including Guest house, plantation area is carried by this drain at location OP4 (near township security gate). However, this drain may not function effectively in future or may not exist in future due to expansion plan of railways.

**Mundabasti nala in North:** Storm runoff from Mundabasti and Bantul village area (mainly agricultural land) enters the plant area through a culvert (Samal branch canal) on north west boundary at location I1 (Photos 6.8 & 6.9). This storm runoff as well as runoff from site of proposed raw water, existing CHP area drains in the Mundabasti nala passing through railway culverts near watch tower (Photos 6.10 & 6.11). There are two culverts; one on railway siding and another on the main Talcher branch of East Coast railway line; each has three spans. One span is being used for water supply pipe lines (Photo 6.12).



Photo 6.8 Mundabasti nala under canal culvert entering north west part of plant at Inlet I1



Photo 6.9 Downstream view of Mundabasti nala at entry I1



Photo 6.10. Mundabasti drain between plant boundary and railway track



Photo 6.11. Mundabasti drain between plant boundary and railway track



Photo 6.12. Railway culvert over Mundabasti nala. One span carries water supply pipe line

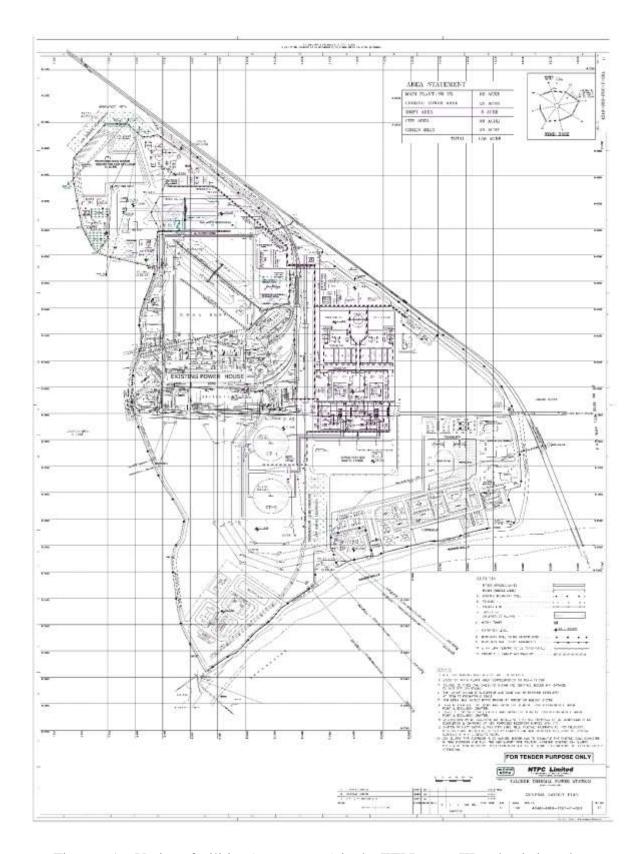


Figure 6.1a: Various facilities (components) in the TTPP stage III and existing plant

# **6.2.3 Partition of Project Area into Drainage Zones**

Partitioning of area and provision of separate outfalls for different zones helps in reducing size of drains and hence cost of land. Outfalls are proposed on Nandira nala and Mundabasti nala for drainage of plant area and for runoff from Jagannathpur and Mundabasti area. Figure 6.2 show the partition of project area into six zones and the proposed outfalls. Table 6.2 shows runoff contributing area (project facilities) and outfall locations for each zone and for the trunk drains.

**Table 6.2: Partition of Project Area into Drainage Zones** 

Zone	Project Facilities	Outfall	Natural
		Location	Drain
	TRUNK DRAINS		
Western Trunk	It carries storm runoff from Jagannathpur	OP1	Nandira nala
Drain for	starting at I3 (inlet for runoff)		
Jagannathpur runoff			
Western Trunk	To carry storm runoff from Mundabasti and	OP1A	Nandira nala
Drain for	Bantul village area which enters the plant area		
Mundabasti runoff	through a canal culvert at location I1		
Alternate Trunk	It carries storm runoff from Jagannathpur	OP8 at	Mundabasti
Drain for runoff	village (entering plant area at I3) to outfall on	rail	drain
from Jagannathpur	Mundabasti drain.	culvert	
Alternate Trunk	To carry storm runoff from Mundabasti and	OP6 at	Mundabasti
Drain for	Bantul village area which enters the plant area	rail	drain
Mundabasti runoff	through a canal culvert at location I1	culvert	
	ZONES		
W	Site of construction office, construction store,	OP2	Nandira nala
	O&M office and vacant land between trunk	Near ETP	
	drain and CTs, APs		
X	Stage III switch yard, main plant area, CTs,	OP3 near	
	transmission line corridor and vacant land, Fire	ETP	Nandira nala
	water HP, Ash silos, ash utility building		
Y	Existing guest house, plantation area and vacant	TP2	Nandira nala
	land(temporary sector of township)		
Z	CISF barracks, play area, OSP, FPH, Green belt	OP5,OP7	Mundabasti
	, raw water reservoir , CHP area, lime storage	at rail	nala
	area, Gypsum dewatering area. temporary	culvert	
	gypsum storage area		
A	vacant land between switch yard and township	TP1	Nandira nala
	, administration office and residences		
В	township area	TP2	Nandira nala

See also figure 6.2.

Trunk Drain for Disposal of Jaganathpur Runoff: Jagannathpur village lies adjacent to the boundary and it does not have its own drainage system. A trunk drain along western boundary starting from location I3 and upto outfall at OP1 on Nandira nala is proposed (photo 6.13). A 600 m long drain (rectangular, concrete) along and inside western boundary already exists. This trunk drain shall be extended upstream and shall cater exclusively to the storm water from outside NTPC premises (i.e. Jagannathpur village area).

However, there is constraint on availability of land along western boundary in existing plant area of stage I and II. Therefore, as an alternative, a trunk drain passing through zone Z and with outfall OP8 on Mundabasti nala is also considered for drainage of runoff from Jagannathpur area till the time stage I& II remain in operation.

**Trunk Drain for Disposal of Mundabasti Runoff:** For drainage of runoff from Mundabasti area, a trunk drain along western boundary (parallel to the Jagannathpur trunk drain) with outfall OP1A on Nandira nala is proposed. As an alternative, a trunk drain with outfall OP6 on Mundabasti nala is also considered till the time stage I& II remain in operation.



Photo 6.13 Outfall of western trunk drain (OP1) in Nandira nala

W Zone: includes i) vacant land between western trunk drain and Stage III CTs, and ii) site of construction office, construction store, O&M Office. The storm runoff shall be carried to outfall

OP2 on Nandira nala through a planned network of drains. An ETP exists near OP2. Therefore, part of the storm runoff from W zone could be treated in the ETP and reused as per requirement.

**X Zone:** It includes proposed sites for switch yard, main plant area, cooling towers, transmission line corridor and vacant land (ash pipes). The storm runoff shall be carried by planned network of drains to outfall OP3 on Nandira nala. Location of outfall OP3 is proposed to be near the existing ETP. Part of the storm runoff from X zone can be treated in the ETP and reused.

Y Zone (Temporary Sector of Township): It includes guest house and plantation area and vacant land. The east side small drain (tributary of Nandira nala) is running parallel & adjacent to the existing railway track. Railways are in the process of expanding the P-way herby introducing 1 track each on the sides of existing track No. 1 & 2. During this expansion, the east side small drain may not be a well-established drain as it is now or may be closed permanently. In view of the above, it is proposed to carry the runoff from Zone-Y through zone B (as part of zone B drain network) with outfall TP2 on Nandira nala.

**Z Zone:** It includes temporary gypsum storage area, Fire water PH, Ash silos, Utility building lime storage area, Gypsum dewatering area, raw water reservoir for stage I, II, III, CHP area, CISF area. The storm runoff shall be carried by planned network of drains to outfall OP5 on Nandira nala Part of runoff from existing plant area shall also be carried to OP5.

#### **Township Zones**

A Zone: It includes vacant land between switch yard and township, administration office and residences. Network of drains shall carry storm runoff to Outfall TP1 on Nandira nala.

**B Zone:** It covers the township area. Network of drains shall carry runoff from zone B and also from zone Y to outfall TP2 on Nandira nala.

Green belt is proposed in north of raw water reservoir for stage I, II and III (in the form low height plantation) and near CISF barracks. Rainwater in the green belt will contribute to recharge of ground water. However adequate drainage is considered to avoid waterlogging.

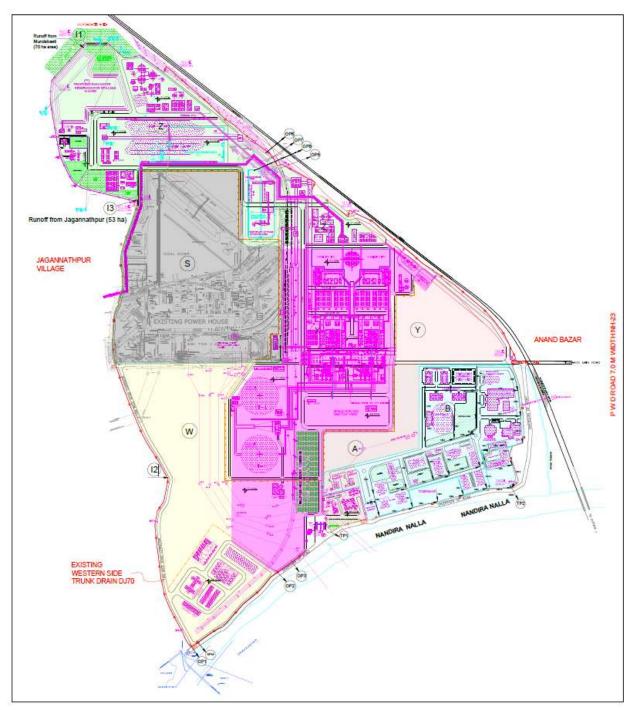


Figure 6.2. Partition of plant area into Zones and Nandira nala.

#### 6.3 DESIGN DISCHARGE

### **6.3.1 Design Considerations**

The drainage layout has been planned based on following considerations:

- (i) Return period of 50 years has been considered in drainage design.
- (ii) Bed slope of drains is kept such that flow is carried with sufficient velocity so that silting does not occur in channels and also so that channel invert levels are not in deep cutting.
- (iii) Concrete channels of rectangular shape are proposed for internal drainage and trunk drains.
- (iv) Width of drains shall not be less than 0.75 m as per standard practice adopted by NTPC.
- (v) Vertical falls shall be provided to negotiate difference if any in formation levels of various components and at the outfall locations.
- (vi) Channel slope, length, bed width is worked out such that capacity utilization in each of the channel segment (ratio of discharge contributed by connecting sub-catchments to the channel carrying capacity) is near to 1.0. However, in few channel segments this requirement may have to be compromised based on hydraulic and drainage layout considerations.

# 6.3.2 Design Discharge for Internal Drainage

The topography of project site is plain. The land use and topography in the project area will get modified during post project condition. However, the net effect of changes in land use, land cover and topography in post project condition shall be negligible. Part of the plant and township area such as road, main plant area, township area etc. will become less pervious. This will cause more storm runoff. On the other hand, infiltration in the open land and green belt area shall increase and hence, storm runoff shall reduce. The flood generated by storm rainfall is expected to be same as for pre project condition.

The procedure for estimation of design flood has been explained in Chapter 5. Internal drains in various zones and the trunk drains are designed considering specific discharge of 0.1616 cumec/ha (corresponding to 50 year return period).

### 6.4 CARRYING CAPACITY AND DESIGN OF CHANNEL SECTIONS

#### **6.4.1 Channel Sections**

Manning's roughness coefficient(n) is taken as 0.016 for concrete channel.

<u>Bed slope</u>: Bed slope of 1:1000 and 1:1500 have been considered for internal drainage channels However, the end channels connecting to outfall in each zone can be laid at steeper slope as sufficient natural gradient is available. For example, the existing west side trunk drain has a slope of 3.8 m per 1000 m (s=0.0038).

<u>Depth of flow in a channel section:</u> a resistance formula proposed by Robert Manning for uniform flow in open channel is used.

$$V(m/s) = \frac{1}{n} \times R^{2/3} \times S^{1/2}; R = A/P$$

 $Q=A\times V$ 

where:

- V is the velocity (m/s),
- S is the slope of channel =  $h_L/L$
- R is hydraulic mean depth (=A/P)
- A is cross section area (m<sup>2</sup>)
- P is perimeter (m) and,
- n is Manning's roughness coefficient (=0.016 for concrete lined channel).
- Q is the discharge (m<sup>3</sup>/sec)

# For rectangular section

 $A = B \times D$ 

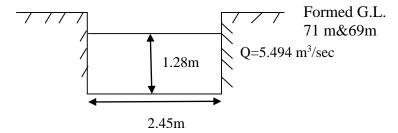
P=B+2D

 $R=A/P=(B\times D)/(B+2D)$ 

and section factor 
$$\frac{Q_n}{\sqrt{S}} = AR^{2/3} = \frac{(B \times D)^{5/3}}{(B + 2D)^{2/3}}$$

For given Q, n, and s, the width and depth of the channel are adjusted so that above equation is satisfied. Depth of flow is constrained by the invert level of outfall and the FGL of the contributing catchment area. To carry maximum flow through a given cross section area, depth of flow (D) should be near about half of the width (B) of section.

A typical section of the lined rectangular channel (DW34 ie end channel of zone W) is shown below (see table 6.3). This channel is laid at slope of 1:1500.



### **6.4.2 Carrying Capacity of Channel Segments**

It is not necessary that a long drain should have same discharge carrying capacity over its length to carry the discharge generated from its catchment. In order to economize the cost and area occupied by drains, a suitable number of channel segments may be considered. A unit length of approximately 100m has been considered for a channel segment and its own contributing catchment is taken to be about 1 hectare  $(100m \times 100m)$ . Discharge contributed by catchment of a channel segment is added to the capacity of its upstream channel segment (s) to estimate carrying capacity of the particular channel segment. Drainage map of entire area is presented in Figure 6.3. Figures 6.4 to 6.9 show the layout of drains in different zones. Size of different channel segments in zone W, X, Y, Z, A and B are stated in tables 6.3 to 6.8 respectively.

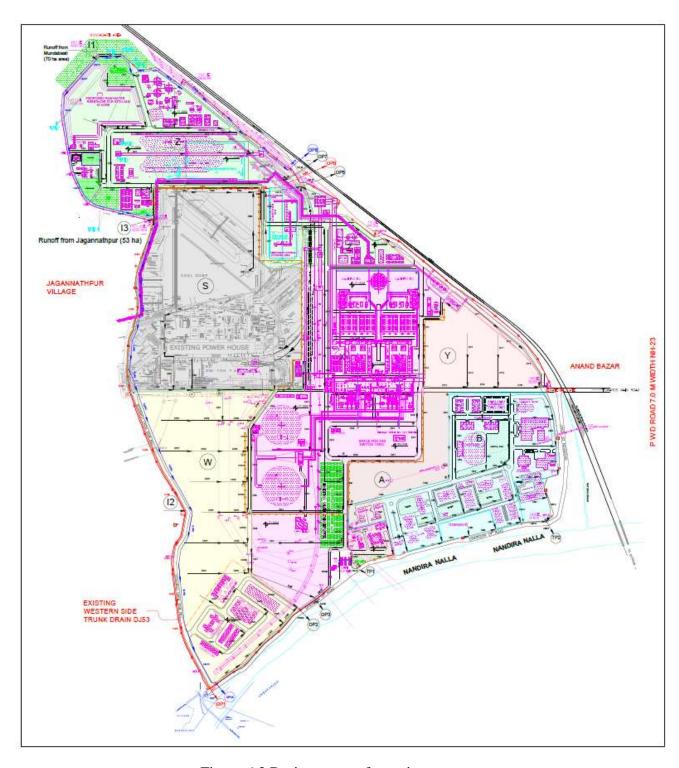


Figure 6.3 Drainage map for entire area

Table 6.3: Design of Channel Sections in W zone

Channel name	Catchment Area (ha)	Carrying Capacity (cumec)	Manning (n)	Slope(s) 1:1000	Section factor (Qn/(S) <sup>1/2)</sup>	Bed Width(B) (m)	Depth(D) (m)
DS1	1	0.162	0.016	0.001	0.082	0.75	0.35
DS2	2	0.323	0.016	0.001	0.164	1.00	0.43
DS3	3	0.485	0.016	0.001	0.245	1.15	0.50
DS4	4	0.646	0.016	0.001	0.327	1.20	0.60
DS5	5	0.808	0.016	0.001	0.409	1.30	0.65
DS6	6	0.970	0.016	0.001	0.491	1.35	0.70
DW1	1	0.162	0.016	0.001	0.082	0.75	0.35
DW2	2	0.323	0.016	0.001	0.164	1.00	0.43
DW3	3	0.485	0.016	0.001	0.245	1.15	0.50
DW4	4	0.646	0.016	0.001	0.327	1.20	0.60
DW5	5	0.808	0.016	0.001	0.409	1.30	0.65
DW6	6	0.970	0.016	0.001	0.491	1.35	0.70
DW7	7	1.131	0.016	0.001	0.572	1.50	0.74
DW8	8	1.293	0.016	0.001	0.654	1.53	0.79
DW9	9	1.454	0.016	0.001	0.736	1.60	0.83
DW10	10	1.616	0.016	0.001	0.818	1.66	0.87
DW15	15	2.424	0.016	0.0015	1.001	1.9	0.89
DW18	18	2.909	0.016	0.0015	1.202	2.05	0.95
DW20	20	3.232	0.016	0.0015	1.335	2.05	1.03
DW22	22	3.555	0.016	0.0015	1.469	2.05	1.1
DW24	24	3.878	0.016	0.0015	1.602	2.15	1.12
DW26	26	4.202	0.016	0.0015	1.736	2.2	1.15
DW34	34	5.494	0.016	0.0015	2.27	2.45	1.28

Table 6.4: Design of Channel Sections in X zone

Channel name	Catchment Area(ha)	Carrying Capacity (cumec)	Manning (n)	Slope(s) 1:1000	Section factor (Qn/(S) <sup>1/2)</sup>	Bed Width(B) (m)	Depth(D) (m)
DX1	1	0.162	0.016	0.001	0.082	0.75	0.35
DX2	2	0.323	0.016	0.001	0.164	1.00	0.43
DX3	3	0.485	0.016	0.001	0.245	1.15	0.50
DX4	4	0.646	0.016	0.001	0.327	1.20	0.60
DW5	5	0.808	0.016	0.001	0.409	1.30	0.65
DX6	6	0.970	0.016	0.001	0.491	1.35	0.70

DX7	7	1.131	0.016	0.001	0.572	1.50	0.74
DX8	8	1.293	0.016	0.001	0.654	1.53	0.79
DX9	9	1.454	0.016	0.001	0.736	1.60	0.83
DX10	10	1.616	0.016	0.001	0.818	1.66	0.87
DX15	15	2.424	0.016	0.0015	1.001	1.90	0.89
DX18	18	2.909	0.016	0.0015	1.202	2.05	0.95
DX20	20	3.232	0.016	0.0015	1.335	2.05	1.03
DX22	22	3.555	0.016	0.0015	1.469	2.05	1.10
DX30	30	4.848	0.016	0.0015	2.003	2.35	1.2

Table 6.5: Design of Channel Sections in Y zone

Channel name	Catchment Area(ha)	Carrying Capacity (cumec)	Manning (n)	Slope(s) 1:1000	Section factor (Qn/(S) <sup>1/2)</sup>	Bed Width(B) (m)	Depth(D) (m)		
DY1	1	0.162	0.016	0.001	0.082	0.75	0.35		
DY2	2	0.323	0.016	0.001	0.164	1.00	0.43		
DY4	4	0.646	0.016	0.001	0.327	1.20	0.60		
DY6	6	0.970	0.016	0.001	0.491	1.35	0.70		
Note: storm runoff is taken to outfall TP2 through township zone B									

Table 6.6: Design of Channel Sections in Z zone

Channel name	Catchment Area(ha)	Carrying Capacity (cumec)	Manning (n)	Slope(s) 1:1000	Section factor (Qn/(S) <sup>1/2)</sup>	Bed Width(B) (m)	Depth(D) (m)
DS1	1	0.162	0.016	0.001	0.082	0.75	0.35
DS2	2	0.323	0.016	0.001	0.164	1.00	0.43
DS3	3	0.485	0.016	0.001	0.245	1.15	0.50
DS4	4	0.646	0.016	0.001	0.327	1.20	0.60
DS8	8	1.293	0.016	0.001	0.654	1.53	0.79
DZ1	1	0.162	0.016	0.001	0.082	0.75	0.35
DZ2	2	0.323	0.016	0.001	0.164	1.00	0.43
DZ3	3	0.485	0.016	0.001	0.245	1.15	0.50
DZ4	4	0.646	0.016	0.001	0.327	1.20	0.60
DZ5	5	0.808	0.016	0.001	0.409	1.30	0.65
DZ6	6	0.970	0.016	0.001	0.491	1.35	0.70
DZ7	7	1.131	0.016	0.001	0.572	1.50	0.74
DZ8	8	1.293	0.016	0.001	0.654	1.53	0.79
DZ9	9	1.454	0.016	0.001	0.736	1.60	0.83
DZ10	10	1.616	0.016	0.001	0.818	1.66	0.87

DZ11	11	1.778	0.016	0.001	0.899	1.75	0.87
DZ13	13	2.101	0.016	0.001	1.063	1.85	0.95
DZ15	15	2.425	0.016	0.0015	1.001	1.9	0.89
DZ23	23	3.717	0.016	0.0015	1.535	2.15	1.1

Table 6.7: Design of Channel Sections in A zone

Channel	Catchment	Carrying	Manning	Slope(s)	Section	Bed	Depth(D)
name	Area(ha)	Capacity	( <b>n</b> )	1:1000	factor	Width(B)	( <b>m</b> )
		(cumec)			$(Qn/(S)^{1/2)}$	( <b>m</b> )	
DA1	1	0.162	0.016	0.001	0.082	0.75	0.35
DA2	2	0.323	0.016	0.001	0.164	1.00	0.43
DA3	3	0.485	0.016	0.001	0.245	1.15	0.50
DA4	4	0.646	0.016	0.001	0.327	1.20	0.60
DA8	8	1.293	0.016	0.001	0.654	1.53	0.79
DA9	9	1.454	0.016	0.001	0.736	1.60	0.83
DA12	12	1.939	0.016	0.001	0.981	1.8	0.9

Table 6.8: Design of Channel Sections in B zone

Channel name	Catchment Area(ha)	Carrying Capacity	Manning (n)	Slope(s) 1:1000	Section factor	Bed Width(B)	Depth(D) (m)
		(cumec)	( )		$(Qn/(S)^{1/2)}$	(m)	· /
DB1	1	0.162	0.016	0.001	0.082	0.75	0.35
DB2	2	0.323	0.016	0.001	0.164	1.00	0.43
DB3	3	0.485	0.016	0.001	0.245	1.15	0.50
DB4	4	0.646	0.016	0.001	0.327	1.20	0.60
DB5	5	0.808	0.016	0.001	0.409	1.30	0.65
DB6	6	0.970	0.016	0.001	0.491	1.35	0.70
DB7	7	1.131	0.016	0.001	0.572	1.50	0.74
DB8	8	1.293	0.016	0.001	0.654	1.53	0.79
DB9	9	1.454	0.016	0.001	0.736	1.60	0.83
DB10	10	1.616	0.016	0.001	0.818	1.66	0.87
DB11	11	1.778	0.016	0.001	0.899	1.75	0.87
DB12	12	1.939	0.016	0.001	0.981	1.8	0.9
DB15	15	2.424	0.016	0.0015	1.001	1.9	0.89
DB27	27	4.363	0.016	0.0015	1.803	2.3	1.15

# 6.5 INVERT LEVEL OF CHANNELS LYING ON LONGEST FLOW PATH

Longest flow path is the path followed by gravity flow from farthest point of drain to outfall. Invert levels of channel segments lying on the longest path will help to lay the main drain on desired slope and to adjust layout of the lateral channels at junctions. Lateral channels at junction point with the main drain (on longest path) shall have invert level of end node equal to or higher than the invert level of end node of the channel segment on main drain. Longest flow path in the six zones are shown in figures 6.4 to 6.9. Tables 6.9 to 6.13 show the computation of invert levels in different channel segments.

Nandira nala flows along the southern boundary of the plant area. Invert level of the end channel connecting to outfall on Nandira nala should be below road level and above HFL in nala. Topography(contour) map shows that elevation of the road along southern boundary of plant and township is above 65.5 m amsl. Nala left bank has elevation around 63.5 m amsl. High flood level in Nandira nala is therefore about 63.5 m amsl.

Table 6.9: Invert Levels of Channels along Longest Flow Path (Main Drain) in W Zone

Channel	Channel	Length	Slope	Drop in bed	Inv	ert	FGL of	Depth of	FSL of
Segment	name	(m)		level (m)	Leve	el(m)	surroundin	flow in	flow in
(ref Figure							g area (m)	Channel	channel
6.4)								(m)	(m)
					Initial	End			
					node	node			
A1-A	Szone	400	0,001	0.4	70.5	70.1	71	0.65	70.75
A-B	DS6	100	0.001	0.1	70.1	70.0	71	0.7	70.70
B-C	DW7	100	0.001	0.1	70.0	69.9	71	0.74	70.64
C-D	DW9	100	0.001	0.1	69.9	69.8	71	0.83	70.63
D-E	DW15	100	0.0015	0.15	69.8	69.65	71	0.89	70.54
E-F	DW18	100	0.0015	0.15	69.65	69.5	71	0.95	70.45
F-G	DW20	100	0.0015	0.15	69.5	69.35	71	1.03	70.38
G-H	DW22	100	0.001	0.15	69.35	69.2	71	1.1	70.3
H-I	DW24	100	0.001	0.15	69.2	69.05	71	1.12	70.17
				Drop o	f 2m				
I-J	DW26	200	0.0015	0.3	67.05	66.75	69	1.15	67.9
J-OP2	DW34	50	0.0015	0.075	66.75	66.67	Sloping land	1.28	67.95

Table 6.10: Invert Level of Channels along Longest Flow Path (Main Drain) in X Zone

Channel	Channel	Length(	Slope	Drop in	Invert Le	evel(m)	FGL of	Depth of	FSL of
Segment	name	m)		bed level			surroundin	flow in	flow in
(ref Figure				(m)			g area(m)	Channel	channel
6.5)								(m)	(m)
					Initial	End			
					node	node			
A-B	DX6	500	0.001	0.5	70.35	69.85	71	0.7	70.55
			Drop of	2 m(Switch	yard FGL i	s 69 m)			
B-C	DX8	350	0.001	0.35	67.85	67.50	69	0.79	68.29
C-D	DX10	120	0.001	0.12	67.5	67.38	69	0.87	68.25
				Drop of 1	m at D				
D-E	DX18	100	0.0015	0.15	66.38	66.23	69	0.95	67.18
E-F	DX20	100	0.0015	0.15	66.23	66.08	69	1.03	67.11
F-G	DX22	140	0.0015	0.21	66.08	65.87	69	1.1	66.97
G-OP3	DX30	50	0.0015	0.075	65.87	65.79	Sloping land	1.2	66.99

Table 6.11: Invert Level of Channels along Longest Flow Path (Main Drain) in Z Zone

Channel	Channel	Length	Slope	Drop in	Invert	Level	FGL of	Depth of	FSL of
Segment	name	(m)		bed level	(n	n)	surrounding	flow in	flow in
(ref Figure				(m)			area (m)	Channel	channel
6.7)								(m)	(m)
					Initial	End			
					node	node			
A-B	DZ2	100	0.001	0.1	70.5	70.4	71	0.35	70.75
B-C	DZ3	175	0.001	0.175	70.4	70.22	71	0.5	70.72
				Drop 0.	52 m				
C-D	DZ7	75	0.001	0.075	69.7	69.62	71	0.74	70.36
D-E	DZ9	185	0.001	0.185	69.62	69.43	71	0.75	70.18
E-F	DZ11	120	0.001	0.12	69.43	69.31	71	0.8	70.11
F-G	DZ13	130	0.001	0.13	69.31	69.18	71	0.85	70.03
				Drop 0	.5 m				·
G-OP7	DZ23	30	0.0015	0.045	68.68	68.63	71	1.1	69.73

Table 6.12: Invert Level of Channels along Longest Flow Path (Main Drain) in A Zone

Channel Segment (ref Figure	Channel name	Length (m)	Slope	Drop in bed level(m	Invert Level(m)		FGL of surrounding area(m)	Depth of flow in Channel	FSL of flow in channel
6.8)				)		1		(m)	(m)
					Initial node	End node			
A-B	DA2	300	0.001	0.3	68.5	68.2	69	0.43	68.63
B-C	DA4	350	0.001	0.35	68.2	67.85	69	0.6	68.45
C-D	DA9	200	0.001	0.2	67.85	67.65	69	0.83	68.48

Ground level in zone A is assumed to be 69.0m.

Table 6.13: Invert Level of Channels along Longest Flow Path (Main Drain) in B Zone

Channel Segment	Channel name	Length (m)	Slope	Drop in bed	Invert Level(m)		FGL of surrounding	Depth of flow in	FSL of flow in
(ref Figure				level(m			area(m)	Channel	channel
6.9)				)				(m)	(m)
					Initial node	End node			
A-B	DB1	200	0.001	0.2	68.5	68.3	69.0	0.35	68.65
B-C	DB2	100	0.001	0.1	68. 3	68.2	69.0	0.43	68.63
C-D	DB3	150	0.001	0.15	68.2 68.05		69	0.5	68.55
Drop 1m at D									
D-E	DB6	150	0.001	0.15	67.05	66.9	69	0.7	67.6
E-F	DB11	100	0.001	0.1	66.9 66.8		69	0.87	67.67
F-G	DB15	80	0.0015	0.12	66.8	66.68	69	0.89	67.57

Note: Ground level in zone B is assumed to be 69.0m.

# 6.6 VERTICAL FALLS

Invert levels of channel segments on longest path in each zone have been worked out in previous section. Vertical drop in invert level have been provided at suitable locations as shown in the tables. Well type fall (also called cylinder fall) is suitable and economical for large height fall and small discharge. The water is dropped into a well over a crest from where it emerges near the bottom dissipating its energy in turbulence inside the well. For low height fall and large discharge, crest weir over full width of channel is suitable. Location and size of vertical falls in all zones is given in Table 6.14.

Table 6.14 Location and Size of Vertical Falls in all Zones

Zone	Channel	Location in figure	Drop Height (m)	Discharge (cumec)	Fall type	Width(m)
		ngure	(III)	` '		
W	HI	1	2	3.878	crest weir	2.15
X	AB	В	2	0.97	Crest weir	1.35
	CD	D	1	1.616	Crest weir	1.66
Z	BC	С	0.52	0.485	drop	1.15
	FG	G	0.5	2.101	drop	1.85
В	CD	D	1	0.485	Well type	1.15

Lateral channels at junction point with the main drain (on longest path) have invert level of end node equal to or higher than the invert level of end node of the channel segment on main drain. The channels are designed with longitudinal slope as 1:1000 and 1:1500. Since level difference is small less than 1 m, there is no need for vertical falls for lateral channels.

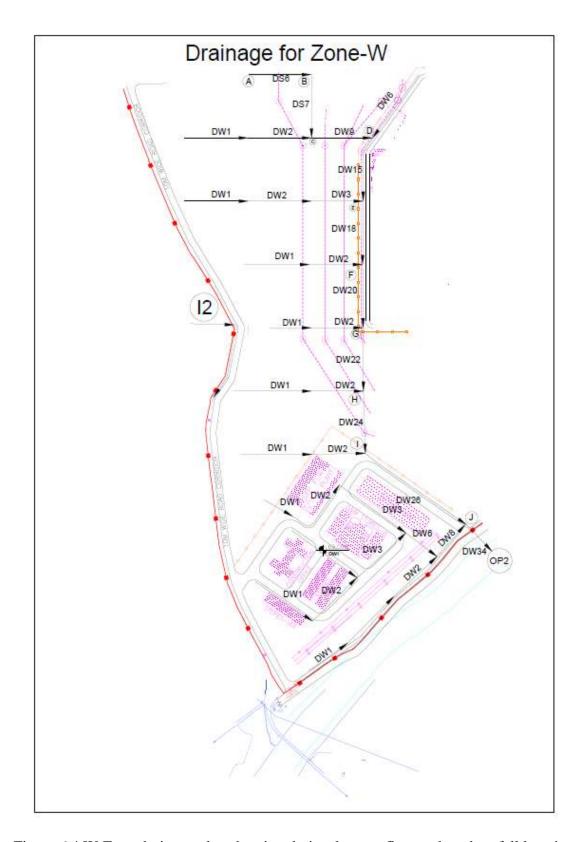


Figure 6.4 W Zone drainage plan showing drains, longest flow path and outfall location

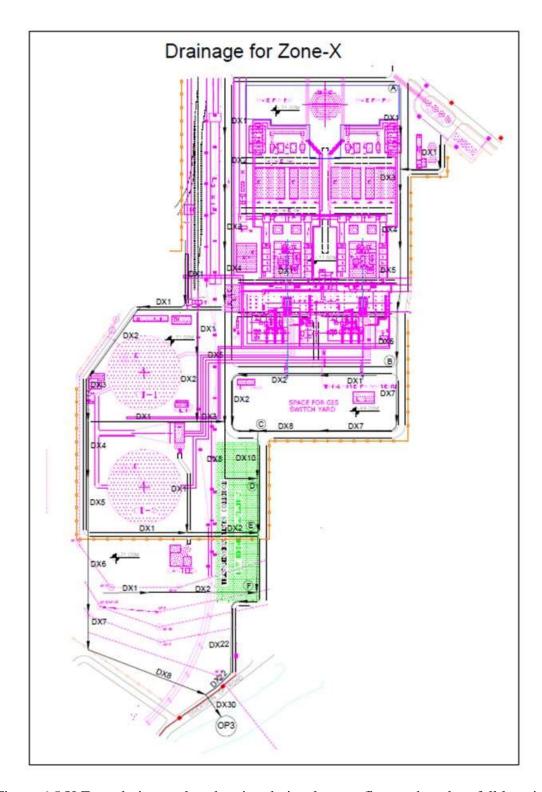


Figure 6.5 X Zone drainage plan showing drains, longest flow path and outfall location

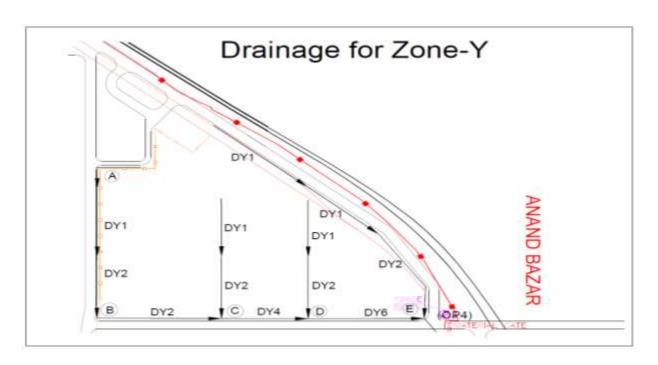


Figure 6.6 Y Zone drainage plan showing drains, longest flow path and outfall location

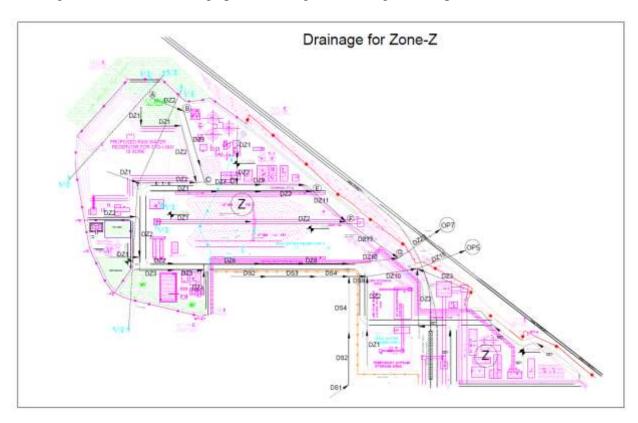


Figure 6.7 Z Zone drainage plan showing drains, longest flow path and outfall location

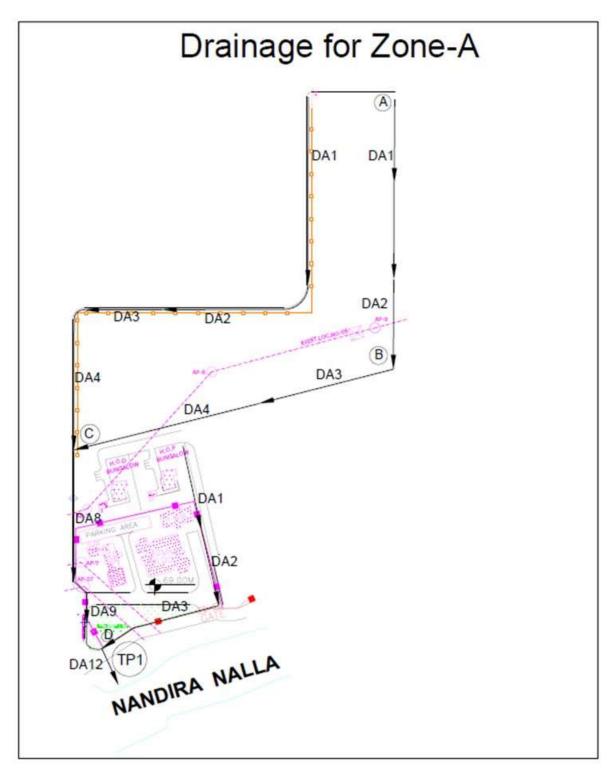


Figure 6.8 A Zone drainage plan showing drains, longest flow path and outfall location

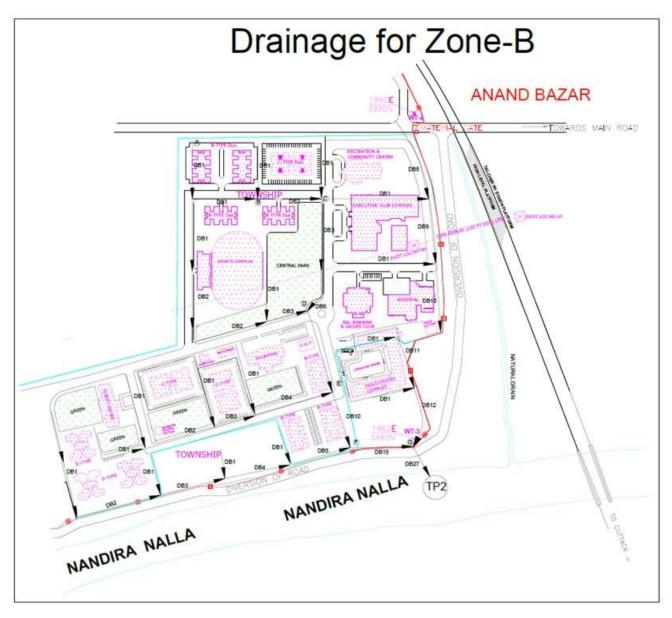


Figure 6.9 B Zone drainage plan showing drains, longest flow path and outfall location

#### 6.7 DESIGN OF WEST SIDE TRUNK DRAIN TO CARRY JAGANNATHPUR RUNOFF

A rectangular concrete drain is already constructed over a length of 600 m from point I2 to OP1. Salient feature of the constructed portion are:

Length is 600 m. Invert level at inlet I2 is 67.64m: invert level at outfall OP1 is 65.38 m. Level difference is 2.26m. slope=2.26/600=0.0038. Manning's roughness coefficient n is taken as 0.02 (concrete drain under normal maintenance) and width is 2.25 m. With 1.6 m depth of flow it can carry a discharge of 8.46 cumec. As discussed above, specific design discharge is 0.1616 cumec/ha. Thus, the trunk drain has capacity to carry storm water from 53ha (8.46 cumec/0.1616 cumec/ha= 52.35 ha say 53 ha) drainage area. It is to be noted that only part of the Jagannathpur village area contributes runoff to the trunk drain. Therefore, the existing drain size is adequate. It will be extended upto location I3 along the existing plant boundary where most of the Jagannathpur runoff enters the trunk drain. The extended portion of this drain shall have same slope as for the existing drain i.e. 0.0038(3.8m per km) (figure 6.10). Table 6.15 shows the longitudinal slope and size of the trunk drain.

Table 6.15: Slope and Channel Section of the Trunk Drain to carry Jagannathpur runoff

Channel name	Catchment Area (ha)	Carrying Capacity (cumec)	Mannin g (n)	Slope(s)	Section factor (Qn/(S) <sup>1/2)</sup>	Bed Width (B) (m)	Depth (D)(m)
DJ53	52.35	8.46	0.02	0.0038	2.745	2.25	1.6

Alternate Arrangement for Disposal of Runoff from Jagannathpur: As discussed earlier, there is constraint on availability of land along western boundary in existing plant area of stage I and II. Therefore, as an alternative, a trunk drain passing through Z zone and with outfall OP8 on Mundabasti nala is also considered for drainage of runoff from Jagannathpur area. The channel section shall be same as given in table 6.15. Layout of this trunk drain is shown in figure 6.11

#### 6.8 DESIGN OF WEST SIDE TRUNK DRAIN TO CARRY MUNDABASTI RUNOFF

A trunk drain on western boundary is proposed for drainage of storm water from Mundabasti area (figure 6.10). However, this drain on western boundary is possible only when the land becomes available along western boundary in Stage I & II area (i.e. after dismantling of stage I and II facilities).

The runoff contributing area of Mundabasti is 70 ha. Required carrying capacity of channel is  $0.1616 \times 70=11.312$  cumec. This discharge is carried by a rectangular trunk drain along western boundary to outfall OP1A on Nandira nala. Longitudinal slope and channel section is as given in table 6.16. Figure 6.10 shows the layout of trunk drain from I1 to outfall OP1A on Nandira nala.

Invert level of channel segments of western trunk drain for Mundabasti runoff are given in Table 6.17.

Table 6.16: Channel Section of Trunk Drain to carry Mundabasti runoff

Channel name	Catchment Area(ha)	Carrying Capacity	Manning (n)	Slope(s)	Section factor	Bed Width(B)	Depth(D) (m)
		(cumec)			$(Qn/(S)^{1/2)}$	(m)	
DM70	70	11.312	0.016	0.0023	3.774	3.0	1.5

Table 6.17: Invert level of channel segments along western trunk drain for Mundabasti runoff

Channel Segment (ref Figure	Channel name	Length (m)	Slope	Drop in bed level (m)	Invert Level (m)		FGL of surrounding area (m)	Depth of flow in Channel	FSL of flow in channel
6.11)						T		(m)	(m)
					Initial	End			
					node	node			
I1-A	DM70	741	0.0023	1.7	69.2	67.5	71	1.5	69.0
A-D	DM70	555	0.0023	1.28	67.5	66.22	71	1.5	67.72
D-E	DM70	463	0.0023	1.06	66.22	65.16	71	1.5	66.66
E-OP1A	DM70	600	0.0023	1.38	65.16	63.78	69	1,5	65.28

Depending on site condition a suitable vertical fall shall be required at outfall OP1A such that runoff passes through road culvert with FSL lower than invert level of road and higher than flood level of Nandiri nala. HFL in Nandiri nala is 63.5m and the invert level at outfall OP1A is 63.78 m hence ok. Channel slope cannot be increased further as invert level of channel at OP1A should be above HFL. By decreasing the slope, bed width of channel and hence land requirement to accommodate the channel shall increase which is not desirable.

# 6.9 NORTH SIDE TRUNK DRAIN FOR MUNDABASTI RUNOFF:

As discussed earlier, there is constraint on availability of land along western boundary in existing plant area of stage I and II. A rectangular concrete channel is proposed along and within the north side plant boundary (figure 6.11). Invert level at inlet I1=71.0 m; invert level at outfall OP6=69.21 (near rail track culvert); length of channel from inlet to outfall=770 m. Slope = (71.0-69.21)/770=0.0023. The channel section is same as given in table 6.16.

It may be noted that the Mundabasti nala at location OP6 passes under a railway culvert. It is observed that some part of the flood plain of this natural drain has been encroached by agricultural fields in downstream (Photo 6.4). Flooding could occur near OP6 due to drainage congestion in downstream. Therefore, the north side trunk drain is to be used till stage I&II are not dismantled to make the land available for west side drain.

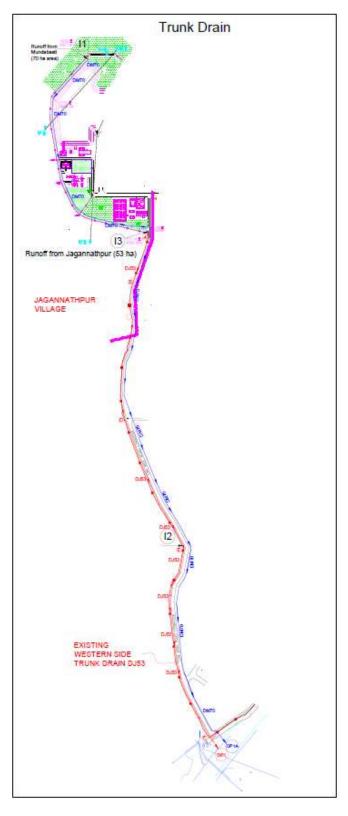


Figure 6.10. The trunk drains on western boundary to carry runoff from Jagannathpur and Mundabasti area

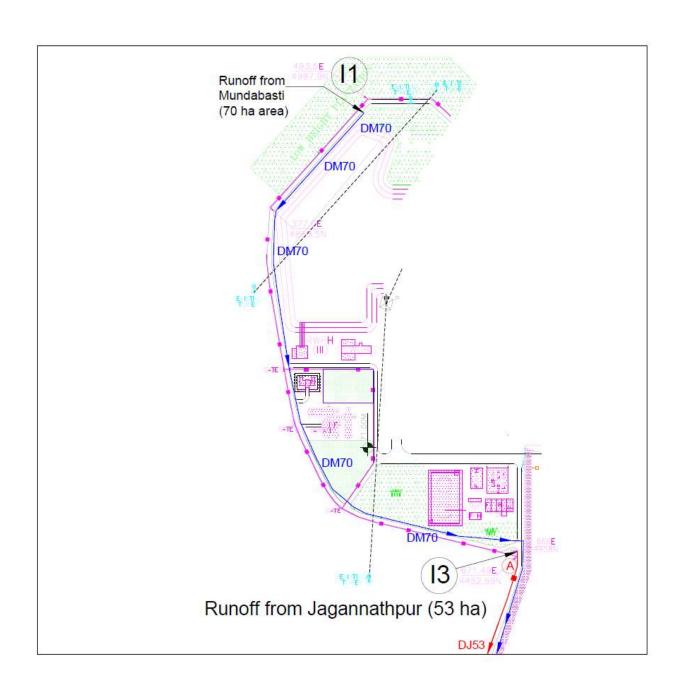


Figure 6.10 (a). Part 1 of The trunk drains on western boundary to carry runoff from Jagannathpur and Mundabasti area

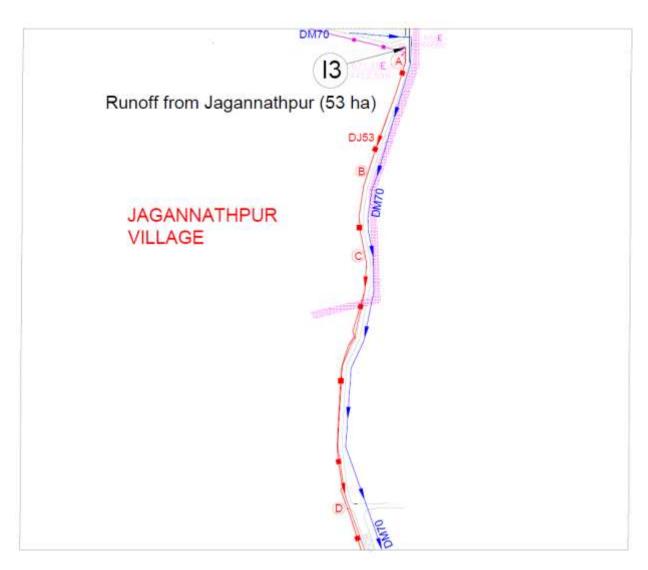


Figure 6.10 (b). Part 2 of The trunk drains on western boundary to carry runoff from Jagannathpur and Mundabasti area

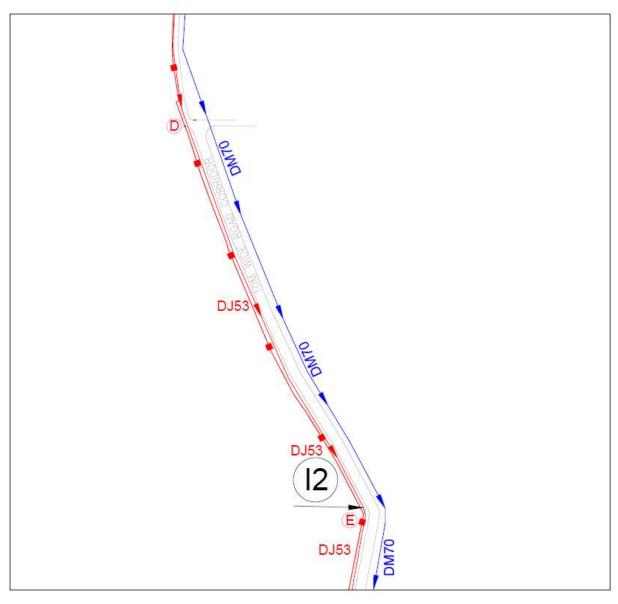


Figure 6.10 (c). Part 3 of The trunk drains on western boundary to carry runoff from Jagannathpur and Mundabasti area

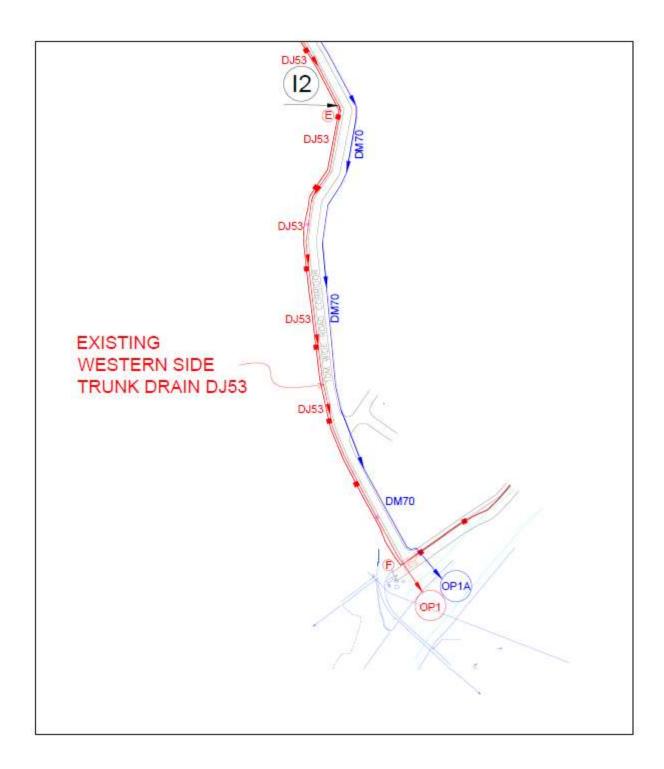


Figure 6.10 (d). Part 4 of The trunk drains on western boundary to carry runoff from Jagannathpur and Mundabasti area

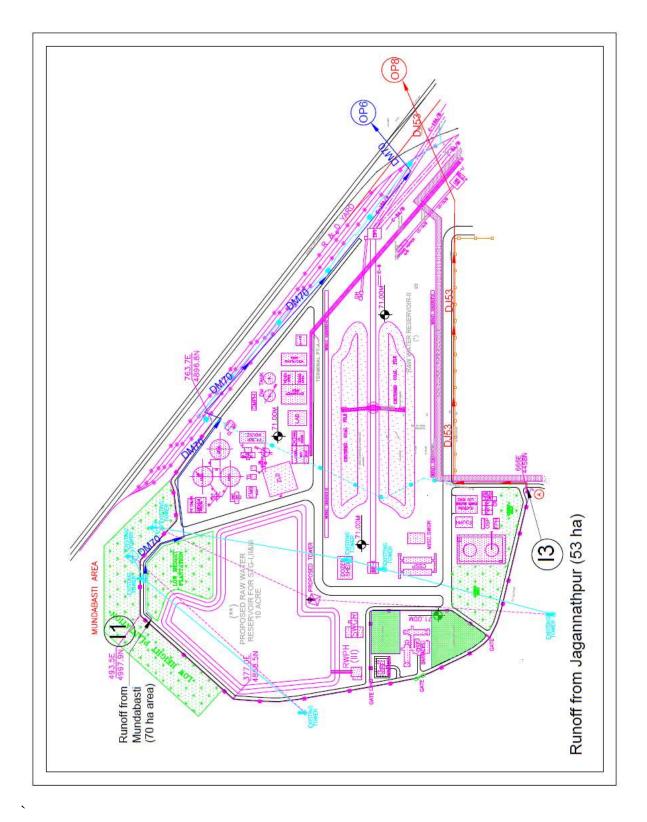


Figure 6.11. The trunk drains to carry runoff from Jagannathpur and Mundabasti area to OP8 and OP6 on Mundabasti Nala

# **CHAPTER 7**

# DRAINAGE OF ASH DISPOSAL SITES

# 7.1 EXISTING AND PROPOSED ASH DISPOSAL AREA

Ash disposal sites consist of i) ash dykes (near Santhapada area) not in service now; ii) mine voids (at South Balanda) being used for ash disposal by TTPS stage I & II and iii) mine voids (at Jagannath) allocated for ash disposal of TTPS stage III.

Ash Dykes Not in Service: Figure 7.1 shows schematic lay out of the ash dykes A, B, C, D, E & F (Abandoned after filling) and ash dykes 1, 2, 3 & 4. Starter dykes of ash dykes 1, 3 & 4 have been partly completed, however these are not used for ash filling. Starter dyke of Ash dyke 2 has been completely utilized & exhausted. 1st raising of Ash dyke 2 has been completed, however it is not used for ash filling. Further work on ash dykes 1, 2, 3 & 4 has been stopped due to environmental considerations.



Photo. 7.1. Filled ash dyke Stage I and II



Photo. 7.2. Ash dyke constructed but (near Brahamini River) not in service

Mine Voids Being used by TTPS stage I&II: Ash is being disposed in the abandoned South Balanda OCP mine voids (Quarry No. 2 & 3) through pipelines (figure 7.2). The decanted water from mine voids is being pumped back to the ash water reservoir situated inside the Talcher TPP. Photo. 7.3 shows the ash filled pilot quarry 2A. Photo. 7.4. shows the mine voids being used by TTPS stage I&II. Photo. 7.5 shows slurry disposal in mine void.



Photo. 7.3. Ash filled pilot quarry 2A



Photo. 7.4. Mine Voids being used by TTPS stage I&II



Photo. 7.5. Slurry disposal at outfall OP3 in mine void

### Mine Voids allocated to Talcher Power Plant Stage III for Ash Disposal:

Lean ash slurry shall be pumped from the ash slurry sump through pipelines upto the ash disposal area identified at abandoned Jagannath OCP mine voids of MCL (Quarry No. 4 & 7). Photo. 7.6. shows abandoned quarry No. 4 proposed for ash disposal under stage –III. These mine voids are located about 14 km from the plant (figure 7.2). The decanted water from mine void shall be pumped out by barge mounted pumps to an over ground sump located near the disposal area. The water from this over ground sump shall be pumped to the ash water sump situated inside the power plant for ash slurry preparation thereby reducing the requirement of raw make-up water for the purpose.



Photo. 7.6. Abandoned quarry No. 4 proposed for ash disposal under stage -III

### 7.2 DRAINAGE PLAN FOR ABANDONED ASH DYKES (A, B, C, D, E, F)

Location of the ash dykes and drainage in vicinity is shown in figure 7.1.

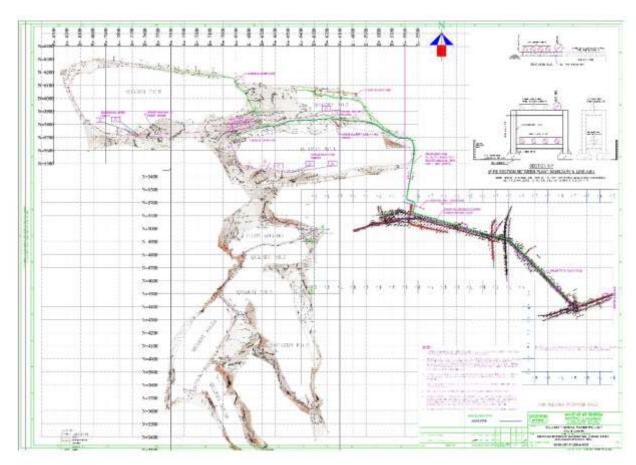
#### **Drainage Design Concept:**

For each of the filled ash dyke (A, B, C, D, E, F) following conceptual drain design shall be followed.

- i) <u>Low Height Peripheral Embankment:</u> The dyke area will have a 1 to 3 m high earthen embankment around it. Purpose of the peripheral embankment is to prevent entry of storm runoff from small size natural drains surrounding the dyke area. It will depend upon elevation of the dyke and surrounding area. The peripheral embankments can be designed using similar design parameters as for flood control earthen embankments.
- ii) <u>Drainage of Embankment Slopes and Blocked Drains on Periphery</u>: A toe drain shall be provided to drain storm runoff on the outer slope of peripheral embankment. The storm runoff from surrounding area will also be carried by this toe drain to Nandiri nala in downstream of the dyke. For detailed design of toe drain of ash dyke embankment, Code of Practice given in Bureau of Standards code IS: 9429: "Code of practice for drainage system for earth and rock filled dams" may be followed.



Figure 7.1: Ash dykes A, B, C, D, E & F (Abandoned) and Ash dykes 1,2,3 & 4



**Figure 7.2:** Quarry No. 2 & 3(for stage I&2) & Jagannath Quarry No. 4 & 7 (for stage III <u>iii)</u>. <u>Ungated Spillway of Ash Dyke:</u> For safety of ash dykes, ungated spillway may be provided in each abandoned ash dyke to spill the excess storm runoff. For preliminary planning, design discharge is worked out as below(table 7.1). The ungated spillway should have sufficient length to spill this discharge. Internal drainage in plant area(chapter 6) is designed based on specific flood discharge of 0.117 m³/sec/ha( details in chapter 5). Same concept is used here for estimation of design discharge of spillway

Table 7.1: Design discharge for ungated spillways in the abandoned ash dykes

Ash dyke	Area(acres)	Area(ha)	Specific discharge	Design discharge
		(1acre=0.4047 ha)	m <sup>3</sup> /sec/ha	m <sup>3</sup> /sec
A	24	9.7	0.117	1.13
В	33	13.4	0.117	1.57
C	60	24.3	0.117	2.84
D	19	7.7	0.117	0.9
Е	41	16.6	0.117	1.94
F(overflow	3.1	1.2	0.117	0.14
lagoon)				

iv) Treatment: The consolidated ash surface will be landscaped with flora that survives on the

relatively hostile terrain and if necessary polymer layering could be provided in the initial phase

of treatment to prevent the ash from being blown by the wind.

v) <u>Drainage</u>: Grass will be planted on the outer slopes of the dyke. Outer slope could be terraced

and catch drains, chute channel may be considered as for the over burden dumps discussed in

section 7.3.1 below. The runoff shall be taken through a channel to outfall on Nandiri nala.

