

T. NARAYANA, B.E. / Civil
Chief Engineer / Civil / Thermal



**TELANGANA STATE
POWER GENERATION CORPORATION LTD.**
(A Govt. of Telangana State Undertaking)
CIN : U40102TG2014SGC094070
Vidyut Soudha, Hyderabad - 500 082. T.S. India.
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Cell : 7901092955
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To,

The Member Secretary (Thermal Power)
3rd Floor, Vayu Bhavan
Indira Paryavaran Bhavan,
Ministry of Environment, Forests & Climate change
Jor Bagh Road, Aliganj,
New Delhi - 110003.

Lr. No. CE/C/Thermal/SE/C/TCD-I/EE-I /F. BTPS Coal Transport/D.No. 83/19, Dt.
15.07.2019

Dear Sir,

Sub: TSGENCO - Environmental Clearance accorded for 1080 MW (4 X 270 MW) Coal Based Bhadradi Thermal Power Station (BTPS) at villages Ramanujavaram, Eddulabayyaram & Seethampuram, Mandals Manuguru & Pinapaka, District Bhadradi Kothagudem, Telangana State - Amendment to Environmental Clearance for temporary transportation of Coal by Road till the Railway siding of the project is commissioned - Additional details as sought by EAC, MoEF & CC, GoI - Submitted - Reg.

Ref

1. Environmental Clearance letter No. J-13012/02/2015-IA.I(T), dated 15.03.2017 of MoEF & CC, GoI, New Delhi.
2. Lr. No. CE/C/Thermal/SE/C/TCD-I/EE-I /F. BTPS Coal Transport/D.No. 29/19, Dt. 10.05.2019
3. Online proposal No. IA/TG/THE/105598/2019, dated.17.05.2019

Telangana State Power Generation Corporation Limited (TSGENCO) has submitted the online application 3rd cited, for issue of amendment to the Environmental Clearance granted for 1080 MW (4x270MW) Bhadradi Thermal Power Station (BTPS) at villages Ramanujavaram, Eddulabayyaram & Seethampuram, Mandals Manuguru & Pinapaka, District Bhadradi Kothagudem, Telangana State for coal transportation by road till the Railway siding of the project is commissioned.

Accordingly, the proposal was discussed in 28th Expert Appraisal Committee (Thermal Power) meeting held on 28.05.2019 at MoEF & CC, GoI, New Delhi and the same was deferred for want of certain additional information.

The additional details as sought by the Expert Appraisal Committee (Thermal Power), MoEF & CC, GoI are furnished herewith duly uploading the same in the web portal of MoEF & CC.

In this connection, the Ministry is requested to grant temporary permission to transport the coal by road from M/s. Singareni Collieries Company Limited (SCCL) mines till the railway siding of BTPS is commissioned, for a period of three (3) years.

Thanking you,

Yours faithfully,

For M/s. TSGENCO

A handwritten signature in blue ink, appearing to be 'J. Srinivas', with the date '15/7/2019' written below it.

Chief Engineer/Civil/Thermal

T. NARAYANA, B.E. / Civil
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New Delhi - 110003.

Lr. No. CE/C/Thermal/SE/C/TCD-I/EE-I /F. BTPS Coal Transport/D.No. 82/19,
Dt. 15.07.2019

Dear Sir,

Sub: TSGENCO - Environmental Clearance accorded for 1080 MW (4 X 270 MW) Coal Based Bhadradi Thermal Power Station (BTPS) at villages Ramanujavaram, Eddulabayyaram & Seetharampuram, Mandals Manuguru & Pinapaka, District Bhadradi Kothagudem, Telangana State - Amendment to Environmental Clearance for temporary transportation of Coal by Road till the Railway siding of the project is commissioned - Change of Consultants - Reg.

- Ref**
1. Environmental Clearance letter No. J-13012/02/2015-IA.I(T), dated 15.03.2017 of MoEF & CC, GoI, New Delhi.
 2. Lr. No. CE/C/Thermal/SE/C/TCD-I/EE-I /F. BTPS Coal Transport/D.No. 29/19, Dt. 10.05.2019
 3. Lr.No:CE/C/SE/TCD-I/EE/TCD-I/F.BTPS EC Amendment/D.No:56/2019, Dt:18.06.2019
 4. P.O.No.CC-0015/CE/C/T/SE/TCD-I/EE/TCD-I/F.BTPS EC Amendment/D.No. 57/2019, dt.18.06.2019.

