for
COALITION MINING LIMITED

DDH C-26

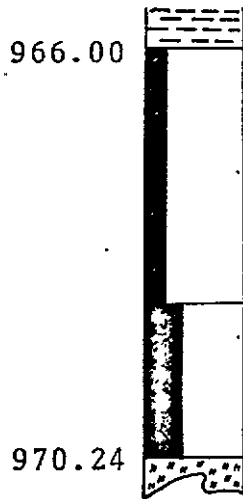
DRAWN BY pm DATE Jan '72

SCALE: 1" to 2'

PAGE 1 of 1

CHAMBERLAIN SEAM
LOWER PLATE/UPPER SPLIT

ASH %
CUMULATIVE
FROM FLOOR



WT%	ASH %	C. S. N ^o	INCL. BANDS	EXCL. BANDS
			11.5	
-	11.5	4½		

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SEAM SECTIONS
DDH C-26

SCALE: 1" to 2'

PAGE 1 of 1

CHAMBERLAIN SEAM
LOWER PLATE/LOWER SPLIT

ASH %
CUMULATIVE
FROM FLOOR

	WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
975.65				4.8	
7.49	-	4.8	7		
983.14					

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CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED
DRAWN BY pm DATE Jan '72

SEAM SECTIONS
DDH C-26

SCALE: 1" to 2'

PAGE 1 of 1

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

CARGO SUPERINTENDENTS

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

CO. (A/SIA.) PTY. LTD.

Certification

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APPLICANT:

COALITION MINING

SUBJECT:

SUKUNKA SAMPLE NO. 189
CORE NO. C26
CHAMBERLAIN UPPER SEAM (UPPER PLATE, UPPER SPLIT)

REPORT NO.

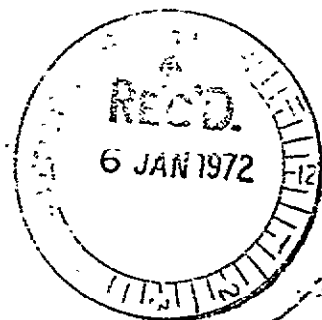
K71-1850

DATE RECEIVED:

17. 11. 71

DATE REPORTED:

31. 12. 71



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been performed in accordance with the
terms of registration.

M. Bradley
Chief Chemist.
A.R.A.C.I.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

[Signature]

INTRODUCTION:

One (1) coal sample designated CORE NO. C26 CHAMBERLAIN UPPER SEAM was received in our Registered Laboratory on 17.11.71 from Clifford McElroy & Associates Pty. Ltd.

METHODS:

The coal sample no. 189 was hand crushed to $\frac{3}{4}$ " size, sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 - 1.60 specific gravity in 0.05 steps.

The float and sink fractions and raw -30 mesh coal fractions were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true S.G. of the sample determined.

A cumulative float 1.60 S.G. fraction was prepared for sample no. 189 and the analysis is given in this report.

NOTE:

The sample weight has not been adjusted to compensate for core loss.

RESULTS:

TABLE 1: gives the sizing, washability and analytical data for the sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 1: WASHABILITY DATA FOR SAMPLE NO. 189 (after hand crushing to $\frac{3}{4}$ "

FRACTION	INDIVIDUAL ANALYSIS				CUMULATIVE ANALYSIS		
	WT. GM.	WT. %	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
F1.30	291	19.4	2.2	8 $\frac{1}{2}$	19.4	2.2	8 $\frac{1}{2}$
S1.30 - F1.35	612	40.8	3.0	3 $\frac{1}{2}$	60.2	2.7	5
S1.35 - F1.40	289	19.3	9.8	1 $\frac{1}{2}$	79.5	4.5	4
S1.40 - F1.45	76	5.1	16.4	1	84.6	5.2	4
S1.45 - F1.50	46	3.1	21.2	1	87.7	5.7	4
S1.50 - F1.55	28	1.9	21.2	1	89.6	6.1	4
S1.55 - F1.60	12	0.8	29.6	1	90.4	6.3	4
S1.60	145	9.6	61.3	0	100.0	11.6	3 $\frac{1}{2}$
-30 Mesh RC	206	12.1	10.1	3 $\frac{1}{2}$			

TOTAL WEIGHT 1705 gms TRUE S.G. 1.361 THICKNESS 4.19"

ANALYSIS OF F1.60 S.G. FRACTION OF SAMPLE NO. 189

YIELD %	90.4
AIR DRIED MOISTURE %	1.0
ASH%	6.2
VOLATILE MATTER %	18.7
FIXED CARBON %	74.1
TOTAL SULPHUR %	0.44
C.S.NO.	4 $\frac{1}{2}$
CALORIFIC VALUE	14200 BTU/lb
PHOSPHORUS %	0.022

SYDNEY
31st December, 1971.

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

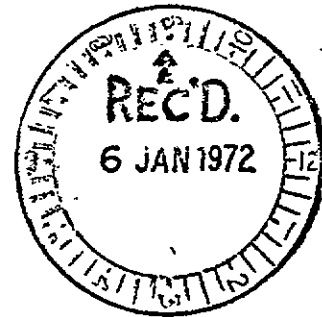
CARGO SUPERINTENDENTS

CO. (A/SIA.) PTY. LTD.

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19 BRIDGE ST.,
SYDNEY, 2000

Certification

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APPLICANT: COALITION MINING

REPORT ON: SUKUNKA SAMPLE NO. 190, 191 (NOT CONTINUOUS)
CORE NO. C26
CHAMBERLAIN LOWER SEAM (LOWER PLATE, UPPER SPLIT, NO. 190)
(LOWER PLATE, LOWER SPLIT, NO. 191)

REPORT NO. K71-1851

RECEIVED: 17. 11. 1971

REPORTED: 31. 12. 1971



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been performed in accordance with the
terms of registration.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

A. Bradley
A.R.A.C.I. Chief Chemist.

[Signature]

INTRODUCTION:

Two (2) Coal Samples designated CORE NO. C26 CHAMBERLAIN LOWER SEAM were received on 17. 11. 1971 from Clifford McElroy & Associates.

METHOD:

The Coal Samples No. 190 and 191 were hand crushed to $\frac{3}{8}$ " sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fractions were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Samples No. 190 and 191 and the analysis are given in this report.

NOTE:

The sample weight has not been adjusted to compensate for core loss.

RESULTS:

TABLES 1-2 : give the sizing, washability and analytical data for the samples after hand crushing to $\frac{3}{8}$ " top size.

TABLE 1WASHABILITY DATA FOR SAMPLE NO. 190 (after hand crushing to $\frac{3}{8}$ "

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
F1.30 SG	571	36.0	1.7	8	36.0	1.7	8
S1.30 - F1.35 SG	339	21.4	4.3	3½	57.4	2.7	6
S1.35 - F1.40 SG	207	13.0	10.4	1	70.4	4.1	5
S1.40 - F1.45 SG	98	6.2	15.4	1	76.6	5.0	5
S1.45 - F1.50 SG	103	6.5	21.9	1	83.1	6.3	4½
S1.50 - F1.55 SG	64	4.0	24.8	1	87.1	7.1	4½
S1.55 - F1.60 SG	61	3.8	30.8	1	90.9	8.1	4½
S1.60 SG	144	9.1	50.4	1	100.0	11.9	4
-30 Mesh RC	214	11.9	8.1	7½			

Total Weight of Sample = 1801 grams
True Specific Gravity = 1.371
Thickness = 4.24'

TABLE 2

WASHABILITY DATA FOR SAMPLE NO. 191 (after hand crushing to 3/4")

FRACTION	INDIVIDUAL				CUMULATIVE		
	WEIGHT	WT.%	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
F1.30 SG	818	45.4	2.1	9	45.4	2.1	9
S1.30 - F1.35 SG	663	36.8	4.6	7	82.2	3.2	8
S1.35 - F1.40 SG	190	10.6	9.4	1½	92.8	3.9	7½
S1.40 - F1.45 SG	50	2.8	12.2	1	95.6	4.2	7
S1.45 - F1.50 SG	20	1.1	14.8	1	96.7	4.3	7
S1.50 - F1.55 SG	18	1.0	18.4	1	97.7	4.4	7
S1.55 - F1.60 SG	8	0.4	19.7	0	98.1	4.5	7
S1.60 SG	33	1.9	29.8	0	100.0	5.0	7
-30 Mesh RC	799	30.7	4.0	8			

Total Weight of Sample = 2599 grams
True Specific Gravity = 1.316
Thickness = 7.49'

ANALYSIS OF F1.60 SG FRACTION OF SAMPLE NO. 190

Yield % 90.9
Air Dried Moisture % 1.0
Ash % 8.3
Volatile Matter % 17.8
Fixed Carbon % 72.9
Total Sulphur % 0.45
C.S.NO. 4½
Calorific Value 13870 BTU/LB
Phosphorus % 0.023

ANALYSIS OF F1.60 SG FRACTION OF SAMPLE NO. 191

Yield % 98.1
Air Dried Moisture % 1.0
Ash % 4.5
Volatile Matter % 20.1
Fixed Carbon % 74.4
Total Sulphur % 0.33
C.S.NO. 7½
Calorific Value 14600 BTU/LB
Phosphorus % 0.027

SYDNEY
31st December 1971

STRATIGRAPHIC LOG
SUKUNKA D.D.H. C-26

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
<p>Fault, possible</p> <p>Dip 30° at 684 ft</p> <p>Dip 45° at 699 ft</p> <p>Dip 10-15° to 724 ft</p>	<p>No core to 646.0 ft.</p>		
	<p>MUDSTONE, dark grey, white clay at 661.5' and 662.5'.</p>	<p>MOOSEBAR FM.</p>	<p>662.5</p>
	<p>SANDSTONE, glauconitic.</p>	<p>GETHING FM.</p>	<p>665.0</p>
	<p><u>COAL.</u></p>	<p>BIRD SEAM</p>	<p>668.5</p>
	<p>SILTSTONE, grey, broken and extensively slickensided from top to 674'.</p>		<p>677.0</p>
	<p>SANDSTONE, grey, medium grained becoming finer to base, quartz-lithic. Coaly wisps at top mottled (worm casts) from 684' to 689'. Dip at top 30° increasing to 45° at 699'. Calcite veining and brecciation from 699' to 701.5' Mottled (worm casts) from 705' to 709', worm casts 712' to 715' and from 719' to 762'.</p>		<p>771.0</p>
	<p>SILTSTONE AND MUDSTONE INTERBEDS.</p>		<p>774.0</p>
	<p>SANDSTONE, grey, fine grained.</p>		<p>797.0</p>
	<p>SILTSTONE, dark grey, sandy interbeds (1' claystone carbonaceous at base).</p>		<p>800.0</p>

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
Dip 10-15° at 815 ft.	<p>SANDSTONE, coaly wisps and brown claystone interbeds, concentrated at 816' and 822' - shell fossils in lower one (822').</p> <p>MUDSTONE, dark grey.</p> <p>SANDSTONE, silty interbeds.</p> <p>MUDSTONE, dark grey, silty interbeds.</p> <p>MUDSTONE, dark grey.</p>		<p>823.0</p> <p>827.0</p> <p>837.0</p> <p>845.0</p> <p>850.0</p>
Dip 15-20° at 860 ft.	<p><u>COAL</u>, carbonaceous claystone splits (3 of about 0.3').</p> <p>SILTSTONE, sandy interbeds, becoming finer at 861' and from 861' to 878' core broken, slickensided and in parts crushed. Calcite infillings</p>	CHAMB. SM. upper split	<p>854.0</p> <p>878.0</p>
Dip 30° at 890 ft.	<p>SANDSTONE, grey, fine grained, silty phase at centre.</p> <p>SILTSTONE, sandy interbeds, 1' claystone carbonaceous at base.</p> <p>SANDSTONE, coaly wisps, claystone (brown) interbeds, these concentrated at 920' and at 925' with shell fossils, and at 927'. Some brecciation at 930'.</p> <p>CLAYSTONE, carbonaceous, silty phases.</p>		<p>899.0</p> <p>903.0</p> <p>932.0</p> <p>940.0</p>

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
Dip 10° at 955 ft.	SANDSTONE, fine, with silty phases.		955.0
	MUDSTONE, silty interbeds.		964.0
	CLAYSTONE, carbonaceous.		966.0
	<u>COAL.</u>	CHAMB. SM. upper split	970.0
	SILTSTONE, grey.		975.7
	<u>COAL.</u>	CHAMB. SM. lower split	983.0
Dip 10-15° to 990 ft.	SANDSTONE, grey, brecciated at 995' - not badly.		1003.0
			<u>Base of Hole</u>

SUKUNKA D.D.H. C-26

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
Core not logged in detail - refer to Stratigraphic Log for particulars.		807.51		
SANDSTONE, grey, fine grained, quartz-lithic, coaly wisps, carbonaceous claystone interbeds concentrating into claystone phases with sandy interbeds from 8.2' to 9.2' from top, and from 0.35' to 0.70' from base. Bedding angle 80 ⁰ to core axis.	13.54	821.05	13.49	
CLAYSTONE, brown, carbonaceous, shell fossils from 0.30' to 0.77' from top. Occasional thin calcite veins parallel to bedding.	6.49	827.54	6.44	
SANDSTONE, grey, fine grained, quartz-lithic, numerous silty interbeds and phases. Some listric surfaces on breaks in the core from 7.0' to 7.9' from top.	9.21	836.75	9.14	
SILTSTONE, grey, sandy interbeds mainly towards top, mudstone interbeds towards base and increasing to become dominant. Bedding angle 73 ⁰ to core axis.	8.22	844.97	8.16	

SUKUNKA D.D.H. C-26

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
CLAYSTONE, brown, carbonaceous.	1.72	846.69	1.71	
CLAYSTONE, brown, carbonaceous.	2.64	849.33	2.62	
<u>COAL</u> , dull, core badly broken.	0.38	849.71	0.30)
)
core fragmented into earthy consistency, some fragments predominantly dull.	0.65	850.36	0.52)
)
mainly dull with minor bright bands.	0.34	850.70	0.27)
)
core fragmented to earthy consistency, fragments mostly dull.	1.12	851.82	0.90)
)
mainly dull with minor bright bands.	1.09	852.91	0.88)
)
powdered coal.	0.13	853.04	0.10)
)
mainly dull with minor bright bands, core badly broken.	0.48	853.52	0.38)

CHAMBERLAIN SEAM

upper split
upper plate

SUKUNKA D.D.H. C-26

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE, grey, sandy interbeds, tending carbonaceous at top. Bedding angle 2.7' from top 72° to core axis. At 6.4' from top 75° to core axis. At 6.9' from top, calcite veins bounded by core with listric surfaces where broken. At 9.4' from top 65° to core axis with calcite veins and listric surfaces.	11.65	865.17	10.92	
CORE LOST IN DRILLING.	7.74	872.91	0.00	
SILTSTONE, grey, core badly broken, listric surfaces.	0.24	873.15	0.24	
SILTSTONE, grey, some sandy interbeds, core broken, numerous calcite veins and fillings, a few listric surfaces.	2.77	875.92	2.71	
SANDSTONE, grey, fine grained, quartz-lithic, occasional calcite veins in various orientations, calcite infillings. Bedding angle at base 70° to core axis.	12.79	888.71	12.45	
MUDSTONE, dark grey.	3.12	891.83	3.04	
MUDSTONE, dark grey.	0.25	892.08	0.24	

SUKUNKA D.D.H. C-26

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, fine grained, quartz-lithic, some heavy calcite veins at 65° to core axis and some irregular ones. A few silty interbeds.	5.28	897.36	5.14	
MUDSTONE, dark grey, numerous silty interbeds.	4.33	901.69	4.22	
CLAYSTONE, carbonaceous.	0.92	902.61	0.90	
SANDSTONE, grey, fine grained, quartz-lithic, silty interbeds and coaly wisps. Calcite veins at approx 20° to core axis, some intersecting in opposite directions. Some slickensides. Bedding angle 80° to core axis.	8.58	911.19	8.35	
SANDSTONE, grey, fine grained, quartz-lithic, coaly wisps, claystone carbonaceous interbeds - these becoming concentrated in zone (1.15') 5.1' from top, and from 1.3' from base to base, Core broken for 0.6' at 0.6' from top - some calcite, calcite veining and brecciation at 1.8', 2.3', 2.8', 5', 5.4', 7.0' from base. Calcite infillings in all. Core broken around breccia zone at 7'.	13.81	925.00	13.45	<u>Hole Abandoned</u> <u>Redrill Required</u>

SUKUNKA D.D.H. C-26A

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
Redrill after wedging off from C-26.		866.08		
<u>COAL</u> , mainly dull with minor bright bands, very hard and possibly stony.	0.65	866.08	0.65	
mainly dull with minor bright bands, core broken into fragments and mixed. A few claystone fragments.	1.35	867.43	1.35	
SILTSTONE, grey, sandy interbeds. Bedding angle 84° to core axis. From 4.4' from base to base these are zones of brecciation, broken zones of core with slickensides and calcite. Partings slickensided.	10.08	877.51	10.07	
SANDSTONE, grey, fine grained, quartz-lithic.	1.09	878.60	1.09	
SANDSTONE, grey, fine grained, quartz-lithic, calcite veins in various orientations and others quite irregular and mostly fine. Massive.	11.51	890.11	11.49	
MUDSTONE, dark grey, one heavy calcite vein 0.3' from top.	2.21	892.32	2.21	

SUKUNKA, D.D.H. C-26A

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE, grey.	0.85	893.17	0.85	
SANDSTONE, grey, fine grained becoming medium to base, quartz-lithic, calcite veins in top 1.0' at 30° to core axis, at 1.15' and 2.75' from top are heavy calcite veins parallel to bedding. Bedding angle 75° to core axis.	3.78	896.95	3.75	
SILTSTONE, grey, one thin calcite vein parallel to bedding.	0.36	897.31	0.35	
MUDSTONE, dark grey.	0.32	897.63	0.31	
SANDSTONE, grey, fine to very fine grained, quartz-lithic, some silty interbeds.	1.14	898.77	1.12	
MUDSTONE, dark grey, thin siltstone interbeds in top 2.3'.	4.28	903.05	4.20	
CLAYSTONE, dark brown, carbonaceous.	0.78	903.83	0.77	
SANDSTONE, grey, fine grained, quartz-lithic, some silty interbeds and a silty phase from 1.68' to 2.90' from top. Coaly wisps. Calcite veins, some 34° to core axis, others parallel to bedding. Bedding angle at 73° to core axis.	12.96	916.79	12.73	

SUKUNKA D.D.H. C-26A

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, fine grained, quartz-lithic, numerous carbonaceous claystone bands concentrating into phases from 6.6' to 7.4', and from 9.0' to 9.75' from top. Bedding angle 65° to core axis.	13.95	930.74	13.70	
CLAYSTONE, brown, carbonaceous, some thin sandy interbeds. At 4.2' from base a plane at 50° to core axis. Beds in 0.3' above bent down to this plane and terminate abruptly on it. Calcite vein (thin) along plane.	10.09	940.83	9.91	
SANDSTONE, grey, fine to very fine grained, quartz-lithic, numerous silty and claystone interbeds. Bedding angle 73° to core axis.	13.56	954.39	13.32	
CLAYSTONE, brown, carbonaceous, silty and sandy interbeds at top. Bedding angle 81° to core axis.	11.61	966.00	11.40	
<u>COAL</u> , dull, joint planes - 45° to core axis 0.3' from top, 35° at 0.6' from top, 50° at 1.15' from top. core fragmented into fine chips mostly dull. dull. core fragmented into fine chips which suggest coal type in mainly dull with minor bright bands.	1.52	967.52	1.26)
	0.21	967.73	0.17)
	0.93	968.66	0.77	) CHAMBERLAIN SEAM
	1.58	970.24	1.31	) Upper Split Lower Plate

SUKUNKA D.D.H. C-26A

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE grey, sandy and some claystone phases. Bedding angle 1' below seam 70° to core axis. From 1.15' to 1.95' from top core broken and some calcite veins.	3.57	973.81	3.41	
SILTSTONE, grey, some listric surfaces and broken core in bottom 0.9'.	1.84	975.65	1.70	
<u>COAL</u> , core almost entirely powdered. Where solid it is dull to mainly dull with minor bright bands. Proportion of bright chips in powdered section very small.	5.29	980.94	4.70	) CHAMBERLAIN SEAM
<u>COAL</u> , dull at top 0.65', remainder powdered with few bright fragments.	2.20	983.14	1.95	) Lower Split) Lower Plate
SANDSTONE, grey, fine grained, quartz-lithic, calcite veins down to 4' from base at 30° to core axis. Below this veins are parallel to bedding. Brecciated zone, top of which is 0.95' from base and reduces gradually to unbrecciated rock over depth of 0.4'. Bedding angle 68° to core axis 6.8' from top.	13.15	996.29	13.15	
SANDSTONE, grey, fine grained, quartz-lithic, a few silty interbeds, and minor calcite veins.	7.53	1003.82	7.53	<u>Base of Hole</u>

BORE NUMBER C-27

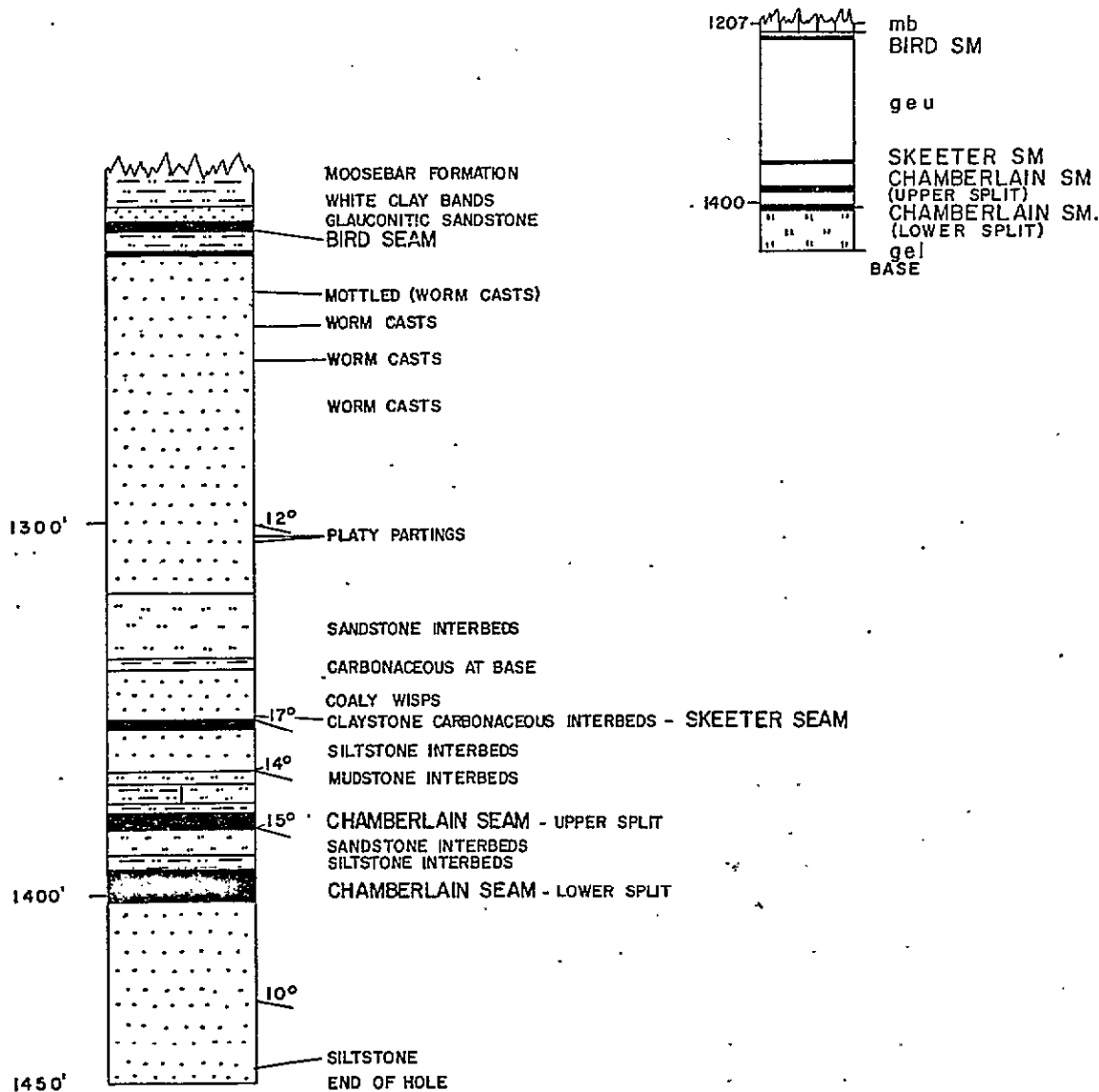
Grid Reference 35337.5 N 91924.0 E
Exploration Grid Reference K + 1400'N / 3 + 425'E

Date Commenced 13th Oct., 1971 Completed 23rd Oct., 1971

Collar R.L. 5185.8 ft. Standard Datum
Total Depth 1450.00 ft. Electrically Logged Yes/No
Drilled by Canadian Longyear Ltd. Angled Hole
For Coalition Mining Limited Tropari Angle 60°
Azimuth 108°
Logged by F.H.S. Tebbutt

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Chamberlain - upper split	3804.2 ft.	4.18	81%	
Chamberlain - lower split	3887.1 ft.	7.91	96%	



DETAIL OF GETHING
 FORMATION
 SCALE: 1" to 50'

SCALE: 1" to 200'

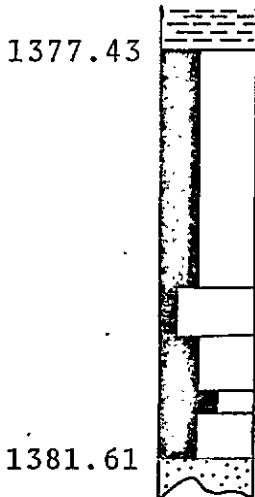
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 for
 COALITION MINING LIMITED

STRATIGRAPHIC LOGS
 DDH C-27

CHAMBERLAIN SEAM
UPPER SPLIT

ASH %
CUMULATIVE
FROM FLOOR

WT%	ASH%	C. S. No	INCL. BANDS	EXCL. BANDS
			5.4	
-	5.4	5		



4.18

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COALITION MINING LIMITED
DRAWN BY pm DATE Jan '72

SEAM SECTIONS
DDH C-27

SCALE: 1' to 2'

PAGE 1 of 1

CHAMBERLAIN SEAM
LOWER SPLIT

ASH %
CUMULATIVE
FROM FLOOR

	WT %	ASH %	C. S. N ^o	INCL. BANDS	EXCL. BANDS
1392.91				4.9	
7.91	-	4.9	6½		
1400.82					



Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED
DRAWN BY pm DATE Jan '72

SEAM SECTIONS
DDH C-27

SCALE: 1' to 2'

PAGE 1 of 1

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

C A R G O
SUPERINTENDENTS
CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

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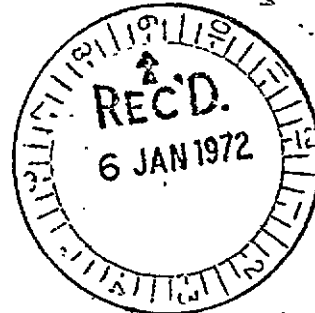
APPLICANT: COALITION MINING

REPORT ON: SUKUNKA SAMPLE NO. 167
CORE NO. C27
~~SKETTER SEAM~~ CHAMBERLAIN SEAM (UPPER SPLIT)

REPORT NO. K71-1852

RECEIVED: 17. 11. 1971

REPORTED: 31. 12. 1971



This Laboratory is Registered by the National Association of Testing Authorities Australia. The tests reported herein have been performed in accordance with the terms of registration.

M. Bradley
A.R.A.C.I. Chief Chemist.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

INTRODUCTION:

One (1) Coal Sample designated CORE NO. C27 SKEETER SEAM was received on 17. 11. 1971 from Clifford McElroy & Associates.

METHOD:

The Coal Sample No. 167 was hand crushed to $\frac{3}{4}$ ", sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 167 and the analysis are given in this report.

NOTE:

The sample weight has not been adjusted to compensate for core loss.

RESULTS:

TABLE 1 : gives the sizing, washability and analytical data for the sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 1WASHABILITY DATA FOR SAMPLE NO. 167 (after hand crushing to $\frac{3}{4}$ ")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
F1.30 SG	753	38.0	1.7	8	38.0	1.7	8
S1.30 - F1.35 SG	759	38.3	4.4	5	76.3	3.1	6½
S1.35 - F1.40 SG	351	17.7	9.4	1	94.0	4.3	5½
S1.40 - F1.45 SG	67	3.4	14.7	1	97.4	4.6	5½
S1.45 - F1.50 SG	19	1.0	16.7	1	98.4	4.7	5
S1.50 - F1.55 SG	6	0.3	27.2	1	98.7	4.8	5
S1.55 - F1.60 SG	3	0.2	31.3	1	98.9	4.9	5
S1.60 SG	23	1.1	51.1	1	100.0	5.4	5
-30 Mesh RC	167	7.8	5.1	8			

Total Weight of Sample = 2148 grams
True Specific Gravity = 1.309
Thickness = 4.18'

ANALYSIS OF F1.60 SG FRACTION OF SAMPLE NO. 167

Yield %	98.9
Air Dried Moisture %	1.0
Ash %	4.9
Volatile Matter %	19.7
Fixed Carbon %	74.4
Total Sulphur %	0.45
C.S.NO.	5½
Calorific Value	14410 BTU/LB
Phosphorus %	0.044

SYDNEY

31st December 1971

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

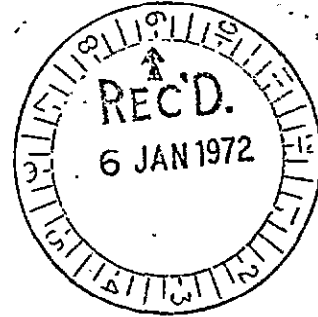
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APPLICANT: COALITION MINING

REPORT ON: SUKUNKA SAMPLE NO. 170
CORE NO: C27
CHAMBERLAIN SEAM (LOWER SPLIT)

REPORT NO. K71-1853

RECEIVED: 17. 11. 1971

REPORTED: 31. 12. 1971



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National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

M Bradley
A.R.A.C.I. Chief Chemist

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

L Duncanson

INTRODUCTION: One (1) Coal Sample designated CORE NO. C27 CHAMBERLAIN SEAM was received on 17. 11. 1971 from Clifford McElroy & Associates.

METHOD: The Coal Sample No. 170 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 170 and the analysis are given in this report.

NOTE: The sample weight has not been adjusted to compensate for core loss.

RESULTS: TABLE 1 : gives the sizing, washability and analytical data for the sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 1 WASHABILITY DATA FOR SAMPLE NO. 170 (after hand crushing to $\frac{3}{4}$ ")

FRACTION	INDIVIDUAL				CUMULATIVE		
	WEIGHT	WT.%	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
F1.30 SG	1924	44.8	2.1	9	44.8	2.1	9
S1.30 - F1.35 SG	1514	35.3	4.4	5	80.1	3.1	7
S1.35 - F1.40 SG	509	11.9	8.7	2	92.0	3.8	6½
S1.40 - F1.45 SG	147	3.4	13.3	2	95.4	4.2	6½
S1.45 - F1.50 SG	74	1.7	16.8	1	97.1	4.4	6½
S1.50 - F1.55 SG	42	1.0	16.4	1	98.1	4.5	6
S1.55 - F1.60 SG	29	0.7	18.5	1	98.8	4.6	6
S1.60 SG	52	1.2	28.5	0	100.0	4.9	6
-30 Mesh RC	496	10.4	4.5	9			

Total Weight of Sample = 4787 grams
True Specific Gravity = 1.290
Thickness = 7.91'

ANALYSIS OF FLOATS 1.60 SG FRACTION OF SAMPLE NO. 170

Yield %	98.8
Air Dried Moisture %	1.0
Ash %	4.8
Volatile Matter %	19.1
Fixed Carbon %	75.1
Total Sulphur %	0.32
C.S.NO.	6½
Calorific Value	14520 BTU/LB
Phosphorus %	0.025

SYDNEY
31st December 1971

STRATIGRAPHIC LOG
SUKUNKA D.D.H. C-27

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
	No core to 1205.0 ft.		
	MUDSTONE, dark grey, white clay bands at 1214' and at base.	MOOSEBAR FM.	1215.0
	SANDSTONE, glauconitic.	GETHING FM.	1219.0
	<u>COAL.</u>	BIRD SEAM	1221.0
	MUDSTONE, dark grey.		1227.0
	<u>COAL.</u>		1228.0
Dip 12° at 1300 ft	SANDSTONE, grey, medium grained becoming finer to base, mottled (worm casts) 1237'. Worm casts at 1248', 1256', 1258', 1266'-1271', platy partings at 1304' and 1305'.		1319.0
	SILTSTONE, grey, sandy interbeds.		1336.0
	MUDSTONE, dark grey, carbonaceous in bottom 1'.		1339.0
Dip 17° to 1350 ft	SANDSTONE, grey, coaly wisps - becoming carbonaceous claystone interbeds to base, claystone carbonaceous at base.		1353.0
	<u>COAL.</u>	SKEETER SM.	1355.0

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
Dip 14° at 1368 ft	SANDSTONE, silty interbeds.		1366.0
	SILTSTONE, grey, mudstone interbeds.		1370.0
	LAMINITE, siltstone and mudstone.		1375.0
	MUDSTONE, dark grey.		1377.5
	<u>COAL.</u>	CHAMB. SM. upper split	1381.5
Dip 15° at 1385 ft	SILTSTONE, grey, sandy interbeds.		1389.0
	MUDSTONE, silty interbeds becoming less to base.		1393.0
	<u>COAL,</u>	CHAMB. SM. lower split	1401.0
Dip 10° at 1430 ft	SANDSTONE, grey, medium grained becoming finer to base, silty at base.		1450.0
			<u>Base of Hole</u>

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
Core not logged in detail - refer to Stratigraphic Log for particulars.		1322.76		
SANDSTONE, grey, fine grained, quartz-lithic, mud blebs 0.16' from base.	0.60	1323.36	0.60	
SILTSTONE, grey, sandy interbeds and phases, with some mudstone interbeds as well towards base, zone (0.55') of calcite veins 2.08' from top, bedding angle 77°.	12.34	1335.70	12.79	
MUDSTONE, dark grey, some silty interbeds.	2.84	1338.54	2.98	
CLAYSTONE, brown, carbonaceous.	0.55	1339.09	0.58	
SANDSTONE, grey, fine grained, quartz-lithic, coaly wisps, some very fine (small) worm casts 0.55' from base.	2.62	1341.71	2.75	
SANDSTONE, grey, fine grained, quartz-lithic, coaly wisps, carbonaceous claystone interbeds concentrating to claystone carbonaceous phases from 8.85' to 9.75' from base, being heavily interbedded below this with a phase of claystone carbonaceous in basal 0.38'. Some small worm casts in zone (0.5') 0.8' from top. Bedding angle 73° to core axis.	11.12	1352.83	11.33	

SUKUNKA D.D.H. C-27

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
COAL, badly broken, fragments mostly dull with bright bands or stony, with about 30% of total length being fines.	2.32	1355.15	0.52	) SKEETER SEAM.
SANDSTONE, grey, fine grained, quartz-lithic, silty interbeds and phases, carbonaceous in top 0.2'.	7.41	1362.56	7.04	
SANDSTONE, grey, fine grained, quartz-lithic, silty interbeds. Some current bedding.	4.11	1366.67	3.91	
SILTSTONE, grey, with mudstone dark grey interbedded. Mudstone increases towards base. Bottom 3' a laminite. Bedding angle 76° to core axis.	7.98	1374.65	7.59	
CLAYSTONE, carbonaceous, with less carbonaceous phases.	2.78	1377.43	2.71	
COAL, mainly dull with minor bright bands. Joint planes of 55° to core axis at 1.3' from top and 77° at 2.25' from top.	2.44	1379.87	2.27	) CHAMBERLAIN SEAM
dull, joints at 74° at top and bottom and at 54° to core axis at centre.	0.47	1380.34	0.44	) upper split
mainly dull with minor bright bands, joint at 60° to core axis at base.	0.58	1380.92	0.54)

SUKUNKA D.D.H. C-27

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , bright and dull.	0.24	1381.16	0.22	) CHAMBERLAIN SEAM
mainly dull with minor bright bands.	0.45	1381.61	0.42	) upper split
SANDSTONE, grey, fine grained, quartz-lithic.	0.38	1381.99	0.39	
SANDSTONE, grey, very fine grained, quartz-lithic, silty interbeds, these increasing to base. Bedding angle 75° to core axis.	6.98	1388.97	7.23	
MUDSTONE, dark grey, silty interbeds, some thin calcite veins towards the base.	3.76	1392.73	3.87	
<u>COAL</u> , dull.	0.07	1392.80	0.07)
SANDSTONE, grey, fine grained, quartz-lithic, coaly wisps and carbonaceous phases.	0.11	1392.91	0.11)
<u>COAL</u> , joint planes at 22° to core axis throughout this seam. Less marked to base and increasing to 32°. Coal types as follows:-				) CHAMBERLAIN SEAM
mainly dull with minor bright bands.	0.20	1393.11	0.21	) lower split

SUKUNKA D.D.H. C-27

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
COAL, core broken, larger fragments dull with bright bands, but 50% core is fines containing much bright coal.	0.32	1393.43	0.33)
dull and bright.	0.82	1394.25	0.85)
dull.	0.12	1394.37	0.12)
dull and bright.	0.15	1394.52	0.16)
dull.	0.08	1394.60	0.08)
bright.	0.12	1394.72	0.13)
dull and bright.	0.05	1394.77	0.05)
bright.	0.15	1394.92	0.16)
dull and bright.	0.26	1395.18	0.27)
mainly dull with minor bright bands.	0.29	1395.47	0.30)
dull and bright.	0.11	1395.58	0.11)

CHAMBERLAIN
SEAM
lower split

SUKUNKA D.D.H. C-27

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , mainly dull with minor bright bands.	0.09	1395.67	0.09)	
mainly dull with minor bright bands.	0.14	1395.81	0.15)	
dull and bright.	0.32	1396.13	0.33)	
dull, cleat not well developed.	0.33	1396.46	0.34)	
mainly dull with minor bright bands.	0.21	1396.67	0.21)	
bright.	0.11	1396.78	0.11)	
mainly bright with minor dull bands.	0.17	1396.95	0.18)	CHAMBERLAIN SEAM
dull.	0.23	1397.18	0.24)	lower split
mainly dull with minor bright bands.	0.58	1397.76	0.60)	
dull and bright.	0.28	1398.04	0.29)	
bright.	0.07	1398.11	0.07)	
bright and dull.	0.43	1398.54	0.45)	

SUKUNKA D.D.H. C-27

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull.	0.08	1398.62	0.08)	
bright and dull.	0.14	1398.76	0.15)	
mainly dull with minor bright bands.	0.73	1399.49	0.77)	CHAMBERLAIN SEAM
bright and dull.	0.31	1399.80	0.32)	lower split
dull and bright.	1.02	1400.82	1.08)	
SANDSTONE, grey, fine grained, quartz-lithic, carbonaceous in top 0.07', coaly wisps and lenses.			0.33	
SANDSTONE, as above.	4.92	1405.74	4.81	
SANDSTONE, grey, medium grained becoming finer to base, quartz-lithic, worm casts from 12.0' to 14.4' from top. Bedding angle 83°-78° from core axis. Current bedded.	19.65	1425.39	19.22	
SANDSTONE, grey, fine to very fine grained, quartz-lithic.	20.10	1445.49	19.66	
SANDSTONE, as above, silty interbeds to base.	0.66	1446.15	0.65	
	3.85	1450.00	3.77	<u>Base of Hole</u>

BORE NUMBER C - 28

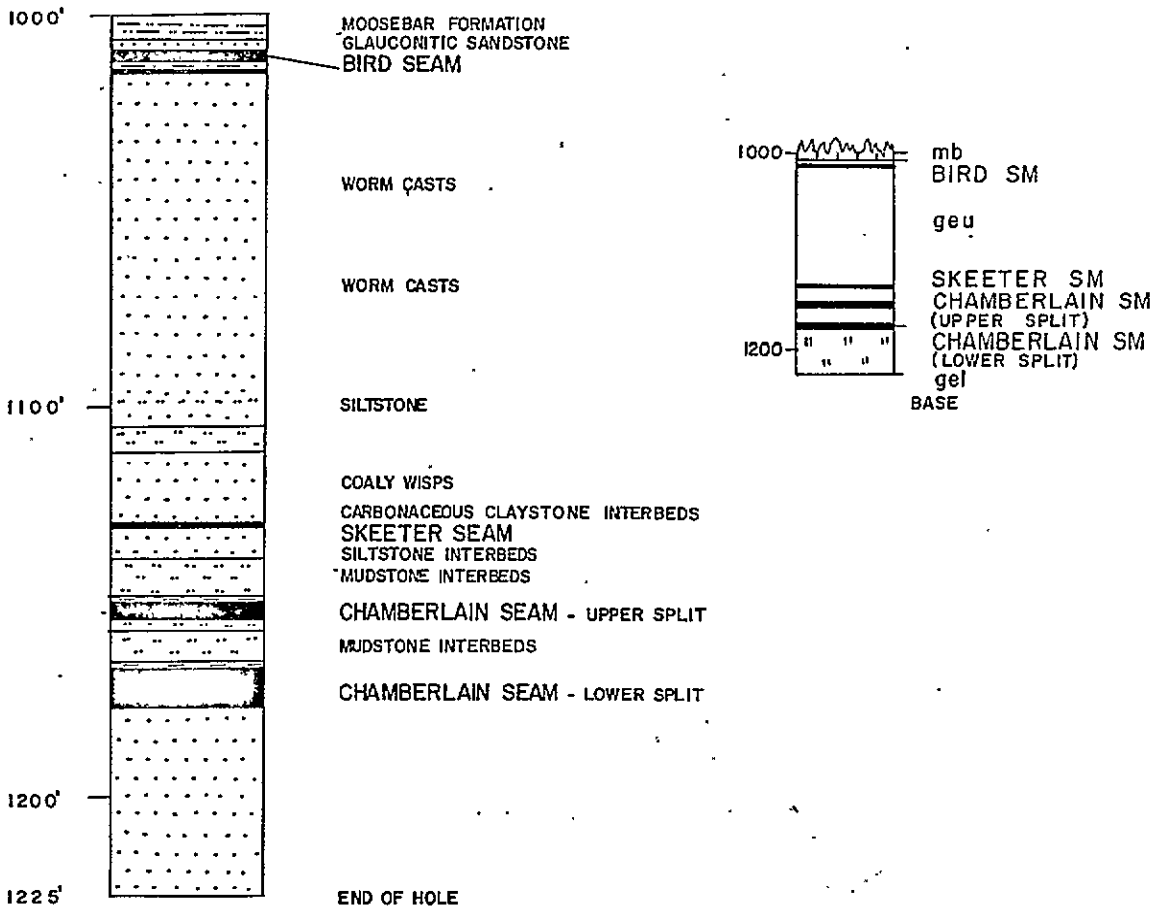
Grid Reference 38435.4 N 91981.7 E
Exploration Grid Reference J + 1875'N / 4 + 200'E

Date Commenced 16th Oct., 1971 Completed 21st Oct., 1971

Collar R.L. 4999.2 ft. Standard Datum
Total Depth 1224.61 ft. Electrically Logged Yes/~~No~~
Drilled by Canadian Longyear Ltd.
For Coalition Mining Limited
Logged by F.H.S. Tebbutt

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Chamberlain - upper split	3845.3 ft.	4.91	88%	
Chamberlain - lower split	3822.7 ft.	9.44	87%	



DETAIL OF GETHING
FORMATION
SCALE: 1" to 50'

SCALE: 1" to 200'


Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS
DDH C-28

DRAWN BY S.A.

DATE: January '72

PAGE 1 of 1

				ASH % CUMULATIVE FROM FLOOR		
CHAMBERLAIN SEAM UPPER SPLIT		WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
1148.99		-	25.8	4	25.8	
1153.90		4.91				

Prepared by:
 CLIFFORD McELROY & ASSOCIATES PTY. LTD.
 for
 COALITION MINING LIMITED
 DRAWN BY pm DATE Jan '72

SEAM SECTIONS
 DDH C-28

SCALE: 1" to 2'

PAGE 1 of 1

STRATIGRAPHIC LOG
SUKUNKA D.D.H. CS-4

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft.)</i>
	No core to 20.0 ft.		
	MUDSTONE, dark grey, bentonite? bands at 103', 137', 147', 168' and 169'.	MOOSEBAR	169.0
	SANDSTONE, glauconitic.	GETHING	171.0
	SANDSTONE, grey, quartz-lithic, medium grained, pebbles at 178' 179' and from 180.5' to base.		181.9
	<u>COAL.</u>))		184.8
	MUDSTONE, grey.))	BIRD SEAM	185.7
	<u>COAL.</u>))		185.10
	SANDSTONE, grey, medium grained (fine at base), quartz-lithic, mottled (worm casts) at 192', mudstone bands at 206', pebble band at 208'.		246.0
	SILTSTONE AND MUDSTONE INTERBEDS, worm casts, granules at base.		263.0
	SANDSTONE, grey, medium grained.		267.0
	MUDSTONE, grey.		271.0
	SANDSTONE, grey, medium grained, coaly wisps.		398.0

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

C A R G O
SUPERINTENDENTS
CO. (A/SIA.) PTY. LTD.

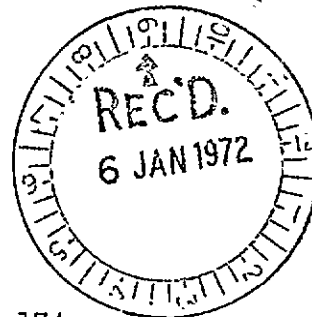
Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify

APPLICANT:

COALITION MINING



SUBJECT:

SUKUNKA SAMPLE NO. 171 - 174
CORE NO. C28
~~SKEETER SEAM~~ CHAMBERLIAN SEAM (UPPER SPLIT)

REPORT NO.

K71 - 1854

DATE RECEIVED:

17. 11. 71

DATE REPORTED:

31. 12. 71



This Laboratory is Registered by the
National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

A. B. Bradley
A.R.A.C.I. Chief Chemist.

For

CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

[Signature]

INTRODUCTION: One (1) coal sample designated CORE NO. C28 SKEETER SEAM was received on 17.11.71 from Clifford McElroy & Associates.

METHODS: The coal sample no. 171-174 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 - 1.60 specific gravity in 0.05 steps.

The float and sink fractions and raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true S.G. of the sample determined.

The cumulative floats 1.60 S.G. fraction was prepared for sample no. 171-174 and the analysis are given in this report.

NOTE: The sample weight has not been adjusted to compensate for core loss.

RESULTS: TABLE 1: gives the sizing, washability and analytical data for the sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 1: WASHABILITY DATA FOR SAMPLE NO. 171-174 (after hand crushing to $\frac{3}{4}$ ")

FRACTION	WEIGHT	WT. %	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
F1.30	689	24.0	1.8	9	24.0	1.8	9
S1.30 - F1.35	597	20.8	4.7	4 $\frac{1}{2}$	44.8	3.1	7
S1.35 - F1.40	257	9.0	10.5	4 $\frac{1}{2}$	53.8	4.4	6 $\frac{1}{2}$
S1.40 - F1.45	98	3.4	16.1	1	57.2	5.1	6
S1.45 - F1.50	70	2.4	22.5	1	59.6	5.8	6
S1.50 - F1.55	147	5.1	28.4	1	64.7	7.6	5 $\frac{1}{2}$
S1.55 - F1.60	122	4.3	33.6	1	69.0	9.2	5
S1.60	890	31.0	66.3	0	100.0	26.9	3 $\frac{1}{2}$
-30 Mesh RC	250	8.0	12.4	8			
					TOTAL WEIGHT	3120 gms	
					TRUE S.G.	1.487	
					THICKNESS	4.91'	

ANALYSIS OF F1.60 S.G. FRACTION OF SAMPLE NO. 171-174

YIELD %	69.0
AIR DRIED MOISTURE %	1.0
ASH %	9.2
VOLATILE MATTER %	20.2
FIXED CARBON %	69.6
TOTAL SULPHUR %	0.48
C.S.NO.	5 $\frac{1}{2}$
CALORIFIC VALUE	13,880 BTU/LB
PHOSPHORUS %	0.021

SYDNEY

Telegrams and Cables:
"Visor", Sydney

CARGO SUPERINTENDENTS

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Telephone: 241 1105

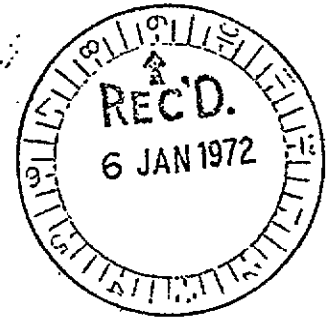
CO. (A/SIA.) PTY. LTD.

Certification

This is to Certify

APPLICANT:

COALITION MINING



SUBJECT:

SUKUNKA SAMPLE NO. 175
CORE NO. C28
CHAMBERLAIN SEAM (LOWER SPLIT)

REPORT NO.

K71-1855

DATE RECEIVED:

17. 11. 71

DATE REPORTED:

31. 12. 71



This Laboratory is Registered by the
National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

A. R. A. C. I.
A. R. A. C. I.
Chief Chemist.

For

CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

L. J. D. Campbell

INTRODUCTION:

One (1) coal sample designated Core No. C28 CHAMBERLAIN SEAM was received on 17. 11. 71 from Clifford McElroy & Associates Pty. Ltd.

METHODS:

The coal sample no. 175 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 - 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative floats 1.60 S.G. fraction was prepared for sample no. 175 and the analysis are given in this report.

NOTE:

The sample weight has not been adjusted to compensate for core loss.

RESULTS:

TABLE 1: gives the sizing, washability and analytical data for the sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 1: WASHABILITY DATA FOR SAMPLE NO. 175 (after hand crushing to $\frac{3}{4}$ ")

FRACTION	INDIVIDUAL ANALYSIS				CUMULATIVE ANALYSIS		
	WEIGHT	WT. %	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
F1.30	2181	46.1	2.2	9	46.1	2.2	9
S1.30 - F1.35	1632	34.5	4.2	7	80.6	3.1	8
S1.35 - F1.40	446	9.4	10.6	4 $\frac{1}{2}$	90.0	3.8	8
S1.40 - F1.45	162	3.4	14.5	2 $\frac{1}{2}$	93.4	4.2	7 $\frac{1}{2}$
S1.45 - F1.50	87	1.8	18.0	1	95.2	4.5	7 $\frac{1}{2}$
S1.50 - F1.55	51	1.1	18.8	1	96.3	4.7	7 $\frac{1}{2}$
S1.55 - F1.60	19	0.4	20.0	1	96.7	4.7	7 $\frac{1}{2}$
S1.60	150	3.3	63.4	1	100.0	6.7	7
-30 Mesh RC	484	9.3	5.0	9			
	TOTAL WEIGHT	5251 gms	TRUE S.G.	1.316	THICKNESS	9.44 $\frac{1}{2}$	

SHEET THREE ATTACHED:

ANALYSIS OF Fl.60 S.G. FRACTION OF SAMPLE NO. 175

YIELD %	96.7
AIR DRIED MOISTURE %	1.0
ASH %	4.8
VOLATILE MATTER %	20.5
FIXED CARBON %	73.7
TOTAL SULPHUR %	0.42
C.S.NO.	8
CV (BTU/lb)	14450
PHOSPHORUS %	0.021

SYDNEY

31st December, 1971

STRATIGRAPHIC LOG
SUKUNKA D.D.H. C-28

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
	No core to 1000.0 ft.		
	MUDSTONE, dark grey, white claystone bands at 1006, 1007'.	MOOSEBAR FM.	1007.0
	SANDSTONE, glauconitic.	GETHING FM.	1009.0
	<u>COAL.</u>	BIRD SEAM	1011.0
	MUDSTONE, dark grey, 6" coal at base.		1014.0
	SANDSTONE, grey, medium grained becoming finer to base. Worm casts from 1030'-1057' and 1065' to 1072'. Siltstone band of 1.5' at 1098'.		1105.0
	SILTSTONE, grey, mudstone at base.		1111.0
	SANDSTONE, coaly wisps, from 1117' to base carbonaceous claystone interbeds with concentrated zones at 1124' and at base.		1130.0
	<u>COAL.</u>	SKEETER SM.	1131.0
	SANDSTONE, silty interbeds.		1139.0
	SILTSTONE; grey, mudstone interbeds.		1149.0

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
	MUDSTONE, dark grey.		1150.0
	<u>COAL.</u>	CHAMB. SM. upper split	1153.5
	SILTSTONE, sandy interbeds.		1157.0
	SILTSTONE, mudstone interbeds, mudstone at base.		1167.0
	<u>COAL.</u>	CHAMB. SM. lower split	1176.0
	SANDSTONE, grey, medium becoming fine grained, quartz-lithic.		1225.0
			<u>Base of Hole</u>

SUKUNKA D.D.H. C-28

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
Core not logged in detail - refer to Stratigraphic Log for particulars.		1057.65		
SANDSTONE, grey, fine grained, quartz-lithic, worm casts and tracks from 7.35' to 13.60' from top. Bedding angle 85° to core axis.	19.36	1077.01	19.34	
SANDSTONE, as above. No worm casts.	5.06	1082.07	5.06	
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey interbedded.	0.38	1082.45	0.38	
SANDSTONE, grey, fine grained to very fine grained, quartz-lithic.	13.66	1096.11	13.65	
SANDSTONE, grey, fine grained becoming medium grained towards base, quartz-lithic.	1.89	1098.00	1.89	
SILTSTONE, grey.	1.69	1099.69	1.69	
SANDSTONE, grey, fine grained, quartz-lithic, current bedded, some silty interbeds. Bedding angle 86° to core axis.	6.38	1106.07	6.38	

SUKUNKA D.D.H. C-28

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE, grey.	4.23	1110.30	4.23	
CLAYSTONE, brown, carbonaceous.	0.76	1111.06	0.76	
SANDSTONE, grey, fine grained, quartz-lithic, coaly wisps and silty interbeds.	4.36	1115.42	4.36	
SANDSTONE, as above, with claystone carbonaceous interbeds, these concentrated from 8.2' to 9.4' from top and from 12.15' to base. Bedding angle 86° to core axis. Worm casts 7.5' from top.	13.57	1128.99	13.55	
<u>COAL</u> , core broken badly, composed of fragments of dull and bright, and dull coal in ratio of approximately 70 : 30 respectively. Some coal stony fragments near base. One section shows shearing at approximately 15° and 40° to core axis.	1.47	1130.46	0.97	) SKEETER SEAM
CLAYSTONE, carbonaceous, some bright bands.	0.17	1130.63	0.17	
SANDSTONE, grey, fine grained, quartz-lithic, silty interbeds.	4.10	1134.73	4.10	

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE, grey, sandy interbeds and phases in top half, becoming mudstone interbeds towards base. Bedding angle 86° to core axis.	11.66	1146.39	11.68	
MUDSTONE, dark grey, with carbonaceous claystone phases above and at base.	2.60	1148.99	2.60	
<u>COAL</u> , stony.	0.13	1149.12	0.13)
mainly dull with minor bright bands to stony with minor bright bands, remainder of seam contains joints at 15° to core axis.	1.01	1150.13	1.04)
dull with bright bands.	0.71	1150.84	0.74	) CHAMBERLAIN SEAM
stony to mainly dull with minor bright bands.	0.53	1151.37	0.55	) upper split
mainly dull with minor bright bands.	0.96	1152.34	0.99)
bright and dull.	0.14	1152.47	0.15)
mainly dull with minor bright bands.	0.46	1152.93	0.48)

SUKUNKA D.D.H.. C-28

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull and bright.	0.20	1153.13	0.21)	
mainly dull with minor bright bands, joints at 70° to core axis.	0.16	1153.29	0.17)	
coal type indeterminate due to shearing at 70° to core axis, no vertical cleat developed, core breaks into narrow sheared pieces.	0.20	1153.49	0.21)	CHAMBERLAIN SEAM upper split
mainly dull with minor bright bands, some shearing at 70° to core axis.	0.22	1153.71	0.23)	
bright.	0.19	1153.90	0.20)	
<u>SANDSTONE</u> , grey, very fine grained, quartz-lithic, silty interbeds. Bedding angle 90° to core axis. Carbonaceous in top 0.3'.	3.68	1157.58	3.76	
<u>SILTSTONE</u> , grey, with mudstone interbeds and phases, becoming more muddy towards base.	9.44	1167.02	9.66	
<u>COAL</u> , mainly dull with minor bright bands. Top 0.45' core splits neatly parallel to core axis and at				

SUKUNKA D.D.H. C-28

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
90° to core axis to form numerous rectangular blocks. 1' from top joint at 10° to core axis.	1.20	1168.22	1.20)	
<u>COAL</u> , bright.	0.07	1168.29	0.07)	
dull and bright.	0.23	1168.52	0.23)	
mainly dull with minor bright bands.	0.65	1169.17	0.65)	
bright and dull.	0.13	1169.30	0.13)	
mainly dull with minor bright bands.	0.37	1169.67	0.37)	
bright. Joint at 20° to core axis.	0.13	1169.80	0.13)	CHAMBERLAI SEAM
mainly dull with minor bright bands.	0.13	1169.93	0.13)	lower spli
dull and bright.	0.23	1170.16	0.23)	
mainly dull with minor bright bands, joint at 74° to core axis.	0.39	1170.55	0.39)	

SUKUNKA D.D.H. C-28

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull and bright.	0.13	1170.68	0.13)
mainly dull with minor bright bands.	0.20	1170.88	0.20)
dull and bright.	0.32	1171.20	0.32)
dull.	0.14	1171.34	0.14)
dull and bright, joint at top 68° to core axis.	0.76	1172.10	0.76)
mainly dull with minor bright bands.	0.66	1172.76	0.66)
bright.	0.06	1172.82	0.06)
dull and bright.	0.47	1173.29	0.47	) CHAMBERLAIN SEAM
mainly dull with minor bright bands.	0.26	1173.55	0.26	) lower split
dull and bright.	0.81	1174.36	0.81)
mainly dull with minor bright bands.	0.46	1174.82	0.46)

CHAMBERLAIN SEAM lower split

SUKUNKA D.D.H. C-28

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull and bright.	0.30	1175.12	0.30)	
bright and dull.	0.22	1175.34	0.22)	
bright.	0.11	1175.45	0.11)	
bright and dull.	0.06	1175.51	0.06)	
bright.	0.30	1175.81	0.30)	CHAMBERLAIN SEAM
mainly dull with minor bright bands, bottom 0.15' no vertical cleat developed. Splits readily at 90° to core axis.	0.52	1176.33	0.52)	lower split
dull.	0.09	1176.42	0.09)	
SANDSTONE, black, fine grained, carbonaceous.	0.03	1176.45	0.03)	
<u>COAL</u> , bright.	0.01	1176.46	0.01)	
SANDSTONE, grey, medium grained, quartz-lithic, coaly wisps and irregular masses.	1.86	1178.32	1.86	

SUKUNKA D.D.H. C-28

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, medium grained becoming finer towards base, quartz-lithic, Bedding angle at 85° to core axis. Three calcite veins in top 1.9' parallel to bedding.	19.28	1197.60	19.28	
SANDSTONE, grey, fine grained, quartz-lithic. Bedding angle 88° to core axis.	18.93	1216.53	18.93	
SANDSTONE, as above, some silty interbeds towards base.	8.08	1224.61	8.08	
				<u>Base of Hole</u>

BORE NUMBER C-29

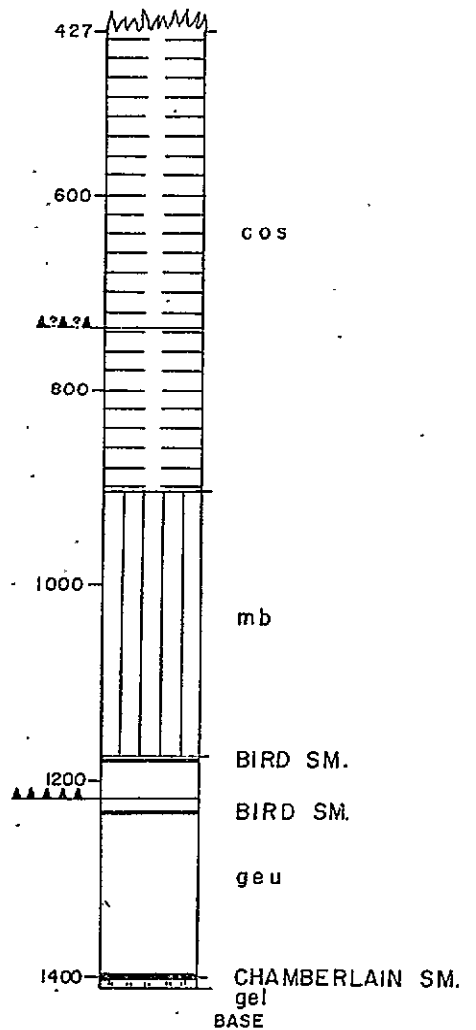
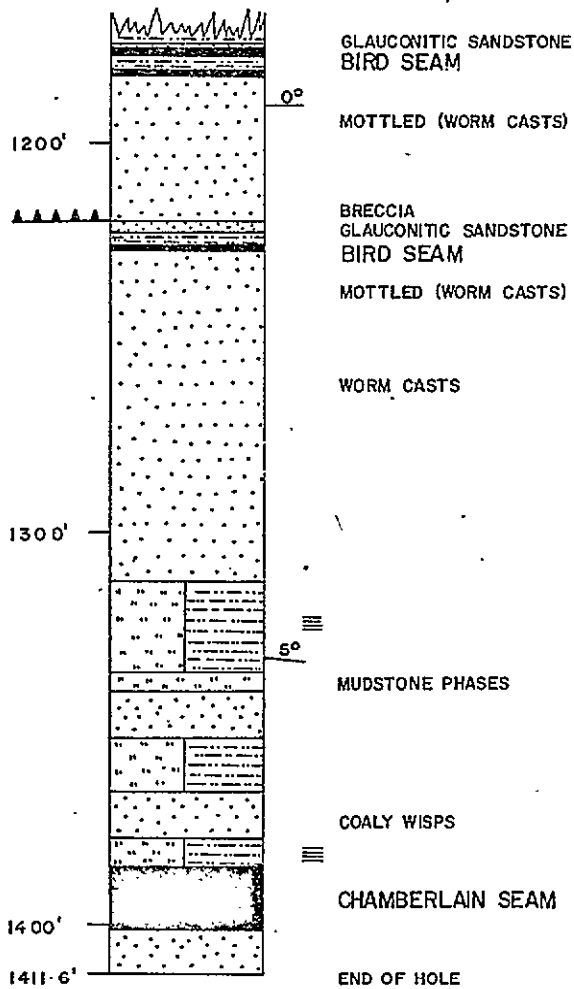
Grid Reference 37448.7 N 96572.7 E
Exploration Grid Reference K + 450'N / 5 + 1400'E

Date Commenced 19th Oct., 1971 Completed 4th Nov., 1971

Collar R.L. 5642.8 ft. Standard Datum
Total Depth 1411.60 ft. Electrically Logged Yes/No
Drilled by Canadian Longyear Ltd.
For Coalition Mining Limited
Logged by R. Shields

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Chamberlain	4243.6 ft.	13.61	80%	



DETAIL OF GETHING
 FORMATION
 SCALE 1" to 50'

SCALE : 1" to 200'

Prepared by :
 CLIFFORD McELROY & ASSOCIATES PTY. LTD.
 for
 COALITION MINING LIMITED

STRATIGRAPHIC LOGS
 DDH C-29

DRAWN BY S.A.

DATE: January '72

PAGE 1 of 1

CHAMBERLAIN SEAM

ASH %
CUMULATIVE
FROM FLOOR

	WT %	ASH %	C. S. N ^o	INCL. BANDS	EXCL. BANDS
1385.89					
13.61	100.0	6.8	5	6.8	



Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED
DRAWN BY S.A. DATE February '72

SEAM SECTIONS
DDH. C- 29

SCALE: 1" to 2'

PAGE 1 of 2

CHAMBERLAIN SEAM

ASH %
CUMULATIVE
FROM FLOOR

WT%

ASH%

C. S. N^o

INCL.
BANDS

EXCL.
BANDS

See page 1

Core broken

1399.50



Prepared by:
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for
COALITION MINING LIMITED

SEAM SECTIONS
DDH C-29

DRAWN BY S.A.

DATE February '72

SCALE: 1" to 2'

PAGE 2 of 2

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

C A R G O SUPERINTENDENTS

CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY. 2000

Certification

This is to Certify

APPLICANT: COALITION MINING

REPORT ON: SUKUNKA SAMPLE NO. 208
CORE NO. C29
CHAMBERLAIN SEAM

REPORT NO. K71-1985

RECEIVED: 10. 12. 1971

REPORTED: 31. 12. 1971



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Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

A.R.A.C.I.
A.R.A.C.I. Chief Chemist

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

[Signature]

INTRODUCTION:

One (1) Coal Sample designated CORE NO. C29 CHAMBERLAIN SEAM was received on 10. 12. 1971 from Clifford McElroy & Associates.

METHOD:

The Coal Sample No. 208 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 208 and the analysis are given in this report.

NOTE:

The sample weight has not been adjusted to compensate for core loss.

RESULTS:

TABLE 1 : gives the sizing, washability and analytical data for the sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 1WASHABILITY DATA FOR SAMPLE NO. 208 (after hand crushing to $\frac{3}{4}$ "

FRACTION	INDIVIDUAL				CUMULATIVE		
	WEIGHT	WT.%	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
F1.30 SG	2019	30.9	2.1	8½	30.9	2.1	8½
S1.30 - F1.35 SG	2832	43.4	4.4	5	74.3	3.4	6½
S1.35 - F1.40 SG	843	12.9	9.5	1½	87.2	4.3	6
S1.40 - F1.45 SG	346	5.3	15.1	1	92.5	5.0	5½
S1.45 - F1.50 SG	156	2.4	17.2	1	94.9	5.3	5½
S1.50 - F1.55 SG	102	1.6	19.8	1	96.5	5.5	5½
S1.55 - F1.60 SG	35	0.5	20.8	1	97.0	5.6	5
S1.60 SG	193	3.0	49.1	1	100.0	6.9	5
-30 Mesh RC	635	8.9	5.4	8			

Total Weight of Sample = 7161 grams

True Specific Gravity = 1.351

Thickness = 13.61'

ANALYSIS OF F1.60 SG FRACTION OF SAMPLE NO. 208

Yield %	97.0
Air Dried Moisture %	1.0
Ash %	5.6
Volatile Matter %	22.0
Fixed Carbon %	71.4
Total Sulphur %	0.31
C.S.NO.	5½
Calorific Value	14420 BTU/LB
Phosphorus %	0.018

SYDNEY

31st December 1971

STRATIGRAPHIC LOG
SUKUNKA D.D.H. C29

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
	No core to 427.0 ft.		
	SILTSTONE AND MUDSTONE INTERBEDDED, sandy phases, small breccia zone 734' (1').	SUKUNKA MB.	902.0
	MUDSTONE.	MOOSEBAR FM.	1175.0
	SANDSTONE, glauconitic.	GETHING FM.	1176.0
	<u>COAL.</u>)	BIRD SEAM	1177.5
)		
	MUDSTONE.)		1182.0
)		
	<u>COAL.</u>)		1183.0
	SANDSTONE, medium to fine grained, coarser at top, 1194' mottled (worm casts), calcite veins, breccia 1219'-1226'.		1221.0
	SANDSTONE, glauconitic.		1222.5
	MUDSTONE, slickensided zones.		1226.0
	<u>COAL.</u>	BIRD SEAM	1227.0
Fault, established	SANDSTONE - medium to fine grained, coarser at top, mottled (worm casts) at 1237', worm casts 1262'.		1312.0

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
	LAMINITE, siltstone and mudstone, silty phases.		1336.0
	SILTSTONE, mudstone phases.		1340.0
	SANDSTONE, medium grained.		1352.5
	SILTSTONE AND MUDSTONE INTERBEDDED, mudstone from 1363-1364'.		1366.0
	SANDSTONE, coaly wisps.		1377.0
	LAMINITE, siltstone and mudstone, mudstone at base.		1385.6
	<u>COAL.</u>	CHAMB. SM.	1400.3
	SANDSTONE, medium to fine grained, coarser at top, carbonaceous at top.		1411.6
			<u>Base of Hole</u>

SUKUNKA C-29

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
Core not logged in detail - refer to Stratigraphic log for particulars.		1307.64		
SANDSTONE, fine grained to medium grained, quartz-lithic, thin carbonaceous phases. Bedding angle 73° to core axis.	2.84	1310.48	2.84	
LAMINITE, grey siltstone and dark grey claystone, sandstone phases in top 2', pyritic replacement of worm casts.	6.52	1317.00	6.52	
CLAYSTONE, black, pyritic, carbonaceous, upper and lower contact gradational.	0.71	1317.71	0.68	
SANDSTONE, fine grained, carbonaceous interbeds, coaly wisps, worm casts (sandy blebs).	4.55	1322.26	4.43	
SANDSTONE, as above, carbonaceous interbeds predominate.	2.45	1324.71	2.34	
CLAYSTONE, black, carbonaceous, coaly inclusions.	0.71	1325.42	0.60	
SANDSTONE, very fine grained, massive.	0.80	1326.22	0.68	
CLAYSTONE, dark grey to black.	0.80	1327.02	0.64	

INTRODUCTION:

Two (2) coal samples designated Core No. CS2 Chamberlain Seam were received on 4.11.71 from Mc Elroy and Associates.

METHODS:

1. The visibly inferior coal sample No. 126 was hand crushed to $-\frac{3}{4}$ " sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.60 S.G.

The float and sink fractions and raw -30 mesh coal fractions were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample re-constituted and the true S.G. of the sample determined.

2. The good quality coal samples No. 127 was hand crushed to $\frac{3}{4}$ ", sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 130-160 S.G. in 0.05 steps.

The float and sink fractions and raw -30 mesh coal fractions were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample re-constituted and the true S.G. of the sample determined.

A cumulative floats 1.60 S.G. fraction was prepared for sample No. 127 and the analysis are given in this report.

NOTE:

Sample weights have not been adjusted to compensate for core loss.

RESULTS:

FIGURE 1 : give the graphic log of the core

TABLES 1-2 : give the sizing, washability and analytical data for each coal sample after hand crushing to $\frac{3}{4}$ " top size.

SHEET THREE ATTACHED

SUKUNKA D.D.H. C-29

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, as above, carbonaceous interbeds less predominant.	8.92	1376.36	8.92	
LAMINITE, grey siltstone and dark grey claystone. Sandstone phases in top 2'. Bedding angle 72° to core axis. Listric surfaces on bedding planes.	7.48	1383.84	7.56	
CLAYSTONE, dark grey to black, carbonaceous. Bedding weakly developed. Bedding angle 72° to core axis.	1.66	1385.50	1.51	
STONE, coaly, specific gravity > 1.60.	0.39	1385.89	0.39	
<u>COAL</u> , dull.	0.25	1386.14	0.24	) Bedding angle 70°
bright.	0.02	1386.16	0.02	) to core axis, shear plane 63°
dull.	0.43	1386.59	0.41	) to core axis
mainly dull with minor bright bands.	0.15	1386.74	0.14	) CHAMBERLAIN SEAM
dull.	0.51	1387.25	0.49)
dull and bright.	0.42	1387.67	0.40)

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , mainly bright with minor dull bands.	0.09	1387.76	0.09)	
dull.	0.34	1388.10	0.33)	
dull and bright.	0.18	1388.28	0.17)	
dull.	1.55	1389.83	1.48)	
dull and bright.	0.47	1390.30	0.45)	
mainly dull with minor bright bands.	0.64	1390.94	0.61)	
dull.	0.95	1391.89	0.91)	CHAMBERLAIN SEAM
dull and bright.	0.85	1392.74	0.81)	
dull.	0.38	1393.12	0.36)	
dull and bright.	2.16	1395.28	2.07)	
dull.	0.14	1395.42	0.14)	
bright.	0.02	1395.44	0.02)	

SUKUNKA D.D.H. C-29

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull.	0.76	1396.20	0.76)	
dull and bright.	0.03	1396.23	0.03)	
dull.	0.40	1396.63	0.40)	
dull and bright.	0.25	1396.88	0.25)	
dull.	0.18	1397.06	0.18)	
dull and bright.	0.29	1397.35	0.29)	CHAMBERLAIN
dull.	0.82	1398.17	0.82)	SEAM
dull and bright.	0.09	1398.26	0.09)	
dull, core broken, chips.	0.65	1398.91	0.65)	
dull and bright, chips.	0.40	1399.31	0.40)	
bright, broken.	0.19	1399.50	0.19)	

SUKUNKA D.D.H. C-29

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, medium grained, quartz lithic, carbonaceous in top 5', coaly inclusions in top 5', Bedding angle 69° to core axis.	12.10	1411.60	12.60	<u>Base of Hole</u>

BORE NUMBER C-30

Grid Reference 48657.0 N 77698.0 E

Exploration Grid Reference A + 450'N / I + 375'E

Date Commenced 2nd Oct., 1971 Completed 5th Oct., 1971

Collar R.L. 4094.6 ft. Standard Datum

Total Depth 408.0 ft. Electrically Logged Yes/~~No~~

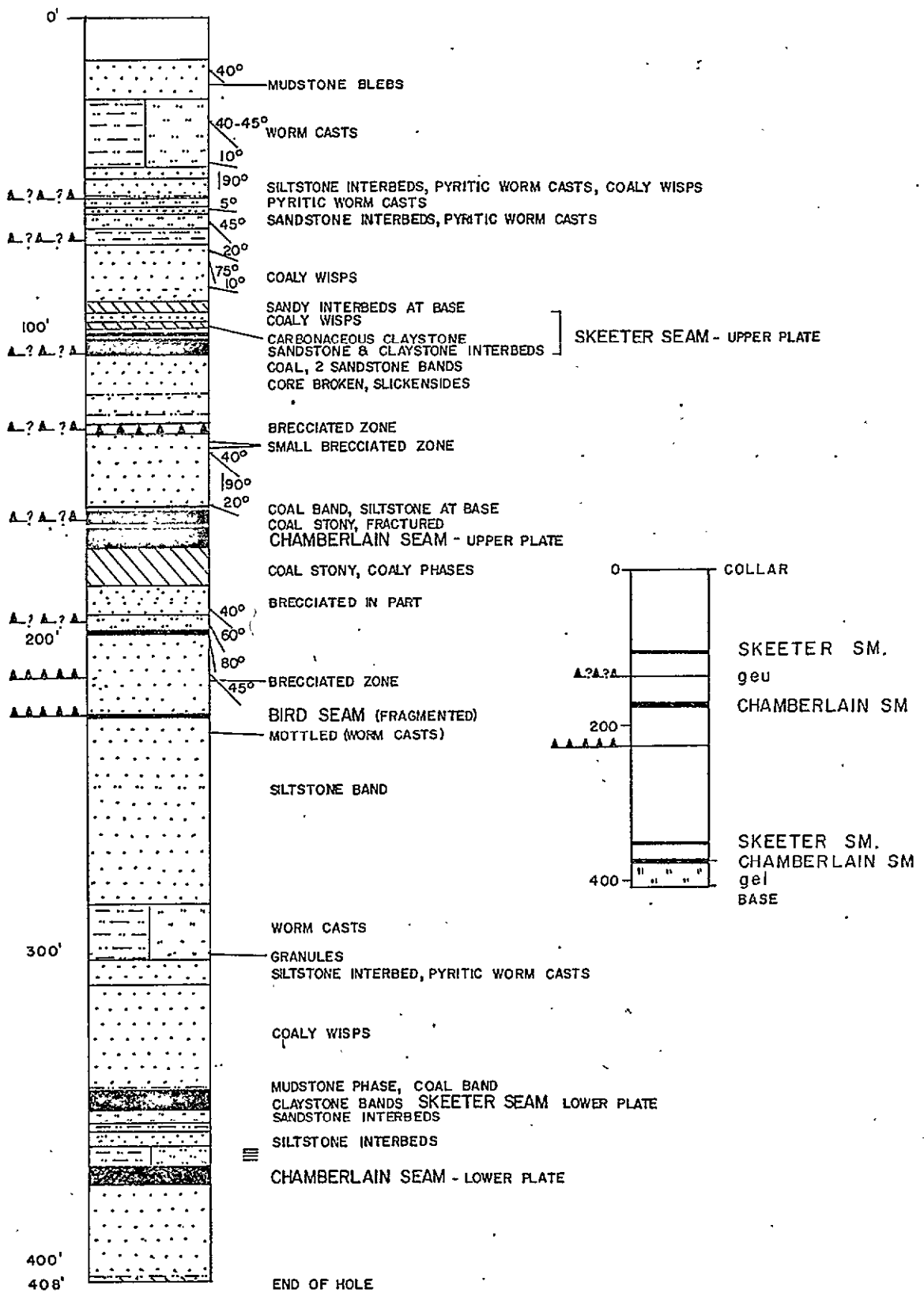
Drilled by Connors Drilling Ltd.

For Coalition Mining Limited

Logged by F.H.S. Tebbutt

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Chamberlain - upper plate	3910.7 ft.	26.60	Not calculated	- faulted
Skeeter - lower plate	3742.4 ft.	7.15	78%	
Chamberlain - lower plate	3718.2 ft.	5.99	80%	



DETAIL OF GETHING
FORMATION
SCALE: 1" to 50'

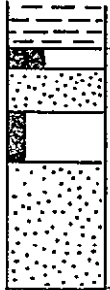

SCALE: 1" to 200'

Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS
DDH C-30

SKEETER SEAM
UPPER PLATE

ASH %
CUMULATIVE
FROM FLOOR

	WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
101.07					
	2.43	NOT	ANALYSED		
	4.81	not	analysed		
108.31					

Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

SEAM SECTIONS

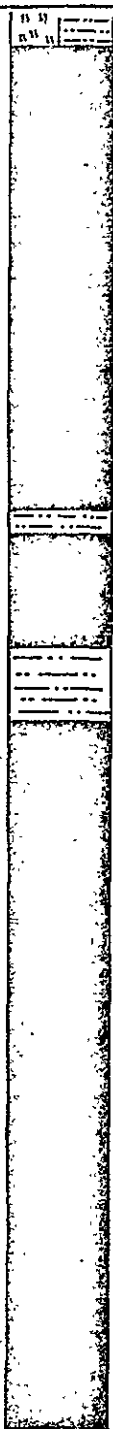
DDH C-30

DRAWN BY pm

DATE Jan '72

SCALE: 1' to 2'

PAGE 1 of 1

				ASH % CUMULATIVE FROM FLOOR		
CHAMBERLAIN SEAM UPPER PLATE		WT %	ASH %	C. S. No	INCL. BANDS	EXCL. BANDS
157.30.						
		15.72	NOT	ANALYSED		

Continued

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

C A R G O
SUPERINTENDENTS
CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify

APPLICANT: COALITION MINING

**REPORT ON: SUKUNKA SAMPLES NO. 117/118, 119, 119A, 119B
CORE NO. C32
SKEETER SEAM**

REPORT NO. K71-1752

RECEIVED: 4. 11. 1971

REPORTED: 26. 11. 1971



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been performed in accordance with the
terms of registration.

M. Bralley
A.R.A.C.I. Chief Chemist.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

L. H. Campbell

SKEETER SEAM
LOWER PLATE

ASH %
CUMULATIVE
FROM FLOOR

	WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
345.09	0.81	-	88.3✓	0	
	4.31	69.8	8.4✓	7	14.1 11.3
	0.12	3.8	86.9✓	0	27.4 18.8
	1.91	26.4	18.8✓	6	18.8 18.8
352.24					



Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.

SEAM SECTIONS

for
COALITION MINING LIMITED

DDH C-30

DRAWN BY pm.

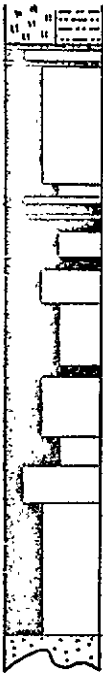
DATE Jan '72

SCALE: 1' to 2'

PAGE 1 of 1

CHAMBERLAIN SEAM
LOWER PLATE

ASH
CUMULATIVE
FROM FLOOR

			WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
370.44		5.99	-	6.3	6½	6.3	
376.43							

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CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED
DRAWN BY pm DATE Jan '72

SEAM. SECTIONS
DDH C-30

SCALE: 1" to 2'

PAGE 1 of 1

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"Vistor", Sydney

Telephone: 241 1105

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SUPERINTENDENTS
CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify

APPLICANT: COALITION MINING

REPORT ON: SUKUNKA SAMPLES NO. 141/142, 143, 144, 145/146
CORE NO. C30
SKEETER ~~(LOWER)~~ SEAM (LOWER PLATE)

REPORT NO. K71-1790

RECEIVED: 8. 11. 1971

REPORTED: 26. 11. 1971



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been performed in accordance with the
terms of registration.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

A.R.A.C.I.

Chief Chemist.

INTRODUCTION:

Two coal samples and two non coal samples designated CORE C30 SKEETER LOWER SEAM were received on 8. 11. 1971 from Clifford McElroy & Associates.

METHODS:

1. The non coal samples No. 141/142, 144 were weighed, prepared and analysed for Ash and True Specific Gravity.
2. The good quality coal samples No. 143 and 145/146 were hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions and raw -30 mesh coal fractions were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true Specific Gravity of each sample determined.

A cumulative floats 1.60 S.G. fraction was prepared for the full seam i.e. 143-146 inclusive and the analysis are given in this report.

NOTE:

Sample weights have been adjusted to compensate for core loss.

RESULTS:

FIGURE 1 : gives the graphic log of the core

TABLES 1-2 : give the sizing, washability and analytical data for each coal sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 3 : gives the calculated washability data for the Full Seam i.e. 143-146 inclusive.

SAMPLE NO. 141/142

RAW COAL TOTAL WEIGHT OF SAMPLE = 720 grams
ASH % = 88.3
TRUE SPECIFIC GRAVITY = 2.381

TABLE 1

WASHABILITY DATA FOR SAMPLE NO. 143 (after hand crushing to $\frac{3}{4}$ "

FRACTION	INDIVIDUAL				CUMULATIVE		
	WEIGHT	WT.%	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
	1068	50.1	2.1	9	50.1	2.1	9
S1.30 - F1.35 SG	530	24.9	5.5	7	75.0	3.2	8½
S1.35 - F1.40 SG	168	7.9	10.2	3½	82.9	3.9	8
S1.40 - F1.45 SG	85	4.0	15.4	1	86.9	4.4	7½
S1.45 - F1.50 SG	80	3.7	20.0	1	90.6	5.1	7½
S1.50 - F1.55 SG	68	3.2	24.6	1	93.8	5.7	7
S1.55 - F1.60 SG	49	2.3	29.3	1	96.1	6.3	7
S1.60 SG	81	3.9	60.0	0	100.0	8.4	7
-30 Mesh	231	9.8	9.8	7½			

Total Gross Weight of Sample = 2360 grams
True Specific Gravity = 1.340

SAMPLE NO. 144

RAW COAL TOTAL WEIGHT OF SAMPLE = 127 grams
 ASH % = 86.9
 TRUE SPECIFIC GRAVITY = ~~1.340~~ 2.326

TABLE 2

WASHABILITY DATA FOR SAMPLE NO. 145/146 (after hand crushing to 3/4")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
F1.30 SG	348	40.6	2.4	9	40.6	2.4	9
S1.30 - F1.35 SG	215	25.1	5.1	7½	65.7	3.4	8½
S1.35 - F1.40 SG	89	10.4	9.5	3	76.1	4.3	8
S1.40 - F1.45 SG	23	2.6	15.2	1	78.7	4.6	7½
S1.45 - F1.50 SG	18	2.1	20.4	1	80.8	5.0	7½
S1.50 - F1.55 SG	8	0.9	26.2	1	81.7	5.3	7½
S1.55 - F1.60 SG	0	-	-	-	81.7	5.3	7½
S1.60 SG	157	18.3	79.1	0	100.0	18.8	6
-30 Mesh	36	41.0	10.5	7½			

Total Weight of Sample = 894 grams
 True Specific Gravity = 1.507

TABLE 3

CALCULATED WASHABILITY DATA FOR FULL SEAM i.e. SAMPLES 143-146 INCLUSIVE

F1.30 SG	45.7	2.2	9	45.7	2.2	9
S1.30 - F1.35 SG	24.0	5.4	7	69.7	3.3	8½
S1.35 - F1.40 SG	8.3	9.9	3½	78.0	4.0	8
S1.40 - F1.45 SG	3.5	15.3	1	81.5	4.5	7½
S1.45 - F1.50 SG	3.1	20.3	1	84.6	5.1	7½
S1.50 - F1.55 SG	2.5	24.5	1	87.1	5.6	7
S1.55 - F1.60 SG	1.6	29.4	1	88.7	6.1	7
S1.60 SG	11.3	77.5	0	100.0	14.1	6

ANALYSIS OF FLOATS 1.60 SG FRACTION OF SAMPLE NO. 143-146 INCLUSIVE

Yield %	88.7
Air Dried Moisture %	0.7
Ash %	6.1
Volatile Matter %	23.7
Fixed Carbon %	69.5
Total Sulphur %	0.46
C.S.NO.	7½
Calorific Value	14300 BTU/LB

SYDNEY
 26th November 1971

K71-1798

COALITION MINING

SUKUNKA C30 -

SKEETER (LOWER) SEAM

	SPL	THICK	WT%	ASH%	CENP	ASH% Sum	
						Incl bands	Excl bands
6	{ 141 142	0.81	-	88.3	0	141	113
4	142	4.31	57.8	84	7		
2	144	0.12	3.8	85.9	0	274 12.8	14 12.8
0	{ 145 146	1.91	26.4	19.8	6		

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

C A R G O
SUPERINTENDENTS
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Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify

APPLICANT: COALITION MINING

SUBJECT: SUKUNKA SAMPLES NO. 147/148/149
CORE NO. C30
CHAMBERLAIN (~~LOWER~~) SEAM (LOWER PLATE)

REPORT NO: K 71-1791

RECEIVED: 8.11.71

REPORTED: 26.11.71



This Laboratory is Registered by the
National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

M. Bralley
Chief Chemist.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

L. H. Joseph

INTRODUCTION:

One (1) coal sample designated Core C30 Chamberlain (Lower) were received on 8.11.71 from Clifford Mc Elroy and Associates.

METHODS:

The coal ply sample No. 147 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 130-160 specific gravity in 0.05 steps.

The float and sink fractions raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and crucible swelling number and the composite raw coal sample re-constituted and the true S.G. of the sample determined.

A cumulative floats 1.60 S.G. fraction was prepared for sample No. 147 and the analysis are given in this report.

NOTE:

The sample weight has not been adjusted to compensate for core loss.

RESULTS:

Figure 1: gives the graphic log of the core

Table 1: gives the sizing washability and analytical data for the sample after hand crushing to $\frac{3}{4}$ " top size.

SHEET THREE ATTACHED

TABLE 1

WASHABILITY DATA FOR SAMPLE NO. 147/148/149 (after hand crushing
TO $\frac{3}{4}$ ")

FRACTION	INDIVIDUAL				CUMULATIVE		
	WEIGHT	WT.%	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
Fl.30 SG	1400	49.0	1.7	8 $\frac{1}{2}$	49.0	1.7	8 $\frac{1}{2}$
Sl.30- Fl.35 SG	962	33.6	3.5	5 $\frac{1}{2}$	82.6	2.4	7 $\frac{1}{2}$
Sl.35- Fl.40 SG	220	7.7	8.5	2	90.3	2.9	7
Sl.40- Fl.45 SG	48	1.7	10.6	1 $\frac{1}{2}$	92.0	3.1	7
Sl.45- Fl.50 SG	9	0.3	13.6	1	92.3	3.1	7
Sl.50- Fl.55 SG	17	0.6	20.5	1	92.9	3.2	7
Sl.55- Fl.60 SG	29	1.0	28.6	1	93.9	3.5	6 $\frac{1}{2}$
Sl.60 SG	174	6.1	49.1	0	100.0	6.3	6 $\frac{1}{2}$
-30 Mesh	193	6.3	1.4	8 $\frac{1}{2}$			

Total Weight of sample : 3052 gms.

