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 IIa - Lithologic and geophysical logs for the Indus Plain area

compiled by

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Open-File Report 94-596-A

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

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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 Indus Plain 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-B	Lakhra south area
Open-File Report 94-596-C	Meting-Jhimpir extensions
Open-File Report 94-596-D	Thar Desert area

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DRILLING LOGS AND LITHOLOGIC DESCRIPTIONS

by

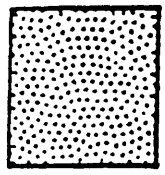
M. Dawood Khan, M. Riaz Khan, and Ch. Mohammad Anwar

GEOPHYSICAL LOGS

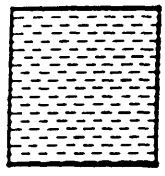
by

Mehtab-ur-Rahman, Nizamani, and Huda

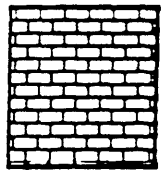
EXPLANATION OF LITHOLOGIC SYMBOLS USE



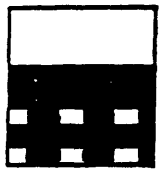
Sandstone



Shale/Claystone

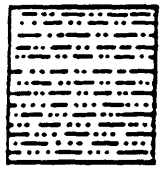


Limestone

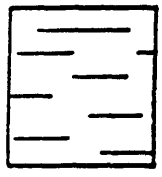


Coal

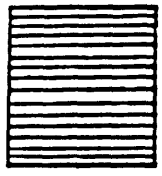
Dirty coal



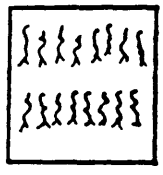
Siltstone



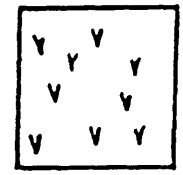
Mudstone



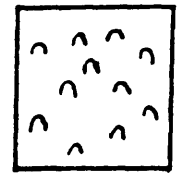
Carbonaceous shale



Underclay

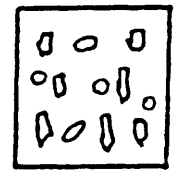


Alluvium

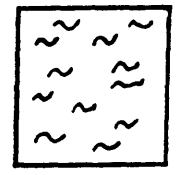


Fossil shell fragments

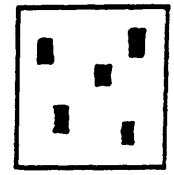
Fossil plant fragments



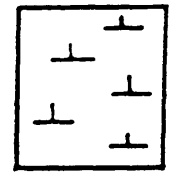
Pebbles / lithic fragments



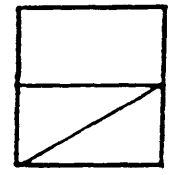
Glauconite



Pyrite



Calcareous



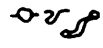
Core loss

Roots

Carbonaceous material

Pelecypods

Siderite



Burrows

Gastropods

Mica

Foraminifera

modified from Thomas and others, 1988

DRILLING RECORD
COAL REAP

Drill hole BN-1

Topo Sheet 40 D/1

Grid ref 810189 mN 2159103 mE

Surface elev. (m) 14.0 (Surveyed)

Drill rig LONGYEAR-38

Drilling started Date 22nd May-1992 Time 18 Hrs Hrs
Drilling completed Date 2nd June 1992 22nd Hrs

Drill Bit				
Surface	to	25.90	m	Tricon Rollen Bit 3 7/8"
25.90	to	78.63	m	DIAMANT BIT HC
78.63	to	213.96	m	Tungsten Bit no 59203 HQ
	to		m	
	to		m	
	to		m	
	to		m	

Fluids used Bentonite

Casing set				
Surface	to	0.00-25	m	HW-Diamond casing shoe.
	to		m	
	to		m	

Lith logged by MUHAMMAD ANWAR
MUHAMMAD DAWOOD

Geophysical logs:

		From		to		through
XAP	GAMMA	3	m	202	m	RODS
	GGNR	3	m	206	m	"
	GGFR	3	m	206	m	"
JLP	GAMMA	3	m	204	m	"
	NEUTRON	3	m	206	m	"
JLP	GAMMA	3	m	209	m	OPEN HOLE
	NEUTRON	3		211		" "

REMARKS:

XAP	GAMMA	5	206
	CALIPER	34	209
	GGER	5	210
	GGNR	5	210

Surface casing to 25m

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COAL REAP

Drill Hole BN-1

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
22-5-1992	2215 Hr.	00 – 9.46m	Drilling start.
23-5-1992	1400 – 1700 Hrs		lower the NW casing from 9.46m to 24.40m.
			with HQ Diamond shoe.
23-5-1992	1700 – 2200 Hrs	24.03 – 35.96m	Drilling continued.
23-5-1992	2200 – 0600 Hrs	35.96 – 47.72	Drilling continued
24-5-1992	1600-2200 Hrs		Drilling stops, Water will hole
			was caved up to 25.90m and same
			time gear box was borken.
25-5-1992	0600-0600	57.30 – 6035m	Drilling start with HQ bit.
25-5-1992	0600 – 0930 Hr	60.35	Drilling stop for change of bit and other arrangement.
25-5-1992	930 – 1400 Hr	60.35 – 72.54	Drilling continued
25-5-1992	1400 – 2200 Hr	72.54m	Drilling stop due to mechineal faul.
			in gearbox
26-5-1992	0100 – 0600 Hrs	72.54 – 78.63	Drilling continued
26-5-1992	0600 – 1400 Hrs	78.63	Drilling stop due to hole was caved
26-5-1992	2000 – 2130 Hrs	78.94	Drilling stop due to Mechanical faul
26-5-1992	0330 – 0600 Hrs	78.94 – 85.64	Drilling continued
27-5-1992	0600 – 1600 Hr.	85.64 – 94.18	Drilling continued
27-5-1992	1615 – 2065	94.18 – 99.97	Drilling continued
27-5-1992	2200/0600	99.97m	Hole was caved up to 52.73 m
28-5-1992	0600 –	99.97m	Redrilling for reaching bottom.

COAL REAP

Drill Hole BN-1

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
28/5/92	1510-2200 Hr	99.97-108.20 m	Drilling continued
28/5/92	2200-0600 Hrs	108.20-117.65 m	Drilling continued
29/5/92	0600/1400 Hrs	117.65-126.79 m	Drilling continued
29-5-1992	1400-2200 Hrs	126.79-139.90 m	Drilling continued
29-5-1992	2200-0600 Hrs	139.90-146.30 m	Drilling continued
30-5-1992	0600-1600 Hrs	146.30-157.14 m	Drilling continued
30-5-1992	1600/2200 Hrs	157.14-163.06 m	Drilling continued
30-5-1992	2200/0600 Hrs	166.72 m	Drilling stop due to caveing and water was not return.
31-5-1992	0600/1000 Hrs	166.72 m	Drilling stop due to caveing and water was not return and wireline broken
31-5-1992	1000/1600 Hrs	166.72-180.44 m	Drilling continued
31-5-1992	2200/0600 Hrs	180.44-189.22 m	Drilling continued
1-6-92	0600/1400 Hrs	189.22-195.07 m	Drilling continued
1-6-92	1400/2000	195.07-200.91 m	Drilling continued
1-6-92	2200/0600	200.91-206.69 m	Drilling continued. Progress very slow due to blockage of core.
2-6-92	0600/1600	206.69-209.09 m	— do —
2-6-92	1600/2200	209.09-213.96 m	Drilling continued.
2-6-92	2200 Hr.	213.96 m	Hole completed.

DRILL-HOLE NO 3N-1

CORE RECOVERY				WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
FROM	TO	CORE	CORE%					
		N O N C O R I N G						UNIT NO 2 0.00 – 25.30m (Non Coring) silt and clay light gray N7 ± Med light gray N6 sandy micaceous containing Qtz. mica & lacunite calcareous. NON CORING

DRILL-HOLE NO BN-1

CORE RECOVERY				WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
FROM	TO	CORE	CORE %					
		NON CORING			11 12 13 14 15 16 17 18 19 20			UNIT NO. 1 contd.

DRILL-HOLE NO BN-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
			NON - CORING		21 22 23 24 25			
	25.90							25.90
25.90					26		0.07	Clay stone:- Dark yellowish brown 10YR 4/2 hard compact- UNIT NO 2 sticky. mica flake very rare. glauconite. 25.97
	3.05	0.07	9.29%		27		2.88	CORE LOSS FROM 25.97 – 28.85 = (2.88)m
	28.85				28			28.59
28.05								UNIT NO 3
	0.92	NIL	100% LOSS		29			CORE LOSS FROM 28.85 – 29.87 = (0.82)m
	29.87							29.35
29.87					30			UNIT NO 4 CORE LOSS FROM 28.87 – 31.76 = (1.89)m
					1			
					2			

DRILL-HOLE NO BN-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
					31		1.20	CORE LOSS IN CLAY 29.87 − 31.76 = (1.89)m 31.76m
	3.04	1.15	37.8%	25%	32		1.15	Clay: Medium light grey N6, variegated in colour, Compact-Sticky when wet. coaly specks, leaf impressions, carbonaceous matter, rare glauconite pellets, mica rare. 32.91
32.91	35.96	1.55	50.8%	25%	33 34 35		1.50 1.55	UNIT NO 5:- CORE LOSS IN CLAY 32.91 − 34.41 = (1.50)m 34.41 CLAY:- Same as above unit No. 4 35.96
35.96	39.01	1.22	40%	25%	36 37 38		1.83 1.22	UNIT No. 6 CORE LOSS IN CLAY 35.96 − 37.79 = (1.83)m 37.79 Same as above unit No 3 39.01
39.01	43.05	1.97	64.5%		39 40 2		1.08	UNIT No. 7. CORE LOSS IN CLAYSTONE 39.01 − 40.09 = (1.08)m

DRILL-HOLE NO BN-1

CORE RECOVERY FROM	TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
								42.09
				25%	41		1.42	Clay stone:- Brownish gray 5YR 4/1 hard compact, sticky Coaly speeler mica very rare, Gastropoad Shells fergments, ferromagnesium grains.
		1.97	64.5%					41.51
							0.50	Sandstone:- Olive gray 5Y 4/1 fine grained, angular to subrounded soft loose friable, ferromagnesium pellets, glauconitic pellets @ t2. 70-80%, calcarious mica flakes. 42.01
	42.06				42		0.05	Claystone Brownish gray 5YR 4/1 hard compact sticky mica very rare. 42.06
42.06								UINT No 8:
					43		1.25	CORE LOSS IN CLAY ST. 42.06 - 43.31 = (1.25)m
								43.31
	3.05	1.80	59%		44		1.80	Claystone:- Dark yellowish brown 10YR 2/2 and variegated in colour, compact, sticky, glauconitic pellets very rare., mica flakes scattered, calcarious.
	45.11				45			45.11
45.11				25%			1.08	UNIT No. 9 CORE LOSS IN CLAYSTONE 45.11 - 46.19 = (1.08)m
					46			46.19
	2.61	1.53	58.6%				1.26	Claystone:- Light gray N7, hard compact; sticky, slightly calcarious, mica flakes very rare.
								47.45
1					47		0.27	Gritstone:- Dark yellowish orange 10YR 6/6 to Greenish gray 5GY 6/1, hard compact, contains granules of @ t2. Lst. subangular to subroundeel, matrix, silty Calcarious 47.72
	47.72							BARA (47.47)m
47.72					48		0.60	UNIT No. 10 Claystone:- Moderate yadish brown 10R 4/6 To dark yellowish orange 10YR 6/6 mottled. calcarious, maicaceous. Kaolinite
								48.32
	2.82	1.90	65%		49		1.30	Sandstone:- Moderate yaddish brown 10R 4/6 To Dark grayish orange 5YR 7/4 fine to Medium grained Subrounded grains, loose friable, micaceous ferromagnesium grains, Sand Stone.
								49.62
					50		1.02	CORE LOSS IN SANDSTONE 49.62 - 50.62 (1.02)m
					1			
					2			

BARA FORM 1

DRILL-HOLE NO BN-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	50.64							CORE LOSS IN SAND STONE 50.64
50.64	0.56	.13	23%		51		0.43	UNIT NO 1 CORE LOSS IN SST. 50.64 – 51.07 = 0.43. 51.07
	51.20						0.13	Sandst:- Dusty yellow 5Y6/4 To grayish orange 5YR7/2 fine to medium grained loose soft friable. Top clayey, mica flakes, ferromagnesium & ferrogenius SST. 51.20m
51.20	3.05	0.75	24.6%	25%	52		0.75	UNIT No. 12 Sand stone:- Greenish gray 5G6/1 to Pale red 5R6/2, fine to medium grained, soft loose friable, subrounded grained. Top is clayey micaceous. ferromagnesium grains. Calcareous 51.95m
					53		2.30	CORE LOSS IN SAND STONE FROM 51.95 – 54.25 = (2.30) m.
	54.25				54			54.25m
54.25	3.05	—	100% Loss		55		3.05	UNIT NO. 13 CORE LOSS IN SAND STONE FROM 54.25 – 57.30 =
	57.30				56			
					57			57.30m
57.30	3.05	—	100 Loss		58		3.05	UNIT No 14 CORE LOSS IN SAND STONE FROM – 57.3 – 60.35 = (3.05) m
					59			
					60			
					1			
					2			

Form 3a 10 & 29

DRILL-HOLE NO BN-1

CORE RECOVERY FROM	TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	60.35							CORE LOSS IN SST. 60.35m
60.35	3.04	—	100% Loss		61 62 63		3.04	UNIT NO 15:- CORE LOSS IN SAND STONE FROM:- 60.35 – 63.39 = (3.05)m 63.39m
63.39	3.05	—	100% Loss		64 65 66		3.05	UNIT NO. 16 CORE LOSS IN SAND STONE FROM 63.39 – 66.44 = (3.05)m. 66.44 m
66.44	3.05	—	100% Loss		67 68 69		3.05	UNIT NO. 17 CORE LOSS IN SAND STONE FROM 66.44 – 69.49 = (3.05)m 69.49m
69.49		0.40	13.11%	25%	70 1 2		0.17 0.23	UNIT NO. 18 Sand Stone:- Medium Light gray N6, fine grained subrounded, clayey, contain qtz. and ferromagnesium 69.66 Sand Stone:- Dusty yellow 5Y6/4, Medium to coarse grained, subangular to subrounded, ferromagensium, grain ferrogenious, soft loose friable 70.9