Telangana State Power Generation Corporation Limited (TSGENCO) is pleased to inform the Ministry that TSGENCO has submitted the online application/proposal No. IA/TG/THE/105598/2019, dated.17.05.2019 vide letter 2nd cited for issue of amendment to the Environmental Clearance granted for 1080 MW (4x270MW) Bhadradi Thermal Power Station (BTPS) at villages Ramanujavaram, Eddulabayyaram & Seetharampuram, Mandals Manuguru & Pinapaka, District Bhadradi Kothagudem, Telangana State for coal transportation by road till the Railway siding of the project is commissioned.

Accordingly, the proposal was considered and discussed in 28th Expert Appraisal Committee (Thermal Power) meeting held on 28.05.2019 at MoEF & CC, GoI, New Delhi. The above proposal was deferred seeking certain additional information vide minutes of the meeting published in the website in the month of June, 2019.

Further, the Expert Appraisal Committee has expressed displeasure on the consultants i.e. M/s. B.S. Envi-Tech Pvt. Limited, Secunderabad as certain lapses were observed on the part of the of the consultants while preparing the report on traffic impact assessment and also in furnishing the required information such as width of roads, load bearing capacity of the road, details on baseline data such as air, quality, noise quality, traffic monitoring locations, etc.

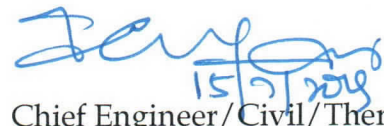
In view of the above, the order placed on M/s. B.S. Envi-Tech Pvt. Limited, Secunderabad for carrying the subject work was cancelled duly short closing the P.O. placed on them vide this office letter 3rd cited and M/s. Vimta Labs Limited, Hyderabad have been engaged as new environmental consultants in place of M/s. B.S. Envi-Tech Pvt. Limited, Secunderabad to carryout the further work vide this office P.O. 4th cited.

This is submitted for favour of information.

Thanking you,

Yours faithfully,

For M/s. TSGENCO

A handwritten signature in blue ink, appearing to read 'Jeyan', with the date '15/5/2019' written below it.

Chief Engineer/Civil/Thermal

**RESPONSE TO CLARIFICATION SOUGHT BY
EXPERT APPRAISAL COMMITTEE
FOR
AMENDMENT TO EC GRANTED FOR CHANGE IN MODE OF COAL
TRANSPORTATION FOR THE PROPOSED MANUGURU (BHADRADRI) THERMAL
POWER STATION (4 X 270 MW) AT MANUGURU & PINAPAKA MANDALS
BHADRADRI - KOTHAGUDEM DISTRICT, TELANGANA STATE**

Project Proponent



**Telangana State Power Generation
Corporation Limited**
(TSGENCO- A Government of Telangana State Undertaking)

Environment Consultant:



Vimta Labs Limited
142, IDA, Phase-II, Cherlapally,
Hyderabad-500 051, www.vimta.com
*(NABL/ISO 17025 Certified Laboratory,
Recognized by MoEF&CC, New Delhi)*

July, 2019



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradi) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradi-Kothagudem District, Telangana

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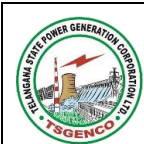
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Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradri-Kothagudem District, Telangana

1.0 INTRODUCTION

Telangana State Power Generation Corporation Limited (TSGENCO) proposes to set up Manuguru Thermal Power Station (4 x 270 MW) which is renamed as **Bhadradri Thermal Power Station (BTPS)** at villages of Ramanujavaram, Edulabayyaram & Seetharamapuram, in Manuguru & Pinapaka mandals, Bhadradri – Kothagudem district, Telangana. The cost of the BTPS is about Rs. 7290.60 Crores

2.0 PROJECT BACKGROUND

Environmental Clearance (EC) for the BTPS was accorded by MoEF&CC, GOI, New Delhi vide letter no: J-13012/02/2015-IA.I (T), dated 15th March, 2017. The Environmental Clearance issued by MoEF&CC is enclosed as **Annexure-I**. The raw material – coal required for 4x270 MW power plant is about 13,000 T/day which is proposed to be procured from Manuguru Opencast Mines of M/s. Singereni collieries Company Ltd.

As per Environmental Clearance granted, the transportation of coal from coalfields shall be by rail network. Railway route alignment from Manuguru Railway station to BTPS will be with a length of about 20.25 km. The extent of land required for railway siding will be about 69.27 ha (Acres 171.19 Gts.). Out of which about 25.9 ha (Ac 64.10 Gts) of area is of forest land and the remaining is assigned/patta land of about 43.33 ha (Ac 107.09 Gts).

