RESULTS OF EXPLORATORY DRILLING FROM FEBRUARY 1992 TO JULY 1992, COAL RESOURCE EXPLORATION AND ASSESSMENT PROGRAM (COALREAP), THAR DESERT, LAKHRA SOUTH, INDUS PLAIN, AND ADJACENT AREAS, SINDH PROVINCE, PAKISTAN

Part IId - Lithologic and geophysical logs for the Thar Desert area

compiled by

John R. SanFilipo[1], Rafiq A. Khan[2], and Abbas Ali Shah[2]

Open-File Report 94-596-D

Prepared jointly by the Geological Survey of Pakistan and the U.S. Geological Survey, under the auspices of the U.S. Agency for International Development

[1]U.S.Geological Survey, 956 National Center, Reston VA 22092

[2]Geological Survey of Pakistan, 42-R, Block-6, PECHS, Karachi

1994

PREFACE

This report was originally one portion of a proprietary administrative report that was prepared by the Geological Survey of Pakistan and the U.S. Geological Survey (USGS) for the U.S. Agency for International Development. As such it received a limited distribution within Pakistan as Geological Survey Project Report (IR)PK-108. Because of it's length, (IR)PK-108 has been divided into five parts for its release to the public by USGS. This part of the report contains only the basic drill-hole data for the Thar Desert area. The companion volumes that contain the introductory text from (IR)PK-108 and the basic data for the other drilling areas are:

Open-File Report 94-595	Text
Open-File Report 94-596-A	Indus Plain area
Open-File Report 94-596-B	Lakhra south area
Open-File Report 94-596-C	Meting-Jhimpir extensions

CONTENTS

DRILLING LOGS AND LITHOLOGIC DESCRIPTIONS

by

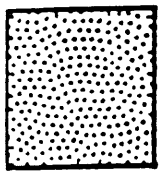
Mohammad A. Tagar, Ch. Mohammad Anwar,
Ghulam Sarwar Lashari, and Abdul Rahim Memon

GEOPHYSICAL LOGS

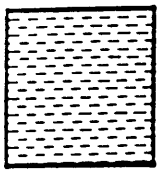
by

Mehtab-ur-Rahman, Nizamani, and Huda

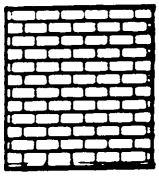
EXPLANATION OF LITHOLOGIC SYMBOLS USED



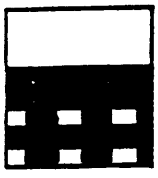
Sandstone



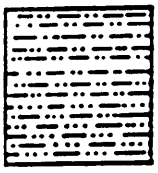
Shale/Claystone



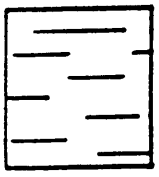
Limestone



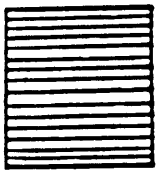
Coal
Dirty coal



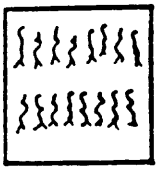
Siltstone



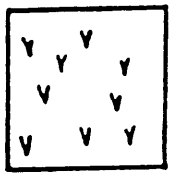
Mudstone



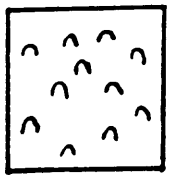
Carbonaceous shale



Underclay

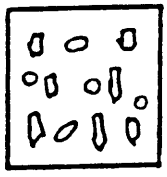


Alluvium

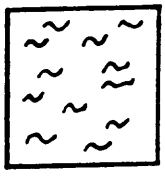


Fossil shell fragments

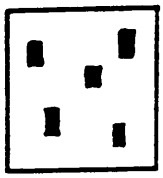
Fossil plant fragments



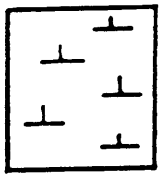
Pebbles / lithic fragments



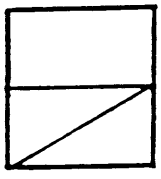
Glauconite



Pyrite



Calcareous



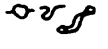
Core loss

Roots

Siderite

Mica

Carbonaceous material



Burrows

Foraminifera

Pelecypods

Gastropods

modified from Thomas and others, 1988

 10841

DRILLING RECORD
COAL REAP

Drill hole TP-1

Topo Sheet 40L/5

Grid ref 802144 m N 2365892 mE

Surface elev. (m) 78.0 (surveyed)

Drill rig LONG YEAR - 44

Drilling started Date 01-02-1992 Time 1530 Hrs.
Drilling completed Date 12-02-1992 1800 Hrs.

Drill Bit				
Surface to	54.86	m	TRICON ROLLER 5 3/8
54.86 to	253.13	m	DIAMOND BIT HQ
____ to	____	m	____
____ to	____	m	____
____ to	____	m	____
____ to	____	m	____
____ to	____	m	____

Fluids used BENTONITE

Casing set			
Surface to	NIL	m	____
____ to	____	m	____
____ to	____	m	____

Lith logged by MOHAMMAD ALI TAGAR, ASSISTANT DIRECTOR
NAJEEB REHMAN KAKI, APPRENTICE GEOLOGIST

dated 17 & 18 Feb. 92.

ME Geophysical logs:

		From		to		through
5-2345	XAP	0.0	m	196 m	m	DRILL PIPE
	____	____	m	____	m	____
o	JLP	0.0	m	199 m	m	OPEN HOLE
,	XAP	0.0	m	199 m	m	OPEN HOLE
,	____	____	m	____	m	____
	____	____	m	____	m	____

REMARKS:

XAP - GAMMA
CALIPER (OPEN HOLE)
GGNR } DENSITY
GGFR }
GRD RESISTIVITY

JLP - GAMMA ONLY;
NEUTRON - SP not functioning

INTENTIONALLY

LEFT

BLANK

COAL REAP

Drill Hole TP-1

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
01-02-92	1530	0.0	Non-Coring drilling Started
	1615	1.52	with tricon roller bit 5 3/8"
	1800	4.57	Drilling Stoped 3rd Shift Notarai 16.
02-02-92	0730		Drilling resumed & testing of mud
	0900	7.62	Non-Coring drilling Continued
	0950	10.65	
	1015	13.71	
	1150	16.76	Pulled out rods & lower down
	1225	19.81	after Checking bit.
	1315	22.86	
	1400	25.90	
	1500	28.95	
	1600	32.00	
	1700	35.05	
	1750	38.10	
	1845	41.14	
	1930	44.19	
	2030	47.24	Pulled out rods & prepared mud.
03-02-92	0845		Lowered down rods and mixed mud.
	1020	50.29	Drilling resumed & Continued.
	1200	53.34	" " "

COAL REAP

Drill Hole IP-1

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
03-02-92	1300	54.86	Non-Coring drilling Stopped
	1900		Pulled out rods, coupled HQ rods
			set a core barrel, changed rig oil.
			Lowered the rods up to 24.38m
			with diamond bit, Washed hole
			from 24.38 to 54.86m bottom.
	2030	54.86	Drilling with Core recovery started.
	2100	57.04	Drilling Stopped, 3rd shift not available
	2200		Pulled out rods, filled hole with mud
04-02-92	0900		Lowered down rods until bottom.
	1030	60.09	Drilling resumed and Continued.
	1400	60.70	
	1440	62.48	
	1520	64.31	
	1700	67.36	
	1800	70.40	
	1930	73.15	
	2030	74.54	
	2200		Pulled out rods, filled hole with mud.
05-02-92	0830		Lowered rods with H/Q Core barrel
	1000		Redrilled from 57.91 to 74.54m

COAL REAP

Drill Hole TP-1

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
05-02-92	1120	75.46	
	1300	78.51	
	1400		Pulled out rods up to mud.
	1630		Mud Pump repairing. Lowered rods
			and [illegible] hole.
	1800	80.94	
	2000	83.99	
	2130	86.48	Drilling stoped and Pulled out rods.
06-02-92	0830		Lowered down rods & resumed drill.
	1130	89.48	
	1400	92.53	
	1530	94.66	
	1630	95.79	
	1730	99.84	
	1800	100.15	
	19[illegible]		Pulled out all rods. Drilling stoped
07-02-92			Maintanance of Rig machine.
08-02-92			Drilling stoped due mechanical
			fault of Rig machine.
09-02-92	1400		Started lowering HQ rods
			from 67 m to 100.15 m

COAL REAP

Drill Hole TP-1

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
09-02-92	1530	100.15	Drilling resumed
	1700	102.89	
	1730	105.94	
	1835	108.83	
	1930	111.88	
	2010	114.93	
	2100	117.98	
	2125	121.02	
	2200	124.07	Drilling Continued in third Shift
10-02-92	0050	127.12	
	0450	130.17	
	0730	133.19	
	0945	135.86	
	1230	138.91	
	1430	141.96	
	1630	144.93	
	1800	147.98	
	1920	151.02	
	2020	154.07	
	2100	157.12	
11-2-92	0100	160.17	

Form 2 of 5

COAL REAP

Drill Hole TP-1

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
11-02-92	0200	160.78	
	0400	163.83	COAL Broken not Sampled
	0430	166.87	COAL
	0830	169.92	COAL
	0940	172.97	
	1100	176.02	
	1210	179.07	
	1320	182.11	
	1400	185.16	
	1530	188.21	
	1630	191.26	
	1730	194.31	
	1830	197.35	
	1930	200.40	
	2030	203.45	
	2100	206.50	
	2200	209.55	
	2330	212.59	
12-02-92	0100	215.64	
	0220	218.69	
	0340	221.74	

7 0641-

COAL REAP

Drill Hole TP-1

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
12-02-92	0480	224.79	Drilling Continued
	0550	227.83	
	0855	230.88	
	0900	233.93	
	0930	236.98	
	1010	240.03	
	1120	243.07	
	1200	243.99	CORE NIL
	1545	247.04	CORE NIL
	1630	250.08	17% Core Recovery
	1800	253.13	Drilling Stopped.

Form 3a

DRILL-HOLE NO T P- 1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
0.0	1.52				1		1.52	SAND/CLAY Color: Yellowish gray 5 Y 8/1 Loose sand, very fine to fine-grained, silty, clayey, poorly sorted, sub-angular to sub-rounded few medium size quartz grains and black bits of biotite.
1.52	3.05	CORE RETRIEVED			2 3		1.53	LAND SILT Color: Yellowish gray 5 Y 8/1 Loose sand very fine to fine-grained sub-angular, poorly to ill-sorted with few quartz grains slightly silty, clayey also coarse sandstone hard pieces.
	4.57				4		1.52	SANDSTONE: Color: Yellowish gray 5 Y 8/1 - Loose sand fine-grained, silty poorly sorted, sub-angular to sub-rounded with few medium size quartz grains and black particles of biotite.
4.57	3.05	CORE			5 6		1.52	SANDSTONE: Color: Yellowish gray 5 Y 8/1 - Loose sand fine-grained, sub-angular, poorly to ill-sorted with few quartz grains slightly silty also coarse sandstone hard pieces.
	7.62				7		1.53	SANDSTONE: Color: Yellowish gray 5 Y 8/1 Loose sand very fine to fine-grained silty, clayey, poorly sorted, sub-angular to sub-rounded with few medium size quartz grains and black particles of biotite.
7.62	3.04	NO CORE			8 9		1.52	SANDSTONE: Color: Yellowish gray 5 Y 8/1 Loose sand - fine-grained, silty poorly sorted, sub-angular to sub-rounded with few medium size quartz grains and black particles of biotite.
					10 1 2		1.52	SANDSTONE: Color: Yellowish gray 5 Y 8/1 Loose sand very fine to fine-grained sub-angular to sub-rounded, poorly sorted few medium size quartz grains and black particles of biotite.

Form 3a

DRILL-HOLE NO TP-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	10.66							
10.66	13.71	CORING			11		1.53	SANDSTONE: Color: Yellowish gray 5Y 8/1 Loose sand fine-grained, silty poorly sorted, sub-angular to sub-rounded with few black particles of biotite.
					12			
					13		1.52	SANDSTONE: Color: Yellowish gray 5Y 8/ Loose sand fine-grained, silty sub angular - poorly to ill-sorted with few slightly silty also contains sandstone hard pieces.
13.71	16.76				14		1.53	SANDSTONE: Color: Yellowish gray 5Y 8/1 Loose sand very fine to fine-grain silty, clayey, poorly sorted, sub-angular to sub-rounded with few medium size quartz grains and black particles of biotit
					15			
					16		1.52	SANDSTONE: Color: Yellowish gray 5Y 8/1 Loose sand fine-grained, silty, poorly sorted, sub-angular to sub-rounded and black particles of biotite.
16.76	19.81	NON			17		1.52	SANDSTONE: Color: Yellowish gray 5Y 8/ Loose sand very fine to fine-grain sub-angular - poorly sorted to ill-sorted slightly silty, clayey also contains sand-stone hard pieces.
					18			
					19		1.53	SANDSTONE: Color: Yellowish gray 5Y 8/ Loose sand, fine-grained sub-angular to sub-rounded poorly sorted and black particles of biotite.
19.81					20			SANDSTONE: Color: Yellowish gray 5Y 8/ Loose sand very fine to fine-grained sub-angular - poorly sorted to ill-sorted
					1			

Form 3a

DRILL-HOLE NO TP-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
					21		1.52	Slightly silty clayey also contains sand-stone hard pieces.
	3.05	CORE			22		1.53	SANDSTONE:- Color:- Yellowish gray 5 Y 8 Loose sand very fine to fine-grained silty, clayey, poorly sorted sub-angular to sub-rounded with black particles of biotite.
22.82	22.82				23		1.52	SANDSTONE:- Color: Yellowish gray 5 Y 8/ Loose sand very fine to fine-grain sub-angular to sub-rounded, poorly to ill-sorted, slightly silty, clayey also contains sandstone hard pieces.
	3.04	CORE			24			
	25.90				25		1.52	SANDSTONE:- Color:- Yellowish gray 5 Y 8/ Loose sand fine-grained, silty-sub-angular, poorly to ill-sorted also contains sandstone hard pieces.
25.90					26			
	3.05	CORE			27		1.53	SANDSTONE:- Color:- Yellowish gray 5 Y 8/ Loose sand fine-grained, silty poorly sorted, sub-angular to sub-rounded with black particles of biotite.
	28.95				28		1.52	SANDSTONE:- Color:- Yellowish gray 5 Y 8/ Loose sand very fine to fine-grained silty, clayey, poorly to ill-sorted sub-angular to sub-rounded with black particles of biotite.
28.95					29			
	3.05	CORE			30		1.53	SANDSTONE:- Color:- Yellowish gray 5 Y 8/ Loose sand fine-grained with few medium sand grains poorly sorted sub-angular also contains biotite.
					1			

Form 3a

DRILL-HOLE NO TP-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
					31			
	32.m						1.m	SANDSTONE: Color: Yellowish gray 5Y 8 Fine-grained, silty, sub-angular poor to ill-sorted also contains sand-stone hard pieces.
32.m					32			
					33		1.52	SANDSTONE: Color: Yellowish gray 5Y 8/ Loose sand, very fine to fine-grain silty, clayey, poorly, sorted, sub-angular sub-rounded and black particles of biotite.
					34		1.53	SANDSTONE: Color: Yellowish gray 5Y8 Loose sand, fine-grained, sub angular poorly to ill-sorted slightly silty also contains sand-stone hard pieces.
	35.05				35			
35.05								SANDSTONE: Color: Yellowish gray 5Y8/
					36		1.52	Loose sand, very fine to fine-grain silty, poorly to ill-sorted, sub angular to sub-rounded and black particles of biotite
	38.1m				37		1.53	SANDSTONE: Color: Yellowish gray 5Y8/ Loose sand very fine to fine-grain silty, clayey, poorly sorted sub angular to sub-rounded and black particles of biotite
38.1m					38			
	39.4				39		1.52	SANDSTONE: Color: Yellowish gray 5Y8 Fine-grained with few medium sand grains poorly sorted, sub-angular, also contains biotite.
					40			LIMESTONE: Color: Yellowish gray 5Y8 Fine-grained, silty, sub-angular
					1			
					2			

Form 3a

DRILL-HOLE NO TP-1

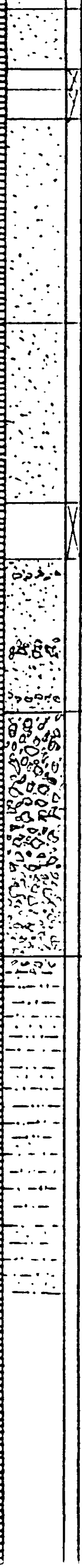
CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	41.14				41		1.52	poorly to ill-sorted also contains sand stone hard pieces.
41.14		C			42		1.53	SANDSTONE:- Color:- Yellowish gray 5Y 8/1 Loose sand, very fine to fine-grained silty, poorly to ill-sorted, sub-angular to sub-rounded and black particles of biotite.
	3.05	N						
		I			43		1.52	SANDSTONE:- Color:- Yellowish gray 5Y 8/1 Fine-grained, silty, sub-angular poorly to ill-sorted also contains sand stone hard pieces.
	44.19				44			
44.19		R						SANDSTONE:- Color:- Yellowish gray 5Y 8
		E			45		1.53	Fine-grained with few medium sand grains poorly sorted, sub-angular also containg biotite.
	3.05	C						
		O			6			SANDSTONE:- Color:- Yellowish gray 5Y 8
		V					1.52	Loose sand fine-grained, silty, clay poorly sorted - sub-angular to sub-round sand biotite particles.
	47.24	E			1.7			
47.24		R						SANDSTONE:- Color:- Yellowish gray 5Y 8/1
		E			1.8			Fine-grained, silty, sub-angular, poor to ill-sorted also contains sandstone hard pieces.
		N						
		C			1.9			SANDSTONE:- Color:- Yellowish gray 5Y 8/1
		E						Fine-grained silty, poorly to ill-sorted, sub-angular to sub-rounded contains sandstone hard pieces.
					50			
					1			
					2			

DRILL-HOLE NO TP-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	50.29							
50.29		CORING			51		1.52	SANDSTONE: Color: Yellowish gray 5Y 8/1 Fine-grained with few medium sand grains - poorly to ill-sorted - sub-angular also contains biotite.
	305				52		1.52	SANDSTONE: Color: Yellowish gray 5Y 8/1 Fine-grained, silty, sub-angular poorly to ill-sorted also contains sand stone hard pieces.
	53.34				53			
53.34		NON-CORING						SANDSTONE: Color: Yellowish gray 5Y 8/1
	1.52				54		1.52	Fine-grained, silty, poorly to ill-sorted, sub-angular to sub-rounded contains sandstone hard pieces and black particles of biotite
	54.86							
54.86					5		0.30	SANDSTONE: Color: Yellowish gray 5Y 8/1 to Yellowish gray 5Y 7/2
	2.18	13%			56		1.98	Hard and compact to loose at places. Hard bands varies from 0.03 to 0.10. Sand grains very fine to fine, poorly sorted, sub-angular to sub-rounded with black particles of biotite and green particles may be glauconite? This unit is slightly calcareous
	57.04				57			Core Loss: 1 Probably in sandstone at bottom
57.04								Core Loss: Probably in sandstone at top.
	2.05	8%			58		2.50	SANDSTONE: Color: Yellowish gray 5Y 8/1 to Yellowish gray 5Y 7/2. Semi hard compact and at places with hard bands of sandstone varies from 0.05 to 0.1 In the middle loose and in the bottom about 0.20 cm hard band of calcareous sandstone. Sandstone fine-grained, poorly sorted, sub-angular to sub-rounded, with few biotite particles.
					59			
					60			
					1			
					2			

DRILL-HOLE NO TP-1

CORE RECOVERY FROM	TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
60.01	0.61 / 60.70	75%					0.46	SANDSTONE:: Color Yellowish gray 5Y 7/2. Hard compact at places and loose in the middle. In lower part of unit a band of 0.05 very hard sandstone with slightly calcareous material. Sandstone fine-grained poorly sorted, sub-angular to sub-rounded with few quartz grains and black particles of biotite
							0.15	Core Loss:: Probably of sandstone at bottom
60.70					61		0.23	Core Loss:: Probably of Sandstone at Top.
	1.78 / 62.48	87%			62		1.55	SANDSTONE:: Color: Yellowish gray 5Y 7/2. Semi hard compact and loose at places with few hard compact bands also contains calcareous material. Sandstone fine-grained at top but towards bottom fine to medium-grained, poor to ill-sorted, sub-angular to sub-rounded. The unit consist of few coarse sand grains, other granules and pebbles of weathered material of varigated color, Calcareous, Argillaceous
62.48	1.83 / 64.31	76%			63, 64		1.40	SANDSTONE:: Color: Yellowish gray 5Y 7/2. Semi hard compact and loose at places fine to medium-grained with few medium size quartz grains, sugary white, poorly to ill-sorted, sub-angular to sub-rounded, slightly calcareous. The unit also contains few granules of argillaceous and calcareous material.
							0.43	Core Loss:: Probably of Sandstone at bottom
64.31	3.05 / 67.36	100%			65		1.15	SANDSTONE:: (SAME AS ABOVE) Color: Yellowish gray 5Y 7/2. At places semi hard, compact bands of conglomerate varies from 0.05 to 0.10 cm consist of quartz coarse-grains, calcareous and argillaceous granules & pebbles. The lower end grades into conglomerate.
					66, 67		1.90	CONGLOMERATE:: Color: Varigated colors such as: moderate yellow 5Y 7/6, Dusky yellow 5Y 6/4 and Dusky red 5R 3/4. Hard compact and semi hard at places consist of coarse-grained quartz, granules and pebbles of argillaceous and calcareous material. The upper part of unit mostly calcareous and arenaceous where as the lower part argillaceous and silty that grades into siltstone. A band of siltstone 0.18 cm from 66.73 to 66.91, fine to medium-grained with few sugary quartz poorly sorted sub-angular to sub-rounded. The [illegible] granules and pebbles may be of microcline with pinkish small [illegible]
67.36	3.04	100%			68, 69, 70, 1, 2		3.04	SANDYSILTSTONE:: Color: Very Light gray N8 and varigated colors such as moderate yellow 5Y 7/6, Dusky yellow 5Y 6/4 and Dusky red 5R 3/4. Semi hard and medium compact loose at places, inter-mixed with very fine-grained sand; poorly sorted, sub-angular to sub-rounded. The varigated patches consist of sandy and clay...



Form 3a

DRILL-HOLE NO TP-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE RECOVERY CORE%	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	70.40						SANDY SILTSTONE:- Color:- Light gray N7 to very light gray N8
70.40	2.75	53%		71		2.30	Variegated colors. Semi hard compact loose at places intermixed with very fine-grained sand, poorly sorted sub-angular to sub-rounded. The variegated clay material more in upper part of unit and scattered through out the unit. consist of argillaceous and arenaceous material, with few black particles of biot
	78.15			72			Core Loss:- Probably sandy siltstone at bottom
							Core Loss:- Probably of sandy siltstone at top
				73		0.45	SANDSILTSTONE:- Color:- Light gray N7 and variegated color
73.15	1.39	53%				0.65	Hard to semi hard, medium compact, breakable at pl very fine-grained sand also intermixed that is po sorted. sub-angular to sub-rounded. At some places variegated patches consist of clay and sand. Th whole unit is argillaceous and arenaceous.
	74.54			74		0.74	
74.54						0.35	SANDYSILTSTONE:- SAME AS ABOVE
	0.92	38%		75		0.57	Core Loss:- Probably of sandy siltstone at bott
75.46	75.46						
	3.05	100%		76		3.05	SANDY SILTSTONE:- Color:- Light gray N7 to Very light gray and variegated colors at places. Siltstone hard compact and semi-hard at places, some intermixed with siltstone through out the unit and at places patches of variegated color clays are the The upper part of unit about 1 m semi hard and lo with alternate patches of variegated color clays contains small hard concretion mixed with sand particles. Slickensided at middle of the unit. The mixed very fine-grained sand, sugary — transparent, poorly sorted, sub. angular to sub-rounde
	78.51			77			
				78			
78.51							SANDYSILTSTONE:- Color:- Light gray N7 to very light gray N8 and at places patches of variegated color.
	2.43	100%		79		2.43	Hard compact and semi hard at breaking point. very fine to fine-grained sand intermixed with silt variegated color consist of clay & silty material & slightly sandy that forms hard concretion at th The whole unit is slightly argillaceous & arenaceo contains very few biotite particles at places.
				80			
				1			

Form 3a

DRILL-HOLE NO TP-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	80.94				81			SANDYSILTSTONE: Color: Light gray N7 to very light gray N8 and at places patches of varigate color. The upper part of unit contains more varigated color clay with silt, based also hard concretions at the top of unit. Hard compact and semi hard at breaking point. very fine to fine-grained based intermixed with silt varigated color consist of clay & silty materials and slightly sandy that forms hard concretion at places. The whole unit is slightly argillaceous & arenaceous contains very few biotite particles at places.
80.94	83.99	3.05	100%		82 83		3.05	
83.99	86.48	2.49	100%		84 85 86		2.49	SANDYSILTSTONE: Color: Light gray N7 to very light gray N8 and at places patches of varigated color Hard compact and semi hard at few places but in part loose and breakable more clayey with varigated color. very fine to fine-grained sand inter-mixed with silt, varigated colors consist clay and sandy material that forms hard concretion at places sub-angular to sub-rounded poorly sorted. The whole unit argillaceous and arenaceous.
86.48	89.48	1.55	51%		87 88 89		1.55 1.45	SANDSILTSTONE: Color: Light gray N7 to very light gray N8 and at places patches of varigated color. Hard and compact at the upper part where as the Lower part is semihard, loose easily breakable clayey varigated color patches at top. The whole unit intermixed with very fine to fine-grained sand and varigated colors consist of silty clayey material and slightly sandy sub-angular to sub-rounded, poorly sorted. The whole unit is argillaceous and arenaceous sand percent increases towards bottom. Core Loss: Probably in sandy siltstone at bottom.
89.48					70 1 2		0.30	SANDYSILTSTONE: Color: Very light gray N8 Semi hard and loose intermixed with very fine grained sand, poorly sorted sub-angular to sub-rounded. Rare patches of silty clay varigated color.