DRILL-HOLE NO BN-1

CORE RECOVERY FROM	TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	72.54	3.05			71, 72		2.65	CORE LOSS IN SANDSTONE FROM 69.89 – 72.54 = (2.65)m. — 72.54
72.54	3.05 / 75.59	0.47	15.4%	25%	73, 74, 75		2.58	UNIT No. 19 CORE LOSS IN SAND STONE FROM 72.54 – 75.12 = (2.58)m — 75.12m
							0.47	Sandstone:- Light gray N7 - to Light olive gray 5Y6/1. Medium to carse, V. hard compact, contain Qtz. Ferromagnesium grain, biotite flakes. Subangular to subrounded also contains kaolonite — 75.59m
75.59	1.57 / 77.16	0.13	8.28%		76, 77		0.13	UNIT NO. 20 Sandstone:- Same as above unit No. 19 — 75.72m
							1.44	CORE LOSS IN SAND STONE FROM 75.72 – 77.16 = (1.44)m — 77.16m
77.16	1.47 / 78.63	.20	13.60%		78		0.20	UNIT NO. 21 Sandstone:- Medium light gray N6 to Medium gray N5, hard Fine to coarse Compact, contain Qtz. Ferromagnesium, upper part clayey and fractured. — 77.36m
							1.27	CORE LOSS IN SAND STONE FROM - 77.36 – 78.63 = (1.27m) — 78.63m
78.63	0.38 / 79.01	0.38	100%				0.38	UNIT No. 22 Sandstone:- Medium gray N5. Fine to Medium grain subrounded. hard compact contain Qtz. Biotite, Coal specks coal lining Carbonaceous, resin, Pyritic Chlorite, at the bottom at top are clayey, ferromagnesium pellets. glauconitic — 79.01m
79.01	1.63	1.63	100%		79, 80		0.22	UNIT No. 23 Sandstone:- Same as above unit No. 21 — 79.23
							1.41	Sandstone:- Light olive gray 5Y6/1 Fine to Medium grained Subrounded grains. contains Qtz. Biotite, Ferromagnesium mineral. loose soft friable.
					1, 2			

DRILL-HOLE NO BN-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	80.64						1.41	Sandstone.
80.64								80.64m
	3.05	2.50	81%		81		1.31	UNIT NO 24 Sandstone:- Light gray N7 to light olive gray 5Y6/1 fine to Medium grained soft little bit compact carbonaceous coal like lining at places, pyritic resin at few places contains Qtz. ferromagnesium grain
								81.95m
					82		1.24	Sandstone:- Light gray N7 fine to medium grained, very loose soft friable, contains Qtz. Mica flakes (biotite) ferromagnesium mineral.
					83			83.19m
	83.69						0.50	CORE LOSS IN SAND STONE FROM 83.19 - 83.69 = (0.50m) 83.69m
83.69								
	2.56	2.35	91.7%		84		2.35	UNIT NO. 25 Sand stone light olive gray 5Y6/1 fine to Medium grained, subrounded grain, Qtz. Mica flakes (biotite) ferromagnesium grain, coal lining, Pyritic, carbonaceous, very loose, soft friable,
					85			86.04m
	86.25				86		0.21	CORE LOSS IN SAND STONE FROM 86.04 - 86.25 = (0.21)m
86.25				25%				86.25m
	0.71	0.46	67.6%					UNIT NO. 26 CORE LOSS IN SST. 86.25 - 86.48 = (0.23)m 86.48m
	86.96						0.48	Same as above UNIT No 25
86.96					87			86.96m
	0.82	0.82	100%				0.82	UNIT NO 27 Sandstone:- Light olive gray 5Y6/1 compact hard, Medium grain, contains Qtz Mica flakes (biotite) coal specks Qtz granules at places. Top is very soft, cross bedded Pyrite grains ferro magnesium mineral. carbonaceous
	87.78							87.78m
87.78								UNIT No. 28
	3.05	0.15	4.9%		88			CORE LOSS IN SANDSTONE
					89		2.90	FROM 87.78 — 90.68 = (2.90)m
					90			

DRILL-HOLE NO BN-1

CORE RECOVERY FROM	TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
							2.90	CORE LOSS IN SAND STONE 90.68m
				25%				Sandstone:- Light gray N7, Medium to coarse grain, soft loose friable subangular to subrounded contains Qtz, ferromagnesium mineral at the back
	90.83						0.15	Sedimitic nodule, Py grain v. rare 90.83
90.83					91		0.14	UNIT NO 29 Sand stone:- Light gray N7, Medium coarse grain soft loose friable, subangular to subrounded contains Qtz grain, Pyrite grains, ferromagnesium mineral with v. hard pices of SST. contain leaf impressions
								90.97m
	3.04	0.14	4.6%	25%	92			CORE LOSS IN SAND STONE FROM 90.97 – 93.87 = (2.90)m
					93		2.90	
	93.87							93.87m
93.87	0.31				94		0.20	UNIT NO 29 Sand Stone:- Same as above unit No 29
	94.18	0.20	6.4%				0.11	CORE LOSS IN SST 94.07 – 94.18 (0.11) 94.18m
94.18								UNIT NO 30
							2.09	CORE LOSS IN SAND STONE FROM 94.18 – 96.27 = (2.09)m. 96.27m
	3.05			25%	95			Sand Stone: Loose sst. Same as above UNIT No. 29 96.53m
		0.96	31.47%		96		0.26	Grit stone:- Light olive gray 5Y6/1 hard compact granules of Qtz. Patches of sticky clays, open solution cavities. Coarse grain Qtz & Pyritic. 97.03m
							0.50	Sand stone (loose) Light gray N7 Medium to coarse grain subrounded soft, loose friable contains ferromagnesium grain Qtz. Pyrite grain.
	97.23				97		0.20	97.23
97.23	0.30	0.20	66.6%	25%			0.10	UNIT NO 31 CORE LOSS IN SAND STONE 97.23 – 97.33 = (0.10)m 97.33
	0.53						0.20	Sand stone:- Same as above Unit No 30 (with hard Sand Stone at bottom) 0.05m sst coarse grained hard compact contain ferromagnesium grains Pyrite grain. 97.53
97.53							0.14	UNIT NO 32:- CORE LOSS IN SAND STONE FROM 97.53 – 97.67 = (0.14)m 97.67
					98		1.57	Clay stone:- Light bluish gray 5B7/1 to Light gray N7 Compact, hard, Qtz. granules carboneaceous. Pyritic 99.24
	2.66							Shale Medium gray N7 hard compact carboneaceous pyritic coal sparkles, coaly thin lining 99.42
		2.30	94.26%		99		0.18	Carby Shale:- Medium dark gray N4, thin coaly lining pyritic resin 99.60
							0.25	Sandy, carboneaceous, at places in dark gray colour 99.85
	99.97						0.30	Clay stone Same as above in unit No 32 99.97
99.97					100		0.19	UNIT NO 33 Clay stone Core Loss in Clay st. 99.97 – 100.16 = 0.19m

DRILL-HOLE NO 3N-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
							0.13	CORE LOSS from 99.97 – 100.16 = 0.19m (100.16m)
	0.99	0.80	80.8%				0.80	Claystone Light bluish gray 5B7/1 to Medium Light gray N6, carbonaceous matter, Coal specks. coal lining Pyritic, leaf impressions at the base Medium gray carby Shale, pyritic coal specks (100.96)
100.96	100.96				101		0.19	UNIT NO 35 CORE LOSS IN SANDSTONE 100.96 – 101.15 = (0.19)m. (101.15m)
	1.32	1.13	85.6%	25%			0.48	Sand st. Light olive gray 5Y6/1 Med. to coarse grain. subrounded to subangular. soft loose friable. contain Qtz. glauconite pellets micas flecks (101.64m)
							0.16	clay st. :- Light bluish gray 5B7/1 to Medium Light gray N6. Compact, sticky coal specks. carbonaceous matter. resin. (101.76m)
					102		0.32	COAL SEAM :- Greenish black N2 to black N1 blacky texture, resin, clay walls. Pyritic banded. (102.08m)
	102.08						0.22	CLAYSTONE SAME AS ABOVE UNIT NO. 33 (102.26)
102.28							0.85	UNIT NO 36 CLAYSTONE :- Greenish 5G6/1, Compact. Containing Coal specks Pyrite grains, leaf impressions and thin Sand lens at places. (103.13m)
	3.05	3.05	100%	25%	103		1.27	CARBYSHALE :- Dark gray N3, Compact. thin lining of coal at places. Pyritic, leaf impressions carbonaceous matter, at the Top 0.25m more highly carby. (104.40m)
					104		0.92	CLAYSTONE :- olive gray 5Y4/1, hard compact containing coal lining, pyritic, leaf impressions (105.33m)
105.33								UNIT NO 37
	3.05	3.05	100%	25%	106		3.05	Sandstone :- Light olive gray 5Y6/1 to Medium gray N5, fine to Medium grain, subangular to subrounded grains, compact hard, carbonaceous thin coal lining (inter bedded with thin layer of dark gray shales at places. lens of light gray sand at places Pyrite grain, leaf impressions, cross bedded. glauconitic pellets
					107			
	106.38				108			(108.38m)
108.38							0.84	UNIT NO 38 Sandstone :- Light olive gray 5Y6/1 Same as above Unit No 36 (at the Top is v. soft coarse grain Sandstone) (109.22m)
	3.04	1.30	42.7%		109		0.46	Sandstone :- Light olive gray 5Y6/1, Medium to fine grained, subrounded grain. Soft loose friable contains Qtz, ferromagnesium grains, at the bottom carbonaceous matter 5% rare (109.68m)
							1.74	CORE LOSS IN SAND STONE 109.68 – 111.42 = (1.74)
					110			
					1			
					2			

DRILL-HOLE NO BN-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	111.42			25%	111			CORE LOSS IN SAND STONE FROM 109.68 — 111.42 = (1.74) m (111.42 m)
111.42							0.51	UNIT NO 39: Sandstone:- Same as above unit No. 38 (111.93m)
					112		0.68	Claystone:- Greenish gray 5G 6/1 Compact hard, carbonaceous at places, pyritic at places. leaf impressions (112.61m)
	2.75	2.75	100%	25%			0.60	Sand Stone:- Light bluish gray 5B 7/1 to Light gray N7, fine to Medium grained carbonaceous matter leaf impressions coal specks pyrite grains. (113.21m)
					113		0.17	Shale:- olive gray 5Y 4/1 to Medium gray N5 hard compact, lens of Pyrite Carbonaceous matter leaf impressions (113.38m)
							0.17	Coal seam:- Grayish black N2 to Medium dark gray N4 dull, dirty Pyritic, resin thin sandy lensal places. silty, leaf impressions (113.55)
	114.17				114		0.62	Shale:- Medium gray N5 to Medium dark gray N4 carbonaceous matter leaf impressions Pyritic, coal specks fractured, sticky in the lower Part. (114.17)
114.17							0.34	UNIT NO. 40 Claystone:- Light gray N5 Compact hard Pyritic, leaf impressions (114.51m)
							0.62	Sandstone:- Greenish gray 5G6/1 fine to medium grained hard compact clayey at places, Pyritic coal sparal places (115.13m)
					115		0.60	Shale:- olive gray 5Y 4/1 hard Compact fissile carbonaceous Pyritic leaf impressions, Burrows (115.73m)
							0.17	Coal seam:- Gray Black N2 to Medium dark gray N4, dull dirty, resin, blocky, fissile texture, lignitic type, thin sandy lens, pyritic (115.90)
	3.04	3.04	100%	25%	116		1.31	Clay stone:- Same as above unit No. 40 Note:- Top is carby shale 0.10m and containing Pyritic leaf impressions (117.21m)
117.21					117		0.07	Carby shale, green gray 5GG/1 to medium gray, carby and coaly specks, thin lining of coal (117.28)
					118		2.39	clay stone 5Y4/1 to medium dark gray N4 Carby coal specks and thin lining at the top. Closed calcite vein and resin. followed by coal black dirty resin leaf impressions and carby clay stone at the base. 5cm (119.67)
					119		0.36	Coal seam: Dark gray N3 to grayish black N2: blocky to fissile texture. partly banded resinal specs lignitic type dirty leaf (120.03) impressions in the middle part. thin Py vein, thin sandy lenses. in lower part, low sp. gravity
					120			
					1			
					2			

DRILL-HOLE NO BN-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	120.26						0.23	Carby Shale as above (120.26m)
120.26							0.39	UNIT NO 42 CORE LOSS 120.26 – 120.65 (0.39m) (120.65m)
					121		0.50	Sandstone :- Light olive gray 5Y6/1 to Medium gray N5, Fine to Medium grained hard compact clayey at the bottom spoted by light gray colour. SST med. grained at places. Carbonaceous matter, pyritic. Leaf impressions (121.15)
	3.05	2.66	87.2%	25%			1.27	Claystone :- Medium light gray N6 to greenish gray 5G6/1 compact hard Containing Carbonaceous matter, coal specks, pyritic lower portion is more clayey. (122.66m)
					122		0.68	Claystone :- Medium dark gray N4 highly carbonaceous. thin lining of coal, resin, leaf impressions, pyritic, coal specks lower part. more carbonaceous and coaly. (122.34m)
							0.41	COAL SEAM :- SAMPLE No. BN-1-C-92 (0.46m) Grayish Black N2 to Black N1, blocky to fissile texture banded resin scattered through out. Pyrite disseminated, Alum leus ? Calcite, leaf impression, liquitic type. (123.30m)
123.31					123		0.30	
							0.72	UNIT No. 43 Claystone :- Medium gray N5, hard compact soapy/sticky Leaf impressions carbonaceous matter coal specks Pyritic. (124.02m)
					124		0.90	Sandstone :- Medium gray N5, Medium to coarse grains sub angular to subrounded. carbonaceous, clayey at places. Coal specks. and pyritic, ferromagnesium (124.92m
	2.87	2.87	100%	25%			0.26	Claystone :- Light gray N7 compact fractured coal specks Pyrite disseminated. (125.18m)
					125		0.99	Sandstone :- Same as above (Same Unit No. 43) (126.18m)
126.18	126.18				126		1.10	UNIT NO 44 Sandstone :- Light bluish gray 5B7/1 fine to medium grained angular to subrounded hard compact, leaf impressions Pyrite rare, Coal specks v. rare. The lower portion of 0.12 m clayey light bluish gray 5B7/1 compact sticky coaly specks. ferromagnesium. (127.28m
					127		0.67	Sandstone :- Light gray 5Y6/1 to Medium gray N5, Medium to Coarse grained loose soft friable cross bedded carbonaceous thin coal lining resins leaf impressions. 8% ferromagnesium (128.15m)
	3.05	1.97	64.6%	25%				CORE LOSS IN SAND STONE FROM: 128.15 – 129.23 = (1.08) (129.23m)
					128		1.08	
	129.23				129			
129.23							0.18	UNIT NO 45 Sand stone :- Light gray N7, Medium grain, subrounded to sub. very loose, friable Containing Carbonaceous matter, 6% ferromagne sium mineral rare. coal specks. glauconitic pelleti mica (129.41m)
	1.04	0.14	13.5%	25%			0.86	CORE LOSS IN SANDSTONE 129.41 – 130.27 = (0.8
					130			
					1			
					2			