7.3 DRAINAGE OF ASH FILLED OCP MINE VOIDS (QUARRY NO. 2, 3A,3B)

The South Balanda mine has three quarries namely Quarry-1, Quarry-2 and Quarry 3. The

mining activities in Quarry-1, Quarry-2 and Quarry-3A & 3B had stopped in April, 2004. At

present ash is being disposed in the abandoned Quarry No. 2, 3A, 3B through pipelines (figure

7.3).

Quarry 2 is partitioned in two parts; part 2A is pilot quarry which is already filled upto 124.5 m

amsl. Part 2B is filled upto 123.5m amsl. It is planned to fill Part 2B upto 124.5m amsl. The

deepest point in Quarry-2/3 is about RL (+) 75m amsl. The average depth of the quarry is

varying from 40 m to 50 m. The quarry area has been estimated based on topography map.

Quarry no. 2: 32.50 ha

Quarry no. 3A: 18.00 ha

Quarry no. 3B: 11.00 ha

Total 61.50 ha.

The DEM of the study area is shown as contour zoning map in Figure 7.4 and elevation variation

from 101 m to 161.9 m is depicted through different colours.

7-6

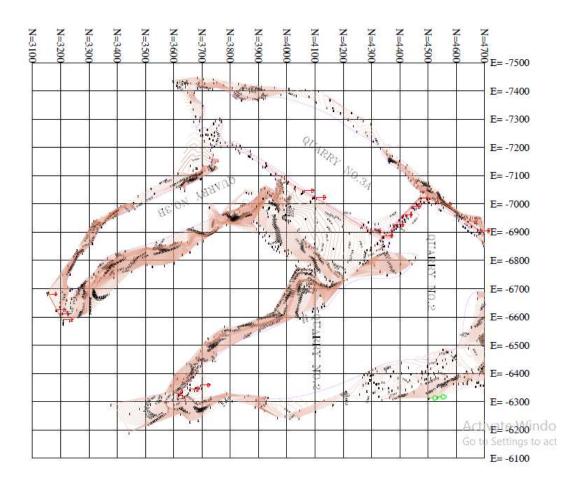


Figure 7.3: South Balanda OCP mine voids (Quarry No. 2 & 3) being used for ash disposal

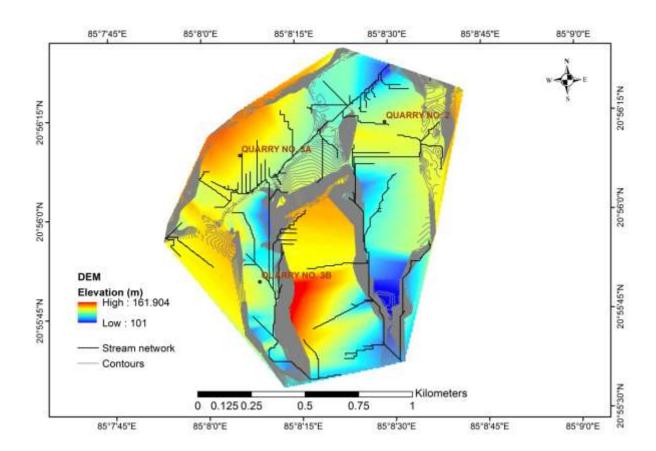


Figure 7.4: DEM of the Quarry No. 2 & 3 being used for ash disposal at present (stage I&II)

## 7.3.1 Drainage arrangement for the OB Dumps

OB dumps are in the form of hills with steep slope. As OB dumps typically have limited catchments, inflows of surface water tend to be small. However smooth disposal of storm water from overburden dump is extremely essential to avoid gully formation on the dump body (due to steep slope) and also siltation problem of the nearby natural drains. The following steps are proposed for effective drainage:

Low Height Embankment on Periphery of Ash Filled Quarry: The ash filled quarry area will have a 1 to 3 m high earthen embankment around it. Purpose of the peripheral embankment is to prevent entry of storm runoff from OB area into ash fill area. Thus, storm runoff from OB area and that from ash fill area are carried by separate drains towards a common outfall. The peripheral embankments can be designed using similar design parameters as for flood control earthen embankments.

As discussed in chapter 5 and chapter 6, specific flood is 0.117 m<sup>3</sup>/sec/ha. The drains shall be designed using this specific flood discharge.

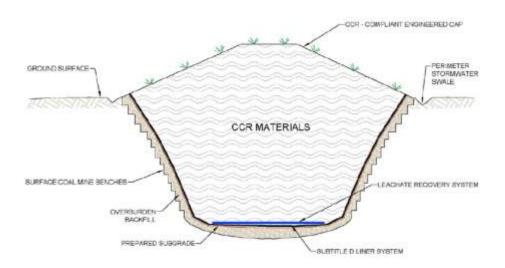
Catch Drain for OB: Overburden on the periphery of the quarries greatly vary in shape, size, height, slope, vegetation etc. Overburden area where plantation has already been done for picnic site is considered here for catch drain design as an example. Its area is approximately 20 ha. The area is partitioned into 4 bench terraces; each terrace having approximately 5 ha area. Considering specific flood discharge as 0.117 m³/sec/ha, flood discharge of one bench terrace works out to be 0.585 m³/sec. A concrete lined rectangular open drain having 1.1 m bed width and 0.6 m floe depth (table 7.2) will be provided on inner side of each terrace.

<u>Masonry Chute or Grassed Channel:</u> Flood from upper bench is discharged to the lower benches through masonry chute or a grassed channel, thus minimizing gully formation in the OB area.

Foot drain: A foot drain of proper size depending on size of each OB will be provided along the periphery of OB and sloping in north south direction. This drain will collect run-off from face of dump and direct it to an outfall at southern end of quarry.

## 7.3.2 Drainage arrangement for Ash Fill Area

Conceptual drawing of ash filled mine void is given in figure 7.5.



Note: CCR: coal combustion residuals

Figure 7.5: Conceptual drawing of ash filled mine void

Once the ash filling has reached a level of 124.5 m amsl (quarry 2, 3A,3B), the plots will be leveled, graded and cleared of large stone pieces lying on the surface. A slope towards periphery will be provided (preferably less than 2%) as shown in the figure 7.5. The graded and leveled area will be divided into small sectors and small check bunds will be constructed to retain moisture and humus in the soil. The drainage arrangements are as follows:

Peripheral drain (perimeter storm water swale) shall be provided to collect storm runoff (in excess of ponding by check bunds) from the ash filled area. DEM (figure 7.4) shows that natural slope in vicinity of quarry 2, 3A and 3B is in north-south direction. Therefore, the drains in general shall be sloping in north-south direction.

The size of drains carrying storm runoff from OB area are given in table 7.2 below.

Table 7.2: Design of Channels for storm runoff in Existing & Proposed Ash Fill Quarries

Channel name	Runoff contribu ting area (ha)	Carrying Capacity (cumec)	Manning roughness coeff (n)	Slope (S) 1:1000	Section factor (Qn/(S) <sup>1/2)</sup>	Bed Width (B) (m)	Depth (D) (m)
OB terrace drain	5	0.585	0.016	0.001	0.296	1.1	0.6
OB foot drain FD5	5	0.585	0.016	0.001	0.296	1.1	0.6
OB foot drain FD10	10	1.17	0,016	0.001	0.592	1.5	0.75
OB foot drainFD15	15	1.755	0.016	0.001	0.888	1.75	0.87
OB foot drain FD20	20	2.34	0.016	0.001	1.184	1.91	1.00
Outfall channel QD20	20	2.34	0.016	0.001	1.184	1.91	1.00
Outfall channel QD40	40	4.68	0.016	0.001	2.368	2.9	1.1
Outfall channel QD60	60	7.02	0.016	0.001	3.552	3.0	1.5

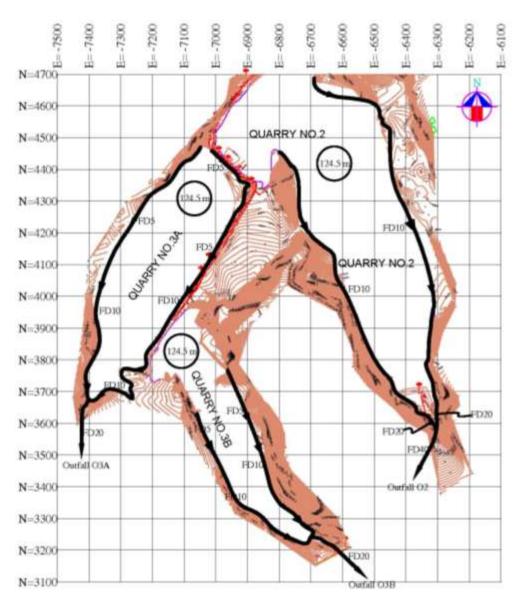


Figure 7.6 Layout of the drain for ash fill area in quarry 2, 3A and 3B.

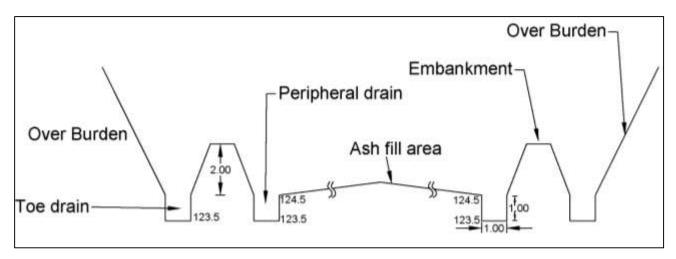


Figure 7.7 Sectional view of OB toe drain, ash fill area peripheral drain and low height embankment in between.

## Drainage of Mine Voids Allocated for proposed Talcher TP Project, Stage-III (2×660 MW)

The ash disposal area is identified at abandoned Jagannath OCP mine voids of MCL (Quarry No. 4 & 7) located about 14 Km from the plant (figure 7.8). The DEM of the mine void area and vicinity is shown as contour zoning map in Figure 7.9 and elevation variation from 71.5 m to 155.25 m is depicted through different colours. DEM of the area (figure 7.9) shows that ground is sloping in north-west direction.

As shown in figure 7.6, the rain water over mine void area and decanted water( of ash slurry) from mine void shall be pumped out by barge mounted pumps to an over ground sump located near the disposal area. The water from this over ground sump shall be pumped to the ash water sump situated inside the power plant for ash slurry preparation thereby reducing the requirement of raw make-up water for the purpose.

Storm runoff from the OB area around the mine voids shall not be allowed to enter the mine void. Drainage arrangement for OB of quarries 4 and 7 will be on the same pattern as for quarries 2,3A,3B discussed in section 7.3.1. Catch drains and foot drains shall be provided to safely discharge the storm runoff to natural drains (tributaries of Bangaru nala). Local drainage is controlled by a small seasonal nala flowing northerly in the western part of Jagannath block. This nala joins Bangaru nala flowing easterly to the north of Jagannath Coal Mines.

Figure 10 shows layout of the peripheral drain network for ash fill area in quarry 4, quarry 7 and quarry 8.

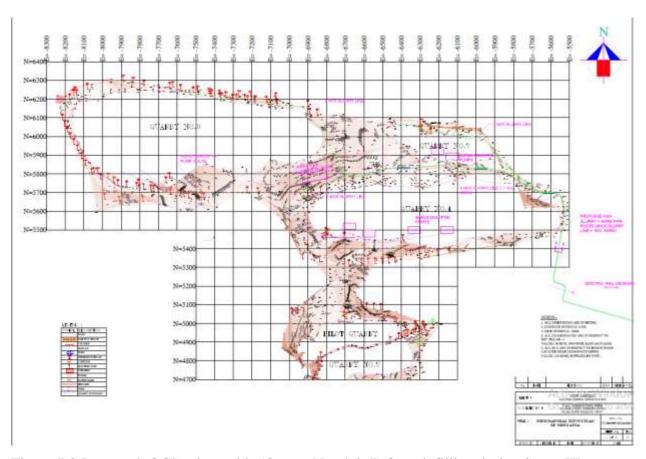


Figure 7.8 Jagannath OCP mine voids (Quarry No. 4 & 7) for ash filling during Stage-III

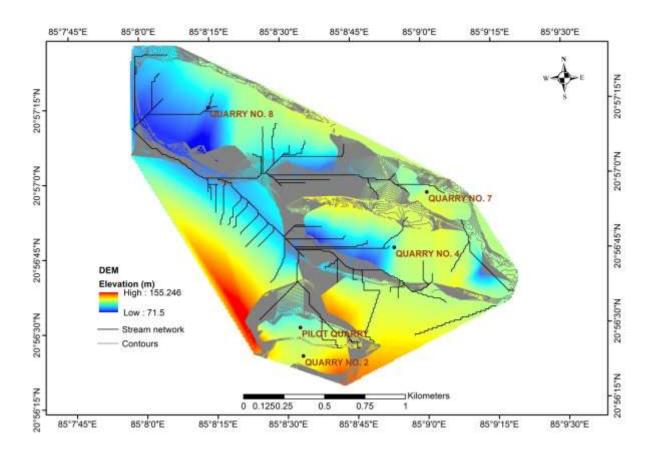


Figure 7.9: DEM of the Jagannath mine voids (Quarry No. 4 & 7) for ash disposal in Stage III

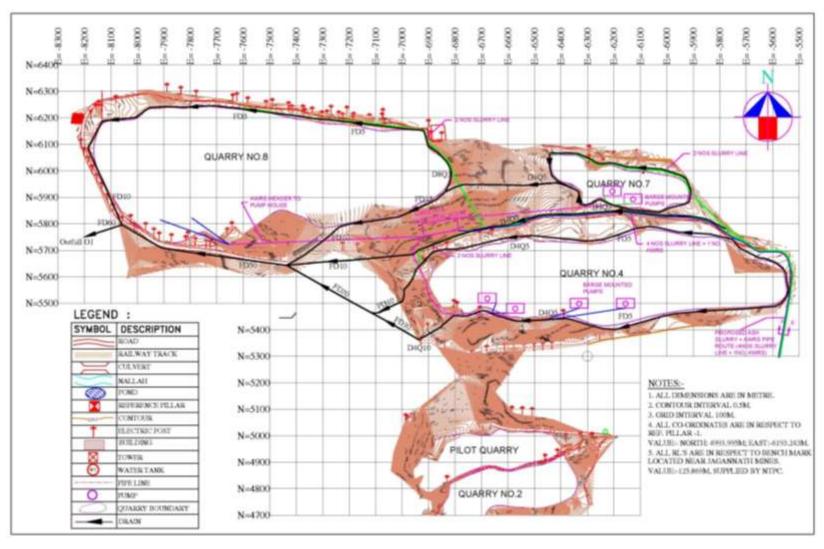


Figure 7.10 Lay out of drains on periphery of Quarry 4, Quarry 7 and Quarry 8

CLAUSE NO.		TECH	NICAL REQ	UIREME	NT	एनरीपी NTP					
D-1-12(M)				ANNE	EXURE – M						
	-	cification For High Per ting System	rformance Mo	isture Con	npatible Corrosion Resistan	it					
	a)	Resistant Coating	<b>System</b> mar ical Research	nufactured	Moisture Compatible Co as per technical specificat Karaikudi, (C.S.I.R. affiliate In	ions of					
	b)	conditions also and	shall be tole The system sh	rant to un	ble, compatible for applying der-prepared surfaces and quick curing so as to be suit	existing					
		_	eady for use.	The coatin	nner as per recommendation ng material shall be used wit e.						
	c) The coating system shall conform to the following :										
		PI	ROPERTIES C	F PAINT							
		Base		High Perf Moisture Compatib Corrosion Coating S CECRI kr system	ole n Resistant System						
		Volume Solids		70%							
		Specific Gravity (AS	STM-D-1475)	1.25 ± 0.1	1						
		Dry Film Thickness 1186)	(ASTM-D-	160 ± 10	μm per coat						
		Coverage		4 - 4.5 sq	.m/ ltr						
		Touch Dry		2 Hours							
		Recoating		24 Hours							

CLAUSE NO.		TECH	INICAL REQ	UIREMEI	NT	एनरीपीमी NTPG
		P	PROPERTIES C	F COATIN	 G	
		Salt Spray (ASTM-	-B 117)	2000 Hou	rs	
		Resistance to sea	water	Passes		
		(Carried out upto 6	6 months)			
		Coating Resistance	е	10 <sup>9</sup> Ω. cm	2	
		(Carried out upto 6	6 months)			
		Adhesion (ASTM-I	O 4541)	4.5 N/mm	Sq	
		Flexibility (ASTM-D	D-522)	1/8" passe	es	
		Elongation		33%		
		Impact (ASTM G 1	4–04)	45 cm pas	sses	
	!	High Performanc	e Moisture	Compatible	Caraikudi for technical know Be Corrosion Resistant By shall be got duly approve	Coating
TALCHER THER PROJECT STAGE EPC PAC	-III (2X660 MW)	BID DOC. NO.: CS-4540-001-2	TECHN SPECIFIC/ SECTION-VI	ATIONS	SUB SECTION D-1-12(M) High Performance Moisture Compatible Corrosion Resistant Coating System	Page 2 of 2

## Details of facilities to be dismantled

The control of the					1	Detai	is of facilities to be dismanti	cu	1		1
Control of Control o				Plinth Area							
March   Marc	Sl. No.	Name of facility				Type of Super-structure	Type of Sub-structure		Scope of Dismantling	Facilities envisaged under TTPS Stage-III	
Part			of Units		Area {Sq.m.}			Configuration			Location of facility
Part	1	F-type & F-type Orts in BHFI sector	39	150	5850	Brick masonry load bearing walls	Brick masonry foundation with PCC mudmat	Triple storey	Sub-structure	PT Plant	
	2		1				,				
	3		1		350	Brick masonry load bearing walls	Brick masonry foundation with PCC mudmat		Sub-structure		
Bit St. Chemps	4	2R 121 -136 - Sector 2	4	150	600	Brick masonry load bearing walls	Brick masonry foundation with PCC mudmat	Single Storey	Sub-structure	Switchyard CR & Canteen	
Page 100   100	5	2R 49-68 - Sector 2	5			Brick masonry load bearing walls	Brick masonry foundation with PCC mudmat	Single Storey	Sub-structure	Main Plant - TG Bay	
Part	6									· ·	
March   10   10   10   10   10   10   10   1	7		10								
Register   1	8		7								Residential
1	10		16				,				facilities in
	11	7	1							<u> </u>	
10   Rep   18-15   2   2017   19   10   10   10   10   10   10   10	12	/	2				,			1	lownsnip
Texas   Section   10	13		5								area
Teach   Teac	14		15							,	
The Content of the	15	3R 1-16 Sector 2	8	350	2800	Brick masonry load bearing walls	Brick masonry foundation with PCC mudmat		Sub-structure	Main Plant - TG Hall & FO handling area	
1	16	3R 17-21/ 62-65	4	350	1400	Brick masonry load bearing walls	Brick masonry foundation with PCC mudmat	Single Storey	Sub-structure	Inplant Railway siding	
1	17	NC 1-4 Temp sector	1			Brick masonry load bearing walls	Brick masonry foundation with PCC mudmat	Double Storey	Sub-structure	Inplant Railway siding	
Part   Tell Secure   Part   198   200   Secure Note Secure and Secure Control   Secure Secure Control   Se	18		8				·			, ,	
	19	·	8				,			• • • • • • • • • • • • • • • • • • • •	
20   Control Sept.   1   10   10   10   10   10   10   10	20		/				·			•	
1	22		1								
A	22		1					,			
2	24		1				,				
No.   Common   Comm	25		1								
2	26		1				·			·	
25   Mary Manages   1   75   5   67   67   67   67   67   67	27		1	15	15	Brick masonry load bearing walls	Brick masonry foundation with PCC mudmat		Sub-structure	Main Plant - TG Bay	
Description   1	28	Cable tv room	1	46	46	Brick masonry load bearing walls	Brick masonry foundation with PCC mudmat	Single storey	Sub-structure	Main Plant - Transformer Yard	
1.   Source of the Control   1	29	Mangla mandir	1	75	75	Brick masonry load bearing walls	Brick masonry foundation with PCC mudmat	Single storey	Sub-structure	Main Plant - Transformer Yard	
Descriptor   Control   C	30	Kalayani Mandap	1			Brick masonry load bearing walls	Brick masonry foundation with PCC mudmat	Single storey			
10   10   10   10   10   10   10   10	31		1								
The Ferrors quarter guarter guarter   1   20   20   20   30   30   30   30   30	32		1			, ,	,	<del> </del>	1		-
20   Set Barrack Nortice   1   26   254   2548   set of manony foundation with PCC multiples   1   2548   2548   set of manony foundation with PCC multiples   2549   Set of	33		1								_
1	34		1		1						-
Month   Mont	36		1								-
25   STEEL, Market   1   150	37		1								Non-
20	38	BHEL Market	1		1500		Brick masonry foundation with PCC mudmat		Sub-structure	PT Plant	recidential
## ACT HISRIN SCHOOL    1	39	LITTLE ANGEL SCHOOL	1	250	250	Brick masonry load bearing walls	Brick masonry foundation with PCC mudmat	Double storey	Sub-structure	Main Plant area - Boiler	
Automotion   1	40	DAY TT HIGH SCHOOL	1	1052	1052	Prick maconry load bearing walls	Prick masonry foundation with DCC mudmat	1	Sub structure	Main Plant area -ID Fan	facilities in
A	40		1				,				Townshin
ACCOUNTING Store   1	41	BANK BUILDING	1	742	742	Brick masonry load bearing walls	Brick masonry foundation with PCC mudmat	Double storey	Sub-structure	AWRS & Ash classification	TOWNSHIP
ADDITION NAIL   1	42	T/S Civil Office	1	100	100	Brick masonry load bearing walls	Brick masonry foundation with PCC mudmat	Double storey	Sub-structure	CWPH	area
ADDITION NAIL   1	43	T/S Civil Office Store	1	400	400	Brick masonry load bearing walls	Brick masonry foundation with PCC mudmat	Single Storey	Sub-structure	CWPH	
An   Stage   1   288   298   Structurer Steef with Brick in-III panels   C. Coundation with P.CC mudmat   Single Storery   Sub-structure   Main Plant area - ESP	44	BADMINTON HALL	1	406	406	Structurel Steel with sheet cladding	RCC foundation with PCC mudmat			Main Plant area - Boiler	
DOLD MAN Building	45	-	1					,			
MATER TANK & PUMP HOUSE	46		1		221	Structurel Steel with Brick in-fill panels	RCC foundation with PCC mudmat	,	Sub-structure	Main Plant - Transformer Yard	
Page   17.5 EECTRICALO FIFE   1   064	47	OLD UPL Building	1	106	106	Brick masonry load bearing walls	Brick masonry foundation with PCC mudmat	Single storey	Sub-structure	Chmney	
OSF BARRACK   1   3338   3328   Structured Seet with Brick in fill panels   RCC houndation with PCC mudmat   Single Storey   Sub-structure   Track Hopper	48		1					Triple storey		,	
SAS GOWDOWN   1   122   112	49		1			, ·				,	
SAI MANDIR SHED	50		1								
RC frundation with PCC mudmat Single Storey Sub-structure Main Plant - Transformer Yard Steel Shed RC Structural Steel shed RC Grundation with PCC mudmat Single Storey Sub-structure Main Plant area - ESP Main Plant area	51		1			,					
Security barrack   1   1984   1984   1984   Structural Steel shed   RCC foundation with PCC mudmat   Single Storey   Sub-structure   Main Plant area - ESP	52	SAI MANDIK SHED	1								
DAY TH SCHOOL CSTAND   1   365   365   Structural Steel shed   RCC foundation with PCC mudmat   Single Storey   Sub-structure   Main Plant area -ID Fan	54	Security harrack	1								
GRIDCO OFFICE   1   347   347   347   Structural Steel shed   RCC foundation with PCC mudmat   Single Storey   Sub-structure   Switchyard	55		1								
Ash Brick manufacturing Plant 2 750 1500 Structural Steel shed RCC foundation with PCC mudmat Single Storey Sub-structure Switchyard  58 Vehicle Parking Sheds 1 400 400 Structural Steel shed RCC foundation with PCC mudmat Single Storey Sub-structure Main Plant area handling, TAC,CAC &ESP  59 Store Sheds 28 640 17920 Structural Steel shed RCC foundation with PCC mudmat Single Storey Sub-structure Main Plant area handling, TAC,CAC &ESP  60 Under ground RCc sump Under ground RCc sump Individual Sub-structure Main Plant - Park and in Plant - Pa	56		1								
Vehicle Parking Sheds   1	57		2							·	
Some Sheds 28 640 17920 Structural Steel shed RCC foundation with PCC mudmat Single Storey Sub-structure Main Plant - Ash handling, TAC,CAC & ESP Under ground Diesel tank 1 100 100 100 Under ground RCC sump Sub-structure Main Plant - 10 fan area Main Plant area - 10 fan	58	, and the second	1								
Fig. Watch Towers 7 20 140 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Triple storey Sub-structure Main Plant & CHP area  62 Admin Building 1 2998 2998 RCC structure with Brick in-fill panels RCC foundation with PCC mudmat Double storey Sub-structure Main Plant area -CPU area  63 C&M office Building 1 378 378 RCC structure with Brick in-fill panels RCC foundation with PCC mudmat Double storey Sub-structure Main Plant area -TAC  64 Old Admin BUILDING 1 1622 RCC structure with Brick in-fill panels RCC foundation with PCC mudmat Double storey Sub-structure Main Plant area -PDU area  65 Safety building 1 103 103 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area -CPU area  66 Weigh Bridge Room 1 40 40 40 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area -TAC  67 DG room 1 53 53 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area -CPU area  68 plant tea stall 1 86 86 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area -CPU area  68 plant tea stall 1 86 86 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area -CPU area  69 Stage-l Raw water reservoir 1 21000 21000 CC Clined under-ground reservoir Super-structure & Sub-structure CHP area - CH, coal stock pile & Gypsum area  70 Heavy Machinery shed 1 320 320 Structural Steel shed RCC foundation with PCC mudmat Single Storey Super-structure & Sub-structure CHP area - CH, coal stock pile & Gypsum area	59	Store Sheds	28	640	17920	Structural Steel shed	RCC foundation with PCC mudmat		Sub-structure	Main Plant - Ash handling, TAC,CAC & ESP	
Admin Building 1 2998 2998 RCC structure with Brick in-fill panels RCC foundation with PCC mudmat Double storey Sub-structure Main Plant area -CPU area  62 C&M office Building 1 378 378 RCC structure with Brick in-fill panels RCC foundation with PCC mudmat Double storey Sub-structure Main Plant area -TAC  64 Old Admin BUILDING 1 1622 1622 RCC structure with Brick in-fill panels RCC foundation with PCC mudmat Single storey Sub-structure Main Plant area -Boiler  65 Safety building 1 103 103 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area -CPU area  66 Weigh Bridge Room 1 40 40 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area -CPU area  67 DG room 1 53 53 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area -CPU area  68 plant tea stall 1 86 86 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area -CPU area  69 Stage-I Raw water reservoir 1 21000 21000 C1000 C1000 C1000 C1000 Structural Steel shed RCC foundation with PCC mudmat Single Storey Sub-structure Sub-structure CHP area - CH, coal stock pile & Gypsum area  70 Heavy Machinery shed 1 320 320 Structural Steel shed RCC foundation with PCC mudmat Single Storey Super-structure & Sub-structure CHP area - CH, coal stock pile & Gypsum area	60	Under ground Diesel tank	1								
C&M office Building 1 378 378 RCC structure with Brick in-fill panels RCC foundation with PCC mudmat Double storey Sub-structure Main Plant area -TAC  64 Old Admin BUILDING 1 1622 1622 RCC structure with Brick in-fill panels RCC foundation with PCC mudmat Double storey Sub-structure Main Plant area - Boiler  65 Safety building 1 103 103 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area -CPU area  66 Weigh Bridge Room 1 40 40 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area -CPU area  67 DG room 1 53 53 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area -CPU area  68 plant tea stall 1 86 86 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area -Boiler  69 Stage-I Raw water reservoir 1 21000 21000 CC lined under-ground reservoir Super-structure & Sub-structure CHP area - CH, coal stock pile & Gypsum area  70 Heavy Machinery shed 1 320 320 Structural Steel shed RCC foundation with PCC mudmat Single Storey Super-structure & Sub-structure CHP area - CH	61	Watch Towers	7	20	140	Brick masonry load bearing walls	Brick masonry foundation with PCC mudmat	Triple storey	Sub-structure	Main Plant & CHP area	
64 Old Admin BUILDING 1 1622 1622 RCC structure with Brick in-fill panels RCC foundation with PCC mudmat Double storey Sub-structure Main Plant area - Boiler 65 Safety building 1 103 103 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area - CPU area 66 Weigh Bridge Room 1 40 40 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area - TAC 67 DG room 1 53 53 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area - CPU area 68 plant tea stall 1 86 86 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area - Boiler 69 Stage-I Raw water reservoir 1 21000 21000 CC lined under-ground reservoir Super-structure & Sub-structure CHP area - CH, coal stock pile & Gypsum area 70 Heavy Machinery shed 1 320 320 Structural Steel shed RCC foundation with PCC mudmat Single Storey Super-structure & Sub-structure CHP area - CH	62	Admin Building	1	2998	2998	RCC structure with Brick in-fill panels	RCC foundation with PCC mudmat	Double storey	Sub-structure	Main Plant area -CPU area	
64 Old Admin BUILDING 1 1622 1622 RCC structure with Brick in-fill panels RCC foundation with PCC mudmat Double storey Sub-structure Main Plant area - Boiler 65 Safety building 1 103 103 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area - CPU area 66 Weigh Bridge Room 1 40 40 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area - TAC 67 DG room 1 53 53 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area - CPU area 68 plant tea stall 1 86 86 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area - Boiler 69 Stage-I Raw water reservoir 1 21000 21000 CC lined under-ground reservoir Super-structure & Sub-structure CHP area - CH, coal stock pile & Gypsum area 70 Heavy Machinery shed 1 320 320 Structural Steel shed RCC foundation with PCC mudmat Single Storey Super-structure & Sub-structure CHP area - CH	63	C&M office Building	1	378	378	RCC structure with Brick in-fill panels	RCC foundation with PCC mudmat	Double storey	Sub-structure	Main Plant area -TAC	
Safety building 1 103 103 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area -CPU area  Main Plant area -CPU area  Main Plant area -TAC  Main Plant area -TAC  Sub-structure Main Plant area -TAC  Main Plant area -TAC  Main Plant area -TAC  Main Plant area -CPU area  Sub-structure Main Plant area -CPU area  Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area -CPU area  Sub-structure Main Plant area -CPU area  Sub-structure Main Plant area -CPU area  Sub-structure Main Plant area -CPU area  Main Plant area -CPU a	64	-	1			,		· ·			
Weigh Bridge Room 1 40 40 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area -TAC  DG room 1 53 53 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area -CPU area  Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area -CPU area  Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area -Boiler  Stage-I Raw water reservoir 1 21000 21000 CC lined under-ground reservoir Super-structure & Sub-structure CHP area - CH, coal stock pile & Gypsum area  Heavy Machinery shed 1 320 320 Structural Steel shed RCC foundation with PCC mudmat Single Storey Super-structure & Sub-structure CHP area - CH	04		1			·					
67 DG room 1 53 53 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area -CPU area 68 plant tea stall 1 86 86 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area - Boiler 69 Stage-I Raw water reservoir 1 21000 21000 CC lined under-ground reservoir Super-structure & Sub-structure CHP area - CH, coal stock pile & Gypsum area 70 Heavy Machinery shed 1 320 320 Structural Steel shed RCC foundation with PCC mudmat Single Storey Super-structure & Sub-structure CHP area - CH	65		1								
plant tea stall 1 86 86 Brick masonry load bearing walls Brick masonry foundation with PCC mudmat Single storey Sub-structure Main Plant area - Boiler  Stage-I Raw water reservoir 1 21000 21000 CC lined under-ground reservoir Super-structure & Sub-structure CHP area - CH, coal stock pile & Gypsum area  Heavy Machinery shed 1 320 320 Structural Steel shed RCC foundation with PCC mudmat Single Storey Super-structure & Sub-structure CHP area - CH	67		1								
69 Stage-I Raw water reservoir 1 21000 21000 CC lined under-ground reservoir Super-structure & Sub-structure CHP area - CH, coal stock pile & Gypsum area 70 Heavy Machinery shed 1 320 320 Structural Steel shed RCC foundation with PCC mudmat Single Storey Super-structure & Sub-structure CHP area - CH	68		1								
70 Heavy Machinery shed 1 320 320 Structural Steel shed RCC foundation with PCC mudmat Single Storey Super-structure & Sub-structure CHP area - CH	69		1			Took seeing mails					
	70		1			Structural Steel shed	-	Single Storey	'		
	71	'	1						'		

72	Waste storage shed	1	180	180	Structurel Steel shed	RCC foundation with PCC mudmat	Single Storey	Super-structure & Sub-structure	CHP area	
73	Stage-II Raw water reservoir	1	20000	20000		CC lined under-ground reservoir		Super-structure & Sub-structure	CHP area - coal stock pile, truck tippler, TP-9 & Dozer shed	
74	Stage-II Raw Water Pumphouse	1	200	200	RCC structure with Brick in-fill panels	Under ground RCC sump	Double storey	Super-structure & Sub-structure	TP-8	Facilities in
75	Stage-II PT Plant clarifiers	2	1100	2200	RCC Over-ground 30m dia	RCC foundation with PCC mudmat	Single Storey	Super-structure & Sub-structure	Pipe conveyor	
76	Stage-II PT Sludge sump & Pumphouse	1	80	80	Structural Steel shed	Under ground RCC sump	Single Storey	Super-structure & Sub-structure	Pipe conveyor	Plant area
77	Stage-II PT Plant Building including clarified/Filtered water Pumphouse, sump, Chemical House etc	1	700	700	RCC structure with Brick in-fill panels	Under ground RCC sump	Double storey	Super-structure & Sub-structure	Pipe conveyor	
78	AAQMS Room	1	20	20	Brick masonry load bearing walls	Brick masonry foundation with PCC mudmat	Single storey	Super-structure & Sub-structure	CSSP	
79	Cylinder Shed	1	70	70	Structurel Steel	RCC foundation with PCC mudmat	Single Storey	Super-structure & Sub-structure	CSSP	
80	Coal Slurry Settling pit	1	1200	1200		brick masonry under-ground pit		Super-structure & Sub-structure	Coal stock Pile	
81	Dozer shed	1	500	500	Structurel Steel shed	RCC foundation with PCC mudmat	Single Storey	Super-structure & Sub-structure	Coal stock Pile	
82	Coal yard shed	1	1000	1000	Structurel Steel shed	RCC foundation with PCC mudmat	Single Storey	Super-structure & Sub-structure	BOP Laydown area	
83	TP-14	1	180	180	Structurel Steel shed with side cladding	RCC foundation with PCC mudmat	Triple storey	Super-structure & Sub-structure	Coal stock Pile	
84	Ground Conveyor 16A/B - 2m wide 600m long	1	1200	1200	Ground conveyor along with stacker-Reclaimer support rails			Super-structure & Sub-structure	Coal stock Pile	
85	Conveyor 17 - overground - 5m wide 275m long	1	1375	1375	Overhead structural steel conveyor gallery	RCC foundation with PCC mudmat		Super-structure & Sub-structure	BOP Laydown area	
86	Conveyor 17 - underground - 5m wide 80m long	1	400	400		Under-ground RCC tunnel		Super-structure & Sub-structure	BOP Laydown area	
87	Site Store sheds	1	1500	1500	Brick masonry load bearing walls	Brick masonry foundation with PCC mudmat	Single Storey	Super-structure & Sub-structure	Coal stock Pile	

CLAUSE NO.	т	ECHNICAL REQUIREMENTS	5	एनशैपीसी NTPC
D-1-12(C)		GEOTECHNICAL DATA	Annex	ure (C)
TALCHER TI	PP STAGE-III (2X660 MW) PC PACKAGE	TECHNICAL SPECIFICATIONS SECTION-VI, PART-B DOC NO. CS-4540-	SUB-SECTION-D-1-12 (C) CIVIL WORKS BORE HOLE DATA	PAGE 1 OF 263

ſ	Project : Prelimi	narv G.	I. Work for Tal	lcher	<b>↓</b> Ther	rmal	Powe	er Pro	iect-	·III (2x660	MW). <b>(=</b>	T=ST
[	Job No : 3975		Created by:							•	Sheet N	
	BORE LOG	DATA	SHEET	BO	RE	H	LE	NO.	1	Co-o	rdinates N=	:1321 :4260
	Field Test	Nos	Samples		Nos	3		icement etion			)8/17 )8/17	
	Penetrometer (SPT	) 2	Undisturbed (U		0	- 1	•	ole Dia			mm. / N.	x.
	Cone (Pc)		Penetrometer ( Disturbed (DS)	(SPT)	2 2	- 1		Of Gro Struct			73 m.	
	Vane (V)		Water Sample	(WS)	0	- 1		Struci Water			m.	
Ī	DES	CRIPTION	· · · · · · · · · · · · · · · · · · ·	SYMB	OL			ALUE			SAMPLES	
-			0.00m	J:::1 1:::1	E	EACH	DIVN	. = 1	5cm.	Ref. No	Depth	(m)
_	Very dense, yello with boulder. (SM)				10	00 5. 00 2.	) km Re	fusal Pentn fusal Pentn		DS-1 *SPT-1 *SPT-2 R1	0.50 1.00-1 1.10-1.12 CR=56% RQD=NIL	.05
						NX rd 1.1	tary d Om to	rilling 1 16.10r	from n	R2	CR=52% RQD=NIL CR=60%	1.85 2.60
	Moderately to yellowish grey, fractured sandstone	fine gr								R3 R4	RQD=16% CR=64%	3.35
		••		井	닠					R5	RQD=NIL CR=66%	4 10
										R6	RQD=18% CR=72% RQD=NIL	4.85
•			5.60m							R7	CR=68% RQD=NIL	5 60
					닠					R8	CR=72% RQD=NIL	6.35
										R9	CR=70% RQD=32%	7,10
				H						R10	CR=84% RQD=32%	7 <b>.</b> 85
										R11	CR=76% RQD=23%	8:60
										R12	CR=78% RQD=16%	9:35
	Slighty weathered									R13	CR=82% RQD=24%	10:10
	grained, moderatel	ly Irdell	irea sanastone.							R14	CR=76% RQD=23%	10.85
					립					R15	CR=83% RQD=36%	↓
										R16	CR=78% RQD=48%	12.35
										R17	CR=88% RQD=24%	13.10
										R18	CR=85% RQD=52%	13.85
					닠					R19	CR=96%	
	N.B. — '*' mean be recovered.	ıs sam	ple could not 16.10m								RQD=80%	16.10
			16.10m	1	<b>1</b>						   BH-	16.10 1/Sheet-1

Project : Prelimina	arv G.	I. Work for Ta	lcher	<b>↓</b> The	rmal	Powe	er Pro	oiect-	·III (2x660	MW). <b>C</b>	TEST	1
Job No : 3975		Created by:						_	17/08/2017	Sheet N		
BORE LOG D	ATA	SHEET	BO	RE	НО	LE	NO	. 2	Co-o	rdinates E	=1420 =4257	
Field Test	Nos	Samples		No:	3			nt Date	: 29/0	)7/17 )8/17		
Penetrometer (SPT)	4	Undisturbed (U	DS)	1	- 1	•		Date ameter		mm. / N	. x.	
Cone (Pc)		Penetrometer (	(SPT)	4	Le	/el	Of Gr	round	: 72.49	92 m.		
Vane (V)		Disturbed (DS)	(110)	3	''			ck At				
varie (v)		Water Sample	(WS)				Wate ALUE	r Leve		<u>m.</u> SAMPLES		_
DESCF	RIPTION	١	SYMB					15cm.		Depth	(m)	
		0.00m										
									DS-1	0.50	)	
									UDS-1	1.00-1	1 45	
Medium dense, br	ownis	h yellow silty		1			24		WS-1	1.20 1.45-1	)	
sand with kankars	. (SM	1)			0 8 1				SPT-1	1.45-1	1.90	
									DS-2	2.50	)	
		3.00m			6 10 2	2	<u>32</u>		SPT-2	3.00-3	3.45	
	• • •											
Hard, deep yellow, silt with sand mixtu	silty re. (C	clay / clayey :1)	11/1			D <sub>C</sub>	fusal		DS-3	4.00	)	
				\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	0010.0	cm	Pent	n.	SPT-3	4.50-4	1.60	
		4.80m		· 1	00	Re	<u>fusal</u>		*SPT-4	4.80-4.82	2 <b>4.80</b>	
				낶	2.0	¢m	Pent 	:n.	R1	CR=28% RQD=NIL	_ <b> </b>	4
			$\frac{1}{1}$	╁╢╷	NX rot				R2	CR=32%	5 <b>.</b> 55	
				1111	4.60	m to	30.05	3m		RQD=NIL	6,30	
				H					R3	CR=26% RQD=NIL		
				<del>     </del>					D4	CR=30%	7 <b>.</b> '05	
Highly weathered,				$\prod$					R4	RQD=NIL	7.80	
to medium grained,	Tracti	area sanasione.							R5	CR=30% RQD=NIL	Ì	
										CR=28%	8.55	
									R6	RQD=NIL	9.30	
				Ш					R7	CR=30% RQD=NIL		
											10,05	
				Щ					R8	CR=27% RQD=NIL	10,00	
				Д.					R9	CR=28%	10:80	
		11.50m	<del>Д II,</del>	Щ						RQD=NIL	11,50	
				Ц					R10	CR=75% RQD=53%		
									R11	CR=85%	12:25	
			HH	$\dashv$						RQD=19%	13,00	
Slightly weathered / to medium grained,				井					R12	CR=76% RQD=20%		
to mediani grained,	nucli	arca sanastone.							D47	CR=72%	13 <b>.</b> 75	
			<del>                                     </del>	4					R13	RQD=NIL	14.50	
				耳					R14	CR=75% RQD=NIL		
		15.25m									15.25	
										BH-	-2/Sheet-1	ı

ī	D : 4 D		~	T TIT 3 A M 3	•	<b>1</b>				n .		*** (0.000	) F TOT \		
-	Project : Pre Job No : 397		ary G.	I. Work for Tall Created by:										): 	1
-			ATA	SHEET	BOI							T T	E=	=1420 =4257	
-	Field Test	•	Nos	Samples		Nos	1			nent [			7/17	1207	
	Penetrometer	(SPT)	4	Undisturbed (U	-	1		•		on Do Diam			o/ 1 / mm. / N.	X.	
	Cone (Pc)			Penetrometer (	SPT)	4	1			Grou			92 m		
	\/ano (\/)			Disturbed (DS)		3	1			ruck					
-	Vane (V)			Water Sample	(WS)	$\stackrel{o}{-}$	Sto			ater L	evel				
		DESCF	RIPTION	l	SYMB		A C L	N-V		: 15c		Ref. No	SAMPLES Depth	(m)	
ŀ				 15.25m				ועוט	. <u>-</u>	- 130	m.	Rei. No	Берин		
				10.20111								R15	CR=85% RQD=NIL	16.00	
												R16	CR=89% RQD=NIL	16.75	
												R17	CR=81% RQD=NIL		
													·	18.25	
												R18	CR=61% RQD=NIL		
												R19	CR=85% RQD=NIL	19.75	
•												R20	CR=83% RQD=NIL	20.50	<b>+</b>
												R21	CR=80% RQD=NIL		
				deep grey, fine red sandstone.										22.75	
												R22	CR=87% RQD=NIL		
													OD-00%	24.25	
												R23	CR=92% RQD=25%	<b>↓</b>	
												R24	CR=81% RQD=NIL	25.75	
													NQD-IIIE	27.25	
											R25	CR=85% RQD=NIL			
						Ħ								28.75	
												R26	CR=86% RQD=08%	;	
	N.B. — '*' m be recovered.	neans	samp	30.05m ole could not										30.05	
L	De l'ecovereu.					<b>↑</b>			Ш				BH-:	2/Sheet-2	] ?

Project : Prelimina	ry G. I	I. Work for Ta	lcher	<b>↓</b> Theri	nal F	ower	Proje	<u>ct</u> -1	III (2x660	MW).	TES
Job No: 3975		Created by:	Char	ıdrar	i Cr	eated	l on	: 2	2/09/2017		
BORE LOG D	ATA	SHEET	BO	RE	HOI	E I	10.	3	Co-o	rdinates <mark>E=</mark> N=	=1510 =4270
Field Test	Nos	Samples		Nos			ment I on D			18/17 18/17	
Penetrometer (SPT)	4	Undisturbed (L	JDS)	1	1	•	Diam			mm. / N.	X.
Cone (Pc)		Penetrometer		4			Grou			13 m.	
Vane (V)		Disturbed (DS)		2 0			ruck			<b></b>	
· ·	I	Water Sample		Ť		I-VAL	/ater L UE	.evei		SAMPLES	
DESCR	PIPTION		SYMB	OL E				m.	Ref. No	Depth	(m)
		0.00m									
Filled up soil consis	sts of (	deep brownish							DS-1	0.50	)
grey, silty sand with		bats.				16			*UDS-1	1.00-1	.45
Very stiff to hard	d are		1. \ `.	<u></u> 5	7 9				SPT-1	1.55-2	.00
silty clay with fine		nixture. (CI)		42	57 5.0	>10			SPT-2	2.10-2	.30
Very dense, yello				100		Refu cm P	<u>sal</u>		*SPT-3	2.45-2	.48
fined sand with rock	dust.	(SM) <u>2</u> .55m		Щю		Refu	<u>sal</u>		DS-2 *SPT-4	2.55 2.55 2.55	2.55
				<u> </u>	3.0	cm P	enth.		R1	CR=24% RQD=NIL	
				H N	rota	ry dril	ling fr 0.00m	 			3,25
				Н	2.331		V.00m		R2	CR=28% RQD=NIL	
				Щ							<b>4.</b> 00
				<del>-</del>					R3	CR=36%	
				<del>     </del>						RQD=NIL	<b>↓</b> 4.75
Highly to moderately	weathe	ered, yellowish							R4	CR=46%	Ï
brown, fine to med fractured sandstone.									114	RQD=NIL	_ \ 
mactarea samastone.				Щ						CR=40%	5.50
				Щ					R5	RQD=16%	
				Щ							6.25
									R6	CR=42% RQD=18%	
				╫							7.00
				H					R7	CR=48% RQD=NIL	
		7.75m	╻ <mark>╟╶╌┼╌┼</mark> ┆ <del>╏╶╏╏</del>	井							7;75
				<del>     </del>					R8	CR=50% RQD=30%	
				<del>     </del>							8.50
Moderately weathers	ad val	lowish brown							R9	CR=56%	
fine to medium	graine	d, highly to							-,-	RQD=16%	9.25
moderately fractured	sandst	tone.		Щ					D10	CR=45%	
				Щ					R10	RQD=17%	1
				$\square$					D11	CR=48%	10.00
		10.50m		Ш					R11	RQD=22%	

	Project : Prelimi	inarv G.	I. Work for Ta	lcher	<b>↓</b> Therr	mal l	owe	r Pro	iect-	III (2x660	MW). CETEC	<b>.</b>
	Job No : 3975		Created by:						-	•	Sheet No:	
	BORE LOG	DATA	SHEET	BO	RE						rdinates E=151 N=427	0
	Field Test	Nos	Samples		Nos				t Date Date		)8/17 )8/17	
	Penetrometer (SPT	7 4	Undisturbed (U		1	Bore	· Ho	le Dic	meter	: 150	mm. / N. X.	
	Cone (Pc)		Penetrometer (	SPT)	4	1			ound		43 m.	
	Vane (V)		Disturbed (DS)	(MC)	2 0				k At			
	valio (v)		Water Sample		Ť			LUE	Level		SAMPLES	
	DES	CRIPTION	1	SYMB	OL EA				5cm.	Ref. No	Depth (m)	
			10.50m								10.	75
										R12	CR=57% RQD=40% 11.	.50
										R13	CR=62% RQD=20% 12.	,
	Moderately weather fine to medium moderately fractur	n grain	ed, highly to	<u>                                    </u>						R14	CR=46% RQD=16%	,
					<u> </u>					R15	13. CR=49% RQD=18%	,
<b>→</b>										R16	13. CR=48% RQD=22%	•
			——— 14.50m							R17	14. CR=69% RQD=20%	50
										R18	15. CR=64% RQD=NIL	25
										R19	16. CR=79% RQD=48%	00
	Slightly weathered,	brownis	h grey, medium							R20	16. CR=62% RQD=36%	75
	grained, moderately				T T					R21	17. CR=64% RQD=23%	50
										R22	18. CR=76% RQD=33%	25
											19. 	00
			20.00m							R23	CR=78% RQD=38% 20.	.00
			20.00111								20.	
	N.B. — '*' mear be recovered.	ns sam	ple could not									
•					1						BH-3/She	et-2

1	Desirat . De	1::	C	I Wanta for Ma	1 - 1	<b>↓</b>		1 D	T	) <del></del> 4	III (0eeo		<b>=</b> _T
		renmina 975	ıry G.	I. Work for Ta Created by:									<u>=&gt; 1</u> :
	BORE L		ATA							0. 4		rdinates E=16 N=42	507 2 <b>4</b> 5
	Field Te	st	Nos	Samples		Nos	3			ent Dat	te: 04/0	08/17 08/17	
	Penetrometer	(SPT)	3	Undisturbed (U		1	- 1			Diamete		mm. / N.	x.
	Cone (Pc)			Penetrometer (		3				Groun		19 m.	
	Vane (V)			Disturbed (DS)		2				uck A			
	varie (v)			Water Sample	(WS)	0	5			ter Lev		m. SAMPLES	
		DESCR	IPTION	I	SYMB		ACI		VALUI N. =		n. Ref. No	Depth (	m)
			brow	0.00m n, silty sand			4 16	124	40		DS-1 UDS-1 SPT-1	0.50 1.00-1.4 1.45-1.9	
	/ sandy silt.			3.00m			5 56		>10C	<u>)</u>	DS-2 SPT-2	2.50 3.00-3.2	
	Very dense silty sand wi			grey, clayey ed rock. (SM) ————4.00m		Щ <sup>Т</sup>	00	7.0 <u>E</u>	Refus		*SPT-3	4.00-4.02	
							2	.0 cr	n Pe	nth.	R1 R2	CR=68% RQD=23% CR=68%	4.75
							NX 4.	otary 00m	drillii to 17	ng fron .50m		RQD=15% CR=79% RQD=31%	5.50
•				resh, greyish							R4	CR=92% RQD=NIL	6.25
	yellow, me fractured san		to f	ine grained,							R5	CR=75% RQD=40%	7.00
											R6	CR=91% RQD=24%	7:75
											R7	CR=79% ROD=15%	8.50
				10.00							R8	CR=73% ROD=15%	9.25
				——— 10.00m		<del>=</del>					R9	CR=87% ROD=37%	0.00
											R10	CR=88% ROD=17%	0:75 1:50
											R11	CR=83% RQD=15%	700
	Fresh, deep o		dium	to fine grained,							R12	CR=84% RQD=24%	3.00 4.50
											R13	CR=83% RQD=29%	
				47.50							R14	CR=82% RQD=33%	6:00
	N.B. — '*' be recovered.		samı	17.50m ole could not									7:50
						T						BH-4	∕Sheet-1

Project : Prelimina	ary G.	I. Work for Tal	lcher	<b>↓</b> The	erm	al P	owe	er Pr	oject	:-III	(2x660	MW). <b>(=</b>	TES1	
Job No : 3975	4 CT 4	Created by:												7
BORE LOG D	A'I'A	SHEET	BO	KE							_	ordinates N=	4230	_
Field Test	Nos	Samples		No	)S				nt Do Dat			08/17 08/17		
Penetrometer (SPT)	3	Undisturbed (U	-	1					iamet			mm. / N.	Χ.	
Cone (Pc)		Penetrometer (	(SPT)	3					roun		72.4	92 m.		
Vane (V)		Disturbed (DS)	(MC)	1					ick A		1 55			
valle (V)		Water Sample			<u>'  </u>			wate ALUE	er Lev	ei:		 SAMPLES		-
DESCF	RIPTION	N	SYMB	아	EAC					1. R	ef. No	1	(m)	-
		0.00m												
											DS-1	0.50		
Filled up soil consists											D3-1	0.50		
medium to coarse grain	ied sar	nd. Obs. boulders.								<b>.</b>	UDS-1	1.00-1	70	
		4.50						100			DD2-1	1.00-1	.30	
Very dense, yell	- · · · · - ·	1.50m			23	16 21 5.0					SPT-1	1.50-1	.85	
medium grained sar	id. Ob	os. decomposed				5.0		Pen fusa						
rock. (SM)		0.50		IIII I		4.0		Pen			SPT-2	2.20-2		
		2.50m			06	4.0	Re cm	fusal Pen	<u>l</u>     itn.	*	SPT-3	2.50-2.54	2.50	
   Moderately to sl	iahtl	v weathered.		$\square$							R1	CR=53% RQD=19%		
brownish grey, fine				凵									3.25	
sandstone.				Ч	NX	rota:	y d	rilling	fron	ן ר	R2	CR=64% RQD=51%		
		4.00m		Ц			10	10.0	)'''				4.00	
											R3	CR=93%		
			$H^{\perp}$	$\dashv$							11.0	RQD=90%	.↓	
				П								CR=92%	4:75 	
				╚							R4	RQD=84%		
													5.50	
				Ц										
				Ґ							R5	CR=87% RQD=19%		
			H	$\dashv$										
Fresh, brownish				耳									7.00	
grained, fractured so	andsto	ne.												
			$\vdash$	닠								CR=85%		
				디							R6	RQD=77%		
			H	ᅰ									8.50	
				$\exists$										
				ᆸ							R7	CR=98%		
			<del>                                      </del>	닊								RQD=78%		
		10.00		Ц									10000	
N.B. — '*' means	sam	10.00m ple could not											10:00	
be recovered.														
				1								BH-	5/Sheet-	-1

	Omoiost :	Dualinain	. mer. C	T W1-	for M-	lob a	<b>₩</b>		. o.1 F	)	.m. Th	oisst		(9000	ww\	TET
_	ob No :	Prelimina 3975	ary G.	_	$\frac{10r}{2}$ ed by:									•		): ):
<u> </u>			ATA			BO										
	Field	Test	Nos	S	amples		No	s				nt Da		14/0	08/17	30.10
F	enetrome	eter (SPT)	3	Undistu	rbed (L	IDS)	1			•		Dat amet			08/17 mm. / N.	x.
	Cone (Pc)			Penetro	meter (	(SPT)	3	5	Leve	el (	Of G	roun	d :	71.2	42 m.	
	ane (V)			Disturbe			3					ck A				
Ľ	une (v)			Water S	sample	(WS)		<u> </u>			Wate ALUE	er Lev	el:	1.9	m. SAMPLES	
		DESCF	RIPTION	I		SYMB		ΕA				15cm	1. Re	ef. No	Depth (	m)
					0.00m										,	
		soil cor			oulders.									DS-1 DS-2	0.50 1.00	
		ght grey ed rock. ((		y clay.				16	51 33 5.0	3 cm	<u>100</u> Pen	tn.	S	JDS-1 SPT-1	2.00-2. 2.30-2.	
	/ery de	nse, yell decompos	owish		-3.00m silty _3.70m			100	3.0	≥ cm	<u>100</u> Pen	 tn.	*5	OS-3 SPT-2 SPT-3	3.00 3.60-3.	
		·							2.0	cm	<u>fusal</u> Pen	tn.		R1 R2	3.70-3.72 CR=58% RQD=19% CR=56%	4 40
		ely to sl grey, medi												R3	RQD=NIL CR=55% RQD=24%	5 15
	ock.	grey, mean	uiii gi	amea, m	actarca			NX.	rota 3 70n	ny d	rill <b>i</b> ng 20.0	from	,	R4	CR=76% RQD=40%	5,90
					7.40		ᆸ		5.7011		20.0			R5	CR=72% RQD=NIL	6'65
					– 7.40m									R6	CR=60% RQD=NIL	7,40 8,15
							ᆸ							R7	CR=72% RQD=46%	8,90
														R8	CR=56% RQD=NIL	9,65
							Ц							R9	CR=72% RQD=14% CR=68%	10,40
							П							R10	ROD=24%	11,15
														R11 R12	RQD=20% CR=76%	11 90
							Ш							R13	CR=72%	12 65
		eathered / ractured so			nedium									R14	CR=68%	13 40
"	, avriou, ii	ractaroa et	4114010											R15	CR=77% ROD=22%	14,15
														R16	CR=68%	14,90
														R17	CR=72%	15,65 16,40
														R18	CR=74% RQD=20%	17,15
							ᅦ							R19	CR=76% RQD=56%	17,90
							Щ							R20	CR=81% RQD=22% CR=84%	18,65
	N.B. — ''	*' means	samı	ole cou	ld not									R21 R22	RQD=72% CR=80%	19,40
	e recovei		111	500	20.00m		-							r~Z	DOD_759/	20.00
						1	<b>→</b>			Ш					<u> </u> BH−6	S/Sheet-1