True S.G. : 1.301

ANALYSIS OF FLOATS 1.60 S.G. FRACTION OF SAMPLE
NO. 147 - 149

Yield %	93.9
Air Dried Moisture %	0.7
Ash %	3.5
Volatile Matter %	23.3
Fixed Carbon %	72.5
Total Sulphur %	0.36
C.S.NO.	7 $\frac{1}{2}$
Calorific Value	14,800 BTU/LB

SYDNEY

26th November, 1971

K71-1791

COALITION MINING

SUKUNKA C30 -
CHAMBERLAIN (LOWER)
SEAM

	GPI	THICK	ASH%	CEMF
6				
4	1147 1148 1149	5.00	63	1/2
2				
0				

STRATIGRAPHIC LOG
SUKUNKA D.D.H. C-30

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft.)</i>
	No core to 14.0 ft.	GETHING FM.	
	SANDSTONE, grey, fine grained, quartz lithic, dip angle 40 ⁰ , mud blebs at 23'.		26.0
	SILTSTONE AND MUDSTONE INTERBEDS, core broken in part, no slickensides, worm casts. Dip 40-45 ⁰ lessening to base.		48.0
	SANDSTONE, grey, fine grained, quartz-lithic, dip 10 ⁰ .		52.0
Fault, possible	SANDSTONE, fine, silty interbeds, 0.15' fractured mudstone band at 50', pyritic worm casts, coaly wisps and irregular masses.		58.0
Fault; possible	SILTSTONE, grey, sandy interbeds, pyritic worm casts, from 58' to 61'. Beds dip from 10 ⁰ to vertical with slickensides. Beds below dip 5 ⁰ . A few calcite veins.		61.0
	SANDSTONE, medium grained.		63.0
	SILTSTONE, grey, sandy interbeds, pyritic worm casts. Dip steepening to 45 ⁰ at base.		68.0
Fault, possible	MUDSTONE, dark grey, fractures with		

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
	<p>slickensides 20° to core axis, core broken, carbonaceous at base (1').</p>		73.0
	<p>SANDSTONE, medium grained, dip starting at 40° steepening to 75° at 83' and abruptly back to 10° at 87' with no brecciation. A little calcite, coaly wisps and partings.</p>		92.0
	<p>CLAYSTONE, carbonaceous, some displacement within the bed itself. Sandy interbeds at base.</p>		95.0
	<p>SANDSTONE, coaly wisps.</p>		98.0
	<p>CLAYSTONE, carbonaceous.</p>		99.0
	<p>SILTSTONE, sandstone and claystone interbeds.</p>		101.0
	<p><u>COAL</u>, 2 sandstone splits, top one .5', second 1.5', coal at base, shattered and with listric surfaces.</p>	SKEETER SM.	108.5
Fault, possible	<p>SANDSTONE, grey, fine grained, silty interbeds, core broken from 110'-121', calcite fillings, variable dips and slickensides. Mudstone bands at 122' and 128' core broken and brecciated from 132'-134' with other minor zones at 137' and 138.5'. At 142' dip 40°. At 150' beds above met abruptly (at 90°) by beds apparently overfolded with steep dips flexing one way and then the other. Calcite veins and fillings.</p>		

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
	Slickensides. At 158' terminates abruptly in coal band (0.1') and siltstone dipping at 20°.		158.0
Fault, possible	<u>COAL</u> , stony, listric surfaces, core fractured.		164.0
	SILTSTONE, grey.		165.0
	<u>COAL</u> , fractured.		171.0
	<u>COAL</u> , stony, coaly phases, fragmented at base.		183.0
	SANDSTONE, grey, variable dips brecciated in parts, calcite fillings and veins throughout.		193.0
	SILTSTONE, grey, dip 40°, core fragmented in part, and brecciated at 193'.		198.0
	<u>COAL</u> , broken.		198.5
	SANDSTONE, medium grained, coaly wisps and partings, carbonaceous claystone bands at 200' and 201'. Dips steepen from 60° at 200' to 80° at 205' and back to 45° at 212'. 1.5' breccia zone at 214' calcite veins below to base.		225.0
Fault, possible	<u>COAL</u> , broken into small pieces.		225.5
	SANDSTONE, grey, medium grained becoming finer. Silty bands at 248'. Mottled (worm casts at 230').		286.0

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation : or Member</i>	<i>Depth to Base of Stratum (ft.)</i>
	SILTSTONE AND MUDSTONE INTERBEDS, worm casts, granules at base.		302.0
	SANDSTONE, grey.		304.0
	SANDSTONE, silty interbeds, pyritic worm casts.		312.0
	SANDSTONE, medium grained, coaly wisps, mudstone at base and coal band within it.		346.0
	<u>COAL.</u>	SKEETER SM.	352.0
	SILTSTONE, sandy interbeds.		357.0
	MUDSTONE, dark grey.		359.5
	SANDSTONE, silty interbeds, fine bedding towards base.		364.0
	LAMINITE, siltstone and mudstone.		370.5
	<u>COAL.</u>	CHAMB. SM.	376.0
	SANDSTONE, grey, medium grained, coal band at 406'.		408.0
			<u>Base of Hole</u>

SUKUNKA D.D.H. C-30

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
No core, tri-cone roller bit.		14.84		
SANDSTONE, grey, fine grained, quartz-lithic, brown stained phases (weathering), band (0.07') mud blebs 8.2' from top. Bedding angle 58° to core axis.	11.61	26.45	11.12	
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey interbedded. Some sandy interbeds. Worm casts and mud blebs. From 0.2' to 0.5' core broken, a little calcite at centre where dips of top and bottom half seem discordant. Bedding angle 55° to core axis.	6.44	32.89	6.07	
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey interbedded, a few sandy interbeds. Worm casts and mud blebs. Bedding angle increases to 70° at base. 6.5' from top, two calcite veins along fractures (one along bedding, one at 35° to core axis). Slickensides. Fractures 0.4' apart.	15.63	48.52	14.72	
SANDSTONE, grey, medium grained, quartz-lithic, one fracture with some slickensides at 17° to core axis and 2 fine calcite veins at similar altitude.	4.17	52.69	3.92	

SUKUNKA D.D.H. C-30

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, as above.	0.81	53.50	0.76	
MUDSTONE, dark grey, broken in top 0.20' with slickensides.	0.61	54.11	0.57	
SANDSTONE, grey, fine grained, quartz-lithic, numerous silty interbeds, pyritic worm casts. 0.09' zone crushed at base.	2.75	56.86	2.59	
SANDSTONE, grey, medium grained, quartz-lithic, coaly wisps towards base.	0.94	57.80	0.89	
MUDSTONE, dark grey.	0.18	57.98	0.17	
SANDSTONE, grey, fine grained, quartz-lithic, numerous silty interbeds and phases. Bedding angle at top 57° to core axis, steepening till parallel to core axis and overfolding slightly (slickensides). Abrupt junction (along calcite vein with some slickensides) with beds below dipping at 80° to core axis. Pyritic worm casts. 0.45' zone of broken core 7.1' from top with calcite and slickensides.	7.81	65.79	7.36	

SUKUNKA D.D.H. C-30

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
MUDSTONE, dark grey, some silty interbeds. At 2.6' slickensides along vertical planes, at 3.5' 34° to core axis, at 5' from top, 58° to core axis.	4.89	70.68	4.61	
MUDSTONE, dark grey, some silty interbeds.	0.96	71.64	0.90	
CLAYSTONE, carbonaceous.	0.83	72.47	0.78	
SANDSTONE, grey, medium grained, quartz-lithic, coaly wisps and irregular coaly masses. Calcite veins along bedding, and across bedding at angles within 10° of 90° to bedding. Bedding angles measured from top - at 1.2' - 58°, at 4.2' - 50°, at 6.6' - 34°, at 8.8' - 24°, at 11.9' bedding indistinct but possibly vertical at 13.1' - 24°, at 14.2' - 85° to 90°. Core broken at 9.8' with slickensides on surfaces for 1' either side. Core broken with no slickensides at 14.15'.	17.33	89.80	16.33	
SANDSTONE, grey, medium grained, quartz-lithic, coaly wisps.	1.91	91.71	1.80	

SUKUNKA D.D.H. C-30

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
CLAYSTONE, dark greyish brown, fine sandy interbeds. In top 0.75' bedding severely distorted and possibly displaced. At 1.55' from top bedding angle 82° from core axis.	3.08	94.79	2.90	
SANDSTONE, grey, medium grained, quartz-lithic, coaly wisps and fine carbonaceous phases.	3.04	97.83	2.86	
CLAYSTONE, dark brown, carbonaceous, sandy interbeds and phases towards base. Bedding angle 85-90°, core broken in 0.15' zone with listric surfaces 1.25' from top.	3.24	101.07	3.05	
<u>COAL</u> , mainly dull with minor bright bands.	0.17	101.24	0.17)
SANDSTONE, grey, medium grained, quartz-lithic, tending carbonaceous.	0.46	101.70	0.46)
<u>COAL</u> , dull, broken.	0.53	102.23	0.26	) SKEETER SEAM
SANDSTONE, grey, medium grained, quartz-lithic, carbonaceous.	1.27	103.50	1.27	) upper plate
<u>COAL</u> , core badly broken, sheared, highly listric surfaces.	4.81	108.31	0.85)

SUKUNKA D.D.H. C-30

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, fine grained, quartz-lithic, numerous silty interbeds, current bedding. Bedding angle 47° . 1.05' from top, minor? displacement and brecciation at 0.3', 1.1' and 1.9' from top, calcitic fillings throughout, but brecciation with heavy calcitic infillings concentrated at base (0.30'). Bedding angle at base 70° to core axis. Slickensides throughout.	4.61	112.92	3.27	
MUDSTONE, dark grey, numerous silty interbeds. Bedding angle 85° - 90° 0.4' from top increasing to 53° to core axis with slickensides at 1' from top. Below this core is fragmented.	2.33	115.25	2.16	
SANDSTONE, grey, medium to fine grained, quartz-lithic.	0.46	115.71	0.43	
MUDSTONE, dark grey, core badly broken, listric surfaces at various angles - mostly small in relation to core axis.	3.33	119.04	3.09	
SANDSTONE, grey, fine grained, quartz-lithic, numerous silty interbeds, brecciated in top 0.33', heavy vertical calcite vein from 0.75'-0.95' from top and				

SUKUNKA D.D.H. 30

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
others parallel to bedding below this with perpendicular offshoots.	2.60	121.44	2.41	
MUDSTONE, dark grey.	0.84	122.48	0.78	
SANDSTONE, grey, fine grained, quartz-lithic, silty phase at top and silty interbeds below. A few oblique calcite veins.	3.00	125.48	2.78	
MUDSTONE, dark grey.	2.65	128.13	2.46	
SILTSTONE, grey, sandy interbeds, some irregular mudstone masses, bedding angle 40° to core axis.	2.33	130.46	2.16	
MUDSTONE, dark grey, top 1.5' fragmented and containing pieces of brecciated mudstone with calcite infillings, core broken in bottom 1.7'.	5.72	136.18	5.30	
SANDSTONE, grey, fine grained, quartz-lithic, numerous silty interbeds, subvertical calcite veins and infillings throughout, brecciated zone from 1.3' to 2.1' from top.	3.31	139.49	3.07	

SUKUNKA D.D.H. C-30

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
MUDSTONE, dark grey.	3.21	142.70	2.98	
SILTSTONE, grey, mudstone interbeds and fine sandy interbeds. Some irregular sandy masses towards base. Bedding angle 43° to core axis.	6.08	148.78	5.68	
MUDSTONE, dark grey, heavy calcite vein at top.-	0.54	149.32	0.54	
SILTSTONE AND MUDSTONE INTERBEDDED, siltstone grey and mudstone dark grey interbedded, some sandy interbeds. Bedding angle at top 50° to core axis. Beds below this in recumbent folds with local displacements and brecciation, numerous calcite veins and heavy infillings, calcite crystals in large cavity (width of core x 0.2') at 1.2' from base.	7.98	157.30	7.98	
<u>COAL</u> , highly sheared with listric surfaces between 45° and 0° to core axis.	4.74	162.04	1.90)
MUDSTONE, dark grey.	0.29	162.33	0.29	) CHAMBERLAIN SEAM
<u>COAL</u> , highly sheared, listric surfaces, badly broken.	1.10	163.43	0.44	) upper plate

SUKUNKA D.D.H. C-30

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
MUDSTONE, dark grey.	0.78	164.21	0.78)	
<u>COAL</u> , highly sheared, listric surfaces core badly broken in most of length, bedding angle 50° to core axis. 0.6' from top and 65° 3.3' from top.	8.81	173.02	3.53)	
<u>COAL</u> , highly sheared and badly broken. Shear angle at 1.15' from top 35° to core axis.	4.00	177.02	1.60)	
<u>COAL</u> , sheared at 50° to core axis, cleat destroyed.	4.40	181.42	1.76)	
SANDSTONE, grey, fine grained, quartz-lithic, coaly wisps and irregular calcitic veining.	0.45	181.87	0.45)	CHAMBERLAIN SEAM upper plate
<u>COAL</u> , sheared and very friable, cleat destroyed.	0.72	182.59	0.29)	
CLAYSTONE, carbonaceous.	0.56	183.15	0.56)	
<u>COAL</u> , powdered.	0.75	183.90	0.30)	

SUKUNKA D.D.H. C-30

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, fine to medium grained, quartz-lithic, coaly wisps and irregular masses, calcite veins numerous. 1' breccia zone 4.6' from top, core broken in part with slickensided mudstone bands at 0.2', 1.35', and 3.0' from base. Bedding angle 45° to core axis 3.7' from base.	8.42	192.32	8.42	
MUDSTONE, dark grey, brecciated in top 0.5', vertical calcite vein. Slickensided along oblique shears below this.	1.02	193.34	1.02	
MUDSTONE, dark grey, sheared obliquely, slickensides, broken into small fragments at base.	0.27	193.61	0.27	
SANDSTONE, grey, fine grained, quartz-lithic, brecciated and broken in top 1', with calcite infillings. Bedding angle below 58° to core axis. Junction with mudstone below oblique (35° to core axis) and slickensided.	2.27	195.88	2.14	
MUDSTONE, dark grey.	0.23	196.11	0.22	
<u>COAL</u> , core broken and slickensided.	2.30	198.41	0.19	

SUKUNKA D.D.H. C-30

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, fine to medium grained, quartz-lithic, carbonaceous at top and bottom.	0.95	199.36	0.90	
CLAYSTONE, carbonaceous, sandy phases, slickensided surfaces along bedding planes. Bedding angles from top - 50° at 0.66', 35° at 1.9', 55° at 2.9'. Mud band (broken) at base.	3.48	202.84	3.28	
SANDSTONE, grey, medium grained, quartz-lithic, coaly wisps and irregular masses, listric surfaces, bedding contorted, possibly overfolded. Bedding angles from top - 27° at 1.63', 40° at 2.8', 50° at 3.7', 55° at 4.95', 42° at 7.8' and 10.7'. Core badly broken for 0.35' at 3.7' from top.	10.52	213.36	9.97	
CLAYSTONE, carbonaceous.	0.08	213.44	0.08	
SANDSTONE AND SILTSTONE, brecciated into small pebbled-sized fragments and recemented. Calcite veins.	0.13	213.57	0.12	
SANDSTONE AND SILTSTONE, as above.	1.27	214.84	1.20	

SUKUNKA D.D.H. C-30

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, medium to fine grained, quartz-lithic, irregular coaly masses 2.9' from top. Mottled (worm casts) at top for 1.8'. Numerous calcite veins parallel to bedding and at various angles. Core broken from 0.6' to 1.2' from top and from 9.3' to 10.1' from top. Bedding angle 52° at 1.2' from top and 62° at 7.4' from top.	10.50	225.34	10.44	
<u>COAL</u> , dull, sheared, listric surfaces, badly broken.	0.36	225.70	0.16	
SANDSTONE, grey, medium to fine grained, quartz-lithic, bedding angle 85-90°, mottled (worm casts) from 4.7' from top to base.	6.72	232.42	6.72	
SANDSTONE, as above, with mottled appearance (worm tracks) from top to 0.30', some silty interbeds from 3.2' to 4.1' from base. Mud blebs 2.9' from base. Some current bedding. Bedding angle 85-90° to core axis.	18.58	251.00	18.48	
SANDSTONE, grey, fine grained, quartz-lithic, bedding angle 85°-90° to core axis.	34.62	285.62	34.40	

SUKUNKA D.D.H. C-30

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey interbedded, some sandy interbeds, worm casts and mud blebs.	2.95	288.57	2.93	
SILTSTONE AND MUDSTONE INTERBEDS, as above.	3.77	292.34	3.75	
SANDSTONE, grey, fine grained, quartz-lithic, mud blebs and shelly (?) fragments at base.	1.86	294.20	1.85	
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey, some sandy interbeds towards base, worm casts and mud blebs. Bedding angle 85° - 90° to core axis.	8.25	302.45	8.20	
SANDSTONE, grey, medium grained, quartz-lithic with some calcite (?) fragments, and coaly wisps.	0.35	302.80	0.35	
SANDSTONE, grey, fine grained, quartz-lithic.	1.73	304.53	1.72	
MUDSTONE, dark grey.	1.13	305.66	1.12	
SANDSTONE, grey, fine grained, quartz-lithic, numerous silty interbeds.	1.41	307.07	1.41	

SUKUNKA D.D.H. C-30

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>
SANDSTONE, as above, some current bedding and worm casts. Bedding angle 85 ⁰ -90 ⁰ to core axis. More silty towards base.	5.18	312.25	5.15
SANDSTONE, grey, medium grained, quartz-lithic, coaly wisps, some current bedding.	13.91	326.16	13.83
SANDSTONE, grey, fine grained at top, medium to coarse grained in bottom half, coaly wisps, pennybands and irregular masses. Bedding angle 85 ⁰ -90 ⁰ to core axis.	18.25	344.41	18.13
CLAYSTONE, brown carbonaceous, sandy interbeds.	0.47	344.88	0.47
CLAYSTONE, as above, coaly bands.	0.21	345.09	0.21
<u>COAL</u> , mainly dull with minor bright bands, badly broken.	0.15	345.24	0.12)
CLAYSTONE, carbonaceous, becoming less so towards base.	0.66	345.90	0.66)

SUKUNKA D.D.H. C-30

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull.	0.11	346.01	0.09)
dull and bright, fracture plane at 42° to core axis.	0.85	346.86	0.67)
0.15' from top, core fragmented 0.20'-0.35' from top bedding angle 85°-90° to core axis.)
mainly dull with minor bright bands, sheared with slickensides at 45° to core axis.	0.85	347.71	0.67)
dull and bright.	0.45	348.16	0.36)
mainly dull with minor bright bands, fractures and bedding angle 85°-90° to core axis.	0.54	348.70	0.43)
coal type indistinct, cleat absent, core breaks into slivers at 85°-90° to core axis with listric surfaces.	0.63	349.33	0.50)
mainly dull with minor bright bands.	0.73	350.06	0.57)
broken into slivers with listric surfaces.	0.15	350.21	0.12)

SKEETER SEAM
lower plate

SUKUNKA D.D.H. C-30

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, fine grained, quartz-lithic, carbonaceous.	0.12	350.33	0.12)	
<u>COAL</u> , dull..	0.29	350.62	0.23)	
mainly dull with minor bright bands. Bedding angle 85°-90° to core axis, a fracture plane at 45° to core axis.	0.59	351.21	0.47)	SKEETER SEAM
dull, fracture plane at 38° to core axis.	0.68	351.89	0.54)	lower plate
core broken, listric surfaces, some dull with bright bands, some stony fragments.	0.35	352.24	0.28)	
SILTSTONE, grey.	2.81	355.05	2.74	
SANDSTONE, grey, fine grained, quartz-lithic, silty interbeds.	1.71	356.76	1.67	
SILTSTONE, grey.	2.49	359.25	2.43	
SANDSTONE, grey, fine grained, quartz-lithic, silty interbeds, irregularly disturbed sedimentary structures in zone (0.38') 0.99' from top.	1.85	361.10	1.80	

SUKUNKA D.D.H. C-30

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE, grey, numerous sandy interbeds. Bedding angle 85° to core axis.	2.59	363.69	2.52 ~	
LAMINITE, siltstone grey and mudstone dark grey interbedded, some fine sandy interbeds.	0.45	364.14	0.44	
LAMINITE, as above, bedding angle 85° to core axis.	6.26	370.40	6.09	
CLAYSTONE, carbonaceous.	0.04	370.44	0.04	
<u>COAL</u> , core badly broken, sheared, with listric surfaces. Coal probably stony.	0.12	370.56	0.12)	
stony, with bright bands.	0.22	270.78	0.22)	
mainly dull with minor bright bands, bedding angle 80° to core axis, fracture at 50° to core axis.	1.04	371.82	1.01)	
dull and bright.	0.13	371.95	0.13)	CHAMBERLAIN SEAM
dull, fracture at 55° to core axis.	0.11	372.06	0.11)	lower plate

SUKUNKA D.D.H. C-30

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , bright.	0.08.	372.14	0.08)	
dull.	0.05	372.19	0.05)	
bright.	0.12	372.31	0.12)	
dull and bright.	0.29	372.60	0.28)	
bright.	0.10	372.70	0.10)	
mainly dull with minor bright bands.	0.37	373.07	0.36)	
dull and bright.	0.64	373.71	0.63)	CHAMBERLAIN SEAM
bright, bedding angle 80° to core axis.	0.10	373.81	0.10)	lower plate
mainly dull with minor bright bands, fracture plane at 20° to core axis.	0.61	374.42	0.60)	
dull and bright.	0.26	374.68	0.25)	
dull.	0.38	375.06	0.37)	

SUKUNKA D.D.H. C-30

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , mainly dull with minor bright bands, bedding angle 85°-90° to core axis. Fracture planes at top at 35° to core axis. Core broken.	1.37	376.43	1.33	) ) ) CHAMBERLAIN SEAM lower plate
SANDSTONE, grey, medium grained, quartz-lithic, coaly wisps in top 0.2'.	2.72	379.15	2.72	
SANDSTONE, as above, bedding angle 85°-90° to core axis.	18.61	397.76	18.61	
SANDSTONE, as above, some coaly wisps and coarse phases.	7.66	405.42	7.66	
<u>COAL</u> , dull and bright, core broken at base.	0.69	406.11	0.25	
SANDSTONE, grey, medium grained, quartz-lithic, coaly wisps.	1.89	408.00	1.89	
				<u>Base of Hole</u>

BORE NUMBER C-31

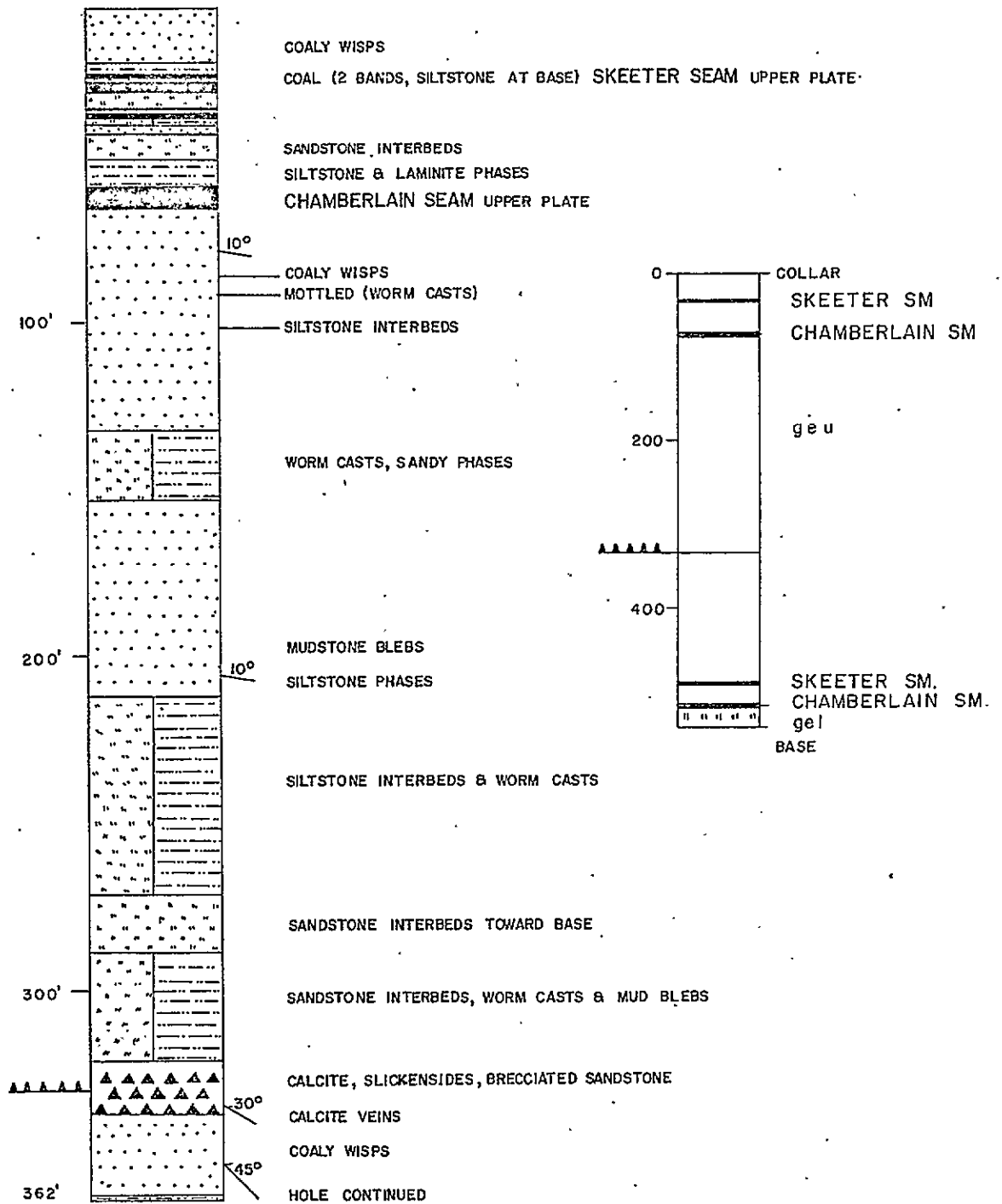
Grid Reference 48321.8 N 77152.5 E
Exploration Grid Reference A + 450'N / 1 - 1700'E

Date Commenced 7th Oct., 1971 Completed 9th Oct., 1971

Collar R.L. 4119.3 ft. Standard Datum
Total Depth 541.0 ft. Electrically Logged Yes/~~No~~
Drilled by Connors Drilling Ltd.
For Coalition Mining Limited
Logged by F.H.S. Tebbutt

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Skeeter - upper plate	4087.2 ft.	4.89	44%	Close to Chamberlain Fault
Chamberlain - upper plate	4053.5 ft.	6.80	75%	
Skeeter - lower plate	3624.6 ft.	6.85	59%	
Chamberlain - lower plate	3600.1 ft.	5.32	49%	

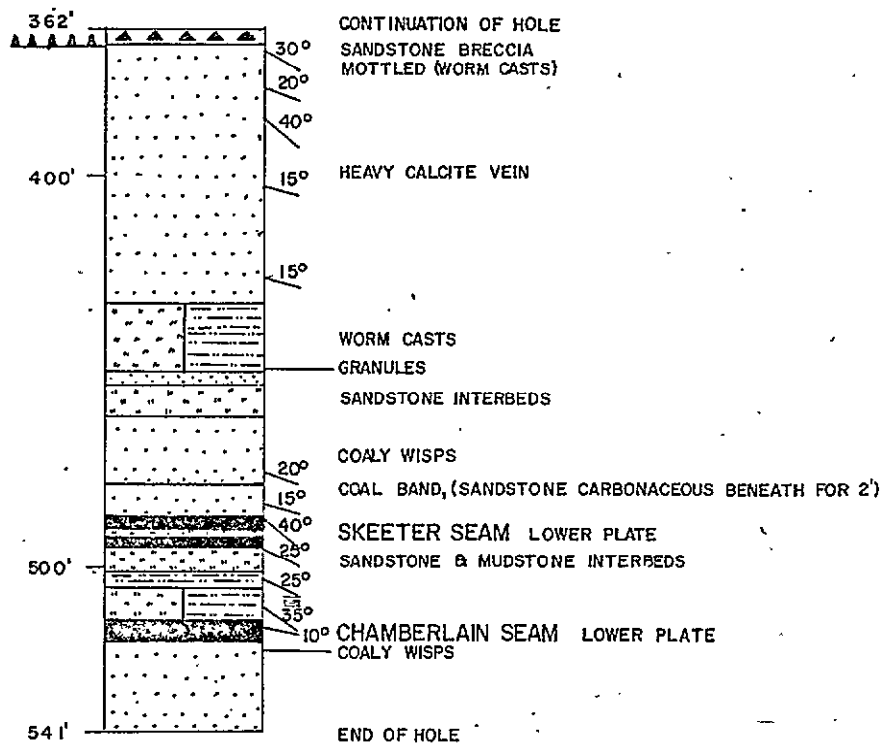


DETAIL OF GETHING
FORMATION
SCALE: 1" to 50'

SCALE: 1" to 200'

Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS
DDH C-31



DETAIL OF GETHING
FORMATION
SCALE: 1" to 50'

SCALE: 1" to 200'

Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS
DDH C-31

SKEETER SEAM
UPPER PLATE

ASH %
CUMULATIVE
FROM FLOOR

	WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
27.21				15.4	
4.89	-	15.4	5½		
32.10					

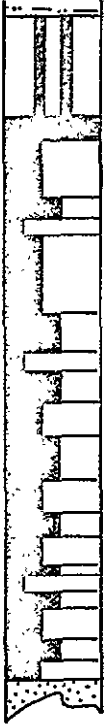


Prepared by
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COALITION MINING LIMITED
DRAWN BY pm DATE Jan '72

SEAM SECTIONS
DDH C-31

SCALE: 1" to 2'

PAGE 1 of 1

				ASH % CUMULATIVE FROM FLOOR			
CHAMBERLAIN SEAM UPPER PLATE			WT%	ASH%	C.S.Nº	INCL. BANDS	EXCL. BANDS
59.04		6.80	-	11.0 ✓	1½	11.0	
65.84							

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SCALE: 1' to 2'

SEAM SECTIONS

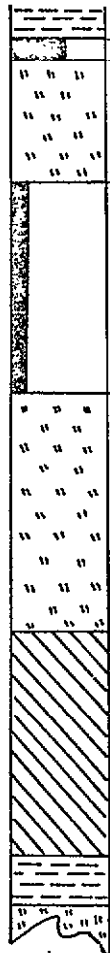
DDH C-31

PAGE 1 of 1

SKEETER SEAM
LOWER PLATE

ASH %
CUMULATIVE
FROM FLOOR

	WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
487.84	2.17	6.7	8		
494.69	4.68	87.4	0		



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SEAM SECTIONS

for
COALITION MINING LIMITED

DDH C-31

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DATE Jan '72

SCALE: 1" to 2'

PAGE 1 of 1

CHAMBERLAIN SEAM
LOWER PLATE

ASH %
CUMULATIVE
FROM FLOOR

	WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
513.86				5.3	
5.32	-	5.3	7		
519.18					

Prepared by:
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for
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SEAM SECTIONS
DDH C-31

SCALE: 1" to 2'

PAGE 1 of 1

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

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SUPERINTENDENTS
CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify

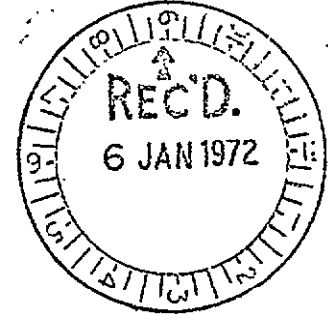
APPLICANT: COALITION MINING

REPORT ON: SUKUNKA SAMPLE NO. 176-178
CORE NO. C31
SKEETER UPPER SEAM (UPPER PLATE)

REPORT NO. K71-1856

RECEIVED: 17. 11. 1971

REPORTED: 31. 12. 1971



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been performed in accordance with the
terms of registration.

A. Bradley
A.R.A.C.I. Chief Chemist.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

L. D. [Signature]

INTRODUCTION:

One (1) Coal Sample designated CORE NO. C31 SKEETER UPPER SEAM was received on 17. 11. 1971 from Clifford McElroy & Associates.

METHOD:

The Coal Sample No. 176-178 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 176-178 and the analysis are given in this report.

NOTE:

The sample weight has not been adjusted to compensate for core loss.

RESULTS:

TABLE 1 : gives the sizing, washability and analytical data for the sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 1

WASHABILITY DATA FOR SAMPLE NO. 176-178 (after hand crushing to $\frac{3}{4}$ ")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
F1.30 SG	701	52.6	1.9	8	52.6	1.9	8
S1.30 - F1.35 SG	190	14.3	5.0	7½	66.9	2.6	8
S1.35 - F1.40 SG	95	7.1	9.0	1	74.0	3.2	7
S1.40 - F1.45 SG	89	6.7	14.8	1	80.7	4.1	7
S1.45 - F1.50 SG	41	3.1	19.3	1	83.8	4.7	6½
S1.50 - F1.55 SG	37	2.8	22.8	1	86.6	5.3	6½
S1.55 - F1.60 SG	8	0.6	28.5	1	87.2	5.5	6
S1.60 SG	172	12.8	84.3	0	100.0	15.5	5½
-30 Mesh RC	92	6.5	13.2	8			

Total Weight of Sample = 1425 grams

True Specific Gravity = 1.376

Thickness = 4.89'

ANALYSIS OF F1.60 SG FRACTION OF SAMPLE NO. 176-178

Yield %	87.2
Air Dried Moisture %	1.0
Ash %	5.3
Volatile Matter %	23.6
Fixed Carbon %	70.1
Total Sulphur %	0.60
C.S.NO.	6½
Calorific Value	14470 BTU/LB
Phosphorus %	0.007

SYDNEY

31st December 1971

Telegrams and Cables:
"Visor", Sydney

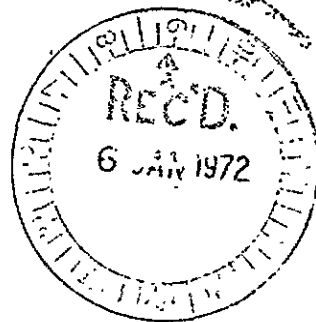
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APPLICANT: COALITION MINING

REPORT ON: SUKUNKA SAMPLE NO. 179-180
CORE NO. C31
CHAMBERLAIN UPPER SEAM (UPPER PLATE)

REPORT NO. K71-1857

RECEIVED: 17. 11. 1971

REPORTED: 31. 12. 1971



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For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

M. Bradley
A.R.A.C.I. Chief Chemist.

INTRODUCTION:

One (1) Coal Sample designated CORE NO. C31 CHAMBERLAIN UPPER SEAM was received on 17. 11. 1971 from Clifford McElroy & Associates.

METHOD:

The Coal Sample No. 179-180 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 179-180 and the analysis are given in this report.

NOTE:

The sample weight has not been adjusted to compensate for core loss.

RESULTS:

TABLE 1 : gives the sizing, washability and analytical data for the sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 1

WASHABILITY DATA FOR SAMPLE NO. 179-180 (after hand crushing to $\frac{3}{4}$ ")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
F1.30 SG	616	20.2	1.5	4½	20.2	1.5	4½
S1.30 - F1.35 SG	1560	51.0	2.3	1	71.2	2.1	2
S1.35 - F1.40 SG	218	7.1	6.4	0	78.3	2.5	2
S1.40 - F1.45 SG	50	1.6	10.5	0	79.9	2.6	2
S1.45 - F1.50 SG	29	0.9	14.0	0	80.8	2.8	2
S1.50 - F1.55 SG	9	0.3	17.9	0	81.1	2.8	2
S1.55 - F1.60 SG	7	0.2	25.5	0	81.3	2.9	2
S1.60 SG	567	18.7	47.5	0	100.0	11.2	1½
-30 Mesh RC	234	7.1	7.4	2			

Total Weight of Sample = 3290 grams
True Specific Gravity = 1.332
Thickness = 6.80'

ANALYSIS OF F1.60 SG FRACTION OF SAMPLE NO. 179-180

Yield %	81.3
Air Dried Moisture %	1.0
Ash %	2.9
Volatile Matter %	22.6
Fixed Carbon %	73.5
Total Sulphur %	0.43
C.S.NO.	2½
Calorific Value	14850 BTU/LB
Phosphorus %	0.012

SYDNEY

31st December 1971

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

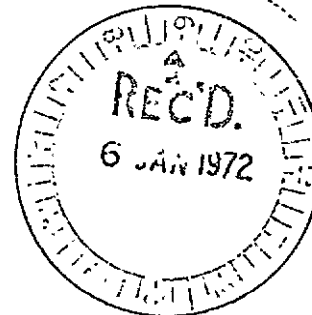
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APPLICANT:

COALITION MINING

REPORT ON:

SUKUNKA SAMPLES NO. 181, 182
CORE NO. C31
SKEETER ~~LOWER~~ SEAM (LOWER PLATE)

REPORT NO.

K71-1858

RECEIVED:

17. 11. 1971

REPORTED:

31. 12. 1971



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For

CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

A.R.A.C.I.
A.R.A.C.I. Chief Chemist.

INTRODUCTION:

One (1) Coal Sample and One (1) Non Coal Sample designated CORE NO. 31 SKETTER LOWER SEAM were received on 17. 11. 1971 from Clifford McElroy & Associates

METHODS:

1. The Non Coal Sample No. 182 was weighed, prepared and analysed for Ash and true specific gravity.
2. The Coal Sample No. 181 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions and raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 181 and the analysis are given in this report.

NOTE:

Sample weight has not been adjusted to compensate for core loss

RESULTS:

TABLE 1 : gives the sizing, washability and analytical data for the coal sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 1

WASHABILITY DATA FOR SAMPLE NO. 181 (after hand crushing to $\frac{3}{4}$ ")

FRACTION	INDIVIDUAL				CUMULATIVE		
	WEIGHT	WT.%	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
F1.30 SG	457	53.5	2.3	8½	53.5	2.3	8½
S1.30 - F1.35 SG	247	28.9	5.8	8	82.4	3.5	8½
S1.35 - F1.40 SG	88	10.3	10.3	7½	92.7	4.3	8
S1.40 - F1.45 SG	33	3.9	17.0	2	96.6	4.8	8
S1.45 - F1.50 SG	9	1.1	21.2	1½	97.7	5.0	8
S1.50 - F1.55 SG	4	0.5	27.4	1½	98.2	5.1	8
S1.55 - F1.60 SG	5	0.6	33.8	1½	98.8	5.3	8
S1.60 SG	12	1.2	49.4	1	100.0	5.8	8
-30 Mesh RC	95	10.0	14.6	8			

Total Weight of Sample = 950 grams
True Specific Gravity = 1.310
Thickness = 2.17'

SAMPLE NO. 182

Total Weight of Sample = 2960 grams
Ash % = 87.4
True Specific Gravity = 2.412
Thickness = 4.68'

ANALYSIS OF F1.60 SG FRACTION OF SAMPLE NO. 181

Yield %	98.8
Air Dried Moisture %	1.0
Ash %	5.2
Volatile Matter %	24.4
Fixed Carbon %	69.4
Total Sulphur %	0.46
C.S.NO.	8
Calorific Value	14570 BTU/LB
Phosphorus %	0.006

SYDNEY
31st December 1971

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

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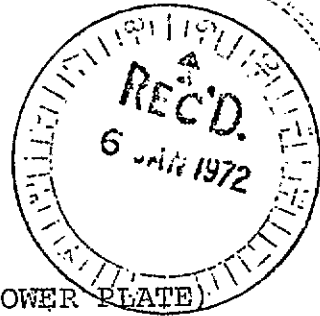
APPLICANT: COALITION MINING

REPORT ON: SUKUNKA SAMPLE NO. 183
CORE NO. C31
CHAMBERLAIN LOWER SEAM (LOWER PLATE)

REPORT NO. K71-1859

RECEIVED: 17. 11. 1971

REPORTED: 31. 12. 1971



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terms of registration.

M. Bradley
A.R.A.C.I. Chief Chemist

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

D. W. Sumpster

INTRODUCTION:

One (1) Coal Sample designated CORE NO. C31 CHAMBERLAIN LOWER SEAM was received on 17. 11. 1971 from Clifford McElroy & Associates.

METHOD:

The Coal Sample No. 183 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 183 and the analysis are given in this report.

NOTE:

The sample weight has not been adjusted to compensate for core loss.

RESULTS:

TABLE 1 : gives the sizing, washability and analytical data for the sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 1WASHABILITY DATA FOR SAMPLE NO. 183 (after hand crushing to $\frac{3}{4}$ ")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
F1.30 SG	818	53.7	1.9	8	53.7	1.9	8
S1.30 - F1.35 SG	410	26.9	4.9	7½	80.6	2.9	8
S1.35 - F1.40 SG	131	8.6	8.7	7	89.2	3.5	8
S1.40 - F1.45 SG	47	3.1	10.1	3	92.3	3.7	7½
S1.45 - F1.50 SG	30	2.0	13.5	3	94.3	3.9	7½
S1.50 - F1.55 SG	18	1.2	17.5	3	95.5	4.1	7½
S1.55 - F1.60 SG	12	0.8	19.9	1	96.3	4.2	7½
S1.60 SG	57	3.7	34.7	1	100.0	5.3	7
-30 Mesh RC	141	8.5	5.2	7½			

Total Weight of Sample = 1664 grams
True Specific Gravity = 1.306
Thickness = 5.32'

ANALYSIS OF F1.60 SG FRACTION OF SAMPLE NO. 183

Yield %	96.3
Air Dried Moisture %	1.0
Ash %	4.4
Volatile Matter %	23.6
Fixed Carbon %	71.0
Total Sulphur %	0.39
C.S.NO.	7½
Calorific Value	14590 BTU/LB
Phosphorus %	0.011

SYDNEY

31st December 1971

STRATIGRAPHIC LOG
SUKUNKA D.D.H. C-31

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
Dips 0°-10°	No core to 7.0 ft.		
	SANDSTONE, grey, medium grained quartz-lithic, coaly wisps.	GETHING FM.	23.0
	MUDSTONE, dark grey, 0.3' coal at base.		25.6
	SILTSTONE, grey, coal band (0.16')? 0.2' from top.		27.0
	<u>COAL.</u>	SKEETER SM.	31.3
	SILTSTONE, grey, sandstone at top, mudstone towards base. Coal band (0.3')? 0.5' from base.		38.0
	<u>COAL.</u>		39.0
	SILTSTONE AND MUDSTONE INTERBEDS.		40.0
	SANDSTONE, fine, brown, current bedded.		43.0
	SILTSTONE, grey, sandstone interbeds.		51.0
MUDSTONE, dark grey, fine siltstone interbeds, laminite phases, mudstone at base.		60.0	
<u>COAL.</u>	CHAMB. SM.	66.0	

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
	SANDSTONE, grey, medium becoming fine grained, quartz-lithic, coaly wisps at 87', mottled (worm casts) at 92', 2 narrow siltstone interbeds at 102'.		133.0
	SILTSTONE AND MUDSTONE INTERBEDS, worm casts, sandstone phases.		153.0
	SANDSTONE, grey, fine grained, quartz-lithic. Mudstone blebs at 197', 202', 203', 204', 207'. Siltstone phases from 209' to base.		212.0
	SILTSTONE AND MUDSTONE INTERBEDS, sandstone interbeds, worm casts.		271.0
	SILTSTONE, grey, sandstone interbeds towards base.		288.0
	SILTSTONE AND MUDSTONE INTERBEDS, sandstone interbeds and phases, some mudstone blebs and worm casts.		321.0
Fault, possible	SANDSTONE, breccia, highly disturbed, much calcite veining and infilling, slickensides.		336.0
	SANDSTONE, grey, medium grained, coaly wisps, numerous calcite veins, irregular and at various angles, listric surfaces. Dip 30° at top, 45° to base.		361.0
	MUDSTONE, dark grey, highly disturbed, listric surfaces.		362.0

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
Fault, established	SANDSTONE, breccia, core broken, calcite veining.		366.0
	SANDSTONE, grey, medium becoming finer, mottled (worm casts) at 370', current bedding, dip 30° at top, 20° at 380', 40° at 388', heavy calcite vein at 400'. Dip 15° at 403' and to base. Towards base some calcite filled fractures at 55° dip.		433.0
	SILTSTONE AND MUDSTONE INTERBEDS, sandstone interbeds, worm casts, granules at base.		450.0
	SANDSTONE, fine, grey.		453.0
	SILTSTONE, grey, sandstone interbeds and phases.		461.0
	SANDSTONE, coaly wisps, coaly band at 478', carbonaceous for 2' beneath, coal band at 486'. Dip 20°.		487.5
	<u>COAL</u> .)	SKEETER SM.	490.0
	SILTSTONE, mudstone interbeds, dip 15° at top, 40° at base, calcite filled tension cracks, listric surfaces.)		492.5
	<u>COAL</u> , broken.)		494.5
	SILTSTONE, sandstone and mudstone interbeds, dip 25°.		502.0
	MUDSTONE, dark grey and soft mud.		505.0

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
	<p>LAMINITE, siltstone and mudstone, dips 25° at top, 35° at middle, 10° at base.</p> <p><u>COAL.</u></p> <p>SANDSTONE, coaly wisps at top.</p>	CHAMB. SM.	<p>514.3</p> <p>519.3</p> <p>541.0</p> <p><u>Base of Hole</u></p>

SUKUNKA D.D.H. C-31

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
No core; tri-cone roller bit.		7.00		
SANDSTONE, grey fine grained becoming medium grained towards base, quartz-lithic, some current bedding, core broken into lengths averaging about 0.2' in top 5', no calcite or slickensides, coaly wisps, irregular masses.	15.92	22.92	15.92	
CLAYSTONE, dark brown, carbonaceous, fine silty interbeds, two pennybands coal in bottom 0.05'. Bedding angle 80° to core axis.	2.55	25.47	2.55	
<u>COAL</u> , mainly dull with minor bright bands.	0.19	25.66	0.19)
SILTSTONE, grey, brown and carbonaceous at top with a few coaly wisps.	0.14	25.80	0.14	) SKEETER SEAM
SANDSTONE, grey, fine grained, quartz-lithic, silty at top and base, coaly wisps and irregular coaly masses.	1.41	27.21	1.41	) upper plate

SUKUNKA D.D.H. C-31

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<p><u>COAL</u>, dull, top 0.04' appears weathered, from 0.2' to 0.35' there are joint planes at 20° to core axis (no slickensides).</p> <p>mainly dull with minor bright bands, joint at base at 25° to core axis, core broken in top 0.32'.</p>	0.32	27.53	0.32)	
<p><u>COAL</u>, dull and bright, core broken at top and bottom.</p>	2.47	30.50	1.23)	SKEETER SEAM
<p>SILTSTONE, grey, becoming carbonaceous.</p>	0.21	30.71	0.21)	upper plat
<p><u>COAL</u>, mainly dull with minor bright bands, core badly broken, slickensided fractures 0.25' and 0.65' from top at 55° to core axis.</p>	1.39	32.10	0.69)	
<p>SILTSTONE, grey, sandy interbeds and phases in top 3.8' mainly, mudstone interbeds below this, some slump structures, listric surface 0.7' from top at 45° to core axis.</p>	5.56	37.66	5.57)	

SUKUNKA D.D.H. C-31

Geological Description of Strata	Estimated Thickness (ft)	Estimated Depth to Stratum Floor (ft)	Footage Recovered (ft)	Remarks
<u>COAL</u> , mainly dull with minor bright bands, core broken.	0.40	38.06	0.20)
SILTSTONE, grey, yellow veinlets parallel to bedding at base.	0.68	38.74	0.68	) SKEETER SEAM
<u>COAL</u> , mainly dull with minor bright bands, joint plane at 15° to core axis in top 0.22'. Bedding angle 70° to core axis 0.33' from top.	0.78	39.52	0.39	) upper plat
stony with bright bands.	0.20	39.72	0.10)
SILTSTONE, grey, coaly wisps at top where core broken in top 0.37', sandy interbeds and phases increasing towards base, current bedded calcite vein at 15° to core axis at base.	3.32	43.04	3.40	
MUDSTONE, grey, silty towards base.	1.35	44.39	1.38	
MUDSTONE, grey, silty.	0.72	45.11	0.74	
SILTSTONE, grey, sandy interbeds towards base.	3.75	48.86	3.84	

SUKUNKA D.D.H. C-31

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, fine grained, quartz-lithic, silty interbeds and coaly wisps.	2.79	51.65	2.86	
MUDSTONE, dark grey, silty interbeds and phases. Bedding angle 83° to core axis.	5.98	57.63	6.11	
LAMINITE, siltstone grey and mudstone dark grey, interbedded.	1.10	58.73	1.11	
MUDSTONE, dark grey.	0.31	59.04	0.31	
<u>COAL</u> , stony, sheared, listric surfaces, shattered into small flaky pieces, angle of shearing 70° to core axis.	1.08	60.12	0.98)
coal type indeterminable, coal sheared with listric surfaces at 90° to core axis, no vertical cleat.	0.19	60.31	0.17)
mainly dull with minor bright bands. At top a joint plane at 70° and at 0.25' from top a joint plane at 60° to core axis.	0.59	60.90	0.53	) CHAMBERLAIN SEAM upper plate
)

SUKUNKA D.D.H. C-31

Geological Description of Strata	Estimated Thickness (ft)	Estimated Depth to Stratum Floor(ft)	Footage Recovered (ft)	Remarks
<u>COAL</u> , dull and bright, joint plane at 45° to core axis.	0.22	61.12	0.20)
dull, joint plane at 45° to core axis.	0.17	61.29	0.15)
mainly dull with minor bright bands, through this section there are joint planes at 70° to core axis in two opposing directions.	0.82	62.11	0.74)
dull and bright, joint plane at 40° to core axis.	0.37	62.48	0.33)
dull, shear planes (slickensides) at 60° in one direction and 75° to core axis in opposing direction.	0.19	62.67	0.17	) CHAMBERLAIN SEAM
dull and bright.	0.37	63.04	0.33	) upper plate
mainly dull with minor bright bands.	0.33	63.37	0.30)
dull and bright, joint plane at 25° to core axis 0.20' from top.	0.45	63.82	0.41)

SUKUNKA D.D.H. C-31

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , mainly dull with minor bright bands.	0.34	64.16	0.31)
dull and bright, joints at 60° to core axis, vertical cleat absent.	0.19	64.35	0.17)
mainly dull with minor bright bands, joint plane parallel to bedding at 83° to core axis.	0.30	64.65	0.27)
dull and bright, joint plane at 80° to core axis at base.	0.11	64.76	0.10	) CHAMBERLAIN SEAM
dull	0.12	64.88	0.11	) upper plate
bright and dull.	0.28	65.16	0.25)
mainly dull with minor bright bands, sheared at 85°-90° to core axis, vertical cleat absent.	0.26	65.42	0.23)
dull and bright, joint plane at 75° to core axis.	0.23	65.65	0.21)
mainly dull with minor bright bands, sandy.	0.19	65.84	0.17)

SUKUNKA D.D.H. C-31

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, medium grained, quartz-lithic, and few coaly wisps. Bedding angle 85° to core axis. Some current bedding, from 0.35' to 2.4' from top core broken at various angles in different directions, some angles curved and very oblique to core axis.	15.81	81.65	15.56	
SANDSTONE, grey, medium grained, quartz-lithic, coaly wisps and partings, mottled (worm casts) from 10.4' to 12.5' from top. Bedding angle 83° to core axis. Current bedded.	18.37	100.02	18.08	
SANDSTONE, grey, fine grained, quartz-lithic, current bedded, and few silty interbeds, in top 2' core fractured along planes at 15° - 20° to core axis, fracture surfaces iron stained. Bedding angle 82° to core axis.	18.83	118.85	18.53	
SANDSTONE, grey, fine grained, quartz-lithic. Bedding angle 83° to core axis.	14.76	133.61	14.53	

SUKUNKA D.D.H. C-31

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE & MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey, interbedded; sandy interbeds, large pyrite nodule 0.29' from top, 0.04' thick and through half diameter of core	1.09	134.70	1.07	
SANDSTONE, grey, fine grained, quartz-lithic.	1.20	135.90	1.18	
SILTSTONE & MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey, interbedded; some sandy interbeds.	1.93	137.83	1.90	
SILTSTONE AND MUDSTONE INTERBEDS, as above; a few worm casts and mud blebs.	3.29	141.12	3.24	
SANDSTONE, grey, fine grained, quartz-lithic, current bedded. Bedding angle 80° to core axis.	1.59	142.71	1.56	
SILTSTONE & MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey, interbedded; some sandy interbeds and worm casts.	10.42	153.13	10.25	
SANDSTONE, grey, medium grained, quartz-lithic silty interbeds.	0.50	153.63	0.49	

SUKUNKA D.D.H. C-31

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, fine grained, quartz-lithic, worm casts in top 2'.	3.24	156.87	3.19	
SANDSTONE, grey, fine grained, quartz-lithic, angular fractures with some iron staining, fracture angles between 1.1' and 2.1' from top between 30° and 40° to core axis, 4.7' from top fracture with thin calcite at 8° to core axis, 3.6' from base fracture at 18° to core axis.	18.76	175.63	18.46	
SANDSTONE, grey, fine grained, quartz-lithic, bedding angle 80° to core axis, fracture at 28° to core axis 5.2' from top, and at 25° to core axis 8.2' from top. Current bedded band (0.05') of mud blebs 0.85' from base.	18.02	193.65	17.73	
SANDSTONE, grey, fine grained, quartz-lithic, occasional narrow bands of mud blebs and also isolated mud blebs, iron stained fractures at 18° to core axis 4.1' from base and 1.5' from base, silty phase (2') 2' from base. Bedding angle 80° to core axis.	18.55	212.20	18.26	

BORE NUMBER C-40

Grid Reference 35403.5 N 90668.9 E
Exploration Grid Reference J + 150'N / 2 + 1400'E

Date Commenced 6th Nov., 1971 Completed 12th Nov., 1971

Collar R.L. 4512.8 ft. Standard Datum
Total Depth 890.0 ft. Electrically Logged Yes/No

Drilled by Canadian Longyear Ltd. Angled Hole
For Coalition Mining Limited Tropari Angle 55°
Azimuth 090° True
Logged by G. Jordan

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Skeeter	3696.0	4.57	-	Not Analysed
Chamberlain Upper Split	3658.4	4.57	86.9%	
Chamberlain Lower Split	3677.8	8.18	58.0%	

SUKUNKA D.D.H. C-31

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE, grey, mud blebs, a few irregular sandy interbeds, becomes muddier towards base.	8.11	280.98	7.98	
MUDSTONE, dark grey.	1.94	282.92	1.91	
SILTSTONE, grey, with mudstone interbeds and phases, becoming more sandy towards base. Bedding angle 85° .	4.69	287.61	4.62	
SANDSTONE, grey, fine grained, quartz-lithic, coaly wisps.	0.66	288.27	0.65	
SILTSTONE, grey.	0.24	288.51	0.24	
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey, interbedded, sandy interbeds and phases, mud blebs, a few worm casts, an occasional fracture (iron stained) at 10° - 12° to core axis.	12.95	301.46	12.74	
SANDSTONE, grey, fine grained, quartz-lithic, silty interbeds, an occasional fracture, calcite filled at 10° - 18° to core axis, some current bedding. Bedding angle 77° to core axis.	6.10	307.56	6.00	

SUKUNKA D.D.H. C-31

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, fine grained, quartz-lithic, fractured in two directions at 90° to one another, each being at 10° to core axis.	0.90	308.46	0.89	
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey, and mudstone dark grey, interbedded; sandy interbeds and phases, mud blebs. Two oblique fractures (10° to core axis). Bedding angle 77° to core axis.	12.41	320.87	12.21	
MUDSTONE, dark grey, silty at base .	1.51	322.38	1.49	
SILTSTONE, brecciated and crushed so that the fragments trend at about 15° to core axis, calcite infillings. numerous, core fractured across at 45° to core axis.	2.19	324.57	2.16	
SILTSTONE AND SANDSTONE, brecciated, siltstone mainly at top, sandstone mainly at bottom, calcite infillings numerous, but especially heavy in the sandstone, fractures across core at various angles.	12.18	336.75	11.99	

SUKUNKA D.D.H. C-31

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, medium grained, quartz-lithic, numerous small calcite veins. Bedding angle 75° to core axis 1.6' from top, 70° to core axis 2.85' from top. Coaly wisps, some slickensides.	4.22	340.97	4.15	
SANDSTONE, grey, medium grained, quartz-lithic, numerous calcite veins of no particular orientation, coaly wisps, core fractured at various angles along coaly partings with slickensiding, current bedding 10' from top, Bedding angle 45° to core axis.	18.37	359.34	18.08	
SANDSTONE, grey, medium grained, quartz-lithic, numerous calcite veins, coaly wisps.	3.96	363.30	3.90	
SILTSTONE, brecciated, coaly wisps.	0.39	363.69	0.38	
SANDSTONE, brecciated and calcite filled, core broken at top, and in zone (0.4') 0.5' from top, and in zone (1.2') 1.7' from top.	2.96	366.65	2.91	

SUKUNKA D.D.H. C-31

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, medium grained, becoming fine grained towards base, occasional calcite veins, current bedding, mottled (worm casts) in zone (2.3') 2.4' from top. Bedding angle 70° near top and 75° to core axis near base. Coaly wisps near top.	9.10	375.75	8.96	
SANDSTONE, grey, fine grained, quartz-lithic, a few fine coaly wisps, calcite veins, current bedding, sparse pebble bands at 7.8', 8.6', 11.7' and 12.5' from top. Bedding angle 6.5' from top 66° to core axis, and 70° to core axis near base.	18.12	393.87	17.83	
SANDSTONE, grey, fine grained, quartz-lithic, a few very fine calcite veins tending to be at 40°-45° to core axis, planes of fractures at angles between 55° and 12° to core axis. Bedding angle 70° to core axis. Current bedding.	18.60	412.47	18.30	
SANDSTONE, grey, fine grained, quartz-lithic, calcite veins at 30° to core axis. Bedding angle 70° to core axis.	19.61	432.08	19.29	

SUKUNKA D.D.H. C-31

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey, interbedded; sandy interbeds and phases mainly in top half, worm casts and mud blebs. Bedding angle 70° to core axis.	16.59	448.67	16.33	
SANDSTONE, grey, medium to coarse grained, quartz-lithic, silty interbeds, one calcite vein.	0.98	449.65	0.96	
SANDSTONE, grey, fine grained, quartz-lithic.	2.76	452.41	2.71	
SILTSTONE, grey.	1.30	453.71	1.28	
SANDSTONE, grey, fine grained, quartz-lithic, silty interbeds and coaly wisps. Bedding angle 64° to core axis.	3.27	456.98	3.22	
MUDSTONE, dark grey, silty interbeds in top half, calcite veins in base.	3.96	460.94	3.90	

SUKUNKA D.D.H. C-31

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, medium grained, quartz-lithic, coaly wisps and irregular masses. Bedding angle 70° to core axis.	8.01	468.95	7.88	
SANDSTONE, grey, medium grained becoming finer, quartz-lithic, coaly wisps and irregular masses and pennybands, carbonaceous phase from 8.4' to 9.4' from top. Bedding angle 60° to core axis	14.13	483.08	13.91	
CLAYSTONE, carbonaceous, sandy interbeds.	1.71	484.79	1.68	
SANDSTONE, grey, fine grained, quartz-lithic, coaly wisps.	1.15	485.94	1.15	
CLAYSTONE, carbonaceous, a few sandy interbeds.	0.43	486.37	0.43	
<u>COAL</u> , dull and bright, pennyband of claystone carbonaceous 0.10' from top.	0.20	486.57	0.20)
<u>COAL</u> , mainly dull with minor bright bands.	0.03	486.60	0.03	) SKEETER SEAM) lower plat

SUKUNKA D.D.H. C-31

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE, grey, sandy phases, carbonaceous at top, pennyband coal 0.11' from top.	1.24	487.84	1.24)
COAL, dull, joint planes (signs of shearing) at 70° to core axis at 0.75' from top, 55° at 1.05' from top, core sheared finely from 1.3' to base at 70° to core axis, some shearing along vertical cleat except from 1.3' to base where vertical cleat absent.	2.17	490.01	1.90	) SKEEETER SEAM
SILTSTONE, grey, interbeds of fine sandstone, current bedded, calcite filled tension cracks at top for 0.42', and from 1.2' to base where core broken with listric surfaces. Bedding angles 70° at top and 55° near base (relative to core axis). Some displacement in calcite zones.	2.41	492.42	2.41	) lower plat
COAL AND CLAYSTONE, core broken into small pieces and coal and claystone carbonaceous fragments mixed, all pieces have highly listric surfaces.	2.27	494.69	0.58)
CLAYSTONE, dark grey, carbonaceous.	0.54	495.23	0.54)

SUKUNKA D.D.H. C-31

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE, grey, becoming carbonaceous at top, sandy and some muddy interbeds towards base. Bedding angle 75° to core axis. Tension cracks with displacement and calcite infillings in basal 0.7'.	7.19	502.42	7.19	
MUD, brown, soft when wet.	1.12	503.54	0.59	
SILTSTONE, grey, sandstone and mudstone interbeds, extensively fractured and filled with brown mud.	2.10	505.64	1.10	
MUDSTONE, dark grey, occasional phases of fine siltstone interbedded (laminite). Bedding angle 77° to core axis 2.8' from top, 63° at 5.6' from top, 77° to core axis 7.7' from top. At 6.4' from top, a fine calcite vein at 40° to core axis with some displacement.	7.82	513.46	7.82	
CLAYSTONE, carbonaceous, brown.	0.40	513.86	0.40	
<u>COAL</u> , dull and bright.	0.50	514.36	0.32	) ) ) CHAMBERLAIN SEAM lower plate

SUKUNKA D.D.H. C-31

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<p><u>COAL</u>, coal types indeterminable as core breaks into thin sections, no vertical cleat, joint planes with some evidence of shearing at 62° to core axis 0.5' from top, 70° from 1.1' to 2.4' from top.</p>	4.82	519.18	3.10	) CHAMBERLAIN SEAM) lower plate
<p>SANDSTONE, grey, medium grained, quartz-lithic, coaly wisps and irregular masses in top 0.8'. Bedding angle 78° to core axis.</p>	4.82	524.00	4.82	
<p>SANDSTONE, grey, medium grained, quartz-lithic, a few coaly wisps. Bedding angle 82° to core axis.</p>	17.00	541.00	19.57	
				<p><u>HOLE</u> <u>COMPLETE</u></p>

BORE NUMBER C-32

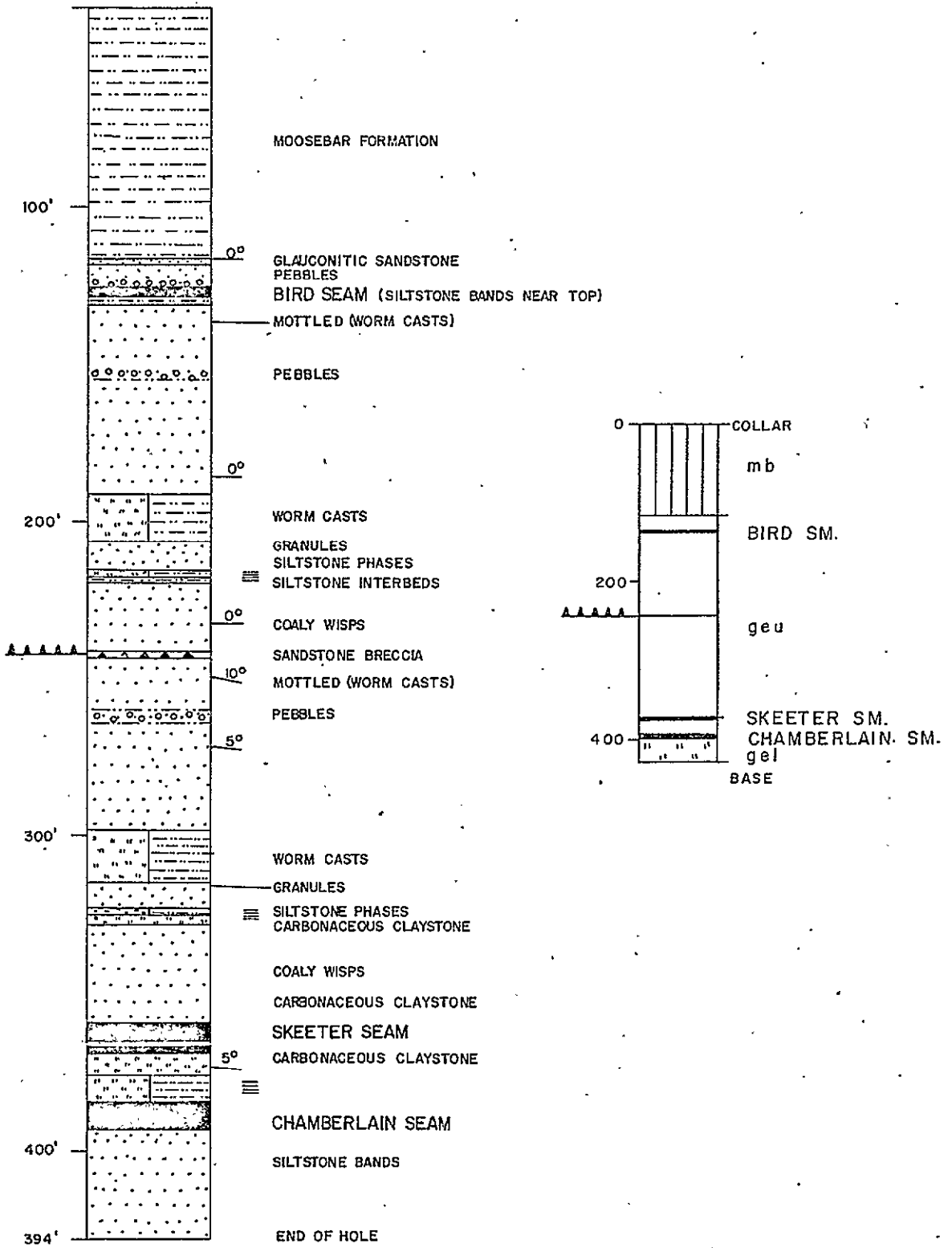
Grid Reference 47332.0 N 81815.2 E
Exploration Grid Reference C' / 2 + 975'E

Date Commenced 26th Sept., 1971 Completed 29th Sept., 1971

Collar R.L. 4150.0 ft. Standard Datum
Total Depth 428.1 ft. Electrically Logged *Yes/No*
Drilled by Connors Drilling Ltd.
For Coalition Mining Limited
Logged by F.H.S. Tebbutt

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Skeeter	3781.16 ft.	8.81	85%	
Chamberlain	3756.3 ft.	8.56	91%	



DETAIL OF GETHING FORMATION
SCALE: 1" to 50'

SCALE: 1" to 200'

Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS
DDH C-32

DRAWN BY S.A.

DATE: January '72

PAGE 1 of 1

SKEETER SEAM

360.03



368.84

ASH
CUMULATIVE
FROM FLOOR

WT %	ASH %	C. S. N ^o	INCL. BANDS	EXCL. BANDS
-	50.5	3		
-	5.9	7		
-	93.3	0		
-	21.8	5		

Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.

SEAM SECTIONS

for

DDH C-32

COALITION MINING LIMITED

DRAWN BY pm

DATE Jan '72

SCALE: 1' to 2'

PAGE 1 of 1

CHAMBERLAIN SEAM

ASH %
CUMULATIVE
FROM FLOOR

	WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
385.15	0.58	-	47.3	1	
393.71	7.98	-	3.8	6½	3.8



Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.

SEAM SECTIONS

for
COALITION MINING LIMITED

DDH C-32

DRAWN BY pm

DATE Jan '72

SCALE: 1" to 2'

PAGE 1 of 1

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

C A R G O
SUPERINTENDENTS
CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify

APPLICANT: COALITION MINING

**REPORT ON: SUKUNKA SAMPLES NO. 117/118, 119, 119A, 119B
CORE NO. C32
SKEETER SEAM**

REPORT NO. K71-1752

RECEIVED: 4. 11. 1971

REPORTED: 26. 11. 1971



This Laboratory is Registered by the
National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

M. Bralley
A.R.A.C.I. Chief Chemist.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

L. H. Campbell

INTRODUCTION:

Three coal samples and one non coal sample designated CORE NO. C32 SKEETER SEAM were received on 4. 11. 1971 from Clifford McElroy & Associates.

METHODS:

1. The non coal sample No. 119A was weighed, prepared and analysed for Ash and true specific gravity.
2. The visibly inferior coal samples No. 117/118 was hand crushed to $-\frac{3}{4}$ ", sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.60 SG.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

3. The good quality coal sample No. 119 and 119B were hand crushed to $\frac{3}{4}$ ", sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 119 and the analysis are given in this report.

NOTE:

Sample weights have not been adjusted to compensate for core loss.

RESULTS:

FIGURE 1 : gives the graphic log of the core

TABLES 1-3 : give the sizing, washability and analytical data for each coal sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 1

WASHABILITY DATA FOR SAMPLE NO. 117/118 (after hand crushing to $-\frac{3}{4}$ ")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
F1.60 SG	219	38.9	11.6	7	38.9	11.6	7
S1.60 SG	344	61.1	75.2	0	100.0	50.5	3
-30 Mesh	28	4.7	26.1	7½			

Total Weight of Sample = 591 grams

True Specific Gravity = 1.709

TABLE 2

WASHABILITY DATA FOR SAMPLE NO. 119 (after hand crushing to -7)

FRACTION	INDIVIDUAL				CUMULATIVE		
	WEIGHT	WT.%	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
F1.30 SG	1021	35.2	1.9	8	35.2	1.9	8
S1.30 - F1.35 SG	1302	44.9	4.4	7½	80.1	3.3	8
S1.35 - F1.40 SG	294	10.1	9.6	7	90.2	4.0	7½
S1.40 - F1.45 SG	138	4.8	14.9	4	95.0	4.6	7½
S1.45 - F1.50 SG	58	2.0	16.6	2	97.0	4.8	7½
S1.50 - F1.55 SG	27	0.9	23.2	1	97.9	5.0	7½
S1.55 - F1.60 SG	13	0.4	30.0	1	98.3	5.1	7½
S1.60 SG	49	1.7	52.5	½	100.0	5.9	7
-30 Mesh	216	6.9	3.2	8			

Total Weight of Sample = 3118 grams
True Specific Gravity = 1.302

SAMPLE NO. 119A

RAW COAL
Total Weight of Sample = 1155 grams
Ash % = 93.3
True Specific Gravity = 2.548

TABLE 3

WASHABILITY DATA FOR SAMPLE NO. 119B (after hand crushing to -¾")

FRACTION	INDIVIDUAL				CUMULATIVE		
	WEIGHT	WT.%	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
F1.30 SG	166	24.6	2.5	9	24.6	2.5	9
S1.30 - F1.35 SG	196	29.0	4.5	7½	53.6	3.6	8
S1.35 - F1.40 SG	50	7.4	10.0	2	61.0	4.4	7½
S1.40 - F1.45 SG	46	6.8	16.5	1½	67.8	5.6	7
S1.45 - F1.50 SG	31	4.6	21.4	1	72.4	6.6	6½
S1.50 - F1.55 SG	29	4.3	27.2	1	76.7	7.7	6
S1.55 - F1.60 SG	14	2.1	29.1	1	78.8	8.3	6
S1.60 SG	143	21.2	71.8	0	100.0	21.8	5
-30 Mesh	42	5.9	7.5	8½			

Total Weight of Sample = 717 grams
True Specific Gravity = 1.550

ANALYSIS OF FLOATS 1.60 SG FRACTION OF SAMPLE NO. 119

Yield % 98.3
Air Dried Moisture % 0.9
Ash % 5.1
Volatile Matter % 21.3
Fixed Carbon % 72.7
Total Sulphur % 0.37
C.S.NO. 8
Calorific Value 14570 BTU/LB

SYDNEY
30th November 1971

K91-1952

COALITION MINING.

SUNUNKA C32 -

SKEETER SEAM

SPL.	FACE	ACR.	OSB.
{ 117 118	0 49	505	5
119	5 64	5 9	1
119A	0 44	933	1
119B	1 35	2 1 9	5

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

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SUPERINTENDENTS
CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify

APPLICANT: COALITION MINING

REPORT ON: SUKUNKA SAMPLES NO. 120, 121
CORE NO. C32
CHAMBERLAIN SEAM

REPORT NO. K71-1753

RECEIVED: 4. 11. 1971

REPORTED: 26. 11. 1971



This Laboratory is Registered by the
National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

A.R.A.C.I.
A.R.A.C.I. Chief Chemist

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

[Signature]

INTRODUCTION:

Two coal samples designated CORE NO. C32 CHAMBERLAIN SEAM were received on 4. 11. 1971 from Clifford McElroy & Associates.

METHODS:

1. The visibly inferior coal sample No. 120 was hand crushed to $-\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.60 SG.

The float and sink fractions and raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

2. The good quality coal sample No. 121 was hand crushed to $-\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions and raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 121 and the analysis are given in this report.

NOTE:

Sample weights have not been adjusted to compensate for core loss.

RESULTS:

FIGURE 1 : gives the graphic log of the core

TABLES 1-2 : give the sizing, washability and analytical data for each coal sample after hand crushing to $\frac{3}{4}$ "

TABLE 1

WASHABILITY DATA FOR SAMPLE NO. 120 (after hand crushing to $-\frac{3}{4}$ "

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
F1.60 SG	37	8.8	13.6	3	8.8	13.6	3
S1.60 SG	382	91.2	50.6	$\frac{1}{2}$	100.0	47.3	1
-30 Mesh	8	1.9	36.8	1			

Total Weight of Sample = 427 grams
True Specific Gravity = 1.770

TABLE 2

WASHABILITY DATA FOR SAMPLE NO. 121 (after hand crushing to -30 Mesh)

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
Fl.30 SG	2011	47.8	1.8	8	47.8	1.8	8
S1.30 - Fl.35 SG	1631	38.8	3.3	6	86.6	2.5	7
S1.35 - Fl.40 SG	304	7.2	7.3	1	93.8	2.8	6½
S1.40 - Fl.45 SG	83	2.0	12.6	1	95.8	3.0	6½
S1.45 - Fl.50 SG	141	3.4	18.4	1	99.2	3.6	6½
S1.50 - Fl.55 SG	16	0.4	19.7	1	99.6	3.6	6½
S1.55 - Fl.60 SG	3	0.1	24.8	1	99.7	3.7	6½
S1.60 SG	14	0.3	41.4	0	100.0	3.8	6½
-30 Mesh	300	6.7	2.1	9			

Total Weight of Sample = 4503 grams

True Specific Gravity = 1.270

ANALYSIS OF Fl.60 SPECIFIC GRAVITY OF SAMPLE NO. 121

Yield %	99.7
Air Dried Moisture %	0.8
Ash %	3.6
Volatile Matter %	21.6
Fixed Carbon %	74.0
Total Sulphur %	0.35
C.S.NO.	7½
Calorific Value	14720 BTU/LB

SYDNEY

30th November 1971

K71-1753
COALITION MINING

SUKUNKA C32

CHAMBERLAIN SEAM

	SPL	THICK	ASH%	COMP
8	120	0.58'	47.3	1
6				
4	121	7.98'	3.8	6 1/2
2				
0				

STRATIGRAPHIC LOG
SUKUNKA D.D.H. C-32

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
	Start coring at 36.0 ft.		
	MUDSTONE, dark grey, white clay bands at 114', 116', 117'.	MOOSEBAR FM.	117.0
	SANDSTONE, glauconitic.	GETHING FM.	118.0
	SANDSTONE, grey, medium grained, quartz-lithic, pebbles from 124' to base.		126.5
	<u>COAL</u> , siltstone bands in upper 1'.	BIRD SEAM	128.7
	MUDSTONE, dark grey.		130.5
	SANDSTONE, grey, medium grained, finer towards base, quartz lithic, mottled (worm casts) at 137'. Pebbles at 153' over thin mudstone band.		191.0
	SILTSTONE AND MUDSTONE INTERBEDS, sandy phases, worm casts, granules at base.		207.5
	SANDSTONE, silty phases.		216.0
	LAMINITE, siltstone and mudstone.		217.67
	MUDSTONE, silty interbeds.		220.0

Structure	Description of Strata	Formation : or Member	Depth to Base of Stratum (ft)
Fault, established	SANDSTONE, coaly wisps.		241.10
	SANDSTONE, breccia zone with calcite.		242.0
	SANDSTONE, grey, medium grained becoming finer to base, mottled. (worm casts) at 250', pebbles 261' with muds bands above and below.		299.0
	SILTSTONE AND MUDSTONE INTERBEDS, worm casts, granules at base.		315.0
	SANDSTONE, grey, medium grained, quartz lithic, slump structure at 319', silty phases towards base.		323.0
	LAMINITE, siltstone and mudstone.		325.0
	SILTSTONE, grey, mudstone interbeds, becoming more muddy to base.		328.0
	CLAYSTONE, carbonaceous.		329.0
	SANDSTONE, coaly wisps, carbonaceous claystone band at 354' and at base?		360.0
	<u>COAL</u> , 1' siltstone band at 366'.	SKEETER SM.	368.5
	SILTSTONE, sandy phases, carbonaceous claystone band at top.		376.0
	LAMINITE, siltstone and mudstone.		385.0
<u>COAL</u> .	CHAMB. SM.	394.0	

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
	SANDSTONE, grey, medium grained becoming finer to base, calcite vein at 399, some silty bands, between 404' and 406'.		428.0 <u>BASE OF HOLE</u>

SUKUNKA D.D.H. C-32

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
Core not logged in detail-refer to Stratigraphic Log for particulars.		203.78		
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey, interbedded; Worm casts and mud blebs, sandy interbeds in bottom 0.2'.	3.10	206.88	3.10	
SANDSTONE, grey, medium grained in top 0.55' and fine below this, quartz-lithic, zone of irregular silty and claystone interbeds (0.12') 0.55' from top, siltstone band (0.07') 0.35' from base .	3.94	210.82	3.93	
MUDSTONE, dark grey.	0.23	211.05	0.23	
SILTSTONE, grey, sandy interbeds, one calcite band parallel to bedding at 85° to core axis.	1.59	212.64	1.58	
SANDSTONE, grey, fine and medium grained phases, quartz-lithic, a few coaly wisps, a silty band (0.03') 0.53' from base .	3.26	215.90	3.25	

SUKUNKA D.D.H. C-32

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
MUDSTONE, grey with numerous fine silty interbeds, mudstone phases.	3.93	219.83	3.91	
CLAYSTONE, carbonaceous.	0.85	220.68	0.85	
SANDSTONE, grey, fine grained, quartz-lithic, coaly wisps and fine carbonaceous phases.	1.83	222.51	1.82	
SANDSTONE, as above. Heavy zone (0.34') of carbonaceous phases and coaly wisps 8.0' from top. Bedding angle 80° to core axis. Two calcite veins 2.5' from base at 12° to core axis.	18.40	240.91	18.32	
SANDSTONE, grey, fine grained, quartz-lithic, coaly wisps. Bedding angle 85°90° to core axis.	0.93	241.84	0.93	
SANDSTONE, brecciated, calcite infillings.	0.17	242.01	0.17	
SANDSTONE, grey, medium grained becoming fine grained at base, quartz-lithic, some slickensides near breccia zone, calcite veins infrequent, but at 20° to core				

SUKUNKA D.D.H. C-32

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
axis, one heavy calcite vein parallel to core axis. Bedding angle 80° to core axis. 1.3' zone mottled (worm casts) 6.2' from top, granule and small pebble bands at 1.15' (0.04') from base and 1.7' (0.10') from base.	17.67	259.68	17.59	
SANDSTONE, grey, fine grained, quartz-lithic, silty interbeds and phases of granules (0.16') 0.2' from top and of pebbles (0.10') 0.67' from top, vertical calcite vein.	0.99	260.67	0.99	
MUDSTONE, grey, calcite veins.	0.28	260.95	0.28	
CONGLOMERATE, pebble and granule, grey, pebbles of variable fine grained lithology.	0.67	261.62	0.67	
SANDSTONE, grey, fine grained, quartz-lithic, subvertical calcite vein.	0.63	262.25	0.63	
SILTSTONE, grey.	0.14	262.39	0.14	

SUKUNKA D.D.H. C-32

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, fine grained, quartz-lithic, pebble band (0.15') 0.60' from top. Bedding angle 87° to core axis.	15.28	277.67	15.20	
SANDSTONE, grey, fine grained, quartz-lithic. Bedding angle 0-5° to core axis.	20.52	298.19	20.41	
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey, worm casts and mud blebs, sandy interbeds. Bedding angle for most part about 83° to core axis, but steepens for 0.4' to about 74° to core axis 0.60' from base. Calcite vein at 90° to core axis at base.	16.40	314.59	16.32	
SANDSTONE, grey, fine grained, quartz-lithic, medium grained phase at top, zone (0.08') of mud blebs 0.13' from base.	0.59	315.18	0.59	
SANDSTONE, grey, fine grained, quartz-lithic, medium to coarse grained phase at top, silty and mudstone phases and interbeds.	8.06	323.24	8.02	

SUKUNKA D.D.H. C-32

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
MUDSTONE, grey, with fine silty interbeds, (laminite). Bedding angle 82° to core axis.	4.62	327.86	4.60	
CLAYSTONE, carbonaceous .	0.83	328.69	0.83	
SANDSTONE, grey, fine grained, quartz-lithic, coaly wisps and partings.	5.18	333.87	5.16	
SANDSTONE, grey, fine grained, quartz-lithic, coaly wisps and fine carbonaceous phases. Bedding angle 80° to core axis .	18.18	352.05	18.09	
SANDSTONE, grey, fine grained, quartz-lithic, coaly wisps .	1.94	353.99	1.93	
CLAYSTONE, carbonaceous .	0.54	354.53	0.54	
SANDSTONE, grey, fine grained, quartz-lithic, coaly wisps .	4.59	359.12	4.57	
CLAYSTONE, carbonaceous .	0.79	359.91	0.79	

SUKUNKA D.D.H. C-32

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, fine grained, quartz-lithic, coaly wisps.	0.12	360.03	0.12	
<u>COAL</u> , mainly dull with minor bright bands, sheared, planes at 55° to core axis.	0.42	360.45	0.41)
stonny to claystone carbonaceous.	0.40	360.85	0.40)
sheared, planes at 40° to core axis, coal type indistinct, probably dull with bright bands.	0.19	361.04	0.19)
CLAYSTONE, carbonaceous, at 68° to core axis and opposed to shear direction.	0.01	361.05	0.01	) SKEETER SEAM
<u>COAL</u> , type indistinct, probably dull, cleat poor and sheared at top.	0.30	361.35	0.29)
dull and bright, shear planes at 40° to core axis.	0.41	361.76	0.40)
dull, shear planes 40° to core axis.	0.21	361.97	0.21)
dull and bright, shear planes at 55° to core axis.	0.78	362.75	0.77)

SUKUNKA D.D.H. C-32

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull.	0.28	363.03	0.28)
types indistinct, but probably dull with bright bands.	0.79	363.82	0.78)
dull and bright.	0.37	364.19	0.36)
CLAYSTONE, carbonaceous. Bedding angle 83° to core axis.	0.01	364.20	0.01)
<u>COAL</u> , dull and bright, claystone lens (0.01") 3.01' from top.	0.53	364.73	0.52)
dull.	0.18	364.91	0.18	) SKEETER SEAM
dull and bright.	0.11	365.02	0.11)
mainly dull with minor bright bands, shear planes at 40° to core axis.	0.58	365.60	0.57)
bright.	0.07	365.67	0.07)

SUKUNKA D.D.H. C-32

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , sheared horizontally, cleat absent, coal type indistinct, mainly dull.	0.87	366.54	0.85	) SKEETER SEAM
SILTSTONE, grey.	0.94	367.48	0.94)
<u>COAL</u> , dull.	0.19	367.67	0.18)
mainly dull with minor bright bands. Bedding angle 40° to core axis. Cleat not well developed.	0.65	368.32	0.64)
stony, with occasional coaly band.	0.52	368.84	0.51)
CLAYSTONE, carbonaceous.	0.57	369.41	0.57	
SILTSTONE, grey, with sandstone interbeds 3.2' from top, to base.	7.46	376.87	7.46	
LAMINITE, siltstone grey and mudstone dark grey, interbedded; mudstone phase near centre. Bedding angle 85° to core axis.	7.93	384.80	7.93	
CLAYSTONE, carbonaceous.	0.35	385.15	0.35	

SUKUNKA D.D.H. C-32

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , stony.	0.58	385.73	0.58)	
dull and bright.	0.33	386.06	0.33)	
mainly dull with minor bright bands, fracture planes at 15° and 65° to core axis.	0.97	387.03	0.96)	
dull and bright.	0.64	387.67	0.64)	
mainly dull with minor bright bands.	0.25	387.92	0.25)	CHAMBERLAIN SEAM
dull and bright, fracture planes at 25° to core axis.	0.84	388.76	0.83)	
mainly dull with minor bright bands.	0.21	388.97	0.21)	
dull and bright. Bedding angle 83° to core axis.	1.20	390.17	1.19)	
mainly dull with minor bright bands, fractures at 35° to core axis.	0.74	390.91	0.73)	

SUKUNKA D.D.H. C-32

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull.	0.35	391.26	0.35)
mainly dull with minor bright bands, fracture planes at 20° to core axis.	0.53	391.79	0.53)
dull and bright.	0.40	392.19	0.40	) CHAMBERLAIN SEAM
mainly dull with minor bright bands. Bedding angle 20° to core axis. Cleat disturbed.	0.76	392.95	0.75)
dull and bright. Bedding angle 87° and shear planes at 50° to core axis.	0.76	393.71	0.75)
SANDSTONE, grey, medium grained, quartz-lithic, calcite veins at 60° to core axis 3.53' from base, mudstone band (0.03') 1.35' from base. Bedding angle 80° to core axis.	9.26	402.97	9.26	
SANDSTONE, grey, fine grained, quartz-lithic, some phases of fine mudstone bands near top. Bedding angle 83° to core axis.	25.16	428.13	25.16	BASE OF HOLE

BORE NUMBER C-33

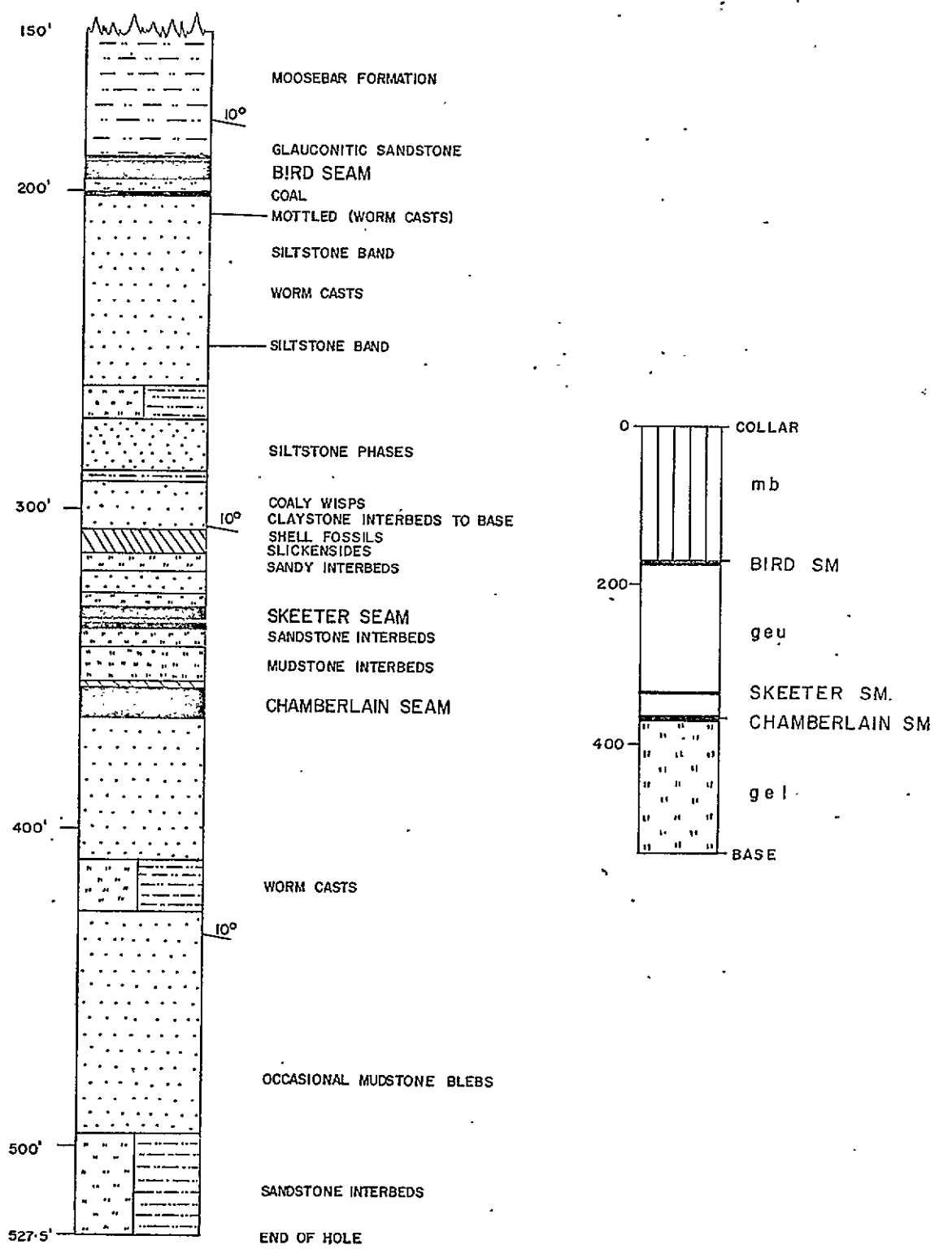
Grid Reference 40473.1 N 84243.5 E
Exploration Grid Reference G + 1950'N / 1 + 1025'E

Date Commenced 12th Oct., 1971 Completed 15th Oct., 1971

Collar R.L. 3937.7 ft. Standard Datum
Total Depth 378.62 ft. Electrically Logged ~~Yes~~/No
Drilled by Connors Drilling Ltd.
For Coalition Mining Limited
Logged by F.H.S. Tebbutt

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Skeeter	3600.5 ft.	5.90	86%	
Chamberlain	3572.9 ft.	10.07	74%	



DETAIL OF GETHING FORMATION
SCALE: 1" to 50'

SCALE: 1" to 200'

Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS
DDH C-33


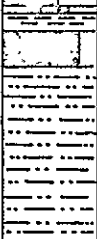

DRAWN BY S.A.

DATE: January '72

PAGE 1 of 1

SKEETER SEAM

ASH %
CUMULATIVE
FROM FLOOR

		WT %	ASH %	C. S. N ^o	INCL. BANDS	EXCL. BANDS
331.30		3.42	-	16.5	5	
		1.82	-	83.8	0	
337.20		0.66	-	20.6	6	

Prepared by:

CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for

COALITION MINING LIMITED

DRAWN BY pm

DATE Jan '72

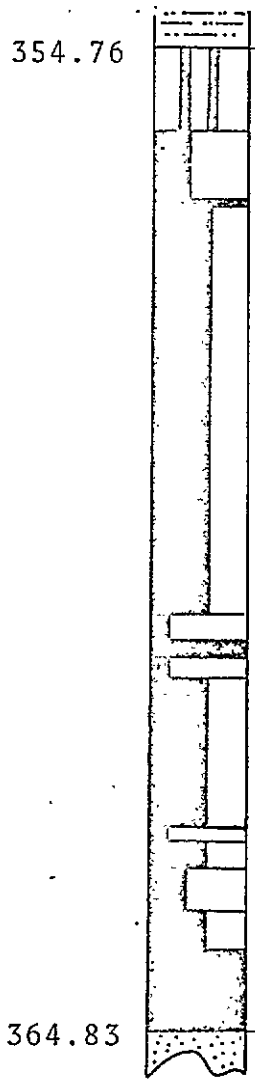
SCALE: 1"to 2'

SEAM SECTIONS

DDH C-33

PAGE 1 of 1

CHAMBERLAIN SEAM



354.76

10.07

364.83

ASH %
CUMULATIVE
FROM FLOOR

WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
			8.7	
-	8.7	7		

Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED
DRAWN BY pm DATE Jan '72

SEAM SECTIONS
DDH C-33

SCALE: 1" to 2'
PAGE 1 of 1

Telegrams and Cables:
"Visor", Sydney

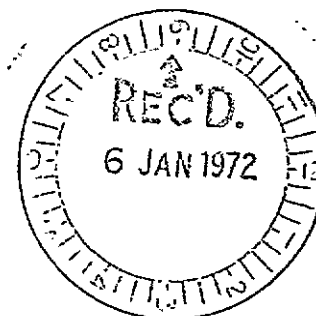
Telephone: 241 1105

C A R G O
SUPERINTENDENTS
CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify



APPLICANT: COALITION MINING

REPORT ON: SUKUNKA SAMPLES NO. 151-153, 154, 155
CORE NO. C33
SKEETER SEAM

REPORT NO. K71-1860

RECEIVED: 17. 11. 1971

REPORTED: 31. 12. 1971



This Laboratory is Registered by the National Association of Testing Authorities Australia. The tests reported herein have been performed in accordance with the terms of registration.

A.R.A.C.I.
A.R.A.C.I. Chief Chemist.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

[Signature]

INTRODUCTION:

Two (2) Coal Samples and One (1) Non Coal Sample designated CORE NO. C33 SKEETER SEAM were received on 17. 11. 1971 from Clifford McElroy & Associates.

METHODS:

1. The non coal sample No. 154 was weighed, prepared and analysed for Ash and true specific gravity.
2. The visibly inferior coal sample No. 155 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.60 specific gravity

The floats and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

3. The good quality coal sample No. 151-153 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 151-153 and the analysis are given in this report.

NOTE:

Sample weights have not been adjusted to compensate for core loss.

RESULTS:

TABLES 1-2 : give the sizing, washability and analytical data for each coal sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 1

WASHABILITY DATA FOR SAMPLE NO. 151-153 (after hand crushing to $\frac{3}{4}$ ")

FRACTION	INDIVIDUAL				CUMULATIVE		
	WEIGHT	WT.%	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
F1.30 SG	609	34.9	2.9	9	34.9	2.9	9
S1.30 - F1.35 SG	512	29.3	5.8	6	64.2	4.2	7½
S1.35 - F1.40 SG	202	11.6	10.0	1½	75.8	5.1	6½
S1.40 - F1.45 SG	87	5.0	15.0	1½	80.8	5.7	6½
S1.45 - F1.50 SG	34	1.9	20.0	1	82.7	6.0	6
S1.50 - F1.55 SG	12	0.7	22.5	1	83.4	6.2	6
S1.55 - F1.60 SG	9	0.5	24.1	1	83.9	6.3	6
S1.60 SG	282	16.1	72.8	0	100.0	17.0	5
-30 Mesh RC	126	6.7	9.9	8			

Total Weight of Sample = 1873 grams
True Specific Gravity = 1.383
Thickness = 3.42'

SAMPLE NO. 154

Total Weight of Sample = 2233 grams
 True Specific Gravity = 2.560
 Ash % = 83.8
 Thickness = 1.82'

TABLE 2

WASHABILITY DATA FOR SAMPLE NO. 155 (after hand crushing to 75")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
F1.60 SG	277	82.4	12.2	7½	82.4	12.2	7½
S1.60 SG	59	17.6	62.9	0	100.0	21.1	6
-30 Mesh RC	19	5.4	11.7	8			
Total Weight of Sample = 355 grams							
True Specific Gravity = 1.388							
Thickness = 0.66'							

ANALYSIS OF F1.60 SG FRACTION OF SAMPLE NO. 151-153

Yield % 83.9
 Air Dried Moisture % 1.0
 Ash % 6.4
 Volatile Matter % 20.5
 Fixed Carbon % 72.1
 Total Sulphur % 0.58
 C.S.NO. 7
 Calorific Value 14300 BTU/LB
 Phosphorus % 0.021

SYDNEY
 31st December 1971

Telegrams and Cables:
"Visor", Sydney

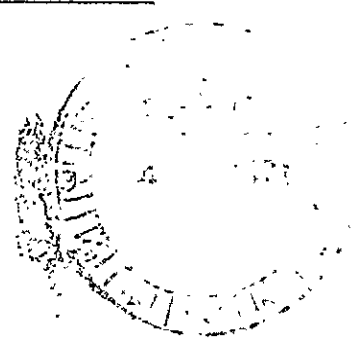
Telephone: 241 1105

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SUPERINTENDENTS
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Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify



APPLICANT: COALITION MINING

REPORT ON: SUKUNKA SAMPLE NO. 156-157
CORE NO. C33
CHAMBERLAIN SEAM

REPORT NO. K71-1861

RECEIVED: 17. 11. 1971

REPORTED: 31. 12. 1971



This Laboratory is Registered by the
National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

A.R.A.C.I.
A.R.A.C.I. Chief Chemist.