Form 3a

DRILL-HOLE NO TP-1

CORE RECOVERY FROM	TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
								Core Loss:. Probably sandy siltstone at bottom.
	3.05	0.30	9%		91		2.75	Core Loss:. Probably in sandy siltstone at top.
	92.53				92			SANDY SILTSTONE:. Color:. Very light gray N8 Semi hard and loose intermixed with very fine-grained sand poorly sorted sub-angular to sub-rounded. Rare patches of silty clay variegated color.
92.53								
	2.13	0.33	15%		93		1.80	
					94			
	94.66						0.33	
94.66								Core Loss:. Probably in claystone at top.
	2.13	1.20	56%		95		0.93	CLAYSTONE:. Color:. Light gray N7 and thin patches of variegated color at places. Semi hard and medium compact slightly sandy and silty, slickensided fine-grained sand patches and lamination at place. clay slightly stick
					96		1.20	
	96.79							Coreloss:. Probably in Siltyclaystone at top.
96.79					97		0.25	SILTYCLAYSTONE:. Color:. medium light gray N6 to light gr N7
	3.05	2.80	91%		98		2.80	Hard compact and semi hard at places slightly Silty and sandy material. The claystone sticky and breaks at places vertically. The sand gra. very fine to fine-grained and sub-rounded.
	99.84				99			
99.84								
	1.31	0.31	100%		100		0.31	SILTYCLAYSTONE:. Color:. medium light gray N6 to light gray N Semi hard and medium compact, slightly sand and silty. sticky. and contains very fine-gr. sand at places.
					1			
					2			

Form 3a

DRILL-HOLE NO TP-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE RECOVERY CORE	CORE RECOVERY CORE%	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	100.15							
100.15	2.74	2.74	100%		101		2.71	SILTYCLAYSTONE: Color: Light gray N7 varigated color at places. Semi hard and medium compact gritty massive, sand very fine-grained, towards lower end very hard. concretions may be siderite nodules slightly sticky.
102.89					102			
	3.05	3.05	100%		103		3.05	SILTYCLAYSTONE: Color: Light gray N7 varigated color at places. Semi hard and medium compact gritty massive sand very fine-grained upper part of the unit. Slickensided at one places, 70% varigated color at top hard concretion of siderite nodule varigated color throu out unit. Sticky.
105.94					104			
					105			
105.94					106			SILTYCLAYSTONE: Color: Light gray N7 varigated color at places Semi hard and medium compact gritty massive, Sticky, 8% varigated color through out unit, hard concretion siderite nodules, sticky and Sand very fine-grained towards lower end.
	2.89	2.89	100%		107		2.89	
	108.83				108			SILTYCLAYSTONE: color: Light gray N7 to N8, very Light gray varigated color at place semi hard and medium compact gritty mass Sand very fine-grained and hard concretions may be of siderite nodules slightly sticky. Broken at lower end medium to coarse-graine quartz grains scattered through the unit
108.83					109			
	5.05	3.05	100%		110		3.05	
					1			
					2			

DRILL-HOLE NO BP-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	111.88				111			SILTYCLAYSTONE: Color:- Light gray N7, very light gray N8 variegated color at places. Semi hard and medium compact silty massive, sand very fine-grained, through out unit very hard concretions may be siderite nodules, slightly sticky, more sandy and silty towards lower end medium to coarse-grained quartz grain scattered through out the un also fine-grained sand at places.
111.88	114.93	3.05	100%		112 113 114		3.05	SILTYCLAYSTONE:- Color:- Very light gray N8 and variegated colors at places. Semi hard and medium compact silty, massive sand fine-grained, sub-angular to sub-rounded very hard concretions may be siderite nodules slightly sticky, hard concretions of siderite band range from 0.03 to 0.07cm more at the upper and few at middle part of unit grades into sandy siltstone.
114.93	117.98	3.05	100%		115 116 117		1.95 1.10	SANDYSILTSTONE: Color:- Very light gray N8. Semi hard and medium compact at places contain medium to coarse-grained quartz sub-angular to sub-rounded, poorly sorted, slightly clayey quartz grains 25% intermixed with silt through out the unit. Grades in silty sandstone
117.98	121.02	NIL			118 119 120 1 2		3.04	Core Loss:- Probably in silty sandstone

DRILL-HOLE NO T 21

CORE RECOVERY FROM	TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	121.02				121			Core Loss: Probably in Silty sandstone
121.02	124.07	3.05	NIL		122 123 124		3.05	SILTYSANDSTONE: Color: very light gray N8. Loose, medium-grained to coarse grained sa quartzitic, subangular to sub-rounded, ill-sorte The silty sand stone abruptly changed into cl stone. Shows the change of formation?
124.07	125.01	0.94	99%		125		0.94	CLAYSTONE: Color: medium gray N5. Semi hard to compact slightly gritty, Slickensided at places, carbonaceous mater homogeneously distributed through out the wood pyritized, coaly flacks at places, slight resinous & pyritic.
125.41 m Contact							0.40	
BARA? Fm.	127.12	3.05	2.11	69%	126		0.25 1.46	SHALE: Color: Dark gray N4. Semi hard and medium compact fissile, high Slickensided at upper and lower part of unit contains siderite band of about 0.12 m at bot and slightly silty through out. The unit contai resin, pyrite, rare coaly & carby material & glauconite.
127.12		3.05	2.75	90%	127 128 129		2.75	SHALE: Color: medium dark gray N4. Medium hard and compact fissile grittyto Slickensided contains one siderite band ab about 0.05 m thick. 5% sandstone laminatio of approximately 1 m.m thick. Sandstone is very fine-grained, sub-rounded, The shale rooted, contains abundant carbonized leaves, wood fragment and pyritized root, distribu through out the unit, also contains coalified & carbonaceous material distributed through out the unit, It also contain resin which is abundant in lower part of the unit.
					130		0.30	Core Loss: Probably in shale at bottom
					2			

DRILL-HOLE NO TP 1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE RECOVERY CORE	CORE RECOVERY CORE%	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	130.17							
130.17	133.19	3.02	100%		131 / 132 / 133		3.02	SHALE:- Color: medium dark gray N4. Medium hard compact, fissile, gritty, slickensided, sandstone laminae of approximately 1mm thick. Sandstone is very-fine-grained - sub-rounded. The shale is rooted containing carbonized leaves wood fragment and pyritized root, distributed through out the unit, also contains coalified and carbonaceous material distributed through out the unit. Also contains resin abundant in upper part of unit. At depth of 138.2 band of about 25 cm claystone very hard and comp. color: yellowish gray 5Y 8/1 rare coaly fragments. Highly glauconite at the bottom. rare carbonaceous.
133.19	135.86	2.67	100%		134 / 135		2.67	SHALE:- Color:- medium dark gray N4. Medium hard and compact fissile gritty, rare slickensided. Highly glauconite upper part of the. The two claystone bands very hard and compact one band is 23 cm towards top and other band 50 cm at the middle, to p 10 cm semi hard comp claystone with slightly gritty and contains rare glauconite, rare carbonaceous material. The sh is rooted contains abundant carbonized leaves w fragment and pyritized root also contains coalifi and carbonaceous material distributed through the unit, it also contain resin.
135.86	138.91	3.05	100%		136 / 137 / 138		3.05	SHALE:- Color:- Greenish gray 5G Y 6/1. and medium dark gray N4 Semi hard and medium compact fine grained sand, sub-rounded, fissile slightly silty, slickensided rare, Siderite ba of 5 cm and 25 cm clay stone band toward lower and highly glauconitic. The unit contains root pyritized coaly, carby trace and carbonaceous material at places. Slight resins.
138.91		3.05	100%		139 / 140 / 2		3.05	SHALE:- Color:- Medium dark gray N4. Semi hard and medium compact, fissile, slightly silty and sandy, unit contains coaly carby traces and resineous at place highly root pyritized and thin band of 1

DRILL-HOLE NO T.P-1

FROM	TO	CORE	CORE %	WATER LOSS	DEPTH METRES
	3.05 / 141.96	3.05	100%		141, 142
141.96	2.97 / 144.93	0.85			143, 144, 145
144.93	3.05 / 147.98	2.87			146, 147, 148
147.98	3.04	3.04	100%		149, 150, 1, 2

THICKNESS	LITHOLOGIC DESCRIPTION
3.05	Pyrite at the upper part of unit. highly resinous 140.90, towards lower and fine grained sand laminations interbedded with shale contain re pyritized about 2 cm thick at bottom.
	Core loss: Probably dirty coal at top.
2.12	COAL / Dirty: color: Brownish black 5YR 2/1, bi It contains dark brownish minute specks of resin and pyritic wood pyritized grades into shale, light in
0.20	SHALE: Color: Medium dark gray N4. Medium hard compact gritty, rar slickensided Highly glauconit The shale is rooted contains carbonized leaves wood fragment and pyritized root also cont. coalified and carbonaceous material distribu through out the unit. A band of siderite about at the bottom of unit.
0.65	
1.45	CLAYSTONE: Color: Medium gray N5. Hard and compact slightly silty rare slick sided resins, wood pyritized a band of coal about 8 cm with resins pyrite at the middle of sand very fine grained interbed with clay coaly carb. flakes with resin through out unit.
1.42	COAL Color: Bownish black 5YR 2/1 bi. It contains specks of resin at places and band in middle: cleating on top and bottom. light weight and pyritic.
0.18	Core Loss: Probably drity coal at bottom
0.72	CLAYSTONE: Color: medium gray N5. Semi hard compact sandy and slightly very fine grained sandstone laminations with resins - coaly, carb. material at places, pyr through out the unit.
1.53	COAL: Color: Brownish black 5YR 2/1 bi. The coal contains specks of res scattered at places, has cleating pyrit Light in weight, woody texture. At bottom 0.30 slightly heavier.

DRILL-HOLE NO TP-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE RECOVERY CORE	CORE RECOVERY CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	151.02				151		0.20	SHALE: Color: Medium dark gray N4 to Medium light gray. Medium hard and compact fissile gritty, ran slickensided highly resinous. The upper part of about 15 contains remains of leaves preserved in good condition also highly carbonized and coalified material at the upper part.
151.02					152		3.05	CLAYSTONE: Color: Light gray N7. Semi hard compact sandy and slightly silty coaly carbon traces and flak wood imprints. Carbonaceous material preserved at coaly films material homogenously distributed. The carbonaceous material found the unit is preserved as coaly films in broken shape and larger fragments of coalified wood flakes which is distributed homogeneously in at places concentrated into specific zone not rooted
	154.07				153			
	3.05	3.05	100%		154			
154.07					155		2.60	CLAYSTONE: Color: Medium gray N5 Hard and compact slightly silty and sandy, resins, wood pyritized sandy Sand very fine-grained intermixed with claystone. It contains siderite bands from 5cm to 9cm and slickensided through out the unit, but not rooted.
	3.05	2.60			156			Core Loss: Probably in claystone at bottom.
	157.12				157		0.45	
157.12					158		3.05	CLAYSTONE: Color: Medium light gray N6. Semi hard compact slickensided gritty. Sand fine-grained intermixed with claystone through out the unit siderite bands ranges from 5cm to 9 cm coaly, carboy traces in places it blows towards lower and more silty and sandy slightly resins, pyritic yet rooted.
	3.05	3.05			159			
					160			
					1			
					2			

DRILL-HOLE NO T P-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
160.17	160.17						0.50	CLAYSTONE: Color: Medium gray N5. semi hard compact, gritty, without siderite band, sandy, Fine sand lamination are interlayered, Fissile characteristic present, resins, wood pyritize coalycarby traces and flacks, scattered thro out the unit, root pyritized.
	160.78						0.11	
160.78							0.18	Core Loss: Probably in claystone at bottom.
					161			Core Loss: Probably in claystone at top.
							0.70	CLAYSTONE: Color: medium dark gray N4. Medium hard compact and break along weak zone, slightly silty, sandy, fine-grained sand intermixed, fissile, slickensided, rooted, root and wood pyritized, resins, coaly carby traces, highly ro and slickensided at bottom abrupt contact with dirty coal
							0.20	
					162		0.33	COAL / Dirty: Color: Brownish Black 5YR 2/1 black N1 The coal appears to be dirty coal contai specks of resin scattered at places it is pyritic. Light in weight, highly resins.
							1.72	
					163			CLAYSTONE: Color: Brownish gray 5YR 4/1. Very hard and compact slightly silty. and sandy, pyritic, resins.
163.83	163.83							
					164		0.30	COAL / Dirty: Color: Brownish black 5YR 2/1 black N1 The coal appears to be dirty coa contains specks of resin scattered at places it is pyrit light in weight. A band of claystone from 163.23-163.58 (0.3 medium light gray N6, semi hard compact silty and sa burrows simple horizontal filled with fine sand. Th unit contains carbonaceous material and glauconitic.
					165		2.74	Core Loss: Probably in coal at top.
								COAL / Dirty: Color: Brownish black 5YR 2/1 black N The coal appears to be dirty coal contai specks of resin scattered at places it is pyrit light in weight highly resin at top.
					166			
166.57	166.27							
					167			COAL / Dirty: Color: Brownish black 5YR 2/1 black N1 The coal appears to be dirty coal contains specks of resin scattered at places it is pyri light in weight.
							1.15	
					168		0.15	CARBONACEOUS SHALE: The top of the unit is a carbonaceous shale Color: Black N1, containing fissile carbonaceous, abundant coalified leaf impressions, coalified woody fragments not rooted and makes sharp contact on upper side with coal lower side with claystone.
							1.00	
					169			CLAYSTONE: Color: Light brownish-gray. medium hard compact slightly silty and fine-gr sand lamination at places highly rooted, rooty pyritize coaly carby traces resinenous, sticky, slickensided wood pyritized.
							0.75	
169.92	169.92				170			COAL / Dirty: color: brownish black 5YR 2/1 black N1. The coal appears to be dirty coal co specks of resins also pyritic, light in weight, band of peat at places.
	3.05	3.05					3.05	
								COAL / Dirty: / argillaceous. color: brownish black 5YR 2/1 black N1. Dirty coal contains black streak, brownish specks contains carbonaceous material and of resins, brittle at one place contains green specks may be Marcasite. Light in weight.

DRILL-HOLE NO TP-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE RECOVERY CORE	CORE RECOVERY CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	3.05	3.05	100%		171		3.15	After 40 cm from top of this unit, band of claystone 25 cm (170.32 – 170.57), pyritic, semi hard compact slightly silty sticky, coaly carby material and carby flecks resineous.
								COAL / Dirty: Color: Brownish black 5 YR 2/1. The coal appears to be dirty contains specks of resin scattered at places it pyritic. Light in weight.
172.97	172.97				172			
					173		0.90	CLAYSTONE: Color: Medium gray N5. Medium hard compact, fine grained sandy, silty Slickensided, fissile, rare quartz, coaly carby flecks rooted slightly, resins, massive at places, pyritic. Fine-grained sand intermixed at upper and lower part. Fine-grained sand interlayered with claystone, lower part is glauconitic & burrowed. The top of unit more carbonaceous. The burrowes are localized in lower zone & parallel to the bedding plane and branches are filled with fine grained sand
	3.05	3.05	100%		174			
					175		2.15	CLAYSTONE: Color: Medium dark gray N4 and Medium gray Medium hard compact Sandy, Silty, Fissile Sand fine-grained, coaly, carby flecks rooted slightly resins, massive at places, pyritic. The upper part of unit is more sandy and silty with siderite, sand very hard composed of clay material of about 6 cm. upper part and about 3 cm. siderite band at lower part of the unit. In upper part intermixed sand, in lower part sand interlayered glauconitic & hard shard contact with coal.
176.02	176.02				176			
					177		1.37	COAL: Color: Brownish black 5YR 2/1. Coal slightly brittle, light in weight, contains resin and pyrite at places. At top slightly clayey.
	3.05	3.05	100%		178		1.68	COAL / Color: Brownish black 5YR 2/1. The coal contains specks of resin scattered at places; it is pyritic. Light in weight. Dirty coal at bottom.
179.07	179.07				179			
	3.04	3.04	100%		180		1.40	
					2			

DRILL-HOLE NO "T.P-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	3.04	3.04	100%		181		0.55	CLAYSTONE: Color: Medium light gray N6. Very hard compact, fine-grained, massive, slickensided At top contact with coal slickensided and lower contact with coal at bottom. Rare coaly flecks at places. Slightly sandy, silty through out. Sticky, resin at few places.
							0.54	COAL / Dirty Color: Brownish black 5YR 2/1. The Coal appears to be dirty coal containing specks of resin scattered at places. It is pyritic. Light in weight.
182.11	182.11				182		0.45	CLAYSTONE: Color: Medium light gray N6. Hard compact, fine-grained, massive, slickensided, rare coaly flakes at places. Slightly sandy, silty through out, sticky resin at places.
					183			
	3.05	3.05	100%		184		3.05	CLAYSTONE: Color: Medium gray N5. Hard compact, massive at top and bottom middle seam silty, sand fine-grained intermixed and interlayered lamination at places, Sediritic bands hard varies from 8cm to 28cm at bottom composed of clay material coaly carby material at places with resins, glauconit
	185.16				185			CLAYSTONE: Color: Medium gray N5. Hard compact, fine-grained sand laminations at and breaks with smooth surface along sand highly rooted pyritized, no siderite nodules. Sharp/abrupt contact with dirt coal wood pyritized slightly resins, and only slightly sandy silty.
185.16							1.15	COAL: Dirty: Color: Brownish black 5YR 2/1 The coal appear to be dirty coa Contain specks of resin scattered at places. upper part of coal highly rooted, root pyritized. Gradesinto claystone.
	3.05	3.05	100%		186		0.55	CLAYSTONE: Color: medium gray N5. Hard compact, fine-grained, massive, slickensided, coal carby flacks and traces, through out unit more carby trac and wood pyritize towards lower end. Fine-grained sand laminations upper part of unit coaly carby traces and fe flacks. upper part contact with coal gradational.
	188.81				187		1.35	
188.21					188			CLAYSTONE: Color: medium gray N5. Hard compact. Fine-grained sand, massive, Slickensided, coaly carby traces at places. sticky, res at places. The lower part of unit with fine-graine band interminked and interlayered have siderite bands at lower end. contact with coal abrupt.
	3.05	3.05	100%		189		2.26	
					190			
					1			
					2			

DRILL-HOLE NO TP-1

CORE RECOVERY FROM	TO	CORE	CORE%	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
					191		0.79	COAL: Colour: Brownish black 5YR 2/1. Coal contains dark brownish minute specks scattered may be of vein woody structure also observed. specks of pyrite, prominant in crystal form preserved at the bottom of coal bed.
191.26	191.26							
	2.05	3.05	100%		192		2.24	COAL: Colour: Brownish black 5YR 2/1. Coal contains dark brownish minute specks scattered may be of vein woody-structure, brittle, pyritic and contains vein through out the coal.
					193			CARBY CLAYSTONE: Colour: Medium Light gray N6. Hard compact slightly silty to sandy highly carbonac. contains leaf impressions abundant coalified woody fragment not rooted. Coaly films at top and coaly flak scattered through out the unit. Contact with coal sharp Where as the lower part of unit from 193.90-194.31 coa carby traces wood pyritize massive slightly silty & sandy.
					194		0.81	
194.31	194.31							
	3.04	3.04	100%		195		3.04	CLAYSTONE: Colour: Medium Light gray N6. Hard compact massive, silty, sandy and rare resins an carbonaceous material scattered homogeneously through the unit, coaly traces and pieces at places. Towards lower end more sandy fine-sand and silt intermixed with claystone this part is pyritic.
					196			
					197			CLAYSTONE: Colour: Medium Light gray N6. Hard compact massive, silty, sandy, rare resins an carbonaceous material scattered homogeneously through out the unit, coaly carby traces and pieces at places. The unit is more sandy and silty towar lower part and grades into sandy claystone.
197.35	197.35							
	3.05	2.95	96%		198		2.25	SANDY CLAYSTONE: Colour: Medium light gray N6 to light gray N7. Semi hard medium compact, massive sandy silty, more sandy at middle, sand fine-grain poorly-sorted, intermixed with clay through out the unit. Coaly, carby traces an rare coaly flacks in the unit.
					199			
					200		0.70	
					2			

Form 3a

29 06 41

DRILL-HOLE NO TR1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	200.40						0.10	Core loss :- Probably in sandy claystone at bottom.
200.40					201		0.60	SANDY CLAYSTONE :- Color :- Medium Light gray N6 to Light gray N7. Semi hard medium compact, massive, Silty, Sandy, Sand fine-grained poorly-sorted. The u is pyritic contains coaly carby, sand intermixed with clay through out the unit and rare coaly flacks, grades into s.
	3.05	1.20	39%		202		1.85	Core Loss :- Probably in sandstone at middle. SANDSTONE :- Color :- Medium gray N5. Semi compact and loose at places, sand fine-grained to medium about 25% and other mineral 5%, sub angular to sub-rounded, poorly sorted, quartz 95%. Slightly argillaceous claystone 1cm bands at places present, other mineral contain are glauconite and black particles of biotite carbonaceous material broken pieces at places, grades into sandy claystone.
	203.45				203		0.37	
203.45							0.23	SANDY CLAYSTONE :- Color :- Medium gray N5. Semi hard medium compact, massive; sandy, silty, sand fine grained poorly-sorted. The unit is pyritic contains coaly, carb sand intermixed with clay through out the unit and the coaly flacks not massive.
					204		0.80	
	3.05	2.00	65%		205		1.20	SANDYCLAYSTONE :- Color :- medium gray N5. Semi hard compact fissile silty and sandy, resinous sand fine-grained, sub-angular, poorly-sorted, intermixed with finely laminated with claystone at places. Carbonaceous material coaly, carby flacks and fragments forming thin layer at places and scattered through out the unit. The unit also contains very thin lamination of medium grained sand with few coarse quartz grains, grades into s. sto
	206.50				206		1.05	SANDSTONE :- Color :- Light gray N7. Semi compact loose at places argillaceous sand medium grained and coarse 40%, quartz 95% other mineral 5%, clays and black particles may be biotite, coaly carby traces at places but highly carbonaceous about 15 cm towards lower end of unit rabin abundant. carbonaceous material contains coaly car flacks and resin abundant grades into carbonaceous shal
206.50								Core loss :- Probably in carby shale at bottom.
					207		1.25	Core loss :- Probably in shale at top. CARBONACEOUS SHALE :- Color :- Light gray N7. to black N1. loose medium compact fissile carbonaceous carbo abundant coalified leaf impressions and woody fragment, coal fla streaks and thin lamination of coal, highly resinous fine to medium grained sand intermixed with coaly carby material through out the whole unit is slightly argillaceous.
	3.05	1.80	59%		208		0.35	
	209.55				209		1.45	SANDSTONE :- Color :- Light Gray N7 Semi compact loose at places argillaceous sand medium - grained 55% and coarse 40%, quartz 95% other mineral 5%; clay and black particles may be biotite, coaly carby traces at place but highly carbonaceous resins abundant. Toward lower er sandstone interlayered with shale. The shale bands is thine upto 1 cm. Shale lamination frequently contains abund carbonaceous material and also coal flacks and resin. In the middle of sandstone there is band of carb shale (0.50) from 209.80 to 209.30. carbonac shale contains coaly and carby flacks slightly resinaceous, also slightly sandy, silty
209.55					210			
					1			
					2			

DRILL-HOLE NO T.R-1

CORE RECOVERY FROM	TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
207.55					211		1.80	Core loss: Probably in sandstone at top. CARBONACEOUS SHALE: Color: Light gray N7 to black N1 loose medium compact, fissile, carbonaceous contains abundant coalified leaf impressions and woody fragments, coal streaks and thin lamination of coal, highly resineous fine - medium grained sand intermixed with coaly carby material through out the whole unit is ——— slightly argillaceous, grades
	3.04	1.24	41%				0.25	
					212		0.55	SANDSTONE: Color: Light gray N7. Semi compact loose at places argillaceous sand medium - grained 60% and coarse 35% mainly 95% other mineral 5% dark and black particles may be siltite, coaly, carby traces at places slightly carbonaceous and resineous: Carbonaceous material contains - coaly carby flacks and grades into sandy claystone.
	212.59						0.44	
212.59							0.45	
					213			SANDY CLAY STONE: Color: Light gray N5. Semi hard compact fissile, silty and sandy, resineous sand fine grained, sub-angular, bassly-sorted, intermixed & finely laminated with claystone at places. Carbonaceous material coaly, carby flacks and fragment forming thin layer at places and scattered through out the unit the unit also contains very thin lamination of medium - grained sand with few coarse quartz grains, grades into claystone.
					214			
	3.05	2.60	85%				2.60	
					215			Core loss: Probably in sandy claystone at top. CLAYSTONE: Color: Medium light gray N6. Hard compact massive, silty, sandy rare resin and carbonaceous material scattered homogeneously through out unit coaly traces pieces at places. Fissile, towards upper part more sandy, Slickensided band of carbonaceous at middle part of unit fine grained sand lamination through out the unit
	215.64							
215.64					216			CLAYSTONE: Color: Medium gray N5. Hard compact massive, silty, sandy rare resin and carbonaceous material scattered homogeneously through out unit coaly traces and pieces at places. Fissile, silty to sandy, towards lower end more sandy and have a band of 15 cm sandstone sandy claystone intermixed with medium to coarse grained sand - sub - angular to sub - rounded, grades into sandy - claystone.
	3.05	2.25	73%				2.25	
					217			
	218.69							Core Loss: Probably in sandyclaystone at bott.
					218		0.80	
218.69								Core Loss: Probably in sandy claystone at to
					219		2.15	
	3.04	0.90	26%					
					220			
					2			

..Form 3a

30 84

DRILL-HOLE NO T.P-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
216.61	221.74				221		0.90	SANDYCLAYSTONE: Color: Medium gray N5 to light gray N7. Semi hard and compact fissile silty and sandy. Sand fine to medium grained interlaminated with claystone places sand intermixed with claystone, unit contains resin coaly carby material at places coal flacks & siderite bands about 1cm at places. Toward lower end sand medium to coarse grained.
221.74	224.79	3.05	1.20	39%	222 223		1.85	Core Loss: Probably in sandyclaystone at top. SANDYCLAYSTONE: Color: Medium gray N5 to light gray N7. Semi hard compact fissile, silty, sandy, sand fine to me grained interlaminated with claystone. At places sand intermixed with claystone, unit contains resin, coaly ca traces at places, more sandy than above sandyclaysto
224.79	227.83	3.04	1.70	55%	224 225 226 227		1.20 1.34 1.70	Core Loss: Probably in sandyclaystone at top. SANDYCLAYSTONE: Color: Medium gray N5 to light gray N7. Semi hard compact, fissile, silty, sandy sand fine to medium grained interlaminated with claystone. At plac sand intermixed with claystone, unit contains resin, coal carby traces at places, siderite bands and coal flacks absent. SANDYCLAYSTONE: Color: Medium gray N5. Semi hard compact, fissile, silty & sandy sand fine to medium grained interlaminated with claysto At places sand intermixed with claystone, unit contai resin, coaly, carby traces at places, Grades into Highly carbonaceous shale.
227.83	230.88	3.05	1.50	49%	228 229		0.90 0.60	HIGHLY CARBONACEOUS SHALE: Color: Shale Black N1. Semi compact fissile carbonaceous contains abundant leaf impression woody & fragments dirty coal bands 3cm to 7cm. interbedded with fine-grained thin lamination, highly resinec towards top thin bands of claystone at interval. grades into sandstone. Core Loss: Probably in sandstone at bottom.
					230		1.55	

33

DRILL-HOLE NO TP-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
227.23	230.28							Core Loss:. Probably in sandstone at top
230.28	233.93	3.05	0.55	18%	231 232 233		2.50	SANDSTONE:. Color: Light gray N7. Semi compact and loose 50% coarse-grained 45% very coarse-grained all 95% quartz and 5% other mineral biotite? constituent slightly argillaceous, sand grains, sub-rounded to sub. angular clay as a matrix material.
							0.55	SANDSTONE:. Color:. Light gray N7. Semi compact and loose 50% coarse-grained 45% very coarse-grained all 95% quartz and 5% other mineral biotite? constituent slightly argillaceous sand grains, subrounded to sub angular clay as matrix material. Coaly bands about 3 cm at bottom
235.93	236.98	3.05	0.50	16%	234 235 236		0.50	Core Loss:. Probably in sandstone at bott.
							2.55	Core Loss:. Probably in sandstone at top.
236.98	239.03	3.05	2.20	72%	237 238 239 240 1 2		0.85	SANDSTONE:. Color:. Light gray N7. Loose and Semi compact sandstone medium-grained 35% coarse-grained 50% and very coarse grained 10% clay/stone bands sticky at upper part of unit. Sand poorly-sorted sub-angular to sub-rounded middle part, medium to coarse-grained while the upper and lower part of the unit coarse to very coarse grained, matrix material is clay. All sand grains are 95% quartz.
							2.20	

DRILL-HOLE NO TP-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
240.03	243.07	3.04	1.80	59%	241		1.80	SANDSTONE: Color: Light gray N7 to Very Light gray N8 Loose and semi consolt: sandstone fine to me with 5% coarse sand grains all 95% quartz, with mal clay material, rare traces of coaly material tow lower end fine-grained sand, sub-angular to su rounded. well sorted slightly silty.
					242		1.24	Core Loss: Probably in sandstone at bottom.
243.07	243.99	0.92	Nil		243			- Core Nil - Probably Sandstone.
243.99	247.04	3.05	Nil		244 245 246 247			- core Nil - Probably Sandstone
247.04	250.08	3.04	0.54	17%	248 249 250		2.50 0.54	Core Loss: Probably in sandstone at top. SANDSTONE: Color: Medium light gray N6. Fine to medium grained sand equal and 10% coarse sand, 95% quartz grai slightly silty matrix clay. well sorted, sub-angular to sub-rounded.