2.1 Status of Land Acquisition for Railway Line

- Forest Land: 25.90 ha (Acres 64.10 Gts.)

An application has been submitted to Principal Chief Conservator of forests vide letter no: ED/C/Thermal/SE/C/TCD-II/BTPS/F.Forest/D.No.127/18, dated 23rd July 2018. PCCF, Hyderabad has returned the proposal to the Conservator of Forests, Kothagudem, requesting to identify the Non-forest CA land to an extent of 26 ha and resubmit the proposal for further processing of the same vide letter no: 6727/2018/FCA-3/PS, dated 17th December 2018. The revenue department is being pursued for identifying the Non-forest CA land to an extent of 26 ha. Identification of non-forest CA-Land to an extent of 26 ha is under process.

- Assigned/Patta Land (43.33 ha (Ac 107.09 Gts))

The acquisition/alienation of Assigned/patta land was filed with the Sub collector/Bhadrachalam, Bhadradri Kothagudem district on 11th April, 2018 vide letter no: CE/Elec/Construction/BTPS (4x270 MW)/F.No/D.No.21/18. Survey by Revenue department is also completed on 18th April, 2019. Preliminary notification for acquisition of lands was published in three different daily newspapers on the dates: 28th, 29th & 30th of June, 2019 for inviting objections if any from the public so as to finalise the land acquisition process. The preliminary paper notification clippings are enclosed as **Annexure-II**.



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradi) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradi-Kothagudem District, Telangana

3.0 PURPOSE OF SUBMISSION

The present proposal is for amendment to EC granted by MoEF&CC vide letter no: J-13012/02/2015-IA. I(T), dated 15th March, 2017 for temporary arrangement of coal transportation by road instead of rail network till the construction of railway line from Manuguru to BTPS is completed.

The application for EC amendment was filed with MoEF&CC – Thermal Committee for obtaining permission for coal transportation by road for three years instead of railway siding which was earlier proposed in Environmental Clearance granted for the 4x270 MW Bhadradi Thermal Power Station (BTPS). The proposal was discussed during the 28th Meeting of the Reconstituted EAC meeting of Thermal Power Projects in MoEF&CC on 28th May, 2019. As per the minutes dated 17th June, 2019 EAC sought clarifications on the following:

- ❖ *Revised traffic impact assessment report incorporating details of roads, traffic sufficiency and load bearing capacity, details of modelling parameters and results, details of village, habitation and forests and impact of proposed traffic on them; and*
- ❖ *The progress report containing milestones for completing all activities of railway siding/line within timelines.*

Minutes of 28th EAC meeting are enclosed as **Annexure-III**.

4.0 JUSTIFICATION OF THE PROPOSAL

The diversion of forest land in favour of TSGENCO from forest department and transfer of Assigned/Patta lands from Revenue department may take another 3 months as the land acquisition process is in advanced stage. Further, the construction of railway line from Manuguru railway station to BTPS plant and marshalling yard in BTPS may take about 2 1/2 years after land acquisition. Hence, the total time period required for completion of railway line will be about 3 years.

This project is a priority project of Govt. of Telangana, for providing power to the farmers and lift irrigation sector. Hence, the commissioning of the project is utmost important. Thus, temporary permission to transport coal by existing road till the railway line is implemented is essential.

4.1 Scope of the Study

The scope of the study includes

- Collection of road details for the purpose of the traffic study along the proposed route (Manuguru – Eturunagaram State Highway) from mine to BTPS plant and at road junctions;
- Assessment of adequacy of transportation infrastructure to cater to the additional load due to proposed coal transportation by road;
- Development of preliminary traffic management proposals including infrastructure capacity enhancements and demand management measures to meet the estimated demand on the access road network.



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradi) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradi-Kothagudem District, Telangana

5.0 PROJECT PROPONENT

Telangana State Power Generation Corporation Limited (TSGENCO) is one of the pivotal organizations of Telangana, engaged in the business of power generation. Apart from the operation and maintenance of the power plants it has under taken the execution of the ongoing and new power projects scheduled under capacity addition program and is also taking up renovation and modernization works of the old power stations.