Γ	Project : Prelimin	ary G.	I. Work	for Tal	lcher	<b>↓</b> The	ern	nal P	owe	er P	roje	ct-	III (2x660	MW). <b>C</b>	TEST
F	Job No : 3975		•								_		7/08/2017		o: =1140
L	BORE LOG I	)ATA	SHE	5T	B01	RE	]	HOI						rumates N=	=4009
	Field Test	Nos	Sc	ımples		No	s	Com			ent [ a Da			)8/17 )8/17	
	Penetrometer (SPT)	5	Undistu	•	-	1			•		)iam			mm. / N.	X.
	Cone (Pc)		Penetro		(SPT)	5		Leve						20 m.	
	Vane (V)		Disturbe Water S		(WS)	2   c		Wat Stan						m	
ŀ	<u> </u>	DIDTION		dilipic			<u></u>			ALUE				SAMPLES	
	DESC	RIPTION	<b>N</b>		SYMB	OL	ΕĄ	CH D	IVN	. =	15c	m.	Ref. No	Depth	(m)
				0.00m									DS-1	0.50	
	Brownish grey, boulders. (SM)	silty	sand.										*UDS-1	1.00-1	
ľ				- 1.50m			9	13 14		<u>27</u>			SPT-1	1.60-2	.05
	Stiff to very sti silty clay. Obs. kan			grey,						14			DS-2	2.50	
				7 70		'\	4	6 8		100			SPT-2	3.00-3	.45
Ī	Very dense, brown			-3.70m sand			48	52 10.0		100			SPT-3	4.00-4	
_	with decomposed ro Highly weathered, b			- 4.70m			100 100	4.0	cm Re	Per fusc	hth. <u>:l</u>		*SPT-4 *SPT-5	4.40-4 4.70-4.74 CR=28%	l l
	to fine grained from					<del>-</del>		4.0	cm	Pe	ntn.		R1 R2	RQD=NIL CR=65%	5 25
•							ХИ	rotai	ny d	rillin	g fro	m		RQD=44% CR=76%	6,00
	Slightly weather					Ц	,	4.7 <mark>0m</mark>	l to	15.	00m		R3	RQD=48%	6 <sub>1</sub> 75
	to deep grey, med fractured sandstone		o rine g	rainea									R4	CR=71% RQD=22%	7,50
				- 8.25m									R5	CR=68% RQD=NIL	8,25
													R6	CR=84% RQD=74%	9,00
													R7	CR=81% RQD=52%	↓
						$\frac{\perp}{\Box}$							R8	CR=88%	9:75
						$\exists$							КО	RQD=21%	11.00
	Fresh, deep grey, f	ine gr	ained, fro	ıctured										CR=87%	
	rock												R9	RQD=72%	
						П									12.50
													R10	CR=86% RQD=23%	
														OD 544	14,00
				15.00m		I							R11	CR=81% RQD=64%	15.00
	N.B. — '*' means	s sam													13.00
	be recovered.														
L					1	1	1							BH-	7/Sheet-1

Г	Project : Prelim	inary G	I Work for Ta	lcher	<b>↓</b> The	rmal	Pow	er Pro	iect –	III (2x660	MW) C=	TECT
	Job No : 3975	illiary a.	Created by:							•		io:
	BORE LOG	DATA	SHEET	BO	RE			NO.				=1110 =3920
	Field Test	Nos	Samples		Nos	3		ncement etion			)8/17 )8/17	
	Penetrometer (SP	T) 4	Undisturbed (U	-	1	Во	re Ho	ole Diar	meter	: 150	mm. / N.	x.
	Cone (Pc)		Penetrometer (	(SPT)	4			Of Gro			42 m.	
	Vane (V)		Disturbed (DS) Water Sample	(MC)	0			Strucl Water			m	
-	74110 (17)		water Sample		Ť	310		ALUE	Level		 SAMPLES	
	DES	SCRIPTION	J	SYMB		ACH			5cm.	Ref. No	Depth	(m)
	Medium dense, medium sand. C of clay binders. (	)bs. kan				3 111	2	23		DS-1 *UDS-1 SPT-1	0.50 1.00-1 1.45-1	.45
-			2.00m							DS-2	2.50	
	Very dense, ye	ellowis	n grey, silty		1	8 30	≤ ا	100		D3-2   SPT-2	2.80-3	
	fine to medium decomposed rock.		ed sand. Obs.		10	od I	∣R€	Pentn fusal		*SPT-3	3.50-3	
_			3.80m			4.0 00 3.0	Re	Penth fusal Pentn		*SPT-4 R1	3.80-3.83 CR=42% RQD=NIL	3,80 4.50
				Щ						R2	CR=52% RQD=NIL	↓
<b>→</b>	Moderately to yellowish grey, m				┤ ┤	0X ro  3.8	tary o Om to	rilling 15.00	from n	R3	CR=64% RQD=NIL	5,25 6,00
	fractured sandstor				П					R4	CR=70% RQD=NIL	<b>↓</b>
					$\Box$					R5	CR=69% RQD=NIL	6.75
										R6	CR=68% RQD=NIL	7.50
-										R7	CR=80% RQD=76%	8.25
										no	CR=92%	9,00
										R8	RQD=22%	9.75
										R9	CR=88% RQD=80%	11.00
	Fresh, grey to c fine grained, frac	deep gre tured sa	ey, medium to ndstone.							R10	CR=83% RQD=70%	
										R11	CR=84% RQD=20%	12.50
			15.00m							R12	CR=85% RQD=72%	15.00
	N.B. — '*' mea be recovered.	ns sam	ple could not		<b>1</b>						חם	-8/Sheet-1

Project : Prelimina	rv G	I. Work for Ta	lcher T	r her	mal	Ром	er Pr	oiect	-III (2 <del>x</del> 6)	60 MW). <b>(=</b>	T=CT
Job No : 3975	ay u.	Created by:									Vo:
BORE LOG D	ATA	SHEET	BOR	E	HO	)LE	NC	). 9	Co-	-ordinates E	=1100 =3826
Field Test	Nos	Samples		Vos			nceme		te: 22.	/07/17	
Penetrometer (SPT)	3	Undisturbed (U	IDS)	1	1	•	etion			/07/17	
	J	Penetrometer (	•	3	1		ole Di Of G			0 mm. / N .497 m.	· x.
Cone (Pc)		Disturbed (DS)		2			Stru			. 137 111.	
Vane (V)		Water Sample	(WS)	0	St	andin	g Wate	r Lev	el: 1.5	52 m.	
DESCR	IPTIO	N	SYMBO	ıL			/ALUE			SAMPLES	
				_  E	ACH	DIV	<b>V.</b> =	15cm	Ref. N	o Depth	(m)
Grey, Silty sand. Obs	. grav	vels. (SM) 0.00m 0.40m	11:::1 1:::1 1:::							0.54	
Medium, yellowish		silty clay with							DS-1		
sand mixture & ka	nkars.	. (CI) ———— 1.05m		3	4	4	8		SPT-1	.	
Loose, yellowish grey									DS-2		
silt. Obs. kankars. (S	SM)	2.50m		  -  10	ا ہ		<u>efusal</u>	' I I	SPT-2		
Very dense, yellowis		ey, silty 2 70m		$\prod_{0}^{10}$	1 51		n Pen efusal	tn.	*SPT-		
sand with decompos	ed ro	ck. (SM)	╟┼┼┼	╣,	2.		Pen	th.	R1	CR=29% RQD=NIL	
				<del> </del>						CR=27%	3.40
				╢					R2	RQD=NIL	4.15
			┟┸┼┼	4					R3	CR=29% RQD=NIL	i
			┞┵┼┼┼	$\exists$							4.90
				<del> </del>					R4	CR=24% RQD=14%	
Highly weathered	ve	llowish arev		-					R5	CR=28%	5 <b>.</b> 65 <b>₹</b>
medium grained, highl			┠┸┯╂	Чм		_ i .	drilling 15.0	_		RQD=NIL	6.40
			<mark>┡╌</mark> ┵┼┼┼┼ ┃┃┃┃┃┃┃	1			]   ]	]	R6	CR=27% RQD=NIL	<b>.</b>
				┧					R7	CR=27%	7 <u>'</u> 15
			$\parallel \parallel \parallel \parallel$						"	RQD=NIL	7 90
			┠ <del>┖</del> ╌╏┼ ┃	٦					R8	CR=21% RQD=NIL	8.45
			<del>┡</del> ┵┼┼┼ ┃┃┃┃┃┃	Ī					R9	CR=35% RQD=NIL	
		9.20m		4						CR=84%	9.20
				$\Box$					R10	RQD=NIL	9.95
									R11	CR=88%	9.93
										RQD=NIL	10,70
				╣						CR=82%	
				4					R12	RQD=24%	
Fresh, deep grey, fractured sandstone.	med	tium grained,		4							12.20
				ightharpoons						OD-000/	
				$\forall$					R13	CR=80% RQD=29%	
			HT	1							13.70
				╣						CR=81%	
				4					R14	RQD=66%	
N.B. — '*' means	sam	15.00m ple could not		4							15.00
be recovered.											
			1							BH-	-9/Sheet-1

rock dust. (SM)  Highly weathered, yellowish grey, medium grained, fractured sandstone.  Moderately weathered, yellowish grey, medium grained, fractured sandstone.  NX rotary drilling from 2.80m to 14.00m  R4 CR=57% RQD=NIL 5.0  R5 CR=58% RQD=NIL 5.7  R5 CR=73% RQD=NIL 7.2  R6 RQD=NIL 7.2  R7 CR=83% RQD=80%  R8 CR=81% RQD=NIL 7.2  R8 CR=83% RQD=NIL 7.2  R8 CR=83% RQD=NIL 7.2  R8 CR=83% RQD=NIL 7.2  R8 CR=84% RQD=NIL 7.2  R10 CR=82% RQD=84%  11.0  R10 CR=82% RQD=84%  11.0  R11 CR=84% RQD=74%  12.5	ſ	Project : Prelimin	arv G.	I. Work for Ta	lcher	<b>↓</b> The	rma	l Por	ver i	Project-	-III (2x660	MW). <b>(=</b> )	r=ST	
Field Test Nos Samples Nos Commencement Date: 20/07/17  Penetrometer (SPT) 3 Undisturbed (UDS) 1 Penetrometer (SPT) 5 Disturbed (DS) 1 Disturbed (DS) 1 Noter Sample (NS) 1 Noter Sample (NS) 2 Noter Sample (NS) 2 Noter Sample (NS) 2 Noter Sample (NS) 3 Noter Sample (NS) 3 Noter Sample (NS) 3 Noter Sample (NS) 4 Noter Sample (NS) 4 Noter Sample (NS) 4 Noter Sample (NS) 4 Noter Sample (NS) 5 Noter Sample (NS) 5 Noter Sample (NS) 6 Noter Sample (NS) 8 Noter Sample (NS) 1 Note Sample (NS)		_	<u></u>								•	Sheet N		
Penetrometer (SPT) 3 Undisturbed (UDS) 1 Penetrometer (SPT) 3 Disturbed (UDS) 1 Penetrometer (SPT) 3 Disturbed (US) 1 Disturbed (US) 1 Disturbed (US) 1 Water Sample (WS) 0 Water Sample (WS) 0 Water Struck At: Standing Water Level: 1.40 m.  DESCRIPTION SYMBOL 0.00m  DESCRIPTION SYMBOL 0.00m  Loose, yellowish grey, sitty sand.  Obs. konkars. (SM) 10 Very dense, yellowish grey, sitty sand.  Obs. konkars. (SM) 10 Very dense, yellowish grey, sitty sand.  Obs. konkars. (SM) 10 Very dense, yellowish grey, sitty sand.  Novel of Ground: 7.1.425 m.  Novel of Ground: 7.1.		BORE LOG D	ATA	SHEET	B0	RE							1044 3785	
Penetrometer (SPT) Cone (Pc) Vane (V)  Vane (V)  Disturbed (DS) Water Sample (WS)  DESCRIPTION  SYMBOL  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  SYMBOL  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  SYMBOL  DESCRIPTION  DESCRIPTION  DESCRIPTION  SYMBOL  DESCRIPTION  DESCRIPTION  DESCRIPTION  SYMBOL  DESCRIPTION  DESCRIPTION  SAMPLES  EACH DIVN. = 15cm. Ref. No Depth (m)  DESCRIPTION  Penth. *SPT-2 2.50-2.56  Each Signal  SPT-1 1.50-1.95  Refusal  DESCRIPTION  Penth. *SPT-2 2.50-2.56  REFERENCE  SERIOR SYMBOL  DESCRIPTION  REGION  REFERENCE  RE		Field Test	Nos	Samples		No	S							
Disturbed (DS)   Water Struck At :		Penetrometer (SPT)	3				- 1						х.	
Vane (V)   Water Sample (WS)   0   Standing Water Level : 1.40 m.		Cone (Pc)			(SPI)	_						25 m.		
DESCRIPTION  SYMBOL  N-VALUE  SAMPLES  SAMPLES  ACH DIVN. = 15cm. Ref. No Depth (m)  *UDS-1 0.50-0.95  DS-1 1.25  SPT-1 1.50-1.95  Ref.usal  Very dense, yellowish grey, sitty sand with kankars. Obs. decomposed 2.80m rock dust. (SM)  Highly weathered, yellowish grey, 3.50m medium grained, fractured sandstone.  Moderately weathered, yellowish grey, medium grained, fractured sandstone.  N. refery drilling from 2.80m to 14.00m  R4 CR=57x R0D=NIL  R5 CR=58x R0D=NIL  R6 CR=38x R0D=NIL  R7 CR=81x R0D=NIL  R8 CR=81x R0D=NIL  R8 CR=81x R0D=NIL  R9 CR=82x R0D=84x  R10 CR=82x R0D=84x  R11 CR=84x R0D=80x  14.00m  N.B '* means sample could not		Vane (V)			(WS)							m.		
CR-52%   Ref.   No   Depth (m)	Ī	DESCI	ZIPTION	·			!							
Loose, yellowish grey, silty sand.  Obs. kankars. (SM)  Very dense, yellowish grey, silty sand with kankars. Obs. decomposed 2.80m rock dust. (SM)  Highly weathered, yellowish grey, medium grained, fractured sandstone.  Moderately weathered, yellowish grey, medium grained, fractured sandstone.  NY retary drilling from 2.80m to 14.00m  NA retary drilling from 2.80m to 14.00m  R4  CR=57% R0D=81% R0D=80%  R60=81% R0D=80%  R8 CR=81% R0D=80%  R8 CR=81% R0D=80%  R11 CR=84% R0D=74%  R12.5  R11 CR=84% R0D=80%  R12.5  R11 CR=84% R0D=80%  R11 CR=84% R0D=80%  R11 CR=84% R0D=80%	ļ		\II 1101			I I	EACH	l DIV	N. =	= 15cm.	Ref. No	Depth (	(m)	
Very dense, yellowish grey, sitty sand with kankars. Obs. decomposed rock dust. (SM)   2.80m   2.80m   2.80m   3.0 cm   Penth.   *SPT-2   2.50-2.56   2.80-2.83   2.80m   2.80m   3.0 cm   Penth.   *SPT-3   2.80-2.83   2.80m   2.80m   3.0 cm   Penth.   *SPT-3   2.80-2.83   2.80m   3.0 cm   Penth.   *SPT-3   3.5 cm		loose vellowish	arev											
Very dense, yellowish grey, silty sand with kankars. Obs. decomposed rock dust. (SM) Highly weathered, yellowish grey, medium grained, fractured sandstone.  Moderately weathered, yellowish grey, medium grained, fractured sandstone.  NX ratary drilling fram R4 CR=52X ROD=NIL 5.75m  NX ratary drilling fram R4 CR=52X ROD=NIL 5.75m  Sightly weathered / fresh, grey, fine to medium grained, slightly fractured sandstone.  R8 CR=83X ROD=80X  R9 CR=82X ROD=84X  ND=80X  ND=80		Obs. kankars. (SM)	grey	, strey sarra.			,   ,		<u>8</u>					
Very dense, yellowish grey, sitty sand with kankars. Obs. decomposed rock dust. (SM)  Highly weathered, yellowish grey, medium grained, fractured sandstone.  Moderately weathered, yellowish grey, medium grained, fractured sandstone.  Sightly weathered fresh, grey, fine to medium grained, slightly fractured sandstone.  Slightly weathered fresh, grey, fine to medium grained, slightly fractured sandstone.  Slightly weathered fresh, grey, fine to medium grained, slightly fractured sandstone.  14.00m  N.B. — '* means sample could not 14.00m  14.00m  N.B. — '* means sample could not 14.00m  14.00m  N.B. — '* means sample could not 14.00m  N.B. — '* means sample could not 14.00m  N.B. — '* means sample could not 14.00m  14.00m  N.B. — '* means sample could not 14.00m							2 3		Refus	al	521-1	1.50-1.	.95	
rock dust. (SM)  Highly weathered, yellowish grey, medium grained, fractured sandstone.  Moderately weathered, yellowish grey, medium grained, fractured sandstone.  NX rotary drilling fram 2.80m to 14.00m  R4 CR=57% RQD=NIL 5.0 CR=57% RQD=NIL 5.7 CR=73% RQD=NIL 5.7 CR=73% RQD=NIL 7.2 R7 CR=83% RQD=NIL 7.2 R8 CR=81% RQD=NIL 7.2 R	ŀ	Very dense, yellowi	ish gr	ev siltv	1									
medium grained, fractured sandstone.  Moderately weathered, yellowish grey, medium grained, fractured sandstone.  NX ratary drilling fram 2.80m to 14.00m  R4 CR=57% RQD=NIL 5.75m  R5 CR=53% RQD=NIL 7.2 RRD=NIL 7.2 RRD=NIL 7.2 RRD=S0% RQD=S0% RQD=	_	rock dust. (SM)		7.50			00			1 1		CR=37%	↓	
Moderately weathered, yellowish grey, medium grained, fractured sandstone.    NX ratary drilling fram 2.80m to 14.00m				$\mathcal{L}_{\mathcal{L}}}}}}}}}}$							R2		4.25	
2.80m to 14.00m R4 CR=57% RQD=NIL 57 R5 CR=73% RQD=62% 6.5 R6 R6 RQD=NIL 7.2 R7 CR=83% RQD=34% 8.0 R8 CR=89% RQD=80% R9 CR=92% RQD=84% R10 CR=82% RQD=84% R10 CR=82% RQD=84% R10 CR=82% RQD=84% R10 CR=82% RQD=74% R10 CR=82% RQD=80%							NX r	otary	drilli	ng from		CR=52% RQD=NIL	5.00	
R5 CR=73% RQD=62% 6.5 R6 CR=81% RQD=NIL 7.2 R7 CR=83% RQD=34% 8.0 R8 CR=89% RQD=80% P9.5 R9 CR=92% RQD=84% R10 CR=82% RQD=84% R11 CR=84% RQD=80% R11 CR=84%	•	, , , , , , , , , , , , , , , , , , ,					2.	30m 1	to 14	00m			5.75	H
R6 R81% RQD=NIL 7,2 R7 RR=83% RQD=34% 8.0  R8 CR=89% RQD=80% 9.5  R9 CR=92% RQD=84% RQD=84% RQD=84% RQD=84% RQD=84% RQD=80% 11.0  R10 CR=82% RQD=74% RQD=80% 12.5				<i>31,</i> 3							R5	CR=73% RQD=62%	6,50	
Slightly weathered / fresh, grey, fine to medium grained, slightly fractured sandstone.  R8 CR=89% RQD=80%  R9 CR=92% RQD=84%  11.0  R10 CR=82% RQD=74%  12.5  R11 CR=84% RQD=80%  14.00m  N.B '*' means sample could not						$\dashv$					R6	CR=81% RQD=NIL		
Slightly weathered / fresh, grey, fine to medium grained, slightly fractured sandstone.  R9 CR=92% RQD=84%  11.0  R10 CR=82% RQD=74%  12.5  R11 CR=84% RQD=80%  14.00m  N.B. — '*' means sample could not											R7			
fine to medium grained, slightly fractured sandstone.  R9  CR=92% RQD=84%  11.0  R10  CR=82% RQD=74%  12.5  N.B. — '*' means sample could not											R8	CR=89% RQD=80%		
R10 CR=82% RQD=74%  12.5  R11 CR=84% RQD=80%  N.B. — '*' means sample could not		fine to medium grai				<u> </u>					R9		9.50	
N.B. — '*' means sample could not R11 CR=84% RQD=80% 14.00m											R10	CR=82% RQD=74%	11.00	
N.B. — '*' means sample could not											R11		12.50	
BH-10/Sheet		N.B. — '*' means be recovered.	sam	14.00m ple could not								Dil 4	14.00	

	Project : Prelimina	arv G.	I. Work for Ta	lcher	<b>↓</b> Ther	rmal	Powe	er Pro	oiect-	·III (2x660	MW). <b>C</b> =	TEST	 •
	Job No : 3975		Created by:							03/08/2017	Sheet N		
	BORE LOG D	ATA	SHEET	BO	RE	HC	LE	NO	. 1	<b>1</b>   Co-o	rdinates N=	:1137 :3769	
	Field Test	Nos	Samples		Nos	3		cemen		: 17/0	07/17		
	Penetrometer (SPT)	3	Undisturbed (L	DS)	1		•	etion ole Dia			07/17 mm. / N.	X.	
	Cone (Pc)		Penetrometer (	(SPT)	3	- 1		Of Gr			45 m.	<b>,</b>	
			Disturbed (DS)		1	Wo	iter	Struc	ck At	:			
	Vane (V)		Water Sample	(WS)	0	Sto		Water	r Leve				-
	DESCF	RIPTION	١	SYMB		. V C L		ALUE	15am	Ref. No	SAMPLES Depth	(m)	-
			0.00m			ACH	TIVIN		John.	itel. No	Вери	(111)	-
										DS-1	0.50	1	
										03-1	0.50		
	Soft, brownish grey, silt with kankars &	, silty & sand	clay / clayey d mixture. (CI)	111						*UDS-1	1.00-1	.45	
						,   ,		3		CDT 1	1.00.0	OF	
			2 20m			1 1	176	<u>fusal</u>		SPT-1	1.60-2		
	Very dense, yellowi sand with decompos	sh gr	ey, silty 2.40m		4	30 5.k		Pent f <u>usal</u>	n.	*SPT-2 *SPT-3	2.20-2 2.40-2.44 CR=70%	2.40	
	Sana with decompos	ica ro	CK. (SIVI)		$\top$	4.0	) cm	Pent	n.	R1	RQD=58%	3.00	
	<b>M</b> 1 1 1 11									R2	CR=45% RQD=41%		
	Moderately weather medium grained, fro										100-41%	3 <mark>,</mark> 75	
	•									R3	CR=52% RQD=17%		
			4.50m		∄╹	VX rot	ary c	rilling 13.50	from		CR=77%	4,50	
₽					$\top$	2.4	/m 10	13.50	[""	R4	RQD=72%		+
					$\overline{\mathbf{H}}$					R5	CR=75%	5.25	
										l KS	RQD=19%	6.00	
					4					R6	CR=76% RQD=73%		
											RQD=73%	6 <mark>.</mark> 75	
										R7	CR=80% RQD=58%		
												7 <mark>,</mark> 50	
										R8	CR=87% RQD=20%	ļ	
												8 <b>.</b> 25	
	Slightly weathered									R9	CR=94%		
	medium grained, f	ractur	red sandstone.							N9	RQD=88%		
												9,75	
										R10	CR=86% RQD=23%		
					4							10.50	
											OD-909/		
										R11	CR=80% RQD=62%		
					$\dashv$							12.00	
					$\dashv$							12.00	
										R12	CR=85%		
					4						RQD=76%		
	N.D. '4'		13.50m	⊭	$\blacksquare$							13.50	
	N.B. — '*' means be recovered.	sam	pie could not										
_				age 7	1	777				•	BH-1	1/Sheet-	1

Project: Prelimina Job No: 3975	ıгу G.	Created by												<b>= 1 = &gt;</b> No:
BORE LOG D	ATA		BO								2		1. 1	E=115 N=367
Field Test	Nos	Samples		No		Co	mm	ence	men	t Da			08/17	<u> </u>
Penetrometer (SPT)	4	Undisturbed (l	JDS)	2	2		•			Dat mete			08/17 mm./	N. X.
Cone (Pc)	·	Penetrometer	(SPT)	4	ļ					oun			12 m.	
		Disturbed (DS)	)	2	2	Wo	ate	r S	truc	k A	t:			
Vane (V)		Water Sample	(WS)	<u> </u>	)	Sto				Lev	el:	2.20		
DESCR	RIPTION	N	SYME	30L	FΔ(	.H		-VAL <b>/N</b>		5cm	l Re	ef. No	SAMPLES Depth	n (m)
Filled up soil consis	sts of	kankars, 0.40m							<u> </u>			DS-1	0.5	
boulders.												IDS-1	1.00-	
					4	4	5	9	-			SPT-1	1.45-	
Stiff to very stiff	, ligi	ht grey, silty										)S-2	2.5	50
clay with traces of	sand	d mixture. (Cĺ)	<b>\`.\</b>	٠,١	5	7   7	1 1	18	<u>3</u>			PT-2	3.00-	
		4.50m						<u>&gt;10</u>	<u>00</u>		U	DS-2	4.00-	-4.45
Very dense, yellowis with decomposed ro		own, silty sand			28 100	52 4 5.0	40  )	m F Refu	Pent Isal	n.		PT-3 SPT-4	4.45- 5.00-5.0	
·				╀╢		3.0	- 1-		ent	n.		R1	CR=25% RQD=NII	.
Highly weathered brown, medium to fine				Щ								R2	CR=56% RQD=NII	5,75
sandstone.				$\Box$	NX	rol	ary	dril	ling 20.00	from	1	R3	CR=82% RQD=16	6:50
				$\perp$		,	,,,,		.0.00	""		R4	CR=78%	7:2
				ᅰ								R5	RQD=NII CR=89%	8:00
				口									RQD=24 CR=68%	×. /,
				凵								R6	RQD=24 CR=84%	% 9 <sup>†</sup> 50
				凵								R7	RQD=22 CR=76%	% 10.25
												R8	RQD=33 CR=90%	% 11 <sup>1</sup> 00
				Н								R9	RQD=18	% 11.75
				Ц								R10	CR=77% RQD=52	% <sub>12</sub> √ <sub>50</sub>
Slightly weathered	/ fre	sh. liaht arev.		廿								R11	CR=91% RQD=24	
fine grained, fractu				$\top^{\parallel}$								R12	CR=96% RQD=NII	1
				$\Box$									CR=83%	14,00
				凵								R13	RQD=38	%
														15.50
												R14	CR=89% RQD=18	
				Ц										17
				世								R15	CR=88% RQD=61	
				$\dashv$										18.50
				$\exists$								R16	CR=99%	
		20.00n										<del>.</del>	RQD=95	% 20.00
N.B. — '*' means	sam	ple could not	']											20.00
be recovered.			1		- 1			- 1	1		1		1	

Γ	Project : Prelimin	nary G	I Work for Ta	lcher	<b>↓</b> The	rms	1 Pa	νwe:	r Pr	niect-	III (2×660	MW) C=	T=GT	
Į	Job No : 3975	iary a.	Created by:							-	•		o:	1
	BORE LOG 1	DATA	SHEET	B0	RE						_		=1290 =3713	<u> </u>
	Field Test	Nos	Samples		Nos	S				nt Date Date		)7/17 )7/17		
	Penetrometer (SPT)	5	Undisturbed (U		2	- 1		•		ameter		mm. / N.	X.	
	Cone (Pc)		Penetrometer (	(SPT)	5	- 1				round		55 m.		
	Vane (V)		Disturbed (DS) Water Sample	(WS)	0					ck At r Leve		m		
ŀ	DECC	DIDTION			Ť				LUE	LOVO	1	SAMPLES		1
	DESC	RIPTION		SYMB	OL E	AC	ı Di	VN.	= '	15cm.	Ref. No	Depth	(m)	
			0.00m		////						DS-1	0.50	)	
	Stiff, deep grey	, silt	v clav Obs						4		UDS-1	1.00-1	.45	
	kankars. (CI)	, Siic	y Clay. Obs.			5 7	7				SPT-1	1.45-1	.90	
											DS-2	2.50	)	
_			3.00m			9   1 6	26	Γ	1 <u>2</u>		*UDS-2 SPT-2	3.00-3 3.10-3		
	Dense to very dense grained sand with				2	4 5	224		. Pent	.n	SPT-3	4.10-4	.49	
					:::: <b>  </b>	oo  _		Kat	<u>usal</u> Pent		*SPT-4	4.60-4		
•			4.75m		1( 	υq		Rdf	usal Pent		*SPT-5 R1	4.75-4.78 CR=48% RQD=17%	4.75	+
	Moderately to s					1X r 4.	otary 75m	dri to	illing 13.50	from m	R2	CR=67% RQD=20%	5.50 6,25	
	grained, fractured	sandsto	ne.								R3	CR=80% RQD=64%	7,00	
_			7.75m								R4	CR=77% RQD=20%	7 7 75	
											R5	CR=82% RQD=32%	8,50	
											R6	CR=80% RQD=20%	9.25	
											R7	CR=90% RQD=22%		
	Fresh, grey, fine sandstone.	grair	ned, fractured								R8	CR=93% RQD=87%	10.50	
											R9	CR=97% RQD=93%	12.00	
	N.B. — '*' means be recovered.	s sam	13.50m ple could not		<u> </u>							BH1	13.50	.1

Project : Prelimina	arv G.	I. Work	for Ta	lcher	<b>↓</b> Ther	rmal	Po	wer	Proje	ect-	III (2x660	MW). <b>C</b>	r=st
Job No : 3975		Create									03/08/2017	Sheet N	
BORE LOG D	ATA	SHE	ET	BO	RE	H	OLI	E I	10.	1	<b>4</b>   Co-o	rdinates N=	=1143 =3758
Field Test	Nos	Sc	mples		Nos	3			ment			07/17	
Penetrometer (SPT)	4	Undistu	rbed (l	IDS)	1		•		on D Diam			07/17 mm. / N.	v
•	'	Penetro	meter (	(SPT)	4	- 1			Gro			22 m.	^.
Cone (Pc)		Disturbe	ed (DS)		3	- 1			ruck				
Vane (V)		Water S	ample	(WS)	<u> </u>	St			ater I	Leve			
DESCR	RIPTION	1		SYMB		- 4 01 1		-VALI				SAMPLES	(70)
			0.00m			ACH	יוט	/N.	= 15	cm.	Ref. No	Depth	(m)
Yellowish brown, s	ilty c	lay with									DS-1	0.50	
mixture. (CI)											UDS-1	1.00-1	45
			- 1.45m	1	┧,	2 2	4	6			SPT-1	1.45-1	
					`\  '	2 2	4				571-1	1.45-1.	.90
Medium, yellowish grey	, silty	clay. (CI)									DS-2	2.50	
						3 4	4	8			SPT-2	3.00-3	.45
Very dense, yell	 owisł	arev.	-4.00m silty					>100			DS-3	4.00	
sand with decompos					6	449	أ ما		entn.		SPT-3	4.50-4	.70
			-5.00m		<u> </u>	79	.  -	<u>Rqfu</u> :	sal Pentni		*SPT-4	5.00-5.03	5.00
Moderately to sl yellowish grey, media sandstone.								rm F	entin		R1	CR=57% RQD=17%	5.75
sanastone.					4						R2	CR=80% RQD=16%	
			– 6.50m		<b>∏</b> ,	NX rd 5.0	tary 0m	drill to 1	ing fr 3.00m	rom	R3	CR=79% RQD=20%	6.50
											R4	CR=75% RQD=NIL	7:25
											R5	CR=89% RQD=24%	8.00   8.75
	fuaala		d:								R6	CR=87% RQD=21%	9.50
Slightly weathered / grained, fractured so	rresn ndsto	, grey, m ne.	neatum								R7	CR=85% RQD=16%	
													11.00
											R8	CR=83% RQD=38%	
N.B. — '*' means	sam		13.00m d not								R9	CR=90% RQD=76%	12,50 13.00
be recovered.					<u></u>							   BH-1	4/Sheet-1

Γ	Project : Prelimi	nary G.	I. Work for Tal	lcher	<b>↓</b> The	rma	l Por	wer	Pro	ject-	III (2x660	MW). <b>C</b> =	TEST
	Job No : 3975	•	Created by:								•	Sheet N	
	BORE LOG	DATA	SHEET	BO	RE	H	OLE		<u>.0۷</u>	1	5 Co-o	rdinates N=	=1523 =3681
	Field Test	Nos	Samples		No	SI				Date Date		)7/17 )7/17	
Ī	Penetrometer (SPT)	) 4	Undisturbed (U	DS)	1		•			meter		mm. / N.	x.
	Cone (Pc)		Penetrometer (	SPT)	4	-				ound		92 m.	
	Vane (V)		Disturbed (DS)	(MC)	2	''				k At			
-	varie (v)		Water Sample		<u> </u>	5		ng w VAL		Level		_m. SAMPLES	
	DES	CRIPTION	1	SYMB	OLL	EACH				5cm.		Depth	(m)
Ī			0.00m										
				11							DS-1	0.50	
				11/1							UDS-1	1.00-1	.45
	Madium to diff	٠ا				2 4	4	8			SPT-1	1.45-1.	.90
	Medium to stift silty clay / cla			<b>' '</b>	` 1								
	mixture. (CI)										DS-2	2.50	
											DO 2	2.00	
					\	2 4	7	11			SPT-2	3.00-3	.45
								1,					
	Very dense, yellow	vish are			<u> </u>	70 =	.0 c	>10 m F	<u>90</u> Pentr	<u>,    </u>	SPT-3	4.20-4	.25
	sand with decompo				<del>    </del>  1	od	<u>  E</u>	<u>Refu</u>	<u>\$al</u>		*SPT-4	4.30-4.32	4,30
▶	Moderately weath				T.	2	.0 c	m) F	Pentr	า.	R1	CR=53% RQD=NIL	←
	medium grained, fr	actured	sandstone.5.00m									05 000	5¦00
					Н						R2	CR=69% RQD=20%	
	Slightly weather				Ы							OD-70%	5.75
	medium grained, f	ractured		$\vdash$	4	NX r	otany	drill	ling	from	R3	CR=72% RQD=NIL	<b>↓</b>
F			6.50m		Ħ	4.3	0m	to 1	2.50r	m		CD-81%	6.50
					Н						R4	CR=81% RQD=17%	<b> </b>
					Д.							CR=84%	7.25
											R5	RQD=19%	
				$\vdash$	닊								8 <b>'</b> 00
					口						D.C	CR=80%	
					Н						R6	RQD=24%	
					Д								9.50
	Fresh grey medi	um ara	ined fractured										9.50
	Fresh, grey, medi sandstone.	uiii gra	mea, mactured		Ц						R7	CR=84%	
					$\Box$						11.7	RQD=35%	
				H	$\dashv$								11.00
					耳								
											R8	CR=86%	
					П							RQD=47%	
			12.50m		벡								12.50
	N.B. — '*' mean be recovered.	is sam	ple could not										
L	23 . 333 751 34.			1	<b>1</b>		Ш					BH-1	5/Sheet-1

1	Project : Prelimina	arv C	I Work for Ta	loher	The	rm	ı D	OWO	r Dro	nient-	.III <i>(</i> 2v660	MW)	r=ct
	Job No : 3975	ary G.	Created by :										0:
	BORE LOG D	ATA		BO			OL		NO		<del></del>		:1064 :3629
	Field Test	Nos	Samples		No	)S				t Date	e: 22/0	07/17	
	Penetrometer (SPT)	5	Undisturbed (U	JDS)	2			•		Date meter		07/17 mm. / N.	
			Penetrometer (	-	5	۱ ا				ound		111111. / N.	^.
	Cone (Pc)		Disturbed (DS)		4	- 1				ck At			
	Vane (V)		Water Sample	(WS)	0	) !	Stand	ding	Wate	r Leve	l: 2.50	m.	
	DESCF	RIPTION	١	SYMB	OL-			-VA				SAMPLES	
			0.00m			EAC	H D	IVN.	<u> </u>	5cm.	Ref. No	Depth	(m)
	Filled up soil cons		of brownish								DS-1	0.50	
	grey, silty sand.		0.70m					,	31		UDS-1	1.00-1	45
				1		101	4 17		-		SPT-1	1.45-1	
	Hard, deep grey	. silt	v clav. Obs.								DS-2	2.50	
	calcáreous nodú				`.\				<u>10</u>				
				11/1	$\left  \cdot \right $	1 1/1	9 21				SPT-2 DS-3	3.00-3	
			4.00m						14		UDS-2	4.10-4	
	Hard, yellowish gr	ey, si	ilty clay. Obs.		\\]	172	024				SPT-3	4.55-5	
	sand mixture. (CI)		•						<u> 100</u>		DS-4	5.40	
	Very dense, yellowi	oh ar	6.00m		<u> </u>	6110	)0  2. 0	cm	Pent	h.	SPT-4	5.80-5	
	sand with decompos					oq			<u>usal</u> Pent		*SPT-5 <b>R1</b>	6.50-6.53 CR=58%/RQD=I	6.50 NIL _v
<b>→</b>						'	3.0		FEII		R2	CR=64% RQD=NIL	. ↓ ★
					$\blacksquare$						R3	CR=68%	7,75
						NX  6	rotar .50m	y dr to	illing 20.00	from m		RQD=21% CR=72%	8 <mark>,</mark> 50
	Moderately to sl	iahtl	v weathered.								R4	RQD=20%	9,25
	yellowish brown,				$\perp$						R5	CR=76% RQD=32%	10.00
	fractured sandstone.				П						R6	CR=72% RQD=16%	10.75
											R7	CR=70% RQD=NIL	. ↓
					$\blacksquare$						R8	CR=80% RQD=NIL	11,50
											R9	CR=76%	12 25
			13.00m									RQD=NIL CR=72%	13,00
					Щ						R10	RQD=NIL	13.75
					Ц						R11	CR=80% RQD=32%	14.50
											R12	CR=78% RQD=28%	. ↓
											R13	CR=72% RQD=16%	15 25
	Slightly weathered	, gre	y, medium to		$\exists$						R14	CR=80%	16,00
	fine grained, fractur				$\dashv$							RQD=NIL CR=76%	1675
					Д						R15	RQD=NIL	17 50
					П						R16	CR=72% RQD=NIL	18.25
					$\exists$						R17	CR=78% RQD=NIL	19.00
					$\dashv$						R18	CR=76%	19.00
	N.B. — '*' means	sam	ple could not	<del> </del>	$\dashv$							RQD=NIL	20.00
	be recovered.												6 (6) 1 1
					┰							BH-1	6/Sheet-1

ſ	Duningt . Dunlimin	C	I Words for To	lah an	<b>₩</b>	1	D	T	)i4	III (nee	WW CETEC	<b>=</b>	
ļ	Job No : 3975		Chandrani   Created on : 03/08/2017   Sheet No:										
		)ATA	·	BO			OLE			<del></del>	ordinates N=360	2	
	Field Test	Nos	Samples		Nos	3 I			ent Da	te: 26/0	07/17		
	Penetrometer (SPT)	7	Undisturbed (L	IDS)	2				n Dat Diamet		07/17 mm. / N. X.		
	Cone (Pc)		Penetrometer (		7	Le	evel	Of	Groun	d : 70.7	82 m.		
			Disturbed (DS)		3	' '			uck A				
	Vane (V)		Water Sample	(WS)	<u> </u>	St		g Wa /ALUI	ter Lev		m. SAMPLES	-	
	DESC	RIPTION	1	SYMB		ACH			 15cn		Depth (m)	+	
			0.00m		$\overline{}$			ΪΤ		DS-1	0.50		
						5 9	11	20		UDS-1 SPT-1	1.00-1.45 1.45-1.90		
										DS-2	2.50		
	Very stiff, grey kankars. (CI)	, silt	y clay. Obs.			6 9	10	19		SPT-2	3.00-3.45		
	Kulikurs. (Ci)					5   3   1 1	15	26		UDS-2 SPT-3	4.00-4.45 4.45-4.90		
										DS-3	5.50		
					\\	3 12	16	<u>28</u>  >100	<u>)</u>	SPT-4	6.00-6.45		
	Very dense, browr				::I  :I		.0 cr R	m Pe		SPT-5 *SPT-6	6.80-6.92 7.20-7.24		
•	sand with decompos	sed ro	<del>ck. (SM)</del> 7.40m			00 +	l IR	dfusk	ntn.   al	*SPT-7	7.40-7.44 <b>7.40</b> CR=56%	+	
					$\exists$	4.	U Cn	n Pe	nun.	R1 R2	RQD=18% 8'00 CR=57% RQD=NIL		
					ı	NX ro	otary Om t	drillir d 20.	ng fron .00m	n R3	CR=78%   8.75		
	Moderately to s	p grey,	fine to medium		$\exists$					R4	CR=76% RQD=NIL 10,25		
	grained, highly fr	acture	ea sanasione.		$\exists$					R5	CR=79%   RQD=NIL 11.00		
					$\Box$					R6	CR=78%   RQD=16%   11.75		
			12.50m		T					R7	CR=77% RQD=NIL CR=80%		
					Д					R8	RQD=16% CR=85%		
										R9	RQD=16% 14.00		
					$\sharp$					R10	CR=81% RQD=29%		
	Slightly weathered deep grey to light									R11	15.50 CR=80%		
	grained, highly frac				$\exists$						RQD=19%		
					$\forall$					R12	CR=81% RQD=NIL		
											18.50		
	N.B. — '*' means	sam								R13	CR=77% RQD=14%		
	be recovered.		20.00m								20.00		
ι				•	<del>                                      </del>						BH-17/Sheet	 _1	

Г	Thurster 4 . The state of		T 707 1 0	1 - 1	<b>₩</b>			<u> </u>		-		***	(0.000	1 (TAT)	
-	Project: Prelimina  Job No: 3975	ary G.	I. Work for Ta												):   =>
	BORE LOG D	ATA	<u> </u>	BOI				)L		NO		18			
ŀ	Field Test	Nos	Samples		No						it Da			N=. 07/17	3336
-			·	IDC)				•	,		Dat		22/0	07/17	
	Penetrometer (SPT)	6	Undisturbed (U Penetrometer (		2 6						met			mm. / N.	X.
	Cone (Pc)		Disturbed (DS)		5						oun k A	d :	70.12	28 m.	
	Vane (V)		Water Sample		0						Lev		2.75	m.	
Ī	DESCE	RIPTION		SYMB				N-	-VAL	.UE			,	SAMPLES	
	DESCI					EAG	СН	DI	VN.	= '	5cn	1. Re	ef. No	Depth (	m)
	Filled up soil consist fly ash.	s of l	ight grey, 0.50m										DS-1	0.50	
Ī									2	_		Ι.	IDS-1	1.00-1.	45
						1 1 1	ا 3	14		4			SPT-1	1.45-1.	
	Very stiff to hard,	vellow	vish arev. siltv		`.								)S-2	2.50	
	clay / clayey silt Obs. calcareous nod	with	sand mixture.			12	17	19	3	<u>6</u>		S	PT-2	3.00-3.	45
				1									)S-3	3.80	
									4.	3		ļυ	DS-2	4.20-4.	65
			5.20m	1///		11	19	24				S	PT-3	4.65-5.	10
	Hard, yellowish gr	ev. si		11/1					6	<u>6</u>			)S-4	5.50	
•	sand mixture. (CI)		,,			18	28	38				S	PT-4	6.00-6.	45
	Very dense, yell	مسنما	7.00m			00			<u>   </u>				)S-5 :PT-5	7.00 7.20-7.	30
	sand witih decompo	sed ro	ock. (SM) 7.50m		1:::1	00	10		cm <u>Refu</u>		tn.		SPT-6	7.50-7.53	
ľ					H		3.0		m F		h.		R1	CR=78% RQD=23%	<b>J</b>
													R2	CR=75% RQD=29%	8,25 9,00
	Slightly weathere	d, ye	ellowish grey,		$\blacksquare$								R3	CR=64% RQD=NIL	↓
	medium grained, f	ractu	red sandstone.		$\Box$								R4	CR=68% RQD=24%	9.75
													R5	CR=72%	10,50
-			11.50m		ᆸ	NX	ro 7.50	lary Om	dril to 1	lling ∣6.50	fron m	וי		RQD=20% CR=76%	11 25
			, , , , , ,		뷥								R6	RQD=16%	12,00
					ᆸ								R7	CR=72% RQD=58%	12,75
					뷬								R8	CR=74% RQD=22%	13.50
	Slightly weathers medium to fine				ᅦ								R9	CR=80% RQD=40%	<b>.</b>
	sandstone.				닠								R10	CR=84% RQD=40%	14 25
													R11	CR=82%	15:00
					$\exists$									RQD=40%	
	N.B. — '*' means be recovered.	sam	16.50m ple could not												16.50
L				-1	1					-1				BH-18	

Project : Prelimina	ry G.											
юь No : 3975 BORE LOG D	ATA	Created by : SHEET	BO			[O]		ed N(		: 1 19	<u>'</u>	E=1319
Field Test	Nos	Samples	DO	No	т.			ceme				08/17
	5	Undisturbed (U	IDS)	2	-		•	etior				08/17
Penetrometer (SPT)	Э	Penetrometer (	-	5				ole D Of C				mm. / N. X. 52 m.
Cone (Pc)		Disturbed (DS)	(=, ,,	3				Stru				JZ 111.
/ane (V)		Water Sample	(WS)	0				Wat				m.
DESCR	IPTION	J	SYMB	101		١	1–V	ALUE	-			SAMPLES
	11 1101				EAC	<u>H [</u>	IVN	. =	150	m.	Ref. No	Depth (m)
		0.00m									DC 1	0.50
											DS-1	0.50
Filled up soil consis silty clay followed b											*UDS-1	1.00-1.45
ing oray ronowed by	, 4311				2 3	,   3   4					SPT-1	1.55-2.00
		2.50m		$\overrightarrow{\ }$							DS-2	2.50
			11/1	``\	2 4	4		8			SPT-2	3.00-3.45
					- -						J. 1 Z	3.55 5.45
Stiff, greyish yello	w, s	ilty clay with		\\							UDS-2	4.00-4.45
sand mixture. (CI)	ı				4 6	,   3   7		<u>13</u>			SPT-3	4.45-4.90
					7	' ′						
		5.80m						100			DS-3	5.50
/ery dense, yellowis				:::	00	3.0	cm	<u>100</u> Per			SPT-4	6.00-6.08
with decomposed ro	ock. (	SM) <u>6.</u> 20m		ΗŢ	00	2.0		<u>fusa</u> Per	_		*SPT-5	6.20-6.22 <b>6.2</b> CR=40%
			H	귀	'		ļ				R1	RQD=23% 7.0
Paleto de la della della			H + H	Щ	XN	rota	rv c	  rillin	a fr	om	R2	CR=53% RQD=17%
Highly to moderately prown, medium to fi				Щ	·``[6	.20n	to	15.0	oom	]		7.7 CR=59%
sandstone.	·		╟┼┼┼	낶							R3	RQD=NIL 8.5
				귀							R4	CR=45% RQD=17%
		9.25m	++-	버								9.2
											R5	CR=64% RQD=16%
				$\dashv$							R6	CR=67%
				爿								RQD=15% 10.7
				岀							R7	CR=68% RQD=40%
				Щ							R8	11.5 CR=72%
Slightly weathered				$\Box$							NO NO	RQD=24% 12.2
medium to fine gr Fractured sandstone.	raine	a, moderately		$\exists$							R9	CR=85% RQD=48%
				$\dashv$							<b></b>	13.0
				$\rightrightarrows$							R10	RQD=32% 13.1
				$\perp$							R11	CR=84%
				Д							IX I I	RQD=53%
UD (#)	sam	15.00m ple could not	₽	=								15.00
N.B. — * means												

Project :	Prelimina	arv G.	I. Work	for Ta	lcher	<b>↓</b> The	rma	al P	OWe	er i	Projec	et.–	III (2x660	MW). <b>(=</b>	T=ST
Job No:													3/08/2017	Sheet N	
BORE	LOG D	ATA	SHEE	$T \mid$	BO	RE	H	OI	Œ	N	0.	20	) Co-o	rdinates N=	=1399 =3412
Field	Test	Nos	Sai	mples		No	S I				nent D		: 21/0	)7/17	
Penetrome	ter (SPT)	7	Undisturl	ped (U	IDS)	2					on Do Diame			)7/17 mm. / N.	. x.
Cone (Pc)			Penetron		(SPT)	7	'   <sub> </sub>				Grou			17 m.	
Vane (V)			Disturbed		(MC)	3					ruck				
Valle (V)			Water Sc	ımpıe		Ť	' ,			ALU	ater Le IE	evei		 SAMPLES	
	DESCF	RIPTION	1		SYMB	OL	EĄC					m.	Ref. No	Depth	(m)
Filled up		sts of		5 ,									DS-1	0.50	)
				1.00m									UDS-1	1.00-1	.45
Filled up grey, silty				wnish			3 3	5 4		7			SPT-1	2.00-2	2.45
				2.60m	( \ ' \ '								DS-2	3.00	)
Medium to							3 4	. 4		<u>8</u>			SPT-2	3.50-3	5.95
						`. N				9			UDS-2	4.10-4	
				5.10m		;;; );	3 4	. 5					SPT-3	4.55-5	5.00
<b>→</b>							9	153 3.0	cm	10 Pe	enth		SPT-4	5.40-5	
Very dense rock. Obs.				posed			46 6	1	_ ≥ cm	10 P	ontn.		DS-3 SPT-5	6.00 6.30-6	
				7.20m			04 1	1.0	cm Re		<u>al</u> entn. <u>al</u> entn.		*SPT-6 *SPT-7 <b>R1</b>	6.90-6 7.20-7.24 CR=47% RQD=30%	
													R2	CR=44% RQD=20%	8.00 8.75
													R3	CR=56% RQD=15%	9.50
													R4	CR=47% RQD=NIL	10.25
Highly to							NX 7	rotai .20m	y c i to	Irilli 15	ng fro 5.00m	m	R5	CR=28% RQD=NIL	11.00
medium gi	rained, fra	icturec	sandstor	ie.									R6	CR=27% RQD=NIL	11.75
													R7	CR=29% RQD=NIL	12.50
													R8	CR=33% RQD=NIL	13.25
													R9	CR=32% RQD=NIL	14.00
						$\dashv$							R10	CR=36% RQD=NIL	
N.B '*		sam	ole could	5.00m d not											15.00
					age 7	1	/ 7 1							BH-2	20/Sheet-1

1	Desired . Desired	C	T Wands Con Mai	1 - 1	₩.		1				D	2 4	TTT	(0000		TECT	4
	Project : Prelimin  Job No : 3975	ary G.	Created by :													<u>1 <b>=                                   </b></u>	-
	BORE LOG D	ATA	·	BO											rdinates N=		
	Field Test	Nos	Samples		No	os							te :	17/0	07/17		
	Penetrometer (SPT)	5	Undisturbed (U	DS)	2	2			•				e : er :		07/17 mm. / N.	x.	
	Cone (Pc)		Penetrometer (	(SPT)	5	5							d :		46 m.		
	Vane (V)		Disturbed (DS)	(110)	-	3						k A					
	valle (v)		Water Sample	(WS)		1	St		ling –V			Lev	el :		<u>m.</u> SAMPLES		-
	DESC	RIPTION	1	SYMB	OL	ΕA	CH					5cm	1. R	ef. No	Depth	(m)	1
			0.00m														
														DS-1	0.50	1	
	Filled up soil cogrey, silty clay f	ollow	ed by ash							6			<b> </b> *(	JDS-1	1.00-1	.45	
	110111 0.00111	to	2.40111.			3	3	3		SI N			5	SPT-1	1.60-2	.05	
			2.40m											WS-1 DS-2	2.45 2.50		
	Stiff, grey, silty	/ cla	y with sand							10			U	DS-2	3.00-3	.45	
	mixture. (CI)					3	4	6		<u>10</u>			S	SPT-2	3.45-3	.90	
			4.30m										[	DS-3	4.50	·	
	Very dense, grey decomposed rock. (		ty sand with			16	29		0		P	entn	.	SPT-3	5.00-5	.35	
			5.80m			53 51		4. 4.	Re 0 ( <u>Re</u> 0 (	fus fus fus	<u> </u>	enth. enth.	*(	SPT-4 SPT-5	5.60-5 5.80-5.84 CR=40%		
				┞ <del>╶</del> ┼╌┖										R1	RQD=31%	6.50	
					ļ Į	KN	5.8	tar 0m	y d to	rilli 10	ng ).00	from m	י 	R2	CR=58% RQD=47%	7.25	
	Highly to mode yellowish grey to	grey,												R3	CR=42% RQD=24%	8.00	
	fractured sandstone.			 	<del>     </del> 									R4	CR=25% RQD=NIL	8.75	
					H									R5	CR=28% RQD=NIL		
			10.00m											R6	CR=38% RQD=NIL	9.50	
	N.B. — '*' means be recovered.	sam	ple could not														
					T										BH-2	21/Sheet-	1

Moderately to slightly weathered, deep grey, fine grained, fractured sandstone.  NX rotary drilling from R2 CR=48% RQD=17%  NX rotary drilling from R2 CR=69% RQD=31%	Project : Preli	•	_					_							
Field Test			·	<u> </u>										<u> </u>	
No.					נסת	l	-								
Penetrometer (SPT)   7   Disturbed (DS)   3   Water Sample (WS)   0   Symbol   Struck At : Standing Water Level : 4.50 m.	Field lest			•											
Disturbed (DS)   Water Sample (WS)   3   Water Struck At   Standing Water Level   4.50 m.	Penetrometer (S	SPT) 7					- 1								
Value (V)   Water Sample (WS)   0   Standing Water Level : 4.50 m.   N-VALUE   SAMPLES   SAMPLES   N-VALUE   SAMPLES   SAMPL	Cone (Pc)				SPI)		- 1								12 m.
DESCRIPTION   SYMBOL   N-VALUE   SAMPLES	Vane (V)				(MC)	-	- 1								
DESCRIPTION	vario (v)		water 50	umpie	(WS)		<u>'                                    </u>	St		<u>_</u>			Leve		
0.00m  4 7 22 29 **UDS-1 1.00-1.10  SPT-1 1.25-1.70  Filled up soil consists of silty clay with boulders & ash.  DS-2 2.50  5 7 9 16 SPT-2 3.00-3.45  4.00m  4 6 8 14 SPT-3 4.45-4.90  DS-3 5.50  SPT-4 6.00-6.45  Very dense, grey, silty fine grained sand with decomposed rock. (SM)  Very dense, grey, silty fine grained sand with decomposed rock. (SM)  Noderately to slightly weathered, deep grey, fine grained, fractured sandstone.  N.B '* means sample could not	D	ESCRIPTION	٧		SYMB		FΔ(	СН					icm.		
Filled up soil consists of silty clay with boulders & ash.  4 7 22 29 **UDS-1 1.00-1.10 **SPT-1 1.25-1.70 **UDS-2 2.50 **DS-2 2.50 **DS-2 2.50 **DS-2 2.50 **DS-2 3.00-3.45 **DS-2 3.00-3.45 **DS-3 4.45-4.90 **DS-3 4.45-4.90 **DS-3 5.50				0.00m							Ī	Ť			
Filled up soil consists of silty clay with boulders & ash.  4 7 22 29 SPT-1 1.25-1.70  DS-2 2.50  DS-2 3.00-3.45  A.00m  4 6 8 14 SPT-2 3.00-4.45  SPT-3 4.45-4.90  Stiff to very stiff, light grey, silty clay. Obs. kankars. (Cl)  Stiff to very stiff, light grey, silty clay. Obs. kankars. (Cl)  Stiff to very stiff, light grey, silty clay. Obs. kankars. (Cl)  Stiff to very stiff, light grey, silty clay. Obs. kankars. (Cl)  Stiff to very stiff, light grey, silty clay. Obs. kankars. (Cl)  Stiff to very stiff, light grey, silty clay. Obs. kankars. (Cl)  Stiff to very stiff, light grey, silty clay. Obs. kankars. (Cl)  Stiff to very stiff, light grey, silty clay. Obs. kankars. (Cl)  Stiff to very stiff, light grey, silty clay. Obs. kankars. (Cl)  Stiff to very stiff, light grey, silty clay. Obs. kankars. (Cl)  Stiff to very stiff, light grey, silty clay. Obs. kankars. (Cl)  SPT-4 6.00-6.45  SPT-5 7.00-7.10  SPT-5 7.00-7.10  SPT-6 7.80-7.84  SPT-7 7.80-7.84  SPT-7 Raffusal and self-state an														DS-1	0.50
Filled up soil consists of silty clay with boulders & ash.  4.00m  4.00m  4.00m  4.00m  4.00m  4.00m  5.7 9 16  SPT-2 3.00-3.45  SPT-2 3.00-3.45  SPT-3 4.45-4.90  SST-3 4.45-4.90  SPT-4 6.00-6.45  SPT-4 6.00-6.45  SPT-5 7.00m  Very dense, grey, silty fine grained sand with decomposed rock. (SM)  SPT-6 7.00m  Very dense, grey, silty fine grained sand with decomposed rock. (SM)  Noderately to slightly weathered, deep grey, fine grained, fractured sandstone.  Noderately to slightly weathered, deep grey, fine grained, fractured sandstone.  Noderately to slightly weathered, deep grey, fine grained, fractured sandstone.  Noderately to slightly weathered, deep grey, fine grained, fractured sandstone.  Noderately to slightly weathered, deep grey, fine grained, fractured sandstone.  Noderately to slightly weathered, deep grey, fine grained, fractured sandstone.  Noderately to slightly weathered, deep grey, fine grained, fractured sandstone.														*UDS-1	1.00-1.10
### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ### According to very stiff, light grey, silty clay. Obs. kankars. (CI)  ##							4	7	22		<u>29</u>			SPT-1	1.25-1.70
4.00m  4.00m  4.00m  4.00m  4 6 8			clay												
4.00m  4.00m  4.00m  4.00m  5 7 9														DS-2	2.50
Stiff to very stiff, light grey, silty clay. Obs. kankars. (CI)  Town Very dense, grey, silty fine grained sand with decomposed rock. (SM)  NX rotary drilling from R2 Refusal to slightly weathered, deep grey, fine grained, fractured sandstone.  NX rotary drilling from R2 RR RQD=41% NX rotary drilling from R2 RR RQD=41% NX RQD=41							5	7	9		16			SPT-2	3.00-3.45
Stiff to very stiff, light grey, silty clay. Obs. kankars. (Cl)  7.00m  Very dense, grey, silty fine grained sand with decomposed rock. (SM)  8.10m  Moderately to slightly weathered, deep grey, fine grained, fractured sandstone.  NX rotary drilling from 8.10m  R2 CR=69% RQD=31%  R3 CR=74% RQD=41%  NN. R3 CR=74% RQD=41%				-4.00m		7								UDS-2	4.00-4.45
Stiff to very stiff, light grey, silty clay. Obs. kankars. (Cl)  7.00m  Very dense, grey, silty fine grained sand with decomposed rock. (SM)  8.10m  Moderately to slightly weathered, deep grey, fine grained, fractured sandstone.  NX rotary drilling from 8.10m  NX RQD=41%  NX RQD=41%  NX RQD=41%							4	6	8		14			SPT-3	4.45-4.90
7.00m  Very dense, grey, silty fine grained sand with decomposed rock. (SM)  8.10m  Moderately to slightly weathered, deep grey, fine grained, fractured sandstone.  NX rotary drilling from 8.10m  R2  R2  R3  CR=69% R0D=31%  R3  CR=74% R0D=41%  NX R0D=41%  NX R0D=41%	Stiff to very clay. Obs. kank	stiff, lig ars. (CI)	ht grey,			'\								DS-3	5.50
Very dense, grey, silty fine grained sand with decomposed rock. (SM)  8.10m  Moderately to slightly weathered, deep grey, fine grained, fractured sandstone.  NX rotary drilling from 8.10m  R2  R2  CR=69% RQD=31%  R3  CR=74% RQD=41%  10.00m  N.B. — '*' means sample could not					V , /		5	7	9		<u>16</u>			SPT-4	6.00-6.45
Very dense, grey, silty fine grained sand with decomposed rock. (SM)  8.10m  8.10m  8.10m  Moderately to slightly weathered, deep grey, fine grained, fractured sandstone.  NX rotary drilling from to 10.00m  8.10m  NX rotary drilling from to 10.00m  R2  R3  CR=69% RQD=31%  R3  CR=74% RQD=41%  10.00m  NX rotary drilling from to 10.00m  R2  R3  R3  R4  R1  R1  R1  R1  R2  R3  CR=69% RQD=31%  R3  R3  R4  R1  R1  R1  R1  R2  R3  R4  R4  R4  R4  R4  R4  R4  R4  R4				- 7.00m	1/ /						<u>84</u>			*UDS-3	
Moderately to slightly weathered, deep grey, fine grained, fractured sandstone.  NX rotary drilling from to 10.00m t				ained			20	36	48		fuso	,,		SPT-5	7.10-7.55
Moderately to slightly weathered, deep grey, fine grained, fractured sandstone.  NX rotary drilling from R2 CR=69% RQD=31% R3 CR=74% RQD=41%  NN.B. — '*' means sample could not	sana with decor	mposed ro	CK. (SM)				100	4.	0	cm	Per	nt n	.	*SPT-6	7.80-7.84
deep grey, fine grained, fractured sandstone.  NX rotary drilling from R2 R2 RQD=31% RQD=31% RQD=41% R3 RQD=41% R3 R3 RQD=41%				-8.10m			100	4.	0			_			RQD=17%
N.B. — '*' means sample could not	deep grey, fi						KN	rc 8.1	tar 0m	y c	rillin 10.	g f 00n	rom n	R2	1
'				10.00m										R3	CR=74%   P.50   P.00   P.00
be recovered.	N.B. — '*' me be recovered.	eans sam	ple coul	d not											