Form 3a

33-641

DRILL-HOLE NO TP-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
250.08	250.08				251		1.15	Core Loss:: Probably in sandstone at top.
								SANDSTONE:: Color:: Medium Light gray N6. Fine to medium grained sand. equal % and 10% coarse, 95 % quartz, sand sub-angular to sub-rounded with clay matrix. Coaly material towards lower part of unit
	253.13				252		1.90	
253.13					253			
					254			TOTAL DEPTH – 253.13m
					255			THE END
					256			
					257			
					258			
					259			
					260			
					T			
					2			

COALREAP
Coal Intercepts

Drill hole TP-1 Collar elevation

Bed Name	Depth From	Depth To	Thickness	Core Recovery	Struct. Top	Info. Source	Sample No.
	141.96	144.08	2.12	CORE LOSS	SHALE	COAL	—
	144.08	144.28	0.20	0.20	COAL	SHALE	Not Sampled
	146.38	147.80	1.42	1.42	CLAYSTONE	COAL	TP-1-1-92
	147.80	147.98	0.18	CORE LOSS	COAL	CLAYSTONE	—
	148.70	150.22	1.52	1.52	CLAYSTONE	SHALE	TP-1-2-92
	161.58	161.78	0.20	0.20	CLAYSTONE	CLAYSTONE	Not Sampled
	162.11	163.83	1.72	1.72	CLAYSTONE	COAL	*Not Sampled
	163.83	164.13	0.30	CORE LOSS	COAL	COAL	—
	164.13	168.02	3.89	3.89	COAL	CARBY SHALE	TP-1-3-92
	169.17	173.87	4.70	4.70	CLAYSTONE	CLAYSTONE	TP-1-4-92
	177.39	180.47	3.08	3.08	CLAYSTONE	CLAYSTONE	TP-1-5-92
	181.02	181.66	0.64	0.64	CLAYSTONE	CLAYSTONE	Not Sampled
	186.31	186.86	0.55	0.55	CLAYSTONE	CLAYSTONE	Not Sampled
	190.47	193.50	3.03	3.03	CLAYSTONE	CARBY C. STONE	TP-1-6-92
	TOTAL		23.55m	20.95m			

* TP-1-7-92 Sampled 7 Mar 92
162.11 - 163.83

COAL SAMPLE DATA

SAMPLE NO. TP-1-1-92 NO. OF BAGS ONE

COLLECTOR MOHAMMAD ALI TAGAR ~~NAJEEB REHMAN~~ COAL FIELD THAR

LATITUDE _____ LONGITUDE _____

PROVINCE SINDH DISTRICT THAR

DRILL HOLE TP-1 DATE SAMPLED 16-2-92

FORMATION BARA ? AGE PALEOCENE

COAL SEAM _____ ESTIMATED RANK LIGNITE

TOTAL SEAM THICKNESS _____ in 1.42 m THICKNESS SAMPLED _____ in 1.42 m

DEPTH TO TOP OF COAL _____ ft 146.38 m SURFACE ELEVATION _____ ft@MSL _____ m

ROOF ROCK CLAY STONE FLOOR ROCK CLAY STONE

SAMPLE TYPE DRILL CORE
(channel, channel/upper bench, grab, drillcore, etc.)

COMMENTS:

COAL SAMPLE DATA

SAMPLE NO. TP-1-2-92 NO. OF BAGS ONE

COLLECTOR MOHAMMAD ALI TAGAR NAJEEB REHMAN COAL FIELD THAR

LATITUDE _____ LONGITUDE _____

PROVINCE SINDH DISTRICT THAR

DRILL HOLE TP-1 DATE SAMPLED 10-2-92

FORMATION BARA ? AGE PALEOCENE

COAL SEAM _____ ESTIMATED RANK LIGNITE

TOTAL SEAM THICKNESS _____ in THICKNESS SAMPLED _____ in

1.52 m 1.52 m

DEPTH TO TOP OF COAL _____ ft SURFACE ELEVATION _____ ft@MSL

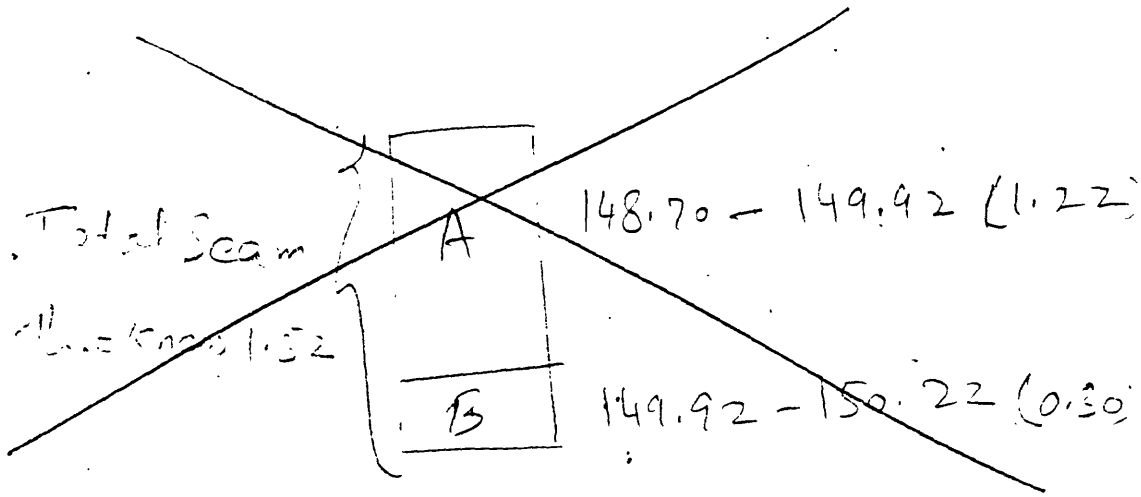
148.70 m _____ m

ROOF ROCK CLAY STONE FLOOR ROCK SHALE

SAMPLE TYPE DRILL CORE

(channel, channel/upper bench, grab, drillcore, etc.)

COMMENTS:



COAL SAMPLE DATA

Bench
~~SAMPLE~~ NO. TP-1-3-92 NO. OF ~~BAGS~~ samples THREE (A, B & C)

COLLECTOR MOHAMMAD ALI TAGAR / NAJEEB REHMAN COAL FIELD THAR

LATITUDE _____ LONGITUDE _____

PROVINCE SINDH DISTRICT THAR

DRILL HOLE TP-1 DATE SAMPLED 11-2-92

FORMATION BARA? AGE PALEOCENE

COAL SEAM _____ ESTIMATED RANK LIGNITE

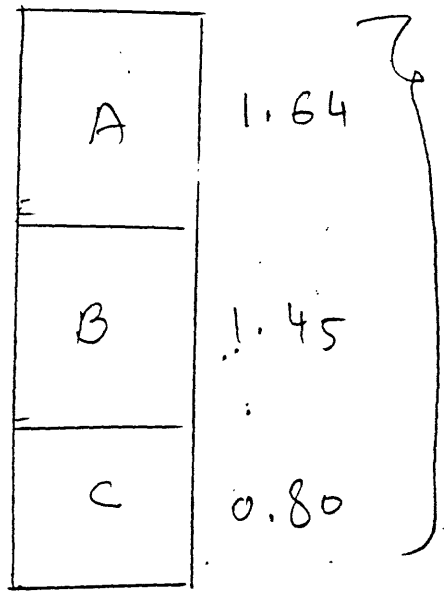
TOTAL ~~SEAM~~ Bench THICKNESS _____ in 3.89 m THICKNESS SAMPLED _____ in 3.89 m

DEPTH TO TOP OF COAL _____ ft 164.13 m SURFACE ELEVATION _____ ft@MSL _____ m

ROOF ROCK CLAY STONE FLOOR ROCK CARBY SHALE

SAMPLE TYPE DRILL CORE
(channel, channel/upper bench, grab, drillcore, etc.)

COMMENTS:



COAL SAMPLE DATA

BENCH ~~SAMPLE~~ NO. TP-1-4-92 NO. OF SAMPLES ~~BAGS~~ FOUR (A, B, C & D)

COLLECTOR MOHAMMAD ALI TAGAR / NAJEEB REHMAN COAL FIELD THAR

LATITUDE _____ LONGITUDE _____

PROVINCE SINDH DISTRICT THAR

DRILL HOLE TP-1 DATE SAMPLED 11-2-92

FORMATION BARA ? AGE PALEOCENE

COAL SEAM _____ ESTIMATED RANK LIGNITE

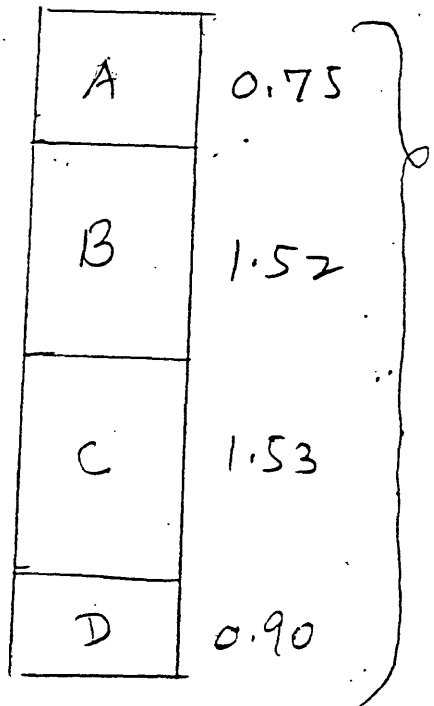
TOTAL ~~SEAM~~ BENCH THICKNESS _____ in 4.70 m THICKNESS SAMPLED _____ in 4.70 m

DEPTH TO TOP OF COAL _____ ft 169.17 m SURFACE ELEVATION _____ ft@MSL _____ m

ROOF ROCK CLAY STONE FLOOR ROCK CLAY STONE

SAMPLE TYPE DRILL CORE
(channel, channel/upper bench, grab, drillcore, etc.)

COMMENTS:



TOTAL BENCH ~~SEAM~~ THICKNESS 4.70 m

COAL SAMPLE DATA

Bench ~~SAMPLE~~ NO. TP-1-5-92 NO. OF Samples ~~BAGS~~ 3 (A1, A2, B)

COLLECTOR MOHAMMAD ALI TAGAR ~~NAEEM REHMAN~~ COAL FIELD THAR

LATITUDE _____ LONGITUDE _____

PROVINCE SINDH DISTRICT THAR

DRILL HOLE TP-1 DATE SAMPLED 11-2-92

FORMATION BARA? AGE PALEOCENE

COAL SEAM _____ ESTIMATED RANK LIGNITE

TOTAL ~~SEAM~~ Bench THICKNESS _____ in THICKNESS SAMPLED _____ in

3.08 m 3.08 m

DEPTH TO TOP OF COAL _____ ft SURFACE ELEVATION _____ ft@MSL

177.39 m _____ m

ROOF ROCK CLAY STONE FLOOR ROCK CLAY STONE

SAMPLE TYPE DRILL CORE

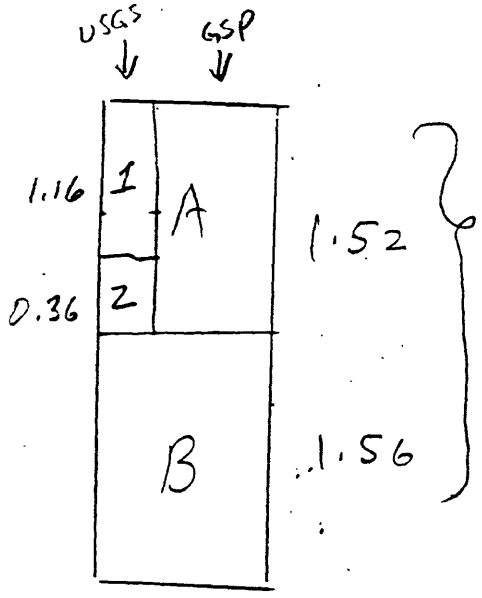
(channel, channel/upper bench, grab, drillcore, etc.)

COMMENTS:

TP-1-5A1
177.39-178.55

TP-1-5A2
FOR ERL

178.55-178.91



40 of 4

COAL SAMPLE DATA

Bench
~~SAMPLE~~ NO. TP-1-6-92 NO. OF Samples ~~BAGS~~ TWO (A, B)

COLLECTOR MOHAMMAD ALI TAGAR
NAJEEB REHMAN COAL FIELD THAR

LATITUDE _____ LONGITUDE _____

PROVINCE SINDH DISTRICT THAR

DRILL HOLE TP-1 DATE SAMPLED 11-2-92

FORMATION BARA AGE PALEOCENE

COAL SEAM _____ ESTIMATED RANK LIGNITE

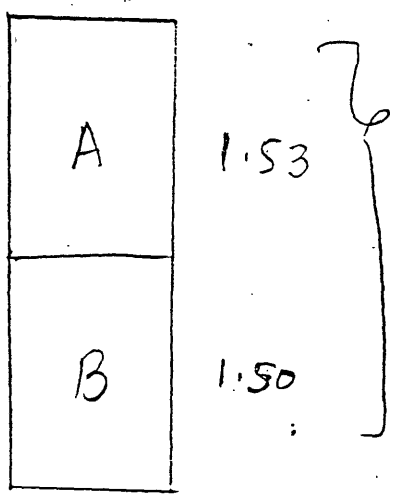
Bench
TOTAL ~~SEAM~~ THICKNESS _____ in 3.03 m THICKNESS SAMPLED _____ in 3.03 m

DEPTH TO TOP OF COAL _____ ft 190.47 m SURFACE ELEVATION _____ ft@MSL _____ m

ROOF ROCK CLAYSTONE FLOOR ROCK CARBY CLAYSTONE

SAMPLE TYPE DRILL CORE
(channel, channel/upper bench, grab, drillcore, etc.)

COMMENTS:



Bench
TOTAL ~~SEAM~~ THICKNESS
3.03 m

41 of 41

COAL SAMPLE DATA

SAMPLE NO. TP-1-7-92 NO. OF BAGS 1

COLLECTOR SANFILIPO COAL FIELD THAR

LATITUDE _____ LONGITUDE _____

PROVINCE _____ DISTRICT _____

DRILL HOLE TP-1 DATE SAMPLED _____

FORMATION _____ AGE _____

COAL SEAM _____ ESTIMATED RANK LIG

TOTAL SEAM THICKNESS _____ in THICKNESS SAMPLED _____ in

_____ m 1.72 m

DEPTH TO TOP OF ~~COAL~~ SAMPLE _____ ft SURFACE ELEVATION _____ ft@MSL

162.11 m _____ m

ROOF ROCK CLAYSTONE ? FLOOR ROCK COAL

SAMPLE TYPE CORE

(channel, channel/upper bench, grab, drillcore, etc.)

COMMENTS:

162.11 - 163.83

Coal was cut 11 Feb 92

Described at site as dirty + not sampled

Sampled by SanFilipo at core library 7 MAR 92

DRIED Includes muddy glauc ss p'g 163.23 - 163.58

Much of RUN appears out of place in box

In particular claystone roof.

Actually roof probably coal (not sampled) described from 161.58 - 162.78 (really 161.91 - 162.11 ?)

Form 1 of 5

DRILLING RECORD
COAL REAP

Drill hole TP-2

Topo Sheet 40 L/13

Grid ref 803082 mN 2415787 mE

Surface elev. (m) 89.6 (surveyed)

Drill rig LONG YEAR - 44

Drilling started Date 03-03-92 Time 0900 HRS
Drilling completed Date 22-03-92 1400 HRS

Drill Bit				
Surface	to	54.86	m	TRICON-ROLLERS
54.86	to	196.42	m	DIAMOND BIT HQ

Fluids used BENTONITE

Casing set Surface to 72.59 m HW

Lith logged by Choudhury Md. Anwar Asstt. Director
MOHAMMAD ALI TAGAR Assistant Director

24-3-92
1225 HRS

Geophysical logs:

	Log	From (m)	to (m)	through
JLP	NATURAL GAMMA	Surface	190.80	DRILL PIPE / CASING
	NEUTRON	"	193.[illegible]	"
XAP	NATURAL GAMMA	"	189.[illegible]	"
	GG NR	"	193.00	"
	GG ER	"	193.00	"
[illegible]	NATURAL GAMMA	"	192.80	CASING / OPEN HOLE
	NEUTRON	"	195.00	"

REMARKS:

	Log	From (m)	to (m)	through
XAP	NATURAL GAMMA	76	190.00	OPEN HOLE
	CAL	76	194.10	"
	GG NR	76	194.40	"
	GG ER	76	194.50	"
XAP	N. GAMMA	0	75	CASING
	GG NR	"	"	"
	GG ER	"	"	"

COAL REAP

Drill Hole TP-2

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
3-3-92	0900	0.0	NON-CORING DRILLING
	1000	3.05	WithTriconRollerbitstarted
	1045	6.09	
	1125	9.14	
	1220	12.19	
	1318	15.24	
	1430	18.28	
	1510	19.81	Drilling Stopped.
	1600		Pulled out rods & checked Rollerbit
4-3-92	0900	19.81	Drilling resumed.
	0955	22.86	
	1105	25.90	
	1240	28.95	
	1430	32.00	
	1540	35.05	Drilling Stopped.
5-3-92	0830		Drilling resumed
	0955	38.10	
	1040	41.14	
	1119	44.19	
	1210	47.24	
	1240	50.29	

COAL REAP

Drill Hole TP-2

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
5-3-92	1300	53.34	Drilling Continued
	1315	54.86	NON-CORING stopped.
7-3-92	0930		Lowered rods with diamond bit
	1030	57.03	and started drilling with core.
	1200	60.08	
	1245	63.13	
	1345	66.18	
	1740	69.23	Pulled out rods & changed bit
	1200		Prepared mud & Lowered rods.
	0115	72.13	Resumed drilling.
	0210	75.18	
	0245	75.48	
	0345	78.53	
	0425	81.58	
	0530	84.63	
	0730	87.53	
8-3-92	0830	90.58	
	0915	93.63	
	1000	96.68	
	1100	99.73	
	1400		Pulled out rods set up tower.

COAL REAP

Drill Hole IB-2

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
8-3-92	1500	99.73	Lowered rods up to 76.25 m
			and circulating with bit No. BE720
	2200		H.W casing up to 18.30 m
	2400		H.W casing up to 54.90 m
9-3-92	0600		Rods stucked
	1200		Try to release stucked rods
	1400		Again rods stucked.
	2200		Reaming up to 45 m
10-3-92	0600		Prepare mud & continue reaming
	1400		Reaming up to 76.25 m
	2200		Pulled out all the rods
11-3-92	0600		Lowered rods up to 91.5 m
	1050		Lowered rods up to bottom.
	1130	101.43	Drilling resumed
	1200	102.96	
	1255	106.01	
	1350	108.42	
	1530	111.47	
	1600	112.08	
	1630	113.13	
	1945	118.18	

5 5 -?

COAL REAP

Drill Hole 1-5

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
11-3-92	2100	121.23	Drilling machine
	2230	124.28	
	2315	126.11	
	0115	128.71	
	0300	131.76	
	0430	134.81	
12-3-92	0600	137.86	
	0820	139.39	
	0945	142.30	
	1020	143.83	
	1215	146.40	
	1400	149.45	
	1500	150.06	
	1745	152.20	
	1820	154.33	
	2100		Maintenance of rig machine
	2300	157.07	
	0215	160.12	
	0345	163.17	
	0600	166.22	
	0700	169.27	

COAL REAP

Drill Hole TP-2

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
12-3-92	0500	169.88	Drilling Stopped. Pull out rods up
	0600		to 125.05 m depth.
13-3-92			closed on FRIDAY
14-3-92	1300		Lowered rods & check the rig.
	1400	170.80	Drilling resumed
	1500	172.02	
	1630	174.76	
	1730	177.81	
	1745		Changed the Wale Shivel
	1815	179.35	
	1915		Break for Fasting
	2045	182.08	
	2230	185.13	
	2305	188.18	
	2400	189.72	
	0500	190.93	
	0600		Pull out rods check the bit.
15-3-92	0800		Lowered the rods with new bit
	1400		Lowered rods up to 79.30, & Washed hole
	2000		Washed hole and re-drilled
			from 79.30 to 190.93 m.

COAL REAP

Drill Hole TP-2

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
15-3-92	2300	191.23	Stopped drilling, waiting
			for instructions from USAID
			office & GSP HQ.
21-3-92	0600		Resumed working for drilling
			more 5m to check the depth rock
	1400		Lowered rods up to 91.5m and
			washed the hole. Redrilled
			from 91.5m to 191.23 m
			Pulled out rods the inner tube
			was stucked at bottom.
	1820		Lowered rods up to 129.01m
			and redrilled up to 191.23 m
	0600	194.28	Drilling resumed
22-3-92	0730		Prepared mud
	0800		clean the rod collers
	1000		Lowered the rods with water
			Circulation and redrilled from 167.7m
			to bottom.
	1100	194.89	Drilling resumed & Continued
	1400	196.42	Drilling Stopped.
			THE END

DRILL-HOLE NO TP-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
0.0	3.05	CORING			1		1.52	SAND / CLAY :- Colour grey N8 to yellowish grey 5Y 8/1 fine grained, with silt and clay, subangular to subrounded grains contains biotite black particles.
	3.05				2		1.53	SAND / CLAY :- Colour 5Y 8/1 fine grained, sub-angular to subrounded grains contains few grains of biotite
3.05	3.04	CORE			3		1.57	SAND / SILT :- very light grey N8 to yellowish grey 5Y very fine grained with silt and clay, sub-angular to sub-rounded grains contains Quartz and biotite.
	6.09				4		1.52	SAND / SILT :- Colour Pinkish grey 5YR 8/1 to yellowish grey 5Y 8/1 very fine grained to fine grained, sub-angular to sub-rounded, contains Quartz and biotite with siltstone hard pieces mixed with clay
6.09	3.05	NON			7		1.53	SAND / SILT :- Pinkish grey 5YR 8/1 to yellowish grey 5Y 8/1 very fine grained to fine grained, subangular to subrounded, contains quartz biotite and epidote (Pistachio colour) mixed with silt and clay.
	9.14				8		1.52	SAND / SILT :- Pinkish grey 5YR 8/1 to yellowish grey 5Y 8/1, fine grained, sub-angular to sub-rounded, contains quartz, biotite glauconite.
9.14					10		1.52	SAND / CLAY :- Pinkish gray, 5YR 8/1, very fine grains to fine grained, subangular to sub-rounded, poorly sorted, contains quartz biotite with clay

DRILL-HOLE. NO TP-2

FROM	TO	CORE	CORE%	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	12.19				11, 12		1.53	SAND/CLAY:- very light gray N8 to pinkish grey 5YR 8/1, fine grained, loose, poorly sorted, sub-angular to sub-rounded. Contains quartz, biotite and few sandy chips.
12.19	3.05	G			13		1.52	SAND/SILT:- pinkish grey 5YR 8/1, very fine grained, sub-rounded, contains quartz, biotite, poorly sorted and sandy chips.
	15.24	N I R			14, 15		1.53	SANDSTONE/SILT:- Pinkish grey 5YR 8/1 to very light grey N8, fine grained, silty, clayey, sticky, sub-rounded grains, contains quartz and biotite.
15.24		O C			16		1.52	SANDSTONE/SILT:- Pinkish grey 5YR 8/1 to very light grey N8 very fined grained, compact, clayey subrounded contains quartz, biotite epidote (pistachio colour).
	3.04 / 18.28	I N C			17, 18		1.52	SILT STONE/SAND STONE:- yellowish grey 5Y 8/1 very fine grained subrounded, loose, with pieces of hard sandstone contains quartz and biotite.
18.28	1.53 / 19.81	N			19		1.53	SAND/SILT:- yellowish grey 5Y 8/1 very fine to fine grained, subangular to sub-rounded pieces of sandstone, compact, contains quartz, biotite.
19.81					20, 1			

DRILL-HOLE NO TP-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	3.05	NGI			21		1.52	SAND STONE:- Pinkish grey 5YR 8/1 to yellowish grey 5Y 8/1, fine grained, subrounded, poorly sorted, contains quartz, biotite and spotted by dirty white material, pieces of hard sandstone.
	22.86				22		1.53	SAND STONE:- yellowish grey 5Y 8/1, fine grained subrounded, pieces of hard sandstone contains quartz, biotite, slightly clayey.
22.86	3.04	CORE			23		1.52	SAND STONE:- yellowish grey 5Y 8/1, fine grained subrounded pieces of hard sandstone contains quartz, biotite, poorly sorted.
	25.90				24 25		1.52	SAND STONE:- yellowish grey 5Y 8/1 fine grained subrounded, pieces of hard sand stone, contains quartz, biotite and clayey.
25.90	3.05	NO			26 27		1.53	SAND STONE:- yellowish grey 5Y 8/1 fine grained, sub-angular to subrounded, pieces of hard sand stone, well sorted, contains quartz, biotite.
	28.95	NO			28		1.52	SAND STONE:- yellowish grey 5Y 8/1 very fine to fine grained, subrounded, poorly sorted clayey, contains quartz and biotite
28.95	3.05				29 30 1		1.53	SAND STONE:- yellowish grey 5Y 8/1, fine to medium grained, sub angular subrounded, hard compact, well sorted, contains Quartz, biotite.

DRILL-HOLE NO TP-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	32.0	NO CORE			31		1.52	SAND STONE :- yellowish grey 5Y 8/1 very fine to fine grained, sub-rounded, loose, sticky, contains quartz, biotite and glauconite.
32.0	35.05	NO CORE			32 33 34 35		1.52 1.53	SAND STONE :- yellowish grey 5Y 8/1 fine grained, sub-rounded, loose, clayey, contains quartz, biotite. SAND STONE :- yellowish grey 5Y 8/1, very fine to fine grained, subrounded, compact contains quartz, biotite, glauconite.
35.05	38.10	NO CORE			36 37 38		1.52 1.53	SAND STONE :- yellowish grey 5Y 8/1, very fine grained subrounded grains, clayey, contains quartz, biotite. SAND STONE :- yellowish grey 5Y 8/1 very fine to fine grained, sub-angular to subrounded with hard chips of sand stone, silty contains quartz, biotite and glauconite.
38.10	3.4				39 40 1		1.52	SAND STONE :- yellowish grey 5Y 8/1 fine grained sub rounded, chips of sand stone, contains quartz, biotite and glauconite.