DRILL-HOLE NO 3N-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	130.27							CORE LOSS IN SAND STONE 130-27m.
130.27							0.15	UNIT No 46. Sandstone:- Light gray N7, Medium grained, subangular to subrounded contains ferromagnesium mineral. Glauconitic pellet, mica flakes (130.42m)
	3.05	0.15	4.9%	25%	131		2.90	CORE LOSS IN SAND STONE FROM 130.42 – 133.32 = (2.90)m.
	133.32				132			(133.32m)
133.32					133			UNIT No. 47
	3.00	NIL	100% Loss	25%	134		3.00	CORE LOSS IN SAND STONE FROM 133.32 – 136.32 = (3.00)
	136.32				135			(136.32m)
136.32					136			UNIT NO 48 CORE LOSS IN SAND STONE FROM:- 136.32 – 137.11 = (0.79)m (137.11m)
	1.01	0.22	21.7%	25%	137		0.79	Sandstone:- Light gray N7, Medium to coarse grained, subrounded grain, V. hard, Compact- containing Qtz. granules, ferromagnesium mineral, Calcareous. (137.33m)
	137.33						0.22	
137.33							0.15	UNIT No. 49 Sandstone: Same as above unit No. 48 (137.48m)
							0.10	Coal seam:- Grayish black N2, dull, dirty, resin, fissile texture, thinly banded leaf impression, pyrite disseminated, thin sandy lens. (137.58m)
	3.96	2.05	80.7%	25%	138		1.8	Claystone:- Medium light-gray N6 to Medium bluish gray 5B5/1 Compact & medium hard, APPLE TOP rich pyrite, containing carbonaceous coal specks, leaf impression, fractured at places. (139.38m)
	139.53				139		0.21	CORE LOSS IN CLAY STONE FROM 139.38 – 139.59 = (0.21) (139.59m)
139.59	3.05	1.32		25%			1.73	UNIT No. 50 CORE LOSS IN CLAY STONE FROM 139.59 – 141.32
					140			
					1			
					2			

DRILL-HOLE NO BN-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
					141		1.73	CORE LOSS IN CLAY STONE (141.32m)
				25%				Claystone:- Same as above unit No. 48 (142.02m)
	3.05	1.32	43.27%		142		0.62	Siltstone:- Medium bluish gray 5B5/1, Compact hard Carbonaceous, coal specks. Pyrite disseminated (142.64m)
142.64					143		2.08	UNIT NO. 50 CORE LOSS IN SAND STONE FROM 142.64 – 144.72 = (2.08) (144.72m)
	2.82	0.74		25%	144			
	145.46				145		0.74	Claystone: Same as above unit No. 49 (145.46m)
145.46							0.50	UNIT NO 52 Siltstone:- Same as above UNIT NO 48 (145.96m)
	1.22	1.22		25%	146		0.72	Claystone:- Olive gray, 5Y4/1 to Medium bluish gray 5B5/1 fractured, Pyrite disseminated, rare coal specks Carbonaceous matter rare, soapy/sticky sandy at base (146.68m)
146.68								UNIT NO 53 Siltstone Same as above UNIT NO. 50
	3.05	3.05		25%	147		1.70	
					148			(148.38m)
					149		1.35	Sandstone:- Greenish gray 5G6/1 fine to Medium grained Subrounded grains, hard compact contains Pyrite Ferromagnessium grain at the bottom, Light gray colour Medium grained Sands at places. Mica flacks Glauconitic pelleti
	149.73							(149.73)
149.73		?					0.22	UNIT NO 54 Siltstone:- Same as above Unit No. 49 (149.95m)
					150		0.39	Claystone:- pale yellowish brown 10YR6/2 to pale brown 5YR5/2 and Greenish gray 5G6/1, compact and hard
					1			
					2			

DRILL-HOLE NO BN-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
							0.30	(150.25m)
	3.05	3.05	100%	25%	151		2.53	Sandstone :- Pale brown 5YR 5/2, Medium to fine grained subrounded grain containing ferromagnesium mineral pyrite grain, Spoiled ... middle part with brown colour (Pale brown 5YR 5/2). Clayey in middle portion, at the bottom open solution cavity present; Glauconitic pellet Mica flake.
	152.78				152			(152.78m)
152.78								UNIT NO 55
	3.04	2.70	88.5%	25%	153			Silt stone :- Medium bluish gray 5B5/1 to pale brown 5YR5/2, Compact, hard, clayey at places iron oxidize in the lower part, rare Pyrite grain
					154		2.70	
					155			(155.48m)
	155.82						0.34	CORE LOSS in silt stone 155.48 − 155.82 = (0.35) (155.82m)
155.82					156		0.80	UNIT NO 56
	1.32	0.52	39%	25%				CORE LOSS IN silt-stone 155.82 − 156.62 (156.62m)
	157.14				157		0.52	Silt stone :- Same as above unit No. 54
								(157.14m)
157.14								UNIT No 57
	3.05	—	—	25%	158			CORE LOSS 100%
		100%			159		3.05	157.14 — 160.19 = 3.05
		100%			160			

DRILL-HOLE NO BN-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	160.19							CORE LOSS. (160.19m)
160.19					161		1.70	UNIT NO 58 silt stone Same as above unit No 54 (161.89m)
					162		1.41	Sandstone Medium bluish gray 5B5/1 fine to Medium grained subrounded compact hard contains ferromagnesium grain. glaucunitic pellets (163.30m)
163.30	163.30							
	2.61	0.36	13.7%	25%	164		0.36	UNIT NO 59 Sandstone:- Medium bluish gray 5B5/1 fine to medium grained loose, soft; clayey fractured contain Qtz granules at places, mica flakes at places. (163.66)
					165		2.25	CORE LOSS IN SAND STONE FROM. 163.66 – 165.91 (165.91m)
	165.91							
	1.09	1.09	1%		166		1.09	UNIT NO 60 claystone:- Medium bluish gray 5B5/1 to brownish gray 5YR 4/1 Mottled and top is sandy fractured, while bottom is sticky and clayey. (167.00)m
	167.00				167		0.23	UNIT NO 61 Claystone:- Same as above UNIT No. 60 (167.23m)
167.00							0.87	Sandstone:- same as above unit No 59 (168.10m)
	3.05	2.80	91.8%	25%	168		1.70	Sandstone:- Medium gray N5 to Medium bluish gray 5B5/1 fine to medium grained, sub rounded grained Contains Qtz. ferromagnesium few coal specks Pyrite disseminated carbonaceous matter cross bedded. (169.80m)
					169			CORE LOSS IN SAND STONE FROM. 165.80 – 170.05 = (0.25)m
					170			
					1			
					2			

DRILL-HOLE NO BN-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
170.05								170.05m
170.05	3.05	3.05	100%	25%	171 / 172 / 173		3.05	UNIT No 62 Sandstone:- Greenish gray 5G 6/1 to medium bluish gray 5B5/1, medium to coarse grained, loose, soft, friable cross bedded, contains Qtz. ferromagnesium mineral Pyrite disseminated, coal lining (very thin)
	173.10							(173.10m)
173.10	3.05	0.80	26%	25%	174 / 175			UNIT NO. 63 CORE LOSS IN SAND STONE FROM : 173.10 – 175.35 = (2.25)m
								(175.35m)
	176.15				176		0.80	Same as above unit No. 62
								(176.15m)
176.15	3.04	3.04	100%		177 / 178 / 179		3.04	UNIT No 63 sandstone:- Same as above unit No 62 Note:- very loose soft friable,
	179.19							(179.19m)
179.19	1.48	1.20	81%		180		1.20	UNIT No 45 sand stone:- Medium Light gray N6 to Medium Bluish gray 5B5/1, medium to coarse grained, sub angular to subrounded grains soft, loose friable. Contains Qtz, ferromagnesium.

DRILL-HOLE NO BN-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
							1.20	Sand Stone (158.39)
	180.67						0.28	CORE LOSS IN SAND STONE 180.39 – 180.67 = (0.28)m (180.67m)
180.67					181			UNIT NO. 66
	3.04	0.12	3.9%	2%	182		2.92	CORE LOSS IN SAND STONE FROM 180.67 – 183.59 = (2.92)m
					183			(183.59m) Sandstone:- Light-gray N7 medium to coarse grained sub-rounded hard grains, contains Qtz. fractured
	183.71						0.12	(183.71m)
183.71					184		0.50	UNIT NO 67 Sandstone:- Light-gray N7, coarse grained hard compact; Qtz granules, Pyritic, the bottom is clayey. mica flaky. very (184.21m)
							0.60	Sandstone:- Medium bluish gray 5B5/1, medium grained soft loose friable, contains Qtz, Pyrite & ferromagnesium mica flakes (184.21)
	3.05	1.10	36%		185			CORE LOSS IN SAND STONE FROM 184.81 – 186.76
	186.76				186		1.95	(186.76m)
186.76					187		1.05	UNIT NO 68. Claystone:- Medium bluish gray 5B5/1 compact with medium grained sandstone unlit bedded at places carbonaceous at places, Pyritic.
	3.05	1.05	34%		188			(187.81m) CORE LOSS IN SAND STONE FROM 187.81 – 189.81
	189.81				189		2.00	
189.81	3.05	3.05	100%					(189.81m)
							3.05	UNIT NO. 69 Claystone:- Medium pale brown to bluish gray 5YR 5/2, Compact sticky and shaley

DRILL-HOLE NO BN-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%	25%	191		3.05	Claystone.
	192.86				192			(192.86m)
192.86					193		0.60	UNIT No. 70 Claystone:- Same as above unit No 69 (193.46m)
	3.05	3.05	100%	25%	194		7.00	Sandstone:- Grayish brown 5YR3/2 to medium bluish gray 5B5/1, fine to medium grained. Pyrite are oxidized (194.46m)
	195.91				195		1.45	Claystone:- Same as above unit No. 69 (195.91m)
195.91					196		0.60	UNIT NO 71 Sandstone:- Medium bluish gray 5B5/1 to pale brown 5YR 5/2 compact hard fine to medium grained, pyrite (196.51m)
	3.05	3.05	100%	25%	197		2.45	Claystone: Same as above unit No 69
	198.95				198			(198.95m)
198.95					199		0.38	UNIT NO 71 Claystone:- Same as above unit No 68 199.33
	2.69	2.52	94%	25%			0.75	Sandstone:- Medium bluish gray 5B5/1 fine to medium grained, subrounded grained containing Qtz, ferromagnesium mineral
					200			

DRILL-HOLE NO BN-1

CORE RECOVERY FROM	TO	CORE	CORE%	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
								(200.08) Sandstone
							0.26	Claystone:- Same as above unit No 68 (200.34m)
	2.64	2.52	95%		201		1.02	Sandstone:- Same as above (same unit-72) Note. Loose, at bottom. (201.36m)
	201.64						0.11	Claystone Same as above (same unit No 72) (201.47m)
201.64								CORE LOSS FROM 201.47 – 201.64 = 0.17 (201.64m)
					202			UNIT NO 73 Claystone:- Medium bluish gray 5B5/1 to spotted pale brown 5YR 5/2 Compact at places it is interbedded with sst. of same colour, medium grained Pisolitic, this pale brown material looks to be primary Compact, Calyey portion is mostly sticky.
	3.05	3.05	100%	25%	203		3.05	
	204.69				204			204.69
204.69								UNIT NO 74 Claystone: Same as above unit No 73
					205		0.95	
					206		1.36	Sandstone:- Bluish gray 5B5/1 and in the lower portion it is spotted by pale brown 5YR 5/2 medium grained hard Pisolitic plant fossils, Some bluish clay spots will in the Sand stone.
	3.05	3.05	100%	25%	207		0.26	Claystone:- Medium bluish gray 5B5/1 to Medium gray spotted by bluish colour, clay, plant fossils.
207.74							0.64	Claystone:- Medium dark gray, N4, pyritic, leaf impressions Lower portion is sticky.
207.74					208		0.52	UNIT NO 75 Shale:- Medium dark gray N4, fissile, sticky Pyritic, leaf impressions plant fossils lower portion is Carbonaceous & sandy.
	2.57	2.57	100%	25%	209		1.64	Sand stone:- Medium gray N5 to light gray N7 Medium grained hard, Compact, Carbonaceous matter, leaf impressions pyritic, plant fossils.
					210		1.41	Sand stone:- Light gray N7 fine to medium grained, subrounded grains, contains 1 to 2, ferromagnesium and top is slightly carbonaceous material
					1			
					2			

DRILL-HOLE NO BN-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	210.31						0.141	(210.31m)
210.31	3.05 213.36	3.05	100%	25%	212 213			UNIT NO. 76 Core loss from 210.31 — 213.36 = (3.05) 213.36
213.36	0.60 213.96	0.60	100%				0.60	UNIT NO. 77 Sandstone same as above. UNIT No. 75

COALREAP
Coal Intercepts

Form 4 of 5
Rev Apr 90

Drill hole BN-1 Collar elevation

Bed Name	Description	Depth From	Depth To	Thickness	Info Source	%Dry Ash	Sample No.
	Lignite	101.74	102.06	0.32m			BN-1-1-92
	Lignite	119.67	120.02	0.36m			BN-1-2-92
	Lignite	122.85	123.31	0.46m			BN-1-3-92

COAL SAMPLE DATA

SAMPLE NO. BN-1-1-92 NO. OF BAGS 1

COLLECTOR MUHAMMAD ANWAR / MUHAMMAD DAWOOD COAL FIELD INDUS EAST

LATITUDE _____ LONGITUDE _____

PROVINCE SINDH DISTRICT THATTA

DRILL HOLE BN-1 DATE SAMPLED 28-5-92

FORMATION BARA AGE PALEOCENE

COAL SEAM _____ ESTIMATED RANK LIGNITE

TOTAL SEAM THICKNESS _____ in THICKNESS SAMPLED _____ in

0.32 m 0.32 m

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

101.74 m _____ m

ROOF ROCK CLAYSTONE FLOOR ROCK CLAYSTONE

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

COMMENTS:

