

ANNEXURE II B

**Lithological Log of Boreholes drilled in Jhamkola area,
Wardha Valley Coalfield, Yavatmal district, Maharashtra.**

Borehole No. WJ-1

Location	Date of Commencement : 18.06.2012
Latitude : 19° 57' 30" N	Date of Closing : 09.07.2013
Longitude : 78° 47' 12" E	Drill Unit : 487
Toposheet No. : 56 I/13	
R. L. : 259.87 m	
Final Depth : 587.30 m	

From (m)	To (m)	Thickness (m)	Recovery (m)	Lithology
1	2	3	4	5
0.00	1.50	1.50	0.35	Black cotton soil
1.50	3.00	1.50	0.85	Loose basaltic boulders.
3.00	4.25	1.25	1.20	Steel grey, fine porphyritic basalt.
<i>Contact between Deccan Trap and Motur Formation</i>				
4.25	16.1	11.90	0.60	Dirty white fine grained loose sand.
16.15	18.2 0	2.05	0.35	Yellow, pink, brick red, variegated claystone.
18.20	20.8 0	2.60	0.10	Brown coarse grained loose sand.
20.80	22.2 0	1.40	0.40	Brick red siltstone intercalated with brown claystone.
22.20	25.2 0	3.00	0.15	Reddish brown medium to coarse grained, poorly sorted, feldspathic sandstone, also consist yellow clay gals
25.20	31.5 0	6.30	0.35	Light brown fine grained loose sand.
31.50	37.00	5.50	0.45	Reddish brown medium grained loose sand.
37.00	38.50	1.50	0.15	Reddish brown fine to medium grained loose
38.50	43.50	5.00	0.25	Pink fine grained loose sand.
43.50	45.10	1.60	0.20	Pink fine to medium grained loose sand.
45.10	51.60	6.50	0.50	Light brown to pink fine grained loose sand.
51.60	58.65	7.05	0.25	Light pink fine to medium grained loose sand.
58.65	59.20	0.55	0.15	Brick red compact clay stone.
59.20	65.20	6.00	0.30	Light brown fine grained loose sand.

1	2	3	4	5
65.20	68.55	3.35	0.15	Light brown fine to medium grained loose sand.
68.55	71.55	3.00	0.20	Light brown fine grained loose sand.
71.55	81.10	9.55	0.65	Light brown fine to medium grained loose sand.
81.10	93.10	12.00	0.50	Light brown fine grained loose sand.
93.10	96.50	3.40	0.20	Brick red fine to medium grained loose sand.
96.50	109.0	12.50	0.55	Brick red medium grained loose sand.
109.00	115.2	6.20	0.50	Light brown fine to medium grained loose
115.20	127.6	12.40	0.45	Light brown fine grained loose sand.
127.60	140.0	12.40	0.95	Light brown fine to medium grained loose
140.00	142.3	2.30	0.30	Light brown fine grained loose sand.
142.30	143.1 0	0.80	0.05	Brown claystone with very thin layer of medium grained sandstone.
143.10	144.1	1.00	0.50	Red siltstone with fractures.
144.10	151.1 5	7.05	3.55	Red and grey claystone.
151.15	155.5	4.35	2.90	Reddish brown mudstone.
155.50	164.2 5	8.75	2.20	Grey claystone with slicken sides and fractures.
164.25	164.6 0	0.35	0.35	White medium to coarse grained, moderately sorted, and crudely laminated sandstone.
164.60	167.0	2.40	2.40	Grey mudstone with patches of brown mudstone.
167.00	167.7	0.70	0.40	Grey claystone.
167.70	168.4 5	0.75	0.75	Reddish brown siltstone with small patches of dirty white claystone.
168.45	169.1 5	0.70	0.70	Grey claystone.
169.15	172.4 0	3.25	3.25	Reddish brown to variegated colour, siltstone intercalated with grey claystone.
172.40	179.0 5	6.65	6.25	Variegated mudstone interlayered with claystone and siltstone.
179.05	185.2 0	6.15	0.95	Grey to dirty white fine to medium grained, moderately sorted grey shale clast and quartz granule at base.
185.20	187.2 5	2.05	1.30	Dirty white medium grained, moderately sorted with parallel lamination of reddish brown

1	2	3	4	5
187.25	189.2 0	1.95	0.95	Reddish brown mudstone with clay clast.
189.20	192.2 0	2.60	0.40	Dirty white fine to medium grained sandstone.
192.20	192.8 5	0.65	0.15	Dirty white medium grained ill sorted sandstone, intercalated with thin bands of reddish brown mudstone.
192.85	193.8 0	0.95	0.60	Dirty white fine grained moderately sorted sandstone with clay clast.
193.80	195.0 0	1.20	0.50	Dirty white fine to medium grained moderately sorted sandstone with clay clast.
195.00	201.0 0	6.00	4.50	Variegated claystone intercalated with few siltstone bands.
201.00	203.0 5	2.05	1.05	Reddish brown to grey siltstone, thin carbonaceous shale stringers towards bottom, lower contact erosional.
203.05	204.0 0	0.95	0.40	Reddish brown to grey fine grained, moderately sorted sandstone with interlamination of parallel laminae of grey shale.
204.00	205.0	1.05	0.35	Khaki claystone.
205.05	205.6 0	0.10	0.55	Dirty white very coarse grained poorly sorted, feldspathic sandstone.
205.60	206.0	0.40	0.10	Grey claystone.
206.00	210.5 0	4.50	3.85	Reddish brown mudstone with Ferricrits.
210.50	211.4 5	0.95	0.95	Brown very fine grained sandstone.
211.45	213.1 0	1.65	1.05	White fine to medium grained feldspathic sandstone with crude plane lamination.
213.10	214.2 0	1.10	1.10	Grey mudstone.
214.20	214.5 5	0.35	0.35	Grey micaceous siltstone.
214.55	215.8 5	1.30	0.10	Grayish white fine grained, moderately sorted highly friable micaceous sandstone.
215.85	217.9 0	2.05	2.05	Grey claystone interlaminated with dark grey micaceous shale, interbanded with few siltstone bands.
217.90	227.3 0	9.40	3.15	Reddish brown claystone with intercalation of grey and green claystone.
227.30	227.8 0	0.50	0.20	Reddish brown fine grained sandstone interlaminated with high angle deformed laminae brown claystone, deformed lamination, one fault plane with 45° angle

1	2	3	4	5
				is observed at bottom part demarcated with silken planes.
227.80	237.2 5	9.45	5.10	Reddish brown claystone interbanded with light grey very fine grained, micaceous sandstone and lenticular laminations.
237.25	243.0 0	5.75	4.40	Reddish brown claystone interbanded with very fine grained cross laminated sandstone.
243.00	246.2 5	3.25	1.40	Reddish brown very fine grained cross laminated sandstone, interbanded with claystone.
246.25	257.2 5	11.00	5.52	Reddish brown claystone with Ferricrits and slicken sides.
257.25	258.4 5	1.20	0.80	Greenish grey siltstone.
258.45	259.1 0	0.65	0.43	Light brown claystone with Ferricrits.
259.10	260.2 5	1.15	0.85	Light brown fine grained, immature argillaceous sandstone
260.25	263.2 5	3.00	0.50	Brown claystone intermixed with green claystone.
263.25	263.5 5	0.30	0.22	Brown very fine grained sandstone with angular rock fragment and feldspar grained at base, lower contact erosional.
263.55	264.3 0	0.75	0.75	Reddish brown claystone grading in to siltstone towards bottom.
264.30	266.5 5	2.25	1.85	Brown claystone consist few thin interbands of dirty white fine grained sandstone.
266.55	267.9 5	1.40	0.90	Reddish brown and green intermixed siltstone.
267.95	270.8 5	2.90	0.65	Light grey, fine grained, moderately sorted, sub-mature sandstone with plane lamination of grey shale and carbonaceous shale.
270.85	271.3 5	0.50	0.20	Dark green medium to coarse grained, ill sorted sandstone consist weathered feldspar.
271.35	271.8 0	0.45	0.20	Light grey siltstone consist very fine grained sandstone band at base.
271.80	272.4 0	0.60	0.50	Brown claystone.
272.40	272.9 5	0.55	0.45	Light grey medium grained, moderately sorted, felspathic sandstone, consist few light grey siltstone laminae.
272.95	275.7 0	2.85	1.83	Dark brown to black claystone.
275.70	277.0 0	1.30	1.00	Dark brown mudstone.