Field Test   Nos   Samples   Nos   Commencement Date   20/08/17   Penetrometer (SPT)   6   Undisturbed (UDS)   Penetrometer (SPT)   6   Disturbed (DS)   3   Water Struck At	Duning to Duniture	A	I Want for m	lah	<b>₩</b>	o Pro	1	n	A **** -	<sub>m</sub> Tr	<b>0</b>	.4	III (neen	wy Peter
BORE LOG DATA SHEET   BORE HOLE NO. 23   Co-ordinates   E=8.56	_	ıry G.					_				_		•	
Field Test		ATA												
Penetrometer (SPT)   6	Field Test	Nos	Samples		No	os							: 20/0	08/17
Penetrometer (SPT)   Disturbed (DS)   Samples (WS)   Standing where Level: 1.20 m.	Denetrometer (CDT)		•	IDS)	-	$\dashv$			•					
Disturbed (DS)   Vane (V)   Vater Sample (WS)   Vater Struck At   Vater Standing Water Level   1.20 m. Standing Water Level	, , , , , , , , , , , , , , , , , , , ,	O												•
Vary stiff, grey, silty clay. Obs. kankars. (CI)   Very stiff, grey, silty clay. Obs. kankars. (CI)   Very dense, brownish grey, silty medium grained sand with decomposed 7,30m rock. (SM)   Very dense, brownish grey, silty fractived sandstone.   Slightly weathered / fresh, brownish grey to grey, medium to fine grained, fractured sandstone.   Slightly weathered / fresh, brownish grey to grey, medium to fine grained, fractured sandstone.   Slightly weathered / fresh, brownish grey to grey, medium to fine grained, fractured sandstone.   Show the recovered.   Show the	Cone (Pc)													12 111.
DESCRIPTION  SYMBOL  N-VALUE  SAMPLES  AMPLES  SAMPLES  AMPLES  Depth (m)  DS-1  0.50  DS-1  0.50  DS-1  1.00-1.45  SFT-1  1.45-1.90  DS-2  2.50  SFT-2  3.00-3.45  STT-3  4.45-4.90  DS-3  5.50  DS-3  5.50  DS-3  5.50  DS-3  5.50  DS-3  5.50  DS-3  5.50  AMPLES  AND-1.45  ALOO-1.45  SPT-1  ALOO-1.45  SPT-2  ALOO-4.45  SPT-3  ALOO-6.45  AND-6.45  AND-6.4	Vane (V)				-									m.
EACH DIVN. = 15cm, Ref. No   Depth (m)	DECCE			CAMB				N-	_VA	LUE			(	SAMPLES
Filled up soil consists of sitty clay with road materials.  0.80m  0.80m  3 4 5 9 9 11 1.00-1.45  1.45-1.90  DS-2 2.50  DS-2 2.50  DS-2 2.50  Stiff, grey, sitty clay. Obs. kankars.  (CI)  Very stiff, grey, sitty clay. Obs. kankars. (CI)  Very dense, brownish grey, sitty feather from rock. (SM)  Very dense, brownish grey, sitty feather from rock. (SM)  NN relary drilling from rock. (SM)  R1  R2  R2  R2  R2  R2  R3  R4  R6  R6  R6  R6  R6  R6  R6  R6  R6	DESCR		N 	SIMIB	OL	ΕA	СН	D	IVN.	=	15c	m.	Ref. No	Depth (m)
Stiff, grey, silty clay. Obs. kankars.  (CI)  Very stiff, grey, silty clay. Obs. kankars.  Very dense, brownish grey, silty clay. Obs. kankars.  (CI)  Very dense, brownish grey, silty clay. Obs. kankars.  N.X. ratary delling from R3 R1 R2 R0D=52% R		sists	of silty clay										DS-1	0.50
Stiff, grey, silty clay. Obs. kankars.  SpT-2  SpT-2  3.00-3.45  SpT-2  3.00-3.45  SpT-3  4.45-4.90  DS-3  5.50  SpT-4  6.00-6.45  SpT-5  7.00-7.10  7.30 penth. 2100  4.0 pm Penth. 2100  4.0 pm Penth. 2100  R2  R3  R3  R4  R4  R6  R6  R7  R7  R8  R8  R8  R9  R9  R8  R8  R9  R9  R1  R1  R1  R1  R1  R1  R1  R1										۵			UDS-1	1.00-1.45
Stiff, grey, silty clay. Obs. kankars.  (CI)  Very stiff, grey, silty clay. Obs. kankars.  (CI)  Very dense, brownish grey, silty medium grained sand with decomposed 7.30m  Very dense, brownish grey, silty medium grained sand with decomposed 7.30m  NN rotary drilling from 7.30m  NN rotary drilling from 7.30m  R1  R2  R2  R3  R3  R8  R8  R8  R9  R1  R1  R1  R1  R2  R8  R0  R1  R1  R2  R8  R0  R1  R1  R1  R2  R8  R8  R0  R1  R1  R1  R1  R2  R8  R0  R1  R1  R1  R1  R2  R8  R0  R8  R0  R0  R1  R1  R1  R1  R1  R1  R2  R8  R8  R8  R8  R8  R8  R8  R8  R9  R9				11	\;	3	4	5		<del>-</del>			SPT-1	1.45-1.90
Stiff, grey, silty clay. Obs. kankars.  (CI)  Very stiff, grey, silty clay. Obs. kankars.  (CI)  Very dense, brownish grey, silty medium grained sand with decomposed 7.30m  Very dense, brownish grey, silty medium grained sand with decomposed 7.30m  NN rotary drilling from 7.30m  NN rotary drilling from 7.30m  R1  R2  R2  R3  R3  R8  R8  R9  R8  R00=52%  R1  R1  R1  R8  R00=60%  R1  R1  R8  R8  R00=60%  R1  R1  R8  R8  R00=70%  R1  R1  R1  R1  R8  R8  R00=22%  R00=22%  R00=22%  R1  R1  R1  R1  R2  R8  R8  R00=22%  R00=22%  R1  R1  R1  R1  R1  R2  R8  R8  R00=60%  R1  R1  R1  R1  R1  R1  R2  R8  R00=60%  R1  R1  R1  R1  R1  R2  R8  R8  R00=60%  R1  R1  R1  R1  R1  R1  R2  R8  R00=60%  R1  R1  R1  R1  R1  R2  R8  R00=60%  R1  R1  R1  R1  R1  R1  R1  R2  R8  R00=60%  R1  R1  R1  R1  R1  R1  R1  R2  R8  R00=60%  R1  R1  R1  R1  R1  R1  R1  R2  R8  R00=60%  R1  R1  R1  R1  R1  R1  R1  R2  R8  R00=60%  R1  R1  R1  R1  R1  R1  R1  R2  R8  R00=60%  R1  R1  R1  R1  R1  R1  R1  R1  R2  R8  R00=70%  R1  R1  R1  R1  R1  R1  R1  R1  R1  R													DS-2	2.50
Very stiff, grey, silty clay. Obs. kankars.  (Ci)  Very dense, brownish grey, silty medium grained sand with decomposed 7.30m rock. (SM)  NX ratary drilling from 7.30m to 13.00m ratary drilling from 7.30m to 13.00m ratary drilling from 7.30m to 13.00m ratary drilling from 7.30m ratary drilling from 7.30m ratary drilling from 7.30m ratary drilling from 7.30m to 13.00m ratary drilling from 7.30m ratary drilling from 7.30m ratary drilling from 8.75 cr=61% RQD=52% RQD=54% p.50 ratary drilling from 7.30m to 13.00m ratary drilling from 7.30m to 13.00m ratary drilling from 7.30m ratary drilling from 8.75 cr=76% RQD=54% p.50 ratary drilling from 7.30m to 13.00m ratary drilling from 7.30m to 13.00m ratary drilling from 7.30m to 13.00m ratary drilling from 7.30m ratary drilling from 7.30m ratary drilling from 8.75 cr=61% RQD=54% p.50 ratary drilling from 7.30m to 13.00m ratary drilling from 7.30m to 13.00m ratary drilling from 7.30m ratary drilling from 7.30m ratary drilling from 8.75 cr=61% RQD=52% ratary drilling from 7.30m ratary drilling from 7.30m ratary drilling from 8.75 ratary drilling from 9.75	Stiff. arev. silty o	:lav.	Obs. kankars.		)	4	5	6	-	11			SPT-2	3.00-3.45
Very stiff, grey, silty clay. Obs. kankars. (C)  Very dense, brownish grey, silty medium grained sand with decomposed 7.30m rock. (SM)  NX retary drilling from 7.30m R2 CR=61% R0D=52% R0D=52% R0D=17% R1 CR=71% R0D=54% R2 CR=71% R0D=54% R0D=72% R1 CR=78% R0D=72% R1 CR=88% R0D=72% R1 R0D=72% R1 R0D=54% R1 R1 R0D=54% R1 R2													TIDG 3	4.00 4.45
Very stiff, grey, silty clay. Obs. kankars. (CI)  Very dense, brownish grey, silty medium grained sand with decomposed rock. (SM)  7,30m  NX retary drilling from 7,30m to 15.00m  R1  R2  R2  R6.80m R7,30m to 15.00m  R3  R4  R6  R7  R7  R8  R8  R8  R9  R9  R8  R8  R9  R8  R8						_	6		-	14				
Very stiff, grey, silty clay. Obs. kankars. (CI)  Very dense, brownish grey, silty medium grained sand with decomposed 7.30m  NX ratary arilling from 7.30m  NX ratary arilling from 7.30m  R2 Refer R0D=15% R1  R2 R0D=52% R0D=52% R0D=15% R2  R4 R0D=52% R0D=17% R3  R5 R2						3	О	0					SP1-3	4.45-4.90
Very stiff, grey, silty clay. Obs. kankars. (CI)  Very dense, brownish grey, silty medium grained sand with decomposed 7.30m rock. (SM)  Very dense, brownish grey, silty medium grained sand with decomposed 7.30m rock. (SM)  NX ratary drilling from 7.30m to 15.00m R2 R0D=52% R0D				111	``;								DS-3	5.50
Very dense, brownish grey, sitty medium grained sand with decomposed 7.30m 7.3		/ clay	. Obs. kankars.			7	8	9		1 /			SPT-4	6.00-6.45
A	Very dense browni	sh g	rov cilty		Ì	100							SPT-5	7.00-7.10
NX rotary drilling from   R2   CR=61% RQD=52%   8.75   R3   CR=76% RQD=17%   10.25   R5   RQD=172%   11.00   R6   CR=88% RQD=60%   R7   R7   CR=82% RQD=75%   R8   CR=84% RQD=22%   R8   R9   R9   R9   R9   R9   R9   R9	medium grained sand rock. (SM)	with d	ecomposed 7.30m			100			k	<u> 100</u>			*SPT-6	7.30-7.34 <b>7.30</b> CR=62% RQD=16%
7.30m to 15.00m   R3   CR=71%   RQD=54%   9.50   R4   CR=76%   RQD=17%   10.25   R5   CR=79%   RQD=72%   11.00   R6   CR=88%   RQD=60%   11.75   R7   CR=82%   RQD=72%   12.50   R8   CR=84%   RQD=22%   R8   CR=84%   RQD=22%   R8   CR=84%   RQD=22%   R8   CR=84%   RQD=22%   R9   CR=86%   RQD=42%   R10   CR=86%   R10   C													R2	CR=61%
Slightly weathered / fresh, brownish grey to grey, medium to fine grained, fractured sandstone.						ХИ	7.3	tar 0m	y di to	rill <b>i</b> ng 15.0	fro 0m	m	R3	8.75   CR=71%     POD=54%
Slightly weathered / fresh, brownish grey to grey, medium to fine grained, fractured sandstone.  R5 CR=79% RQD=72% 11.00 R6 CR=88% RQD=60% 11.75 R7 CR=82% RQD=75% 12.50 R8 RQD=75% 12.50 R8 CR=84% RQD=22% 13.25 R9 CR=82% RQD=42% 14.00 R10 CR=86% RQD=70% 15.00 N.B. — '*' means sample could not be recovered.													R4	9.50   CR=76%
Slightly weathered / fresh, brownish grey to grey, medium to fine grained, fractured sandstone.  R6 CR=88% RQD=60%  11.75  R7 CR=82% RQD=75%  12.50  R8 CR=84% RQD=22%  13.25  R9 CR=82% RQD=42%  14.00  R10 CR=86% RQD=70%  15.00m  N.B. — '*' means sample could not be recovered.														10,25
Ro														11,00
R8 R8 CR=84% RQD=22% 13.25 R9 CR=82% RQD=42% 14.00 R10 CR=86% RQD=70% 15.00m be recovered.					$\frac{+}{+}$								R6	RQD=60%
R8 CR=84% RQD=22% 13.25 R9 CR=82% RQD=42% 14.00 CR=86% RQD=70% 15.00m N.B. — '*' means sample could not be recovered.													R7	CR=82% RQD=75% 12.50
N.B. — '*' means sample could not be recovered.													R8	RQD=22% <b> </b>
N.B. — '*' means sample could not be recovered.													R9	CR=82% RQD=42%
N.B. — '*' means sample could not be recovered.													R10	CR=86%
		sam												15.00
	be recovered.				<b></b>			Ш						RH_23/Sheet-

Project : Prelimina	ary G.											
Job No : 3975	A /TTI A	Created by:								_	<del></del>	
BORE LOG D	ATA	SHEET	BO	KE			LE		10			N=4703
Field Test	Nos	Samples		No	วรา					t Date Date		08/17 08/17
Penetrometer (SPT)	5	Undisturbed (U	-	2	۱ ·		•			meter		mm. / N. X.
Cone (Pc)		Penetrometer (	(SPT)	5		Le	vel	Of	Gr	ound	: 73.13	24 m.
Vane (V)		Disturbed (DS)	(11/0)	3						k At		
valle (v)		Water Sample	(WS)	C		Sto		ig W VALI		Level		m. SAMPLES
DESCR	RIPTIO	N	SYMB	OL	EAC	:H				5cm.	Ref. No	Depth (m)
		0.00m						T				
											DS-1	0.50
Filled up soil consist	s of (	grey to brownish										
grey, silty clay with	bould	der & coal dust.						7			*UDS-1	1.00-1.45
					2	3	4	-			SPT-1	1.60-2.05
		2.20m		7							DS-2	2.50
								10			DO 2	2.00
Clift III	• • • •			`\`	3 !	5	5				SPT-2	3.00-3.45
Stiff, light grey, kankars. (CI)	Silt	y clay. Obs.						1,			UDS-2	4.00-4.45
					4	5	7	12	-		SPT-3	4.45-4.90
				``								
				$\langle \cdot \rangle$							DS-3	5.50
Very dense, browni	ish a	rev. silty fine			425			<u> </u>			SPT-4	6.00−6.22
sand with decompose		ck. (SM)			'	7.C		n P	ent	n.		
		6.40m			100	4.C		<u>lefu:</u> n P		n.	*SPT-5 <b>R1</b>	6.40-6.44 6.40 CR=33% i RQD=NIL _
Highly to moderately	weat	hered brownish	┟┸┰╁┸									CR=49%
grey, fine grained,			┞┼┼┼	╙╢						from	R2	RQD=NIL
				┸┼╢	6	.40	m	o 1	<b>5</b> .00	m	R3	CR=48%   RQD=15%
											R4	8.50     CR=64%
				$\Box$							114	RQD=28%
				$\Box$							R5	CR=45% RQD=27%
				$\Box$							R6	10:00   CR=61%   RQD=NIL
			$\vdash$	$\perp$								10.75
   Slightly weathered	/ +	fresh. arev to		Ц							R7	CR=63% RQD=21% V
blackish grey, fine				$\Box \!\!\! \mid$							R8	CR=68%   RQD=NIL
sandstone.												12,25
				$\dashv$							R9	CR=71% RQD=NIL
				$\Box$							R10	13:00   CR=92%   RQD=76%
				텎								13.75 CR=82%
				ᆸ							R11	RQD=20%
		15.00m									R12	CR=83% 14.30 RQD=47% 15.00
N.B. — '*' means be recovered.	sam	ple could not										13.00
De l'ecoveleu.				1								BH-24/Sheet-1

		T 700 1 0 00		<b>+</b>					• •	*** (0.000	
Project: Prelimina Job No: 3975	ry G.	I. Work for Ta Created by:									
BORE LOG D	ДΤΔ		BO			IOI		NC			ordinates N=4670
			DO	1					nt Dat		08/17
Field Test	Nos	Samples		No	)S				Date		08/17
Penetrometer (SPT)	7	Undisturbed (U		2	.				amete		mm. / N. X.
Cone (Pc)		Penetrometer		7					round		52 m.
Vane (V)		Disturbed (DS) Water Sample		4   0					ck A r Lev		m
		•		Ť	<u>′                                     </u>			LUE	I LEV		SAMPLES
DESCR	IPTION	N	SYMB	OL	EAC				15cm		Depth (m)
Filled up soil consi brownish grey, silty										DS-1	0.50
								1 1		UDS-1	1.00-1.45
					3	5 6				SPT-1	1.45-1.90
Stiff, grey, silty c	lay.	(CI)						15		DS-2	2.50
					5	7   8		10		SPT-2	3.00-3.45
Very dense, brownish	n grey	4.00m , silty medium			425	58 2.0		100 Peni	in.	*UDS-2 SPT-3	4.00-4.10 4.10-4.37
to fine grained sa rock. (SM)	ınd 8	decomposed 4.90m			ıool	4.0	cm	Pent fusal Pen	t n.	*SPT-4	4.60-4.64 4.90-4.93 <b>4.90</b>
Completely weather fine grained rock		vellowish grey,		=	50	3.0	cm	fusal Pen fusal	t n.	R1 DS-3 *SPT-6	CR=NIL RQD=NIL 5.50-5.53 5.50
as sludge.		6.25m			50	3.0	1 1	Pen fusal		<b>R2</b> DS-4 *SPT-7	CR=NIL RQD=NIL 6.25-6.28 6,25
Moderately weather to deep grey, media		yellowish grey				3.0	cm	Pen	tn.	R3	CR=41% RQD=23%
fractured sandstone		7.75m			NX 4	rotai .90m	ry dr	illing 11.50	from m	R4	CR=46% RQD=20%
		, , , , , ,								R5	CR=51% RQD=20% 8.50
										R6	CR=56% RQD=31% 9,25
Moderately to slyellowish grey to a to fine grained, from	deep	grey, medium								R7	CR=68% RQD=34%
J										R8	CR=72% RQD=31% 10.75
		11.50m								R9	CR=73% RQD=37%
N.B. — '*' means be recovered.	sam										
				T							BH-25/Sheet-

	Project : Prelimina	ary G.	I. Work for Ta	lcher	<b>↓</b> The	ern	nal l	Pow	er ]	Proje	ct-	III (2x660	MW). CE	TEST
	Job No : 3975		Created by:									8/09/2017	Sheet N	
	BORE LOG D	ATA	SHEET	BO	RE	<u>.</u>	HO:	LE	N	0.	26	3 Co-o	rdinates N=	=781 =4713
	Field Test	Nos	Samples		No	os				nent [		: 23/0	08/17	
	Penetrometer (SPT)	5	Undisturbed (U	IDS)	2	2		•		on De Diam			)8/17 mm. / N.	х.
	Cone (Pc)		Penetrometer (	(SPT)	5	5				Grou			88 m.	
			Disturbed (DS)			2				ruck				
	Vane (V)		Water Sample	(WS)						ater L	evel			
	DESCR	RIPTION	N	SYMB	OL	FΛ			ALU	: 15d	m		SAMPLES Depth	(m)
	Filled up soil con with fly ash.	nsists								- 130		DS-1	0.50	
	<u>,                                      </u>		0.80m									UDS-1	1.00-1	15
					\\	3	4   5		9			SPT-1	1.45-1	
					\\		7					3F1-1	1.45-1	.90
	Stiff to very stiff, grey, silty clay. Ob								<u>12</u>			DS-2	2.50	
	grey, sitty ciay. Of	JS. K	dikuis. (Ci)			4	6 6	;				SPT-2	3.00-3	.45
									22			UDS-2	4.00-4	.45
						7	9 1.	3	22			SPT-3	4.45-4	.90
	Very dense, brownish					42	58 10.0		10 P			SPT-4	5.10-5	
•	<u> </u>	· ·	5.50m			100	4.0			entn. <u>al</u> entn.		*SPT-5	5.50-5.54 CR=43%	
							4,0	CII		eriuri.		R1	CR=43% RQD=18%	6.25
						ΧИ	roto 5.50r	iry (	rilli 15	ng fro	m	R2	CR=65% RQD=NIL	7.00
	Moerately to slightly grey, fine grained,						0.001					R3	CR=67% RQD=23%	7.75
	g. 2, , g. a ,											R4	CR=65% RQD=27%	8.50
												R5	CR=71% RQD=39%	9.25
			10.00m									R6	CR=74% RQD=41%	10.00
												R7	CR=80% RQD=22%	10.75
												R8	CR=83% RQD=43%	
	Fresh, yellowish	arev	to blackish									R9	CR=81% RQD=39%	12.25
	grey, fine grained,											R10	CR=86% RQD=49%	13.00
												R11	CR=81% RQD=20%	V
												R12	CR=88% RQD=51%	14.00
	N.B. — '*' means be recovered.	sam	15.00m ple could not											15.00
					1								BH-2	6/Sheet-1

ſ	Project : Prelimin	narv G.	I. Work for Ta	lcher	The	erm	al	Po	wer	Pr	oiec	t-I	II (2x660	MW). <b>C</b> =	TEST	
ļ	Job No : 3975		Created by:				_						2/09/2017	Sheet N		
	BORE LOG	DATA	SHEET	BO	RE	I	OF	LI	<b>E</b> ]	NC	).	27	Co-c	ordinates E= N=	=698 =4635	
	Field Test	Nos	Samples		No	s					nt D			08/17		
ŀ	Penetrometer (SPT)	5	Undisturbed (U	JDS)	2	<u>-</u>		•			Da ame			08/17 mm. / N.	χ.	
	Cone (Pc)		Penetrometer	(SPT)	5	5					rou			42 m.		
			Disturbed (DS)		3	5			_		ck					
ļ	Vane (V)		Water Sample	(WS)	C	)			<u> </u>		er Le	vel				
	DESC	RIPTION	N	SYMB	30L	FΛ(			·VAL		15c	<u>_</u>	Ref. No	SAMPLES Depth	(m)	
ŀ			0.00m							Ŧ		····	1101. 110	3000.1	(11)	
	Filled up soil cons	ists of	ash.										DS-1	0.50		
ŀ			0.80m		$\overline{}$											
					`.\				15	<u>5</u>			UDS-1	1.00-1		
	Stiff deep grey, si	ty clay	. Obs. kankars.			4	6	9					SPT-1	1.45-1	.90	
	(CI)												DS-2	2.50		
					\\				18	8			03-2	2.50		
ŀ			3.00m			6	8  1	0					SPT-2	3.00-3	.45	
	Very stiff deep g	rev si	ilty clay Obs										UDS-2	4.00.4	4.5	
	kankars. (CI)	10,	ity cray. cbc.			7	9 1		19	<u>9</u>			SPT-3	4.00-4 4.45-4		
			F 20				9	٦					31 1-3	4.45-4	.90	
Ī			5.20m										DS-3	5.50		
▶	Very dense, browni grained sand with					43	57		<u> 1</u>	<u>oo</u>			SPT-4	6.00-6	.27	•
	g					1	2.0		m F		1 1					
Ī			6.40m			100	4.0	- 1-	Refu m l	_	- 1		*SPI-5	6.40-6.44 CR=40%	1 1	
					T¦									RQD=20% CR=56%	7:00	
													R2	RQD=23%	7.75	
					$\mathbb{H}$	NX 6	roto .40:	ory m i	dril o 1	lihg 3.75	froi 5m	m	R3	CR=61% RQD=31%		
														CR=60%	8,50	
													R4	RQD=40%	9.25	
													R5	CR=63% RQD=40%		
	Moderately to s fresh, brownish g				Ц										10,00	
	grained, fractured	sandsto	ne.										R6	CR=65% RQD=13%		
					+								R7	CR=76%	10.75	
													•••	RQD=69%	11,50	
													R8	CR=81% RQD=67%		
					Ц,								R9	CR=80%	12:25	
					$\prod_{i=1}^{n}$								N.J	RQD=57%	13,00	
													R10	CR=93% RQD=89%		
			13.75m												13.75	
	N.B. — '*' mean	s sam	ple could not													
	be recovered.															
				age 7	1	/ 7.	1			- 1				BH-2	7/Sheet-1	ı

Project : Prelimina	ary G.	I. Work	for Ta	lcher	<del>↓</del> The	rmal	Po	wer	Pro	oject-	III (2x660	MW). <b>CETEST</b>
Job No : 3975	A 7T1 A	•									12/09/2017	-
BORE LOG D	ATA			BOI	KE				NO			N=4708
Field Test	Nos	S	amples		No	SI				nt Date Date		08/17 08/17
Penetrometer (SPT)	5		ırbed (U	-	2	- 1	•			ameter		mm. / N. X.
Cone (Pc)			meter (	(SPT)	5	-	evel	l 0	f Gr	ound	: 71.9	03 m.
Vane (V)			ed (DS)	(14/0)	3	''				ck At		
varie (v)		Water :	Sample	(WS)	0	St		ing -VAL		r Level		m. SAMPLES
DESCR	RIPTIO	١		SYMB		FACH				15cm.	Ref. No	Depth (m)
			0.00m		╡			Ť				
Filled up soil consis	sts of	ash.	— 0.60m								DS-1	0.50
			– 0.60m		7							
								1	5		UDS-1	1.00-1.45
				111		4 6	9				SPT-1	1.45-1.90
Stiff to very stif			grey,									
silty clay. Obs. kank	ars. (	(CI)		11/1	`.\						DS-2	2.50
				11/1		5 8	10	┟	8		SPT-2	3.00-3.45
			— 4.00m								*UDS-2	4.00-4.45
								3	7			
Dense to very dense medium grained sar					1	10 16	21				SPT-3	4.60-5.05
rock. (SM)	ia wit	ii decoii	ipoosed								DS-3	5.50
					1	00 4.			<u>00</u> Pent	h.	*SPT-4	6.00-6.04
			— 6.30m		<u> </u>	00	.	<u>Refu</u>	<u>usal</u>		*SPT-5	
					Ш	3.	10 b	m	Pent	n.	R1	CR=44% RQD=18% 7.00
											R2	CR=41%
Moderately weathered, to fine grained, fractu			medium	ШЦ		NX rd	tary 0m	dri to	ill <b>i</b> ng 15.00	from Im		RQD=NIL 7.75
To fine grained, fracta	, ca 50	indotono.									R3	CR=43% RQD=NIL
											D4	8.50   CR=58%
			— 9.25m								R4	RQD=25% 9.25
											R5	CR=73% RQD=28%
					Ц							10.00
											R6	CR=68% RQD=16%
				$\Box$	-						R7	10:75   CR=69%
					#						'`'	RQD=32% 11.50
Slightly weathered, b				<del>                                     </del>	4						R8	CR=67% RQD=39%
sandstone.					耳							12.25 CR=72%
											R9	RQD=17% 13.00
					$\dashv$						R10	CR=69%   RQD=NIL
												13.75
				H	$\perp$						R11	CR=73% RQD=13%
											R12	CR=70% 14 50 RQD=NIL 45
N.B. — '*' means	sam	ple cou	15.00m ld not									15:00
be recovered.		•										<u></u>
					1							BH-28/Sheet-

ſ	Duningt . Dunlimi	C	I Wank for To	lah an	The c		1 D		- D		.1	III (neen	1/W) <b>/=</b>	reet
ŀ	Project : Prelimi Job No : 3975	nary G.	Created by :											<u>                                     </u>
ŀ		DATA		BO			OI			).				
ľ	Field Test	Nos	Samples		No	S I				ent D		: 23/0	08/17	1000
	Penetrometer (SPT	) 4	Undisturbed (L	IDS)	1	- 1		•		n Do iame			08/17 mm. / N.	x.
	Cone (Pc)		Penetrometer (	(SPT)	4					rou			62 m.	
			Disturbed (DS)		2	:   \	Vate	er	Stru	ıck	Αt	:		
	Vane (V)		Water Sample	(WS)	<u> </u>	) (				er Le	evel			
	DES	CRIPTION	N	SYMB	OL-	<u> </u>			ALUE				SAMPLES	(70)
	Filled up soil ogrey, silty clay wit		0.00m s of blackish <u>0</u> .60m			EAC	НД	IVN	. <u>=</u>   	15c	m.	DS-1	0.50	
				1111	``				<u>10</u>			UDS-1	1.00-1	
						2 4	6					SPT-1	1.45-1	.90
	Stiff, steel grey,	silty cl	ay. (CI)						13			DS-2	2.50	
			7.00	<b>/</b> \ \		3 5	8		<u> 100</u>			SPT-2	3.00-3	.45
İ	Very dense, yellow with deocomposed					65 3	50		Per			SPT-3	4.00-4	.20
	with deocomposed	TOCK.	4.50m			00		l≥	<u>100</u> Per			*SPT-4 <b>R1</b>	4.50-4.52 CR=41% RQD=13%	
•												R2	CR=44% RQD=28%	6.00
	Moderately wea medium grained, f					NX 4.	rotai .50m	to	rillin 15.	g frd 00m	m	R3	CR=42% RQD=20%	6.75
												R4	CR=44% RQD=16%	7,50
					坩							R5	CR=43% RQD=17%	8,25
					$\perp$							R6	CR=61% RQD=28%	9.00
												R7	CR=52% RQD=37%	9.75
												R8	CR=62% RQD=16%	10.50
		l  : _										R9	CR=60% RQD=27%	11,25
	Slightly weathered grained, fractured	sandsto	ne.									R10	CR=62% RQD=31%	
												R11	CR=63% RQD=20%	l l
					$\blacksquare$							R12	CR=68% RQD=32%	l l
					+							R13	CR=71% RQD=52%	
	N.B. — '*' mean be recovered.	s sam	15.00m ple could not									R14	CR=79% RQD=25%	
Ĺ	20 100010104.			<u> </u>	1			Ш					<u> </u> BH−2	9/Sheet-1

Project : Prelimin	ary G.	I. Work for Tal	lcher	<del>↓</del> Thei	rma	Pow	er Pr	oject-	-III (2x660	MW). <b>CET</b>	EST
Job No : 3975		Created by:						_	•	Sheet No	
BORE LOG D	ATA	SHEET	BO	RE	H	OLE	NO	0.3	<b>0</b>   Co-o	rdinates N=2	871 1772
Field Test	Nos	Samples		Nos	3			nt Date		08/17	
Penetrometer (SPT)	6	Undisturbed (U	DS)	2	- 1			Date iametei		08/17 mm. / N.	x.
Cone (Pc)		Penetrometer (	SPT)	6				round		42 m.	~··
		Disturbed (DS)		3				ck At			
Vane (V)		Water Sample	(WS)	0	S		<u> </u>	er Leve	1		
DESC	RIPTION	١	SYMB		ACH		VALUE N. =		Ref. No	SAMPLES Depth (i	m)
		0.00m		= -							
									DS-1	0.50	
Filled up soil co	nsist	s of blackish									
grey to brownish / clayey silt with a	n gre	y, silty clay					100		*UDS-1	1.00-1.4	45
/ clayey sill with c	1511 &	boulders		4		90 0 cn	n Pen	th	SPT-1	1.60-1.9	95
		2.50m	ļ		ľ				DS-2	2.50	
							16				
\/		-114	1,1		5   7	9			SPT-2	3.00-3.4	45
Very stiff, brownish	grey,	stity clay. (CI)					20		UDS-2	4.00-4.4	45
			11/1		7   9	11	20		SPT-3	4.45-4.9	90
		5.30m		1 3	6 64		<del>  100</del>		SPT-4	5.30-5.5	55
Very dense, grey, s sand. Obs. decompo				1 10	10	l IR	n Pen efusa	<u>.</u>	*SPT-5	5.70-5.7	74
- Jana: Obs. accompo		5.80m			4	0 cn <u>R</u>	n Pen efusal		*SPT-6	5.85-5.88	
Moderately weathe	red. v	vellowish arev	╟╁┼	]	3	0 cn	n Pen	th.	R1	CR=45% RQD=NIL	6.50
fine grained, fractur				Ħ					R2	CR=48% RQD=NIL	
		7.25m		当,	NX r	) otany	drilling	g from			7 25
				H	5.8	0m <sup>′</sup> t	o 15.č	00m	R3	CR=62% RQD=15%	
Moderately to slightly				$\exists$					R4	CR=52%	8'00
grey, fine grained, f	ractur	ed sandstone.								RQD=25%	8 <mark>,</mark> 75
		0.50		Н					R5	CR=77% RQD=49%	<b>J</b>
		——— 9.50m		q					R6	CR=80%	9.50
				口					""		10,25
									R7	CR=84% RQD=77%	<b>↓</b>
				$\mathbf{H}$					R8	CR=80%	11:00
									l Ko	RQD=28%	11,75
Slightly weathered / to deep grey, fine									R9	CR=83% RQD=45%	↓
sandstone.	, g. u.	mastar su		딖					D10	CR=92%	12.50
				口 口 二					R10	RQD=21%	13.25
				╣					R11	CR=82% RQD=56%	
				Н						,	14,00
				口					R12	CR=92% RQD=85%	
N.B. — '*' means	sam	ple could not		_							15.00
be recovered.		•									40)
				1						BH-30	∕Sheet-1

	Project : Prelimina	ary G.	I. Work for Ta	lcher	<b>↓</b> The	ern	nal P	owe	er Pi	oject	-III (2x660	MW). <b>CE</b>	TEST
	Job No : 3975	4 TD 4	Created by:										
ļ	BORE LOG D	ATA	SHEET	BO	KŁ	; ]				). 3		rdinates N=	=4828
	Field Test	Nos	Samples		No	os				nt Da <sup>.</sup> Dat		08/17 08/17	
Ī	Penetrometer (SPT)	5	Undisturbed (L	JDS)	2	2		•		iamete		mm. / N.	X.
	Cone (Pc)		Penetrometer	(SPT)		5	Leve	el (	Of G	roun	d: <b>71.9</b>	93 m.	
			Disturbed (DS)		2					ick A			
-	Vane (V)		Water Sample	(WS)		)		<u>_</u>		er Lev	1		
	DESCR	RIPTION	1	SYMB	OL	FΔ			ALUE =		n. Ref. No	SAMPLES Depth	(m)
ŀ			0.00m			Î				1 1	1. 1101. 110		<u> </u>
											DS-1	0.50	)
	Filled up soil cor												
	with boulders, moore	um &	ash.						<u>27</u>		*UDS-1	1.00-1	
			2.00m			7	15 12				SPT-1	1.45-1	.90
			2.0011								DS-2	2.50	,
	Ctiff door area cilt	بملمين	. (CI)						10		03-2	2.50	'
	Stiff, deep grey, silt	y Ciay	7. (CI)			4	5 5				SPT-2	3.00-3	.45
			4.00	1	``\								
Ī			4.00m	<b>'i III I</b>	ÌÌ						*UDS-2	4.00-4	.30
	Very dense, browni					16	29 32		<u>61</u>		SPT-3	4.55-5	.00
	with decomposed ro	ck. (S	M)					Ι≥	100		*SPT-4	5.30-5	. 35
•			5.60m	╏╢╢		100 100	5.0	cm ≥	Pen 100	th.	*SPT-5	5.60-5.63 CR=41%	
				$\parallel \downarrow \downarrow \downarrow$	Щ		3.0	cm	Pen	th.	R1	RQD=NIL	6.25
					ᅫ						R2	CR=48% RQD=15%	
	Highly to moderately	v weat	hered, brownish	H	귀	ХИ	rotar 5.60m	y d	rilling 15.0	g from Om	ו	CR=36%	7.00
	grey to grey, medifractured sandstone.	um to	fine grained,	<b> </b>	┵┦						R3	RQD=15%	7.75
	ridetared sandstone.				Щ						R4	CR=31% RQD=NIL	'j'3
					뮈								8,50
			0.05		귀						R5	CR=47% RQD=NIL	<b>↓</b>
Ī			9.25m								R6	CR=60%	9.25
												RQD=NIL	10,00
											R7	CR=64% RQD=NIL	<b>,</b>
											De	CR=71%	10.75
											R8	RQD=43%	11.50
	Slightly weathered	, are	v. medium to								R9	CR=76% RQD=73%	1 1
	fine grained, fractur											CR=78%	12,25
											R10	RQD=43%	13.00
											R11	CR=72% RQD=15%	
					Д								13.75
					Ш						R12	CR=77% RQD=60%	
			15.00m		$\exists$						R13	CR=79% RQD=61%	14.50
	N.B. — '*' means	sam											15:00
L	be recovered.				<b></b>							   BH:	31/Sheet-1

ı	T) ' ( T) 1' '		T W 1 C M		<u>+</u>		<u> </u>			• •	XXX (D. 000	1 (707)	F=_=
	Project : Prelimina  Job No : 3975	ary G.	Created by :							_	•		0:   <b>=5</b>
		ATA	·	BO			IOL		NO		<u> </u>	_	
	Field Test	Nos	Samples		No	$\neg$				nt Dat		08/17	-4314
			Undisturbed (L	IDC)	1	_		•		Date		08/17	
	Penetrometer (SPT)	4	Penetrometer (	-	'   4					amete rounc		mm. / N.	X.
	Cone (Pc)		Disturbed (DS)		'					ck At		35 m.	
	Vane (V)		Water Sample		c					r Leve		m.	
	DESCE	RIPTION		SYMB		'	N	_VA	LUE			SAMPLES	
		1101				EAC	HD	IVN.	=	15cm	Ref. No	Depth	(m)
			0.00m										
					\\]						DS-1	0.50	
	Very stiff to hard,	browr	ish grey, silty						10		UDS-1	1.00-1	.45
	clay with sand mixt	ure. (	CI)			8 9	9 10		<u>19</u>		SPT-1	1.45-1.	.90
									40				
			2.95m			16 1	923		<u>42</u>		SPT-2	2.50-2	.95
	Very dense, browni with decomposed ro		ey, silty sand			00	4.0	. –	<u>100</u> Pent		*SPT-3	3.20-3	.24
	with accomposed to	CK. (3	3.40m			00			<u> 100</u>		*SPT-4	3.40-3.43 CR=42%	3,40
	Moderately weathe						3.0	cm	Pent	:h.	R1	RQD=NIL	4.00
	fine grained, fractur	ea sa			<del> </del>						R2	CR=41% RQD=13%	
			4.75m			NX 3	rotar .40m	y di to	rill <b>i</b> ng 1 <b>5.</b> 00	from m	R3	CR=73%	4:75   
-												RQD=56%	5.50
											R4	CR=72% RQD=63%	
	Slightly weathere	ed br	rownish arev		$\perp$						R5	CR=76%	6.25
	fine grained, fra				$\top$						l KS	RQD=58%	7.00
											R6	CR=75% RQD=22%	. ↓
											D7	CR=77%	7.75 
			8.50m								R7	RQD=50%	8.50
											R8	CR=82% RQD=57%	
												CR=81%	9.25
											R9	RQD=38%	10.00
											R10	CR=85% RQD=20%	
													11 EO
	Fresh, light grey, fi sandstone.	ne gro	ained, fractured										11.50
	Sanastone.										R11	CR=81% RQD=48%	
													\
													13:00
					$\sharp$						R12	CR=83% RQD=23%	
					$\perp$								. ↓
			45.00		Д						R13		14,50
	N.B. — '*' means	sam	15.00m ple could not	\ <del>\</del>								RQD=72%	15!00
	be recovered.				<u> </u>							DU 7	2 /Sh 4
					U							BH-3	2/Sheet-1

	Project : Prelimina	ary G.	I. Work for Ta	lcher	The	ern	nal	Pow	er	Proje	ct-	III (2x660	MW). C=	rest
	Job No : 3975		Created by:									29/08/2017	Sheet N	
	BORE LOG D	ATA	SHEET	BO	RE			LE		0.			rdinates N=	=512 =4853
	Field Test	Nos	Samples		No	os				nent I on D			)8/17 )8/17	
	Penetrometer (SPT)	4	Undisturbed (L		1	`				Diam			mm. / N.	х.
	Cone (Pc)		Penetrometer		4					Grou			42 m.	
	Vane (V)		Disturbed (DS) Water Sample		2	.				ruck ater L			m	
	DECOE		·					N-\			.0101		SAMPLES	
	DESCR		<b>\</b> 	SYMB	SOL	ΕĄ	СН	DIVI	١. =	= 15	cm.	Ref. No	Depth	(m)
	Blackish grey, silty	clay.										DS-1	0.50	
			——— 0.70m									1100 4	4 00 4	4.5
									12			UDS-1 WS-1	1.00-1 1.10	
	Stiff to very stiff, stee	el arev	. siltv clav. (CI)			3	5	7	12			SPT-1	1.45-1	.90
	,,	· 3· -7	,,,						16			DS-2	2.50	
			3.50m			4	7	9	×10			SPT-2	3.00-3	.45
	Very dense, yello sand with decompos		~k (SM)			100	14.0			entn.		SPT-3	3.80-3	
	'		4.20m			100	3.0	-	$\overline{}$	<u>0</u> enth.		*SPT-4	4.20-4.23 CR=44%	4.20
					╫							R1	RQD=24%	5,00
•												R2	CR=42% RQD=14%	5.75
	Moderately weathers medium grained frac				_ <u> </u>					ng fr .00m		R3	CR=42% RQD=NIL	6.50
												R4	CR=50% RQD=14%	7.25
			8.00m		Щ							R5	CR=60% RQD=13%	8.00
			3,33,1		닊							R6	CR=56% RQD=NIL	8.75
												R7	CR=48% RQD=16%	9.50
												R8	CR=54% RQD=30%	<b>↓</b>
												R9	CR=40% RQD=NIL	10,25
	Moderately to sl light grey, medium sandstone.											R10	CR=61% RQD=15%	11,00
	surfusione.				$\Box$							R11	CR=56% RQD=17%	11,75
												R12	CR=55% RQD=17%	12,50
					$\Box$							R13	CR=53% RQD=35%	13,25
					Ц							R14	CR=62% RQD=37%	14,00
	N.B. — '*' means	samı	15.00m ple could not									R15	CR=71% RQD=46%	14.50 15.00
	be recovered.				1								   BH-3	3/Sheet-1

Project : Prelimina	rv C	I. Work for Ta	lcher '	<b>↓</b> The	יוויןי	al	Pow	er	Pro	iect –	III (2 <del>x</del> 660	MW) CITICT
Job No : 3975	ay a.	Created by :										
BORE LOG D	ATA	SHEET	BOI	RE	I	OF	LE	N	10.	34	<b>1</b> Co-o	rdinates E=1032 N=3212
Field Test	Nos	Samples		No	s					Date	: 12/0	08/17
Penetrometer (SPT)	3	Undisturbed (l	JDS)	1	_		•			Date meter		08/17 mm. / N. X.
	5	Penetrometer		3	;					ound		94 m.
Cone (Pc)		Disturbed (DS)	ı	2	:					k At		
Vane (V)		Water Sample	(WS)	0		Sta	ndin	g W	ater	Level	: 1.10	m.
DESCR	!IPTIOI	١	SYMB	ol-				/ALL				SAMPLES
		0.00m			EA(		DIV	N. =	= 1:	5cm. │	Ref. No	Depth (m)
Filled up soil consis moourm & brick pie		silty sand with									DS-1	0.50
		———— 0.80m									UDS-1	1.00-1.45
Stiff, yellowish brown,	clayey	y sandy silt. (CI)			3	4 4	4	8			SPT-1	1.45-1.90
		2.50m									DS-2	2.50
Medium dense, yel sand with clay bir					5	7 1		20			SPT-2	3.00-3.45
		4.00m			00	3.0		efus n Pe	entn	1.	*SPT-3	4.00-4.03 4.00 CR=30% RQD=16%
Highly to moderately brown to whitish gro					NX	rot 4.00	ary m t	drilli o 10	ng ).00i	from m	R2	4.75 CR=46% RQD=NIL 5.50
fractured sandstone.				<u>-  </u> 							R3	CR=44% RQD=14% 6.25
		7.00m									R4	CR=48% RQD=20%
		,.0011		 							R5	CR=60% RQD=22%
Moderately to sl											R6	7:75 CR=62% RQD=40%
yellowish brown to v grained, moderately											R7	8:50 CR=72% RQD=44%
		4									R8	9:25 CR=76% RQD=56%
N.B. — '*' means be recovered.	sam	10.00m ple could not										10:00
				1								BH-34/Sheet-

ſ	T) ' ( T) 1' '		T TW 1 C TD		<u>+</u>					<del>.</del>		TTT (D. 000		<b>-</b> =
ŀ	Project: Prelimin  Job No: 3975	ary G.	Created by :				_							<u> </u>
ŀ		ATA	_	BO			10			10.			ordinates N=31	72
•	Field Test	Nos	Samples		No		Com	me	ncer	nent	Date	: 13/0	08/17	05
	Danishas as den (CDT)	4	Undisturbed (U	IDS)	1					on D			08/17	
	Penetrometer (SPT)	4	Penetrometer (		4					Diam Grou			mm. / N. X. 92 m.	
	Cone (Pc)		Disturbed (DS)		2					ruck			92 III.	
	Vane (V)		Water Sample	(WS)	c	)				ater l			m.	
Ì	DECCI	RIPTION		SYMB			l	<b>√</b> −/	ALU	JE			SAMPLES	
	DESCI	XIF HOI			OL	EAG	СН	IVIO	١. =	= 15	cm.	Ref. No	Depth (m)	
			0.00m											
	Filled up soil cor with boulders & bri													
	with boulders & bit	CK DU	.s. 0.80m									DS-1	0.70	
									   <u>7</u>			UDS-1	1.00-1.45	
						2	3   4	.	-			SPT-1	1.45-1.90	
	Medium to stiff, ye clay with grey patch			1 \	, 4									
	ciay with grey paten	es. Or	s. Doubters. (Ci)		``\							DS-2	2.50	
									14					
						5	6 E	3	-			SPT-2	3.00-3.45	
					\\]			Ι,	100					
•			3.90m			34	68		10 			SPT-3	3.90-4.13	<b>+</b>
	Hard, yellowish br	own,					8.0		l P	entn.				70
	decomposed rock. (CI)		4.30m			100	4.0		1	entn.			4.30-4.34 <b>4.</b>	30
				$\parallel \parallel \parallel \parallel \parallel$	┼┼┤							R1	CR=38% RQD=16%	
				╟┼╟╌	出								1	00
				┝┵┼┼		ХИ	roto	iry o	rilli	ng fr ).00m	dm	R2	CR=44% RQD=13%	
				┟┼┴┼┤	ᆛᆊ		<b>F.</b> 301			[]			5,	75
	Highly to moderately brown to brownish				ᆛᆊ							R3	CR=48% RQD=14%	
	fractured sandstone.		neaturn grainea	ʹͰͰͰͰ	出								1	50
				HHH	┸								CR=40%	30
				┟┼┴┼┤	ᆛᆌ							R4	RQD=NIL	
					廾┨								7'	25
				╟┼╟╌	出							R5	CR=48% RQD=14%	
			8.00m	╽╌┸╌	Щ								1	00
												R6	CR=54% RQD=16%	
	Madarataly to a	l:ab+l	v woathord		+								<b>!</b>	
	Moderately to sl brownish grey,												1	75
	fractured sandst				丩							R7	CR=50% RQD=32%	
					Ц									50
			40.00		$\Box$							R8	CR=64% RQD=20%	
	N.B. — '*' means	sam	10.00m ple could not	\									10!	00
	be recovered.													
L				1	1				-			ı	BH-35/Sh	 eet-1

with rock dust. (SM)  4.40m  4	ſ	Project : Prelimin	arv G.	I. Work for Ta	lcher	<b>↓</b> The	rm	al F	owo	er 1	Proie	ct-	III (2x660	MW). C=	TEST
Field Test		_												Sheet N	
Penetrometer (SPT)   Cone (Pc)   Disturbed (UDS)   Penetrometer (SPT)   Disturbed (DS)		BORE LOG I	DATA	SHEET	BO	RE							_		=925 =3070
Penetrometer (SPT) 5   Dristurbed (USS)   Penetrometer (SPT)   Disturbed (DS)   Secondary	Field Test	Nos	Samples		No	)S									
Cone (Pc)  Vane (V)  Disturbed (DS) Water Sample (WS)  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  SYMBOL  O.000m  O.000m  D.000m  D		Penetrometer (SPT)	5			_			•						x.
Very stiff, light brownish grey, silty clay with fine sand mixture. (Cl)  Very dense, greyish brown, silty sand with rock dust. (SM)  Very dense, greyish brown, silty sand with rock dust. (SM)  Very dense, greyish brown, silty sand with rock dust. (SM)  Very dense, greyish brown, silty sand with rock dust. (SM)  Very dense, greyish brown, silty sand with rock dust. (SM)  Very dense, greyish brown, silty sand with rock dust. (SM)  Very dense, greyish brown, silty sand with rock dust. (SM)  Very dense, greyish brown, silty sand with rock dust. (SM)  Very dense, greyish brown, silty sand with rock dust. (SM)  Very dense, greyish brown, silty sand with rock dust. (SM)  Very dense, greyish brown, silty sand with rock dust. (SM)  Very dense, greyish brown, silty sand with rock dust. (SM)  Very dense, greyish brown, silty sand with rock dust. (SM)  Very dense, greyish brown, silty sand with rock dust. (SM)  Very dense, greyish brown, silty sand with rock dust. (SM)  Nound pent.  SymBOL  EACH DIVN. = 15cm. Ref. No Depth (m)  DS-1  1.00-1.45  SPT-2  3.10-3.55  SPT-2		Cone (Pc)			SPI)									12 m.	
DESCRIPTION  SYMBOL  CACH DIVN. = 15cm. Ref. No Depth (m)  0.00m  DS-1 0.50  *UDS-1 1.00-1.45  SPT-1 1.55-2.00  DS-2 2.50  Very stiff, light brownish grey, silty clay with fine sand mixture. (Cl)  Very dense, greyish brown, silty sand with rock dust. (SM)  Very dense, greyish brown, silty sand with rock dust. (SM)  4.40m  Highly weathered, yellowish brown, fine grained, highly fractured sandstone.  NN ratary drilling from 4.40m to 10.00m  R1  R2  R2  R2  R2  R2  R2  R2  R2  R2		Vane (V)			(WS)									m.	
O.00m  O.	Ī	DESC	RIPTION	1	SYMB	OL-	•							1	
Filled up soil consists of light grey, silty sand, fly ash mixed.  2 2 2 2 4 1 SPT-1 1.55-2.00  Very stiff, light brownish grey, silty clay with fine sand mixture. (CI)  3.70m  Very dense, greyish brown, silty sand with rock dust. (SM)  Very dense, greyish brown, silty sand with rock dust. (SM)  4.40m  Highly weathered, yellowish brown, fine grained, highly fractured sandstone.  6.00m  No. and a silty sand with rock dust. (SM)  No. and a silty sand silty sand with rock dust. (SM)  No. and a silty sand sandstone.  No. and a silty sand sandstone.  DS-1 0.50  *UDS-1 1.00-1.45  SPT-1 1.55-2.00  DS-2 2.50  DS-3 3.80  SPT-3 4.00-4.18  *SPT-4 4.25-4.28  *SPT-5 4.40-4.12  *R1 Refused  *SPT-4 4.25-4.28  *SPT-5 4.40-4.12  *R2 Reg_21%  R0D=NIL  6. R3 CR=26%  R0D=NIL  7. R5 Reg_28%  R0D=NIL  8. R6 R2-28%  R0D=NIL  9. Omn  Moderately weathered, yellowish brown to grey, fine grained, highly fractured sandstone.  10.00m  N.B '*' means sample could not	-						EAC	HC	IVN	. = 	= 150	m.	Ref. No	Depth	(m)
2.00m  3.70m  3.													DS-1	0.50	)
2.00m  3.0m  3.0m  3.0m  3.0m  3.0m  3.0m  3.0m  3.0m  3.0m  4.40m  4.40										4			*UDS-1	1.00-1	.45
Very stiff, light brownish grey, silty clay with fine sand mixture. (CI)  3.70m  Very dense, greyish brown, silty sand with rock dust. (SM)  Very dense, greyish brown, silty sand with rock dust. (SM)  4.40m  4.40m  A.40m  A.40	-			2.00m		$\overline{}$	2	2 2					SPT-1	1.55-2	.00
Clay with fine sand mixture. (Cl)  3.70m  3.70m  Very dense, greyish brown, silty sand with rock dust. (SM)  4.40m  4.40m  With rock dust. (SM)  4.40m  A.40m  With rock dust. (SM)  4.40m  A.40m  A.4		\/am. aliff  :abt		-b: -: -: -: -: -: -: -: -: -: -: -						19			DS-2	2.50	)
Very dense, greyish brown, silty sand with rock dust. (SM)  Very dense, greyish brown, silty sand with rock dust. (SM)  4.40m  5.  CR=21% RQD=NIL  6.00m  R2  CR=22% RQD=NIL  6.00m  R3  R4  R4  CR=21% RQD=NIL  6.00m  R5  R6  CR=38% RQD=31%  7.  CR=37% RQD=NIL  8.  CR=28% RQD=NIL  8.  CR=28% RQD=NIL  8.  CR=28% RQD=NIL  8.  R6  CR=38% RQD=NIL  8.  R7  CR=36% RQD=NIL  8.  R6  CR=36% RQD=NIL  8.  R7  CR=56% RQD=NIL  10.  N.B '*' means sample could not				re. (CI)			5   8	3  1 <i>1</i>					SPT-2	3.10-3	.55
Very dense, greyish brown, silty sand with rock dust. (SM)  4.40m  A.40m   Ī			3.70m						10	0		DS-3	3.80	)	
with rock dust. (SM)  4.40m  4	<b>→</b>	Very dense, greyis	sh bro	wn, silty sand			33 6	57 3.0					SPT-3	4.00-4	.18
Highly weathered, yellowish brown, fine grained, highly fractured sandstone.  NX ratary drilling from 4.40m to 10.00m  R2 CR=22% RQD=NiL  6.00m  Highly to moderately weathered, yellowish brown to grey, fine grained, highly fractured sandstone.  R3 CR=26% RQD=13%  R4 CR=38% RQD=31%  R5 CR=37% RQD=NiL  8 R6 CR=28% RQD=NiL  9.00m  Moderately weathered, yellowish brown to grey, fine grained, highly fractured sandstone.  NX ratary drilling from 4.40m to 10.00m  R2 CR=26% RQD=NiL  8 R6 CR=28% RQD=NiL  9.00m  Moderately weathered, yellowish brown to grey, fine grained, highly fractured sandstone.  NX ratary drilling from 4.40m to 10.00m  R2 CR=26% RQD=13%  R3 CR=26% RQD=31%  R6 CR=28% RQD=16%  R7 CR=56% RQD=NiL  9.00m  NN NS PRODE NIL NS PRODE		with rock dust. (SM	)	-		1	00	3.0	cm Re	fus P fus	entn.				
6.00m  6.00m  6.00m  R2 CR=22% RQD=NIL  6. R3 CR=26% RQD=13%  6. R4 CR=38% RQD=31%  7. CR=37% RQD=NIL  8. R6 CR=28% RQD=NIL  8. R6 CR=28% RQD=NIL  9.00m  Moderately weathered, yellowish brown to grey, fine grained, highly fractured sandstone.  10.00m  N.B. — '*' means sample could not													R1	CR=21% RQD=NIL	F OF
Highly to moderately weathered, yellowish brown to grey, fine grained, highly fractured sandstone.  R4 R4 R4 R0D=31%  R5 R7 R6D=NIL  8. R6 CR=28% RQD=NIL  9.00m  Moderately weathered, yellowish brown to grey, fine grained, highly fractured sandstone.  N.B. — '*' means sample could not		fine grained, highly	fracti	ured sandstone.		$\leq$	4	rota .40m	ny c n to	10	ng   170 0.00m	m	R2	CR=22% RQD=NIL	5.25
Highly to moderately weathered, yellowish brown to grey, fine grained, highly fractured sandstone.  R4 CR=38% RQD=31%  R5 CR=37% RQD=NIL  8. R6 CR=28% RQD=NIL  9.00m  9. Moderately weathered, yellowish brown to grey, fine grained, highly fractured sandstone.  N.B. — '*' means sample could not	•			6.00m									R3	CR=26%	6.00
Highly to moderately weathered, yellowish brown to grey, fine grained, highly fractured sandstone.  R5 RQD=31%  7. CR=37% RQD=NIL  8. R6 CR=28% RQD=NIL  9.00m  Moderately weathered, yellowish brown to grey, fine grained, highly fractured sandstone.  N.B. — '*' means sample could not															6.75
fractured sandstone.  R5  CR=37% RQD=NIL  8.  CR=28% RQD=NIL  9.00m  Moderately weathered, yellowish brown to grey, fine grained, highly fractured sandstone.  N.B. — '*' means sample could not													R4	CR=38% RQD=31%	7.50
Moderately weathered, yellowish brown to grey, fine grained, highly fractured sandstone.  N.B. — '*' means sample could not  R6  CR=28% RQD=NIL  9.  CR=56% RQD=16%  10.				,g,									R5	CR=37% RQD=NIL	
9.00m  Moderately weathered, yellowish brown to grey, fine grained, highly fractured sandstone.  10.00m  N.B. — '*' means sample could not						Ц							R6	CR=28%	8.25
brown to grey, fine grained, highly fractured sandstone.  10.00m  N.B. — '*' means sample could not				9.00m		耳							NO	RQD=NIL	9.00
10.00m 10.		brown to grey, fi	ine gr										R7	CR=56% RQD=16%	
				10.00m											10.00
be recovered.  BH-36/Sh		N.B. — '*' means be recovered.	s sam	ple could not											V0 (0)