Form 3a 12 5/22

DRILL-HOLE NO TP-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	41.14				41		1.52	SAND STONE:- yellowish grey 5Y 8/1, very fine grained subrounded, chips of sand stone, contains quarts, biotite and glauconite.
41.14					42		1.53	SAND STONE:- yellowish grey 5Y 8/1 very fine to fine grained, soft, loose. Contains biotite, quarts, glauconite.
	3.05		NIL CORE		43		1.52	SAND STONE:- yellowish grey 5Y 8/1 very fine grained to fine grained, subangular to subrounded, contains quarts, biotite.
	44.19				44			
44.19					45		1.53	SAND STONE:- yellowish grey 5Y 8/1, fine grained subrounded, contains quarts, biotite glauconite, chlorite.
	3.05		NIL CORE		46		1.52	SAND STONE yellowish grey 5Y 8/1 to very light grey N8, sub-rounded, soft, loose, ill sorted, contains quarts, biotite and glauconite.
	47.24				47			
47.24			NIL CORE		48		1.52	SAND STONE:- yellowish grey 5Y 8/1 to Pinkish grey 5YR 8/1, fine grained, subrounded Poorly sorted, Contains quarts biotite, chlorite, glauconite.
	3.05				49		1.53	SAND STONE:- yellowish grey 5Y 8/1 to Pinkish grey 5YR 8/1 fine grained, sub-rounded loose & soft, contains quarts, biotite glauconite.
					50			
					1			

Form 3a 13/7/28

DRILL-HOLE NO TP-2

CORE RECOVERY FROM	TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	50.29							
50.29	3.05	CORING			51		1.52	SAND STONE yellowish grey 5Y 8/1 to Pinkish grey 5YR 8/1, fine grained, sub-rounded grain, Contains quarts, biotite, glauconite.
	53.34				52		1.53	SAND STONE yellowish grey 5Y 8/1 sub-rounded contain quarts, biotite, loose Soft fine grained Sand.
53.34	1.52	NON-			53			
	54.86				54		1.52	SAND STONE yellowish grey 5Y 8/1 fine grained Sub-rounded, loose, soft, Contains quarts, biotite, glauconite.
54.86	2.17	NIL			55			CORE Loss Probably Sandstone Collect-The Sample of loose Sand Coming with mud. Sand yellowish grey 5Y 8/1 very fine grained contains quarts, biotite.
	57.03				56		2.17	
57.03	3.05	NIL			57			CORE LOSS Probably Sandstone Collect-The Sand Sample from the cutting Coming with mud. Sand, Pinkish grey 5YR 8/1 fine-grained, sub rounded grains Poorly Sorted, Contains quarts, biotite.
					58		3.05	
					59			
					60			

57

DRILL-HOLE NO TP-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
60.08					61		2.37	SAND STONE- yellowish grey 5Y 8/1 fine grained sub-rounded grains, Poorly sorted, loose, clayey, contains Quartz, biotite, glauconite.
	63.13	0.73	24%		62		0.73	
63.13					63			
	66.18	3.05	100%		64		3.05	SAND STONE yellowish grey 5Y 8/1 to pinkish grey 5YR 8/1 fine grained, sub-rounded, contains quartz, biotite, Poorly sorted clayey, soft.
66.18					65			
	69.23	0.76	25%		66			CORE LOSS Probably Sandstone
					67		2.29	SAND STONE yellowish grey 5Y 8/1, fine grained subrounded grains, contains quartz biotite, chlorite, loose, Poorly sorted, hard in lower portion.
					68			
					69		0.76	
69.23								CORE LOSS Probably Sandstone
					70			

DRILL-HOLE NO TP-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	2.90	0.45	15%		71		2.45	SAND STONE:- yellowish grey 5Y 8/1 to pinkish grey 5YR 8/1, fine grained, sub rounded, contains quartz, biotite, chlorite, compact, clayey.
	72.13				72		0.45	SAND STONE:- Grayish orange 10YR 7/4 to pale yellowish orange 10YR 8/6 fine to medium grained sub rounded, with 0.2 to 0.5 m thick hard, compact sand stone at places, contains quartz, biotite glauconite with 0.15 m sand stone. pinkish grey 5YR 8/1, hard at bottom
72.13							0.98	
	3.05	3.05	100%		73		0.91	SAND STONE:- pinkish grey 5YR 8/1 to greyish orange 10YR 7/4, medium grained, granular at places, loose. contains quartz & biotite
					74		0.26	
	75.18				75		0.90	Conglomerate:- very pale orange 10YR 8/7 to greyish orange 10YR 7/4 consists of pebbles of Limestone, clay stone, Quartz and other clastic material, loosely cemented, matrix is silty, Pebbles are mostly calcareous.
75.18	0.30 75.48	0.30	100%				0.30	SAND STONE:- Greyish orange 10YR 7/4 with Calcareous hard pieces at Places, fine to medium grained sub rounded, loose, soft. Contains quartz biotite, siddrite at the bottom. The sand stone is oxydized.
75.48					76		0.80	
							0.30	CONGLOMERATE:- Greyish orange 10YR 7/4 Consists of Pebbles ranging in size from 1Cm to 3Cm, composed of Limestone, Clay stone, granules of Quartz, matrix is silty, loosely cemented, Cemented Calcareous at top of conglomerate has gradational while the bottom has sharp contact with sand stone.
	3.05	3.05	100%		77		1.95	
	78.53				78			SANDSTONE:- Greyish orange 10YR 7/4 medium to coarse grain, granular, sub rounded to sub rounded, at Places 1Cm to 4Cm clastic material, Calcareous, Contains quartz biotite, glauconite, clay pebbles, thin sand looks to be fluvial in
78.53								CONGLOMERATE:- yellowish grey 5Y 8/1 Consists of Pebbles and granules of Limestone, clay stone, quartz. matrix silty, Calcareous Pebbles Loosely Cemented.
	3.05	3.05	100%		79		3.05	SANDSTONE:- yellowish grey 5Y 7/2 to greyish orange 10YR 7/4 medium to coarse grained, granular at places, gritty, sub-rounded to sub angular quartz grains, loose calcareous, argillaceous contains quartz, biotite.
					80			

Form 3a

16 5 27

DRILL-HOLE NO TP-2

CORE RECOVERY FROM	TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	81.58				81			SAND STONE:- Yellowish grey 5Y 7/2 medium to coarse grained, subrounded with hard sand stone pieces ranging in size from 0.2cm to 0.5cm thick, loose, contains quartz, biotite glauconite, Quartz 70%
81.58								SAND STONE:- Yellowish grey 5Y 7/1 medium grained Subrounded contains quartz, biotite, siddrite, Loose, Poorly sorted.
	3.05	3.05	100%		82		1.90	CLAY STONE:- Greyish orange Pink 5YR 7/2 to greyish orange 10YR 7/4 contains quartz biotite, siddrite, clay concretion are calcareous, poorly sorted.
					83		0.35	CONGLOMERATE:- Pale yellowish brown 10YR 6/2 consists of pebbles ranging in size from 2cm to 3cm Limestone, clay stone, Quartz, matrix is calcareous, Poorly sorted.
							0.20	
	84.63				84		0.30	
84.63							0.30	BRECCIATED CONGLOMERATE:- Greyish yellow 5Y 8/4 Consists of limestone, clay stone pebbles, Quartz granules, calcareous conglomeratic and breccicted top white it has the sharp contact with the clay stone.
	2.90	2.90	100%		85		1.40	
					86			CLAY STONE:- Greyish orange Pink 5YR 7/2 fine to medium grained sand, loose, Soft and also lateritic.
	87.53				87		1.50	CLAY STONE:- Same as in above unit No. 30 light bluish grey MnO_2, lateritic, Concretions are not transported
87.53								MUD STONE:- Variegated Colour, yellowish grey 5Y 7/2 to greyish orange Pink 10R 8/2 hard compact at places, Calcareous iron oxides.
	3.05	3.05	100%		88		1.00	MUD STONE:- Same as in unit No. 31
					89		2.05	SAND STONE:- Pale yellowish brown 10YR 6/2 medium grained, sub-rounded, contains quartz, biotite, siddrite, at places it is silty, loose, Poorly Sorted, It looks to be fluvial.
					90			

Form 3a

17 5 22

DRILL-HOLE NO TP-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	90.58							SAND STONE:- Same as unit 32.
90.58	93.63	3.05	100%		91 92 93		3.05	SAND STONE:- Colour yellowish grey 5Y 7/2 to light olive grey 5Y 6/1, medium grained, at places granular, sub rounded grains contains Quartz, biotite, oxidized, calcareous clots at places. While at bottom it is silty.
93.63	96.68	3.05	100%		94 95 96		1.50 1.55	SAND STONE:- yellowish grey 5Y 7/2 to light olive grey 5Y 6/1, fine to medium grained, sub-rounded, contains quarts, biotite, oxidized at places, spotted by light grey N7 material, calcareous, silty at occasional places.
96.68	99.73	3.05	100%		97 98 99		3.05	SAND STONE:- Light olive grey 5Y 5/2, medium grained, sub-rounded, contains quarts, biotite chlorite, black color iron oxide, hard pieces ranging from 1cm to 4cm at places.
99.73					100		0.55	CORE LOSS probable of Sandstone

DRILL-HOLE NO TP-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	101.43				101		NS	SAND STONE :- Same as in unit 35
101.43	1.53	0.30	19%		102		0.30	SAND STONE :- Same as in unit 35
	102.96						1.23	CORE LOSS Probably in Sandstone
102.96					103			CORE LOSS Probably in Sandstone
	3.05	0.96	31%		104		2.09	SAND STONE :- yellowish grey 5Y 6/4 to dusky yellow 5Y 5/4, medium grained, very loose, soft, clayey, Contains Quartz biotite, Quartz oxidized.
	106.01				105		0.96	
106.01					106		0.175	SAND STONE :- Light olive brown 5Y 6/6 fine to medium grained, subrounded grains, Contains Quartz, biotite, chlorite very loose, Soft, Poorly sorted
	2.41	0.175	31%		107		1.66	CORE LOSS Probably in Sandstone
	108.42				108			
108.42								CORE LOSS Probably in Sandstone
	3.05	0.85	27%		109		2.20	
					110			

DRILL-HOLE NO T P-2

CORE RECOVERY FROM	TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	111.47				111		0.85	SAND STONE:- Light olive brown 5Y 5/6 to dusky yellow 5Y 6/4, medium to coarse grained, subrounded to subangular, contains quartz, biotite oxidized, slightly calcareous, the lower portion is hard, gritty.
111.47	0.61 / 112.08	0.16	26%				0.16	SAND STONE:- Same as in unit-40
					112		0.45	CORELOSS Probable in Sandstone
112.08					113		1.10	CORE LOSS Probable in Sandstone
	3.05	1.95	63%		114		1.95	SAND STONE:- Light olive brown 5Y 5/5 to dusky yellow 5Y 6/4, medium grained, sub-rounded grains, contain quartz, biotite, siderite, loose, soft, poorly sorted, lateritic.
	115.13				115			
115.13					116		1.37	SAND STONE:- Same as in unit-42
	3.05	1.37	45%		117		1.68	CORELOSS Probably in sand stone
	118.18				118			SAND STONE:- Dark yellowish orange 10YR 6/6 to dusky yellow 5Y.. medium grained, hard, contains quartz, biotite, pebbly ranging from 1 cm to 3 cm, smoky quartz in the lower portion.
118.18							0.60	
	3.05	3.05	100%		119		0.35	CONGLOMERATIC SANDSTONE Dusky yellow 5Y 6/4, gritty, hard, compact, contains calcareous [illegible] at places.
					120		2.10	SAND STONE:- Light olive grey 5Y 6/1 to dusky yellow 5Y 6/4 very [illegible], [illegible] [illegible]
					1			

DRILL-HOLE NO TP-2

CORE RECOVERY FROM	TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	121.23				121			medium grained, sub-rounded contains quartz, biotite, glauconite
121.23	3.05	2.20	72%		122, 123		2.24	SAND STONE :- Same as in unit-44
	124.28				124		0.85	CORE LOSS Probably in Sandstone
124.28	1.83	0.40	21%		125		1.43	CORE LOSS Probably in Sand Stone
							0.40	SAND STONE :- Same as in unit-44
	126.11				126		0.65	CONGLOMERATE :- Light olive grey 5Y6/1 to dusky yellow 5Y 6/4, consists of pebbles of Limestone, Clay stone, Quartz, Calcareous cement, gritty, sandy loosely cemented.
126.11	2.60	2.45	94%		127, 128		1.80	SAND STONE :- Light olive grey 5Y6/1 fine to medium grained, sub-rounded, contains quartz, biotite, glauconite, [illegible]
	128.71						0.15	CORE LOSS Probably of Sandstone
128.7[illegible]	3.05	3.05	100%		129, 130		3.05	SAND STONE :- Same as in unit-47 Also micaceous at places

DRILL-HOLE NO TP-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	131.76				131			SAND STONE:- Light olive gray 5Y 6/1 to greyish orange 10YR 7/4, fine grained, sub-rounded, poorly sorted, clayey, micaceous.
131.76					132		1.04	
	3.05	3.05	100%		133			CLAY STONE:- Pale red 10R 6/2 light olive gray 5Y 5/2, compact, sandy, lateritic, oxidized
	134.81				134		2.01	CORE LOSS Probably of Clay stone.
134.81					135		0.97	CLAY STONE:- Pale red 10R 6/2, pale red purple 5RP 6/2, mottled, slicken sided, compact, contains clay concretions, lateritic.
	3.05	2.08	68%		136			
	137.86				137		2.08	
137.86					138			CLAY STONE:- Greenish grey 5GY 6/1 to pale red 10R 5/2, sticky, slickensided, hard in the lower portion. Some root plant at places.
	1.39	1.39	100%		139		1.39	
	139.25							
139.25					140		0.61	SILT STONE:- Light olive gray 5Y 6/1, pale red 10R 5/2, clayey, [illegible]

Form 3a 22.5.27

DRILL-HOLE NO TP-2

CORE RECOVERY FROM	TO	CORE	CORE%	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	3.05	2.60	85%		141		1.65	CLAY STONE :- Pale red 5R 6/2 to pale yellowish brown 10YR 6/2, silty, compact, slickensided, loose, lateritic.
							0.34	CLAY Greenish grey 5G 6/1 and pale red 5R 6/2, hard, compact, sticky.
	142.30				142		0.45	CORE LOSS
142.30	1.53	1.13	73%		143		1.13	CLAY STONE :- Grayish orange pink 5YR 7/2, sticky, slickensided, compact, pisolitic, weathered.
	143.83						0.40	CORE LOSS Probably in Clay Stone
143.83	2.57	2.57	100%		144			CLAY STONE :- Mottled, moderate yellowish brown 10R 4/6 to dark yellowish orange 10YR 6/6 and greenish gray 5GY 6/1, slickensided, argillized.
					145		2.57	
	146.40				146			
146.40	3.05	3.05	100%		147			CLAY STONE :- Same as in unit-5
					148		3.05	CLAY STONE :- Moderate yellowish brown 10R 4/6 to greenish gray 5GY 6/1 and dusky yellow, Some plant remains, compact clayey.
	149.45				149			
149.45	0.61	0.45	73%				0.40	
					150		0.16	SHALE :- Medium dark gray NG, laminated Carbonaceous, coal pieces, resinous, Pyrite grains, moderate to low,
								CORE LOSS Probably in Shale

Form 3a 23 of 28

DRILL-HOLE NO TP-2

CORE RECOVERY FROM	TO	CORE	CORE%	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
150.06	150.06							
							0.50	SHALE :- Moderate dark gray N_4 to dark gray N_3, carbonaceous, compact, leave prints, broken shell fragments, pyrite grains at places, sandy vein at places, carbonaceous matter in the upper part very close to coal, more coaly
					151		0.44	
	2.14	2.00	93%				1.06	
	152.20				152		0.14	SHALE :- Medium light-gray N_6 to Greenish grey 5 GY 6/1, friable, leave prints broken shell fragments, sand in the lower part
152.20								
					153		1.83	SILTSTONE :- Greenish grey 5GY 6/1 to light olive gray 5 Y 6/1, fine grained, shell fragments, hard and compact.
	2.13	0.30	14%					CORE LOSS Probably in silt-stone.
	154.33				154		0.30	CORE LOSS Probably in silt stone
154.33								CLAY STONE :-
					155			Varigated Colour, greenish 5 G 6/1, fractured, oxidized, lateritic, weathered.
	2.74	2.74	100%				2.74	CLAY STONE :- Moderate brown 5 Y R 4/4, greenish grey 5 G 6/1, dusky yellow 5 Y 6/1, mottly clayey, slicken-sided, oxidized hard pieces at places, slightly calcareous
	157.07				156			
157.07								CLAY STONE :- Varigated Colour range from greenish grey 5 G Y 6/1, light-bluish gray 5 B 7/1 and light-brown 5 Y R 6/4 very sticky, argillized, sandy in the lower part. While at the bottom silt and clay grades in to
					157			
	3.05	3.05	100%				3.05	
					158			
					159			
					160			

DRILL-HOLE NO TP-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
160.12	160.42							
	3.05	2.90	95%		161			SAND STONE:- Moderate yellow 5Y 7/3, dusky yellow 5Y 6/1, more sandy, very fine grained, subrounded grains, silty and slickensided.
					162		2.90	CORE Loss Probably in Sand Stone
								CORE Loss Probably in Sand Stone.
	163.17				163		0.15	SAND STONE:- Moderate yellow 5Y 7/3 dusky yellow 5Y 6/1, more Sandy, very fine grained subrounded grains, silty and slickensided.
163.17							0.15	
	3.05	2.90	95%		164			
					165		2.90	
	166.22				166			
166.22								SAND STONE:- Same as in unit-6 laterite in the lower portion.
	2.44	1.80	73%		167		1.80	CORE LOSS Probably in Sandstone
	168.66				168		0.64	
168.66							0.30	CORE Loss Probably in Sand Stone.
	1.22	0.92	75%		169		0.92	MUD STONE:- Moderate yellow 5Y 7/3 to dusky yellow 5Y 6/1, very fine grained Sand, Sticky, Contains Quartz, biotite.
169.88	169.82				170			

DRILL-HOLE NO TP-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	170.80						0.70	MUD STONE:- very light grey N8 to Pale red Purple 5RP 6/2, very fine grained Sand, Contains Quartz, biotite.
170.80							0.22	CORE LOSS Probably in Muds Stone
	172.02	1.22	1.22	100%	171		1.22	CLAY STONE:- very light-grey N8 to grayish red 10R 4/2, Sticky, argillized Sandy nodules, lateritic, oxidized, Pyritic.
172.02					172			
	174.76	2.74	2.74	100%	173		2.74	CLAY STONE:- Moderate brown 5YR 4/4, greenish brown and medium light grey N6 in argillized portion, oxidized, sticky, Lateritic.
174.76					174			
	177.81	3.05	2.90	95%	175		2.90	CLAY STONE:- Light bluish grey 5B 7/1 to light-grey N7, hard Sandy nodules at Places and at Places lateritic, oxidized, Pyritized.
	179.81				176			
					177		0.15	CORE LOSS Probably in Clay Stone
177.81					178			CLAY STONE:- Light bluish grey 5B 7/1 to light grey N7, hard Sandy nodules at Places and at Places lateritic, oxidized and Pyritized.
	179.33	1.54	1.54	100%	179		1.54	
179.33					180			

DRILL-HOLE NO TP-2

CORE RECOVERY FROM	TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	2.73	2.50	91%		181		2.50	CLAY STONE:- Light bluish gray 5B 7/1 to light gray N7, hard sandy nodules at places and at places lateritic, oxidized, pyritized.
	182.08				182		0.23	CORE LOSS probably of clay stone
182.08	3.05	3.05	100%		183, 184		2.37	CLAY STONE:- Moderate reddish brown 10R 4/6, very light gray N8, soft, sticky, quartz nodules at places, oxidized, lateritic, coarse grained quartz.
	185.13				185		0.68	Granite:- 184.45m Pale reddish brown 10R 5/4 very loose, coarse grained quartz, feldspar, highly altered, kaolinized granite, quartz granules.
185.13	3.05	3.05	100%		186, 187, 188		3.05	Kaolinized Granite:- Pale reddish brown 10R 5/4, dusky yellow 5Y 6/4 and very light gray N8, highly altered, kaolinized, quartz in the form of granules, pyritized, siderite.
	188.18						0.19	CORE LOSS probably of granite.
188.18	1.54	1.35	87%		189		0.62	Granite:- Same as of unit-72
	189.72						0.73	Granite:- Medium light gray N6, very hard, subangular quartz, contains mostly quartz, orthoclase, hornblende, biotite, chlorite and other ferromagnesian minerals, [illegible] the granules.
189.72					190			

DRILL-HOLE NO TP-2

CORE RECOVERY FROM	TO	CORE	CORE%	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	1.21	1.15	95%				1.15	Granite :- Same as in unit-73
	190.93						0.08	CORE Loss Probably of Granite.
190.93	0.30	0.30	100%		191		0.30	
	191.23							Granite :- Same as in unit_73
191.23								Granite :- Medium light-gray N6, medium to coarse grained, hard, contains quartz, biotite, hornblende, chlorite, orthoclase, feldspar, altered feldspar, pyrite grains, slikensided, along fractures oxidized at and in the lower most portion, Kaolinized.
	3.05	2.55	83%		192		2.55	
					193			
	194.28				194		0.50	CORE Loss Probably of granite
194.28							0.31	
	0.61	0.30	49%				0.30	CORE Loss Probably of granite.
	194.89							
194.89					195		0.63	Granite :- Light-gray N7, fractured, Kaolinized, medium to coarse grained, contains quartz, hornblend, biotite, orthoclase, feldspar oxidized along fractures.
	1.53	0.90	58%				0.15	CORE Loss Probably of granite.
	196.42				196		0.75	Granite :- medium light-gray N6, medium to coarse grained, mostly fractured, Kaolinized, contains Quartz, biotite, hornblend, orthoclase and other ferromagnesium minerals.
196.42								Granite :- Medium light-gray N7 medium to coarse grained, contains quartz 7%, biotite, hornblend, orthoclase, chlorite, quartz granule.
					197			
					198			
					199			
					200			
					1			

THE END Total Depth - 196.42m.

COALREAP
Coal Intercepts

Form 4 of 5
Rev Apr 90

Drill hole TP-2 Collar elevation

Bed Name	Description	Depth From	Depth To	Thickness	Info Source	%Dry Ash	Sample No.
	NO COAL =						
	probably eroded						

1042

Form 1 of 5

DRILLING RECORD
COAL REAP

Drill hole TP-3

Topo Sheet 40 L/5

Grid ref 781018 m N 2376377 mE

Surface elev. (m) 73.7 (surveyed)

Drill rig LONG YEAR-44

Drilling started Date 21-04-92 Time 0830 HRS
Drilling completed Date 18-05-92 2130 HRS

Drill Bit				
	Surface to	22.70	m	TRICONE ROLLER
	22.70 to	209.57	m	DIAMOND HQ
	------- to	----------	m	----------
	------- to	----------	m	----------
	------- to	----------	m	----------
	------- to	----------	m	----------
	------- to	----------	m	----------

Fluids used BENTONITE

Casing set				
	Surface to	NIL	m	----------
	------- to	----------	m	----------
	------- to	----------	m	----------

Lith logged by MOHAMMAD ALI TAGAR ASSISTANT DIRECTOR
MOHAMMAD AMINEN ASSISTANT DIRECTOR
GHULAM SARWAR LACHARI AID

Geophysical logs:

XAP	NGAM	From	SURFACE m	to	18.40 m	through	DRILL PIPE
	GGNR		" m		184.90 m		" "
	GGER		" m		164.80 m		" "
JLP	NGAM		" m		179.80 m		" "
	NLN		" m		182.00 m		" "
JLP	NGAM		" m		166.00 m		OPEN HOLE
	NN		"		165.20 m		" "
	~~REMARKS~~:						
	NGAM		"		160.80 m		" "
XAP	CAL		"		163.90 m		" "
	GGNL		"		164.30 m		" "
	GGER		"		164.20 m		" "

REMARKS: HOLE WAS E-LOGGED BEFORE REACHING TD DUE TO SEVERE WATER LOS THREATENING HOLE STABILITY; AFTER RESUMING DRILLING, BASEMENT WAS REACHED AT SHALLOWER DEPTH THAN ANTICIPATED AND HOLE WAS NOT RELOGGED TO TD.

COAL REAP

Drill Hole T. P-3

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
21-04-92	0830	0.0 m	Drilling Non-Coring Started
	0920	1.52	Drilling continued with
	1120	4.57	tricon roller bit.
	1250	7.62	
	1400	10.66	
	1505	13.71	
	1620	16.76	
	1715	19.81	
	1800	22.70	Drilling stopped. After second Shift.
	1900		Pulled out rods, filled the
			hole with mud.
22-04-92	0600	22.70	Arrangement made to start
			drilling with H/Q core barrel,
			attached Diamond bit.
			Lowered H.Q rods with Diamond bit
			up to 16.76 and redrilled upto 22.7m
	0900	22.70	Drilling Coring with Diamond
	0930	23.46	bit started and continued.
	1100	26.51	
	1200	29.56	Complete Core loss of 3.05m
	1330	32.61 m	84% Core Loss (Core loss 2.55m)

COAL REAP

Drill Hole TP-3

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
22-04-92	1445	35.66m	Drilling Coring Continued
	1600	38.70	in second Shift
	1645	41.75	
	1730	44.80	
	1815	46.32	
	1845	47.85	
	1930	50.90	
	2000	53.94	Drilling Stopped, no third shift
	2100		Pulled out all rod from hole.
23-04-92	0600		Drilling resumed in 1st shift
	1000		Red rilled from 39.62 to 53.94m
	1110	56.99	Drilling Continued
	1220	60.04	
	1350	63.09	
	1515	66.14	
	1630	69.18	
	1800	71.47	
	1945	74.52	
	2100	75.28m	Drilling stopped, no third shift
	2200		Pulled out all the rods
			from hole.

COAL REAP

Drill Hole TP-3

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
24-04-92	-------	75.28 m	Maintanaince of rig +
----------	-------	-------	Prepared 10 bags of mud.
25-04-92	0500	-------	Resumed drilling activities.
----------	0900	-------	Jetting of mud, clean Pits
----------	1000	-------	Lowered the rods up to 33.52
----------	-------	-------	and redrilled up to 39.62 m
----------	1300	-------	Drilling stopped due to mud
----------	-------	-------	Pump out of order.
----------	1400	-------	Redrilled up to 58.82 m
----------	1600	-------	Redrilled up to 75.28 m
----------	1800	77.57 m	Drilling resumed
----------	2200	-------	Cable wire line broken,
----------	-------	-------	Pulled out all the rods.
----------	2300	-------	Prepared Bentonite mud,
----------	-------	-------	CMC 1 Kg, 80-51 A ½ Kg.
----------	0030	-------	Set the Core barrel.
----------	-------	-------	Lowered rods up to 45.72 m
----------	-------	-------	Redrilled up to 77.57 m
----------	0130	80.61	Drilling resumed and
----------	-------	-------	Continued in third shift.
----------	0230	83.66	----------

COAL REAP

Drill Hole TP-3

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
25-04-92	0330	85.71	Drilling continued in third
	0430	87.47	Shift.
	0630	90.52	
26-04-92	0715	93.57	Drilling continued in 1st Shift
	0830	96.62	
	0930	99.66	
	1030	102.71	
	1130	105.76	
	1230	108.81	
	1330	111.86	
	1400	114.90	Pulled out 12.19 m rods due to mud
	1650	117.95	caller in the rods.
	1800	121.00	
	1930	124.05	
	2030	127.10	Complete Core Loss of 3.05 m
	2200	130.15	46% Core recovery
	2330	133.20	Core dropped, changed core lifters
	0030	134.42	Pulled out tube to check core recovery
	0140	136.25	Coal seam 0.20 m at Depth 134.87
	0245	138.25	1st Coal 137.06 to 137.40 (0.34) TR3-1
			As driller not informed on proper time and pull out core from inner tube at 0600 HRS dated 27-4-92 [illegible] sorption test con [illegible] on Coal Sam

6 of 42

COAL REAP

Drill Hole T.P-3

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
27-04-92	1030	140.49	Drilling Stopped due to 100% mud loss.
	1200		filled out all rods.
02-05-92	0700		Jetted mud & Prepared 3 bags mud.
	1330		Lowered rods C/B up to 39.62m
			By water circulation and
			rotation up to 81.53 m
	2200		Redrilled from 81.53 to 135.33m
	0100		Redrilled from 135.33 to 140.49m
	0310	142.34	Drilling resumed after
			reaching at bottom.
03-05-92	0910	144.78	very slow drilling due to
			sticky clay slime
	1210	147.82	COAL TP-3-2A & 2B/92
	1425	150.87	COAL TP-3-2C to 2F/92
	1623	153.92	COAL TP-3-2G to 2J/92
	1842	156.97	COAL TP-3-2K to 2M/92
	2030	160.02	COAL TP-3-2N to 2Q/92
	2220	163.07	COAL TP-3-2R to 2T/92
	0005	166.11	COAL TP-3-2U to 2X/92
	0200	169.21	COAL TP-3-2Y to 2Z2/92

COAL REAP

Drill Hole TP-3

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
03-05-92	0330	172.26	COAL TP-3-2AA to 2AD/92
	0530	175.30	COAL TP-3-2AE to 2AG/92
	0600	178.30	CLAY STONE & SAND STONE
04-05-92	1400	-------	Pulled out rods due Water.
	2200	-------	Water tanker Under repair.
05-05-92	1400	-------	Waited for Water
	1830	-------	Redrilling from 173.73 to 178.30 m
	1915	181.35	Drilling resumed C.L 2.60m
	2000	184.40	Complete Core Loss 3.05m
	2045	187.45	CORE Loss 2.95 m at top
	2130	190.50	Good Core recovery
	2215	193.54	Complete Core Loss 3.04 m
	2245	194.94	Complete core Loss 1.40 m
06-05-92	-------	-------	Drilling Stopped due to Water loss
	-------	-------	Drilling Stopped for mud chemicals
07-05-92	-------	-------	ERTIAN
08-05-92	-------	-------	Prepared mud. DRILLING STOPPED
09-05-92	-------	-------	Jetted mud set-No. C/B
10-05-92	0600	-------	Lowered rods upto 39.62m
	0800	-------	Redrilled upto 48.76m
	0930	-------	

COAL REAP

Drill Hole TP-3

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
10-05-92	1400		Redrilled up to 142.57 m
	1600		Pull out rods due to
			shortage of Water
11-05-92			Waited for Water
12-05-92	0600		Lowered rods up to 39.62 m
	1400		Redrilled up to 63.09 m
	2200		Redrilled up to 191.28
	2305		Handed over to logger for
			Probe Through Drill Pipe
13-05-92	0135		Pull out rods for open hole
	0537		Started open hole Probe
	0700		Probe Completed.
14-05-92			Waited for Water
15-05-92			Waited for Water
16-05-92	0600		Lowered rods up to 64.00
	1400		Redrilled upto 182.88 m
	1800		Redrilled up to 194.94 m
	1830	194.94	DRILLING RESUMED
	2040	197.20	Drilling Continued.
	2330	200.25	COAL TP-3-3-42 197.25 - 198.35(1.
	0130	203.30	Complete CORE Loss

COAL REAP

Drill Hole IP-3

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
16-05-92	0530	203.30	Pump Down on order. Work closed.
17-05-92	0600		Lowered rods.
	1200		Redrilled up to 182.88 m
	1400		Washed hole up to Bottom.
	1900		Redrilled from 202.69 to 203.30m
			Mud loss 100%. Pulled out
			rods 12.19 m and lowered down.
	1915		Resumed drilling.
	2100	206.35	Granite appear at 204.20m
	2200	206.80	
18-05-92	0130	207.11	
	2130	209.57	Pull out rods.
	2300		HOLE COMPLETED.