INTRODUCTION: One (1) Coal Sample designated CORE NO. C33 CHAMBERLAIN SEAM was received on 17. 11. 1971 from Clifford McElroy & Associates

METHOD: The Coal Sample No. 156-157 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 156-157 and the analysis are given in this report.

NOTE: The sample weight has not been adjusted to compensate for core loss.

RESULTS: TABLE 1 : gives the sizing, washability and analytical data for the sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 1 WASHABILITY DATA FOR SAMPLE NO. 156-157 (after hand crushing to $\frac{3}{4}$ ")

FRACTION	INDIVIDUAL				CUMULATIVE		
	WEIGHT	WT.%	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
F1.30 SG	2373	55.8	2.2	9	55.8	2.2	9
S1.30 - F1.35 SG	1003	23.6	4.6	7	79.4	2.9	8½
S1.35 - F1.40 SG	202	4.7	9.9	2½	84.1	3.3	8
S1.40 - F1.45 SG	84	2.0	15.0	1½	86.1	3.6	8
S1.45 - F1.50 SG	53	1.2	22.2	1	87.3	3.8	8
S1.50 - F1.55 SG	68	1.6	28.5	1	88.9	4.3	7½
S1.55 - F1.60 SG	13	0.3	31.2	1	89.2	4.4	7½
S1.60 SG	460	10.8	47.6	1	100.0	9.0	7
-30 Mesh RC	542	11.3	6.4	9			
Total Weight of Sample = 4798 grams							
True Specific Gravity = 1.329							
Thickness = 10.07'							

ANALYSIS OF F1.60 SG FRACTION OF SAMPLE NO. 156-157

Yield %	89.2
Air Dried Moisture %	1.0
Ash %	4.5
Volatile Matter %	20.3
Fixed Carbon %	74.2
Total Sulphur %	0.36
C.S.NO.	8
Calorific Value	14770 BTU/LB
Phosphorus %	0.027

SYDNEY
31st December 1971

STRATIGRAPHIC LOG
SUKUNKA D.D.H. C-33

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
All strata dips at 0-10°.	No core to 20.0 ft.		
	MUDSTONE, dark grey, dark brown mudstone bands 36', 46'. Core broken from 58' to 65' with calcite infillings and slickensides at 63'. White clay bands at 124', 188', 189'. Vertical fractures 127'-131'.	MOOSEBAR FM.	189.5
	SANDSTONE, glauconitic.	GETHING FM.	190.3
	<u>COAL</u>)		196.5
)		
	SILTSTONE, grey.)	BIRD SEAM	200.5
)		
	<u>COAL</u> .)		201.0
	SANDSTONE, grey, medium grained becoming finer, quartz-lithic, mottled (worm casts) 207', siltstone band at 220' and 250', worm casts at 222', 249'-253'.		261.0
	SILTSTONE AND MUDSTONE INTERBEDS.		271.0
SANDSTONE, medium grained, silty phases.		288.0	
MUDSTONE; dark grey.		291.0	
SANDSTONE, coaly wisps, carbonaceous claystone interbeds and phases towards base.		306.0	

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
	CLAYSTONE, brown, carbonaceous shell fossils at 307'. Some slickensides at 311' and carbonaceous mudstone (brown) at 312' and 314'.		314.0
	SILTSTONE, grey, sandy interbeds.		320.0
	SANDSTONE, grey, medium grained.		327.0
	SILTSTONE, grey.		331.5
	<u>COAL.</u>)		334.5
)		
	CLAYSTONE, dark grey.)	SKEETER SM.	336.5
)		
	<u>COAL.</u>)		337.5
	SILTSTONE, sandy interbeds.		343.0
	SILTSTONE, grey, mudstone interbeds.		354.0
	CLAYSTONE, carbonaceous.		355.5
	<u>COAL.</u>	CHAMB. SM.	365.0
	SANDSTONE, grey, medium grained becoming finer.		410.0
	SILTSTONE AND MUDSTONE INTERBEDS, sandy interbeds and phases, worm casts.		426.0
	SANDSTONE, fine grained, occasional bands of siltstone, and also mudstone blebs from 464' to base.		496.0
	SILTSTONE AND MUDSTONE INTERBEDS, sandy interbeds and phases, worm casts.	<u>Base of Hole</u>	527.5

SUKUNKA D.D.H. C-33

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
Core not logged in detail-refer to Stratigraphic Log for particulars		264.25		
SANDSTONE, grey, fine grained, quartz-lithic.	1.44	265.69	1.44	
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey, interbedded; some sandstone and mudstone.	1.81	267.50	1.81	
SANDSTONE, grey, medium to fine grained, quartz-lithic, silty interbeds, mud blebs and irregular coaly masses in upper 1.6', coaly wisps and partings from 2.4' to 2' from base, siltstone phase in bottom 2.0'. Bedding angle 81° to core axis.	14.99	282.49	10.33	
CLAYSTONE, dark grey.	0.68	283.17	0.47	
SANDSTONE, grey, fine grained, quartz-lithic, silty wisps.	4.98	288.15	3.86	

SUKUNKA D.D.H. C-33

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
MUDSTONE, pale grey in top 1.5', then dark grey.	4.27	292.42	3.31	
SANDSTONE, grey, fine grained, quartz-lithic, coaly wisps, phase of claystone (brown) interbeds from 1.5' to 2.2' from top? Bedding angle 80° to core axis.	7.87	300.29	6.10	
SANDSTONE, grey, fine grained, quartz-lithic, coaly wisps, carbonaceous claystone interbeds and phases from 0.75' to 1.5' from top and 2.75' to 3.7' from top.	5.56	305.85	4.31	
CLAYSTONE, carbonaceous, shell fossils from 0.5' to 1.1' from top.	2.85	308.70	2.48	
CLAYSTONE, dark grey.	1.47	310.17	1.47	
CLAYSTONE, carbonaceous, some coaly pennybands, core broken, some listric surfaces in zone (0.7') 1.09' from top.	2.47	312.64	2.47	
<u>COAL</u> , fragmented, some bright and some dull chips.	0.62	313.26	0.07	
CLAYSTONE, carbonaceous.	1.47	314.73	1.47	

SUKUNKA D.D.H. C-33

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
COAL, powdered.	1.34 -	316.07	0.15	
SILTSTONE, grey, sandstone interbeds. Bedding angle 80° to core axis.	3.98	320.05	4.02	
SANDSTONE, grey, fine grained, quartz-lithic, siltstone interbeds, concentrated in upper 0.5'. 0.5'.	2.10	322.15	2.12	
SANDSTONE, as above, some silty blebs in top 1' and near base, slump structure 2' from top, heavy calcite vein 4.6' from top.	4.88	327.03	4.91	
SILTSTONE, grey, sandstone interbeds at top, mudstone interbeds at base. Bedding angle 84° to core axis.	4.27	331.30	4.26	
COAL, mainly dull with minor bright bands.	0.40	331.70	0.37)
dull and bright, vertical cleat well developed.	0.28	331.98	0.26	) SKEETER SEAM
bright.	0.13	332.11	0.12)

SUKUNKA D.D.H. C-33

Geological Description of Strata	Estimated Thickness (ft)	Estimated Depth to Stratum Floor(ft)	Footage Recovered (ft)	Remarks
<u>COAL</u> , mainly dull with minor bright bands, hard, vertical cleat well developed, in top 0.65' heavy bright bands widely spaced, below this bright bands are fine and closely spaced, in top 0.5' a joint plane at 15° to core axis.	1.68	333.79	1.56)
dull and bright.	0.34	334.13	0.32)
stony with minor bright bands.	0.04	334.17	0.04	) SKEETER SEAM
CLAYSTONE, carbonaceous.	0.18	334.35	0.18)
<u>COAL</u> , mainly bright with minor dull bands, core broken into small fragments in part, one joint plane at 25° to core axis.	0.37	334.72	0.34)
MUDSTONE, dark grey, siltstone phase at base.	1.78	336.50	1.78)
CLAYSTONE, carbonaceous.	0.04	336.54	0.04)
<u>COAL</u> , mainly dull with minor bright bands.	0.31	336.85	0.29)
dull and bright, joint plane at 30° to core axis.	0.13	336.98	0.12)

SUKUNKA D.D.H. C-33

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , mainly dull with minor bright bands:	0.19	337.17	0.18	) SKEETER SEAM
stony with minor bright bands.	0.03	337.20	0.03)
CLAYSTONE, carbonaceous.	0.13	337.33	0.13	
SILTSTONE, grey, becoming carbonaceous at top.	2.00	339.33	1.92	
SANDSTONE, grey, fine grained, quartz-lithic, some	1.01	340.34	0.97	
SILTSTONE, grey, sandstone interbeds and phases, diminishing towards base. Bedding angle 80° to core axis.	4.97	345.31	4.77	
MUDSTONE, dark grey, siltstone interbeds, at 4.25' from top a slickensided fracture at 55° to core axis is met on top by abrupt overbending of bedding over depth of 0.15'. Bedding angle 80° to core axis 1.5' from base.	9.45	354.76	9.37	
<u>COAL</u> , stony to coal dull.	0.84	355.60	0.73	) CHAMBERLAIN SEAM

SUKUNKA D.D.H. C-33

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<p><u>COAL</u>, mainly dull with minor bright bands, planes at 65° to core axis, at 0.15' and 0.60' from top show signs of shearing, at 0.35' from top a joint plane at 10° to core axis.</p>	0.73	356.33	0.64	
<p>bright.</p>	0.05	356.38	0.04	
<p>dull and bright, core broken into regular rectangular blocks along well developed right angled joint planes..</p>	0.86	357.24	0.75	
<p>dull and bright, joint plain with signs of shearing at top at 65° to core axis.</p>	0.49	357.73	0.43	CHAMBERLAIN SEAM
<p>mainly bright with minor dull bands, very friable in part.</p>	0.55	358.28	0.48	
<p>mainly dull with minor bright bands, plane of gentle shearing at 65° to core axis near base.</p>	0.53	358.81	0.46	
<p>dull and bright, good vertical cleat, shear plane at 65° to core axis.</p>	0.60	359.41	0.52	

SUKUNKA D.D.H. C-33

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , mainly bright with minor dull bands, joint planes at 65° to core axis.	0.53	359.94	0.46)
dull and bright, joint plane at 55° to core axis.	0.63	360.57	0.55)
dull, soft and apparently weathered.	0.25	360.82	0.22)
bright, broken.	0.15	360.97	0.13)
dull, weathered.	0.25	361.22	0.22)
mainly bright with minor dull bands, joint at 20° to core axis.	0.51	361.73	0.44)
dull and bright, joint at 20° to core axis, coal weathered along joint.	0.80	362.53	0.70)
mainly bright with minor dull bands, joints at 55° to core axis.	0.22	362.75	0.19)
dull.	0.13	362.88	0.11)

CHAMBERLAIN SEAM

SUKUNKA D.D.H. C-33

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , mainly bright with minor dull bands; joint at top 60° to core axis and at base 50° to core axis.	0.29	363.17	0.25)	
mainly dull with minor bright bands, joint at 50° to core axis.	0.44	363.61	0.38)	
dull and bright, joint at 60° to core axis.	0.38	363.99	0.33)	CHAMBERLAIN SEAM
bright, joint at 50° to core axis.	0.24	364.23	0.21)	
coal fragmented into small pieces and possibly weathered, approx. 40% of fragments are bright.	0.60	364.83	0.53)	
SANDSTONE, grey, medium grained, becoming finer towards base, quartz-lithic, core broken in top 0.17'. Bedding angle 80° to core axis.	13.79	378.62	13.79	
				<u>Base of Hole</u>

BORE NUMBER C-34

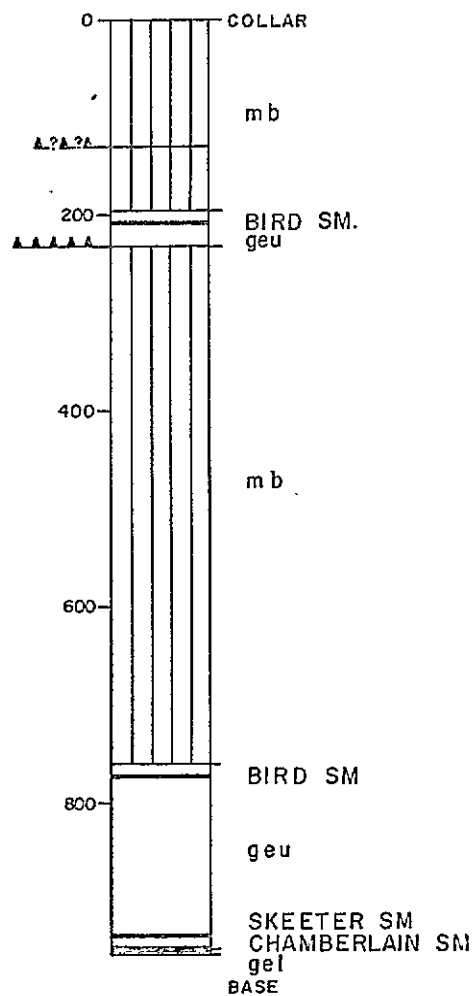
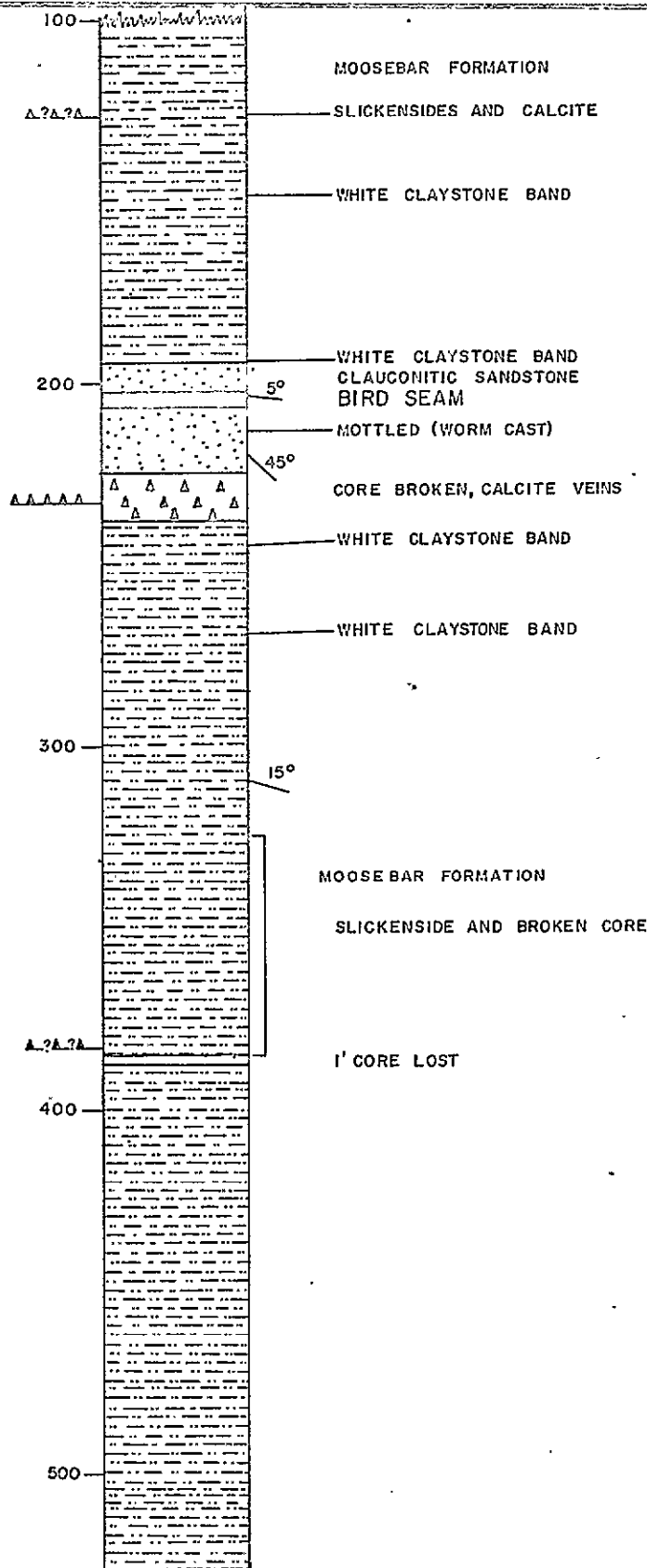
Grid Reference 49371.7 N 85754.0 E
Exploration Grid Reference C + 375'N / 4 + 1375'E

Date Commenced 17th Oct., 1971 Completed 25th Oct., 1971

Collar R.L. 4083.2 ft. Standard Datum
Total Depth 957.3 ft. Electrically Logged Yes/~~No~~
Drilled by Connors Drilling Ltd.
For Coalition Mining Limited
Logged by F.H.S. Tebbutt

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Skeeter	3149.2 ft.	4.71	61%	
Chamberlain	3131.64 ft.	7.04	52%	Adjacent to fault zone

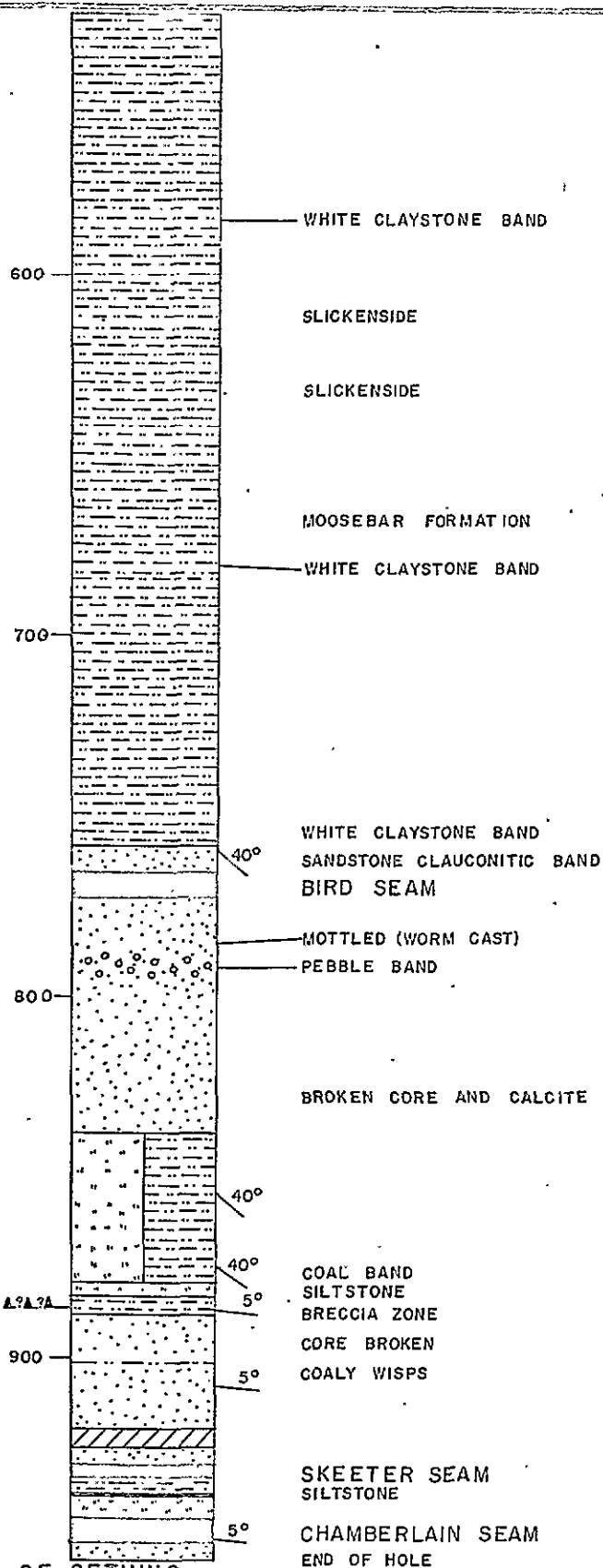


DETAIL OF GETHING
FORMATION
SCALE 1" to 50'

SCALE 1" to 200'

Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS
D.D.H. C-34



DETAIL OF GETTING
FORMATION
SCALE: 1" to 50'

SCALE: 1" to 200'

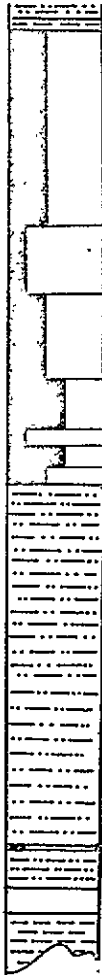
Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS
D.D.H. C-34

SKEETER SEAM

ASH %
CUMULATIVE
FROM FLOOR

	WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
929.26				5.0	
4.71		5.0	5		
933.97					



Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

SEAM SECTIONS
DDH C-34

DRAWN BY pm


DATE Jan '72

SCALE: 1" to 2'

PAGE 1 of 1

CHAMBERLAIN SEAM

ASH %
CUMULATIVE
FROM FLOOR

		WT %	ASH %	C. S. N ^o	INCL. BANDS	EXCL. BANDS
944.52					4.7	
		100.0	4.7	5		
951.56						

Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED
DRAWN BY S.A. DATE February '72

SEAM SECTIONS
DDH C-34

SCALE: 1" to 2'

PAGE 1 of 1

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

C A R G O SUPERINTENDENTS

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2330

CO. (A/SIA.) PTY. LTD.

Certification

This is to Certify

APPLICANT: COALITION MINING

REPORT ON: SUKUNKA SAMPLE NO. 200
CORE NO. C34
~~CHAMBERLAIN UPPER ? SEAM SKEETER SEAM~~

REPORT NO. K71-1986

RECEIVED: 10. 12. 1971

REPORTED: 30. 12. 1971



This Laboratory is Registered by the
National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

A. R. A. C. I.
A. R. A. C. I. Chief Chemist.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

INTRODUCTION: One (1) Coal Sample designated CORE NO. C34 CHAMBERLAIN SEAM was received on 10. 12. 1971 from Clifford McElroy & Associates.

METHOD: The Coal Sample No. 200 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 200 and the analysis are given in this report.

NOTE: The sample weight has not been adjusted to compensate for core loss.

RESULTS: TABLE 1 : gives the sizing, washability and analytical data for the sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 1WASHABILITY DATA FOR SAMPLE NO. 200 (after hand crushing to $\frac{3}{4}$ "

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
F1.30 SG	234	13.7	2.3	8½	13.7	2.3	8½
S1.30 - F1.35 SG	1106	64.8	3.6	5	78.5	3.4	5½
S1.35 - F1.40 SG	227	13.3	8.6	2½	91.8	4.1	5
S1.40 - F1.45 SG	91	5.3	12.3	1½	97.1	4.6	5
S1.45 - F1.50 SG	43	2.5	16.9	1½	99.6	4.9	5
S1.50 - F1.55 SG	3	0.2	19.6	1	99.8	4.9	5
S1.55 - F1.60 SG	NIL	NIL	-	-	99.8	4.9	5
S1.60 SG	3	0.2	43.4	0	100.0	5.0	5
-30 Mesh RC	99	5.5	4.8	8			

Total Weight of Sample = 1806 grams
 True Specific Gravity = 1.302
 Thickness = 4.71'

ANALYSIS OF F1.60 SG FRACTION OF SAMPLE NO. 200

Yield %	99.8
Air Dried Moisture %	1.0
Ash %	5.0
Volatile Matter %	19.9
Fixed Carbon %	74.1
Total Sulphur %	0.42
C.S.NO.	6
Calorific Value	14450 BTU/LB
Phosphorus %	0.023

SYDNEY
 30th December 1971

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

C A R G O
SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify

APPLICANT: COALITION MINING

**REPORT ON: SUKUNKA SAMPLE NO. 201
CORE NO. C34
CHAMBERLAIN SEAM**

REPORT NO. K71-1987

RECEIVED: 10. 12. 1971

REPORTED: 30. 12. 1971



This Laboratory is Registered by the
National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

[Signature]
A.R.A.C.I. Chief Chemist

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

[Signature]

INTRODUCTION: One (1) Coal Sample designated CORE NO. C34 CHAMBERLAIN SEAM was received on 10. 12. 1971 from Clifford McElroy & Associates.

METHOD: The Coal Sample No. 201 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 201 and the analysis are given in this report.

NOTE: The sample weight has not been adjusted to compensate for core loss.

RESULTS: TABLE 1 : gives the sizing, washability and analytical data for the sample after hand crushing to $\frac{3}{4}$ " top size.

<u>TABLE 1</u>		<u>WASHABILITY DATA FOR SAMPLE NO. 201 (after hand crushing to $\frac{3}{4}$")</u>						
		<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
<u>FRACTION</u>		<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
	F1.30 SG	713	32.4	1.6	9	32.4	1.6	9
	S1.30 - F1.35 SG	1003	45.6	3.5	3½	78.0	2.7	6
	S1.35 - F1.40 SG	245	11.1	7.1	2	89.1	3.3	5½
	S1.40 - F1.45 SG	97	4.4	11.3	1	93.5	3.6	5
	S1.45 - F1.50 SG	64	2.9	13.4	1	96.4	3.9	5
	S1.50 - F1.55 SG	43	2.0	19.7	1	98.4	4.3	5
	S1.55 - F1.60 SG	19	0.9	28.7	1	99.3	4.5	5
	S1.60 SG	14	0.7	44.6	1	100.0	4.8	5
	-30 Mesh RC	167	7.1	3.2	9			
		Total Weight of Sample = 2365 grams						
		True Specific Gravity = 1.324						
		Thickness = 7.04"						

ANALYSIS OF F1.60 SG FRACTION OF SAMPLE NO. 201

Yield %	99.3
Air Dried Moisture %	1.0
Ash %	4.4
Volatile Matter %	20.0
Fixed Carbon %	74.6
Total Sulphur %	0.29
C.S.NO.	5½
Calorific Value	14680 BTU/LB
Phosphorus %	0.019

SYDNEY
30th December 1971

STRATIGRAPHIC LOG
SUKUNKA D.D.H. C-34

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
	No core to 14.0 ft.		
	MUDSTONE, dark grey, slickensides and calcite veins from 124' to 132', white clay bands at 148', 194', 195'.	MOOSEBAR FM.	196.0
	SANDSTONE, glauconitic, grading to non glauconitic.	GETHING FM.	203.5
	<u>COAL</u> , (sandstone split of 1').	BIRD SEAM	207.5
Dip 5° Dip 45° near base	SANDSTONE, grey, medium grained, quartz-lithic, mottled (worm casts), 213'. Core broken and calcite veins and fillings occur 225' to 233'.		233.0
Fault, established Dip 15° at 313'	MUDSTONE, dark grey, core broken from top to 238' and occasionally (with slickensides) to 270'. White clay bands at 245', 270', core broken (with slickensides from 323' to 387' (where 1' core lost). White clay bands at 586', 681', 757', 758' and 760'. Some slickensides at 611', 628' to 635' but not much fracturing.	MOOSEBAR FM.	760.0
Dip 40°	SANDSTONE, glauconitic, grading to non glauconitic.	GETHING FM.	767.0
	<u>COAL</u> , (2' mudstone split), 2.6' core broken.	BIRD SEAM	773.0

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
Dip 40°	SANDSTONE, grey, medium grained becoming finer, quartz-lithic, mottled (worm casts) at 777', pebble band 792'. Core broken (not visibly displaced) with calcite veining.		839.0
	SILTSTONE AND MUDSTONE INTERBEDS, bedding planes slickensided, more muddy to base, coal bands at base.		880.0
Dip 40° at top, 0-5° at base.	SILTSTONE, grey.		883.0
	MUDSTONE, dark grey, carbonaceous at base; 0.2' breccia zone at 887'. Bedding angle changes.		888.0
Dip 0-5°	SANDSTONE, coaly wisps, core broken (1') at 897', mudstone band (1') at 901', carbonaceous claystone bands at 922' and 924'.		930.0
	<u>COAL.</u>)		934.0
	MUDSTONE, dark grey.)	SKEETER SM.	938.0
	<u>COAL.</u>)		939.0
	SILTSTONE, grey, mudstone to base.		945.0
	<u>COAL.</u>)	CHAMB. SM.	952.0
Dip 0-5°	SANDSTONE, grey, medium grained, quartz-lithic.		957.0
			<u>Base of Hole</u>

SUKUNKA D.D.H. C-34

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
Core not logged in detail - refer to Stratigraphic Log for particulars.		870.39		
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey, interbedded. Bedding angle 50° to core axis.	2.57	872.96	2.57	
MUDSTONE, dark grey, bedding angle at base 65° to core axis. Some slickensides at base.	3.77	876.73	3.77	
SILTSTONE, grey, some slickensided fractures, brecciated zone (0.18') with calcite infillings. Bedding angle below breccia 75° to core axis.	1.90	878.63	1.89	
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey, interbedded.	1.80	880.43	1.78	
<u>COAL</u> , mainly dull with minor bright bands.	0.04	880.47	0.04	
SANDSTONE, grey, fine grained, quartz-lithic, carbonaceous phases and coaly wisps, some thin calcite veins, pennyband coal 0.2' from top.	0.44	880.91	0.44	

SUKUNKA D.D.H. C-34

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
CLAYSTONE, carbonaceous, pennyband coal near top.	0.40	881.31	0.40	
SANDSTONE, grey, medium grained, quartz-lithic, mudstone blebs in bottom 0.15'.	0.34	881.65	0.34	
SILTSTONE, grey, very fine sandstone interbeds.	2.39	884.04	2.37	
MUDSTONE, dark grey.	1 3.44	887.48	3.41	
CLAYSTONE, carbonaceous.	0.83	888.31	0.82	
SANDSTONE, grey, fine grained, quartz-lithic, coaly wisps at top.	0.76	889.07	0.75	
SANDSTONE, as above, bedding angle 88° near top, 80° above 1.4' zone of broken core which starts 7.1' from top. Bedding angle at base 89° to core axis. Current bedding, coaly wisps.	11.83	900.90	11.71	
CLAYSTONE, carbonaceous.	0.78	901.68	0.77	
SANDSTONE, grey, fine grained, quartz-lithic, coaly wisps.	6.57	908.25	6.50	

SUKUNKA D.D.H. C-34

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, fine grained, quartz-lithic, some siltstone interbeds, worm casts 4.8' from top to 8.3' from top, a few fine calcite veins and coaly wisps.	13.78	922.03	13.64	
CLAYSTONE, carbonaceous.	0.65	922.68	0.64	
SANDSTONE, grey, fine grained, quartz-lithic, coaly wisps and carbonaceous claystone interbeds.	1.03	923.71	1.02	
CLAYSTONE, carbonaceous, coaly wisps and pennybands.	0.69	924.40	0.68	
SILTSTONE, grey, sandstone phases.	4.08	928.48	4.04	
MUDSTONE, dark grey.	0.67	929.15	0.66	
CLAYSTONE, carbonaceous.	0.11	929.26	0.11	
COAL, mainly dull with minor bright bands, curved joints at 10° to core axis.	2.07	931.33	1.42	} SKEETER SEAM

SUKUNKA D.D.H. C-34

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull, curved joints at 10° to core axis.	0.65	931.98	0.45	SKEETER SEAM
mainly dull with minor bright bands.	0.84	932.82	0.57	
dull and bright.	0.53	933.35	0.37	
dull, joint plane at 20° to core axis.	0.16	933.51	0.11	
dull and bright.	0.26	933.77	0.18	
mainly dull with minor bright bands.	0.20	933.97	0.14	
MUDSTONE, dark grey.	3.69	937.66	3.69	
<u>COAL</u> , mainly dull with minor bright bands.	0.04	937.70	0.03	
MUDSTONE, dark grey, becoming carbonaceous.	0.39	938.09	0.39	
<u>COAL</u> , sheared 35° to core axis, coal type indeterminate.	0.26	938.35	0.20	
CLAYSTONE, carbonaceous, a few calcite veins at base.	0.35	938.70	0.35	

SUKUNKA D.D.H. C-34

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE, grey, mudstone dark grey, interbeds increasing towards base. Bedding angle 90° to core axis.	4.64	943.34	4.64	
MUDSTONE, dark grey, 0.1' calcite vein at base with mudstone flakes within it.	1.02	944.36	1.02	
MUDSTONE, dark grey, coaly wisps.	0.16	944.52	0.16	
<u>COAL</u> , mainly dull with minor bright bands, core broken, joint plane near top at 40° to core axis.	0.83	945.35	0.64)
mostly dull with minor bright bands, core badly broken and mixed, some larger fragments show joints at 40° to core axis.	1.30	946.65	1.00)
dull, vertical cleat very poorly developed.	0.62	947.27	0.48	) CHAMBERLAIN SEAM
mainly dull with minor bright bands, core broken.	0.61	947.88	0.47)
dull, joint planes at 55° to core axis.	0.18	948.06	0.14)
mainly dull with minor bright bands, joint planes at 55° to core axis.	0.30	948.36	0.23)

SUKUNKA D.D.H. C-34

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull and bright, joints at 55° to core axis.	0.36	948.92	0.43)
dull, joints at 40° to core axis.	0.53	949.45	0.41)
dull and bright, joints at 55° to core axis.	0.13	949.58	0.10)
dull.	0.14	949.72	0.11	) CHAMBERLAIN SEAM
dull and bright.	0.16	949.88	0.12)
mainly dull with minor bright bands, core sheared at 70° to core axis, core badly broken.	1.68	951.56	1.28)
SANDSTONE, grey, fine grained, quartz-lithic. Bedding angle 81° to core axis.	5.77	957.33	5.77	) <u>Base of Hole</u>

STRATIGRAPHIC LOG
SUKUNKA D.D.H. C-35

645

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
<p>All strata dips at 0-5°</p>	<p>No core to 12.0 ft.</p>		
	<p>SILTSTONE, grey, mudstone interbeds and blebs, some sandy interbeds.</p>	<p>SUKUNKA MB.</p>	<p>319.0</p>
	<p>MUDSTONE, dark grey, core broken slickensided from 599-603' with fault gouge near base. Broken and slickensided from 618-622' and spasmodically down to 648'. White clay bands at 705', 750' and 751'.</p>	<p>MOOSEBAR FM.</p>	<p>751.0</p>
	<p>SANDSTONE, glauconitic.</p>	<p>GETHING FM.</p>	<p>752.0</p>
	<p><u>COAL.</u></p>		<p>757.5</p>
	<p>MUDSTONE, dark grey, silty interbeds, pyritic worm casts.</p>		<p>760.0</p>
	<p><u>COAL.</u></p>		<p>760.3</p>
	<p>SANDSTONE, fine grained, mottled (worm casts) 765', heavy calcite veins and broken core 778'-781'. Worm casts at 782', coaly wisps 810' - base with some silty interbeds.</p>		<p>821.0</p>
<p>SILTSTONE AND MUDSTONE INTERBEDS, some worm casts and sandy interbeds.</p>		<p>832.0</p>	

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
	SANDSTONE, fine grained.		836.0
	CLAYSTONE, carbonaceous, coaly bands.		837.0
	SILTSTONE, grey.		841.0
	SANDSTONE, medium grained, coaly wisps.		845.0
	SILTSTONE, grey, sandy interbeds, carbonaceous claystone (1') at base.		850.0
	SANDSTONE, coaly wisps, carbonaceous claystone concentration (1') at 864', and (1') 869' and (1') with shell fossils at 870'.		872.0
	<u>COAL.</u>)		872.5
)		
	CLAYSTONE, carbonaceous.)		877.5
)		
	<u>COAL.</u>)		878.0
)		
	SILTSTONE, sandy interbeds.)	SKEETER SM.	884.0
)		
	<u>COAL</u> , one carbonaceous claystone)		
	split (.5') from base.)		890.0
	SILTSTONE, grey, sandy interbeds.		898.0
	LAMINITE, siltstone and mudstone, small slickensided and brecciated zones at 899', 900', and 902'. Carbonaceous claystone at base (1').		908.0
	<u>COAL.</u>	CHAMB. SM.	917.0

Structure	Description of Strata	Formation or Member	Depth ± Base of Stratum (ft)
Fault, possible	SANDSTONE, medium-fine grained.		959.0
	SILTSTONE AND MUDSTONE INTERBEDS, sandy phases. Beds overturned at 966' with brecciation and calcite infilling above and below (1' either way), granules at base.		987.0
Dip 0-5°	SANDSTONE, fine grained, silty bands at 1020', 1027', and other interbeds. Mud blebs at 1034', 1035', 1036', 1038', 1039', 1040', 1053', and at base.		1055.0
	SILTSTONE AND MUDSTONE INTERBEDS, sandy phases and interbeds.		1104.0
	MUDSTONE, dark grey.		1114.0
	SILTSTONE, grey, sandy interbeds, glauconitic band at top.		1155.0
	MUDSTONE, dark grey.		1185.0
	SANDSTONE, glauconitic in top 2', grey, fine grained, silty phases.		1197.0
	SILTSTONE AND MUDSTONE INTERBEDS, sandy phases and interbeds.		1258.0
Dip 5-15°	MUDSTONE, dark grey, some silty phases at centre.		1294.0
	SANDSTONE, fine grained - coaly wisps.		1312.0

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
Dip 45° Fault, possible	SILTSTONE AND MUDSTONE INTERBEDS, sandy interbeds and phases. Slickensides, some brecciation, and calcite infilling from 1318'-1323'.		1335.0
	MUDSTONE, dark grey, pebble band at base.		1350.0
	<u>COAL</u> , some bands.		1360.0
Dip 0-5°	CLAYSTONE, carbonaceous, coaly bands.		1365.0
	SILTSTONE, grey, some sandy interbeds, coaly bands at 1382', 1383', 1384', 1385'.		1394.0
	MUDSTONE, dark grey, coaly bands at 1398', some slickensided surfaces.		1404.0
	SILTSTONE, grey.		1408.0
			<u>Base of Hole</u>

SUKUNKA D.D.H. C-35

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
Core not logged in detail - refer to Stratigraphic Log for particulars.		849.57		
CLAYSTONE, black, carbonaceous.	1.00	850.57	1.00	
SANDSTONE, grey, fine to medium grained, quartz-lithic, coaly wisps and fine carbonaceous zones, core split roughly and parallel to core axis from 1.35' to 3.4' from top. Bedding angle 85° to core axis, current bedding, zone of concentrated carbonaceous claystone interbeds (1.01') 3.46' from base.	17.82	868.39	17.59	
SANDSTONE, grey, fine grained, quartz-lithic, numerous carbonaceous claystone interbeds, concentrating to claystone carbonaceous zones with sandstone interbeds from 0.95' to 1.95' from top, and from 2.55' to base with shelly fossils in this lower zone, a 0.04' pyrite band at base.	4.13	872.52	4.07	
<u>COAL</u> , bright.	0.07	872.59	0.07	
mainly dull with minor bright bands.	0.39	812.98	0.38	

SUKUNKA D.D.H. C-35

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
CLAYSTONE, dark brownish grey, some sandstone interbeds near centre, carbonaceous at top and bottom, coaly pennybands in bottom 0.6'. Bedding angle 85° to core axis.	4.64	877.62	4.57	
<u>COAL</u> , highly sheared and broken into small pieces with listric surfaces.	0.32	877.94	0.32	
SILTSTONE, grey, carbonaceous in top 0.1', becoming more sandier towards base.	5.29	883.23	5.21	
MUDSTONE, grey.	0.45	883.68	0.44	
<u>COAL</u> , the seam has joint planes at 80° to core axis throughout, vertical cleat not well developed, coal types as follows.				
<u>COAL</u> , dull.	0.63	884.31	0.48)
mainly dull with minor bright bands.	0.63	884.94	0.48	) SKETER SEAM
dull.	1.50	886.44	1.14)
dull and bright.	0.18	886.62	0.14)

SUKUNKA D.D.H. C-35

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull.	0.25	886.87	0.19)	
mainly dull with minor bright bands.	0.22	887.09	0.17)	
dull.	0.79	887.88	0.60)	
mainly dull with minor bright bands.	0.22	888.10	0.17)	
CLAYSTONE, black, carbonaceous.	0.19	888.29	0.19)	SKEETER SEAM
<u>COAL</u> , mainly dull with minor bright bands.	0.18	888.47	0.14)	
dull and bright.	0.39	888.86	0.30)	
CLAYSTONE, carbonaceous, slickensided surfaces at 45° to core axis near base.	0.70	889.56	0.70)	
<u>COAL</u> , mainly dull with minor bright bands, core broken.	0.72	890.28	0.55)	
CLAYSTONE, carbonaceous.	0.38	890.66	0.36)	
SILTSTONE, grey, sandstone interbeds and phases, coaly wisps, 0.05' band mudstone blebs 0.32' from base. Bedding angle 86° to core axis.	3.61	894.27	3.40)	

SUKUNKA D.D.H. C-35

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE, grey, dark grey mudstone interbeds.	4.16	898.43	3.96	
LAMINITE, siltstone grey and mudstone dark grey, interbedded. Bedding angle 85° but there are zones of disturbance with slickensided surfaces, one zone (0.38') 0.73' from top brecciated slightly and slickensides at 50° to core axis, another zone (0.35') 1.65' from top with slickensided surfaces at 65° to core axis, another zone of brecciation (0.30') 3.70' from top.	7.96	906.39	7.96	
LAMINITE, siltstone grey and mudstone dark grey, interbedded.	0.39	906.78	0.39	
MUDSTONE, dark grey.	0.46	907.24	0.46	
CLAYSTONE, brown, carbonaceous.	0.69	907.93	0.69	
<u>COAL</u> , dull.	0.18	908.11	0.18)
)
dull and bright, joint plane at 50° to core axis at top.	0.90	909.01	0.90)
)
mainly dull with minor bright bands, joint plane at 70° to core axis.	0.22	909.23	0.22)
)

CHAMBERLAIN SEAM

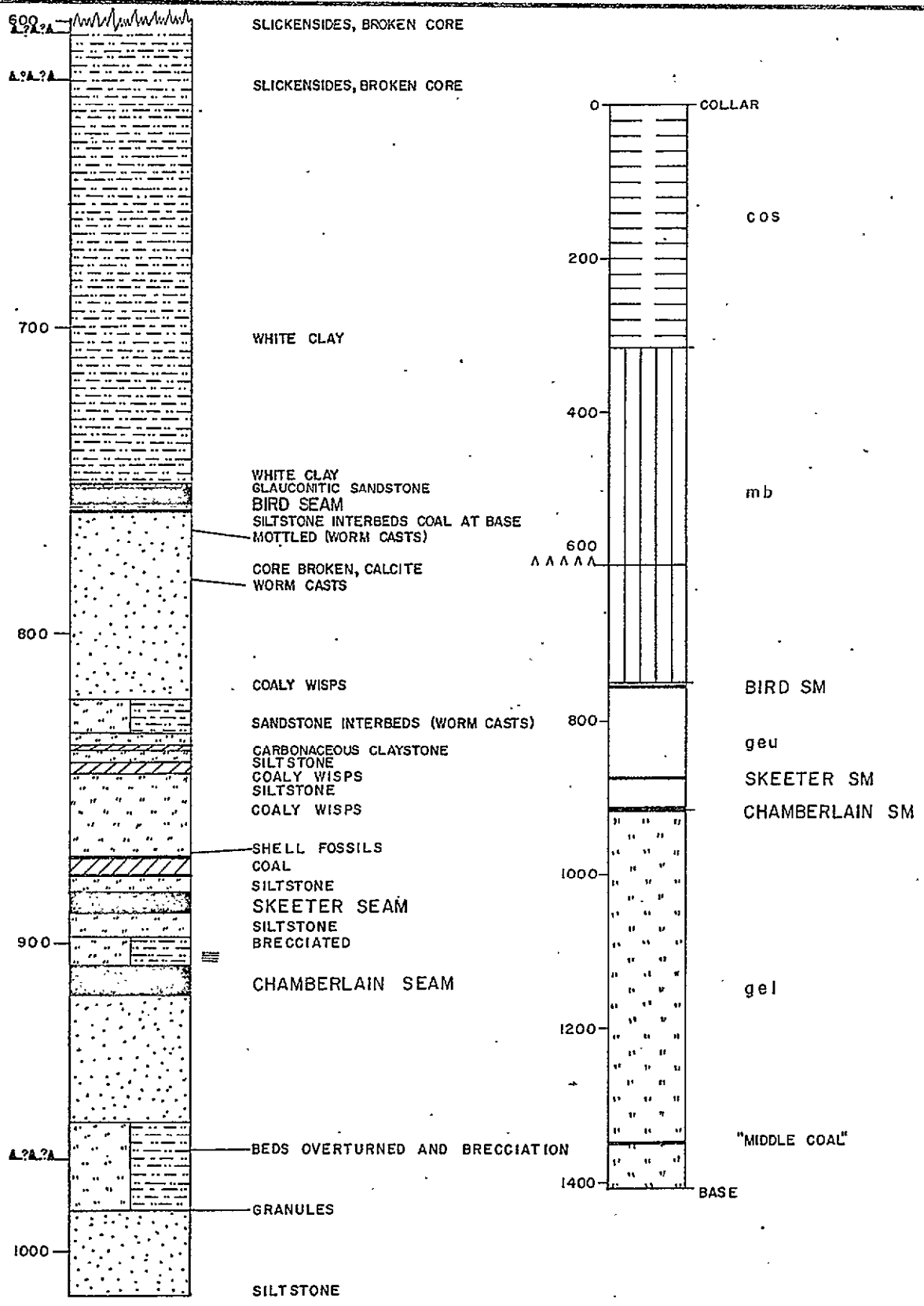
SUKUNKA D.D.H. C-35

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull, joints at 70° to core axis.	0.22	909.45	0.22)	
dull and bright, joint at 75° to core axis 0.85' from top, and at 72°, 1.12' from top.	1.22	910.67	1.22)	
mainly dull with minor bright bands, joints at 70° to core axis.	0.70	911.37	0.70)	
dull and bright.	0.25	911.62	0.25)	
dull.	0.20	911.82	0.20)	CHAMBERLAIN SEAM
mainly dull with minor bright bands.	0.08	911.90	0.08)	
dull and bright.	0.20	912.10	0.20)	
mainly dull with minor bright bands.	0.23	912.33	0.23)	
dull.	0.33	912.66	0.33)	
bright.	0.08	912.74	0.08)	
dull, joint at 75° to core axis.	0.28	913.02	0.28)	

SUKUNKA D.D.H. C-35

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull and bright.	0.37	913.39	0.37)
dull.	0.29	913.68	0.29)
bright.	0.11	913.79	0.11)
dull and bright.	0.22	914.01	0.24)
dull.	0.61	914.62	0.61)
bright.	0.07	914.69	0.07)
CLAYSTONE, carbonaceous.	0.06	914.75	0.06)
<u>COAL</u> , mainly bright with minor dull bands.	0.12	914.87	0.12)
mainly dull with minor bright bands.	0.32	915.19	0.32)
dull.	0.32	915.51	0.32)
coal types indeterminable due to shearing at 60° to core axis.	0.50	916.01	0.50)
)
)

CHAMBERLAI SEAM

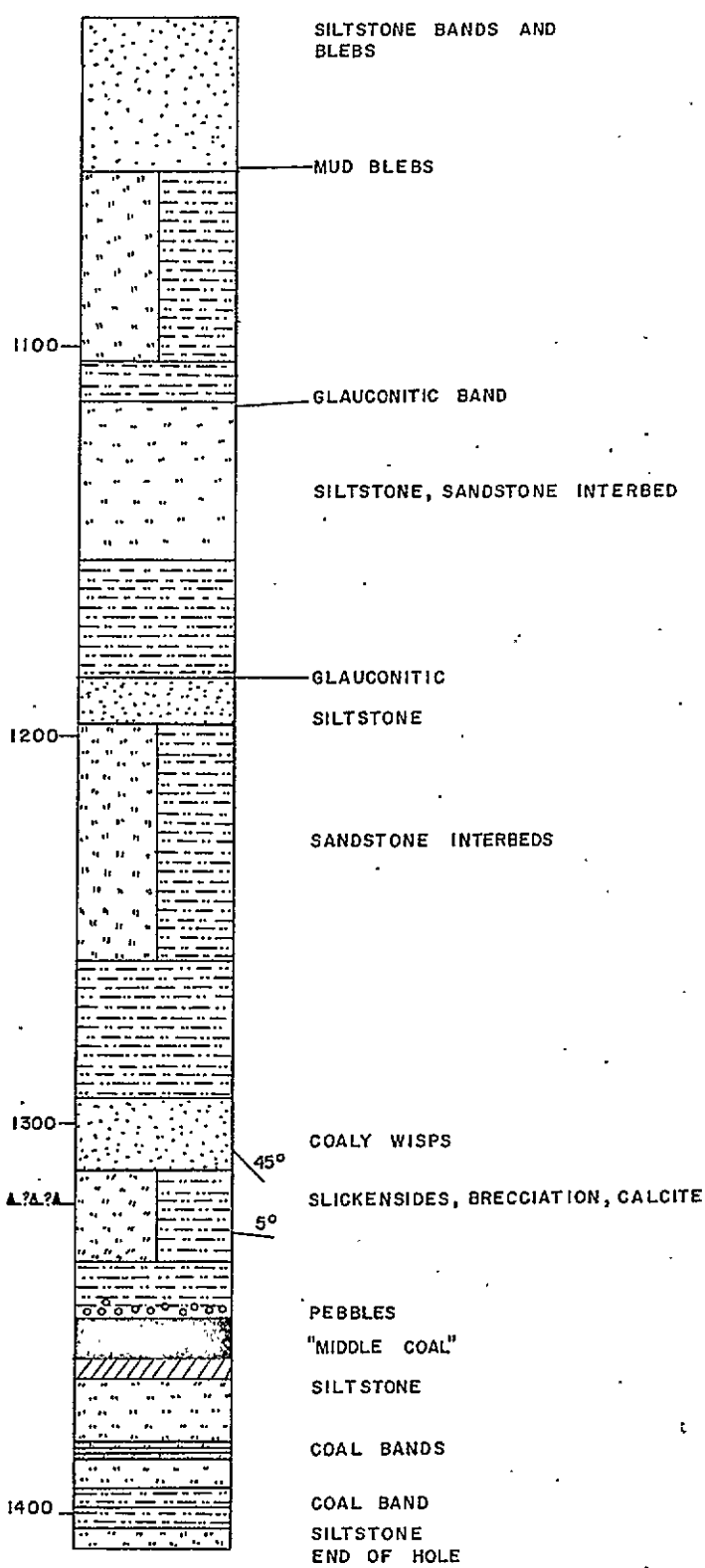


DETAIL OF GETHING FORMATION
SCALE 1" to 50'

SCALE : 1" to 200'

Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS
D.D.H.C-35



DETAIL OF GETHING
 FORMATION
 SCALE: 1" to 50'

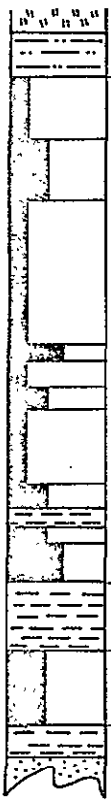
SCALE: 1" to 200'

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STRATIGRAPHIC LOGS
 DDH. C-35

SKEETER SEAM

ASH %
CUMULATIVE
FROM FLOOR


		WT%	ASH%	C. S. N°	INCL. BANDS	EXCL. BANDS
883.68						
		5.18	-	11.5	5	
		0.70	-	80.7	0	
890.28		0.72	-	38.6	3½	

Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
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SEAM SECTIONS
DDH C-35

SCALE: 1" to 2'

PAGE 1 of 1

CHAMBERLAIN SEAM				ASH % CUMULATIVE FROM FLOOR		
				WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
907.93					5.7	
		8.70	-	5.7	6½	
916.63						

Prepared by:
 CLIFFORD McELROY & ASSOCIATES PTY. LTD.
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SEAM SECTIONS
 DDH C-35

DRAWN BY pm

DATE Jan '72

SCALE: 1" to 2'

PAGE 1 of 1

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

C A R G O
SUPERINTENDENTS
CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify

APPLICANT: COALITION MINING

**REPORT ON: SUKUNKA SAMPLES NO. 202-204, 205, 206
CORE NO. C35
SKEETER SEAM**

REPORT NO. K71-1988

RECEIVED: 10. 12. 1971

REPORTED: 30. 12. 1971



This Laboratory is Registered by the
National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

M. Bradley
A.R.A.C.I. Chief Chemist.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

L. W. Campbell

INTRODUCTION:

Two (2) Coal Samples and One (1) Non-Coal Sample designated CORE NO. C35 SKEETER SEAM were received on 10. 12. 1971 from Clifford McElroy & Associates.

METHODS:

1. The non coal sample No. 205 was weighed, prepared and analysed for Ash and True Specific Gravity.
2. The visibly inferior coal sample No. 206 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.60 specific gravity.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

3. The good quality coal sample no. 202-204 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 202-204 and the analysis are given in this report.

NOTE:

Sample weights have not been adjusted to compensate for core loss.

RESULTS:

TABLES 1-2 : give the sizing, washability and analytical data for each coal sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 1

WASHABILITY DATA FOR SAMPLE 202/203/204 (after hand crushing to $\frac{3}{4}$ ")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
F1.30 SG	722	33.3	2.4	8	33.3	2.4	8
S1.30 - F1.35 SG	861	39.8	5.2	4	73.1	3.9	6
S1.35 - F1.40 SG	194	9.0	10.7	5	82.1	4.7	6
S1.40 - F1.45 SG	108	5.0	15.7	2	87.1	5.3	5½
S1.45 - F1.50 SG	90	4.2	19.6	1	91.3	6.0	5½
S1.50 - F1.55 SG	16	0.7	21.5	1	92.0	6.1	5½
S1.55 - F1.60 SG	7	0.3	29.2	1	92.3	6.2	5½
S1.60 SG	167	7.7	76.9	0	100.0	11.6	5
-30 Mesh RC	115	5.0	8.9	8½			

Total Weight of Sample = 2280 grams
True Specific Gravity = 1.370
Thickness = 5.18'

SAMPLE NO. 205

Total Weight of Sample = 663 grams
Ash % = 80.7
True Specific Gravity = 2.322
Thickness = 0.70'

TABLE 2

WASHABILITY DATA FOR SAMPLE NO. 206 (after hand crushing to 3/4")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
F1.60 SG	112	53.1	10.9	6½	53.1	10.9	6½
S1.60 SG	99	46.9	71.8	0	100.0	39.5	3½
-30 Mesh RC	8	3.7	14.0	8			
Total Weight of Sample = 219 grams							
True Specific Gravity = 1.619							
Thickness = 0.72'							

ANALYSIS OF F1.60 SG FRACTION OF SAMPLE NO. 202-204

Yield %	92.3
Air Dried Moisture %	1.0
Ash %	6.1
Volatile Matter %	21.8
Fixed Carbon %	71.1
Total Sulphur %	0.44
C.S.NO.	6
Calorific Value	14290 BTU/LB
Phosphorus %	0.024

SYDNEY
30th December 1971

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

C A R G O
SUPERINTENDENTS
CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify

APPLICANT: COALITION MINING

**REPORT ON: SUKUNKA SAMPLE NO. 207
CORE NO. C35
CHAMBERLAIN SEAM**

REPORT NO. K71-1989

RECEIVED: 10. 12. 1971

REPORTED: 30. 12. 1971



This Laboratory is Registered by the
National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

M. Bradley
A.R.A.C.I. Chief Chemist.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

E. D. ...

INTRODUCTION:

One (1) Coal Sample designated CORE NO. C35 CHAMBERLAIN SEAM was received on 10. 12. 1971 from Clifford McElroy & Associates.

METHOD:

The Coal Sample No. 207 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 207 and the analysis are given in this report.

NOTE:

No core loss was experienced on drilling this hole.

RESULTS:

TABLE 1 : gives the sizing, washability and analytical data for the sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 1WASHABILITY DATA FOR SAMPLE NO. 207 (after hand crushing to $\frac{3}{4}$ ")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
F1.30 SG	2302	50.6	2.2	8½	50.6	2.2	8½
S1.30 - F1.35 SG	1478	32.5	4.4	5½	83.1	3.1	7½
S1.35 - F1.40 SG	330	7.3	10.8	1	90.4	3.7	7
S1.40 - F1.45 SG	117	2.6	14.1	1	93.0	4.0	7
S1.45 - F1.50 SG	62	1.4	17.4	1	94.4	4.2	6½
S1.50 - F1.55 SG	74	1.6	20.1	1	96.0	4.4	6½
S1.55 - F1.60 SG	50	1.1	21.1	1	97.1	4.6	6½
S1.60 SG	134	2.9	39.2	1	100.0	5.6	6½
-30 Mesh RC	380	7.7	7.0	8			

Total Weight of Sample = 4927 grams

True Specific Gravity = 1.325

Thickness = 8.70'

ANALYSIS OF F1.60 SG FRACTION OF SAMPLE NO. 207

Yield %	97.1
Air Dried Moisture %	1.0
Ash %	4.6
Volatile Matter %	23.4
Fixed Carbon %	71.0
Total Sulphur %	0.39
C.S.NO.	7
Calorific Value	14440 BTU/LB
Phosphorus %	0.019

SYDNEY

30th December 1971

BORE NUMBER C-35

Grid Reference 41805.5 N 83047.1 E
Exploration Grid Reference F + 1750'N / 1 + 850'E

Date Commenced 20th Oct., 1971 Completed 28th Oct., 1971

Collar R.L. 4565.3 ft. Standard Datum
Total Depth 958.2 ft. Electrically Logged Yes//~~No~~

Drilled by Connors Drilling Ltd.
For Coalition Mining Limited

Logged by F.H.S. Tebbutt

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Skeeter	3675.0 ft.	6.60	52%	Lower 0.72 ft. sheared.
Chamberlain	3648.7 ft.	8.70	88%	

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BORE NUMBER C-36

Grid Reference 44139.0 N 85738.1 E
Exploration Grid Reference E + 150'N / 3 + 350'E

Date Commenced 22nd Oct., 1971 Completed 30th Oct., 1971

Collar R.L. 4979.4 ft. Standard Datum
Total Depth 1352.7 ft. Electrically Logged Yes/No
Drilled by Canadian Longyear Ltd.
For Coalition Mining Limited
Logged by G. Jordan

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment.
Skeeter	3702.2 ft.	3.35	48%	
Chamberlain	3672.4 ft.	8.20	64%	

SUKUNKA D.D.H. C-36

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
COAL, dull and bright - coal sheared, fragments 0.01' wide, with listric surfaces, shear planes 80° to core axis.	0.39	1306.86	0.35	) ) ) ) ) CHAMBERLAIN SEAM
bright.	0.06	1306.92	0.05	
dull and bright.	0.06	1306.98	0.05	
SANDSTONE, medium grained, carbonaceous, quartz lithic, black.	0.19	1307.17	0.19	
SANDSTONE, medium to coarse grained, grey, quartz lithic, carbonaceous, massive, mudstone phases at base. Bedding angle 87° to core axis. Calcite filled joints 75° to core axis and spaced 5' along core.	13.58	1320.75	13.58	
SANDSTONE, fine to medium grained, light grey, quartz lithic massive, bedding as above.	30.26	1351.01	30.26	
CLAYSTONE, sandstone interbeds.	0.87	1351.88	0.87	
SANDSTONE, as above.	0.79	1352.67	0.79	
				<u>Base of Hole</u>

BORE NUMBER C-37

Grid Reference 40994.3 N 86818.1 E
Exploration Grid Reference G + 225'N / 2 + 1425'E

Date Commenced 24th Oct., 1971 Completed 30th Oct., 1971

Collar R.L. 4747.8 ft. Standard Datum
Total Depth 1235.3 ft. Electrically Logged Yes/No

Drilled by Canadian Longyear Ltd.
For Coalition Mining Limited

Logged by G. Jordan

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Skeeter	3574.7 ft.	10.67	43%	3' of coal analysed
Chamberlain	3545.3 ft.	7.01	90%	7' of coal analysed

SUKUNKA D.D.H. C-37

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , mainly dull with minor bright bands.	0.57	1165.42	0.47)
core lost; probably <u>coal</u>	2.15	1167.57	0.00)
CLAYSTONE, carbonaceous, black, calcite filling irregular fractures, calcite filled joint plane 70° to core axis.	1.19	1168.76	1.19)
SILTSTONE, grey, with dark grey claystone interbeds.	2.62	1171.38	2.62)
<u>COAL</u> , mainly dull with minor bright bands, core broken.	1.71	1173.09	0.57)
SILTSTONE, some mudstone phases. Bedding indistinct and irregular.	4.32	1177.41	4.32)
SILTSTONE AND MUDSTONE INTERBEDDED, grey siltstone and dark grey mudstone, sandstone phases near top.	6.01	1183.42	6.13)
LAMINITE, dark grey claystone and grey siltstone. Bedding angle 88° to core axis.	11.68	1195.10	11.68)
STONE, coaly specific gravity > 1.6.	0.39	1195.49	0.39)

SKEETER SEAM

SUKUNKA D.D.H. C-40

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , mainly dull with minor bright bands.	0.65	825.33	0.20)	SKEETER SEAM
mainly bright with minor dull bands.	0.72	826.05	0.23)	
SILTSTONE, grey, some sandy phases and claystone interbeds.	0.95	827.00	0.95	
LAMINITE, grey claystone and light grey siltstone, sandstone phases. Bedding angle 88° to core axis.	7.53	834.53	7.40	
SANDSTONE, medium grained, quartz lithic, some siltstone interbeds. Bedding angle 88° to core axis.	2.53	837.06	2.53	
LAMINITE, grey claystone and light grey siltstone, sandstone phases. Bedding angle 88° to core axis.	8.94	846.00	8.58	
CLAYSTONE, dark grey, carbonaceous phases.	3.40	849.40	3.40	
STONE, coaly.	0.43	849.83	0.43	
<u>COAL</u> , dull and bright.	0.27	850.10	0.27)	CHAMBERLAIN SEAM upper split
mainly dull with minor bright bands.	0.25	850.35	0.25)	

SUKUNKA D.D.H. C-40

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull.	0.47	850.82	0.47)
)
dull and bright.	0.13	850.95	0.13)
)
dull.	0.24	851.19	0.24)
)
mainly dull with minor bright bands.	0.18	851.37	0.18)
)
CLAYSTONE, carbonaceous, bright coal bands.	0.35	851.72	0.35)
)
<u>COAL</u> , mainly dull with minor bright bands.	0.32	852.04	0.32)
)
CLAYSTONE, carbonaceous - bright coal bands.	0.11	852.15	0.11)
)
<u>COAL</u> , mainly dull with minor bright bands.	0.20	852.35	0.20)
)
dull.	0.32	852.67	0.32)
)
dull and bright.	0.12	852.79	0.12)
)
mainly dull with minor bright bands.	0.55	853.34	0.55)
)
bright.	0.08	853.42	0.08)

CHAMBERLAIN
SEAM
upper split

SUKUNKA D.D.H. C-40

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull.	0.05	853.47	0.05)
)
CLAYSTONE, carbonaceous, bright coal bands.	0.24	853.71	0.24)
)
<u>COAL</u> , mainly dull with minor bright bands.	0.32	854.03	0.15)
)
dull.	0.37	854.40	0.17)
)
SILTSTONE, sandstone phases, siltstone grey with darker grey claystone interbeds. Bedding angle 87° to core axis.	5.39	859.79	5.14)
)
SILTSTONE AND MUDSTONE INTERBEDDED, grey siltstone and darker grey claystone.	4.61	864.40	4.61)
)
CLAYSTONE, dark grey.	0.12	864.52	0.12)
)
<u>COAL</u> , core lost in drilling.	2.87	867.39	0.00)
)
dull banded, mainly dull with minor bright bands.	0.13	867.52	0.13)
)
dull and bright.	0.13	867.65	0.13)
)
dull banded, mainly dull with minor bright bands.	0.25	867.90	0.25)
)

CHAMBERLAIN
SEAM

upper split

Core loss.
verified as
coal from
Gamma Ray-
Neutron Log.CHAMBERLAIN
SEAM
lower split

SUKUNKA D.D.H. C-40

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
COAL, dull.	0.21	868.11	0.21)
mainly dull with minor bright bands, subvertical cleat.	0.15	868.26	0.15)
dull.	0.24	868.50	0.24)
mainly dull with minor bright bands.	0.29	868.79	0.29)
dull and bright.	0.11	868.90	0.11)
dull.	0.62	869.52	0.62	) CHAMBERLAIN SEAM
dull and bright.	0.22	869.74	0.22	) lower split
dull.	0.11	869.85	0.11)
mainly dull with minor bright bands.	0.28	870.13	0.28)
dull and bright.	0.10	870.23	0.10)
dull.	0.29	870.52	0.29)

SUKUNKA D.D.H. C-40

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull and bright, core broken.	0.20	870.72	0.20)
dull.	0.22	870.94	0.22)
mainly bright with minor dull bands.	0.11	871.05	0.11)
bright.	0.05	871.10	0.05)
mainly dull with minor bright bands.	0.11	871.21	0.11)
dull and bright.	0.15	871.36	0.15)
bright.	0.05	871.41	0.05)
dull.	0.02	871.43	0.02)
bright.	0.16	871.59	0.16)
dull.	0.19	871.78	0.19)
mainly dull with minor bright bands.	0.10	871.88	0.10)
bright.	0.10	871.98	0.10)

CHAMBERLAIN
SEAM
lower split

SUKUNKA D.D.H. CS-6

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE, carbonaceous, grading to claystone carbonaceous and coal stony at top.	1.12	277.76	1.12)	SKEETER SEAM
<u>COAL</u> , very broken, mainly dull with minor bright bands.	0.69	278.45	0.30)	
CLAYSTONE; carbonaceous.	1.02	279.47	1.02	
SILTSTONE, grey, a few sandy interbeds. Bedding angle 90° to core axis.	2.75	282.22	2.75	
SANDSTONE, grey, fine grained, silty interbeds. Bedding angle 60° to core axis, 6.8' from top. Brecciate zone (0.42') 7.1' from top. Bedding angle 75° to core axis, beneath breccia zone.	9.21	291.43	9.21	
SILTSTONE, grey, sandy interbeds in top 2.8', mudstone interbeds below this. Bedding angle varies from 50° near top to 82° to core axis. at base.	6.65	298.08	6.65	
MUDSTONE, dark grey, some silty interbeds near top, slump structure 1.7' from top, core broken in part.	13.99	302.07	4.74	
SHALE, carbonaceous, soft and easily split.	0.76	302.83	0.24	

SUKUNKA D.D.H. CS-6

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
CLAYSTONE, carbonaceous in part.	0.12	302.95	0.09)
<u>COAL</u> , mainly dull with minor bright bands.	0.60	303.55	0.45)
dull.	0.80	304.35	0.60)
core broken into small fragments, possibly bright with minor dull bands.	0.36	304.71	0.27)
dull and bright.	0.32	305.03	0.24	) CHAMBERLAIN SEAM
dull.	0.80	305.83	0.61)
dull and bright.	0.67	306.50	0.50)
mainly dull with minor bright bands.	1.19	307.67	0.90)
dull and bright.	0.12	307.81	0.09)
dull.	0.67	308.48	0.50)
dull and bright.	0.47	308.95	0.35)

BORE NUMBER C-40

Grid Reference 35403.5 N 90668.9 E
Exploration Grid Reference J + 150'N / 2 + 1400'E

Date Commenced 6th Nov., 1971 Completed 12th Nov., 1971

Collar R.L. 4512.8 ft. Standard Datum
Total Depth 890.0 ft. Electrically Logged Yes/~~∅~~

Drilled by Canadian Longyear Ltd. Angled Hole
For Coalition Mining Limited Tropari Angle 55°
Azimuth 090° True
Logged by G. Jordan

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Skeeter	3696.0	1.37	-	Not Analysed
Chamberlain Upper Split	3658.4	4.57	86.9%	
Chamberlain Lower Split	3677.8	8.18	58.0%	

BORE NUMBER R-1

Grid Reference 38404N 86877E

Exploration Grid Reference H+1100'/2

Date Commenced 4th August, 1971 Completed 6th August, 1971

Collar R.L. 3868

Standard Datum

Total Depth 310

Electrically Logged /Yes/No

Drilled by Big Indian Drilling

For Coalition Mining Limited

Logged by F.H.S. Tebbutt and G.R. Jordan

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Chamberlain	3586	Not determinable		

BORE NUMBER R-2

Grid Reference 38660N 87273E

Exploration Grid Reference H+900'/2+200'

Date Commenced 6th August, 1971 Completed 7th August, 1971

Collar R.L. 3826

Standard Datum

Total Depth 302

Electrically Logged /No

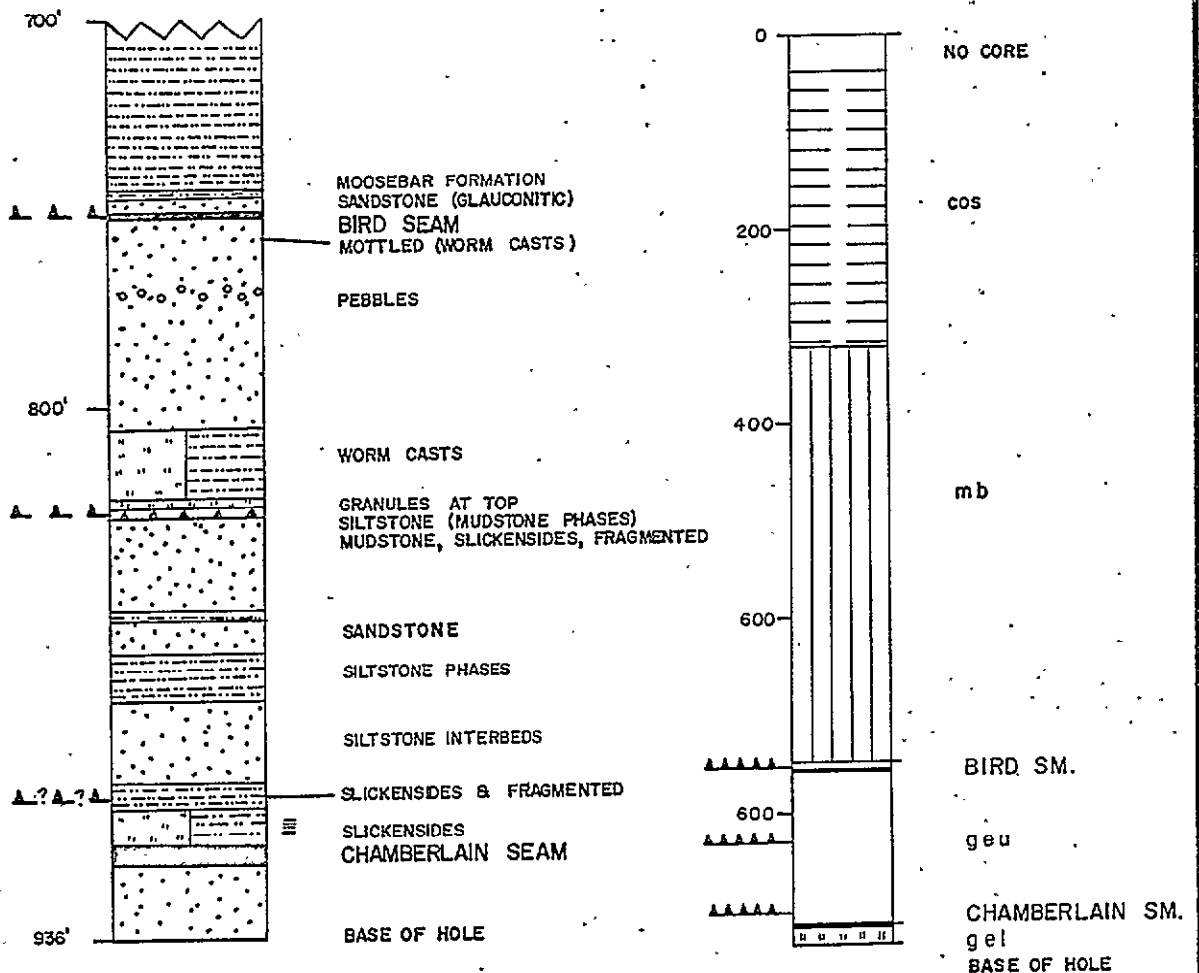
Drilled by Big Indian Drilling

For Coalition Mining Limited

Logged by F.H.S. Tebbutt and G. R. Jordan

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Chamberlain	3542	Not determinable		



DETAIL OF GETHING
FORMATION
SCALE : 1" to 50'

Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS
DDH S-6

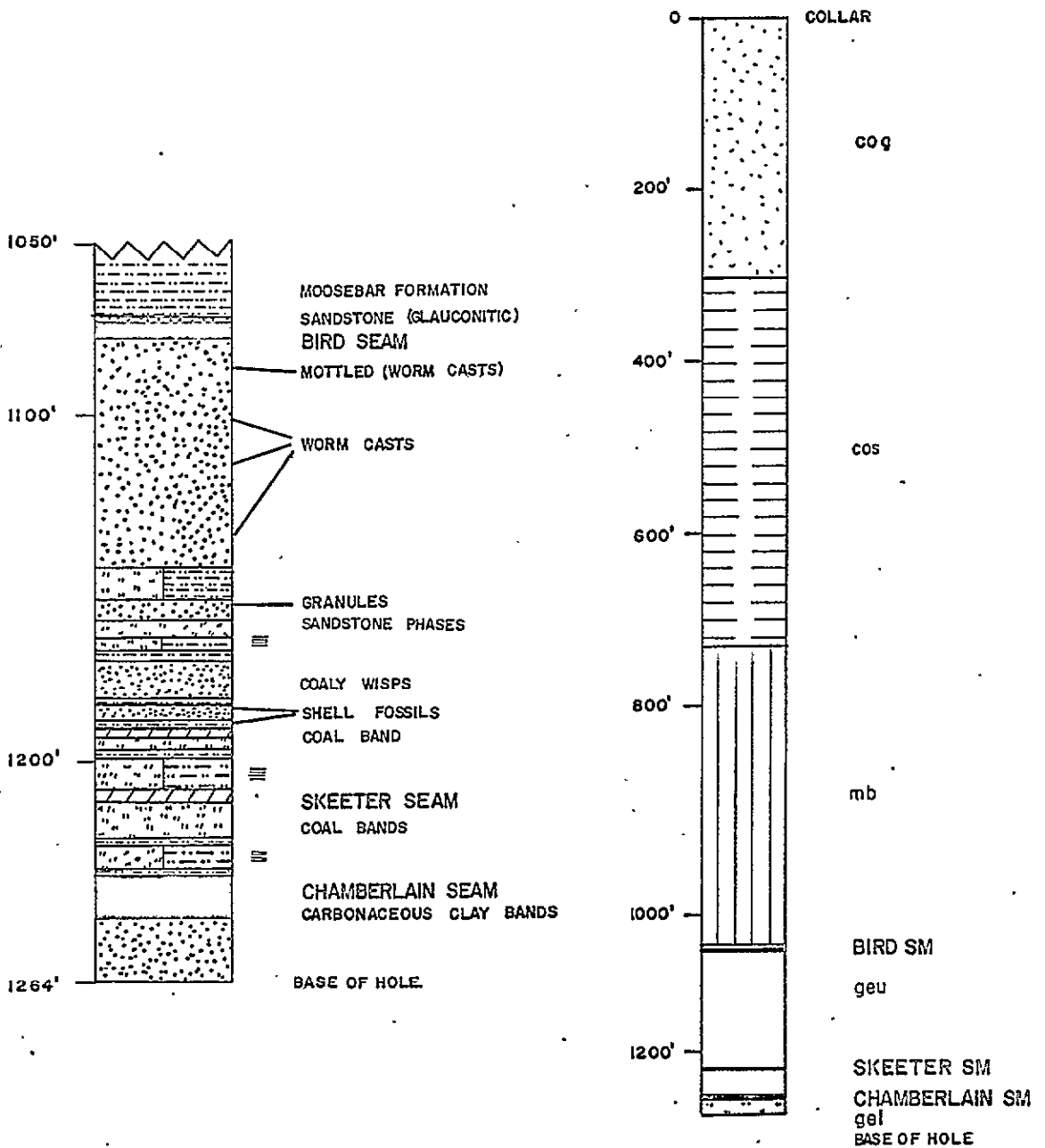
DRAWN BY S.A.

DATE: October '71

PAGE 1 of 1

STRATIGRAPHIC LOG
SUKUNKA D.D.H. S-6

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
	NO CORE TO 39.0'		
Fault Possible	SILTSTONE AND MUDSTONE INTERBEDDED	SUKUNKA	320.0
	MUDSTONE, brecciated ash bed	MOOSEBAR	746.0
	SANDSTONE, glauconitic	GETHING	750.0
Fault Probable	<u>COALY</u> FRAGMENTS	BIRD SEAM	750.5
	SANDSTONE, coarse at top becoming finer, mottled (worm casts) 757', pebbles 771'		806.0
Fault Probable	SILTSTONE AND MUDSTONE INTERBEDDED, granules at base, worm casts		824.0
	SILTSTONE, mudstone phases		826.0
	MUDSTONE, slickensides, fragmented		827.0
	SANDSTONE, coaly wisps, mudstone band 854', sandstone blebs 858'		864.0
	MUDSTONE, siltstone phases		875.0
	SANDSTONE, siltstone interbeds		897.0
	MUDSTONE, some siltstone interbeds, slickensided zones throughout		903.0
Fault Possible	LAMINITE, siltstone and mudstone, mudstone base, slickensided zones		913.0



DETAIL OF GETHING FORMATION
SCALE: 1" to 50'

SCALE: 1" to 200'

Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.

STRATIGRAPHIC LOGS

for
COALITION MINING LIMITED

DDH S-27, 27a

BORE NUMBER S-50

Grid Reference 50298N 80911.8E) Located at Site of
Exploration Grid Reference B+1900'/2+1900') Bore Hole C-6

Date Commenced 23rd November, 1970 Completed 23rd November, 1970

Collar R.L. 4059.4' Standard Datum
Total Depth 218' Electrically Logged Yes/No

Drilled by Connors Drilling Ltd.
For Brameda Resources Limited

Logged by F.H.S. Tebbutt and G.R. Jordan

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Skeeter	3959.7	6.5	89.2%	
Chamberlain	3935.1	4.8	100%	

STRATIGRAPHIC LOG
SUKUNKA D.D.H. C-23

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
	No core to 999.0 ft.		
	SANDSTONE, grey, medium grained, quartz-lithic,	GATES MB.	1050.0
	SANDSTONE, as above, with silty interbeds and phases, 3 conglomerate bands between 1076' and 1079', Dip 0-5°.		1120.0
	SANDSTONE, fine, silty interbeds and phases, worm casts, mud blebs. From 1336-1338.5' dip angle increases from 0 → 30° with mudstone bands at top and bottom containing rock chips - some calcite. Dip below this 0°.	SUKUNKA MB.	1338.0
	MUDSTONE, dark grey. Increased dips and slight slickensiding in small zones at 1564', 1565-1570', mudstone band at 1583'-1585', white clay bands at 1732', 1744', 1780', 1788.5'.	MOOSEBAR FM.	1780.5
	SANDSTONE, glauconitic.	GETHING FM.	1782.0
	<u>COAL.</u>	BIRD SEAM	1783.5
	SANDSTONE, grey, medium grained becoming finer, quartz-lithic, mottled (worm casts) at 1797', silty interbeds 1804-1833', worm casts 1808-1824' and at 1832'.		

SUKUNKA D.D.H. C-35

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<p><u>COAL</u>, coal types indeterminable, coal sheared into thin slivers with listric surfaces which readily crumble. Shearing at approx. 90° to core axis.</p>	0.62	916.63	0.62	) ) ) CHAMBERLAIN SEAM
<p>SANDSTONE, grey, medium-grained, quartz-lithic, coaly wisps in top 1.4', top 0.03' carbonaceous. Bedding angle 90° to core axis.</p>	4.39	921.02	4.39	
<p>SANDSTONE, grey, medium grained becoming finer to base, quartz-lithic, worm casts 7.8' from top, current bedded.</p>	18.81	939.83	18.81	
<p>SANDSTONE, grey, fine grained, quartz-lithic.</p>	18.41	958.24	18.41	

PR-SUKUNKA - 71(3) A-5
NATIONAL TRUST CO. LTD. (AS TRUSTEE)

COALITION MINING LIMITED
SUKUNKA COAL PROJECT

GEOLOGY
~~GEOLOGY~~

00047

APPENDIX F

DRILL HOLE DATA

DIAMOND DRILL HOLES C-36 TO C-41

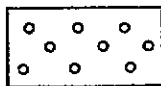
DIAMOND DRILL HOLES CS-1 TO CS-7

Reference for Graphic
Sections of Drill Hole Data

See reverse side

DETAIL OF GETHING FORMATION

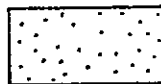
Scale 1" = 50'



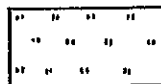
CONGLOMERATE
pebble to granule



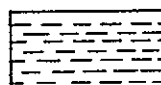
BRECCIA



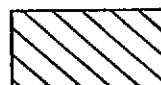
SANDSTONE



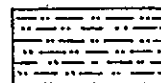
SILTSTONE



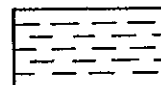
CLAYSTONE



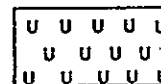
STONE COALY or
CLAYSTONE
CARBONACEOUS



MUDSTONE



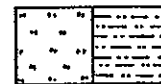
SHALE, SILTSHALE,
CLAYSHALE



SOIL, WEATHERED and
UNCONSOLIDATED
MATERIAL



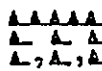
INTERBEDDED



LAMINITE



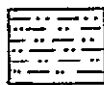
45° INCLINED STRATA



FAULT established
probable
possible

TOTAL DRILL HOLE SECTIONS

Scale 1" = 200'



HULLCROSS MEMBER



COMMOTION
FORMATION GATES MEMBER



SUKUNKA MEMBER



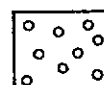
MOOSEBAR
FORMATION



UPPER GETHING
SEQUENCE



GETHING
FORMATION
LOWER GETHING
SEQUENCE



CADOMIN
FORMATION

COAL SEAMS

Scale 1" = 2'



COAL BRIGHT or UNDIFFERENTIATED

COAL MAINLY BRIGHT with MINOR DULL
BANDS

COAL DULL and BRIGHT

COAL MAINLY DULL with MINOR BRIGHT
BANDS

COAL DULL

COAL INTERLAYED with NON-COAL

NON-COAL INTERLAYED with COAL

COAL STONY

STONE COALY

COAL WEATHERED

REFERENCE FOR GRAPHIC SECTIONS

of

DRILL HOLE DATA

PREPARED BY CLIFFORD McELROY & ASSOCIATES PTY LIMITED

COALITION MINING LIMITED

SUKUNKA COAL PROJECT

January 1972

NOTES TO ACCOMPANY APPENDIX F

This appendix includes logs for all drill holes sunk on behalf of Coalition Mining Limited during the 1971 field season and for most of the drill holes completed during the two previous field seasons by Brameda Resources Ltd. The drill hole data are included in the following volumes:

<u>Volume No.</u>	<u>Drill Hole No.*</u>
6	D.D.H.'s C-1 to C-8
7	D.D.H.'s C-9 to C-22
8	D.D.H.'s C-23 to C-35
9	D.D.H.'s C-36 to C-41; CS-1 to CS-7.
10	D.D.H.'s CM-1 to CM-9; RDH R-1 to R-15
11	D.D.H. S-1 to S-50

*D.D.H. - Diamond Drill Hole; R.D.H. Rotary Drill Hole.

Data for the following drill holes are not included;

D.D.H. S-2 and D.D.H. S-29 - the core of these holes was not available for logging as it is stored by the Alberta Study Group of the Canadian Geological Survey in Calgary, Alberta:

D.D.H. S-3 - This hole is outside the area of immediate interest and was collared below the level of the Chamberlain Seam.

R.D.H. R-7 - This hole was abandoned in the overburden.

The data included for each drill hole, drilled on behalf of Coalition Mining Limited, are included in the following order:

Graphic section - Stratigraphic Log of Drill Hole.

Graphic section - Detail of Gething Formation.

Graphic section - Seam sections of Chamberlain and Skeeter Seams.

Analytical Data.

Written Stratigraphic Log.

Written Log of Gething Formation.

Accompanying each of Volume 6 to 11 is a Reference relating to the graphic sections.

Stratigraphic Logs are included for all drill holes, at a scale of 200 feet to 1 inch. The footages quoted in these logs are based on the drillers depth markers and are not corrected for core loss. The footages quoted are considered to be accurate to within 0.5 feet.

Detailed Logs of the Gething Formation for the interval from about 50 feet below to about 50 feet above the Chamberlain/Skeeter Seams have been corrected for core loss and are accurate to 0.01 feet. Observations of the coal and the adjacent strata, recovered in a stationary split inner tube, have enabled corrections for core loss to be applied to that part or parts of the core which were broken, disturbed and obviously not fully recovered during drilling. Graphic logs, at a scale of 50 feet to 1 inch have been constructed for this interval of the Gething Formation.

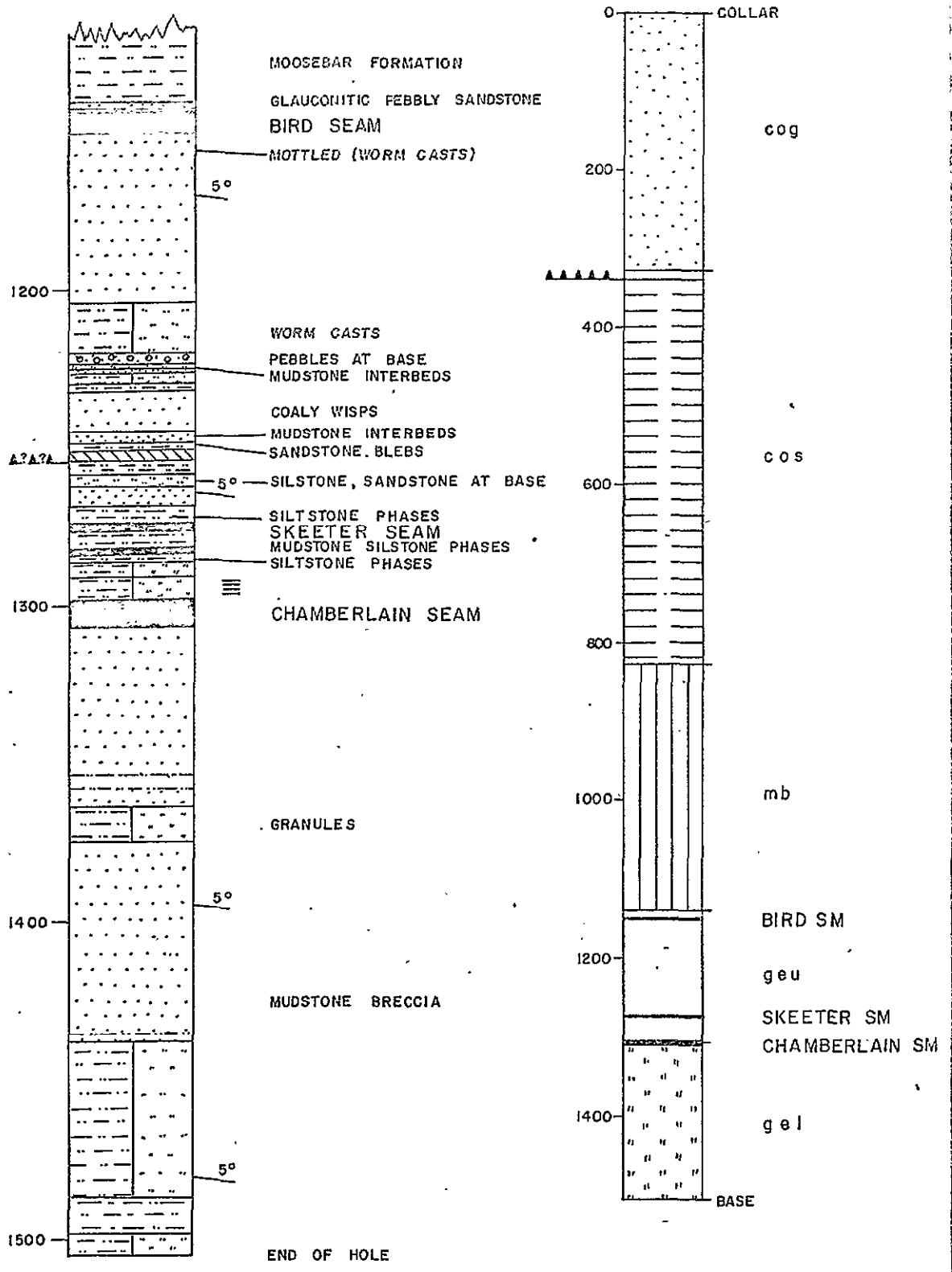
Graphic Sections of the Chamberlain and Skeeter Seams have been prepared at a scale of 2 feet to 1 inch. These logs and sections give details of the coal and the stone bands within the seams. Some analytical data has been included on the graphic sections.

The S-Series drill holes were completed during the 1969 and 1970 field seasons by Connors Drilling Limited for Brameda Resources Limited. Stratigraphic sections and logs of these drill holes are accompanied by analytical data provided by Brameda Resources Limited.

The R-Series drill holes were completed during the 1971 field season by Big Indian Drilling Ltd, using a reverse circulation method of rotary drilling. A graphic, stratigraphic log of each of these drill holes at a scale of 50 feet to 1 inch is included.

The C, CS and CM-Series diamond drill holes were completed during the 1971 field season by Connors Drilling Limited and Canadian Longyear Limited for Coalition Mining Limited.

In addition, D.D.H.'s S-14, S-17 and S-41 were deepened during the 1971 programme. A complete set of graphic sections, written logs and analytical data is included for these drill holes.



DETAIL OF GETHING
 FORMATION
 SCALE: 1" to 50'

SCALE: 1" to 200'

Prepared by :
 CLIFFORD McELROY & ASSOCIATES PTY. LTD.
 for
 COALITION MINING LIMITED

STRATIGRAPHIC LOGS
 D.D.H.C-36

BORE NUMBER C-36

Grid Reference 44139.0 N 85738.1 E
Exploration Grid Reference E + 150'N / 3 + 350'E

Date Commenced 22nd Oct., 1971 Completed 30th Oct., 1971


Collar R.L. 4979.4 ft. Standard Datum
Total Depth 1352.7 ft. Electrically Logged Yes/~~No~~
Drilled by Canadian Longyear Ltd.
For Coalition Mining Limited
Logged by G. Jordan

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment.
Skeeter	3702.2 ft.	3.35	48%	
Chamberlain	3672.4 ft.	208.51	64%	

SKEETER SEAM

ASH %
CUMULATIVE
FROM FLOOR

		WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
1273.90						
1277.25		-	9.3	5½	9.3	
1282.91						

Prepared by:

CLIFFORD McELROY & ASSOCIATES PTY. LTD.

for

COALITION MINING LIMITED

DRAWN BY K.W.