Highly to moderately weathered, yellowish brown, medium grained, highly to moderately fractured sandstone.  R3 CR=42% RQD=16%  5.0  R3 CR=44% RQD=38%  6.5  R5 CR=45% RQD=38%  6.5  R6 CR=53% RQD=21%  8.00m  8.00m  8.00m  R7 CR=64% RQD=21%  8.7  Slightly weathered, grey, fine grained, moderately fractured sandstone.  R8 CR=61% RQD=20%  8.7  R9 CR=64% RQD=28%	Γ	Duciost : Duclimi	n o mrz. C	I Work for Tol	lohom	The		al D	0.THT 0	.m. D:	maiaa	4 _ T1	II (2#660	ww) C=1	r=cT
Field Test	-	-	nary G.					_							o:
Field Test	-		DATA												
Penetrometer (SPT) Cone (Pc) Vane (V)  Vane (V)  DESCRIPTION  SYMBOL  O.00m  O.00m  O.00m  O.00m  O.00m  O.00m  O.00m  O.00m  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  SYMBOL  DESCRIPTION  DESCRIPTION  DESCRIPTION  SYMBOL  DESCRIPTION  DESCRIPTION  DESCRIPTION  SYMBOL  DESCRIPTION  DESCRIPTION  DESCRIPTION  SYMBOL  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  DESCRIPTION  O.00m  O.00m  O.00m  O.00m  O.00m  O.00m  DESCRIPTION	-	Field Test	Nos	Samples		No	s						: 23/0	08/17	0.00
Disturbed (DS)   Water Sample (WS)   O   Water Struck At :	-	Penetrometer (SPT)	) 4	Undisturbed (U	DS)	1			•						x.
Disturbed (DS)   Water Sample (WS)   Standing Water Level : 1,30 m.		Cone (Pc)		Penetrometer (	(SPT)	4	-	Leve	el C	Of C	rour	nd	: 68.4	14 m.	
DESCRIPTION  SYMBOL  N-VALUE  SAMPLES						4									
DESCRIPTION  SYMBOL  EACH DIVN. = 15cm. Ref. No Depth (m)  0.00m  DS-1 0.50  *UDS-1 1.00-1.45  SPT-1 1.60-2.05  DS-2 2.60  SPT-2 Seffusal SPT-2 Seffusal SPT-3 3.40-3.25  SPT-3 3.40-3.25  SPT-3 3.40-3.25  SPT-3 3.40-3.55 3.5  RI Refusal SPT-4 3.55-3.58 3.5  RI REfusal SPT-4 3.55-3.58 3.5  RI REfusal SPT-4 Seffusal SPT-4 SPT-4 Seffusal SPT-4 Seffusal SPT-4 Seffusal SPT-4 Seffusal SPT-4 Seffusal SPT-4 SPT-4 Seffusal SPT-4 SPT-4 Seffusal SPT-4 SPT-4 SPT-4 Seffusal SPT-4	-	Vane (V)		Water Sample	(WS)	<u> </u>	)					vel			
DS-1 0.50  Loose, yellowish brown, silty sand. (SM)  Very sitff to hard, deep grey, silty clay with calcareous nodules. Obs. decomposd rock pieces. (Cl)  Note that the property of the proper		DES	CRIPTION	N	SYMB	BOL-						$\perp$			(m)
Loose, yellowish brown, silty sand. (SM)  Loose, yellowish brown, silty sand. (SM)  Very sitff to hard, deep grey, olds, decomposd rock pieces. (Cl)  2 2 2 2 4	-			0.00m			EAC	<u>и</u> и	IVN	· <u>=</u>	150	<u>n.</u>	Ret. No	Depth	
2   2   2   4   SPT-1   1.60-2.05				0.00111	1								DS-1	0.50	
Very sitff to hard, deep grey, sitty clay with calcareous nodules. Obs. decomposd rack pieces. (CI)  3.55m  No. retary drilling from 3.55m to 10.00m  No. Ratival 2.5 1.3 Refusal 2.5 SPT-2 2.80-3.25 SPT-3 3.40-3.50 SPT-2 3.55-3.58 3.5 CR=29% ROD=NIL 4.2 SPT-3 SPT-3 3.55-3.58 3.5 CR=29% ROD=NIL 4.2 SPT-3 SPT-3 SPT-4 SPT-3 SPT-4 SPT-4 SPT-3 SPT-4			ish b	orown, silty									*UDS-1	1.00-1.	.45
Very sitff to hard, deep grey, sitty clay with calcareous nodules. Obs. decomposd rock pieces. (CI)  3.55m  NX retary drilling from 3.55m  NX retary drilling from 10.00m  R2 CR=42% RQD=16%  R3 CR=29% RQD=16%  R4. CR=46% RQD=28%  Spt—2 2.80—3.25  3.40—3.50  **SPT—4 3.55—3.58  **SPT—4 3.55—3.58  **SPT—4 3.55—3.58  **SPT—4 3.55—3.58  **SPT—4 3.55—3.58  **RQD=NIL  4.2  **CR=42% RQD=16%  **RQD=16%  **RQD=28%  **RQD=20%  **RQD=28%							2	2 2		4			SPT-1	1.60-2.	.05
Very sith to hard, deep grey, Sitty clay with calcareous nodules. Obs. decomposd rock pieces. (CI)  3.55m  NX rotary drilling from Penth.  Highly to moderately weathered, yellowish brown, medium grained, highly to moderately fractured sandstone.  NX rotary drilling from R2  R1  R2  CR=42% RQD=16%  S.7.2  R6  R7  R8  R7  R8  R8  CR=53% RQD=19%  R7  R8  R8  CR=64% RQD=20%  R9  N.B '*' means sample could not	-									18			DS-2	2.60	
decomposd rock pieces. (CI)  3.55m  8.00m  R2  R2  R2  R2  R2  R2  R2  R2  R2  R		Very sitff to ha	rd, dee reous :	ep grey, silty nodules. Obs.		\\	- 1								
Highly to moderately weathered, yellowish brown, medium grained, highly to moderately fractured sandstone.    Highly to moderately weathered, yellowish brown, medium grained, highly to moderately fractured sandstone.   R4   R7   R8   R9   R8   R9   R8   R8   R9   R8   R9   R9				CI)		\	- 11	0.0	c <u>m</u>	<u>fusa</u> Per	<u>l</u>   ntn.				
Highly to moderately weathered, yellowish brown, medium grained, highly to moderately fractured sandstone.  R1 RQD=KRI 4.2  R2 CR=42% RQD=16%  5.0  R3 CR=44% RQD=16%  5.7  R4 CR=46% RQD=38%  6.5  R5 CR=45% RQD=19%  7.2  R6 CR=53% RQD=21%  8.00m  R7 CR=64% RQD=21%  8.00m  R8 CR=64% RQD=20%  8.7  Slightly weathered, grey, fine grained, moderately fractured sandstone.  R8 R8 CR=61% RQD=20%  9.5  R9 CR=64% RQD=28%  10.00m	Ī			3.55m		וְׁעַן	100		1 <u>Ra</u>	tu\$a	<u>l</u>				3.55
Highly to moderately weathered, yellowish brown, medium grained, highly to moderately fractured sandstone.  R3 CR=42% RQD=16%  R4 RQD=16%  R5.0  R5 CR=46% RQD=38%  R6 RQD=38%  R7 CR=45% RQD=19%  R8 CR=53% RQD=21%  R8 CR=64% RQD=21%  R9 CR=64%  R9 CR=64%  R9 CR=64%  R10.00m  N.B. — '*' means sample could not	<b>→</b>				ЩЦ	Щ			[	, J.			R1	RQD=NIL	↓
Highly to moderately weathered, yellowish brown, medium grained, highly to moderately fractured sandstone.  R3 CR=44% RQD=16%  5.7  R4 CR=46% RQD=38%  6.5  R5 CR=45% RQD=19%  7.2  R6 CR=53% RQD=21%  8.00m  R7 CR=64% RQD=21%  8.7  Slightly weathered, grey, fine grained, moderately fractured sandstone.  R8 CR=61% RQD=20%  9.5  R9 CR=64% RQD=28%  10.00m							NX <sub>3</sub>	rotar 3.55m	y d to	rilling 10.0	g fro	m	R2	CR=42% RQD=16%	4.25 5.00
fractured sandstone.  R4  CR=46% RQD=38% 6.5  CR=45% RQD=19% 7.2  R6  CR=53% RQD=21% 8.00m R7  CR=64% RQD=24% RQD=24% RQD=20% R8  CR=61% R9  CR=61% RQD=20% R9  R9  CR=64% RQD=28% RQD=28% R0D=28% R0D		Highly to moderate	ely weat	hered, yellowish									R3	CR=44% RQD=16%	
Slightly weathered, grey, fine grained, moderately fractured sandstone.  8.00m  8.0  R7				nly to moderately									R4	CR=46% RQD=38%	5.75
8.00m  8.00m  8.00m  R7 CR=64% RQD=21%  8.7  Slightly weathered, grey, fine grained, moderately fractured sandstone.  R8 CR=61% RQD=20%  R9 CR=64% RQD=20%  10.00m  N.B. — '*' means sample could not													R5	CR=45% RQD=19%	7.25
Slightly weathered, grey, fine grained, moderately fractured sandstone.  R8  R8  R8  CR=61% RQD=20% RQD=20% R9  CR=64% RQD=28% RQD=28% ROD=28% ROD=28%													R6	CR=53% RQD=21%	8.00
Slightly weathered, grey, fine grained, moderately fractured sandstone.  R8  CR=61% RQD=20%  9.5  CR=64% RQD=28%  10.00  N.B. — '*' means sample could not													R7	CR=64% RQD=24%	975
N.B. — '*' means sample could not		Slightly weathered moderately fracture	d, grey ed sand	, fine grained, stone.		井							R8	CR=61% RQD=20%	
				10.00m									R9		9.50
BH-37/Shee			s sam	ple could not										pu v	7/Shas* 4

	Project : Prelimina	ry G.	I. Work	for Tale	cher T	<del>↓</del> 'hern	nal Po	wer	Projec	et-II	I (2x660 N	MW). <b>C</b> =	TEST
ļ	Job No : 3975										20/09/2017	Sheet N	
	BORE LOG DAT	A S	HEET	BORE	E HC	)LE	NO.	CS	ST-	01	(M) Co-o	rdinates N=	=1469 =3904
	Field Test	Nos	So	amples		Nos			ement tion D			)8/17 )8/17	
	Penetrometer (SPT)	2	Undistu	rbed (U	DS)	1		•	e Diam			mm./ N.X	,
	Cone (Pc)		Penetro		(SPT)	2			f Gro			06 m.	
	Vane (V)		Disturbe Water S		(WC)	1 0			Struck Water				
	<u> </u>			ampie		Ť		มเก่ฐ I−VAI	Water LUE	Levei		SAMPLES	
	DESCR	RIPTION	V		SYMB				N=15C	М	Ref. No	Depth	(m)
				0.00m									
	Greyish yellow, silty Obs. sand mixture.		with ko	ankars.							DS-1	0.60	
			***	<del>-</del> 1.50m		3!	5 54 1 1 3.0	<u>  &gt;1</u>	00		UDS-1 SPT-1	1.00-1 1.45-1	
	Very dense, greyish b with decomposed roo			1.90m		10	4	l Rdf	Penth. <u>usal</u>		*SPT-2	1.90-1.93 CR=35%	1,90
Ì	Highly to moderately						3.0	cm	Pentn.		R1	RQD=NIL	2.50
	brown, fine to mediurock.	ım gr	ained, fro	actured – 3.25m		N	X rotar	y dri	lling fr 16.00m	om	R2	CR=44% RQD=20%	3.25
											R3	CR=62% RQD=40%	
											R4	CR=56% RQD=23%	4:00 4.75
											R5	CR=72% RQD=42%	
<b>→</b>	Moderately to sl yellowish brown, fine										R6	CR=52% RQD=16%	
	fractured rock.	το π	iediaiii g	irainea,							R7	CR=64% RQD=17%	
											R8	CR=80% RQD=44%	
											R9	CR=66% RQD=20%	8.50
				– 9.25m							R10	CR=80% RQD=NIL	9.25
											R11	CR=76% RQD=32%	10.00
											R12	CR=69% RQD=22% CR=84%	10.75
											R13	RQD=18% CR=84%	11.50
	Slightly weathered grey, medium to fin										R14 R15	RQD=40% CR=78%	12:25
	rock.	e gra	inea, irad	ctureed							R16	RQD=24% CR=80%	13.00
											R17	RQD=14%  CR=72%	13.75
											R18	RQD=52% CR=91%	14.50
											R19	RQD=37% CR=94% RQD=48%	15.25
	NID (*)	0.5:5	nla arri	16.00m								1.45-40%	16.00
	N.B. — '*' means be recovered.	sam	pie cou	ia not									
L					200 7	1				1	i	BH-	1/Sheet-1

Project : Prelimina	ry G.	I. Work	for Tale	cher I	<del>↓</del> 'herm	al Po	wer ]	Project-I	II (2x660 ]	MW). <b>C=</b> 1	rest
Job No : 3975			•						21/09/2017	-	
BORE LOG DAT	ra s	HEET	BORI	E HC	LE					ramates N=	1305 3987
Field Test	Nos	So	amples		Nos			ement Dat ion Date		08/17 08/17	
Penetrometer (SPT)	2	Undistu	rbed (U	DS)	0		•	: Diamete		mm./ N.X.	
Cone (Pc)		Penetro		(SPT)	2	Leve	el Of	Ground	1 : 70.0	06 m.	
Vane (V)		Disturbe		(WC)	1			truck At			
varie (v)		Water S	sample	(WS)	0		ding V -VAL	Vater Leve	1	SAMPLES	
DESCF	IOITAIS	٧		SYMB				=15CM	Ref. No	Depth (	(m)
Very dense, grey sand with decompos	ed ro	ck. (SM)	– 1.00m		7 <i>6</i>		Refu	Pentn.	DS-1 *SPT-1 *SPT-2 <b>R1</b>	0.50 0.60-0. 1.00-1.02 CR=53% RQD=29%	1.00
Moderately weathere medium to fine rock.					N.	rotar 1.00m	y dril to 1	ling from 6.00m	R2 R3	CR=56% RQD=51% CR=65% RQD=51%	1.75 2.50
   Moderately weathered   to fine grained, frac									R4	CR=67% RQD=36%	3.25
			– 4.20m						R5	CR=48% RQD=35%	4.00 4.75
Slightly weathered   grey, medium to fir   rock									R6	CR=65% RQD=28%	5.50
			– 6.25m						R7	CR=87% RQD=45%	6.25
			- 0.25m						R8	CR=72% RQD=64%	7.00
									R9	CR=82% RQD=56%	3,50
									R10	CR=83% RQD=82%	8.50
Slightly weathered fine grained, fractur			grey,						R11	CR=84% RQD=74%	10.00
j									R12	CR=85% RQD=82%	11.50
									R13	CR=81% RQD=73%	13.00
			16.00-						R14	CR=83% RQD=72%	14.50
N.B. — '*' means be recovered.	sam	ple cou	16.00m ld not								16.00
				age 7	T	156				BH-3	3/Sheet-1

Project : Prelimina	ry G.											TEST
Job No : 3975  BORE LOG DA	ነጥለ የ		•	Char RE H						·	Sheet N	:1317
Field Test	Nos		nples		Nos	Со	mmen	cemen	nt Date Date	: 13/C	N= 08/17 08/17	:3914
Penetrometer (SPT)	2	Undisturb	ped (U	DS)	0	1	•		Date meter		10/1/	
Cone (Pc)		Penetrom		SPT)	2	Le	vel (	Of Gr	ound	: 70.13	32 m.	
Vane (V)		Disturbed		(11/0)	1				ck At			
varie (v)		Water Sa	imple	(WS)	0	Sto	anding N-VA		r Level	1	m. SAMPLES	
DESCR	RIPTION			SYMBO		EAC	H DIV		SCM	Ref. No	Depth	(m)
			0.00m							DS-1	0.50	
Stiff, light grey, silt with sand mixtur rock. (CI)					3	4	6	10		SPT-1	1.50-1	.95
			2.00m		100	2.		<u>fusal</u> Pent	n.	*SPT-2	2.00-2.02 CR=54% RQD=30%	1
					∏ ∏ N)	( ro	tary d Om to	rilling 12.50	from m	R2	RQD=30% CR=58% RQD=48%	2.75
Moderately to slightly grey, medium to fi fractured rock.										R3	CR=67% RQD=53%	3.50
										R4	CR=53% RQD=40%	4.25 5.00
			5.75m							R5	CR=69% RQD=32%	1
										R6	CR=89% RQD=47%	1
										R7	CR=95% RQD=64%	7.25
										R8	CR=87% RQD=56%	
Fresh, deep grey, find rock.	ne gra	ined, frac	ctured							R9	CR=86% RQD=84%	8.75
										R10	CR=90% RQD=80%	10.25
N.B. — '*' means be recovered.	samp		l not 2.50m							R11	CR=91% RQD=82%	11.75 12.50
<del></del> -				1	- 1	1 1						

Project : Prelimina	ary G.											TES
Job No : 3975	\ m \									<u>'</u>	Sheet N	
BORE LOG DA	AIA T			KE H	OLL			PMT-				=1504 =3979
Field Test	Nos	Sar	nples		Nos			cement etion [			)8/17 )8/17	
Penetrometer (SPT)	2	Undisturb	ed (U	IDS)	0		•	le Dian			,0,1,	
Cone (Pc)		Penetrom	eter (	(SPT)	2	Lev	el (	Of Gro	und	: 70.18	30 m.	
		Disturbed			1			Struck				
Vane (V)		Water Sa	mple	(WS)	0	l .		Water	Level	i		
DESCF	RIPTION	V		SYMBO	DL			ALUE N=15C	<b>.</b>	Ref. No	SAMPLES Depth	(m)
			0.00m			EACH		$\frac{N=130}{1}$	IVI	Rei. No	Берит	(111)
Filled up soil con	nsists											
yellow, silty clay.			0.70m	<u></u>				100		DS-1	0.50	
Very dense, brow		yellow,	silty		39	61 2.0	cm	Pentn.		SPT-1	1.00-1	
sand with decompos	ed ro	ck. (SM)	1.20m		100	2.0	Kd	<u>fusal</u> Pentn.		*SPT-2 R1	1.20-1.22 CR=29% RQD=NIL	1.20 
Highly to moderate					<del> </del>	2. 0	Y'''			IN I	RQD=NIL	1.7
yellow, medium to fractured rock.	fine	grained, h	ighly		<del>- - </del>					R2	CR=44% RQD=16%	
Tractared Took.			2.50m		님 NX	rota	ry d	rilli <mark>ng f</mark> i	rom			2.50
					Ц	1.20n	n to	12.50m	۱	R3	CR=83% RQD=24%	
												3.2
										R4	CR=86% RQD=26%	
											1140-2076	4.00
										R5	CR=90% RQD=18%	
Eroob door will		ممائل	f:		H						10%	
Fresh, deep yellow grained, highly from	w, me actur	ed rock.	iine									5.50
- J					Щ							
					П					R6	CR=81% RQD=21%	
											NQD-Z1/	
												7.00
					Ц					R7	CR=84% RQD=36%	
											1.40-30%	
			8.50m									8.50
										R8	CR=93% RQD=NIL	
					Ц							
												10.00
Fresh, deep grey, me	edium	to fine gro	ained,									
fractured rock.										R9	CR=87% RQD=58%	
											,_ ,_	
												11.50
										R10	CR=94% RQD=72%	,
N.B '*' means	sam	ple could	not		H					110	KQD=72%	<b>+</b>
be recovered.		1	2.50m		<del>-  </del>							12.50
				<u> </u>	lacktriangle					<u> </u>	l RH-	-3/Shee

	Project : Prelimina	ıry G.	I. Work fo	or Talo	her T	<b>↓</b> herr	nal Po	wer	Project	:-II	I (2x660 M	<b>A</b> W). <b>C=1</b>	EST
	Job No : 3975	\ m \					-				22/09/2017		
	BORE LOG DA				KE E		Com		PMT- cement [			rdinates N= N= 08/17	1400 4240
	Field Test	Nos		nples		Nos			tion Do			)8/17 )8/17	
	Penetrometer (SPT)	4	Undisturb Penetrom	•	•	0 4			e Diame				
	Cone (Pc)		Disturbed		3F1)	2			)f Grou Struck			12 m.	
	Vane (V)		Water So		(WS)	0			Water L			m.	
	DESCF	RIPTION	1		SYMB	OL			LUE			SAMPLES	
				0.00m			EACH T T	DIV T	N=15CM	1	Ref. No	Depth (	<u>m)</u>
				0.00111					12		DS-1	0.50	
	Medium dense, silty with decomposed rock						5 4 8				SPT-1 DS-2	1.50-1. 2.50	95
						5			20		SPT-2	3.00-3.	45
	Very dense, silty sand	/ 2000		3.50m		6		Ref	Fusal Pentn.		*SPT-3	3.50-3.	
	with decomposed rock &			4.00m		1C		Ref	usal		*SPT-4	4.00-4.02	4.00
					_ <u> </u>   	- -	2.0	cm	Pentn.		R1	CR=39% RQD=19%	
	Highly to moderatel yellow, medium to fi				 		IX rota 4.00n	ry di n to	filling fro	m	R2	CR=51% RQD=NIL	4.75
				6.25m							R3	CR=49% RQD=20%	5.50 6.25
				0.23111							R4	CR=52% RQD=NIL	7.00
	Moderately to sl greyish yellow, med fractured rock.										R5	CR=55% RQD=20%	7.75
	Tractaroa rook.										R6	CR=67% RQD=33%	8.50
-				9.00m							R7	CR=65% RQD=56%	9.25
		, ,									R8	CR=71% RQD=51% CR=97%	10.00
	Slightly weathered fine grained, sligh										R9	RQD=67% CR=98%	10.75
											R10 R11	RQD=97%	11.50
				2.00m								NQD-34/0	12.00
	N.B. — '*' means be recovered.	sam	ple coulc	l not									
					200 7	<b>T</b>						BH-4	√Sheet-1

CLIENT: NTPC			
PROJECT NAME: Geotechnica	al Investigation for NTPC Talche	er Thermal Stage III ( 2 x 660 MVV)	
BOREHOLE ID: BH 1		CO-ORDINATES: East: 1413.2	North: 3923.08
SITE LOCATION : Tr Yard		START DATE: 5/26/2009	END DATE: 5/28/2009
GROUND REDUCED LEVEL:	69.930	DRILLING METHOD: Rotary	
GROUND WATER TABLE DEP	ΓH: 1.45	CASING DIA: 150mm upto 2.00	m & Nx from 2.00 to 20.0m BGL

E_	(m)	D E		SA	MPLE	BLO	WS/1	15cm	1 1	e ry(%)	(%)	Other	
DEPTH (m)	Reduced Level (m)	GRAPHIC	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
1		y	Stiff greyish brown Clay with low plasticity	1	UDS	+1		F	Recoveres	i			
2	67.93 67.83		Completely weathered deeply decomposed light yellowish Sandstone	2 2.1	SPT RC			ble	8 cm in 100 ows,N>1	00			
3										68	16		
			Moderately weathered light yellowish medium grained Sandstone	3.1	RC					65	12		
4 -	65.83		Moderately weathered, light yellowish fine grained Siltstone with	4.1	RC						ic:		
5 -			sarbonaceous Clay	5.1	RC					88	36		
6			Moderately to slightly weathered dark medium grained yellowish brown Sandstone	6.1	RC					75	60		
7	62.83		**	7.1	RC					77	77		
8			Slightly weathered light greyish fine grained Sandstone	7.1	RC					78	40		
	61.83			8.1	RC					79	54		
9 -			Moderately to slightly weathered light greyish fine grained Sandstone	9.1	RC					68	11		
10											1230		

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



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Checked by: S. Padhi

Job No:

PAGE 1 OF 2

CLIENT: NTPC PROJECT NAME: Geotechnical Investigation for NTPC Talcher Thermal Stage III ( 2 x 660 MW) BOREHOLE ID: BH 1 CO-ORDINATES: East: 1413,2 North: 3923.08 SITE LOCATION: Tr Yard START DATE: 5/26/2009 END DATE: 5/28/2009 GROUND REDUCED LEVEL: 69.930 DRILLING METHOD: Rotary GROUND WATER TABLE DEPTH: 1.45 CASING DIA: 150mm upto 2.00m & Nx from 2.00 to 20.0m BGL

H_	peo (m)	SHC		SA	MPLE	BLC	WS/	15cm		e ry(%)	(%)	Other	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
-	59.83			10.1	RC								
11			Slightly weathered dark greyish	11.1	RC					77	48		
			medium grained Sandstone		NO.					88	88		
12 -	57.83			12.1	RC								
13	56.83		Moderately weathered dark greyish medium grained Sandstone with carbonaceous clay bands	13.1	RC					81	27		
				13.1	KC					75	0		
14			Highly to moderately weathered dark	14.1	RC								
15			Highly to moderately weathered dark greyish fragmented Sandstone(weak rock)	15.1	RC					75	18		
16	53.83			16.1	RC					.00	. 21		
17	52.83		Slightly weathered light greyish Siltstone with Sandstone patches							80	68		
18			Highly to moderately weathered light greyish medium grained fragmented Sandstone	17.1	RC					80	0		
	51.83			18.1	RC					80	42		
19 -			Highly to moderately weathered light greyish fine grained Siltstone with Sandstone patches.	19.1	RC					80	0		

\$PT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE RC = ROCK CORE

DS = DISTURBED SAMPLE

VST = VANE SHEAR TEST



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Job No:

CLIEN	IT:	NTP	C										
PROJ	ECT NAI	ME: Geot	technical Investigation for NTPC Talcher	Thermal S	Stage III (2)	x 660	MVV)			7			7.77
BORE	HOLE I	D: BH 2			CO-ORE	TANIC	ES:	Eas	st: 150	0		North:	3923.02
SITE I	OCATIO	ON:	Tr Yard		START	DATE	5	/28/2	2009	•	END D	ATE: 5/3	30/2009
GROU	IND RED	DUCED LE	VEL: 69.977		DRILLIN	IG ME	ТНО	D:	Rotary				
GROU	IND WA	TER TABL	E DEPTH: 3.35		CASING	DIA:	9	150	mm upto	3.20m	& Nx fro	m 3.20 to	16.20m BGL
H.	(m)	OHIC G		SA	MPLE	BLC	W\$/1	15cm		re rry(%)	(%)	Other	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
1	67.477		Stiff yellowish brown Clay with low plasticity	1.5	UDS SPT				Recovere 8 cm in blows.N>		_		
3	66.777		Completely weathered deeply decomposing light yellowish brown Sandstone		0.75 (0.07.1			100	010113,11	100			
4			Highly to moderately weathered yellowish brown fine grained Siltstone with Sandstone patches	4.2						42	10		
5	64.777			5.2						64	12		
6				6.2						85	77		
7			Slightly weathered yellowish brown fine grained Sandstone	6.2					2	86	62		
				7.2									

SPT N = STANDARD PENETRATION TEST VALUE RC = ROCK CORE

RQD = ROCK QUALITY DESIGNATION DS = DISTURBED SAMPLE

8.2

9.2

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



61,777

9

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Slightly weathered medium grained yellowish brown Sandstone

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92 88

90 24

78 56

> Checked by S. Padhi

Job No:

PAGE 1 OF 2

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for NTPC T	alcher Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 2	CO-ORDINATES: East: 1500 North: 3923.02
SITE LOCATION : Tr Yard	START DATE: 5/28/2009 END DATE: 5/30/2009
GROUND REDUCED LEVEL: 69.977	DRILLING METHOD: Rotary
GROUND WATER TABLE DEPTH: 3.35	CASING DIA: 150mm unto 3.20m & Nx from 3.20 to 16.20m BG

H_	(m)	SHC SHC		SA	MPLE	BLC	)WS/	15cm		ry(%)	(%)	Other	E CONTRACTOR
(m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
	59.777			10.2						78	56		
11			Slightly weathered light greyish compacted Sandstone	11.2						78	42		
12	57.777		2							90	90		
	57.477		Medium grained Sandstone with Clay patches  Slightly weathered grevish fine grained	12.2						90	70		
13	56.777		Slightly weathered greyish fine grained compacted Sandstone	13.2									
14				14.2						83	52		
15			Slightly weathered dark greyish compacted medium to coarse grained Sandstone	15.2						92	75		
16				15.2						92	67		
-	53.777		15									`	
17		8											
18													
-													
9													
20													

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION RC = ROCK CORE

DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



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Job No:

START DATE   6/15/2009   END DATE   6/2/2700   END DATE   6/2/27	OJECT NA	ME: Geot	echnical Investigation for NTPC Talcher 1	Thermal S	stage III ( 2 :	x 660	MW)			.5			
Common   C	REHOLE II	D: BH 3			CO-ORE	CANIC	TES:	Eas	st: 130	6,11		North: 3	3967,14
Sample   S					START	DATE	: 6	/15/2	2009		END D	ATE: 6/2	2/2009
Sample   S	AT IN ACCOUNT ON THE	VI. 1. 2. 12. 13. 17. 18	#15989 DESTRUCTION OF THE PROPERTY OF THE PROP		100000000000000000000000000000000000000		-	10000					
Total   Filled up soil consisting of Sand	OUND WA	TER TABLE	E DEPTH: 1.05		CASING	DIA:		150	mm upto		& Nx fro	m 2.75 to 3	30.0m BGL
Total   Filled up soil consisting of Sand	(m)	DHIC O	MATERIAL DESCRIPTION	SA	MPLE	BLC	WS/	15cm	1	re ery(%).	(%)	Other	DEMARK
1.5   UDS	Redi	GRAI	WATERIAL DESCRIPTION	Depth		15	15	15	N Fleid	Recov	ROD	Tests	REMARK
1.5   UDS	70.495	11111	Filled up soil consisting of Sand					П					
Very dense greyish Clayeysand   2.75   SPT   5   5   48   53	68 495	▼	Stiff greyish Sandyclay	1.5	UDS				Recovered	1	-		
Moderately weathered light yellowish fine grained Sandstone with Sitstone patches  4.2  Slightly weathered light yellowish fine grained Sandstone with thin layer of Shale  5.2  93 93  6.2  Slightly weathered light yellowish brown fine grained Sandstone  7.2  Slightly weathered light yellowish brown fine grained Sandstone  7.2  Slightly weathered light yellowish brown fine grained Sandstone  95 80  Slightly weathered greyish fine grained Sandstone  9.2	1		Very dense greyish Clayeysand		SPT	5	5	48	53				
Slightly weathered light yellowish fine grained Sandstone with thin layer of Shale  5.2  5.2  94  94  94  95  65.495  6.2  Slightly weathered light yellowish brown fine grained Sandstone  7.2  95  80  72  Slightly weathered greyish fine grained Sandstone  9.2			fine grained Sandstone with Siltstone	3.2						67	32		
Slightly weathered light yellowish brown fine grained Sandstone  7.2  93 93  100 100  7.2  95 80  8.2  Slightly weathered greyish fine grained Sandstone  9.2	100.493		grained Sandstone with thin layer of	4.2						94	94		
5 brown fine grained Sandstone  7.2  95 80  62.495  8.2  Slightly weathered greyish fine grained Sandstone  9.2	65.495		a *	513						93	93		
8.2  62.495  Slightly weathered greyish fine grained Sandstone  9.2				7.2						100	100		
Slightly weathered greyish fine grained Sandstone 9.2	62.495			8.2						95	80		
-			Slightly weathered greyish fine grained Sandstone	9.2						80	72		
0 1			ANTITOLATION TEST						LIDS				
PT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE  C = ROCK CORE DS = DISTURBED SAMPLE VST = VANE SHEAR TEST						siGN/	MOITA	N					PLE

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for N	TPC Talcher Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 3	CO-ORDINATES: East: 1306.11 North: 3967.14
SITE LOCATION: TG Hall	START DATE: 6/15/2009 END DATE: 6/22/2009
GROUND REDUCED LEVEL: 70.695	DRILLING METHOD: Rotary
CROHND WATER TARI E DEPTH: 1.05	CASING DIA: 150mm unto 2.75m 2. Ny from 2.75 to 30.0m RCI

Ξ	(m)	O E		SA	MPLE	BLC	)WS/	15cm		y(%)	(%)	Ortes	
(m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Other Tests	REMARKS
11			Slightly weathered greyish fine grained Sandstone (continued)	10.2						95	84		
12	58.495		v	- 12.2						92	72		
13			Moderately weathered greyish laminated Shale	12.2						95	37		
14	57.495		Highly to moderately weathered greyish fine to medium grained Sandstone with Siltstone patches	- 13.2						92	0		
15	56.495		Slightly weathered greyish fine grained Sandstone	- 14.2						99	78		
16	55.495			15.2						88	0		
17			Moderately weathered greyish fine to medium grained Sandstone with Siltstone patches	16.2						94	0	,	
18				17.2						86	0		
19	52.495	300 AND	Highly to moderately weathered greyish Siltstone with patches of Shale	18.2						85	0		
20	51.495		Moderately weathered greyish fine to medium grained Sandstone	19.2						68	31		

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



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Logged by: Akash

Checked by: S. Padhi

Job No:

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for N	TPC Taicher Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 3	CO-ORDINATES: East: 1306.11 North: 3967.14
SITE LOCATION: TG Hall	START DATE: 6/15/2009 END DATE: 6/22/2009
GROUND REDUCED LEVEL: 70.695	DRILLING METHOD: Rotary
GROUND WATER TABLE DEPTH: 1.05	CASING DIA: 150mm upto 2.75m & Nx from 2.75 to 30.0m BGL

Ŧ.	(m)	S E		SA	MPLE	BLC	WS/	15cm	100000000000000000000000000000000000000	e ry(%)	(%)	Other	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
				20.2						68	31		
21	49.495		Moderately weathered greyish fine to medium grained Sandstone (continued)	- 21.2						65	32		
22	48.495		Slightly weathered greyish Siltstone with patches of Shale							95	70		
23	10.420			22.2						73	47		
24				23.2						83	74		
25			Moderately to slightly weathered greyish Siltstone to fine grained Sandstone	24.2						85	50		
26				25.2						68	17		
27	44.495		19	26.2						93	76		
			Slightty weathered greyish fine grained Sandstone	27.2						85	71		
28			- 3ai เมลิปาซ	28.2									
29	41.495			29.2						82	75		
30	40.695		Highly to moderately weathered greyish Siltstone to Sandstone							80	0		

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION RC = ROCK CORE DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by : Akash Checked by : S. Padhi

Job No:

PAGE 3 OF 3

LIEN	111:	NTPO	2										
ROJ	ECT NA	ME: Geot	echnical Investigation for NTPC Talcher	Thermal S	Stage III ( 2	x 660	MVV)						
ORE	HOLE I	D: BH 4			CO-ORE	DINA	TES:	Eas	t: 138	4.37		North:	3966.57
ITE L	OCATIO	ON:	TG Hall		START	DATE	: 5	/21/2	009		END D	ATE: 5/2	3/2009
ROL	IND RED	DUCED LE	VEL: 70.367		DRILLIN	IG ME	ETHO	D: F	Rotary				
ROL	IND WA	TER TABLE	E DEPTH: 0.65		CASING	DIA:	<u></u>	150	mm upto	3.00m	& Nx fro	m 3.00 to 2	0.0m BGL
	(m)	HIC	1000	SA	MPLE	BLC	WS/1	15cm	0000000000	e ry(%)	(%)	Other	0.010.000.000
(m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Tests	REMARK
1 2			Stiff to very stiff greyish brown Clayey Sand	1.5	UDS			F	decovered	1			
3 =	67.367	HHA	Completely weathered deeply	- 3	SPT			1008	13 cm in olows,N>	100			
_	66.867		decomposed brownish Sandstone	3.5									
4	65.867		Moderately weathered light brownish Siltstone							100	19		
;			Highly to moderately weathered light greyish medium grained Sandstone	4.5						86	0		
The second	64.867		es.	5.5						84	0	,	
				6.5						80	47		
			Highly to moderately weathered medium grained greyish Siltstone to fine grained Sandstone	7.5						88	52		
al contra				8.5						84	0		
0				9.5						90	0		
TN	= STAN				ALITY DES	SIGNA	TION		UDS = U VST = V			SOIL SAMI	PLE

Borehole termination at 20 m

PAGE 1 OF 2

Job No:

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for	NTPC Talcher Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 4	CO-ORDINATES: East: 1384.37 North: 3966.57
SITE LOCATION: TG Hall	START DATE: 5/21/2009 END DATE: 5/23/2009
GROUND REDUCED LEVEL: 70.367	DRILLING METHOD: Rotary
GROUND WATER TABLE DEPTH: 0.65	CASING DIA: 150mm unto 3 00m & Nx from 3 00 to 20 0m BGI

Ε_	(m)	일		SA	MPLE	BLC	WS/1	15cm		e ry(%)	(%)	Other	100 THE RESERVE OF THE RES
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	"N" Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
				10.5						90	0		
11				11.5						82	0		
12			Highly to moderately weathered medium grained greyish Siltstone to fine grained Sandstone (continued)	12.5						70	0		
13				13.5						83	0		
14	55.867			14.5						88	0		
15										81	11		
16			Highly to moderately weathered light greyish medium grained Sandstone	15.5						82	0	,	
17	53.867		,	16.5						85	0		
18			Highly to moderately weathered light	17.5						85	0		
19			Highly to moderately weathered light greyish Siltstone to fine grained Sandstone	18.5						78	0		
20	50.367			19.5						78	0		

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by : Akash

Checked by: S. Padhi

Job No:

CLIEN	T:	NTPO	0											
PROJE	ECT NAM	ME: Geot	echnical Investigation for NTPC Talcher T	hermal S	Stage III ( 2 :	x 660	MVV)			1				
BORE	HOLE ID	): BH 5			CO-ORE	TANIC	ES:	Eas	t 145	1.33		North:	3966.91	
ITE L	OCATIO	N:	TG Hall		START	DATE	: 5	/28/2	009		END D	ATE: 6/2	/2009	
ROU	ND RED	UCED LE	VEL: 70.704		DRILLING METHOD: Rotary									
ROU	IND WAT	TER TABLE	E DEPTH: 2.35		CASING	DIA:		150	mm upto	2.90m	& Nx fro	m 2.90 to 3	0.0m BGL	
r	eq m)	ic ic		SA	MPLE	BLOWS/1		5cm		y(%)	(%)			
(m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (	Other Tests	REMARK	
1	69.204		Filled up soil consisting of Clay with Gravel & Kankar	1.5	UDS				Recovered					
2		7	Stiff greyish Clay with low plasticity	1.5					10 cm					
3 -	67.804	,,,,,,,,,,,	Completely weathered yellowish brown	2.9	SPT			blo	in 100 ws,N>1	00				
-	67.504		Sandstone	3.2	RC							1 2		
4 -			Moderately weathered brownish fine grained Sandstone with close spaced bedding planes	4.2	RC					70 68	36			
-	65.504			5.2	RC									
6	64.504		Highly to moderately weathered light brown medium graineed Sandstone	6.2	RC					92	0			
7				0.2	NO.					86	28			
8			Moderately weathered light brown medium grained Sandstone	7.2	RC					78	14			
	62.504			8.2	RC									
9			Moderately to slightly weathered greyish medium grained Sandstone	9.2	RC					94	16			
					JALITY DES	iGN/	ATION					SOIL SAM	PLE	
C =	ROCK C	ORE	DS = DIS	TURBED	SAMPLE				VST = V	ANE SH	EAR TE	ST		

Borehole termination at 30 m

PAGE 1 OF 3

Job No:

CLIENT:	NTPC	
PROJECT NAME	Geotechnical Investigation for NTPC Talcher Thermal	Stage III ( 2 x 660 MW)
BOREHOLE ID:	BH 5	CO-ORDINATES: East: 1451,33 North; 3966.91
SITE LOCATION	TG Hall	START DATE: 5/28/2009 END DATE: 6/2/2009
GROUND REDUC	ED LEVEL: 70.704	DRILLING METHOD: Rotary
GROUND WATER	TABLE DEPTH: 2.35	CASING DIA: 150mm upto 2.90m & Nx from 2.90 to 30.0m BGL

H_	Ded (m)	S E		SA	MPLE	BLC	)WS/	15cm		e ry(%)	(%)	Other	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
	60.504			10.2	RC					88	16		
11	59.504		Moderately weathered greyish sandstone with patches of shale		RC					93	28		
12			Ψ.	11.2	KC					82	10		
			Moderately weathered fine to medium grained greyish Sandstone	12.2	RC					90	22		
13	57.504			- 13.2	RC								
14	56.504		Light greyish Shale							78	0		
15	56.504			14.2	RC					91	12		
16			Moderately weathered light greyish medium grained Sandstone	15.2	RC					88	0		
17	54.504		Moderately weathered light greyish fine grained Sandstone with patches of Shale	16.2	RC					87	0	`	
18	53.504		Moderately weathered light greyish fine grained Siltstone	17.2	RC					90	37		
	52.504	*****	Light greyish fine grained Shale	18.2	RC					84	17		
19			Highly to moderately weathered greyish medium grained Sandstone	19.2	RC					92	31		

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by : Akash

Checked by: S. Padhi

Job No:

NTPC CLIENT: PROJECT NAME: Geotechnical Investigation for NTPC Talcher Thermal Stage III ( 2 x 660 MW) BOREHOLE ID: BH 5 CO-ORDINATES: East: 1451.33 3966.91 SITE LOCATION: TG Hall START DATE: 5/28/2009 END DATE: 6/2/2009 GROUND REDUCED LEVEL: 70.704 DRILLING METHOD: Rotary GROUND WATER TABLE DEPTH: 2.35 CASING DIA: 150mm upto 2.90m & Nx from 2.90 to 30.0m BGL

E.	peg (m)	O HC		SA	MPLE	BLC	WS/	15cm	1	e ry(%)	(%)	Other	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	"N" Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
E :	50.504			20.2	RC					92	31		
21	49.504		Highly to moderately weathered greyish fine grained Siltstone	300000	0.53000					90	13		
22			Highly to moderately weathered greyish fine to medium grained Sandstone	21.2	RC					94	29		
23	48.504		Moderately weathered greyish medium grained Sandstone with patches of Shale	- 22.2	RC					90	27		
	47.504		10 cm 10cm	23.2	RC					80	21		
24				24.2	RC					90	0		
25				25.2	RC					5000			
26			Highly to moderately weathered greyish fine grained Sandstone with patches of Clay	26.2	RC					92	0	,	
27				27.2	RC					90	0		
- 28										85	0		
29				28.2	RC					90	10		
	41.504		Highly to moderately weathered greyish fine to coarse grained Sandstone	29.2	RC					90	0		

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION RC = ROCK CORE

DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

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Job No:

PAGE 3 OF 3

CLIENT: NTPC PROJECT NAME: Geotechnical Investigation for NTPC Talcher Thermal Stage III (2 x 660 MW) BOREHOLE ID: CO-ORDINATES: East: 1506.46 North: 3967.48 SITE LOCATION: TG Hall START DATE: 5/28/2009 END DATE: 5/30/2009 DRILLING METHOD: Rotary GROUND REDUCED LEVEL: 70.401 GROUND WATER TABLE DEPTH: CASING DIA: 150mm upto 3.50m & Nx from 3.50 to 20.0m BGL BLOWS/15cm Recovery(%) SAMPLE Reduced Level (m) DEPTH (m) RaD (%) Core Other MATERIAL DESCRIPTION 'N' Field REMARKS Sample Depth Tests SAMPLE 15 15 15 (m) TYPE Filled up soil consisting of Clay with Kankar pieces 69,001 1.4 SPT 10 23 15 38 Medium dense to dense yellowish

SPT in 100 4.5 blows,N>100 Completely weathered yellowish brown Sandstone 9 cm in 6 SPT 6 64.301 100 RC 6.1 blows.N>100 75 12 7.1 RC 75 13 Highly to moderately weathered 8.1 RC yellowish brown sandstone 90 20 Q 9.1 RC

RQD = ROCK QUALITY DESIGNATION

3

SPT 20 35 50 85

RC = ROCK CORE DS = DISTURBED SAMPLE

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83 0

VST = VANE SHEAR TEST

UDS = UNDISTURBED SOIL SAMPLE

Checked by:

10

ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

SPT N = STANDARD PENETRATION TEST VALUE

brown SiltySand

66.901

11 cm

S. Padhi

Job No:

PAGE 1 OF 2

CLIENT: NTPC PROJECT NAME: Geotechnical Investigation for NTPC Talcher Thermal Stage III ( 2 x 660 MW) BOREHOLE ID: BH 6 CO-ORDINATES: East: 1506.46 North: 3967.48 SITE LOCATION : TG Hall END DATE: 5/30/2009 START DATE: 5/28/2009 GROUND REDUCED LEVEL: 70.401 DRILLING METHOD: Rotary GROUND WATER TABLE DEPTH: 2.75 CASING DIA: 150mm upto 3.50m & Nx from 3.50 to 20.0m BGL

Ŧ.	(m)	3 HIC		SA	MPLE	BLC	WS/	15cm	1 1	e ny(%)	(%)	Other	
DEPTH (m)	Reduced Level (m)	GRAPHIC	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
	60.301			10.1	RC								
11			Highly to moderately weathered greyish Siltstone laminated with Clay portions & consisting of fragments of Coal	11.1	RC					85	23		
- 12	58.301		P	12.1	RC					88	0		
13				12.1	NC					76	10		
			Highly to moderately weathered light greyish to yellowish brown fine to medium grained sandstone  Highly to moderately weathered brownish green Claystone with Siltstone patches	13.1	RC					92	0		
14				14.1	RC					89	0		
15	55,301			15.1	RC					09	Ü		
- 16				16.1	RC					82	0		
17				Sens						75	0		
				17.1	RC					85	47		
18				18.1	RC					82	12		
19				19.1	RC								
20	50.401									99	0		

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION RC = ROCK CORE

DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by : Akash

Checked by: S. Padhi

Job No:

LIEN	IT:	NTPO	0										
ROJ	ECT NAM	ME: Geot	echnical Investigation for NTPC Talcher T	hermal S	Stage III ( 2	x 660	MVV)	į.					
ORE	HOLEIC				CO-ORE				t: 156	1.94		North:	3968.06
ITE I	OCATIO	N:	TG Hall		START	DATE	: 5	/21/2	009		END D	ATE: 5/2	3/2009
		UCED LE	VEL: 70.222		DRILLIN	IG ME	THO	D: I	Rotary				
ROL	JND WA	ER TABLE	E DEPTH: 0.95		CASING	DIA:	3	150	mm upto	2.00m	& Nx fro	m 2.00 to 2	0.0m BGL
										-			
(m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample	MPLE	15	WS/1		'N' Field	Core Recovery(%)	RQD (%)	Other Tests	REMARK
	47	0		Depth (m)	SAMPLE TYPE	10	15	15		Re	LE.		
	70.072	444	-Concrete pieces										
1	68.822		Yellowish brown SandyClay	1,4	RC								
2			Moderately weathered light brown fine to medium grained sandstone	1.4	No					69	17		
_	67.822			2.4	RC								
3				3.4	RC					80	76		
4			Slightly weathered light greyish Silt to fine grained Sandstone	0.4	NO.					90	57		
5				4.4	RC					90	82		
-	64.822			5.4	RC								
6			Moderately to slightly weathered light greyish medium grained Sandstone	6.4	RC					86	40	,	
7	62.822			7.4	RC					69	47		
8	61 000		Slightly weathered light greyish Siltstone							85	41		
9	61.822			8.4	RC					86	61		
10			Moderately weathered greyish medium grained Sandstone	9.4	RC					90	0		
PT N	= STAN				JALITY DES SAMPLE	SIGN	ATION	٧	UDS = U VST = V			SOIL SAM	PLE
		RESE	TAL INFRASTRUCTURI ARCH PRIVATE LTD 0. 1134, MAHANADI BIHAR, CUTTAK -		NSUL	TA	NC	Y 8	Logge Akash	d by :			Checked I S. Padhi

PAGE 1 OF 2

Job No:

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for	NTPC Talcher Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 7	CO-ORDINATES: East: 1561,94 North: 3968.06
SITE LOCATION: TG Hall	START DATE: 5/21/2009 END DATE: 5/23/2009
GROUND REDUCED LEVEL: 70.222	DRILLING METHOD: Rotary
GROUND WATER TABLE DEPTH: 0.95	CASING DIA: 150mm unto 2.00m & Nx from 2.00 to 20.0m BGI

E.	(m)	HIC		SA	MPLE	BLC	WS/	15cm	1 1	e ny(%)	(%)	Other	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	Rab (%)	Tests	REMARKS
				10.4	RC					90	0		
11			Moderately weathered greyish medium grained Sandstone (continued)	11.4	RC					88	13		
12										86	0		
13	57.822		Moderately weathered greyish coarse grained Sandstone	12.4	RC					90	12		
	56.822			13.4	RC								
14			Moderately weathered greyish Siltstone(weak rock)	14.4	RC					90	0		
15	54.822			15.4	RC					96	0		
16				15.4	NO					93	0		
			Moderately weathered greyish medium grained Sandstone(weak rock)	16.4	RC					88	0		
17	52.822	M. M. M. M. M.		17.4	RC					00	U		
18									5.8	95	10		
19				18.4	RC					55	0		
20			19.4	RC					55	0			

DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD
PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by : Akash

Checked by : S. Padhi

Job No:

LIEN	T:	NTP	С										
ROJ	ECT NA	ME: Geot	echnical Investigation for NTPC Talcher T	hermal S	Stage III ( 2	x 660	MW)			ш			
ORE	HOLEIC	): BH 8			CO-ORE	'ANIC	TES:	Eas	t: 129	2.96		North: 4	4012.71
ITE L	OCATIO	ON:	Boiler		START	DATE	: 6	/15/2	009		END DA	ATE: 6/1	9/2009
ROU	IND RED	DUCED LE	VEL: 71.121		DRILLIN	IG ME	THO	D: F	Rotary				
ROL	IND WA	TER TABL	E DEPTH: 0.65		CASING	DIA:	8	150	mm upto	3.00m	& Nx fro	m 3.00 to 2	0.0m BGL
	D (F	ō		SA	MPLE	BLC	WS/1	15cm		(%)	(%		
(m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Other Tests	REMARK
	70.921	<b>******</b>	Filled up soil										
2			Loose greyish Clayey sand with gravel.	1.5	UDS			F	decovered	ı	_		
3	68.121		ii.	- 3	SPT	30			11cm in 100 blows N>100	40	20		
5			Highly to moderately weathered yellowish brown fine grained Sandstone.	5	RC					80 65	0 34		
6				6	RC					76	0		
8	63.121		Highly weathered yellowish brown Siltstone.	7	RC					47	0		
9			Highly to moderately weathered	- 8	RC					52	12		
10			Highly to moderately weathered greyish fine grained Sandstone.	9	RC					61	28		
PT N	= STAI				JALITY DES	SIGN	MOITA	N	UDS = U VST = V			SOIL SAM	PLE
1	ya.	ORBIT	TAL INFRASTRUCTUR			TA	NC	Y 8		25.51			Checked S. Padhi

PAGE 1 OF 2

Job No:

CLIENT: NTPC PROJECT NAME: Geotechnical Investigation for NTPC Talcher Thermal Stage III ( 2 x 660 MW) BOREHOLE ID: BH 8 CO-ORDINATES: East: 1292.96 North: 4012.71 SITE LOCATION: END DATE: 6/19/2009 Boiler START DATE: 6/15/2009 GROUND REDUCED LEVEL: 71.121 DRILLING METHOD: Rotary GROUND WATER TABLE DEPTH: 0.65 CASING DIA: 150mm upto 3.00m & Nx from 3.00 to 20.0m BGL

Ŧ.	(m)	SHIC		SA	MPLE	BLC	WS/	15cm	1 1	e ry(%)	(%)	Other	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
11			Highly to moderately weathered greyish fine grained Sandstone. (continued)	10	RC RC					57	0		
12	61.121		Commen	40	-					91	0		
13	58.121		Highly weathered greyish Siltstone with Sandstone patches	12	RC					86	0		
	30.121		Highly weathered greyish Siltstone with clay patches.	13	RG					90	19		
14	57.121			- 14	RC					87	17		
15				15	RC					93	0		
16			Highly weathered greyish fine grained Sandstone.	16	RC					96	11	,	
17				17	RC					90	0		
18	53.121			- 18	RC						10		
19			Highly weathered greyish Siltstone with patches of SHALES.	19	RC					99	12		
20	51.121									96	0		

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION RC = ROCK CORE

DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by: Akash

Checked by : S. Padhi

Job No:

CLIEN	NT:	NTP	C										
PROJ	ECT NA	ME: Geot	echnical Investigation for NTPC Talcher T	Thermal S	Stage III ( 2 :	x 660	MW	)					
BORE	HOLE I	D: BH 9			CO-ORE	CANIC	TES:	Eas	st: 132	7.16		North:	4038.11
SITE	LOCATIO	ON:	Boiler		START	DATE	: 5	/4/20	009		END D	ATE: 5/5	5/2009
GRO	JND RED	DUCED LE	VEL: 71.323		DRILLIN	IG ME	ETHO	D:	Rotary				
GROU	JND WA	TER TABL	E DEPTH: 0.6		CASING	DIA:		150	mm upto	3.50m	& Nx fro	m 3.50 to 2	20.0m BGL
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SA	MPLE	BLC	)WS/	15cm		re ary(%)	(%)	Other	5.010000000000
DEP (m	Redu	GRAF	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	"N" Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
	71.123	2444	Concrete filling										
1	69.223		Stiff blakish brown Sandyclay	1.5	UDS			F	Recovered	d			
3	67 723		Medium dense brownish Siltysand	3 3.45	SPT	6	8	14	22 15 cm in 100				
	67.723 67.623		Completely weathered brownish	3.7	RC			bli	ws,N>1	00			
4			Sandstone Highly to moderately weathered light							55	0		
5			greyish fine to medium grained Sandstone	4.7	RC					64	64		
6	65.623			5.7	RC					76	75	,	
7				6.7	RC					11.55			
-			Moderately to slightly weathered light greyish fine to medium grained Sandstone	7.7	RC					78	70		

SPT N = STANDARD PENETRATION TEST VALUE RC = ROCK CORE

RQD = ROCK QUALITY DESIGNATION DS = DISTURBED SAMPLE

RC

RC

8.7

9.7

12 UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST

40



62,623

9

10

ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Highly to moderately weathered greyish Siltstone with Sandstone patches

Logged by : Akash

51 0

71

Checked by : S. Padhi

Job No:

CLIENT: NTPC PROJECT NAME: Geotechnical Investigation for NTPC Talcher Thermal Stage III ( 2 x 660 MW) BOREHOLE ID: BH 9 CO-ORDINATES: East: 1327.16 North: 4038.11 SITE LOCATION: END DATE: 5/5/2009 Boiler START DATE: 5/4/2009 GROUND REDUCED LEVEL: 71.323 DRILLING METHOD: Rotary GROUND WATER TABLE DEPTH: 0.6 CASING DIA: 150mm upto 3.50m & Nx from 3.50 to 20.0m BGL

E.	(m)	O HIC		SA	MPLE	BLO	WS/	15cm		e ny(%)	(%)	Other	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
11			Highly to moderately weathered greyish Stitistone with Sandstone patches (continued)	10.7	RC					71	12		
12	59.623	27.22	Moderately weathered greyish fine to medium grained Sandstone	11.7	RC					83	14		
13	58.623		Highly to moderately weathered grey Siltstone	12.7	RC					80	0		
14	57.623			13.7	RC					2000.00			
15	56.623		Highly to moderately weathered greyish Siltstone with fine grained Sandstone patches	14.7	RC					72	10		
16				15.7	RC					80	0		
17			Highly to moderately weathered greyish greyish medium to coarse grained Sandstone(weak rock)	16.7	RC					79	0	`	
18				17.7	RC					74	0		
	52 623			18.7	RC					80	0		
19			Highly to moderately weathered greyish Siltstone(weak rock)							73	0		
20	51.323			19.7						83	0		

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION RC = ROCK CORE

DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD
PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by : Akash

Checked by: S. Padhi

Job No:

CLIEN	T:	NTPO											
PROJ	ECT NA	ME: Geot	echnical Investigation for NTPC Talcher T	hermal S	tage III ( 2 :	x 660	MW)			+			
	HOLE II		Down Div		CO-ORE		7 700	A 15-11-	200	8.78			1011.11
	OCATIO		Boiler		START			21/2		-	END D	ATE: 5/2	8/2009
127.55.1	A 10 10 10 10 10 10 10 10 10 10 10 10 10	TER TABLE	National Control of the Control of t		DRILLIN	ini mana	THO			3.00m	8. Ny fro	m 3.00 to 3	10.0m BGI
01100			L L L L L L L L L L L L L L L L L L L		Critinite			_			GI TAX II O	11 0.00 to t	U.UIII DOL
F.	Dec (E)	OH O		SA	MPLE	BLO	WS/1	5cm		re ery(%	(%)	Other	
DEPTH (m)	Reduced Level (m)	GRAPHIC	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Care Recovery(%)	Rab (%)	Tests	REMARKS
1	69.277		Filled up soil consisting of Clay with Kankar & Gravel		UDG								
2			Stiff greyish brown Clay with low plasticity	1.5	UDS			r	Recovered				
3	67.777 67.657		Completely weathered deeply decomoposed Sandstone	3	SPT				15cm in 100 blows, N>100				
4			Moderately weathered yellowish brown fine grained Sandstone	4	RC					91	32		
5	65.777		Moderately weathered yellowish brown medium grained Sandstone	- 5	RC					90	26		
7	64.777		Moderately weathered light greyish Siltstone	- 6	RC					88	0		
	63.777		=	7	RC					90	0		
8			Moderately weathered light greyish medium grained Sandstone	8	RC					90	0		
9	160.777		-	9	RC					82	0		
SPTN					SAMPLE	SIGNA	MOITA	1	UDS = U VST = V			SOIL SAM	PLE
		ORBIT	TAL INFRASTRUCTUR ARCH PRIVATE LTD	E CO	NSUL	TAI	NC	Y 8	Logge Akash	d by :		10	Checked by : S. Padhi