TSGENCO has been incorporated under Companies Act, 2013, on 19th May 2014 and commenced its operations from 02-06-2014. After bifurcation of Telangana state as per Andhra Pradesh State Re-Organization Act, this was a sequel to Government's reforms in power sector to un-bundle the activities relating to generation, transmission and distribution of power, which were earlier taken up by APSEB. All the generating stations owned by erstwhile APSEB and APGENCO located in the Telangana state were transferred to the control of TSGENCO.

TSGENCO is establishing power plants for power generation to meet the growing demand for industrial, agriculture, domestic and other sectors in Telangana. As per 18th Electric Power Survey (EPS), CEA, peak demand anticipated by 2016-17 is 11,210 MW and base demand is 8968 MW. Telangana State will require about installed capacity of 4445.26 MW by the end of 12th Plan and 17,041 MW by the end of 13th Plan.

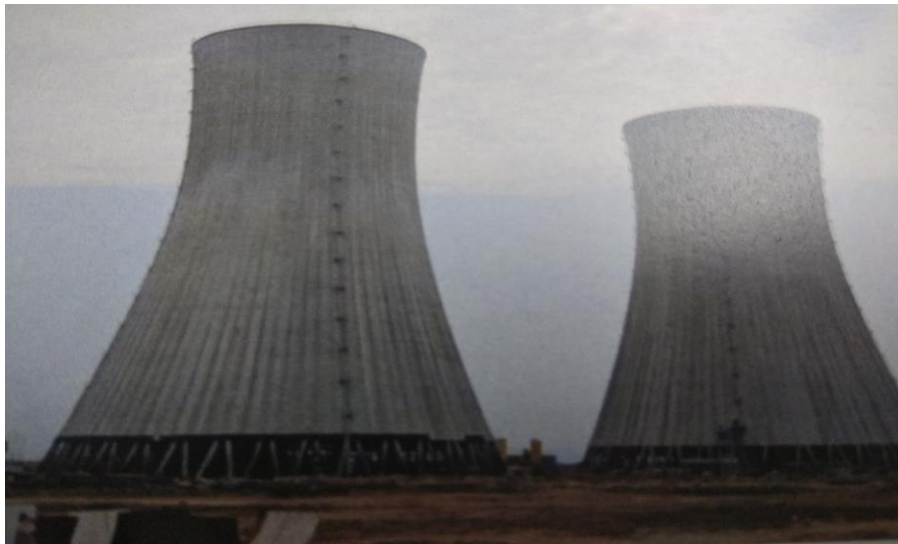
Telangana state government has mandated TSGENCO for adding capacity of 6,160 MW in next 3 to 4 years to meet ever growing power demand for industrial, agriculture, domestic and other sectors in Telangana State. As a part of above programme, TSGENCO has proposed to install 4 x 270 MW (green field) coal based power generation unit at Manuguru, Bhadradi – Kothagudem district, Telangana

❖ Implementation Status of 4x270 MW BTPS

The construction works are under progress and proposed to synchronize the unit-1 by end of July, 2019 and other three units by end of December, 2019. The photographs showing the present project implementation status is given in **Figure-1**.



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradi) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradi-Kothagudem District, Telangana



**FIGURE-1
PRESENT PROJECT IMPLEMENTATION STATUS**



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradri-Kothagudem District, Telangana

6.0 ENVIRONMENTAL SETTING OF THE SITE

The environmental setting of the proposed thermal power plant site is given in **Table-1**. The location map of the proposed project site and study area map of 10 km radius around the power plant are given in **Figure-2** and **Figure-3** respectively. The plant is well connected by road and State High Way (SH-12) is passing adjacent to project site.