DATE February '72

SCALE: 1' to 2'

SEAM SECTIONS

DDH C-36

PAGE 1 of 1

CHAMBERLAIN SEAM

1298.47

1306.98



8.51

WT%

ASH%

C. S. No

ASH %
CUMULATIVE
FROM FLOOR

INCL.
BANDS

EXCL.
BANDS

5.4

5.4

7

Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.

SEAM SECTIONS

for

DDH C-36

COALITION MINING LIMITED

DRAWN BY K.W.

DATE February '72

SCALE: 1" to 2'

PAGE 1 of 1

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

C A R G O
SUPERINTENDENTS
CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify

APPLICANT: COALITION MINING

**REPORT ON: SUKUNKA SAMPLE NO. 215
CORE NO. C36
SKEETER SEAM**

REPORT NO. K71-1990

RECEIVED: 10. 12. 1971

REPORTED: 30. 12. 1971



This Laboratory is Registered by the
National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

[Signature]

[Signature]
A.R.A.C.I. Chief Chemist.

INTRODUCTION:

One (1) Coal Sample designated CORE NO. C36 SKEETER SEAM was received on 10. 12. 1971 from Clifford McElroy & Associates.

METHOD:

The Coal Sample No. 215 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fractions were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true S.G. of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 215 and the analysis are given in this report.

NOTE:

The sample weight has not been adjusted to compensate for core loss.

RESULTS:

TABLE 1 : gives the sizing, washability and analytical data for the sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 1

WASHABILITY DATA FOR SAMPLE NO. 215 (after hand crushing to $\frac{3}{4}$ "

FRACTION	INDIVIDUAL				CUMULATIVE		
	WEIGHT	WT.%	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
F1.30 SG	131	12.8	2.6	9	12.8	2.6	9
S1.30 - F1.35 SG	590	57.4	4.3	7	70.2	4.0	7½
S1.35 - F1.40 SG	36	3.5	9.8	3½	73.7	4.3	7
S1.40 - F1.45 SG	53	5.2	15.8	2½	78.9	5.0	7
S1.45 - F1.50 SG	67	6.5	19.7	1	85.4	6.1	6½
S1.50 - F1.55 SG	87	8.5	23.2	1	93.9	7.7	6
S1.55 - F1.60 SG	39	3.8	26.2	1	97.7	8.4	6
S1.60 SG	24	2.3	51.7	0	100.0	9.4	5½
-30 Mesh RC	46	4.3	7.9	7½			

Total Weight of Sample = 1073 grams

True Specific Gravity = 1.365

Thickness = 3.35'

ANALYSIS OF F1.60 SG FRACTION OF SAMPLE NO. 215

Yield %	97.7
Air Dried Moisture %	1.0
Ash %	8.4
Volatile Matter %	20.0
Fixed Carbon %	70.6
Total Sulphur %	0.55
C.S.NO.	6½
Calorific Value	13890 BTU/LB
Phosphorus %	0.029

SYDNEY

30th December 1971

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

C A R G O
SUPERINTENDENTS
CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify

APPLICANT: COALITION MINING

**REPORT ON: SUKUNKA SAMPLE NO. 216
CORE NO. C36
CHAMBERLAIN SEAM**

REPORT NO. K71-1991

RECEIVED: 10. 12. 1971

REPORTED: 30. 12. 1971



This Laboratory is Registered by the National Association of Testing Authorities Australia. The tests reported herein have been performed in accordance with the terms of registration.

M. B. ...
A.R.A.C.I. Chief Chemist.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

[Signature]

INTRODUCTION:

One (1) Coal Sample designated CORE NO. C36 CHAMBERLAIN SEAM was received on 10. 12. 1971 from Clifford McElroy & Associates.

METHOD:

The coal sample No. 216 was hand crushed to $\frac{3}{8}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true S.G. of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 216 and the analysis are given in this report.

NOTE:

The sample weight has not been adjusted to compensate for core loss.

RESULTS:

TABLE 1 : gives the sizing, washability and analytical data for the sample after hand crushed to $\frac{3}{8}$ " top size.

TABLE 1WASHABILITY DATA FOR SAMPLE NO. 216 (after hand crushing to $\frac{3}{8}$ ")

FRACTION	INDIVIDUAL				CUMULATIVE		
	WEIGHT	WT.%	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
F1.30 SG	1803	57.3	2.1	9	57.3	2.1	9
S1.30 - F1.35 SG	789	25.1	5.3	5½	82.4	3.1	8
S1.35 - F1.40 SG	298	9.5	9.8	1½	91.9	3.8	7½
S1.40 - F1.45 SG	121	3.8	14.1	1½	95.7	4.2	7
S1.45 - F1.50 SG	46	1.5	17.0	1	97.2	4.4	7
S1.50 - F1.55 SG	9	0.3	16.2	1	97.5	4.4	7
S1.55 - F1.60 SG	25	0.8	24.6	1	98.3	4.6	7
S1.60 SG	53	1.7	46.2	1	100.0	5.3	7
-30 Mesh	362	10.3	6.6	9			

Total Weight of Sample = 3506 grams
True Specific Gravity = 1.315
Thickness = 8.52'

ANALYSIS OF F1.60 SG FRACTION OF SAMPLE NO. 216

Yield %	98.3
Air Dried Moisture %	1.0
Ash %	4.7
Volatile Matter %	22.3
Fixed Carbon %	72.0
Total Sulphur %	0.47
C.S.NO.	7½
Calorific Value	14600 BTU/LB
Phosphorus %	0.030

SYDNEY

30th December 1971

STRATIGRAPHIC LOG
SUKUNKA D.D.H. C-36

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft.)</i>
Dip 5°	<p>No core to 20.0 ft.</p> <p>SANDSTONE, fine grained with grey siltstone interbeds.</p> <p>CONGLOMERATE, closely packed, grey white, green and black pebbles, well rounded, well sorted, and tightly compressed pebbles to 0.05'.</p> <p>SILTSTONE, medium grained, pebble conglomerate phases.</p> <p><u>COAL</u> AND CLAYSTONE, carbonaceous claystone with coal bands.</p>	GATES MB.	<p>52.0</p> <p>67.0</p> <p>77.0</p> <p>78.5</p>
Dip 5°	<p>CLAYSTONE, some sandy phases, carbonaceous towards base.</p> <p><u>COAL</u>, claystone bands.</p> <p><u>COAL</u>.</p> <p>CLAYSTONE, coal bands.</p> <p><u>COAL</u>.</p> <p>CLAYSTONE.</p> <p>SANDSTONE, massive, quartz-lithic, finer at base, contains worm casts, mudstone phases and interbeds in lower half.</p>		<p>103.5</p> <p>104.0</p> <p>106.0</p> <p>106.5</p> <p>107.0</p> <p>108.5</p> <p>196.0</p>

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
Dip 0°	SILTSTONE AND MUDSTONE, interbedded.		223.0
	MUDSTONE, coaly bands.		226.0
	<u>COAL.</u>		226.5
Dip 5°	CONGLOMERATE, closely packed, grey white, green and black pebbles to 0.15'.		261.0
Fault, established	SANDSTONE, mudstone phase towards base. SANDSTONE, mudstone interbeds, bedding irregular, zone of slickensides, variable dips 0°-90° and calcite veins 335' to 373'.	SUKUNKA MB.	326.0 425.0
Dip 0°-5°	SILTSTONE AND MUDSTONE INTERBEDDED, with sandy phases.		502.0
	SILTSTONE AND MUDSTONE INTERBEDDED, worm casts throughout.		829.0
	MUDSTONE, silty phases at top, white claystone (bentonitic?) at base.	MOOSEBAR FM.	1140.2
	SANDSTONE, glauconitic.	GETHING FM.	1142.7
	SANDSTONE, pebbly phases.		1143.7
	<u>COAL.</u>	BIRD SEAM	1149.7
	MUDSTONE.		1150.7
	SANDSTONE, coarse at top, fine at base, mottled (worm casts) at 1155'.		1204.0

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
Dip 5°	SILTSTONE AND MUDSTONE INTERBEDDED, worm casts in centre .		1220.0
	SANDSTONE, coarse in top 0.5', medium grained for rest.		1223.5
	SILTSTONE, mudstone interbeds.		1225.0
	SANDSTONE, medium grained.		1226.0
	SILTSTONE AND MUDSTONE INTERBEDDED.		1230.0
	MUDSTONE, carbonaceous.		1232.0
	SANDSTONE, medium grained, coaly wisps.		1245.5
	SANDSTONE, mudstone interbeds, sand blebs at base.		1249.0
	MUDSTONE, carbonaceous.		1251.3
	SHALE, carbonaceous.		1251.8
	CLAYSTONE, carbonaceous phases and coaly bands.		1259.5
Fault, possible	CLAYSTONE, carbonaceous, coaly bands, listric surfaces, calcite veins.		1260.0
	SILTSTONE, sandy at base.		1262.5
	SANDSTONE, medium grained.	GETHING FM.	1268.0
	MUDSTONE, silty phases.		1274.2

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
Dip 0-5°	COAL.)		1276.5
)		
	MUDSTONE, silty interbeds, mudstone)	SKEETER SM.	
	bands at top and base.)		1282.0
)		
	COAL AND CLAYSTONE.)		1283.5
	MUDSTONE, silty phases, irregular bedding.		1286.5
	SILTSTONE AND MUDSTONE INTERBEDDED.		1291.0
	LAMINITE, siltstone and mudstone, mudstone at base.		1298.0
	COAL. . .	CHAMB. SM.	1307.0
	SANDSTONE, carbonaceous at top, coarse becoming fine at base, mudstone bands near base.		1364.0
	SILTSTONE AND MUDSTONE INTERBEDDED.		1373.0
	SANDSTONE, coarse grained to granule conglomerate.		1374.5
	SANDSTONE, medium to fine grained, sedimentary mudstone breccia band at 1426', 1430', 1435', mudstone band at 1434'.		1437.0
SILTSTONE AND MUDSTONE INTERBEDDED		1487.0	
MUDSTONE.		1498.0	
SILTSTONE AND MUDSTONE INTERBEDDED, one sandy phase.	<u>Base of Hole</u>	1505.0	

SUKUNKA D.D.H. C-36

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
Core not logged in detail - refer to Stratigraphic Log for particulars.		1212.68		
SILTSTONE AND MUDSTONE INTERBEDDED, grey siltstone and dark grey mudstone, joint at 22° to core axis, fractures parallel to bedding. Bedding angle 87° to core axis, worm casts in lower half.	6.43	1219.11	6.43	
SANDSTONE, coarse grained, massive, carbonaceous phase near base.	0.54	1219.65	0.54	
SANDSTONE, fine to medium grained, massive, quartz-lithic.	3.73	1223.38	3.73	
SILTSTONE AND MUDSTONE INTERBEDDED, sandstone phase in centre.	3.57	1226.95	3.57	
LAMINITE, grey siltstone and dark grey mudstone, bedding disturbed near top, pyrite filled worm casts. Bedding angle 88° to core axis.	3.86	1230.81	3.86	
CLAYSTONE, dark grey, carbonaceous at base.	1.63	1232.44	1.63	
SANDSTONE, medium grained, quartz-lithic, irregular				

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
coaly wisps and inclusions. Bedding irregular throughout, disturbance not tectonic.	10.43	1242.87	10.43	
SANDSTONE, as above, calcite filled fracture 50° to core axis.	3.28	1246.15	3.28	
CARBONACEOUS CLAYSTONE, fine grained, light grey irregular sandstone interbeds in black carbonaceous claystone.	1.00	1247.15	1.00	
SANDSTONE, fine to medium grained, quartz-lithic, dark grey carbonaceous claystone interbeds throughout, light coloured worm casts in lower half (sand blebs).	2.58	1249.73	2.58	
CLAYSTONE, dark grey, carbonaceous phases, fractures parallel to bedding in shale phases. Bedding angle 85° to core axis.	3.76	1253.49	3.76	
SHALE, dark grey to black, pyrite, light coal bands.	6.29	1259.78	6.29	
CLAYSTONE, dark grey, broken fragments in base, slickensided surfaces and calcite vein material.	0.40	1260.18	0.40	

SUKUNKA D.D.H. C-36

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
CLAYSTONE, as above, no slickensides.	1.06	1261.24	1.06	
SANDSTONE, fine grained, massive quartz-lithic, calcite veins with slickensiding at 70° to core axis.	2.06	1263.30	2.06	
SANDSTONE, medium grained, quartz lithic cross-bedded throughout, calcite veins along irregular fractures approximately parallel to bedding at 88° to core axis at 1265'.	5.50	1268.80	5.50	
CLAYSTONE, grey, some siltstone interbeds. Bedding angle 90° to core axis.	4.47	1273.27	4.47	
MUDSTONE, dark grey.	0.63	1273.90	0.63	
<u>COAL</u> , dull banded.	0.68	1274.58	0.39)
)
dull banded.	0.26	1274.84	0.15)
)
dull.	0.23	1275.07	0.13)
)
mainly dull with minor bright bands, vitrain bands 97° to core axis:	0.21	1275.28	0.12)

SKEETER SEAM

SUKUNKA D.D.H. C-36

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull.	0.35	1275.63	0.20)
bright.	0.07	1275.70	0.04)
mainly dull with minor bright bands.	0.56	1276.26	0.32)
dull.	0.47	1276.73	0.27)
dull and bright.	0.09	1276.82	0.05)
bright.	0.10	1276.92	0.06)
mainly bright with minor dull bands.	0.17	1277.09	0.10)
dull and bright.	0.16	1277.25	0.09)
MUDSTONE, black:	0.57	1277.82	0.57)
SILTSTONE AND MUDSTONE INTERBEDDED, bedding angle 90° to core axis.	4.56	1282.38	4.58)
<u>COAL</u> , mainly dull with minor bright bands.	0.15	1282.53	0.15)

SKEETER
SEAM

SUKUNKA D.D.H. C-36

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
CLAYSTONE, carbonaceous.	0.29	1282.82	0.29	
<u>COAL</u> , mainly dull with minor bright bands.	0.09	1282.91	0.09	
CLAYSTONE, grey, carbonaceous at top and bright coal bands.	1.09	1284.00	1.09	
SILTSTONE, mudstone phases. Bedding irregular and indistinct.	2.12	1286.12	2.12	
SANDSTONE AND MUDSTONE INTERBEDDED; fine grained sandstone with grey claystone interbeds.	2.38	1288.50	2.38	
LAMINITE, claystone and siltstone. Bedding angle 88° to core axis.	9.18	1297.68	9.18	
MUDSTONE, core broken during drilling.	0.79	1298.47	0.79	
<u>COAL</u> , core broken, coal mainly bright with minor dull bands.	0.75	1299.22	0.67)
bright banded mainly bright with minor dull bands.	0.17	1299.39	0.15	) CHAMBERLAIN SEAM
)

SUKUNKA D.D.H. C-36

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull.	0.07	1299.46	0.06)
bright.	0.07	1299.53	0.06)
dull and bright.	0.46	1299.99	0.41)
bright.	0.08	1300.07	0.07)
dull.	0.06	1300.13	0.05)
mainly bright with minor dull bands.	0.10	1300.23	0.09)
dull and bright.	0.07	1300.30	0.06	) CHAMBERLAIN SEAM
bright.	0.11	1300.41	0.10)
dull.	0.16	1300.57	0.14)
mainly dull with minor bright bands.	0.19	1300.76	0.16)
dull and bright.	0.11	1300.87	0.10)

CHAMBERLAIN SEAM

SUKUNKA D.D.H. C-36

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
COAL, mainly dull with minor bright bands.	0.14	1301.01	0.13)	
mainly dull with minor bright bands, core broken and disoriented.	0.33	1301.34	0.30)	
mainly bright with minor dull bands.	0.22	1301.56	0.20)	
mainly dull with minor bright bands.	0.46	1302.02	0.41)	
dull and bright.	0.22	1302.24	0.20)	1
dull.	0.14	1302.38	0.13)	
bright.	0.08	1302.46	0.07)	CHAMBERLAIN SEAM
mainly dull with minor bright bands.	0.47	1302.93	0.42)	
dull and bright.	0.20	1303.13	0.18)	
bright.	0.24	1303.37	0.22)	
dull.	0.27	1303.64	0.24)	

SUKUNKA D.D.H. C-36

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull and bright,	0.42	1304.06	0.38)
dull.	0.16	1304.22	0.14)
dull and bright.	0.26	1304.48	0.23)
mainly bright with minor dull bands.	0.31	1304.79	0.28)
mainly dull with minor bright bands.	0.29	1305.08	0.26)
bright.	0.07	1305.15	0.06)
mainly bright with minor dull bands.	0.10	1305.25	0.09	) CHAMBERLAIN SEAM
dull.	0.28	1305.53	0.25)
dull and bright, cleat 10° to core axis.	0.17	1305.70	0.15)
dull.	0.27	1305.97	0.24)
bright.	0.14	1306.11	0.13)
dull and bright.	0.36	1306.47	0.32)

SUKUNKA D.D.H. C-36

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
COAL, dull and bright - coal sheared, fragments 0.01' wide, with listric surfaces, shear planes 80° to core axis.	0.39	1306.86	0.35)
bright.	0.06	1306.92	0.05)
dull and bright.	0.06	1506.98	0.05)
SANDSTONE, medium grained, carbonaceous, quartz lithic, black.	0.19	1307.17	0.19)
SANDSTONE, medium to coarse grained, grey, quartz lithic, carbonaceous, massive, mudstone phases at base. Bedding angle 87° to core axis. Calcite filled joints 75° to core axis and spaced 5' along core.	13.58	1320.75	13.58)
SANDSTONE, fine to medium grained, light grey, quartz lithic massive, bedding as above.	30.26	1351.01	30.26)
CLAYSTONE, sandstone interbeds.	0.87	1351.88	0.87)
SANDSTONE, as above.	0.79	1352.67	0.79)
				CHAMBERLAIN SEAM
				<u>Base of Hole</u>

BORE NUMBER C-37

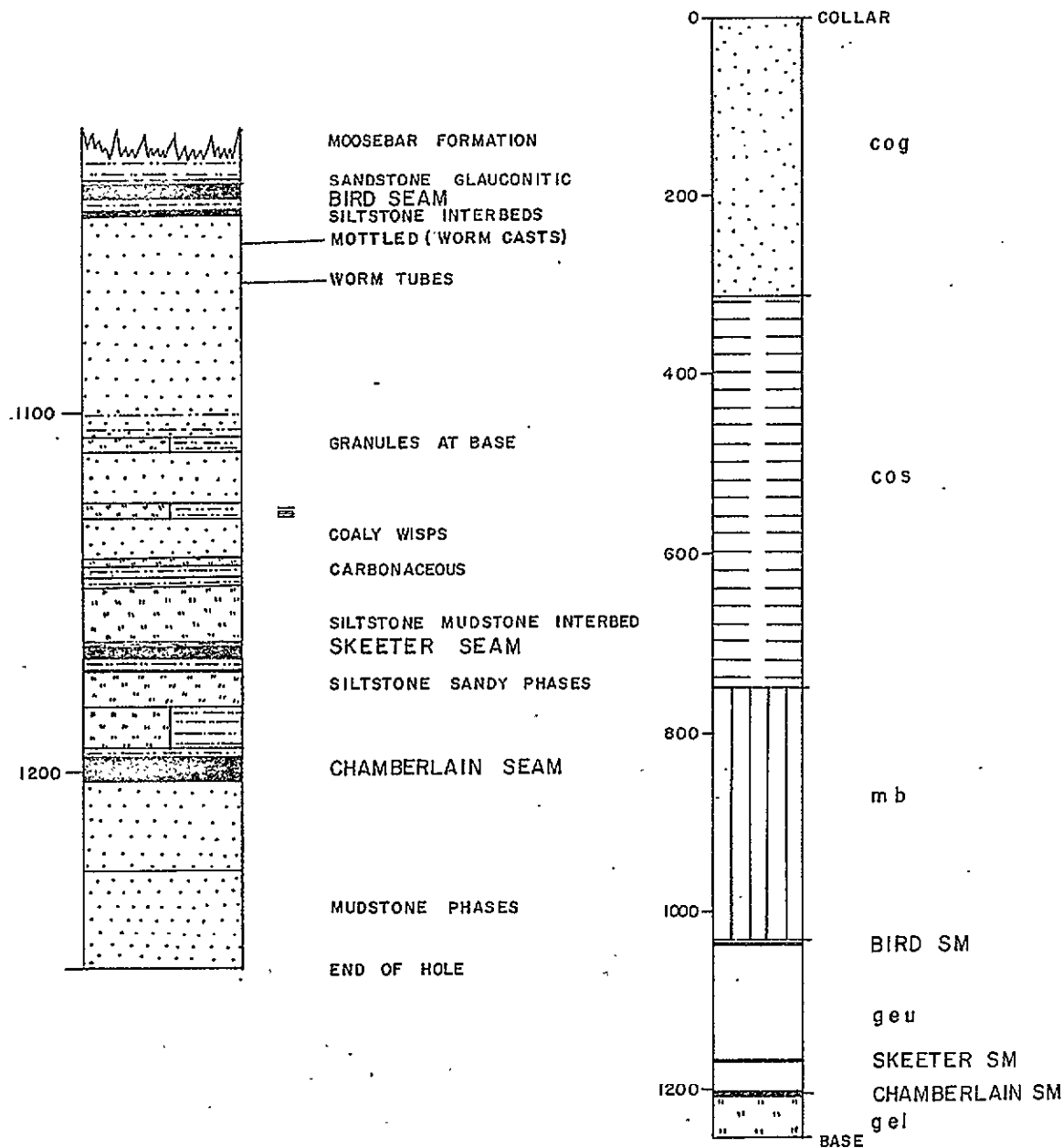
Grid Reference 40994.3 N 86818.1 E
Exploration Grid Reference G + 225'N / 2 + 1425'E

Date Commenced 24th Oct., 1971 Completed 30th Oct., 1971

Collar R.L. 4747.8 ft. Standard Datum
Total Depth 1235.3 ft. Electrically Logged Yes/No
Drilled by Canadian Longyear Ltd.
For Coalition Mining Limited
Logged by G. Jordan

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Skeeter	3574.7 ft.	10.67	43%	3' of coal analysed
Chamberlain	3545.3 ft.	39.82	90%	7' of coal analysed

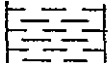
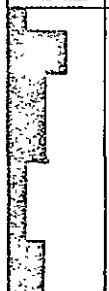
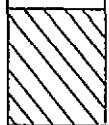
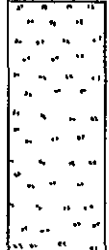




DETAIL OF GETHING
FORMATION
SCALE: 1" to 50'

SCALE: 1" to 200'

Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS
D.D.H. C-37

SKEETER SEAM				ASH % CUMULATIVE FROM FLOOR		
				WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
1162.42						
		3.00	-	24.3	3	24.3
1165.42						
	CORE LOSS					
						
						
1171.38						
		1.71		NOT	ANALYSED	
1173.09						
						

Prepared by:

CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for

COALITION MINING LIMITED

DRAWN BY S.A.

DATE February '72

SCALE: 1' to 2'

SEAM SECTIONS

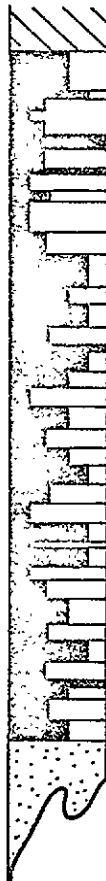
DDH C-37

PAGE 1 of 1

CHAMBERLAIN SEAM

ASH %
CUMULATIVE
FROM FLOOR

1195.49



7.01

WT%

ASH%

C. S. No

INCL.
BANDS

EXCL.
BANDS

5.1

5.1

6½

1202.50

Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.

SEAM SECTIONS

for
COALITION MINING LIMITED

DDH C-37

DRAWN BY S.A.

DATE February '72

SCALE: 1" to 2'

PAGE 1 of 1

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

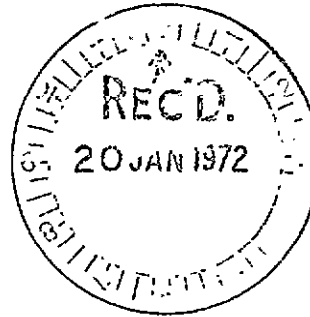
C A R G O
SUPERINTENDENTS
CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify

APPLICANT: COALITION MINING



REPORT ON: SUKUNKA SAMPLE NO. 223
CORE NO. C37
SKEETER SEAM

REPORT NO. K71-2017

RECEIVED: 16. 12. 1971

REPORTED: 19. 1. 1972



This Laboratory is Registered by the
National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

A.B. Brantly
Chief Chemist
A.R.A.C.I.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

P.M.C. Jones

INTRODUCTION:

One (1) Coal Sample designated CORE NO. C37 SKEETER SEAM was received on 16. 12. 1971 from Clifford McElroy & Associates.

METHOD:

The Coal Sample No. 233 was hand crushed to 3/4", sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 233 and the analysis is given in this report.

NOTE:

The sample weight has not been adjusted to compensate for core loss

RESULTS:

TABLE 1 : gives the sizing, washability and analytical data for the sample after hand crushing to 3/4" top.size.

TABLE 1WASHABILITY DATA FOR SAMPLE NO. 223 (after hand crushing to 3/4")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
Fl.30 SG	58	7.1	2.7	9	7.1	2.7	9
Sl.30 - Fl.35 SG	116	14.3	6.7	9	21.4	5.4	9
Sl.35 - Fl.40 SG	111	13.7	11.8	2½	35.1	7.9	6½
Sl.40 - Fl.45 SG	100	12.3	17.7	1½	47.4	10.4	5
Sl.45 - Fl.50 SG	76	9.3	21.9	1	56.7	12.3	4½
Sl.50 - Fl.55 SG	61	7.5	28.8	½	64.2	14.2	4
Sl.55 - Fl.60 SG	83	10.2	33.2	½	74.4	16.8	3½
Sl.60 SG	208	25.6	48.3	0	100.0	24.9	2½
-30 Mesh RC	49	5.7	15.0	7½			

Total Weight of Sample = 862 grams

True Specific Gravity = 1.389

Thickness = 3.00'

ANALYSIS OF Fl.60 SG FRACTION OF SAMPLE NO. 223

Yield %	74.4
Air Dried Moisture %	1.0
Ash %	16.8
Volatile Matter %	16.5
Fixed Carbon %	65.7
Total Sulphur %	0.54
C.S.NO.	3
Calorific Value	12670 BTU/LB

SYDNEY

19th January 1972

✓

Telegrams and Cables:
"Visor", Sydney

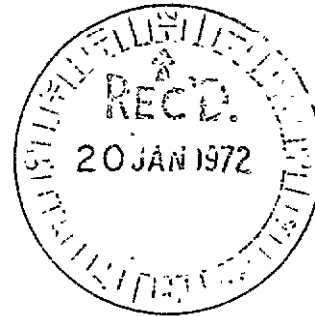
Telephone: 241 1105

C A R G O
SUPERINTENDENTS
CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

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APPLICANT: COALITION MINING

REPORT ON: SUKUNKA SAMPLE NO. 224
CORE NO. C37
CHAMBERLAIN SEAM

REPORT NO. K71-2018

RECEIVED: 16. 12. 1971

REPORTED: 19. 1. 1972



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been performed in accordance with the
terms of registration.

M. Bradley
A.R.A.C.I. Chief Chemist.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

S. McPherson

INTRODUCTION:

One (1) Coal Sample designated CORE NO. C37 CHAMBERLAIN SEAM was received on 16. 12. 1971 from Clifford McElroy & Associates

METHOD:

The Coal Sample No. 224 was hand crushed to 3/4", sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 224 and the analysis is given in this report.

RESULTS:

TABLE 1 : gives the sizing, washability and analytical data for the sample after hand crushing to 3/4" top size.

TABLE 1WASHABILITY DATA FOR SAMPLE NO. 224 (after hand crushing to 3/4")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
Fl.30 SG	2168	58.2	1.8	9'	58.2	1.8	9
Sl.30 - Fl.35 SG	954	25.6	5.5	4½	83.8	2.9	7½
Sl.35 - Fl.40 SG	288	7.7	10.6	1½	91.5	3.6	7
Sl.40 - Fl.45 SG	150	4.0	14.7	1½	95.5	4.0	7
Sl.45 - Fl.50 SG	83	2.2	17.9	1½	97.7	4.4	7
Sl.50 - Fl.55 SG	39	1.0	20.7	1	98.7	4.5	7
Sl.55 - Fl.60 SG	8	0.2	24.4	1	98.9	4.6	7
Sl.60 SG	37	1.1	63.1	1	100.0	5.2	6½
-30 Mesh RC	295	7.3	3.6	9			

Total Weight of Sample = 4022 grams

True Specific Gravity = 1.310

Thickness = 7.01'

ANALYSIS OF FLOATS 1.60 SG FRACTION OF SAMPLE NO. 224

Yield %	98.9
Air Dried Moisture %	1.0
Ash %	4.5
Volatile Matter %	21.1
Fixed Carbon %	73.4
Total Sulphur %	0.43
C.S.NO.	7½
Calorific Value	14610 BTU/LB

SYDNEY

19th January 1972

-STRATIGRAPHIC LOG
SUKUNKA D.D.H. C-37

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>	
Dip 0-5°	No core to 50.0 ft.			
	MUDSTONE, carbonaceous phase.	GATES MB.	77.0	
	<u>COAL.</u>		78.5	
	SANDSTONE, worm casts (mottled) at top.		152.0	
	SILTSTONE AND MUDSTONE INTERBEDDED, sandy phases.		184.0	
	SANDSTONE, mudstone phases, carbon- aceous mudstone at base.		202.0	
	SANDSTONE, coaly wisps, mudstone phases near base.		258.0	
	SANDSTONE, mudstone phases and silty interbeds.		312.0	
	Fault, possible	SILTSTONE AND MUDSTONE INTERBEDDED, sandy phases and worm casts, small breccia zone at 338' (1'), white.	SUKUNKA MB.	757.0
		MUDSTONE, claystone bands at base.	MOOSEBAR FM.	1035.0
SANDSTONE, glauconitic.		GETHING FM.	1035.5	
<u>COAL.</u>)		BIRD SM.	1039.0	
MUDSTONE, silty interbeds)		1043.0		

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
	COAL.))		1044.0
	SANDSTONE, coarse at top, fine towards base, mottled (worm casts) at 1051', worm casts 1063', bedding disturbed 1088' to 1094', mudstone bands 1100', 1104'.		1107.0
	SILTSTONE AND MUDSTONE INTERBEDDED, granule conglomerate at base.		1111.0
	SANDSTONE.		1124.0
	LAMINITE, mudstone at base.		1128.0
	SANDSTONE, coaly wisps.		1140.0
	SILTSTONE, mudstone interbeds.		1144.0
	MUDSTONE.		1146.0
	MUDSTONE, carbonaceous at base.		1149.0
	SILTSTONE, mudstone interbeds.		1164.0
	MUDSTONE, carbonaceous.	GETHING FM.	1165.0
	COAL.))		1168.0
	MUDSTONE, silty interbeds.))	SKEETER SM.	1172.0
	COAL.))		1173.0
	SILTSTONE, sandy phases.		1182.0
	SILTSTONE AND MUDSTONE INTERBEDDED.		1193.0

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
	MUDSTONE.		1195.0
	<u>COAL.</u>	CHAMB. SM.	1202.0
	SANDSTONE, carbonaceous at top, coarse at top, finer towards base.		1247.0
	SANDSTONE, mudstone phases.		1254.0
			<u>BASE OF HOLE</u>

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
Core not logged in detail - refer to Stratigraphic Log for particulars.				
SANDSTONE, medium grained, quartz lithic, bedding highly disturbed by worm casts 1.45' to 2.80' from top. Bedding angle 88 ^o to core axis.	8.21	1099.42	8.16	
SANDSTONE, medium to fine grained, quartz lithic, graded sequences (younging upwards), with grey claystone phases at top.	6.90	1106.32	6.76	
SILTSTONE AND MUDSTONE INTERBEDDED, grey siltstone and dark grey claystone, graded sequences, bedding planes. disturbed, sole markings and lode casts present throughout, worm casts in centre. Bedding angle 88 ^o to core axis.	4.60	1110.92	4.51	
SANDSTONE, lithic, medium grained, some fine sandstone interbeds, angular fragments.	0.48	1111.40	0.47	
SILTSTONE AND MUDSTONE INTERBEDDED, as above.	0.47	1111.87	0.46	
SANDSTONE, medium grained, quartz-lithic, massive.	9.10	1120.97	8.93	

SUKUNKA D.D.H. C-37

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, medium grained, grey claystone phases.	3.96	1124.93	3.88	
LAMINITE, grey claystone and light grey siltstone. Bedding angle 89° to core axis, pyrite filled worm casts.	3.44	1128.37	3.37	
CLAYSTONE, dark grey.	0.42	1128.79	0.41	
SANDSTONE, medium grained coaly wisps, quartz-lithic. Bedding angle 88° to core axis.	11.90	1140.69	11.66	
CLAYSTONE, carbonaceous, sandy interbeds throughout, sandstone phases often crossbedded, carbonaceous claystone at base, bedding planes often disturbed.	2.74	1143.43	2.69	
SANDSTONE, medium grained, quartz lithic, coaly inclusions. Bedding irregular.	1.34	1144.77	1.31	
CLAYSTONE, carbonaceous, black, sandstone interbeds near top with worm casts (sandy blebs). Bedding angle 89° to core axis.	2.32	1147.09	2.27	
<u>COAL</u> , bright.	0.12	1147.21	0.12	

SUKUNKA D.D.H. C-37

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
CLAYSTONE, black, bright coal bands, carbonaceous.	0.34	1147.55	0.33	
CLAYSTONE, carbonaceous, black, bright coal bands.	1.45	1149.00	1.42	
SILTSTONE, grey, with sandstone phases throughout, sandstone phases often crossbedded.	1.27	1150.27	1.27	
SANDSTONE, medium grained, quartz lithic, some crossbedded phases.	7.84	1158.11	7.84	
LAMINITE, grey siltstone and dark grey claystone, Bedding angle 90° to core axis.	3.59	1161.70	3.59	
CLAYSTONE, carbonaceous, black.	0.72	1162.42	0.72	
<u>COAL</u> , mainly dull with minor bright bands.	0.29	1162.71	0.12)
dull and bright.	0.48	1163.19	0.20)
mainly dull with minor bright bands.	0.82	1165.01	0.34)
dull.	0.84	1164.85	0.35)

SKEETER SEAM

SUKUNKA D.D.H. C-37

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , mainly dull with minor bright bands.	0.57	1165.42	0.47)
core lost.	2.15	1167.57	0.00)
CLAYSTONE, carbonaceous, black, calcite filling irregular fractures, calcite filled joint plane 70° to core axis.	1.19	1168.76	1.19)
SILTSTONE, grey, with dark grey claystone interbeds.	2.62	1171.38	2.62)
<u>COAL</u> , mainly dull with minor bright bands, core broken.	1.71	1173.09	0.57)
SILTSTONE, some mudstone phases. Bedding indistinct and irregular.	4.32	1177.41	4.32)
SILTSTONE AND MUDSTONE INTERBEDDED, grey siltstone and dark grey mudstone, sandstone phases near top.	6.01	1183.42	6.13)
LAMINITE, dark grey claystone and grey siltstone. Bedding angle 88° to core axis.	11.68	1195.10	11.68)
STONE, coaly specific gravity > 1.6.	0.39	1195.49	0.39)

SKEETER SEAM

SUKUNKA D.D.H. C-37

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull and bright.	0.40	1195.89	0.34)
)
mainly bright with minor dull bands.	0.08	1195.97	0.08)
)
mainly dull with minor bright bands.	0.10	1196.07	0.10)
)
dull.	0.10	1196.17	0.10)
)
mainly dull with minor bright bands.	0.19	1196.36	0.19)
)
bright.	0.10	1196.46	0.10)
)
mainly dull with minor bright bands.	0.20	1196.66	0.20)
)
bright.	0.04	1196.70	0.04)
)
dull.	0.22	1196.92	0.22)
)
mainly dull with minor bright bands.	0.08	1197.00	0.08)
)
dull.	0.37	1197.37	0.37)
)
mainly dull with minor bright bands.	0.22	1197.59	0.22)

CHAMBERLAIN SEAM

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , mainly bright with minor dull bands.	0.27	1197.86	0.27)
dull and bright.	0.19	1198.05	0.19)
mainly bright with minor dull bands.	0.24	1198.29	0.24)
mainly dull with minor bright bands.	0.19	1198.48	0.19)
bright.	0.09	1198.57	0.09)
mainly bright with minor dull bands.	0.18	1198.75	0.25	) CHAMBERLAI SEAM
dull and bright.	0.15	1198.90	0.15)
dull.	0.21	1199.11	0.21)
dull and bright.	0.24	1199.35	0.24)
mainly dull with minor bright bands.	0.22	1199.57	0.22)
dull and bright.	0.13	1199.70	0.13)
mainly bright with minor dull bands.	0.19	1199.89	0.19)

SUKUNKA D.D.H. C-37

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , mainly dull with minor bright bands.	0.22	1200.11	0.22)
dull.	0.15	1200.26	0.15)
mainly bright with minor dull bands.	0.19	1200.45	0.19)
dull.	0.07	1200.52	0.07)
mainly bright with minor dull bands.	0.22	1200.74	0.22)
dull.	0.09	1200.83	0.09	) CHAMBERLAIN SEAM
mainly dull with minor bright bands.	0.27	1201.10	0.37)
dull and bright.	0.24	1201.34	0.24)
mainly dull with minor bright bands.	0.14	1201.48	0.14)
mainly bright with minor dull bands.	0.21	1201.69	0.21)
dull banded mainly dull with minor bright bands.	0.22	1201.91	0.22)
bright.	0.07	1201.98	0.07)

CHAMBERLAIN SEAM

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull and bright.	0.12	1202.10	0.12)	
mainly dull with minor bright bands.	0.20	1202.30	0.30)	
dull and bright.	0.20	1202.50	0.20)	CHAMBERLAIN SEAM
SANDSTONE, medium to fine grained, quartz lithic, carbonaceous in top 5', coaly inclusions in top 5'. Bedding angle 89° to core axis. Calcite along bedding planes and irregular fractures 0.50 feet from base.	32.81	1235.31	31.17	↓ <u>Base of Hole</u>

BORE NUMBER C-38

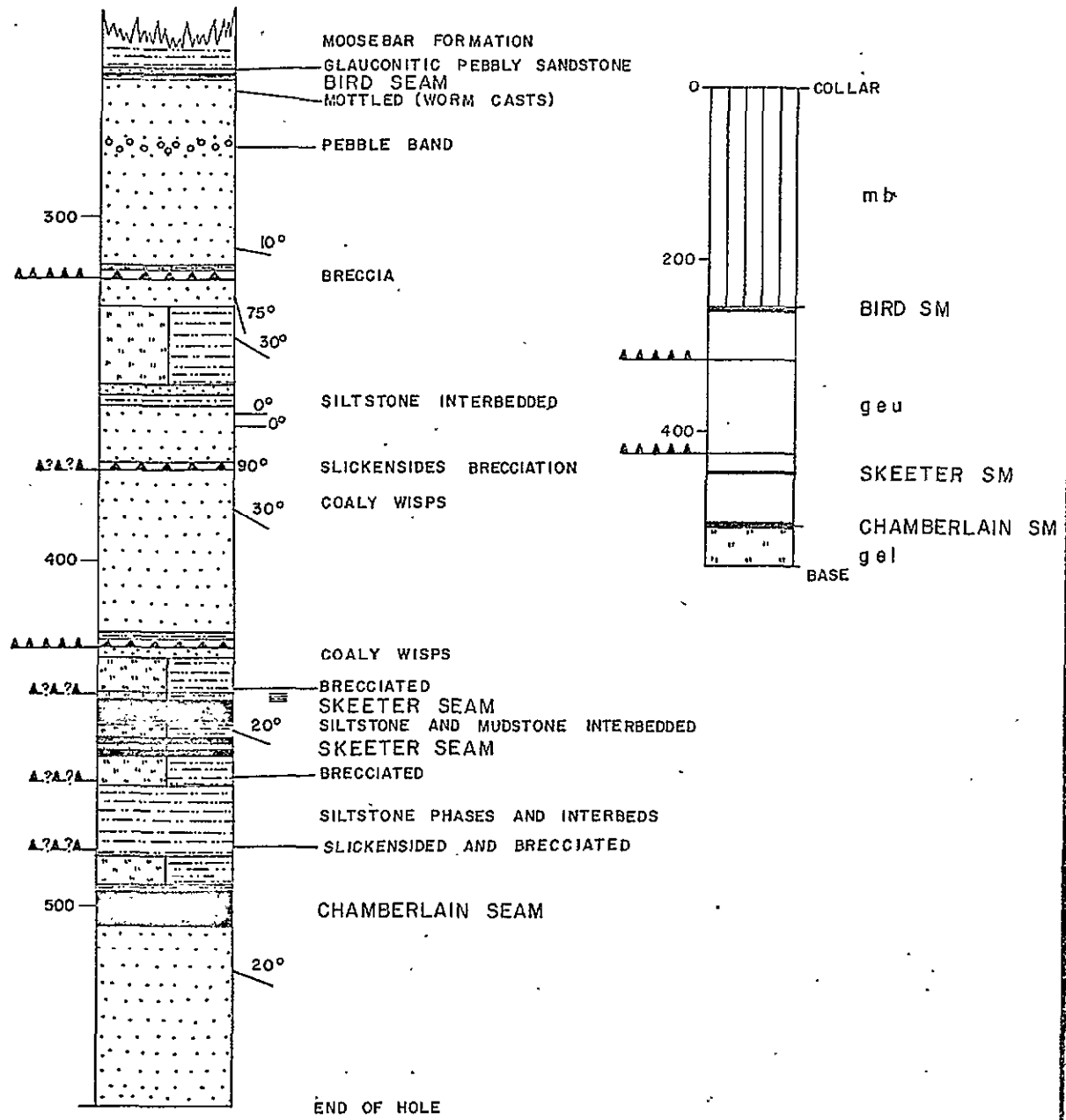
Grid Reference 50914.4 N 85361.1 E
Exploration Grid Reference C' + 900'N / 4 + 1950'E

Date Commenced 26th Oct., 1971 Completed 30th Oct., 1971

Collar R.L. 3764.7 ft. Standard Datum
Total Depth 557.5 ft. Electrically Logged Yes/~~No~~
Drilled by Connors Drilling Ltd.
For Coalition Mining Limited
Logged by R. Shields

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Skeeter	3308.8 ft.	16.86	55%	7.10' of coal analysed
Chamberlain	3257.5 ft.	11.07	81%	



DETAIL OF GETHING FORMATION
SCALE: 1" to 50'

SCALE: 1" to 200'

Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS
D.D.H. C-38

Telegrams and Cables:
"Visor", Sydney

CARGO SUPERINTENDENTS

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Telephone: 241 1105

CO. (A/SIA.) PTY. LTD.

Certification

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APPLICANT: COALITION MINING

SUBJECT: SUKUNKA SAMPLES NO. 111, 112
CORE NO. CS3
CHAMBERLAIN SEAM

REPORT NO: K 71-1757

RECEIVED: 4.11.71

REPORTED: 26.11.71

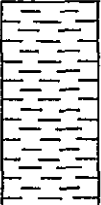

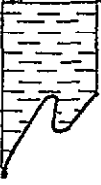


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M. B. ...
Chief Chemist

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

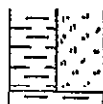
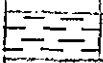

D. W. ...

SKEETER SEAM			ASH % CUMULATIVE FROM FLOOR		
			WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
Continuation					
448.60					
450.67		0.59	NOT ANALYSED		
451.26					
454.37		1.49	NOT ANALYSED		
455.86					

Prepared by:
 CLIFFORD McELROY & ASSOCIATES PTY. LTD.
 for
 COALITION MINING LIMITED
 DRAWN BY S.A. DATE February '72

SEAM SECTIONS
 DDH C-38

SCALE: 1" to 2'

CHAMBERLAIN SEAM				ASH % CUMULATIVE FROM FLOOR		
		WT %	ASH %	C. S. N ^o	INCL. BANDS	EXCL. BANDS
496.08						
					8.4	4.6
		4.06	-	4.9	5½	
500.14						
500.61		0.47	-	85.5	0	
		6.54	-	4.4	7	
507.15						

Prepared by:
 CLIFFORD McELROY & ASSOCIATES PTY. LTD.
 for
 COALITION MINING LIMITED
 DRAWN BY S.A. DATE February '72

SEAM SECTIONS
 DDH C-38

Telegrams and Cables:
"Visor", Sydney

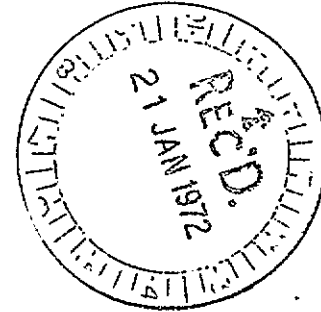
Telephone: 241 1105

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SUPERINTENDENTS
CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

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APPLICANT: COALITION MINING

REPORT ON: SUKUNKA SAMPLE NO. 225
CORE NO. C38
SKEETER SEAN

REPORT NO. K71-2019

RECEIVED: 16. 12. 1971

REPORTED: 19. 1. 1972



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terms of registration.

A.B. Bradley
A.R.A.C.I. Chief Chemist.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

INTRODUCTION: One (1) Coal Sample designated CORE NO. C38 SKEETER SEAM was received on 16. 12. 1971 from Clifford McElroy & Associates

METHOD: The Coal Sample No. 225 was hand crushed to $\frac{3}{4}$ ", sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 225 and the analysis is given in this report.

NOTE: The sample weight has not been adjusted to compensate for core loss.>

RESULTS: TABLE 1 : gives the sizing, washability and analytical data for the sample after hand crushing to $\frac{3}{4}$ " top size

<u>TABLE 1</u>		<u>WASHABILITY DATA FOR SAMPLE NO. 225 (after hand crushing to $\frac{3}{4}$")</u>						
		<u>INDIVIDUAL</u>			<u>CUMULATIVE</u>			
<u>FRACTION</u>		<u>WEIGHT</u>	<u>WT. %</u>	<u>ASH %</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH %</u>	<u>C.S.NO.</u>
	F1.30 SG	800	36.8	2.1	9	36.8	2.1	9
S1.30 -	F1.35 SG	1041	47.9	4.3	8	84.7	3.3	8½
S1.35 -	F1.40 SG	185	8.5	10.4	3	93.2	4.0	8
S1.40 -	F1.45 SG	101	4.6	14.1	2	97.8	4.5	8
S1.45 -	F1.50 SG	19	0.9	17.1	2	98.7	4.6	7½
S1.50 -	F1.55 SG	8	0.4	20.5	2	99.1	4.6	7½
S1.55 -	F1.60 SG	5	0.2	31.0	2	99.3	4.7	7½
S1.60 SG		14	0.7	49.8	½	100.0	5.0	7½
-30 Mesh RC		315	12.7	3.6	8½			
		Total Weight of Sample = 2488 grams						
		True Specific Gravity = 1.305						
		Thickness = 7.10'						

ANALYSIS OF F1.60 SG FRACTION OF SAMPLE NO. 225

Yield %	99.3
Air Dried Moisture %	1.0
Ash %	4.6
Volatile Matter %	19.4
Fixed Carbon %	75.0
Total Sulphur %	0.41
C.S.NO.	8
Calorific Value	14520 BTU/LB

SYDNEY

19th January 1972

Telegrams and Cables:
"Visor", Sydney

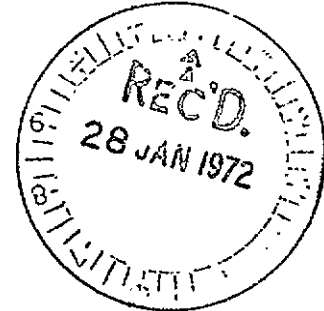
Telephone: 241 1105

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Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

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APPLICANT: COALITION MINING

REPORT ON: SUKUNKA SAMPLES NO. 226, 227, 228
CORE NO. C38
CHAMBERLAIN SEAM

REPORT NO. K71-2020

RECEIVED: 16. 12. 1971

REPORTED: 18. 1. 1972



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been performed in accordance with the
terms of registration.

A. G. Bradley
A.R.A.C.I. Chief Chemist

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

P. McKeown

INTRODUCTION:

Two (2) Coal Samples and One (1) Non Coal Sample designated CORE NO. C38 CHAMBERLAIN SEAM were received on 16. 12. 1971 from Clifford McElroy & Associates

METHODS:

1. The Non Coal Sample No. 227 was weighed, prepared and analysed for Ash and true specific gravity.
2. The good quality Coal Samples No. 226 and 228 were hand crushed to 3/4", sized at 30 mesh BSS and the +30 mesh FRACTION washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps

The float and sink fractions and raw -30 mesh coal fractions were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for the Full Seam and the analysis is given in this report.

RESULTS:

FIGURE 1 : gives the graphic log

TABLES 1-2 : give the sizing, washability and analytical data for each coal sample after hand crushing to 3/4" top size.

TABLE 3 : gives the calculated washability data for the Full Seam i.e. Samples No. 226 + 227 + 228

NOTE:

The sample weights have been adjusted to compensate for core loss

TABLE 1

WASHABILITY DATA FOR SAMPLE NO. 226 (after hand crushing to 3/4")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
FL.30 SG	704	36.7	1.8	9	36.7	1.8	9
S1.30 - FL.35 SG	870	45.3	3.4	4	82.0	2.7	6
S1.35 - FL.40 SG	220	11.4	8.0	1 1/2	93.4	3.3	6
S1.40 - FL.45 SG	64	3.3	10.1	1 1/2	96.7	3.6	5 1/2
S1.45 - FL.50 SG	12	0.6	16.1	1 1/2	97.3	3.6	5 1/2
S1.50 - FL.55 SG	15	0.8	17.5	1 1/2	98.1	3.8	5 1/2
S1.55 - FL.60 SG	4	0.2	22.3	1/2	98.3	3.8	5 1/2
S1.60 SG	32	1.7	83.2	0	100.0	5.1	5 1/2
-30 Mesh RC	215	10.1	3.4	7 1/2			

Total Weight of Sample = 2136 grams
 True specific gravity = 1.299
 Thickness = 4.06'

SAMPLE NO. 227

Total Weight of Sample = 274 grams
 True Specific Gravity = 2.268
 Ash % = 85.5
 Thickness = 0.47'

7

TABLE 2

WASHABILITY DATA FOR SAMPLE NO. 228 (after hand crushing to 3/4")

FRACTION	INDIVIDUAL				CUMULATIVE		
	WEIGHT	WT.%	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
F1.30 SG	1642	54.0	1.7	9	54.0	1.7	9
S1.30 - F1.35 SG	1079	35.5	3.0	5½	89.5	2.2	7½
S1.35 - F1.40 SG	93	3.1	8.3	3½	92.6	2.4	7½
S1.40 - F1.45 SG	38	1.2	9.6	3½	93.8	2.5	7½
S1.45 - F1.50 SG	51	1.7	12.7	3½	95.5	2.7	7½
S1.50 - F1.55 SG	43	1.4	17.0	2½	96.9	2.9	7½
S1.55 - F1.60 SG	21	0.7	19.9	1½	97.6	3.0	7
S1.60 SG	77	2.4	66.2	1	100.0	4.5	7
-30 Mesh RC	355	10.4	3.1	8½			
Total Weight of Sample = 3399 grams							
True Specific Gravity = 1.298							
Thickness = 6.54'							

TABLE 3

CALCULATED WASHABILITY DATA FOR FULL SEAM i.e. SAMPLES NO.
226 + 227 + 228

F1.30 SG	45.1	1.7	9	45.1	1.7	9
S1.30 - F1.35 SG	37.4	3.2	5	82.5	2.4	7
S1.35 - F1.40 SG	6.0	8.1	2½	88.5	2.8	7
S1.40 - F1.45 SG	1.9	10.0	2½	90.4	2.9	7
S1.45 - F1.50 SG	1.2	13.5	2½	91.6	3.1	7
S1.50 - F1.55 SG	1.1	17.3	2	92.7	3.2	7
S1.55 - F1.60 SG	0.5	19.6	1	93.2	3.3	6½
S1.60 SG	6.8	80.4	½	100.0	8.6	6

ANALYSIS OF F1.60 SG FRACTION OF FULL SEAM i.e. SAMPLES
NO. 226 + 227 + 228

Yield %	93.2
Air Dried Moisture %	1.0
Ash %	3.3
Volatile Matter %	20.2
Fixed Carbon %	75.5
Total Sulphur %	0.31
C.S.NO.	6½
Calorific Value	14750 BTU/LB

SYDNEY
18th January 1972

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STRATIGRAPHIC LOG
SUKUNKA D.D.H. C-38

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
Dip 10°	No core to 12.0 ft.		
	MUDSTONE, white bentonic claystone beds at base.	MOOSEBAR FM.	257.6
	SANDSTONE, glauconitic, pebbly.	GETHING FM.	258.5
	<u>COAL.</u>	BIRD SEAM	259.0
	MUDSTONE.		259.5
Dip 5°-10°	SANDSTONE, medium grained, mottled (worm casts) at 261', pebble band at 278'.		314.0
	SILTSTONE AND MUDSTONE INTERBEDDED.		315.0
	SILTSTONE AND SANDSTONE, breccia.		319.0
	SANDSTONE, medium grained, quartz-lithic.		326.6
	SILTSTONE AND MUDSTONE INTERBEDDED, worm casts near base.		349.0
	SANDSTONE.		352.0
	MUDSTONE, silty interbeds.		355.0
	SANDSTONE, coaly wisps, calcite veins and breccia at 372', bedding		

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
	from 0° to 90° at 372', 30° below 372'.		421.0
	MUDSTONE.		423.0
Fault, established	SANDSTONE BRECCIA.		425.0
	SANDSTONE, coaly wisps.		428.0
	SILTSTONE AND MUDSTONE INTERBEDDED, brecciated at 436.0.		437.0
	LAMINITE.		439.0
	<u>COAL.</u>	SKEETER SM.	446.0
	MUDSTONE.)		447.0
)		
	SILTSTONE AND MUDSTONE INTERBEDDED.)		451.0
)		
	<u>COAL.</u>)		452.0
)		
Dip 20°	SILTSTONE AND MUDSTONE INTERBEDDED.)		455.0
)		
	<u>COAL.</u>)		456.0
)		
	SILTSTONE AND MUDSTONE INTERBEDDED, brecciated at 462' and slickensided.	GETHING FM.	465.0
	MUDSTONE, silty phases and interbeds, slickensided and brecciated from 480' to 485'.		486.0
	SILTSTONE AND MUDSTONE INTERBEDDED, mudstone at base.		496.0
	<u>COAL.</u>	CHAMB. SM.	507.0

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
	SANDSTONE, carbonaceous at top - coarse at top becoming finer.		557.5 <u>Base of Hole</u>

SUKUNKA D.D.H. C-38

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
Core not logged in detail - refer to Stratigraphic Log for particulars.				
SANDSTONE, fine grained to medium grained, quartz-lithic, carbonaceous interbeds, crossbedded phase. 0.5' carbonaceous claystone at 369.6', occasional joint 15° to core axis.	19.33	374.91	19.27	
SANDSTONE, as above. Bedding angle 78° to core axis.	2.54	377.45	2.54	
SANDSTONE, as above, calcite, breccia slickensides. 378' bedding 61° to core axis. 380' slickensides 38° to core axis. 381' bedding 35° to core axis. 381.4' slickensides 015° to core axis. 382' bedding 0° to core axis. 386' bedding 61° to core axis. 393' bedding 60° to core axis.	16.05	393.50	16.0	
SANDSTONE, fine grained to medium grained, quartz-lithic, carbonaceous interbeds crossbedded phases, coaly wisps.	3.65	397.15	3.64	

SUKUNKA D.D.H. C-38

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
worm casts (sand blebs) at 408.5', carbonaceous claystone band (0.5') at 399.8'. Bedding angle 60° to core axis.	24.05	421.20	23.98	
CLAYSTONE, black, carbonaceous, slickensides. Bedding planes 50° to core axis.	1.01	402.21	1.01	
SANDSTONE, as above, thin carbonaceous interbeds predominant, slickensides at base 40° to core axis.	0.90	423.11	0.90	
SANDSTONE, fine grained to medium grained, quartz-lithic, carbonaceous interbeds, coaly wisps, calcite and breccia in upper half.	6.03	429.14	5.80	
CLAYSTONE, black, carbonaceous, weak bedding 65° to core axis.	0.68	429.82	0.60	
SANDSTONE, thin carbonaceous interbeds predominant.	0.98	430.80	0.85	
CLAYSTONE, black, carbonaceous, slickensides, 47° to core axis.	0.73	431.53	0.64	
SILTSTONE, grey, coaly inclusions.	2.28	433.81	1.99	

SUKUNKA D.D.H. C-38

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
LAMINITE, grey siltstone and dark grey claystone, sandstone phases, calcite and slickensides at 436', 65° to core axis. Bedding angle 80° to core axis at base.	4.39	438.20	3.92	
CLAYSTONE, black, carbonaceous.	0.80	439.00	0.79	
<u>COAL</u> , shear planes 40°, 75° to core axis, coal too friable to detail log.)
dull, chips only	2.05	441.05	1.60)
dull.	3.13	444.18	2.45)
dull and bright.	1.92	446.10	1.50	) FAULTED ?
CLAYSTONE, dark grey, siltstone phases, 0.02' coal and calcite at top, two slickensides 45°, 65° to core axis.	0.90	447.00	0.90	) SKEETER
CLAYSTONE, dark grey, occasional sandstone phases.	3.67	450.67	3.67	) SEAM
<u>COAL</u> , dull, friable, broken.	0.59	451.26	0.35)

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
CLAYSTONE, dark grey, coaly at top.	0.72	451.98	0.72)
SILTSTONE, grey, calcite on bedding planes 65° to core axis. Breccia and slickenside at base, slickenside 40° to core axis.	2.39	454.37	2.39	) FAULTED ?) SKEETER) SEAM
<u>COAL</u> , dull, friable, broken.	1.49	455.86	0.65)
CLAYSTONE, dark grey, coaly at top.	0.70	456.56	0.70	
SILTSTONE, grey, slickensides on bedding planes, highly broken at base. 458.3' bedding angle 35° to core axis. 461.3' bedding angle 15°, 10° to core axis. 462.5' bedding angle 0° to core axis.	6.02	462.58	5.41	
CLAYSTONE, black, highly broken, slickenside 5° to core axis.	4.92	467.50	1.24	
SILTSTONE, grey, dark grey towards base.	1.74	469.24	1.70	
LAMINITE, grey siltstone and dark grey claystone. Bedding angle 73° to core axis.	2.92	472.16	2.85	

SUKUNKA D.D.H. C-38

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
LAMINITE, as above, slickensides on bedding planes. 475' bedding angle 68° to core axis. 478' bedding angle 46° to core axis. Slickensided at base, 70° to core axis.	6.74	478.90	6.57	
CLAYSTONE, black, highly broken, slickensides, fault gouge.	4.00	482.90	3.90	
SILTSTONE, grey, calcite veinlets, highly broken, slickensides.	2.23	485.13	2.18	
LAMINITE, as above, highly broken, calcite, slickensides on bedding planes. 487' bedding plane 40° to core axis. 486.7' slickenside 65° to core axis. 489.6' bedding plane 58° to core axis.	4.72	489.85	4.60	
LAMINITE, as above, broken, slickensides. at 491' bedding angle 54° to core axis. at 491' slickensides 35° to core axis. at 493' bedding angle 60° to core axis. at 493' slickensides 19°, 31° to core axis. at base bedding and slickenside 31° to core axis.	5.98	495.83	4.74	

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Rema</i>
CLAYSTONE, dark grey, chips SG > 1.60.	0.25	496.08	0.25	
<u>COAL</u> , coal breaks along shear planes, highly friable, no cleats or bands discernable. Major shear plane 29° to core axis.	4.06	500.14	3.47)
CLAYSTONE, dark grey, chips (roof again?) SG > 1.60.	0.47	500.61	0.40)
<u>COAL</u> , coal breaks along shear planes, highly friable no cleats or bands discernable. Major shear plane 29° to core axis.	6.54	507.15	5.60)
SANDSTONE, medium grained, quartz-lithic, coaly in upper 5', carbonaceous. 507.5' slickenside 45° to core axis. 508' slickenside 50° to core axis. 508.5' joint 90° to above slickenside.	1.43	508.58	1.42	) CHAMBEI SEAM
SANDSTONE, as above, broken medium grained to 517.5', fine grained to medium grained. Calcite on joints, occasional slickensides. Joints 47°, 70° to core axis two slickensides 49°, 21° to core axis. Bedding angle 45° to core axis.	18.42	527.00	18.23	

SUKUNKA D.D.H. C-38

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<p>SANDSTONE, as above, massive. 528.2', slickenside 38° to core axis. 528.2', slickenside 70° to above slickenside. 5325' slickenside on bedding 16° to core axis. 542.5' slickenside on bedding 15° to core axis.</p>	18.97	545.97	18.79	
<p>SANDSTONE, as above, fine grained to medium grained, less disturbed than above, coaly inclusions last 2'. 547' slickenside on bedding 19° to core axis. 552' bedding 19° to core axis.</p>	11.53	557.50	11.41	
				<p style="text-align: center;"><u>Base of Hole</u></p>

BORE NUMBER C-39

Grid Reference 49866.7 N 84115.0 E
Exploration Grid Reference C' + 700'N / 4 + 300'E

Date Commenced 30th Oct., 1971 Completed 6th Nov., 1971

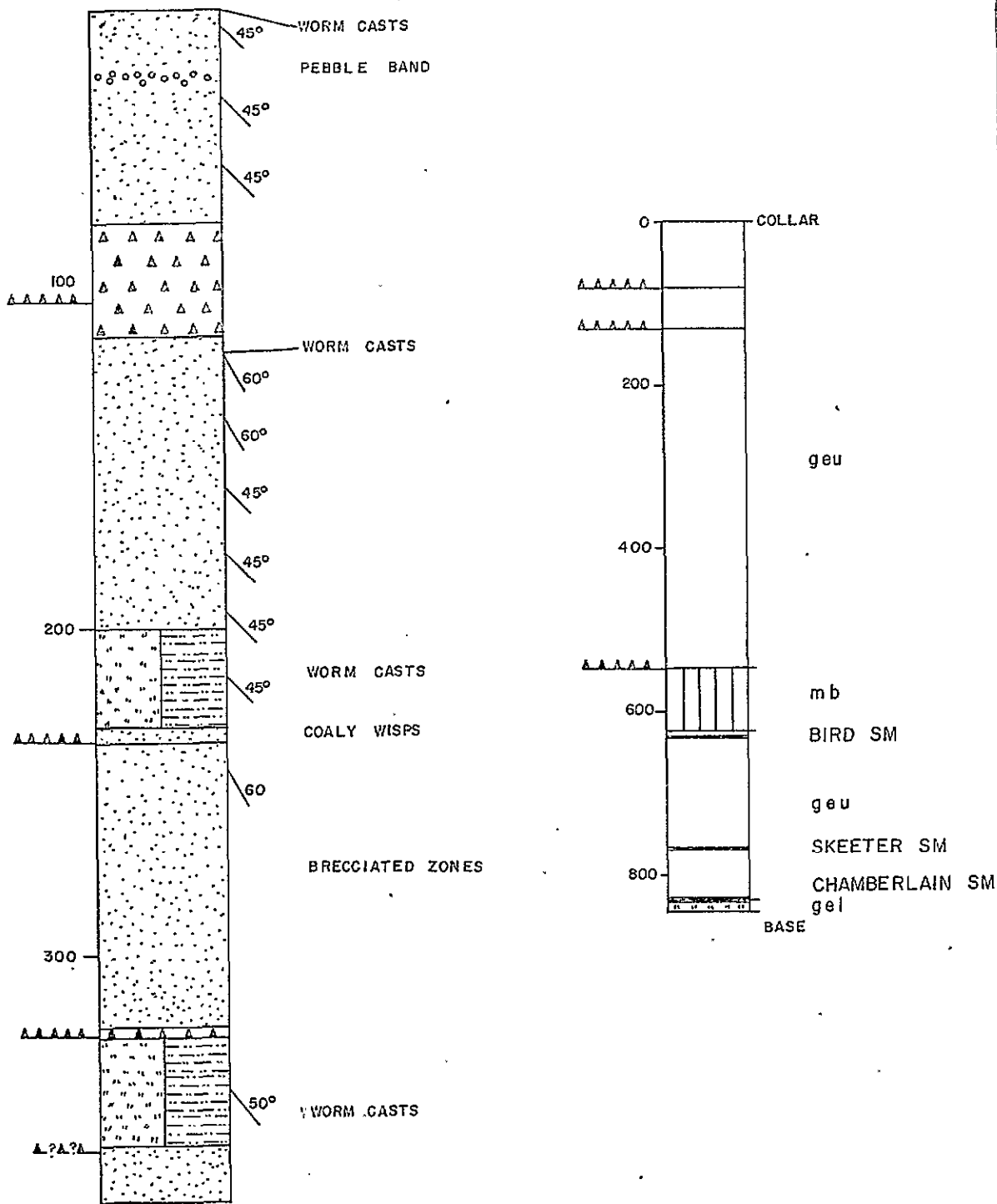
Collar R.L. 3888.6 ft. Standard Datum
Total Depth 846.5 ft. Electrically Logged Yes/No

Drilled by Connors Drilling Ltd. Angled Hole
For Coalition Mining Limited Tropari Angle 50°
Azimuth 235° True

Logged by G. Jordan

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Skeeter	3223.1 ft.	7.45	65%	
Chamberlain	3173.6 ft.	3.90	23%	



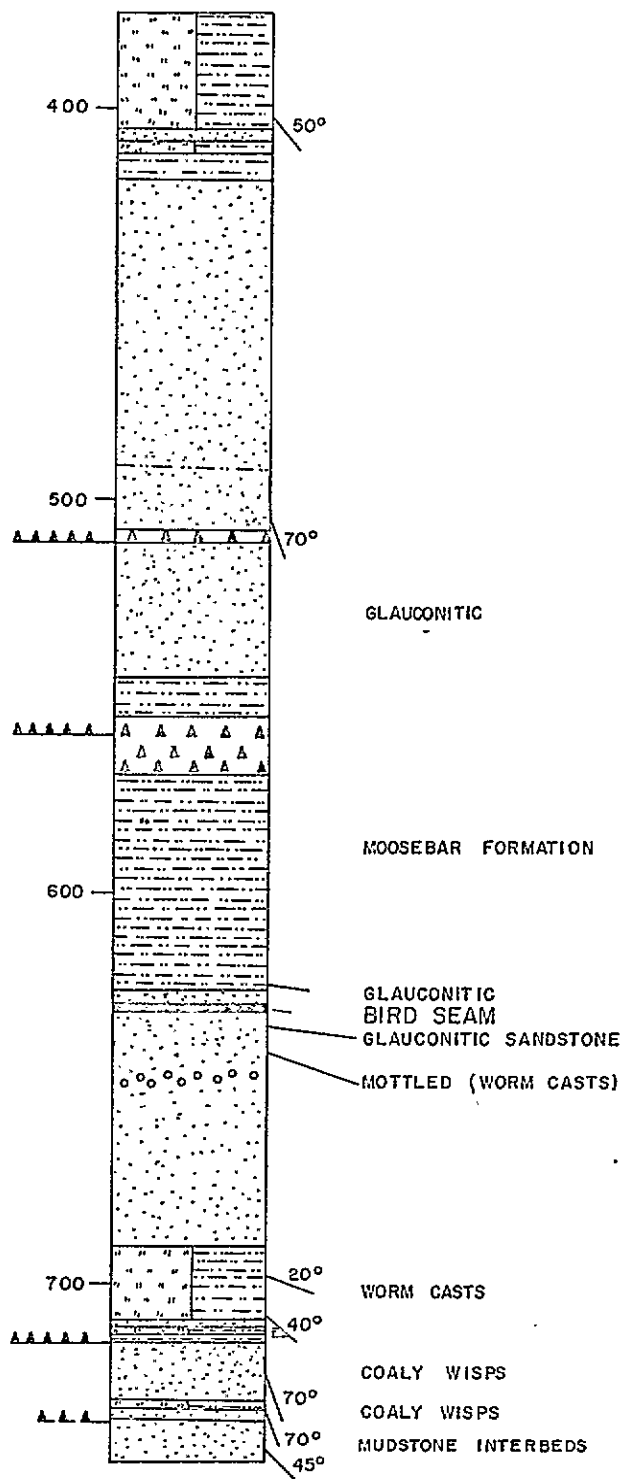
DETAIL OF GETHING
FORMATION
SCALE: 1" to 50'

SCALE: 1" to 200'

Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS

D.D.H. C-39

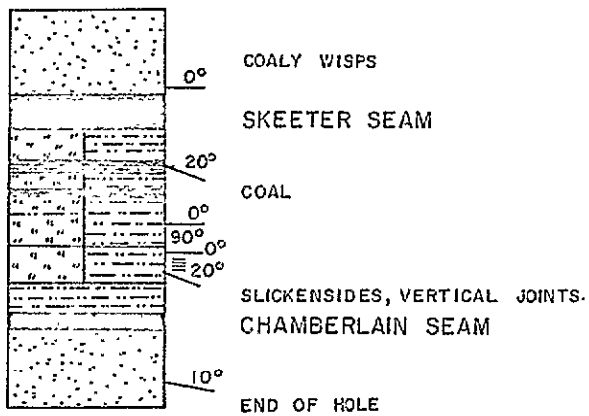


DETAIL OF GETHING
FORMATION
SCALE: 1" to 50'

SCALE: 1" to 200'

Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS
D.D.H. C-39



DETAIL OF GETHING
 FORMATION
 SCALE: 1" to 50'

SCALE: 1" to 200'

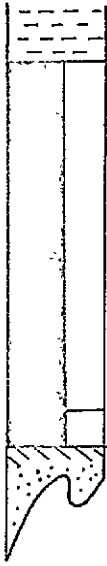
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STRATIGRAPHIC LOGS
 D.D.H. C-39

SKEETER SEAM				ASH CUMULATIVE % FROM FLOOR	
	WT %	ASH %	C. S. N ^o	INCL. BANDS	EXCL. BANDS
768.70	0.28	2.5	8	14.4	
	0.48	87.0	0		
	6.69	5.7	7½	5.7	
776.15					

CHAMBERLAIN SEAM

ASH %
CUMULATIVE
FROM FLOOR

		WT%	ASH%	C. S. No	INCL BANDS	EXCL. BANDS
823.51					7.2	
		-	7.2	4½		
827.41						

Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED
DRAWN BY K.W. DATE February '72

SEAM SECTIONS
DDH C-39

SCALE: 1" to 2'

PAGE 1 of 1

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

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CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

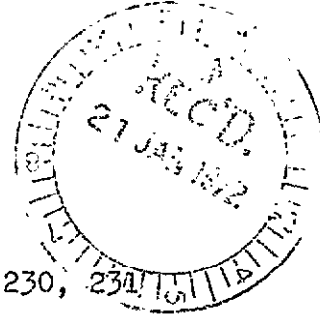
Certification

K 71 - 2021

This is to Certify

APPLICANT: COALITION MINING

REPORT ON: SUKUNKA SAMPLES NO. 229, 230, 231,
CORE NO. C39
SKEETER SEAM



REPORT NO: K 71 - 2021

RECEIVED: 16. 12. 71

REPORTED: 19. 1. 72



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Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

A. R. A. Bennett
A. R. A. Bennett

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

[Signature]

INTRODUCTION:

Two (2) coal samples and one (1) non coal sample designated Core No. C 39 Skeeter Seam were received on 16.12.71 from Clifford McElroy and Associates.

METHODS:

1. The non coal sample No. 230 was weighed, prepared and analysed for Ash and true Specific Gravity.
2. The visibly inferior coal sample No. 229 was hand crushed to $\frac{3}{4}$ " , sized at 30 Mesh BSS and the + 30 Mesh BSS fraction washed in organic liquids at 1.60 S.G. The float and sink fractions, raw -30 Mesh coal fractions were weighed, prepared and analysed for Ash and Crucible Swelling Number and the compositeraw coal sample reconstituted and the true S.G. of the sample determined.
3. The good quality sample No. 231 was hand crushed to $\frac{3}{4}$ " , sized at 30 Mesh BSS and the +30 Mesh BSS fraction washed in organic liquids at 1.30 to 1.60 S.G. in 0.05 steps.

The float and sink fractions, raw -30 Mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true S.G. of the sample determined.

Accumulative F160 S.G. fraction was prepared for sample No. 231 and the analysis is given in this report, the analysis of the fullseam i.e. samples 229 to 231 as also given

NOTE:

Sample weights have been adjusted to compensate for core loss.

RESULTS:

Tables 1 - 2 : give the sizing washability and analytical data for each coal samples after hand crushing to $\frac{3}{4}$ " top size.

TABLE 1

WASHABILITY DATA FOR SAMPLE NO. 229 (after hand crushing to $\frac{3}{4}$ ")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT %</u>	<u>ASH%</u>	<u>CS NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>CS NO.</u>
F 1.60 SG.	52	100.0	25	8	100.0	2.5	8
S 1.60 SG.	NIL	NIL	NIL	NIL	100.0	2.5	8
-30 Mesh	2	3.7	3.7	8½			

Total Weight : 54 gms.
True Specific G.: 1.289
Thickness : 0.28'

SHEET THREE ATTACHED

SAMPLE NO. 230

Total Weight : 479 gms.

Ash : 87.0 %

TRUE S.G. : 2.300

Tickness : 0.48²

TABLE 2

WASHABILITY DATA FOR SAMPEE No. 231 (after hand crushing to $\frac{3}{4}$ ")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT %</u>	<u>ASH%</u>	<u>CS NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>CS NO</u>
F 1.30 SG.	838	34.3	2.1	9	34.3	2.1	9
S 1.30 -F 1.35 SG.	954	39.0	4.7	9	73.3	3.5	9
1.35 -F 1.40	341	13.9	9.1	4 $\frac{1}{2}$	87.2	4.4	8 $\frac{1}{2}$
1.40 -F 1.45	109	4.4	11.1	4	91.6	4.7	8
1.45 -F 1.50	98	4.0	15.5	3	95.6	5.2	8
1.50 -F 1.55	63	2.6	18.9	2 $\frac{1}{2}$	98.2	5.5	7 $\frac{1}{2}$
1.55 -F 1.60	23	0.9	19.9	1 $\frac{1}{2}$	99.1	5.6	7 $\frac{1}{2}$
1.60	20	0.9	40.8	0	100.0	6.0	7 $\frac{1}{2}$
-30 Mesh	338	13.8	3.5	8 $\frac{1}{2}$			

Total Weight : 2784 gms

True S.G. ; 1.311

Tickness : 6.69

ANALYSIS OF F 1.60 S.G. FRACTION OF SAMPLE NO.231

<u>YIELD</u>	<u>AIR DRIED</u>	<u>ASH</u>	<u>VOLATILE</u>	<u>FIXED</u>	<u>TOTAL</u>	<u>CRUCIBLE</u>	<u>CALORIFIC</u>
	<u>MOISTURE</u>		<u>MATTER</u>	<u>CARBON</u>	<u>SULPHUR</u>	<u>SWELLING</u>	<u>VALUE</u>
						<u>NUMBER</u>	
99.1	1.0	5.5	20.8	72.7	0.41	7 $\frac{1}{2}$	14240

ANALYSIS OF F 1.60SG. FRACTION OF FULL SEAM i.e. 229+230+231

YIELD	85.0
AIR DRIED MOISTURE	1.0
ASH	5.5
VOLATILE MATTER	20.8

FIXED CARBON	72.7
TOTAL SULPHUR	0.41
CRUCIBLE SWELLING NUMBER	7 $\frac{1}{2}$
CALORIFIC VALUE	14,240

SYDNEY

19th January, 1972.



Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

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SYDNEY, 2000

Certification

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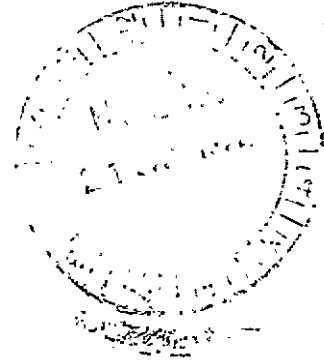
APPLICANT: COALITION MINING

**REPORT ON: SUKUNKA SAMPLE NO. 232
CORE NO. C39
CHAMBERLAIN SEAM**

REPORT NO. K71-2022

RECEIVED: 16. 12. 1971

REPORTED: 20. 1. 1972



This Laboratory is Registered by the
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Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

M. Bradley
A.R.A.C.I. Chief Chemist.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

INTRODUCTION:

One (1) Coal Sample designated CORE NO. C39 CHAMBERLAIN SEAM was received on 16. 12. 1971 from Clifford McElroy & Associates.

METHOD:

The Coal Sample No. 232 was hand crushed to $\frac{3}{8}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 232 and the analysis is given in this report.

NOTE:

The sample weight has not been adjusted to compensate for core loss.

RESULTS:

TABLE 1 : gives the sizing, washability and analytical data for the sample after hand crushing to $\frac{3}{8}$ " top size.

TABLE 1

WASHABILITY DATA FOR SAMPLE NO. 232 (after hand crushing to $\frac{3}{8}$ ")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
Fl.30 SG	148	27.7	1.6	8½	27.7	1.6	8½
S1.30 - Fl.35 SG	271	50.7	3.4	3½	78.4	2.8	5½
S1.35 - Fl.40 SG	50	9.4	7.4	1½	87.8	3.3	5
S1.40 - Fl.45 SG	19	3.6	10.2	1½	91.4	3.5	5
S1.45 - Fl.50 SG	12	2.2	13.9	1½	93.6	3.8	5
S1.50 - Fl.55 SG	6	1.1	21.9	1	94.7	4.0	4½
S1.55 - Fl.60 SG	1	0.2	25.9	½	94.9	4.0	4½
S1.60 SG	27	5.1	70.3	0	100.0	7.4	4½
-30 Mesh RC	33	5.8	3.9	8			

Total Weight of Sample = 567 grams
True Specific Gravity = 1.304
Thickness = 3.90"

ANALYSIS OF Fl.60 SG FRACTION OF SAMPLE NO. 232

Yield %	94.9
Air Dried Moisture %	1.0
Ash %	4.0
Volatile Matter %	18.1
Fixed Carbon %	76.9
Total Sulphur %	0.39
C.S.NO.	5
Calorific Value	14690 BTU/LB

SYDNEY
20th January 1972

STRATIGRAPHIC LOG
SUKUNKA D.D.H. C-39

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
Fault, established	<p>No core to 10.0 ft.</p> <p>SANDSTONE, medium grained, calcite veins and fractures throughout, mottled (worm casts) at 11, 116, pebble band at 29', 141' and 144', worm casts at 51', brecciated from 76' to 111', carbonaceous shale and slickensided coaly bands at 110'. - Dip 45° at 20', 45° at 40', 45° at 60', variable in brecciated zone, 60° at 120', 60° at 140', 45° at 160', 45° at 180' 45° at 200'.</p>	GETHING FM.	202.0
Fault, established	<p>SILTSTONE AND MUDSTONE INTERBEDDED, worm casts, bedding 45°.</p> <p>SANDSTONE, coaly wisps.</p>		229.0 233.0
Dip 60° at 250 ft.	<p>MUDSTONE, silty interbeds, slickensides and sheared at base (1').</p>		243.0
Fault, established	<p>SANDSTONE, medium grained, calcite veins and some small brecciated zones.</p>		322.0
Fault, established	<p>SANDSTONE AND SILTSTONE, breccia, slickensided and broken chips.</p>		325.0
	<p>SILTSTONE AND MUDSTONE INTERBEDDED, worm casts 350', slickensides and listric surfaces at base, granules at base (above breccia).</p>		358.0

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
Dip 50°	SANDSTONE.		376.0
	SILTSTONE AND MUDSTONE INTERBEDDED, worm casts, granules at base.		404.0
	SANDSTONE.		408.0
Dip 50°	LAMINITE, siltstone and mudstone.		411.0
	MUDSTONE.		417.0
Fault, established	SANDSTONE, coaly wisps, brecciated at base, mudstone bands at 490'.		510.0
Dip 70°	SANDSTONE, glauconitic.	GETHING FM.	546.0
Fault, established	MUDSTONE, calcite veins and slickensides throughout, breccia zone 554'-561'.	MOOSEBAR FM.	625.0
Dip 5°-10°	SANDSTONE, glauconitic, core lost 628.9'-629.9'? - probably Bird Seam, coal chip in box.	GETHING FM.	628.9
	SANDSTONE, glauconitic.		630.6
	SANDSTONE, coarse at top becoming finer, pebble band at 649.3' (1.0') mottled (worm casts) at 635'.		690.0
Dip 20°	SILTSTONE AND MUDSTONE INTERBEDDED, (worm casts).		709.0
	SANDSTONE.		711.0
	LAMINITE, siltstone and mudstone.		713.0

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
Fault, established Dip 20° at top 40° at base	MUDSTONE, listric surfaces near base.		719.0
Dip 40°-70° at base	SANDSTONE, coaly wisps.		729.0
Dip 70° to recumbent	LAMINITE, brecciated at base.		731.0
	SANDSTONE, coaly wisps, recumbent fold.		734.0
Dip 70° at top 40° at base	SANDSTONE AND MUDSTONE INTERBEDDED.		746.0
Dip varies from 45° to 0° at base	SANDSTONE, coaly wisps.		768.0
	MUDSTONE.		768.8
	<u>COAL.</u>)		770.3
	MUDSTONE.)		770.8
	<u>COAL.</u>)	SKEETER SM.	776.0
	SILTSTONE AND MUDSTONE.)		783.0
	<u>COAL.</u>)		784.5
	MUDSTONE.		786.0
Dip 20°	SILTSTONE AND MUDSTONE INTERBEDDED.	GETHING FM.	791.0
	<u>COAL</u> , fragments.		792.0
	MUDSTONE.		793.0
	SILTSTONE AND MUDSTONE INTERBEDDED, mudstone band at 798' bedding 0°-90°-0° at 802'.		806.6

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
Dip 10°	LAMINITE.		815.0
	MUDSTONE, slickensided, vertical joints.		823.6
	<u>COAL.</u>	CHAMB. SM.	827.0
	SANDSTONE, coarse at top, fine near base.		846.6
			<u>Base of Hole</u>

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
Core not logged in detail - refer to Stratigraphic Log for particulars.				
SANDSTONE, fine grained, quartz-lithic. Bedding angle 70° to core axis.	3.00	690.05	3.00	
SILTSTONE AND MUDSTONE INTERBEDDED, grey siltstone and dark grey claystone forming graded sequences, (younging upwards), bedding planes disturbed by sole markings and worm casts.	19.42	709.47	19.20	
SANDSTONE, medium grained, coaly inclusions in top 1'. Bedding angle 77° to core axis, calcite along irregular fractures in top 0.50'.	2.11	711.58	2.07	
LAMINITE, grey siltstine and dark grey claystone, slickensides and listric surfaces along some bedding planes. Bedding angle to core axis increases from 77° to 40°.	5.86	717.44	5.76	
CLAYSTONE, black, listric surfaces become sub-parallel to core axis, siltstone bands show drag faults in claystone.	2.19	719.63	2.15	

SUKUNKA D.D.H. C-39

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, medium grained, quartz-lithic, coaly wisps and inclusions throughout. Bedding angles, 40° to core axis. Calcite along joints is 43° and 68° to core axis, recumbent fold in the stratum.	8.10	727.73	7.96	
LAMINITE, grey, siltstone and dark grey claystone, listric surfaces. Bedding angle from 20° to core axis to vertical and cusped at base, listric surfaces on all breaks, slickensided fragments at base.	2.39	730.12	2.35	
SANDSTONE, as above, large recumbent fold in the stratum.	3.71	733.83	3.65	
LAMINITE, as above, sandstone interbeds towards base, pyritic band near base.	8.35	742.18	8.21	
SANDSTONE, medium grained, quartz-lithic, claystone interbeds. Bedding angle 47° to core axis.	3.45	745.63	3.39	
SANDSTONE, medium grained, quartz-lithic, coaly wisps and inclusions, calcite along irregular fractures, bedding planes and vertical joint planes. Bedding angle varies from 60° to 90° to core axis.	21.92	767.55	21.57	

SUKUNKA D.D.H. C-39

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE AND CARBONACEOUS CLAYSTONE INTERBEDDED, fine grained quartz-lithic sandstone interbedded with irregular laminae of carbonaceous claystone. Bedding angle 85° to core axis.	0.84	768.39	0.83	
CLAYSTONE, carbonaceous.	0.31	768.70	0.30	
<u>COAL</u> , dull and bright.	0.28	768.98	0.28)
CLAYSTONE, grey.	0.48	769.46	0.48)
<u>COAL</u> , dull and bright, fragments in base, no bands seen as core breaks along very closely spaced shear planes (less than 0.01' apart), no cleats, one shear plane at 55° to core axis.	6.69	776.15	2.65	) SKEETER SEAM
CLAYSTONE, dark grey, calcite along fractures.	0.15	776.30	0.15	
SILTSTONE, grey, claystone phases and interbeds. Bedding angle 72° to core axis.	3.91	780.21	3.91	
SILTSTONE, core broken with slickensides, calcite veins and listric surfaces.	1.73	781.94	0.15	

SUKUNKA D.D.H. C-39

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE, core unbroken, as above.	1.27	783.21	1.27	
<u>COAL</u> , dull and bright, core broken.	1.77	784.98	0.55	
CLAYSTONE, carbonaceous, bright coal bands.	0.41	785.39	0.41	
CLAYSTONE, grey, slickensides at base.	1.12	786.51	1.12	
SILTSTONE, grey, with dark grey claystone phases.	0.76	787.27	0.76	
SILTSTONE, as above, bedding highly irregular, sedimentary disturbance.	2.09	789.36	2.09	
SILTSTONE AND MUDSTONE INTERBEDDED, grey siltstone and dark grey claystone, bedding irregular. Bedding angle 65° to core axis.	0.83	790.19	0.83	
<u>COAL</u> , very fine chips in box.	0.31	790.50	0.76	
CLAYSTONE, carbonaceous, black - possible repeat of claystone carbonaceous at 786.5'.	1.50	792.00	1.50	
SANDSTONE, fine grained, quartz-lithic, grey claystone interbeds. Bedding angle 72° to core axis.	2.05	794.05	2.05	

SUKUNKA D.D.H. C-39

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
CLAYSTONE, dark grey, core broken and slickensided, calcite along irregular fractures.	0.82	794.87	0.82	
CLAYSTONE, dark grey, carbonaceous phases, possibly second repeat of claystone carbonaceous at 786.5'.	0.73	795.60	0.73	
SANDSTONE, quartz lithic, fine grained, with grey claystone interbeds, calcite along irregular fractures.	1.46	797.06	1.46	
CLAYSTONE, carbonaceous.	0.18	797.24	0.16	
CORE MISSING.	1.41	798.65	0.00	
CLAYSTONE, dark grey to carbonaceous, slickensided surfaces, core broken.	0.19	798.84	0.17	
CLAYSTONE, dark grey, carbonaceous at top, possibly third repeat of claystone carbonaceous at 786.5'.	1.39	800.23	1.21	
SANDSTONE, fine grained, quartz-lithic, grey claystone interbeds throughout. Bedding angle 85° to core axis calcite along joints and irregular fractures, joints at 32° to core axis.	1.89	802.12	1.65	

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
LAMINITE, grey siltstone and dark grey claystone. Bedding angle 88° to core axis.	0.44	802.56	0.38	
LAMINITE, as above, variable core axis to bedding angle from 90° to 20°, calcite along bedding and fractures, all surfaces slickensided.	1.75	804.31	1.53	
LAMINITE, as above, core not broken and bedding angle 68° to core axis.	1.00	805.31	0.87	
SILTSTONE AND CLAYSTONE, core broken, dip slickensided.	0.95	806.26	0.83	
LAMINITE, grey siltstone and dark grey claystone. Bedding angle 85° to core axis at top ranging to 45° at base - calcite along bedding planes and fractures.	5.23	811.49	4.56	
LAMINITE, as above, core highly distorted, tectonically, bedding random, calcite throughout.	0.30	811.79	0.26	
LAMINITE, as above, some calcite near top, core broken towards base. Bedding angle 85° to core axis.	6.60	818.39	5.76	

SUKUNKA D.D.H. C-39

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
CLAYSTONE, dark grey, some silty interbeds and laminite phases. Bedding angle variable, 75° to core axis immediately above coal.	5.12	823.51	4.47	
<u>COAL</u> , fragments in box of dull and bright coal. dull and bright, core broken.	3.55	827.06	1.05	) CHAMBERLAIN
	0.35	827.41	0.35	) SEAM
SANDSTONE, medium grained, carbonaceous in top 5', coaly inclusions in top 2', quartz lithic. Bedding angle 73° to core axis.	19.09	846.50	19.10	<u>Base of Hole</u>

BORE NUMBER C-40

Grid Reference 35403.5 N 90668.9 E
Exploration Grid Reference J + 150'N / 2 + 1400'E

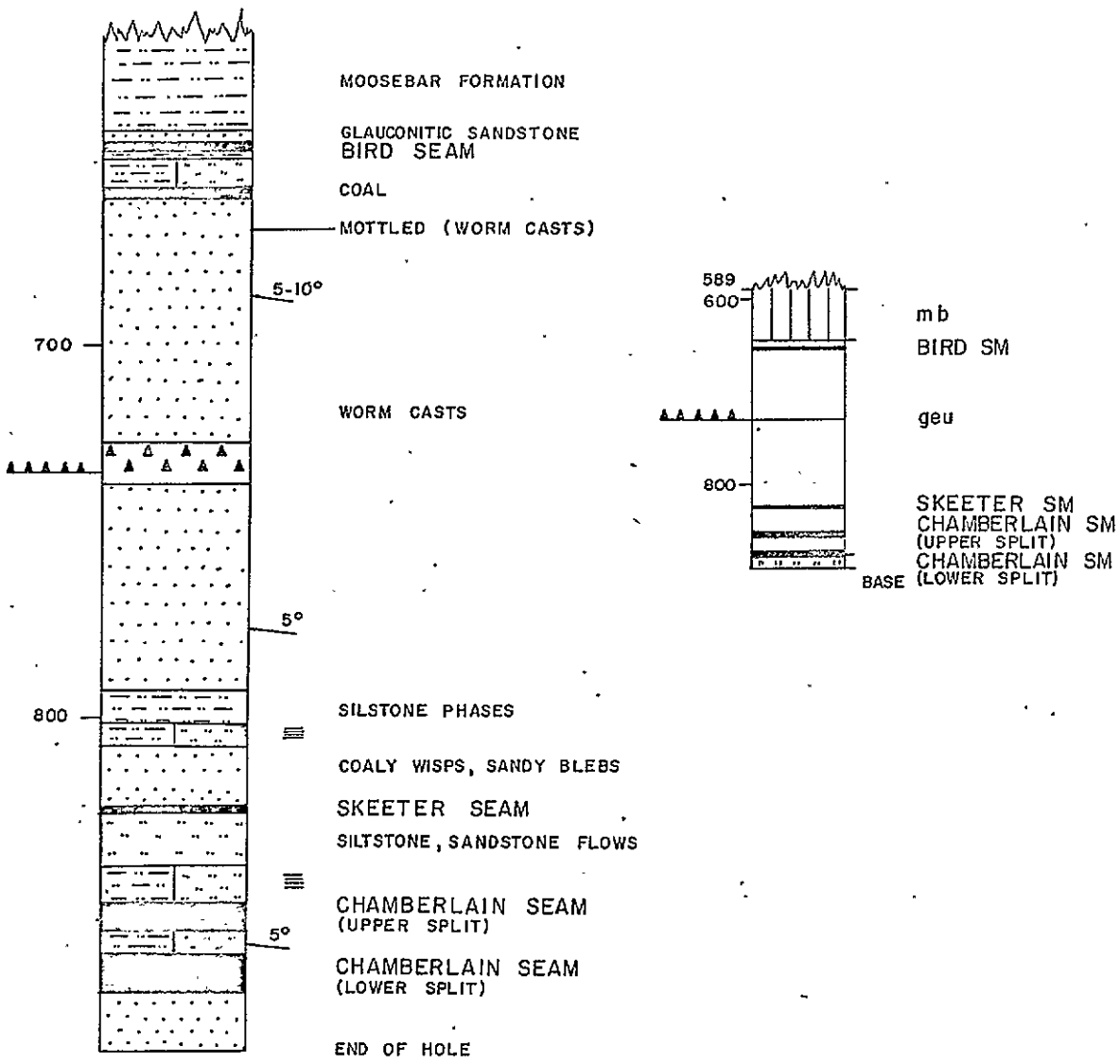
Date Commenced 6th Nov., 1971 Completed 12th Nov., 1971

Collar R.L. 4512.8 ft. Standard Datum
Total Depth 890.0 ft. Electrically Logged Yes/No

Drilled by Canadian Longyear Ltd. Angled Hole
For Coalition Mining Limited Tropari Angle 55°
Azimuth 090° True
Logged by G. Jordan

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Skeeter	3696.0	4.57	-	Not Analysed
Chamberlain Upper Split	3658.4	4.57	86.9%	
Chamberlain Lower Split	3677.8	8.18	58.0%	



DETAIL OF GETHING
FORMATION
SCALE: 1" to 50'

SCALE: 1" to 200'

Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.