1	2	3	4	5
277.00	280.0 0	3.00	2.05	Dark brown to black claystone.
280.00	286.0 0	6.00	1.50	Dark brown mudstone.
286.00	289.9 5	3.95	2.97	Reddish brown claystone with sandy intercalations and Ferricrits.
289.95	290.9 0	0.95	0.30	Light green and brown intermixed, coarse to very coarse grained, poorly sorted sandstone sharp lower contact.
290.90	291.2 5	0.35	0.35	Brown and green siltstone intermixed.
291.25	294.5 0	3.25	3.05	Reddish brown claystone with Ferricrits.
294.50	299.4 5	4.95	1.20	Variegated claystone.
299.45	300.0 5	0.60	0.10	Reddish to yellowish, fine to medium grained moderately sorted sandstone.
300.05	303.0 0	2.95	2.30	Reddish brown siltstone interbanded with thin bands of fine grained sandstone and few claystone bands.
303.00	303.4 5	0.45	0.15	Variegated, medium grained moderately sorted sandstone.
303.45	313.7 0	10.25	4.50	Reddish-brown claystone with few siltstone interbands.
313.70	322.0 0	8.30	0.55	Brown siltstone.
322.00	329.0 0	7.00	3.30	Variegated claystone with Ferricrits, also consist few crude lamination claystone.
329.00	331.0 0	2.00	0.35	Dirty white coarse to very coarse grained, ill-sorted sandstone, consist few reddish brown claystone clast.
331.00	337.2 0	6.20	1.45	Reddish brown to variegated claystone having crude lamination.
337.20	337.7 0	0.50	0.05	Variegated, medium to coarse grained ill sorted sandstone.
337.70	343.7 0	6.00	1.45	Reddish brown siltstone with a few claystone interbands.
343.70	353.7 0	10.00	1.50	Variegated colour claystone with slicken sides.
353.70	356.5 0	2.80	1.70	Reddish brown claystone with Ferricrits also consist few thin siltstone bands at lower part.
356.50	357.3 0	0.80	0.60	Dirty white very fine grained, ill-sorted sandstone consist few thin interbands of coarse grained ill-sorted sandstone.
357.30	359.4 0	2.10	2.10	Reddish brown siltstone with thin bands of claystone.

1	2	3	4	5
359.40	360.8 5	1.45	1.05	Reddish brown claystone with thin siltstone bands towards bottom.
360.85	361.3 5	0.50	0.15	Variegated very fine grained, sandstone, sharp lower contact.
361.35	362.6 0	1.25	1.25	Reddish brown claystone, sharp lower contact.
362.60	363.9 0	1.30	1.30	Reddish brown siltstone grading into sandstone towards bottom.
363.90	364.2 0	0.30	0.30	Brown fine grained sandstone, a few thin layers of claystone, sharp lower contact.
364.20	365.0 0	0.80	0.60	Dirty white, fine to medium grained, poorly sorted sandstone with micaceous laminae, lower contact scoured.
365.00	365.5 5	0.55	0.20	Dirt white, coarse to very coarse grained, ill sorted sandstone with crude lamination of claystone.
365.55	368.1 5	2.60	2.60	Reddish brown claystone, scoured lower contact.
368.15	368.4 0	0.25	0.25	Dark violet colour, fine to medium grained, moderately sorted sandstone with thin bands of claystone.
368.40	368.5 0	0.10	0.10	Dirty white claystone.
368.50	368.7 8	0.28	0.28	Dark violet colour, coarse to very coarse grained, ill sorted sandstone with thin bands of claystone.
368.78	369.7 3	0.95	0.95	Reddish brown claystone.
369.73	370.4 0	0.67	0.67	Reddish brown siltstone.
370.40	371.3 0	0.90	0.90	Reddish brown and grey intermixed claystone.
371.30	371.9 0	0.60	0.60	Reddish brown mudstone intermixed with siltstone.
371.90	373.1 5	1.25	1.25	Reddish brown siltstone with few interbands of light green fine grained sandstone.
373.15	373.5 0	0.35	0.35	Green medium to coarse grained immature, ill sorted argillaceous sandstone.
373.50	374.1 0	0.60	0.60	Reddish brown and grey claystone with silken planes.
374.10	376.0 0	1.90	1.85	Reddish brown fine grained, ill-sorted argillaceous sandstone inter layered with few thin light green medium grained ill sorted sandstone and siltstone.
376.00	376.2 0	0.20	0.20	Dark grey claystone, sharp lower contact.
376.20	379.0	2.80	1.30	Dirty white, fine to medium grained, moderately

1	2	3	4	5
	0			sorted, loosely compacted sandstone.
379.00	387.0 0	8.00	0.85	Reddish brown mudstone inter-layered with thin layer of green claystone.
387.00	388.0 0	1.00	0.15	Reddish brown to grey claystone, consist silken planes.
388.00	395.4 0	7.40	0.30	Reddish brown mudstone with claystone interbands.
395.40	398.0 0	2.60	0.80	Reddish brown claystone with a few yellow claystone bands.
398.00	401.5 0	3.50	0.70	Reddish brown siltstone.
401.50	402.8 0	1.30	0.20	Reddish brown fine to medium grained sandstone with claystone interbands.
402.80	405.8 0	3.00	0.20	Reddish brown, medium to coarse grained, sandstone interbanded with thin claystone bands.
405.80	406.4 0	0.60	0.10	Slaty grey claystone with silken planes.
406.40	407.1 5	0.75	0.25	Chocolate brown claystone consist of reddish brown claystone clast.
407.15	408.8 0	1.65	0.90	Reddish brown siltstone interbanded with mudstone bands.
408.80	410.1 0	1.30	0.70	Reddish brown medium grained moderately sorted, argillaceous sandstone, also consist clay clast.
410.10	412.0 0	1.90	0.40	Coarse to very coarse grained, ill sorted sandstone.
412.00	414.7 0	2.70	1.75	Reddish brown claystone with few siltstone interbands.
414.70	416.5 0	1.80	0.80	Reddish brown to dirty white very fine to fine grained sandstone with few clay bands.
416.50	417.0 5	0.55	0.55	Dark brown claystone.
417.05	417.3 5	0.30	0.30	Reddish brown fine to medium grained sandstone friable towards bottom.
417.35	418.1 0	0.75	0.75	Khaki medium to coarse grained moderately sorted sandstone with thin gritty band at top.
418.10	425.8 0	5.25	5.25	Reddish brown claystone with thin band of siltstone at places.
425.80	427.2 0	1.40	0.40	Dirty white medium to coarse grained ill sorted sandstone with clay gals at places.
427.20	439.3 5	12.15	11.95	Reddish brown claystone with thin bands of dirty white medium grained sandstone at places.
439.35	447.5 5	8.20	5.85	Reddish brown claystone silty at places.
447.55	451.5	4.00	1.25	Reddish brown siltstone.