Borehole termination at 30 m

PAGE 1 OF 3

Job No:

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for	NTPC Talcher Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 10	CO-ORDINATES: East: 1418.78 North: 4011.11
SITE LOCATION : Boiler	START DATE: 5/21/2009 END DATE: 5/28/2009
GROUND REDUCED LEVEL: 70.777	DRILLING METHOD: Rotary
GROUND WATER TABLE DEPTH: 1	CASING DIA: 150mm unto 3 00m & Ny from 3 00 to 30 0m BG

H.	(m)	SHIC		SA	MPLE	BLC	WS/	15cm		e ry(%)	(%)	Other	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
- 11	59.777		Highly to moderately weathered light greyish Sandstone	10	RC					91	0		
			u u	- 11	RC					86	0		
12			Highly to moderately weathered light greyish medium grained Sandstone	12	RC					90	0		
13	57.777			- 13	RC					85	0		
14			Highly to moderately weathered light greyish to whitish fine grained	14	RC					91	0		
15			Sandstone	15	RC								
16	54.777			- 16	RC					82	0	,	
17			Highly to moderately weathered light greyish white Siltstone with patches of	17	RC					85	0		
18	50 777		Sandstone							55	0		
			Highly to moderately weathered light greyish medium greyish Sandstone	- 18	RC					64	0		
20	51.777		Highly to moderately weathered dark greyish fine grained Sandstone	- 19	RC					80	11		

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION RC = ROCK CORE DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD
PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by : Akash

Checked by : S. Padhi

Job No:

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for	NTPC Talcher Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 10	CO-ORDINATES: East: 1418.78 North: 4011.11
SITE LOCATION : Boiler	START DATE: 5/21/2009 END DATE: 5/28/2009
GROUND REDUCED LEVEL: 70.777	DRILLING METHOD: Rotary
GROUND WATER TABLE DEPTH: 1	CASING DIA: 150mm unto 3 00m & Ny from 3 00 to 30 0m BG

-					_								
Ŧ.	(m)	OHIC G		SA	MPLE	BLO	WS/	15cm		re try(%)	(%)	Other	DE 1012
DEPTH (m)	Reduced Level (m)	GRAPHIC	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE RC	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
				20	RC					82	0		
21			ð	21	RC								
- 22			Highly to moderately weathered dark greyish fine grained Sandstone	22	RC					74	0		
			(continued)							90	0		
23				23	RC					89	0		
24	46.777			- 24	RC					-			
25	45		Highly to moderately weathered greyish brown fine grained Sandstone							85	0		
25	45.777			- 25	RC					59	13		
26			Mederately to slightly weathered greyish fine grained Sandstone	26	RC								
27	43.777			27	RC					90	33		
			Highly to moderately weathered greyish medium to coarse grained Sandstone.							73	0		
28	42.777			- 28	RC					73	0		
29			Highly to moderately weathered greyish fine grained Sandstone.	29	RC					.3	v		
			o Taratana ya 1902 Tarata da Santanta a Anga Affa							92	22		
30 "	40.777												

RC = ROCK CORE DS = DISTURBED SAMPLE UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD
PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by: Akash

Checked by: S. Padhi

Job No:

PAGE 3 OF 3

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for NTP	C Talcher Thermal Stage III ( 2 x 660 MVV)
BOREHOLE ID: BH 11	CO-ORDINATES: East: 1490.41 North: 4013.42
SITE LOCATION : Boiler	START DATE: 5/26/2009 END DATE: 5/28/2009
GROUND REDUCED LEVEL: 70.714	DRILLING METHOD: Rotary
GROUND WATER TABLE DEPTH: 1.45	CASING DIA: 150mm upto 2.00m & Nx from 2.00 to 20.0m BGI

E.	(m)	의 의		SAMPLE		BLC	WS/	15cm	1 1	ny(%)	(%)	Other	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Other Tests	REMARKS
1	68.714		Very dense yellowish brown Silty sand.	1.4	SPT	22	37	41	78			38	
3	67.514		Completely weathered yellowish brown Sandstone	3.1	SPT				10cm in 100 blows,				
4				3.2					N>100	65	37		
			Moderately to weathered light brown Siltstone	4.2									
5	65.514			5.2						70	41		
6										84	64		
7			Silghtly weathered medium to coarse grained yellowish brown Sandstone	6.2						82	68		
,				7.2						35.0			
8	62.514			8.2						85	25		
9			Slighly weathered light greyish brown Siltstone.							82	55		
	61.514		Moderately weathered yellowish brown medium grained Sandstone.	9.2						70	14		

DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by: Akash

Checked by: S. Padhi

Job No:

CLIENT:	NTPC	
PROJECT NAME:	Geotechnical Investigation for NTPC Talcher Them	nal Stage III ( 2 x 660 MVV)
BOREHOLE ID:	BH 11	CO-ORDINATES: East: 1490.41 North: 4013.42
SITE LOCATION:	Boiler	START DATE: 5/26/2009 END DATE: 5/28/2009
GROUND REDUC	ED LEVEL: 70.714	DRILLING METHOD: Rotary
GROUND WATER	TABLE DEPTH: 1.45	CASING DIA: 150mm upto 2.00m & Nx from 2.00 to 20.0m BGL

E_	m)	3 HC	at the distribution and state of a	SA	MPLE	BLC	WS/	15cm	1	e ry(%)	(%)	Other	A. SANSON A. CONSISSO
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
. :				10.2				П		70	14		
11	59.514		Moderately weathered yellowish brown medium grained Sandstone. (continued)	- 11.2						82	10		
12	58.514		Moderately weathered light greyish fine grained Sandstone.	12.2						90	26		
- 13				LEVEL OF						96	42		
14			Slightly weathered dark greyish medium grained Sandstone.	13.2						98	77		
			₩ 31	14.2						90	47		
15	55.514		Slightly weathered dark greyish	15.2						90	42		
16	54.514		Siltstone	16.2									
17			Slightly weathered light greyish coarse grained Sandstone.							91	74		
	53.514			17.2						84	41		
18			Slightly weathered light greyish fine grained Siltstone.	18.2									
- 19	51.514			19.2						90	59		
20	50.714		Slightly weathered light greyish medium grained Sandstone.	75.5						87	22		

DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by: Akash

Checked by : S. Padhi

Job No:

LIEN	IT:	NTPO	С										
ROJI	ECT NAI	ME: Geot	technical Investigation for NTPC Talcher T	Thermal S	Stage III ( 2	x 660	MVV)			4			
ORE	HOLE I	D: BH 12	2		CO-ORE	TANIC	TES:	Eas	t: 128	3.28		North: 4	1075.82
ITE L	OCATIO	ON:	Boiler		START	DATE	: 6	/22/2	009		END D	ATE: 6/2	5/2009
GROL	IND RED	DUCED LE	VEL: 71.798		DRILLIN	IG ME	THO	D:	Rotary				
ROL	JND WA	TER TABL	E DEPTH: 0.85		CASING	DIA:		150	mm upto	2.20m	& Nx fro	m 2.20 to 2	0.0m BGL
	(m)	S G		SA	MPLE	BLC	WS/1	15cm	5555000000	re ery(%)	(%)	Other	
(m)	Reduced Level (m)	GRAPHIC	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	ROD	Tests	REMARK
	71.348		Filled up soil										
1 -			Loose greyish brown Sandy Clay	1.5	UDS			F	Recoverer 9 cm in	d			
-	69.598	1111111	Completely weethered light vellowish	2.2	SPT				100	***	***		
-	69,348		Completely weathered light yellowish brown Sandstone	2.45	RC			bl	ws.N>1	00			
3				3.45	RC					51	20		
4			Moderately weathered light yellowish brown fine grained Sandstone	4.45	RC					80	65		
5	66.348			5.45	RC					89	81		
6			Slightly weathered light greyish	6.45	RC					99	99	,	
7	64.348		Siltstone	7.45	RC					92	92		
8			Cr. No.							100	100		
9			Slight weathered light to fresh greyish fine gained Sandstone	8.45	RC					95	87		
0	62,348		Slightly weathered to fresh greyish Siltstone to fine grained Sandstone patches	9.45	RC					84	84		
	ROCK C				SAMPLE	SIGNA	ATION	٧	UDS = U			SOIL SAM	PLE
	7/4.	ORBIT	TAL INFRASTRUCTURI ARCH PRIVATE LTD			TAI	NC.	Y 8	Vanne	17.50	marries I.E		Checked I

Borehole termination at 20 m

PAGE 1 OF 2

Job No:

CLIENT:	NTPC	
PROJECT NAME	: Geotechnical Investigation for NTPC Talcher The	rmal Stage III ( 2 x 660 MVV)
BOREHOLE ID:	BH 12	CO-ORDINATES: East: 1283.28 North: 4075.82
SITE LOCATION	: Boiler	START DATE: 6/22/2009 END DATE: 6/25/2009
GROUND REDU	CED LEVEL: 71.798	DRILLING METHOD: Rotary
GROUND WATE	R TABLE DEPTH: 0.85	CASING DIA: 150mm upto 2.20m & Nx from 2.20 to 20.0m BGL

Ŧ.	(m)	O.H.C	\$16,79575 (ASSAULT) A PAGE 2007 (ACC) A TO SEE SA A A	SA	MPLE	BLC	WS/1	15cm	54546392955	e 1y(%)	(%)	Other	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
				10.45	RC					84	84		
11			Slightly weathered to fresh greyish Siltstone to fine grained Sandstone patches (continued)	11.45	RC					98	98		
12	59.348			10.45	BC.					60	45		
- 13			Highly weathered greyish Siltstone	12.45	RC					54	0		
14	58.348		Highly weathered greyish fine grained	13.45	RC					60	0		
	57.348		Sandstone	14.45	RC								
15			Moderately weathered greyish	15.45	RC					60	0		
16			Siltstone		5.075					74	19	,	
17	55.348			16.45	RC					65	10		
			Moderately weathered greyish fine grained Sandstone	17.45	RC								
18	53.348			18.45	RC					71	36		
19			Slightly weathered greyish Siltstone							81	81		
20	E4 700			19.45	RC					82	71		

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by: Akash

Checked by: S. Padhi

Job No:

CLIENT:	NTPC			
PROJECT NAME	Geotechnical Investigation for NTPC Talcher Therma	al Stage III ( 2	x 660 MVV)	
BOREHOLE ID:	BH 13	CO-OR	DINATES: East: 1363.83 North:	4078.14
SITE LOCATION	Boller	START	DATE: 5/5/2009 END DATE: 6	/8/2009
GROUND REDU	CED LEVEL: 71.701	DRILLI	IG METHOD: Rotary	
GROUND WATE	R TABLE DEPTH: 0.85	CASIN	DIA: 150mm upto 1.90m & Nx from 1.90 to	20.0m BGL
m) ed	2	SAMPLE	BLOWS/15cm	

					1					•			
E.	(m)	OHG G			MPLE	BLO	WS/1	15cm		ery (%	(%)	Other	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	"N" Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
1	70.701		Filled up Soil consisting of Clay with Boulders & Concrete pieces										
2	69.801		Very dense yellowish brown Clayey sand with boulder pieces	1.5	SPT			ble	12 cm in 100 ows,N>10	 00			
3	68.801		Moderately weathered light brown medium grained Sandstone	2.9	RC					66	42		
				Shares	2					86	42		
4			Moderately to slightly weathered light yellowish brown Sandstone	3.9	RC					85	0		
5				4.9	RC					84	34		
6	65.801		a	5.9	RC					89	10	,	
7				6.9	RC					89	10		
8			Moderately to slightly weathered light greyish Siltstone with fine grained Sandstone patches	7.9	RC					95	13		
- 9				8.9	RC					90	13		
10				9.9	RC					95	0		

DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by : Akash

Checked by: S. Padhi

Job No:

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for	NTPC Talcher Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 13	CO-ORDINATES: East: 1363.83 North: 4078.14
SITE LOCATION : Boiler	START DATE: 5/5/2009 END DATE: 6/8/2009
GROUND REDUCED LEVEL: 71.701	DRILLING METHOD: Rotary
GROUND WATER TABLE DEPTH: 0.85	CASING DIA: 150mm upto 1.90m & Nx from 1.90 to 20.0m BGL

Ŧ.	(m)	O H		SA	MPLE	BLC	WS/1	15cm	1 1	e ny(%)	(%)	Other	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
F =										94	0		
11			-	10.9	· RC					94 87	0		
12				11.9	RC								
13			Moderately to slightly weathered light greyish Siltstone with fine grained Sandstone patches (continued)	12.9	RC					90	0		
14				13.9	RC					88	0		
	56.801									85	15		
15	20.001			14.9	RC					89	30		
16			Slightly weathered greyish medium grained Sandstone	15.9	RC					85	79	,	
17	54.801		Slightly weathered greyish coarse	16.9	RC					99	91		
18	53.801.		grained Sandstone	17.9	RC								
				10.0	200					95	63		
19 -	51.701		Slightly weathered greyish Silt to fine grained Sandstone	18.9	RC					95	0		

DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by : Akash

Checked by: S. Padhi

Job No:

PROJEC	TNAN	AE: Geote	echnical Investigation for NTPC Talcher	Thermal S	Stage III ( 2	x 660	MW						
BOREHO				THORITION C	CO-ORI			Eas	st: 145	1.3		North: 4	1044.21
SITE LOC		1000	Boiler		START	-		/1/20		-	END D		/2009
		UCED LE			DRILLIN						LIND D	116. 40	12000
1011011111111		ER TABLE	50000000 SEEDE		CASING	_				2.00m	P. Nly fro	m 2.00 to 2	0.0m PCI
GROUNL	JVVA	ER TABLE	E DEPTH: 0.95	_	CASING	DIA.		150	mm upto	2.00111	& INX IIU	111 2.00 to 2	U.UIII BGL
(m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION		MPLE	BLC	BLOWS/15cm		"N" Field	Core overy(%)	(%)	Other	REMARKS
DE	Leve	GRA	WATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	14 T ICIG	Core Recovery(%)	Rab	Tests	KLWAKKO
70	599		Filled up soil consisting of Clayey Sand										
2 69	9.049	¥	Loose yellowish brown Silty Sand	1.5	UDS			F	Recovered	i			
- 1										53	0		
3 -			Moderately to slightly weathered medium to coarse grained light brown Sandstone	3	RC					76	22		
4				4	RC					88	82		
5 -66	5.049			- 5	RC					76	34		
6			Highly to moderately weathered brownish to greyish fine to medium grained Sandstone	6	RC					70	0		
7			gramed Sandstone	7	RC								
8 63	3.049			- 8	RC					50	0		
9 62	2.049		Highly weathered greyish Claystone with Siltstone patches						11cm in	51	0		
10 61			Completely weathered.deeply decomposed greyish Siltstone	9	SPT			bl	100 lowsN>10	00			
	STAN	NDARD PE			JALITY DES	SIGN	ATION	٧	UDS = U VST = V			SOIL SAM	PLE
		RESE	TAL INFRASTRUCTUR ARCH PRIVATE LTD D. 1134, MAHANADI BIHAR, CUTTAK		NSUL	TA	NC	Y 8	Logge	ed by :			Checked by S. Padhi
1									Job	No:		PAGE	1 OF 2

CLIENT: NTPC	i i
PROJECT NAME: Geotechnical Investigation for NTPC Talcher	Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 14	CO-ORDINATES: East: 1451.3 North: 4044.21
SITE LOCATION : Boiler	START DATE: 6/1/2009 END DATE: 4/6/2009
GROUND REDUCED LEVEL: 71.049	DRILLING METHOD: Rotary
CPOLIND WATER TARLE DEPTH: 0.05	CASING DIA: 150mm unto 2.00m & Ny from 2.00 to 20.0m BGI

E	(m)	일	2000. 1000.000 200.000 200.000	SA	MPLE	BLO	WS/1	15cm		e ny(%)	(%)	Other	C1000000000000000000000000000000000000
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	"N" Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
11		M. M	Completely weathered deeply decomposed greyish Siltstone in the	11	SPT			b	11cm in 100 lowsN>10	0			
12			decomposed greyish Siltstone in the form Silty sand	12	SPT			b	11cm in 100 lowsN>10	0			
13	58.049			13 13.1	SPT RC			b	10cm in 100 lowsN>10	0	***		
14				14.1	RC					46	0		
15			Highly weathered dark greyish medium grained Sandstone	15.1	RC					48	15		
16			E	16.1	RC					62	0	,	
17	54.049			17.1	RC					58	29		
18			Highly to moderately weathered grey Siltstone	18.1	RC								
19	52.049			19.1						60	0		
20	51.049		Moderately weathered greyish fine grained sandstone							72	72		

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE RC = ROCK CORE

DS = DISTURBED SAMPLE

VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by: Akash

Checked by: S. Padhi

Job No:

NTPC CLIENT: PROJECT NAME: Geotechnical Investigation for NTPC Talcher Thermal Stage III ( 2 x 660 MW) BOREHOLE ID: 1477.91 BH 15 CO-ORDINATES: East: 4075.6 North: SITE LOCATION : Boiler START DATE: 5/3/2009 END DATE: 6/3/2009 GROUND REDUCED LEVEL: 71.067 DRILLING METHOD: Rotary GROUND WATER TABLE DEPTH: 1.15 CASING DIA: 150mm upto 4.50m & Nx from 4.50 to 20.0m BGL BLOWS/15cm SAMPLE Reduced Level (m) GRAPHIC (%) DEPTH Core Recovery(% Other E MATERIAL DESCRIPTION 'N' Field ROD REMARKS Sample Tests 15 Depth SAMPLE 15 15 (m) TYPE Fill up soil 70.667 11cm in 100 SPT 1.5 blows Boulder pieces embeded in Clay N>100 68 267 SPT 3 3 6 11 17 Medium dense to very greyish Clayey Sand with Gravel 66.567 SPT 4.5 18 24 31 55 Very dense greyish Siltysand 13cm in 100 SPT 6 blows N>100 64.067 12cm in 100 7.5 SPT Completely weathered greyish Rock blows N>100 63.067 8 RC Highly weathered light greyish fine 56 10 grained Sandstone 62.067 9 RC Highly weathered greyish fine to 56 0 medium grained Sandstone 10 SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE RC = ROCK CORE DS = DISTURBED SAMPLE VST = VANE SHEAR TEST Logged by : Checked by:

ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Akash

S. Padhi

PAGE 1 OF 2 Job No:

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for NTPC Ta	alcher Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 15	CO-ORDINATES: East: 1477.91 North: 4075.6
SITE LOCATION : Boiler	START DATE: 5/3/2009 END DATE: 6/3/2009
GROUND REDUCED LEVEL: 71.067	DRILLING METHOD: Rotary
CROLIND WATER TABLE DEPTH: 1.16	CACING DIA: 150mm unto 4 50m 8 Nu from 4 50 to 20 0m DCI

F.	(m)	SHO		SA	MPLE	BLC	WS/	15cm		re rry(%)	(%)	Other	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
11			Highly weathered greyish fine to medium grained Sandstone	. 11	RC RG					49	23		
12	59.067		(continued)	- 12	RC					60	21		
	58.367		Moderately weathered brownish fine to medium grained Sandstone							61	39		
13	57.567		Moderately weathered light greyish Siltstone	13	RC					69	53		
14			Highly weathered brownish Siltstone to medium grained Sandstone	14	RC					48	15		=
15	56.067			- 15	RC					56	0		
16			Highly to moderately weathered ,brownish with greyish medium to coarse grained Sandstone patch	16	RC					71	49		3
	54.067		Highly weathered greyish fine to medium grained Sandstone	17	RC					72	0		
	53.067	M M M M M M M M M M M M M M M M M M M	Highly to moderately weathered greyish Siltstone	18	RC					84	21		
19 -	51.067		Moderately weathered greyish medium grained Sandstone	19	RC					70	13		

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION DS = DISTURBED SAMPLE

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PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by : Akash

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Job No:

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for N	ITPC Talcher Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 16	CO-ORDINATES: East: 1270.53 North: 4118.82
SITE LOCATION: ESP	START DATE: 6/15/2009 END DATE: 6/18/2009
GROUND REDUCED LEVEL: 72.520	DRILLING METHOD: Rotary
GROUND WATER TABLE DEPTH: 0.9	CASING DIA: 150mm unto 3.70m & Nx from 3.70 to 20.9m BGI

Ε	pag (m)	SHC		SA	MPLE	BLO	WS/1	15cm		e y(%)	(%)	0.11	0.0000000000000000000000000000000000000
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Other Tests	REMARKS
=													
1		MAK	Medium dense to very greyish Clayey Sand with Gravel										
1 =			Sand with Gravel						12cm in				
=	71.02	1919		1.5	SPT				100				
2		0000		1000					blows N>100				
=		0000	Completely weathered yellowish brown						8cm in				
=	69.82	0000 0000 0000	rock.	2.5 2.7	SPT				100 blows		***		
3	03.02			2.7	RC				N>100				
=		::::::::								65	44		
=					-								
4				3.7	RC								
=										80	54		
=				4.7	RC								
5 =				7.7	110								
=										95	78		
=				5.7	RC								
6 -													
Ξ										83	27		
_ =				6.7	RC					0.7			
7 =													
										94	0		
8				7.7	RC								
0 -										87	0		
=								- 0		0/	U		
9 =			Slightly weathered greyish fine grained	8.7	RC								
=			Sandstone.							69	0	Α,	
=				250									
10				9.7	RC								
										84	0		
-										5.00	27/6		
11				10.7	RC								
=										85	0		
-				11.7	RC								
12 -				11.7	NO								
Ē										84	0		
1				12.7	RC								
13 =				12.7	NO								
3										87	0		
. =				13.7	RC								
14				No.	6777								
4										87	0		
		:::::::		14.7	RC					91	0		

DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD
PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by: Akash

Checked by: S. Padhi

Job No:

CLIENT: NTPC	A 0
PROJECT NAME: Geotechnical Investigation for NTPC Talcher Therma	I Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 16	CO-ORDINATES: East: 1270.53 North: 4118.82
SITE LOCATION: ESP	START DATE: 6/15/2009 END DATE: 6/18/2009
GROUND REDUCED LEVEL: 72.520	DRILLING METHOD: Rotary
GROUND WATER TABLE DEPTH: 0.9	CASING DIA: 150mm upto 3.70m & Nx from 3.70 to 20.9m BGL

H.	(m)	CHIC		SA	MPLE	BLC	WS/	15cm	1 1	e ny(%)	(%)	Other	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
16				15.7	RC					91	0		
17			92	16.7	RC					91	0		
			Slightly weathered greyish fine grained Sandstone. (continued)	17.7	RC					92	0		
18				18.7	RC					93	0		
19										97	0		
20	52.52			19.7	RC RC	_		_		74	0		
21													
22		2								46			
23			۸										
24													
25			9									,	
26													
27													
28													
29													
30							1						

DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD
PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by: Akash

Checked by: S. Padhi

Job No:

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for I	NTPC Talcher Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 17	CO-ORDINATES: East: 1325.4 North: 4148.92
SITE LOCATION: ESP	START DATE: 6/25/2009 END DATE: 6/27/2009
GROUND REDUCED LEVEL: 72.109	DRILLING METHOD: Rotary
GROUND WATER TABLE DEPTH: 1	CASING DIA: 150mm upto 1.75m & Nx from 1.75 to 20.0m BGL

I.	pe (E	OH C		SA	MPLE	BLC	WS/	15cm		ny(%)	(%)	Other	
(m)	Reduced Level (m)	GRAPHIC	MATERIAL DESCRIPTION	Sample Depth	SAMPLE	15	15	15	'N' Field	Core ecovery(%)	RQD (%)	Tests	REMARKS
-	71.259		Field of soil consisting of pebbles.										
1		200 M 200 M 2000 2000 2000 2000 2000	Completely weathered vellowich brown	1.4	SPT	29			12cm in 100 blows N>100	-	***		
2 -	, M. William		•	1.75	RC					84	62		
3			Highly to moderately weathered light yellowish Siltstone to fine grained Sandstone.	2.75	RC								
4	68.359			3.75	RC					78	0		
										95	0		
5				4.75	RC					68	40		
3 -			Moderately to slightly weathered light greyish Siltstone to fine grained Sandstone.	5.75	RC					75	66		
,				6.75	RC						00		
	64.359			7.75	RC					72	59		
-			Slightly weathered greyish fine grained Sandstone.							91	43		
	63,359		Slightly weathered greyish Siltstone	8.75	RC					99	43		0
0 =		ph an ph an	ongress requirement greyton contactories	9.75	RC					92	52		

DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD
PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

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Checked by: S. Padhi

Job No:

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for	NTPC Talcher Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 17	CO-ORDINATES: East: 1325.4 North: 4148.92
SITE LOCATION: ESP	START DATE: 6/25/2009 END DATE: 6/27/2009
GROUND REDUCED LEVEL: 72.109	DRILLING METHOD: Rotary
GROUND WATER TABLE DEPTH: 1	CASING DIA: 150mm upto 1.75m & Nx from 1.75 to 20 0m BGI

Ŧ.	pec (m)	3 HIC		SA	MPLE	BLC	WS/	15cm	l	e ny(%)	(%)	Other	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m) SAMPLE 1		15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Other Tests	REMARKS
11			Slightly weathered greyish Siltstone (continued)	10.75	RC					92	52		
	60.359			11.75	RC					90	90		
12			Slightly weathered greyish Sandstone.	12.75	RC					96	96		
13 -	58.359		Signity weathered greysh Sandstone.		200					93	40		
14	57.359		Slightly weathered greyish fine grained Sandstone.	13.75	RC					99	99		
15			Slightly weathered greyish Siltstone with clay paches.	14.75	RC					90	82		
16	56,359		5	15.75	RC					99	99		
17				16.75	RC					96	96		
18			Slightly weathered weathered greyish Siltstone.	17.75	RC					93	88		
19				18.75	RC								
20										97	97		

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE RC = ROCK CORE

DS = DISTURBED SAMPLE

VST = VANE SHEAR TEST



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Checked by :

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by:

S. Padhi

Job No:

CLIENT: NTPC	i i
PROJECT NAME: Geotechnical Investigation for NTPC	Talcher Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 17	CO-ORDINATES: East: 1325.4 North: 4148.92
SITE LOCATION: ESP	START DATE: 6/25/2009 END DATE: 6/27/2009
GROUND REDUCED LEVEL: 72.109	DRILLING METHOD: Rotary
GROUND WATER TABLE DEPTH: 1	CASING DIA: 150mm upto 1.75m & Nx from 1.75 to 20.0m BGL

1	10 11/1	TER TABLE	DEPTH: 1	_	CASING	DIA.	_	130	Tim upto		& INX IIO	m 1.75 to .	20.0m BGL
(m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	= 1	MPLE	BLC	OWS/	15cm	'N' Field	Core Recovery(%)	RQD (%)	Other	REMARK
	Rec	GR		Sample Depth (m)	SAMPLE TYPE	15	15	15				Tests	7,2,17,0,0
=				20						***			
=													
-													
=													
=													
-													
1													
-													
=													
=													
=													
-													
-								6					
4													
=												8	
=													
1													
-									2				
=													
=													
1													
=													
4													
=													
=													

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE

DS = DISTURBED SAMPLE

VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & Logged by : Akash

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Checked by :

S. Padhi

Job No:

PAGE 3 OF 3

CLIEN	NT:	NTP	С										
PRO	ECT NA	ME: Geo	technical Investigation for NTPC Talcher T	Thormal S	Stage III / 2	v een	BANAA	_					
-	HOLE			neimai c	CO-ORI				+ 141	3.04		North:	4115.92
	LOCATION		ESP		START			/3/20		7.04	END D	V-100 177 11 11 11	/2009
-11/1/	0.0000000000000000000000000000000000000	DUCED LE			DRILLIN						LIAD D	ATE. OF	W2005
			E DEPTH: 1.05		CASING					3.0m &	Nx fron	n 3.00 to 20	0.0m BGL
	T												
(m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SA	MPLE	BLC	WS/1	15cm	'N' Field	Core Recovery(%)	RQD (%)	Other Tests	REMARK
0	E.R.	8		Depth (m)	SAMPLE TYPE	15	15	15		Reco	RO.	16313	220.30.000
1	70.857		Field of soil consisting of clayey sand with gravel.										
2			Stiff to hard brownish sandy clay with gravel.	1.5	UDS			F	Recovered	1			
3	69.157 68.757		Completely weathered deeply decomposed yellowish brown Sandstone.	2.7	SPT				10cm in 100 blows N>100	-	2777		
4				4.1	RC					50	0		
5			Highly to moderately weathered fine to medium grained yellowish brown Sandstone.	5.1	RC					84	22		
6				6.1	RC					85	15		
8	64.757		Moderately weathered light greyish fine to medium grained Sandstone.	7.1	RC					85	0		
9	63.757		Moderately weathered light gray silt	8.1	RC					92	0		
			Moderately weathered light gray sitt stone.	9.1	RC					95	0		

RC = ROCK CORE DS = DISTURBED SAMPLE ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD
PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST

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Checked by: S. Padhi

Job No:

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for I	NTPC Talcher Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 18	CO-ORDINATES: East: 1413.04 North: 4115.92
SITE LOCATION: ESP	START DATE: 6/3/2009 END DATE: 6/4/2009
GROUND REDUCED LEVEL: 71.857	DRILLING METHOD: Rotary
GROUND WATER TABLE DEPTH: 1.05	CASING DIA: 150mm upto 3 0m & Nx from 3 00 to 20 0m BGI

E	(m)	D HC	500074-908 MOVEMENT	SA	MPLE	BLC	WS/	15cm		e // (%)	(%)	011-	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Other Tests	REMARKS
5	61.757			10.1	RC								
11			÷	11.1	RC					93	51		
12			Slightly weathered dark greyish fine graind Sandstone.	12.1	RC					65	50		
13										91	68		
				13.1	RC								
14										92	0		
15	57.757		Slightly weathered dark greyish fine to medium graind Sandstone.	- 14.1	RC					93	67		
16	56.757		Moderately weathered dark greyish medium to coarse graind Sandstone.	15.1	RC					96	0		
	55.757		18	16.1	RC					96	0		
17			Moderately weathered greyish Siltstone.	17.1	RC					85	0		
18	53.757			18.1	RC					00	U		
19										91	0		
			Moderately weathered greyish medium grained Sandstone.	19.1	RC					85	0		
- 20 -	51.857												

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST

ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by: Akash

Checked by : S. Padhi

Job No:

CLIEN	T:	NTPO			10								
PROJE	CT NA	ME: Geot	echnical Investigation for NTPC Talcher T	hermal S	tage III (2	x 660	MVV)			3			
	HOLE ID	S. (5) 11 12 12 12 12 12 12 12 12 12 12 12 12	150-550		CO-ORI				1000				4113.5
	OCATIO		ESP 74.574		START			/8/20			END D	ATE: 6/1	1/2009
1311115-5	272779	DUCED LE			DRILLIN		THO			2.00==	P. No. fee	m 2 00 to 2	10.0m BCI
BROU	NU WA	TER TABL	E DEPTH: 1.55	_	CASING	DIA.		150	mm upto		ox IVX IIO	III 2.00 to 2	0.0m BGL
(E)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION		MPLE	BLC	WS/1	5cm	'N' Field	Core Recovery(%)	RQD (%)	Other Tests	REMARK
5	Rec	GRV		Sample Depth (m)	SAMPLE TYPE	15	15	15		Reco	RQ	Tests	
1 -	69.574		Medium stiff greyish sandy clay.	1.5	UDS			F	Recovered				
=	69.424		Completely weathered deeply decomposed brownish to greyish Sandstone.	2.15	RC				blows N>100				
3			Moderately weathered brownish to greyish fine to medium grained Sandstone.							78	61		
4	68.424		Moderately weathered greyish	3.15	RC					78	44		
4	67.424		Siltstone.	4.15	RC					70	44		
5										84	58		
-				5.15	RC								
6			Moderately to slightly weathered light greyish compacted fine to medium grained Sandstone.	6.15	RC					96	96		
7			grained Sandstone.							82	48		
4				7.15	RC					91	63		
8 =	63.424			8.15	RC					5943			
9			Slightly weathered greyish fine grained Sandstone.	9.15	RC					75	40		
10										80	44		
	= STAN				ALITY DES	SIGNA	MOITA	1	UDS = U			SOIL SAM EST	PLE
	A	ORBIT	AL INFRASTRUCTUR	E CO	NSUL	TAI	NC	Y 8	Logge	d by :			Checked S. Padhi

PAGE 1 OF 2

Job No:

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for N	NTPC Talcher Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 19	CO-ORDINATES: East: 1502.29 North: 4113.5
SITE LOCATION: ESP	START DATE: 6/8/2009 END DATE: 6/11/2009
GROUND REDUCED LEVEL: 71.574	DRILLING METHOD: Rotary
GROUND WATER TARLE DEPTH: 1.55	CASING DIA: 150mm unto 2.00m 8 Ny from 2.00 to 20.0m RC

57100	1111		L DEF 111. 1.00	_	UNUING	W-17-1		,00	min upto		W 14X 110	111 2.00 10 2	LO.OH DOL
Ŧ.	(m)	E CO		SA	MPLE	BLC	WS/	15cm	1 1	e ry(%)	(%)	Other	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
	61.424			10.15	RC								
11	60.424		Slightly weathered greyish Siltstone.	- 11.15	RC					90	22		
12				11.15	RC					65	0		
13	58.424		Highly weathered dark greyish medium to coarse grained Sandstone.	12.15	RC					93	17		
14			Highly weathered dark greyish fine grained Sandstone.	13.15	RC					80	0		
	57.424			14.15	RC							-	
F :	57 074		Dark greyish Siltstone.										
15				15.15	RC					70	0		
16				16.15	RC					76	0		
17			Highly weathered dark greyish medium to carse grained Sandstone.	17.15	RC								
18				18.15	RC					71	0		
19				19.15	RC					62	0		
20	51.574									71	18		

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

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S. Padhi

Job No:

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for NTI	PC Talcher Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 20	CO-ORDINATES: East: 1263.41 North: 4184.35
SITE LOCATION : ESP	START DATE: 6/23/2009 END DATE: 6/27/2009
GROUND REDUCED LEVEL: 72.319	DRILLING METHOD: Rotary
GROLIND WATER TARLE DEPTH: 1.05	CASING DIA: 150mm upto 1 50m 8 Ny from 1 50 to 20 0m BCI

Ξ	(m)	9		SA	MPLE	BLC	WS/	15cm		у(%)	(%)	Oll	
(m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Other Tests	REMARKS
	72.019	<b></b>	Filled up soil										
	71,419		Greyish sand with pebbles.										
	70.519		Completely weathered yellowish brown Sandstone.	1.5	SPT	28			11cm in 100 blows N>100	_	_		i i
2			Moderately weathered light yellowish fine grained Sandstone.	1.0	RC					79	21		
3	69.519			2.8	RC								
-	68.519		Moderately weathered light greyish Siltstone.							85	56		
4		X		3.8	RC					91	78		
5		X X X X X X X X X X X X X X X X X X X		4.8	RC								
6		X X X X X X X X X X X X X X X X X X X X		5.8	RC					100	100		
		X X X X X X X X X X X X X X X X X X X	35							96	76	*	
7		X X X X X X X X X X X X X X X X X X X	Slightly weathered to fresh light greyish fine grained Siltstone	6.8	RC					99	99		
8		X X X X X X X X X X X X X X X X X X X		7.8	RC					55	99		
-		× × × × × × × × × × × × × × ×								97	97		
9		x x x x x x x x x x x x x x x x x x x		8.8	RC								
-		x x x x x x x x x x x x x x x x x x x	74							99	91		
10		x x x x x x x x x x x x x x x x x x x		9.8	RC					96	94		

DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST

ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by : Akash

Checked by : S. Padhi

Job No:

CLIENT: NTPC PROJECT NAME: Geotechnical Investigation for NTPC Talcher Thermal Stage III ( 2 x 660 MW) BOREHOLE ID: BH 20 CO-ORDINATES: East: 1263.41 North: 4184.35 SITE LOCATION: ESP START DATE: 6/23/2009 END DATE: 6/27/2009 GROUND REDUCED LEVEL: 72.319 DRILLING METHOD: Rotary GROUND WATER TABLE DEPTH: 1.05 CASING DIA: 150mm upto 1.50m & Nx from 1.50 to 20.0m BGL

E.	(m)	E C		SA	MPLE	BLC	)WS/	15cm		3(%)	(%)	0.11	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Other Tests	REMARKS
11				10.8	RC					96	94		
12		X X X X X X X X X X X X X X X X X X X	Slightly weathered to fresh light greyish fine grained Siltstone (continued)	11.8	RC					97	86		e i
	59.519	XXXX	15	- 12.8	RC					95	95		
13										91	91		
14			Slightly weathered greyish Siltstone.	13.8	RC					90	90		
15				14.8	RC					92	0		
16	56.519			15.8	RC					86	0		
17			Moderately weathered greyish fine grained Sandstone.	16.8	RC					0000	25		
18	54.519			17.8	RC					93	0		
			Madantal	18.8	RC					91	0		
19 -	52.319		Moderately weathered greyish Siltstone.							80	0		

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION RC = ROCK CORE

DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by :

Checked by:

Akash

S. Padhi

Job No:

CLIEN	IT:	NTPO	C											
PROJ	ECT NA	ME: Geot	echnical Investigation for NTPC Talcher T	Thermal S	Stage III ( 2 :	x 660	MVV)							
BORE	HOLE I				CO-ORE			Eas	t: 1374	4.24		North:	4180.08	
SITEL	OCATIO	ON:	Chimney		START	DATE	: 6/	20/2	009		END D	ATE: 6/2	3/2009	
GROL	IND RED	DUCED LE	VEL: 72.092		DRILLIN	IG ME	THOE	D: Rotary						
ROL	IND WA	TER TABLE	E DEPTH: 1.1		100000000000000000000000000000000000000	CASING DIA: 150mm upto 2.10m & Nx from 2.10 to 20								
(m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth	MPLE	BLC 15	15	5cm	'N' Field	Core Recovery(%)	RQD (%)	Other Tests	REMARK	
				(m)	TYPE		10	10		Re				
4	71.442		Filled up soil											
1	70.592		Greyish brown Sandy clay with pebbles.	- 1.5	SPT	32			13cm in 100		222			
2	69,992		Completely weathered yellowish brown Sandstone.	2.1	RC				blows N>100					
				2.1	No					85	13			
3 -			Highly weathered yellowish fine grained Sandstone.	3.1	RC					93	0			
4	67.992		Highly weathered light greyish fine	4.1	RC					86	0			
5	66.992		grained Sandstone.	5.1	RC					10.000				
6	65.992		Highly weathered light greyish medium grained Sandstone.	6.1	RC					90	0			
7										57	0			
				7.1	RC					88	0			
8 -			Highly weathered light greyish Siltstone to fine grained Sandstone.	8.1	RC					92	34			
9 -				9.1	RC					90	0			
0 -														
T N	= STAN		NETRATION TEST VALUE RQD = R DS = DIS		SAMPLE	ign/	ATION		UDS = U VST = V			SOIL SAM	PLE	

Borehole termination at 20 m

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

PAGE 1 OF 3

Job No:

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for I	NTPC Talcher Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 21	CO-ORDINATES: East: 1374.24 North: 4180.08
SITE LOCATION : Chimney	START DATE: 6/20/2009 END DATE: 6/23/2009
GROUND REDUCED LEVEL: 72.092	DRILLING METHOD: Rotary
GROUND WATER TABLE DEPTH: 1.1	CASING DIA: 150mm unto 2 10m & Nx from 2 10 to 20 0m BGI

H_	(m)	OH C		SA	MPLE	BLC	WS/	15cm		e ry(%)	(%)	Other	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
	61.992			10.1	RC								
11	60.992		Highly weathered greyish fine grained Sandstone.	- 11.1	RC					92	0		
12				90.00						74	10		
13	58.992		Highly weathered coarse grained Sandstone.	12.1	RC					58	0		
14	56.892		Highly weathered greyish Siltstone with day paches.	- 13.1	RC					60	10		
17	57.992	M. M. M. M.		14.1	RC								
15	56.992		Moderately weathered grayish fine grained Sandstone.	- 15.1	RC					82	50		
16	55.992		Slightly weathered greyish fine grained Sandstone.	10.1						95	86		
_	55.552		,	16.1	RC					84	54		
17			Moderately weathered light greyish Siltstone.	17.1	RC					81	37		
18	53.992		emere) IÇ.	- 18.1	RC								
19			Higly to moderately weathered greyish fine grained Sandstone.	19.1	RC					90	90		
20										86	0		

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by : Akash

Checked by : S. Padhi

Job No:

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for NTPC Talche	er Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 21	CO-ORDINATES: East: 1374.24 North: 4180.08
SITE LOCATION : Chimney	START DATE: 6/20/2009 END DATE: 6/23/2009
GROUND REDUCED LEVEL: 72.092	DRILLING METHOD: Rotary
CPOLIND WATER TABLE DEPTH: 1.1	CASING DIA: 150mm unto 2 10m & Ny from 2 10 to 20 0m BCI

	(m)	D I		SAMPLE		BLOWS/15cm				3(%)	(%)	011	
Œ	Reduced Level (m)	Reduced Level (m) GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Other Tests	REMARK
1111111	51.292		Higly to moderately weathered greyish fine grained Sandstone. (continued)	20.1	RC					86	0		
	21.232		2)										
			ā										
1									7				
111111													
1													
-													

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by : Akash

Checked by: S. Padhi

Job No:

PAGE 3 OF 3

ROJ	ECT NA	ME: Geot	technical Investigation for NTPC Talcher	Thermal S	tane III / 2	v 660	MANA						
-	HOLE I				CO-ORI				st: 145	1.54		North:	4151.98
TEL	OCATIO	ON:	Chimney		START	DATE	: 6	/5/20	109		END D	-	3/2009
ROL	IND REI	DUCED LE	VEL: 72.194		DRILLIN	IG ME	ETHO	D:	Rotary				
ROL	IND WA	TER TABL	E DEPTH: 1.98		CASING	DIA:		150	mm upto	1.98m	& Nx fro	m 1.98 to 2	20.0m BGL
	20	C)		SAI	MPLE	BLC	)WS/	15cm		(%	-		
(m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Other Tests	REMARK
-	71.894	<b>****</b>	Filled up soil consisting of brick and concrete pieces	(44)				Г					
	70.744		Very dense yellowish brown dayey sand.	1	SPT	20	28	33	61	-	-		
			Completely weathered deeply decomposed brownish Sandstone.	2	SPT	38			10cm in 100 blows N>100				
1111111111	68.894			3.3	RC					47	10		
				4.3	RC								
				5.3	RC					69	19		
			Highly to moderately weathered yellowish brown fine to medium grained Sandstone.							85	10		
1111111				6.3	RC			-		87	13	`	
Post				7.3	RC					30-75	574		
	63.894	M. At M. M. M.		8.3	RC					92	0		
			Highly weathered light greyish		DC.					83	0		
-			Siltstone	9.3	RC					92	0		
	= STAN			ROCK QUA	ALITY DES SAMPLE	IGNA	TION		UDS = U VST = V			SOIL SAM	PLE
		ORBIT	AL INFRASTRUCTUR	E CO	NSUL	TAN	VC'	Y 8	Logge	d by :			Checked I

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for NTI	PC Talcher Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 22	CO-ORDINATES: East: 1451.54 North: 4151.98
SITE LOCATION : Chimney	START DATE: 6/5/2009 END DATE: 6/8/2009
GROUND REDUCED LEVEL: 72.194	DRILLING METHOD: Rotary
GROUND WATER TABLE DEPTH: 1.98	CASING DIA: 150mm unto 1 98m & Ny from 1 98 to 20 0m BGI

	_	_		_	1		_						
H.	p (iii	SH S		SA	MPLE	BLC	WS/	15cm		e :ry(%)	(%)	Other	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
				13-9/05/2013	2019					92	0		
-	61.894	***		10.3	RC						35915		
F	-												
Ε	3									92	0		
- 11													
Ė :	1			11.3	RC								
	1			3,335	1212								
E	3	::::::::	Highly weathered light greyish medium							96	0		
- 12	3		grained Sandstone.							90	0		
-			Determination of the section										
-				12.3	RC								
F 7	3	1::::::::											
- 13			22							87	0		
- 10													
E :	58.894			13.3	RC								
					1920								
			Highly weathered light greyish fine to							95	0		
14	1		medium grained Sandstone.										
E :	57.894		1000	14.3	RC								
				14.3	NC.				- 1		4.5		
			LEable weathered Eable and isk and it										
- 15	-		Highly weathered light greyish medium to coarse grained Sandstone.							77	14		
-	=		•	1000	1450								
- 1	56.894			15.3	RC								
- 10	3									78	39		
16		*****											
			Moderately to slightly weathered	16.3	RC							,	
			greyish Siltstone.	5076.740	33.51								
-										92	63		
17									-	52	03		
-	54.894			47.0	20								
E :				17.3	RC								
- :	4									645			
18										93	58		
-	3												
-			Slightly weathered greyish medium	18.3	RC								
			grained Sandstone.										
F :										88	37		
19										220	350		
-	52.894	:::::::		19.3	RC								
= =			STANDARD TO SELECT SEC. AS STORAGE SEA.	13.0	1.0								
E			Slightly weathered greyish Siltstone to fine grained Sandstone.							80	38		
- 20	52,194		iiie granieu danusione.										

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION RC = ROCK CORE DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD
PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by: Akash

Checked by : S. Padhi

Job No:

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for N	TPC Talcher Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 23	CO-ORDINATES: East: 1492.04 North: 4181.92
SITE LOCATION: ESP	START DATE: 6/8/2009 END DATE: 6/10/2009
GROUND REDUCED LEVEL: 71.784	DRILLING METHOD: Rotary
GROUND WATER TABLE DEPTH: 1.35	CASING DIA: 150mm unto 2 10m & Nx from 2 10 to 20 0m BG

Ξ	pec (m)	⊇ ≅		SA	MPLE	BLC	WS/	15cm	1 1	y(%)	(%)	Otto	
DEPTH (m)	Reduced Level (m)	GRAPHIC	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Other Tests	REMARKS
	70.784		Filled up soil consisting at Clay with gravel						40				
		¥	Completely weathered deeply decomposed brownish Sandstone.	1.25	SPT				12cm in 100 blows N>100				
2 -	69.684		decomposed brownish Sandstone.	2 2.2	SPT RC				10cm in 100 blows N>100	***	***		
3			Highly weathered yellowish brown, medium to coarse grained Sandstone.						1	76	0		
	68.584			3.2	RC					78	0		
4			Highly weathered yellowish brown medium to fine grained Sandstone.	4.2	RC								
5	66.584			5.2	RC				*3	79	0		
6				5.2	NO.					86	12		
				6.2	RC							١.	
7				7.2	RC					95	0		
			Highly to moderately weathered light yellowish brown medium to coarse grained Sandstone.	2000						95	0		
				8.2	RC								
9 -				9.2	RC					97	0		
10										88	11		

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by : Akash

Checked by: S. Padhi

Job No:

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for NTF	C Talcher Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 23	CO-ORDINATES: East: 1492.04 North: 4181.92
SITE LOCATION: ESP	START DATE: 6/8/2009 END DATE: 6/10/2009
GROUND REDUCED LEVEL: 71.784	DRILLING METHOD: Rotary
GROUND WATER TABLE DEPTH: 1.35	CASING DIA: 150mm upto 2.10m & Nx from 2.10 to 20.0m BGI

Ξ	pac (m)	⊇ 		SA	MPLE	BLC	WS/	15cm		)(%) (%)	(%)	0.1	
(m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Other Tests	REMARKS
				10.2	RC			П		88	11		
11	60.584		Highly to moderately weathered light yellowish brown medium to coarse grained Sandstone. (continued)	- 11.2	RC					86	0		
12				100						90	68		
13			Moderately to slightly weathered greyish Siltstone.	12.2	RC					92	28		
	58.584			13.2	RC					85	57		
4			Slightly weathered greyish medium grained Sandstone	14.2	RC								
5	56.984 56.084		Slightly weathered greyish Siltstone	15.2	RC					87	56		
6	55.584		Slightly weathered greyish fine to medium grained Sandstone	16.2	RC					83	38		*
17	54.504		Slightly weathered greyish Sandstone.		,,,,					92	22		
-	54.584		Greyish medium grained Sandstone.	17.2	RC					92	25		
18 -	53.584		Greyish Siltstone.	18.2	RC								
19			Slightly weathered greyish medium							93	46		
			grained Sandstone with some petches of Siltstone	19.2	RC					100	46	=	

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION RC = ROCK CORE

DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by : Akash

Checked by: S. Padhi

Job No:

PAGE 2 OF 2

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for	NTPC Talcher Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 24	CO-ORDINATES: East: 1293.53 North: 4225.03
SITE LOCATION: ESP	START DATE: 6/19/2009 END DATE: 6/22/2009
GROUND REDUCED LEVEL: 72.383	DRILLING METHOD: Rotary
GROUND WATER TABLE DEPTH: 0.85	CASING DIA: 150mm upto 2.00m & Nx from 2.00 to 20.0m BGI

3 -	+(0)		- OM	MPLE	BLC	10001	15cm		, v	8	Other	
Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	"N" Field	Core Recovery(%)	RQD (%)	Tests	REMARK
72.183	*****	Concrete pieces										
70.883		Very dense greyish silty gravel.	1	SPT	22	24	28	52				
70.383		Completely weathered yellowish brown Sandstone.	1.9	SPT				10cm in 100 blows				
			2	RC				N>100				
			3	RC					83	60		
		Highly to moderately weathered light yellowish fine to medium grained Sandstone.	4	RC					85	12		
67.383			- 5	P.C.		+			93	12		
			5	RC					90	29		
		Highly to moderately weathered light yellowish Siltstone	6	RC					80	10	`	
65.383		Highly to moderately weathered light greyish fine grained Sandstone.	- 7	RC					90	37		
64.383		Highly weathered light greyish fine grained Sandstone.	- 8	RC					85	0		
63.383		Highly weathered greyish Siltstone.	- 9	RC					90	11		
	70.883. 70.383. 67.383. 64.383.	70.383 70.383 64.383	70.883  Completely weathered yellowish brown Sandstone.  Completely weathered yellowish brown Sandstone.  Highly to moderately weathered light yellowish fine to medium grained Sandstone.  Highly to moderately weathered light yellowish Siltstone  Highly to moderately weathered light greyish fine grained Sandstone.  Highly weathered light greyish fine grained Sandstone.  Highly weathered light greyish fine grained Sandstone.	Very dense greyish silty gravel.  70.883  Completely weathered yellowish brown Sandstone.  1.9  2  Highly to moderately weathered light yellowish fine to medium grained Sandstone.  4  Highly to moderately weathered light yellowish Siltstone  4  Highly to moderately weathered light greyish fine grained Sandstone.  8  Highly weathered light greyish fine grained Sandstone.  8  Highly weathered light greyish fine grained Sandstone.	Very dense greyish silty gravel.  70.883  Completely weathered yellowish brown Sandstone.  1.9 SPT RC  RC  Highly to moderately weathered light yellowish fine to medium grained Sandstone.  5 RC  Highly to moderately weathered light yellowish Siltstone  4 RC  Highly to moderately weathered light yellowish Siltstone  5 RC  Highly to moderately weathered light yellowish Siltstone  8 RC  Highly to moderately weathered light greyish fine grained Sandstone.  8 RC  Highly weathered light greyish fine grained Sandstone.  9 RC  Highly weathered greyish Siltstone.	Very dense greyish silty gravel.  70.883 Completely weathered yellowish brown Sandstone.  1.9 SPT RC  3 RC  Highly to moderately weathered light yellowish fine to medium grained Sandstone.  4 RC  67.383 FRC  Highly to moderately weathered light yellowish Siltstone  4 RC  Highly to moderately weathered light greyish fine grained Sandstone.  8 RC  Highly to moderately weathered light greyish fine grained Sandstone.  8 RC  Highly weathered light greyish fine grained Sandstone.  9 RC	Very dense greyish silty gravel.  70.883 Completely weathered yellowish brown Sandstone.  1.9 SPT RC  1.9 SPT RC  3 RC  Highly to moderately weathered light yellowish fine to medium grained Sandstone.  4 RC  67.383 FRC  Highly to moderately weathered light yellowish Siltstone  4 RC  Highly to moderately weathered light greyish fine grained Sandstone.  8 RC  Highly weathered light greyish fine grained Sandstone.  8 RC  Highly weathered light greyish fine grained Sandstone.	Very dense greyish silty gravel.  70.883  Completely weathered yellowish brown Sandstone.  1.9 SPT RC  3 RC  Highly to moderately weathered light yellowish fine to medium grained Sandstone.  4 RC  FRC  Highly to moderately weathered light yellowish Siltstone  Highly to moderately weathered light greyish fine grained Sandstone.  8 RC  Highly to moderately weathered light greyish fine grained Sandstone.  8 RC  Highly weathered light greyish fine grained Sandstone.  9 RC  Highly weathered greyish Siltstone.	Very dense greyish silty gravel.  70.883  Completely weathered yellowish brown Sandstone.  1.9 SPT RC  1.9 SPT RC  Highly to moderately weathered light yellowish fine to medium grained Sandstone.  4 RC  Highly to moderately weathered light yellowish Siltstone  4 RC  Highly to moderately weathered light yellowish Siltstone  85.383  7 RC  Highly to moderately weathered light greyish fine grained Sandstone.  8 RC  Highly weathered light greyish fine grained Sandstone.  9 RC	Very dense greyish silty gravel.  1 SPT 22 24 28 52  Completely weathered yellowish brown Sandstone.  1.9 SPT 2 RC  1.0cm in 100 blows N>100 blows N>1	Very dense greyish silhy gravel.   1   SPT   22   24   28   52	Very dense greyish silty gravel.   1   SPT   22   24   28   52

C = ROCK CORE DS = DISTURBED SAMPLE

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PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

VST = VANE SHEAR TEST

Logged by :

Akash

Checked by : S. Padhi

Job No:

PAGE 1 OF 2

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for	NTPC Talcher Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 24	CO-ORDINATES: East: 1293.53 North: 4225.03
SITE LOCATION: ESP	START DATE: 6/19/2009 END DATE: 6/22/2009
GROUND REDUCED LEVEL: 72.383	DRILLING METHOD: Rotary
GROUND WATER TABLE DEPTH: 0.85	CASING DIA: 150mm unto 2.00m & Ny from 2.00 to 20.0m BG

			E DEPTH: 0.05		CASING	T							20.0m BGL
Ξ.	Deg (E	일	3540 W 01011 F000 (1900)	SA	MPLE	BLC	)WS/	15cm	1 1	, % , %	(%)	Other	
DEPTH (m)	Reduced Level (m)	GRAPHIC	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE RC	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
				10	RC					91	0		
11 -			Highly weathered greyish Siltstone. (continued)	11	RC					84	34		
12	60.383		8	12	RC			3					
			=						3-1	82	58		
13 -				13	RC					84	22		
14			7/	14	RC					1610			
15				15	RC					85	20		
										49	0		
16			Highly to moderately weathered light yellowish fine to medium grained Sandstone.	16	RC								
17				17	RC					84	0		
-										85	0		
18				18	RC								
19				19	RC					90	0		
.										90	0		
20 -	52.383	111111111											

RC = ROCK CORE

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Logged by: Akash

Checked by: S. Padhi

Job No:

PAGE 2 OF 2

CLIENT: NTPC PROJECT NAME: Geotechnical Investigation for NTPC Talcher Thermal Stage III ( 2 x 660 MW) BOREHOLE ID: CO-ORDINATES: East: 1386.16 North: 4272.92 SITE LOCATION: START DATE: 6/24/2009 END DATE: 6/29/2009 DRILLING METHOD: Rotary GROUND REDUCED LEVEL: 73,157 GROUND WATER TABLE DEPTH: CASING DIA: 150mm upto 2.50m & Nx from 2.50 to 20.0m BGL Recovery(%) BLOWS/15cm SAMPLE Reduced Level (m) GRAPHIC RQD (%) DEPTH (m) Other MATERIAL DESCRIPTION 'N' Field REMARKS Sample Depth Tests SAMPLE 15 15 15 (m) TYPE Fill up soil with kankar. 1.5 UDS Recovered --Greyish sandy clay 13cm in 70.657 100 2.5 SPT 70.527 blow Completely weathered yellowish brown Sandstone. 2.65 N>100 84 33 3.65 RC Highly to moderately weathered yellowish brown fine Sandstone. 87 0 4.65 RC 91 21 67.507 5.65 RC 90 22

SPT N = STANDARD PENETRATION TEST VALUE RC = ROCK CORE

Sandstone.

RQD = ROCK QUALITY DESIGNATION DS = DISTURBED SAMPLE

RC

RC

RC

RC

7.65

8.65

9.65

12 UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST

87 0

91 0

92 42

84



10

65.507

64.507

ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Highly to moderately weathered light greyish fine grained Sandstone.

Highly to moderately weathered yellowish brown fine grained

Sandstone to greyish Siltstone.