COAL SAMPLE DATA

SAMPLE NO. BN-1-2-92 NO. OF BAGS 1

COLLECTOR MUHAMMAD ANWAR MUHAMMAD SAWOOD COAL FIELD INDUS EAST

LATITUDE _____ LONGITUDE _____

PROVINCE SINDH DISTRICT THATTA

DRILL HOLE BN-1 DATE SAMPLED 29-5-92

FORMATION BARA AGE PALEOCENE

COAL SEAM _____ ESTIMATED RANK LIGNITE

TOTAL SEAM THICKNESS _____ in THICKNESS SAMPLED _____ in

0.26 m 0.36 m

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

119.67 m _____ m

ROOF ROCK CARB-SHALE FLOOR ROCK CARB SHALE

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

COMMENTS:

COAL SAMPLE DATA

SAMPLE NO. BN-1-3-92 NO. OF BAGS 1

COLLECTOR MUHAMMAD ANWAR MUHAMMAD DAWOOD COAL FIELD INDUS EAST

LATITUDE _____ LONGITUDE _____

PROVINCE SINDH DISTRICT THATTA

DRILL HOLE BN-1 DATE SAMPLED 29-5-92

FORMATION BARA AGE PALEOCENE

COAL SEAM _____ ESTIMATED RANK LIGNITE

TOTAL SEAM THICKNESS _____ in 0.46 m THICKNESS SAMPLED _____ in 0.46 m

DEPTH TO TOP OF COAL _____ ft 122.35 m SURFACE ELEVATION _____ ft@MSL _____ m

ROOF ROCK CLAYSTONE FLOOR ROCK CLAYSTONE

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

COMMENTS:

Form 1 of 5

DRILLING RECORD
COAL REAP

Drill hole KHN-1

Topo Sheet 40 D/6

Grid ref 787206 m N 2187089 m E

Surface elev. (m) 9.6 (surveyed)

Drill rig LONG YEAR - 32

Drilling started Date 7TH MARCH 92 Time 0830 Hrs
Drilling completed Date 19TH MARCH 92 1815 Hrs

Drill Bit				
Surface	to	3.35	m	5 5/8"
3.35 m	to	105.28	m	DIAMOND BIT HQ
105.28	to	137.31	m	DIAMOND BIT NQ
	to		m	
	to		m	
	to		m	
	to		m	

Fluids used BENTONITE, CMC

Casing set				
Surface	to	27.43	m	HW (Diamond Casing shoe)
27.43	to	105.28	m	NW (Diamond Casing shoe)
	to		m	

Lith logged by MOHAMMED [illegible]
MOHAMMED DAWOOD KHAN

Geophysical logs:

		From		to		through
XAP	Natural Gamma	00	m	124.8	m	CASING/OPEN
	G.G.F.R	00	m	128.2	m	" "
	G.G.N.R	00	m	128.2	m	" "
	Caliper	105.60	m	127.9	m	OPEN
JLP	Neutron	00	m	127.8	m	CASING/OPEN
	Natural Gamma	00	m	126.0	m	" "

REMARKS:

COAL REAP

Drill Hole KHW-I

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
7th March 1992	0800 Hrs	0 – 3.35m	Drilled with 5 5/8 in bit
9th March 1992	1100 Hrs	3.35m	Started drilling.
9th March 1992	1900 Hrs	23.49	Stopped drilling.
10th March 1992	1100 Hrs	23.49m	Started drilling.
10th March 1992	2330 Hrs	27.98 m	After drilling to 27.98m started casing with HW Casing and cased up to 24.5m
---	---	---	---
11th March 1992	0900 Hrs	27.98m	Casing with HW at the depth 27.57m
12th March 1992	0900 Hrs	27.98m	Started drilling.
12th March 1992	1840 Hrs	44.57m	Stopped drilling due to shortage of drilling crew.
13th March 1992	1000 Hrs	44.67m	Drilling started.
13th March 1992	1845 Hrs	59.91m	Drilling stopped.
14th March 1992	0940 Hrs	59.91m	Started drilling.
14th March 1992	1830 Hrs	78.38m	Drilling stopped due to shortage of night shift crew.
15th March 1992	1230 Hrs	78.38m	Drilling started.
15th March 1992	1830 Hrs	96.67m	Drilling stopped.
16th March 1992	1300 Hrs	96.67m	Drilling started.
16th March 1992	2200 Hrs	105.28	Drilling stopped.
16th March 1992	2200 Hrs	105.28	Casing started with N.W
17th March 1992	1300 Hrs	105.28	Cased upto 105.28m
17th March 1992	1700 Hrs	105.28	Drilling started
18th March 1992	1400 Hrs	122.02	Drilling stopped due to wire line cable damage.

COAL REAP

Drill Hole KHW-I

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
18th March, 92	12:30 Hrs	122.02	Drilling started
19th March 92	18:15 Hrs.	137.31	Drilling completed.
19th March, 92	18:15 Hrs	137.31	Mud circulation started to wash the hole for Geo-physical logging.
22nd March, 92	1220 Hrs.	-	Geo-physical logging started
22nd March, 92	1530 Hrs.	-	Geo-physical logging completed

Form 3a

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DRILL-HOLE NO KHW-I

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
0.0	2.75	NON-CORING			1 2 3		2.75	Alluvial Cover- (Silty Sand) Light olive gray 5Y 5/2, soft, loose, friable sand particles are mostly fine, ferromagnesium grains, sand particles are angular to sub-rounded, organic material present, salt crystals are present due to the salinity in the area
3.65	4.55	0.90	47%		4		0.90	Sandstone – Light olive gray 5Y 5/2, very fine to fine, sub-angular to sub-rounded, well sorted, soft, loose, friable, silica about 85%, ferromagnesium grains about 15%, rare mica flakes, glauconite pellets, slightly silty, looks Channel Sand?
							0.98	CORE LOSS - in Sandstone from 4.25m to 5.23m
5.23	5.81	0.58	19%		5		0.58	Sandstone – Light olive gray 5Y 5/2, fine to medium grained, finer in upper part, subangular to sub-rounded, soft, loose, friable ferromagnesium grains
					6		2.47	CORE LOSS - in Sandstone from 5.81m to 8.28m
8.28	9.38	1.10	36%		7 8 9		1.10	Sandstone – Light olive gray 5Y 5/2, medium to fine, finer towards bottom, angular to sub-angular, poorly sorted, soft loose, friable, glauconite pellets, ferromagnesium grains, silica about 88%
					10		1.95	CORE LOSS - in Sandstone from 9.38m To 11.33m

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DRILL-HOLE NO KHW-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	11.33				11			CORE LOSS – in Sandstone
11.33					12	~ m	0.80	Sandstone – Light olive gray 5Y 5/2, fine to very fine, angular to sub-angular, sorted, soft, loose, friable, glauconite pellets, rare mica flakes, ferromagnesium grains.
	3.04	0.80	25?		13		2.24	CORE LOSS – in Sandstone from 12.13m to 14.37m
	14.37				14			
14.37	0.46	0.16	34?			~ m	0.15	Sandstone – Light olive gray 5Y 5/2, silty, sub angular – sub rounded, sorted (fine grained) soft, loose, friable, glauconite pellets, micaceous, ferromagnesium grains.
	14.83						0.30	CORE LOSS – in Sandstone from 14.53 m to 14.83
14.83					15		0.15	Sandstone – Light olive gray 5Y 5/2, very fine grained, sub-rounded to rounded, well sorted, soft, loose, friable, micaceous, glauconite pellets, ferromagnesium grains.
	3.05	0.15	3.9		16		2.90	CORE LOSS – in Sandstone from 14.98m To 17.88m
	17.88				17			
17.28					18	~ m	0.15	Sandstone – Light olive gray 5Y 5/2, very fine, sub rounded to rounded, well sorted, soft, loose, friable, micaceous, glauconite pellets, ferromagnesium grains, Silica about 70?
	2.79	0.15	5.3		19		2.64	CORE LOSS – in Sandstone from 18.03 m To 20.67m
					20			
					1			

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DRILL-HOLE NO KHW-I

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	20.67							CORE LOSS - in Sandstone from 18.03m - 20.67m
20.67	22.82	0.75	26		21		2.07	CORE LOSS - in Sandstone from 20.67m To 22.74m
	23.49				22			
					23		0.75	Claystone (Silty) – Light gray N7, hard, Compact, Sticky when wet, Sandy, Sand grains are mostly fine to ufine, plant imprints, rooted, shell fragments, Calcareous.
23.49							0.40	Claystone – Pale yellowish brown 10YR 6/2, hard, Compact, silty, slightly sandy at places., rooted, shell fragments, Calcareous, rare un petrified organic material.
	26.54	0.40	13		24			
					25		2.65	CORE LOSS - Sandstone from 23.89m To 26.54m
					26			
26.54	27.99	0.60	41		27		0.60	Sandstone – Olive gray 5Y 4/2, fine-medium, sub-angular to sub-rounded, sorted, soft, loose, friable, rare mica, glauconite ferromagnesium grains, silica about 75%.
							0.85	CORE LOSS - in sandstone from 27.14m To 27.99m
27.99	29.61	0.60	37		28		0.18	Claystone – Pale yellowish brown 10YR 6/2, hard, Compact, plant remnants
							0.16	Sandstone – Olive gray 5Y 4/2, fine-medium, subangular-sub rounded, poorly sorted, soft, loose friable, glauconite pellets.
							0.52	Claystone – Pale yellowish brown 10YR 6/2, hard, Compact, Sticky when wet, rare mica flakes, shell fragments, un petrified organic material.
					29		1.02	CORE LOSS - in Sandstone from 28.59m To 29.61
29.61					30			

DRILL-HOLE NO KHW-I

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
					31		1.07	Sandstone – Medium dark gray N4, fine-medium, sub-angular to sub-rounded, sorted, soft, loose, friable, micaceous, glauconite pellets, ferromagnesium grains, silica about 70%
	3.05	1.07	35				1.98	CORE LOSS- in Sandstone from 30.68 m to 32.66
	32.66				32			
32.66							0.16	Sandstone – Medium dark gray N4, fine to medium, sub-angular to sub-rounded, sorted, soft, loose, friable, mica present
	3.05	0.16	5.2		33			
					34		2.89	CORE LOSS- in Sandstone from 32.82m to 35.71
	35.71				35			
35.71					36			
	2.87	0.72	25				2.15	CORE LOSS - in Sandstone from 35.71m to 37.86m
					37			
	38.58				38		0.72	Claystone – Pale yellowish brown 10YR 6/2, hard, compact, sticky and soft when wet, slightly silty, shell fragments.
38.58								Claystone – olive gray 5Y 4/1, medium hard, compact, sticky and soft when wet, slightly silty, rare sandy patches, rare coaly flakes (Not completely coalified ?)
	3.04	0.85	16.4		39		0.85	39.43
								CORE LOSS- in claystone from 39.43m – 41.62m
					40			

DRILL-HOLE NO KHW-I

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	41.62				1		2.19	CORE LOSS - in claystone from 39.43m - 41.62m
41.62					2		0.85	Claystone – olive gray 5Y 4/1, hard, compact, sticky and soft when wet, slightly silty at places, coaly flakes not carbonized / petrified;
	3.05	0.85	27.8		3		2.20	CORE LOSS - in Sandstone from 42.47m to 44.67m
	44.67				4			
44.67					5		0.51	Sandstone – Light olive gray 5Y 5/2, very fine in upper 30cm rest is medium grained, angular-subrounded, sorted, micaceous, soft, loose, friable, glauconite pellets.
							0.14	Claystone – olive gray 5Y 4/1, hard, compact, very silty in lower 10 cms, very fine sand grains observed;
	3.05	0.65	21		6		2.40	CORE LOSS - in Sandstone from 45.32m to 47.72m
	47.72				7			
47.72					8		3.05	CORE LOSS - in Sandstone from 47.72m to 50.77
	3.05	00	00		9			
					50			
					1			

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DRILL-HOLE NO [illegible]

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	50.77							CORE LOSS - in Sandstone from 47.72 m - 50.77m
50.77					51		0.60	Claystone olive gray 5Y4/1, hard compact silty very fine sand grain present.
	1.17	0.58	42.7					Sand St. light olive gray 5Y 6/1 very fine to fine grained poorly sorted soft loose friable highly micaceous ferromagnesium grains, silty
	51.94						2.67	CORE LOSS in sandstone from 51.27 to 51.94
51.94					52		0.56	CORE LOSS in Sandstone from 51.94 to 52.50m
	1.88	1.32	70.2				0.33	Sand stone Light olive gray 5Y 6/1 very fine to fine, poorly sorted, silty soft loose friable, highly micaceous, ferromagnesium grain
					53		1.08	Claystone olive black 5Y 2/1, hard compact very sticky and soft when wet, petrified plant remnants at places, mica flake
	53.52							
53.62					54		0.90	Claystone, light olive gray 5Y 5/1 hard compact, sticky when wet. Two thin Sandy patches present, mica flakes in Sandy lance.
	3.04	0.96	27.6		55			
							2.14	CORE LOSS in siltstone from 54.72 to 56.86m
					56			
56.86	56.86							
					57		0.35	Silt stone (Sandy) olive gray 5Y 4/1, very fine sand grain are Promenent, sub angular to sub rounded, soft loose friable, micaceous ferromagnesium grain
					58		2.70	CORE LOSS IN SILT STONE from 57.21 to 59.91m
					59			
	59.91							
59.91					60			

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DRILL-HOLE NO IKHIN-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
					0		0.90	Silt stone - light olive gray 5Y 6/1, Sand grain very fine Medium hard, medium compact, rare glaconitic pellet-ized wood, ferromagnesium grain present, coaly flakes very rare. A green colour perline unidentified is present.
	3.05	0.90 m	59.9		1			
					2		2.15	CORE LOSS IN SAND STONE from 68.81 to 62.96m
	62.96				3			
62.96							1.00 m	Sandstone: olive gray 5Y 4/1 very fine to fine, subangular to subrounded sorted, soft loose friable, silty, micaceous, glauconitic pellets, ferromagnesium grain. Silica 80%
	2.26	1.00 m	66.24		4			
							1.26 m	CORE LOSS IN SAND STONE from 63.96 to 65.22m
	65.22				5			
65.22							0.35 m	Siltstone Light olive gray 5Y 6 sand grains are very fine, grains rounded to subrounded loose sandy, glauconitic pellets, ferromagnesium grains.
	0.97	0.10 m	10.3				0.87 m	CORE LOSS IN SAND STONE from 65.32 to 66.19
	66.19				6			
66.19							0.25 m	Sandstone (silty) olive gray 5Y 4/1 fine grained, soft loose friable, silty, ferromagnesium grains, silica about 80%.
					7			
	3.05 m	0.25 m	8.1				2.80 m	CORE LOSS IN SAND STONE from 66.44 to 69.24m
					8			
					9			Sandstone olive gray 5Y 4/1, fine grained soft. loose friable, rare glauconitied, mica flakes, ferromagnesium grain. Present, silty
69.24	69.24						0.30	
	3.04	0.30	9.8				2.74	CORE LOSS IN SAND STONE
					0			
					1			