1	2	3	4	5
	5			
451.55	455.5 5	4.00	3.70	Reddish brown very fine grained sandstone.
455.55	459.5 5	4.00	3.85	Reddish brown fine to medium grained sandstone.
459.55	460.5 5	1.00	0.30	Dirty white very coarse grained to gritty sandstone.
460.55	467.3 5	6.80	3.15	Reddish brown siltstone with claystone at places having pedogenic silken planes.
467.35	468.3 5	1.00	0.30	Dirty white very coarse to gritty, ill sorted sandstone.
468.35	479.3 5	11.00	5.70	Brown siltstone with thin interbands of claystone.
479.35	492.8 5	13.50	9.30	Reddish brown claystone with few thin siltstone bands.
492.85	493.2 5	0.40	0.15	Dirty white very fine grained sandstone.
493.25	493.9 5	0.70	0.45	Reddish brown claystone.
493.95	494.9 0	0.95	0.50	Grey to brown medium grained sandstone with clay bands.
494.90	495.2 5	0.35	0.25	Reddish brown to grey medium to coarse grained, ill sorted sandstone, intermixed with reddish brown claystone.
495.25	499.0 0	3.75	3.75	Reddish brown claystone, interbanded with thin bands of fine grained sandstone and siltstone at places.
499.00	503.8 0	4.80	4.80	Chocolate brown claystone with Ferricrits, consist thin lenticular bands of light green claystone and siltstone.
503.80	504.9 0	1.10	1.10	Green claystone with few irregular lenses of brown claystone.
504.90	508.5 0	3.60	3.60	Brown claystone interbanded with light green micaceous claystone.
508.50	516.8 0	8.30	8.10	Brown claystone with few lenses of green claystone.
516.80	517.4 5	0.65	0.50	Dirty white siltstone consist one sub vertical fracture filled with calcareous concretions.
517.45	523.0 0	5.55	5.23	Brown claystone having lenses of white claystone with diffused margin.
523.00	532.0 0	9.00	7.95	Brown claystone with light green siltstone intercalation.
532.00	533.3 5	1.35	1.00	Brown fine grained argillaceous sandstone.

1	2	3	4	5
533.35	537.0 0	3.65	3.65	Brown claystone with thin bands of green claystone, also consist Ferricrits and calcrits.
537.00	548.0 0	11.00	0.00	Brown siltstone and claystone.
548.00	563.0 0	15.00	0.00	Brown claystone and siltstone.
563.00	568.3 0	5.30	3.15	Greenish grey claystone consist one 10cm thick band of coarse grained ill sorted sandstone and thin carbonaceous shale laminae.
568.30	572.3 0	4.00	0.30	Brown claystone.
572.30	573.3 0	1.00	0.10	Green claystone.
<i>Contact between Motur / Barakar Formation.</i>				
573.30	573.5 0	0.20	0.10	White coarse to gritty, ill sorted felspathic sandstone.
573.50	574.3 0	0.80	0.10	Greyish white, medium grained, moderately sorted, compact and hard sandstone.
574.30	574.7 5	0.45	0.45	Light grey, medium to coarse grained, ill sorted, felspathic, highly compact and hard sandstone.
574.75	582.9 5	6.00	0.90	White, coarse grained, ill sorted, felspathic, friable, porous sandstone.
582.95	583.8 5	0.90	0.15	White, very coarse grained, ill sorted felspathic, friable, porous sandstone.
583.85	586.0 0	2.15	0.00	Core not recovered sludge of white very coarse grained friable sandstone.
586.00	587.3 0	1.30	0.00	Core not recovered sludge of white coarse grained, friable sandstone.

Borehole WJ-1 abandoned at 587.30m with Barakar Formation on 09.07.2013.

Logged by- Shri R. Khangar,
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Shri L. Khasdeo,
(Senior Geologist)

Borehole No. WJ-2

Location		Date of Commencement	: 18.06.2012
Latitude	: 19° 57' 11" N	Date of Closing	: 04.01.2013
Longitude	: 78° 47' 11.4" E	Drill Unit	: 486
Toposheet No.	: 56I/13		
R. L.	: 268.46m		
Final Depth	: 228.00m		

From (m)	To (m)	Thicknes s (m)	Recover y (m)	Lithology
1	2	3	4	5
0.00	3.25	3.25	3.25	Brown weathered basalt.
3.25	6.25	3.00	2.20	Steel grey coarse highly porphyritic compact
6.25	9.25	3.00	0.20	Brick red claystone (Red bole) Intertrappean
9.25	12.25	3.00	1.00	Brown highly weathered basalt consist few cavities filled with secondary silica.
12.25	16.25	4.00	0.65	Black fine sparsely porphyritic, mostly non vesicular basalt, a few amygdales in top part.
16.25	17.75	1.50	1.50	Steel grey coarse moderately porphyritic basalt with few fractures.
17.75	21.75	4.00	1.85	Black fine sparsely porphyritic, mostly non vesicular basalt, a few amygdales in top part.
21.75	30.00	9.25	7.32	Black fine sparsely porphyritic, mostly non vesicular basalt.
Contact between Deccan Trap and Motur Formation				
30.00	31.00	1.00	0.20	Dirty white fine grained highly friable sandstone.
31.00	37.00	6.00	0.20	Dirty white medium to coarse grained highly friable sandstone.

1	2	3	4	5
37.00	42.0 0	5.00	0.20	Sludge of dirty white medium grained, ill sorted highly friable sandstone.
42.00	43.0 0	1.00	0.20	Brown, coarse grained highly friable, argillaceous sandstone.
43.00	43.7 0	0.70	0.45	Light red to pink claystone and siltstone with calcareous nodules.
43.70	44.0 0	0.30	0.10	Light brown, medium grained, highly friable argillaceous sandstone.
44.00	50.00	6.00	0.25	Light brown, fine grained, highly friable argillaceous sandstone.
50.00	51.00	1.00	0.20	Reddish brown claystone.
51.00	52.00	1.00	0.20	Brown, fine to medium grained, highly friable argillaceous sandstone.
52.00	53.00	1.00	0.20	Brown, fine grained, immature, ill sorted, highly friable argillaceous sandstone.
53.00	58.20	5.20	0.20	Brown, fine to medium grained, immature, highly friable argillaceous sandstone.
58.20	64.20	6.00	0.20	Brown, medium grained immature, highly friable argillaceous sandstone.
64.20	65.30	1.10	0.10	Brown and grey variegated claystone.
65.30	66.53	1.13	0.13	Brown, medium grained friable sandstone.
66.53	67.38	0.85	0.85	Variegated claystone.
67.38	68.50	1.12	0.20	Brown, fine grained highly friable, argillaceous sandstone.
68.50	69.68	1.18	0.18	Brown, coarse grained, ill sorted, sandstone consist clast of cherts, mostly elliptical, randomly oriented, size varies from 2mm to 4cm.
69.68	70.50	0.82	0.47	Grey and reddish brown claystone with silken planes.
70.50	76.50	6.00	0.20	Brown, medium grained immature, highly friable
76.50	82.50	6.00	0.20	Brown, coarse grained, ill sorted, argillaceous sandstone
82.50	88.70	6.20	0.85	Brown, yellow, variegated claystone with sandy intercalations towards bottom.
88.70	92.00	3.30	2.90	Intercalated and interlaminated sequence of very fine grained sandstone with claystone thin parallel laminae is also present occasionally throughout the unit, core dip 5 ⁰ -6 ⁰

1	2	3	4	5
92.00	101.0 0	9.00	0.30	Brown, fine grained, highly friable, argillaceous sandstone
101.00	103.0 0	2.00	0.15	Brown, very fine grained argillaceous
103.00	105.0 0	2.00	0.15	Brown, medium grained argillaceous sandstone.
105.00	110.0 0	5.00	0.15	Brown, coarse grained argillaceous sandstone.
110.00	112.5 0	2.50	1.90	Reddish brown claystone interbanded with light green siltstone and siltstone, lenticular lamination.
112.50	117.0 5	4.55	3.05	Reddish brown siltstone interlaminated with mudstone and light green siltstone.
117.05	117.5 0	0.45	0.45	Reddish, khaki and grey, very fine grained sandstone.
117.50	119.2 0	1.70	0.70	Light grey fine grained sandstone intermixed with claystone.
119.20	119.7 0	0.50	0.15	Dirty white coarse grained, moderately sorted sandstone.
119.70	131.3 0	11.60	4.35	Brick red claystone with silty claystone interbands, also consist few thin irregular laminae of white claystone.
131.30	137.3 0	6.00	0.20	Red siltstone with clay interbands.
137.30	141.5 5	4.25	0.10	Red siltstone.
141.55	147.5 5	6.00	0.20	Red very fine grained sandstone.
147.55	150.6 0	3.05	0.10	Red fine grained sandstone.
150.60	156.6 0	6.00	1.65	Brick red claystone.
156.60	160.0 0	3.40	0.10	red fine grained sandstone.
160.00	166.0 0	6.00	0.10	Reddish medium grained sandstone.
166.00	172.0 0	6.00	1.40	Brick red claystone.
172.00	176.0 0	4.00	0.25	Red fine to medium grained sandstone.
176.00	182.0 0	6.00	0.10	Red fine grained sandstone.
182.00	187.0 0	5.00	0.10	Sludge of reddish medium grained, ill sorted sandstone.
187.00	193.2 0	6.20	0.10	Red fine grained, sub-mature, argillaceous sandstone with clay interbands.
193.20	195.5 0	2.30	0.10	Brick red claystone.
195.50	200.0	4.50	0.10	Brick red siltstone and claystone.