**TABLE-1
ENVIRONMENTAL SETTING OF THE PROJECT SITE**

Sr. No.	Particulars	Details																																													
1	Plant location	Plant is located in villages of Ramanujavaram, Eddulabayyaram & Seetharamapuram, in Manuguru & Pinapaka mandals, Bhadradri – Kothagudem district (erstwhile Khammam district), Telangana																																													
2	Plant site coordinates	<p align="center">PLANT SITE COORDINATES</p> <table border="1"> <thead> <tr> <th>CODE</th> <th>LATITUDE</th> <th>LONGITUDE</th> </tr> </thead> <tbody> <tr><td>R1</td><td>18° 01' 24.3725" N</td><td>80° 43' 50.6635" E</td></tr> <tr><td>R3</td><td>18° 01' 39.2950" N</td><td>80° 43' 51.4611" E</td></tr> <tr><td>R4</td><td>18° 01' 53.8001" N</td><td>80° 43' 48.5259" E</td></tr> <tr><td>R5</td><td>18° 01' 56.0764" N</td><td>80° 44' 25.7654" E</td></tr> <tr><td>R6</td><td>18° 01' 56.2008" N</td><td>80° 44' 27.8020" E</td></tr> <tr><td>R6A</td><td>18° 02' 0.1226" N</td><td>80° 44' 38.9906" E</td></tr> <tr><td>R6B</td><td>18° 02' 5.2855" N</td><td>80° 44' 43.8115" E</td></tr> <tr><td>R9</td><td>18° 01' 48.7232" N</td><td>80° 44' 48.7332" E</td></tr> <tr><td>R10</td><td>18° 01' 31.7872" N</td><td>80° 44' 49.5143" E</td></tr> <tr><td>R11</td><td>18° 01' 8.4694" N</td><td>80° 44' 49.3050" E</td></tr> <tr><td>R12</td><td>18° 01' 9.1109" N</td><td>80° 44' 46.3803" E</td></tr> <tr><td>R13</td><td>18° 01' 23.2465" N</td><td>80° 44' 40.5629" E</td></tr> <tr><td>R14</td><td>18° 01' 21.4915" N</td><td>80° 44' 17.7147" E</td></tr> <tr><td>R15</td><td>18° 01' 10.6761" N</td><td>80° 44' 15.9220" E</td></tr> </tbody> </table>	CODE	LATITUDE	LONGITUDE	R1	18° 01' 24.3725" N	80° 43' 50.6635" E	R3	18° 01' 39.2950" N	80° 43' 51.4611" E	R4	18° 01' 53.8001" N	80° 43' 48.5259" E	R5	18° 01' 56.0764" N	80° 44' 25.7654" E	R6	18° 01' 56.2008" N	80° 44' 27.8020" E	R6A	18° 02' 0.1226" N	80° 44' 38.9906" E	R6B	18° 02' 5.2855" N	80° 44' 43.8115" E	R9	18° 01' 48.7232" N	80° 44' 48.7332" E	R10	18° 01' 31.7872" N	80° 44' 49.5143" E	R11	18° 01' 8.4694" N	80° 44' 49.3050" E	R12	18° 01' 9.1109" N	80° 44' 46.3803" E	R13	18° 01' 23.2465" N	80° 44' 40.5629" E	R14	18° 01' 21.4915" N	80° 44' 17.7147" E	R15	18° 01' 10.6761" N	80° 44' 15.9220" E
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7	Plant site elevation above MSL	65 to 75 m above MSL																																													



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradi) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradi-Kothagudem District, Telangana