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DRILL-HOLE NO KHW-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
		0.32	9.8		71		2.76	CORE LOSS IN SAND STONE. from 69.54 to 72.88
	72.28				72			
72.28					73		3.05	CORE LOSS IN SAND STONE from 72.88 to 75.33
	3.05	–	–		74			
	75.33				75			
75.33					76		3.51	CORE LOSS IN SAND STONE from 75.33 to 77.84
	3.05	0.54	17.7		77			
	78.38				78		0.34	Sand stone, medium gray N5, fine to medium grained subangular to sub rounded, well sorted, soft loose friable ferromagnesium grains, glauconite pellets, biotite flakes, silica 90%
78.38							0.20 m	COAL SEAM, Brownish black 5YR 2/1, dull, non banded, soft, resinous, rare Pyrite, very low specific gravity, looks to be lignite.
	3.39	0.35	16.6		79		2.04	CORE LOSS IN COAL from 78.38 m to 80.42 m
								COAL SEAM (Continued)
					80			

DRILL-HOLE NO KHW-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
								CORE LOSS IN COAL SEAM
	80.77						0.25	COAL SEAM, brownish black 5YR 2/1, dull, non banded, soft, resinous, rare pyrite, very low specific gravity, looks to be lignite
80.77	0.66 m	0.66 m			81		0.48	CORE LOSS IN COAL from 80.77 to 81.25 m
	81.43						0.18	Carbonaceous shale, olive black 5Y 2/1 hard compact, silty micaceous vitreous carby specks.
81.43							0.47	Carbonaceous shale olive black 5Y 2/1, hard compact, silt; vitreous carby patches, mica present.
					82			Sand stone with alternate thin layers of coal and silt stone. Dark gray N3, hard, Compact, Middle part is very silty, lower part is very sandy, at places atmost one centimeter layers of coal are present; resinous material.
	3.05 m	3.05 m	100%		83		2.62	
	84.48				84			
84.48					85		1.00 m	Sand stone (with thin Carby layers)- Brownish gray 5YR 4/1 fine to medium grained; Subangular to subrounded sorted, Coaly partings Present, Soft Loose with Thin (few) Carby layers, resin present with in Carby layers.
	3.06 m	1.00 m	32.7		86		2.04 m	CORE LOSS IN SANDSTONE from 85.48 to 87.52
	87.52				87			
87.52					88		0.80	Sand stone, light gray N7, very fine grained sub-angular to subrounded, Thin Coaly layers; ferromagnesium grains, slightly silty Silica above 90%
	3.05	0.80 m	26.2		89		2.45	CORE LOSS IN SANDSTONE from 88.32 to 90.57 m
					90			

DRILL-HOLE NO KHW-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	90.57							CORE LOSS IN SAND STONE
90.57					91		0.55	Sand Stone, Light-gray N7, very fine medium, Subangular to sub-rounded, Well sorted, rare ferromagnesium, rare Coaly flakes, at-places thin Coaly layers present, Silica above 95%
	93.05	55cm	18%		92		2.50	CORE LOSS IN SANDSTONE from 91.12 to 93.62m
	93.62				93			
93.62					94		0.79	Sand Stone (silty) light-gray N7, fine very fine, Sub angular to Sroundedd, Sorted, Soft-loose, friable, Silty at-places, Silica above 90%
	96.67	0.79	25.9		95		2.26	CORE LOSS IN SAND STONE from 94.41 to 96.67
					96			
96.67					97		0.75	Sand Stone light-gray N7, very fine to fine subangular to sub rounded, well sorted, Soft loose, friable, very rare ferromagnesium grain silica above 90%, in lower 10cm contain 1mm carby shale layer with Coaly flakes, resinous, with in coaly specks, Py. grains, Silty at places.
	99.72	0.75	24.5		98		2.30	CORE LOSS IN SANDSTONE from 97.42 to 99.72m
					99			
99.72					100		1.16	Sandstone-

CORE RECOVERY FROM	TO	CORE	CORE%	WATER LOSS	DEPTH METRES	THICKNESS	LITHOLOGIC DESCRIPTION
						1.16	Sandstone – Light gray N7, fine to medium, sub-angular to sub-rounded, well sorted, soft, loose, friable, very rare ferromagnesian medium, Silica above 90%, thin Carby layers, Coaly layers are [illegible] and pyritic.
	3.05	1.16	38		1, 2	1.89	CORE LOSS – [illegible] from [illegible] to [illegible]
[illegible]	1.80	1.50	[illegible]		3	0.30	CORE LOSS – in Sandstone from [illegible] to [illegible]
					4	1.15	Sandstone – Light gray [illegible] – [illegible]-medium, Subangular to sub-rounded, well sorted, soft, loose, friable, very rare ferromagnesian medium grains, Silica above 90% Carby layers, Carby layers are [illegible] and pyritic
						0.30	Claystone (Silty) – Light olive gray 5Y 5/[illegible], very hard, compact, sticky when wet, Coaly specks, pyrite and marcasite patches.
[illegible]	0.76	0.25	32.8		5	0.25	Claystone – Medium dark gray N4, hard, compact, coaly flakes, siderite nodules embedded, pyrite grains.
						0.51	CORE LOSS – in Claystone from [illegible] to 105.22m
[illegible]	105.68	0.40	0.40			0.40	Claystone (Silty) Medium dark gray N4 hard compact coaly flakes siderite nodules about cobble size, Sticky when wet.
[illegible]	1.63	1.13	69%		6	0.50	CORE LOSS IN SAND STONE FROM 105.68 – [illegible]
					7	1.13	Siltstone. Medium dark gray N4, hard Compact, Shaly in upper few centimetres. siderite cobbles embedded.
107.31	1.37	1.09	[illegible]			0.25	CORE LOSS IN SILTSTONE FROM 107.31 – 107.5[illegible]
						0.37	Claystone Dark green gray 5GY 4/1, hard Compact silty, Coaly flakes, Gastropod fossils. Siderite Grains. Sideritic nodules above 1.5 cm is present.
					8	0.72	Carbonaceous Shale. [illegible] gray N[illegible], [illegible] Compact silty at places, with [illegible] highly Carbonaceous and coaly bands at bottom 2 cm coal layer present.
108.68	3.05	[illegible]	[illegible]		9	[illegible]	CORE LOSS IN SANDSTONE FROM 108.68 – 109.5[illegible]
						[illegible]	Sandstone – Light olive gray 5Y 5/1 very fine to fine, sub-[illegible] to rounded, [illegible] Coaly partings.
					0		
					1		

DRILL-HOLE NO KHW-7

CORE RECOVERY FROM	TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	3.05	2.20	35.6		111		2.20	Sand stone Light-olive gray 5Y 6/1, Very fine to fine, sub angular to rounded, well sorted, soft, compact, rare ferromagnesium grains, coaly partings, Silica cement, slightly silty, lower 3cm claystone bed, micaceous and coaly partings.
111.73								
	3.05	2.68	87.4		112		0.45	Claystone olive gray 5Y 4/1 hard, compact, burrows filled with sandstone, thin coaly specks present, marcasite, mica flakes
					113		2.23	Sand Stone (Silty) Dark gray N3, fine to coarse subangular to subrounded, poorly sorted clayey and silty patches, pyrite grains, Carbonaceous patches present; muddy.
					114			
114.78							0.27	CORE LOSS IN SAND STONE FROM 111.41 – 114.78
114.78					115		1.20	Silt stone Medium gray N5, hard compact sandy. Carbonaceous bands, burrowed, alternate coaly bands Coaly flakes micaceous rare ferromagnesium grains.
	3.05	2.80	91%		116		1.60	Sand stone (silty) - Medium gray N5 very fine mostly sub-angular poorly sorted Soft compact coaly patches, burrows filled with clean sand muddy - ferromagnesium grains
					117			
117.83							0.25	CORE LOSS IN SANDSTONE FROM 117.58 to 117.83.
117.83					118		0.30	Sand stone
	3.04	0.30	9.9					Medium gray N5, fine grained sub angular to angular, sorted, compact, silty burrowed, coaly bands siderite - pellets
					119		2.74	CORE LOSS IN SAND STONE FROM 118.13 to 120.87
					120			
					1			

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DRILL-HOLE NO KHW-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
								CORE LOSS IN SAND STONE
120.67	120.67				121		0.67	Sandstone (Muddy) Medium dark gray N4, fine coarse subangular, Poorly Sorted, hard compact, Carby and coaly specks, Hatty silty at the bottom about 20cm burrows filled with micaceous sand in the Lower part
	1.15	0.48	34.7					CORE LOSS IN SAND STONE FROM 121.35 to 122.02 m
122.02	122.02				122		0.35	Siltstone Dark gray N3, hard, Compact, Coaly and Carbonaceous Shally Patches, Sandy, Patches, mercacite in lower part plant imprints.
	3.05	0.35	11.4		123		2.70	CORE LOSS IN SILTSTONE FROM 122.37 – 125.07
125.07	125.07				125		0.12	Siltstone. Dark gray N3 hard Compact coaly and Carbonaceous shally patches sand patches mercacite in Low part plant imprints
	3.05	0.12	3.9		126		2.93	CORE LOSS IN SILTSTONE. From 125.19 to 128.12m
128.12	128.12				128		0.10	Sandstone Brownish gray 5YR 4/1, fine-medium, subangular to subrounded, Poorly sorted soft loose muddy coaly spars
	1.90	0.10	5.3		129		1.60	CORE LOSS IN SAND STONE From 128.22 to 130.02 m
	130.02				130			

Form 3a 17820

DRILL-HOLE NO KHW-I

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
130.14							0.93	Sandstone – Light olive gray 5Y 6/2, Subangular to Sub-rounded bottle, Soft, loose, Coaly spars, silica above 90%.
	3.05	0.12	3.9		131		2.93	CORE LOSS- in Sandstone from 130.14m To 133.07m
	133.07				132			
133.07					133		0.72	Sandstone – Light gray N7, fine-medium, poorly sorted, Soft, loose, friable, alternate thin Coaly bands, silica above 95%
	2.26	0.72	31.8		134		1.54	CORE LOSS- in Sandstone from 133.79 to 135.33
	135.33				135			
135.33							0.45	Sandstone – Light gray N7, fine-medium, poorly sorted, Soft, loose, friable, alternate thin Coaly bands, two very hard nodules with high sp. gravity at bottom, looks like Siderite?
	1.98	0.45	22.7		136		1.53	CORE LOSS- in Sandstone from 135.78m To 137.31
	137.31				137			
	Drilling completed							
					138			
					139			
					140			
					1			

18 & 20

COALREAP
Coal Intercepts

Form 4 of 5
Rev Apr 90

Drill hole KHW-1 Collar elevation

Bed Name	Description	Depth From	Depth To	Thickness	Info Source	%Dry Ash	Sample No.
	COAL	78.18	78.38	0.20	CORE		KWH-1-1A
	Loss (COAL)	78.38	80.42	2.04	E-logs		
	COAL	80.42	80.77	0.35	CORE		KWH-1-1B
	Loss (COAL)	80.77	81.25	0.48	E-logs		

NO USGS SPLIT

COAL SAMPLE DATA

SAMPLE NO. KHW-1-1(A) NO. OF BAGS 1

COLLECTOR M. Riaz Khan et al Dawood Group COAL FIELD Badin

LATITUDE _____ LONGITUDE _____

PROVINCE Sindh DISTRICT Badin

DRILL HOLE KHW-1 DATE SAMPLED 14th March 1992

FORMATION Bara AGE Paleocene

COAL SEAM Badin-I ESTIMATED RANK LIGNITE

TOTAL SEAM THICKNESS — in 3.07 m THICKNESS SAMPLED — in 0.20 m

DEPTH TO TOP OF COAL _____ ft 78.18 m SURFACE ELEVATION _____ ft@MSL _____ m

ROOF ROCK Sandstone FLOOR ROCK Carby Shale

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

COMMENTS:

The total Coal Seam thickness is 3.07 meters from 78.18 meter to 81.25 meters, but this particular sample was collected between 78.18 m to 78.38 m.

In the next run from 78.38 m to 80.77, Core recovery was only 0.35 m and the coal cuttings were observed till 81.25 meters depth.

✡ The Geophysical logging indicates the Top of Coal Seam from 78.10 m, and Total Seam thickness 3.30 m.

NO SPLIT REQUESTED BY USGS

NO USGS SPLIT

COAL SAMPLE DATA

SAMPLE NO. KHW-1-1 (B) NO. OF BAGS 1

COLLECTOR M. Riaz Khan & M. Dawood Khan COAL FIELD Badin

LATITUDE ____ LONGITUDE ____

PROVINCE Sindh DISTRICT Badin

DRILL HOLE KHW-1 DATE SAMPLED 15th March 1992

FORMATION BARA AGE PALEOCENE

COAL SEAM Badin-I ESTIMATED RANK LIGNITE

TOTAL SEAM THICKNESS — in / 3.07 m THICKNESS SAMPLED — in / 0.35 m

DEPTH TO TOP OF COAL — ft / 78.18 m SURFACE ELEVATION ____ ft@MSL / ____ m

ROOF ROCK Sandstone FLOOR ROCK Carby Shale

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

COMMENTS: The sample collected was between the run 78.38m to 80.77m ; the core recovery was only 0.35m while the coal partings with mud were observed throughout the run. In the next run from 80.77 to 81.43 ; the coal partings were observed till 81.25 meter depth and the rest of the run is Carby shale.

✡ This particular sample is representative of 2.87 meters coal sample.

NOTE – Geophysical logging indicates the top of Coal Seam at 78.10 m and total seam thickness 3.30m.