DRILL-HOLE NO TP-3

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
0.0	1.52	GRAB			1		1.52	SAND / SILT yellowish grey 5Y 7/2, fine to medium grained, sub angular to sub-rounded Contains quartz, biotite, chlorite epidote.
1.52	4.57	CORING			2 3 4		3.05	SAND / SILT Same as unit no. 1
4.57	7.62	CORE-1			5 6 7		3.05	SAND / SILT Pinkish grey 5Y 8/1, fine to medium grained, sub-angular to sub-rounded, Contains Quartz, biotite, chlorite, clayey with Sandy chips.
7.62		NON CORING			8 9 10 1		3.04	SAND / CLAY Pinkish grey 5Y 8/1, fine to medium grained, sub-angular to sub-rounded grains, contains Quartz, biotite chlorite, epidote with sticky clay at places.

DRILL-HOLE NO TP-3

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	10.66							
10.66	13.71	GRAB CORE - NONE			11 12 13		3.05	SAND yellowish gray 5Y 7/2 fine to medium grained, sub-rounded grains contains Quartz, biotite with greenish specks and hard sandy chips.
13.71	16.76				14 15 16		3.05	SAND Pinkish grey 5Y 7/2, fine to medium grained, subrounded, grains, contains Quartz, biotite few hard pieces of sandy chip clayey.
16.76	19.81				17 18 19		3.05	SAND Same as above unit-
19.81					20			

DRILL-HOLE NO TP-3

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	22.70	NON-CORING			21		2.89	SAND:- Pinkish grey 5Y 7/2 fine to medium grained, sub-rounded, contain Quartz, biotite and hard chips of sand stone
22.70m NON-CORING	22.70				22			
22.70	23.46	0.76	0.35	46%	23		0.41	CORE LOSS Probably of Sand
CORING							0.35	SAND STONE:- Pinkish grey 5YR 8/1 fine to medium grained, subangular to subrounded contains Quartz, biotite, mica flak chlorite, Clayey, Calcareous.
23.46	26.51	1.80	59%		24		1.80	
					25			
					26		1.25	SAND STONE:- yellowish grey 5Y 7/1 medium grain Subangular to Subrounded, Contain Quartz, biotite and greenish speck With hard pieces of light-grey N Sand stone at Places. Also calcareous
26.51	29.56	NIL			27		3.05	CORE LOSS Probably Sand Stone
					28			CORE LOSS Probably Sand Stone
					29			SAND yellowish grey 5Y 7/1 fine to medium grained, sub rounded, contains quartz, biotite, chlorite Loose, Soft, Clayey and calcareous
29.56	30.06	0.50	16%		30		0.50	

DRILL-HOLE NO TP-3

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
					31			CORE Loss Probably in Sand
	32.61				32		2.55	CORE Loss Probably in Sand
32.61					33			SAND STONE :- yellowish grey 5Y 7/1, fine to medium grained, Sub-rounded grain Contains Quartz, biotite, greenish specks, Clayey and Calcareous.
	35.66	1.05	34%		34		2.00	
					35		1.05	
35.66					36			CORE Loss Probably Sand Stone
	38.70	0.94	39%		37		2.40	SAND STONE :- Same as above unit No. 13
					38		0.94	
38.70					39		0.40	SAND STONE :- yellowish grey 5Y 7/1 fine to med grained, Sub-angular to Sub-round Contains Quartz, biotite, Soft, friable and Calcareous.
	39.05	0.40	13%		40		2.65	

Form 3a 14 of 42

DRILL-HOLE NO TP-3

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
					41		2.65	CORE LOSS Probably of Sand
	41.75							CORE LOSS Probably of Sand
41.75					42			SAND :- yellowish grey 5 y 7/1, fine grained, very loose, soft with occasional sand stone. Light grey N7 Rock at places, contains quarts, biotite and greenish specks. appears like dune sa...
	3.05	1.05	34%		43		2.10	
					44		1.05	SAND STONE :- yellowish grey 5 y 7/1 fine to medium grained, sub-rounded grains, contains quarts, biotite, appears like dune sand.
	44.80							
44.80					45		0.28	CORE LOSS Probably of Sand
	1.52	0.28	18%				1.24	CORE LOSS Probably of Sand
	46.32				46			
46.32								SAND STONE -- Same as in Unit-17
	1.53	0.63	41%		47		0.90	
	47.85						0.63	
47.85					48		0.40	CORE LOSS Probably of Sand
	3.05	2.65	86%		49		2.65	SAND :- pale yellowish brown 10 YR fine to medium grained, sub-rounde grains contains Quarts, biotite very loose, soft, clayey, calcareo Looks like dune sand.
					50			

DRILL-HOLE NO TP-3

CORE RECOVERY FROM	TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	50.90							
50.90	3.04	1.30	42%		51, 52		1.30	SAND STONE:- Greyish orange 10 YR 7/2 to yellowish grey 5 Y 7/1 fine to medium grey sub-rounded grains contains quartz, biotite siddrite, few greenish specks loose & soft.
					53		1.74	CORE LOSS Probably in Sandstone
	53.94							CORE LOSS Probably in Sandstone
53.94					54		0.90	SANDSTONE:- Pinkish grey to yellowish grey 5 Y 7/1, fine to medium grained sub-rounded to sub-angular contains quartz, mica flakes, soft loose, ferroginous.
								SAND STONE:- Same as in Unit No. 21
	3.05	2.15	70%		55, 56		2.15	SAND STONE:- Greyish orange 10 YR 7/4 to greyish orange 5 Y R 7/2, fine to medium grained, compact, micaseous, contains quartz, biotite, clayey, some what hard, ferroginous. It looks to be the transitional zone between alluvium and grit stone.
	56.99				57		0.20	
56.99							0.95	
					58		0.26	GRIT STONE:- Pale yellowish brown 10 YR 6/ Contains granules of quartz, Lime & line clay, ferroginous material, compact hard, matrix is calcareous. Contact between grit stone and mud stone is sharp.
	3.05	2.70	88%		59		1.29	MUD STONE:- Dark yellowish orange 10 YR 7/4, moderate reddish brown and greenish grey 5 G 6/1 ferroginous, oxidized and [illegible] argillaceous [illegible]
					60, 1		0.35	CORE LOSS Probably in mud stone

DRILL-HOLE NO TP-3

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
60.04	60.04				61		1.45	CORE LOSS Probably of mud stone
	3.05	1.60	52%				0.40	MUD STONE:- Mottled, greenish grey 5G 6/1 to Pale reddish brown 10R 5/4, oxidized ferroginous. This ferroginous material is secondary and is transported.
					62		1.20	SAND STONE:- Greenish grey 5G 6/1 to Pale reddish brown 10R 5/4, fine to medium grained, ferroginous oxidized, the contact between mud stone and sandstone is gradational.
63.09	63.09				63			
	3.05	3.05	100%		64		2.00	SAND STONE:- Greenish grey 5G 6/1 to dark yellowish orange 10YR 6/6 fine to medium grained sub-rounded grains, Contains Quartz mica flakes, biotite, Soft, Clayey towards bottom it grades in to mud stone
					65			
66.14	66.14				66		1.05	MUD STONE:- Greenish grey 5G 6/1 to dark yellowish orange 10 YR 6/6 ferroginous, oxidized. clayey.
							0.24	CORE LOSS Probably of Sand Stone
66.14					67		0.90	MUD STONE -- Same as unit-24
	3.04	2.80	92%					SAND STONE:- Light greenish grey 5G 6/1 to dark yellowish orange 10YR 6/6 fine to medium grained, sub-rounded to sub-angular grains, Contains Quartz, mica flakes, oxidized, ferroginous material.
	69.18				68		1.90	
					69			
69.18								
	2.29	1.50	65%		70		1.50	SAND STONE:- Same as above unit-25 with laterite, boulders at bottom.

DRILL-HOLE NO T P-3

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
					0			CORE LOSS Probably of Sand Stone
	71.47				71		0.79	CORE Loss Probably of Sand Stone
71.47							0.75	MUD STONE :- yellowish grey 5Y 7/1 to Pale reddish brown 10R 5/4, loose soft, laminated with alternate thin bands of fine-grained sand Stone at places.
	3.05	2.30	75%		72			
					73		2.30	
	74.52				74			MUD STONE :- Same as above unit-27
74.52								SAND STONE,- Light greenish grey 5GY to reddish brown 10R 5/4, fine to medium grained, loose, Soft, Sub-rounded grain contains Quartz, mica flacks and ferroginous material, Compact, lateritic Places.
	0.76	0.76	100%		75		0.76	
	75.28							
75.28					76		1.36	
	2.29	2.29	100%					
					77		0.93	MUD STONE :- Same as above in unit-27
	77.57							
77.57							0.44	CORE Loss Probably of Mud Stone.
					78			MUD STONE ,- Light-greenish grey 5G 5/1 to moderate red, mottled, oxidized, limonitized.
	3.04	2.60	85%		79		2.60	
					80			
					1			

DRILL-HOLE NO TP-3

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	80.61							MUD STONE :-
80.61					81			Same as above unit-30
	3.05	3.05	100%		82		3.05	
					83			CORE LOSS Probably in sand stone
	83.66							
83.66					84		0.85	SAND STONE :-
	3.05	2.20	72%		85		2.20	Greenish grey 5GY 4/1 to moderate red 5R 5/4 and dark yellowish orange 10YR 6/6, fine to medium grained, sub-rounded, contains Quartz, biotite, mica flakes, Limonite, clayey.
	86.71				86			
86.71								SAND STONE :-
	0.76	0.76	100%		87		0.76	Same as above unit-32
	87.47							
87.47					88			SAND STONE :-
	3.05	1.58	51%				1.58	Same as above unit-32
					89			
								CORE LOSS Probably of Sand Stone
					90		1.47	

DRILL-HOLE NO TP-3

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	90.52							
90.52					91		1.10	SAND STONE:- Light greenish grey 5GY 6/1 to moderate red 5R 5/4, mottled, limonitized fine to medium grained, loose, contains Quartz, mica flacks, lateritic.
	93.57	1.95	62%		92		1.95	
					93			CORE LOSS Probably of Sand Stone.
93.57					94		1.85	MUD STONE:- Dark yellowish orange 10YR 6/6 to light greenish grey 5GY 6/1 mottled, limonitized, clayey.
	96.62	1.20	39%		95			
					96		1.20	
96.62					97		0.93	MUD STONE:- Light greenish grey 5GY 6/1 to Pale red Purple 5RP 6/2 limonite, fractured, oxidized, clayey in the upper part.
	99.66	2.20	72%		98		1.27	
					99		2.34	SAND STONE:- Greenish grey 5GY 6/1 to varied colour, fine to medium grained sub-angular to sub-rounded, contain Quartz, biotite, mica flacked, lateri clayey.
99.66					100			CORE LOSS probably of Sand Stone

DRILL-HOLE NO TP-3

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	3.05	3.05	100%		101		2.96	SAND STONE:- Light olive grey 5Y 6/1 to dark yellowish orange 10YR 6/6 and spotted by Pale yellowish brown 10YR 6/2 fine to medium grained, sub-angular to sub-rounded grains Contains Quartz biotite, mica flacks, oxidized, soft, Loose.
	102.71				102		0.09	MUD STONE Same as above unit
102.71					103			MUD STONE. Light greenish grey 5Y 6/1 to Pale reddish brown 10R 5/4 and dark yellowish orange 10YR 6/6 Quartz granules, limonite.
	3.05	3.05	100%		104		3.05	
	105.76				105			MUD STONE:- Same as in unit-34
105.76					106			
	3.05	2.68	88%		107		2.68	
	108.81				108		0.37	CORE Loss Probably of Mud stone
108.81								CLAY STONE:- Light greenish grey 5Y 8/1 to greyish orange pink 5YR 7/ mottled open solution cavities, thin calcite veins, iron oxide, Quartz granules
	3.05	3.05	100%		109		3.05	
					110			

DRILL-HOLE NO TP-3

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	111.86				111			CLAY STONE - Dark yellowish orange 10YR 6/6 to light greenish grey 5 G 8/1 and spotted by pale reddish brown 10R 5/4, slicken sided, soft, interbedded with mudstone, oxidized, limonitized.
111.86	3.04	3.04	100%		112			
					113		3.04	
	114.90				114			SAND STONE - Greyish orange 10YR 7/4 to moderate reddish orange 10R 6/6, medium to coarse grained, subangular to subrounded grains, contains Quartz mica flacks, limonite thin layering of hard sand stone at places.
114.90	3.05	2.55	83%		115			
					116		2.55	
	117.45				117			CORE Loss Probably of Sand Stone
							0.50	
117.45					118			MUD STONE - Light greenish grey 5 GY 6/1 to moderate reddish brown 10R 4/6, granule of quartz sub-angular, oxidized, loose, changes to clay in the lower portion and becomes more white chalky, soft.
	3.05	3.05	100%		119		2.40	
					120			

DRILL-HOLE NO TP-3

CORE RECOVERY FROM	TO	CORE	CORE%	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	121.0				121		0.65	CLAY – White weathered surface, pinkish grey, compact, chalki, Quartz granules, Quartz grains are subangular, black minerals maybe ferromagnesian minerals, Kaolinized, gradational contact between claystone and clay.
121.0	3.05	1.95	63%		122		0.90	
					123		1.05	CLAY STONE – White N9 to Pale Pink 5RP8/2, Kaolinized, contains Quartz at places ferromagnesian minerals, quartz grains are sub-angular to sub-rounded.
	124.05				124		1.10	SAND STONE – Light bluish grey 5B7/1 to grayish orange pink 5YR 7/2, medium to coarse grained, loose, clayey, towards bottom more muddy, Kaolinized, Quartz granules, and ferromagnesian minerals.
124.05	3.05	NIL			125			CORELOSS Probably of Sand Stone
					126		3.05	CORELOSS Probably of Sand Stone
	127.10				127			CORELOSS Probably of Sand Stone
127.10	3.05	1.43	46%		128		1.62	SAND STONE – Same as in unit 45
					129		1.28	
					130			CLAYEY SAND STONE – White N9 [illegible] Kaolinized, soft quartz grains and granules, few black minerals
					1			

DRILL-HOLE NO TP-3

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	130.15							
130.15					131		2.40	Core Loss Probably Sand Stone
	3.05	0.65	21%					CLAY STONE:- Light-grey N7 to medium dark grey N4, Carbonaceous matter, Coal Specks, Pyrite (marcasite) at few Places, Slickensided, Sharp Contact with upper Clay Stone stone, resin at Places.
	133.20				132		0.65	CLAY STONE:- Light-grey N7 to medium grey N5, Hard, Compact, thin lenses of Sand at Places, Pyritic, Carbonaceous matter thin layers of Coal towards lower part.
133.20					133		1.22	
	1.22	1.22	100%					CLAY STONE:- Same as in Unit-49
	134.42				134		0.45	COAL:- Brownish black 5 YR 2/1 to black N1, blocky to fissile texture faintly banded, resins, Pyrite, thin laminae of Sand in middle Part, Quartz grains
134.42							0.20	
	1.83	1.60	87%		135		0.45	CLAY STONE:- Dark grey N3 Compact, thin Sand lenses, Pyrite grains and nodules of 0.05m
	136.25				136		0.23	
136.25							0.11	CORE Loss Probably of Coal
	2.49	1.25	62%		137		0.70	COAL:- Same as in Unit-50
	138.25						0.34	CLAY STONE:- olive grey 5Y 4/1 to medium dark grey N4, thin Sandy layers at Places, Carbonaceous matter, Pyritic.
					138		0.10	
							0.75	COAL:- TP-3-1-92 Greyish black N2 blocky texture, banded, Pyrite grains, resins scattered throughout, dull, dirty, few Shaly Specks at Places
138.25							0.24	
	2.24	2.00	89%		139		2.00	CARBONACEOUS SHALE:- Medium dark grey N4 Compact, Pyritic, thin Sandy lenses, Carbonaceous matter, Coal Specks, Slickensided.
					140			CORE Loss Probably Carb. Shale
								CORE Loss Probably Carb. Shale
								CLAY STONE:- Medium dark grey N4, Sand laminae, burrows filled with fine grained Sand Sickle rite nodules at Origin.

Recent? Fm Contact 132.55 BARA Fm ↓

DRILL-HOLE NO TP-3

CORE RECOVERY FROM	TO	CORE	CORE %	WATER LOSS	DEPTH METRES	THICKNESS
	140.49					
140.49	1.85	1.70			141, 142	1.70, 0.15
	142.34					
142.34	2.44	2.05			143, 144	0.83, 0.37, 0.29, 0.56, 0.39
	144.78					
144.78	3.04	2.96			145, 146, 147	1.18, 0.82, 0.41, 0.55, 0.08
	147.82					
147.82	3.05	3.05	100%		148, 149, 150	0.82, 0.22, 0.50, 0.76

LITHOLOGIC DESCRIPTION

CLAY STONE:- Medium dark grey N4, Quartz granules, resins, Pyritic, Carbonaceous matter, leaf impressions.

CORE LOSS

CLAY STONE:- Same as in unit-53

SHALE:- Light olive grey 5 Y 6/1 to greenish grey 5 GY 6/1, Pyritic, resins, Coal Specks.

COAL:- Dark grey N3 to greyish black N2, blocky texture, fractured, resins scattered throughout. leaf impressions, Pyritic.

CLAY STONE:- Light grey N7 to medium light grey N6 Carbonaceous matter, resins, leaf impressions, Sand grains at places.

CORE LOSS Probably of Clay stone

CLAY STONE:- Medium grey N5 to medium dark grey N4, resin in specks and disseminated form, Carbonaceous matter, Coal specks, thin Coal layers at places.

COAL:- TP-3-2A-92 Brownish black, blocky to fissile texture banded at places, resins scattered throughout abundantly, Pyrite druse, no visible cleat.

CARBONACEOUS SHALE:- Dark grey N3, resins, Coal in thin layers at places and in specks, abundant resins, leaf impressions, Carbonaceous matter, fissile, Pyrite grains and Specks.

COAL:- Brownish black, blocky to slightly fissile, non-banded, dull, lignitic coal, resins throughout, Pyrite specks, Pyrite druse, moderately heavy. 2E

CORE LOSS probably of COAL

COAL:- Light brown to brownish black, dull, blocky texture, resin abundantly scattered through. Same as the brown coal [illegible] of Pyrite within lower [illegible]. 2C

2D

COAL:- Same as above

COAL:- Dark grey to brownish black, dull, blocky texture, abundant resin at top, scattered in the middle, [illegible] abundant Pyrite at base.

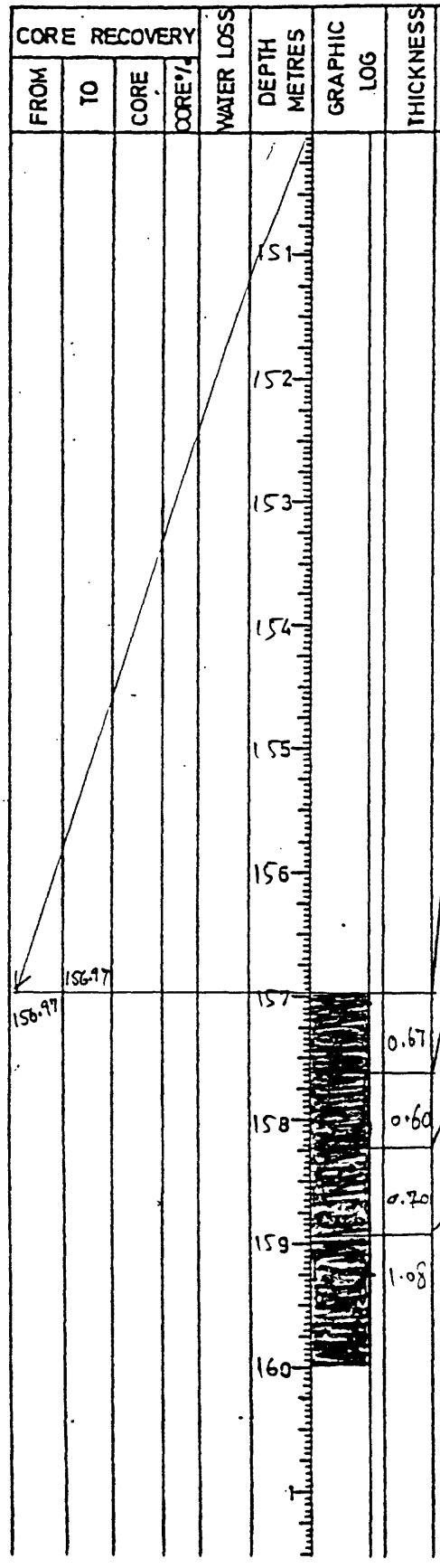
COAL:- Medium brownish to dark brown, dull, bands, blocky to fissile texture, abundant resin at top, abundant semi-thick nodules of Pyrite in middle and in lenses.

DRILL-HOLE NO TP-3

CORE RECOVERY FROM	TO	CORE	CORE%	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
								at few places, 0.5cm thick band of clay at base.
	150.87						0.75	CLAY STONE :- Medium light grey N6, Coal specks streaks, thin coal layers at places, resins, Pyrite in specks and crystals, leaf impressions.
150.87					151		0.25	CORE LOSS Probably clay stone
							0.57	CLAY STONE :- Medium light-grey N6, Carbonaceous, Coal specks, resins, Pyritic, leaf impressions.
	3.05	3.00	98%		152		0.61	COAL :- TP-3-2G-92 Medium dark brown, to black, dull blocky to fissile texture, some Conchoidal fracture resins scattered throughout, abundant Pyrite, drusy filling cavities, slickensided at top.
					153		0.93	COAL :- TP-3-2H-92 Medium brown to black, dull irregular brown and black banding specially at top and base, resins scattered throughout, abundant Pyrite drusy cavities specially in middle fine grained lenses of sand in the middle.
	153.92						0.64	
153.92					154		0.30	COAL :- Dark brown, dull, dirty, faintly banded TP-3-2I-92 with blacks, abundant resins throughout appear to be oriented along banded, few leaf impression
							0.58	
	3.05	3.60	(a)%		155		0.90	COAL :- Medium to dark brown, faintly irregular TP-3-2J-92 banded, dull, blocky to slightly fissile, few very thin fine grained sandstone streaks, abundant Pyrite, resins throughout, slickenside
					156		1.02	COAL :- TP-3-2K1-92 Sampled at higher not described.
	156.97						0.25	COAL :- TP-3-2K2-92 Coal sampled at higher, not described.
156.97					157			CARBONACEOUS SHALE :- Medium dark grey N3, highly carbonaceous, and slightly lighter to top, resins, Coaly, leaf impressions, abundant at top, fissile, thin laminae of coal at places, Pyritic,
					158			COAL :- TP-3-2L-92 Coal not described.
					159			COAL :- TP-3-2M-92 Highly fractured, encell in Run 0.55 0.25 + 0.55 = 0.80 m not described.
					160			

97

DRILL-HOLE NO TP3



LITHOLOGIC DESCRIPTION

COAL :- TP-3-2N-92
Medium dark brown to brownish black, blocky to fissile texture, abundant resins, faintly banded, resins are scattered throughout, slightly hearty to slightly light; dull.

COAL :- TP-3-2O-92
Dark brown to brownish black, dull, blocky texture, faintly banded, resins are scattered throughout; abundant in the lower portion, cleat; pyrite, leaf impression, slightly light;

COAL :- TP-3-2P-92
Light brown to brownish black, blocky to fissile texture, irregularly banded, resins, leaf impressions are scattered, and rare very thin sandy lenses.

COAL :- TP-3-2Q-92
Dark brown to black resins are scattered in the lower horizon, pyrite, leaf impression, blocky texture, faintly banded, cleat, resin thin sandy lenses at the bottom, slightly light

98

DRILL-HOLE NO TP-3

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
160.02	163.07	3.05	100%		161		1.50	COAL :- TP-3-2R-92 Brownish black, blocky to fissile texture, faintly banded, dull, resin scattered throughout, abundant in the lower portion, pyrite nodule in the middle leaf impressions, cleats, brittle at places, slightly light, drusecavities in the bottom
					162		0.90	
					163		0.65	COAL :- TP-3-2S-92 Medium dark brown to brownish blackish to fissile texture, dull, faint banded, resins scattered throughout, pyrite at places,
163.07	166.11	3.04	100%		164		1.23	COAL :- TP-3-2T-92 Dark brownish to brownish black, blocky texture, dull, faint banded, resins scattered, leaf impressions, thin sand lenses in the lower portion, slightly lighter.
					165		0.45	
					166		0.77	COAL :- TP-3-2U-92 Brownish black to black brittle at top, slightly dull, blocky texture, resin scattered throughout abundant in the lower portion, leaf impressions, slightly light.
							0.59	
166.11					167			COAL :- TP-3-2V-92 Light brown to brownish black, blocky to fissile texture, faint banded, resins are scattered through out, but more in the lower portion dull, slightly heavy, leaf impressions
					168			
					169			COAL :- TP-3-2W-92 Brownish black to black brittle, slightly dull at bottom, conchoidal fracture, resins scattered throughout, slightly light, lower portion full of resin.
					170			COAL :- TP-3-2X-92 Light brown, dull, dirty, blocky texture, abundant resin, leaf impressions dirty bands at bottom.

DRILL-HOLE NO TP-3

CORE RECOVERY FROM	CORE RECOVERY TO	CORE RECOVERY CORE	CORE RECOVERY CORE%	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	166.11				166			
166.11	169.21	3.10	3.10	100%	167		1.55	COAL :- TP-3-2Y-92 Brownish black with thin bands of black coal in the lower portion, blocky to fissile texture, faintly banded, resins are scattered throughout, brittle at places, slightly light to slightly heavy, leaf impressions
169.21		3.05	3.05	100%	168		0.55	COAL :- TP-3-2Z1-92 Light brown to greyish black blocky to fissile texture, dull, dirty, resins are abundantly scattered throughout, leaf impressions, clays in the lower most end.
					169		1.0	COAL :- TP-3-2Z2-92 Greyish black to black, blocky to fissile texture brittle, dull in the lower mass portion, resins are abundantly scatter siderite nodule 3cm at 168.51m leaf impressions, Cleat in the middle Concoindal fracture in the midd
					170		0.69	COAL :- TP-3-2AA-92 Brownish black to black brittle, slightly dull at the bottom, blocky to fissile texture, cleats, thin bands of black coal, resins scattered throughout, resins more in middle
							0.83	COAL :- TP-3-2AB-92 Light brown to brownish black, blocky texture, dull abundant resins scattered throughout thin bands of black coal at places abound of resin at top.