STRATIGRAPHIC LOGS

for
COALITION MINING LIMITED

D.D.H. C-40

CHAMBERLAIN SEAM
UPPER SPLIT

ASH %
CUMULATIVE
FROM FLOOR

	WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
849.83				24.4	
	3.88	26.2	3½		
854.40	0.69	13.7	7	13.7	



Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED
DRAWN BY K.W. DATE February '72

SEAM SECTIONS
DDH C-40

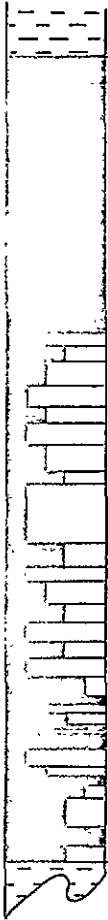
SCALE: 1" to 2'

PAGE 1 of 1

CHAMBERLAIN SEAM
LOWER SPLIT

ASH %
CUMULATIVE
FROM FLOOR

	WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
864.52				10.9	
8.18	-	10.9	6		
872.70					



Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED
DRAWN BY K.W. DATE February '72

SEAM SECTIONS
DDH C-40

SCALE: 1" to 2'

PAGE 1 of 1

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

CARGO SUPERINTENDENTS

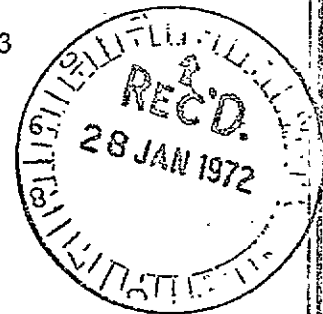
CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

K 71 - 2023

This is to Certify



APPLICANT:

COALITION MINING

SUBJECT:

SUKUNKA SAMPLES NO. 233 - 236 and 237

CORE NO. C 40

~~SKEETER SEAM~~ CHAMBERLAIN SEAM (UPPER SPLIT)

REPORT NO:

K 71 - 2023

DATE RECEIVED:

16. 12. 1971

DATE REPORTED:

20. 1. 1972



This Laboratory is Registered by the
National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

H. Bradley
Chief Chemist.
A.R.A.C.I.

For

CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

L. K. Jones

INTRODUCTION:

Two (2) coal samples designated CORE NO. C 40 -SKEETER SEAM - were received on 16. 12. 1971 from Clifford McElroy and Associates.

METHOD:

1. The visibly inferior coal sample No. 237 was hand crushed to $-3/4''$, sized at 30# BSS and the +30# BSS fraction washed in organic liquids at 1.60 Specific Gravity.

The float and sink fractions and raw -30# coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true S.G. of the sample determined.

2. The good quality coal sample No. 233 - 236 was hand crushed to $3/4''$, sized at 30# BSS and the +30# BSS fraction washed in organic liquids at 1.30 - 1.60 S.G. in 0.05 steps.

The float and sink fractions and raw -30# coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true S.G. of the sample determined.

A cumulative floats 1.60 S.G. fraction was prepared for sample No. 233 - 236 and the analysis are given in this report.

NOTE:

Samples weights have not been adjusted to compensate for Core loss.

RESULTS:

TABLES 1 - 2 : give the sizing, washability and analytical data for each coal sample after hand crushing to $3/4''$ top size.

FIGURE 1 : gives the graphic log.

SHEET THREE ATTACHED

TABLE 1 WASHABILITY DATA FOR SAMPLE NO. 233 - 236 (after hand crushing to 3/4")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WT. GM.</u>	<u>W.T.%</u>	<u>ASH%</u>	<u>CS.NO.</u>	<u>W.T%</u>	<u>ASH%</u>	<u>CS.NO.</u>
F1.30 SG	379	15.7	2.0	9	15.7	2.0	9
S1.30- F1.35 SG	470	19.4	4.7	7	35.1	3.5	8
S1.35- F1.40 SG	172	7.1	11.3	2	42.2	4.8	7
S1.40- F1.45 SG	241	10.0	15.8	1½	52.2	6.9	6
S1.45- F1.50 SG	167	6.9	21.1	1	59.1	8.6	5½
S1.50- F1.55 SG	120	5.0	28.5	1	64.1	10.1	5
S1.55- F1.60 SG	137	5.7	31.7	1	69.8	11.9	4½
S1.60- F. -30# RC	734 149	30.2 5.8	61.7 15.6	½ 7½	100.0	26.9	3½

Total Weight : 2569
 True Specific Gravity : 1.440
 Thickness : 3.88'

TABLE 2 WASHABILITY DATA FOR SAMPLE NO. 237 (after hand crushing to 3/4")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WT. GM.</u>	<u>W.T. %</u>	<u>ASH%</u>	<u>CS.NO.</u>	<u>W.T.%</u>	<u>ASH%</u>	<u>CS.NO.</u>
F 1.60 SG.	174	89.2	5.6	7½	89.2	5.6	7½
S 1.60 SG.	21	10.8	86.0	0	100.0	14.3	7
-30# RC	16	7.6	5.8	8½			

Total Weight : 211 gm
 True Specific Gravity : 1.347
 Thickness : 0.69'

ANALYSIS OF F 1.60 Specific Gravity FRACTION OF SAMPLE NO. 233 - 236

<u>YIELD%</u>	<u>A.D.M.%</u>	<u>ASH%</u>	<u>V.M.%</u>	<u>F.C.%</u>	<u>T.S.%</u>	<u>CS.NO.</u>	<u>C.V.(BTU/lb)</u>
69.8	1.0	12.0	18.8	68.2	0.51	5	13160

SYDNEY
 26th January, 1972

Telegrams and Cables:
"Visor", Sydney

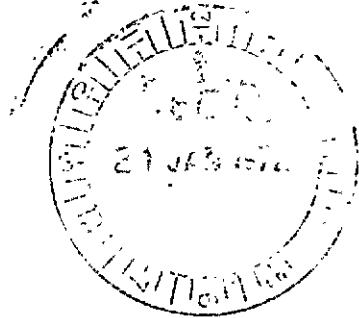
Telephone: 241 1105

C A R G O
SUPERINTENDENTS
CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify



APPLICANT: COALITION MINING

REPORT ON: SUKUNKA SAMPLE NO. 238
CORE NO. C40
CHAMBERLAIN SEAM (LOWER SPLIT)

REPORT NO. K71-2024

RECEIVED: 16. 12. 1971

REPORTED: 20. 1. 1972



This Laboratory is Registered by the National Association of Testing Authorities Australia. The tests reported herein have been performed in accordance with the terms of registration.

M. Brantly
A.R.A.C.I. Chief Chemist

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

INTRODUCTION: One (1) Coal Sample designated CORE NO. C40 CHAMBERLAIN SEAM was received on 16. 12. 1971 from Clifford McElroy & Associatés.

METHOD: The Coal Sample No. 238 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 238 and the analysis is given in this report.

NOTE: The sample weight has not been adjusted to compensate, for core loss.

RESULTS: TABLE 1 : gives the sizing, washability and analytical data for the sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 1 WASHABILITY DATA FOR SAMPLE NO. 238 (after hand crushing to $\frac{3}{4}$ ")

FRACTION	INDIVIDUAL				CUMULATIVE		
	WEIGHT	WT.%	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
F1.30 SG	1107	39.1	2.2	9	39.1	2.2	9
S1.30 - F1.35 SG	928	32.8	4.4	5½	71.9	3.2	7½
S1.35 - F1.40 SG	344	12.1	9.4	1½	84.0	4.1	6½
S1.40 - F1.45 SG	67	2.4	12.3	1½	86.4	4.3	6½
S1.45 - F1.50 SG	56	2.0	14.5	1½	88.4	4.6	6½
S1.50 - F1.55 SG	28	1.0	15.9	1½	89.4	4.7	6
S1.55 - F1.60 SG	30	1.1	18.2	1	90.5	4.8	6
S1.60 SG	272	9.5	72.8	0	100.0	11.3	5½
-30 Mesh RC	256	8.3	7.0	8½			

Total Weight of Sample = 3088 grams
True Specific Gravity = 1.332
Thickness = 8.18'

ANALYSIS OF F1.60 SG FRACTION OF SAMPLE NO. 238

Yield %	90.5
Air Dried Moisture %	1.0
Ash %	4.9
Volatile Matter %	21.3
Fixed Carbon %	72.8
Total Sulphur %	0.35
C.S.NO.	7
Calorific Value	14320 BTU/LB

SYDNEY
20th January 1972;

STRATIGRAPHIC LOG
SUKUNKA D.D.H. C-40

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft.)</i>
	No core to 589.0 ft.		
	MUDSTONE, bentonitic white claystone bands near base.	MOOSEBAR FM.	643.0
	SANDSTONE, glauconitic.	GETHING FM.	645.0
	<u>COAL.</u>)		646.5
)		
Dips 5°-10°	MUDSTONE.)		649.5
)		
	SILTSTONE AND MUDSTONE INTERBEDDED)	BIRD SEAM	657.5
)		
	<u>COAL.</u>)		660.0
)		
Fault, established	SANDSTONE, medium to fine grained, coarser at top, mottled (worm casts) at 671', worm casts from 687' to 761', sandstone breccia and calcite veins from 729' to 737'.		793.0
Dip 0°-5°	MUDSTONE, silty phases.		802.0
	LAMINITE.		807.0
	SANDSTONE, coaly wisps, sandy blebs 816'.		825.0
	<u>COAL.</u>	SKEETER SM.	825.5
	SILTSTONE, sandy phases.		840.0
	LAMINITE, mudstone at base.		850.0

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
Dip 0°-5°	<u>COAL</u> , claystone bands.	CHAMB. SM. upper split	857.0
	SILTSTONE AND MUDSTONE INTERBEDDED.		864.0
	<u>COAL</u> .	CHAMB. SM. lower split	874.0
	SANDSTONE, carbonaceous at top, coarse at top becoming finer.		890.0
			<u>Base of Hole</u>

SUKUNKA D.D.H. C-40

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
Core not logged in detail - refer to Stratigraphic Log for particulars.				
SANDSTONE, fine to medium grained, quartz-lithic. Bedding angle 85° to core axis.	10.10	793.08	9.88	
SILTSTONE, grey, some claystone interbeds.	1.85	794.93	1.85	
SILTSTONE, sandstone phases and claystone interbeds - grey siltstone and dark grey claystone. Bedding angle 88° to core axis.	8.83	803.76	8.83	
SILTSTONE AND MUDSTONE INTERBEDDED, grey siltstone and dark grey claystone, graded sequences, (younging upwards), core broken near base, Bedding angle 85° to core axis.	4.00	807.76	3.75	
SANDSTONE, medium to fine grained, quartz-lithic, coaly wisps and inclusions becoming predominant towards base, worm casts (sandy blebs) 3.40', 5.70' and 7.50' from top. Bedding angle 87° to core axis.	14.05	821.81	13.75	
SANDSTONE AND CLAYSTONE INTERBEDDED, sandstone as above and carbonaceous claystone interbedded.	2.87	824.68	2.87	

SUKUNKA D.D.H. C-40

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , mainly dull with minor bright bands.	0.65	825.33	0.20	
mainly bright with minor dull bands.	0.72	826.05	0.23	
SILTSTONE, grey, some sandy phases and claystone interbeds.	0.95	827.00	0.95	
LAMINITE, grey claystone and light grey siltstone, sandstone phases. Bedding angle 88° to core axis.	7.53	834.53	7.40	
SANDSTONE, medium grained, quartz lithic, some siltstone interbeds. Bedding angle 88° to core axis.	2.53	837.06	2.53	
LAMINITE, grey claystone and light grey siltstone, sandstone phases. Bedding angle 88° to core axis.	8.94	846.00	8.58	
CLAYSTONE, dark grey, carbonaceous phases.	3.40	849.40	3.40	
STONE, coaly.	0.43	849.83	0.43	
<u>COAL</u> , dull and bright.	0.27	850.10	0.27)
mainly dull with minor bright bands.	0.25	850.35	0.25)
				) SKEETER SEAM

SUKUNKA D.D.H. C-40

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull.	0.47	850.82	0.47)
dull and bright.	0.13	850.95	0.13)
dull.	0.24	851.19	0.24)
mainly dull with minor bright bands.	0.18	851.37	0.18)
CLAYSTONE, carbonaceous, bright coal bands.	0.35	851.72	0.35)
<u>COAL</u> , mainly dull with minor bright bands.	0.32	852.04	0.32	) SKEETER SEAM
CLAYSTONE, carbonaceous - bright coal bands.	0.11	852.15	0.11)
<u>COAL</u> , mainly dull with minor bright bands.	0.20	852.35	0.20)
dull.	0.32	852.67	0.32)
dull and bright.	0.12	852.79	0.12)
mainly dull with minor bright bands.	0.55	853.34	0.55)
bright.	0.08	853.42	0.08)

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull.	0.05	853.47	0.05)
)
CLAYSTONE, carbonaceous, bright coal bands.	0.24	853.71	0.24)
)
<u>COAL</u> , mainly dull with minor bright bands.	0.32	854.03	0.15)
)
dull.	0.37	854.40	0.17)
)
SILTSTONE, sandstone phases, siltstone grey with darker grey claystone interbeds. Bedding angle 87° to core axis.	5.39	859.79	5.14)
)
SILTSTONE AND MUDSTONE INTERBEDDED, grey siltstone and darker grey claystone.	4.61	864.40	4.61)
)
CLAYSTONE, dark grey.	0.12	864.52	0.12)
)
<u>COAL</u> , core lost in drilling.	2.87	867.39	0.00)
)
dull banded, mainly dull with minor bright bands.	0.13	867.52	0.13)
)
dull and bright.	0.13	867.65	0.13)
)
dull banded, mainly dull with minor bright bands.	0.25	867.90	0.25)
)

SKEETER
SEAMCore loss.
verified as
coal from
Gamma Ray-
Neutron LogCHAMBERLAIN
SEAM

SUKUNKA D.D.H. C-40

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull.	0.21	868.11	0.21)
mainly dull with minor bright bands, subvertical cleat.	0.15	868.26	0.15)
dull.	0.24	868.50	0.24)
mainly dull with minor bright bands.	0.29	868.79	0.29)
dull and bright.	0.11	868.90	0.11)
dull.	0.62	869.52	0.62	) CHAMBERLAIN SEAM
dull and bright.	0.22	869.74	0.22)
dull.	0.11	869.85	0.11)
mainly dull with minor bright bands.	0.28	870.13	0.28)
dull and bright.	0.10	870.23	0.10)
dull.	0.29	870.52	0.29)

CHAMBERLAIN SEAM

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull and bright, core broken.	0.20	870.72	0.20)	
dull.	0.22	870.94	0.22)	
mainly bright with minor dull bands.	0.11	871.05	0.11)	
bright.	0.05	871.10	0.05)	
mainly dull with minor bright bands.	0.11	871.21	0.11)	
dull and bright.	0.15	871.36	0.15)	
bright.	0.05	871.41	0.05)	CHAMBERLAIN SEAM
dull.	0.02	871.43	0.02)	
bright.	0.16	871.59	0.16)	
dull.	0.19	871.78	0.19)	
mainly dull with minor bright bands.	0.10	871.88	0.10)	
bright.	0.10	871.98	0.10)	

SUKUNKA D.D.H. C-40

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , mainly bright with minor dull bands.	0.08	872.06	0.08)
dull and bright.	0.08	872.14	0.08)
dull and bright, core broken.	0.24	872.38	0.24	) CHAMBERLAIN SEAM
bright.	0.16	872.54	0.16)
dull and bright.	0.16	872.70	0.16)
CLAYSTONE, carbonaceous, black.	0.29	872.99	0.29	
SANDSTONE, medium to fine grained, quartz-lithic, coaly inclusions near top, carbonaceous in top 3 feet. Bedding angle 87° to core axis.	17.01	890.00	17.24	<u>Base of Hole</u>

BORE NUMBER C-41

Grid Reference 36847.3 N 85426.6 E

Exploration Grid Reference H + 325'N / 1

Date Commenced 7th Nov., 1971 Completed 8th Nov., 1971

Collar R.L. 4070.3 ft. Standard Datum

Total Depth 357.00 ft. Electrically Logged Yes/~~No~~

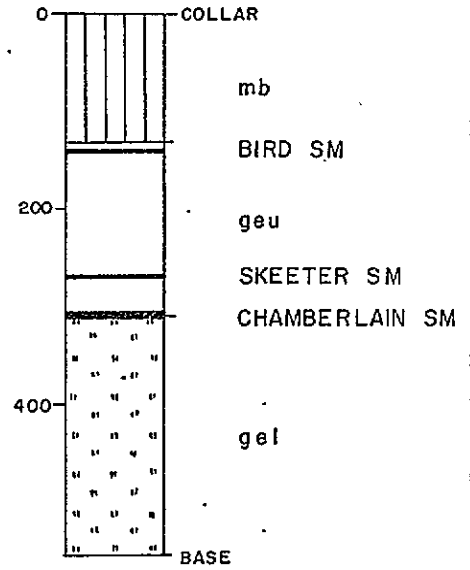
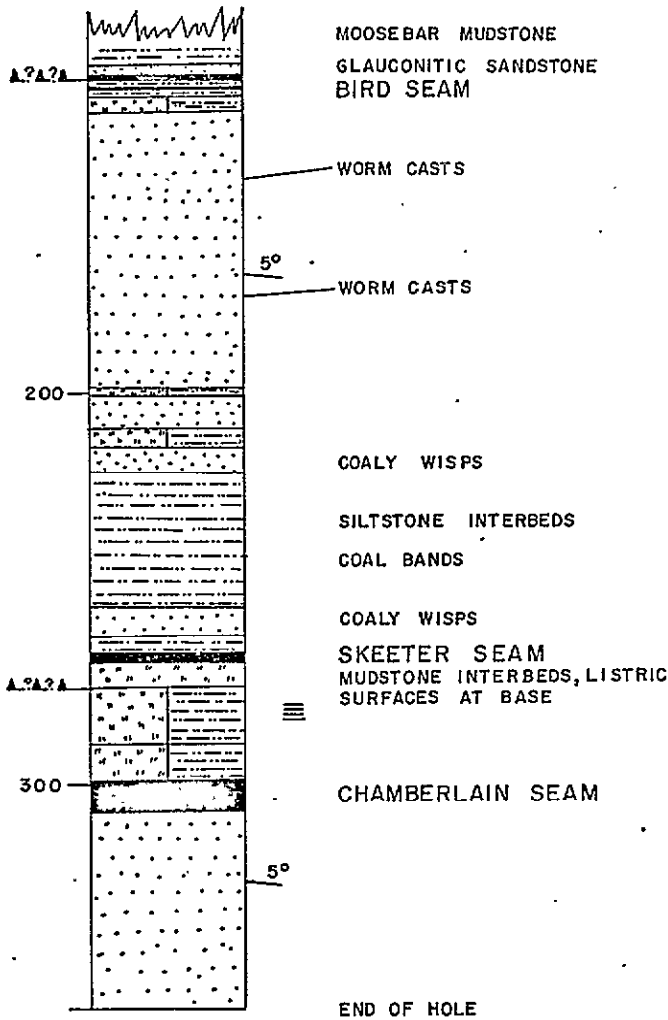
Drilled by Connors Drilling Ltd.

For Coalition Mining Limited

Logged by R. Shields

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Skeeter	3800.3 ft.	3.41	58%	
Chamberlain	3764.8 ft.	6.84	71%	



DETAIL OF GETHING
FORMATION
SCALE: 1" to 50'

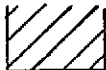

SCALE: 1" to 200'

Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS
D.D.H. C-41

SKEETER SEAM

ASH %
CUMULATIVE
FROM FLOOR

		WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
266.63	 CORE LOSS 3.15					
270.04	 0.26	-	15.6	7½		

Prepared by:
 CLIFFORD McELROY & ASSOCIATES PTY. LTD.
 for
 COALITION MINING LIMITED
 DRAWN BY S.A. DATE February '72

SEAM SECTIONS
 DDH C-41

SCALE: 1' to 2'

PAGE 1 of 1

CHAMBERLAIN SEAM

ASH %
CUMULATIVE
FROM FLOOR

	WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
298.67					
6.84	-	4.7	7	4.7	
305.51					



Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED
DRAWN BY S.A. DATE February '72

SEAM SECTIONS
DDH C-41

SCALE: 1" to 2'

PAGE 1 of 1

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

C A R G O
SUPERINTENDENTS
CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify



APPLICANT: COALITION MINING

REPORT ON: SUKUNKA SAMPLE NO. 239
CORE NO. C41
SKEETER SEAM

REPORT NO. K71-2025

RECEIVED: 16. 12. 1971

REPORTED: 19. 1. 1972



This Laboratory is Registered by the
National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

A.R.A.C.I.
A.R.A.C.I. Chief Chemist.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

INTRODUCTION:

One (1) Coal Sample designated CORE NO. C41 SKEETER SEAM was received on 16. 12. 1971 from Clifford McElroy & Associates.

METHOD:

The visibly inferior coal sample No. 239 was hand crushed to $-\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.60 specific gravity.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

RESULTS:

TABLE 1 : gives the sizing, washability and analytical data for the sample after hand crushing to $-\frac{3}{4}$ " top size.

TABLE 1

WASHABILITY DATA FOR SAMPLE NO. 239 (after hand crushing to $-\frac{3}{4}$ ")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
F1.60 SG	88	94.6	15.0	8	94.6	15.0	8
S1.60 SG	5	5.4	49.1	0	100.0	16.8	7½
-30 Mesh RC	14	13.1	7.5	8			

Total Weight of Sample = 107 grams
True Specific Gravity = 1.458
Thickness = 0.26'

SYDNEY
19th January 1972



Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

C A R G O SUPERINTENDENTS

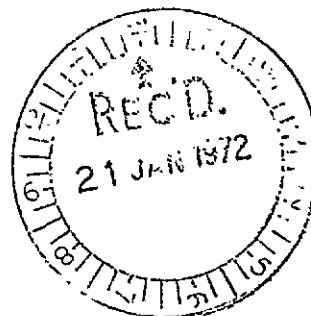
Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

CO. (A/SIA.) PTY. LTD.

Certification

This is to Certify

APPLICANT: COALITION MINING



REPORT ON: SUKUNKA SAMPLE NO. 240
CORE NO. C41
CHAMBERLAIN SEAM

REPORT NO. K71-2026

RECEIVED: 16. 12. 1971

REPORTED: 20. 1. 1972



This Laboratory is Registered by the
National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

M.B. Colley
A.R.A.C.I. Chief Chemist

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

A large, stylized handwritten signature in black ink, likely representing the company's representative.

INTRODUCTION:

One (1) Coal Sample designated CORE NO. C41 CHAMBERLAIN SEAM was received on 16. 12. 1971 from Clifford McElroy & Associates.

METHOD:

The Coal Sample No. 240 was hand crushed to $\frac{3}{8}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 to 1.60 specific gravity in 0.05 steps.

The float and sink fractions and raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample reconstituted and the true specific gravity of the sample determined.

A cumulative Floats 1.60 SG fraction was prepared for Sample No. 240 and the analysis is given in this report.

NOTE:

The sample weight has not been adjusted to compensate for core loss.

RESULTS:

TABLE 1 : gives the sizing, washability and analytical data for the sample after hand crushing to $\frac{3}{8}$ " top size.

TABLE 1

WASHABILITY DATA FOR SAMPLE NO. 240 (after hand crushing to $\frac{3}{8}$ ")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
Fl.30 SG	1601	57.0	1.9	9	57.0	1.9	9
S1.30 - Fl.35 SG	795	28.3	4.1	5	85.3	2.6	8
S1.35 - Fl.40 SG	213	7.6	10.1	4	92.9	3.2	7½
S1.40 - Fl.45 SG	84	3.0	14.2	3½	95.9	3.6	7½
S1.45 - Fl.50 SG	34	1.2	16.1	3½	97.1	3.7	7
S1.50 - Fl.55 SG	14	0.5	24.2	3	97.6	3.8	7
S1.55 - Fl.60 SG	5	0.2	28.4	2	97.8	3.9	7
S1.60 SG	63	2.2	40.7	½	100.0	4.7	7
-30 Mesh RC	245	8.0	4.7	8½			

Total Weight of Sample = 3054 grams
True Specific Gravity = 1.286
Thickness = 6.84'

ANALYSIS OF Fl.60 SG FRACTION OF SAMPLE NO. 240

Yield %	97.8
Air Dried Moisture %	1.0
Ash %	3.9
Volatile Matter %	22.7
Fixed Carbon %	72.4
Total Sulphur %	0.49
C.S.NO.	7½
Calorific Value	14640 BTU/LB

SYDNEY
20th January 1972

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
	SANDSTONE, coaly wisps.		262.0
	MUDSTONE, silty phases.		268.0
	<u>COAL.</u>	SKEETER SM.	269.0
	SILTSTONE, mudstone interbeds, listric surfaces at base.		276.0
	LAMINITE, siltstone and mudstone.		290.0
	SILTSTONE AND MUDSTONE INTERBEDDED.		299.0
	<u>COAL.</u>	CHAMB. SM.	306.7
	SANDSTONE, carbonaceous at top, coarse at top, fine towards base.		357.0
			<u>Base of Hole</u>

SUKUNKA D.D.H. C-41

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
Core not logged in detail - refer to Stratigraphic Log for particulars.				
SANDSTONE, fine grained, quartz-lithic, massive in upper half, cross-bedded phases in lower half.	7.63	210.01	7.63	
LAMINITE, grey siltstone and (dark quartz-lithic) grey claystone. Bedding angle 88° to core axis. Sandstone phases in upper 1', pyrite blebs in lower half.	3.85	213.86	3.85	
SANDSTONE, fine grained to medium grained, quartz-lithic, coaly wisps and inclusions throughout. Becoming carbonaceous towards base.	7.00	220.86	6.99	
SANDSTONE, as above, highly carbonaceous. 221.6'- 0.5' claystone, black, carbonaceous. 224'-224.5' shell fossils. 229.3' worm casts. 228.6'-1.3' claystone, black, carbonaceous, coal inclusions.	18.14	239.00	18.12	
SANDSTONE, as above, coal inclusions occasional slickenside on bedding planes. Bedding variable 70°-88° to core axis.	8.54	247.54	8.53	

SUKUNKA D.D.H. C-41

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
CLAYSTONE, black, coal partings < 0.01'.	0.73	248.27	0.73	
SILTSTONE, grey.	2.55	250.82	2.55	
LAMINITE, siltstone and sandstone, fine grained. Bedding angle 83° to core axis.	3.08	253.90	3.08	
SANDSTONE, medium grained, quartz-lithic, slump structure in top half.	6.25	260.15	6.25	
SANDSTONE, thin bedded, claystone phases.	1.58	261.73	1.58	
LAMINITE, dark grey claystone and grey siltstone. Bedding angle 83° to core axis.	3.95	265.68	3.95	
CLAYSTONE, black, carbonaceous.	0.95	266.63	0.95	
<u>COAL</u> , apparent core loss.	3.15	269.78	0.00)
bright.	0.02	269.80	0.02)
dull.	0.11	269.91	0.11)
dull and bright.	0.13	270.04	0.13)

SKEETER SEAM

SUKUNKA D.D.H. C-41

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
CLAYSTONE, black, broken, carbonaceous coal inclusions.	0.61	270.65	0.61	
SILTSTONE, grey, thin claystone phases. Bedding angle 87° to core axis.	4.57	275.22	4.57	
CLAYSTONE, black, broken, carbonaceous, coal inclusions, one listric surface 63° to core axis.	0.78	276.00	0.78	
CLAYSTONE, black, carbonaceous, chips with listric surfaces.	0.20	276.20	0.19	
CLAYSTONE, black, carbonaceous undisturbed. Weak bedding angle 90° to core axis.	0.18	276.38	0.17	
SANDSTONE, fine grained, quartz-lithic, thin grey siltstone interbeds.	5.87	282.25	5.50	
LAMINITE, grey siltstone and dark grey claystone. Bedding angle 88° to core axis.	3.73	285.98	3.50	
CLAYSTONE, black, carbonaceous.	2.17	288.15	2.03	
LAMINITE, as above between 282.25' and 285.98'.	9.64	297.79	7.85	

SUKUNKA D.D.H. C-41

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , bright.	0.02	299.30	0.02)
)
mainly dull with minor bright bands.	0.07	299.37	0.07)
)
bright.	0.01	299.38	0.01)
)
mainly dull with minor bright bands.	0.04	299.42	0.04)
)
bright.	0.01	299.43	0.01)
)
dull, shear plane 44° to core axis.	1.07	300.50	1.03)
)
mainly dull with minor bright bands.	0.05	300.55	0.05)
)
dull and bright.	0.10	300.65	0.09)
)
mainly dull with minor bright bands.	0.24	300.89	0.22)
)
bright.	0.04	300.93	0.04)
)
dull.	0.04	300.97	0.04)
)
bright.	0.02	300.99	0.02)

CHAMBERLAIN
SEAM

SUKUNKA D.D.H. C-41

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull and bright.	0.09	301.08	0.08)
)
bright.	0.10	301.18	0.09)
)
STONE, coaly specific gravity > 1.60.	0.04	301.22	0.04)
)
<u>COAL</u> , bright.	0.04	301.26	0.04)
)
dull.	0.07	301.33	0.07)
)
bright.	0.03	301.36	0.03)
)
dull.	0.18	301.54	0.17)
)
mainly dull with minor bright bands.	0.19	301.73	0.18)
)
dull.	0.03	301.76	0.03)
)
bright.	0.04	301.80	0.04)
)
dull.	0.03	301.83	0.03)
)
bright.	0.04	301.87	0.04)

CHAMBERLAIN
SEAM

SUKUNKA D.D.H. C-41

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull.	0.11	301.98	0.10)
bright.	0.04	302.02	0.04)
dull, friable.	1.30	303.32	1.22)
bright, friable.	0.09	303.41	0.08)
dull, friable.	0.37	303.78	0.35)
dull.	0.04	303.82	0.04	) CHAMBERLA
bright and dull.	0.11	303.93	0.10	) SEAM
bright.	0.05	303.98	0.05)
dull.	0.05	304.03	0.05)
bright.	0.19	304.22	0.18)
bright and dull, broken chips.	0.32	304.54	0.30)
bright.	0.22	304.76	0.21)

SUKUNKA D.D.H. C-41

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , mainly dull with minor bright bands.	0.12	304.88	0.11)
bright.	0.01	304.89	0.01)
dull.	0.04	304.93	0.04)
bright.	0.15	305.08	0.14)
bright and dull.	0.32	305.40	0.30)
bright and dull chips.	0.11	305.51	0.10)
CLAYSTONE, black, carbonaceous, broken.	0.13	305.64	0.13)
STONE, coaly specific gravity > 1.60.	0.09	305.73	0.09)
<u>COAL</u> , bright.	0.04	305.77	0.04)
STONE, coaly specific gravity > 1.60.	0.03	305.80	0.03)
SANDSTONE, medium grained, quartz-lithic, carbonaceous, coal inclusions.	0.02	305.82	0.02)

CHAMBERLAIN
SEAM

SUKUNKA D.D.H. C-41

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
STONE, coaly specific gravity >1.60.	0.03	305.85	0.03	
SANDSTONE, medium grained, quartz-lithic, carbonaceous, coal inclusions, joint 0° to core axis.	0.07	305.92	0.07	
SANDSTONE, as above, carbonaceous, medium grained to 315'. Joint 3° to core axis top 1'. Bedding angle 88° to core axis.	11.37	317.29	11.14	
SANDSTONE, fine grained, quartz-lithic, thin bedded, claystone phases at 319'. Carbonaceous to 322'.	8.98	326.27	8.80	
SANDSTONE, as above. Bedding angle 88° to core axis. Siltstone phase at 348' (0.6' long).	30.04	356.31	29.43	
SILTSTONE AND MUDSTONE INTERBEDDED, grey siltstone and dark grey mudstone.	0.69	357.00	0.68	
				<u>Base of Hole</u>

BORE NUMBER CS-1

Grid Reference 48883.2N 78647.4E

Exploration Grid Reference A+100' /1+1200'

Date Commenced 5/Oct Completed 9/Oct

Collar R.L. 4141.2 ft. Standard Datum

Total Depth 428.0 Electrically Logged Yes/~~No~~

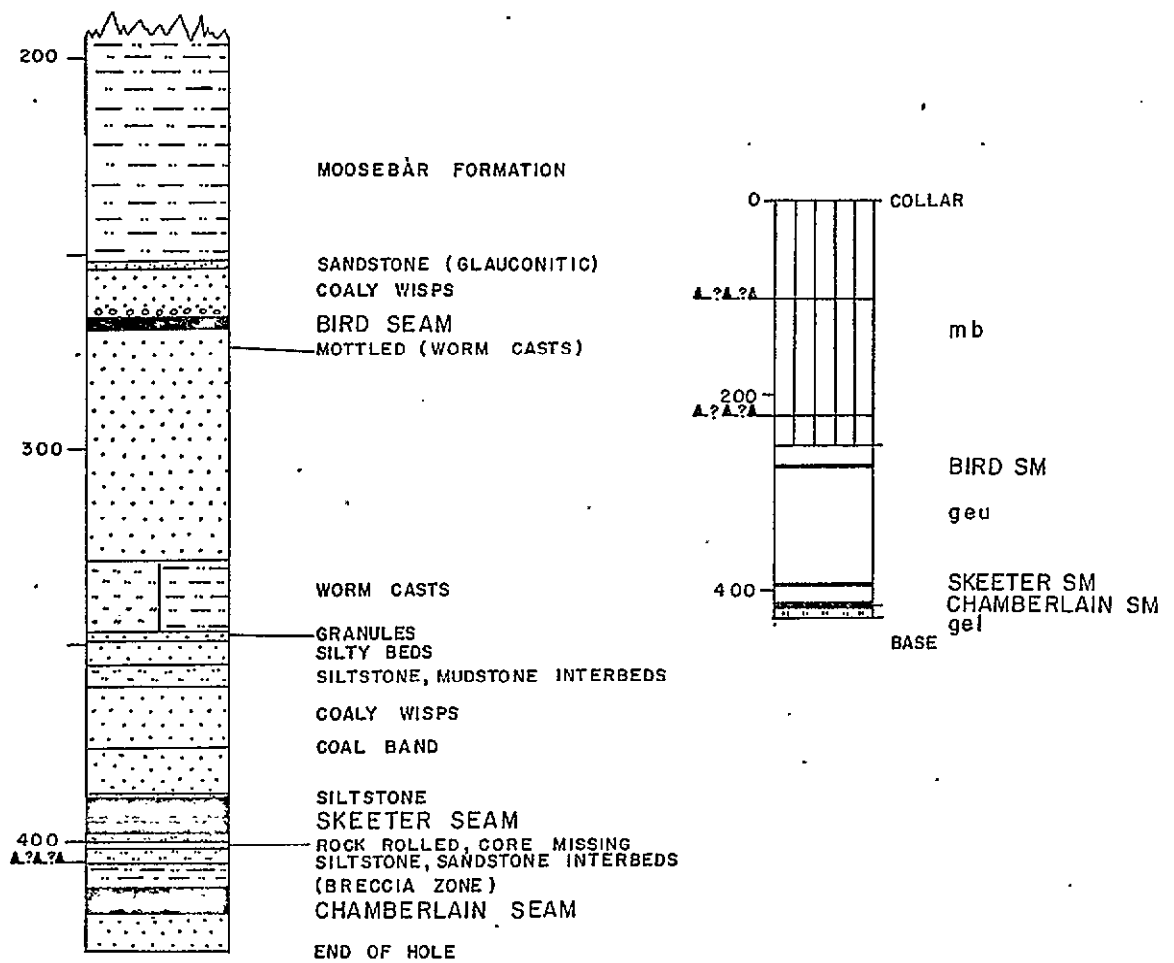
Drilled by Connors Drilling Ltd.

For Coalition Mining Limited

Logged by F.H.S. Tebbutt

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Skeeter	3743.5	8.29	47%	
Chamberlain	3723.5	6.27	73%	



DETAIL OF GETHING
FORMATION
SCALE 1" to 50'

SCALE : 1" to 200'

Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS
D.D.H.CS-1

SKEETER SEAM				ASH % CUMULATIVE FROM FLOOR		
				WT%	ASH%	C. S. N°	INCL. BANDS	EXCL. BANDS
389.42		5.34	-	5.0	8	
		1.41	-	90.9	0	
		1.54	-	24.2	6	
397.71						

Prepared by:
 CLIFFORD McELROY & ASSOCIATES PTY. LTD.
 for
 COALITION MINING LIMITED
 DRAWN BY pm DATE Jan '72

SEAM SECTIONS
 DDH CS-1

ASH %
CUMULATIVE
FROM FLOOR

CHAMBERLAIN SEAM

	WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
411.43				4.1	
6.27	-	4.1	8		
417.70					



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for
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DRAWN BY pm DATE Jan '72

SEAM SECTIONS
DDH CS-1

SCALE: 1" to 2'

PAGE 1 of 1

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

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SUPERINTENDENTS
CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify

APPLICANT: COALITION MINING

SUBJECT: SUKUNKA SAMPLES NO. 159, 160, 161/162
CORE NO. CSL
SKIBETER SEAM

REPORT NO: K 71-1782

RECEIVED: 8.11.71

REPORTED: 26.11.71



This Laboratory is Registered by the
National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

M. Bradley
Chief Chemist.
A.R.A.C.I.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

L. Sample

INTRODUCTION:

Two (2) coal samples and one non coal sample designated Core CS1 - SKREETER SEAM - were received on 8.11.71 from Clifford Mc Elroy and Associates.

METHODS:

1. The non coal sample No. 160 was weighed, prepared and analysed for Ash and true specific gravity.
2. The visibly inferior coal sample No. 161/162 was hand crushed to $-\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.60 S.G.

The float and sink fractions and raw -30 mesh coal fractions were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample re-constituted and the true S.G. of the sample determined.

3. The good quality coal sample No. 159 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 130 - 160 specific gravity in 0.05 sseps. The float and sink fractions and raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample re-constituted and the true S.G. of the sample determined.

A cumulative Floats 1.60 S.G. fraction was prepared for sample No. 159 and the analysis are given in this report,

NOTE:

Sample weight have not been adjusted to compensate for core loss.

RESULTS:

FIGURE 1 : gives the graphic log of the core

TABLE 1 - 2: give the sizing, washability and analytical data for each coal sample after hand crushing to $\frac{3}{4}$ " top size.

SHEET THREE ATTACHED

TABLE 1:

WASHABILITY DATA FOR SAMPLE NO. 159 (after hand crushing to $\frac{3}{4}$ ")

FRACTION	INDIVIDUAL				CUMULATIVE		
	WEIGHT	WT.%	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
Fl.30 S ^G	971	80.5	1.9	9	80.5	1.9	9
S1.30 - Fl.35 SG	97	8.0	5.8	6 $\frac{1}{2}$	88.5	2.3	9
S1.35 - Fl.40 SG	48	4.0	10.0	6	92.5	2.6	9
S1.40 - Fl.45 SG	28	2.3	12.0	4	94.8	2.8	8 $\frac{1}{2}$
S1.45 - Fl.50 SG	9	0.7	15.5	1	95.5	2.9	8 $\frac{1}{2}$
S1.50 - Fl.55 S ^G	6	0.5	19.3	1	96.0	3.0	8 $\frac{1}{2}$
S1.55 - Fl.60 SG	3	0.2	22.0	1	96.2	3.0	8 $\frac{1}{2}$
S1.60 SG	44	3.8	54.2	0	100.0	5.0	8
-30 Mesh	133	9.9	3.6	8			

Total Weight of Sample = 1339 gms.

True Specific Gravity = 1.284

SAMPLE NO. 160

RAW COAL	Total Weight	1478
	Ash %	90.9
	True S.G.	2.531

TABLE 2:

WASHABILITY DATA FOR SAMPLE NO. 161/162 (after hand crushing to $\frac{5}{8}$ ")

Fl.60 SG	246	72.6	6.5	8	72.6	6.5	8
S1.60 SG	93	27.4	71.1	0	100.0	24.2	6
-30 Mesh	80	19.1	36.0	2			

Total Weight of Sample = 419 gms.

True Specific Gravity = 1.502

ANALYSIS OF FLOAT 1.60 S.G. FRACTION OF SAMPLE NO. 159

Yield %	96.2
Air Dried Moisture %	0.9
Ash %	3.0
Volatile Matter %	24.4
Fixed Carbon %	71.7
Total Sulphur %	0.39
Crucible Swelling Number	8 $\frac{1}{2}$
Calorific Value	14,750

SYDNEY

26th November, 1971

K71-1782

COALITION MINING

SUKUNKA CSI -

SKEETER SEAM

	SPL	THICK	ASH%	CSM?
8				
6	159	556	50	7
4				
2	160	142	709	0
0	161	160	242	6

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

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SYDNEY, 2000

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APPLICANT: COALITION MINING

SUBJECT: SUKUNKA SAMPLES NO. 163/164
CORE NO. CS1
CHAMBERLAIN SEAM

REPORT NO: K 71-1783

RECEIVED: 8.11.71

REPORTED: 26.11.71



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been performed in accordance with the
terms of registration.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

M. Bradley
Chief Chemist.

(Signature)

INTRODUCTION:

One (1) coal sample designated CS1 Chamberlain Seam was received on 8.11.71 from Mc Elroy and Associates.

METHODS:

The coal sample No. 163/164 was hand crushed to $\frac{3}{4}$ " size, sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 - 1.60 specific gravity in 0.05 steps.

The float and sink fraction and raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and crucible swelling number and the composite raw coal sample reconstituted and the true S.G. of the sample determined.

A cumulative float 1.60 S.G. fraction was prepared for sample No. 163/164 and the analysis is also given in this report.

NOTE:

Sample weights have not been adjusted to compensate for core loss.

RESULTS:

FIGURE 1 : gives the graphic log of the core

TABLE 1 : gives the sizing, washability and analytical data for each coal sample after hand crushing to $\frac{3}{4}$ " top size.

SHEET THREE ATTACHED

TABLE 1:

WASHABILITY DATA FOR SAMPLE NO. 163/164 (after hand crushing to $\frac{3}{4}$ ")

FRACTION	INDIVIDUAL				CUMULATIVE		
	WEIGHT	WT.%	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
Fl.30 SG	1634	61.1	1.8	9	61.1	1.8	9
Sl.30 - Fl.35 SG	863	32.2	3.9	6 $\frac{1}{2}$	93.3	2.5	8
Sl.35 - Fl.40 SG	79	3.0	10.1	2 $\frac{1}{2}$	96.3	2.8	8
Sl.40 - Fl.45 SG	19	0.7	12.3	1	97.0	2.8	8
Sl.45 - Fl.50 SG	7	0.3	16.6	1	97.3	2.9	8
Sl.50 - Fl.55 SG	2	0.1	21.5	1	97.4	2.9	8
Sl.55 - Fl.60 SG	6	0.2	28.7	1	97.4	2.9	8
Sl.60 SG	66	2.4	51.4	0	100.0	4.1	8
-30 Mesh	143	5.1	1.6	8			

Total Weight of Sample = 2819 gms.

True Specific Gravity = 1.269

ANALYSIS OF FLOATS 1.60 S.G. FRACTION OF SAMPLE NO. 163/164

Yield %	97.6
Air Dried Moisture %	0.9
Ash %	2.9
Volatile Matter %	22.4
Fixed Carbon %	73.8
Total Sulphur %	0.37
Crucible Swelling Number	8
Calorific Value	14,800 BTU/LB

SYDNEY

26th November, 1971

K71-1783

COALITION MINING

SUKUNKA CS 1 -

CHAMBERLAIN SEAM

	SPL	THICK ²	ASH%	CSIM
6				
4	{163 {164	6.27	4.1	8
2				
0				

STRATIGRAPHIC LOG
SUKUNKA D.D.H. CS-1

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
	<p>No core to 24.0 ft.</p> <p>MUDSTONE, dark grey, zones of fragmented core (clay and rock chips) to 46', core with fragmented zones and clay bands from 66'-81'. From 95'-112' core slickensided with calcite veins and core badly broken from 95'-128'. Core fractured and slickensided from 131'-133'. White clay horizons at 162', 182', 251' and 252'. Slickensides at 195'. Zones of broken core, slickensides and calcite from 227'-235'.</p>		252.0
	SANDSTONE, glauconitic.	GETHING	254.0
	SANDSTONE, grey, medium grained, quartz-lithic, coaly wisps, pebble band at base.		266.0
	<u>COAL</u> , siltstone band of 1'.	BIRD SEAM	269.0
	SANDSTONE, grey, medium grained becoming finer, quartz-lithic, mottled (worm tracks) at 274'.		329.0
	SILTSTONE AND MUDSTONE INTERBEDS, worm casts, granules at base.		347.0

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
	SANDSTONE . grey, medium grained, quartz-lithic.		349.5
	SANDSTONE, silty interbeds.		355.0
	SILTSTONE, fine mudstone interbeds.		361.0
	SANDSTONE, .coaly wisps, 2" coal band at 376'.		388.0
	<u>COAL</u> .		388.5
	SILTSTONE, grey.		389.2
	<u>COAL</u> .		394.0
	SILTSTONE, grey, mudstone band) at top.)		395.5
	<u>COAL</u> , becoming carbonaceous,) mud base.)	SKEETER SM.	397.7
	SILTSTONE, grey.)		401.0
	SILTSTONE, numerous sandy interbeds, at 405' a 1' zone of brecciation and calcite infilling. Core broken.		406.0
	MUDSTONE, dark grey.		412.5
	<u>COAL</u> .	CHAMB. SM.	418.0
	SANDSTONE, grey, medium grained, quartz lithic.		428.0
			<u>Base of Hole</u>

SUKUNKA D.D.H. CS-1

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
Core not logged in detail - refer to Stratigraphic Log for particulars.		332.25		
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey, and mudstone dark grey interbedded, beds becoming finer 6.2' from top. Worm casts, mud blebs, sandy interbeds. Bedding angle 78° to core axis.	13.51	345.76	13.38	
SANDSTONE, grey, medium grained, quartz-lithic.	0.46	346.22	0.45	
SANDSTONE, grey, fine grained, quartz-lithic.	2.60	348.82	2.56	
CLAYSTONE, dark brown, carbonaceous, some coaly bands, core broken.	0.16	348.98	0.16	
SILTSTONE, grey, darker and becoming carbonaceous at top, sandy interbeds and phases. Bedding angle 85° to core axis.	1.89	350.87	1.86	
SILTSTONE, as above, becoming more sandy towards base and grading into sandstone, fine grained.	4.22	355.09	4.15	

SUKUNKA D.D.H. CS-1

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE, grey, with fine muddy interbeds. Bedding angle 90° to core axis.	4.21	359.30	4.14	
CLAYSTONE, brown, carbonaceous, two fine calcite veins parallel to bedding at base.	0.20	359.50	0.20	
SANDSTONE, grey, fine to medium grained, quartz-lithic; coaly wisps, lenses and irregular masses. Some claystone interbeds in top 0.15'.	11.08	370.58	10.89	
SANDSTONE, as above, but no claystone bands. Coaly pennybands. Some current bedding. Bedding angle 85-90° to core axis.	5.14	375.72	5.14	
<u>COAL</u> , bright, fragmented.	0.85	376.57	0.10	
SANDSTONE, grey, fine to medium grained, quartz-lithic; coaly wisps and lenses.	11.30	387.87	11.30	
SANDSTONE, as above.	0.16	388.03	0.16	
<u>COAL</u> , mainly dull with minor bright bands.	0.30	388.33	0.08	

SUKUNKA D.D.H. CS-1

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, fine grained, quartz-lithic, coaly wisps.	0.60	388.93	0.60	
CLAYSTONE, brownish grey, becoming carbonaceous.	0.49	389.42	0.49	
<u>COAL</u> , core broken to small pieces - most fragments are dull with minor bright bands, some listric surfaces.	1.63	391.05	0.96)
)
dull and bright, joint plane at 50° to core axis at top.	0.75	391.80	0.44)
)
mainly dull with minor bright bands, core breaks into small discs at 90° to core axis, vertical cleat not developed. 2 joint planes; one at 24° and the other at 80° (opposed to the first plane) to core axis. Both planes with slickensides.	0.91	392.71	0.54)
)
dull, joint plane at 18° to core axis.	0.58	393.29	0.34)
)
mainly dull with minor bright bands, joint plane with slickensides at 70° to core axis. 0.2' from top.	1.13	394.42	0.67)
)

SKEETER SEAM

SUKUNKA D.D.H. CS-1

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remark</i>
<u>COAL</u> , dull, sheared, slickensided planes at 70 ^o to core axis, some fine vertical calcite veins.	0.34	394.76	0.20)
CLAYSTONE, grey, silty.	0.17	394.93	0.17)
MUD, brown and soft when wet.	0.30	395.23	0.18	) SKEETER SEAM
SILTSTONE, grey.	0.94	396.17	0.94)
<u>COAL</u> , mainly dull with minor bright bands, one joint at 33 ^o to core axis, 0.14' from top.	0.90	397.07	0.53)
MUD, brown, soft when wet.	0.64	397.71	0.38	
SILTSTONE, grey, grading to claystone brown and becoming carbonaceous.	0.96	398.67	0.96	
No core, Tri coned for 2.33'.	2.33	401.00	0.00	
SILTSTONE, grey, numerous sandy interbeds in upper half, numerous mudstone interbeds in lower half, bedding angle 80 ^o to core axis.	4.32	405.32	4.32	

BORE NUMBER CS-2

Grid Reference 49172.9 N 78846.2E
Exploration Grid Reference A+200/1+1700

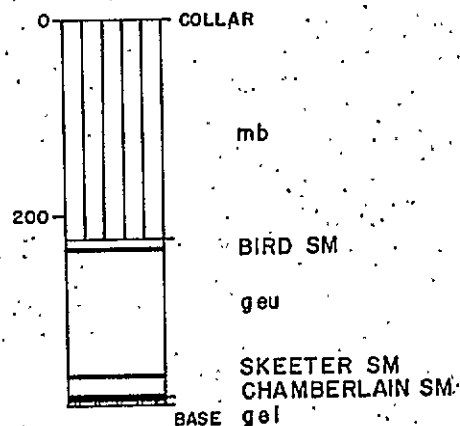
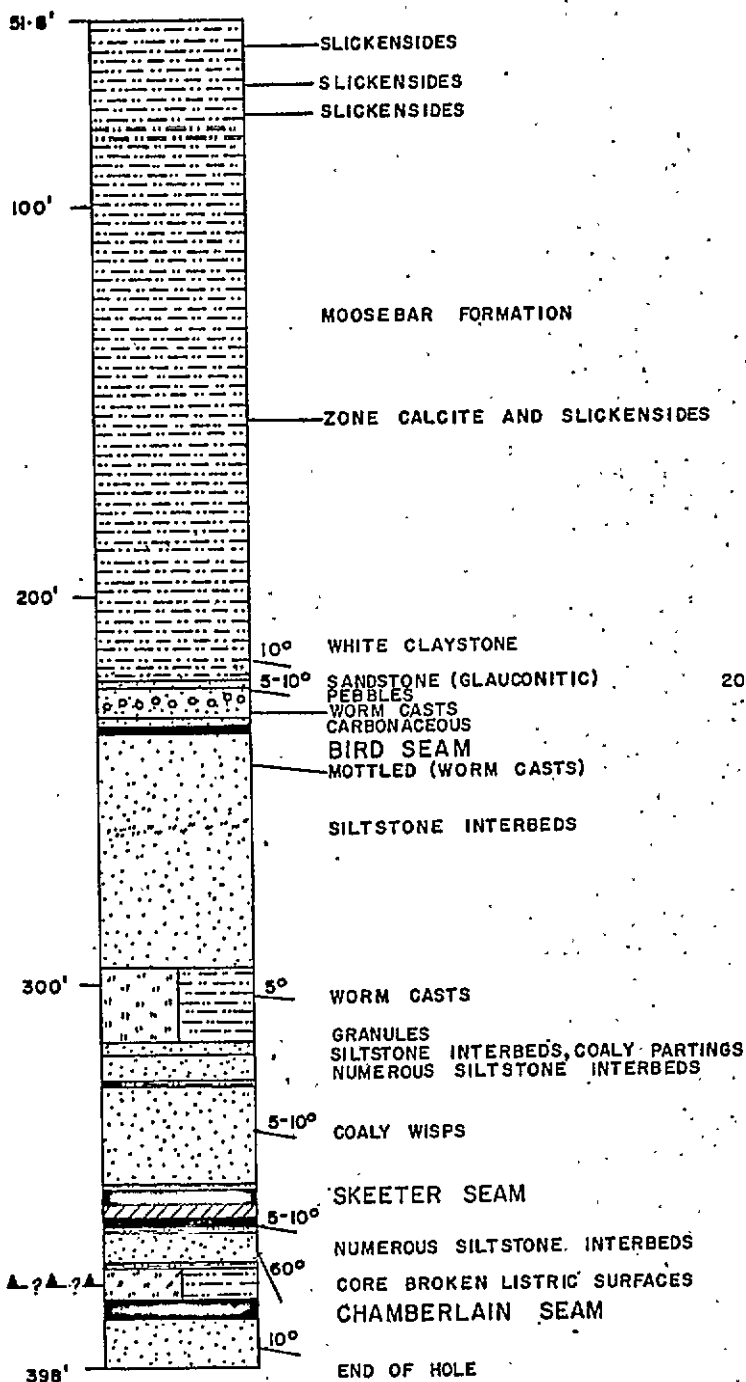
Date Commenced 30/Sept. Completed 5/Oct.

Collar R.L. 4133.3 ft. Standard Datum
Total Depth 398.0 Electrically Logged Yes/~~XX~~

Drilled by Connors Drilling Ltd.
For Coalition Mining Limited
Logged by F.H.S. Tebbutt

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Skeeter	3771.1	8.27	71.5%	
Chamberlain	3747.3	5.28	82%	



DETAIL OF GETHING
FORMATION
SCALE: 1" to 50'

SCALE: 1" to 200'

Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS
D.D.H. CS-2

SKEETER SEAM

ASH %
CUMULATIVE
FROM FLOOR

		WT%	ASH%	C. S. N°	INCL. BANDS	EXCL. BANDS
354.00		5.01	67.7	4.6	7½	7.9 4.8
		1.26	3.6	92.2	0	14.9 5.2
		2.00	28.7	5.2	8	
362.27						

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COALITION MINING LIMITED
DRAWN BY pm DATE Jan '72



SEAM SECTIONS
DDH CS-2

SCALE: 1" to 2'

PAGE 1 of 1

CHAMBERLAIN SEAM

ASH %
CUMULATIVE
FROM FLOOR

		WT%	ASH%	C. S. No	INCL. BANDS	EXCL. BANDS
380.76		0.62	-	41.3	1/2	
		4.66	-	3.6	6	
386.04						

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SEAM SECTIONS
DDH CS-2

DRAWN BY pm

DATE Jan '72

SCALE: 1' to 2'

PAGE 1 of 1

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"Visor", Sydney

Telephone: 241 1105

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19 BRIDGE ST.,
SYDNEY, 2000

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APPLICANT: COALITION MINING

SUBJECT: SUKUNKA SAMPLES NO. 122, 123, 124 and 125
CORE NO. CS2
SKETCHER SEAM

REPORT NO: K 71-1754

RECEIVED: 4.11.71

REPORTED: 26.11.71



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been performed in accordance with the
terms of registration.

A. Bradley
Chief Chemist.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

[Signature]

INTRODUCTION:

Two (2) coal samples and two non coal samples designated Core CS2 -SKEETER SEAM - were received on 4.11.71 from Mc Elroy and Associates.

METHODS:

1. The non coal samples No. 122, 124 were weighed, prepared and analysed for Ash and true specific gravity.
2. The good quality coal samples No. 123, 125 were hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30-1.60 S.G. in 0.05 steps.

The float and sink fractions and raw -30 mesh coal fractions were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample re-constituted and the true S.G. of the sample determined.

A cumulative floats 1.60 S.G. fraction was prepared for the Full Seam i.e. 123 - 125 inclusive and the analysis are given in this report.

NOTE:

Sample weights have not been adjusted to compensate for core loss.

RESULTS:

FIGURE 1 : give the graphic log of the core

TABLES 1-2: give the sizing, washability and analytical data for each coal sample after hand crushing to $\frac{3}{4}$ "

TABLE 3 : calculated washability data for the Full Seam i.e. 123 - 125 inclusive

SAMPLE NO. 122

RAW COAL Total Weight : 136 gms.
Ash % : 54.1
True S.G. : 1.786

TABLE 1:

WASHABILITY DATA FOR SAMPLE NO. 123 (after hand crushing to $-\frac{3}{4}$ ")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.WS. NO.</u>
Fl.30 SG	1251	58.8	2.2	9	58.8	2.2	9
S1.30 - Fl.35 SG	619	29.1	4.0	7	87.9	2.8	8
S1.35 - Fl.40 SG	117	5.5	9.8	1	93.4	3.2	8
S1.40 - Fl.45 SG	67	3.1	12.7	1	96.5	3.5	8
S1.45 - Fl.50 SG	30	1.4	14.7	1	97.9	3.7	7 $\frac{1}{2}$
S1.50 - Fl.55 SG	5	0.2	20.0	1	98.1	3.7	7 $\frac{1}{2}$
S1.55 - Fl.60 SG	4	0.2	29.9	1	98.3	3.8	7 $\frac{1}{2}$
S1.60 SG	36	1.7	51.9	0	100.0	4.6	7 $\frac{1}{2}$
-30 Mesh	173	7.5	4.0	7 $\frac{1}{2}$			

Total Weight of Sample = 2302 gms.
True Specific Gravity = 1.280

SAMPLE NO. 124

RAW COAL

1410

Total Weight : ~~124~~ 1410 gms.
Ash % : 92.2
True S.G. : 2.564

TABLE 2:

		<u>WASHABILITY DATA FOR SAMPLE NO. 125 (after hand crushing to $-\frac{3}{4}$")</u>						
		<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
	F1.30 SG	591	64.1	2.0	9	64.1	2.0	9
S1.30 -	F1.35 SG	219	23.8	4.6	7 $\frac{1}{2}$	87.9	2.7	8 $\frac{1}{2}$
S1.35 -	F1.40 SG	53	5.7	10.3	7 $\frac{1}{2}$	93.6	3.2	8 $\frac{1}{2}$
S1.40 -	F1.45 SG	21	2.2	15.4	7 $\frac{1}{2}$	95.8	3.4	8 $\frac{1}{2}$
S1.45 -	F1.50 SG	10	1.1	23.1	4	96.9	3.7	8 $\frac{1}{2}$
S1.50 -	F1.55 SG	4	0.5	29.9	1	97.4	3.8	8 $\frac{1}{2}$
S1.55 -	F1.60 SG	6	0.6	33.7	1	98.0	4.0	8 $\frac{1}{2}$
S1.60	SG	18	2.0	64.9	0	100.0	5.2	8
-30	Mesh	54	5.6	2.6	8 $\frac{1}{2}$			

Total Weight of Sample = 976 gms.

True Specific Gravity = 1.291

TABLE 3:CALCULATED WASHABILITY DATA FOR FULL SEAM i.e. SAMPLES 123-125 INCLUSIVE

F1.30	SG	58.2	2.1	9	58.2	2.1	9
F1.35	SG	26.5	4.2	7 $\frac{1}{2}$	84.7	2.8	8 $\frac{1}{2}$
F1.40	SG	5.4	9.9	4 $\frac{1}{2}$	90.1	3.2	8 $\frac{1}{2}$
F1.45	SG	2.7	13.5	4 $\frac{1}{2}$	92.8	3.5	8
F1.50	SG	1.3	16.3	2 $\frac{1}{2}$	94.1	3.7	8
F1.55	SG	0.3	23.3	1	94.4	3.7	8
F1.60	SG	0.3	32.8	1	94.7	3.8	8
S1.60	SG	5.3	80.9	0	100.0	7.9	7 $\frac{1}{2}$

ANALYSIS OF FLOATS 1.60 S.G. FRACTION OF FULL SEAM i.e. SAMPLES 123 - 125 INCLUSIVE

Yield %	94.7
Air Dried Moisture %	0.6
Ash %	3.8
Volatile Matter %	23.3
Fixed Carbon %	72.3
Total Sulphur %	0.39
Crucible Swelling Number	8
Calorific Value	14,720 BTU/LB

SYDNEY

26th November, 1971

K71-1754

COALITION MINING

SUKUNKA CS2 -

SKEETER SEAM

	SPL	THICK ^s	WT%	ASH%	CEN ^o	ASH% cum.	
						Incl. bands:	Excl. bands:
8'	122	0.90'	-	54.1	0	7.9	4.8
6'	123	5.01'	67.7	4.6	7 1/2		
4'						14.9	5.2
2'	124	1.26'	3.6	92.2	0	5.2	
0'	125	2.00'	28.7	5.2	8		

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"Visor", Sydney

Telephone: 241 1105

CARGO SUPERINTENDENTS

CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify

APPLICANT: COALITION MINING

SUBJECT: SUKUNKA SAMPLES NO. 126, 127
CORE NO. CS2
CHAMBERLAIN SEAM

REPORT NO: K 71-1755

RECEIVED: 4.11.71

REPORTED: 26.11.71



This Laboratory is Registered by the
National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

P. Bradley
Chief Chemist.

A.R.A.C.I.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

E. W. Campbell

INTRODUCTION:

Two (2) coal samples designated Core No. CS2 Chamberlain Seam were received on 4.11.71 from Mc Elroy and Associates.

METHODS:

1. The visibly inferior coal sample No. 126 was hand crushed to $-\frac{3}{4}$ " sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.60 S.G.

The float and sink fractions and raw -30 mesh coal fractions were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample re-constituted and the true S.G. of the sample determined.

2. The good quality coal samples No. 127 was hand crushed to $\frac{3}{4}$ ", sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 130-160 S.G. in 0.05 steps.

The float and sink fractions and raw -30 mesh coal fractions were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample re-constituted and the true S.G. of the sample determined.

A cumulative floats 1.60 S.G. fraction was prepared for sample No. 127 and the analysis are given in this report.

NOTE:

Sample weights have not been adjusted to compensate for core loss.

RESULTS:

FIGURE 1 : give the graphic log of the core

TABLES 1-2 : give the sizing, washability and analytical data for each coal sample after hand crushing to $\frac{3}{4}$ " top size.

SHEET THREE ATTACHED

TABLE 1: WASHABILITY DATA FOR SAMPLE NO. 126 (after hand crushing to $-\frac{3}{4}$ ")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>			
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>	
Fl.60 SG	77	19.7	18.0	1	19.7	18.0	1	
Sl.60 SG	314	80.3	47.0	$\frac{1}{2}$	100.0	41.3	$\frac{1}{2}$	
-30 Mesh	6	1.5	33.4	$2\frac{1}{2}$				

Total Weight of Sample = 397 gms.
True Specific Gravity = 1.739

TABLE 2: WASHABILITY DATA FOR SAMPLE NO. 127 (after hand crushing to $-\frac{3}{4}$ ")

Fl.30 SG	1157	53.1	1.7	$8\frac{1}{2}$	53.1	1.7	$8\frac{1}{2}$
Sl.30 - Fl.35 SG	777	35.6	3.4	4	88.7	2.4	7
Sl.35 - Fl.40 SG	144	6.6	7.5	$2\frac{1}{2}$	95.3	2.7	$6\frac{1}{2}$
Sl.40 - Fl.45 SG	63	2.9	12.8	2	98.2	3.0	$6\frac{1}{2}$
Sl.45 - Fl.50 SG	14	0.6	13.8	1	98.8	3.1	6
Sl.50 - Fl.55 SG	9	0.4	15.1	1	99.2	3.1	6
Sl.55 - Fl.60 SG	3	0.1	27.4	1	99.3	3.2	6
Sl. 60 SG	13	0.7	59.7	0	100.0	3.6	6
-30 Mesh	188	7.9	3.8	$8\frac{1}{2}$			

Total Weight of Sample = 2368 gms.
True Specific Gravity = 1.265

ANALYSIS OF FLOATS 1.60 S.G. FRACTION OF SAMPLE NO. 127

Yield %	99.3
Air Dried Moisture %	1.0
Ash %	3.2
Volatile Matter %	20.9
Fixed Carbon %	74.9
Total Sulphur %	0.38
Crucible Swelling Number	$7\frac{1}{2}$
Calorific Value	14,800 BTU/LB

SYDNEY
26th November, 1971

K71-1785

COALITION MINING

SURUNKA 652

CHAMBERLAIN SEAM

SPL	THICK ^S	RES TH	COMP
126	0.62	41.5	1/2
127	4.66	3.6	6

STRATIGRAPHIC LOG
SUKUNKA D.D.H. CS-2

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft.)</i>
	No core to 51.8 ft.		
	MUDSTONE, dark grey, slickensides 59-60', 69-72', 75-76', 167', calcite in tension cracks for 0.5' plus slickensides contract with this zone at 156.5', white claystone bands at 220. ' 221.5', dip 10 ⁰ .	MOOSEBAR FM.	221.5.
	SANDSTONE, dark grey, medium grained, glauconitic.	GETHING FM.	223.5
	SANDSTONE, medium to coarse, quartz-lithic, pebbles from 226-227', worm casts 230'. Dip 5-10 ⁰ .		231.0
	SANDSTONE, carbonaceous.		233.5
	<u>COAL.</u>	BIRD SEAM	235.0
	SANDSTONE, grey, medium becoming fine grained, quartz lithic, carbonaceous claystone on top. Mottled worm tracks 242'. Zone (2.5') silty interbeds at 259'.		296.0
	SILTSTONE AND MUDSTONE INTERBEDS, worm casts, mud blebs, granules at base. Dip 0-5 ⁰ .		315.0
	SANDSTONE, a few silty interbeds, coaly partings.		318.0

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
	SANDSTONE, numerous silty interbeds, mudstone at base.		326.0
	SANDSTONE, coaly wisps, mudstone at base, dip 5-10°.		353.0
	<u>COAL</u> , carbonaceous claystone split (1.5') at 358.5'.		362.5
	SANDSTONE, numerous silty interbeds and phases, mudstone at top, softish clay at base. Dip 5-10°.		373.0
	LAMINITE, siltstone and mudstone, dips increase to 60° at 376', listric surfaces, mud band at 380' core broken throughout, minor calcite.		381.0
			<u>Base of Hole</u>

SUKUNKA D.D.H. CS-2

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
Core not logged in detail - refer to Stratigraphic Log for particulars.		289.58		
SANDSTONE, grey, fine grained, quartz-lithic, bedding angle 85° to core axis.	6.96	296.54	6.96	
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey, interbedded; sandy interbeds, worm casts, mud blebs.	11.52	308.06	11.55	
SILTSTONE AND MUDSTONE INTERBEDS, as above.	5.83	313.89	5.85	
SANDSTONE, grey, medium grained, quartz-lithic, coarse interbeds in top 0.7', silty interbeds in bottom 1.2', pennybands of coal 0.28', 0.33' and 0.7' from base.	4.17	318.06	4.18	
SANDSTONE, grey, fine grained, quartz-lithic, numerous silty interbeds.	3.87	321.93	3.88	
SILTSTONE, grey, numerous mudstone interbeds. Bedding angle 84° to core axis.	4.18	326.11	4.19	
CLAYSTONE, carbonaceous.	0.36	326.47	0.36	

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, medium grained, quartz-lithic, coaly wisps and partings, fine carbonaceous phases.	0.56	327.03	0.56	
SANDSTONE, as above, bedding angle 80°-87° to core axis.	18.76	345.79	18.81	
SANDSTONE, as above, coal bands (0.04') at 0.35' from base and (0.02') at 0.14' from base. Bedding angle 80° to core axis.	6.65	352.44	6.67	
<u>COAL</u> , stony with bright pennybands.	0.10	352.54	0.10	
CLAYSTONE, carbonaceous, pyrites at top.	0.19	352.73	0.19	
SILTSTONE, dark grey.	0.37	353.10	0.37	
CLAYSTONE, carbonaceous, core broken, listric surfaces.	0.90	354.00	0.19	
<u>COAL</u> , dull, bedding angle 90° to core axis.	0.81	354.81	0.81)
dull and bright.	0.15	354.96	0.15	) SKEETER SEAM
dull.	0.24	355.20	0.24)

SUKUNKA D.D.H. CS-2

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , mainly dull with minor bright bands, fracture plane with slickensides at 30° to core axis, 0.4' from top.	0.96	356.16	0.96)
core broken into small fragments. Listric surfaces make identification impossible.	0.63	356.79	0.63)
mainly dull with minor bright bands.	0.15	356.94	0.15)
core sheared, breaks into numerous fine horizontal slivers with listric surfaces. No cleat remains. Fracture plane at 20° to core axis.	1.00	357.94	1.00)
mainly dull with minor bright bands, fracture plane with slickensides at 35° to core axis.	0.63	358.57	0.63	) SKEETER SEAM
core broken. Fragments mainly dull.	0.44	359.01	0.44)
CLAY, brown, carbonaceous, soft.	0.16	359.17	0.16)
CLAYSTONE, brown, carbonaceous.	1.10	360.27	1.10)
<u>COAL</u> , dull.	0.13	360.40	0.13)

SKEETER SEAM

SUKUNKA D.D.H. CS-2

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
COAL, mainly dull with minor bright bands, shear planes with slickensides at 25° to core axis.	0.89	361.29	0.89)
dull.	0.29	361.58	0.29)
core largely lost, fragmented and with listric surfaces.	0.69	362.27	0.05)
CLAYSTONE, carbonaceous.	1.14	363.41	1.14)
SILTSTONE, grey, becoming mudstone at top.	3.23	366.64	3.23)
SANDSTONE, grey, fine grained, quartz-lithic, numerous silty interbeds.	6.24	372.88	5.17)
CLAYSTONE, brown, becoming carbonaceous, soft phases.	1.42	374.30	1.11)
LAMINITE, siltstone grey and mudstone dark grey, interbedded. Bedding angle at top 57° to core axis. At 1.8' from top 42° to core axis. Slickensides.	2.63	376.93	2.05)
MUDSTONE, dark grey, slickensides.	1.00	377.93	0.78)

SKEETER SEAM

SUKUNKA D.D.H. CS-2

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
LAMINITE, siltstone grey and mudstone dark grey, slickensides. Bedding angle 47° to core axis.	0.67	378.60	0.52	
MUDSTONE, dark grey.	1.05	379.65	0.87	
CLAY, dark brown, soft.	0.12	379.77	0.12	
LAMINITE, siltstone grey and mudstone dark grey interbedded, becoming mudstone at base. Core broken, minor calcite, no slickensides.	0.99	380.76	0.99	
<u>COAL</u> , stony, coaly band (0.04') 0.04' from bottom	0.62	381.38	0.60)
mainly dull with minor bright bands.	0.48	381.86	0.47)
dull and bright.	0.20	382.06	0.20)
mainly dull with minor bright bands, fracture plane at 50° to core axis, 0.2' from top.	0.74	382.80	0.71	) CHAMBERLAIN SEAM
dull and bright.	0.12	382.92	0.12)
mainly dull with minor bright bands.	0.58	383.50	0.57)

SUKUKUNKA D.D.H. CS-2

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull and bright.	0.12	383.62	0.12)
)
mainly dull with minor bright bands, shear plane at 60° to core axis.	0.55	384.17	0.54)
)
bright.	0.02	384.19	0.02)
)
mainly dull with minor bright bands.	0.30	384.49	0.29)
)
bright.	0.07	384.56	0.07)
)
dull and bright.	0.13	384.69	0.13)
)
mainly dull with minor bright bands.	0.14	384.83	0.14)
)
dull, cleat not well developed.	0.17	385.00	0.17)
)
mainly dull with minor bright bands, sheared at 30° to core axis, cleat absent.	0.25	385.25	0.14)
)
dull and bright.	0.25	385.50	0.14)
)
mainly dull with minor bright bands, core broken.	0.54	386.04	0.30)

CHAMBERLAIN SEAM

SUKUNKA D.D.H. CS-2

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, medium grained, quartz-lithic, coaly wisps at top, core broken in parts along planes at 10° to core axis. Bedding angle 85° to core axis.	12.11	398.15	12.11	<u>Base of Hole</u>

BORE NUMBER CS-3

Grid Reference 49369.3 N 79524.1 E
Exploration Grid Reference B+1900'/2+200'

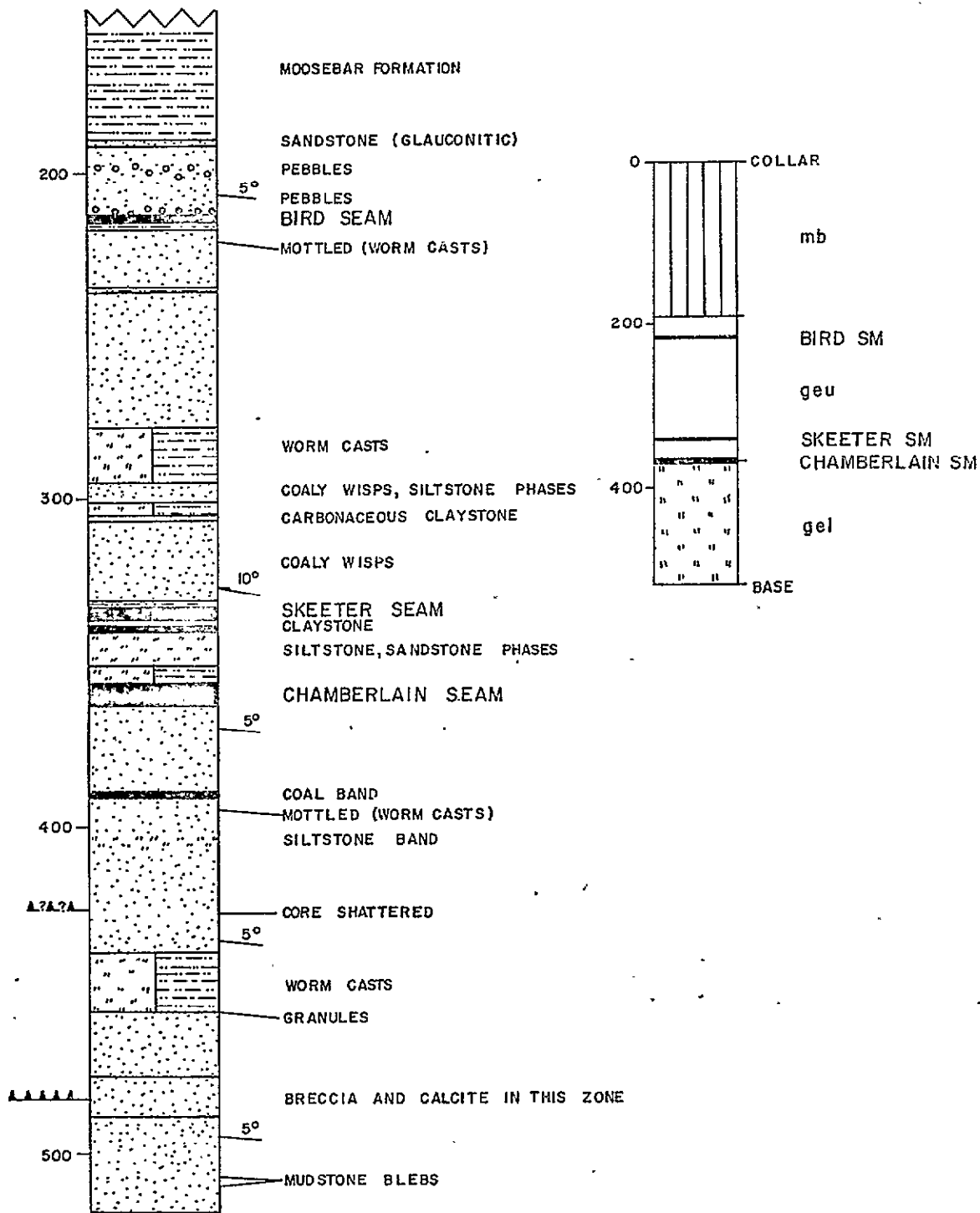
Date Commenced 27 Sept. Completed 30 Sept.

Collar R.L. 4194.2 ft. Standard Datum
Total Depth 518.0 Electrically Logged Yes/No
XX

Drilled by Connors Drilling Ltd.
For Coalition Mining Limited
Logged by F.H.S. Tebbutt

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Skeeter	3853.6	7.71	81%	
Chamberlain	3831.0	5.42	84%	



DETAIL OF GETHING
FORMATION
SCALE: 1" to 50'

SCALE: 1" to 200'


Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS

D.D.H. CS-3

SKEETER SEAM

ASH %
CUMULATIVE
FROM FLOOR

		WT %	ASH %	C. S. N ^o	INCL. BANDS	EXCL. BANDS
332.87						
	4.54	51.2	4.4	7½	31.9	
	3.17	48.8	60.7	2½	60.7	
340.58						

Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED
DRAWN BY pm DATE Jan '72

SEAM SECTIONS
DDH CS-3

SCALE: 1" to 2'

PAGE 1 of 1

CHAMBERLAIN SEAM

ASH %
CUMULATIVE
FROM FLOOR

		WT %	ASH %	C. S. N ^o	INCL. BANDS	EXCL. BANDS
357.76	0.56	-	52.2	1		
					4.0	
	4.86	-	4.0	6½		
363.18						



Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.

SEAM SECTIONS

for
COALITION MINING LIMITED

DDH CS-3

DRAWN BY pm

DATE Jan. '72

SCALE: 1' to 2'

PAGE 1 of 1

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19 BRIDGE ST.,
SYDNEY, 2000

CO. (A/SIA.) PTY. LTD.

Certification

This is to Certify

APPLICANT: COALITION MINING

SUBJECT: SUKUNKA SAMPLES NO. 107, 108/109/110
CORE NO. CS3
SKEETER SEAM

REPORT NO: K 71-1756

RECEIVED: 4.11.71

REPORTED: 26.11.71



This Laboratory is Registered by the
National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

P. Bradley
Chief Chemist.
A.R.A.C.I.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

G. W. Campbell

INTRODUCTION:

Two (2) coal samples designated Core No. CS3 - SKEETER SEAM - were received on 4.11.71 from Mc Elroy and Associates.

METHODS:

The coal samples No. 107 and 108 were hand crushed to $\frac{3}{4}$ " sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 130-160 S.G. in 0.05 steps.

The float and sink fractions and raw -30 mesh coal fractions were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample re-constituted and the true S.G. of the sample determined.

A cumulative floats 1.60 S.G. fraction was prepared for the Full Seam i.e. 107 - 110 inclusive and the analysis is given in this report.

NOTE:

No Core losses were encountered in this case.

RESULTS:

FIGURE 1 : gives the graphic log of the core

TABLES 1-2 : give the sizing, washability and analytical data for each coal sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 3 : gives the calculated washability data for the Full Seam i.e. 107 - 110 inclusive.

TABLE 1:

WASHABILITY DATA FOR SAMPLE NO. 107 (after hand crushing to $\frac{3}{4}$ ")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
Fl.30 SG	1156	49.8	2.1	9	49.8	2.1	9
Sl.30 - Fl.35 SG	802	34.6	4.6	7 $\frac{1}{2}$	84.4	3.1	8 $\frac{1}{2}$
Sl.35 - Fl.40 SG	278	12.0	7.7	3 $\frac{1}{2}$	96.4	3.7	8
Sl.40 - Fl.45 SG	20	0.9	11.2	3	97.3	3.8	8
Sl.45 - Fl.50 SG	13	0.6	14.2	1	97.9	3.8	8
Sl.50 - Fl.55 SG	28	1.2	17.9	1	99.1	4.0	7 $\frac{1}{2}$
Sl.55 - Fl.60 SG	3	0.1	22.6	1	99.2	4.0	7 $\frac{1}{2}$
Sl.60 SG	20	0.8	54.9	0	100.0	4.4	7 $\frac{1}{2}$
-30 Mesh	141	5.7	2.5	8			

Total Weight of Sample = 2461 gms.

True Specific Gravity = 1.277

TABLE 2: WASHABILITY DATA FOR SAMPLE NOS. 108/109/110 (after hand crushing to $\frac{3}{4}$ ")

FRACTION	INDIVIDUAL				CUMULATIVE		
	WEIGHT	WT.%	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
Fl.30 SG	403	18.0	2.1	8 $\frac{1}{2}$	18.0	2.1	8 $\frac{1}{2}$
Sl.30 - Fl.35 SG	226	10.1	4.5	7	28.1	3.0	8
Sl.35 - Fl.40 SG	51	2.3	9.8	7	30.4	3.5	8
Sl.40 - Fl.45 SG	24	1.1	15.2	7	31.5	3.9	8
Sl.45 - Fl.50 SG	14	0.6	20.2	3	32.1	4.2	8
Sl.50 - Fl.55 SG	13	0.6	23.3	1	32.7	4.5	7 $\frac{1}{2}$
Sl.55 - Fl.60 SG	6	0.3	31.5	1	33.0	4.8	7 $\frac{1}{2}$
Sl.60 SG	1505	67.0	88.2	0	100.0	60.7	2 $\frac{1}{2}$
-30 Mesh	106	4.5	29.6	7 $\frac{1}{2}$			

Total Weight of Sample = 2348 gms.

True Specific Gravity = 2.110

TABLE 3: CALCULATED WASHABILITY DATA FOR FULL SEAM i.e. SAMPLES 107-110
INCLUSIVE

Fl.30 SG	34.3	2.1	8 $\frac{1}{2}$	34.3	2.1	8 $\frac{1}{2}$
Sl.30 - Fl.35 SG	22.6	4.6	7	56.9	3.1	8
Sl.35 - Fl.40 SG	7.3	8.0	5	64.2	3.7	7 $\frac{1}{2}$
Sl.40 - Fl.45 SG	1.0	13.3	5	65.2	3.8	7 $\frac{1}{2}$
Sl.45 - Fl.50 SG	0.6	17.1	2	65.8	3.9	7 $\frac{1}{2}$
Sl.50 - Fl.55 SG	0.9	19.8	1	66.7	4.1	7 $\frac{1}{2}$
Sl.55 - Fl.60 SG	0.2	28.8	1	66.9	4.2	7 $\frac{1}{2}$
Sl.60 SG	33.1	87.8	0	100.0	31.9	5

ANALYSIS OF FLOATS 1.60 S.G. FRACTION OF SAMPLE NO. 107 - 110

Yield %	66.9
Air Dried Moisture %	0.8
Ash %	4.2
Volatile Matter %	22.7
Fixed Carbon %	72.3
Total Sulphur %	0.41
Crucible Swelling Number	8
Calorific Value	14,720 BTU/LB

SYDNEY

26th November, 1971

K71-1736

COBALTION MINING

BURUNGA GSB -

SHEETER SEAM

	SPL	THICK ^S	WT%	ASH%	CSNP	ASH% COVER 31.9
6'	107	4.54	51.2	25.4	7 1/2	
4'						607
2'	{ 108 109 110	3.17	48.8	60.7	2 1/2	

Telegrams and Cables:
"Visor", Sydney

CARGO SUPERINTENDENTS

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Telephone: 241 1105

CO. (A/SIA.) PTY. LTD.

Certification

This is to Certify

APPLICANT: COALITION MINING

SUBJECT: SUKUNKA SAMPLES NO. 111, 112
CORE NO. CS3
CHAMBERLAIN SEAM

REPORT NO: K 71-1757

RECEIVED: 4.11.71

REPORTED: 26.11.71



This Laboratory is Registered by the
National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

M. B. ...
Chief Chemist

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

D. W. ...

INTRODUCTION:

Two (2) coal samples designated Core No. CS3 Chamberlain Seam were received on 4.11.71 from Mc Elroy and Associates.

METHODS:

1. The visibly inferior coal sample No. 111 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.60 S.G.

The float and sink fractions and raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample re-constituted and the true S.G. of the sample determined.

2. The good quality coal samples No. 112 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 130 - 160 S.G. in 0.05 steps.

The float and sink fractions and raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample re-constituted and the true S.G. of the sample determined.

A cumulative floats 1.60 S.G fraction was prepared for sample No. 112 and the analysis is given in this report.

NOTE:

No core losses were encountered in drilling this hole.

RESULTS:

FIGURE 1 : gives the graphic log of the core

TABLE 1 - 2: give the sizings, washability and analytical data for each coal sample after hand crushing to $\frac{3}{4}$ " top size.

SHEET THREE ATTACHED

TABLE 1: WASHABILITY DATA FOR SAMPLE NO. 111 (after hand crushing to $\frac{3}{4}$ ")

FRACTION	INDIVIDUAL				CUMULATIVE		
	WEIGHT	WT.%	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
Fl.60 SG.	12	3.5	4.3	7	3.5	4.3	7
Sl.60 SG	332	96.5	53.9	$1\frac{1}{2}$	100.0	52.2	1
-30 Mesh	14	4.1	51.1	0			

Total Weight of Sample = 358 gms.
True Specific Gravity = 1.792

TABLE 2: WASHABILITY DATA FOR SAMPLE NO. 112 (after hand crushing to $\frac{3}{4}$ ")

Fl.30 SG	1244	51.9	1.7	$8\frac{1}{2}$	51.9	1.7	$8\frac{1}{2}$
Sl.30 - Fl.35 SG	970	40.5	3.4	5	92.4	2.4	7
Sl.35 - Fl.40 SG	115	4.8	7.3	4	97.2	2.7	7
Sl.40 - Fl.45 SG	9	0.4	9.4	$4\frac{1}{2}$	97.6	2.7	7
Sl.45 - Fl.50 SG	5	0.2	14.8	1	97.8	2.7	7
Sl.50 - Fl.55 SG	8	0.3	20.5	1	98.1	2.8	7
Sl.55 - Fl.60 SG	5	0.2	31.9	1	98.3	2.9	7
Sl.60 SG	39	1.7	68.0	0	100.0	4.0	$6\frac{1}{2}$
-30 Mesh	160	6.3	1.8	8			

Total Weight of Sample = 2555 gms.
True Specific Gravity = 1.270

ANALYSIS OF FLOATS 1.60 S.G. FRACTION OF SAMPLE NO. 112

Yield %	98.3
Air Dried Moisture %	0.8
Ash %	2.9
Volatile Matter %	22.4
Fixed Carbon %	73.9
Total Sulphur %	0.34
Crucible Swelling Number	$7\frac{1}{2}$
Calorific Value	14,830 BTU/LB

SYDNEY
26th, November, 1971

K71-1757

COALITION MINING

SUKUNKA CSB -
CHAMBERLAIN

	SPL	THICK ^S	ASH%	CSN ²
	111	0.56	52.2	1
4'				
	112	4.86	4.0	6 1/2
2'				
0				

STRATIGRAPHIC LOG
SUKUNKA D.D.H. CS-3

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
	No core to 13.0 ft.		
	MUDSTONE, dark grey, white clay bands at 189, 189.5', 190'.	MOOSEBAR	190.0
	SANDSTONE, glauconitic.	GETHING	192.0
	SANDSTONE, grey, medium grained quartz lithic, pebbles at 198' and at base.		213.0
	<u>COAL</u> .	BIRD SEAM	215.0
	MUDSTONE, grey.		216.0
	SANDSTONE, grey, medium grained becoming finer to base. Mottled (worm casts) at 219'. Mudstone band at 236'.		278.0
	SILTSTONE AND MUDSTONE INTERBEDS, worm casts, some sandy phases.		295.0
	SANDSTONE, coaly wisps, silty phases.		301.0
	LAMINITE, siltstone and mudstone.		305.0
	CLAYSTONE, carbonaceous.		306.0
	SANDSTONE, coaly wisps, mudstone at base.		333.0

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
Fault possible	<u>COAL</u> , claystone band at 238'.	SKEETER SM.	340.0
	SILTSTONE, sandy phases and interbeds.		351.0
	LAMINITE, siltstone and mudstone.		357.0
	<u>COAL</u> .	CHAMB. SM.	363.0
	SANDSTONE, grey, medium grained.		390.0
	<u>COAL</u> .		390.2
	SANDSTONE, grey, medium grained, finer to base, mottled (worm casts) at 394', siltstone band at 404', core shattered over 1' zone at 427', no calcite.		439.0
	SILTSTONE AND MUDSTONE INTERBEDS, sandy phases, worm casts, granules at base.		457.0
SANDSTONE, grey, fine grained, quartz-lithic, calcite fillings in tension cracks and fractures, shattered core from 476'-488', slickensides. Mudstone blebs at 507 and 510'.		518.0	
			<u>Base of Hole</u>

SUKUNKA D.D.H. CS-3

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
Core not logged in detail - refer to Stratigraphic Log for particulars.		282.27		
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey, and mudstone dark grey, interbedded; some sandy interbeds, worm casts. Bedding angle 85 ⁰ -90 ⁰ to core axis.	12.94	295.21	12.87	
SANDSTONE, grey, mainly fine grained but with a coarse phase at top (0.66') and another (1.12') 2.8' from top. Silty phases, coaly wisps.	6.18	301.39	6.12	
SILTSTONE, grey, mudstone interbeds, becoming muddier towards base. Pyritic worm casts.	2.07	303.46	2.05	
MUDSTONE, dark grey.	1.66	305.12	1.64	
CLAYSTONE, carbonaceous.	0.24	305.36	0.24	
<u>COAL</u> , dull.	0.16	305.52	0.16	
CLAYSTONE, carbonaceous.	0.24	305.76	0.24	

SUKUNKA D.D.H. CS-3

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, medium grained, quartz-lithic; coaly wisps and partings, carbonaceous in top 0.26'.	14.38	320.14	14.24	
SANDSTONE, as above.	12.16	332.29	12.04	
CLAYSTONE, carbonaceous.	0.58	332.87	0.57	
<u>COAL</u> , mainly dull with minor bright bands.	0.51	333.38	0.52)
dull and bright.	0.71	334.09	0.73)
dull.	3.32	337.41	3.39)
CLAYSTONE, dark grey.	0.53	337.94	0.53)
CLAYSTONE, dark grey, fine calcite veins at base.	0.34	338.28	0.34)
<u>COAL</u> , dull.	1.19	339.47	1.22)
sheared coal, coal stony and claystone carbonaceous with calcite veins mainly near base.	1.11	340.58	1.14)

SKEETER SEAM

SUKUNKA D.D.H. CS-3

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE, grey, sandy interbeds and phases with mudstone interbeds in bottom 3.0'. Bedding angle 80° to core axis.	10.19	350.77	10.19	
MUDSTONE, dark grey, fine silty interbeds.	5.95	356.72	5.95	
MUDSTONE, as above, grading to claystone and finally to claystone carbonaceous.	1.04	357.76	1.04	
<u>COAL</u> , stony with minor bright bands.	0.56	358.32	0.56)
mainly dull with minor bright bands.	0.96	359.28	0.96)
dull and bright.	0.25	359.53	0.25)
mainly dull with minor bright bands.	0.25	359.78	0.25)
dull and bright.	0.65	360.43	0.65)
dull.	0.54	360.97	0.54)
dull and bright.	1.02	361.99	1.02)
dull.	1.19	363.18	1.19)

CHAMBERLAIN SEAM

SUKUNKA D.D.H. CS-3

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, medium grained, quartz-lithic, carbonaceous at top, a few coaly wisps. Bedding angle 85°-90° to core axis.	11.40	374.58	11.40	
SANDSTONE, grey, medium grained, quartz-lithic; coaly wisps and partings. Current bedded, pebble band (0.20') 5.43' from base.	18.61	393.19	18.61	
SANDSTONE, grey, medium grained, grading to fine grained towards base, quartz-lithic, mottled (worm casts) zone (2.9') 0.8' from top. Silty interbeds, some concentrated into a zone (0.4') 7.5' from base. A few coaly wisps, current bedded. Bedding angle 85°-90° from core axis.	18.85	412.04	18.85	
SANDSTONE, grey, fine grained, quartz-lithic, bedding angle approx. 82° throughout, core shattered in zone (0.85') 3.25' from base.	18.81	430.85	18.81	
SANDSTONE, grey, fine grained, quartz-lithic, core broken at 6.9' from top. A few silty interbeds towards base, irregular siltstone blebs 5.4', 5.85' and 6.8' from top.	7.95	438.80	7.95	

SUKUNKA D.D.H. CS-3

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey, interbedded. Some sandy interbeds, mud blebs. Zone (0.4') of calcite veins and slickensides 4.25' from base. Bedding angles not affected - 80 ^o -90 ^o to core axis throughout.	10.77	449.57	10.77	
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey, interbedded, some sandy interbeds, mud blebs and worm casts.	7.53	457.10	7.53	
SANDSTONE, grey, coarse grained, quartz-lithic, a few pebbles near base.	0.39	457.49	0.39	
SANDSTONE, grey, fine grained, quartz-lithic. Bedding angle 75 ^o to core axis. Some silty interbeds in top 0.15'.	11.14	468.63	11.14	
SANDSTONE, as above, but bottom 2.45' badly shattered. Above this zone core is broken, calcite veins and fillings, slickensides. Bedding angles vary from 55 ^o -85 ^o to core axis.	18.75	487.38	18.75	
SANDSTONE, grey, fine grained, quartz-lithic, top 1.55' shattered. Current bedding. Bedding angle 85 ^o to core axis.	19.07	506.45	19.07	

SUKUNKA D.D.H. CS-3

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, as above, with bands of mudstone blebs 1.2', 3.8', 4.3', 6.5' and 9.2' from top.	12.19	518.64	12.19	<u>Base of Hole</u>

BORE NUMBER CS-4

Grid Reference 49438.7 N 79854.3E
Exploration Grid Reference B+1750'/2+500'

Date Commenced 22/Sept. Completed 26/Sept.