NO SPLIT REQUESTED BY USGS

DRILLING RECORD
COAL REAP

Drill hole KHW-2

Topo Sheet 40 D/6

Grid ref 787742 mN 2186838 mE

Surface elev. (m) 10.6 (Surveyed)

Drill rig LONGYEAR-38

Drilling started Date Dab 29th March, 92 Time 1200 Hrs
Drilling completed Date 9th May 1992 1325 Hrs

Drill Bit				
Surface	to	1.82	m	5 5/8" Bit
1.82	to	140.20	m	Diamond Bit HQ
140.20	to	230.73	m	Diamond Bit NQ
	to		m	
	to		m	
	to		m	
	to		m	

Fluids used Bentonite and CMC Polymer

Casing set				
Surface	to	76.32	m	HW Diamond Casing Shoe
76.32	to	164.59	m	NW
	to		m	

Lith logged by MUHAMMAD RIAZ KHAN
MUHAMMAD DAWOOD KHAN

Geophysical logs:

		From		to		through
JLP	Natural Gamma	00	m	175.90	m	Casing/open
	Neutron	00	m	175.10	m	" "
XAP	Natural Gamma	00	m	175.10	m	" "
	Caliper	00	m	178.20	m	" "
	GG FR	00	m	178.50	m	" "
	GG NR	00	m	174.60	m	" "

REMARKS: Hole was completed to 186.91 on 24Apr and reopened on 6 MAY on orders of D.G.

XAP	Natural Gamma	00	to	225.6	CASING/OPEN
	Caliper	00	to	228.5	" "
	G/G Far	00	to	228.5	" "
	G/G Near	00	to	228.9	" "
JLP	Natural gamma	00	to	223.9	" "
	Neutron	00	to	226.8	" "

(2) of 30

COAL REAP

Drill Hole KHW-2

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
29th March 1992	1200 Hrs.	00 m	Drilling started
29th March 92	1630 Hrs.	14.63m	Drilling stopped due to mechanical fault in the mud Pumps
30th March, 92	0820 Hrs.	14.63m	Circulation of mud and washing of hole as completely filled with Sandstone due to caving
30th March, 92	1800 Hrs.	17.68m	Drilling stopped due to the crew shortage and for the Eid vacations
12th April, 92	0700 Hrs.	17.68	Redrilled due to caving and inserted Casing H.W from 00m to
12th April, 92	1500	17.68m	Drilling started
12th April, 92	1830	20.73m	Drilling stopped due to crew shortage
13th April, 92	0800	20.73m	Drilling started
13th April, 92	2359	48.76m	Drilling continued
14th April, 92	0001	75.59m	Drilling continued
15th April, 92	0330	78.63m	Drilling stopped due to water return problem and started inserting H.W Casing
16th April, 92	1900	78.63m	H.W Casing Continued
17th April, 92	1040	78.63	Drilling started after inserting H.W Casing upto 76.32m
17th April, 92	1300	84.73	Drilling discontinued due to Caving
17th April, 92	2215	87.78	Drilling started
18th April, 92	2359	113.18	Drilling continued
19th April, 92	1830	140.20	Drilling stopped for inserting NW Casing
20th April, 92	1330	140.20	Drilling started, casing NW upto 140.36m
20th April, 92	2359	142.44	Drilling Continued
21st April, 92	2359	176.86	Drilling continued

(3)

COAL REAP

Drill Hole KHW-2

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
22nd April 92	0315	179.90	Drilling discontinued due to hole was encased with NW upto 164.50m
23rd April 92	1400	179.90	Cored with NW upto 164.50m
24th April 92	1300	186.91	Drilling Completed. MAIN GEAR BROKEN
24th April 92	2300	186.91	Geo-Physical logging Carried out from 1900 hours to 2300 Hrs.
25th April 92	0000	186.91	Break down due to mechanical fault
To	---	---	in the drilling rig
6th May 1992			-do-
6th May 1992	2200	186.91	Drilling started from 186.91m with
			NQ rod and hole cased upto 164.59m
7th May 1992	0600	197.20	Drilling started
7th May 1992	1300	204.20	Drilling stop due to break down of Safety Valve
7th May 1992	1400	204.46	Drilling Started with NQ rod
7th May 1992	1500	204.46	Hole Caved
7th May 1992	1900	204.46	Hole Caved
7th May 1992	2200	204.46	Drilling stop due to caveing
8th May 1992	0600	204.46	Drilling start
8th May 1992	1400	218.54	Drilling stop due to break down of feed
			valve and Hyd. pipeline
8th May 1992	2200	167.21 to 219.36	Mud circulation and rotation
9th May 1992	0100	220.36	Drilling start

ON 24 APR USGS ORDERED hole closed when main gear box broke,

On 28 Apr the Director General GSP ordered the hole reopened Rig under repair until 6 May

(4) of 30

COAL REAP

Drill Hole KHW-2.

DRILLING LOG

DATE	TIME	DEPTH	REMARKS
9th May 1992	12.35	229.81	Drilling continued
9th May 1992	13.25	830.73	Drilling Completed
9th May 1992	16 to 1530	-do-	Mud circulation
9th May 1992	1800	-do-	Drilling rod pulled out from hole

Form 3a

(5) 063C

DRILL-HOLE NO KHW-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	1.82				1			NON CORE ING FROM 00-00 TO 1.82 m
1.82					2		0.67	S.st. light-olive gray 5Y 6/1, fine to very fine, sucangular to subrounded well sorted, soft-loose friable, ferromagnesium grains, glauconite pellets rare, muscovite flakes
	2.95	0.67			3		2.28	CORE LOSS IN SAND STONE FROM 2.49 m to 4.77 m
	4.77				4			
4.77					5		0.30	Sand Stone light olive gray 5Y 6/1, fine to very fine, subangular to subrounded, well sorted, soft, loose friable, ferromagnesium grains, glanconite pellets, muscovite and biotite flakes.
	3.05	0.30			6		2.75	CORE LOSS IN SAND STONE FROM 5.07 to 7.82.
	7.82				7			
7.82	0.66	0.30	45		8		0.36	CORE LOSS IN SAND STONE FROM 5.82 To 8.18m
	8.48						0.30	Sand Stone Light olive gray 5Y 5/2 fine medium subangular to subrounded sorted soft-loose friable, ferromagnesian grains muscovite with few biotite flakes, yellow colored calcareous grains gli: foundation stone, silica 80%
8.48							0.10	Sand Stone light olive gray 5Y 5/2 fine to medium, subangular, subrounded sorted, soft, loose friable, ferromagnesian grains muscovite and biotite flakes silica about 80%
	1.95	0.10	5%		9		1.98	CORE LOSS IN SAND STONE FROM 8.58 to 10.46.
					0			
					1			

Form 3a

6/630

DRILL-HOLE NO KHW-2

CORE RECOVERY FROM	TO	CORE	CORE%	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
								CORE LOSS IN SAND STONE FROM 5.58 to 10.46.
10.46	10.46							
	11.12	0.35	31.2%		11		0.35	Sand Stone, olive gray 5Y 3/2 medium to coarse, subangular to sub rounded, Poorly Sorted, soft loose, friable ferromagnesium grains highly micaceous. Muscovite + biotite.
	11.58						0.77	CORE LOSS IN SAND STONE FROM 10.81 – 11.58,
11.58					12		0.35	Sand stone olive gray 5Y 3/2 medium coarse, sub angular to sub-rounded poorly sorted soft loose friable ferromagnesium grains highly micaceous (mainly biotite) silica about 70%
	3.05	0.35	11.4%		13		2.70	CORE LOSS IN SAND STONE FROM 11.93m – 14.63m
	14.63				14			
14.63					15		1.55	CORE LOSS IN SAND STONE FROM 14.63 TO 16.18
	3.05	1.50	49%		16		0.75	Sand Stone Medium dark gray N4, Medium grains sorted, soft loose friable highly micaceous (Muscovite + biotite) ferromagnesium grains, recent gastropod shell fragments, slightly silty at base silica about 60% rare glauconite pellets.
	17.68				17		0.75	Claystone olive gray 5Y 4/1 hard compact sticky and soft when wet tiny muscovite flakes roots very rare?
17.68	0.61	0.50	82%		18		0.50	Claystone – Dark yellowish brown 10YR 4/2, hard, Compact, soft and sticky when wet, slightly silty, very rare sandy patches, silt particles are highly micaceous
	18.29						0.11	CORE LOSS in Claystone from 18.18m To 18.29
18.29					19		1.95	Claystone – Dark yellowish brown 10YR 4/2, hard, Compact, soft and sticky when wet, slightly silty, silt particles are micaceous, very rare sandy patches
	2.44	1.95	80%					
					20			
					1			

DRILL-HOLE NO KHV-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
							1.95	Claystone-
	20.73						0.49	CORE LOSS in Claystone from 20.24m To 20.73m
20.73					21		1.66	Claystone – olive gray 5Y 4/1, hard, Compact, Soft and sticky when wet, recent organic plant remnants, Two wood like (un-petrified and un-coalified) remains each of about 10 Cms Size, indicates, recent Channel deposit
	2.43	1.66	68%		22			
	23.16				23		0.77	CORE LOSS in claystone from 22.39m To 23.16m
23.16							0.45	Claystone – olive gray 5Y 4/1, Soft, Compact, Silty, Sandy in lower 20 Cms, Sand is very fine & micaceous.
					~4		0.55	Sandstone – Light olive gray 5Y 6/1, very fine to fine, Subangular to Subrounded, well Sorted, Soft, Loose, friable, ferromagnesium glauconitic muscovite & biotite flakes, silica about 80%
	3.05	1.0	32%		25		2.05	CORE LOSS in Sandstone from 24.16m to 26.21m
	26.21				26			
26.21							0.25	Sandstone – Light olive gray 5Y 6/1, fine to very fine, Subangular to Subrounded, well sorted, Soft, Loose, friable, ferromagnesium grains,
	26.82						0.36	CORE LOSS in Sandstone from 26.46m To 26.82m
26.82					27		0.40	Sandstone (Silty) – Light olive gray 5Y 4/1, very fine, Subangular to Sub rounded, Sorted, Soft, loose, friable, ferromagnesium grains, micaceous
							0.45	Sandstone – Light gray N6, medium grained, Subangular to Sub-rounded, Sorted, Soft, loose, friable, ferromagnesium grains, glauconitic
	3.05	0.85	28%		28			
					29		2.20	CORE LOSS in Sandstone from 27.67m to 29.87m
	29.87							
29.87					30			
					1			

DRILL-HOLE NO KHW-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
					31		1.40	Sandstone - Medium gray N5, fine in upper while medium grained in middle and lower part, mostly sub angular, poorly sorted, soft, loose, friable, ferromagnesium grains glauconitic, highly micaceous in middle part.
	3.05	1.40	46		32		1.64	CORE LOSS in Sandstone from 31.27m to 32.91m
32.91	32.91				33		0.20	Sandstone - Light olive gray 5Y 6/1, very fine, subangular to sub rounded, well sorted, soft, loose, friable, ferromag-nesium grains, glauconitic, muscovite and biotite flakes, Silica about 90%
	3.05	0.20	6%		34		2.85	CORE LOSS in Sandstone from 33.11m to 35.96m.
					35			
35.96	35.96				36		0.20	Sandstone - Light olive gray 5Y 6/1, fine grained, sub-angu-lar to sub rounded, well sorted, soft, loose, friable, ferro-magnesium grains, glauconitic, muscovite and biotite flakes. Silty at bottom, Silica about 85%
	3.05	0.20	6%		37		2.85	
					38			CORE LOSS in Sandstone from 36.16m to 39.01
39.01	39.01				39		0.20	Sandstone - Light olive gray 5Y 6/1, very fine to fine, subangular to subrounded, well sorted, soft, loose, friable, ferromagnesium grains
							2.85	CORE LOSS in Sandstone from 39.21m to 42.06m
					40			
					1			

DRILL-HOLE NO KHV-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
3.05	42.06	0.20	6%		41–42		2.85	CORE LOSS in Sandstone from 39.21m to 42.06m
42.06	3.05	0.32	10%		42–45		0.32	Sandstone – Light olive gray 5Y 6/1, fine grained, Subangular to Sub rounded, well sorted, Soft, loose, friable, ferromagnesium grains, glauconitic, highly micaceous (Muscovite & biotite flakes), silica about 80%
							2.73	CORE LOSS in Sandstone from 42.38m to 45.11m
45.11	3.04	0.75	24.5		45–48		0.75	Sandstone – Light olive gray 5Y 6/1; fine grained, Subangular to Sub rounded, sorted, Soft, loose, friable, ferromagnesium grains glauconitic pellets, muscovite & biotite flakes, upper 20cm is silty/shely
							2.29	CORE LOSS in Sandstone from 45.86m to 48.15m
48.15	3.05	1.42	46%		48–50		1.0	Claystone – Dark yellowish brown 10YR 5/2, hard, Compact, Soft and sticky when wet, slightly silty, very tiny mica flakes
							0.42	Sandstone (Silty) – olive gray 5Y 4/1, very fine to silt size particles, subangular, Soft, loose, highly micaceous, ferromagnesium grains.
							1.63	CORE LOSS

DRILL-HOLE NO KHW-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	51.20				51		1.63	CORE LOSS in Sandstone from 49.57m to 51.20
51.20					52		2.0	CORE LOSS in Sandstone from 51.20m to 53.20
	3.05	1.05	34		53		0.65	Sandstone (Silty) - olive gray 5Y 4/1, very fine to silt size particle sub-angular, soft, loose, highly micaceous, ferromagnesium grains, at places silty and muddy, silica about 80%
	54.25				54		0.40	Claystone - olive gray 5Y 4/1, hard, compact, soft and sticky when wet, slightly silty at places, rare sand grains, tiny mica flakes.
54.25					55		0.95	Sandstone - Light olive gray 5Y 5/2, very fine, sub angular to sub rounded, poorly sorted, soft, loose, friable, ferromagnesium grains, glauconitic, micaceous, silty & muddy, silica about 80%
	3.05	0.95	31		56		2.10	CORE LOSS in Sandstone from 55.20m To 57.30m
	57.30				57			
57.30					58		0.18	Sandstone - Light olive gray 5Y 5/2, very fine, sub angular-sub rounded, poorly sorted, soft, loose, friable, micaceous, ferromagnesium grains, glauconitic
	1.39	0.35	25				0.27	Claystone - Dark yellowish brown 10YR 4/2, hard, compact, soft and sticky when wet, burrowed, burrow filled with Cady spars, lower part is silty
	58.69						0.94	CORE LOSS in Sandstone from 57.75m to 58.69m
58.69					59		0.57	Sandstone (Silty) - Light olive gray 5Y 5/2, lower 34 Cms is olive gray 5Y 4/1, very fine, sub angular-sub rounded, soft, loose, friable, ferromagnesium grains, highly micaceous, silty
					60		2.48	CORE LOSS in Sandstone from 59.26m to 61.74m