DRILL-HOLE NO TP-3

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
					171		0.65	COAL :- TP-3-2AC-92 Brownish black to light brown, blocky to fissile texture, black coal bands at places, resins are scattered abundantly throughout, dull, slightly hearty.
	172.26				172		0.88	COAL :- TP-3-AD-92 Brownish black to black, dull, dull in upper portion cleats, blocky to fissile texture, scare resins, slightly light, brittle.
172.26					173		0.67	COAL :- TP-3-2AE-92 Brownish black, dull, dirty, blocky texture, abundant resins throughout the coal, especially at top and bottom, thin lenses of black coal at places, a little bit clayey in the middle portion, leaf impressions.
	3.04	3.04	1m		174		0.90	
	175.59				175		1.45	COAL :- TP-3-2AF-92 Greyish brown to dusky brown, blocky texture, thin lenses of black coal, dull, dirty, brittle in the middle, cleats, abundant resins throughout, leaf impressions.
175.59					176			COAL :- TP-3-2AG-92 Brownish black, blocky to fissile texture, dull, dirty, resin abundant at top, cleats, conchoidal fracture, the lower part is highly fractured, clayey, slightly hearty, pyrite at places.
					177			CLAY STONE :- 0.02m thickness. Pale yellowish brown. Carbonaceous. Coal blocks sandy.
					178			
					179			
					180			

DRILL-HOLE NO TP-3

CORE RECOVERY FROM	CORE RECOVERY TO	CORE RECOVERY CORE	CORE RECOVERY CORE%	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
					171			CLAY STONE:- very light grey N8 to light grey N7, Carbonaceous matter, Coal Specks, Coal Streaks, resins.
					172			
					173			SILT STONE:- Light grey N7, resins Carbonaceous matter, leaf impressions, Sandy partings at places.
					174			
	175.30				175			SAND STONE:- Light grey N7 to medium light grey N6, Carbonaceous matter, Coal flacks, Coal layering, fine to medium grained soft, loose friable.
175.30							0.24	
					176		1.0	
	177.07	2.07	66%					
					177		0.76	
	178.30						1.07	CORE LOSS Probably of Sand Stone
178.30					178		0.45	SAND STONE:- Light olive grey 5Y 6/1 fine to medium grained, loose, soft friable, Carbonaceous matter, resins, leaf impressions in Coal partings, coarse at places. Clayey at the top
					179			
	3.05	0.45	14%				2.60	
					180			
								CORE LOSS Probably of Sand Stone

DRILL-HOLE NO TP-3

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	181.39				181			
181.39					182			CORE Loss Probably of Sand Stone
	3.05	NIL			183		3.05	
	184.44				184			
184.44					185			CORE LOSS Probably of Sand Stone
	3.05	0.10	3%		186		2.45	SAND STONE:- Seen in unit-66
	184.45				187		0.10	CLAY STONE:- Light Pinkish grey to light-olive grey, Carbonaceous matter, Coal lining, Coal Speck resins, thin Sandy layers at Places, Shale from 188.94 - 189.05 (0.11) m dark grey, leaf impression resins, with Carbonaceous matter.
184.45					188		2.m	
	3.05	2.60	85%		189			SAND STONE:- Light olive grey fine to medium grained, at Places Coarse grained, loose soft, Carbonaceous matter.
					190		0.60	

DRILL-HOLE NO TP-3

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	190.50						0.45	CORE Loss Probably of Sand Stone
190.50					191			CORE Loss Probably of Sand Stone
								CORE Loss Probably of Sand Stone
	193.54	NIL			192		3.04	CLAY STONE :- Medium light grey N6 Compact with thin sandy layers coal streaks, coal specks, pyritic, with 0.10m sand stone band medium dary grey N4 at the bottom, soft, medium to coarse grained.
193.54					193			
	194.94	NIL			194		1.40	CORE Loss Probably of Clay stone
194.94					195			CLAY STONE :- 0.05 m thickness Same as above unit - 72
	197.20	2.26	2.10	92%	196		2.10	COAL :- TP-3-3-92 Light brown to medium dark grey, faintly banded, blocky texture, abundant scattered resins throughout, with lining of black to grey black coal throughout, as band of thin sand at 197.62 m, very dirty dull coal, leaf impressions slightly heavy
					197		0.16	0.05
197.20							1.10	
	200.25	3.05	1.62	46%	198		0.97	
							0.20	CLAY STONE :- Same as unit - 72
					199		1.63	SAND STONE :- Light grey, medium to coarse grained, sub-angular to sub-rounded, pyrite nodules, Coal lining, coal specks, carbonaceous matter, towards bottom grades in to Clay Stone.
					200			CORE Loss Probably of Sand Stone
					1			

DRILL-HOLE NO TP-3

CORE RECOVERY FROM	TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	200.25					X		
200.25								CORE Loss Probably of Sand Stone
								CORE Loss Probably of Sand Stone
					201			CLAYSTONE:- Light grey N8 to light bluish grey, Sandy Contains granules of Quartz, Which are mostly Sub-angular, Kaolinized, Soft, it gradual changes to Weathered granite at the bottom.
	3.05	NIL			202			
	203.30				203			
203.30						X	0.40	GRANITE (Weathered) White to light grey mostly Contain Quartz granules and are Subangular to sub-rounded, Kaolinized Soft, white clay, Pyrite and some orthoclase
					204		0.50	
	3.05	2.65	86%					GRANITE:- Light grey, Contains most Quartz and pinkish orthoclase, ferro magnesian minerals, very hard, Compact, at top Slightly Kaolinised.
					205		2.15	
	206.35				206			
206.35	206.80	0.45	100%				0.45	GRANITE:- Light grey. very hard. Contains Quartz, orthoclase, rare ferromagnesian minerals, Slightly Kaolinised, at top about 10cm is partly weathered.
206.80	207.11	0.31	100%		207		0.31	
207.11								GRANITE:- Medium grey Contains Coarse grained and fine granules of Quartz, Pinkish orthoclase, rare ferromagnesian minerals, very hard, very thin often solution veins.
	209.57	2.46	2.27	92%	208		2.27	
					209			
209.57						X	0.19	CORE Loss Probably of Granite during Pulling of inner tube.
					210			

HOLE COMPLETED
T.D = 209.57m

COALREAP
Coal Intercepts

Form 4 of 5
Rev Apr 90

Drill hole TP-3 Collar elevation

Bed Name	Description	Depth From	Depth To	Thickness	Info. Source ROOF	%Dry Ash FLOOR	Sample No.
DHAKLA	COAL	134.87	135.07	0.20	CLAYSTONE	CLAYSTONE	——
DHAKLA	COAL	137.06	137.40	0.34	CLAYSTONE	CARB. SHALE	TP-3-1-92
DHAKLA	COAL	143.54	143.83	0.29	SHALE	CLAYSTONE	——
THARIO	COAL	145.96	146.78	0.82	CLAYSTONE	CARB. SHALE	TP-3-2A-92
THARIO	COAL	147.19	150.12	2.93	CARB. SHALE	CLAYSTONE	TP-3-2B to 2F
THARIO	COAL	151.17	154.80	3.63	CLAYSTONE	CARB. SHALE	TP-3-2G to 2K
THARIO	COAL	155.70	175.28	19.58	CARB. SHALE	CLAYSTONE	TP-3-2L to 2AG
THARIO	COAL	197.25	198.35	1.10	CLAYSTONE	CLAYSTONE	TP-3-3-92
	COAL	136.25	136.36	0.11	LOSS	CLAYSTONE	——

COALREAP
Coal Intercepts

Form 4 of 5
Rev Apr 90

Drill hole TP-3 Collar elevation

Bed Name	Description	Depth From	Depth To	Thickness	Info Source	%Dry Ash	Sample No.
	COAL	134.87	135.07	0.20	CORE		—
	LOSS	136.02	136.25	0.23			
	COAL	136.25	136.36	0.11	CORE		—
	COAL	137.06	137.40	0.34	CORE		TP-3-1
	COAL	143.54	143.83	0.29	CORE		—
	COAL	145.96	146.78	0.82	CORE		TP-3-2A
ptg	CARB SH	146.78	147.19	0.41	}		—
*	COAL	147.19	147.74	0.55	CORE		TP-3-2B
	LOSS	147.74	147.82	0.08			—
	COAL	147.82	148.64	0.82	CORE		TP-3-2C
*	}	148.64	148.86	0.22	}		TP-3-2D
	}	148.86	149.36	0.50	}		TP-3-2E
	COAL	149.36	150.12	0.76	}		TP-3-2F
ptg	CLST	150.12	151.17	1.05	}		—
	COAL	151.17	151.74	0.57	}		TP-3-2G
	}	151.74	152.35	0.61	}		TP-3-2H
	}	152.35	153.28	0.93	}		TP-3-2I
	}	153.28	153.72	0.44	}		TP-3-2J
*	COAL	153.72	154.22	0.50	CORE		TP-3-2K1

NB: SOME SAMPLES MAY BE COMBINED BEFORE ANALYSIS

* DESORPTION SAMPLE

COALREAP
Coal Intercepts

Form 4 of 5
Rev Apr 90

Drill hole TP-3 Collar elevation

Bed Name	Description	Depth From	Depth To	Thickness	Info Source	%Dry Ash	Sample No.
	CONTINUED FROM PREV PAGE						
	COAL	154.22	154.80	0.58			TP-3-2K2
rtq	CARB SH	154.80	155.70	0.90			—
	COAL	155.70	156.72	1.02			TP-3-2L
		156.72	156.97	0.25 (+55cm EXCESS IN RUN)			TP-3-2M
		156.97	157.64	0.67			TP-3-2N
		157.64	158.24	0.60			TP-3-2O
		158.24	158.94	0.70			TP-3-2P
		158.94	160.02	1.08			TP-3-2Q
		160.02	161.52	1.50			TP-3-2R
		161.52	162.42	0.90			TP-3-2S
		162.42	163.07	0.65			TP-3-2T
		163.07	164.30	1.23			TP-3-2U
		164.30	164.75	0.45			TP-3-2V
		164.75	165.52	0.77			TP-3-2W
*		165.52	166.11	0.59			TP-3-2X
		166.11	167.66	1.55			TP-3-2Y
		167.66	168.21	0.55			TP-3-2Z1
		168.21	169.21	1.00			TP-3-2Z2
		169.21	169.90	0.69			TP-3-2AA
		169.90	170.73	0.23			TP-3-2AB
		170.73	171.38	0.65			TP-3-2AC
		171.38	172.26	0.88			TP-3-2AD
		172.26	172.93	0.67			TP-3-2AE
		172.93	173.83	0.90			TP-3-2AF
	COAL	173.83	175.28	1.45			TP-3-2AG
	COAL	197.25	198.35	1.10			TP-3-3

NB: SOME SAMPLES MAY BE COMBINED FOR ANALYSIS
* DESORBTION SAMPLE

COAL SAMPLE DATA

SAMPLE NO. TP-3-1-92 NO. OF BAGS ONE

COLLECTOR M. ALI TAGAR COAL FIELD THAR

~~LATITUDE~~ M. ANWAR R. A. KHAN LONGITUDE

PROVINCE SIND DISTRICT THAR

DRILL HOLE TP-3 DATE SAMPLED 27-04-92

FORMATION BARA ? AGE

COAL SEAM DHAKLA ESTIMATED RANK SUB-BITUMINOUS

TOTAL SEAM THICKNESS _____ in THICKNESS SAMPLED _____ in

0.34 m 0.34 m

DEPTH TO TOP OF COAL _____ ft SURFACE ELEVATION _____ ft@MSL

137.06 m _____ m

ROOF ROCK CLAYSTONE FLOOR ROCK CARB. SHALE

SAMPLE TYPE DRILL CORE

(channel, channel/upper bench, grab, drillcore, etc.)

COMMENTS:

Top Bench MAIN BED

COAL SAMPLE DATA

SAMPLE NO. TP-3-2A-92 NO. OF BAGS ONE

COLLECTOR M. ALI TAGAR / M. ANWAR COAL FIELD THAR

~~LATITUDE~~ Mr. JOHN LONGITUDE

PROVINCE SINDH DISTRICT THAR

DRILL HOLE TP-3 DATE SAMPLED 03-05-92

FORMATION BARA ? AGE

COAL SEAM THARIO ESTIMATED RANK LIGNITE

TOTAL ~~SEAM~~ BENCH THICKNESS 0.82 m THICKNESS SAMPLED 0.82 m

DEPTH TO TOP OF COAL 145.96 m SURFACE ELEVATION m

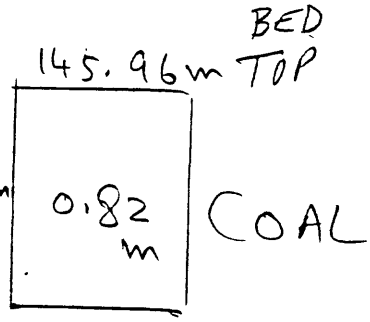
ROOF ROCK CLAY STONE FLOOR ROCK CARB. SHALE

SAMPLE TYPE DRILL CORE
(channel, channel/upper bench, grab, drillcore, etc.)

COMMENTS:

TP-3-2A-92 145.96 – 146.78 (0.82) m

CARB. SHALE 146.78 – 147.19 (0.41) m



U. MIDDLE BENCH MAIN BED

COAL SAMPLE DATA

SAMPLE NO. TP-3-2B to 2F NO. OF BAGS ONE FOR EACH SAMPLE

COLLECTOR M. ALI TAGAR M. ANWAR COAL FIELD THAR

LATITUDE Mr. JOHN LONGITUDE

PROVINCE SIND DISTRICT THAR

DRILL HOLE TP-3 DATE SAMPLED 03-05-92

FORMATION BARA? AGE

COAL SEAM THARIO ESTIMATED RANK LIGNITE

TOTAL ~~SEAM~~ BENCH THICKNESS in THICKNESS SAMPLED in

2.93 m 2.85 m

DEPTH TO TOP OF ~~COAL~~ BENCH ft SURFACE ELEVATION ft@MSL

147.19 m m

ROOF ROCK CARB. SHALE FLOOR ROCK CLAYSTONE

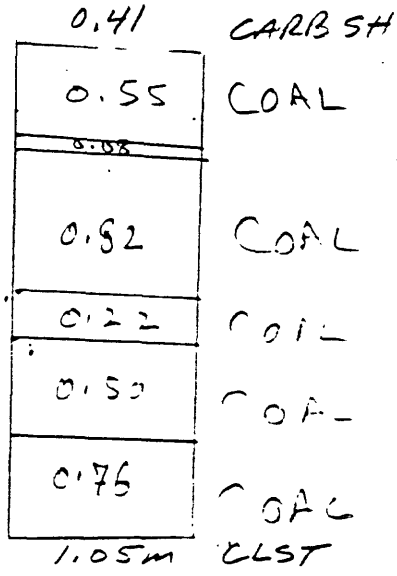
SAMPLE TYPE DRILL CORE

(channel, channel/upper bench, grab, drillcore, etc.)

COMMENTS:

Desorbtion Run on 2B (bottom 30cm) and 2D

TP-3-2B-92	147.19 — 147.74	(0.55) m	COAL
CORE LOSS	147.74 — 147.82	(0.08) m	
TP-3-2C-92	147.82 — 148.64	(0.82) m	COAL
TP-3-2D-92	148.64 — 148.86	(0.22) m	COAL
TP-3-2E-92	148.86 — 149.36	(0.50) m	COAL
TP-3-2F-92	149.36 — 150.12	(0.76)	COAL



L. MIDDLE BENCH MAIN BED.

COAL SAMPLE DATA

SAMPLE NO. TP-3-2G to 2K2 NO. OF BAGS ONE FOR EACH SAMPLE

COLLECTOR M. ALI TAGAR COAL FIELD THAR

LATITUDE M. ANWAR / M. JOHN LONGITUDE

PROVINCE SINDH DISTRICT THAR

DRILL HOLE TP-3 DATE SAMPLED 03-05-92

FORMATION BARA? AGE

COAL SEAM THAR 10 ESTIMATED RANK LIGNITE

TOTAL ~~SEAM~~ BENCH THICKNESS in THICKNESS SAMPLED in

3.63 m 3.63 m

DEPTH TO TOP OF ~~COAL~~ BENCH ft SURFACE ELEVATION ft@MSL

151.17 m m

ROOF ROCK CLAYSTONE FLOOR ROCK CARB. SHALE

SAMPLE TYPE DRILL CORE

(channel, channel/upper bench, grab, drillcore, etc.)

COMMENTS: DESORBTION RUN ON K1

		1.05 m	CLST
TP-3-2G-92	151.17 — 151.74 (0.57) m	0.57 m	COAL
TP-3-2H-92	151.74 — 152.35 (0.61) m	0.61 m	COAL
TP-3-2I-92	152.35 — 153.28 (0.93) m	0.93 m	COAL
TP-3-2J-92	153.28 — 153.92 (0.64) m	0.64 m	COAL
TP-3-2K1-92	153.92 — 154.22 (0.30) m	0.30 m	COAL
TP-3-2K2-92	154.22 — 154.80 (0.58) m	0.58 m	COAL
		0.90	CARB SH

LOWER BENCH MAIN BED

COAL SAMPLE DATA

SAMPLE NO. TP-3-2L to 2AG NO. OF BAGS ONE FOR EACH SAMPLE

COLLECTOR M. ALI TAGAR, M. ANWAR COAL FIELD THAR

LATITUDE _____ LONGITUDE _____

PROVINCE SINDH DISTRICT THAR

DRILL HOLE TP-3 DATE SAMPLED 03-05-92 — 2L & M; 04-05-92 — 2N to T; 05-05-92 — 2U to AG

FORMATION BARA 7 AGE _____

COAL SEAM THAR 10 ESTIMATED RANK LIGNITE

TOTAL ~~SEAM~~ BENCH THICKNESS _____ in THICKNESS SAMPLED _____ in

19.58 m 19.58 m

DEPTH TO TOP OF ~~COAL~~ BENCH _____ ft SURFACE ELEVATION _____ ft@MSL

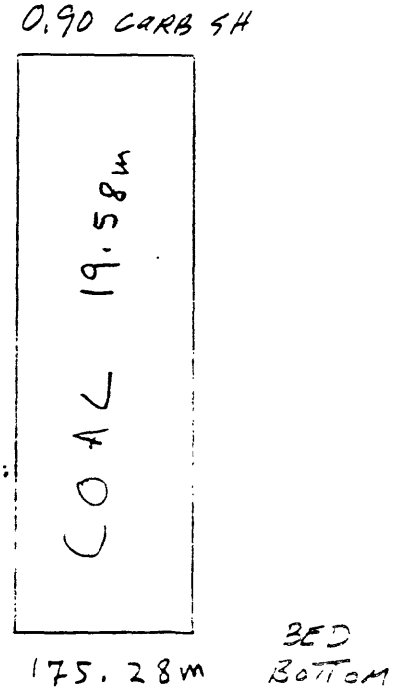
155.70 m _____ m

ROOF ROCK CARB. SHALE FLOOR ROCK CLAY. STONE

SAMPLE TYPE DRILL CORE
(channel, channel/upper bench, grab, drillcore, etc.)

COMMENTS:

TP-3-2L-92 155.70-156.72 (1.02m)
TP-3-2M-92 156.72-156.97 (0.25m)
TP-3-2N-92 156.97-157.64 (0.67m)
TP-3-2O-92 157.64-158.24 (0.60m)
TP-3-2P-92 158.24-158.94 (0.70m)
TP-3-2Q-92 158.94-160.02 (1.08m)
TP-3-2R-92 160.02-161.52 (1.50m)
TP-3-2S-92 161.52-162.42 (0.90m)
TP-3-2T-92 162.42-163.07 (0.65m)
TP-3-2U-92 163.07-164.30 (1.23m)
TP-3-2V-92 164.30-164.75 (0.45m)
TP-3-2W-92 164.75-165.52 (0.77m)
TP-3-2X-92 165.52-166.11 (0.59m) — Desorption run on entire sample 2X
TP-3-2Y-92 166.11-167.66 (1.55m)
TP-3-2Z1-92 167.66-168.21 (0.55m)
TP-3-2Z2-92 168.21-169.21 (1.00m)
TP-3-2AA-92 169.21-169.90 (0.69m)
TP-3-2AB-92 169.90-170.73 (0.83m)
TP-3-2AC-92 170.73-171.38 (0.65m)
TP-3-2AD-92 171.38-172.26 (0.88m)
TP-3-2AE-92 172.26-172.93 (0.67m)
TP-3-2AF-92 172.93-173.82 (0.90m)
TP-3-2AG-92 [illegible] (1.45m)



COAL SAMPLE DATA

SAMPLE NO. TP-3-3-92 NO. OF BAGS ONE

COLLECTOR M. ALI TAGAR, M. ANWAR COAL FIELD THAR

LATITUDE _____ LONGITUDE _____

PROVINCE SINDH DISTRICT THAR

DRILL HOLE TP-3 DATE SAMPLED 16-5-92

FORMATION BARA ? AGE _____

COAL SEAM THAR II-Lower ESTIMATED RANK LIGNITE

TOTAL SEAM THICKNESS _____ in / 1.10 m THICKNESS SAMPLED _____ in / 1.10 m

DEPTH TO TOP OF COAL _____ ft / 19725 m SURFACE ELEVATION _____ ft@MSL / _____ m

ROOF ROCK CLAY STONE FLOOR ROCK CLAY STONE

SAMPLE TYPE DRILL CORE
(channel, channel/upper bench, grab, drillcore, etc.)

COMMENTS:

DRILLING RECORD
COAL REAP

Drill hole TP-4

Topo Sheet 40H/15

Grid ref 755653 mN 2333256 mE

Surface elev. (m) 19.8 (surveyed)

Drill rig LONGYEAR 44 (GSP-103)

Drilling started Date 17-5-92 Time _____
Drilling completed Date 5-7-92 _____

Drill Bit
Surface to 12.32 m TRICONE BIT 4 7/8"
12.32 to 252.60 m TUNGSTAN CARBIDE STEP TYPE HQ
252.60 to 312.72 m NQ
_____ to _____ m _____
_____ to _____ m _____
_____ to _____ m _____
_____ to _____ m _____

Fluids used Quick Thick Mud + CMS POLYMER
KAM, CPAN 80 ASI

Casing set
Surface to 12.19 m HW
12.19 to 253 m NW
_____ to _____ m _____

Lith logged by GHULAM SARWAR LASHARI
ABDUL RAHIM MEMON "
MOHD ALI JAGAR "

Geophysical logs:

		From		to		through
JLP	GAMMA	0 m		248.80 m		NW CASING
	NEUTRON	0 m		251.00 m		" "
	[illegible]	[illegible] m		_____ m		_____
XAP	GAMMA	4 m		247.60 m		NW CASING
	GGER	4 m		250.80 m		" "
	GGNR	4 m		250.80 m		" "

REMARKS: Hole was temporarily abandoned at 252.60m on 8 July 92 for Eid holiday. Projected depth was: 350m, basement, or 30 meters of clean sandstone whichever came first. Drilling resumed in early July without USGS direct supervision. Hole was completed at 312.72 after 27 meters of complete core loss. Hole could not be logged to TD due to reluctance of GSP to log through NQ rods.

This page intentionally left blank

COAL REAP

Drill Hole IP-4

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
19-5-92	1115	3.05	Drilling started on 19th May 1992
			non coring started from ao.oam
			with 4 7/8" roller bit
	1200	6.40	
	1230	9.14	
		12.19	The non coring ended up to the depth of 12
		14.34	The coring started from 12.23m
		17.40	Core loss 3.05m, hole was caved upto 12
		20.44	Core loss 3.05m
		22.35	Core loss 1.91m
20-5-92	0730	25.40	Core loss 3.05
	0820	28.44	
	0850	29.60	
	1100	32.64	
	1155	35.68	
	1235	38.40	
	1330	41.45	
	1600	43.91	
	1700	46.96	
	1715	50.01	Core loss 3.05m
	1730	52.12	

30653

COAL REAP

Drill Hole IP-4

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
	2200	52.12	Pulled out the total string because
			inner tube was stuck into the
			Core barrel due to sand, so work
			Stopped.
	2330	52.91	Core mil.
21-5-92	0830	55.95	
	0915	57.17	
	1100	60.22	
	1330	63.27	
	1600	66.06	
	1730	19.11	
	1900	72.16	wire line system of rig was carried
			order, so pulled out the total string
	2330	75.21	
23-5-92	1100		Hole was cased from 51.82m
			to 75.21m, so reddilled and
			washed from 51.82 to bottom (75.21
	1200	78.08	
	1330	81.13	
	1430	84.17	
	1515	87.22	

COAL REAP

Drill Hole IP-4

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
23-5-92	1615	88.74	
	1730	91.79	
	1915	94.84	
	1930	97.89	
	2000	100.94	
	2030	103.98	
	2115	107.03	
	2145	110.08	
	2230	111.23	
	2325	113.66	
	2345	114.91	
24-5-92	0120	117.96	
	0230	121.00	
	0700	124.05	
	0830	127.10	
	0945	130.15	
	1015	133.20	
	1100	136.24	
	1130	139.29	
	1210	142.34	
	1300	145.39	

COAL REAP

Drill Hole IP-4

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
24-5-92	1400	148.44	
	1500	151.48	
	1530	154.53	
	1615	156.97	
	1700	160.02	
	1735	163.07	
	1800	166.12	
	1830	169.16	
	2000	172.21	
	2100	172.84	
	2200	175.89	
	2250	178.94	
25-5-92	0520	181.99	
	0620	185.03	
	0815	188.08	
	0915	191.13	
	1000	192.05	
	1130	194.18	
	1230	197.23	
	1420	200.28	
	1600	200.32	

COAL REAP

Drill Hole TP-4

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
	1600	203.22	
	1730	205.31	
	1900	208.35	
	2030	211.40	
	2200	214.14	
	2345	217.19	
26-5-92	00.30	218.72	Core nil
	0130	221.77	
	0300	224.66	
	0700	227.71	
	0900	230.76	
	1030	233.55	As the water pressure gage is not
			working, gate valve sudden broken,
			replaced with one. In the meantime
			string became tight, pulled out I/T.
			the hydraulic pipe broken and also
			there was shortage of water.
27-5-92	0250		pulled out all rods. The hydraulic
			pipe was brought from TP-3 (other
			drilling site), lowered down the rods
			the hole was caved from 195.99 to

COAL REAP

Drill Hole IP-4

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
27-5-92	1500	233.55	233.55m coredrilled from 195.90
			to 233.55m and drilling started
	1600	235.48	
	1720	238.53	
	1750	240.56	
	1815	243.53	Due to the thick of mud, fast
			drilling and out of order of mud
			pump rods became very tight,
			then unscrewed by applying 48"
			wrench with 10' rod. Made Mud
28-5-92	0355		thin in both pits.
	0520		Inner tube stucked between the
			rods and core barrel so it made
			free by using many methods
			above 9.14m from bottom (243.61m)
			Hole was filled with mud, cleane..
			the inner tube
	0700		Set the core barrel, made necessary
			arrangements, lower down the rods,
			the hole was cored from 19.20m
			to 243.61m. Coredrilled from

6553

COAL REAP

Drill Hole IP-4

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
29-5-92	0530		19.20m to 243.53m
	0600	246.00	
	0900	248.44	Hydraulic pipe became out of
			codes, so pulled out all rods,
			repaired hydraulic pipe, lowered
			down rods, hole was caved from
			21.34m to 248.44, had drilled from
30-5-92	1700		21.34 to 248.44.
	1930	250.24	
	2230	252.60	cable became out of codes,
			after repairing of cable lowered
			down the rods, hole was
			caved from 39.62m to
			252.60m so had drilled from
1-6-92			39.62m to 161.54, rods blocked so pulled
			out all rods. Again lowered the rods up to
			19.20m, there was caving in hole, had drilled
			from 19.20m to 134.11m, rods again blocked
			so pulled out all rods. Again lowered the rods
			with 6 inch tube, at the depth of 228.60
6-6-92		252.60	rods blocked, so pulled out rods up to 194.76
			washed the hole and waited for loggers,
			but due to shortage of mud and damaged
			bearing, rods blocked, so pulled out
			all rods before the reaching of loggers

NO GSP Drilling Record beyond this Point

Reconstruction by JRS

COAL REAP

Drill Hole TP-4

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
7 JUNE 92	1500	252.60	Geophysical logger arrives on site but hole is not able to be cleared to bottom. Swivel head broke while pulling rods
? 8 JUNE 92			Hole temporarily abandoned for Eid-ul-Azha holiday
EARLY JULY ?		252.60	Hole is washed to TD and geophysically logged
			SET NW casing
			Reduced hole to NQ
5 JULY 92		312.72	Hole completed
			Complete core loss from 285.74 to 312.72

DRILL-HOLE NO 7124

CORE RECOVERY FROM	TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
00.00					1		1.52	Sand: yellowish gray 5Y 7/2, loose dry, Fine grained some medium grained, small black and light yellowish pieces, slightly calcareous, black reddish, yellowish and green color grains, sub rounded to rounded
1.52		1.52			2		1.53	Sand:- Same as above unit but very fine grained
3.05		3.05			3		1.52	Sand:- Same as above unit but very fine grained
4.57		4.57			4		1.53	Sand:- Same as above unit.
6.10		6.10			5		1.52	Sand:- Same as above unit
7.62		7.62			6		1.53	Sand:- Same as above unit
9.14		9.14			7			Sand:- Same as above unit
					8			
					9			
					10			

Form 3a

11 ? 53

DRILL-HOLE NO TP-4

CORE RECOVERY FROM	TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	10.67						1.52	SAND:- yellowish gray 5Y7/2, loose sand, clayey, very fine to fine and some where medium grained, small pieces of black and light yellowish colors, slightly calcareous, black, redish, yellowish and green colour grains)
10.67	11.28				11		0.61	
11.28	12.19				12		0.91	SAND:- Same as above unit
12.19	12.34							
12.34	14.34	2.02	1.00		13		1.00	SANDSTONE:- yellowish gray 5Y 7/2, compact, semihard, very fine grained, some coarse quartz grains, slightly calcareous, subrounded, sideritic nodules throughout unit, some clayey.
					14		1.02	Core loss at bottom
14.34	17.39	3.05	n.l		15, 16, 17		3.05	Complete Core loss
17.39		3.05	n.l		18, 19, 20, 1		3.05	Complete Core loss

(Written vertically down the TO column: NON CORING; NIL RECOVERY)

DRILL-HOLE NO TP-4

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
		20.44						Complete core loss
20.44		1.91	Nil		21		1.91	Complete core loss
		22.35			22			SANDSTONE:- Light olive grey 5Y 5/2, Semi compact, Fine grained, Rare Coarse quartz grains, slightly calcareous at places, Some clayey.
22.35		3.05	Nil		23		3.05	Core loss at bottom
					24			SANDSTONE:- light olive grey 5Y 5/2, Semi Compact, Fine grained, Rare Coarse quartz grains, slightly calcareous at places, Some clayey.
		25.40			25			
25.40		3.04	1.04		26		1.04	Core loss at bottom
					27		2.00	SANDSTONE:- Same as above unit but calcareous
		28.44			28			Rock bond of Sandstone of 0.04 m near bottom.
28.44		1.15	0.22		29		0.95	
		29.59						
29.59		3.05	1.60		30		1.60	

DRILL-HOLE NO TP-6.