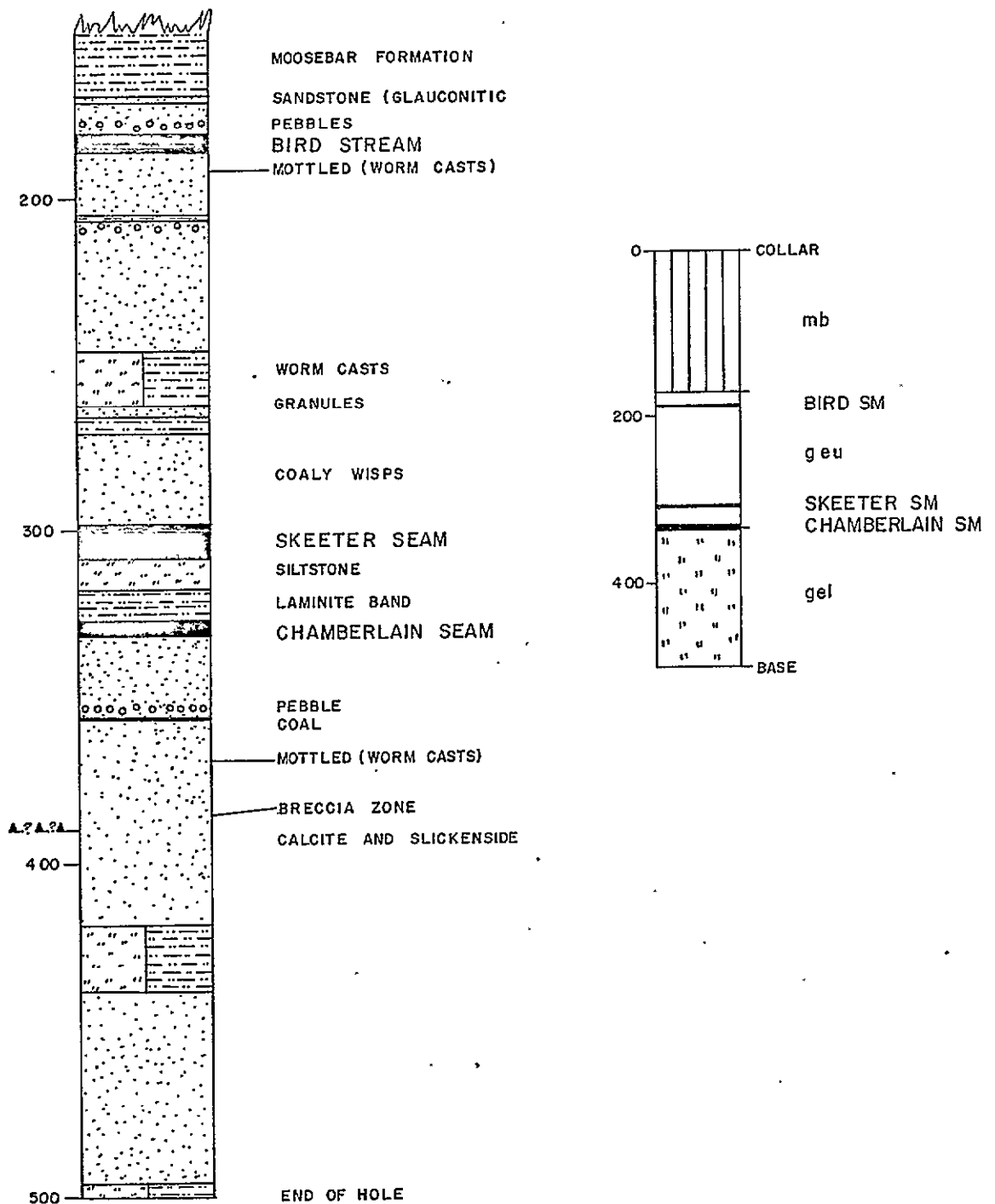
Collar R.L. 4180.1 Standard Datum
Total Depth 500.0 Electrically Logged Yes/~~No~~

Drilled by Connors Drilling Ltd.
For Coalition Mining Ltd.

Logged by F.H.S. Tebbutt

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Skeeter	3872.5	8.57	70%	
Chamberlain	3848.5	5.21	60%	



DETAIL OF GETHING
FORMATION
SCALE: 1" to 50'

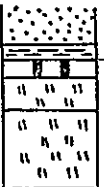
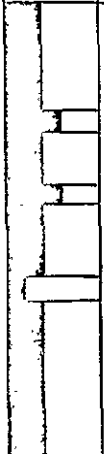
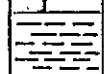


SCALE: 1" to 200'

Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS
DDH. CS-4

SKEETER SEAM

ASH %
CUMULATIVE
FROM FLOOR

		WT%	ASH%	C. S. No	INCL. BANDS	EXCL. BANDS
299.18		-	90.1	0		
		1.32				
		-	3.7	7		
		4.74				
		-	92.1	0		
		0.66				
		-	17.7	7		
		1.85				
307.75						

Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED
DRAWN BY pm DATE Jan '72


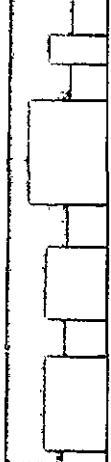

SEAM SECTIONS
DDH CS-4

SCALE: 1' to 2'

PAGE 1 of 1

CHAMBERLAIN SEAM

ASH %
CUMULATIVE
FROM FLOOR

		WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
326.54		-	51.7	1/2		
		0.41			3.1	
		-	3.1	6 1/2		
331.75						
		4.80				

Prepared by:

CLIFFORD McELROY & ASSOCIATES PTY. LTD.

for

COALITION MINING LIMITED

DRAWN BY pm

DATE Jan '72

SCALE: 1" to 2'

SEAM SECTIONS

DDH CS-4

PAGE 1 of 1

Telegrams and Cables:
"Visor", Sydney

Telephone: 241-1105

C A R G O
SUPERINTENDENTS
CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify

APPLICANT: COALITION MINING

SUBJECT: SUKUNKA SAMPLES NO. 83, 84, 85 and 86
CORE NO. CS4
SKEETER SEAM

REPORT NO: K 71-1758

RECEIVED: 4.11.71

REPORTED: 26.11.71



This Laboratory is Registered by the
National Association of Testing Authorities,
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

M. Bradley
.....
Chief Chemist.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

R. H. Joseph
.....

INTRODUCTION:

Two (2) coal samples and two non coal sample designated Core No. CS4 Skeeter Seam were received on 4/11/71 from Clifford Mc Elroy and Associates.

METHODS:

1. The coal samples No. 83, 85 were weighed, prepared and analysed for Ash and true specific gravity.
2. The visibly inferior coal sample No. 86 was hand crushed to $-\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.60 S.G.

The float and sink fractions and raw -30 mesh coal fractions were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample re-constituted and the true S.G. of the sample determined.

3. The good quality coal sample No. 84 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 130 - 160 S.G. in 0.05 steps. The float and sink fractions and raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample re-constituted and the true S.G. of the sample determined.

A cumulative floats 1.60 S.G. fraction was prepared for sample No.84 and the analysis is given in this report.

NOTE:

Sample weights have not been adjusted to compensate for core loss.

RESULTS:

FIGURE 1 : gives the graphic log of the core

TABLES 1 - 2: give the sizing, washability and analytical data for each coal sample after hand crushing to $\frac{3}{4}$ " top size.

SHEET THREE ATTACHED.

SAMPLE NO. 83

RAW COAL	Total Weight of Sample	1464
	Ash %	90.1
	True S.G.	2.510

TABLE 1:

WASHABILITY DATA FOR SAMPLE NO. 84 (after hand crushing to $\frac{3}{4}$ ")

<u>FRACTION</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
Fl.30 SG	1045	49.4	2.1	8 $\frac{1}{2}$	49.4	2.1	8 $\frac{1}{2}$
Sl.30 - Fl.35 SG	861	40.6	4.3	6	90.0	3.1	7 $\frac{1}{2}$
Sl.35 - Fl.40 SG	171	8.1	7.6	3 $\frac{1}{2}$	98.1	3.5	7
Sl.40 - Fl.45 SG	17	0.8	12.1	2 $\frac{1}{2}$	98.9	3.5	7
Sl.45 - Fl.50 SG	16	0.8	15.3	1	99.7	3.6	7
Sl.50 - Fl.55 SG	2	0.1	21.5	1	99.8	3.6	7
Sl.55 - Fl.60 SG	1	0.1	22.8	1	99.9	3.7	7
Sl.60 SG	2	0.1	65.8	0	100.0	3.7	7
-30 Mesh	109	4.9	3.2	9			

Total Weight of Sample = 2224 gms.

True Specific Gravity = 1.266

SAMPLE NO.85

RAW COAL	Total Weight of Sample	745 gms.
	Ash %	92.1
	True S.G.	2.512

TABLE 2:

WASHABILITY DATA FOR SAMPLE NO. 86 (after hand crushing to $\frac{3}{4}$ ")

Fl.60 SG	330	84.6	6.0	8 $\frac{1}{2}$	84.6	6.0	8 $\frac{1}{2}$
Sl.60 SG	60	15.4	82.1	0	100.0	17.7	7
-30 Mesh	17	4.2	9.1	8 $\frac{1}{2}$			

Total Weight of Sample = 407 gms.

True Specific Gravity = 1.490

ANALYSIS OF FLOATS 1.60 S.G. FRACTION OF SAMPLE NO. 84

Yield %	99.9
Air Dried Moisture %	0.8
Ash %	3.7
Volatile Matter %	23.2
Fixed Carbon %	72.3
Total Sulphur %	0.43
Crucible Swelling Number	7 $\frac{1}{2}$
Calorific Value	14,750 BTU/LB

SYDNEY

26th November, 1971

K71-1758
 CORLITON MINING
 CS4 - SKETER SEAM

	SPL	THICK	ASH%	CSM%
8'	83	1.32	90.1	0
6'	84	4.74	3.7	7
4'				
2'	85	0.66	92.1	0
0	86	1.85	17.7	7

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

CARGO SUPERINTENDENTS

CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify

APPLICANT: COALITION MINING

SUBJECT: SUKUNKA SAMPLES NO. 87, 88
CORE NO. CS4
CHAMBERLAIN SEAM

REPORT NO: K 71-1759

RECEIVED: 4.11.71

REPORTED: 26.11.71



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Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

For

CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

M. Bralley
Chief Chemist.

INTRODUCTION:

Two (2) coal samples designated Core No. CS4 Chamberlain Seam were received on 4.11.71 from Mc Elroy and Associates.

METHODS:

1. The visibly inferior coal sample No. 87 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.60 S.G.

The float and sink fractions and raw -30 mesh BSS coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample re-constituted and the true S.G. of the sample determined.

2. The good quality coal sample No. 88 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 130 -160 specific gravity in 0.05 steps.

The float and sink fraction and raw -30 mesh coal fraction were weighed, prepared and analysed for Ash and Crucible Swelling Number and the composite raw coal sample re-constituted and the true S.G. of the sample determined.

A cumulative floats 1.60 S.G. fraction was prepared for sample No. 88 and the analysis are given in this report.

NOTE:

Sample weights have not been adjusted to compensate for core loss.

RESULTS:

FIGURE 1: gives the graphic log of the core

TABLE 1 - 2: give the sizing, washability and analytical data for each coal sample after hand crushing to $\frac{3}{4}$ " top size.

SHEET THREE ATTACHED

TABLE 1: WASHABILITY DATA FOR SAMPLE NO. 87 (after hand crushing to $\frac{5}{4}$ ")

<u>FRACTION:</u>	<u>INDIVIDUAL</u>				<u>CUMULATIVE</u>		
	<u>WEIGHT</u>	<u>WT.%</u>	<u>ASH%</u>	<u>C.S.NO</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
Fl.60 SG	1	0.3	4.5	8	0.3	4.5	8
Sl.60 SG	305	99.7	51.8	$\frac{1}{2}$	100.0	51.7	$\frac{1}{2}$
-30 Mesh	5	1.6	47.2	1			

Total Weight of Sample = 311 gms.
True Specific Gravity = 1.792

TABLE 2: WASHABILITY DATA FOR SAMPLE NO. 88 (after hand crushing to $\frac{5}{4}$ ")

Fl.30 SG	852	52.8	1.9	9	52.8	1.9	9
Sl.30 - Fl.35 SG	648	40.1	3.3	$4\frac{1}{2}$	92.9	2.5	7
Sl.35 - Fl.40 SG	70	4.3	6.1	1	97.2	2.7	7
Sl.40 - Fl.45 SG	23	1.4	10.4	$\frac{1}{2}$	98.6	2.8	7
Sl.45 - Fl.50 SG	10	0.6	14.0	$\frac{1}{2}$	99.2	2.8	7
Sl.50 - Fl.55 SG	1	0.1	20.9	$\frac{1}{2}$	99.3	2.9	7
Sl.55 - Fl.60 SG	1	0.1	24.9	$\frac{1}{2}$	99.4	2.9	7
Sl.60 SG	9	0.6	39.1	0	100.0	3.1	$6\frac{1}{2}$
-30 Mesh	73	4.3	0.9	$8\frac{1}{2}$			

Total Weight of Sample = 1687 gms.
True Specific Gravity = 1.255

ANALYSIS OF FLOATS 1.60 S.G. FRACTION OF SAMPLE NO. 88

Yield %	99.4
Air Dried Moisture %	0.6
Ash %	2.9
Volatile Matter %	22.4
Fixed Carbon %	74.1
Total Sulphur %	0.33
Crucible Swelling Number	8
Calorific Value	14,860 BTU/LB

K71-1759

COALITION MINING

CS# - CHAMBERLAIN SEAM

SPL	THICK ^S	ASH	CSN ^o
87	0.41	51.7	1/2
88	4.80	3.1	6 1/2

4'

2'

0

STRATIGRAPHIC LOG
SUKUNKA D.D.H. CS-4

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
	No core to 20.0 ft.		
	MUDSTONE, dark grey, bentonite? bands at 103', 137', 147', 168' and 169'.	MOOSEBAR	169.0
	SANDSTONE, glauconitic.	GETHING	171.0
	SANDSTONE, grey, quartz-lithic, medium grained, pebbles at 178' 179' and from 180.5' to base.		181.9
	<u>COAL.</u>))		184.8
	MUDSTONE, grey.))	BIRD SEAM	185.7
	<u>COAL.</u>))		185.10
	SANDSTONE, grey, medium grained (fine at base), quartz-lithic, mottled (worm casts) at 192', mudstone bands at 206', pebble band at 208'.		246.0
	SILTSTONE AND MUDSTONE INTERBEDS, worm casts, granules at base.		263.0
	SANDSTONE, grey, medium grained.		267.0
	MUDSTONE, grey.		271.0
	SANDSTONE, grey, medium grained, coaly wisps.		398.0

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
	COAL.)		298.3
)		
	SANDSTONE, grey, fine grained.)	SKEETER SM.	300.6
)		
	COAL, band (0.5') at 306'.)		307.11
	SILTSTONE, grey, sandy and muddy phases.		318.0
	MUDSTONE, grey, silty interbeds becoming laminite in bottom 2' with mudstone at base.		326.10
	COAL.	CHAMB. SM.	331.9
	SANDSTONE, grey, medium grained becoming finer to base. Pebble band 352', 1' coal band at 357', worm casts (mottled) 370'. 0.5' zone of brecciation with calcite at 387', slickensides at 390', calcite veins and minor slickensides in zone from 387'-397'.		419.0
	SILTSTONE AND MUDSTONE INTERBEDS.		331.0
	SANDSTONE, grey, fine grained, minor mud bands and mud blebs towards base.		496.0
	SILTSTONE AND MUDSTONE INTERBEDS.		500.0
			<u>Base of Hole</u>

SUKUNKA D.D.H. CS-4

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
Core not logged in detail - refer to Stratigraphic Log for particulars.		245.56		
SANDSTONE, grey, fine grained, quartz-lithic, mudstone blebs in bottom 0.2'.	0.77	246.33	0.77	
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey, and mudstone dark grey, interbedded; some sandy interbeds, mudstone blebs; especially below 9.3' from top; worm casts. Bedding angle 90° to core axis.	16.11	262.44	16.07	
SANDSTONE, grey, medium to coarse grained, quartz-lithic, mudstone pennyband 0.4' from top.	0.27	262.71	0.27	
MUDSTONE, grey.	0.12	262.83	0.12	
SANDSTONE, grey, medium grained, quartz-lithic, medium to coarse grained in top 0.09'.	0.81	263.64	0.81	
CLAYSTONE, dark grey.	0.61	264.25	0.61	
CLAYSTONE, as above.	0.22	264.47	0.22	

SUKUNKA D.D.H. CS-4

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, medium grained, quartz-lithic, mudstone band (0.04') 1.07' from top, below which is a zone of mudstone blebs.	3.63	268.10	3.61	
MUDSTONE, dark grey, fine silty interbeds, worm casts replaced by pyrite.	3.26	271.36	3.24	
CLAYSTONE, carbonaceous.	0.35	271.71	0.35	
SANDSTONE, grey, fine grained, quartz-lithic, coaly wisps and a few irregular masses, one sub-vertical fine calcite vein 2.5' from top.	11.16	282.87	11.10	
SANDSTONE, grey, fine grained at top and bottom, medium to coarse grained at centre; coaly wisps and partings. Bedding angle averaging 80° to core axis.	16.14	299.01	16.05	
CLAYSTONE, carbonaceous.	0.17	299.18	0.17	
COAL, stony with minor bright bands and coal, dull and bright. Core broken and mixed.	0.18	299.36	0.18	) SKEETER SEAM
SILTSTONE, carbonaceous.	0.32	299.68	0.32	

SUKUNKA D.D.H. CS-4

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE, grey.	0.82	300.50	0.82))
<u>COAL</u> , mainly dull with minor bright bands, core broken.	0.70	301.20	0.70))
mainly dull with minor bright bands.	0.42	301.62	0.42))
dull and bright.	0.22	301.84	0.22))
mainly dull with minor bright bands.	0.55	302.39	0.55))
dull and bright.	0.20	302.59	0.20 )	) SKEETER SEAM
mainly dull with minor bright bands.	0.70	303.29	0.71))
dull.	0.29	303.58	0.29))
mainly dull with minor bright bands.	1.66	305.24	1.09))
CLAYSTONE, grey.	0.66	305.90	0.66))
<u>COAL</u> , dull and bright.	0.36	306.26	0.17))
mainly dull with minor bright bands.	1.49	307.75	0.70))

SUKUNKA D.D.H. CS-4

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
CLAYSTONE, carbonaceous, calcitic pennybands, coaly bands and possible shell fragments.	0.79	308.54	0.77	
SILTSTONE, grey, sandy interbeds towards base.	4.43	312.97	4.34	
SANDSTONE, grey, fine grained, quartz-lithic, silty interbeds, increasing in number to base. Bedding angle 90° to core axis.	5.06	318.03	4.96	
LAMINITE, siltstone grey and mudstone dark grey, interbedded.	2.29	320.32	2.24	
MUDSTONE, dark grey, phases of laminite where siltstone interbeds are present. Bedding angle 85° to core axis.	6.22	326.54	6.11	
<u>COAL</u> , stony.	0.41	326.95	0.40)
dull and bright.	0.39	327.34	0.30)
mainly dull with minor bright bands.	0.27	327.61	0.21)
dull and bright.	0.40	328.01	0.31)
core broken, predominantly dull fragments.	0.41	328.42	0.32)

CHAMBERLAIN SEAM

SUKUNKA D.D.H. CS-4

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull.	0.69	329.11	0.54)	
dull and bright.	0.42	329.53	0.33)	
mainly dull with minor bright bands.	0.75	330.28	0.58)	
dull and bright.	0.35	330.63	0.27)	CHAMBERLAIN SEAM
core badly broken - fragments mainly dull with minor bright bands.	0.99	331.62	0.77)	
dull and bright.	0.13	331.75	0.10)	
SANDSTONE, grey, medium grained, quartz-lithic, carbonaceous at top.	4.83	336.58	4.80	
SANDSTONE, grey, medium grained, quartz-lithic, coaly partings, and pennybands 4.98', 6.5', 9.6', 11.1', 15.3' from top. Phase of very coarse sandstone to granule conglomerate in bottom 2.3'. Bedding angle 85°-90° to core axis.	18.62	355.20	18.50	
SANDSTONE, grey, medium grained, quartz-lithic, coal penny-band 1.85' from top, top 1.15' very coarse grained phase.	2.07	357.27	2.06	

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull and bright.	0.42	357.69	0.42	
SANDSTONE, grey, medium grained, quartz-lithic, mottled (worm casts) from 2.2' to 3.9' from top. Silty bands (0.07') 4.4' from top, (0.12') 5.1' from top, (0.18') 5.5' from top, (0.15') with sandy interbed 12.5' from top. Further mottling (worm casts) 9.2' to 9.8' from top.	16.10	373.79	16.00	
SANDSTONE, grey, fine grained, quartz-lithic, zone of brecciation with calcite infillings (0.06') 8.9' from base. Calcite veins and fillings of tension cracks 8.9' from base diminishing towards base. Zone of slickensides and shattered core (1.4') 2.1' from base. Bedding angle 85° - 90° to core axis throughout.	19.26	393.05	19.13	
SANDSTONE, grey, fine grained, quartz-lithic, occasional calcite veins and fillings to 4.65' from top. Bedding angle 85° - 90° to core axis. Slickensides in calcitic zone.	18.58	411.63	18.45	
SANDSTONE, grey, fine grained, quartz-lithic, calcite vein and some mud blebs 6.58' from top.	6.83	418.46	6.79	

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey, interbedded.	0.22	418.68	0.22	
SANDSTONE, grey, fine grained, quartz-lithic.	0.94	419.62	0.93	
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey, interbedded, worm casts.	1.01	420.63	1.00	
SANDSTONE, grey, fine grained, quartz-lithic.	1.35	421.98	1.34	
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey, interbedded, worm casts, sandy interbeds and phases.	15.94	437.92	15.84	
SANDSTONE, grey, fine grained, quartz-lithic, granule bands in top 0.87'.	12.08	450.00	12.00	
Core not logged in detail below 450.00'. Refer to Stratigraphic Log for particulars.				

BORE NUMBER

CS-5

Grid Reference 49719.9 N 80135.0 E
Exploration Grid Reference B+1700'/2+900'

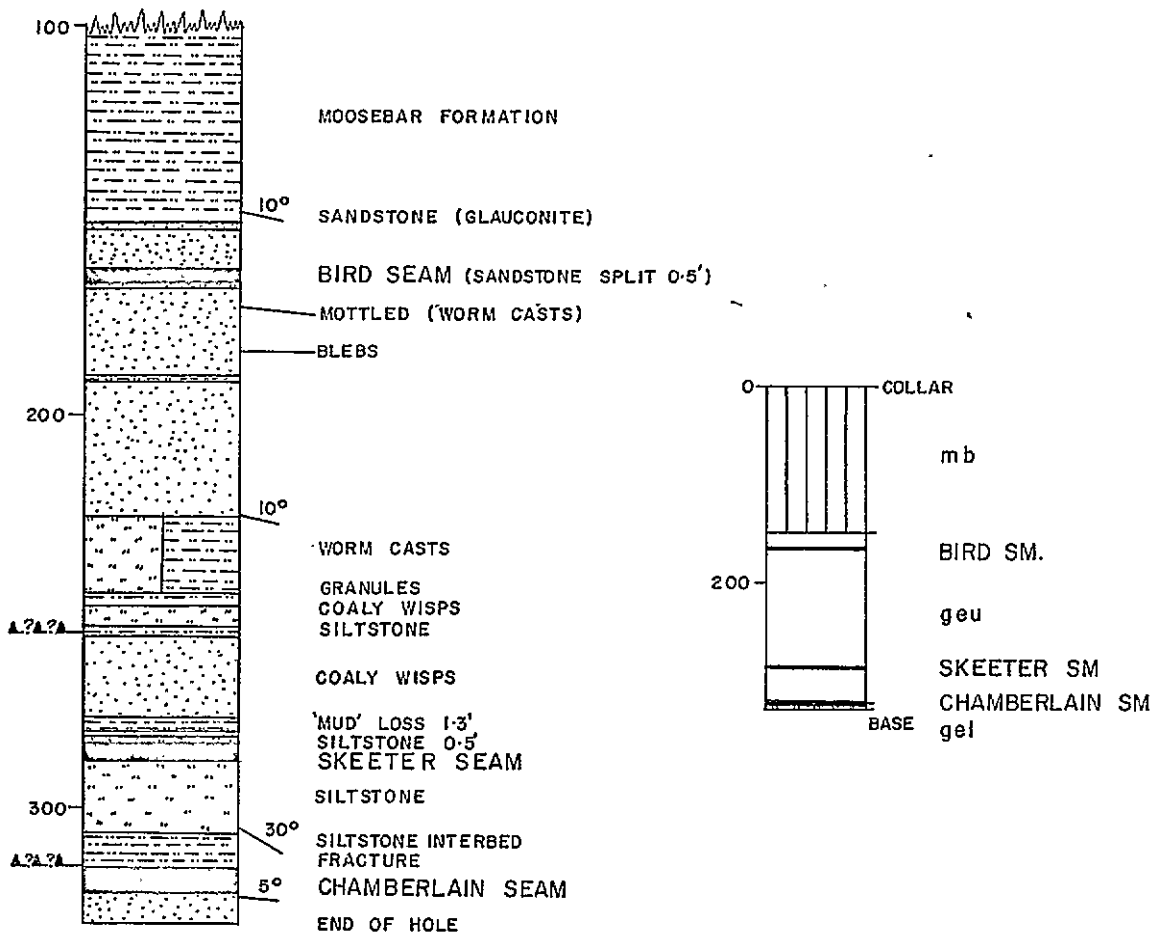
Date Commenced 20/Sept. Completed 22/Sept.

Collar R.L. 4154.5 ft. Standard Datum
Total Depth 330.0 Electrically Logged Yes/~~No~~

Drilled by Connors Drilling Ltd.
For Coalition Mining Ltd.
Logged by F.H.S. Tebbutt

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Skeeter	3866.1	6.49	55%	
Chamberlain	3832.2	6.52	67%	



DETAIL OF GETHING
FORMATION
SCALE: 1" to 50'

SCALE: 1" to 200'

Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS
DD.H.CS-5

SKEETER SEAM

ASH %
CUMULATIVE
FROM FLOOR


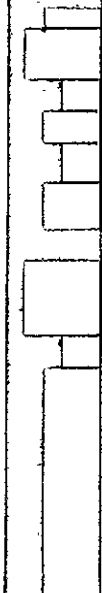

		WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
282.00		4.05	-	4.8	7½	
		0.67	-	91.9	0	
		1.77	-	13.3	8	
288.49						

Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED
DRAWN BY pm DATE Jan '72

SEAM SECTIONS
DDH CS-5

SCALE: 1' to 2'

PAGE 1 of 1

				ASH % CUMULATIVE FROM FLOOR				
CHAMBERLAIN SEAM				WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
315.83		0.30	-	46.8	2			
		6.22	-	3.7	7	3.7		
322.35								

Prepared by:
 CLIFFORD McELROY & ASSOCIATES PTY. LTD.
 for
 COALITION MINING LIMITED
 DRAWN BY pm DATE Jan '72

SEAM SECTIONS
 DDH CS-5

SCALE: 1" to 2'

PAGE 1 of 1

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

CARGO SUPERINTENDENTS

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

CO. (A/SIA.) PTY. LTD.

Certification

This is to Certify

APPLICANT:

COALITION MINING

REPORT ON:

SUKUNKA SAMPLES NOS. 89, 90, 91
CORE NO. CS5
SKEETER SEAM

REPORT NO.

K71-1760

DATE RECEIVED:

4.11.71

DATE REPORTED:

26.11.71



This Laboratory is Registered by the
National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

A. Bradley
Chief Chemist.

A.R.A.C.I.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

INTRODUCTION: Two (2) coal samples and one (1) non coal sample designated CORE NO. CS5 SKEETER SEAM were received on 4. 11. 71 from CLIFFORD MCELROY & ASSOCIATES PTY. LTD.

METHODS:

1. The non coal sample, No. 90, was weighed, prepared and analysed for ash and true specific gravity.
2. The visibly inferior coal sample, no. 91, was hand crushed to $-\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.60 S.G.

The float and sink fractions and raw -30 mesh coal fraction were weighed, prepared and analysed for ash and crucible swelling number and the composite raw coal sample reconstituted and the true S.G. of the sample determined.

3. The good quality coal sample, no. 89, was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 - 1.60 specific gravity in 0.05 steps. The float and sink fractions and raw -30 mesh coal fraction were weighed, prepared and analysed for ash and crucible swelling number and the composite raw coal sample reconstituted and the true S.G. of the sample determined.

A cumulative floats 1.60 S.G. fraction was prepared for sample no. 89 and the analyses are given in this report.

NOTE: Sample weights have not been adjusted to compensate for core loss.

RESULTS: FIGURE 1: gives the graphic log of the core.
TABLES 1 - 2: give the sizing, washability and analytical data for each coal sample after hand crushing to $\frac{3}{4}$ " , top size.

TABLE 1: WASHABILITY DATA FOR SAMPLE NO. 89 (after hand crushing to $-\frac{3}{4}$ ")

FRACTION	INDIVIDUAL ANALYSIS				CUMULATIVE ANALYSIS		
	WT. GM.	WT. %	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
F1.30	810	51.7	1.8	9	51.7	1.8	9
S1.30 - F1.35	441	28.1	4.4	7 $\frac{1}{2}$	79.8	2.7	8 $\frac{1}{2}$
S1.35 - F1.40	180	11.5	9.1	3	91.3	3.5	8
S1.40 - F1.45	83	5.3	11.9	2 $\frac{1}{2}$	96.6	4.0	7 $\frac{1}{2}$
S1.45 - F1.50	14	0.9	16.6	1 $\frac{1}{2}$	97.5	4.1	7 $\frac{1}{2}$
S1.50 - F1.55	19	1.2	20.0	1 $\frac{1}{2}$	98.7	4.3	7 $\frac{1}{2}$
S1.55 - F1.60	7	0.4	22.1	1/2	99.1	4.4	7 $\frac{1}{2}$
S1.60	14	0.9	53.3	0	100.0	4.8	7 $\frac{1}{2}$
-30 Mesh RC	97	5.8	2.6	8 $\frac{1}{2}$			

TOTAL WEIGHT OF SAMPLE 1665 gms

TRUE S.G. = 1.280

SHEET THREE ATTACHED:

SAMPLE NO. 90

<u>FRACTION</u>	<u>INDIVIDUAL ANALYSIS</u>				<u>CUMULATIVE ANALYSIS</u>		
	<u>WT. GM.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>	<u>WT. %</u>	<u>ASH%</u>	<u>C.S.NO.</u>
RAW COAL	TOTAL WEIGHT OF SAMPLE = 647						
				ASH% = 91.9			
				TRUE S.G. = 2.540			

TABLE 2: WASHABILITY DATA FOR SAMPLE NO. 91 (after hand crushing to - $\frac{3}{4}$ ")

F1.60	203	86.4	3.0	9	86.4	3.0	9
S1.60	32	13.6	78.5	0	100.0	13.3	8
-30 Mesh RC	13	5.2	8.0	9			

TOTAL WEIGHT OF SAMPLE 248 gms

TRUE S.G. = 1.420

ANALYSIS OF F1.60 S.G. FRACTION OF SAMPLE NO. 89

<u>YIELD %</u>	<u>ADM%</u>	<u>ASH%</u>	<u>V.M.%</u>	<u>F.C.%</u>	<u>S. %</u>	<u>C.S.NO.</u>	<u>CV(BTU/lb)</u>
99.1	0.6	4.6	23.8	71.0	0.34	8	14,650

SYDNEY

30th November, 1971.

K71-1760

COALITION MINING

COB - SKEETER SEAM

	SPL	THICK	ASH%	COMP
6'				
4'	89	4.05	4.8	7 1/2
2'	90	0.67	91.9	0
0	91	1.77	13.3	8

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

CARGO SUPERINTENDENTS

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

CO. (A/SIA.) PTY. LTD.

Certification

This is to Certify

APPLICANT: COALITION MINING

SUBJECT: SUKUNKA SAMPLES NOS. 92, 93
CORE NO. CS5
CHAMBERLAIN SEAM

REPORT NO. K71 - 1761

DATE RECEIVED: 4. 11. 71

DATE REPORTED: 26. 11. 71



This Laboratory is Registered by the National Association of Testing Authorities, Australia. The tests reported herein have been performed in accordance with the terms of registration.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

M. Bradley
.....
Chief Chemist.
A.R.A.C.I.

INTRODUCTION: Two (2) coal samples designated CORE NO. CS 5 CHAMBERLAIN SEAM were received on 4. 11. 71 from CLIFFORD MCELROY & ASSOCIATES PTY. LTD.

METHODS: 1. The visibly inferior coal sample no. 92, was hand crushed to $-3/4''$, sized at 30 mesh BSS and the $+30$ mesh BSS fraction washed in organic liquids at 1.60 S.G.

The float and sink fraction and raw -30 mesh coal fraction were weighed, prepared and analysed for ash and crucible swelling number and the composite raw coal sample was reconstituted and the true S.G. of the sample determined.

2. The good quality coal sample, no. 93, was hand crushed to $3/4''$, sized at 30 mesh BSS and the $+30$ mesh BSS fraction washed in organic liquids at 1.30 - 1.60 specific gravity in 0.05 steps.

The float and sink fraction, raw -30 mesh coal fraction were weighed, prepared and analysed for ash and crucible swelling number and the composite raw coal sample reconstituted and the true S.G. of the sample determined.

A cumulative floats 1.60 S.G. fraction was prepared of sample no. 93 and the analysis is given in this report.

NOTE: Sample weights have not been adjusted to compensate for core loss.

RESULTS: FIGURE 1: gives the graphic log of the core.
TABLES 1 - 2 : give the sizing, washability and analytical data for each coal ply after hand crushing to $3/4''$, top size.

TABLE 1: WASHABILITY DATA FOR SAMPLE NO. 92 (after hand crushing to $3/4''$)

FRACTION	INDIVIDUAL ANALYSIS				CUMULATIVE ANALYSIS		
	WT. GM.	WT. %	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
F1.60 SG	40	30.1	2.8	7 $\frac{1}{2}$	30.1	2.8	7 $\frac{1}{2}$
S1.60 SG	93	69.9	65.8	0	100.0	46.8	2
-30 Mesh RC	3	2.2	40.1	4			

TOTAL WEIGHT OF SAMPLE = 136 gms

TRUE S.G. = 1.790

SHEET THREE ATTACHED:

TABLE 2: WASHABILITY DATA FOR SAMPLE NO. 93 (after hand crushing to $\frac{3}{4}$ ")

FRACTION	INDIVIDUAL ANALYSIS				CUMULATIVE ANALYSIS		
	WT. GM.	WT. %	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
F1.30	1092	45.5	1.8	8 $\frac{1}{2}$	45.5	1.8	8 $\frac{1}{2}$
S1.30 - F1.35	1034	43.0	3.5	6	88.5	2.6	7 $\frac{1}{2}$
S1.35 - F1.40	183	7.6	7.2	4 $\frac{1}{2}$	96.1	3.0	7
S1.40 - F1.45	24	1.0	12.9	2 $\frac{1}{2}$	97.1	3.1	7
S1.45 - F1.50	23	1.0	14.6	1	98.1	3.2	7
S1.50 - F1.55	9	0.4	15.2	1	98.5	3.3	7
S1.55 - F1.60	6	0.2	24.1	1	98.7	3.3	7
S1.60 - . . .	31	1.3	34.1	0			
-30 Mesh RC	186	7.2	1.6	9			

TOTAL WEIGHT OF SAMPLE = 2,588 gms

TRUE S.G. 1.266 .

ANALYSIS OF F1.60 S.G. FRACTION OF SAMPLE NO. 93

YIELD %	ADM%	ASH%	V.M.%	F.C.%	S. %	C.S.NO.	CV(BTU/lb)
98.7	0.6	3.3	22.1	74.0	0.37	8	14,900

SYDNEY

29th November, 1971.

KTIP17H1

COALITION MINING

CSS - CHANDERMAIN SEAM

SPL	THICK	ASH%	CEN%
92	0.30	45.8	2

6

4

93 6.22 37 7

2

0

STRATIGRAPHIC LOG
SUKUNKA D.D.II. CS-5

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
	No core to 20.0 ft.		
	MUDSTONE, dark grye, core broken, in parts, but no slickensides, or calcite, white bentonite (?) layers at 150' and 150.5'.	MOOSEBAR FM.	150.5
	SANDSTONE, glauconitic.	GETHING FM.	152.5
	SANDSTONE, grey, medium grained, quartz-lithic, coaly wisps.		161.0
	CONGLOMERATE, sandy interbeds.		163.0
	<u>COAL.</u>	BIRD SEAM	165.5
	SILTSTONE, grey.		166.5
	<u>COAL.</u>		167.0
	SANDSTONE, grey, medium to fine grained, quartz-lithic, worm casts at 130', mudstone blebs at 784'. Mudstone band at 190'.		227.0
	SILTSTONE AND MUDSTONE INTERBEDS, worm casts, granules at base.		245.0
	SANDSTONE, grey, medium grained, quartz-lithic, coaly wisps, mudstone at 247'.		249.0

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
Fault possible	SILTSTONE, grey, mudstone interbeds, carbonaceous phase at base.		254.0
	SANDSTONE, grey, coaly wisps, mudstone phase at 255'. Broken, with calcite over 0.02'. Mudstone phases at 278' and base with sand blebs at base.		280.33
	CORE LOSS? - 1.17' (probably coal).		281.7
	SILTSTONE, grey.		282.0
	<u>COAL</u> , (.5' band between 285' and 286' between 285 and 286').	SKEETER SM.	288.5
	SILTSTONE, sandy phases, small disturbed zone 0.2' with some minor calcite and slickensides at 302'.		306.0
	MUDSTONE, silty interbeds at top, dip steepens to small fracture zone at 315', bedding horizontal beneath.		215.83
	<u>COAL</u> .	CHAMB. SM.	322.5
SANDSTONE, grey, medium grained, quartz-lithic.		330.0	
			<u>Base of Seam</u>

SUKUNKA D.D.H. CS-5

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
Core not logged in detail - refer to Stratigraphic Log for particulars.		229.56		
SANDSTONE, grey, fine grained, quartz-lithic.	1.63	231.19	1.63	
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey, interbedded, worm casts, mud blebs, some sandy interbeds.	13.01	244.20	12.88	
SANDSTONE, grey, medium to coarse grained, quartz-lithic, mudstone blebs and calcitic (?) blebs; mudstone band (0.06') at base.	0.83	245.03	0.81	
SANDSTONE, grey, fine grained, quartz-lithic.	1.60	246.63	1.57	
CLAYSTONE, carbonaceous.	0.37	247.00	0.36	
SANDSTONE, grey, fine to medium grained, quartz-lithic, silty phase (0.2') 0.55' from top, numerous coaly wisps and irregular masses in top 0.55'.	2.69	249.69	2.64	

SUKUNKA D.D.H. CS-5

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE, grey, numerous mudstone interbeds becoming finer towards base, one sandstone phase (0.06') 0.12' from top. Bedding angle 88° to core axis.	4.00	253.69	3.92	
CLAYSTONE, carbonaceous, a few fine coaly bands.				
SANDSTONE, grey, medium to fine grained, quartz-lithic, coaly wisps and partings, some fine carbonaceous phases.	9.00	263.34	8.82	
SANDSTONE, grey, fine grained at top and grading to medium to coarse grained at base, quartz-lithic, coaly wisps and partings, coaly blebs; brecciated zone (0.23') 1.09' from top, several calcite veins in 1.2' zone below breccia. Bedding angle above breccia zone 87°-90° to core axis. Bedding angle below breccia zone 80° to core axis.	15.17	278.51	14.88	
CLAYSTONE, carbonaceous, sandy blebs at top.	0.67	279.18	0.66	
SANDSTONE, grey, fine grained, quartz-lithic, numerous coaly wisps and fine carbonaceous phases; sandy blebs.	1.29	280.47	1.26	
CLAYSTONE, carbonaceous, some silty interbeds.	1.53	282.00	1.50	
<u>COAL</u> , mainly dull with minor bright bands; core broken. dull and bright, core broken.	0.46	282.46	0.42	) SKEETER SEAM)

SUKUNKA D.D.H. CS-5

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , mainly dull with minor bright bands, core broken.	0.49	283.14	0.45)
dull and bright, core broken.	0.51	283.65	0.47)
mainly dull with minor bright bands, core broken.	0.78	284.43	0.71)
dull, core broken.	0.66	285.09	0.60)
mainly dull with minor bright bands, core broken.	0.28	285.37	0.26)
dull, core broken.	0.68	286.05	0.62)
CLAYSTONE, dark grey, bottom 0.22' badly broken.	0.67	286.72	0.67)
<u>COAL</u> , dull.	1.20	287.92	0.42)
mainly dull with minor bright bands and containing a claystone band (0.04'), core broken and mixed.	0.57	288.49	0.20)
CLAYSTONE, carbonaceous, with pockets of carbonaceous mud (soft) at top.	0.93	289.42	0.93)
CLAYSTONE, dark grey.	1.00	290.42	1.00)

SKEETER SEAM

SUKUNKA D.D.H. CS-5

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE, grey, sandy interbeds and phases, some mudstone interbeds towards the base, calcite veins from 1.4' to 2.8' from top, slump structure 2.1' from top. Bedding angle 82° to core axis.	17.58	308.00	17.58	
MUDSTONE, grey, silty at top, core broken at top.	1.91	309.91	1.81	
MUDSTONE, dark grey, bedding angle at top 82° to core axis, at 4.14' from top bedding angle 62° to core axis. Core broken (0.12') 4.34' from top beneath which bedding angle 90° to core axis.	5.92	315.83	5.61	
<u>COAL</u> , stony.	0.30	316.13	0.24	) ) ) ) ) ) ) CHAMBERLAIN SEAM
bright.	0.08	316.21	0.06	
mainly dull with minor bright bands.	0.22	316.43	0.17	
dull.	0.56	316.99	0.44	
dull and bright.	0.32	317.31	0.25	

SUKUNKA D.D.H. CS-5

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , mainly dull with minor bright bands.	0.32	317.63	0.25)	CHAMBERLAIN SEAM
dull and bright.	0.43	318.06	0.34)	
mainly dull with minor bright bands.	0.41	318.47	0.32)	
core fragmented to fine chips.	0.36	318.83	0.28)	
dull.	0.76	319.59	0.60)	
dull and bright.	0.32	319.91	0.25)	
coal sheared, core mainly dull to dull with minor bright bands.	2.44	322.35	1.94)	
SANDSTONE, grey, medium grained, quartz-lithic, carbonaceous at top and with coaly partings to 1.7' from top. Bedding angle 85° to core axis.	5.20	327.55	5.20	
SANDSTONE, grey, medium grained, quartz-lithic.	5.53	333.08	5.53	<u>Base of Hole</u>

BORE NUMBER CS-6

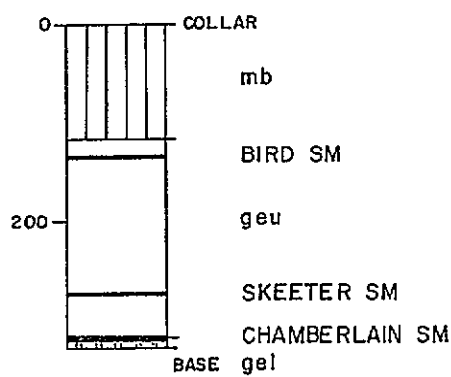
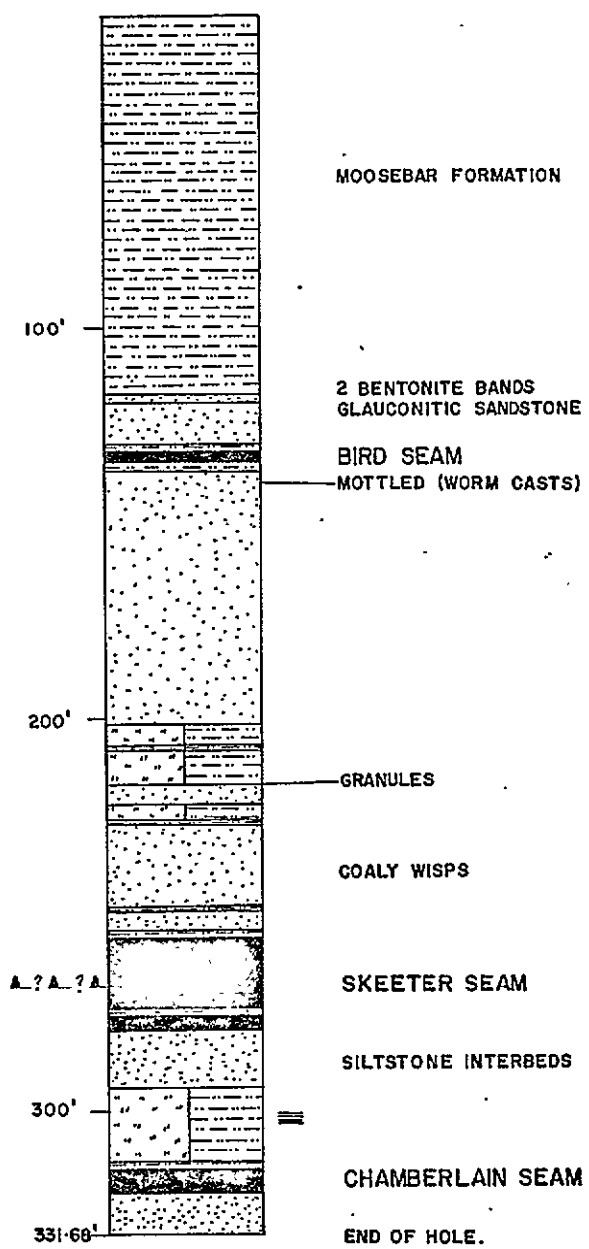
Grid Reference 49704.9 N 80380.3 E
Exploration Grid Reference B+1600' / 2+1200'

Date Commenced 17/Sept. Completed 19/Sept.

Collar R.L. 4097.9 Standard Datum
Total Depth 331.67 Electrically Logged Yes/~~No~~
Drilled by Connors Drilling Ltd.
For Coalition Mining Limited
Logged by F.H.S. Tebbutt

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Skeeter	3819.5	22.52	38%	Faulted Seam
Chamberlain	3777.95	6,12	75%	



DETAIL OF GETHING FORMATION
SCALE: 1" to 50'

SCALE: 1" to 200'

Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS
DDH CS-6

SKEETER SEAM

ASH %
CUMULATIVE
FROM FLOOR

	WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
255.93					
10.33	-	6.0	6½		
266.78					
0.52	-	83.0	0		
Continued					



Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED
DRAWN BY pm DATE Jan '72

SEAM SECTIONS
DDH CS-6

SCALE: 1" to 2'

SKEETER SEAM

ASH %
CUMULATIVE
FROM FLOOR

		WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
Continuation						
266.78		9.86	-	11.1	6	
		1.12	-	84.8	0	
		0.69	-	9.3	8	
278.45						

Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED
DRAWN BY pm DATE Jan '72

SEAM SECTIONS
DDH CS-6

SCALE: 1" to 2'

PAGE 2 of 2

CHAMBERLAIN SEAM

ASH %
CUMULATIVE
FROM FLOOR

	WT%	ASH%	C. S. N ^o	INCL. BANDS	EXCL. BANDS
313.83	0.12	85.7	0	2.9	
6.00	-	2.9	7		
319.95					



Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED
DRAWN BY pm DATE Jan '72

SEAM SECTIONS
DDH CS-6

SCALE: 1' to 2'

PAGE 1 of 1

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

CARGO SUPERINTENDENTS

CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify

APPLICANT:

COALITION MINING

SUBJECT:

SUKUNKA SAMPLES NO. 94, 95, 96, 97, 98
CORE NO. CS6
SKEETER SEAM

REPORT NO.

K71-1762

DATE RECEIVED:

4. 11. 71

DATE REPORTED:

24. 11. 71



This Laboratory is Registered by the
National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

M. Bradley
A.R.A.C.I. Chief Chemist

For

CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

INTRODUCTION:

Three (3) coal samples and two (2) non coal samples designated CORE NO. CS6 SKEETER SEAM were received on 4.11.71 from CLIFFORD MCELROY & ASSOCIATES PTY. LTD.

METHODS:

1. The non coal samples, nos. 95, 97, were weighed, prepared and analysed for ash and true specific gravity.

2. The visibly inferior coal sample, no. 98, was hand crushed to $-\frac{3}{4}$ ", sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.60 S.G.

The float and sink fractions and raw -30 mesh coal fractions were weighed, prepared and analysed for ash and crucible swelling number and the composite raw coal sample reconstituted and the true S.G. of the sample determined.

3. The good quality coal samples, nos. 94, 96, were hand crushed to $\frac{3}{4}$ ", sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 - 1.60 in 0.05 steps. The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for ash and crucible swelling number and the composite raw coal sample reconstituted and the true S.G. of the sample determined.

A cumulative floats 1.60 S.G. fraction was prepared for samples nos. 94 and 96 and the analyses are given in this report.

NOTE:

Sample weights have not been adjusted to compensate for core loss.

RESULTS:

FIGURE 1: given the graphic log of the core.

TABLES 1 - 3: give the sizing, washability and analytical data for each coal sample after hand crushing to $\frac{3}{4}$ ", top size.

TABLE 1: WASHABILITY DATA FOR SAMPLE NO. 94 (after hand crushing to $\frac{3}{4}$ ")

FRACTION	INDIVIDUAL ANALYSIS				CUMULATIVE ANALYSIS		
	WT.	GM.WT.	%	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
F1.30	565	31.3	2.1	9	31.3	2.1	9
S1.30 - F1.35	826	45.7	3.9	6	77.0	3.2	7½
S1.35 - F1.40	175	9.7	9.7	4½	86.7	3.9	7
S1.40 - F1.45	147	8.1	14.5	1½	94.8	4.8	6½
S1.45 - F1.50	37	2.0	16.0	1	96.8	5.0	6½
S1.50 - F1.55	26	1.4	20.5	1	98.2	5.3	6½
S1.55 - F1.60	10	0.6	22.6	1	98.8	5.4	6½
S1.60	21	1.2	61.8	0			

TOTAL WEIGHT OF SAMPLE = 1,924 gms

TRUE S.G. = 1.300

SAMPLE NO. 95

RAW COAL TOTAL WEIGHT = 463 gms
 ASH% = 83.0
 TRUE S.G. = 2.339

TABLE 2: WASHABILITY DATA FOR SAMPLE NO. 96 (after hand crushing to 3/4")

FRACTION	INDIVIDUAL ANALYSIS				CUMULATIVE ANALYSIS		
	WT. GM.	WT. %	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
F1.30	629	35.3	2.2	9	35.3	2.2	9
S1.30 - F1.35	618	34.7	4.0	7	70.0	3.1	8
S1.35 - F1.40	188	10.6	10.6	3 1/2	80.6	4.1	7 1/2
S1.40 - F1.45	83	4.7	14.1	2 1/2	85.3	4.6	7
S1.45 - F1.50	76	4.3	21.1	1	89.6	5.4	7
S1.50 - F1.55	16	0.9	27.5	1	90.5	5.6	7
S1.55 - F1.60	4	0.2	29.0	1	90.7	5.7	7
S1.60	167	9.3	63.6	0	100.0	11.1	6
-30 Mesh RC	99	5.3	10.3	7 1/2			

TOTAL WEIGHT = 1,880 gms

TRUE S.G. = 1.384

SAMPLE NO. 97

RAW COAL TOTAL WEIGHT = 2,512 gms
 ASH% = 84.8
 TRUE S.G. = 2.351

TABLE 3: WASHABILITY DATA FOR SAMPLE NO. 98 (after hand crushing to 3/4")

F1.60	152	92.1	5.1	8 1/2	92.1	5.1	8 1/2
S1.60	13	7.9	58.2	0	100.0	9.3	8
-30 Mesh RC	11	6.3	6.0	8 1/2			

TOTAL WEIGHT = 176 gms

TRUE S.G. = 1.355

ANALYSIS OF F1.60 S.G. FRACTION OF SAMPLE NO. 94

YIELD %	ADM%	ASH%	V.M.%	F.C.%	S. %	C.S.NO.	CV(BTU/lb)
98.8	0.6	5.4	22.3	71.7	0.35	7	14,520

ANALYSIS OF F1.60 S.G. FRACTION OF SAMPLE NO. 96

YIELD %	ADM%	ASH%	V.M.%	F.C.%	S.%	C.S.NO.	CV(BTU/lb)
90.7	0.5	5.7	22.1	71.7	0.35	7 1/2	14,500

K71-1762

COALITION MINING

CS6 - SKEETER BEAM

	SPU	THICK ^s	ASA ^u	CS# ^o
22'				
20'				
18'	94	10.33'	6.0	6 1/2
16'				
14'				
12'	95	10.52'	6.0	0
10'				

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

CARGO
SUPERINTENDENTS
CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify

APPLICANT: COALITION MINING

REPORT ON: SUKUNKA SAMPLES NOS. 99, 100
CORE NO. CS6
CHAMBERLAIN SEAM

REPORT NO. K71-1763

DATE RECEIVED: 4. 11. 71

DATE REPORTED: 26. 11. 71



This Laboratory is Registered by the
National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

M. Bralley
A.R.A.C. Chemist

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

INTRODUCTION:

One (1) coal sample and one (1) non coal sample designated CORE NO. CS6 CHAMBERLAIN SEAM were received on 4. 11. 71 from CLIFFORD MCELROY & ASSOCIATES PTY. LTD.

METHODS:

1. The non coal sample, no. 99, was weighed, prepared and analysed for ash and true specific gravity.
2. The good quality coal sample, no. 100, was hand crushed to $-\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 - 1.60 specific gravity in 0.05 steps.

The float and sink fraction and raw -30 mesh coal fraction were weighed, prepared and analysed for ash and crucible swelling number and the composite raw coal sample reconstituted and the true S.G. of the sample determined. A cumulative floats 1.60 S.G. fraction was prepared for sample no. 100 and the analysis is given in this report.

NOTE:

Sample weights have not been adjusted to compensate for core loss.

RESULTS:

FIGURE 1: gives the graphic log of the core.

TABLE 1: gives the sizing, washability and analytical data for the coal sample after hand crushing to $\frac{3}{4}$ " top size.

SAMPLE NO. 99

RAW COAL

TOTAL WEIGHT = 113 gms TRUE S.G. = 2.564
 † ASH% 85.7

TABLE 1: WASHABILITY DATA FOR SAMPLE NO. 100 (after hand crushing to $\frac{3}{4}$ ")

FRACTION	INDIVIDUAL ANALYSIS				CUMULATIVE ANALYSIS		
	WT. GM.	WT. %	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
F1.30	1089	54.6	1.0	8½	54.6	1.0	8½
S1.30 - F1.35	743	37.3	3.4	5½	91.9	2.0	7½
S1.35 - F1.40	113	5.7	7.6	3	97.6	2.3	7
S1.40 - F1.45	17	0.9	13.3	1	98.5	2.4	7
S1.45 - F1.50	7	0.4	17.3	1	98.9	2.5	7
S1.50 - F1.55	6	0.3	18.9	1	99.2	2.5	7
S1.55 - F1.60	1	0.1	22.1	1	99.3	2.5	7
S1.60	17	0.7	49.1	0	100.0	2.9	7
-30 Mesh RC	154	7.2	1.3	8½			

TOTAL WEIGHT = 2,147 gms

TRUE S.G. = 1.250

ANALYSIS OF F1.60 S.G. FRACTION OF SAMPLE NO. 100

YIELD %	ADM%	ASH%	V.M.%	F.C.%	S%	C.S.NO.	CV(BTU/lb)
99.3	0.5	2.5	23.2	73.8	0.35	8	14,100

Methods

Coalition Mining

ESB = CEANURRAIN SEM

SPI	Thick ³	ASH _p	ESW
99	0.12	857	0

100 6.00 2.9 7

STRATIGRAPHIC LOG
SUKUNKA D.D.H. CS-6

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
	No core to 20.0 ft.		
	MUDSTONE, dark grey, from 75' to 78' a 2" core loss no slickensides or calcite. Mud band (0.5') at 115', bentonite (?) at 116' and 116.5'.	MOOSEBAR	117.0
	SANDSTONE, glauconitic.	GETHING	119.0
	SANDSTONE, grey, medium grained, quartz-lithic, mudstone bands at base.		131.0
	<u>COAL</u> .	BIRD SEAM	133.8
	CLAYSTONE, coaly bands.		135.0
	SANDSTONE, grey, medium to fine, quartz-lithic, worm casts at 140'.		201.0
	SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey, worm casts.		206.0
	LAMINITE, siltstone and mudstone.		208.0
	SILTSTONE AND MUDSTONE INTERBEDS:		217.0
	SANDSTONE, grey, medium grained, granules at top and bottom.		219.0
	SANDSTONE, silty interbeds.		222.0

Structure	Description of Strata	Formation or Member	Depth to Base of Stratum (ft)
Fault, possible	LAMINITE, siltstone and mudstone, mudstone at base.		227.0
	SANDSTONE, coaly wisps, mudstone phases at 248' and at base.		255.9
	<u>COAL</u> , split of 2' at 274', core very broken.		278.58
	SANDSTONE, siltstone interbeds and phases.		294.5
	LAMINITE, siltstone and mudstone.		313.83
	CORE LOSS.		314.75
	MUDSTONE, grey.		314.83
	<u>COAL</u> .	CHAMB. SM.	320.5
	SANDSTONE, grey, medium grained, quartz lithic.		331.68
			<u>Base of Seam</u>

SUKUNKA D.D.H. CS-6

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
Core not logged in detail - refer to Stratigraphic Log for particulars.		173.48		
SANDSTONE, grey, fine grained, quartz-lithic, core shattered from 4.0' to 12.9' from top.	19.07	192.55	18.90	
SANDSTONE, grey, fine grained, quartz-lithic.	9.14	201.69	9.05	
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey interbedded; some sandy interbeds, worm casts, some pyritic, mud blebs. Becoming a laminite from 4.1' to 2.25' from base.	16.55	218.24	16.39	
SANDSTONE, grey, coarse grained with fine sandy interbeds, quartz-lithic.	0.81	219.05	0.80	
SANDSTONE, grey, fine grained grading to coarse at base, quartz-lithic.	1.28	220.33	1.27	
SILTSTONE, grey, sandy interbeds in top 2.7', becoming mudstone interbeds below 2.7'.	3.79	224.12	3.75	

SUKUNKA D.D.H. CS-6

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
MUDSTONE, dark grey, some pyritic worm casts.	2.93	227.05	2.90	
CLAYSTONE, carbonaceous.	0.50	227.55	0.50	
SANDSTONE, grey, medium grained, quartz-lithic, coaly wisps and partings and carbonaceous phases.	2.82	230.37	2.79	
SANDSTONE, grey, medium grained, quartz-lithic, coaly wisps and fine carbonaceous phases, calcite vein 11.55' from top.	18.92	249.29	18.74	
CLAYSTONE, carbonaceous.	0.83	250.12	0.82	
SANDSTONE, grey, fine-grained, quartz-lithic, coaly wisps and fine carbonaceous phases.	1.74	251.86	1.72	
SANDSTONE AND CLAYSTONE INTERBEDDED, sandstone grey, fine grained and claystone carbonaceous, interbedded; core broken at top 1.9'.	4.07	255.93	4.03	
<u>COAL</u> , core broken throughout -				

SUKUNKA D.D.H. CS-6

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , mainly dull with minor bright bands, where determinable.	1.62	257.55	0.70)
mainly dull with minor bright bands.	1.62	259.17	0.70)
dull and bright.	1.18	260.35	0.51)
mainly dull with minor bright bands.	0.55	260.90	0.24)
dull.	2.10	263.00	0.91)
dull and bright.	0.88	263.88	0.38)
mainly dull with minor bright bands.	2.38	266.26	1.03)
CLAYSTONE, carbonaceous, some bright coaly bands.	0.52	266.78	0.52)
<u>COAL</u> , mainly dull with minor bright bands.	7.20	273.98	3.11)
<u>COAL</u> , core broken throughout -)
mainly dull with minor bright bands.	1.62	275.60	0.70)
dull and bright.	1.04	276.64	0.45)

SKEETER SEAM

SUKUNKA D.D.H. CS-6

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE, carbonaceous, grading to claystone carbonaceous and coal stony at top.	1.12	277.76	1.12)))))))) SKEETER SEAM
<u>COAL</u> , very broken, mainly dull with minor bright bands.	0.69	278.45	0.30	
CLAYSTONE, carbonaceous.	1.02	279.47	1.02	
SILTSTONE, grey, a few sandy interbeds. Bedding angle 90° to core axis.	2.75	282.22	2.75	
SANDSTONE, grey, fine grained, silty interbeds. Bedding angle 60° to core axis, 6.8' from top. Brecciate zone (0.42') 7.1' from top. Bedding angle 75° to core axis, beneath breccia zone.	9.21	291.43	9.21	
SILTSTONE, grey, sandy interbeds in top 2.8', mudstone interbeds below this. Bedding angle varies from 50° near top to 82° to core axis. at base.	6.65	298.08	6.65	
MUDSTONE, dark grey, some silty interbeds near top, slump structure 1.7' from top, core broken in part.	14.99	313.07	4.74	
SHALE, carbonaceous, soft and easily split.	0.76	313.83	0.24	

SUKUNKA D.D.H. CS-6

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
CLAYSTONE, carbonaceous in part.	0.12	313.95	0.09)
<u>COAL</u> , mainly dull with minor bright bands.	0.60	314.55	0.45)
dull.	0.80	315.35	0.60)
core broken into small fragments, possibly bright with minor dull bands.	0.36	315.71	0.27)
dull and bright.	0.32	316.03	0.24	) CHAMBERLAIN SEAM
dull.	0.80	316.83	0.61)
dull and bright.	0.67	317.50	0.50)
mainly dull with minor bright bands.	1.19	318.69	0.90)
dull and bright.	0.12	318.81	0.09)
dull.	0.67	319.48	0.50)
dull and bright.	0.47	319.95	0.35)

SUKUNKA D.D.H. CS-6

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, medium grained, quartz-lithic, carbonaceous at top, coaly wisps and partings.	0.98	320.93	0.98	
SANDSTONE, grey, medium grained, quartz-lithic, coaly wisps and partings. Bedding angle 90° to core axis.	10.91	331.84	10.91	<u>Base of Hole</u>

BORE NUMBER CS=7

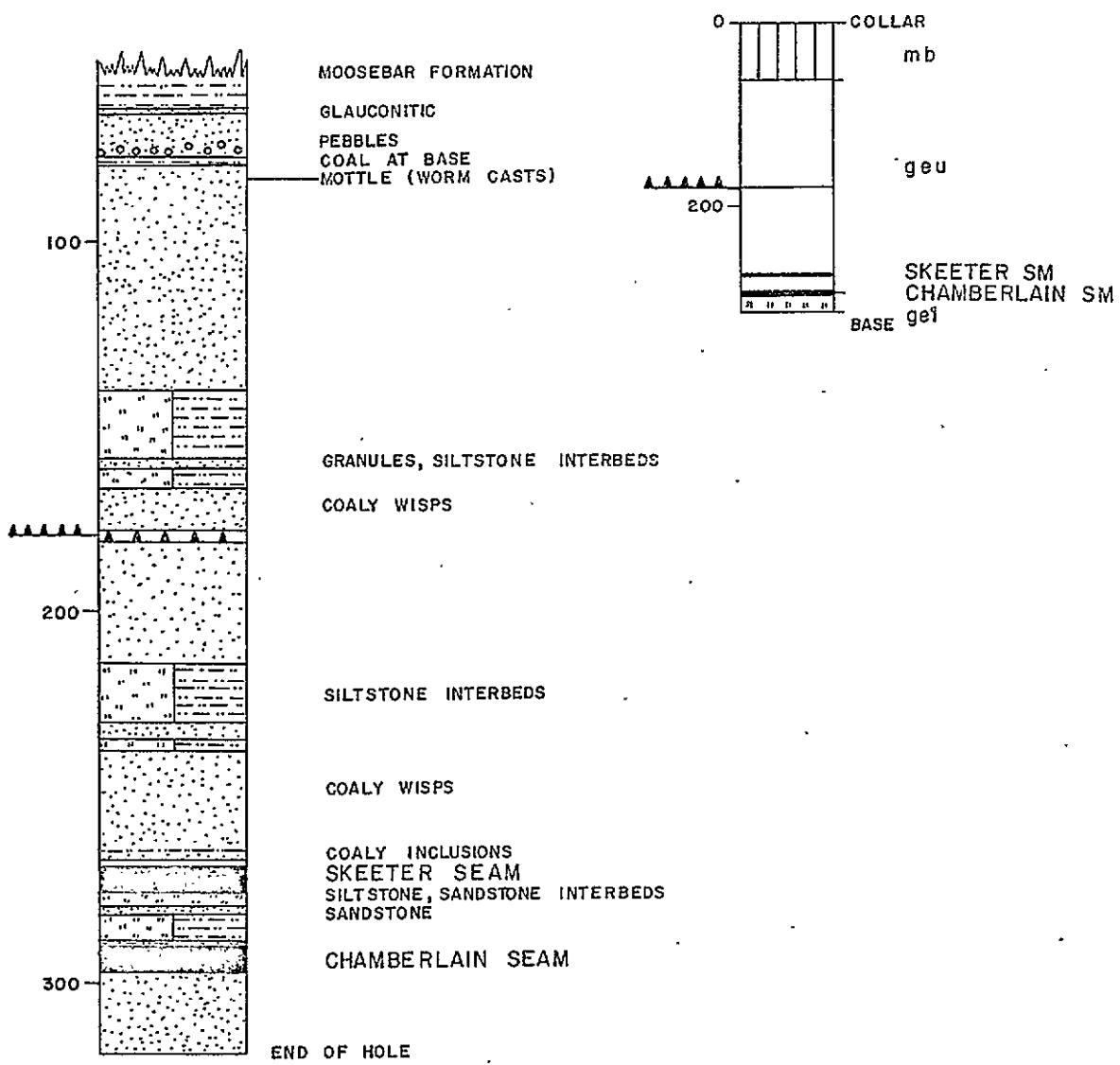
Grid Reference 49636.7 N 80707.9 E
Exploration Grid Reference B+1500/A+1500'

Date Commenced 14/Sept. Completed 17/Sept.

Collar R.L. 4073.4 ft. Standard Datum
Total Depth 356.0 Electrically Logged Yes~~XXX~~
Drilled by Connors Drilling Ltd.
For Coalition Mining Ltd.
Logged by F.H.S. Tebbutt

COAL SEAM INTERSECTIONS

Seam	Floor R.L.	Thickness (ft.)	Recovery	Comment
Skeeter	3797.5	7.92	75.5%	
Chamberlain	3777.0	6.04	72%	



DETAIL OF GETHING
FORMATION
SCALE: 1" to 50'



SCALE: 1" to 200'

Prepared by :
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED

STRATIGRAPHIC LOGS
D.D.H. CS-7

SKEETER SEAM

ASH %
CUMULATIVE
FROM FLOOR

		WT%	ASH%	C. S. N°	INCL. BANDS	EXCL. BANDS
268.00						
	5.09	-	5.7	7		
	0.30	-	90.5	0		
	1.03	-	6.1	9		
	0.32	-	61.4	0		
	1.18	-	29.8	5		
275.92						

Prepared by:
CLIFFORD McELROY & ASSOCIATES PTY. LTD.
for
COALITION MINING LIMITED
DRAWN BY pin DATE: Jan '72

SEAM SECTIONS
DDH CS-7

SCALE: 1" to 2'

PAGE 1 of 1

CHAMBERLAIN SEAM				ASH % CUMULATIVE FROM FLOOR	
	WT %	ASH %	C. S. N ^o	INCL. BANDS	EXCL. BANDS
290.33				3.6	
6.04	-	3.6	7		
296.37					



Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

C A R G O
SUPERINTENDENTS
CO. (A/SIA.) PTY. LTD.

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

Certification

This is to Certify

APPLICANT: COALITION MINING

SUBJECT: SUKUNKA SAMPLES NOS. 101, 102, 103, 104, 105
CORE NO. CS7
SKEETER SEAM

REPORT NO. K71-1764

DATE RECEIVED: 4. 11. 71

DATE REPORTED: 26.11.71



This Laboratory is Registered by the
National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

M. Bradley
Chief Chemist.
A.R.A.C.I.)

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

INTRODUCTION:

Three (3) coal samples and two (2) non-coal samples designated CORE NO. CS7 SKEETER SEAM were received on 4.11.71 from CLIFFORD MCELROY & ASSOCIATES PTY. LTD.

METHODS:

1. The non coal samples no. 102 , 104 were weighed, prepared and analysed for ash and true specific gravity.
2. The visibly inferior coal samples, nos. 103, 105 were hand crushed to $-\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.60 S.G.

The float and sink fractions, raw -30 mesh coal fractions were weighed, prepared and analysed for ash and crucible swelling number and the composite raw coal sample reconstituted and the true S.G. of the sample determined.

3. The good quality coal sample, no. 101, was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 - 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for ash and crucible swelling number and the composite raw coal sample reconstituted and the true S.G. of the sample determined.

A cumulative floats 1.60 S.G. fraction was prepared for sample no. 101 and the analyses are given in this report.

NOTE:

Sample weights have not been adjusted to compensate for core loss.

RESULTS:

FIGURE 1: gives the graphic log of the core.

TABLES 1 - 3: give the sizing, washability and analytical data for each coal sample after hand crushing to $\frac{3}{4}$ " top size.

SHEET THREE ATTACHED:

TABLE 1: WASHABILITY DATA FOR SAMPLE NO. 101 (after hand crushing to $\frac{3}{4}$ ")

FRACTION	INDIVIDUAL ANALYSIS				CUMULATIVE ANALYSIS		
	WT. GM.	WT. %	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.
F1.30	1113	43.5	2.1	9	43.5	2.1	9
S1.30 - F1.35	983	38.4	3.6	7	81.9	2.8	8
S1.35 - F1.40	187	7.3	9.7	3½	89.2	3.4	8
S1.40 - F1.45	91	3.6	15.0	2	92.8	3.8	7½
F1.45 - F1.50	41	1.6	19.3	1	94.4	4.1	7½
S1.50 - F1.55	42	1.6	21.0	1	96.0	4.4	7½
S1.55 - F1.60	31	1.2	31.6	1	97.2	4.7	7½
S1.60	70	2.8	41.6	½			
-30 Mesh RC	162	6.0	3.1	9			

TOTAL WEIGHT = 2,720 gms

TRUE S.G. = 1.295

SAMPLE NO. 102

RAW COAL

TOTAL WEIGHT = 215 gms

ASH% = 90.5

TRUE S.G. = 2.500

TABLE 2: WASHABILITY DATA FOR SAMPLE NO. 103 (after hand crushing to $\frac{3}{4}$ ")

F1.60	547	98.4	5.4	9	98.4	5.4	9
S1.60	9	1.6	51.9	0	100.0	6.1	9
-30 Mesh RC	32	5.4	5.2	9			

TOTAL WEIGHT = 588 gms

TRUE SG = 1.305

+

SAMPLE NO. 104

RAW COAL

TOTAL WEIGHT = 285 gms

ASH% = 61.4

TRUE S.G. = 1.887

TABLE 3: WASHABILITY DATA FOR SAMPLE NO. 105 (after hand crushing to $\frac{3}{4}$ ")

F1.50	89	51.7	7.9	9	51.8	7.9	9
S1.60	83	48.3	53.2	0	100.0	29.8	5
-30 Mesh RC	9	5.0	13.9	9			

TOTAL WEIGHT = 181 gms

TRUE S.G. = 1.565

ANALYSIS OF FLOATS 1.60 SG FRACTION OF SAMPLE NO. 101

YIELD %	ADM %	ASH %	V.H.%	---F.C.%	S. %	C.S.NO.	CV(BTU/1b)
97.2	0.5	4.8	22.5	72.2	0.40	8	14,580

SYDNEY

CARGO FORM 29th November, 1971.

1310-17012

COALITION MINING

CS 1 - SHEETED SCAM

8'

6'

4'

2'

0'

SPL	THICK?	ASH%	CSM?
101	5.09	57	7
102	10.30	19.5	0.1
103	1.03	61	?
104	0.32	61.4	0
105	1.12	29.4	5

Telegrams and Cables:
"Visor", Sydney

Telephone: 241 1105

CARGO SUPERINTENDENTS

Scottish House,
19 BRIDGE ST.,
SYDNEY, 2000

CO. (A/SIA.) PTY. LTD.

Certification

This is to Certify

APPLICANT: COALITION MINING

SUBJECT: SUKUNKA SAMPLES NO. 106,
CORE NO. CS7
CHAMBERLAIN SEAM

REPORT NO. K71-1765

DATE RECEIVED: 4. 11. 71

DATE REPORTED: 26. 11. 71



This Laboratory is Registered by the
National Association of Testing Authorities
Australia. The tests reported herein have
been performed in accordance with the
terms of registration.

For
CARGO SUPERINTENDENTS CO. (A/SIA.) PTY. LTD.

M. Bradley
Chief Chemist.
A.R.A.C.I.

INTRODUCTION:

One (1) coal sample designated CORE' CS7 CHAMBERLAIN SEAM were received on 4.11.71 from CLIFFORD MCELROY & ASSOCIATES PTY. LTD.

METHODS:

The coal ply sample No. 106 was hand crushed to $\frac{3}{4}$ " , sized at 30 mesh BSS and the +30 mesh BSS fraction washed in organic liquids at 1.30 - 1.60 specific gravity in 0.05 steps.

The float and sink fractions, raw -30 mesh coal fraction were weighed, prepared and analysed for ash and crucible swelling number and the composite raw coal sample reconstituted and the true s.g. of the sample determined.

A cumulative floats 1.60 S.G. fraction was prepared for sample no. 106 and the analyses are given in this report.

NOTE:

The sample weight has not been adjusted to compensate for core loss.

RESULTS:

FIGURE 1: gives the graphic log of the core.

TABLE 1: gives the sizing, washability and analytical data for the sample after hand crushing to $\frac{3}{4}$ " top size.

TABLE 1: WASHABILITY DATA FOR SAMPLE NO. 106 (after hand crushing to $\frac{3}{4}$ ")

FRACTION	INDIVIDUAL ANALYSIS					CUMULATIVE ANALYSIS		
	WT. GM.	WT. %	ASH%	C.S.NO.	WT. %	ASH%	C.S.NO.	
F1.30	1248	51.0	1.7	9	51.0	1.7	9	
S1.30 - F1.35	974	39.8	3.3	6	90.8	2.4	8	
S1.35 - F1.40	97	4.0	8.3	3 $\frac{1}{2}$	94.8	2.7	7 $\frac{1}{2}$	
S1.40 - F1.45	59	2.4	13.4	2 $\frac{1}{2}$	97.2	2.9	7 $\frac{1}{2}$	
S1.45 - F1.50	43	1.8	18.8	1	99.0	3.2	7 $\frac{1}{2}$	
S1.50 - F1.55	5	0.2	26.6	1	99.2	3.3	7 $\frac{1}{2}$	
S1.55 - F1.60	2	0.1	32.3	1	99.3	3.3	7	
S1.60	20	0.7	46.6	0	100.0	3.6	7	
-30 Mesh RC	213	8.0	1.6	8 $\frac{1}{2}$				

TOTAL WEIGHT = 2661 gms

TRUE S.G. = 1.263

ANALYSIS OF F1.60 S.G. FRACTION OF SAMPLE NO. 106

YIELD %	ADM%	ASH%	V.M.%	F.C.%	T.S.%	C.S.NO.	CV(BTU/lb)
99.3	0.7	3.4	21.9	74.0	0.44	8	14,820

SYDNEY

29th November, 1971.

137101766

COALITION MINING

CS7 - CHAMBERLAIN SEAM

SPC	THICK ^B	ASU%	CSM
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106	6.04	36	7
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STRATIGRAPHIC LOG
SUKUNKA D.D.H. CS-7

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft.)</i>
Dip 0°-5°	No core to 12.0 ft.		
	MUDSTONE, ash beds at base.	MOOSEBAR	63.0
	SANDSTONE, glauconitic.	GETHING	65.0
	SANDSTONE, pebbles at base.		75.0
	CLAYSTONE, coal band at base.		78.5
	SANDSTONE, mottled (worm casts), 85', coarse at top, fine towards base.		140.0
	SILTSTONE AND MUDSTONE INTERBEDDED, granules at base.		158.0
	SANDSTONE, silty interbeds.		161.0
Dip 0°-5°	LAMINITE, siltstone and mudstone.		166.0
Fault, established	SANDSTONE, coaly wisps, brecciated 178' and 180'.		180.0
	SANDSTONE.		213.0
	SILTSTONE AND MUDSTONE INTERBEDDED, worm casts, granules at base.		229.0
	SANDSTONE, silty interbeds.		233.0
	LAMINITE, siltstone and mudstone.		237.0

<i>Structure</i>	<i>Description of Strata</i>	<i>Formation or Member</i>	<i>Depth to Base of Stratum (ft)</i>
	SANDSTONE, coaly wisps, mudstone band at 264'.		266.0
	CLAYSTONE, carbonaceous, coaly inclusions.		268.0
	<u>COAL</u> .	SKEETER SM.	275.0
	SILTSTONE, sandy interbeds.		279.0
	SANDSTONE.		280.0
	LAMINITE, siltstone and mudstone, mudstone at base.		290.0
	<u>COAL</u> .	CHAMB. SM.	296.0
	SANDSTONE, coarse at top, fine towards base.		318.0

SUKUNKA D.D.H. CS-7

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
Core not logged in detail - refer to Stratigraphic Log for particulars.		149.48		
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey, interbedded; mudstone blebs.	8.06	157.54	8.02	
CLAYSTONE, dark grey.	1.15	158.69	1.14	
SANDSTONE, grey, medium grained in top 0.73' and fine below this, quartz-lithic. Bedding angle 90 ⁰ to core axis.	1.69	160.38	1.67	
SANDSTONE, grey, fine grained, quartz-lithic, siltstone and mudstone interbeds.	2.46	162.84	2.43	
CLAYSTONE, dark grey.	1.19	164.03	1.18	
SILTSTONE, grey; mudstone interbeds.	0.46	164.49	0.46	
CLAYSTONE, dark grey, pyritic worm casts, carbonaceous in bottom 0.45'.	2.36	166.85	2.34	
SANDSTONE, grey, fine grained, quartz-lithic, coaly wisps, some current bedding; core becoming more broken in zone				

SUKUNKA D.D.H. CS-7

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
7.7' to 14.4' from top. Sandstone breccia with minor calcite in zone (0.60') 13.8' from top. Calcite veins and infillings mainly below breccia vein. Bedding angle above and below breccia 83 ⁰ -85 ⁰ to core axis. 0.37' above breccia zone a zone of apparent sedimentary slumping, but with some distortion and slickensides.	12.25	179.10	12.12	
SANDSTONE, grey, fine grained, quartz-lithic.	6.62	185.72	6.55	
SANDSTONE, grey, fine grained, quartz-lithic, occasional calcite veins, zones of brecciation with heavy calcitic infillings at 1.68' (0.4' thick) from top, 4.0' (0.2' thick) from top and 8.95' (0.1' thick) from top. Zone of minor displacement 3.7' from top.	19.48	205.20	19.28	
SANDSTONE, grey, fine grained, quartz-lithic, a few calcite veins at top at 17 ⁰ to core axis. 0.8' band of mud blebs 1.05' from base. Bedding angle 85 ⁰ to core axis.	6.76	211.96	6.69	
SILTSTONE AND MUDSTONE INTERBEDS, siltstone grey and mudstone dark grey interbedded, some sandy interbeds, worm casts, mud blebs.	12.51	224.47	12.38	

SUKUNKA D.D.H. CS-7

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SILTSTONE AND MUDSTONE INTERBEDS, as above, but with a zone (0.47') containing coarse sandy interbeds, 3.75' from top.	5.04	229.51	4.99	
SANDSTONE, grey, very fine grained at top grading to medium grained at base, coaly wisps.	2.64	232.15	2.61	
SILTSTONE, grey, mudstone interbeds, becoming muddier towards base.	3.60	235.75	3.56	
CLAYSTONE, carbonaceous.	0.25	236.00	0.25	
SANDSTONE, grey, medium grained, quartz-lithic, coaly wisps.	7.83	243.83	7.75	
SANDSTONE, grey, medium grained with fine grained phases, quartz-lithic, coaly wisps and partings.	19.73	.56	19.52	
CLAYSTONE, carbonaceous.	0.71	264.27	0.70	

SUKUNKA D.D.H. CS-7

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, medium grained, quartz-lithic, coaly wisps and carbonaceous phases.	2.54	266.81	2.51	
CLAYSTONE, carbonaceous, coal band (0.04') 0.45' from base.	1.19	268.00	1.18	
<u>COAL</u> , stony with bright coaly bands.	0.09	268.09	0.09)
dull and bright. Bright friable, cleat disturbed.	0.30	268.39	0.30)
mainly bright with minor dull bands, pyrite .	0.30	268.69	0.30)
dull and bright.	1.01	269.70	1.01	) SKEETER SEAM
mainly dull with minor bright bands.	1.02	270.72	1.02)
dull.	0.14	270.86	0.14)
mainly dull with minor bright bands, shear angle 30° to core axis.	0.17	271.03	0.17)
dull.	0.10	271.13	0.10)

SUKUNKA D.D.H. CS-7

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , mainly dull with minor bright bands.	0.73	271.86	0.73)	
dull, cleat poorly developed.	0.26	272.12	0.26)	
mainly dull with minor bright bands.	0.11	272.23	0.11)	
dull and bright, cleat poorly developed.	0.60	272.83	0.60)	
dull, cleat poorly developed.	0.26	273.09	0.26)	
<u>CLAY</u> , brown, carbonaceous, soft.	0.30	273.39	0.30)	SKEETER SEAM
<u>COAL</u> , dull	0.09	273.48	0.09)	
dull and bright, bedding angle 45° to core axis.	0.37	273.85	0.37)	
mainly dull with minor bright bands.	0.28	274.13	0.28)	
dull and bright.	0.29	274.42	0.29)	
stony with minor bright bands.	0.32	274.74	0.32)	
dull, sheared along bedding plane, 90° to core axis.	1.18	275.92	0.25)	

SUKUNKA D.D.H. CS-7

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
CLAYSTONE, grey, becoming carbonaceous at top.	1.78	277.70	1.78	
SANDSTONE, grey, fine grained, silty interbeds, concentrated mainly at top and bottom.	2.66	280.36	2.64	
SILTSTONE, grey, with sandstone and mudstone interbeds. Bedding angle 81° to core axis.	0.82	281.18	0.81	
SILTSTONE, grey, dark grey mudstone interbeds.	0.94	282.12	0.93	
CLAYSTONE, carbonaceous.	0.12	282.24	0.12	
SILTSTONE, grey, mudstone interbeds.	1.69	283.93	1.67	
CLAYSTONE, carbonaceous.	0.47	284.40	0.47	
SILTSTONE, grey, mudstone interbeds.	0.80	285.20	0.79	
CLAYSTONE, dark grey.	3.08	288.28	3.06	
LAMINITE, siltstone grey and mudstone dark grey interbedded.	1.78	290.06	1.76	
CLAYSTONE, carbonaceous.	0.27	290.33	0.27	

SUKUNKA D.D.H. CS-7

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor (ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
<u>COAL</u> , dull.	0.41	290.74	0.37)
mainly dull with minor bright bands, bedding angle 90° to core axis.	0.98	291.72	0.88)
dull and bright.	0.19	291.91	0.17)
dull.	0.07	291.98	0.06)
dull and bright.	1.88	293.86	1.69	) CHAMBERLAIN SEAM
dull.	0.87	294.73	0.78)
mainly dull with minor bright bands.	0.98	295.71	0.88)
dull.	0.53	296.24	0.48)
mainly dull with minor bright bands.	0.13	296.37	0.12)
SANDSTONE, grey, medium grained, quartz-lithic, carbonaceous at top; several coaly partings at 15° to core axis at top.	2.60	298.97	2.60	

SUKUNKA D.D.H. CS-7

<i>Geological Description of Strata</i>	<i>Estimated Thickness (ft)</i>	<i>Estimated Depth to Stratum Floor(ft)</i>	<i>Footage Recovered (ft)</i>	<i>Remarks</i>
SANDSTONE, grey, medium grained, quartz-lithic, a very few calcite veins (fine) and coaly wisps, some current bedding, bedding angle 85° to 90° to core axis.	18.68	317.65	18.68	
SANDSTONE, grey, medium grained, quartz-lithic, occasional coaly wisps and pennybands. Mottled (worm casts) in top 0.9', from 7.1' to 7.7' from top, and from 8.6' to 9.0' from top. A few fine calcite veins in upper 6.0', some silty interbeds towards base. Bedding angle 90° to core axis.	18.88	336.53	18.88	
SANDSTONE, grey, grading from medium to fine grained in top 2.0', quartz-lithic, claystone band (0.09') 0.76' from top. Bedding angle 85° from core axis. Some current bedding.	18.99	355.52	18.99	<u>Base of Hole</u>

NOTE: No PR-SORUNKA 71(1)A

BRAMEDA RESOURCES LIMITED

SUKLINA COAL PROJECT

COAL QUALITY DATA

A-vii

March 1971.

GEOLOGICAL BRANCH
ASSESSMENT REPORT

00 645

BRAMEDA RESOURCES LIMITED
SUKUNKA COAL PROJECT
COAL QUALITY DATA

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BRAMEDA RESOURCES LTD.SUKUNKA COAL PROJECTSUMMARY OF COAL QUALITY - CHAMBERLAIN SEAM

A. <u>ANALYSES</u>		<u>Moist.</u>	<u>Ash</u>	<u>V.M.</u>	<u>F.C.</u>	<u>B.T.U.</u>	<u>S</u>	<u>F.S.I.</u>
*	1. Average of Cores	0.78	5.80*	23.35	70.85	14,780	0.43	8.5
	2. No. 2 Adit Bulk (Raw)		11.78	21.51	66.71		0.52	
**	3. No. 2 Adit Bulk (Clean)		5.4	22.70	71.90		0.48	9.0
	*Raw Coal Basis.							
** B. <u>WASHABILITY</u>								
1.	Raw Coal	2" x 28 mesh	(84%)	= 12.10%	Ash			
		28 mesh x 0	(16%)	= 7.40%	Ash			
			100%	= 11.35%	Ash			
2.	Partial Washing			<u>Yield %</u>	<u>Ash %</u>			
		2" x 28 mesh (1.60 s.g.)		85.26	4.52			
		28 mesh x 0 (Raw)		<u>100.00</u>	<u>7.40</u>			
		Combined		87.5	5.34			
3.	Washing and Flotation			<u>Yield %</u>	<u>Ash %</u>			
		2" x 28 mesh (1.60 s.g.)		85.26	4.52			
		28 x 0 (froth flotation)		<u>93.00</u>	<u>4.00</u>			
		Combined		86.50	4.43			
* C.		<u>Grindability</u>	<u>Gieseler</u>	<u>Temp.</u>	<u>Dilatometer</u>			
		<u>Hardgrove Index</u>	<u>Fluidity</u>	<u>Range</u>				
	Cores	83.2 - 87.4	203 DDPM	64-80				
	Bulk (No. 2 Adit)		200 DDPM	75°C	-29 to +40			
	2" x 3/4"	78.8						
	3/4" x 1/4"	81.1						
	1/2" x 28	91.4						

* Analyses by Coast Eldridge & Commercial Testing and Engineering.