1	2	3	4	5
200.00	203.0	3.00	0.15	Brick red claystone.
203.00	206.8	3.80	0.30	Brick red siltstone.
206.80	214.0 0	7.20	0.10	Red fine to medium grained sandstone.
214.00	218.0 0	4.00	0.12	Red fine grained, sub-mature, argillaceous sandstone with clay interbands.
218.00	225.0 0	7.00	0.15	Red medium grained, ill sorted sandstone.
225.00	228.0 0	3.00	0.16	Red fine to medium grained, sub-mature, argillaceous sandstone with clay interbands.

Borehole WJ-2 abandoned at 228m with Motur Formation on 04.01.2013.

Logged by- Shri R. Khangar,
(Senior Geologist)
Shri L. Khasdeo,
(Senior Geologist)

Borehole No. WJ-3

Location		Date of Commencement	: 14.02.2013
Latitude	: 19° 54' 50" N	Date of Closing	: 15.10.2013
Longitude	: 78° 46' 20" E	Drill Unit	: 486
Toposheet No.	: 56I/13		
R. L.	: 290.99m		
Final Depth	: 235.00m		

From (m)	To (m)	Thicknes s (m)	Recover y (m)	Lithology
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1	2	3	4	5
0.00	4.05	4.05	1.35	Brown weathered jointed basalt.
4.05	8.00	3.95	2.85	Steel grey, sparsely porphyritic, vesicular basalt.
8.00	8.20	0.20	0.20	Light green and brown, highly vesicular and jointed basalt.
8.20	9.00	0.80	0.20	Light green and reddish brown claystone.
9.00	11.3 0	2.30	1.70	Light grey, highly vesicular, fractured basalt.
11.30	24.8 5	13.55	13.55	Dark grey, moderately porphyritic, highly vesicular basalt.

1	2	3	4	5
24.85	29.7 0	4.85	4.50	Dark grey sparsely, porphyritic, fractured basalt.
29.70	37.8 0	8.10	8.10	Steel grey, highly vesicular basalt also consist few vugs partly filled with quartz.
37.80	47.2 0	9.40	8.70	Steel grey, porphyritic basalt with mega-crystal of plagioclase feldspar.
47.20	48.5 0	1.30	0.50	Light green claystone.
48.50	48.9 5	0.45	0.45	Dark grey, porphyritic basalt.
48.95	51.1 0	2.15	1.15	Light green, claystone with calcite consist reddish claystone at bottom part.
51.10	61.6 0	10.50	10.50	Dark grey, porphyritic basalt with a few mega-crystal of plagioclase 2 to 4cm long and oriented sub-horizontally.
61.10	68.6 0	7.50	7.50	Dark grey, fine grained, hard and compact basalt with few laths of plagioclase.
68.60	77.40	8.80	8.80	Dark grey, fine sparsely porphyritic, highly fractured basalt consist sub-vertical fractures.
77.40	80.70	3.30	2.10	Light green claystone box work of silicate veins in top part.
80.70	81.30	0.60	0.30	Dark grey sparsely porphyritic basalt consists few vug filled with quartz.
81.30	85.90	4.60	1.60	White to light green claystone consist few clay gals and quartz pebbles in middle part.
85.90	88.00	2.10	2.00	Dark grey, highly vesicular, fractured basalt consist few vugs filled with quartz.
<i>Contact between Deccan Trap and Motur Formation.</i>				
88.00	93.05	5.05	0.45	Dark grey, very fine to fine grained, loose sand with clay pockets
93.05	94.60	1.55	0.25	Dark grey to off-white, very fine grained loose sand with clay pockets
94.60	96.25	1.65	0.35	Reddish brown, fine to medium grained, moderately sorted, cross bedded sandstone.
96.35	97.45	1.10	0.20	Reddish brown, mudstone with few thin layers of off-white fine grained sandstone.
97.45	98.65	1.20	0.20	Dirty white to light brown, fine to medium grained, moderately sorted, cross bedded
98.65	101.4 0	2.75	0.45	Reddish brown, siltstone with few mudstone and claystone layers.

1	2	3	4	5
101.40	104.0 5	2.65	0.75	Off white, fine to medium grained, moderately sorted sandstone.
104.05	104.5 5	0.50	0.25	Reddish brown, medium to coarse grained, illsorted sandstone with clay clasts and plain lamination in lower part.
104.55	105.1 0	0.55	0.30	Reddish brown claystone with sand packets at
105.10	105.9 0	0.80	0.30	Light brown, medium grained, moderately sorted sandstone. Consist of fractures filled with brown clay stone.
105.90	114.9 0	9.00	0.95	Reddish brown, fine to medium grained, moderately sorted sandstone crude lamination of
114.90	117.4 5	2.55	2.30	Reddish brown, medium grained, moderately sorted sandstone
117.45	119.0 5	1.60	1.60	Dirty white, medium to coarse grained, moderately sorted sandstone consist few laminae of red claystone and few intra-clast of claystone.
119.05	120.2 0	1.15	0.50	Brick red claystone with irregular lenses of white medium grained sandstone. Sharp lower contact.
120.20	122.6 0	2.40	1.25	White, medium grained, moderately sorted mature sandstone having rounded to sub-rounded quartz graineds; also consists few intra-clasts of yellow claystone and crude cross lamination.
122.60	125.6 0	3.00	3.00	White, fine to medium grained, well sorted, mature sandstone.
125.60	131.6 0	6.00	0.50	Sludge of dirty white, fine grained, loosely compacted sandstone.
131.60	134.2 0	2.60	0.45	White, fine to medium grained, moderately sorted, sandstone consists few lenses of brown
134.20	137.6 0	3.40	0.40	White, fine grained, ferruginous sandstone consist few irregular layer of white sandstone.
137.60	140.7 0	3.10	1.10	Dirty white, medium to coarse grained moderately sorted sandstone consist few laminae of red claystone and few intra-clast of claystone.
140.70	143.8 8	3.18	0.83	White, fine grained moderately sorted, sandstone consist crude cross laminae of brown claystone. Erosional lower surface.
143.88	146.4 0	2.52	2.52	Brick red claystone with Ferricrits and slicken