DRILL-HOLE NO KHW-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	3.05 / 61.74	0.57	18%		61		2.42	CORE LOSS in Sandstone from 59.26m - 61.74m
61.74					62		0.80	Sandstone (5GY 4/1) - olive gray 5Y 4/1, very fine, subangular to sub-rounded, sorted, soft, loose, friable, ferromagnesium grains, highly micaceous. Silty
	3.05 / 64.79	0.80	26		63		2.25	CORE LOSS in Sandstone from 62.54 to 64.79m.
64.79					64			
	3.05 / 67.84	2.40	78		65		2.40	Sandstone - olive gray 5Y 4/1, very fine to fine, subangular to subrounded, poorly sorted, soft, loose, ferromagnesium grains, glauconitic, muscovite and biotite flakes, silica about 80%, lower part is fine-medium grained.
					66			
					67			
							0.65	CORE LOSS in Sandstone from 67.19m To 67.84m
67.84					68		0.70	Sandstone - olive gray 5Y 4/1, very fine to fine, subangular to subrounded, poorly sorted, soft, loose, friable, ferromagnesium grains, glauconitic, muscovite and biotite flakes, silica about 80%
	1.65 / 69.49	0.70	42		69		0.95	CORE LOSS in Sandstone from 68.54m To 69.49m
69.49					70		1.60	Sandstone - Medium light gray N6, very fine to fine, subangular to sub rounded, well sorted, soft, loose, friable,

DRILL-HOLE NO KHW-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
					71		1.60	glauconitic, muscovite and biotite flakes, silica about 90%, in lower part grain size is fine to medium
	3.05	1.60	53					
					72		1.45	CORE LOSS IN Sandstone from 71.09 m to 74.54m
	72.54							
72.54							0.35	CORE LOSS in Sandstone from 72.54m to 72.89m
					73			Sandstone – Light olive gray 5Y 6/1, fine to medium, sub angular to sub rounded, poorly sorted, soft, loose, friable, ferromagnesium grains, glauconite pellets, muscovite and biotite flakes, silica about 90%
	3.05	2.70	88		74		2.55	
					75			Claystone – Medium gray N5, hard, compact, soft and sticky when wet, silty, uncoalified organic plant material, bluish green coloured sandy patch?, a thin 1 cm. layer in middle part.
	75.59						0.15	
75.59								CORE LOSS in Sandstone from 75.59 m to 77.88m
					76			
	3.04	0.75	24				2.29	
					77			
					78			Sandstone – Light olive gray 5Y 6/1, fine grained, subangular to sub rounded, poorly sorted, soft, loose, friable, glauconitic ferromagnesium grains, muscovite and biotite flakes, very fine in lower part.
	78.63						0.55	Claystone – Medium gray N5, hard, compact, soft and sticky when wet, shell fragments, burrows filled with sand, silty in lower part.
78.63							0.20	
					79			CORE LOSS in claystone from 78.63 m – 81.38m
							2.75	
					80			

DRILL-HOLE NO KHW-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
					81		2.75	CORE LOSS in Claystone from 78.63m to 81.38m
	81.68						0.30	Claystone - Medium grey N5, hard, Conchoidal, soft and sticky when wet, burrowed, burrows filled with Sandstone, the Sandstone is from fine to Coarse, Sub angular to Sub rounded, poorly sorted, Abiotic grounds at bottom
81.68					82			CORE LOSS in Sandstone from 81.68m to 84.43m
	3.05	0.30	9.8		83		2.75	
	84.73				84			Sandstone - Medium light grey N5, fine to Coarse angular to rounded, poorly sorted, Soft, Loose, friable, ferromagnesian, glauconite, pellets, yellow coloured very Coarse grains, pink, Green and variegated coloured clasts, Lustre, striae, lower 15cm having Gravel to pebble large rounded Sand Usub angular nodules, nodules are ferruginised
84.73	84.73	0.00	0.0				0.30	
					85			
					86		3.05	CORE LOSS in Sandstone from 84.73m To 87.78m
	3.05	0.00	0.0		87			
	87.78							
87.78					88			
	3.05	1.32	43		89		1.73	CORE LOSS in Sandstone from 87.78m To 89.51m
							0.52	Sandstone - Light grey N7, fine grained, Subangular to Sub-rounded, Basal, Soothill, Soft, Loose, friable, rare ferromagnesian Coaly shaly, in places.
					90			
					1			

DRILL-HOLE NO KHW-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	90.83						0.80	Sandstone with alternate thin silty clay layers and coaly laminations – olive gray 5Y 4/1, very fine to fine, subangular to subrounded, poorly sorted, soft, loose, friable, silty clay layers with coaly laminations are hard, compact, silica about 90%, resinous, one centimeter claystone layer at bit.
90.83					91			CORE LOSS in Sandstone from 90.83m To 93.16m
	3.04	0.71	23		92		2.33	Claystone – olive gray 5Y 4/1, hard, compact, soft and sticky when wet, few carbonaceous patches, very hard semi rounded nodules.
					93		0.10	Sandstone with alternate carby shale layers and coaly laminations – olive gray 5Y 4/1, fine grained, subangular to subrounded, poorly sorted, soft, loose, friable, Carby shale and coaly layers are hard,
							0.38	Carbonaceous Shale (Silty) – Dark gray N3, hard, Compact, sandy patches,
	93.87						0.23	silty, coaly spars are pyritic and resinous.
93.87					94			CORE LOSS in Sandstone from 93.87m To 95.76m
					95		1.89	
	3.05	1.16	38				0.08	Sandstone with alternate carbonaceous shale and coaly laminations – olive gray 5Y 4/1, fine grained, Carbonaceous shale and coaly laminations are hard, Carbonaceous shale (Silty) with thin Sandy layers – Dark gray N3, hard, Compact,
					96		0.18	silty, coaly spars, Pyritic and resinous. Sand is very fine-fine
							0.35	Sandstone with two 50cm Carby shale layers – Light gray N7, fine to very fine, subangular to subrounded, well sorted, soft, loose, friable, Silica about 95%, Carby shale colour is Dark gray N3, hard, Compact, Coaly spars
							0.50	Claystone (Carby) with alternate thin Sandstone layers and coaly laminae – Dark gray N3, hard, Compact, Carby and coaly shale laminae, Sand is light gray, fine
	96.92						0.42	Carbonaceous shale – Dark gray N3, hard, Compact, coaly spars, resinous,
96.92					97			Carbonaceous shale – Dark gray N3, hard, Compact, Coaly [illegible]
							0.74	Coal Seam – Brownish black 5YR 2/1, dull [illegible]
								Sandstone – [illegible]
							0.14	Sandstone with thin coaly layers and lamination – Dark gray N3, very [illegible]
					98		0.35	
	3.05	1.43	46				0.13	Sandstone – Light gray N7, very fine to fine, subangular to subrounded, [illegible] Coaly bands, mostly, Silica about 90%
								Carbonaceous shale (Silty) – Dark gray N3, hard, Compact, silty, [illegible]
					99		1.62	CORE LOSS in Sandstone from 98.35m To 99.97m
	99.97				100			

DRILL-HOLE NO KHW-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
					101		1.10	Sandstone – Light gray N7, very fine to fine, subangular to sub rounded, well sorted, soft, loose, friable, tiny coaly spars at places, clean sand, silica about 95%
	3.05	1.10	36		102		1.95	CORE LOSS in Sandstone from 101.07m To 103.02m
	103.02				103			
103.02							0.82	Sandstone – Light gray N7, very fine to fine, subangular to sub rounded, well sorted, soft, loose, friable, tiny Coaly spars at places, good clean silica sand, silica 95%
	2.44	0.82	33		104			
					105		1.62	CORE LOSS in Sandstone from 103.84m – 105.46m.
	105.46							
105.46							0.14	Sandstone – Light gray N7, very fine to fine, sub-angular to sub-rounded, poorly sorted, soft, loose, friable, Coaly spars at places, Silty and shely patches near bottom.
	3.04	0.14	4.6		106			
					107		2.90	CORE LOSS in Sandstone from 105.60m to 108.50
	108.50				108			
108.50								
	0.61				109		0.61	Claystone (Silty) – Dark greenish gray 5GY4/1 hard compact silty soft ... sticky when wet sandy and silty patches, Coaly spars, marcasite and pyrite
109.11								
					110		2.5	Claystone – Dark greenish gray 5GY4/1, hard, Compact, Silty at places, very hard quartzitic Sandstone layers and
					1			

DRILL-HOLE NO KHW-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
								and patches at different depths, Coaly specs, marcacite and pyrite, shell fragment ?.
	3.05	2.5	82		111		2.5	
	112.16				112		0.55	CORE LOSS in Claystone from 111.61 m to 112.16m
112.16								Claystone (Silty) – Dark greenish gray 5GY 4/1, hard, Compact, silty, sandy patches, very hard Sandstone nodules and layers, coaly spars
	1.02	0.60	58				0.60	
	113.18				113		0.42	CORE LOSS in Sandstone from 112.76m to 113.18m
113.18								CORE LOSS in Sandstone from 113.18m to 114.42m
							1.24	
					114			Sandstone – Light gray N7, very fine to fine, Subangular to Subrounded, well sorted, Soft, loose, friable, Coaly specs
	2.03	0.79	39				0.06	Claystone – Dark yellowish brown 10YR 4/2, hard, Compact, slightly Carby, burrows burrows filled with Sand, Coaly specs, marcacite and pyrite, Siderite nodules
							0.40	
								Highly Carbonaceous Shale – Brownish black 5YR 2/1, hard, Compact, Sandy patches marcacite and pyrite, with high specific gravity
							0.08	
					115			Sandstone with Siltstone layers – olive gray 5Y 4/1, very fine-fine, hard, Compact, Coaly specs, pyrite grains
	115.21						0.25	
115.21								Sandstone with Siltstone layers and patches – olive gray 5Y 4/1, very fine to medium, Subangular to Subrounded, poorly Sorted, hard, compact, very hard at places, Siltstone layers and patches at places, Coaly specs, marcacite and pyrite, very hard Sandstone or Siderite nodules?
					116		1.78	
	3.05	1.78	58					
					117			
							1.27	CORE LOSS in Sandstone from 116.99m to 118.26m
					118			
	118.26							
118.26								Siltstone with shaly patches and layers – olive gray 5Y 4/1, hard, Compact, Carby shale layers, thin Sandy layers and patches, Coaly specs, marcacite and pyrite, burrows filled with Sand, Siderite nodules
							0.60	
					119			Sandstone with alternate carbonaceous shale and Coaly layers – Sandstone is light gray N7, very fine-fine, Subangular to Subrounded, well sorted, hard compact due to Carby shale and Coaly layers and laminations pyritic, Siderite nodules.
							1.40	
					120			
					121			

Form 3a

(17) 1630

DRILL-HOLE NO KHW-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
							1.40	
							0.64	Claystone – olive gray 5Y 4/1, hard, compact, slightly carbonaceous in middle and lower part, coaly specks at places, pyrite grains
	121.25				121		0.35	COAL SEAM NO. KHW-2-1 – Brownish black 5YR 2/1, dull, non-banded, pyritic, resinous, with low specific gravity. (Continued)
121.25							0.60	COAL SEAM NO KHW-2-1 – Total Seam Thickness = 0.95 m. Brownish black 5YR 2/1, dull, non-banded, pyritic, resinous, with low specific gravity
					122		0.16	Carbonaceous shale – Brownish black 5YR 2/1, hard, compact, with high specific gravity, coaly patches and specks, pyrite
							0.22	Claystone – Dark gray N3, hard, compact, slightly carbonaceous, coaly specks, marcacite, pyrite
	2.75	2.75	100					
					123		1.77	Siltstone with Carbonaceous shale layers – Medium dark gray N4, hard, compact, sandy in middle part, carbonaceous shale layers and patches, coaly specks, highly pyritic at places, marcacite, siderite nodules at places
	124.0							
124.0					124		0.26	Carbonaceous shale – Dark gray N3, hard, compact, carbonaceous, coaly specks, very thin sandy laminae, pyrite layers within the siderite nodule
							0.30	COAL SEAM NO. KHW-2-2 from 124.26 m to 124.56 (Dirty Coal) Brownish black 5YR 2/1, dull, sandy and carby shale patches, pyrite, resin
							0.48	Claystone (Carby) – Dark gray N3, hard, compact, slightly silty, carbonaceous plant impressions, coaly specks, marcacite and pyrite
					125			
	3.05	3.05	100				2.01	Sandstone – Dark gray N3, in upper 55 cms rest is light gray N7, very fine to fine, subangular to subrounded, poorly sorted, soft, coaly specks.
					126			
	127.05							
127.05					127		1.08	Sandstone – light gray N7, very fine to fine, subrounded to rounded, well sorted, soft, loose; clean white sand silica about 95%.
					128			
	3.04	1.08						
					129		1.96	CORE LOSS in Sandstone from 128.13 m to 130.09 m
					130			

Form 3a

(LK) 830

DRILL-HOLE NO KHW-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	130.09						1.96	Core Loss in Sandstone from 128.13m to 130.09m
130.09								
	3.05	Nil	00				3.05	CORE LOSS in Sandstone from 130.09 m To 133.14m
	133.14							
133.14	0.36 133.5	Nil	00				0.36	CORE LOSS in Sandstone from 133.14m To 133.50
133.50								
	3.05	Nil	00				3.05	CORE LOSS in Sandstone from 133.50m To 136.55m.
	136.55							
136.55	0.91	Nil	00				0.91	CORE LOSS in Sandstone from 136.55m To 137.46m
	137.46							
137.46							1.05	Sandstone - yellowish gray 5Y 8/1, very fine to fine, Sub-angular to Sub rounded, well sorted, soft, loose, friable tiny Coaly partings, good quality silica sand with about 95 Silica
	2.74	1.05	38					
							1.52	CORE LOSS in Sandstone from 138.51m To 140.20m