** Analyses by Eastern Associated Coal Corporation.

** D. <u>COKING TESTS</u>	<u>100% Chamberlain</u>	<u>30% Chamberlain</u> *G
Bulk density in oven	48.8 lb./cu. ft.	52.3
Screen test plus 1"	96.4%	96.5%
Shatter, on 2"	60.8%	54.4%
Tumbler, on 1"	<u>59.7%</u>	<u>55.2%</u>
J.I.S. Drum, on 15 mm.	94.2%	93.4%
Apparent s.g.	0.89	0.86
Porosity	48.3%	49.9%
Coke Pressure	3.6 p.s.i.	0.8
COKE YIELD	<u>79.3%</u>	<u>72.8%</u>

* E. ASH ANALYSIS - CORES

<u>Range %</u>			
P ₂ O ₅	0.61 - 1.43	CaO	11.35 - 15.76
SiO ₂	40.00 - 48.26	MgO	3.05 - 3.86
Fe ₂ O ₃	5.58 - 7.49	SO ₃	10.64 - 13.89
Al ₂ O ₃	14.76 - 17.33	K ₂ O	0.62 - 1.10
TiO ₂	0.64 - 0.85	Na ₂ O	1.57 - 2.93
		Other	0.32 - 0.95

F. PETROGRAPHIC (Clean Coal No. 2 Adit) - (Dr. William Spackman - Penn.)

(a) Reflectance Vitrinoid Components	1.32 - 1.34
(b) Total Effective inert Components	30.3%
(c) Predicted Coke Stability	60 - 62%
Actual Coke Oven Test (ASTM Tumbler % + 1 inch)	59.7%

*G Blend	70% High Volatile Coal Wharton No. 2 Mine	
V.M.	35.1%	Sulphur 0.68%
F.C.	60.5%	F.S.I. 6
Ash	4.4%	Max. Fluidity ddpm 25,000

* Analyses by Commercial Testing and Engineering

** Analyses by Eastern Associated Coal Corporation.

SUKUNKA COAL TESTING

CHAMBERLAIN SEAM

07-9-1

MAF BASIS

HOLE NO.	FROM	TO	WIDTH FT.	REC. FT.	WEIGHT %	FLOAT SINK	A. D. M.	ASH %	V. M. %	FIXED CARBON	B. T. U. AIR DRY	S %	F. S. I.	WEIGH LB.
S-1	432.0	437.1	5.1	4.5			0.70	3.45	25.05	70.80	15,220	0.38	8.0	
S-2	100.7	129.5	28.8	14.0	} Analysed in Japan		0.90	7.40	25.90	65.80	14,300	0.34	3.5	
	100.7	129.5	28.8	14.0			1.12	7.90	24.02	66.96	14,800	0.57	8.0	
S-4	54.0	63.2	9.2	6.5			0.55	8.65	22.78	68.02	14,546	0.48	5.0	
S-5	512.7	521.8	9.1	8.0			0.47	6.90	19.66	72.97	14,970	0.64	6.0	
S-6	912.7	917.4	4.7	2.0			0.66	4.63	22.26	72.45	14,741	0.31	5.5	
S-8	141.5	146.1	4.6	4.6			0.77	3.50	24.28	71.45	15,095	0.52	7.5	6.75
S-11	275.0	283.0	8.0	6.0			0.37	6.85	24.13	69.65	14,870	0.47	6.5	
S-12	444.5	453.0	8.5	8.5			0.40	4.95	23.45	71.20	15,269	0.46	8.5	13.0
S-13	369.5	381.0	11.5	11.5			0.52	5.65	24.23	69.60	15,170	0.47	7.5	26.5
S-14	246.0	257.0	11.0	6.0			0.45	8.0	24.80	66.75	14,696	0.52	7.0	6.5
S-15	229.0	237.5	8.5	8.0			0.43	6.55	22.25	70.77	14,970	0.45	7.0	9.0
S-16	1258.0	1273.0?	10.0+	4.0			0.78	10.33	21.40	67.49	13,736	0.33	6.0	3.38
S-17	276.0	283.0	7.0	7.0			0.89	4.68	25.25	69.18	14,663	0.34	8.5	9.5
S-18	282.5	292.0	9.5	9.5			0.75	4.73	23.72	70.80	14,668	0.46	7.5	11.70
S-19	157.0	162.5	5.0+	5.0			0.74	3.68	25.78	69.80	14,896	0.52	9.0	1.69
S-20	1238.0	1246.0	8.0	4.5			0.58	6.85	24.70	67.87	14,334	0.50	6.5	3.0
S-21	625.5	634.0	8.5	7.5			0.86	5.54	22.66	70.94	14,500	0.45	7.0	7.5
S-22	708.5	716.2	7.7	7.7			0.82	6.14	22.98	70.06	14,504	0.58	9.0	11.0
S-23	Chamberlain Seam cut out by fault ?													
S-24	909.5	918.0	8.5	8.5			0.99	4.47	23.06	71.48	14,759	0.37	8.0	6.1
S-25	1474.0	1482.0	8.5	8.5			0.74	4.11	24.04	71.11	14,845	0.35	8.5	5.0
S-25	1474.0	1482.5	8.5	8.5	97.1	Float	0.68	4.06	23.46	71.80	14,886	0.44	9.0	4.4
					2.9	Sink	0.54	41.35				0.56		

SUKUNKA COAL TESTING

CHAMBERLAIN SEAM

HOLE NO.	FROM	TO	WIDTH FT.	REC. FT.	WEIGHT %	FLOAT SINK	A.D.M.	ASH %	V.M. %	FIXED CARBON	B.T.U. AIR DRY	S %	F.S.I.	WEIG LB
S-26	1369.5	1377.5	8.0	6.5	96.2	Float	0.81	5.13	22.84	71.22	14,743	0.46	8.0	7.0
					3.8	Sink	0.94	47.60			0.72			
S-27A	1234.0	1243.0	9.0	9.0	96.5	Float	0.82	4.11	22.25	72.82	14,911	0.48	9.0	13.0
					3.5	Sink	0.64	44.96			0.49			
S-28	1086.0	1095.5	9.5	9.5	97.1	Float	0.78	4.80	22.01	72.41	14,793	0.43	8.5	12.0
					2.9	Sink	0.19	43.17			0.40			
S-29	1515.2	1525.0	9.8	9.5	99.0	Float	0.78	4.18	22.70	72.34	14,933	0.41	9.0	12.0
					1.0	Sink	0.65	32.58			0.25			
S-30	1353.0	1375.2	22.2	21.0	98.3	Float	0.90	4.54	22.19	72.37	14,813	0.43	8.0	24.0
					1.7	Sink	1.01	43.86			0.34			
S-31	1530.0	1545.0	15.0	2.0	-	-	1.02	7.04	22.83	69.11	14,272	0.39	9.0	2.0
S-32	1140.4	1145.4	5.0	5.0	95.5	Float	0.94	5.12	21.57	72.37	14,661	0.31	4.5	6.0
					4.5	Sink	0.72	59.05			0.17			
S-32	1145.4	1155.0	9.6	8.7	95.3	Float	0.97	5.09	22.14	71.80	14,597	0.22	8.5	11.0
					4.7	Sink	0.81	53.47			0.10			
S-34	913.0	951.0	38.0	32.0	-	-	1.10	4.88	25.10	68.92	14,661	0.33	8.5	30.0
S-34	1148.0	1158.3	10.3	10.0	96.6	Float	0.94	4.08	24.80	70.18	14,770	0.35	8.0	12.0
					3.4	Sink	0.53	47.46			0.27			
S-35	1725.5	1733.5	8.0	7.0	93.1	Float	1.00	5.10	22.32	71.58	14,667	0.48	9.0+	8.0
					6.9	Sink	0.76	51.14			0.61			
S-36	1203.5	1213.5	10.0	8.5	97.0	Float	1.05	5.96	22.57	70.42	14,490	0.40	9.0	11.0
					3.0	Sink	0.80	60.56			0.21			
S-37	1182.0	1192.5	10.5	10.0	98.4	Float	0.74	4.05	24.32	70.89	14,956	0.49	9.0	14.0
					1.6	Sink	0.50	37.02			0.35			

SUKUNKA COAL TESTING

CHAMBERLAIN SEAM

HOLE NO.	FROM	TO	WIDTH FT.	REC. FT.	WEIGHT %	FLOAT SINK	A. D. M.	ASH %	V. M. %	FIXED CARBON	B. T. U. AIR DRY	S %	F. S. I.	WEIGH LB.
S-38	1028.5	1038.0	9.5	9.0	97.7	Float	0.92	4.26	23.45	71.37	14,913	0.38	9.0	13.29
					2.3	Sink	0.47	39.68			0.22			
S-39	1569.1	1573.6	4.5	3.0	95.5	Float	0.75	5.27	20.65	73.33	14,732	0.41	7.0	4.44
					4.5	Sink	0.63	52.15			0.22			
S-39	1578.0	1580.0	2.0	1.7	95.3	Float	0.83	4.87	21.96	72.34	14,688	0.39	8.5	2.44
					4.7	Sink	0.63	64.02			0.50			
S-40	1218.0	1227.0	9.0	9.0	97.5	Float	1.06	4.06	21.73	73.15	14,804	0.46	9.0+	12.80
					2.5	Sink	0.56	51.67			0.67			
S-41	529.0	538.0	9.0	9.0	97.0	Float	0.95	4.89	21.67	72.49	14,744	0.47	9.0	10.33
					3.0	Sink	0.46	42.42			0.37			
S-42	1435.1	1444.8	9.7	9.7	98.8	Float	0.70	4.02	22.40	72.88	14,996	0.40	8.5	11.11
					1.2	Sink	0.84	47.14			0.26			
S-43	279.1	289.0	9.9	9.9	96.6	Float	1.00	3.15	25.09	70.76	14,784	0.43	7.5	12.91
					3.4	Sink	0.73	39.19			0.74			
S-44	1504.5	1513.0	8.5	8.5	98.0	Float	0.77	4.02	22.12	73.09	14,897	0.36	8.5	11.81
					2.0	Sink	0.77	33.26			0.15			
S-46	839.5	848.5	9.0	9.0	97.1	Float	0.76	3.97	23.60	71.67	14,884	0.51	9.0	11.21
					2.9	Sink	0.64	53.70			0.30			
S-47	362.5	367.5	5.0	5.0	99.2	Float	0.66	2.85	25.55	70.94	15,052	0.42	8.5	7.01
					0.8	Sink	0.66	57.60			0.62			
S-48	177.2	185.2	8.0	8.0	98.9	Float	0.77	3.63	25.98	69.62	14,943	0.43	8.0	11.40
					1.1	Sink	0.65	43.28			0.25			
S-49	126.0	130.7	4.7	4.7	92.3	Float	0.77	2.57	24.78	71.88	15,084	0.44	8.5	6.81
					7.7	Sink	0.77	56.12			0.10			

SUKUNKA COAL TESTING

CHAMBERLAIN SEAM

PILE NO.	FROM	TO	WIDTH FT.	REC. FT.	WEIGHT %	FLOAT SINK	A. D. M.	ASH %	V. M. %	FIXED CARBON	B. T. U. AIR DRY	S %	F. S. I.	WEIGHT LB.
S-49	428.5	435.0	6.5	6.5	97.0	Float	0.84	3.09	23.23	72.84	14,937	0.43	8.5	7.981
					3.0	Sink	0.60	50.90	"			0.56		
S-50	118.3	124.3	6.0	6.0	96.8	Float	0.69	2.89	24.45	71.97	15,068	0.58	9.0	6.687
					3.2	Sink	0.57	54.23				0.38		
S-45	1174.8	1183.2	8.4	8.4										
<u>Averages</u>														
	S-1 to	S-15			100.0		0.61	6.20	23.57	69.70	14,887	0.47		
	S-16 to	S-24			100.0		0.80	5.80	23.69	69.70	14,508	0.44		
	S-25 to	S-50			96.84	Float	0.84	4.32				0.42		
					3.16	Sink	0.65	48.00				0.37		
	S-25 to	S-50	TOTAL		100.0	S + F	0.84	5.64	23.17	71.64	14,811	0.42		
	S-1 to	S-50					0.78	5.80	23.35	70.85	14,780	0.43		
								Raw Coal						

CHAMBERLAIN SEAM

ASH ANALYSIS AND GRINDABILITY

	GROUP						
	CH-1	CH-2	CH-3	CH-4	CH-5	CH-6	CH-7
Ash Analysis:							
P ₂ O ₅	0.61	0.97	1.20	1.43	1.34	1.26	1.60
SiO ₂	48.26	44.93	40.00	40.30	45.62	45.63	41.41
Fe ₂ O ₃	6.56	5.58	6.04	7.49	4.35	4.30	7.75
Al ₂ O ₃	15.04	15.25	14.76	17.33	17.44	18.37	18.00
TiO ₂	0.73	0.85	0.64	0.85	0.83	0.84	0.78
CaO	11.35	14.65	15.76	13.08	12.87	11.93	12.71
MgO	3.42	3.05	3.86	3.09	2.60	2.12	2.51
SO ₃	11.00	10.64	13.89	12.56	11.19	11.26	11.26
K ₂ O	1.10	0.90	0.76	0.62	0.50	0.47	0.42
Na ₂ O	1.57	2.36	2.14	2.93	2.80	3.01	2.95
Other	0.36	0.82	0.95	0.32	0.46	0.81	0.61
Fusion Temperature:							
Initial Deformation, IT	2020°F	1960°F	1930°F	2000°F	1979°F	2050°F	1980°F
Softening, ST	2120°F	2120°F	2050°F	2120°F	2160°F	2180°F	2120°F
Softening, HT	2140°F	2140°F	2070°F	2140°F	2190°F	2220°F	2160°F
Fluid Temperature, FT	2230°F	2240°F	2160°F	2240°F	2330°F	2310°F	2270°F
Hardgrove Grindability Index							
	84.2	83.2	87.4	86.3	83.6	84.0	74.1

GROUP: CH-1 = S-1, S-5, S-8, S-14.

CH-2 = S-4, S-11, S-12, S-13, S-15.

CH-3 = S-17, S-18, S-19, S-20, S-21, S-22, S-24.

CH-4 = S-26, S-27, S-28, S-29, S-37, S-38, S-40.

CH-5 = S-30, S-35, S-36, S-44

CH-6 = S-32, S-39, S-42, S-46

CH-7 = S-34, S-43, S-47, S-48, S-49, S-50.

CHAMBERLAIN SEAM

COAL PLASTICITY TESTS (GIESELER PLASTOMETER)

Sample No.	D.D.P M. at Max. Fluidity	Temperature at Max. Fluidity °C	Temperature at Initial Fluidity °C	Temperature at Final Fluidity °C	Temp. Range	F. S. I.
CH-25	161	456	411	485	74	7½
CH-26	128	456	414	481	67	7
CH-27	113	462	420	484	64	8
CH-28	89	459	413	482	69	7½
CH-29	178	456	409	485	76	7½
CH-30	44.5	456	422	481	59	7½
CH-32-1	3.8	456	432	470	38	3
CH-32-2	52.0	456	417	481	64	7½
CH-35	103	459	416	485	69	8
CH-36	161.5	456	413	485	72	8
CH-37	417	456	406	485	79	8½
CH-38	326	456	411	485	74	8½
CH-39-1	8.2	462	434	480	46	7
CH-40	179	459	410	488	78	8½
CH-41	74.5	465	421	488	67	7½
CH-42	159	459	417	487	70	8½
CH-44	143	462	415	488	73	8½
CH-46	347	456	408	484	76	9
CH-47	617	453	405	485	80	8½

PAUL WEIR, FOUNDER,
CONSULTANT

LSF/JRB

PAUL WEIR COMPANY
INCORPORATED
MINING ENGINEERS AND GEOLOGISTS
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January 19, 1971

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Mr. Lee Bilheimer
Assistant to Vice President
Brameda Resources Limited
Board of Trade Building, 7th Floor
1177 West Hastings Street
Vancouver, 1, B.C., Canada

Dear Mr. Bilheimer:

You will find enclosed four copies of our report on the petrographic analyses of the washed (1.60 specific gravity) Chamberlain seam coal. These analyses were made at the Pennsylvania State University by Dr. William Spackman, Jr., who is one of the world's outstanding authorities on coal petrography.

The petrographic analyses provide further proof that the Chamberlain seam is an outstanding coking coal.

Respectfully yours,

R. E. Zimmerman
R. E. Zimmerman

REZ/drs

Enclosures: As noted.

BRAMEDA RESOURCES LIMITED
SUKUNKA - CHAMBERLAIN SEAM
PETROGRAPHIC ANALYSES
1.60 FLOAT (WASHED) COAL

PREFACE

As mentioned in the Paul Weir Company report titled "Proposed Mining Project, Sukunka Coal Field", dated November 25, 1970, petro-graphic analyses were to be made on the Chamberlain and the ^{SKEETER} ~~Sukunka~~ seams in order to complete the coal and coke studies of these coals.

These petrographic analyses were to be performed by Dr. William Spackman, Jr., head of the Petrographic Department of The Pennsylvania State University, using the international standard oil reflectance method in use by the leading steel companies of the world as a measure of the suitability of coals for carbonization.

Dr. Spackman has run the analyses on the Chamberlain seam and his data is herein reported. The Skeeter seam analyses will be reported later.

METHODS

The Chamberlain coal sample was taken from the washed bulk sample (Adit No. 2) prepared by Eastern Associated Coal Corp. and used in their coke oven tests and other analyses. Eastern's results have

been reported in the above mentioned Weirco report. The sample used for petrographic analyses was washed at 1.60 specific gravity to a 5.4 percent ash level.

For the maceral microscopic analyses, a total of 1,000 identifications were made using a computerized point count system developed at the University and by Bituminous Coal Research Inc. U.S.A. For the oil reflectance analyses, a total of 50 measurements were made.

RESULTS

Table No. 1

Petrographic Composition (Volume Percent)

	<u>Percent</u>
Vitrinoids	49.1
Pseudo-Vitrinoids	21.3
Fusinoids	13.6
Semi-Fusinoids	10.4
Micrinoids	
Massive	1.5
Granular	0.5
Resinoids & Exinoids	0.0
Mineral Matter	3.5
Percent Ash (Dry Basis)	5.4
Percent Total Sulfur (Dry Basis)	0.48

Table No. 2

Mean Maximum Reflectance in Oil

	<u>Percent</u>
All Vitrinites	1.33
Vitrinoids	1.32
Pseudo-Vitrinoids	1.34

Table No. 3

Inert Content
(Volume Percent)

	<u>Percent</u>
Mineral Matter	3.5
Inert Macerals	15.6
Semi-Inert Macerals	6.9
Inert Pseudo-Vitrinoids	<u>4.3</u>
Effective Inerts	30.3

Anticipated coke stability is based upon two values, the reflectance of the vitrinoid component and the total effective inert content. Predicted coke strengths are shown in the attached graph (Graph 4). Predicted stability (ASTM tumbler test % + 1 inch) is in the range of 60-62, which indicates an exceptionally strong coke. Actual coke oven tests by Eastern Associated gave 59.7. Normally, a 52 to 55 is considered good.

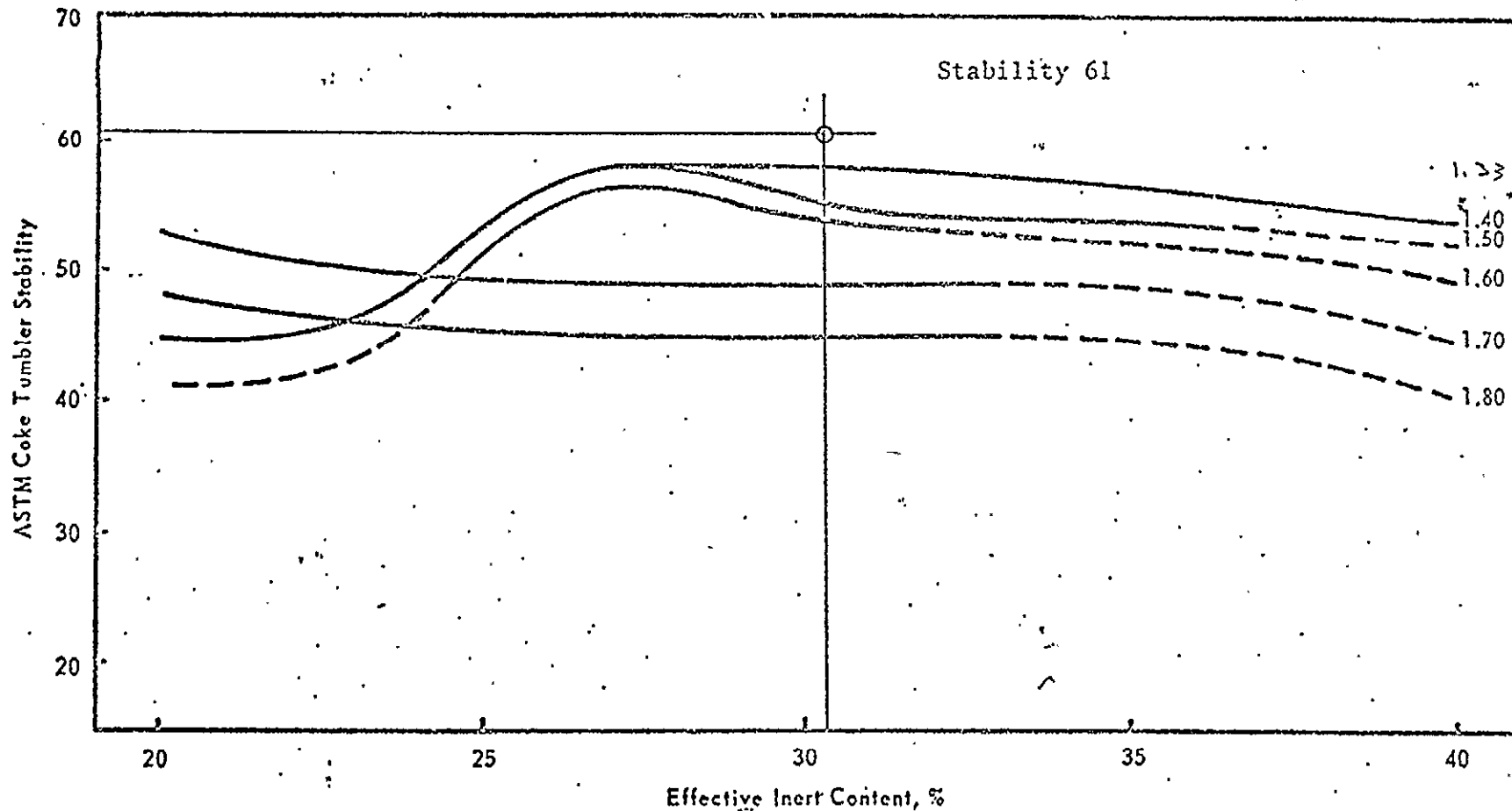
Respectfully submitted,

PAUL WEIR COMPANY


 R. E. Zimmerman

Stability Prediction

for Sample No. 6935



CORRELATION CURVES BETWEEN PETROGRAPHIC COMPOSITION AND ASTM TUMBLER STABILITY
FOR PREDICTING THE STABILITY OF COKE PRODUCED FROM LOW-VOLATILE COALS

*These numbers refer to percent vitrinoid reflectance.

EXCERPT FROM PAUL WEIR CO. REPORT

Table III-2 tabulates the analytical values of drill hole cores floated at 1.60 specific gravity. This more nearly represents the theoretical quality of coal to be expected by washing. One notes an average yield @ 1.60 of 97.1 percent, with an inherent moisture (air dry moisture) of 0.88 percent; ash content of 4.62 percent; sulfur at 0.42 percent; volatile matter of 22.52 percent; Btu value of 14792 and an FSI of 9. The average Gieseler fluidity in D.D.P.M. was 149.

Ash ranges from 4.06 to 5.96 percent; sulfur 0.22 to 0.49 percent and Gieseler fluidities from 67 to 417 D.D.P.M. The FSI remained consistently high, between 8 and 9.

All these cores indicate exceptionally high quality coal of the medium volatile rank and give the indices of being a strongly coking coal.

It is generally true that coal core analyses are of somewhat higher grade than that obtained from proper bulk samples. The cores did not contain the boney coal and/or carbonaceous shale band which lies directly above the Chamberlain seam. Also, in actual mining practice some of the roof and/or bottom gets into the product. All these impurities raise the ash and lower the yield from that shown

PAUL WEIR COMPANY

in the analyses of the coal cores. This is why special attention is attached to analyses of the bulk samples and allowance made in yields of coal in comparison to theoretical recoveries.

Total Sample

Float and sink analyses of the No. 2 adit bulk samples are shown in Table III-3. The raw coal analysis of the coal crushed to minus 2 inches show 12.10 percent ash in the 2" x 28 mesh sizes and 0.47 percent sulfur. The minus 28 mesh, which amounted to 16.0 percent by weight of the sample, ran 7.4 percent ash and 0.56 percent sulfur. Sample procedures for the bulk sample are shown in Exhibit A.

The yield of coal at 1.60 for the 2" x 28 mesh is 85.26 percent at a 4.52 percent ash, but when combined with the raw 28 mesh x 0, the product ash is increased to 5.4 percent. Combined yield 87.5%

$(72 \times 4.52 + 28 \times 7.4) = 5.4.$

The washability characteristics as shown in Table III-3 and in the curves shown in Figures III-2, III-3 and III-4 indicate that at all size ranges the coal is an "easy" coal to clean, with little or no "near gravity" material at the normal separating gravities; i.e., 1.45 to 1.60.

The froth flotation test made on the 28 mesh x 0 fines indicates an exceptionally easy coal to float with a high yield and a very low ash. For example, a yield of 93 percent is obtained at 4.0 percent ash level. This is shown in Figure III-5. Combined yield 86.9% @ 4.40% ash.

Figure III-1 shows the size distribution of the bulk sample crushed to minus 2 inches.

Table III-3

BRAMEDA RESOURCES LIMITED

SUKUNKA RIVER - CHAMBERLAIN SEAM

FLOAT & SINK ANALYSES - BULK SAMPLE ADIT NO. 2

Size	Specific Gravity	Direct			Cumulative Float			Cumulative Sink		
		Wt.,%	Ash,%	Sul.,%	Wt.,%	Ash,%	Sul.,%	Wt.,%	Ash,%	Sul.,%
2" x 3/4" (20.5% by Wt. of Total Sample)	-1.35	59.6	3.4	0.36	59.6	3.40	0.36	100.0	17.58	0.37
	1.40	8.9	10.9	0.24	68.5	4.37	0.34	40.4	38.49	0.40
	1.50	4.4	16.8	0.27	72.9	5.12	0.34	31.5	46.29	0.44
	1.60	2.2	26.7	0.60	75.1	5.76	0.35	27.1	51.08	0.47
	1.70	7.9	41.9	0.40	83.0	9.20	0.35	24.9	53.23	0.46
	1.80	10.8	46.9	0.53	93.8	13.54	0.37	17.0	58.50	0.48
	+1.80	6.2	78.7	0.40	100.0	17.58	0.37	6.2	78.70	0.40
		<u>100.0</u>	<u>17.58</u>	<u>0.37</u>						
3/4" x 1/4" (25.6% by Wt.)	-1.35	65.5	3.3	0.38	65.5	3.30	0.38	100.0	15.28	0.55
	1.40	7.6	9.9	0.38	73.1	3.99	0.38	34.5	38.04	0.87
	1.50	5.0	16.1	0.43	78.1	4.76	0.38	26.9	45.99	1.01
	1.60	2.5	24.7	0.63	80.6	5.38	0.39	21.9	52.81	1.15
	1.70	5.6	39.8	1.51	86.2	7.62	0.46	19.4	56.44	1.21
	1.80	5.4	47.3	1.86	91.6	9.96	0.55	13.8	63.19	1.09
	+1.80	8.4	73.4	0.60	100.0	15.28	0.55	8.4	73.40	0.60
		<u>100.0</u>	<u>15.28</u>	<u>0.55</u>						
2" x 1/4" (Composite) (46.1% by Wt.)	-1.35	62.88	3.34	0.37	62.88	3.34	0.37	100.00	16.30	0.47
	1.40	8.18	10.38	0.31	71.06	4.15	0.36	37.12	38.25	0.64
	1.50	4.73	16.39	0.36	75.79	4.91	0.36	28.94	46.13	0.74
	1.60	2.37	25.53	0.62	78.16	5.54	0.37	24.21	51.94	0.81
	1.70	6.62	40.91	0.92	84.78	8.30	0.41	21.84	54.81	0.83
	1.80	7.80	47.05	1.04	92.58	11.57	0.47	15.22	60.86	0.79
	+1.80	7.42	75.37	0.53	100.00	16.30	0.47	7.42	75.37	0.53
		<u>100.00</u>	<u>16.30</u>	<u>0.47</u>						

Table III-3

(Continued)

Size	Specific Gravity	Direct			Cumulative Float			Cumulative Sink		
		Wt.,%	Ash,%	Sul.,%	Wt.,%	Ash,%	Sul.,%	Wt.,%	Ash,%	Sul.,%
1/4" x 28 Mesh (37.9% by Wt.)	-1.35	85.1	2.50	0.43	85.1	2.50	0.43	100.0	7.00	0.48
	1.40	4.6	8.30	0.47	89.7	2.80	0.43	14.9	32.67	0.75
	1.50	2.8	15.30	0.70	92.5	3.18	0.44	10.3	43.55	0.88
	1.60	1.4	23.90	0.90	93.9	3.48	0.45	7.5	54.10	0.94
	1.70	2.8	44.70	1.32	96.7	4.68	0.47	6.1	61.03	0.95
	1.80	0.6	56.40	1.36	97.3	5.00	0.48	3.3	74.89	0.64
	+1.80	2.7	79.00	0.48	100.0	7.00	0.48	2.7	79.00	0.48
			<u>100.0</u>	<u>7.00</u>	<u>0.48</u>					
2" x 28 Mesh (84.0% by Wt. of Total Sample)	-1.35	72.91	2.90	0.40	72.91	2.90	0.40	100.00	12.10	0.47
	1.40	6.56	9.72	0.36	79.47	3.46	0.40	27.09	36.87	0.67
	1.50	3.86	16.03	0.47	83.33	4.04	0.40	20.53	45.55	0.77
	1.60	1.93	25.00	0.71	85.26	4.52	0.41	16.67	52.39	0.84
	1.70	4.90	41.89	1.02	90.16	6.55	0.44	14.74	55.97	0.85
	1.80	4.55	47.61	1.06	94.71	8.52	0.47	9.84	62.99	0.77
	+1.80	5.29	76.21	0.52	100.00	12.10	0.47	5.29	76.21	0.52
			<u>100.00</u>	<u>12.10</u>	<u>0.47</u>					

28 Mesh x 0 = 16.0% by Wt. of Sample @ 7.4% Ash.

$$\begin{array}{r}
 84 \times 12.1 = 1015 \\
 16 \times 7.4 = \underline{280} \\
 1015 \\
 -280 \\
 \hline
 735 \\
 11.34
 \end{array}$$

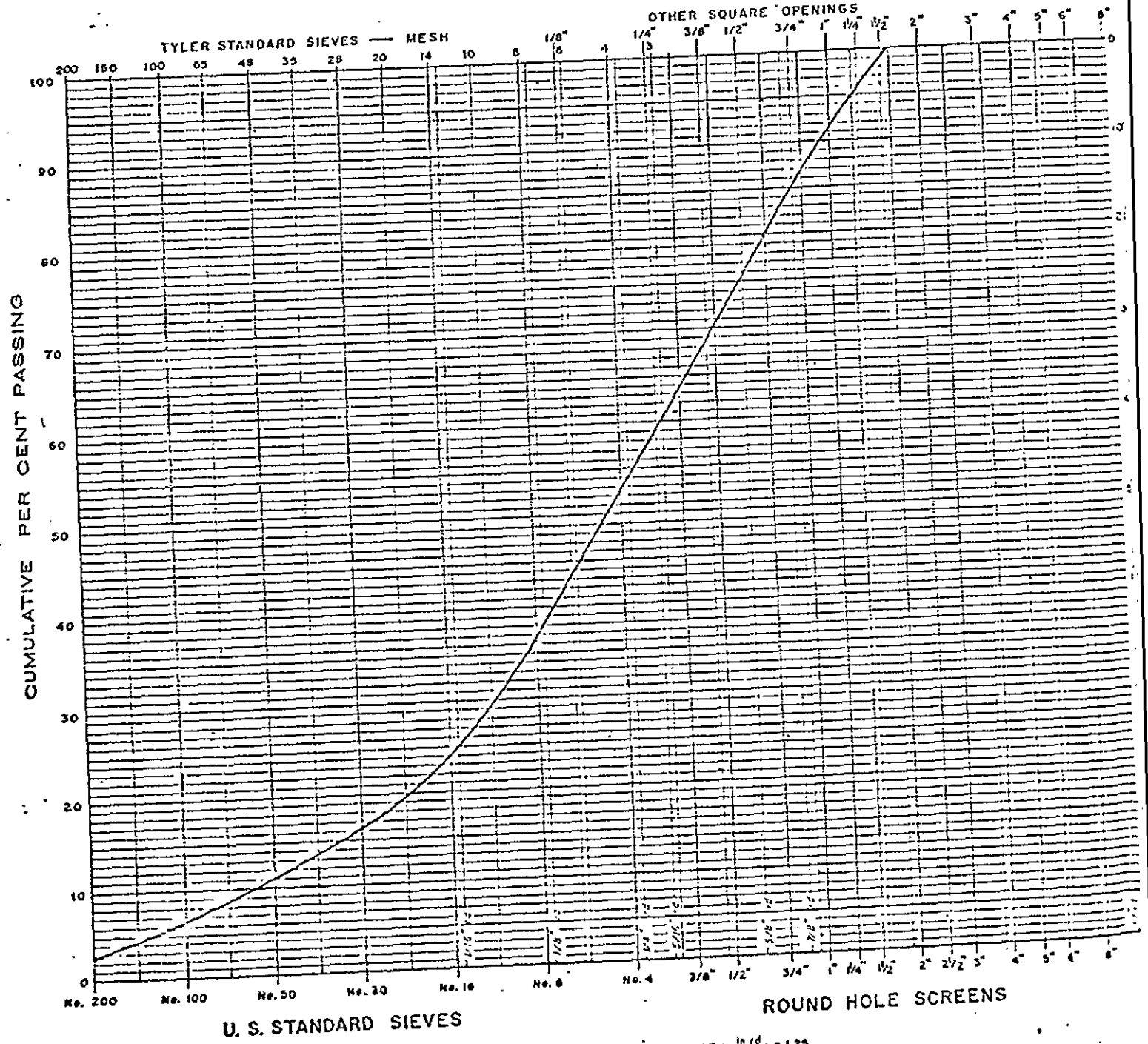
PAUL WEIR COMPANY
INCORPORATED
CHICAGO ILLINOIS

DESCRIPTION BRAMEDA RESOURCES LIMITED
CHAMBERLAIN SEAM SAMPLE FROM ADIT NO. 2

Date November 12, 1970

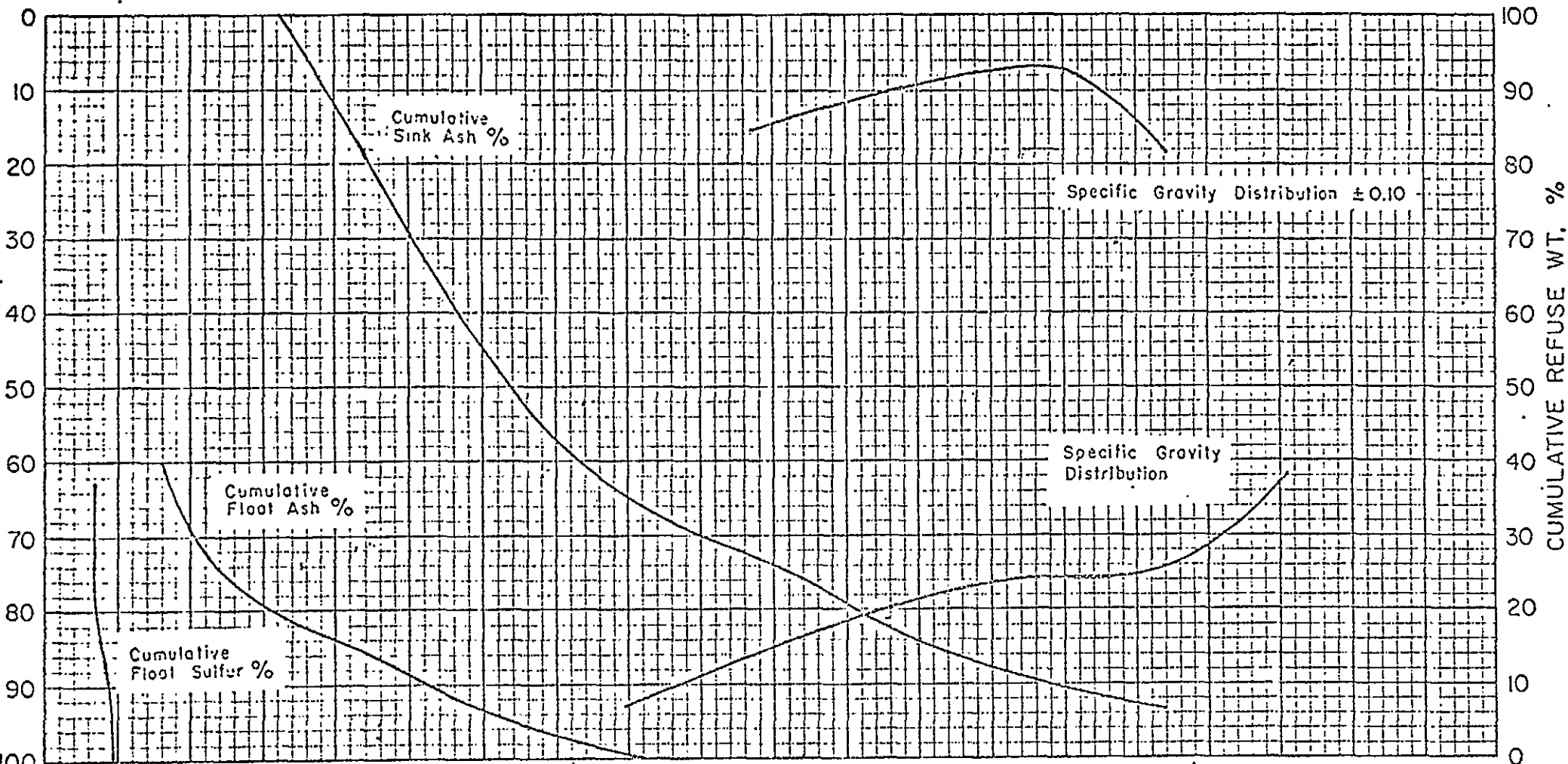
Total Weight of Sample

SCREEN ANALYSIS CURVE



NOTE: SCREEN OPENINGS ON LOGARITHMIC SCALE WITH $\frac{\ln 10}{\ln 2} = 1.25$

2.1 2.0 1.9 1.8 1.7 1.6 1.5 1.4 1.3



0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40

CUMULATIVE FLOAT ASH %

0 10 20 30 40 50 60 70 80 90 100

ELEMENTARY & CUMULATIVE SINK ASH %

0 0.5 1.0 1.5 2.0 2.5 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 9.5 10.0

CUMULATIVE FLOAT SULFUR %

PAUL WEIR COMPANY
CHICAGO Job No. 1693 ILLINOIS

FIGURE III-2

CHAMBERLAIN SEAM - ADIT NO. 2

SPECIFIC GRAVITY

1/4" x 28 Mesh (37.9% Total Wt.)

2.1

2.0

1.9

1.8

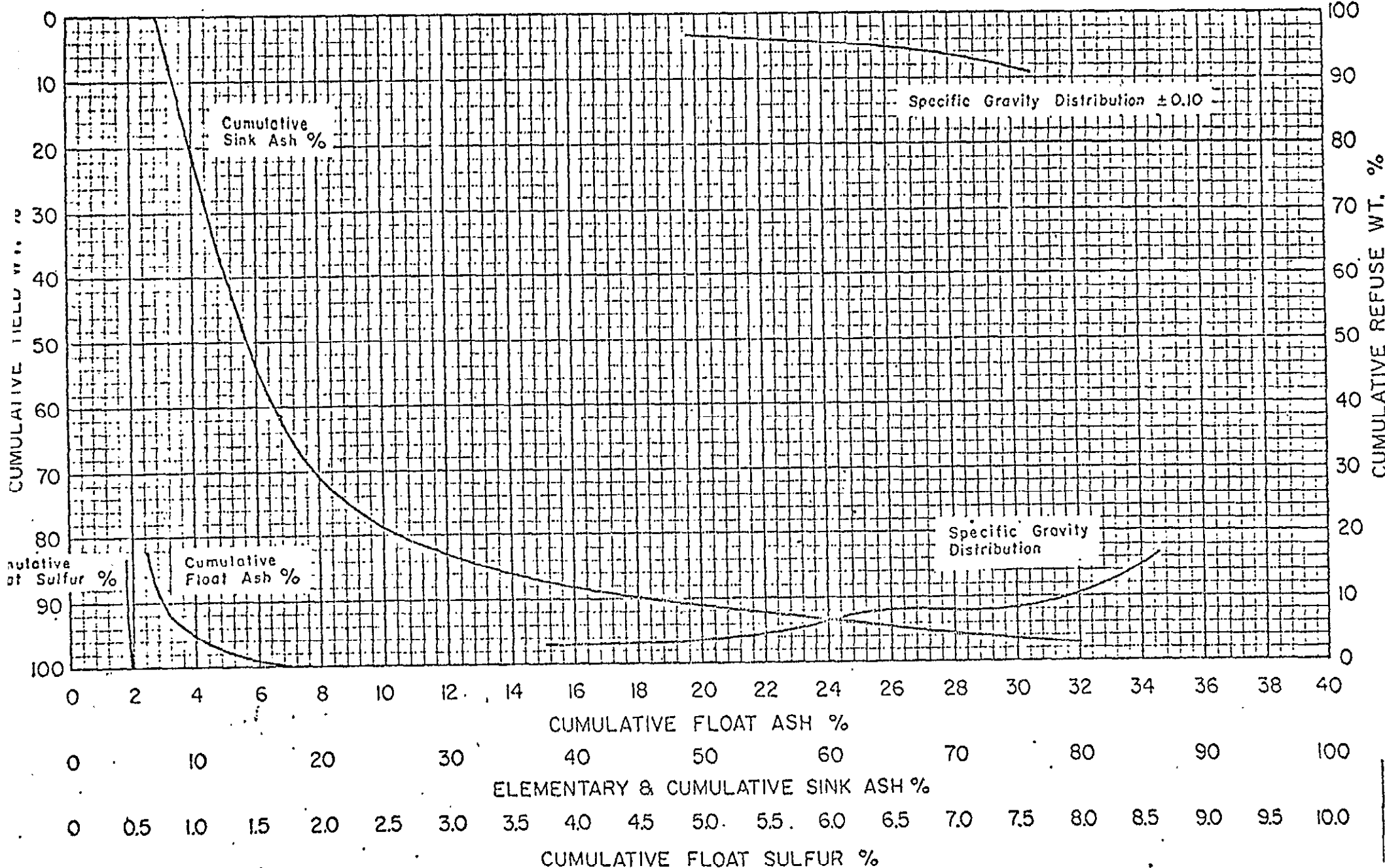
1.7

1.6

1.5

1.4

1.3



CHAMBERLAIN SEAM - ADIT NO. 2

SPECIFIC GRAVITY

2" x 28 Mesh (84.0% Total Wt.)

2.1

2.0

1.9

1.8

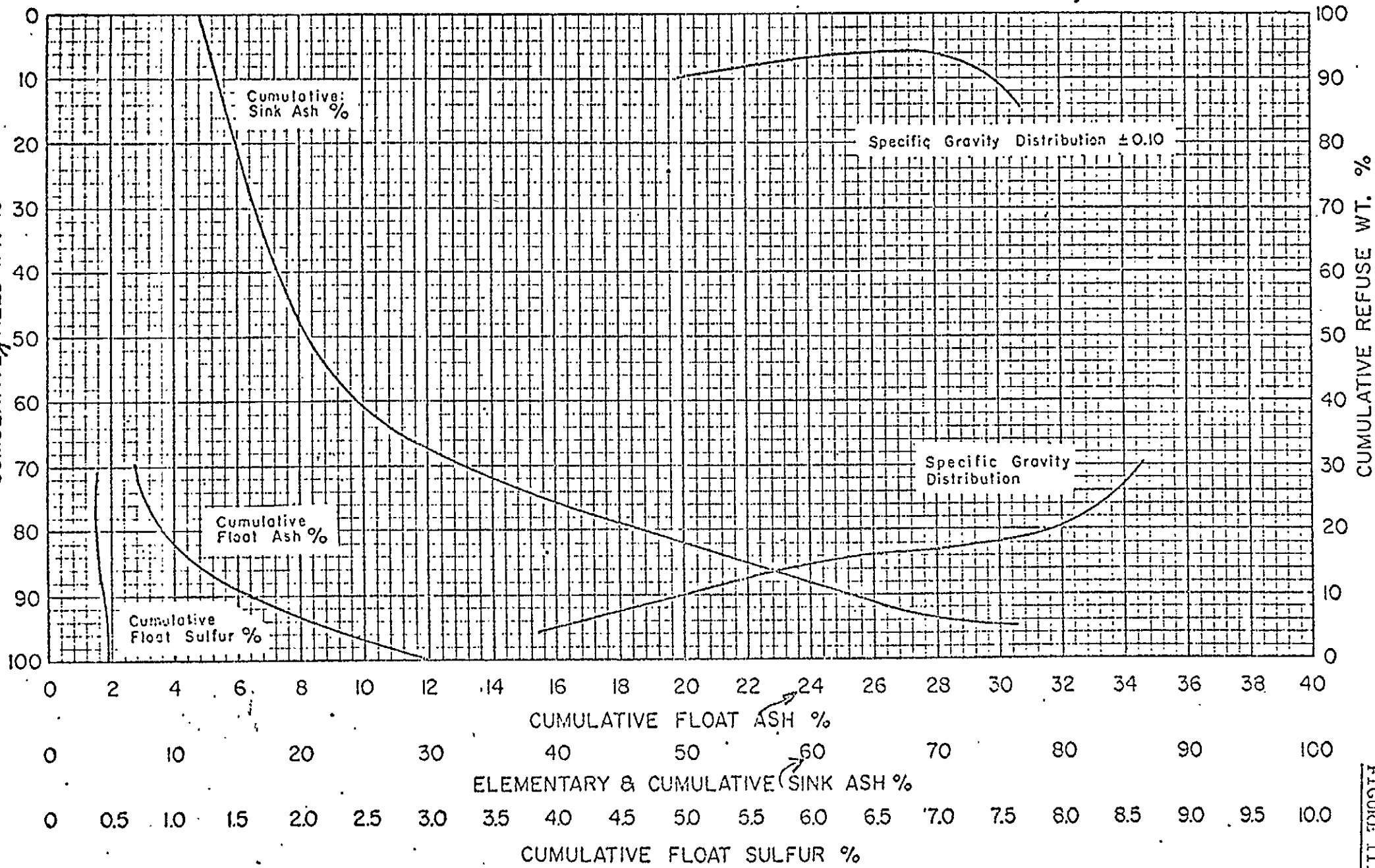
1.7

1.6

1.5

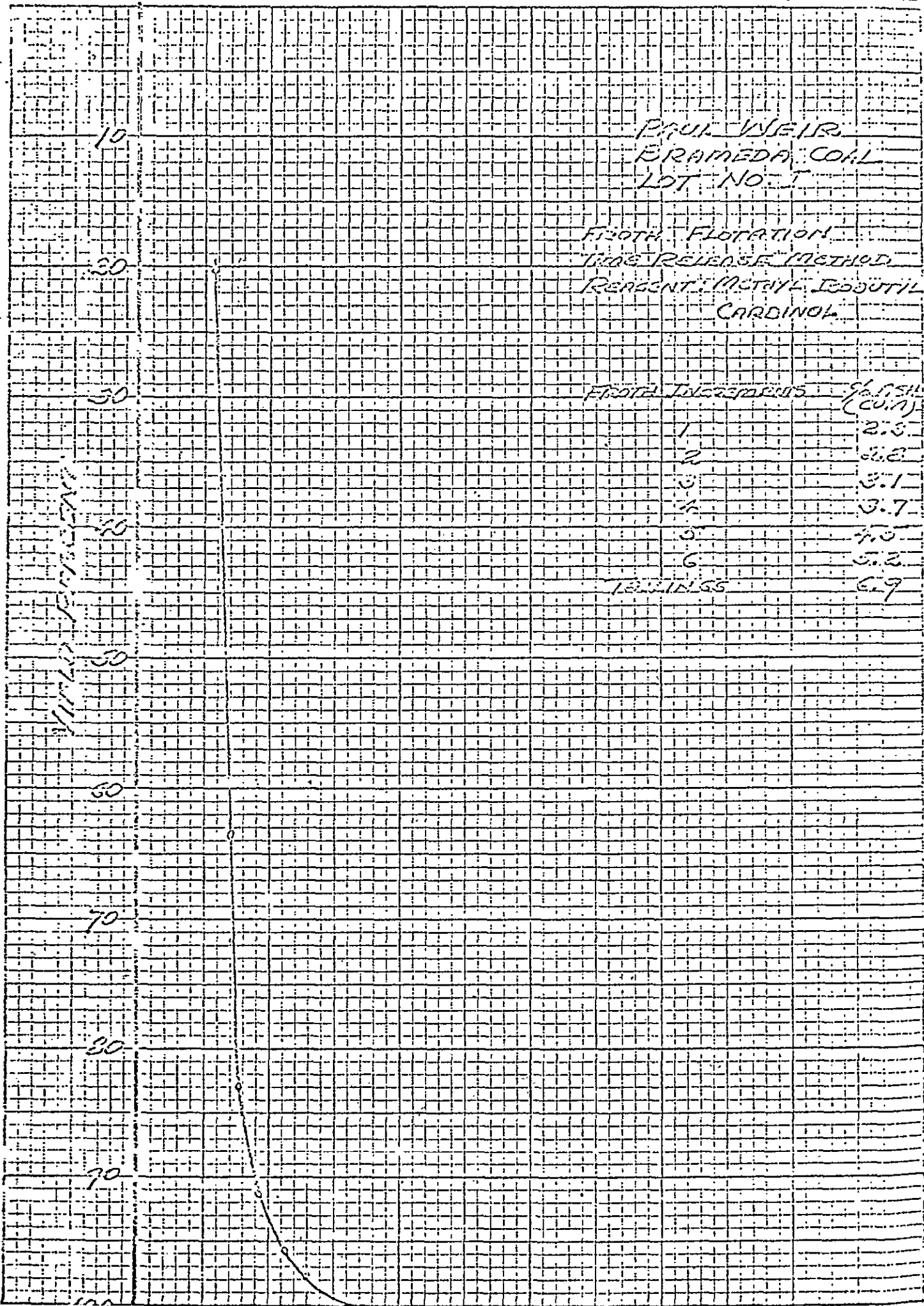
1.4

1.3



PAUL WEIR COMPANY
CHICAGO, ILL. Job No. 1693 ILLINOIS

FIGURE III-4



PAUL WEIR
 FRAMEDA COAL
 LOT NO. 1

FROTH FLOTATION
 TUBE RELEASE METHOD
 REAGENT: MASTYL, ISODUTIL
 CARDINOL

FROTH TOLERANCE	Gr. Ash (CO. 7)
1	2.5
2	2.8
3	3.1
4	3.7
5	4.0
6	5.2
7	6.9

PAUL WEIR COMPANY

Table III-4 contains the tabulated data on sizing, proximates, flotation, etc. made by Eastern Associates on the No. 2 adit bulk sample. The proximate analyses are on a raw coal basis. Note that the coarser sizes (on a raw coal basis) are low in FSI. This is normal for coal in this area, due to its higher durain content. The sample of all sizes combined shows FSI of 9.

The grindability (Hardgrove) indicates this is a soft, friable coal, but not quite as soft as coal of low volatile rank.

Table III-5 gives the analyses of the bulk sample prepared for the coke oven tests. This produced a yield of 85.2 percent at a 5.4 percent ash content at a separating density of 1.60 on the 2" x 28 mesh which, when combined with raw 28 mesh x 0, gives a yield of 87.5 percent overall, with 5.4% ash. After Froth Flotation 28 x 0 yield is 86.8%, ash 4.40%.

Table III-6 shows the expansion properties of the coal, Gieseler fluidity and Audibert-Arnu dilatometer results.

This is an expanding coal as shown by the sole heated oven test and later proven in the movable wall oven tests. This means that the coal would require blending with high volatile coals to bring the expansion down to practical limits. The Gieseler fluidity was 200 D.D.P.M. with a temperature range of 75 degrees. The dilatometer test showed a maximum contraction of -29 and a maximum dilation of +40. All these conditions are normal for coal of this rank.

Table III-4

Screen Size and Analytical Data
Paul Weir Co. Sample

BRAMEDA, Lot #1 (6935)

Preliminary Screen @ 2-inch Round Hole, wt %

Plus 2-inch	23.4
Minus 2-inch	76.6

Secondary Screen (includes +2-inch Rd. Crushed to Minus 2-inch)

	%	% cum
2-inch Rd x 3/4-inch sq	20.5	20.5
3/4-inch sq x 1/4-inch sq	25.6	46.1
1/4-inch sq x 28 mesh	37.9	84.0
28-mesh x 0	16.0	100.0

28-mesh x 0 Size Consist, Tyler Mesh, wt %

	%	% cum
28M x 48M	28.0	28.0
48M x 100M	34.4	62.4
100M x 200M	18.0	80.4
Minus 200M	19.6	100.0

<u>Sample</u>	<u>2" x 3/4" Heads</u>	<u>3/4" x 1/4" Heads</u>	<u>1/4" x 28M Heads</u>	<u>28M x 0 Head</u>
<u>Proximate Analysis,</u>				
<u>% dry basis</u>				
Volatile Matter	19.7	19.7	22.7	23.9
Fixed Carbon	63.0	64.0	69.7	68.7
Ash	17.3	16.3	7.6	7.4
Sulfur, %	0.42	0.60	0.50	0.56
Free Swelling Index	2	3-1/2	9	9
Grindability	78.8	81.1	91.4	----

28M x 0 Fractions

Ash Content of Sieve Test Fractions, % dry basis

28M x 48M	6.6
48M x 100M	6.6
100M x 200M	7.7
Minus 200M	9.3

Froth Flotation

<u>Froth Increments</u>	<u>Cum %, dry basis</u>		
	<u>Yield</u>	<u>Ash</u>	<u>Sulfur</u>
1	20.6	2.3	0.50
2	63.2	2.8	0.52
3	83.0	3.1	0.52
4	91.4	3.7	0.53
5	95.9	4.5	0.54
6	97.7	5.2	0.55
Tailings	2.3	6.9	0.56

Reagent:

MIB

Table III-5

Head Clean Coal Analyses

Proximate Analysis, % dry basis

Volatile Matter	22.7	
Fixed Carbon	71.9	
Ash	5.4	
Sulfur, %	0.48	
Free Swelling Index	9	
BTU		
Grindability		
Ash Fusion		
Yield of Clean Coal (2" rd x 28 M) washed @ 1.60 sp. gr.		85.2%
Total Yield of Coal, 2" rd x 28 M washed @ 1.60 sp gr. plus unwashed (28m"x0) fraction		87.5%

Table III-6

ANALYSES AND BENCH-SCALE TESTS

BRAMEDA Lot #1 (6935)

Sole-Heated Oven (ASTM D2014-64)

Expansion (+) or Contraction (-)

@ 55 lb/cu ft and 1.0% Moisture +9
@ 52 lb/cu ft and 2.0% Moisture +2

Proximate Analysis, % dry basis

Volatile Matter 22.7
Fixed Carbon 71.9
Ash 5.4
Free Swelling Index 9

Gieseler Fluidity (ASTM D2639-67T)

Start, 1 ddpm, °C 417
Final, 1 ddpm, °C 492
Range, °C 75
Max. Fluidity Temp, °C 462-465
Max. Fluidity, ddpm 200

Audibert-Arnu Dilatometer (ISO Recommendation No. 228)

Max. Contraction, % -29
Max. Dilatation, % +40

Temperature, °C

Of Softening 388
Of Max. Contraction 430
Of Max. Dilatation 460

LAR:amc
11/10/70

Eastern Associated Coal Corp.
Research Center
138 Robin Street
Everett, Massachusetts 02149

24.

Coke oven test data are shown in Table III-7, using the 100 percent Chamberlain washed coal. The information includes coke size analyses, shatter test, ASTM tumbler test and JIS drum tests as well as coke yield, porosity and apparent specific gravity.

The results are excellent. Of particular interest is the ASTM (Tumbler) stability of 59.7 percent at plus one inch and the JIS drum test at 15 mm. giving 94.2 percent. This is an exceptionally hard, dense coke.

Table III-8 gives the coke oven log data, while Figure III-6 gives a graph of the oven test as well as pertinent data.

Table III-9 gives the coke test data of a blend of 70 percent high volatile and 30 percent Chamberlain seam coal. This reduces the coke oven pressure to acceptable limits, but at a slight reduction in coke strength. However, its coke stability of 55.2 percent and the JIS drum strength of 93.4 percent at 15 mm. is still quite high.

Table III-10 and Figure III-7 give the test log data of the oven test using the 70 percent high volatile blend.

In summary, the Chamberlain seam is a low ash, high quality strong coking coal of excellent properties. Its ASTM rank is Mvb. Its ISO number is 434, with a Gray-King of G-6 to G-8.

Its Roga Index is over 45 and its free-swelling index is 8 to 9. Its volatile matter content of 22 to 25 percent (MAF) and Gieseler fluidity places it in the lower range of the medium volatile

Table III-7
SUMMARY OF TEST RESULTS
COKE OVEN TESTS

Test No.	PW-CA-13
Date:	11-2-70
<u>Blend Composition, wt.%</u>	
Brameda Lot #1 (6935) 100%	
<hr/>	
Equiv. Coking Time in 17-inch Wide Oven, hr	15.8
Moisture, %	2.8
Pulverization, % minus 1/8 inch	86.1
Bulk Density in Oven, lb/cu ft	48.8
<hr/>	
<u>Coke Screen Test, cum %</u>	
On 5-inch	2.5
On 4-inch	30.1
On 3-inch	72.6
On 2-inch	90.8
On 1-1/2-inch	96.4
On 1-inch	2.6
Minus 1/2-inch	
<hr/>	
<u>Shatter Test, cum % (ASTM D-144-66)</u>	
On 2-inch	60.8
On 1-1/2-inch	86.8
<hr/>	
<u>Tumbler Test, cum % (ASTM D294-64)</u>	
On 1-inch	59.7
On 1/4-inch	68.4
<hr/>	
<u>JIS Drum Test (From JIS-K2151-1960)</u>	
On 50 mm	29.8
On 25 mm	90.0
On 15 mm	94.2
On 6 mm	95.7
<hr/>	
Apparent Specific Gravity	0.89
Coke Porosity	48.3
Yield of Coke, % dry basis	79.3
Coking Pressure, psi	3.6
<hr/>	

LAR:amc
11/10/70

Eastern Associated Coal Corp.
 Research Center
 138 Robin Street
 Everett, Massachusetts 02149

Table III-8

OVEN LOG SHEET
100% CHAMBERLAIN SEAM

pre-peak 11000 psi
peak 3.58 psi

Full Range on Pressure Vacuum

EASTERN ASSOCIATED COAL CORP.

Research Center

Coke Quality Oven Test Specifications

Sheet No. 1

Project No. 2001-f Test No. PAW-CA-13 Date 11-2-70

Mix, Wt. % BROMADE LOT I
100%

Operators PRH-TC

Charge Wt., Lb. Gross 510.0

Excess 9.6 + 8.0 = 17.6

Time of Charge 7:07 A.M.

Net Lb. 492.4

Charge Complete 1:37 Sec.

Heating Data

Heating Program 1650-1900 °F.

Globars Amps. Volts

Rate 30 °F/Hr.

1 29 107

Signal Center Temp. 982 °C

2 25 103

Signal Coking Time 10:30 Hr:Min.

3 26 111

Time of Push 10:34 Hr:Min.

4 26 101

Time of Quench 10:37 Hr:Min.

5 27 101

Moisture 2.8 %

6 27 101

Bulk Density 48.8 Lb./Cu.Ft.

7 29 101

Watt Meter, Final 8365 KWH

8 29 101

Watt Meter, Initial 8100 KWH

9 26 101

Gross Consumption 265 KWH

10 26 101

9 Hr. Flues, 7) 1051 8) 1040 9) 1030

11 27 101

Holding Flue Temp. 1600 °F

12 27 101

P.S. Max. Gas Pressure — Lb/Sq. In.

P.S. Time of Peak — Hr:Min.

C.S. Max. Gas Pressure — Lb/Sq. In.

C.S. Time of Peak — Hr:Min.

Phase Voltage 117 115 117

Remarks:

Top coke level 0" + 02" - small
amount of steam being - same as other
+

EASTERN ASSOCIATED COAL CORP.
 CORE-REDUCTION OPEN CURVE QUALITY

LOG NO. 2001-5
 TUBE NO. FM-6-13
 TEST DATE 11-2-70
 DRILL. DRUMMER 1071 (G. S.)

MAX. FIRE-PEAK PRESS., 20.00 PSI
 MAX. WALL PRESS., 3.63 PSI
 MAX. GAS PRESS., 1.91 PSI
 HEATING PROGRAM 1650-1900° 4.0
 RATE, 30 °F/HR.

CUMUL DENSITY, 49.5 LB./CU. FT.
 IN-PIPE TEMP., 1801 °F.
 PRE-LOAD, 0.05 LB./SQ. IN.
 PRESS. GAUGE, 0.005 IN.
 BURNING TIME, 16.5 HR.
 LOSS, 15.1 %
 MOISTURE, 3.2 %



G.S. 1071 (G. S.)

MAX. PRESS. 20.00 PSI
 WALL PRESS. 3.63 PSI
 GAS PRESS. 1.91 PSI
 HEATING PROGRAM 1650-1900° 4.0
 RATE 30 °F/HR.

SUMMARY OF TEST RESULTSCOKE OVEN TESTS

Test No.	PW-CA-14		
Date:	11-6-70		
<u>Blend Composition, wt. %</u>			
	Brameda Lot #1 (6935)	30%	Chamberlain
	High Volatile (6921)	70%	Wharton No. 2
<hr/>			
Equiv. Coking Time in 17-inch Wide Oven, hr			15.1
Moisture, %			1.0
Pulverization, % minus 1/8 inch			84.4
Bulk Density in Oven, lb/cu ft			52.3
<hr/>			
<u>Coke Screen Test, cum %</u>			
On	5-inch		----
On	4-inch		----
On	3-inch		15.6
On	2-inch		63.0
On	1-1/2-inch		87.6
On	1-inch		96.5
	Minus 1/2-inch		1.9
<hr/>			
<u>Shatter Test, cum % (ASTM D-144-66)</u>			
On	2-inch		54.4
On	1-1/2-inch		83.4
<hr/>			
<u>Tumbler Test, cum % (ASTM D294-64)</u>			
On	1-inch		55.2
On	1/4-inch		68.0
<hr/>			
<u>JIS Drum Test (From JIS-K2151-1960)</u>			
On	50 mm		17.5
On	25 mm		85.5
On	15 mm		93.4
On	6 mm		95.1
<hr/>			
Apparent Specific Gravity			0.86
Coke Porosity			49.9
Yield of Coke, % dry basis			72.8
Coking Pressure, psi			0.8

CHARACTERISTICS OF HIGH VOLATILE COAL
USED IN BLENDING WITH BRAMEDA COAL

High Volatile Coal From Wharton No. 2 Mine
(Eastern Associated Coal Corp. - #6921 Lot)

Proximate Analysis, % Dry Basis

Volatile Matter	35.1
Fixed Carbon	60.5
Ash	4.4
Sulfur	0.68
Free Swelling Index	6

Gieseler Fluidity (ASTM D2639-67T)

Start, 1 ddpm °C.	390
Final, 1 ddpm °C.	477
Range, °C.	87
Maximum Fluidity Temperature, °C.	438
Maximum Fluidity, ddpm	25,000

Audibert-Arnu Dilatometer (ISO No. 228)

Maximum Contraction, %	-26
Maximum Dilatation, %	+162
Temperature, °C.	
Softening	346
Maximum Contraction	412
Maximum Dilatation	478

COKE OVEN LOG SHEET
70% HV 30% CHAMBERLAIN

pre-peak _____ psi
peak 0.8 psi

Normal range on p. recorder

EASTERN ASSOCIATED COAL CORP.

Research Center

Coke Quality Oven Test Specifications

Sheet No. 1

Project No. 2001-5 Test No. PW-CA-14 Date 11-6-70

Mix, Wt. % Princeton 151 (6935) 30% Operators ORR - TG
W. 1000-2 (6932) 70% Charge Wt., Lb. Gross 550.0
Excess 13.3 + 8.8 = 22.0

Time of Charge 6:39 A.M.

Net Lb. 528.0

Charge Complete 5:00 Sec.

Heating Data

Heating Program 1650 - 1900 °F.

Globars

Amps.

Volts

Rate 30 °F/Hr.

1

27

107

Signal Center Temp. 982 °C

2

29

94

Signal Coking Time 11:00 Hr:Min.

3

26

77

Time of Push 10:06 Hr:Min.

4

26

70

Time of Quench 10:09 Hr:Min.

5

27

102

Moisture 1.0 %

6

27

58

Bulk Density 52.3 Lb./Cu.Ft.

7

27

60

Watt Meter, Final 9973 KWH

8

29

70

Watt Meter, Initial 9674 KWH

9

26

58

Gross Consumption 249 KWH

10

26

108

9 Hr. Flues, 710458)10409)1034

11

27

11

Holding Flue Temp. 1765 °F

12

27

66

P.S. Max. Gas Pressure _____ Lb/Sq. In.

P.S. Time of Peak _____ Hr:Min.

C.S. Max. Gas Pressure _____ Lb/Sq. In.

C.S. Time of Peak _____ Hr:Min.

Phase Voltage 120 118 120

Remarks:

slap level 0" for - small amount
if Chamberlain from the sides

EASTERN ASSOCIATED COAL CORP.
 COMB-RESEARCH OVEN CURVE CHART

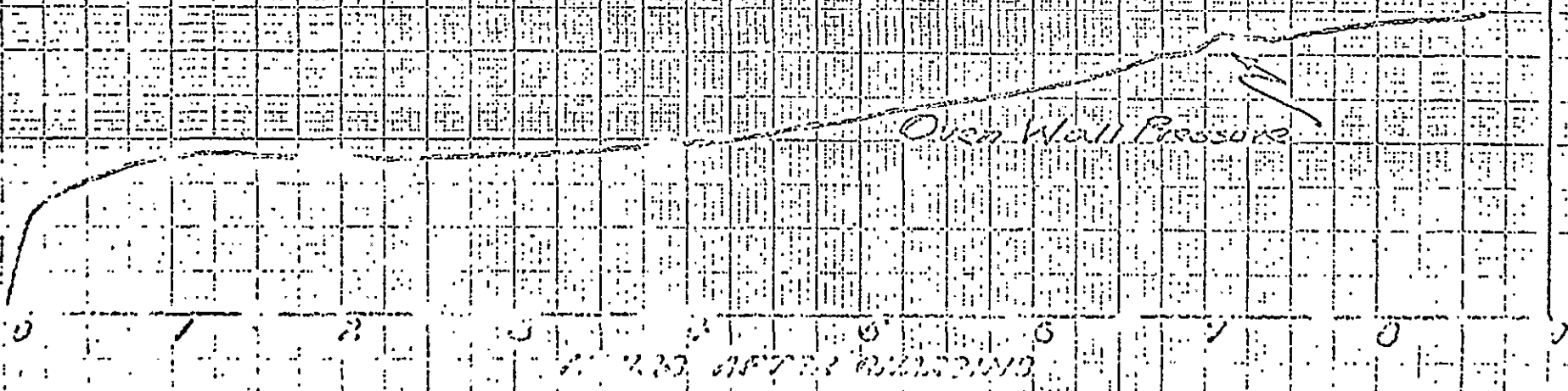
PROJ. NO. 2001-5
 TEST NO. PW-CA-14
 TEST DATE 11-6-70
 BLEND: WINGED 2 (675) 30%
 WINGED 2 (672) 70%
 HEATING PROGRAM 1650-1700°F
 RATE 30 °F/HR.

BULK DENSITY, 52.3 LB./CU. FT.
 AV. FLU. TEMP, 179.6 °F
 PRE-LOAD, 0.05 LB./SQ. IN.
 FEEDER GAUGE, 0.025 IN.
 GOKINS TIME, 10.0 HR.
 PULV., 84.2 - 3 - IN., %
 MOISTURE, 1.0 %

MAX. PRE-PEAK PRESS., — PSI
 MAX. WALL PRESS., 0.0 PSI
 MAX. GAS PRESS., — PSI

1.50 IN.
 1.00 IN.
 0.50 IN.
 0.25 IN.

2.0
 1.0
 0.5
 0.25



PAUL WEIR COMPANY

rank of coal. In fact, it is probable that a considerable proportion of the coal could be substituted for the low volatile coal in many coal blends. Its low ash and low volatile content give it an exceptionally high effective carbon content for blast furnaces.

CHAMBERLAIN SEAMSUMMARY NO. 2 ADITCOKING TESTS - JAPAN

	Kobe Steel	N.K.K.	Sumitomo	Nippon Steel
Proximate:				
I.M.	-	-	1.1%	1.2%
Ash	6.15	5.9	5.1	5.9
V.M.	21.80	22.80	23.0	22.4
F.C.	72.05		70.8	70.5
Sulphur	0.56	0.46	0.58	0.31
P ₂ O ₅				0.038
B.T.U.				14,650
F.S.I.	8	8½	8½	7½
Max. Fluidity DDPM	288		400	960
Temp. Range				75°C
Coke Strength:				
CH 100%	94.9		93.1	93.6
Blend (i)	92.3		93.4	88.5
Blend (ii)			91.9	89.8
Blend (iii)				90.8
Blend (iv)				91.9

Av. 0.47

BRAMEDA RESOURCES LTD.SUKUNKA COAL PROJECTSUMMARY OF COAL QUALITY - SKEETER SEAMA. ANALYSES -

	<u>Moist.%</u>	<u>Ash %</u>	<u>V.M.%</u>	<u>F.C.%</u>	<u>B.T.U.</u>	<u>S %</u>	<u>F.S.I.</u>
** 1. Average of 16 Cores*							
a) Raw Coal	0.82	13.60	22.64	66.16	13,720	0.47	7½
b) Float @ 1.60 (84 %)	0.83	5.46	23.63	70.08	14,584	0.49	8
*Holes in Reserve Block							
*** 2. No. 3 Adit Bulk*							
a) Raw Coal		45.49	16.40	38.11		0.43	
b) Clean Coal Analysis		6.40	21.40	72.2	14,526	0.70	6½
*Outside Reserve Block							

*** B. WASHABILITY

No. 3 Adit Bulk		<u>Yield%</u>	<u>Ash %</u>
1) Wash at 1.50 s.g. 2" x 28 mesh	(89.3%)	46.80	7.00
(28 x 0 (No. 1 Froth Flotation	(10.7%)	12.90	6.30
Combined		43.2	6.33
2) Wash at 1.60 s.g. 2" x 28 mesh	(89.3%)	50.8	8.8
28 x 0 (No. 2 Froth Flotation)	(10.7%)	36.7	8.0
Combined		49.28	8.7

Note: This sample has much higher initial waste (ash) than average in Reserve Block "A".

** Analyses by Coast Eldridge and Commercial Testing & Engineering.

*** Tests by Eastern Associated Coal Corporation

C. OTHER PROPERTIES OF SKEETER COAL

Bulk sample No. 3 Adit - Clean Heads

Grindability (Hardgrove Index)	84.4	
B.T.U.	14,526	
Ash Fusion - Initial	2525 [°] F	(1384 [°] C)
Softening	2670 [°] F	(1464 [°] C)
Liquid	2730 [°] F	(1497 [°] C)

*** D. COKING TEST

	<u>100% Skeeter</u>		<u>30% Skeeter</u>
Bulk Density in Oven	47.6	lb/cu.ft.	53.1
Screen Test : plus 1"	96%		96.9%
Shatter Test : on 2"	66.4%		52.0%
Tumbler Test : on 1"	57.8%		56.0%
J.I.S. Drum Test : on 15 mm.	93.8%		93.2%
Apparent specific gravity	0.89		0.93
Coke Porosity	48.2%		46.1%
Coking Pressure	0.6	p.s.i.	0.6
COKE YIELD	80.4%		74.6%

*** Tests by Eastern Associated Coal Corporation.

PAUL WEIR, FOUNDER,
CONSULTANT

PAUL WEIR COMPANY
INCORPORATED
MINING ENGINEERS AND GEOLOGISTS
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20 NORTH WACKER DRIVE
CHICAGO, ILLINOIS 60606

CLAYTON G. BALL, CHAIRMAN OF THE BOARD
JOHN P. WEIR, PRESIDENT
JOHN E. GOOD, SENIOR VICE PRESIDENT
JOHN S. SNYDER, COMPTROLLER

January 19, 1971

DATE JAN 21 1971	
FILE CODE 52137-9	
VICE PRESIDENTS	
RAYMOND E. ZIMMERMAN	
ERWIN GAMMETER	
DONALD H. DOWNEN	
DAVID J. KACHIK	
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GERALD C. CLARK	
<input type="checkbox"/> RETURN TO SENDER	
<input checked="" type="checkbox"/> CENTRAL FILE	

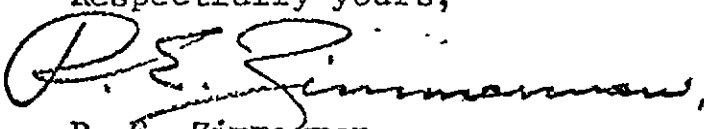
Mr. Lee Bilheimer
Assistant to Vice President
Brameda Resources Limited
Board of Trade Building, 7th Floor
1177 West Hastings Street
Vancouver 1, B.C., Canada

Dear Mr. Bilheimer:

You will find enclosed four copies of Eastern Associated Coal Corp. test results on the Skeeter seam. These data include washability tests, the standard coal analyses, and the results of coke oven tests.

We believe these results are self-explanatory, but if you have any questions concerning them we will be glad to answer them.

As anticipated, this seam is quite dirty and would, of course, give higher ash and lower yields than the Chamberlain seam. The coke tests, however, show that it makes a very strong coke.

Respectfully yours,

R. E. Zimmerman
Vice President

REZ/drs

Enclosures: As noted.

Sink	Float	Weight, %	Ash, %	Sulfur, %	Cum. Float			Cum. Sink		
					Weight, %	Ash, %	Sulfur, %	Weight, %	Ash, %	Sulfur, %
<u>Brameda Lot 2, 2-inch Rd. x 3/4-inch Sq. 9.1 % of Total</u>										
	1.35	29.0	4.6	0.69	29.0	4.6	0.69	100.0	45.5	0.38
1.35	1.40	11.5	11.2	0.58	40.5	6.5	0.66	71.0	62.2	0.26
1.40	1.50	6.5	16.8	0.55	47.0	7.9	0.64	59.5	72.1	0.20
1.50	1.60	4.8	32.3	0.48	51.8	10.2	0.63	53.0	78.9	0.15
1.60	1.70	0.5	41.0	0.48	52.3	10.5	0.63	48.2	83.5	0.12
1.70	1.80	11.5	52.8	0.39	53.8	11.6	0.62	47.7	84.0	0.12
1.80		46.2	85.0	0.11	100.0	45.5	0.38	46.2	85.0	0.11
<u>Brameda Lot 2, 3/4-inch Sq. x 1/4-inch Sq. 38.4 % of Total</u>										
	1.35	21.6	4.5	0.68	21.6	4.5	0.68	100.0	54.5	0.33
1.35	1.40	8.7	11.0	0.57	30.3	6.4	0.65	78.4	68.3	0.23
1.40	1.50	6.1	17.2	0.51	36.4	8.2	0.62	69.7	75.5	0.18
1.50	1.60	3.5	31.2	0.51	39.9	10.2	0.61	63.6	81.1	0.16
1.60	1.70	1.1	38.6	0.53	41.0	11.0	0.61	60.1	84.0	0.14
1.70	1.80	1.1	48.9	0.46	42.1	11.9	0.61	59.0	84.8	0.14
1.80		57.9	85.5	0.13	100.0	54.5	0.33	57.9	85.5	0.13
<u>Brameda Lot 2, 1/4-inch Sq. x 28 Mesh 41.8 % of Total</u>										
	1.35	41.5	3.8	0.71	41.5	3.8	0.71	100.0	34.8	0.51
1.35	1.40	7.5	9.0	0.60	49.0	4.6	0.69	58.5	56.8	0.37
1.40	1.50	7.2	15.2	0.56	56.2	6.0	0.68	51.0	63.9	0.33
1.50	1.60	4.3	28.8	0.52	60.5	7.6	0.66	43.3	71.9	0.30
1.60	1.70	3.0	40.5	0.60	63.5	9.1	0.66	39.5	76.5	0.27
1.70	1.80	2.5	51.2	0.65	66.0	10.7	0.66	36.5	79.5	0.25
1.80		34.0	81.6	0.22	100.0	34.8	0.51	34.0	81.6	0.22
<u>Composite - Brameda Lot 2, 2-in Rd x 28 Mesh 89.3 % of Total</u>										
	1.35	31.8	4.3	0.69	31.8	4.3	0.69	100.0	44.2	0.43
1.35	1.40	8.4	10.1	0.59	40.2	5.5	0.67	68.2	62.8	0.31
1.40	1.50	6.6	16.2	0.55	46.8	7.0	0.65	59.8	70.2	0.27
1.50	1.60	4.0	30.1	0.51	50.8	8.8	0.65	53.2	76.8	0.23
1.60	1.70	1.9	39.7	0.54	52.7	9.9	0.65	49.2	80.7	0.20
1.70	1.80	1.7	50.3	0.53	54.4	11.2	0.64	47.3	82.3	0.18
1.80		45.6	83.5	0.17	100.0	44.2	0.43	45.6	83.5	0.17

Upper Chamberlain or Skeels Seam

Preliminary Screen @ 2-inch Round Hole, wt %

Plus 2-inch 28.1
 Minus 2-inch 71.9

Secondary Screen (includes +2-inch Rd. Crushed to Minus 2-inch)

	%	% cum
2-inch Rd x 3/4-inch sq	9.1	9.1
3/4-inch sq x 1/4-inch sq	38.4	47.5
1/4-inch sq x 28 mesh	41.8	89.3
28-mesh x 0	10.7	100.0

28-mesh x 0 Size Consist, Tyler Mesh, wt %

	%	% cum
28M x 48M	20.8	20.8
48M x 100M	37.3	58.1
100M x 200M	20.0	78.1
Minus 200M	21.9	100.0

Sample	2" x 3/4" Heads	3/4" x 1/4" Heads	1/4" x 28M Heads	28M x 0 H
<u>Proximate Analysis,</u>				
<u>% drv basis</u>				
Volatile Matter	15.5	15.1	17.2	18.7
Fixed Carbon	33.3	28.9	44.7	49.5
Ash	51.2	56.0	38.1	31.8
Sulfur, %	0.33	0.33	0.48	0.72
Free Swelling Index	1	1	2-1/2	4-1/2
Grindability *	NR	NR	NR	-----

28M x 0 Fractions

Ash Content of Sieve Test Fractions, % dry basis

28M x 48M	28.9
48M x 100M	32.4
100M x 200M	31.5
Minus 200M	32.1

Froth Flotation

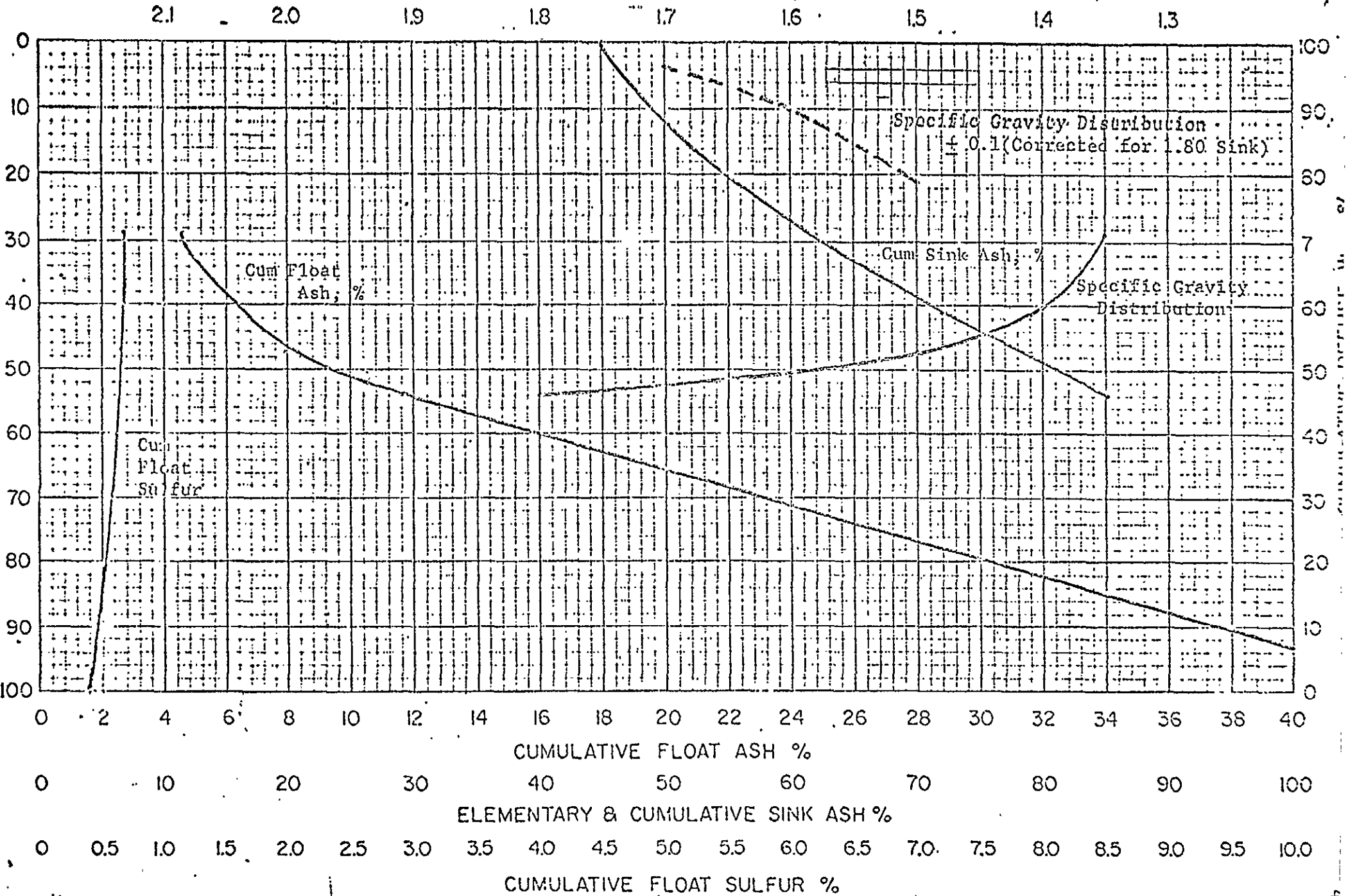
Froth Increments	Cum %, dry basis			Reagent:
	Yield	Ash	Sulfur	
1	12.9	6.3	0.70	MIBC
2	36.7	8.0	0.75	
3	53.0	10.2	0.83	
4	64.9	13.3	0.81	
5	75.4	17.6	0.80	
6	85.2	21.7	0.78	
Tailings	100.0	30.6	0.73	

Head Clean Coal Analyses

Proximate Analysis, % dry basis

Volatile Matter	21.4
Fixed Carbon	72.2
Ash	6.4
Sulfur, %	0.70
Free Swelling Index	6-1/2
BTU	-
Grindability	-
Ash Fusion	-

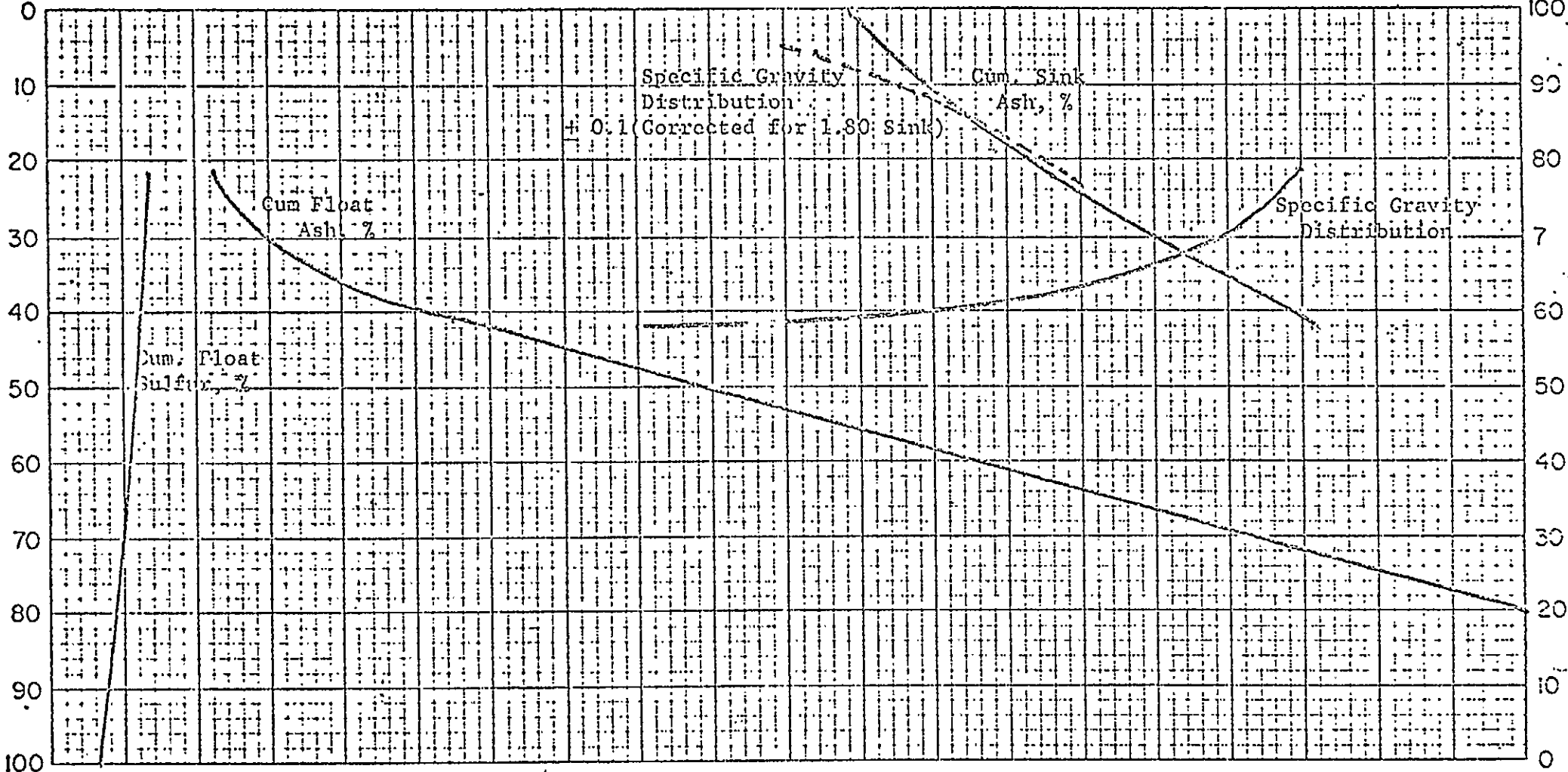
SPECIFIC GRAVITY



BRANEDA LO. J. 2
 3/4-INCH SQ X 1/4-INCH SQ. -
 38.4% OF TOTAL

SPECIFIC GRAVITY

2.1 2.0 1.9 1.8 1.7 1.6 1.5 1.4 1.3



0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40

CUMULATIVE FLOAT ASH %

0 10 20 30 40 50 60 70 80 90 100

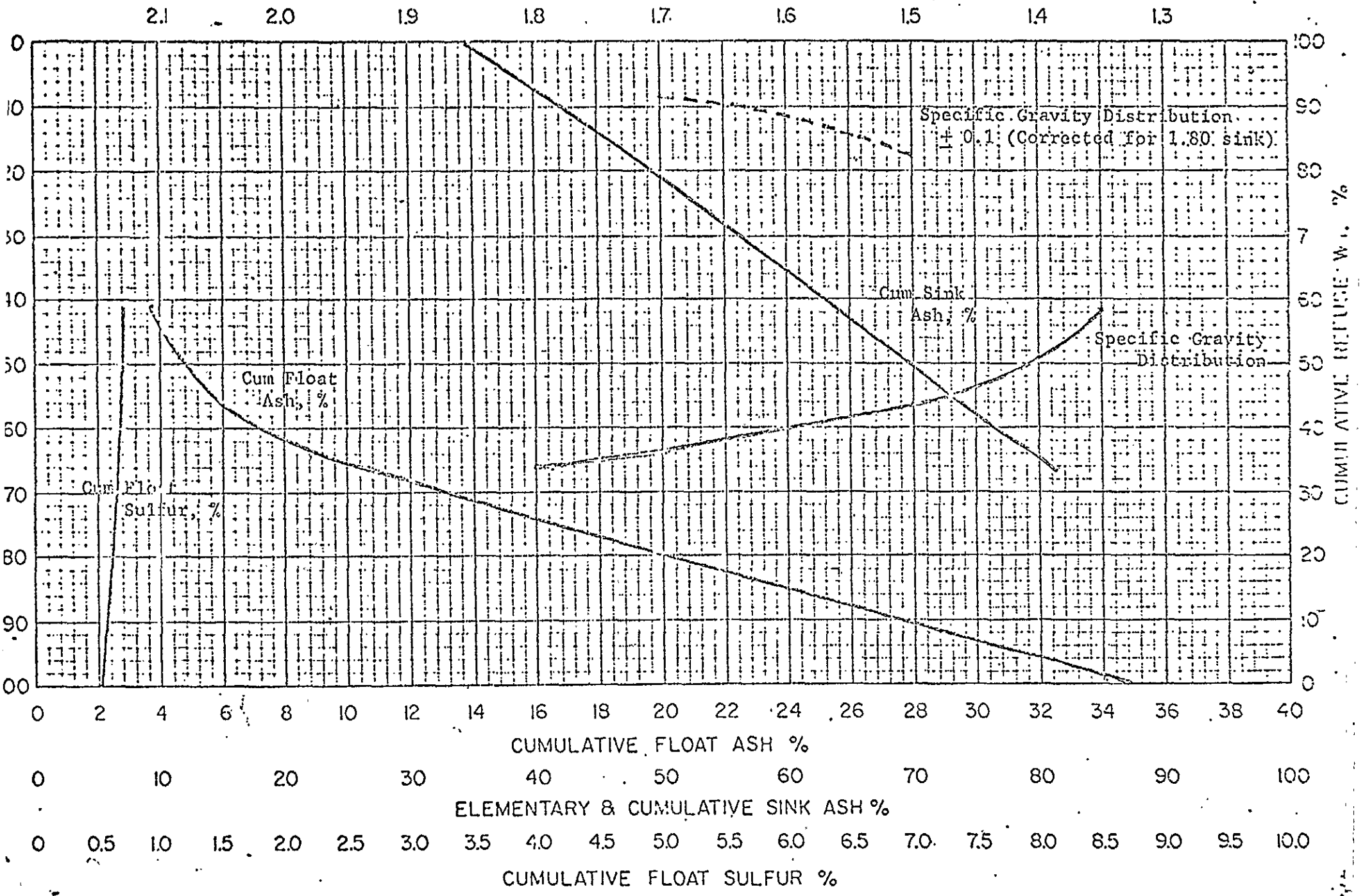
ELEMENTARY & CUMULATIVE SINK ASH %

0 0.5 1.0 1.5 2.0 2.5 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 9.5 10.0

CUMULATIVE FLOAT SULFUR %

1/4-INCH SQ. X 28 MESH - 41.8% OF TOTAL

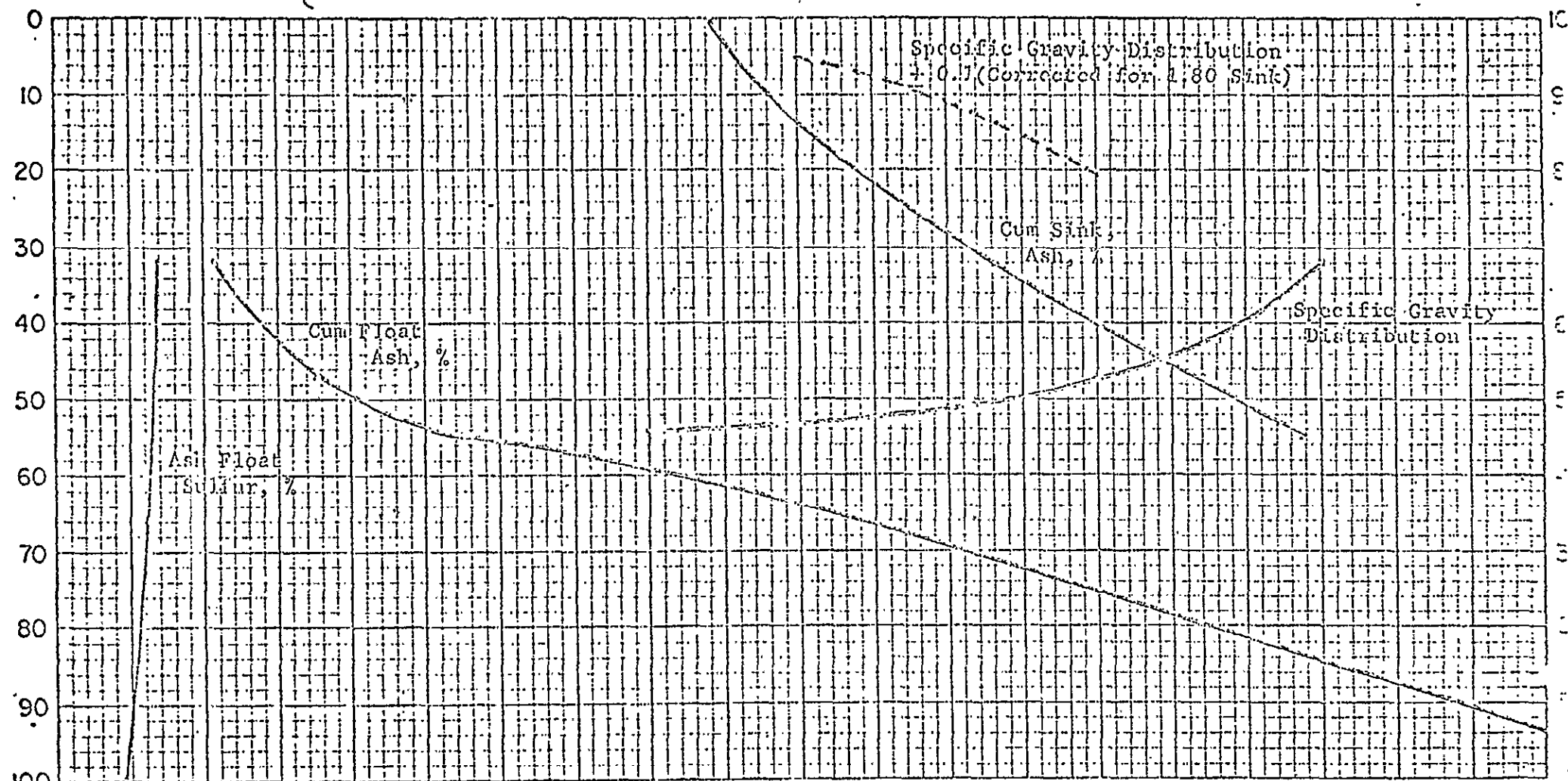
SPECIFIC GRAVITY



COMPOSITE 2-INCH RD. X 28 MESH 89.3% OF TOTAL

SPECIFIC GRAVITY

2.1 2.0 1.9 1.8 1.7 1.6 1.5 1.4 1.3



0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40

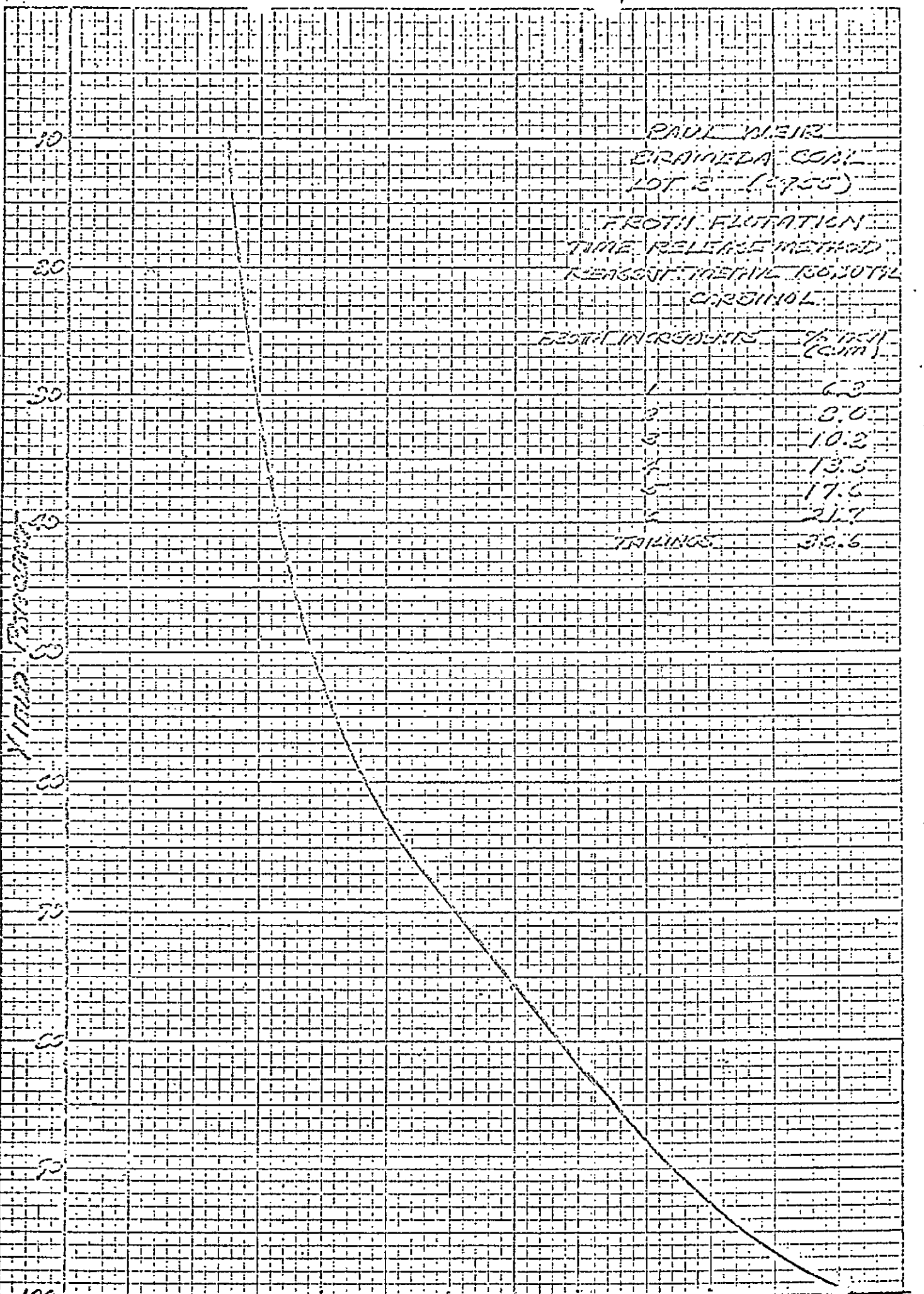
CUMULATIVE FLOAT ASH %

0 10 20 30 40 50 60 70 80 90 100

ELEMENTARY & CUMULATIVE SINK ASH %

0 0.5 1.0 1.5 2.0 2.5 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 9.5 10.0

CUMULATIVE FLOAT SULFUR %



PAUL WEIR
 ERANEDA COPI
 LOT 2 (1955)

FROTH FLUTATION
 TIME RELEASE METHOD
 REAGENT METHYL ROXOLYL
 CARBONOL

FROTH TREATMENTS	% Yield (Cum)
1	6.3
2	8.0
3	10.2
4	13.3
5	17.6
6	21.7
TOTALS	39.6

Yield (%)

10 15 20 25 30

30

SUMMARY OF TEST RESULTS

SKEETER

Test No.	SKEETER	PW-CA-15
Date:		1-6-71

Blend Composition, wt. %.