1	2	3	4	5
146.40	148.0 5	1.65	0.40	Dirty white, fine grained moderately sorted sandstone consist few laminae of brick red claystone and few sub-angular quartz pebbles at
148.05	149.6 0	1.55	1.05	Brick red claystone with few lenticular layers of white fine grained sandstone.
149.60	157.3 0	7.70	4.20	Light brown, medium grained, moderately sorted sandstone interbanded with brown fine grained ferruginuos sandstone.
157.30	167.6 0	10.30	1.90	Dirty white, coarse grained, well sorted mature sandstone consists intraclast of khaki claystone and sandstone, consists crude cross lamination, also consists sub-rounded pebbles of quartz and quartzite at base.
167.60	173.6 0	6.00	0.55	White, fine to medium grained, highly friable sandstone.
173.60	179.6	6.00	0.95	White, fine grained, highly friable sandstone.
179.60	185.6 0	6.00	0.90	White, medium to coarse grained, highly friable sandstone.
185.60	189.7 0	4.10	1.10	Dirty white, coarse grained, highly friable sandstone.
189.70	191.7 0	2.00	0.80	White, coarse grained, felspathic sandstone interbanded with brown medium grained
191.70	197.7 0	6.00	1.00	Dirty white, fine grained, highly friable sandstone.
197.70	198.7 0	1.00	0.60	White, medium grained, ferruginous sandstone.
198.70	199.1 0	0.40	0.12	Brick red, fine grained, ferruginous sandstone.
199.10	200.1 0	1.00	0.80	Brick red, claystone.
200.10	200.8 0	0.70	0.30	Reddish brown, medium grained moderately sorted, ferruginous sandstone.
200.80	202.1 5	1.35	0.97	Brown to brick red, claystone with few interbands of red fine grained sandstone.
202.15	203.1 5	1.00	0.60	White, very fine to fine grained sandstone with interbands of light red argillaceous sandstone.
203.15	205.3 0	2.15	1.25	Brick red shale interlaminated with plane laminae of off-white shale.
205.30	208.9 0	3.60	1.55	Light grey claystone with thin interbands of red claystone.
208.90	215.8	6.90	0.75	Sludge of light green claystone with ferruginous

1	2	3	4	5
	0			concretions.
215.80	217.2 0	1.40	0.40	Light green claystone consists, patches of reddish brown claystone.
217.20	218.4 0	1.20	0.50	Light grey highly compact mudstone.
218.40	219.8 0	1.40	0.70	Grey claystone with pedogenic slicken sides.
219.80	223.8 0	4.00	0.60	Light grey very fine grained sandstone.
223.80	224.7 0	0.90	0.90	Light grey and brown claystone.
224.70	226.0 0	1.30	1.30	Light grey siltstone with few claystone bands, highly crushed core.
226.00	228.2 0	2.20	2.20	Light grey claystone with few influxes of light brown claystone consist pedogenic silken planes.
228.20	231.5 0	3.30	1.45	Light grey to variegated claystone lower part is highly crushed.
231.50	235.0 0	3.50	0.00	Light grey to variegated claystone.

Borehole WJ-3 abandoned at 235m with Motur Formation on 15.10.2013

Logged by- Shri L. Khasdeo,
(Senior Geologist)
Shri K. Rajbanshi,
(Geologist)

Borehole No. WJ-3A

Location	Date of Commencement	: 21.04.2014
Latitude : 19° 54' 50" N	Date of Closing	: 17.06.2014
Longitude : 78° 46' 35" E	Drill Unit	: Outsourced

drilled unit

Toposheet No. : 56I/13
R. L. : 292.06m
Final Depth : 546.50m

From	To	Thickness	Recovery	Description
1	2	3	4	5
0.00	4.20	4.20	4.05	Grey, weathered, medium grained Deccan basalt.
4.20	7.51	3.31	3.26	Dark grey, hard and compact Deccan basalt.
7.51	9.27	1.76	1.76	Greenish grey, vesicular basalt, vugs are filled up with secondary materials.
9.27	9.50	0.23	0.23	Red claystone, broken (Bole)
9.50	12.50	3.00	2.60	Greenish grey, vesicular Deccan basalt, at the bottom part the basalt is amygdular.
12.50	48.65	36.15	35.73	Dark grey, hard and compact vesicular Deccan basalt, vugs are filled up with secondary materials, large plagioclase laths present and vertical fracture observed at places.
48.65	77.00	28.35	28.01	Dark grey to metallic grey, hard and compact fine grained, vesicular Deccan basalt with fracture. The vugs are filled up with secondary materials. Large plagioclase laths present. At the bottom part vesicles are less in number.
77.00	77.70	0.70	0.60	Brownish to grey claystone with veins filled by secondary materials. (Bole)
77.77	82.70	5.00	4.90	Dark grey to grey, hard and compact, vesicular, moderately porphyritic Deccan basalt with joint and fracture which filled up with secondary materials(at places it is calcite)
82.70	85.60	2.90	2.90	Dark grey to metallic grey, moderately porphyritic, hard and compact vesicular Deccan basalt.
85.60	92.25	6.65	6.65	Dark grey, vesicular, hard and compact, moderately to sparsely porphyritic, fractured Deccan basalt.
92.25	93.30	1.05	1.05	Reddish brown to grey claystone. (Bole)
93.30	95.20	1.90	1.90	Dark grey, vesicular Deccan Trap and vesicles are reducing in size at the bottom part.
95.20	97.50	2.30	2.30	Dark grey to metallic grey, hard and compact, large vesicles are partially filled up with secondary materials.
97.50	110.62	13.12	13.08	Dark grey, hard and compact, sparsely to moderately porphyritic, fractured Deccan basalt and at the lower part few vesicles

From	To	Thickness	Recovery	Description
1	2	3	4	5
				observed.
<i>Contact between Deccan Trap and Motur Formation</i>				
110.62	111.50	0.88	0.88	Reddish brown to grey claystone intermix with sand. one sub-vertical fracture at bottom part filled up with quartz.
111.50	112.95	1.45	1.45	Grey claystone with sand intermix. Small lenses of fine grained sandstone are also present.
112.95	113.90	0.95	0.60	Grey, fine to medium grained sandstone intermix with clay.
113.90	115.10	1.20	0.75	Grey, coarse to very coarse sandstone intermix with clay.
115.10	118.85	3.75	2.90	Dirty white to reddish white claystone intermixed medium to coarse grained sandstone.
118.85	120.50	1.65	1.55	Variegated claystone intermix with very fine to fine grained sandstone.
120.50	121.15	0.65	0.60	Dirty white, very fine to fine grained sandstone with sand and clay intermix.
121.15	121.75	0.60	0.60	Variegated claystone.
121.75	122.50	0.75	0.65	Reddish brown, coarse to very coarse grained sandstone.
122.50	123.95	1.45	1.25	Reddish brown pebbly bed and matrix is coarse grained sandstone.
123.95	124.45	0.50	0.50	Reddish brown, coarse to very coarse grained sandstone intermix with clay.
124.45	125.25	0.80	0.60	Dirty white, medium to coarse grained sandstone with pebbles at bottom.
125.25	126.50	1.25	0.75	Reddish brown, fine to medium grained sandstone with pebble, at the bottom part loose sand present.
126.50	137.65	11.15	6.30	Reddish brown, medium to coarse grained loose sandstone intermix with quartz pebbles.
137.65	138.65	1.00	1.00	Dark reddish claystone.
138.65	139.00	0.35	0.35	Dirty white to reddish brown, very fine to fine grained sandstone interbanded with claystone.
139.00	139.60	0.60	0.60	Dirty white to reddish brown, medium to coarse grained sandstone with weathered feldspar.
139.60	140.90	1.30	0.90	Reddish brown, very fine to fine grained friable sandstone.
140.90	143.00	2.10	1.50	Dirty white to light brown, coarse grained sandstone with clay matrix. Thin claystone band at places.
143.00	145.40	2.40	2.40	Dark reddish brown claystone.