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
					31			Core loss at bottom
								SANDSTONE:- Same as above unit
					32		1.45	Core loss at bottom
	32.64							
32.64		3.05	1.40		33		1.40	SANDSTONE:- Same as above unit
								Core loss at bottom
					34			SANDSTONE:- Same as above unit but very
					35		1.65	fine grained
	35.69							
35.69					36			Core loss at bottom
		2.71	2.05				2.05	
					37			
					38		0.66	
	38.40							
38.40		3.05	1.30		39		1.30	
					40		1.25	Continued

Form 3a

14-5 53

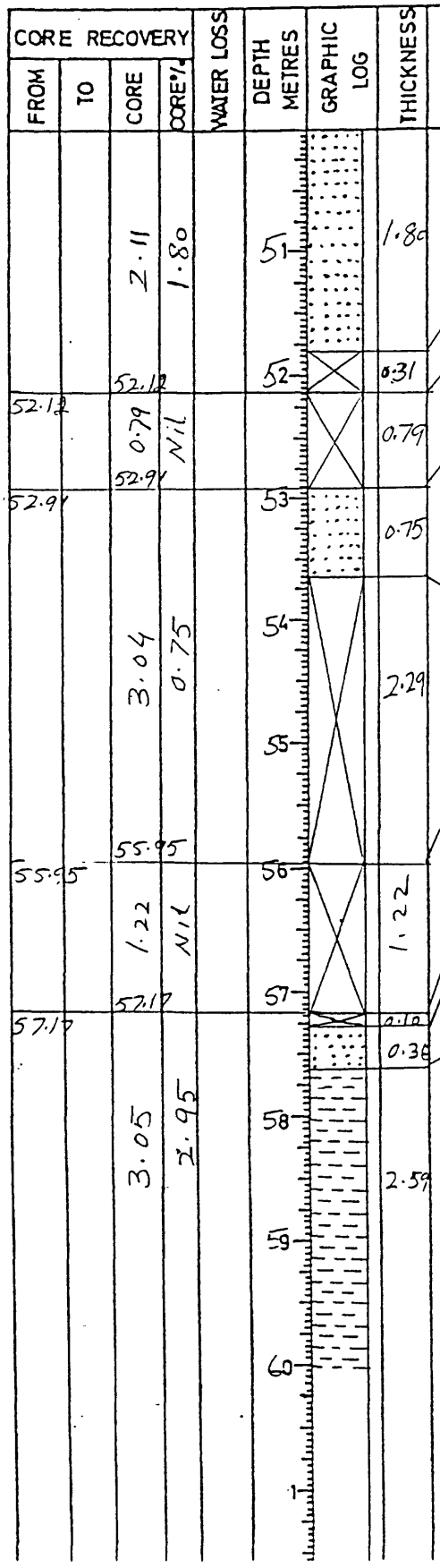
DRILL-HOLE NO TP 4

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
		41.45			41		1.75	SANDSTONE:- light olive gray 5Y 5/2, Semi Compact, Fine grained, Rare coarse quartz grains, slightly calcareous at places, some clayey.
41.45		2.46	2.46		42		2.46	SANDSTONE:- Same as above unit
		43.91			43			Core loss at bottom
43.91		3.05	1.35		44		1.35	
					45			Complete Core loss
					46		1.70	
46.96		46.96			47			
		3.05	NIL		48		3.05	
		50.01			49			
50.01					50			

Form 3a

15 of 53

DRILL-HOLE NO TP 4



LITHOLOGIC DESCRIPTION

SANDSTONE:- Same as above unit

Core loss at bottom

Core loss

SANDSTONE:- light olive gray 5Y5/2, loose, Semi-compact at bottom, Silty at bottom, slightly Calcareous at places, Green, reddish, black and yellowish Colour grains

Core loss

Complete Core loss

Core loss at top

SANDSTONE:- Moderate reddish brown 10R4/6, Semi-Compact, loose, Fine to medium grained, Ferruginous material, non Calcareous.

CLAYSTONE:- Dark yellowish brown 10YR4/2, yellowish gray 5Y7/2, Semi Compact, Silty, non Calcareous, Ferruginous and variegated Colour near bottom

DRILL-HOLE NO TP-6.

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
		60.22						
60.22		3.05	3.05		61		3.05	CLAYSTONE:- Same as above unit
					62			CLAYSTONE:- Same as above unit
	63.27				63			CLAYSTONE:- Pale yellowish brown 10YR 6/2, Compact, Concoidal fracture, sticky, rare shell fragments, siderite, calcareous.
63.27		2.79	2.79		64		2.79	CLAYSTONE:- Light bluish gray 5B 7/1, Grayish green 5G 5/2, Semi Compact, fractured, calcareous, sandy layering, pyrite at places
	66.06				65			
66.06		3.05	3.05		66		1.04	CLAYSTONE:- Pale blue 5BP 7/2, Pale yellowish brown 10YR 6/2, Compact, nodular, calcareous, concoidal fracture, sticky, rare coarse quartz grains near bottom.
					67			
					68		1.22	CLAYSTONE:- Dark yellowish brown 10YR 4/2, Compact, nodules, Slickenside, Sticky, rare coarse grains throughout the unit, Sandy portion in lower half.
	69.14				69		0.79	
69.11					70		1.90	

Form 3a

17 of 53

DRILL-HOLE NO TP4

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
		3.05	1.90		71			Core loss at bottom
							1.15	SILTY CLAYSTONE:- Variegated Colour, Slicken-Side, Silty, non calcareous
		72.16			72			
72.16		3.05	3.05		73		3.05	CLAYSTONE:- Moderate yellowish brown 10YR5/4, Sticky, Semicompact.
					74			SANDSTONE/CLAYSTONE (INTERMIXED):- Dark greenish gray 5B7/1, Soft, Semi Compact, very fine Sand and claystone intermixed throughout the unit but towards bottom Sand increasing, Rare Pyrite disseminated in lower half of the unit
					75			
75.91		2.87	1.83		76		0.44	
							1.39	Core loss at bottom probably
		78.08			77			SILTSTONE:- Light bluish gray 5B7/1, Semi Compact, variegated colour, Ferruginous concretions, Coaly flakes at places, Sandy in lower half of the unit, non calcareous.
78.08		3.05	3.05		78		1.04	
					79		3.05	
					80			

DRILL-HOLE NO T12

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
		81.13			81			SANDSTONE:- Light gray N7 in upper half and medium gray N5, very fine grained, semi hard, soft, silty at places, ferruginous in upper half, Coaly carby traces in lower half of the unit, dissiminated pyrite at places in lower half
81.13		3.04	3.04		82		3.04	
		84.17			83			SANDSTONE:- Medium gray N5, soft, semi compact, Coaly flakes and partings throughout the unit, lightly shell fragments in upper half, very fine grained sand, bunches of fossils in upper half, dissiminated pyrite at places
84.17		3.05	2.11		84			
		87.22			85		2.11	Core loss at bottom
					86			SANDSTONE:- Medium gray N5, Semi hard, very fine grained, Some calcareous, Coaly carby flakes increasing towards bottom, pyrite at places, burrows
87.22		1.52	1.52		87		0.94	
		88.74			88		1.52	SANDSTONE:- Same as above unit
88.71					89		1.55	
					90			

Form 3a

19 & 53

DRILL-HOLE NO TP4

CORE RECOVERY FROM	CORE RECOVERY TO	CORE RECOVERY CORE	CORE RECOVERY CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
		3.05	3.05		91		1.50	SANDYSILTSTONE:- light bluish gray 5B7/1, Semi-compact, hard, Sandy throughout the unit, more clayey at top, due to ferruginous material variegated color near bottom, Sand increasing towards bottom
91.79		91.79			92			
		3.05	3.05		93		3.05	SANDSTONE:- Variegated color, Semi compact, hard, very fine grained, Ferruginous material throughout unit
		94.84			94			
94.84		3.05	2.28		95			SANDSTONE:- yellowish gray 5Y7/2, Semi hard, very fine grained, Ferruginous Siderite at place clayey, non calcareous
					96		2.28	Core less at bottom
					97			SANDSTONE:- Same as above unit
		97.89					0.77	CLAYSTONE:- yellowish gray 5Y7/2, compact hard, Ferruginous material, slickenside, Sandy at top and bottom
97.89					98		0.20	
		3.05	3.05				0.60	SANDSTONE:- yellowish gray 5Y7/2, Semi hard very fine grained, Ferruginous, Siderite at places, clayey, non calcareous
					99		2.25	
					100			

Form 3a

20 of 53

DRILL-HOLE NO TP-4

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
								Clayey SANDSTONE:- yellowish gray 5Y 7/2, Compact, Semihard, more sandy near top, slightly silty, very fine grained, calcareous at places, Ferruginous more clayey near bottom, Slickenside at one place
		100.94						
100.94					101			
		3.04	3.04		102		2.04	SANDSTONE:- Variegated color, Semicompact, hard, very fine grained, Ferruginous material throughout the unit
					103		1.00	
		103.98						SANDSTONE:- Variegated color, Semi hard, Compact, Ferruginous concretions, Fine grained in upper half and very fine grained in lower half of the unit.
103.98					104			
		3.05	3.05		105		3.05	
					106			SANDSTONE:- Same as above unit
		107.03			107			
107.03								
		3.05	3.05		108		3.05	
					109			
					110			

DRILL-HOLE NO TP-4

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
110.08		1.15	0.85		111		0.85	SANDSTONE:- Same as above unit Core loss at bottom
	111.23						0.30	
111.23		2.43	1.55		112		1.55	SANDSTONE:- Same as above unit Core loss at bottom Core loss at top
	113.66				113		0.88	SANDSTONE:- Same as above unit
113.66		1.25	0.75		114		0.50	SANDSTONE:- very light gray N8, yellowish pale very fine grained.
	114.91						0.75	Core loss at bottom
114.91		3.05	2.55		115			Core loss at top
	117.96				116		2.55	
					117		0.50	SANDSTONE:- variegated color, very fine grained, Ferruginous concretion, non calcareous
117.96		3.04	1.20		8			
					119		1.84	
					120			

Form 3a 2207 53

DRILL-HOLE NO TP-6

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
					121		1.20	SANDSTONE:- Very light gray N8, very fine grained, Ferruginous material near top and bare throughout unit, non calcareous.
121.0		121.0						
		3.05	2.30		122		2.30	Core loss at bottom
					123			SANDSTONE:- Very light gray N8, yellowish gray 5Y 7/2 Semihard, Ferruginous material, very fine grained, non calcareous, clayey towards bottom.
		124.05			124		0.75	
124.05								Core loss at bottom
		3.05	2.75		125		2.75	Core loss at top
					126			SANDYCLAYSTONE:- Variegated color, very fine grained, sand interlaminated with clay stone throughout the unit, non calcareous, slickensided at places.
		127.10			127		0.30	
127.10							0.30	
		3.05	2.75		128		2.75	
					129			
					130			

Form 3a 237 53

DRILL-HOLE NO TP-4

CORE RECOVERY FROM	TO	CORE	CORE%	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	130.15							
130.15		3.05	1.25		131		0.65	SANDYCLAYSTONE:- Same as above unit
							0.60	SANDSTONE:- Light bluish gray 5B7/1, Semi hard, very fine grained, Felsitic material throughout the unit, burrows at places, non calcareous
					132		1.80	Core loss at bottom
	133.80				133			SANDSTONE:- Same as above unit
133.80		3.04	3.04		134			SANDSTONE:- Same as above unit
					135		3.04	Core loss at bottom
	136.24				136			
136.24		3.05	2.00		137		2.00	
					138			
	139.29				139		1.05	
139.20					140			

DRILL-HOLE NO TP-4

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
								Core loss at top
		3.05	0.23		141		2.82	SANDSTONE:- Dark yellowish orange to YR 6/6, Ferrugenous concretion, very fine grained, semi-hard, non calcareous.
		142.34			142		0.23	SANDSTONE:- Varigated color, semi hard, Ferrugenous concretions, very fine grained, Argillaceous mix, Ferrugenous concretion at bottom
142.34		3.05	2.55		143		2.55	
					144			Core loss at bottom
		145.39			145		0.50	Core loss at top
145.39							0.30	SANDYSILTSTONE:- Varigated color, semi hard, Ferrugenous concretions throughout unit but more ferrugenous in upper half, silty, clayey, non calcareous
		3.05	2.75		146		2.75	
					147			
		148.44			148			SANDYSILTSTONE:- Same as above unit.
148.44		3.04	3.04		149		3.04	
					150			

DRILL-HOLE NO TP

CORE RECOVERY FROM	TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
					151			SANDY SILTSTONE:- Same as above unit but more clayey towards bottom.
	151.48							
151.48		3.05	2.85		152		2.85	Core loss at bottom
					153			SILTY CLAYSTONE:- Variegated color, Ferruginous concretion, non calcareous, silty through out the unit, clayey.
	154.53				154		0.20	SILTSTONE:- Variegated color, Ferruginous material in lower half, clayey at places, semi hard, Sandy towards bottom
154.53		2.44	2.44		155		2.44	Core loss at bottom
	156.97				156			
156.97		3.05	2.65		157			
					158		2.65	
					159			
					160		0.40	

Form 3a 26 of 53

DRILL-HOLE NO TP 4

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
160.02		160.02						SANDSTONE:- Variegated color, Semi Compact, Silty
		3.05	2.40		161		2.40	near top, more ferruginous material near top, very fine grained
					162			Core loss at bottom
		163.07			163		0.65	Complete Core loss
163.07								
		3.05	Nil		164			Complete Core loss
					165		3.05	
		166.12			166			Complete Core loss
166.12								
		3.04	Nil		167			
					168		3.04	
		169.16			169			
169.16								
					170			

DRILL-HOLE NO TP-4

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
		3.05	Nil		171		3.05	Complete core loss
	172.91				172			
172.91		0.63	Nil				0.63	SANDSTONE:- Variegated color, semi hard, silty matrix, medium to very coarse grained, Ferruginous material throughout unit, non calcareous.
172.84								
		3.05	2.90		173			Core loss at bottom
					174		2.90	
	175.89				175			Core loss at top
175.89							0.15	SANDSTONE:- Same as above unit but fully oxidized. Here is sharp contact between over burden and Bara Formation.
		3.05	1.35		176		1.70	CLAYSTONE:- Greenish gray 5G6/1, Compact, Hard, Glauconite throughout unit but highly glauconite near top, Coaly carby flakes and pyrite throughout unit, slickenside at places, Pyrite Scattered and disseminated
	178.94				177			
					178		1.35	
178.94		3.05	3.05		179		1.86	
					180			
					1			

BARA? { ALLUVIUM?

Form 3a 28 of 53

DRILL-HOLE NO TP-4

CORE RECOVERY FROM	TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
					181		0.11	CARBYCLAYSTONE:- Medium dark gray N4, Semi Compact, hard, Pyritic, Coaly carby flakes and material throughout the unit, Coal partings near bottom, Rare Resin, Wood prints
							1.02	
	181.99				182		0.35	COAL:- Brownish black 5 YR 2/1, Pyritic, Resin, light in weight TP-4-1A 180.91-181.25 TP-4-1B 181.25-181.60 TP-4-1C 181.60-181.95
181.99		3.04	3.04				0.06	
					183		2.69	CARBYSHALE:- Dark gray N3, Semi Compact, Coal partings, Coaly carby flakes, wood prints, Pyritic, Rare Resin
	185.03				184			CARBYCLAYSTONE:- Same as above unit
185.03					185		0.50	SANDSTONE:- very light gray N8, Compact, Hard, Coaly carby flakes near top, medium to very coarse grained, Silty matrix dissiminated Pyrite throughout unit
		3.05	0.50		186		2.55	
					187			Same as above unit -- core loss at bottom
	188.08				188		0.90	CLAYSTONE:- Medium light gray N6, Compact, Hard, Coaly carby flakes throughout unit, Coaly partings and Resin near bottom, dissiminated Pyrite and ore, very coarse grains near top
188.08		3.05	1.30		189		0.40	CARBYSHALE:- Grayish black N2, Semi hard, compact, Highly Resin near top, Coal partings throughout unit, more Pyrite scattered near top
					190		1.75	Core loss at bottom

DRILL-HOLE NO TP-4

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
					191			Core loss at top
		191.13					0.07	CLAYSTONE:- Medium gray N5, medium dark gray N4, Semi compact, Hard, Coaly carby traces, Coaly flakes and coaly partings, wooden pieces and resin at middle, Slickenside at places
191.13		0.92	0.85		192		0.85	
		192.05						COAL:- Brownish black 5YR2/1, light in weight, parting of carby claystone of 0.02m at 192.25 depth, Specks of resin, Scattered pyrite, Root pyritized, layer of Pyrite at bottom TP-4-2A 192.05-193.02 TP-4-2C 193.58-194.31 TP-4-2B 193.03-193.58
192.05		2.13	2.13		193		2.13	
		194.18			194			
194.18							0.13	COAL:- Same as above unit
							0.20	CARBY CLAYSTONE:- Brownish gray 5YR4/1, Compact, Semi hard, Coaly carby flakes throughout the unit, Rare resin throughout unit, Slickenside, Pyrite nodule and more Coaly near bottom.
		3.05	3.05		195		0.65	
					196		2.07	COAL:- Brownish black 5YR2/1, light in weight, more resin near top, Pyrite nodule at middle. TP-4-2D 194.51-195.16
					197			
197.23		197.23					0.80	CLAYSTONE:- Light bluish gray 5B7/1, Compact, Pyrite lenses and scattered grains near top at 0.40m depth after depth carby claystone band with lightly Pyrite of 0.10m, Coaly flakes, Slickenside, Sticky, vertical burrows filled with Coaly carby material
		3.05	2.80		198		0.15	
					199		1.85	Clay stone:- Light bluish gray 5B7/1, Semi hard, Compact, Sticky near top, Rare Coaly flakes and Slickenside throughout the unit, burrows
					200			COAL:- Brownish black 5YR2/1, Resin, light in weight, Pyritic, Dull
								CLAYSTONE:- Light gray N7, Medium dark gray N4,

Form 3a 30 8 53

DRILL-HOLE NO TP-4

CORE RECOVERY FROM	TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
		200.28					0.25	Slicken side at places, Splintery, Compact, Pyrite and Resin at places, Coaly carby traces at places
200.28							0.30	
							0.10	Core loss at bottom
					201		0.44	CLAYSTONE: Medium grey N5, Semi hard, Compact, Pyrite lenses, Fractured, Coaly carby traces, Pyrite grains scattered. TP-4-3
		3.04	2.94					
					202		1.90	Core loss on the top of the coal
								COAL:- Brownish black 5YR 2/1, Resin, Pyrite, light in weight
								CLAYSTONE:- Medium grey N5, Semi hard, Compact, Pyrite lenses, Fractured, Coaly carby traces, Pyrite grains Scattered
		203.32			203		0.30	
203.32							0.13	
							0.30	CARBY CLAYSTONE:- Dark grey N3, Semi hard, Resin, Coaly carby flakes, Coaly partings, roots filled with Pyrite
							0.15	
					204		1.41	CARBY CLAYSTONE:- Same as above unit
		1.99	1.99					COAL:- Brownish black 5YR 2/1, Resin, Pyrite, light in weight TP-4-4
					205			
		205.31						
205.31							0.42	CARBY CLAYSTONE:- Dark grey N3, Semi hard, Resin, Pyrite, Coaly carby flakes, Coaly partings, Slicken side at bottom
							0.35	
					206		0.25	CLAYSTONE:- Same as above unit but more coaly carby flakes in lower half and small Siderite at middle of upper half of the unit
		3.04	3.04				2.02	
					207			CLAYSTONE:- Medium grey N5, Semi hard, Compact, Siderite Resin, Coaly carby traces, flakes and partings with pyrite at bottom
								COAL:- Brownish black 5YR 2/1, Brittle, Rare Resin TP-4-5
					208			CARBY CLAYSTONE:- Brownish grey 5YR 4/1, Dark grey N3, Highly Coaly material band of 0.03m at the top, Resin throughout unit, root pyritized, Slicken side at one place, Coaly carby flakes and partings at top
		208.35						
208.35							0.45	
							1.55	CLAYSTONE:- light brownish grey 5YR 6/1, light bluish grey 5B 7/1, Hard, Compact, Sticky, Coaly carby traces throughout unit, Highly resinous at top
		3.05	2.30		209			
								CLAYSTONE:- Same as above unit
					210			CLAYSTONE:- Medium dark grey N4, Compact, Hard, Fractured, nodular, Coaly carby traces, very fine

Form 3a 31 853

DRILL-HOLE NO TP-4

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
								Sand intermixed with claystone throughout unit, Greenish gray 5GY 6/1 at top.
					211		0.75	Core loss at bottom
								CLAYSTONE:- Same as above unit, but a hard band of siderite of 0.10 m at 1.40 m and other band of 0.06 m at 2.60 m of the unit
211.40		2.74	2.74		212		2.74	CLAYSTONE:- Same as above unit but a very hard siderite band of 0.16 m near bottom and slicken side at bottom
					213			CARBY SANDSTONE:- Medium light gray N6, Medium dark gray N4, loose, soft sand, coaly carby flakes throughout unit, coaly partings towards bottom, Fine to medium grained and rare coarse grains near bottom, Sub angular to sub rounded, clayey, Glauconite.
					214			
214.14		3.05	1.80		215		1.30	Core loss at bottom
							0.50	Complete core loss
					216		1.25	CARBY SANDSTONE:- Same as above unit but thin layer of pyrite at top
					217			CLAYSTONE:- Medium dark gray N4, Compact, Hard, Fractured, nodular, coaly carby traces, very fine sand intermixed with claystone throughout unit, Greenish gray 5GY 6/1 at top
217.19		1.53	Nil		218		1.53	
218.72							0.28	CARBY CLAYSTONE:- Medium light gray N6, medium dark gray N4, Highly carbonaceous, High resin throughout unit, Fine grained sand intermixed, siderite near top.
					219		0.76	
					220		0.52	

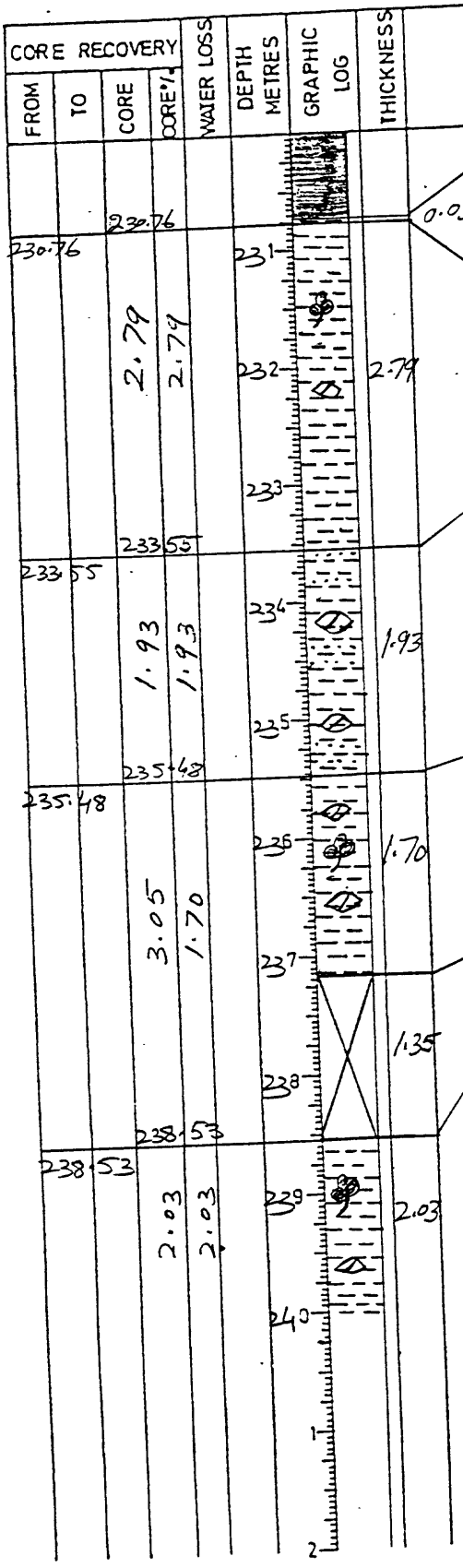
DRILL-HOLE NO TP-4

CORE RECOVERY FROM	TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
								Core loss at bottom
	221.77	3.05	1.56		221		1.49	CLAYSTONE/DIRTY COAL (INTERBEDDED):- Greenish black N2, Medium gray N5, Coaly partings are highly resinous, Pyrite in claystone, Coaly carby traces, Siderite, Coaly flakes at places, Slickenside at places, Sandy Pyrite band near bottom
221.77					222			
		2.89	2.89		223		2.01	COAL:- Brownish black 5YR2/1, Resin, Rare Pyrite
	224.66				224		0.88	CLAYSTONE:- Medium gray N5, light olive gray 5Y6/1, Semi hard, Compact, Coaly carby flakes, Sandy at top, Coaly partings in upper half, after 0.42m thickness one coal band of 0.12 which is brownish black 5YR2/1 and resin
224.66					225		1.30	
		3.05	2.45		226			SANDSTONE:- light gray N7, soft, loose, Coaly carby flakes, Coal partings with resin at places, very fine grained Sand and claystone interlaminated throughout the unit
					227		1.15	
	227.71						0.60	Core loss at bottom
							0.20	Core loss at top
227.71		3.05	(3.05) 2.85		228		1.10	CLAYSTONE:- Medium gray N5, Compact, Hard nodular, Resin at places, Sandy throughout unit, Coaly carby traces
					229		1.72	
					230			COAL:- Brownish black 5YR2/1, light in weight, Dull, Pyritic, Resin scattered throughout unit

TP-4-6

TP-4-7A 229.01 - 229.71
TP-4-7B 229.71 - 230.18
TP-4-7C 230.18 - 230.73

DRILL-HOLE NO TP-4



CLAYSTONE:- Medium gray N5, Compact, Hard, nodular, Resin at places, Sandy throughout unit, Coaly carby traces

CLAYSTONE:- Light bluish gray 5B7/1, Medium light gray N6, Compact, Hard, Sticky, Rare coaly carby traces throughout unit, Siderite nodule at bottom and slickenside.