Brameda Lot No. 2 (6955)	100
--------------------------	-----

Equiv. Coking Time in 17-inch Wide Oven, hr	14.5
Moisture, %	4.0
Pulverization, % minus 1/8 inch	84.4
Bulk Density in Oven, lb/cu ft	47.6

Coke Screen Test, cum %

On 5-inch	-
On 4-inch	4.7
On 3-inch	30.1
On 2-inch	72.0
On 1-1/2-inch	90.1
On 1-inch	96.0
Minus 1/2-inch	3.0

Shatter Test, cum % (ASTM D-144-66)

On 2-inch	66.4
On 1-1/2-inch	86.4

Tumbler Test, cum % (ASTM D294-64)

On 1-inch	57.8
On 1/4-inch	66.8

JIS Drum Test (From JIS-X2151-1960)

On 50 mm	29.6
On 25 mm	90.5
On 15 mm	93.8
On 6 mm	95.4

Apparent Specific Gravity	0.89
Coke Porosity	48.2
Yield of Coke, % dry basis	80.4
Coking Pressure, psi	0.6

WGD:cms
1/14/71

Eastern Associated Coal Corp.
Research Center
138 Robin Street
Everett, Massachusetts 02149

ANALYSES AND BENCH-SCALE TESTS

Bramoda Lot No. 2 (6955)

Sole-Heated Oven (ASTM D2014-64)Expansion (+) or Contraction (-)

@ 55 lb/cu ft and 1.0% Moisture	+6
@ 52 lb/cu ft and 2.0% Moisture	-1

Proximate Analysis, % dry basis

Volatile Matter	21.4
Fixed Carbon	72.2
Ash	6.4
Free Swelling Index	6-1/2

Gieseler Fluidity (ASTM D2639-67T)

Start, 1 ddpm, °C	429
Final, 1 ddpm, °C	489
Range, °C	60
Max. Fluidity Temp, °C	465
Max. Fluidity, ddpm	20

Audibert-Arnu Dilatometer (ISO Recommendation No. 228)

Max. Contraction, %	-28
Max. Dilatation, %	+20

Temperature, °C

Of Softening	382
Of Max. Contraction	436
Of Max. Dilatation	460

WCD:amc

1/14/71

Eastern Associated Coal Corp.
 Research Center
 138 Robin Street
 Everett, Massachusetts 02149

pre-peak _____ psi
peak 1067 psi

FULL RANGE ON PRESS RECORDER

EASTERN ASSOCIATED COAL CORP.

Research Center

Coke Quality Oven Test Specifications

Sheet No. 1

Project No. 2001-5 Test No. PW-CAMS Date 1-6-71

Mix, Wt. % PERMANA (6552) 100%

Lot 2

Operators DW - PRH - TG

Charge Wt., Lb. Gross 510.0

Excess 14.8 + 14.2 = 29.0

Time of Charge 6.56 A.M.

Net Lb. 481.0

Charge Complete 70 Sec.

Heating Data

Heating Program 1650-1000 °F.

Globars

Amps.

Volts

Rate 30 °F/Hr.

1

29

110

Signal Center Temp. 982 °C

2

27

96

Signal Coking Time 9:36 Hr:Min.

3

26

72

Time of Push 9:40 Hr:Min.

4

26

92

Time of Quench 9:43 Hr:Min.

5

27

104

Moisture 0.0 %

6

27

57

Bulk Density 47.6 Lb./Cu.Ft.

7

27

60

Watt Meter, Final 31.34 KWH

8

29

72

Water Meter, Initial 289.5 KWH

9

26

56

Gross Consumption 2.39 KWH

10

26

110

9 Hr. Flues, 7) 104 (8) 111 9) 102

P.S. Max. Gas Pressure _____ Lb./Sq. In.

P.S. Time of Peak _____ Hr:Min.

C.S. Max. Gas Pressure _____ Lb./Sq. In.

C.S. Time of Peak _____ Hr:Min.

Holding Flue Temp. 1675 °F

Phase Voltage _____

Remarks:

Two coke samples expanded 1/2"
normal phenol gas bands like other

10/17/66

EASTERN ASSOCIATED COAL CORP.
 COKE-RESEARCH OVEN CURVE CHART

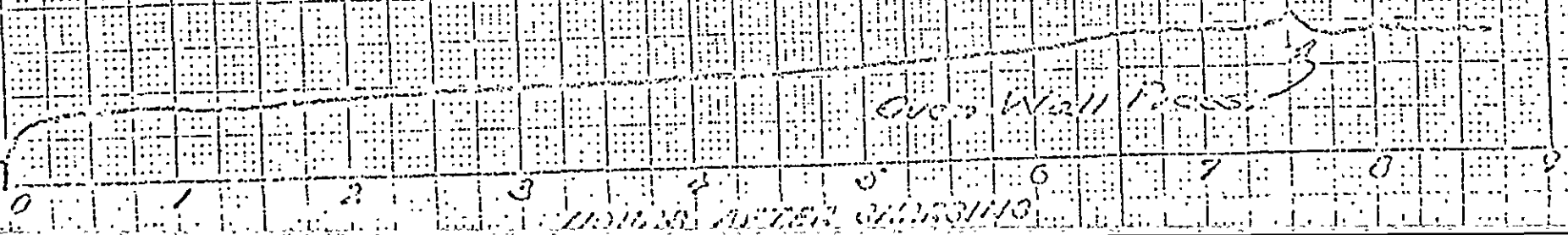
PROJECT 2001-5
 TEST NO. 201-CA-15
 TEST DATE 1-6-71
 BLEND: BIRMINGAM 1002 (6950)
 100%

MAX. PRE-PEAK PRESS., NONE PSI
 MAX. WALL PRESS., 0.57 PSI
 MAX. GAS PRESS., — PSI
 HEATING PROGRAM, 1650-1900F
 RATE, 50 °F/HR.

BULK DENSITY, 47.6 L.B./CU. FT.
 AV. FLUE TEMP., 1792 °F.
 PRE-LOAD, 0.05 L.B./SQ. IN.
 PREHEAT GAUGE, 0.025 IN.
 COOKING TIME, 9.6 HR.
 PULV., 34.4 %
 MOISTURE, 4.0 %

MAX. PRE-PEAK PRESS. 0.11 PSI

MAX. WALL PRESS. 0.57 PSI



SUMMARY OF TEST RESULTS

Test No.	PW-CA-16
Date:	1-7-71

Blend Composition, wt.%

High Volatile Coal (6968)	70
Brameda Lot No. 2 (6955)	30

Equiv. Coking Time in 17-inch Wide Oven, hr	14.9
Moisture, %	0.4
Pulverization, % minus 1/8 inch	82.8
Bulk Density in Oven, lb/cu ft	53.1

Coke Screen Test, cum %

On 5-inch	--
On 4-inch	0.5
On 3-inch	16.1
On 2-inch	65.1
On 1-1/2-inch	89.0
On 1-inch	96.9
Minus 1/2-inch	1.8

Shatter Test, cum % (ASTM D-144-66)

On 2-inch	52.0
On 1-1/2-inch	83.4

Tumbler Test, cum % (ASTM D294-64)

On 1-inch	56.0
On 1/4-inch	68.0

JIS Drum Test (From JIS-K2151-1960)

On 50 mm	26.8
On 25 mm	87.5
On 15 mm	93.2
On 6 mm	94.9

Apparent Specific Gravity	0.93
Coke Porosity	46.1
Yield of Coke, % dry basis	74.6
Coking Pressure, psi	0.6

WCD:ams

Eastern Associated Coal Corp.
Research Center
138 Robin Street
Everett, Massachusetts 02149

pre-peak 0.60 psi
peak 0.63 psi

EASTERN ASSOCIATED COAL CORP.

Research Center

Coke Quality Oven Test Specifications

Sheet No. 1

Project No. 2001-F Test No. PW-18-1B Date 1-7-71

Mix, Wt. % BRACADA LOT 2 (4855) 30% Operators DW-PRM-TG
WAL VOL. (4818) 70% Charge Wt., Lb. Gross _____
Excess 7.3 + 6.3 = 55

Time of Charge 6:59 A.M. Net Lb. 13.6

Charge Complete 20 Sec. Heating Data 536.4

Heating Program 1650-1900 °F. Globars _____ Amps. _____ Volts _____

Rate	°F/Hr.		Amps.	Volts
	<u>30</u>	1	<u>29</u>	<u>110</u>
Signal Center Temp.	<u>982</u> °C	2	<u>29</u>	<u>91</u>
Signal Coking Time	<u>9:52</u> Hr:Min.	3	<u>26</u>	<u>72</u>
Time of Push	<u>9:53</u> Hr:Min.	4	<u>26</u>	<u>42</u>
Time of Quench	<u>10:00</u> Hr:Min.	5	<u>27</u>	<u>105</u>
Moisture	<u>0.4</u> %	6	<u>27</u>	<u>58</u>
Bulk Density	<u>53.1</u> Lb./Cu.Ft.	7	<u>29</u>	<u>60</u>
Watt Meter, Final	<u>3575</u> KWH	8	<u>29</u>	<u>71</u>
Water Meter, Initial	<u>332.8</u> KWH	9	<u>26</u>	<u>56</u>
Gross Consumption	<u>247</u> KWH	10	<u>26</u>	<u>110</u>
% Hr. Flues, <u>7/2533/10429/1034</u>		11	<u>27</u>	<u>68</u>
Holding Flue Temp. <u>1660</u> °F		12	<u>27</u>	<u>54</u>

P.S. Max. Gas Pressure _____ Lb/Sq. In.

P.S. Time of Peak _____ Hr:Min.

C.S. Max. Gas Pressure _____ Lb/Sq. In.

C.S. Time of Peak _____ Hr:Min.

Phase Voltage _____

Remarks: Top rake level 0" + 0.7 normal
Start in bag from the notes

PAUL WEIR, FOUNDER,
CONSULTANT

CABLE ADDRESS "WEIRCO"

Bilke

PAUL WEIR COMPANY
INCORPORATED
MINING ENGINEERS AND GEOLOGISTS
(312) 346-0275

20 NORTH WACKER DRIVE
CHICAGO, ILLINOIS 60606

CLAYTON G. BALL, CHAIRMAN OF THE BOARD

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February 22, 1971

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FEB 24 1971

Mr. Robert E. Hallbauer
Vice President, Mining
Brameda Resources Limited
Board of Trade Building, 7th Floor
1177 West Hastings Street
Vancouver 1, B.C., Canada

Dear Mr. Hallbauer:

Enclosed are copies of analytical reports which complete the analysis of the special sample of Skeeter Seam coal from the Sukunka River area sent to Eastern Associated Coal Corp. at Everett, Massachusetts for coking tests.

Very truly yours,

M. P. Corriveau

M. P. Corriveau

MPC/drs

Enclosures: As noted.

COMMERCIAL TESTING & ENGINEERING CO.

GENERAL OFFICES: 220 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 728-8434

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February 2, 1971

MAIL ADDRESS
16120 VAN DRUNEN ROAD
SOUTH HOLLAND, ILLINOIS
(CHICAGO) 40473
PHONE 312 264-1173

EASTERN ASSOCIATED COAL CORP.
Koppers Building
Pittsburgh, Pennsylvania 15219

Sample Identification
by

Eastern Associated Coal Corp.

Kind of sample
reported to us -----

Sample taken at -----

*BULK
SKEETER JEAM*

Purchase Requisition No. 9876

Sample taken by Eastern Associated Coal Corp.

Sample No. 6955

Date sampled -----

PROXIMATE ANALYSIS	Analysis report no. CH 365488		ULTIMATE ANALYSIS	% Weight	
	As received	Dry basis		As received	Dry basis
% Moisture	xxx	xxx	Moisture	2.18	xxxxx
% Ash	xxx	xxx	Carbon	81.58	83.40
% Volatile	xxx	xxx	Hydrogen	4.48	4.58
% Fixed Carbon	xxx	xxx	Nitrogen	1.10	1.12
			Chlorine	0.06	0.06
			Sulfur	0.71	0.73
Blu	xxx	xxx	Ash	6.66	6.81
% Sulfur	xxx	xxx	Oxygen (diff)	3.23	3.30
% Alk. as Na ₂ O	xxx	xxx		<u>100.00</u>	<u>100.00</u>
				% Wt.	
SULFUR FORMS			MINERAL ANALYSIS	Ignited Basis	
% Pyritic Sulfur	xxx	xxx	Phos. pentoxide, P ₂ O ₅	0.21	
% Sulfate Sulfur	xxx	xxx	Silica; SiO ₂	65.96	
% Organic Sulfur	xxx	xxx	Ferric oxide, Fe ₂ O ₃	3.82	
% Total Sulfur	xxx	xxx	Alumina, Al ₂ O ₃	19.97	
			Titania, TiO ₂	1.35	
WATER SOLUBLE ALKALIES			Lime, CaO	2.22	
% Na ₂ O =	xxx		Magnesia, MgO	0.87	
% K ₂ O =	xxx		Sulfur trioxide, SO ₃	2.34	
			Potassium oxide, K ₂ O	1.56	
			Sodium oxide, Na ₂ O	0.75	
FUSION TEMPERATURE OF ASH	Reducing	Oxidizing	Undetermined	0.95	
Initial Deformation	xxx °F	xxx °F		<u>100.00</u>	
Softening (H = W)	xxx °F	xxx °F	SILICA VALUE =	xxx	
Softening (H = 1/2 W)	xxx °F	xxx °F	T250 =	xxx °F	
Fluid	xxx °F	xxx °F	ESTIMATED VISCOSITY		
% EQUILIBRIUM MOISTURE =	xxx		at Critical Viscosity Temperature of	xxx °F = xxx	Poises
HARDGROVE GRINDABILITY INDEX =	xxx				
FREE SWELLING INDEX =	xxx				

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

I. O. Foster

I. O. FOSTER, Manager, Midwest Division



IOF:bwv

Charter Member

SKEETER SEAM

Analyses:

BRAMEDA NO.2 (6955) Clean Heads.

BTU	14526
Grindability	84.4
<u>Ash Fusion</u>	
Initial Deformation	2525°F
Softening	2670°F
Liquid Temp.	2730°F

BRAMEDA RESOURCES LIMITED

SUKUNKA - SKEETER SEAM

PETROGRAPHIC ANALYSES

1.45 FLOAT (WASHED) COAL

PREFACE

As mentioned in the Paul Weir Company report, dated November 25, 1970, and the Petrographic Analyses report on the Chamberlain Seam, dated January 19, 1971, Dr. William Spackman, Jr. of the Pennsylvania State University, was to make a petrographic analysis of the Skeeter Seam. This has been accomplished and the following contains the information on the analyses of this seam.

METHODS

The Skeeter Seam coal sample was taken from the washed bulk sample prepared by Eastern Associated Coal Corp. and used in their coke oven tests of this seam. The washability and coke tests have previously been reported (January 19, 1971).

The sample was separated at Eastern at a washing gravity of 1.45 to obtain a 6.5% ash content.

For the maceral microscopic composition, a total of 1,000 identifications were made using a computerized point count system and oil reflectance analyses.

RESULTS

Table No. 1

Petrographic Composition

(Volume Percent)

	<u>Percent</u>
Vitrinoids	52.4
Pseudo-Vitrinoids	15.3
Fusinoids	14.5
Semi-Fusinoids	13.0
Micrinoids	
Massive	0.4
Granular	0.0
Resinoids and Exinoids	0.0
Mineral Matter	4.3
Percent Ash (Dry Basis)	6.5
Percent Total Sulfur (Dry Basis)	0.71

Table No. 2

Mean Maximum Reflectance in Oil

	<u>Percent</u>
All Vitrinites	1.30
Vitrinoids	1.30
Pseudo-Vitrinoids	1.31

Table No. 3

Inert Content

(Volume Percent)

	<u>Percent</u>
Mineral Matter	4.3
Inert Macerals	14.9
Semi-Inert Macerals	8.7
Inert Pseudo-Vitrinoids	<u>3.1</u>
Effective Inerts	31.0

The two values used in calculating the anticipated coke stability are the reflectance of the vitrinoid component and the total effective inert content. The predicted strength is plotted in the attached Graph.

Predicted stability (ASTM tumbler test % + 1 inch) is in the range of 62-64, which indicates an exceptionally strong coke.

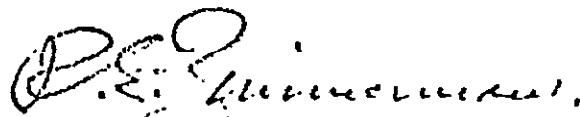
The vitrinoid material composes slightly over one-half of the coal. There were no resinoid nor exinoid macerals, and very low micrinoid macerals. The difference in reflectance value between vitrinoids and pseudo-vitrinoids is unusually low, thus minimizing the amount of "inertness" contributed to the pseudo-vitrinoids.

Dr. Spackman believes this Skeeter Seam coal would make an excellent coke without blending with other coals.

In terms of rank as measured by reflectance values, its somewhat lower reflectance values than the Chamberlain Seam indicate that it is slightly lower in rank than the Chamberlain Seam.

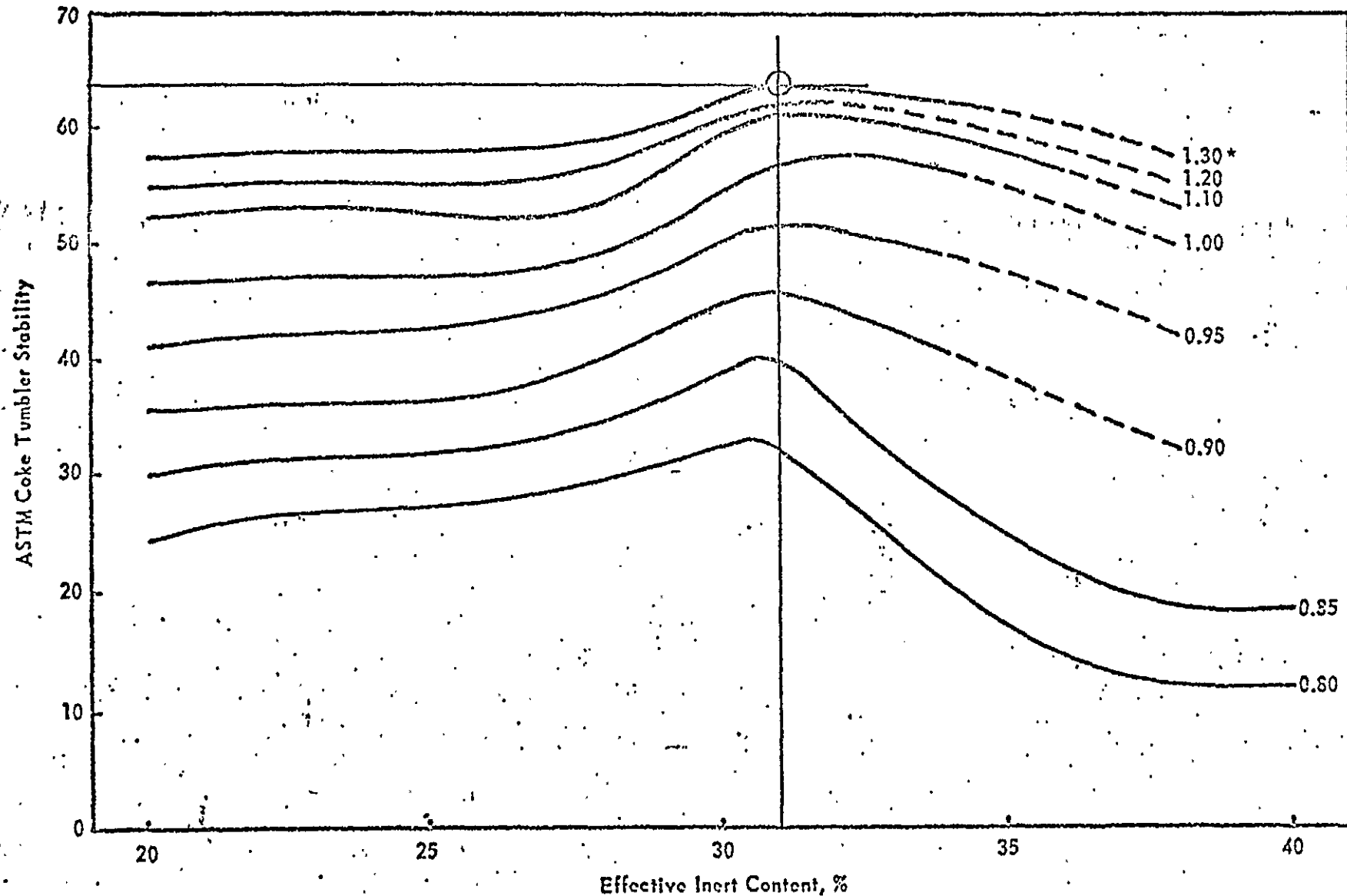
Respectfully submitted,

PAUL WEIR COMPANY



R. E. Zimmerman

for Sample No. 6955



CORRELATION CURVES BETWEEN PETROGRAPHIC COMPOSITION AND ASTM TUMBLER STABILITY FOR PREDICTING THE STABILITY OF COKE PRODUCED FROM HIGH- AND MEDIUM-VOLATILE COALS

* These numbers refer to percent vitrinite reflectance.

SUKUNKA COAL TESTING

COMMOTION SEAM "A"

HOLE NO.	FROM	TO	WIDTH FT.	REC. FT.	WEIGHT %	FLOAT SINK	A.D.M.	ASH %	V.M. %	FIXED CARBON	B.T.U. AIR DRY	S %	F.S.I.	WEIG LB
S-23	36.0	45.5	9.5	8.0	-	-	1.18	21.56	23.45	53.81	11,619	0.35	4.0	6.66
S-27	58.0	64.0	6.0	5.7	-	-	0.97	16.86	24.85	57.32	12,275	0.35	5.5	6.96
S-44	232.5	241.0	8.5	8.5	38.4	Float	0.97	10.53	28.38	60.12	13,572	1.90	9.0	9.14
					61.6	Sink	1.20	66.64			1.95			
S-25	155.0	162.0	7.0	7.0	73.6	Float	1.14	9.20	26.21	63.45	13,856	0.40	8.0	9.78
					26.4	Sink	1.34	63.02			0.17			
S-30	39.0	47.0	8.0	8.0	27.9	Float	1.23	10.41	22.01	66.35	13,719	0.44	6.5	14.38
					72.1	Sink	1.37	79.13			0.11			
S-35	197.2	105.0	7.8	6.4	41.9	Float	1.05	7.86	27.16	63.93	14,054	0.45	8.0	9.67
					58.1	Sink	1.24	84.12			0.02			

SUKUNKA COAL TESTING

MIDDLE COALS

HOLE NO.	FROM	TO	WIDTH FT.	REC. FT.	WEIGHT %	FLOAT SINK	A.D.M.	ASH %	V.M. %	FIXED CARBON	B.T.U. AIR DRY	S %	F.S.I.	WEIGHT LB.	
S-2	547.0	552.0	5.0				0.45	24.75	19.13	55.67	11,377	0.38	1.5		
S-7	526.0	534.0	8.0				0.50	7.75	21.90	69.85	14,521	0.46	1.5		
S-8	606.5	612.5	6.0				0.75	7.30	20.00	-	14,421	0.74	3.0		
S-8	612.5	617.5	5.0				0.80	7.75	19.70	-	14,721	0.30	2.0		
S-8	799.0	803.0	4.0				0.77	18.50	17.58	-	12,800	0.45	1.5		
							AVERAGE	0.65	31.21	19.66	66.48	13,568	0.46	1.9	

SUKUNKA COAL TESTING

BIRD SEAM

HOLE NO.	FROM	TO	WIDTH FT.	REC. FT.	WEIGHT %	FLOAT SINK	A.D.M.	ASH %	V.M. %	FIXED CARBON	B.T.U. AIR DRY	S %	F.S.I.	WEIGH LB.
S-5	354.0	361.5	7.5		-	-	0.30	46.00	16.15	37.55	8,258	2.25	5.0	
S-11	112.0	116.0	4.0		-	-	0.35	20.25	22.32	57.08	12,600	3.23	7.0	2.7
S-17	109.6	115.3	5.7	4.3	-	-	0.59	13.93	25.52	59.96	13,160	4.54	7.0	4.2
S-38	860.0	868.0	8.0	5.5	41.6	Float	0.77	9.31	23.73	66.19	13,998	2.78	8.5	
					58.4	Sink	1.19	80.94				2.76		
S-43	72.0	77.7	5.7	5.0	86.2	Float	0.63	8.17	27.19	64.01	14,201	2.36	8.0	6.8
					13.8	Sink	0.70	53.28				15.98		
					AVERAGE		0.58	29.14	22.98	56.96	12,443.	3.406	7.0	

GEOLOGIC INVESTIGATIONS OF TECK AND
BRAMEDA LICENSES WEST OF THE SUKUNKA RIVER

July - August 1971

M. E. HOPKINS

H. J. GLUSKOTER

INTRODUCTION

The primary purpose of this investigation during the period July 3 through August 6, 1971 was to determine the stratigraphic position of the rocks encountered in Drill Hole D-1 (See figures 1,2) and of the rocks in the area west of the Sukunka River where staking during 1970 had been accomplished. The strata encountered in this drill hole resembles in a general way the strata of the Gething Formation which, on the east side of the Sukunka River contains the important Chamberlain and Skeeter Coals.

In addition to the stratigraphic observations, structural attitudes were measured, thus allowing the compilation of a reconnaissance structural map, which has two principle functions in our studies: (1) to aid in the determination of potential drill hole sites where maximum stratigraphic information can be obtained with a minimum of drilling, and (2) to indicate in a general way the most favorable sites for future prospecting for potential mining.

During the course of the field work, major emphasis was given to the area adjacent to Drill Hole D-1 (see figure 1), however, in order to more fully attack the stratigraphic problem at hand, it was necessary to conduct field observations in areas more distant. The traverse map (figure 3) and the structural map indicate the total areas covered during this period. For purposes of discussion, the areas north and south of the Burnt River are treated separately.

Various coal samples from outcrops and drill holes were sent to Dr. Peter Macquibard of the Geological Survey of Canada, Ottawa, in order to obtain vitrinite reflectance measurements, which, as discussed later, provide aid in determining the stratigraphic position of the sequences sampled.

STRATIGRAPHIC OBSERVATIONS

Few stratigraphic marker beds exist in the Lower Cretaceous strata of this area. It is possible to trace locally certain units or to locally recognize unique lithologic attributes, but the repetitious character of these rocks makes correlation on these bases tenuous. In any vertical section of the Lower Cretaceous in this area, rock types reappear with considerable frequency, indicating the back and forth migration of certain environments. In the most general terms, the following rock types as observed in the sequence under examination in the Foothills area seem to be more frequently the product of the environments listed:

- (1) Chert-pebble conglomerates with sandstone matrix-piedmont alluvial deposits to fluvial channel deposits.
- (2) Coarse sandstones - fluvial channel to delta distributary channels.
- (3) Medium to fine sandstones - delta distributary channels, with minor development of off-shore bars, beaches, and shallow relatively high energy areas.
- (4) Very fine sandstones, siltstones, and silty shales - delta front sediments, high energy bay deposits, and minor delta environments such as overbank, crevasse, and natural levee deposits.
- (5) Dark gray mudstones and shales - Pro-delta and low-energy bay deposits - also simply off-shore marine.
- (6) Coal - paralic swamps or delta plain for the most extensive deposits - other accumulations expected in more areally restricted environments such as abandoned distributary channels or other poorly drained areas where local swamps can develop.

It is expected that many exceptions to the relations listed above will be found but an appreciation of the general nature of the environments giving rise to these sediments enables one to better understand the sequence and to appreciate the numerous lateral variations seen. One would expect going from west to east along any time plane that the grain size would decrease as the environment changed, Ideally the change in environments is from piedmont to fluvial to deltaic to marine, with the changes in lithologies going through conglomerate to sandstone to a variety of rocks including coals then to shales or mudstones. Examples of these types of sediments can be seen in the Gething, Moosebar, and Commotion Formations on the Sukunka Property. The Moosebar apparently represents a major development of pro-delta marine deposits. Mudstones of similar nature, but not as extensive, can be seen in the Gething while the Commotion contains at least one similar sequence, the Hulcross Shale.

In the general area, the most easily recognized rock units which might be locally useful as marker beds are the conglomerates, which because of their resistant nature and because of their certain degree of rarity, at least in comparison to sandstone units, can be traced with some confidence. Above the timber line, and in areas of good exposures in the creeks some of the shale units, in particular the Moosebar or similar shales, can be used as mapping units.

With this background, an attempt was made to tie in the area west of the Sukunka River with the relatively well known sequence on the east side of the River, where considerable drill hole and geologic mapping data are available.

No units were positively identified on the basis of lithology as being equivalent to any of the known strata on the west side of the Sukunka River. At only one place, in a small anticline about 1.6 miles

north of the mouth of Blind Creek just outside of Coal License 1561 was anything observed which might be considered the equivalent of the Moosebar Shale, and this is questionable as only about 25 feet of Moosebar-type mudstone was seen. One unit, however, which appears to have some continuity and value as a mappable unit, is a conglomerate sequence, usually ranging from 15 to 30 feet thick, composed of chert pebbles up to about 3 inches in diameter embedded in a medium to coarse grained sandstone matrix. The conglomerate, while not unique in lithology, is more or less traceable as it forms fairly prominent topographic benches and is, in this part of the section, apparently the only well developed conglomerate present. It should be noted here that in a few exposures two conglomerate units were sometimes observed but usually less than 30 feet or so apart. The mapped extent of the base of this conglomerate section is shown on figures 2 and 4. Prominent outcrop areas are: (1) along the drill road which leads to Drill Hole D-1 on the hillside north of Rocky Creek; (2) on the hillside west of the Sukunka River along the drill site road in Coal Licenses 1074, 1068, 1061; (3) in the north-draining tributary to Rocky Creek, Coal Licenses 1057-1058; (4) just east of the mouth of the south-draining tributary of Rocky Creek, Coal License 181; and (5) in the adjacent south-draining tributary in Rocky Creek just to the west, Coal License 179. This conglomerate sequence can also be observed in three of the north-draining tributaries to the Burnt River. This unit forms the basis of our interpretation as to the locations where the maximum stratigraphic interval may be obtained. The conglomerate unit in Drill Hole D-1 encountered at a depth of 590 feet is correlated with the mapped unit.

If we were to conjecture on the possible correlation of this unit with the area to the east of the Burnt River - the most likely correlation is with the conglomerates previously mapped as Cadomin (Hopkins and Gluskoter-1970 Report) along Bullmoose Creek on the southeast side of

Chamberlain Mountain. As no conglomerates were encountered below the Commotion Formation in any of the intensely drilled areas east of the Sukunka River and as the Cadomin (as mapped) does appear only a few hundred feet below the Chamberlain Coal on Chamberlain Mountain, it is possible that the two conglomerate occurrences may represent essentially the same stratigraphic position.

In the area west of the Sukunka River and south of the Burnt, outcrops of the conglomerate unit as described above are fairly extensive and it is estimated that 1200 to 1500 feet of coal-bearing strata crop out below the conglomerate and around 1000 feet can be expected above. We hesitate to refer this entire sequence to the Gething Formation as mapped in the Bullmoose Creek area but as far as lithologic character of the rocks above and below the conglomerate are concerned no noticeable differences are apparent. Some of the thicker or what seem to be more persistent coals are shown on figure 4. No coals above $3\frac{1}{2}$ feet were noted during the field reconnaissance in this area.

The area north of the Burnt River was investigated primarily to provide additional bases for correlation of the strata south of the Burnt, and more specifically, the rocks encountered in Drill Hole D-1. Again, no positively identified stratigraphic units were found. One outcrop composed of about 25 feet of Moosebar-type mudstone was observed about 1 mile northeast of Coal License 1561, but no suggestion is given here that this is actually Moosebar. No conglomerates which could be referred to the unit discussed in the foregoing section were seen. However, coal-bearing sequences were widely exposed throughout this area. The most notable coal outcrop is the 9 foot (plus) coal observed in Blind Creek (Coal License 1560). The stratigraphic position of this

coal is discussed in the section dealing with coal reflectance. Excellent exposures of coal-bearing rocks can be seen along Brazion Creek-- observations were made as far as about one-half mile above the junction of Mink and Brazion Creeks. A few outcrops of coal up to 5 feet thick are plotted (figure 4).

STRUCTURAL OBSERVATIONS

Structural attitudes, faults, and fold axes are shown on figure 2. Where a fault was observed in outcrop, an "F" is plotted on the map.

In a very general way the area can be divided into two principle structural regions:(1) the area south of the Burnt River where a few relatively large areas are characterized by gentle dips (generally less than 15 degrees) separated by either faults or narrow sharply folded zones, and (2) north of the Burnt River where the folding is more intense and the strata generally more highly inclined.

In the part south of the Burnt River, a relatively sharp flexure (or fault) trending about northwest-southeast is shown passing just west of the location of Drill Hole D-1. Observations based on helicopter reconnaissance, aerial photo interpretation, and visual inspection from Mt. Jilg and "Mt. 5514", about three miles southeast of Mt. Jilg, indicate that a relatively large area southwest of this flexure and northeast of the two mountains is characterized by relatively gentle dips. The flexure east of "Mt. 5514" is shown as partly conjectural.

To the northwest of this flexure, and on the hilltops north and south of Rocky Creek, are two areas of relative gentle dip. Abruptly terminating the gentle area north of Rocky Creek is a disturbed zone mapped as a thrust fault, northeast of which, the strata are tightly folded. It should be pointed out that this fault may tie in with the fault observed on the west side of Chamberlain Mountain and in the tributary to Chamberlain Creek about four miles northeast of Chamberlain Peak

In the area north of the Burnt River, the folding is more intense than that to the south and no sizeable areas of gentle dip were noted. On figure 2, the high dips and numerous reversals can be seen. Relative to the structural attitude of the 9 foot plus coal on Blind Creek (Coal

License 1560), it is likely that the outcrop of this coal can be followed up the hillside north of Blind Creek, however the outcrop will make an "S" pattern as it must come around on the southeast end of the syncline which parallels Blind Creek and whose axis lies about one-half mile northeast of the creek. The outcrop pattern of this coal on the southwest side of the creek is not known.

COAL RANK (REFLECTANCE) AS A STRATIGRAPHIC TOOL

IN THE SUKUNKA REGION

A. Introduction to the Method

Within the past three years, Dr. Peter Hacquebard and J. Roger Donaldson have presented two papers to the Coal Group of the Geological Society of America, both of which were concerned with the increase in coal rank with depth. The first paper, of which the abstract is given below, was primarily concerned with the potential for oil in eastern Canada.

Coal Metamorphism and Hydrocarbon Potential in the Upper Palaeozoic of Eastern Canada

HACQUEBARD, PETER A., and J. ROGER DONALDSON. *Geological Survey of Canada*, 601 Booth Street, Ottawa, Canada

Coal rank is used to measure the degree of organic metamorphism and to evaluate the hydrocarbon potential, using the principles of the "carbon ratio" theory. The rank is determined on true coal seams and small coaly fragments in clastic sediments by measuring the vitrinite reflectance. Most of the areas of deposition and nearly all terrestrial formations could thus be examined.

Within the Fundy basin the surface bedrock shows considerable variation in regional metamorphism. A high zone, above the hydrocarbon "deadline," extends across northern Nova Scotia, from eastern Cape Breton Island to New Brunswick. Low-rank areas, below the deadline, occur in the Cumberland sub-basin, including Prince Edward Island, in the Moncton sub-basin, and in eastern New Brunswick.

The coalification is largely postorogenic, and a good correlation exists between rank and depth of overburden. In the higher-rank coals the increase in rank can be measured accurately by the reflectance. An average increase of 0.05% R_0 per 100 m depth (equal to a loss of 1.3 percent volatile matter) has been recorded. This can be equated with a geothermal gradient of 46 m per degree centigrade. In the lower-rank coals (above 36 percent volatile matter), the reflectance indicates only the approximate position on the coalification band, and precise rank predictions at depth cannot be made from surface observations. However, on suitable borehole samples, rank changes can be measured and the position of the hydrocarbon deadline determined. The thickness of potential strata has thus been determined in several areas.

Utilizing the techniques of this study, Hacquebard and Donaldson (with assistance from another of their colleagues, Dr. Alex Cameron) turned their efforts to western Canada and investigated a series of coal-bearing sequences from the Peace River Canyon on the north to the Crowsnest area on the south. An abstract of a paper on this subject presented to the Geological Society of America at the annual meeting

in 1970 follows.

COAL RANK STUDIES IN THE ROCKY MOUNTAIN FOOTHILLS BELT OF CANADA

Hacquebard, Peter A., and J. Roger Donaldson, Geological Survey of Canada, 601 Booth Street, Ottawa, Canada

In the Rocky Mountains coal rank, as determined from vitrinite reflectance, increases regularly with stratigraphic depth, but not with geologic age, depth of mining or degree of tectonic disturbance. Pre- orogenic coalification is therefore indicated, but its gradient (in comparable stratigraphic intervals and rank ranges) is not the same throughout the Foothills region. This is illustrated with rank-depth curves of ten coal bearing sections of Cretaceous age, that are situated between the Crownsnest coalfield in the south and the Peace River area in the north.

For each curve the coalification gradient is expressed in terms of per cent reflectance (R_0) - change per 100 m increase in depth. Different R_0 -depth factors were obtained, which by comparison with a standard coalification curve can be related to different geothermal gradients.

This R_0 -depth factor also controls the availability of coking coals within the section. With a low factor the corresponding rank range of these coals is present over a greater stratigraphic interval, with the possibility of a larger number of seams, than with a high factor.

Within limited areas of the same coalfield, the R_0 rank values can be used for correlating coal seams of bituminous rank, provided they lie at least 100 feet apart stratigraphically. This result has been obtained with the seams of the Canmore coalfield.

The most significant parts of their work, for our purposes are:

- (1) In each area studied, the rank of the coal, expressed as the percent reflectance of the maceral vitrinite, increased regularly with stratigraphic depth.
- (2) The increase of reflectance may be used, in limited areas, to correlate coal seams and they have been able to demonstrate very successful correlations in the Canmore region.

For a much more complete discussion of increase in coal rank and therefore increase in reflectance, carbon content, Btu and decrease in volatile matter, pore volume, and moisture as depth increases, the following is an excellent report of research and also a review article:

Teichmüller, Marlies, and Teichmüller, Rolf, 1968, Geological aspects of coal metamorphism: Chapter 11, p. 233-267 in Murchison, Duncan, and Westall, T. Stanley, editors, Coal and Coal Bearing Strata, Oliver and Boyd, London.

B. Reflectance Data on Sukunka Coals

In June of 1970, Dr. Cameron of the Geological Survey of Canada collected the Chamberlain Seam from Drill Hole S24. The report of the petrographic study of this sample is authored by Birmingham and Cameron and was given to Brameda Resources Inc. earlier this year. They found the average reflectance of the Chamberlain Seam to be 1.37 (although this is a percentage value only the number is generally given and the "%" sign is omitted).

Because of the many possible ambiguities in correlating the extensive coal bearing stratigraphic sequence in the Foothills belt, we have enlisted the aid of the GSC, in the persons of Dr. Hacquebard and Mr. Donaldson, and have attempted to utilize this relatively new technique as an aid in correlation.

A total of 21 samples were submitted to Ottawa for reflectance analyses. Table I lists all the samples, the identification numbers given them by the GSC, their locations, the reflectances found, and a volatile matter estimate calculated from those reflectance values.

The first five samples are from Drill Hole D-1, which is located in the NE $\frac{1}{4}$ of lease 180. The reflectance of the vitrinite increases regularly with depth in Drill Hole D-1, starting with R₀ of 1.29 at a depth of 72'-73.5' and reaching 1.55 at a depth of 1012'. An outcrop sample (sample 7) taken in the creek approximately one-half mile southwest of D-1 has a reflectance of 1.46. This would make it equivalent to one of the coals in Drill Hole D-1, perhaps at about 800', and this appears to be quite reasonable and consistent with the structure in the area. Birmingham and Cameron found the Chamberlain in Drill Hole S-24 to have a reflectance of 1.37. Sample 15 in Table I is the Chamberlain from Drill Hole S-44 and its reflectance is 1.42. Other Gething coals

submitted for analyses were Sample 6 from Drill Hole S-4 which was 450' below the Chamberlain Seam and had a reflectance of 1.61 and Sample 14 "Bird" Seam which was 154' above the Chamberlain in Drill Hole S-44, and had a reflectance of 1.44.

Samples 8 through 13 are all from the Commotion Formation in Drill Hole S-44. They are all contained in a 310' interval from 1272' to 963' above the Chamberlain and have reflectance of 0.99 to 1.17.

Note: Mr. Donaldson states that his "reproducibility error" (precision) is ± 0.09 , and although the Commotion coals in S-44 do not uniformly increase with depth, the difference between adjacent coals are not significant.

The reflectance data derived from the core samples discussed above (Holes S-4, S-24, S-44, and D-1) are summarized in a schematic diagram in figure 5. A strict interpretation of those data would assume that the interval tested in Drill Hole D-1 included the Chamberlain horizon. However, the precision of the method is not that great over the distance involved and it is more reasonable to conclude that Drill Hole D-1 tested some portion of the Gething Formation, and may have started below the Chamberlain.

Samples 16 through 19 are all from the area southwest of Chamberlain Creek. Samples 18, and 19 are in the range of the lower Gething coal sampled (Sample 7) and sample 16 is a bit higher. Sample 17 is surprisingly low and was probably too badly weathered to give an accurate reading. As a coal weathers the vitrain reflectance drops. For that reason all values obtained on outcrop samples must be considered to be minimum values-- although they may, under the best conditions, approach the true value.

The coal in Blind Creek which is in excess of 9 feet thick gave a higher value than we would have expected. The higher value can be

interpreted to represent a coal much lower than the Chamberlain or the higher value may be the result of greater depth of burial of the coal in the Blind Creek area than in the Chamberlain Creek area. Hacquebard and Donaldson do report an increase in reflectance in a single coal from east to west. It is doubtful, however, if the approximately 14 miles separating Blind Creek on the northwest and Chamberlain Creek on the southeast would allow for such large differences in coalification of a single coal bed.

C. Conclusions Based on Reflectance Data

(1) Coals sampled from drill cores in the Sukunka Area show an increase in reflectance (R_o) of vitrinite with depth. The average increase in Drill Hole D-1 is 0.04 per 100 feet, and in Drill Hole S4 is 0.05 per 100 feet. (2) Coals found in Drill Hole D-1 are younger than Nikanassin and probably represent coals of Gething age. (3) Some coals lying to the southwest of Chamberlain Creek and mapped as Nikanassin by Stott (Dawson Creek Map Sheet) have reflectances somewhat in excess of reflectances of Gething coals. These may lie below the conglomerate mapped as Cedomin but in areas of favorable structure should be considered for future recovery. (4) The relatively thick coal which crops out in Blind Creek cannot be definitely placed stratigraphically based on the reflectance value. The high reflectance may be interpreted as a reasonable value from a coal well below the Chamberlain or the distance between Blind Creek and Chamberlain Creek may be too great for correlation to be made by reflectance because the depth to which the coal was originally buried was greater in the Blind Creek area. We favor the former interpretation; that the Blind Creek coal is older than the Chamberlain. (5) It would be extremely desirable to provide the researchers at the GSC with additional samples of coal of known stratigraphic position (especially

those below the Chamberlain) so that they may add to the reflectance-stratigraphic column. This standard would then be available for future reference when problems of coal bed correlation arise.

CONCLUSIONS

On the basis of the lithologic characters of the strata observed, the structural attitudes, and the vitrain reflectance values of the coals, the following conclusions are drawn:

- (1) The Gething Formation is present over fairly wide areas south of the Burnt River, although the upper and lower limits of the formation could not be established.
- (2) Fairly large areas are characterized by gentle dips where potential minable coal might be found and where maximum stratigraphic information could be found by drilling a minimum number of holes.
- (3) The coal-bearing sequence (Gething Formation plus perhaps older units) is thicker than formerly realized and extends several hundred feet above and below the conglomerate unit mapped in the area south of the Burnt River.
- (4) Coals as old or older than Gething occur along the Sukunka River Road for a distance of about 10 miles above the Chamberlain Creek Bridge. The westernmost coal sampled was found slightly over two miles west of the mouth of Windfall Creek. The reflectance values obtained on these coals, although to be considered minimum values (as weathering lowers the vitrinite reflectance) are high enough to indicate Gething or older. The maximum thickness observed on the road is about three feet. The nine-foot plus coal seen on Blind Creek in the area north of the Burnt River has a reflectance which is 0.56 higher than the Chamberlain Seam from Drill Hole S-44. Using the reflectance gradient of 0.04 or 0.05 per 100 feet depth, the Blind Creek coal should be 1100 to 1400 feet below the Chamberlain. Rocks of equivalent age should be found in the area southwest of the Chamberlain Creek area. One can reasonably project the same rocks southeastward from the southern part of the block south of the Burnt River

across the Sukunka River to the hills southwest of the Chamberlain Creek area. The geology of these two regions on either side of the Sukunka River is likely to be somewhat similar.

RECOMMENDATIONS

(1) To adequately test the area on the west side of the Sukunka River, the following three drill holes (sites as shown on figure 4) should be drilled in the order as listed:

- a. To test the area north of Rocky Creek and west of the flexure located near Drill Hole D-1, a hole should be drilled as shown on figure 4, site A, in Coal License 176. This location is about one mile from the existing drill hole road constructed in 1970.
- b. To test the area south of Rocky Creek and east of the flexure, a hole should be drilled as located on figure 4, site B, in Coal License 1060. This location is only about three-fourths mile from an existing road.
- c. To test the area north of Rocky Creek and east of the flexure, a hole should be drilled as shown on figure 4, site C, in Coal License 1053. This hole should be far enough away from the thrust fault so as not to encounter the fault at depth. An existing drill road is located about one-half mile away.

(2) As it appears that the coal-bearing sequence is thicker than first thought, and as the possibility exists that the conglomerate mapped in the area west of the Sukunka River might be equivalent to that mapped as Cadomin in the Bullmoose Creek area, a drill hole should test the sequence below the Cadomin in Bullmoose Creek area. A drill road is now being built down into Bullmoose Valley and a suitable site could easily be picked out by Robert Hindson.

TABLE I REFLECTANCE ANALYSES OF SUKUNKA COALS

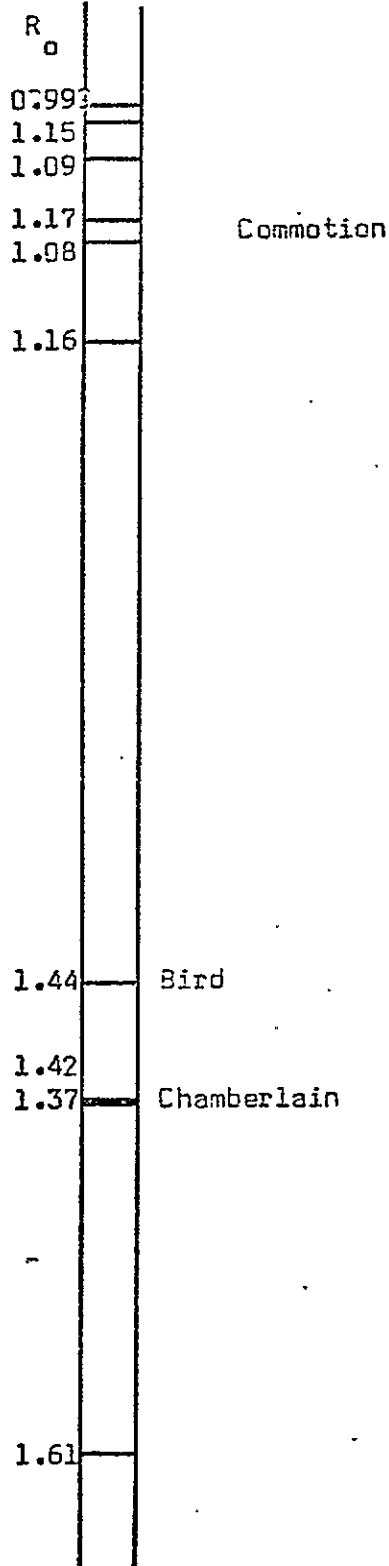
Sample Number	GSC Number	Sample Identification	Reflectance R _g (%)	Volatiles matter (%) calculated
1	1971-44	Drill Hole D-1, depth 1012' - 1013'	1.55	19
2	1971-45	Drill Hole D-1, depth 815' - 818'	1.46	21
3	1971-46	Drill Hole D-1, depth 800' - 800.5'	1.55	19
4	1971-47	Drill Hole D-1, depth 293' - 293.5'	1.32	24
5	1971-48	Drill Hole D-1, depth 72' - 73.5'	1.29	24
6	1971-49	Drill Hole S-4, depth 505' - 508', 450' below Chamberlain	1.61	18
7	1971-50	Outcrop sample tributary to Rocky Creek - Estimated in field to be equivalent to samples 2 or 3. Approx. 0.7 mi sw of Drill Hole D-1.	1.46	21
8	1971-51	Drill Hole S-44, depth 232.5' - 241' - Compton	0.99	31
9	1971-52	Drill Hole S-44, depth 251.3' - 254.6' - Compton	1.15	28
10	1971-53	Drill Hole S-44, depth 304' - 305' - Compton	1.09	29
11	1971-54	Drill Hole S-44, depth 385' - 386.5' - Compton	1.17	27
12	1971-55	Drill Hole S-44, depth 411.2' - 413' - Compton	1.08	29
13	1971-56	Drill Hole S-44, depth 541' - Compton	1.16	27
14	1971-57	Drill Hole S-44, depth 1347.5' - 1350.8' Gething (Bird)	1.44	22
15	1971-58	Drill Hole S-44, depth 1504.5' Gething-Chamberlain	1.42	22
16	1971-59	Drill Hole S-3, 6" coal at 219'	1.71	16
17	1971-60	Outcrop, Sukunka Road, mile 48.1	0.99	31
18	1971-61	Outcrop, Sukunka Road, mile 40.1	1.55	18
19	1971-62	Outcrop, 4" coal in tributary to Chamberlain Creek Map 93 P/4E, Blue Coordinates 17.5 - 86.7	1.62	18
20	1971-63	Outcrop (fresh) 9' coal in Blind Creek, map 93 P/5W Blue coordinates 37.2 - 76.8	1.98	13
21	1971-64	Outcrop, Vitrain lenses in sandstone, map 93P/4E Blue coordinates 20.7 - 81.3	1.19	27

Note: D-1 core angle is from 35° to 65°

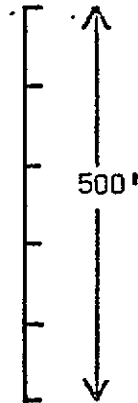
Probably weathered sample

weathered?

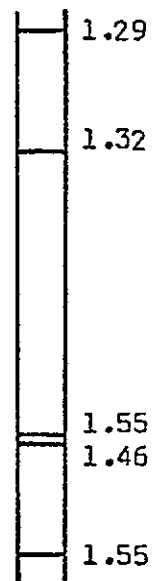
Composite Section
from Drill Holes
S4, S24, S44



Scale



Drill Hole D-1
Corrected for 45° dip
 R_o



Outcrop
Rocky
Creek * ?
1.46

Gething

FIGURE 5: REFLECTANCE OF DRILL CORE SAMPLES OF COALS

FIGURE 2: RECONNAISSANCE MAP OF PORTIONS OF SUKUNKA RIVER
AND BURNT RIVER QUADRANGLES

LEGEND



Strike and dip of bedding



Flat lying beds



Vertical beds



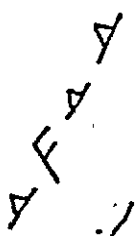
Axis of anticline



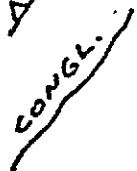
Axis of syncline



Zone of highly contorted bedding



Fault, direction of dip of fault plane shown.
Letter F indicates fault observed in outcrop.



Outcrop of major conglomerate



Coal outcrop

REPORT ON
WASHING AND DRYING OF COKING COAL
for
BRAMEDA RESOURCES LTD.
SUKUNKA COAL

Submitted by
CYCLONE ENGINEERING SALES LTD.
EDMONTON - ALBERTA - CANADA

Report No.: RI-70.17
Job No.: S1 - 95
Dated: November 19, 1970

REPORT ON
WASHING AND DRYING OF COKING COAL
for
BRAMEDA RESOURCES LTD.
SUKUNKA COAL

SUMMARY

The data presented in this report refer to Sukunka Coal.

The analysis and the washability indicates that this coal has a low ash content and that the ash distribution over the various specific gravity fractions indicate that cleaning characteristics are excellent when washing to an ash content of 6½%. This information was confirmed by actual washing.

In order to duplicate as nearly as possible a commercial operation, the raw coal sample was cleaned in water, using pilot plant facilities of the Western Regional Laboratory of the Department of Energy, Mines & Resources in Edmonton. The coarse coal was air dried and the fines were dewatered using the facilities of Shelpac Research & Development Ltd., being developed for use in dewatering pipelined coal. Small amount of oil was used in this dewatering process.

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INTRODUCTION

This report provides:

- a. Washability data, 1/4" x 200 mesh fraction. See Table 1.
- b. Washability curves for 1/4" x 200 mesh fraction, see Fig. 1.
- c. Performance evaluation curves for cleaning Sukunka coal at various levels of efficiency for various ash contents.
- d. Ash, F.S.I. and moisture content of shipment (clean coal), Table 2.
- e. Flowsheet of automatic two-stage 8 in. compound water cyclone plant, made available by the Department of Energy, Mines & Resources, Western Regional Laboratory in Edmonton.
- f. General Flowsheet of the coal dewatering plant section. The plus 1/16" fraction was floor dried.

The cleaning characteristics of the coal are based on the probable error curve, a parameter for cleaning efficiency that is largely independent of the gravimetric composition of the coal (ash distribution) and can be used for comparing coal cleaning systems whose probable error values are known.

In figure 2 the actual results of the washing by water-only cyclones are super imposed on the performance evaluation curves. Only ash of clean coal and yield were determined. Ash content of reject was not established.

It is noted that in order to obtain an ash content of approximately 6.5% the coal was to be cleaned at a high cut point of approximately 1.9. Yield of clean coal at this ash content is near the theoretical yield and yield errors are small. The yield error can be found by subtracting the actual yield from the corresponding theoretical yield, read on the "theoretical curve" at the point vertically above it.

The pilot plant operation was conducted over a period of approximately 3/4 of an hour. This time, in general, is too short to allow for adjustments to maximum efficiency. The determination of the ashes from incremental sampling requires more time than the total pilot plant washing period. As a general statement it can be said, therefore, that actual results on a commercial plant demonstrate a higher efficiency.

SAMPLE PREPARATION, PROCESSING AND SHIPPING.

In preparing the coal for processing the following procedure was applied:

1. Total sample was dried as-received on a clean section of the pilot plant floor (approximately 500 sq. ft.) at room temperature for a period of three days.
2. The air dried coal was crushed in a Sturtevant coal crusher to pass 1/4" sq. screen. A head sample was collected for analysis.
3. The crushed coal was cleaned in bulk in a water-only cyclone wash plant of 5 TPH capacity. The clean coal was passed over a dewatering screen (8 sq. mesh) and the plus 8 mesh coal fraction dried on the floor.
4. The 8 mesh x 0 fraction was conditioned with a small amount of oil (in the order of 1½% by weight of dry coal, 28 mesh x 0), dewatered in a centrifuge and added to the plus 8 mesh fraction. All fine material circulating in the washing circuit was treated in this manner.

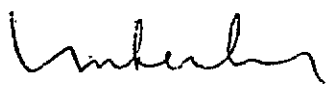
A sub-sample of the clean coal was collected for ash content and F.S.I. determination.

Clean coal was loaded in 45 gallon barrels, sealed, marked and shipped by Canadian Freightways to Vancouver as requested by Nissho-Iwai Canada Ltd.

Respectfully submitted,

CYCLONE ENGINEERING SALES LTD.

Per:


P.D.J. Vinkenborg, P. Eng.
General Manager

T A B L E 1. SUKUNKA COAL

Washability Data - 1/4" x 200 mesh.

Brameda Resources Ltd.

Specific Gravity Fraction	Fractional		Cumulative			
	Wt. %	Ash %	Floats		Sinks	
			Wt. %	Ash %	Wt. %	Ash %
- 1.30	56.72	1.72	56.72	1.72	100.00	10.40
1.30 - 1.35	20.18	4.28	76.90	2.39	43.28	21.77
1.35 - 1.40	5.51	9.43	82.41	2.86	23.10	37.04
1.40 - 1.50	3.78	16.70	86.90	3.47	17.59	45.70
1.50 - 1.60	1.91	25.55	88.10	3.95	13.81	53.62
1.60 - 1.80	5.81	41.61	93.91	6.28	11.90	58.13
+ 1.80	6.09	73.89	100.00	10.40	6.09	73.89
Total	100.00	10.40				

T A B L E 2. SUKUNKA COAL

<u>Determination</u>	<u>Weight %</u>
Ash, raw coal, 1/4" x 200 mesh	10.40%
Ash, Clean coal	5.80%
F.S.I., Clean coal	7½, 8, 8
Moisture (water), clean coal	6%
Yield Clean coal	88%

T A B L E 3. S U K U N K A C O A L

Size Analysis

Brameda Resources Ltd.

Size Fraction	Wt. %	Ash %
1/4" x 28 m.	71.43	11.77
28m. x 200 m.	24.36	7.12
- 200 m.	4.21	11.77

T A B L E 4. S U K U N K A C O A L

Weight % and Ash % Distribution vs. Size and Specific Gravity.

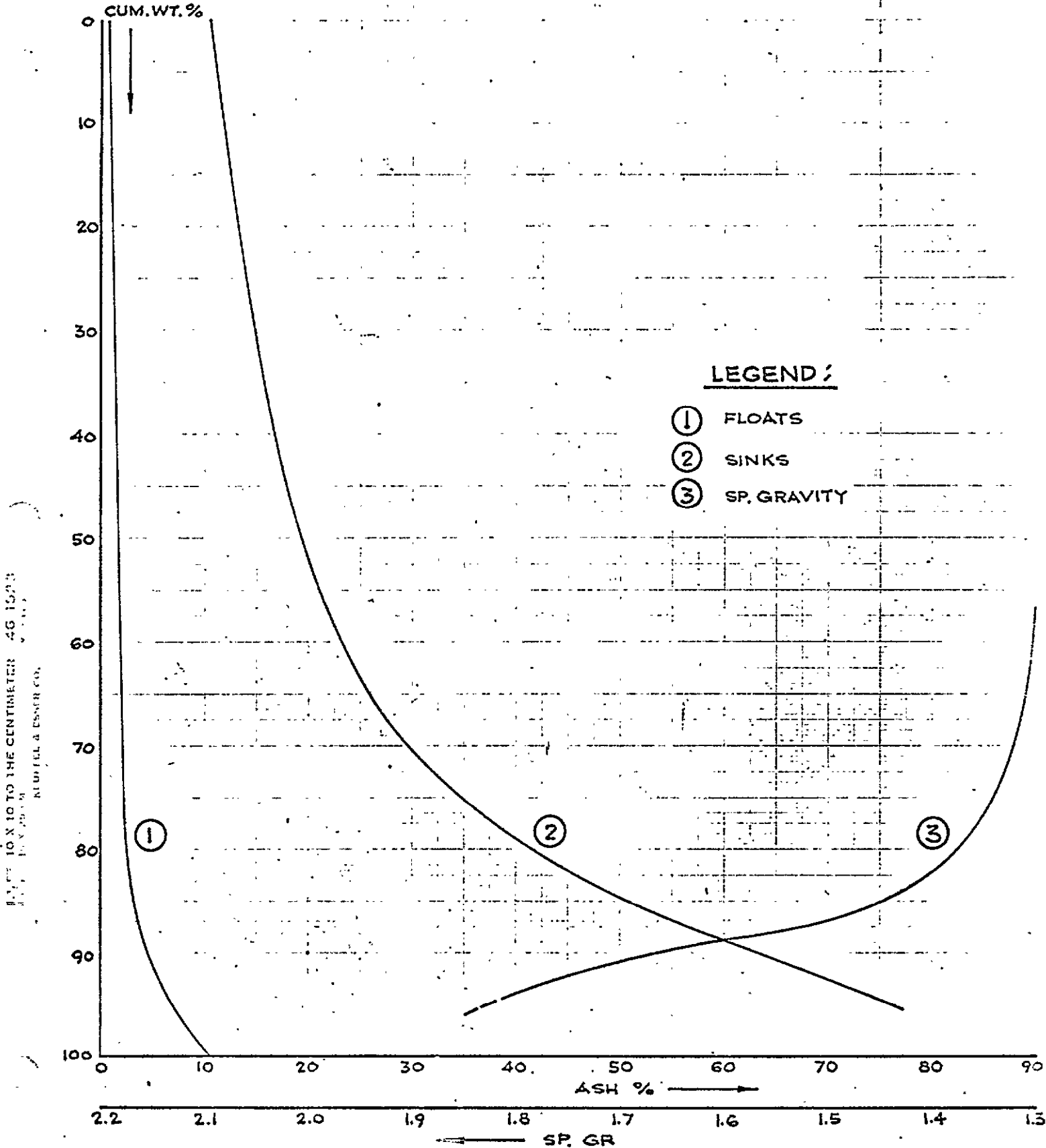
(Figures in Brackets show the Ash Content of Individual Fractions)

Size \ Sp.Gr.								Total
	1.30	1.35	1.40	1.50	1.60	1.80		
1/4" x 28m.	37.40 (1.85)	15.91 (4.40)	3.98 (10.16)	2.95 (17.31)	1.49 (25.94)	4.99 (41.80)	4.71 (74.09)	71.43 (11.57)
28m. x 200m.	16.93 (1.46)	3.42 (3.76)	1.29 (7.19)	0.67 (14.07)	0.34 (23.90)	0.58 (40.00)	1.13 (73.07)	24.36 (6.98)
Total	54.33 (1.72)	19.33 (4.28)	5.27 (9.43)	3.62 (16.70)	1.83 (25.55)	5.57 (41.61)	5.84 (73.89)	95.79 (10.40)
- 200 m.	This fraction forms 4.21% of the total sample and has an ash content of 11.27%, thus giving a total sample ash value of 10.44%.							

FIG. 1

BRAMEDA RESOURCES LTD.

WASHABILITY CURVES FOR 1/4" x 200m



SCALE 10 X 10 TO THE CENTIMETER 46 15223
NEWELL & ESSER CO.

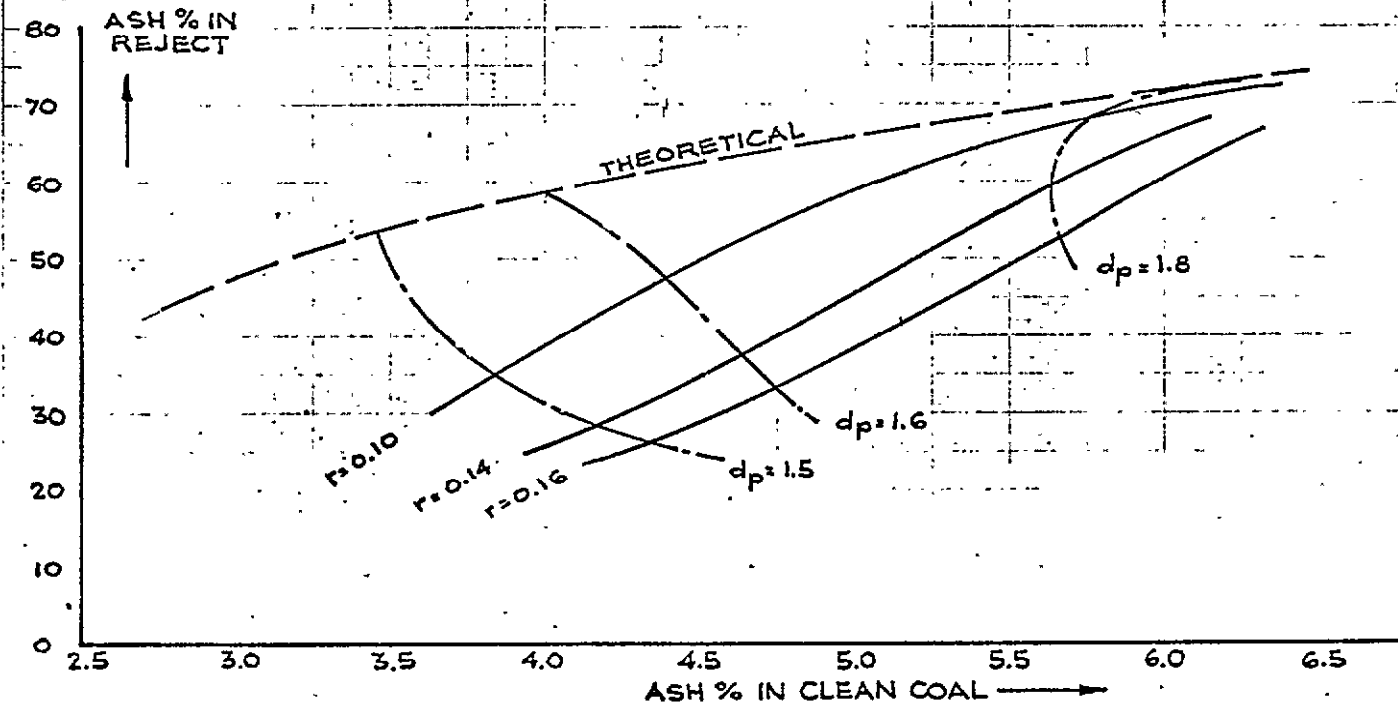
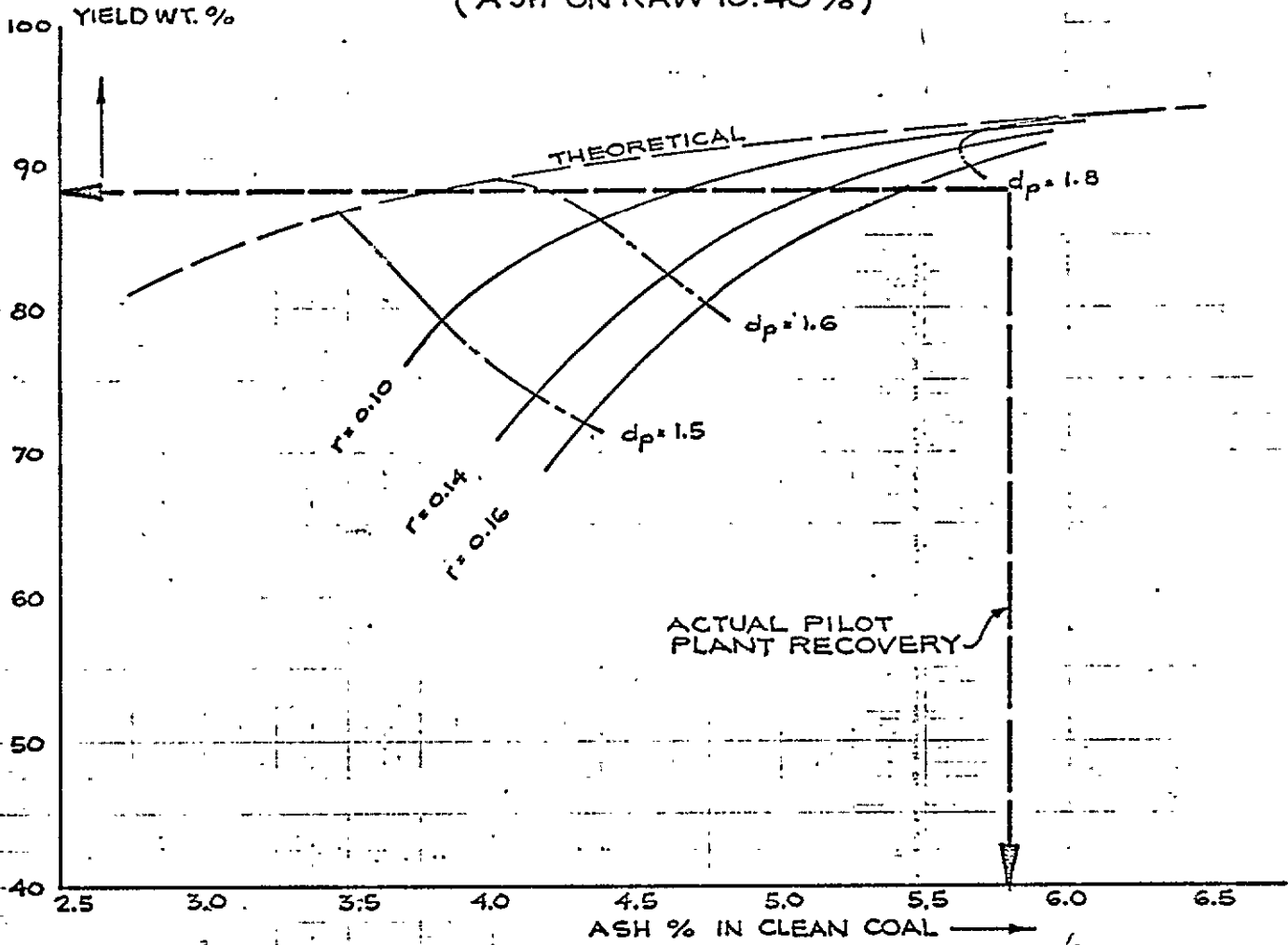
NOV. 9. /70 H.SCH.

CYCLONE ENGINEERING SALES LTD.
EDMONTON ALBERTA CANADA

FIG. 2

BRAMEDA RESOURCES LTD.

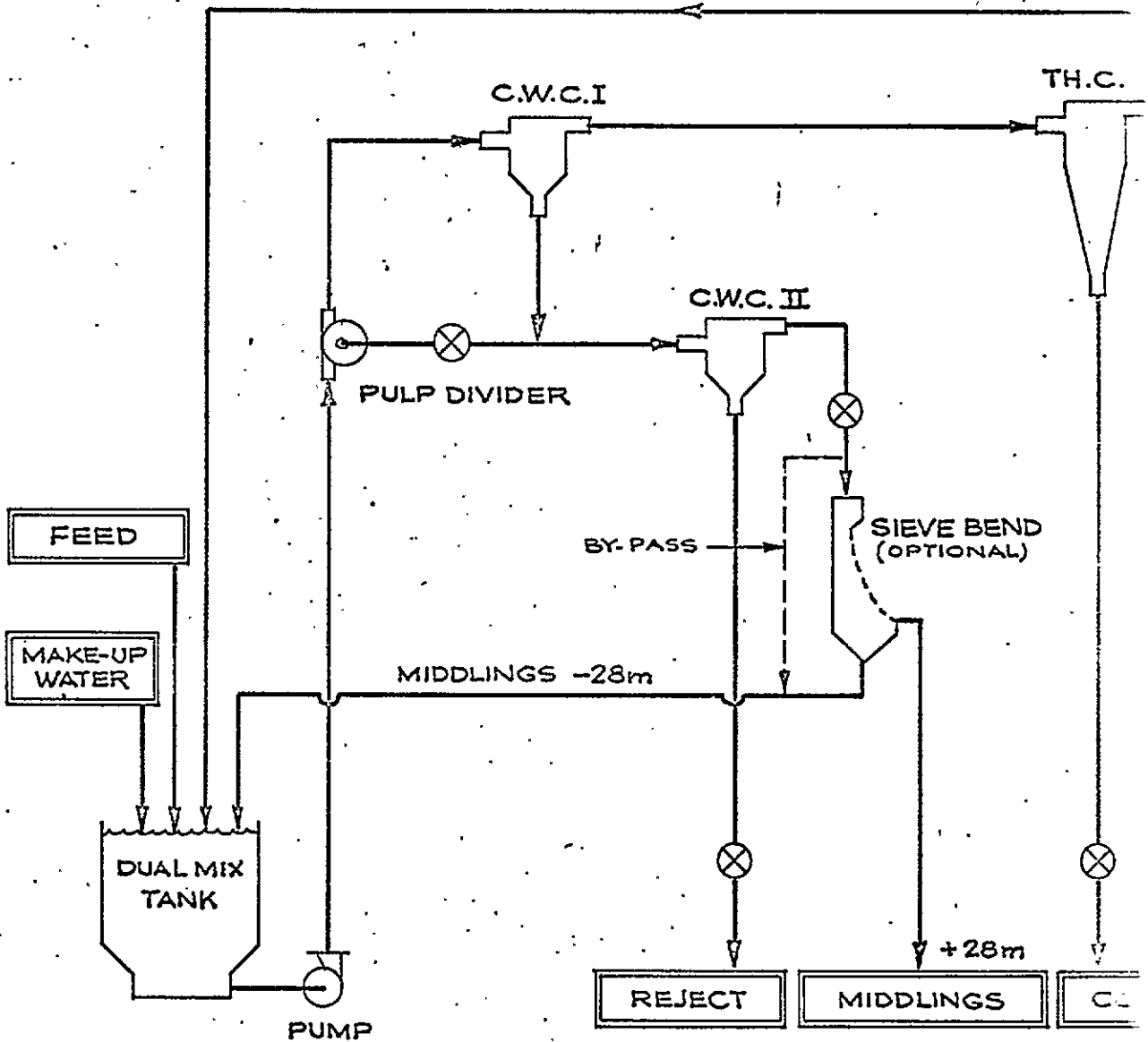
PERFORMANCE EVALUATION CURVES FOR 1/4" x 200m
(ASH ON RAW 10:40 %)



PRICE 10 X 10 TO THE CENTIMETER 43 1523
MAY 1967
KLUFFEL & LESSER CO.

NOV. 9, /70 H.SCH.

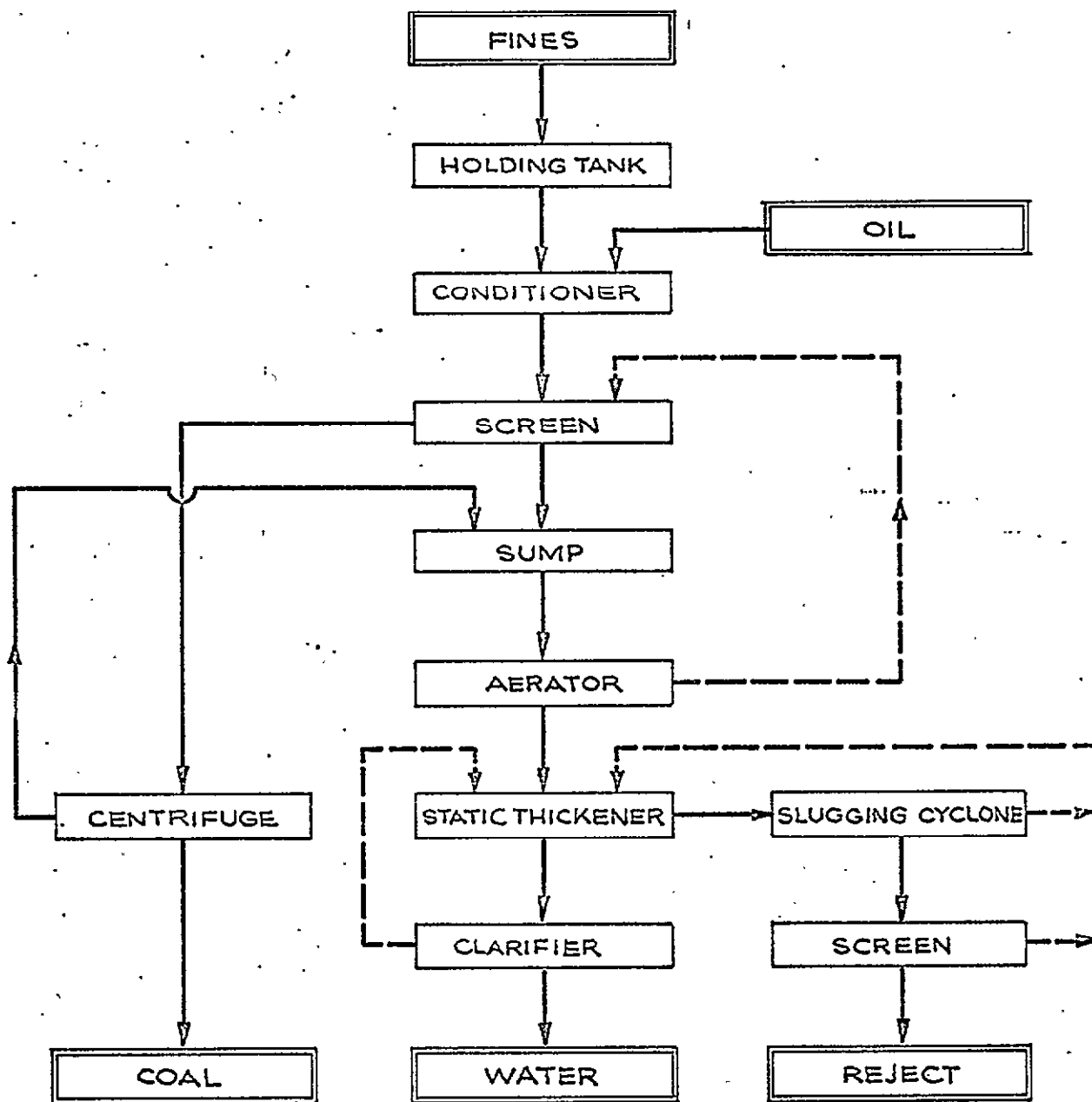
CYCLONE ENGINEERING SALES LTD.
EDMONTON ALBERTA CANADA



⊗ - SAMPLING STATION

WATER ENGINEERING SALES CO. - EDMONTON, ALBERTA, CANADA

NO.	DESCRIPTION	BY	CHKD. BY	DATE	FLOWSHEET OF AUTOMATIC 2-STAGE COMPOUND WATER CYCLONE PLANT		
					SCALE	DWN. BY	DWG. NO.
					N.T.S.	H. SCH.	E150-3
					DATE	CHKD. BY	SHEET
					NOV. 17/70		
					DSGN. BY	APPR. BY	
					V.		



LEGEND:

- > MAIN PRODUCT
- - - - -> RESIDUAL PRODUCT

CYCLONE ENGINEERING SALES LTD. - EDMONTON, ALBERTA, CANADA.

**FLOW DIAGRAM
COAL DEWATERING
PLANT SECTION**

NO.	DESIGNED BY	BY	CHKD. BY	DATE	SCALE	DWN. BY	DWG. NO.
				NOV. 9./70	N.T.S.	H.SCH.	E150-30-4078
					DSGN. BY	APPR. BY	SHEET
					V.		

T A B L E 3. S U K U N K A C O A L

Size Analysis

Brameda Resources Ltd.

Size Fraction	Wt. %	Ash %
1/4" x 28 m.	71.43	11.77
28m. x 200 m.	24.36	7.12
- 200 m.	4.21	11.77

T A B L E 4. S U K U N K A C O A L

Weight % and Ash % Distribution vs. Size and Specific Gravity.

(Figures in Brackets show the Ash Content of Individual Fractions)

Size \ Sp.Gr.								Total
	1.30	1.35	1.40	1.50	1.60	1.80		
1/4" x 28m.	37.40 (1.85)	15.91 (4.40)	3.98 (10.16)	2.95 (17.31)	1.49 (25.94)	4.99 (41.80)	4.71 (74.09)	71.43 (11.57)
28m. x 200m.	16.93 (1.46)	3.42 (3.76)	1.29 (7.19)	0.67 (14.07)	0.34 (23.90)	0.58 (40.00)	1.13 (73.07)	24.36 (6.98)
Total	54.33 (1.72)	19.33 (4.28)	5.27 (9.43)	3.62 (16.70)	1.83 (25.55)	5.57 (41.61)	5.84 (73.89)	95.79 (10.40)
- 200 m.	This fraction forms 4.21% of the total sample and has an ash content of 11.27%, thus giving a total sample ash value of 10.44%.							

Table III-2

BRAMEDA RESOURCES LIMITED

CHAMBERLAIN SEAM

(Core Analyses @ 1.60 Specific Gravity)

Hole No.	Sample No.	Depth, Feet		Thickness, Ft.	Recovered, Ft.	Yield, %	Air Dried Basis						F.S.I.	Automatic Gieseler Fluidities				
		TC	BC				Moist., %	Ash, %	Sul., %	V.M., %	Fixed Carbon, %	Btu/lb.		Temp., °C @ Initial	Temp., °C @ Maximum	Maximum @ D.D.P.M.	Temp., °C @ Final	Temp. Range, °C
<u>SUMMARY OF FLOAT 1.60 ANALYSES OF CORES</u>																		
S-25	CH-25	1,474.0	1,482.3	8.3	7.7	97.1	0.68	4.06	0.44	23.46	71.80	14886	9	411	456	161	485	74
S-26	CH-26	1,369.5	1,377.5	8.0	6.5	96.2	0.81	5.13	0.46	22.84	71.22	14743	8	414	456	128	481	67
S-27A	CH-27	1,234.0	1,243.0	9.0	9.0	96.5	0.82	4.11	0.48	22.25	72.82	14911	9	420	462	113	484	64
S-28	CH-28	1,086.0	1,095.5	9.5	9.5	97.1	0.78	4.80	0.43	22.01	72.41	14793	8-1/2	413	459	89	482	69
S-29	CH-29	1,515.2	1,525.0	9.8	9.5	99.0	0.78	4.18	0.41	22.70	72.34	14933	9	409	456	178	485	70
S-30	CH-30	1,353.0	1,375.2	22.2	21.0	98.3	0.90	4.54	0.43	22.19	72.37	14813	8	422	456	44.5	481	59
S-32	CH-32-1 ex.	1,140.4	1,145.4	5.0	5.0	95.5	0.94	5.12	0.31	21.57	72.37	14661	4-1/2	432	456	3.8	470	38
	CH-32-2	1,145.4	1,155.0	9.6	8.7	95.3	0.97	5.09	0.22	22.14	71.80	14597	8-1/2	417	456	52.0	481	64
S-35	CH-35	1,725.5	1,733.5	8.0	7.0	93.1	1.00	5.10	0.48	22.32	71.58	14667	9+	416	459	103	485	69
S-36	CH-36	1,203.5	1,213.5	10.0	8.5	97.0	1.05	5.96	0.40	22.57	70.42	14490	9	413	456	161.5	485	72
S-37	CH-37	1,182.0	1,192.5	10.5	10.0	98.4	0.74	4.05	0.49	24.32	70.89	14956	9	406	456	417	485	79
S-38	CH-38	1,028.5	1,038.0	9.5	9.0	97.7	0.92	4.26	0.38	23.45	71.37	14913	9	411	456	326	485	74
S-40	CH-40	1,218.0	1,227.0	9.0	9.0	97.5	1.06	4.06	0.46	21.73	73.15	14804	9+	410	459	179	488	78
S-41	CH-41	529.0	538.0	9.0	9.0	<u>97.0</u>	<u>0.95</u>	<u>4.89</u>	<u>0.47</u>	<u>21.67</u>	<u>72.49</u>	<u>14744</u>	<u>9</u>	<u>421</u>	<u>465</u>	<u>67</u>	<u>488</u>	<u>67</u>
AVERAGE FLOAT 1.60						97.1	(0.88)	(4.62)	(0.42)	(22.52)	(71.98)	14792	(9)	415	458	149	483	68

SUMMARY OF SINK 1.60 ANALYSES OF CORES

Rejects, %

S-25	CH-25	7.7	2.9	0.54	41.35	0.56
S-26	CH-26	6.5	3.8	0.94	47.60	0.72
S-27A	CH-27	9.0	3.5	0.64	44.96	0.49
S-28	CH-28	9.5	2.9	0.19	43.17	0.40
S-29	CH-29	9.5	1.0	0.65	32.58	0.25
S-30	CH-30	21.0	1.7	1.01	43.86	0.34
S-32	CH-32-1	5.0	4.5	0.72	59.05	0.17
	CH-32-2	8.7	4.7	0.81	53.47	0.10
S-35	CH-35	7.0	6.9	0.76	51.14	0.61
S-36	CH-36	8.5	3.0	0.80	60.56	0.21
S-37	CH-37	10.0	1.6	0.50	37.02	0.35
S-38	CH-38	9.0	2.3	0.47	39.68	0.22
S-40	CH-40	9.0	2.5	0.56	51.67	0.67
S-41	CH-41	9.0	<u>3.0</u>	<u>0.46</u>	<u>42.42</u>	<u>0.37</u>
AVERAGE SINK 1.60		2.9	0.67	47.59	0.40	

Note:
ex.: Excluded from the average of the F.S.I. and Gieseler test results.

Table III-2