From	To	Thickness	Recovery	Description
1	2	3	4	5
145.40	147.50	2.10	1.80	Reddish brown, fine to medium grained sandstone interbanded with claystone towards top and coarse grained sandstone bed present at the bottom part.
147.50	148.70	1.20	0.70	Reddish brown, fine to medium grained sandstone, towards bottom part core is friable and it become very fine grained sandstone with weathered feldspar.
148.70	150.85	2.15	1.80	Reddish brown, medium to coarse grained interbanded sequence of sandstone, clay bands observed at the bottom part.
150.85	151.20	0.35	0.35	Reddish brown (brick red) claystone.
151.20	153.50	2.30	1.90	Dirty white to light reddish brown, fine to medium grained sandstone, towards bottom core is friable and broken.
153.50	158.00	4.50	3.75	Reddish brown, fine to medium grained sandstone, core is broken, patches of dirty white medium grained sandstone present at the bottom part.
158.00	161.75	3.75	3.25	Light brown, medium grained loose sand.
161.75	163.50	1.75	1.35	Light brown, very fine to fine grained sandstone.
163.50	164.40	0.90	0.75	Light brown, medium grained moderately sorted, sandstone. (core is fractured.)
164.40	166.25	1.85	1.85	Reddish brown, medium grained, moderately sorted sandstone, inter-banded with claystone. (core fractured)
166.25	166.50	0.25	0.25	Reddish brown claystone.
166.50	168.85	2.35	2.15	Reddish brown, medium grained, moderately sorted sandstone. Inter-bands of Claystone present towards top and friable sandstone towards bottom.
168.85	171.00	2.15	2.15	Reddish brown, medium to coarse grained, moderately sorted sandstone. Cross bedding and cross lamination observed.
171.00	174.50	3.50	3.35	Reddish brown, fine to medium grained sandstone with a thin band of coarse to very coarse grained sandstone towards bottom part.
174.50	178.05	3.55	3.45	Reddish brown to dark brown, very fine to fine grained sandstone, inter-banded with claystone. At places intermixing of sand and clay also observed.
178.05	178.45	0.40	0.40	Reddish brown claystone.
178.45	181.10	2.65	2.45	Reddish brown, fine to medium grained sandstone. Core is friable towards bottom part.

From	To	Thickness	Recovery	Description
1	2	3	4	5
181.10	183.50	2.40	2.10	Light reddish brown, very fine to fine grained, friable sandstone.
183.50	186.50	3.00	2.80	Reddish, fine grained loose sandstone.
186.50	188.00	1.50	1.00	Reddish, fine grained sandstone, broken, at places large silica clast present.
188.00	189.20	1.20	0.70	Brown, medium grained sandstone.
189.20	192.50	3.30	1.70	Reddish medium grained sandstone.
192.50	194.20	1.70	1.50	Dirty white, medium to coarse grained sandstone.
194.20	194.30	0.10	0.10	Red clay, broken.
194.30	194.60	0.30	0.30	White, medium grained sandstone, at places red clay patches present.
194.60	195.89	1.29	0.85	Red clay, broken, Slicken sides present.
195.89	199.05	3.16	2.76	White, medium to coarse grained sandstone.
199.05	200.40	1.35	0.75	Grey, fine grained sandstone, loose.
200.40	201.00	0.60	0.15	Red, fine grained sandstone, silica clast present.
201.00	201.50	0.50	0.50	Brown, medium grained sandstone.
201.50	207.80	6.30	3.25	Pink, fine to medium grained sandstone.
207.80	209.25	1.45	1.30	Grey, medium grained sandstone, silica clast present at places.
209.25	210.80	1.55	1.34	White, coarse to very coarse grained sandstone, silica clast present at places.
210.80	212.05	1.25	0.90	White, coarse grained, cross bedded sandstone.
212.05	216.50	4.45	3.53	Sludge of grey fine grained sandstone.
216.50	228.50	12.00	8.35	White, coarse to very coarse grained sandstone, cross bedding present at places.
228.50	229.07	0.57	0.57	White, medium grained sandstone.
229.07	229.87	0.80	0.80	White fine grained sandstone.
229.87	231.50	1.63	1.47	Brown fine grained sandstone.
231.50	233.40	1.90	1.90	White, medium to coarse grained sandstone, quartz clast present at bottom.
233.40	237.50	4.10	3.75	Brown fine grained sandstone.
237.50	237.92	0.42	0.42	White, coarse grained, poorly sorted sandstone.
237.92	240.50	2.58	2.35	Brown fine grained sandstone.
240.50	241.25	0.75	0.75	White, coarse grained sandstone.
241.25	243.50	2.25	2.10	Brown fine grained sandstone.
243.50	243.98	0.48	0.42	White, coarse grained sandstone.
243.98	244.34	0.36	0.26	Brown fine grained sandstone.
244.34	245.34	1.00	0.90	White coarse grained sandstone.
245.34	245.94	0.60	0.60	White, medium to coarse grained sandstone.
245.94	250.40	4.46	4.26	Brown fine grained sandstone.
250.40	253.75	3.35	3.20	Pink, medium to coarse grained sandstone.
253.75	255.90	2.15	1.85	Yellowish, coarse grained sandstone.
255.90	258.10	2.20	2.20	Reddish, fine to medium grained sandstone.

From	To	Thickness	Recovery	Description
1	2	3	4	5
258.10	258.50	0.40	0.40	Red claystone, slicken plane present.
258.50	261.50	3.00	2.85	Red claystone, at places fine grained sandstone patches present.
261.50	263.30	1.80	1.80	Reddish to grey claystone, siltstone intercalation present.
263.30	270.50	7.20	7.10	Grey claystone, slicken plane present, core broken at places.
270.50	271.20	0.70	0.70	Reddish brown, fine grained sandstone and intermix with micaceous clay at places.
271.20	271.50	0.30	0.30	Grey, fine grained sandstone and siltstone alteration.
271.50	275.60	4.10	4.10	Grey, claystone, (core broken).
275.60	275.90	0.30	0.30	Dark, grey fine grained sandstone and siltstone alteration.
275.90	277.20	1.30	1.05	Reddish brown, fine grained sandstone.
277.20	277.70	0.50	0.30	Grey, fine grained sandstone and siltstone alteration.
277.70	280.90	3.20	2.50	Grey claystone, micaceous siltstone patches at places.
280.90	281.70	0.80	0.30	Dark grey, micaceous siltstone.
281.70	282.50	0.80	0.60	Reddish brown claystone.
282.50	286.70	4.20	4.07	Grey claystone, (core broken).
286.70	288.90	2.20	2.10	Grey, fine grained sandstone and siltstone alteration, cross bedding observed.
288.90	291.90	3.00	2.95	Grey claystone. (core broken)
291.90	293.00	1.10	1.10	Grey, very fine to fine grained sandstone.
293.00	294.50	1.50	1.50	Grey claystone. (core broken)
294.50	296.50	2.00	2.00	Grey siltstone, micaceous at places.
296.50	297.50	1.00	1.00	Grey claystone, slicken sides present.
297.50	299.53	2.03	2.00	Grey to brown claystone, broken core.
299.53	299.73	0.20	0.20	Grey claystone, slicken sides observed.
299.73	301.30	1.57	1.57	White, medium grained sandstone.
301.30	303.50	2.20	2.20	Grey claystone, slicken sides present.
303.50	306.38	2.88	2.85	Brown claystone, siltstone patches present at places.
306.38	306.50	0.12	0.12	Grey claystone.
306.50	310.18	3.68	3.62	Grey to brown claystone.
310.18	311.50	1.32	1.32	Grey siltstone, micaceous, thinly laminated,
311.50	312.50	1.00	1.00	Grey claystone, broken core.
312.50	315.70	3.20	3.15	Grey to brown claystone, broken core.
315.70	321.35	5.65	5.65	Brown to grey siltstone and intermixing of brown clay.
321.35	321.50	0.15	0.15	White, medium grained, moderately sorted sandstone.
321.50	321.65	0.15	0.15	Grey claystone, slicken plane observed.
321.65	322.45	0.80	0.75	White, medium to coarse grained sandstone.
322.45	329.10	6.65	6.60	Grey, claystone, slicken plane observed,