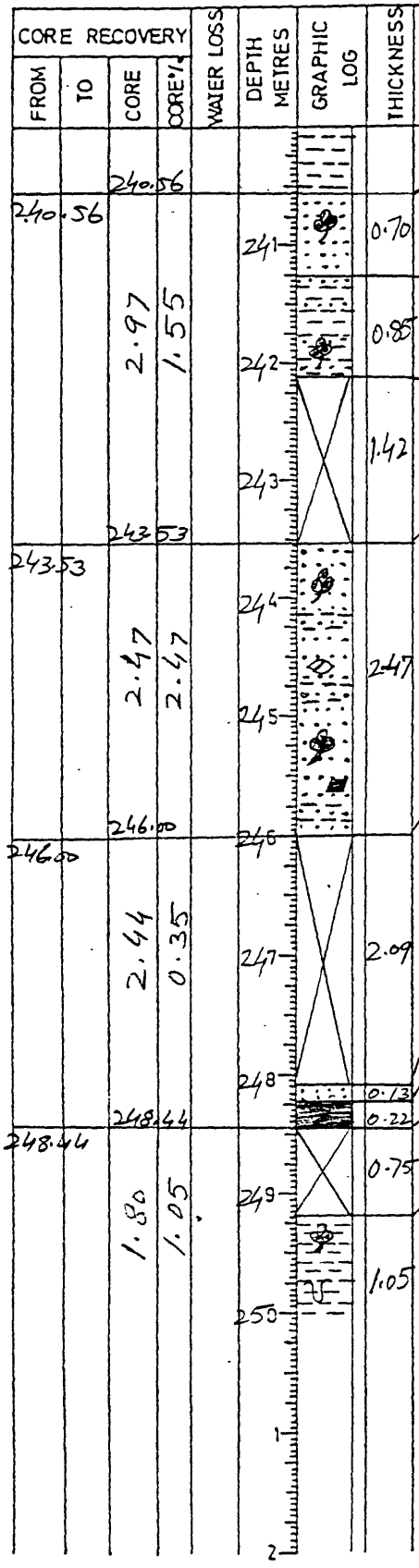
CLAYSTONE:- Medium dark gray N4, Semi hard, Siderite throughout unit, nodular in upper half of the unit, Fractured in lower half, Silty, Sandy throughout unit, slickenside at middle of the unit.

CLAYSTONE:- Same as above unit but after 0.38 m thickness here is one siderite 237.18 – 238.53 m

Coreloss at bottom

CLAYSTONE:- Same as above unit but Siderite band of 0.20 m at bottom of the unit

DRILL-HOLE NO TP-4



LITHOLOGIC DESCRIPTION

SANDSTONE:- light gray N7, very fine to fine grained, bo. Soft, Coaly carby traces throughout unit, clayey at bottom

CLAYSTONE:- Medium gray N5, Semi hard, Compact, more sandy in upper half and Sandy throughout the unit, more coaly carby flakes near top and bottom

Core loss at bottom

SANDSTONE:- Medium light gray N6, Semi Compact, Fine to medium grained, Coaly streakes throughout unit, More clayey, Siderite band at top and bottom, Resin and pyrite at places, Coarse grained at places

Core loss at top

SANDSTONE:- light gray N7, soft, losse, Fine to medium grained, Coaly flakes at bottom

COAL:- Brownish black 5YR2/1, Resin, Dull light in weight, Pyrite at places, Fractured.

Core loss at top

CLAYSTONE:- Medium light gray N6, Greenish gray 5G4/1, Compact, Semi hard, more Sandy in upper half, Coaly carby, traces through out the unit, Sticky, Vertical burrows at places

DRILL-HOLE NO TP-4

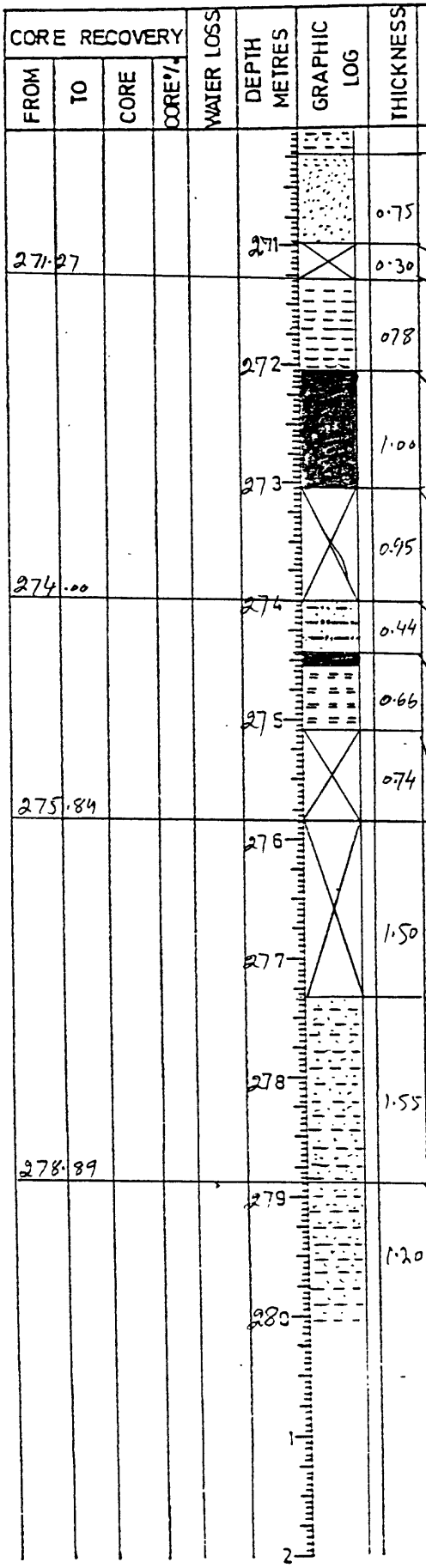
CORE RECOVERY FROM	TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
		25.24						
250.24		2.36	1.82		251		1.82	CLAYSTONE:- Medium dark gray N4, Dark greenish gray 5G 4/1, Semi hard, compact, slickenside near top, nodular, more coaly streaks in upper part, after 0.82 m coaly traces in upper part, after 0.82 m thickness there is one dirty coal bed of 0.08m in brownish black 5YR 2/1, Resin small siderite nodule near top
	252.60				252		0.54	Core loss at bottom
					253		1.85	Core loss
254.55					254		0.10	Sandy Silt-stone:, light-bluish gray 5B 7/1, hard, compact, sandy throughout unit, resin, very hard siderite band of 0.05 m at top.
					255		0.55	Sandy Silt-stone:- light-bluish gray 5B 7/1, hard, compact, sandy near top and clayey towards bottom, resin in clayey portion, slickenside at places.
256.64					256		1.04	Claystone:- Medium dark gray N4, Medium gray N5, semi hard resin throughout unit, coaly carby flakes and traces, fine sandy laminations, a siderite nodule and slickenside in lower half.
					257		0.50	COAL: brownish black 5YR 2/1, light-in weight, resin throughout unit.
					258		0.70	COAL:- Same as above unit.
259.41					259		2.07	CORE LOSS
					260		0.17	Claystone:- Medium gray N5, Medium dark gray N4, compact, semi hard, slicky

Form 3a

DRILL-HOLE NO TP-4

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
					261		1.85	Abundant resin in coaly carby layerings, siderite nodule of 0.02 m at middle, coaly carby flakes and traces throughout unit.
					262		0.67	COAL :- Brownish black 5YR 2/1, light in weight, resin.
262.28							0.18	CARBY claystone :- Dark gray N3, semi compact coaly carby flakes and partings resin at bottom and siderite at top.
							0.19	CORE LOSS
					263			CLAYSTONE :- Medium dark gray N4, Compact, semi hard, sandy layerings silty, siderite nodule at one place a coal band of 0.05 at top, coaly carby flakes and partings throughout the unit a big siderite band of 0.15 m in lower half.
					264		2.70	
265.17					265			
					266			Claystone :- Same as above unit.
					267		2.86	
268.22					268		0.26	CORE LOSS
					269		2.00	Claystone / Sandstone Interlaminated :- Medium dark gray N4, medium light-gray N6, semi hard, siderite nodule of 0.10 m near bottom, Claystone and sandstone interlaminated & intermixed near bottom, Coaly carby flakes, coaly partings at places.
					270			
					1			
					2			

DRILL-HOLE NO TP-4



LITHOLOGIC DESCRIPTION

Claystone/Sandstone Interlaminated.

SANDstone:- light-gray N7, Medium light-gray N6, Soft, loose, fine to medium grained, Coaly Streaks at top.

CORE LOSS.

CLAYstone:- Medium gray N5, Compact, semi hard, Slickey, pyrite band of 0.04 m on top with coaly partings Carby claystone of 0.17 m at bottom with Resin and pyrite layerings.

COAL:- Brownish black 5YR2/1 Black light-in weight-pyrite disseminated at places, medium grained sandy layerings at places and at rare Resin throughout the unit

CORE LOSS

SANDY Siltstone:- Medium light gray, semi hard sandy, coaly carby flakes and traces throughout the unit, rare Resin and pyrite.

CARBY Shale:- Grayish black N2, Medium light-gray N6, slightly sandy, silty, Coal band of 0.13 m at top, with Resin and light-in weight-Coaly carby partings with Resin throughout the unit, more coaly at bottom.

SANDstone/CLAYstone Interlaminated:- Medium light gray N6, semi hard, sideritic throughout unit- coaly carby flakes throughout the unit, Resin at bottom, Very fine grained Sand inter laminated with claystone

Sandstone/claystone Interlaminated:- Same as above unit-

DRILL-HOLE NO TP-4

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
280.58							0.49	CORE LOSS
							0.20	CORE LOSS
					281			Claystone/Sandstone Interlayered:- Medium gray N5, light-gray N7 semi hard, compact- coaly partings near top at-one place and a coal band of 0.03 m near top, big siderite bands throughout-unit, Sandstone interlayered with claystone.
282.39					282		1.61	
					283			
					284		2.50	Claystone/Sandstone Interlaminated and Intermixed:- Medium gray N5 light-gray N7, semi hard, compact- more sandy, claystone & sandstone interlaminated and intermixed, big siderite bands throughout-unit, coaly carbon at places.
285.44					285		0.55	
					286		2.20	CORE LOSS.
					287			
288.49					288		0.85	CLAYstone/Sandstone Interlaminated and Intermixed Same as above unit.
					289			CORE LOSS
					290			
					1			
					2			

Form 3a 39 8/53

DRILL-HOLE NO TP-4

CORE RECOVERY				WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
FROM	TO	CORE	CORE %					
					291			
					292			
					293			
					294			
					295			
					296			
					297			
					298			
					299			
					300			
					1			
					2			

CORE LOSS

DRILL-HOLE NO TP-4

CORE RECOVERY				WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
FROM	TO	CORE	CORE %					
					301			
					302			
					303			
					304			
					305			
					306			
					307			
					308			
					309			
					310			
					1			
					2			

CORE LOSS

DRILL-HOLE NO TP-4

CORE RECOVERY				WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
FROM	TO	CORE	CORE%					
					311			CORE LOSS
312.72					312			
					3			T.D. 312.72 m
					4			DH. TP-4-92 at Bhellian ji veri Khan Distt.
					5			
					6			
					7			
					8			
					9			
					0			
					1			
					2			

COALREAP
Coal Intercepts

Form 4 of 5
Rev Apr 90

Drill hole TP-4 Collar elevation

ed ame	Description	Depth From	Depth To	Thickness	Info Source Roof	%Dry Ash Floor	Sample No.
	COAL	180.91	181.93	1.02	carbyclaystone	Carby Shale	TP-4-1A to 1C
	COAL	192.05	194.31	2.26	claystone	carby clayst.	TP-4-2A to 2C
	COAL	194.51	195.16	0.65	carby claystone	claystone	TP-4-2D
	COAL	198.03	198.18	0.15	claystone	claystone	—
	COAL	200.68	201.12	0.44	claystone	claystone	TP-4-3
	COAL	203.45	203.75	0.30	carby claystone	carby claystone	TP-4-4
	COAL	205.73	206.08	0.35	claystone	carby claystone	TP-4-5
	COAL	223.78	224.66	0.88	claystone	claystone	TP-4-6
	COAL	229.01	230.73	1.72	claystone	claystone	TP-4-7A to 7C
	COAL	248.22	248.44	0.22	sandstone	claystone	—
	COAL	256.14	257.34	1.20	claystone	claystone	TP-4-8-92
	COAL	261.43	262.10	0.67	claystone	carby claystone	TP-4-9-92
	COAL	272.05	273.05	1.00	claystone	Sandy Siltstone	TP-4-10-92
	COAL	274.44	274.57	0.13	Sandy silt-stone	Carby shale	—

COALREAP
Coal Intercepts

Form 4 of 5
Rev Apr 90

Drill hole TP-4 Collar elevation

Bed Name	Description	Depth From	Depth To	Thickness	Info Source	%Dry Ash	Sample No.
	COAL	180.91	181.25	0.34	CORE		TP-4-1A
	〃	181.25	181.60	0.35	〃		TP-4-1B
	COAL	181.60	181.95	0.33	CORE		TP-4-1C
	COAL	192.05	193.02	0.97	CORE		TP-4-2A
	〃	193.02	193.58	0.56	〃		TP-4-2B
	COAL	193.58	194.31	0.73	〃		TP-4-2C
PTG	CARB SH	194.31	194.51	0.20	〃		—
	COAL	194.51	195.16	0.65	CORE		TP-4-2D
	COAL	198.03	198.18	0.15	CORE		—
	COAL	200.68	201.12	0.44	CORE		TP-4-3
	COAL	203.45	203.75	0.30	CORE		TP-4-4
	COAL	205.73	206.08	0.35	CORE		TP-4-5
	COAL	223.78	224.66	0.88	CORE		TP-4-6
	COAL	229.01	229.71	0.70	CORE		TP-4-7A
	〃	229.71	230.18	0.47	〃		TP-4-7B
	COAL	230.18	230.73	0.55	CORE		TP-4-7C
	COAL	248.22	248.44	0.22	CORE		—

→D 252.60M HOLE NOT DEEP ENOUGH
REENTERED AND DRILLED to 312.72m

44-5 53

COAL SAMPLE DATA

SAMPLE NO. TP-4-1A TO 1C NO. OF BAGS ONE FOR EACH

COLLECTOR B.S. LASHARI ~~A.R. MEMON~~ M.A. TAGAR COAL FIELD THAR

LATITUDE _____ LONGITUDE _____

PROVINCE SINDH DISTRICT THAR

DRILL HOLE TP-4 DATE SAMPLED 25-5-92

FORMATION _____ AGE _____

COAL SEAM _____ ESTIMATED RANK LIGNITE

TOTAL SEAM THICKNESS _____ in THICKNESS SAMPLED _____ in

1.02 m 1.02 m

DEPTH TO TOP OF COAL _____ ft SURFACE ELEVATION _____ ft@MSL

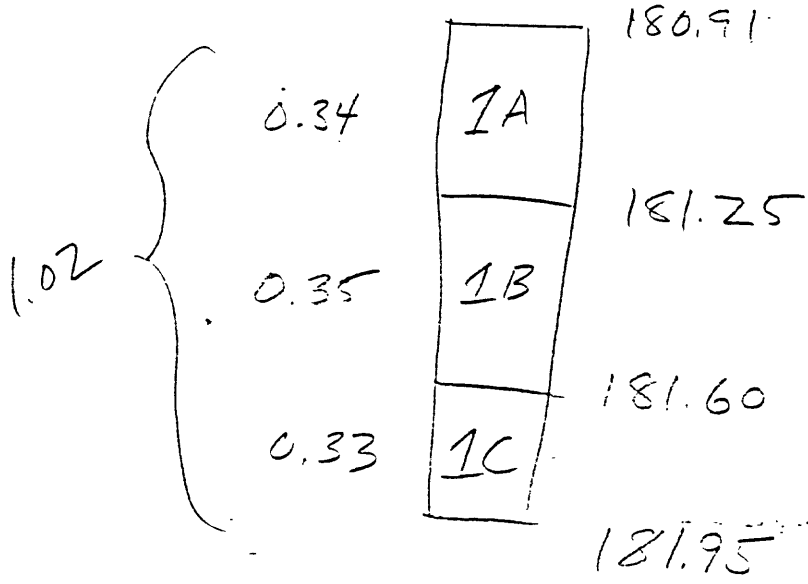
180.91 m _____ m

ROOF ROCK Carby Claystone FLOOR ROCK Carby Shale

SAMPLE TYPE DRILL CORE

(channel, channel/upper bench, grab, drillcore, etc.)

COMMENTS:



45 & 53

COAL SAMPLE DATA

SAMPLE NO. TP-4-2A TO 2D NO. OF BAGS ONE FOR EACH

COLLECTOR G.S. LASHARI ATK-MEMON COAL FIELD THAR

LATITUDE M.A. JAGAR LONGITUDE

PROVINCE SINDH DISTRICT THAR

DRILL HOLE TP-4 DATE SAMPLED 25-5-92

FORMATION AGE

COAL SEAM ESTIMATED RANK LIGNITE

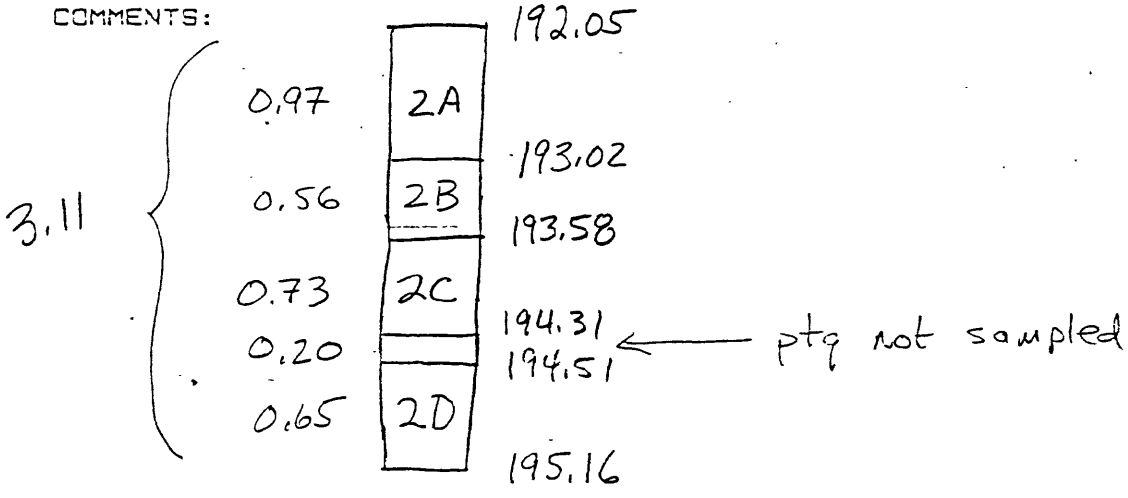
TOTAL SEAM THICKNESS 3.11 m THICKNESS SAMPLED 2.91 m

DEPTH TO TOP OF COAL 192.05 m SURFACE ELEVATION ft@MSL m

ROOF ROCK Claystone FLOOR ROCK Carby clay stone

SAMPLE TYPE DRILL CORE
(channel, channel/upper bench, grab, drillcore, etc.)

COMMENTS:



46 of 53

COAL SAMPLE DATA

SAMPLE NO. TP-4-3 NO. OF BAGS ONE

COLLECTOR G.S. LASHARI ~~A.R MEMON~~ COAL FIELD THAR

LATITUDE M.A JAGAR LONGITUDE

PROVINCE SINDH DISTRICT THAR

DRILL HOLE TP-4 DATE SAMPLED 25-5-92

FORMATION AGE

COAL SEAM ESTIMATED RANK LIGNITE

TOTAL SEAM THICKNESS in 0.44 m THICKNESS SAMPLED in 0.44 m

DEPTH TO TOP OF COAL ft 200.68 m SURFACE ELEVATION ft@MSL m

ROOF ROCK Claystone FLOOR ROCK Claystone

SAMPLE TYPE DRILLCORE
(channel, channel/upper bench, grab, drillcore, etc.)

COMMENTS:

47 of 53

COAL SAMPLE DATA

SAMPLE NO. TP-4-4 NO. OF BAGS ONE

COLLECTOR G.S. LASHARI A.R. MEMON M.A. TAGAR COAL FIELD THAR

LATITUDE _____ LONGITUDE _____

PROVINCE SINDH DISTRICT THAR

DRILL HOLE TP-4 DATE SAMPLED 25-5-92

FORMATION _____ AGE _____

COAL SEAM _____ ESTIMATED RANK LIGNITE

TOTAL SEAM THICKNESS _____ in 0.30 m THICKNESS SAMPLED _____ in 0.30 m

DEPTH TO TOP OF COAL _____ ft 203.45 m SURFACE ELEVATION _____ ft@MSL _____ m

ROOF ROCK Carby claystone FLOOR ROCK Carby clay stone

SAMPLE TYPE DRILL CORE
(channel, channel/upper bench, grab, drillcore, etc.)

COMMENTS:

48 of 53

COAL SAMPLE DATA

SAMPLE NO. IP-4-5 NO. OF BAGS ONE

COLLECTOR G.S. LASHARI, A.R. MEMON, M.A. JAGAR COAL FIELD THAR

LATITUDE _____ LONGITUDE _____

PROVINCE SINDH DISTRICT THAR

DRILL HOLE IP4 DATE SAMPLED 25-5-92

FORMATION _____ AGE _____

COAL SEAM _____ ESTIMATED RANK LIGNITE

TOTAL SEAM THICKNESS _____ in THICKNESS SAMPLED _____ in

0.35 m 0.35 m

DEPTH TO TOP OF COAL _____ ft SURFACE ELEVATION _____ ft@MSL

205.73 m _____ m

ROOF ROCK Claystone FLOOR ROCK Carbaj clay stone

SAMPLE TYPE DRILL CORE

(channel, channel/upper bench, grab, drillcore, etc.)

COMMENTS:

49 of 53

COAL SAMPLE DATA

SAMPLE NO. TP-4-6 NO. OF BAGS ONE

COLLECTOR G.S. LASHARI / A.R. MEMON COAL FIELD THAR

LATITUDE M.A. TAGAR LONGITUDE

PROVINCE SINDH DISTRICT THAR

DRILL HOLE TP-4 DATE SAMPLED 26-5-92

FORMATION AGE

COAL SEAM ESTIMATED RANK LIGNITE

TOTAL SEAM THICKNESS in 0.88 m THICKNESS SAMPLED in 0.88 m

DEPTH TO TOP OF COAL ft 223.78 m SURFACE ELEVATION ft@MSL m

ROOF ROCK clay stone FLOOR ROCK claystone

SAMPLE TYPE DRILL CORE
(channel, channel/upper bench, grab, drillcore, etc.)

COMMENTS:

COAL SAMPLE DATA

SAMPLE NO. TP-4-7A TO 7C NO. OF BAGS ONE FOR EACH

COLLECTOR G.S. LASHARI, A.R. MEMON, M.A. TABAR COAL FIELD THAR

LATITUDE _____ LONGITUDE _____

PROVINCE SINDH DISTRICT THAR

DRILL HOLE TP-4 DATE SAMPLED 26-5-92

FORMATION _____ AGE _____

COAL SEAM _____ ESTIMATED RANK LIGNITE

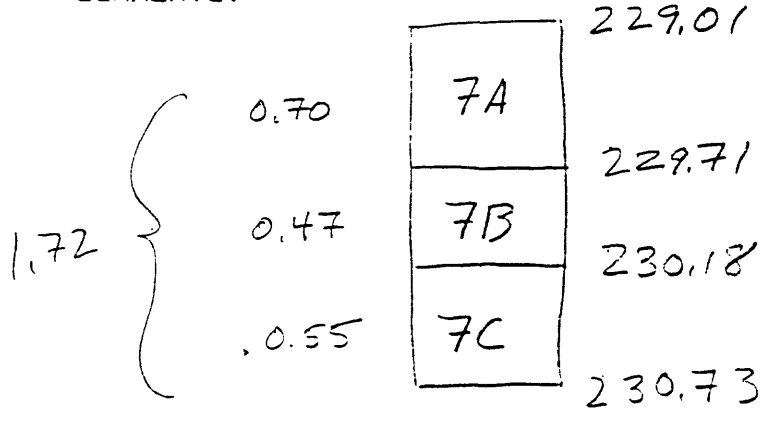
TOTAL SEAM THICKNESS _____ in 1.72 m THICKNESS SAMPLED _____ in 1.72 m

DEPTH TO TOP OF COAL _____ ft 229.01 m SURFACE ELEVATION _____ ft@MSL _____ m

ROOF ROCK Claystone FLOOR ROCK Claystone

SAMPLE TYPE DRILL CORE
(channel, channel/upper bench, grab, drillcore, etc.)

COMMENTS:



COAL SAMPLE DATA

SAMPLE NO. TP-4-8 NO. OF BAGS ONE

COLLECTOR G.S.LASHARI M.A-TABAK COAL FIELD THAR

LATITUDE _____ LONGITUDE _____

PROVINCE SINDH DISTRICT TAR

DRILL HOLE TP-4-92 DATE SAMPLED 2-7-92

FORMATION _____ AGE _____

COAL SEAM _____ ESTIMATED RANK LIGNITE

TOTAL SEAM THICKNESS _____ in 1.20 m THICKNESS SAMPLED _____ in 1.20 m

DEPTH TO TOP OF COAL _____ ft 256.14 m SURFACE ELEVATION _____ ft@MSL _____ m

ROOF ROCK CLAYSTONE FLOOR ROCK CLAYSTONE

SAMPLE TYPE DRILLCORE
(channel, channel/upper bench, grab, drillcore, etc.)

COMMENTS:

coal from 256.14 to 257.34 (1.20) m

COAL SAMPLE DATA

SAMPLE NO. TP-4-9 NO. OF BAGS ONE

COLLECTOR G.S. LASHARI / M.A. TABAR COAL FIELD THAR

LATITUDE _____ LONGITUDE _____

PROVINCE SINDH DISTRICT THAR

DRILL HOLE TP-4-92 DATE SAMPLED 3-7-92

FORMATION _____ AGE _____

COAL SEAM _____ ESTIMATED RANK LIGNITE

TOTAL SEAM THICKNESS _____ in / 0.67 m THICKNESS SAMPLED _____ in. / 0.67 m

DEPTH TO TOP OF COAL _____ ft / 261.43 m SURFACE ELEVATION _____ ft@MSL / _____ m

ROOF ROCK CLAYSTONE FLOOR ROCK CARBY CLAYSTONE

SAMPLE TYPE DRILL CORE
(channel, channel/upper bench, grab, drillcore, etc.)

COMMENTS:

Coal from 261.43 to 262.10 (0.67) m

COAL SAMPLE DATA

SAMPLE NO. TP-4-10 NO. OF BAGS ONE

COLLECTOR G.S. LASHARI COAL FIELD THAR

LATITUDE M.F. TAGAR LONGITUDE

PROVINCE SINDH DISTRICT THAR

DRILL HOLE TP-4-92 DATE SAMPLED 4-7-92

FORMATION AGE

COAL SEAM ESTIMATED RANK

TOTAL SEAM THICKNESS ft THICKNESS SAMPLED ft in.

1.0 m 1.0 m

DEPTH TO TOP OF COAL ft SURFACE ELEVATION ft @MSL

272.05 m m

ROOF ROCK CLAYSTONE FLOOR ROCK SANDY SILTSTONE

SAMPLE TYPE DRILL CORE

(channel, channel/upper bench, grab, drillcore, etc.)

COMMENTS:

Coal From 272.05 to 273.05 (1.0) m