Form 3a

(19) q 30

DRILL-HOLE NO KHW-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	140.21						1.69	CORE LOSS in Sandstone from 138.51m To 140.20m
140.20								
					141		2.09	CORE LOSS in Sandstone from 140.20m to 142.29m
	142.24	0.15	6%					
					142			Claystone (Carby) with siderite nodules— Brownish gray 5YR 4/1, hard, Combact, Carby, Sandy, Coal spars and thin layers, pyritic, very hard quartzitic Sandstone at Side nodules, a big nodule a layer with 8 in specific gravity at bottom.
	142.39						0.15	
142.39								
					143		2.80	CORE LOSS in Sandstone from 142.44m To 145.24m
	3.05	0.25	8%					
					144			
					145			Sandstone (Silty) - Light gray N7, very fine to fine, Subang to Sub rounded, poorly Sorted, soft, loose, friable, Silty, ve tiny Carby partings, burrow filled with Coal at bottom, Silica a 95%
	145.49						0.15	Coal with Carby Shale — Brownish black 5YR 2/1, Soft, brittle
							0.10	pyritic, with clay. Specific gravity while layer 4 Cms are Carby Shale of dark gray N3 colour, hard & Compact, burrow filled with Coa
145.49								
					146		2.25	CORE LOSS in Sandstone from 145.49m To 147.74
	3.05	0.80	35%					
					147			Sandstone with alternate Carby shale and Carby la Medium gray N5, very fine to fine, Subangular to sub rounded, well Sorted, soft, Compact, Carby Shale Carby layers and laminations 5%
					148		2.40	Sandstone — yellowish gray 5Y 7/1, fine grained, Subang to Sub rounded well Sorted, Soft, loose, friable
	148.25						0.15	Highly Carbonaceous Shale with Coal — Brownish b 5YR 3/4, medium hard Compact Sandy with sub specific gravity
148.54								
					149		3.05	CORE LOSS in Sandstone from 148.54m To 151.59m
					150			
					1			

DRILL-HOLE NO KHW-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	151.39	Nil	0%		151		3.05	CORE LOSS in Sandstone from 148.34m To 151.39m
151.39	154.43	Nil	0%		152 153 154		3.04	CORE LOSS in Sandstone from 151.39m to 154.43m
154.43	157.47	Nil	0%		155 156 157		3.05	CORE LOSS in Sandstone from 154.64m to 157.69
157.69	160.73	Nil	0%		158 159 160		2.13	CORE LOSS in Sandstone from 157.69 to 160.73

DRILL-HOLE NO KHW-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
								CORE LOSS in Sandstone from
	160.72						1.30	Sandstone – very light gray N8 to [illegible] gray N7, upper part very fine but grades to coarse towards bottom, subangular to subrounded, poorly sorted, soft, loose, friable, coaly partings, siderite nodules
160.73					161		0.25	Sandstone – Very light gray N8, fine-medium, subangular to subrounded, poorly sorted, soft, loose, friable, coaly specks, silica about 95%
					162			CORE LOSS in Sandstone from 162.33m to 163.22
					163			
					164			Sandstone – Very light gray N8, fine-medium, angular to subrounded, poorly sorted, soft, loose, friable, coaly specks and partings, silica about 95%
	3.04				165		2.84	CORE LOSS in Sandstone from 163.38m to 166.21m
					166			
					167		0.25	Sandstone – same as above
	3.25				168		2.20	CORE LOSS in Sandstone from 167.07m to 169.87m
					169			
					170			[illegible] in sandstone from [illegible] to [illegible]
					1			

DRILL-HOLE NO KHW1-1

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
							0.56	Sandstone – Very light grey N8, very fine to fine, angular to sub-rounded, poorly sorted, soft, loose, friable, Coaly specks and bartings
							0.10	Carbonaceous Shale – Brownish grey 5YR 4/1, hard, Compact, Coaly and Carb specks and bartings, pyrite, Siltstone, Bartings filled with Sand
173.41					171			
	3.05	0.40	13		172		2.65	CORE LOSS in Sandstone from 170.76m to 173.41m
					173			Sandstone – Light grey N7, fine grained, sub angular to sub rounded, well sorted, Soft loose, friable, Silica about 95%
173.81	173.81						0.40	
					174			
							2.75	CORE LOSS in Sandstone from 173.81m to 176.56m
	3.05	0.3	9.8		175			
					176			Sandstone with alternate shaly and Coaly bands – Dark grey N3, very fine to fine, sub angular to sub-rounded poorly sorted, hard and compact due to alternate shaly and Coal bands
176.35	176.26						0.30	
					177			
							2.61	CORE LOSS in Sandstone from 176.86m to 179.50m
	3.04	0.40	13		178			
					179			
179.37							0.10	Carbonaceous shale with alternate Coaly bands – Medium dark grey N4, hard, compact, soft, very sandy bands, alternate Coaly bands in upper part, Coaly specs in lower part, micaceous flakes
					180			

DRILL-HOLE NO KHW-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	3.05	NIL	00		181		3.05	CORE LOSS IN SAND STONE FROM. 179.90 To 182.95m.
182.92	182.95				182			
	3.05				183			CORE LOSS IN SAND STONE FROM 182.95m To 185.41m.
					184		2.46	
					185			Claystone.(Carby) with alternate Sand stone layers and patches Dark gray N3, hard Compact, with alternate Sand stone and Carby shale layers and patches, Silty, Carby specks and Pyrite
	186.0						0.59	
186.0					186			CORE LOSS IN SAND STONE FROM. 186.0m to 186.71m
	0.91	0.20	21%				0.71	Sand stone. with alternate coaly bands, Medium dark gray N4, very fine to fine, Sub angular to subrounded, Poorly sorted hard Compact with alternate coaly band. lower part is siderstic and very hard.
186.91	186.91						0.20	
186.91					187		0.40	Sand stone silty olive gray 5Y 4/1 Medium to fine grained angular to subrounded poorly sorted soft loose friable, slightly carbonaceo in upper part with thin alternable layer of coal, coaly specks, Quartz very high about 90% at the base.
	2.99	0.40	13.3		188		2.59	CORE LOSS IN SAND STONE FROM. 187.31 to 189.90m.
	189.90				189			
189.90					0		0.30	Sand stone

DRILL-HOLE NO KHW-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
							0.30	Sandstone very light-gray N8 to light-gray N7 medium to fine grained angular to subangular poorly sorted soft loose friable coaly spar present; quartz about 90%
	192.93	0.30	9.9		191 192		2.73	CORE LOSS IN SAND STONE FROM 190.20 – 192.93
192.93					193			CORE LOSS IN SAND STONE FROM 192.93 m to 195.68 m
	195.98	0.30	10.7		194 195		2.75	Sand stone very light-gray N8 to light-gray N7, medium to fine grained angular to sub angular/subrounded, A coaly band present at the base in the sand stone ferromagnesium grain present.
							0.30	
195.98					196		0.20	Clay stone (silty) olive gray 5Y 4/1 fine to v. fine, medium hard compact; soft well sorted, glauconite pellets present; ferromagnesium grain present; Carby shale Patch with coaly spar/spakes observed at the base.
	197.20	0.20	16%		197		1.02	CORE LOSS IN SAND STONE FROM 196.18 – 197.20
197.20							0.15	Sandstone light-gray N7, fine to medium grained soft loose friable coaly partings at the bottom (thin layer) Quartz 95%
	3.05	0.15	5.2		198 199		2.90	CORE LOSS IN SAND STONE FROM 197.35 to 200.25
					200			

DRILL-HOLE NO KHW-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
	200.25						2.90	CORE LOSS IN SAND STONE From 197.35 To 200.25m
200.25							0.10	Sand stone Light-gray N7, medium to fine grained angular to subangular Poorly sorted, soft loose, friable, coaly parting, silica about 95%
	2.05	0.10	3%		201			CORE LOSS IN SAND STONE FROM 200.35 - 203.30
					202		2.95	
	203.30				203			
203.30							0.56	CORE LOSS IN SAND STONE FROM 203.30m to 203.86m
	1.16	0.60	51.7%		204		0.60	Sandstone Light gray N7 medium to fine grain angular to sub angular /sub rounded, Poorly sorted, soft loose friable, Coaly specks/spar sideritic nodules embeded in sand stone. Pyrite grain Coaly parting Coven the nodules altho
	206.46							
204.116					205			CORE LOSS IN SAND STONE FROM 206.46m to 206.34
	1.88	—	—				1.88	
	206.34				206			
206.34							1.40	Sandstone Light gray N7, medium to coarse grained, angular to subangular/subrounded soft loose friable. Pyrite grains Present. Quartz 95%
					207			CORE LOSS IN SAND STONE FROM 206.74m - 209.39m
		0.40	13.11					
					208		2.65	
	209.39				209			
209.39								CORE LOSS IN SAND STONE FROM 209.39m - 212.19m
					210			

DRILL-HOLE NO KHW-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
								CORE LOSS IN SAND STONE FROM 209.39 TO 212.19
	3.05	0.25			211		2.80	
					212			Sandstone. Light gray N7, medium to coarse grain soft loose friable silica about 95% ferromagnesium grains, pyrite grains present.
	212.44						0.25	
212.44								CORE LOSS IN SANDSTONE FROM 212.44 TO 215.24
	3.05	0.25	31.19		213			
					214		2.80	
					215			Sandstone light-gray N2 medium to coarse grain angular to sub angular, soft loose friable ferromagnetium grain silica about 95%.
	215.49						0.25	
215.49								CORE LOSS IN SAND STONE FROM 215.49 TO 218.34
	3.05	0.20	6.55		216			
					217		2.85	
					218			Sandstone. Light-olive gray 5Y 6/1 fine to very fine, soleid, medium to hard compact. ferromagnesium grains, glauconite pelleli, A 10cm thick layer of dolomatic / Grity sandston? and quartz granules, Burrows filled with sand a black shell present.
	218.54						0.20	
	1.33	0.20	100		219		1.63	CORE LOSS IN SAND STONE FROM 218.54m TO 220.17m
					220			

DRILL-HOLE NO KHW-2

CORE RECOVERY FROM	CORE RECOVERY TO	CORE	CORE %	WATER LOSS	DEPTH METRES	GRAPHIC LOG	THICKNESS	LITHOLOGIC DESCRIPTION
								- CORE LOSS IN SANDSTONE 218.54 — 220.17m
	220.37						1.20	Sand Stone Light-olive gray 5Y 6/1 fine to very fine, well sorted medium to hard Compact, friable, Glauconite pelleti, Pyrite grain dolomatic nodules or gritty sand stone? Burrows filled with sand
220.37								
		0.83	100		221		0.43	Claystone silty Medium gray N5, hard Compact sticky when wet, silty at places hard quartzitic sand stone at places, rooted, Carby Shale patches coaly specks tiny, mica
					222			Claystone (silty) olive black 5Y2/1, Medium, hard compact, sticky when wet silty at places, coaly specks, resinous, Pyrite grains, mica very rare
	222.69						0.26	COAL SEAM, Brownish Black 5YR 2/1, dirty, dull, Sandy patches, Pyrite grains, resinous, with low sp gravity
222.69							0.07	Carby shale olive black 5Y2/1 hard Compact coaly patches and coaly specks
		0.82	100		223		0.08	Pyrite grain observed
							0.51	Claystone (silty) Medium gray N5 hard compact sticky when wet silty at places Sandstone at places, Mottled (Black & gray) pyrite grain, mica flakes observed
	223.72							
223.72								Claystone (silty) Medium dark gray N4 hard Compact sticky when wet, ferromagnesium grain, marcasite? Pyrite grain very rare, Sandy at places, Coaly specks present
					224			
		3.05	100		225		3.00	
							0.10	COAL SEAM grayish black N2, dull, Sandy patches observed Sp gravity very low, Pyrite grains present; resinous
					226		2.05	Claystone (silty) Medium dark gray N4, hard Compact sticky when wet, ferromagnesium grain, marcasite, grain, Pyrite grain very rare Sandy at places coaly specks
226.77	229.37							
					227			Siltstone Light gray N7, Shaly patches rare, thin Sand Stone layer at places, coaly specks, mottled (Black & gray) Pyrite grain very rare burrows filled with Sand, at the bottom very Sandy.
					228		2.60	
		2.60	80%		229			
							2.45	CORE LOSS IN SAND STONE FROM 229.37 To 229.82
229.82					230			Sand stone Light-gray N7 fine to very fine, grained Compact, soft loose friable, well sorted subrounded to rounded, glauconite pelleti's, ferromagnesium grain present. Quartz abrasive grain
							0.35	CORE LOSS IN SANDSTONE from 230.12 To 230.77
END					231			

COALREAP
Coal Intercepts

Form 4 of 5
Rev Apr 90

Drill hole KHW-2 Collar elevation

Bed Name	Description	Depth From	Depth To	Thickness	Info Source	%Dry Ash	Sample No.
		120.90	121.85	0.95m			KHW-2-1
		124.26	124.56	0.30m			KHW-2-2

COAL SAMPLE DATA

SAMPLE NO. KHW-2-1A, B + C NO. OF BAGS 3 (1 per sample)

COLLECTOR M. Riaz Khan COAL FIELD Badin

LATITUDE _____ LONGITUDE _____

PROVINCE SINDH DISTRICT Badin

DRILL HOLE KHW-2 DATE SAMPLED 19th March 02

FORMATION Bara AGE Paleocene

COAL SEAM _____ ESTIMATED RANK Lignite

TOTAL SEAM THICKNESS - in THICKNESS SAMPLED - in
0.95 m 0.95 m

DEPTH TO TOP OF COAL - ft SURFACE ELEVATION - ft@MSL
120.90 m 9.75 m

ROOF ROCK Claystone FLOOR ROCK Carby shale

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

COMMENTS: The Coal Seam NO. KHW-2-1 is from 120.90m To 121.85m
Total thickness of Seam is 0.95m

(i) The Sample NO. KHW-2-1(A) was Sampled from 120.90m to 121.25m
Sampled Thickness = 0.35m

(ii) Sample NO. KHW-2-1(B) was Sampled from 121.25m to 121.55m
Sampled thickness = 0.30m

(iii) Sample NO KHW-2-1(C) was Sampled from 121.55m to 121.85m
Sampled thickness = 0.30m

NO SPLITS REQUESTED BY USGS.

30
%30

COAL SAMPLE DATA

SAMPLE NO. KHW-2-2 NO. OF BAGS 1

COLLECTOR M. Riaz Khan COAL FIELD Badin

LATITUDE _____ LONGITUDE _____

PROVINCE Sindh DISTRICT Badin

DRILL HOLE KHW-2 DATE SAMPLED 19th April 92

FORMATION Bara AGE Paleocene

COAL SEAM _____ ESTIMATED RANK Lignite

TOTAL SEAM THICKNESS — in 0.30 m THICKNESS SAMPLED — in 0.30 m

DEPTH TO TOP OF COAL _____ ft 124.26 m SURFACE ELEVATION _____ ft@MSL 9.75 m

ROOF ROCK Carbonaceous Shale FLOOR ROCK Claystone

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

COMMENTS:

The Sample is a "Dirty Coal Sample" having Highly Carby shale and sandstone patches and thin layers.

NO SPLIT REQUESTED BY USGS