From	To	Thickness	Recovery	Description
1	2	3	4	5
				broken core at places.
329.10	329.20	0.10	0.10	White, medium grained, hard and compact sandstone, large quartz clast present.
329.20	331.90	2.70	2.70	Grey claystone, broken core at places.
331.90	332.00	0.10	0.10	White, very fine grained sandstone and brown claystone intercalation.
332.00	333.50	1.50	1.50	Grey claystone, slicken sides observed and broken core at places.
333.50	339.50	6.00	5.92	Brown claystone, slicken sides present.
339.50	345.50	6.00	6.00	Grey claystone with micaceous siltstone patches at places. (core broken)
345.50	345.95	0.45	0.40	Dark grey, fine grained sandstone and siltstone alteration, cross bedding observed.
345.95	347.15	1.20	1.20	Reddish brown claystone, (core broken).
347.15	354.50	7.35	7.30	Grey claystone with micaceous siltstone patches at places. (core broken)
354.50	354.80	0.30	0.30	Dirty white, fine grained sandstone, intermixed with shale band and medium grained sandstone.
354.80	355.00	0.20	0.20	Reddish brown, fine grained sandstone intermixed with micaceous siltstone.
355.00	363.62	8.62	8.52	Dark brown claystone, (core broken).
363.62	363.69	0.07	0.07	Brown, coarse grained hard and compact sandstone.
363.69	364.64	0.95	0.85	Brown claystone, broken core.
364.64	364.74	0.10	0.10	Grey coarse grained sandstone.
364.74	366.22	1.48	1.45	Brown claystone, broken core.
366.22	366.50	0.28	0.28	Brownish, very fine to fine grained sandstone.
366.50	367.20	0.70	0.70	Dirty white, medium grained sandstone.
367.20	367.76	0.56	0.56	White, coarse grained sandstone and brown clay intermix.
367.76	368.60	0.84	0.84	White medium grained sandstone.
368.60	368.90	0.30	0.30	Brown claystone, slicken sides observed.
368.90	369.30	0.40	0.40	Brown claystone and white fine grained sandstone intermix.
369.30	370.80	1.50	1.45	Brown claystone, slicken sides observed.
370.80	371.05	0.25	0.25	Grey, very fine grained sandstone, one brown coarse grained layer is observed at bottom.
371.05	371.85	0.80	0.75	White medium grained sandstone.
371.85	378.50	6.65	6.65	Brown claystone, broken core.
378.50	378.90	0.40	0.40	Dirty white to light brown, fine grained sandstone with bands of siltstone.
378.90	379.80	0.80	0.80	Reddish brown, fine grained sandstone, clay patches present at places.
379.80	387.50	7.70	7.70	Brown claystone, slicken sides present,

From	To	Thickness	Recovery	Description
1	2	3	4	5
				broken core at places.
387.50	387.80	0.30	0.30	Dirty white, coarse grained, moderately sorted sandstone.
387.80	388.50	0.70	0.60	Reddish brown, fine grained sandstone, intermixed with micaceous siltstone.
388.50	399.50	11.00	11.00	Grey claystone, slicken sides present.
399.50	400.10	0.60	0.20	Dirty white, medium grained, moderately sorted sandstone.
400.10	400.80	0.80	0.70	Reddish brown, fine grained sandstone, intercalated with micaceous sandstone.
400.80	402.50	1.70	1.60	Black shale, with one high angle fracture.
402.50	404.60	2.10	2.10	Khaki to brown claystone.
404.60	404.90	0.30	0.30	Dirty white, coarse grained, poorly sorted sandstone.
404.90	411.50	6.60	6.60	Grey claystone, slicken plane present.
411.50	411.90	0.40	0.30	Dirty white, coarse grained, moderately sorted, sandstone, loose, quartz clast observed.
411.90	413.60	1.70	1.70	Dark grey, fine to medium grained sandstone, siltstone intercalation present.
413.60	421.40	7.80	7.80	Grey claystone, slicken plane present.
421.40	421.60	0.20	0.20	Brown, coarse grained sandstone, intermixed with clay at places.
421.60	425.03	3.43	3.40	Brown claystone, broken core.
425.03	425.20	0.17	0.12	Brown, coarse grained sandstone, clay intermixed at places.
425.20	429.50	4.30	4.25	Brown claystone, grey claystone patches at places.
429.50	433.76	4.26	4.26	Reddish brown claystone, inter banded with sandstone and siltstone.
433.76	434.28	0.52	0.52	Dirty white to greenish grey, medium to coarse grained sandstone with clay band.
434.28	436.08	0.80	0.80	Reddish brown claystone.
436.08	435.43	0.35	0.35	Dirty white, medium to coarse grained sandstone.
435.43	435.50	0.07	0.07	Reddish brown claystone.
435.50	449.50	14.00	13.65	Reddish brown, claystone with pedogenic fractures at bottom and intermixed with sandstone and siltstone at places.
449.50	450.30	0.80	0.80	Reddish brown claystone highly intermixed with micaceous sandstone.
450.30	450.60	0.30	0.30	Reddish brown, fine grained sandstone intermixed with mica.
450.60	452.10	1.50	1.50	Dirty white, coarse to very coarse grained sandstone with feldspar. Gritty band observed towards bottom.
452.10	452.40	0.30	0.30	Dirty white to light brown, fine grained

From	To	Thickness	Recovery	Description
1	2	3	4	5
				sandstone with bands of dirty white siltstone.
452.40	453.10	0.70	0.70	Dirty white, coarse grained sandstone.
453.10	453.60	0.50	0.50	Reddish brown, fine grained sandstone intermixed with mica and clay at places.
453.60	454.65	1.05	1.05	Dirty white, medium to coarse grained, moderately to poorly sorted, sandstone with a few brown clay bands present at places.
454.65	455.65	1.00	1.00	Dirty white, coarse grained sandstone.
455.65	456.50	0.85	0.85	Dirty white to grey, fine to medium grained sandstone, moderately sorted with bands of coarse grained sandstone at places.
456.50	456.55	0.05	0.05	Khaki to brown claystone.
456.55	456.70	0.15	0.15	Grey, fine grained sandstone with micaceous clay bands at places.
456.70	458.70	2.00	1.80	Dirty white to grey, medium to coarse grained sandstone, moderately to poorly sorted, crud bedding observed at places.
458.70	459.15	0.45	0.45	Dirty white to grey, fine grained, micaceous sandstone.
459.15	459.65	0.50	0.50	Light grey, medium to coarse grained sandstone.
459.65	460.55	0.90	0.90	Reddish brown to variegated coloured claystone with pedogenic slicken sides.
460.55	461.60	1.05	1.05	Dirty white to light grey, coarse to medium grained sandstone.
461.60	462.30	0.70	0.70	Dirty white, fine to medium grained, moderately sorted sandstone.
462.30	462.50	0.20	0.20	Reddish brown to variegated coloured claystone, compact, pedogenic slicken plane present.
<i>Contact between Motur Formation and Barakar Formation</i>				
462.50	467.10	4.60	4.60	Dark grey to grey shale with fracture planes towards bottom with sandstone bands at places.
467.10	467.40	0.30	0.30	Dirty white to grey, very fine to fine grained sandstone with thin micaceous layer present at places
467.40	468.60	1.20	1.20	Dirty white, medium to coarse grained, poorly sorted sandstone.
468.60	468.77	0.17	0.17	Dark grey shale with very thin coal bands.
468.77	468.82	0.05	0.05	Coal band with shale layer (shaley coal)
468.82	468.90	0.80	0.80	Shale with very thin coal bands.
468.90	468.98	0.08	0.08	Coal band with very thin shale layer.
468.98	471.18	2.20	2.20	Dark grey to grey shale intermixed with sandstone and thin coal layer at places, faulted contact.