Moderately to slightly weathered yellowish brown fine grained

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PAGE 1 OF 3

CLIENT: NTPC PROJECT NAME: Geotechnical Investigation for NTPC Talcher Thermal Stage III ( 2 x 660 MW) BOREHOLE ID: BH 25 CO-ORDINATES: East: 1386.16 SITE LOCATION: ESP START DATE: 6/24/2009 END DATE: 6/29/2009 GROUND REDUCED LEVEL: 73,157 DRILLING METHOD: Rotary GROUND WATER TABLE DEPTH: 1.05 CASING DIA: 150mm upto 2.50m & Nx from 2.50 to 20.0m BGL

Ξ	m) Ged	9,,,		SA	MPLE	BLC	WS/	15cm		у(%)	(%		
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Other Tests	REMARKS
11				10.65	RC					84	12		
			Moderately to slightly weathered yellowish brown fine grained Sandstone. (continued)	11.65	RC					92	14		
12	60.507		5							92	21		
13			Slightly weathered dark greyish Siltstone with patches of SHALE.	12.65	RC					93	72		0
- 14	59.507			13.65	RC					99	0		
15			Highly to moderately weathered greyish Siltstone	14.65	RC								
	57.507			15.65	RC					94	13		
16	56.507		Highly to moderately weathered dark greyish fine grained Sandstone.	16.65	RC					80	11	x	
17				10.00	NO.					81	0		
18				17.65	RC					94	0		
19			Highly to moderately weathered dark greyish Siltstone.	18.65	RC								
				10.05	500					70	12		
20				19.65	RC					78	0		

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION RC = ROCK CORE

DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



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PAGE 2 OF 3

CLIENT: NTPC PROJECT NAME: Geotechnical Investigation for NTPC Talcher Thermal Stage III ( 2 x 660 MW) BOREHOLE ID: BH 25 CO-ORDINATES: East: 1386.16 North: 4272.92 SITE LOCATION: ESP START DATE: 6/24/2009 END DATE: 6/29/2009 GROUND REDUCED LEVEL: 73,157 DRILLING METHOD: Rotary GROUND WATER TABLE DEPTH: 1.05 CASING DIA: 150mm upto 2.50m & Nx from 2.50 to 20.0m BGL

E_	pg (iii	S E		SA	MPLE	BLC	WS/1	15cm	1 1	y(%)	(%)	0.11	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Other Tests	REMARKS
				20.65	RC					78	0		
21				10000000						90	0		
22				21.65	RC								
				22.65	RC					82	0		
23										89	0		
24				23.65	RC								
				24.65	RC					90	0		
25			Highly to moderately weathered dark greyish Siltstone. (continued)							92	0		
26				25.65	RC					80	0		
				26.65	RC								
27 -										87	0		
28				27.65	RC					88	0		
				28.65	RC						(7.)		
29 -		******								91	0		
30	43.157			29.65	RC					84	0		

RC = ROCK CORE

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE

VST = VANE SHEAR TEST



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PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

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PAGE 3 OF 3

CLIEN	T:	NTP	С										
PROJE	ECT NA	ME: Geot	echnical Investigation for NTPC Talcher T	Thermal S	Stage III ( 2	x 660	MW	)					
BORE	HOLE I				CO-ORI				st: 1476	3.59		North:	4225.03
SITE L	OCATIO	: NC	Chimney		START	DATE	: 6	6/6/20	009	•	END D	ATE: 6/1	0/2009
GROU	ND RE	DUCED LE	VEL: 72.30		DRILLIN	IG M	ETHO	D:	Rotary				
GROU	ND WA	TER TABL	E DEPTH: 1.4		CASING	DIA:		150	mm upto	2.40m	& Nx fro	m 2.40 to 2	20.0m BGL
DEPTH (m)	Reduced Level (m)	PHIC G	MATERIAL DESCRIPTION	SA	MPLE	BLC	)WS/	15cm		re sry(%)	(%)	Other	
DEP (n	Redu	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	'N' Field	Core Recovery(%)	RQD (	Tests	REMARKS
1 -	70.8	<b>.</b>	Brownish to brownish sandy clay	1	UDS				Recovered	1	***		
2 -			Very dense yellowish clayey sand with gravel.	2.4	SPT	30			12cm in 100 blows N>100				
4	69.3	4,84,44,4	Highly weathered yellowish brown medium grained Sandstone.	- 3	RC					46	34		
5	00.0		Moderately weathered yellowish brown coarse grained Sandstone.	5	RC RC					51	35		
				1000						65	15		
6	66.5		Moderately weathered brownish Siltstone.	5.8 6	RC RC					60	30		
7										57	0		
,			Moderately weathered light brown filled spathic Sandstone.	7	RC				90	71	14		
8 =	63.8		*	8	RC					68	21		
9 -			Moderately weathered with coarse grained Sandstone patches of clay.	9	RC					68	31		

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION RC = ROCK CORE

Moderately weathered light brown Siltstone.

DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST

70



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PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

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Job No:

PAGE 1 OF 2

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for NT	PC Talcher Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 26	CO-ORDINATES: East: 1476.59 North: 4225.03
SITE LOCATION : Chimney	START DATE: 6/6/2009 END DATE: 6/10/2009
GROUND REDUCED LEVEL: 72.30	DRILLING METHOD: Rotary
GROUND WATER TABLE DEPTH: 1.4	CASING DIA: 150mm upto 2.40m & Nx from 2.40 to 20.0m BGI

E	(m)	D E	21-5-5-5-522-2014-7-1-00-00-00-00-00-00-00-00-00-00-00-00-0	SA	MPLE	BLO	WS/1	15cm	1 1	e ny(%)	(%)	Other	
DEPTH (m)	Reduced Level (m)	GRAPHIC	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE RC	15	15	15	'N' Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
11	61.3		Highly weathered greyish Siltstone to fine grained Sandstone.	- 11	RC					72	0		
12	60.3		Highly weathered light brown medium grained Sandstone.							74	0		
				12	RC					73	0		
13			Highly weathered greyish medium grained Sandstone.	13	RC					85	0		
14	58.3			- 14	RC			100				5	
15	57.3		Highly weathered greyish Siltstone.	- 15	RC					75	0		
16				16	RC					78	22		
										80	21	`	
17 -			Highly to moderately weathered greyish fine grained Sandstone.	17	RC					87	0		
18				18	RC								
19				19	RC					82	10		
20													

RC = ROCK CORE

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



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PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

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PAGE 2 OF 2



PH: 0671-2443588 Tele Fax: 0671 - 2443408

													N: _	_			
			technical Investigation for NT										IODT'	NI - 37	_ 2042.2		
			•			_						N	IUKIH:	IN OF Y	= 3813.0	:O	
		RING: R	<u> </u>		00 1 00					BH 42							
			G: 150mm upto 4.30m & N	c from 4.	30m to 20	<u>.00</u> m BGL											
		DEPTH:				_											
LOCA	TION:	Switch Ya	ard T				DA	E S	TART	ED: _2	0/7/09	C	<b>COMPLETED</b> : 30/7/09				
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE	Ξ	BLO	WS/	15cm	Field	Level	Bulk Density	overy agth/ ery (%)	RQD (%)	Fracture Frequency per Meter	Vumbe	
O DEF	Red Leve	GRA	WATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	Sample Number	15 cm	15 cm	15 cm	Ž	Water Level	gmc/cc	Recovery Length/ Recovery (%	RQE	Frac Frequence	Serial Number of Recovered	
3 - 4 - 6 - 7 - 7 - 8 - 8 - 8 - 8 - 8 - 8 - 8 - 8	65.136 64.836		Completely weathered brownish Sandstone Highly to moderately weathered brownish fine grained Sandstone  Highly to moderately weathered brownish fine grained Sandstone	1.5 3 4 4.3 5.3 6.3	UDS  SPT RC  RC  RC  RC	1 2	3 36	 4 100 		8 N > 100	_		73 71 77 92	 0 0			
10				3.3	NO								01	10			
Rema	rks: B	oring, field	l test and sample collection cond	ucted as	per B.I.S S	L pecification	only.		1	I	1	<u> </u>		l			
	R	lef: I.S : 18	92; 1498; 2131 & 2132. lard Penetration Test & UDS : U				٠,٠										

Borehole termination at 20 m



PH: 0671-2443588 Tele Fax: 0671 - 2443408

													N:	_		
			technical Investigation for NT	PC Talch	ner Therma	al Stage II										
GROU	ND SU	RFACE EI	<b>LEVATION</b> : 69.136 m			_	EAS	ST: _	E or	X = 138	1.14	•	NORTH:	N or Y	= 3813.0	5
		RING: R	•							BH 42						
			3: 150mm upto 4.30m & Nx	from 4.	30m to 20	.00m BGL										
		DEPTH:								ER USEI						
LOCA	TION:	Switch Ya	ard			_	DAT	E ST	TART	<b>ED</b> : _20	0/7/09		OMPLE		30/7/09	
Ħ_(	(m)	SH D			SAMPLE	Ē	BLO	WS/	15cm	Field	evel	Bulk	very yth/ rry (%)	(%)	ture ency leter	umber
OEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	Sample Number	15 cm	15 cm	15 cm	<u>г</u>	Water Level	Density gmc/cc	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
	E0 000															
	58.836		Moderately weathered greyish coarse to fine grained Sandstone consisting of pink feldspar& purple bands	10.3	RC								86	11		
- 12 -				11.3	RC								79	23		
  - 13 -	<u>56.836</u>		Moderately weathered greyish coarse grained Sandstone to Shale with light pink laminations	12.3	RC								87	25		
   _ 14 _	<u>55.836</u>		Moderately weathered greyish Shale	13.3	RC								86	11		
  - 15 -	54.836	AR A	Highly to moderately weathered greyish Siltstone with some portions Shale	14.3	RC								72	0		
				15.3	RC								83	10		
  - 17 -	52.836	## ## ## ## ## ## ## ## ## ## ## ## ##	Moderately weathered greyish, medium to coarse grained Sandstone with pink feldspar	16.3	RC								84	11		
  - 18 -	51.836	AR A	Highly to moderately weathered greyish Siltstone	17.3	RC								85	32		
				18.3	RC								90	0		
   - 20 -	49.836 49.136	as as as a	Highly to moderately weathered coarse grained Sandstone with laminated Shale test and sample collection conditions.	19.3	RC	oogifies!:-							52	0		
Rema	F	Ref: I.S : 18	test and sample collection cond 92; 1498; 2131 & 2132. lard Penetration Test & UDS : Ur				only.									



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													N:	_		
			otechnical Investigation for NT	PC Talch	ner Therm	al Stage II									, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
						_				X = 1252			iorth: _	N or Y	= 4320.0	5
		RING: R								BH 49						
			G:150mm upto 1.20m & Nx	trom 1.2	0 to 20.0r	n BGL				USED:_						
		DEPTH:				_										
LOCA	TION:	Track Ho	pper				DA	TE S	TAR1	<b>ED</b> : <u>5/</u>	8/09		OMPLET	ED: _	7/8/09	
Ε_	ced (m)	⊇ E			SAMPLE	Ē	BLO	WS/	15cm	Field	evel	Bulk	/ery th/ ry (%)	(%)	ure ency eter	umbei vered
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Depth	SAMPLE TYPE	Sample Number	15 cm	15 cm	15 cm	Ż	Water Level	Density gmc/cc	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
0		[] [] [] []	Stiff greyish Clayey Sand	(m)							>		-			0, 0
: =			(SC)													
=	71.062									11cm in 100						
			Completely weathered	0.9	SPT	1	38			blows	V					
= =	70.762		_brownish Śandstone	1.2	RC	1				N>100						
			Highly to moderately weathered yellowish													
=			brown fine to medium										65	0		
2 -			grained Sandstone													
				2.2	RC	2										
: ]													81	11		
3 -																
= =				3.2	RC	3										
: ‡													83	0		
4 -																
= =				4.2	RC	4										
: =													91	14		
- 5 -																
= =	66.762		Moderately weathered	5.2	RC	5										
			light greyish Siltstone													
: ]													84	21		
6 -																
= =	65.762	****	Highly to moderately	6.2	RC	6										
			weathered greyish fine													
= =			grained Sandstone										88	62		
- 7 -																
= =				7.2	RC	7										
- 4																
= =													89	80		
- 8 -																
= =				8.2	RC	8										
- =																
= =													80	0		
9 -																
: ‡	62.762		Lighty to moderate!	9.2	RC	9										
<u> </u>			Highly to moderately weathered greyish													
: ‡			Siltstone										88	79		
10																
Rema	rks: B	oring, field Ref: LS : 189	test and sample collection cond 92; 1498; 2131 & 2132.	ucted as p	per B.I.S S	pecification	only.									
			ard Penetration Test & UDS : U	ndisturbed	d soil samp	le.										

Borehole termination at 20 m



PH: 0671-2443588 Tele Fax: 0671 - 2443408

													N:	_		
PROJI	ECT NA	ME Geo	technical Investigation for NT	PC Talch	ner Therm	al Stage II	1(2)	660	MW)							
GROU	ND SU	RFACE EL	<b>EVATION</b> : 71.962 m				EAS	ST: _	E or	X = 125	2.77	N	iorth: _	N or Y	= 4320.0	5
TYPE	OF BO	RING: R	otary				BOF	RING	NO:	BH 49	)					
DIAME	ETER O	F BORING	3: 150mm upto 1.20m & Nx	from 1.2	20 to 20.0r	n BGL	TYP	E OF	BIT	USED:	Double	e tube				
TOTA	L HOLE	DEPTH:	20 m				SOI	L SA	MPLI	ER USE	D:					
LOCA	TION:	Track Ho	oper			_	DAT	E ST	ART	<b>ED</b> : _5	/8/09	c	OMPLET		7/8/09	
					SAMPLE	=	DI O	Mer	15cm				Recovery Length/ Recovery (%)	<u> </u>	25.5	Serial Number of Recovered
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION				BLO	VV3/	ISCIII	"N" Field	Water Level	Bulk Density	gth/ ery (	RQD (%)	Fracture Frequency per Meter	Vum ove
DEF (n	Sed eve	J.R.A L.C	WATERIAL DESCRIPTION	Sample Depth	SAMPLE	Sample	15	15	15	ž	terl	gmc/cc	Cov	3QL	Frac requ	ial l Rec
10				(m)	TYPE	Number	cm	cm	cm	-	Wa		a		- [ 6	Ser
= =		***	Highly to moderately	10.2	RC	10							88	79		
		***	weathered greyish Siltstone (continued)													
													88	26		
- - 11 -																
		***		11.2	RC	11										
_ =													87	0		
- 12 -																
=	59.762	*******	l limble to mendometale.	12.2	RC	12										
E =			Highly to moderately weathered greyish fine													
=			grained Sandstone										84	0		
13																
= =	58.762		Limberto mondonatole	13.2	RC	13										
			Highly to moderately weathered greyish													
=			Siltstone										86	0		
14																
	57.762	****	Highly to moderately	14.2	RC	14										
<u> </u>			weathered greyish													
Ė =			medium grained Sandstone										89	0		
_ 15 _																
				15.2	RC	15										
													91	0		
_ 16 _																
				16.2	RC	16										
<u> </u>																
=													86	0		
- 17 - 		:::::::::::::::::::::::::::::::::::::::														
=				17.2	RC	17										
-																
													83	10		
- 18 - 		::::::::														
<u> </u>		:::::::::::::::::::::::::::::::::::::::		18.2	RC	18										
<u> </u>		::::::::														
<u> </u>													88	0		
<u> </u>	E0 700															
<u> </u>	52.762		Highly to moderately	19.2	RC	19										
<u> </u>		****	weathered greyish										84	0		

Remarks: Boring, field test and sample collection conducted as per B.I.S Specification only.
Ref: I.S: 1892; 1498; 2131 & 2132.
SPT: Standard Penetration Test & UDS: Undisturbed soil sample.



#### ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

PH: 0671- 2443588 Tele Fax: 0671 - 2443408

N: \_\_\_ PROJECT NAME Geotechnical Investigation for NTPC Talcher Thermal Stage III ( 2 x 660 MW) **GROUND SURFACE ELEVATION:** 71.826 m **EAST:** E or X = 1377.25**NORTH:** N or Y = 4331.52TYPE OF BORING: Rotary BORING NO: BH 50 DIAMETER OF BORING: 150mm upto 1.70m & Nx from 1.70 to 20.0m BGL TYPE OF BIT USED: Double tube TOTAL HOLE DEPTH: 20 m SOIL SAMPLER USED: LOCATION: AUX Boiler DATE STARTED: 4/8/09 COMPLETED: 5/8/09 Serial Number of Recovered Recovery (% Fracture Frequency per Meter SAMPLE BLOWS/15cm Reduced Level (m) GRAPHIC LOG Recovery Length/ Water Level Field RQD (%) DEPTH (m) Bulk MATERIAL DESCRIPTION Density Sample SAMPLE 15 Sample 15 15 ż gmc/cc Depth cm **TYPF** Number cm cm (m) Greyish Sandy Clay (CI) 10cm in <sup>1</sup>70 426 SPT 32 14 1 00blows Completely weathered N>100 70.126 deeply decomposed 1.7 RC brownish Sandstone 2 Highly to moderately weathered reddish brown 71 23 to greyish brown fine to coarse grained Sandstone 27 RC 3 69 14 3.7 RC 74 46 4.7 RC 5 82 15 5.7 RC 6 37 86 6.7 RC Moderately to slightly weathered grevish Siltstone 89 35 7.7 RC 8 91 45 8.7 RC 9 91 55 9.7 RC 93 72 10 Remarks:

Boring, field test and sample collection conducted as per B.I.S Specification only. Ref: I.S : 1892; 1498; 2131 & 2132.

Borehole termination at 20 m

SPT : Standard Penetration Test & UDS : Undisturbed soil sample.



PH: 0671-2443588 Tele Fax: 0671 - 2443408

													N:	_		
			technical Investigation for NT													
						_				X = 1377		N	ORTH: _	N or Y	= 4331.5	2
		RING: ROPING	otary S: _150mm upto 1.70m & Nx		0 to 20 0n	— n BGI				_BH 50 USED:_		a tuha				
		DEPTH:		110111 1.7	0 10 20.01	<u>I B</u> GL						tube				
		AUX Boile				_				ED: 4/			OMPLET	T <b>ED</b> : 5	5/8/09	
						<del></del>										oer ed
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample	SAMPLE				15cm	Fiel	Water Level	Bulk Density	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
10	Re	GR		Depth (m)	SAMPLE TYPE	Sample Number	15 cm	15 cm	15 cm	"N	Wate	gmc/cc	Re Le	R	Fre Fre pel	Seria of Re
	61 126		Slightly weathered greyish fine grained Sandstone (continued)										93	72		
- 11 -	01.120		Slightly weathered greyish Siltstone	10.7	RC											
		**************************************											92	92		
- - - 12 -		*******		11.7	RC											
- 'Z													94	89		
13	59.126	AR A	Moderately to slightly weathered greyish Siltstone with fine grained	12.7	RC								93	42		
- 14		Tan Tan Tan Tan Tan Tan Tan Tan Tan Tan Tan Tan	Sandstone patches	13.7	RC								93	42		
- 17  		en len de len len len len len len len len len le											97	37		
- 15 - 		en ma an en ma ma an an an ma an an an ma an an an ma an an an		14.7	RC								95	23		
	56.126	TAN AN TAN AN A	Moderately to slightly weathered greyish	15.7	RC											
			Siltstone with fine grained Sandstone patches										90	53		
17 -		an a		16.7	RC								90	11		
- 18		AN A		17.7	RC											
		an a		18.7	RC								91	24		
19 -		an a			_								95	10		

Remarks: Boring, field test and sample collection conducted as per B.I.S Specification only.
Ref. I.S: 1892; 1498; 2131 & 2132.
SPT: Standard Penetration Test & UDS: Undisturbed soil sample.



PH: 0671-2443588 Tele Fax: 0671 - 2443408

PROJE	ECT NA	ME Geo	technical Investigation for NT	PC Talch	ner Therma	al Stage II										
GROU	ND SUI	RFACE EL	<b>EVATION:</b> 71.887 m				EAS	ST: _	E or	X = 1457	7.05	N	ORTH:	N or Y	= 4330.2	:1
TYPE (	OF BOF	RING: R	otary				BOF	RING	NO:	BH 51						
DIAME	TER O	F BORING	150mm upto 2.30m & Nx	from 2.3	0 to 20.0n	n BGL	TYP	E OF	BIT	USED:_	Double	tube tube				
TOTAL	- HOLE	DEPTH:	20 m				SOI	L SA	MPLI	ER USE	D:					
LOCA	TION: _	ASH Silo					DAT	E ST	ART	<b>ED</b> : <u>31</u>	1/7/09	c	OMPLE	TED: _	5/8/09	
Ε	(m)	SH (S			SAMPLE	Ē	BLO	WS/1	15cm	Field	evel	Bulk	ery th/ 'y (%)	(%)	ure ency eter	umber vered
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	_ ~~.	SAMPLE TYPE	Sample Number	15 cm	15 cm	15 cm	, , ,	Water Level	Density gmc/cc	Recovery Length/ Recovery (%	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
0			Greyish Sandy clay (CI)	(m)				0	0		\$		<u>~</u>			ν̈́ο
= =			Greyish Sandy day (Ci)													
3 -	69.887 69.587		Completely weathered deeply decomposed yellowish brown Sandstone Highly weathered yellowish brown Sandstone	1.5	UDS SPT RC	1				Recovere 14cm in 100 blows N>100	<u></u>		41	  0		
	67.587		Highly weathered	4.3	RC											
5 -	66.587	AR A	yellowish Siltstone	5.3	RC								43	0		
 - 6 -			Highly weathered yellowish Sandstone	6.3	RC								46	13		
7 -													49	10		
				7.3	RC								58	22		
  - 9 -	63.587 62.587		Highly to moderately weathered greyish Sandstone	8.3	RC								61	12		
		10 AL	Highly to moderately weathered greyish Siltstone	9.3	RC								74	0		
Rema	R	Ref: I.S : 189	test and sample collection cond 92; 1498; 2131 & 2132. ard Penetration Test & UDS : Ur				only.									



PH: 0671-2443588 Tele Fax: 0671 - 2443408

GROU	IND SUI	RFACE EL	<b>_EVATION</b> : _71.887 m				EAS	ST: _	E or	X = 145	7.05	N	IORTH:	N or Y	= 4330.2	1
		RING: R				_				BH 51						
			3: 150mm upto 2.30m & Nx	from 2.3	80 to 20 Or	m BGI						e tube				
		DEPTH:	00			<u> D</u> OL						, tabo				
															F 10 100	
LOCA	HON:	ASH Silo					DA	ES	ARI	<b>ED</b> : 3	1/7/09		OMPLE		5/8/09	
TT (c	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE	Ξ	BLO	WS/	15cm	Field	evel	Bulk	very gth/ ery (%)	(%)	ture lency Aeter	Jumbe
DEPTH (m)	Redu	GRAI	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	Sample Number	15 cm	15 cm	15 cm	Ž Z	Water Level	Density gmc/cc	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
	61.587												74	0		
11	61.587	Ma ana ana ana ana ana ana ana ana ana a	Highly to moderately weathered greyish fine grained Sandstone	10.3	RC								63	0		
				11.3	RC								78	12		
12				12.3	RC								70	12		
13	58.587			13.3	RC								68	23		
14			Highly to moderately weathered greyish Siltstone	10.0									63	0		
15	57.587		Highly to moderately weathered greyish Siltstone with Sandstone patches	14.3	RC								73	0		
		an a		15.3	RC								66	0		
16		Jan		16.3	RC											
17	54.587	A A A A A A A A A A A A A A A A A A A	Highly to moderately	17.3	RC								64	10		
18		an a	weathered greyish Sandstone with Siltstone patches										62	0		
19	E2 E27	AN A		18.3	RC								63	0		
  	52.587 51.887	<u> </u>	Highly to moderately weathered greyish Shale	19.3	RC								58	0		



#### ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

PH: 0671-2443588 Tele Fax: 0671 - 2443408

N: \_\_\_ PROJECT NAME Geotechnical Investigation for NTPC Talcher Thermal Stage III (2 x 660 MW) **GROUND SURFACE ELEVATION: 71.108 m EAST:** E or X = 1293.585**NORTH:** N or Y = 4403.211TYPE OF BORING: Rotary BORING NO: BH 52 DIAMETER OF BORING: 150mm upto 3.30m & Nx from 3.30 to 20.0m BGL TYPE OF BIT USED: Double tube TOTAL HOLE DEPTH: 20 m SOIL SAMPLER USED: LOCATION: FO Tank DATE STARTED: 6/8/09 COMPLETED: 8/8/09 Serial Number of Recovered Recovery (% Frequency per Meter SAMPLE BLOWS/15cm Reduced Level (m) GRAPHIC LOG Recovery Length/ Water Level Fracture Field RQD (%) DEPTH (m) Bulk Density MATERIAL DESCRIPTION Sample SAMPLE 15 Sample 15 15 ż gmc/cc Depth cm TYPE Number cm cm (m) Greyish brown Clayey Sand (SC) UDS 15 1 --- Recovered 12cm in 68.108 100 SPT 3 1 40 Completely weathered blows 67.808 deeply decomposed N>100 3.3 RC 70 23 Yellowish brown Sandstone Highly to moderately 4 weathered yellowish brown fine grained Sandstone 4.3 RC 81 72 5 5.3 RC 85 70 6 6.3 RC 82 46 7.3 RC 91 49 8 62.808 8.3 RC 84 0 Highly to moderately weathered greyish fine grained Sandstone 9 61.808 9.3 RC 87 34

Boring, field test and sample collection conducted as per B.I.S Specification only. Ref. I.S : 1892; 1498; 2131 & 2132. Remarks:

Moderately weathered greyish Siltstone

10

SPT: Standard Penetration Test & UDS: Undisturbed soil sample.



PH: 0671-2443588 Tele Fax: 0671 - 2443408

													N: _	_		
PROJI	ECT NA	ME Geo	otechnical Investigation for NT	PC Talcl	ner Therma	al Stage II	1(2)	k 660	MW)	)						
GROU	ND SUI	RFACE EL	<b>EVATION:</b> 71.108 m				EAS	ST: _	E or	X = 129	3.585	N	ORTH:	N or Y	= 4403.2	211
TYPE	OF BOF	RING: R	otary				BOI	RING	NO:	BH 52						
DIAME	ETER O	F BORING	3: _150mm upto 3.30m & Nx	n BGL	TYF	E OF	BIT	USED:_	Double	e tube						
TOTAL	L HOLE	DEPTH:	20 m		SOI	L SA	MPLI	ER USEI	D:							
LOCA	TION:		DA	TE ST	ART	<b>ED:</b> <u>6</u> /	/8/09	c	OMPLE	TED: _8	3/8/09					
E_	ced (m)	RAPHIC LOG			SAMPLE	Ē.,	BLC	WS/	15cm	Field	evel	Bulk	very yth/ ry (%)	(%)	ure ency eter	umber
0 DEPTH	Reduc	GRAF	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	Sample Number		15 cm		Z Z	Water L	Density gmc/cc	Recovery Length/ Recovery (%	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
   		10 10 10 10 10 10 10 10 10 10	Moderately weathered greyish Siltstone (continued)	10.3	RC								84	84		

10	Rec	GR/ L		Depth (m)	SAMPLE TYPE	Sample Number	15 cm	15 cm	15 cm	Ž	Water	gmc/cc	Rec Ler Recov	Z Z	Fra Freq per	Serial of Rec
			Moderately weathered greyish Siltstone (continued)	10.3	RC								84	84		
- 11 -	59.808	A A A A A A A A A A A A A A A A A A A	Highly to moderately weathered greyish Siltstone with Small	- 11.3	RC								86	11		
- 12 -			patches of fine grained Sandstone	12.3	RC								88	32		
- 13 -				13.3	RC								89	20		
14		AR A		14.3	RC								86	0		
- 15 -		20		15.3	RC								85	10		
<u>- 16 - </u>				16.3	RC								89	0		
<u>- 17 - </u>		AR A		17.3	RC								87	27		
- 18 -  				18.3	RC								96	29		
- 19	51.808	AR A	Slightly weathered greyish Siltstone with Small amount of fine grained Sandstone	- 19.3	RC								98	98		

Remarks: Boring, field test and sample collection conducted as per B.I.S Specification only. Ref: I.S: 1892; 1498; 2131 & 2132. SPT: Standard Penetration Test & UDS: Undisturbed soil sample.



# ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004 PH: 0671- 2443588 Tele Fax: 0671 - 2443408

	ME Geo	ai Stage II														
						_						N	ORTH:	N or Y	= 4400.5	7
TYPE (	OF BOF	RING: R	otary				BOF	RING	NO:	BH 53						
DIAME	TER O	F BORING	150mm upto 2.50m & Nx	from 2.5	0 to 20.0n	<u>n B</u> GL	TYP	E OF	BIT	USED:_	Double	e tube				
TOTAL	. HOLE	DEPTH:	20 m				SOI	L SA	MPLI	ER USEI	):					
LOCAT	ΓΙΟN: _	FO Tank				_	DAT	E ST	ART	<b>ED</b> : _7/	8/09	c	OMPLE	TED: _	10/8/09	
					0.1.151.5								(%	_	>-	oer ed
Ħ_	Reduced Level (m)	GRAPHIC LOG			SAMPLE		BLO	WS/1	15cm	Field	Water Level	Bulk	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
DEPTH (m)	edu evel	RAP LO	MATERIAL DESCRIPTION	Sample	SAMPLE	Sample	15	15	15	<u> </u>	er L	Density gmc/cc	eng ove	αD	equ er M	al Seco
	Z Z	g		Depth (m)	TYPE	Number		cm		F	Vat	91110/00	Rec	2	L 문 회	Serie of R
0 -		67 KT KT	Medium stiff brownish	()									_			0, -
    - 1 -			Clayey Sand (SC)													
- - - - - - - - - - - - - - - - - - -																
				1.5	UDS	1			F	Recovere	d					
-																
										11cm in						
= ±	68.963			2.2	SPT	1	38			100						
 	68.663		Completely weatheredbrownish Siltstone			•				blows N>100			00	00		
- 1	00.000	** **	Highly to moderately	2.5	RC					1.00			66	20		
3			weathered yellowish													
			brown Siltstone													
	67.663	** ** ** **	Slightly weathered	3.5	RC								87	79		
			yellowish brown													
_ 4 _			Sandstone													
= =																
	66.663			4.5	RC								88	80		
= =			Slightly weathered yellowish brown Siltstone	1.0	110									00		
- 5 -			yellowish brown Silistone													
  		***														
				5.5	RC								83	60		
6																
= =																
	64.663		Slightly weathered	6.5	RC								89	68		
= =			yellowish brown fine													
7 -			grained Sandstone													
	63.663		Oliabeth atta ana di ana diala	7.5	RC								94	42		
= =			Slightly weathered greyish Siltstone with Sandstone													
- 8 -			patches													
= =		an an an an an an an an an an														
				8.5	RC								93	93		
		عقب عد عد عد مراجع		0.5	RC								93	93		
 - 9 -		en an an en an 'An an 'An an An an an														
= =		10 00 00 00 00 00 00 00 00 00														
_ =				9.5	RC								93	88		
=																
- 10 - Rema	rks: B	oring, field	test and sample collection condi	ucted as	per B.I.S St	ecification	only.									
	R	lef: I.S : 189	92; 1498; 2131 & 2132. ard Penetration Test & LIDS : Ur				,									



#### ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

PH: 0671- 2443588 Tele Fax: 0671 - 2443408

**PROJECT NAME** Geotechnical Investigation for NTPC Talcher Thermal Stage III ( 2 x 660 MW) GROUND SURFACE ELEVATION: 71.163 m **EAST**: E or X = 1364.14 **NORTH:** N or Y = 4400.57

TYPE OF BORING: Rotary BORING NO: BH 53

**DIAMETER OF BORING:** 150mm upto 2.50m & Nx from 2.50 to 20.0m BGL TYPE OF BIT USED: Double tube

TOTAL HOLE DEPTH: 20 m SOIL SAMPLER USED:

		DEPTH:	_				ER USE									
LOCA	TION:	FO Tank				_	DA	E S	ΓART	<b>ED</b> : _7	/8/09		OMPLET	ED: _	10/8/09	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample	SAMPLE				15cm	"N" Field	Water Level	Bulk Density gmc/cc	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
10	Re	8 8 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Depth (m)	SAMPLE TYPE	Sample Number	15 cm		15 cm	Ž	Water	gmc/cc	Reco	a Q	Fre Frec	Serial of Re
- 11	60.663	an an an an	Slightly weathered greyish Sandstone	10.5	RC								96	80		
				11.5	RC								95	72		
- 12 -   - 13 -				12.5	RC								95	44		
- 13   - 14				13.5	RC								97	96		
	56.663	AR.	Moderately to Slightly weathered greyish Siltstone	14.5	RC								95	0		
		AR A		15.5	RC								92	0		
		AG A		16.5	RC								96	10		
		AR A		17.5	RC								95	35		
  - 19	52.663	AR A	Moderately to Slightly weathered greyish Sandstone	18.5	RC								86	0		
- 20	51.163			19.5	RC								80	0		
Rema	irks: E	Boring, field	test and sample collection cond	ucted as	per B.I.S S	pecification	only.									

Boring, field test and sample collection conducted as per B.I.S Spec Ref: I.S: 1892; 1498; 2131 & 2132. SPT: Standard Penetration Test & UDS: Undisturbed soil sample. collection conducted as per B.I.S Specification only.



PH: 0671-2443588 Tele Fax: 0671 - 2443408

N: \_\_\_

PROJE	ECT NA	ME Geo	technical Investigation for NT	PC Talch	ner Therma	al Stage II	I ( 2 x	660	MW)							
						_						N	IORTH:	N or Y	= 4500	
		RING: R				_				BH 54						
			3: 150mm upto 1.50m & Nx	from 1.5	60 to 20.0n	<u>n B</u> GL						e tube				
		DEPTH:								ER USEI						
LOCA	TION: _	CHP Area	<u>a</u>	I		_	DAT	E ST	ART	ED: <u>13</u>	3/8/09	C	OMPLE		18/8/09	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample	SAMPLE SAMPLE			WS/1	15cm	"N" Field	Water Level	Bulk Density gmc/cc	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
0	L R	Ð		Depth (m)	TYPE	Number	cm	cm	cm		Wate	91110/00	Rec	Ĭ.	L F 전	Serië of R
			Greyish Clayey Sand (SC)													
<u>'</u>	69.757 69.557		Completely weathered deeply decomposed yellowish brown Sandstone	1.3 1.5	SPT RC	1 1	35		<sup>^</sup>	4cm in 100blows N>100	<u> </u>					
			Highly to moderately weathered yellowish brown Sandstone	2.5	RC	2							66	10		
3 -    - 4 -	67.557		Slightly weathered greyish Sandstone	3.5	RC	3			-				78	0		
- 5				4.5	RC	4							91	29		
6				5.5	RC	5							94	94		
     - 7 -				6.5	RC	6			-							
				7.5	RC	7			-				89	89		
- 8 -    	62.557	ME AR AR AR AR	Highly to moderately weathered greyish	8.5	RC	8							85	47		
9 -			Siltstone	9.5	RC	9							83	0		
- 10 -	wka: 5		toot and approlate all a Parish				0-1						77	20		
Rema	R	ef: I.S : 189	test and sample collection cond 92; 1498; 2131 & 2132. ard Penetration Test & UDS : U				oniy.									

Borehole termination at 20 m



### ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004 PH: 0671-2443588 Tele Fax: 0671 - 2443408

N: \_\_\_

PROJECT NAME Geotechnical Investigation for NTPC Talcher Thermal Stage II	II ( 2 x 660 MW)	
GROUND SURFACE ELEVATION: _71.057 m	<b>EAST</b> : _E or X = 1226.91	<b>NORTH:</b> N or Y = 4500
TYPE OF BORING: Rotary	BORING NO: BH 54	
DIAMETER OF BORING: 150mm upto 1.50m & Nx from 1.50 to 20.0m BGL	TYPE OF BIT USED: Double tube	
TOTAL HOLE DEPTH: 20 m	SOIL SAMPLER USED:	
LOCATION: CHP Area	<b>DATE STARTED</b> :13/8/09	<b>COMPLETED:</b> 18/8/09

LOCA	ATION:	CHP Area	a				DAT	E S1	TART	ED: _1	3/8/09	c	OMPLET	ED: _1	18/8/09	
F	(m)	Ş Ç			SAMPLE	<u> </u>	BLO	WS/	15cm	ple	vel	Bulk	ery th/ y (%)	(%)	ure ancy eter	ımber vered
H (E)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	Sample Number	15 cm	15 cm	15 cm	"N" Field	Water Level	Density gmc/cc	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
-													77	20		
Ē -	60.557	****		10.5	RC	10							''	20		
- 11			Highly to moderately weathered greyish Sandstone										84	0		
				11.5	RC	11										
12													85	0		
				12.5	RC	12										
<u>13</u>				13.5	RC	13							80	0		
14				13.5	RC	13							84	0		
<u>-</u>	56.557		Highly to moderately	14.5	RC	14										
_ _ 15 _			weathered greyish Sandstone										84	0		
<u>-</u> -				15.5	RC	15										
<u>16</u>													84	0		
- 17				16.5	RC	16							79	0		
-				17.5	RC	17										
- 18 -													85	0		
				18.5	RC	18							82	0		
				19.5	RC	19							32	J		
	51.057 arks: E	Poring field	test and sample collection cond			accification	only						86	0		

Ref: I.S: 1892; 1498; 2131 & 2132.
SPT: Standard Penetration Test & UDS: Undisturbed soil sample.



### ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

PH: 0671- 2443588 Tele Fax: 0671 - 2443408

PROJE	ECT NA	ME Geo	technical Investigation for NT	PC Talch	ner Therma	al Stage II	l (2)	¢ 660	MW)	)						
GROU	ND SUI	RFACE EL	<b>EVATION</b> : 73.928 m			_	EAS	ST: _	E or	X = 117	0.952	N	iorth: _	N or Y	′ = 4431.0	48
TYPE (	OF BOF	RING: R	otary				BOF	RING	NO:	BH 55						
DIAME	TER O	F BORING	: 150mm upto 4.25m & Nx	from 4.2	5 to 20.0n	<u>n B</u> GL	TYP	E OF	BIT	USED:_	Double	e tube				
TOTAL	. HOLE	DEPTH:	20 m				SOI	L SA	MPLI	ER USE	D:					
LOCAT	ΓΙΟN: _	CHP Area	ì			_	DAT	TE ST	ART	<b>ED</b> : _7	/8/09	c	OMPLET	ΓED: _	12/8/09	
					0.11.151.5						_		, (%		>-	oer ed
Ħ_	Reduced Level (m)	일일			SAMPLE		BLO	WS/1	15cm	Field	Water Level	Bulk	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
DEPTH (m)	evel	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample	SAMPLE	Sample	15	15	15	<u> </u> 2	erL	Density gmc/cc	eco Sove	gg	equ er N	al N Seco
0	<b>E 2</b>	0		Depth (m)	TYPE	Number	cm			<u>-</u>	Wat	3	Rec R	œ	" 눈 하	Seri of F
		XXXXX	Filled up Soil	, ,												
    - 1 -		$\bowtie$														
- 1		$\bowtie$														
- 1 -											V					
= =																
	72.428		0 1101 0 1	1.5	UDS	1			F	 Recovere	ed					
= =			Greyish Clayey Sand (SC)													
- 2 -			(00)													
= =																
= =																
- 3 -																
				3	SPT	1	3	4	6	10						
2 - 2 - 3 3 4 4	<b>7</b> 0 400															
- +	70.428	<i>£.7.£.7.£.9</i>	Completely weathered							Oom in						
=			yellowish brown	20	CDT	0	40			9cm in 100						
			Sandstone	3.9	SPT	2	46			blows						
	69.678		Moderately to slightly	4.25	RC	1				N>100						
			weathered greyish fine													
= =			grained Sandstone Stone										86	29		
  				5.25	RC	2										
= =						_										
													95	70		
6 -														70		
= =	67.678			6.25	RC	2										
= =			Slightly weathered greyish	0.25	RC	3										
= =			fine grained Sandstone											00		
   - 7 -													96	80		
	66.678															
	00.078		Slightly weathered greyish	7.25	RC	4										
			Siltstone													
]		***											85	76		
				8.25	RC	5										
 - 9 -													87	47		
				9.25	RC	6										
=													89	88		
- 10 -																
Rema	rks: B	oring, field	test and sample collection cond 92; 1498; 2131 & 2132.	ucted as p	per B.I.S Sp	pecification	only.									
	S	PT : Standa	ard Penetration Test & UDS : Ui	ndisturbed	soil samp	le.										



PH: 0671-2443588 Tele Fax: 0671 - 2443408

N: \_\_\_

			technical Investigation for NT								0.050		IODTU.	NI an N	· - 4424.0	40
		RING: RO				_				X = 1170 BH 55		r	IORIH:	N OF Y	′ = 4431.0	48
			otary :: 150mm upto 4.25m & Nx									a tuba				
			·			<u>I B</u> GL				USED:_		e lube				
		DEPTH:											OMPLE.	TED.	10/0/00	
LUCA	IION:	CHP Area	1			_	DAI	E 3	AKI	<b>ED</b> : <u>7/</u>	6/09				12/6/09	<u> </u>
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample	SAMPLE				15cm	Fiel	Water Level	Bulk Density	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
10	Le Re	RD L		Depth (m)	SAMPLE TYPE	Sample Number	15 cm	15 cm	15 cm	Ž	Wate	gmc/cc	Re Le	SS	Fre	Seria of Re
     - 11 -	63.678		Slightly weathered greyish Siltstone with Shale	10.25	RC	7							89	88		
				11.25	RC	8							93	62		
- 12		AC A											86	80		
  	61.678		Slightly weathered greyish Shale with Sandstone	12.25	RC	9							86	58		
13	60.678		Moderately to Slightly	13.25	RC	10										
			weathered greyish fine to medium grained Sandstone										89	75		
    - 15 -				14.25	RC	11							89	12		
   	58.678		Slightly weathered greyish laminated Shale	15.25	RC	12							89	33		
- 16 -    17 -	<u>57.678</u>	10 AA AA AA AA	Moderately to Slightly weathered greyish	16.25	RC	13							00	00		
			Siltstone	17.25	RC	14							87	26		
		10 10 10 10 10 10 10 10 10 10 10 10 10 1											86	47		
    - 19 -		10 AL AL AL AL		18.25	RC	15										
		TO THE		19.25	RC	16							87	11		
- - 20 -	53.928		test and sample collection cond	untod =	nor D.L.C.C.	nanific-tir							81	32		
Rema	F	Ref: I.S : 189	test and sample collection cond 92; 1498; 2131 & 2132. ard Penetration Test & UDS : Ui				only.									

Borehole termination at 20 m



PH: 0671-2443588 Tele Fax: 0671 - 2443408

## BORING: Rotary   BORING: 150mm upto 4.60m & Nx from 4.60 to 20.0m BGL   TYPE OF BIT TOTAL HOLE DEPTH: 20 m   SOIL SAMPL      CALL OF TOTAL HOLE DEPTH: 20 m   SOIL SAMPLE	Or X = 1077.728 NORTH: N or Y = 4523.98  O: BH 70  BIT USED: Double tube  PLER USED:
Type of Boring:	O: _BH 70  BIT USED:  PLER USED:  RTED:/19/09
DIAMETER OF BORING:   150mm upto 4.60m & Nx from 4.60 to 20.0m BGL   TYPE OF BIT TOTAL HOLE DEPTH:   20 m   SOIL SAMPL   DATE STAR	### Double tube   PLER USED:
COCATION: CHP Area   CHP Area   SAMPLE   SAMPL	RTED: 1/9/09 COMPLETED: 5/9/09
SAMPLE   BLOWS/15cn	
SAMPLE   BLOWS/15cn	
Filled up Soil & concrete  73.326  Filled up Ash dust  1.5 SPT 1 2 3 6  2 71.926  Greyish coloured Clay  3 UDS 1  70.426  70.426  Completely weathered Siltstone of yellowish grey colour  4  69.326  Moderately weathered yellowish coloured Siltstone  5  67.326  6	Water Level  Water Level  Water Level  Scovery (%)  Recovery (%)  ROD (%)  ROD (%)  Practure  Fracture  Fr
Filled up Soil & concrete  73.326  Filled up Ash dust  1.5 SPT 1 2 3 6  2 71.926  Greyish coloured Clay  3 UDS 1  70.426  70.426  Completely weathered Siltstone of yellowish grey colour  4  69.326  Moderately weathered yellowish coloured Siltstone  5  67.326  6	Water Leg Cover Back C
Filled up Soil & concrete  73.326  Filled up Ash dust  1.5 SPT 1 2 3 6  2 71.926  Greyish coloured Clay  3 UDS 1  70.426  70.426  Completely weathered Siltstone of yellowish grey colour  4  69.326  Moderately weathered yellowish coloured Siltstone  5  67.326  6	
Filled up Soil & concrete  73.326  Filled up Ash dust  1.5 SPT 1 2 3 6  2 71.926  Greyish coloured Clay  3 UDS 1  70.426  Completely weathered Siltstone of yellowish grey colour  4  69.326  Moderately weathered yellowish coloured Siltstone  5  6	
Filled up Ash dust  1.5 SPT 1 2 3 6  2 71.926  Greyish coloured Clay  3 UDS 1  70.426  Siltstone of yellowish grey colour  4	
Filled up Ash dust  1.5 SPT 1 2 3 6  2 71.926  Greyish coloured Clay  3 UDS 1  70.426  Siltstone of yellowish grey colour  69.326  Moderately weathered yellowish coloured Siltstone  5  67.326  A	
1.5 SPT 1 2 3 6  2 71.926  Greyish coloured Clay  3 UDS 1  70.426  Completely weathered Siltstone of yellowish grey colour  4.5 SPT 2 28  69.326  Moderately weathered yellowish coloured Siltstone  5  67.326  68.6 RC 2  67.326  68.6 RC 2  68.6 RC 3	
3 UDS 1	
Greyish coloured Clay  3 UDS 1  70.426  Completely weathered Siltstone of yellowish grey colour  69.326  Moderately weathered yellowish coloured Siltstone  5	
3 UDS 1	6 9
3 UDS 1	
3 UDS 1	
70.426  70.426  3.5 SPT 2 28 Siltstone of yellowish grey colour  69.326  Moderately weathered yellowish coloured Siltstone  5.6 RC 2	
70.426  70.426  3.5 SPT 2 28 Siltstone of yellowish grey colour  69.326  Moderately weathered yellowish coloured Siltstone  5.6 RC 2	
70.426  70.426  3.5 SPT 2 28 Siltstone of yellowish grey colour  69.326  Moderately weathered yellowish coloured Siltstone  5.6 RC 2	
Completely weathered Siltstone of yellowish grey colour  69.326  Moderately weathered Siltstone  4.5 SPT 2	Recovered
Completely weathered Siltstone of yellowish grey colour  69.326  Moderately weathered Siltstone  4.5 SPT 2	13cm in
G7.326 man and an an and an an an an an and an	100
69.326 Moderately weathered yellowish coloured Siltstone  5	>100
Moderately weathered yellowish coloured Siltstone  5 -	
Moderately weathered yellowish coloured Siltstone  5 -	10cm in
yellowish coloured  Siltstone  5.6 RC 2  6.326 mm m m m m m m m m m m m m m m m m m	100   blows N
5	>100
6 -	76 0
6 -	
67.326 as	
67.326 as	
67.326 as	80 0
67.326 m m m m m m = 66 RC 3	
Moderately weathered	
grey coloured Sittstone	
An An An An An - An - An - An - An	84 0
7.6 RC 4	
- 8 - 8 - 8 - 8 - 8 - 8 - 8 - 8 - 8 - 8	
- M.	83 0
MA AA	
8.6 RC 5	
9 - 40 00 00 00 00 00 00 00 00 00 00 00 00	
MA AAA AAA AAA AAA AAA AAA AAA AAA A	
9.6 RC 6	85 0
	85 0
Remarks: Boring, field test and sample collection conducted as per B.I.S Specification only.	85 0 86 23

Borehole termination at 20 m



PH: 0671-2443588 Tele Fax: 0671 - 2443408

			technical Investigation for NT								7 700		IODTU.	N an V	_ 4500.0	
						_				BH 70		N	IORTH:	IN OF Y	= 4523.9	80
		RING: ROPING	otary :: _150mm upto 4.60m & Nx			— n BCI				USED:		a tuha				
		DEPTH:										tube				
		CHP Area								ED: _1/			OMPLE		5/9/09	
LOOA		OH AICE	4			_	ואס		AIXI	<u></u>	5/05					<u>——</u>
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample	SAMPLE SAMPLE		BLO 15		15cm	Fie	Water Level	Bulk Density	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
10	% <u>a</u>	G.		Depth (m)	TYPE	Sample Number	cm	15 cm	15 cm	Ž	Wate	gmc/cc	Reco	)X	F 등 의	Seria of R
		AR A	Moderately weathered grey coloured Siltstone (continued)	10.6	RC	7					1		86	23		
<u>11 -</u>	62.326	AR A	Slightly weathered grey	11.6	RC	8							85	0		
12 -		an a	coloured Siltstone with fine grained Sandstone patches.	12.6	RC	9							86	0		
13		en an		12.0	RO	9							85	13		
		AR A		13.6	RC	10							97	0		
		TARA TARA TARA TARA TARA TARA TARA TARA		14.6	RC	11							91	0		
		ARE		15.6	RC	12										
     - 17 -		En an an en an		16.6	RC	13							95	12		
- 17 -      - 18 -		an in an in		17.6	RC	14							93	29		
- 18 - - 18 -    - 19 -		en an		18.6	RC	15							91	0		
- 19 - - 19 - 		gan an gan an an an an an an an an gan an an an an an an an an an an an an an an an an an an an		10.0	110	13	_ <del></del>		<del>_</del>				94	0		
20 -	<u>53.926</u> rks: B	orina field	test and sample collection cond	19.6	RC per B.I.S Si	16 pecification	onlv						100	0		
	R	Ref: I.S : 189	)2; 1498; 2131 & 2132. ard Penetration Test & UDS : Ui				<b></b> .									



# ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004 PH: 0671- 2443588 Tele Fax: 0671 - 2443408

PROJE	ECT NA	ME Geo	technical Investigation for NT	PC Talch	ner Therma	al Stage II	I(2)	660	MW)	)						
GROU	ND SUI	RFACE EL	<b>EVATION:</b> 71.668 m				EAS	ST: _	E or	X = 1253	3.37	N	IORTH:	N or Y	= 4427.7	
TYPE	OF BOF	RING: R	otary				BOF	RING	NO:	BH 71						
DIAME	TER O	F BORING	3: _150mm upto 1.30m & Nx	from 1.3	0 to 20.0n	n BGL	TYP	E OF	ВІТ	USED:_	Double	e tube				
TOTAL	_ HOLE	DEPTH:	20 m				SOI	L SA	MPLI	ER USEI	D:					
LOCA	TION:	CHP Area	a				DAT	E ST	ART	ED: 4/	9/09	c	OMPLE	TED:	5/9/09	
													(%			ja g
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE SAMPLE TYPE		BLO 15 cm	15	15	"N" Field	Water Level	Bulk Density gmc/cc	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
0				(m)	ITPE	Number	CITI	cm	cm		Š		ž			of Sc
 	71.268		Filled up Concrete													
			Completely weathered yellowish brown Siltstone	1 1.3	SPT RC	1	38			12cm in 100 blows N >100						
				2.3	RC						<b>T</b>		84	0		
3	co 200	AR A		2.3							_		88	74		
  	68.368		Slightly weathered grey coloured fine grained Sandstone	3.3	RC								100	72		
   _ 5 _	67.368	AR A	Slightly weathered grey coloured Shale & Siltstone	4.3	RC								95	79		
  - 6	66.368	An	Slightly weathered grey coloured Siltstone with Fine grained Sandstone patches	5.3	RC								91	13		
   - 7 -	65.368		Slightly weathered grey coloured fine grained Sandstone	6.3	RC								98	36		
 8 -	64.368	AR A	Slightly weathered dark grey Siltstone	7.3	RC								97	74		
	63.368		Slightly weathered dark grey fine grained Sandstone with some light grey coloured Shale	8.3	RC								96	72		
	62.368		Slightly weathered grey coloured Siltstone	9.3	RC								98	98		
Rema	rks: B	oring, field Ref: I.S: 189	test and sample collection cond 92; 1498; 2131 & 2132.			pecification	only.									



#### ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004 PH: 0671- 2443588 Tele Fax: 0671 - 2443408

N: \_\_\_

**PROJECT NAME** Geotechnical Investigation for NTPC Talcher Thermal Stage III ( 2 x 660 MW) **NORTH:** N or Y = 4427.7 GROUND SURFACE ELEVATION: 71.668 m **EAST**: <u>E or X = 1253.37</u> TYPE OF BORING: Rotary BORING NO: BH 71

**DIAMETER OF BORING:** 150mm upto 1.30m & Nx from 1.30 to 20.0m BGL TYPE OF BIT USED: Double tube

COLORION: CIPE Area				5: _150mm upto 1.30m & Nx	from 1.	30 to 20.0n	<u>1 B</u> GL				USED:_		e tube				
Supply   Sample   S																	
11	LOCA	TION:	CHP Area	3				DAT	E ST	TART	ED: _4/	/9/09			ED: _	5/9/09	
11	PTH m)	luced el (m)	PHIC OG	MATERIAL DESCRIPTION			<u> </u>	BLO	WS/	15cm	Field	Level	Bulk Density	overy ngth/ rery (%)	(%) C	cture uency Meter	Number
11		Red	GRA L(		Depth	OCIVII LL	Sample Number				Ļ	Water	gmc/cc	Rec Ler Recov	RQI	Fra Freq per	Serial of Rec
11   12   13   14   15   15   15   15   15   15   15				Slightly weathered grey										98	98		
11					10.3	RC											
10				,													
10   10   10   10   10   10   10   10	11 -													96	90		
12   12   13   15   15   15   15   15   15   15	- ' -																
12   Foliar griened Sandstone with   Foliar griened Sandstone patches   12.3   RC		60.368		Slightly weathered grey	11.3	RC											
12. 59.368 Slightly weathered grey coloured fine grained Slitstone with Slitstone				coloured Siltstone with													
13	= =			Fine grained Sandstone										97	97		
13   13   13   13   14   15   15   15   16   16   16   16   16	12		44 44 44 44	pateries													
13	=	59.368	مد مد مد مد مد مد مد مد		12.3	RC.											
13				Slightly weathered grey	12.0	1.0											
13.3 RC	=			Siltstone with Sandstone										07	22		
14   Slightly weathered grey coloured Siltstone	_ 13 _			patches										91	32		
14   Slightly weathered grey coloured Siltstone	= =	58 368															
14.3 RC		50.500		Slightly weathered grey	13.3	RC											
14.3 RC			****	coloured Siltstone													
14.3 RC	14		***											93	25		
15.3 RC																	
15.3 RC 97 81  16.3 RC 96 44  17.3 RC 96 44  18.3 RC 93 93 93  19.3 RC 100 100  19.3 RC 100 100					14.3	RC											
15.3 RC 97 81  16.3 RC 96 44  17.3 RC 96 44  18.3 RC 93 93 93  19.3 RC 100 100  19.3 RC 100 100																	
15.3 RC	15 -													93	77		
16.3 RC 96 44  17.3 RC 98 1  54.368 Slightly weathered grey coloured fine grained Sandstone with Siltstone patches.  18.3 RC 100 100 100  19.3 RC 100 100 100	- 15																
16.3 RC 96 44  17					15.3	RC											
16.3 RC 96 44  17	<u> </u>																
16.3 RC 96 44  17	_ =		***											97	81		
17	16																
17					16.3	RC.											
54.368	<u> </u>				10.0	1.0											
54.368	Ē =													06	44		
Slightly weathered grey coloured fine grained Sandstone with Siltstone patches.  53.368  Grey coloured Siltstone  18.3 RC  19.3 PC  19.3 RC  100 100	17 -		*****											30			
Slightly weathered grey coloured fine grained Sandstone with Siltstone patches.  53.368  Grey coloured Siltstone  18.3 RC  19.3 PC  19.3 RC  100 100	<u> </u>	54.368			17.0	DC.											
Sandstone with Siltstone patches.  53.368	ΕΞ			Slightly weathered grey	17.3	KC											
53.368	<u> </u>			coloured tine grained Sandstone with Siltstone													
53.368	18 -													93	93		
Grey coloured Siltstone  10.3 RC  10.0 100  10.0 100  10.0 100  10.0 100  10.0 100	=	F0 000															
19 - 19 - 100 100 100 100 100 100 100 100 100 1	<u> </u>	<u>53.368</u>		Grey coloured Siltstone	18.3	RC											
19 -	F =			,													
19.3 RC 100 100 100	10													100	100		
100 100 100 100 100 100 100 100 100 100	- 19		***														
	<u> </u>				19.3	RC											
	<u> </u>														465		
20 151.668 As														100	100		
		51.668	oring field	test and sample collection cond	ucted as	ner B I S S	necification	only									

Boring, field test and sample collection conducted as per B.I.S Spec Ref: I.S: 1892; 1498; 2131 & 2132. SPT: Standard Penetration Test & UDS: Undisturbed soil sample.



PH: 0671-2443588 Tele Fax: 0671 - 2443408

PRO.I	FCT NA	MF Geo	otechnical Investigation for NT	PC Talch	ner Therm	al Stane II	11(2)	660	MM	١						
					ici memi						2.92	N	IORTH:	N or Y	= 4382.0	5
		RING: R				_				BH 72						
DIAM	ETER O	F BORING	3: _150mm upto 1.60m & Nx	from 1.6	0 to 20.0r	— n BGL						e tube				
		DEPTH:								_						
		CHP Area								<b>ED</b> : _3			OMPLE			
						_				_						ğ ğ
Ξ_	Reduced Level (m)	GRAPHIC LOG			SAMPLE		BLO	WS/	15cm	eld	evel	Bulk	/ery Tth/ Cy (%	RQD (%)	Fracture Frequency per Meter	umb
DEPTH (m)	edu	RAP	MATERIAL DESCRIPTION	Sample	SAMPLE	Sample	15	15	15	"N" Field	er Le	Density gmc/cc	eng ove	g	ract eque	al N
0	8 7	Ö		Depth (m)	TYPE	Number	cm	cm	cm		Water Level	gilloroo	Recovery Length/ Recovery (%)	Ř	F.F. ed	Serial Number of Recovered
			Filled up soil	, ,							_					
	71.262															
	71.202		Completely weathered													
. 1			dirty yellow weathered Siltstone													
-																
: :				4.5	ODT	_				10cm in 100						
 	70.162		Moderately weathered	1.5 1.6	SPT RC	1				blows N >100						
2	-		dirty yellow Siltstone							/100	_					
		***									Y		84	53		
· ·																
				2.6	RC											
3 -		** **														
	-												81	65		
		***														
				3.6	RC											
4													00	44		
· .		***											88	11		
	-			4.6	RC											
				4.6	RC											
5 -	66.762		Slightly weathered grey										96	20		
			Slightly weathered grey coloured Siltstone										30	20		
	66.162			5.6	RC											
	-		Slightly weathered grey coloured Shale with	0.0												
6			Siltstone										95	31		
	65.162		Oli alatta a a a di a a a di a	6.6	RC											
 . 7 -			Slightly weathered grey coloured Siltstone													
- ' -													97	42		
	64.162		Slightly weathered grey	7.6	RC											
8 -	-	*****	coloured Shale with													
		*****	Siltstone										97	25		
	-	***														
	63.162	46 46 46 4	Slightly weathered grey	8.6	RC											
9 -		ند مد مد مد د مد مد مد	coloured Siltstone with fine grained Sandstone													
	-		patches										94	13		
. : - :																
				9.6	RC								00	_		
10	mles: 5	44 44 44 44 44 44 44 44	toot and agents as the Committee	unter de la la	201 0 10 0	no oifi a ciri							98	0		
Rema	มหร. 🖰	oning, nela	test and sample collection cond 92; 1498; 2131 & 2132.	ucied as	D.1.5 S	pecincation	ı only.									



PH: 0671-2443588 Tele Fax: 0671 - 2443408

PROJ	ECT NA	ME Geo	technical Investigation for NT	PC Talch	ner Therma	al Stage II	1(2)	660	MW)	)						
GROU	ND SUF	RFACE EL	<b>EVATION</b> : 71.762 m			_	EAS	ST: _	E or	X = 1252	2.92	N	IORTH:	N or Y	= 4382.0	5
TYPE	OF BOF	RING: R	otary			_	BOF	RING	NO:	BH 72						
DIAME	TER O	F BORING	: _150mm upto 1.60m & Nx	from 1.6	0 to 20.0n	<u>n B</u> GL	TYP	E OF	BIT	USED:_	Double	e tube				
		DEPTH:				_										
LOCA	TION:	CHP Area	3			_	DAT	E ST	TART	<b>ED</b> : 3	1/8/09		OMPLE		3/9/09	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample	SAMPLE				15cm	<u>Fie</u>	Water Level	Bulk Density	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
□ 10	Re	GR		Depth (m)	SAMPLE TYPE	Sample Number	cm	15 cm	15 cm	Ż	Wate	gmc/cc	Re Le Reco	RC	Fre	Seria of Re
	61.162	AR.	Slightly weathered grey coloured fine grained	10.6	RC								98	0		
- 12			Sandstone	11.6	RC								95	24		
				12.6	RC								94	85		
13 -	58.162			13.6	RC								96	45		
14 -			Slightly weathered grey coloured Siltstone with fine grained Sandstone and patches of Shale	13.0	RC .								97	35		
15	57.162	da d	Slightly weathered grey coloured Siltstone with fine grained Sandstone patches	14.6	RC								99	78		
16	56.162	an an an an an	Slightly weathered grey coloured fine grained Sandstone	15.6	RC								95	38		
17	55.162	MA M	Slightly weathered grey coloured Siltstone & fine grained Sandstone	16.6	RC								97	32		
18	54.162	A A A A A A A A A A A A A A A A A A A	Slightly weathered grey coloured Shale with Siltstone	17.6	RC								96	0		
- 19	53.162	AR A	Slightly weathered grey coloured Siltstone with fine grained Sandstone patches	18.6	RC								98	35		
20	51.762	na da da da da da da da da da		19.6	RC								100	50		
Rema	R	ef: I.S : 189	test and sample collection cond 92; 1498; 2131 & 2132. ard Penetration Test & UDS : Ur				only.									

CLIEN	T:	NTP	С				78						
PROJE	ECT NA	ME: Geot	echnical Investigation for NTPC Talcher T	hermal S	itage III ( 2	x 660	MVV)	V.		V			
BORE	HOLE II	D: BH 7:	3		CO-ORI	DINAT	TES:	Eas	t: 1564	1.61		North:	4050.12
SITEL	OCATIO	ON:	CPU Area		START	DATE	: 9	/9/20	109		END D	ATE: 9/1	2/2009
SROU	ND RED	DUCED LE	VEL: 70.54		DRILLIN	IG ME	THO	D:	Rotary				
SROU	ND WA	TER TABL	E DEPTH: 2.4		CASING	DIA:		150	mm upto	2.20m	& Nx fro	m 2.20 to 2	20.0m BGL
(m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	SA	MPLE	BLC	WS/	15cm	"N" Field	Core Recovery(%)	(%)	Other	REMARK
DEF	Red	GRA	WATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	IN FIEID	Recov	RQD (%)	Tests	REWARD
1	68.54		Grey coloured Clay	1.5	UDS			F	Recovered				
3	68.34		Completely weathered yellowish weathered Siltstone	2.2	RC				blows N >100	***	****		
3										89	37		
4			Moderately weathered light yellow to grey coloured Siltstone	3.2	RC					88	38		
5	66.34			4.2	RC					94	15		
6				5.2	RC					89	50		
7			Moderately to slightly weathered dirty grey coloured fine grained Sandstone	6.2	RC					90	0		*
1				7.2	RC								
8				8.2	RC					89	0		
9 -	61.34			9.2	RC					85	0		
10 -			Moderately weathered Dirty grey coloured Siltstone	U.E	110					85	0	6	
PT N	= STAN		NETRATION TEST VALUE RQD = R DS = DIS		ALITY DES	SIGNA	MOITA	1	UDS = U VST = V			SOIL SAM	PLE
	A	ORBIT	TAL INFRASTRUCTURI	E CO	NSUL	TAI	NC.	Y 8	Logge	d by :			Checked S. Padhi

Borehole termination at 20 m

PAGE 1 OF 2

Job No:

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for NTPC Talcher T	hermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 73	CO-ORDINATES: East: 1564.61 North: 4050.12
SITE LOCATION : CPU Area	START DATE: 9/9/2009 END DATE: 9/12/2009
GROUND REDUCED LEVEL: 70.54	DRILLING METHOD: Rotary
GROUND WATER TABLE DEPTH: 2.4	CASING DIA: 150mm upto 2.20m & Nx from 2.20 to 20.0m BGL

E_	(m)	O.E.		SA	MPLE	BLC	WS/	15cm	100000000	e ry(%)	(%)	Other	200500000000000000000000000000000000000
DEPTH (m)	Reduced Level (m)	GRAPHIC	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	"N" Field	Core Recovery(%)	RQD (%)	Tests	REMARKS
8	60.34			10.2	RC					85	0		
11	59.34		Moderately weathered dirty grey coloured fine grained Sandstone	- 11.2	RC					84	48		14
12	58.34		Slightly weathered dirty grey coloured fine to medium grained Sandstone with some patches of Siltstone	0000	2000					90	0		
13			Slightly weathered dirty grey coloured fine grained Sandstone with some Shale	12.2	RC					90	0		
14	57.34		Moderately weathered dirty grey coloured fine grained Sandstone	13.2	RC					87	0		
15	56.34		21	14.2	RC					93	10		
16			Slightly weathered dirty grey coloured Siltstone	15.2	RC					90	10		
17	54.34		Slightly weathered dirty grey coloured fine grained Sandstone	- 16.2	RC					91	0		
18	53.34	**************************************		17.2	RC					92	12	2	
- 1			Slightly weathered dirty grey coloured Siltstone	18.2	RC					81	12		
19				19.2	RC					90	18		
20	50.54									90	18		

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION RC = ROCK CORE

DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

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Job No:

Checked by: S. Padhi

PAGE 2 OF 2

Borehole termination at 20 m



PH: 0671-2443588 Tele Fax: 0671 - 2443408

			technical Investigation for NT		ner Therma	al Stage II					3.54	N	ORTH:	N or Y	= 3769.5	7
TYPE (	OF BOF	RING: R	otary				BOF	RING	NO:	BH 77						
DIAME	TER O	F BORING	: _150mm upto 4.50m & Nx	from 4.5	0 to 20.0n	<u>n B</u> GL	TYP	E OF	BIT	USED:_	Double	tube tube				
TOTAL	. HOLE	DEPTH:	20 m				SOII	_ SA	MPLI	ER USEI	D:					
LOCA	TION: _	SWITCH	YARD				DAT	E ST	ART	<b>ED</b> : <u>10</u>	)/9/09	c	OMPLE	TED: _1	12/9/09	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample	SAMPLE				15cm	l" Field	Water Level	Bulk Density	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
	Re	GR		Depth (m)	SAMPLE TYPE	Sample Number	15 cm	15 cm	15 cm	Ž	Vate	gmc/cc	Re Le	X	F.e.	seria of Re
0	68.403		Filled by Sandstone rock (Stray)	(111)							^					0, 0
	00.405		Greyish coloured Clay													
   - 2 -				1.5	SPT	1	2	2	3	5						
											<u></u>					
3 -				3	SPT	2	3	5	8	13						
	64.953		Completely weathered dirty yellow coloured	4.1	SPT	3	38	44		9cm in 100 blows N >100						
5 -	<u>64.553</u>		weathered Sandstone Slightly weathered dirty yellowish fine grained Sandstone patches	4.5	RC								94	87		
- - - - - - - - - - -				5.5	RC								94	80		
     - 7 -	62.553	nn an an an an an an an an an an	Slightly weathered grey coloured Siltstone with	6.5	RC											
	61.553	AR A	Sandstone	7.5	RC								92	86		
8 -			Slightly weathered grey coloured Siltstone										96	96		
9 -	60.553	48 48 48 48 48	Slightly weathered fine grained Sandstone with Clay patches	8.5	RC								97	47		
	<u>59.553</u>			9.5	RC								97	97		
10 = Rema	rke. Þ	oring field	test and sample collection cond	incted as i	ner R I S S	necification	Only									
INCIIId	R	lef: I.S : 189	itest and sample collection cond 92; 1498; 2131 & 2132. ard Penetration Test & UDS : Ui				onny.									



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PRO II	CT NA	MF Ger	otechnical Investigation for NT	PC Talcl	her Therm	al Stane II	1(2)	ረ ይይቦ	MVV	١			N: _	_			
		· ·	EVATION 00.050		ilei illeilli		E III ( 2 x 660 MW)  EAST: _E or X = 1298.54 NORTH: _N or Y = 3769.57  BORING NO: _BH 77										
		RING: R															
			3: _150mm upto 4.50m & Nx	from 4.5	50 to 20.0r	m BGL				USED:		e tube					
		DEPTH:								-							
		SWITCH								<b>ED</b> : 1			OMPLE		12/9/09		
			17410			_					1					d e	
Ŧ	Reduced Level (m)	₽.,			SAMPLE	Ē	BLC	WS/	15cm	Field	skel	Bulk	ery y (%	<b>%</b>	Fracture Frequency per Meter	lmb /ere	
DEPTH (m)	oduc vel (	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample	SAMPLE	Sample	15	15	15	ijĔ	r Le	Density	engl	RQD (%)	actr gane	N N	
	Re Le	9		Depth (m)	TYPE	Number	cm	cm	15 cm	Ž	Water Level	gmc/cc	Recovery Length/ Recovery (%)	×	Fre	seria of Re	
10 _		:::::::::	Slightly weathered grey	(111)							>					0, 0	
· -			coloured fine grained Sandstone with Clay										97	97			
			patches (continued)	10.5	RC												
11 -																	
- ' -													93	93			
	F7 FF0																
- - -	57.553		Slightly weathered fine	11.5	RC											ሕፕ	
12 -			grained sandstone with some Shale intercalation														
													84	51			
_	56.553																
	50.555		Slightly weathered grey	12.5	RC												
13			coloured Shale & Siltstone														
													90	68			
_	55.553																
	00.000		Slightly weathered grey	13.5	RC												
14			coloured Sandstone										0.5	4.0			
													95	43			
-	54.553			44.5	RC												
		AR AR AR AR	Slightly weathered fine grained Sandstone with	14.5	RC												
15 -			Siltstone patches										95	95			
. <u>-</u>													33	35			
				15.5	RC												
· -				10.0	1.0												
16_		ga aa ga a ta aa aa da aa											92	92			
=													"-	"-			
_ =	52.553		0,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1	16.5	RC												
			Slightly weathered grey coloured Siltstone with														
17 -			some patches of Sandstone										91	76			
			Janustone														
				17.5	RC												
_																	
18 -		******											96	96			
-																	
			1	18.5	RC												
			1														
19 -													98	98			
-																	
				19.5	RC												
20	40.0=												100	100			
Rema	49.053 rks: B	oring, field	f test and sample collection cond	ucted as	per B.I.S S	l pecification	only.		l	<u> </u>				<u> </u>			
	R	Ref: I.S : 18	92; 1498; 2131 & 2132. lard Penetration Test & UDS : U				,										

Borehole termination at 20 m

CLIEN	T:	NTP	С										
PROJ	ECT NA	ME: Geot	echnical Investigation for NTPC Talcher T	hermal S	Stage III ( 2	x 660	MVV)	)		1			
BORE	HOLE ID	D: BH 8	1		CO-ORE	CANIC	ES:	Ea	st: 122	7.45		North: 4	1090.27
SITEL	OCATIO	ON:	TP		START	DATE	: 9	/7/20	009	,	END D	ATE: 9/9	/2009
GROU	IND RED	DUCED LE	VEL: 72.238		DRILLIN	IG ME	ETHO	D:	Rotary				
GROU	IND WA	TER TABL	E DEPTH: 2.3		CASING	DIA:	8	150	Omm upto	3.20m	& Nx fro	m 3.20 to 2	0.0m BGL
Ded (m)		S G		SA	MPLE	BLC	WS/	15cm	-0.72.77.750.	re ery(%)	(%)	Other	DEMARK
(m) Reduced	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	"N' Field	Core Recovery(%)	RQD	Tests	REMARK
	71.538		Filled up soil										
2			Greyish coloured Clay	1.5	UDS				Recovered	d 	-		
3	69.338 69.038		Completely weathered yellowish brown weathered Siltstone	2.9	SPT RC	38			13cm in 100 blows N >100		277.0		
4		and the second s	Moderately to slightly weathered yellowish brown Sittstone with fine grained Sandstone patches	4.2	RC					92	57 85		
6	67.038			6.2	RC RC					95	90		
7			Slightly weathered grey coloured Siltstone with fine grained Sandstone patches	7.2	RC					100	100		
8		An one de la		8.2	RC					95	35		
9	63.038	20. 20. 20. 20. 20. 20. 20. 20. 20. 20.		9.2	RC					96	96		

SPT N = STANDARD PENETRATION TEST VALUE RC = ROCK CORE

RQD = ROCK QUALITY DESIGNATION DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD
PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

Slightly weathered grey coloured Siltstone

Logged by : Akash

87 56

> Checked by : S. Padhi

Job No:

PAGE 1 OF 2

CLIENT: NTPC	
PROJECT NAME: Geotechnical Investigation for I	ITPC Talcher Thermal Stage III ( 2 x 660 MW)
BOREHOLE ID: BH 81	CO-ORDINATES: East: 1227.45 North: 4090.27
SITE LOCATION: TP	START DATE: 9/7/2009 END DATE: 9/9/2009
GROUND REDUCED LEVEL: 72.238	DRILLING METHOD: Rotary
GROUND WATER TABLE DEPTH: 2.3	CASING DIA: 150mm upto 3.20m & Nx from 3.20 to 20.0m BGL

Ε	(m)	D H		SA	MPLE	BLC	WS/	15cm		e ny(%)	(%)	Other	
(m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	15	15	15	"N' Field	Core Recovery(%)	RQD (%)	Other Tests	REMARKS
	62.038			10.2	RC					87	56		
11	61.038		Slightly weathered Grey coloured fine grained Sandstone	- 11.2	RC					90	90		
12	60.038		Slightly weathered grey coloured fine grained Sandstone with some Shale intercalation							93	34		
13				12.2	RC					97	97		
14			Slightly weathered grey coloured fine to medium grained Sandstone	13.2	RC					97	97		
	58.038			14.2	RC								
15			Slightly weathered grey coloured Siltstone	15.2	RC					88	52		
16	56.038			16.2	RC					97	18	,	
17				17.2	RC					95	86		
18			Slightly weathered grey coloured Siltstone with fine grained Sandstone							97	81		
19		ARE THE THE TANK THE	Siltstone with fine grained Sandstone patches.	18.2	RC					96	79		
				19.2	RC					95	95		

RC = ROCK CORE

SPT N = STANDARD PENETRATION TEST VALUE RQD = ROCK QUALITY DESIGNATION DS = DISTURBED SAMPLE

UDS = UNDISTURBED SOIL SAMPLE VST = VANE SHEAR TEST



ORBITAL INFRASTRUCTURE CONSULTANCY & RESEARCH PRIVATE LTD

PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

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Job No:

PAGE 2 OF 2



PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004

PH: 0671- 2443588 Tele Fax: 0671 - 2443408

N: \_\_\_ PROJECT NAME Geotechnical Investigation for NTPC Talcher Thermal Stage III (2 x 660 MW) **GROUND SURFACE ELEVATION:** 70.759 m **EAST:** E or X = 700**NORTH:** N or Y = 4900TYPE OF BORING: Rotary BORING NO: BH 84 DIAMETER OF BORING: 150mm upto 3.20m & Nx from 3.20 to 25.0m BGL TYPE OF BIT USED: Double tube TOTAL HOLE DEPTH: 25 m SOIL SAMPLER USED: LOCATION: Reservoir Area DATE STARTED: 11/10/09 **COMPLETED:** 11/12/09 Serial Number of Recovered Recovery (% Frequency per Meter SAMPLE BLOWS/15cm Recovery Length/ Reduced Level (m) GRAPHIC LOG Fracture Field Water Leve RQD (%) DEPTH (m) Bulk MATERIAL DESCRIPTION Density Sample SAMPLE 15 ž Sample 15 15 gmc/cc Depth cm **TYPF** Number cm cm (m) Grayish coloured clay 1.5 UDS 1 --- Recovered SPT 3 8 1 67.559 3.2 RC Highly to moderately weathered yellowish coloured fine grained 50 30 sand stone with some Siltstone 4.2 RC 50 41 5 52 RC 53 28 6 RC 6.2 15 66 7.2 RC 68 56 8 62.559 8.2 RC Moderately weathered greyish coloured fine grained sand stone with 72 47 some patches of shales. 9 9.2 RC 74 59 Boring, field test and sample collection conducted as per B.I.S Specification only. Remarks: Ref: I.S: 1892; 1498; 2131 & 2132

Borehole termination at 25 m

SPT: Standard Penetration Test & UDS: Undisturbed soil sample.



PH: 0671-2443588 Tele Fax: 0671 - 2443408

PROJE	ROJECT NAME Geotechnical Investigation for NTPC Talcher Thermal Stage III ( 2 x 660 MW)  ROUND SURFACE ELEVATION: 70.759 m EAST: E or X = 700 NORTH: N or Y = 4900  PE OF BORING: Rotary BORING NO: BH 84															
GROU	ND SUF	RFACE EL	<b>EVATION:</b> 70.759 m				EAS	ST: _	E or	X = 700		N	IORTH:	N or Y	= 4900	
TYPE (	OF BOF	RING: R	otary				BOF	RING	NO:	BH 84						
DIAME	TER O	F BORING	3: 150mm upto 3.20m & Nx	from 3.2	0 to 25.0n	<u>n B</u> GL	TYP	E OF	BIT	USED:_	Double	e tube				
TOTAL	_ HOLE	DEPTH:	25 m				SOI	L SA	MPLI	ER USEI	D:					
LOCA	TION:	Reservoir	Area				DAT	E ST	ΓART	ED: 1	1/10/09	<u> </u>	OMPLET	ΓED: _	11/12/09	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample	SAMPLE SAMPLE		BLO 15		15cm	Fiel	Water Level	Bulk Density	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
о 10	Re Le	GF		Depth (m)	TYPE	Sample Number		15 cm	15 cm	Ž	Wate	gmc/cc	Reco	R	Fre Pe	Seria of Re
- 11			Moderately weathered greyish coloured fine grained sand stone with some patches of shales. (continued)	10.2	RC								74	59 66		
- 12				11.2	RC								80	14		
	58.559	na an an an an an an an an an an an an an an an an an an an	Moderately weathered greyish coloured fine grained Sandstone with patches of Siltstone	12.2	RC								81	47		
13 -  				13.2	RC								80	54		
14 -   		pa an an pa an  an an an pa an  an an an pa an  an an an an  an an  an an an  an an  an an  an an  an		14.2	RC								78	10		
15 -		A A A A A A A A A A A A A A A A A A A		15.2	RC								81	67		
16		an a		16.2	RC								84	79		
- 17 - - 17 -  	<u>53.559</u>	na an an ar an	Moderately weathered greyish coloured shales with some Siltstone	17.2	RC											
18 -	52.259		patches	18.2	RC								73	0		
19 -			Moderately weathered greyish coloured Siltstone	19.2	RC								70	29		
20		TE T											73	58		
Rema	R	ef: I.S: 189	test and sample collection cond 92; 1498; 2131 & 2132. ard Penetration Test & UDS : U				only.									



PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004 PH: 0671- 2443588 Tele Fax: 0671 - 2443408

			111. 0071- 2	io i un	. 507 1 -		•						N: _	_		
			technical Investigation for NT										OPT:	M M	_ 4000	
		RFACE EL RING: _R								X = 700 BH 84		N	ORTH:	N or Y	= 4900	
			3: _150mm upto 3.20m & Nx			— n BGL						e tube				
		DEPTH:								ER USEI						
LOCA	TION:	Reservoir	Area			_	DAT	TE ST	ΓART	ED: <u>1</u>	1/10/09	<u> </u>	OMPLE		1/12/09	
Ŧ	(m)	HIC			SAMPLE	<u> </u>	BLO	WS/1	15cm	Field	evel	Bulk	ery th/ y (%)	(%)	ure ancy eter	umber vered
(m) 20	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	Sample Number	15 cm	15 cm	15 cm	, ii	Water Level	Density gmc/cc	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
	50.559		Moderately weathered greyish coloured sitl stone with some fine grained Sandstone patches	20.2	RC								73 76	58 57		
				21.2	RC								_,			
		10 10 10 10 10 10 10 10 10 10 10 10 10 10 10		22.2	RC								71	0		
23				23.2	RC								78	63		
		10											77	13		
  		10. 30. 30. 30. 30. 30. 30. 30. 30. 30. 3		24.2	RC								90	10		
	45.759	64. 346. 346. 346. 346. 346. 346. 346. 3														

Boring, field test and sample collection conducted as per B.I.S Specification only. Ref: I.S: 1892; 1498; 2131 & 2132. SPT: Standard Penetration Test & UDS: Undisturbed soil sample. Remarks:



PH: 0671-2443588 Tele Fax: 0671 - 2443408

													IN	_		
			etechnical Investigation for NT										IODTI !	N == Y	_ 4700	
										X = 600		N	IORTH:	N or Y	= 4700	
		RING: R	-							BH 87						
			3: <u>150mm upto 5.20m &amp; Nx</u>	from 5.2	0 to 25.0r	n BGL						e tube				
		DEPTH:								ER USEI						
LOCA	TION: _	Reservoir	Area			_	DA	E S	TART	ED: <u>1</u>	1/11/09	<u> </u>		ΓED: _	13/11/09	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE	Ē	BLO	WS/	15cm	Field	Level	Bulk Density	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
o DE	Red Leve	GRA	WATERWE BEGGINI FIGHT	Sample Depth (m)	SAMPLE TYPE	Sample Number	15 cm	15 cm	15 cm	Z	Water Level	gmc/cc	Reco Ler Recov	RQ	Fra Freq per I	Serial I
			Yellowish coloured clay													
1 -																
											V					
				1.5	UDS	1			F	Recovere	_ <del>▼</del>					
				1.0	OBO					COOVER	<b>u</b>					
- 2 -																
_ =																
- 3 -				3	SPT	1	3	3	5	8						
										10 cm						
_	66.87			3.8	SPT	2	23	32		in						
4 -			Completely weathered yellowish coloured fine							100blows N>100	\$					
- 			grained Sandstone							11 cm						
				4.5	SPT	3	34			in 100blows	3					
- <u>-</u> -										N>100						
- 5 <u>-</u>	65.47															
_	05.47		Highly to moderately fine	5.2	RC											
			grained Sandstone and Siltstone											0.4		
6 -													53	24		
					DC.											
				6.2	RC											
													53	0		
- 7 -		, aa , aa , aa , aa , aa , aa , aa , aa											33	U		
				7.2	RC											
				1.2	1.0											
													56	0		
- 8 -														Ū		
				8.2	RC											
		an an an an an														
													61	0		
9 -		46 46 46 46 4 44 46 46 46												-		
				9.2	RC											
													62	0		
10	rlea. D	arina fali	toot and comple sellestics and	uatad ac	201 0 10 0	no oific ati	051.									
Rema	R	ef: I.S: 189	test and sample collection cond 92; 1498; 2131 & 2132. ard Penetration Test & UDS : Ui				i only.									



PH: 0671-2443588 Tele Fax: 0671 - 2443408

													N: _	_		
			otechnical Investigation for NT  LEVATION: _70.67 m									N	ORTH-	NorV	= 4700	
		RING: R				_				BH 87		"	JKIII.	IN UI I	- 7100	
			3: _150mm upto 5.20m & Nx	from 5.2	20 to 25 Or	m BCI						e tube				
			25 m									tube				
												<u> </u>			12/11/00	
LUCA	IION.	Reservoir	Alea			_	DA	E 3	AKI	ED	1/ 1 1/08			ED	13/11/09	<u> </u>
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE	<u> </u>	BLO	WS/	15cm	Field	Level	Bulk Density	overy ngth/ ery (%)	RQD (%)	Fracture Frequency per Meter	Numbe overe
10	Red	GRA	WATERWIE BEGGRIF FIGHT	Sample Depth (m)	SAMPLE TYPE	Sample Number	15 cm		15 cm	Ž	Water Level	gmc/cc	Recovery Length/ Recovery (%	RQI	Fra Freq per l	Serial Number of Recovered
	60.47			10.2	RC								62	0		
			Moderately weathered light greyish coloured fine	10.2	I NO											
			grained Sandstone with Siltstone patches										64	15		
11			Siltstone patches										04	15		
- ' ' -		- da - ad da - ad - ad - ad - ad - a		44.0	50											
= =				11.2	RC											
		10 00 00 10 00 00 00 00 00														
													69	19		
12 -																
: :				12.2	RC											
		er er er er er . er er .														
= =		** ** ** ** **											69	0		
13 -																
= =		an an an an an		13.2	RC											
= =																
: ‡													71	15		
14																
				14.2	RC											
: =		an an an an an		17.2	1.0											
													74	40		
15													74	12		
- 13																
= =				15.2	RC											
		- AB														
: ‡													75	27		
16 -																
: ‡	54.47		Moderately weathered	16.2	RC											
			light greyish coloured													
= =			shales with some Siltstone										65	0		
_ 17 _			G.M.S.CO.T.G													
= =				17.2	RC											
	53.17															
: ‡			Moderately weathered yellowish to grayish										69	23		
18		44 44 44	coloured Siltstone with													
			some fine grained	18.2	RC											
			Sandstone patches	10.2	1.0											
- 7													77	11		
19		ing and the second											77	14		
				45-												
= =				19.2	RC											
													79	0		
: [													'			
- 20 - Rema	rks <sup>.</sup> F	orina field	test and sample collection cond	ucted as	per B.I.S.S	 pecification	only							<u> </u>		
	F	Ref: I.S : 189	92; 1498; 2131 & 2132. ard Penetration Test & UDS : Ui													

Borehole termination at 25 m



PH: 0671-2443588 Tele Fax: 0671 - 2443408

													N:	_		
			technical Investigation for NT													
								_				N	_			
		RING: R	-							BH 87		tube				
		E DEPTH:	35 m			II BGL				ER USE						
		Reservoi	•							ED: 1			OMDI E	TED:	13/11/09	
LUCA			Alea				DA	LJ	IANI	ED	1/11/08			_		<u>—</u>
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE		BLO	WS/	15cm	Field	Level	Bulk Density	overy igth/ ery (%	RQD (%)	Fracture Frequency per Meter	Vumb
20 20	Red	GRA	WATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	Sample Number	15 cm	15 cm	15 cm	 Z	Water Level	gmc/cc	Recovery Length/ Recovery (%)	RQE	Frac Frequent	Serial Number of Recovered
- 21		an a	Moderately weathered yellowish to grayish coloured Siltstone with some fine grained Sandstone patches (continued)	20.2	RC								79 82	12		
- 22		in on on in on on on on on on one of the original o		21.2	RC								79	37		
23	48.47	- 100 - 100	Moderately weathered greyish coloured fine grained Sandstone and some Siltstone patches	22.2	RC								77	29		
24				23.2	RC								80	72		
	45.67			24.2	RC								90	58		
26																
- 27 - - 27 - 																
28																
29 - - 29 -  																
- 30 -																
- 30 - Rema			test and sample collection cond	ucted as	per B.I.S S	L pecification	only.	I								
	F	Ref: I.S : 189 SPT : Stand	92; 1498; 2131 & 2132. ard Penetration Test & UDS : Ur	ndisturbe	d soil samp	le.										

Borehole termination at 25 m



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PROJE	ECT NA	<b>ME</b> Geo	otechnical Investigation for NT	PC Talch	ner Therm	al Stage II	1(2)	k 660	MW	)				_		
					101 11101111							N	IORTH:	N or Y	′ = 4600	
		RING: R								BH 88						
DIAME	TER O	F BORING	3: _150mm upto 4.90m & Nx	from 4.9	0 to 25.0r	n BGL	TYP	E OF	ВІТ	USED:_	Double	e tube				
TOTAL	- HOLE	DEPTH:	25 m				SOI	L SA	MPLI	ER USE	D:					
LOCA	TION:	Reservoir	Area				DA	TE ST	ΓART	ED: <u>1</u>	1/8/09	c		TED:	11/10/09	
TH (ι	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE		BLO	WS/	15cm	Field	evel	Bulk	Recovery Length/ Recovery (%)	(%)	ture iency Aeter	Jumber
O DEPTH (m)	Redu	GRAI	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	Sample Number	15 cm	15 cm	15 cm	Ž	Water Level	Density gmc/cc	Recc Len Recove	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
=			Grayish coloured clay													
- 1 -											_					
											Y					
				1.5	UDS	1			F	ecovere	ed _					
- 2 - 																
- 3 -					OPT					_						
=				3	SPT	1	2	2	3	5						
= =																
4																
				4.5	SPT	2	2	3	3	6						
	66.023															
- 5 - 	00.020		Highly weathered	4.9	RC											
			yellowish brown Siltstone.										54	0		
													34	U		
6	65.023	***		5.9	RC											
			Highly to moderately weathered Siltstone with													
			fine grained Sandstone of yellowish brown colour in										71	0		
			patches.													
- 7 <del>-</del>				6.9	RC											
													70	28		
- 8 -				7.9	RC											
													70	00		
													72	62		
- , -	62.023			8.9	RC			_								
- 9 - 		******	Moderately weathered greyish coloured Siltstone	0.9	, KC											
			with intercolation of										73	43		
			shales.										, ,	70		
10				9.9	RC											
Rema	rks: B	oring, field	test and sample collection cond 92; 1498; 2131 & 2132.	ucted as		pecification	only.									
	S	PT : Stand	ard Penetration Test & UDS : U	ndisturbed	d soil samp	le.										



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PROJE	ECT NA	ME Geo	technical Investigation for NT	PC Talch	er Therma	al Stage II	l (2)	660	MW)	)						
GROU	ND SUI	RFACE EL	<b>EVATION</b> : 70.923 m				EAS	ST: _	E or	X = 500	)	N	IORTH:	N or Y	′ = 4600	
TYPE (	OF BOF	RING: R	otary			_	BOF	RING	NO:	BH 88	3					
DIAME	TER O	F BORING	: 150mm upto 4.90m & Nx	from 4.9	0 to 25.0n	<u>n B</u> GL	TYP	E OF	BIT	USED:	Double	e tube				
TOTAL	. HOLE	DEPTH:	25 m				SOI	L SA	MPLE	ER USE	D:					
LOCA	TION:	Reservoir					DAT	E ST	TART	<b>ED</b> : _1	1/8/09	c	OMPLET	ΓED:	11/10/09	
																ja g
E_	Reduced Level (m)	GRAPHIC LOG			SAMPLE		BLO	WS/	15cm	Field	Water Level	Bulk	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
DEPTH (m)	edu	RAP	MATERIAL DESCRIPTION	Sample	SAMPLE	Sample	15	15	15	i Ž	er L	Density gmc/cc	eng ove	QD	ract eque	al Seco
	چ ۾	Ō		Depth (m)	TYPE	Number	cm	cm		=	Nate	gilloroo	Re _ R	Ř	F F 9	Seria of R
10 			Moderately weathered	()							+-		79	54		0,
 			greyish coloured Siltstone with intercolation of													
			shales. (continued)										79	54		
	60.023			10.9	RC											
			Moderately weathered greyish coloured fine to	10.3	I.C											
			medium grained										78	27		
			Sandstone										'			
- 12 -				11.9	RC											
				11.3	I.C											
  													79	44		
													'5	77		
	58.023			12.9	RC											
			Moderately weathered greyish coloured	12.3	I.C											
= =			Siltstone.										80	37		
														31		
= , =	57.023			13.9	RC											
14			Moderately weathered greyish coloured fine	13.9	RC											
   - 15 -			grained Sandstone										78	44		
													'0	44		
=				14.9	RC											
				14.9	RC											
													80	45		
- +	55.423		Moderately weathered											70		
- 16	<b>5</b> 4.000		greyish coloured Siltstone.	15.9	RC											
	54.923	******	Moderately weathered	10.5	110											
= =			greyish coloured fine grained Sandstone										77	10		
			grained Sandstone													
 - 17 -				16.9	RC											
= =													82	29		
     - 18 -																
- - 18				17.9	RC											
= =													84	0		
- 1																
19		:::::::		18.9	RC											
		:::::::														
  													81	0		
		:::::::											-	•		
- 4	50.923			19.9	RC											
Rema	rks: B	Boring, field	test and sample collection cond 22; 1498; 2131 & 2132.			pecification	only.				1				1	
			ard Penetration Test & UDS : U	ndisturbed	d soil samp	le.										



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PROJE	ROJECT NAME Geotechnical Investigation for NTPC Talcher Thermal Stage III ( 2 x 660 MW)  ROUND SURFACE ELEVATION: _70.923 m															
GROU	ND SU	RFACE EL	<b>EVATION:</b> 70.923 m			_	EAS	ST: _	E or	X = 500		N	ORTH:	N or Y	= 4600	
TYPE (	OF BO	RING: R	otary				BOF	RING	NO:	BH 88						
DIAME	TER O	F BORING	3: 150mm upto 4.90m & Nx	from 4.9	0 to 25.0n	<u>n B</u> GL	TYP	E OF	ВІТ	USED:_	Double	e tube				
TOTAL	. HOLE	DEPTH:	25 m				SOI	L SA	MPLE	ER USEI	D:					
LOCAT	TION:	Reservoir	Area			_	DAT	E ST	ART	ED: <u>1</u>	1/8/09	c	OMPLE	TED: _	11/10/09	
													(%			ja g
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE		BLO	WS/1	5cm	Field	Level	Bulk Density	overy ngth/ery (9	RQD (%)	cture uenc) Meter	Numb
	Red	GRA	WWW.ENW.E BEGORN FIGH		SAMPLE TYPE	Sample Number	15 cm	15 cm	15 cm	Ž	Water Level	gmc/cc	Recovery Length/ Recovery (%)	RQE	Fracture Frequency per Meter	Serial Number of Recovered
20			Moderately to slightly	(m)							>		80	0		80
    - 21 -		******	weathered greyish coloured Siltstone.										80	0		
- 3													00			
- - 21 -				20.9	RC											
													84	0		
- 1																
- - 22 -				21.9	RC											
													83	0		
- 1		*****														
23				22.9	RC											
													84	0		
		****														
	46.923			23.9	RC											
	40.923		Moderately to slightly	20.0												
		44 44 44 44 44 44 44	weathered greyish coloured siltstone with										00			
			fine grained Sandstone										86	52		
	4E 022	46 46 46 46 46 46 46 46	patches													
	40.923	-ia 'ai ' -ia 'ai														
- 1																
- - 26 -																
= =																
- - 27 -																
= =																
28																
= =																
- 29 -																
_																
30																
Rema	F	Ref: I.S : 189	test and sample collection cond 92; 1498; 2131 & 2132. ard Penetration Test & UDS : Ur				only.									



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		<u></u>	technical Investigation for NT		ner Therm						0.23	N	NORTH:	N or Y	′ = 3842.8	3
		RING: R								BH 109						
			3: 150mm upto 5.00m & Nx	from 5.0	0 to 20.0n	m BGL	TYP	E OF	ВІТ	USED:	Double	e tube				
		DEPTH:	· ·													
		Service B					DAT	E ST	ART	ED: _28	3/3/10		OMPLE	TED:	30/3/10	
																e c
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample	SAMPLE		BLO 15	WS/1	15cm	"N" Field	Water Level	Bulk Density gmc/cc	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
0	2 3	Ö		Depth (m)	TYPE	Number	cm		cm	=	Wat	g	Rec P	<u> </u>	F E 9	Seri of R
		,,,,,	Greyish coloured clay	, ,												
2 -				1.5	SPT	1	2	3	4	7						
3 -	66.559		Brownish coloured clay	3	UDS	1			F	Recovere	d					
- 4 -   	64.759			4.5	SPT	2	4	4		5cm in 100 blow N>100						
5 -    	64.559	AR A	Completely weathered yellowish brown coloured fine grained Sandstone patches. Moderately weathered yellowish brown coloured	5	RC								69	47		
6 -		in' an an an' an	fine grained Sandstone with some Siltstone.	6	RC								85	85		
7 -		ann ann an		7	RC								0.7			
8 -	61.359	in an		8	RC								87	79		
   - 9 -	60.559		Moderately weathered greyish coloured fine grained Sandstone with intercolation of Shales.		RC								86	38		
  	59.759		Slightly weathered greyish coloured fine grained Sandstone.	9	KU								93	87		
- 10 -														<u> </u>		
Rema	R	ef: I.S : 189	test and sample collection cond 92; 1498; 2131 & 2132. ard Penetration Test & UDS : U				only.									



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													IN	_		
			etechnical Investigation for NT								0.22		ODTU:	NI on V	- 2042.0	2
		RFACE EI RING: _R								X = 128 BH 10		N	URIH:	IN OF Y	- 3042.8	<u>.                                    </u>
			3: _150mm upto 5.00m & Nx		10 to 20 0n	— n PCI						, tubo				
		DEPTH:	20									e tube				
		Service E	•							ED: 2			OMPLE		30/3/10	
			Milding		SAMPLE	<u> </u>			15cm							nber
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample	SAMPLE	Sample	15		15	"N" Field	Water Level	Bulk Density gmc/cc	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
10	2 3	Ŋ		Depth (m)	TYPE	Number		cm	cm	-	Wat	91110700	Rec	<u>~</u>	F. F. 9	Serie of R
			Slightly weathered greyish	10	RC											
			coloured Shales. (continued)										91	83		
	58.759												91	03		
11 -	00.700		Slighly weathered greyish	11	RC											
			coloured fine grained Sandstone with some													
			Siltstone patches										92	36		
- 12 - 				12	RC											
													98	45		
13																
				13	RC											
: =													07	0.5		
= =													97	85		
14				14	RC											
					1.0											
													90	58		
15 -				15	RC											
													90	77		
16																
				16	RC											
	53.059												07			
	00.000		Slightly weathered greyish coloured Shales.										87	25		
- - 17 -			coloured Shales.	17	RC											
: =				''	INC											
													93	52		
														-		
18 -	51.559		Clighth was athorned arough	18	RC											
			Slightly weathered greyish coloured fine grained													
			Sandstone.										89	0		
<u>- 19 -</u> 				19	RC											
													95	0		
20	49.559															
Rema	ırks: E	oring, field	test and sample collection cond 92; 1498; 2131 & 2132.	ucted as	per B.I.S S	pecification	only.				1				1	
	5	PT : Stand	ard Penetration Test & UDS : U	ndisturbed	d soil samp	le										



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PROJE	ECT NA	ME Geo	technical Investigation for NT	PC Talch	ner Therma	al Stage II	l(2)	660	MW)	)						
GROU	ND SUF	RFACE EL	<b>EVATION</b> : 69.285 m			_	EAS	ST: _	E or	X = 1556	5.13	N	ORTH:	N or Y	= 3840.5	3
TYPE (	OF BOF	RING: R	otary			_	BOF	RING	NO:	BH 110	)					
			: 150mm upto 5.60m & Nx	from 5.6	0 to 20.0n	<u>n B</u> GL						e tube				
		DEPTH:	20 m			_										
LOCA	ΓΙΟN: _	T.G Hall					DAT	E ST	ART	<b>ED</b> : 3	1/3/10	C	OMPLE		/3/10	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample	SAMPLE				15cm	Fie	Water Level	Bulk Density	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
0	Re	GR		Depth (m)	SAMPLE TYPE	Sample Number	15 cm	15 cm	15 cm	Ž	Wate	gmc/cc	Re Le	RG	Per Fig.	Seria of Re
		/////	Greyish coloured clay													
    - 1 -																
= =											_					
2 - 2				1.5	UDS	1			F	Recovere	d					
				1.0	020	•				10001010	_					
2 -																
= =																
= =																
				3	SPT	1	3	4	5	9						
= =																
     - 4 -																
= =	65.085		Completely weathered													
			yellowish brown coloured fine grained Sandstone													
  - 5 -			with Siltstone patches													
 		. 44 44 44 44 44 44 44														
	63.685			5.6	RC											
= =			Moderately weathered yellowish brown coloured	0.0												
- 6 - 		n. 10. 10 in. 10. 10. 10. 10. 10. 11	fine grained Sandstone										61	10		
			with Siltstone patches													
				6.6	RC											
 - 7 -																
													71	11		
	61.685		NA-dt-btbd	7.6	RC											
- 4		en and an an and an an an an	Moderately weathered greyish coloured fine													
- 8 - 			grained Sandstone with Siltstone patches										70	0		
= =			Silisione pateries													
- 7		in in an an in in.		8.6	RC											
 - 9 -																
	60.085												70	0		
=			Moderately weathered greyish coloured fine													
=			grained Sandstone.	9.6	RC											
10													75	0		
Rema	rks: B	oring, field	test and sample collection cond 2; 1498; 2131 & 2132.	ucted as	per B.I.S Sp	pecification	only.							1		
	S	PT : Standa	ard Penetration Test & UDS : Ur	ndisturbed	d soil samp	le.										



PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004 PH: 0671- 2443588 Tele Fax: 0671 - 2443408

			111. 0071- 2440000 10	ic i ax	. 007 1 -	2-10-10	•						N: _	_		
			otechnical Investigation for NT	al Stage II												
			<b>_EVATION</b> : _69.285 m										NORTH:	N or Y	= 3840.5	3
TYPE	OF BO	ring: _r	otary				BOI	RING	NO:	BH 11	0					
DIAMI	ETER O	F BORING	3: <u>150mm upto 5.60m &amp; Nx</u>	from 5.6	60 to 20.0n	n BGL	TYF	E OF	BIT	USED:_	Double	e tube				
TOTA	L HOLE	DEPTH:	20 m				SOI	L SA	MPLI	ER USE	D:					
LOCA	TION:	T.G Hall					DA	TE ST	ΓART	<b>ED</b> : 3	1/3/10	(	OMPLE	TED: _4	1/3/10	
Ŧ	(m)	S E			SAMPLE		BLC	WS/	15cm	Field	evel	Bulk	ery th/ y (%)	(%)	ure ancy eter	umber vered
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	Sample Number	15 cm	15 cm	15 cm	Ē Z	Water Level	Density gmc/cc	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
10			Moderately weathered	(111)							>					0, 0
			greyish coloured fine grained Sandstone. (continued)	10.6	RC								75	0		
- 11	-												82	0		
- 12				11.6	RC											
				12.6	RC								79	0		
- 13				12.0	RC								80	0		
	55.685	M. M. M. M. M.	. Moderately weathered	13.6	RC											
<u> 14 - </u>			greyish coloured Siltstone.										78	0		
	54.685	AG AG AG AG	Moderately weathered greyish coloured fine grained Sandstone.	14.6	RC											
			grained Sandstone.	15.6	RC								82	0		
16	-												85	0		
- 17				16.6	RC											
				17.6	RC								86	0		

20 49.285 Remarks: B Boring, field test and sample collection conducted as per B.I.S Specification only. Ref. I.S: 1892; 1498; 2131 & 2132. SPT: Standard Penetration Test & UDS: Undisturbed soil sample.

19

18.6

19.6

RC

RC

89

76

85

0

0

0



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			technical Investigation for NT		ner Therm						3.25	N	IORTH:	N or Y	= 3896.4	 5		
TYPE (	OF BOF	RING: R	otary				BORING NO: BH 111											
DIAME	TER O	F BORING	3: 150mm upto 3.20m & Nx	from 3.2	0 to 20.0n	n BGL	TYP	E OF	BIT	USED:_	Double	tube tube						
TOTAL	- HOLE	DEPTH:	20 m				SOII	L SA	MPLI	ER USE	):							
LOCA	TION: _	Boiler					DAT	E ST	ART	<b>ED</b> : <u>27</u>	7/3/10	c	OMPLE	TED: _	30/3/10			
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample	SAMPLE SAMPLE		BLO 15	WS/1		Fie	Water Level	Bulk Density	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered		
	Re Le	GF		Depth (m)	TYPE	Sample Number	cm	15 cm	15 cm	Ž	Vate	gmc/cc	Reco	R K	F a P	Seria of R		
0 -		11111	Brownish gray coloured	(111)									_			0, 0		
			clay															
											<u> </u>							
				1.5	UDS	1			F	Recovere	d							
_ <u> </u>	66.943		Moderately weathered	3 3.2	SPT RC	1	5			6cm in 100 blow N>100								
   - 4			yellowish brown coloured fine grained Sandstone.										72	12				
   				4.2	RC									_				
- 5 - - 5 -				5.2	RC								73	0				
   - 6 -													70	16				
    - 7 -				6.2	RC													
	62.943			7.2	RC								70	0				
  			Moderately weathered greyish coloured fine grained Sandstone	7.2	No								68	10				
- 8 -  				8.2	RC													
9 -													65	0				
8 - 9 9 10				9.2	RC								66	17				
- 10 - Rema	R	ef: I.S : 189	test and sample collection cond 32; 1498; 2131 & 2132. ard Penetration Test & UDS : Ui				only.											



PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004 PH: 0671- 2443588 Tele Fax: 0671 - 2443408

N: \_\_\_

PROJECT NAME Geotechnical Investigation for NTPC Talcher Thermal Stage III ( 2 x 660 MW) GROUND SURFACE ELEVATION: 70.143 m **EAST:** E or X = 1343.25 **NORTH:** N or Y = 3896.45 TYPE OF BORING: Rotary BORING NO: BH 111 **DIAMETER OF BORING:** 150mm upto 3.20m & Nx from 3.20 to 20.0m BGL TYPE OF BIT USED: Double tube TOTAL HOLE DEPTH: 20 m SOIL SAMPLER USED:

LO	CATION:	Boiler				_	DAT	E S	TART	<b>ED</b> : <u>27</u>	7/3/10	c	OMPLET	TED: _3	30/3/10	
Ŧ	m)	O T C			SAMPLE	<u> </u>	BLO	WS/	15cm	ple	vel	Bulk	Recovery Length/ Recovery (%)	(%)	ure ancy eter	Serial Number of Recovered
DEPTH	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth	SAMPLE TYPE	Sample	15		15	"N" Field	Water Level	Bulk Density gmc/cc	Recov Lengt cover	RQD (%)	Fracture Frequency per Meter	ial Nu Reco
10				(m)	TYPE	Number	cm	cm	cm	=	Wa				<u>-</u> <u>r</u> α	Ser of I
Ė	59.74	3		10.2	RC								66	17		
F			Moderately weathered greyish coloured Siltstone										70	38		
_ 11	59.14	3											10	30		
E	=		Moderately to slightly weathered greyish	11.2	RC											
-	-		coloured fine grained Sandstone.													
- - 12	. =												67	0		
F	<b>=</b>			12.2	RC											
E	-															
- - 13	=												62	0		
-	<u>'</u>			13.2	RC											
E	4															
Ė.	=												62	0		
- 14				14.2	RC											
E				14.2	, KC											
E													61	0		
15	크			45.0												
F	=			15.2	RC											
E	3												82	0		
_ 16	널															
E	=			16.2	RC											
F	=												83	0		
17																
E	]			17.2	RC											
F	=												84	0		
18	4													J		
F	=			18.2	RC											
E	1												06	0		
_ 19													86	0		
E	=			19.2	RC											
<b>F</b>	=												90	0		
20	50 14	3												•		

Remarks:

Boring, field test and sample collection conducted as per B.I.S Specification only.

Ref: I.S: 1892; 1498; 2131 & 2132.

SPT: Standard Penetration Test & UDS: Undisturbed soil sample.



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													IN	_		
			etechnical Investigation for NT								25		OPTU	NI and N	′ = 4004 O	
						_						N	UKIH:	N Or Y	= 4831.2	σ
		RING: R	-							BH 11						
			3: <u>150mm upto 6.10m &amp; Nx</u>	from 6.1	0 to 24.10	<u>)m</u> BGL						e tube				
		DEPTH:														
LOCA	TION:	Water Tre	eatment Plant				DAT	E S1	ART	ED: 1	7/4/10	C			21/4/10	
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE	Ē	BLO	BLOWS/1		Field	Level	Bulk Density	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
O DE	Red Leve	GRA L(	W TELW E BESSKII TISK	Sample Depth (m)	SAMPLE TYPE	Sample Number	15 cm	15 cm	15 cm	Ž	Water Level	gmc/cc	Reconsection Recon	RQI	Fra Freq per l	Serial of Rec
= =			Filled up soil													
= =																
1																
= =		$\bowtie$														
= =				1.5	SPT	1	3	3	5	8						
:																
- 2 -		$\bowtie$														
: ‡																
	67.417															
- 3 -			Greyish coloured clay	3	SPT	2	4	5	7	12						
= =																
: ‡																
4																
: =																
: ‡				4.5	LIDO											
= =				4.5	UDS	1			h	Recovere	ed					
5 -																
= =																
										10cm in	ı					
<u>6</u>	64.117	//////		6	SPT	3				100 blow						
: ‡		:::::::::::::::::::::::::::::::::::::::	Moderately weathered yellowish brown coloured	6.1	RC					N>100						
			fine grained Sandstone.										64	10		
: =													04	10		
7 -				7.1	RC											
				7.1	RC											
- 4													00			
= =													66	39		
- 8 -																
= =				8.1	RC											
: :													77	74		
9 =																
		:::::::		9.1	RC											
: ]		:::::::														
		:::::::											74	74		
10		::::::::														
Rema	rks: E	Boring, field	test and sample collection cond	ucted as p	per B.I.S S	pecification	only.			L		I	İ		1	
	F	Ref: I.S : 189	92; 1498; 2131 & 2132. ard Penetration Test & UDS : Ur													



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													N: _	_		
PROJ	ECT NA	ME Geo	otechnical Investigation for NT	PC Talc	her Therm	al Stage II	II (2)	k 660	MW)							
GROU	JND SU	RFACE EI	<b>LEVATION</b> : 70.217 m			_	EAS	ST: _	E or 2	X = 791.	.35	N	IORTH:	N or Y	= 4831.2	6
TYPE	OF BO	RING: R	otary				BOF	RING	NO:	BH 11	5					
DIAM	ETER O	F BORING	3: _150mm upto 6.10m & Nx	from 6.1	10 to 24.10	<u>)m</u> BGL	TYP	E OF	BIT	USED:_	Double	e tube				
TOTA	L HOLE	DEPTH:	24.1 m				SOI	L SA	MPLE	ER USEI	D:					
LOCA	TION:	Water Tr	eatment Plant				DAT	TE ST	TART	ED: <u>1</u>	7/4/10	c	OMPLE	ΓED: _2	21/4/10	
Ę.	(m)	SHC G	MATERIAL RECORDERON		SAMPLE	<u> </u>	BLO	WS/	15cm	ield	evel	Bulk	very gth/ ery (%)	(%)	ture iency feter	lumber overed
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	Sample Number	15 cm	15 cm	15 cm	"N" Field	Water Level	Density gmc/cc	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
	-		Moderately weathered yellowish brown coloured fine grained Sandstone. (continued)	10.1	RC								86	86		
- 11	59.117		Moderately weathered greyish coloured laminated Shales with	11.1	RC											
- 12	-		some Siltstone.	12.1	RC								71	0		
13				13.1	RC								77	0		
- 14	56.717	en an	Moderately weathered greyish coloured fine grained Sandstone with some Siltstone patches	14.1	RC								79	40		
- 15		en an en an	come estados o parestos	14.1	NO.								76	58		
15		An an an an an an an an an an an an an an		15.1	RC								74	49		
- 16 -		AR AR AR AR AR AR AR AR AR AR AR AR AR A		16.1	RC											
F -	1	A A A A A A											78	68		

Boring, field test and sample collection conducted as per B.I.S Specification only. Ref: I.S: 1892; 1498; 2131 & 2132. SPT: Standard Penetration Test & UDS: Undisturbed soil sample. Remarks:

18

19

20

17.1

18.1

19.1

RC

RC

RC

77

80

84

63

36

84



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													N:	_			
			technical Investigation for NT	PC Talch	ner Therma	al Stage II											
						_						N	NORTH: _	N or Y	= 4831.2	6	
			otary							BH 11							
			5: 150mm upto 6.10m & Nx	from 6.1	0 to 24.10	<u>lm</u> BGL											
		DEPTH:				_											
LOCA	ΓΙΟN:	Water Tre	eatment Plant			_	DA	E S	TART	ED: <u>1</u>	7/4/10						
TH (ι	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE		BLO	WS/	15cm	Field	evel	Bulk	overy gth/ ery (%)	RQD (%)	ture Jency Aeter	dumbe overed	
DEPTH (m)	Redu	GRAI	MATERIAL DESCRIPTION	Sample Depth (m)	SAMPLE TYPE	Sample Number	15 cm	15 cm	15 cm	Ž	Water Level	Density gmc/cc	Recovery Length/ Recovery (%	RQD	Fracture Frequency per Meter	Serial Number of Recovered	
26 - 27 - 28 - 28 - 28 - 28 - 28 - 28 - 28			Moderately weathered greyish coloured fine grained Sandstone with some Siltstone patches (continued)		RC RC RC	Numbel					W.		86 84 80 85	58 84 65 		S. S. S. S. S. S. S. S. S. S. S. S. S. S	
_ <u>29</u>																	
- - 30																	
Rema			test and sample collection cond	ucted as	l per B.I.S S <sub>l</sub>	L pecification	only.										
	F	Ref: I.S : 189	92; 1498; 2131 & 2132. ard Penetration Test & UDS : Uı														

Borehole termination at 24.1 m



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		<u></u>	LEVATION: _71.467 m						NOPTH: N or V = 4745.75							
		RING: R				_	<b>EAST:</b> <u>E or X = 752.75</u> <b>NORTH:</b> <u>N or Y = 4745.75</u> <b>BORING NO:</b> <u>BH 116</u>									
			3: _150mm upto 5.80m & Nx	from 5.8	0 to 25m	— BGI						e tube				
		DEPTH:		110111 0.0	0 10 20111	<u>50</u> 2						<i>3</i> (450				
			eatment Plant							ED: 4			OMPLE	TED:	15/4/10	
						_										ja g
Ħ_	Reduced Level (m)	GRAPHIC LOG			SAMPLE	Ē	BLC	WS/	15cm	Field	evel	Bulk	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered
DEPTH (m)	edu	LOC	MATERIAL DESCRIPTION	Sample	SAMPLE	Sample	15	15	15		Water Level	Density gmc/cc	eco eco	g	ract eque	al N Reco
0	K _	9		Depth (m)	TYPE	Number	cm		cm	=	Wat		Rec R		L. 도 호	Seri of F
			Filled up soil													
E																
1 -																
= =							_			_						
				1.5	SPT	1	2	3	4	7						
2 -																
= =																
= =																
	68.867		Greyish coloured clay	-												
3 -			i crojion coloured oldy		LIDC	4										
				3	UDS	1				Recovere	ea					
E 3																
4 =																
				4.5	ODT			١,		40						
				4.5	SPT	2	3	4	6	10						
- 5 -																
= =																
= =	65.667															
6 -	05.007		Moderately weathered	5.8	RC											
= =		*****	yellowish brown coloured Siltstone.													
E 3													58	0		
				6.8	RC											
7 -		****		0.0	RC											
													65	0		
E =		***											05	0		
Ė				7.8	RC											
8 -		*****		7.0	RC											
Ė =		*****											64	0		
<u> </u>													04	0		
		***		8.8	RC											
- 9 -				0.0	110											
E =		***											68	23		
<u> </u>																
E =		***		9.8	RC											
- 10 - Rema	ırks <sup>.</sup> 📮	oring field	test and sample collection cond			necification							65	0		
I VCIIIA	F	Pef- I.S - 189	92; 1498; 2131 & 2132. lard Penetration Test & UDS : U				. Orny.									
	3	ıı . Stanlu	ara i chelialion lest & UDS . U	เฉเจเนเมยเ	a son samp	iiC.										



PLOT NO. 1134, MAHANADI BIHAR, CUTTAK - 753 004 PH: 0671-2443588 Tele Fax: 0671 - 2443408

N: \_\_\_

PROJECT NAME Geotechnical Investigation for NTPC Talcher Thermal S	Stage III ( 2 x 660 MW)	
GROUND SURFACE ELEVATION: _71.467 m	<b>EAST</b> : E or X = 752.75	<b>NORTH:</b> N or Y = 4745.75
TYPE OF BORING: Rotary	BORING NO: BH 116	

DIAMETER OF BORING: _150mm upto 5.80m & Nx from 5.80 to 25m BGL  TOTAL HOLE DEPTH: _25 m						TYPE OF BIT USED: Double tube												
			eatment Plant				SOIL SAMPLER USED:  DATE STARTED: _4/12/10 COMPLETED: _15/4/10											
					O A M A D L E											ber ed		
DEPTH (m)	Reduced Level (m)	GRAPHIC LOG	MATERIAL DESCRIPTION		SAMPLE	=	BLO	WS/	15cm	"N" Field	Water Level	Bulk Density	Recovery Length/ Recovery (%)	RQD (%)	Fracture Frequency per Meter	Serial Number of Recovered		
	Red	GRA L		Sample Depth	SAMPLE TYPE	Sample Number	15 cm	15 cm	15 cm	Ž	'ater	gmc/cc	Rec Ler lecov	RQI	Fra Freq per	erial f Rec		
10			Madarataly weathered	(m)		rtarribor		0111	OIII		>		2			δō		
			Moderately weathered yellowish brown coloured										GE	0				
		****	Siltstone. (continued)										65	0				
11				10.8	RC													
													72	26				
		******		11.8	RC													
_ 12 _				11.0	INC													
F =													66	0				
		*****																
13				12.8	RC													
<u>E</u> =	57.967	***											75	0				
=			Moderately weathered greyish coloured	13.8	RC													
14			Siltstone.	13.6	RC													
													65	12				
F -																		
15				14.8	RC													
- 13																		
<u> </u>		***											70	0				
F =		*****		45.0	DC													
16		*****		15.8	RC													
		****											72	0				
F =														-				
17				16.8	RC													
- ''		*****																
<u>E</u> =		*****											75	19				
<u> </u>				17.0	DC.													
18				17.8	RC													
F =													70	0				
F =		**************************************												-				
10		*****		18.8	RC													
_ 19 _		****																
F =													72	0				
F		****		40.5	50													
20 -	rke: 5	as as as as	test and sample collection cond	19.8	RC	oocification	only						75	0				

Remarks: Boring, field test and sample collection conducted as per B.I.S Specification only. Ref: I.S: 1892; 1498; 2131 & 2132. SPT: Standard Penetration Test & UDS: Undisturbed soil sample.