From	To	Thickness	Recovery	Description
1	2	3	4	5
471.18	471.50	0.32	0.32	Grey, fine grained sandstone.
471.50	471.95	0.45	0.45	Dirty white, fine grained sandstone intermixed with shale and medium grained sandstone.
471.95	472.65	0.70	0.70	Dark grey to grey shale with pedogenic slicken plane.
472.65	472.80	0.15	0.15	Grey, medium to coarse grained sandstone with a thin bed of fine grained sandstone.
472.80	474.50	1.70	1.70	Grey to dark grey shale, inter banded with thin layer of fine grained sandstone and pedogenic slicken plane observed.
474.50	474.85	0.35	0.35	Dark grey to grey shale with coal bands.
474.85	475.10	0.25	0.25	Coal with thin shale bands.
475.10	476.35	1.25	1.25	Dark grey micaceous shale.
476.35	476.80	0.45	0.45	Grey claystone.
476.80	478.07	1.27	1.22	Grey, very fine to fine grained sandstone, intermixed with clay. Lower part is mainly micaceous shale.
478.07	478.12	0.05	0.05	Dark grey shale.
478.12	478.42	0.30	0.30	Coal with bands of shaley coal at top.
478.42	479.27	0.85	0.85	Grey shale.
479.27	479.57	0.30	0.30	Dirty white, fine to medium grained sandstone with beds of shale.
479.57	480.75	1.18	1.18	Dirty white, medium to coarse grained sandstone, cross bedding present.
480.75	482.30	1.55	1.45	Dirty white, medium grained sandstone with thin beds of carb shale and coarse grained sandstone with coal streak.
482.30	482.80	0.50	0.50	Dirty white, coarse grained sandstone.
482.80	484.06	1.26	1.26	Dirty white, medium to coarse grained sandstone.
484.06	485.46	1.40	1.20	Grey to dirty white, coarse to very coarse grained sandstone with crude lamination.
485.46	486.26	0.80	0.80	Dirty white to grey, very fine to fine grained sandstone, inter banded with shale bands and medium grained sandstone.
486.26	486.70	0.44	0.44	Grey shale.
486.70	488.95	2.25	1.90	Grey, coarse to very coarse grained, poorly sorted sandstone.
488.95	489.80	0.85	0.85	Grey, coarse grained sandstone.
489.80	491.75	1.95	1.95	Grey, coarse grained to gritty sandstone.
491.75	493.15	1.40	1.40	Dirty white to grey coarse to very coarse grained sandstone.
493.15	494.05	0.90	0.90	Dirty white, coarse grained feldspathic , poorly sorted sandstone with calcareous materials.
494.05	497.30	3.25	3.25	Dirty white, coarse to very coarse grained,

From	To	Thickness	Recovery	Description
1	2	3	4	5
				feldspathic sandstone with carbonaceous shale streaks.
497.30	497.85	0.55	0.55	Dirty white to white, coarse grained, poorly sorted sandstone,.
497.85	498.70	0.85	0.85	Dirty white, coarse to very coarse grained sandstone, gritty bands at places.
498.70	499.25	0.55	0.55	Dirty white coarse grained feldspathic sandstone.
499.25	499.40	0.15	0.15	Dirty white, coarse to very coarse grained sandstone.
499.40	501.40	2.00	2.00	Dirty white, medium to coarse grained sandstone, weathered feldspar present. Cross lamination observed at places.
501.40	502.00	0.60	0.55	Dirty white, very coarse to gritty feldspathic sandstone.
502.00	502.70	0.70	0.70	Dirty white, medium to coarse grained feldspathic sandstone.
502.70	503.15	0.45	0.35	Dirty white, coarse to very coarse grained feldspathic sandstone.
503.15	503.50	0.35	0.35	Dirty white to grey, fine to medium grained feldspathic sandstone.
503.50	504.50	1.00	1.00	Dirty white, medium to coarse grained sandstone.
504.50	506.85	2.35	2.25	Dirty white, very coarse to gritty feldspathic sandstone, cross bedding observed at places.
506.85	507.25	0.40	0.40	Dirty white, medium to coarse grained sandstone with carbonaceous bands.
507.25	507.40	0.15	0.15	Dirty white, coarse to very coarse grained feldspathic sandstone.
507.40	507.50	0.10	0.10	Dirty white to grey, medium to coarse grained feldspathic sandstone with carbonaceous materials.
507.50	507.90	0.40	0.40	Dirty white to grey, medium to coarse grained feldspathic sandstone with carbonaceous materials.
507.90	508.85	0.95	0.95	Dirty white, very coarse to gritty feldspathic sandstone.
508.85	508.87	0.02	0.02	Coal.
508.87	511.15	2.28	2.28	Dirty white, medium to coarse grained, feldspathic sandstone with thin layer of carbonaceous materials.
511.15	513.35	2.20	2.20	Dirty white, coarse to very coarse feldspathic sandstone with thin layer of claystone.
513.35	515.25	1.90	1.90	Dirty white, medium to coarse grained sandstone with weathered feldspar present.
515.25	516.50	1.25	1.25	Dirty white, medium to coarse grained

From	To	Thickness	Recovery	Description
1	2	3	4	5
				sandstone.
516.50	517.10	0.60	0.60	Dirty white, medium to coarse grained, feldspathic sandstone.
517.10	517.60	0.50	0.50	Dirty white, very coarse to gritty sandstone.
517.60	518.70	1.10	1.10	Dirty white, coarse to very coarse grained sandstone.
518.70	519.50	0.80	0.80	Dirty white to grey, medium to coarse grained sandstone with carbonaceous bands at places, planer lamination observed.
519.50	519.85	0.35	0.35	Dirty white, fine to medium grained, massive, hard and compact, feldspathic sandstone.
519.85	520.31	0.46	0.43	Dirty white, coarse grained, feldspathic sandstone,
520.31	521.91	1.60	1.50	Dirty white, medium grained, moderately sorted sandstone with bands of coarse grained sandstone towards top. Planer lamination observed at places.
521.91	522.79	0.88	0.84	Dark grey carbonaceous shale.
522.79	523.55	0.76	0.76	Coal with bands of clay and carbonaceous shale pyritic nodule observed at places. (TOP SEAM)
523.55	524.75	1.20	1.20	Dark grey to dirty white, very fine to fine grained sandstone, inter banded with grey shale.
524.75	525.27	0.52	0.52	Dark grey, carbonaceous shale with pyritic nodule.
525.27	528.35	3.08	3.08	Coal with pyrite nodule and carbonaceous bands. (MIDDLE SEAM)
528.35	528.70	0.35	0.35	Dirty white, fine grained, moderately sorted sandstone with carbonaceous materials.
528.70	529.70	1.00	1.00	Dirty white, medium grained sandstone with thin layer of carbonaceous materials observed. Planer lamination present.
529.70	530.60	0.90	0.90	Dirty white, medium to coarse grained, feldspathic, moderately sorted sandstone.
530.60	531.85	1.25	1.25	Dirty white, fine grained sandstone, planer lamination observed.
531.85	534.50	2.65	2.65	Dirty white, medium to coarse grained sandstone, feldspathic. Inter banded with fine grained sandstone.
534.50	534.90	0.40	0.40	Dirty white, very coarse to gritty feldspathic sandstone.
534.90	537.55	2.65	2.65	Dirty white, medium to coarse grained sandstone, gritty bands present at places. Planer lamination observed.
537.55	537.97	0.42	0.42	Dirty white, medium to very coarse grained,

From	To	Thickness	Recovery	Description
1	2	3	4	5
				feldspathic sandstone. Cross bedding and thin carbonaceous materials observed.
537.97	539.53	1.56	1.40	Dirty white, very coarse to gritty feldspathic sandstone with streaks of carbonaceous materials.
539.53	539.98	0.45	0.45	Dirty white, medium to coarse grained sandstone with thin carbonaceous bands.
539.98	540.04	0.06	0.06	Dirty white, gritty sandstone with pyrite nodule.
540.04	540.59	0.55	0.55	Coal. (BOTTOM SEAM)
540.59	540.79	0.20	0.20	Dark grey shale.
540.79	540.89	0.10	0.10	Grey to dirty white, very fine to fine grained sandstone with carbonaceous materials.
540.89	540.95	0.06	0.06	Dark grey shale.
540.95	541.51	0.56	0.56	Grey to dirty white, very fine to fine grained sandstone, inter banded with shale and carbonaceous materials. Planer lamination observed.
541.51	542.26	0.75	0.75	Dirty white, medium to coarse grained sandstone, inter banded with fine grained sandstone and carbonaceous materials.
542.26	543.05	0.79	0.64	Dirty white, medium to coarse grained sandstone.
543.05	543.60	0.55	0.55	Dirty white, medium grained sandstone with thin coal bands.
543.60	544.55	0.95	0.95	Dirty white, medium to coarse grained, feldspathic and massive sandstone.
544.55	546.50	1.95	1.95	Dirty white, fine to medium grained, micaceous, sandstone. Planer lamination observed at places.

The borehole WJ-3A closed at the depth of 546.50m in Barakar Formation on 17.06.2014.

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