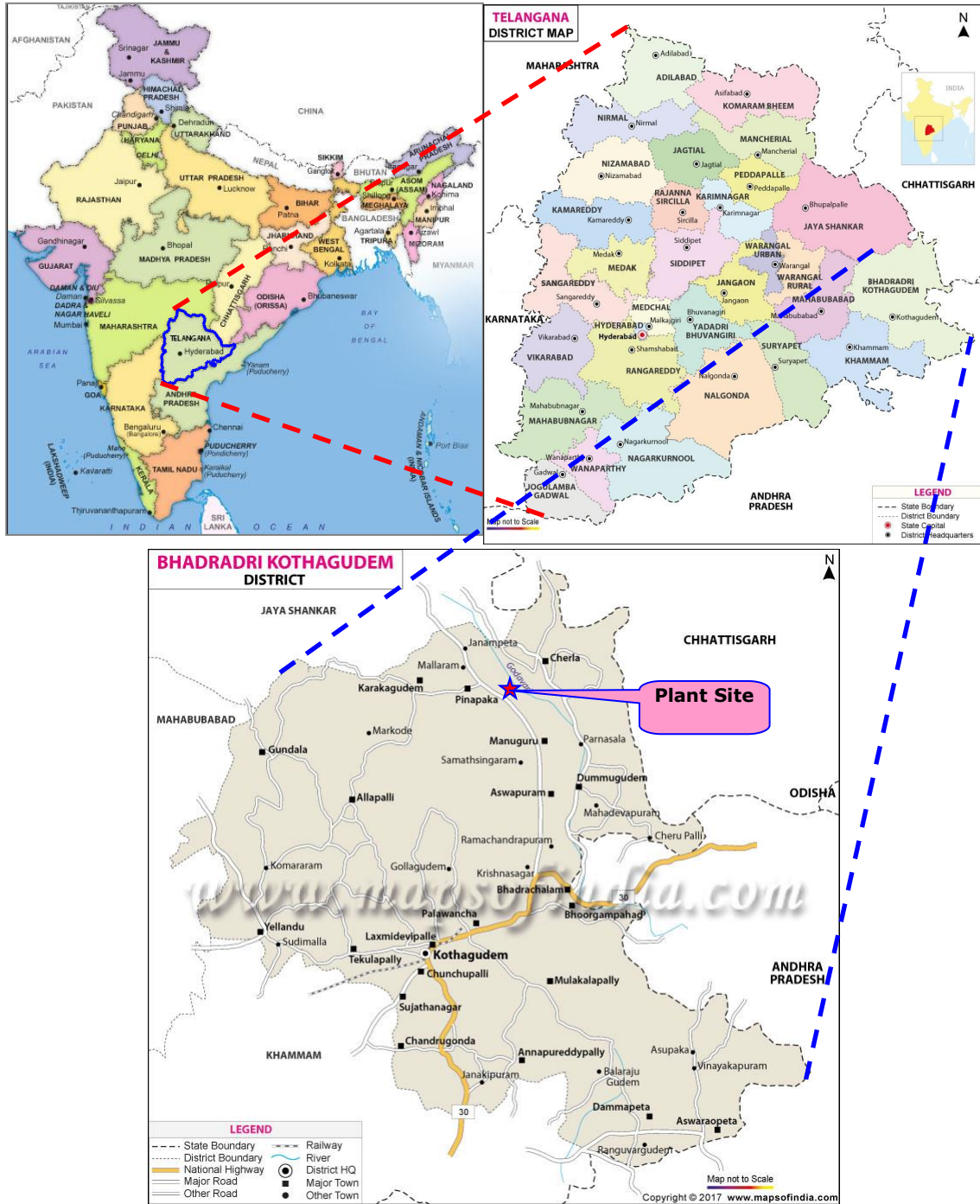
Sr. No.	Particulars	Details
8	Plant site topography	Plain with general gradient
9	Present land use at the site	Agricultural land
10	Nearest highway	NH-221 (37.0 Km, SSE) SH-12 Manuguru to Eturunagaram – adjacent to the project site
11	Nearest railway station	Manuguru (15 km, SSE)
12	Nearest Airport	Rajahmundry (AP) - 154 km, SE Vijayawada (AP) - 165 km, S and Hyderabad Airport (Telangana) – 257 km, SW
13	Nearest major water bodies	Godavari River (0.8 km, E) Perantala Cheruvu (Adjacent to ash pond) Pedda Vagu (1.2 km, N) Talperu river near Eragadda village (8 km, E) Elchireddipalle Cheruvu (2.8 km, NNW)
14	Water source for the project	Godavari River (8.6 km, E)
15	Nearest town/City	Bhadrachalam Town (40 km, SSE)
16	Nearest village	Chikkudugunta Village (0.2 km, SE) Dhamakkapeta Village (0.5 km, SSE)
17	Hills/valleys	No major hills and valleys within 10 km radius except some hillocks
18	Major Crops in study area	Paddy, Chilly, cotton, pulses and eucalyptus
19	Archaeologically important places	None in 10 km radius
20	Protected areas as per Wildlife Protection Act, 1972 (Tiger reserve, Elephant reserve, Biospheres, National parks, Wildlife sanctuaries, community reserves and conservation reserves)	None in 10 km radius
21	Reserved / Protected Forests	1. Kondayyagudem RF (1.8 km, S) 2. RF near Venkatrapeta (4.6 km, NNW) Janapet RF near Gaddigudem village (5.5 km, WNW) 4. Subbampet RF (6.7 km, NE) 5. Kalavanagaram RF (7.9 km, W) 6. Cherla RF (8.2 km, NE)
22	Seismicity	Seismic Zone-III as per IS 1893 (Part I): 2002
23	Defence Installations	Nil
24	Surrounding Industries	Singareni Collieries open cast coal mine (7.0 km, SS) near Manuguru.

Note: All distances mentioned in above table are aerial distances measured on toposheets from boundary to boundary

The proposed coal transportation route map is shown in **Figure-4**. The proposed coal transportation route from manuguru oc-4 and mallepalli – OC mine google imagery is shown in **Figure-5**.



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradri-Kothagudem District, Telangana



**FIGURE-2
PLANT SITE LOCATION MAP**



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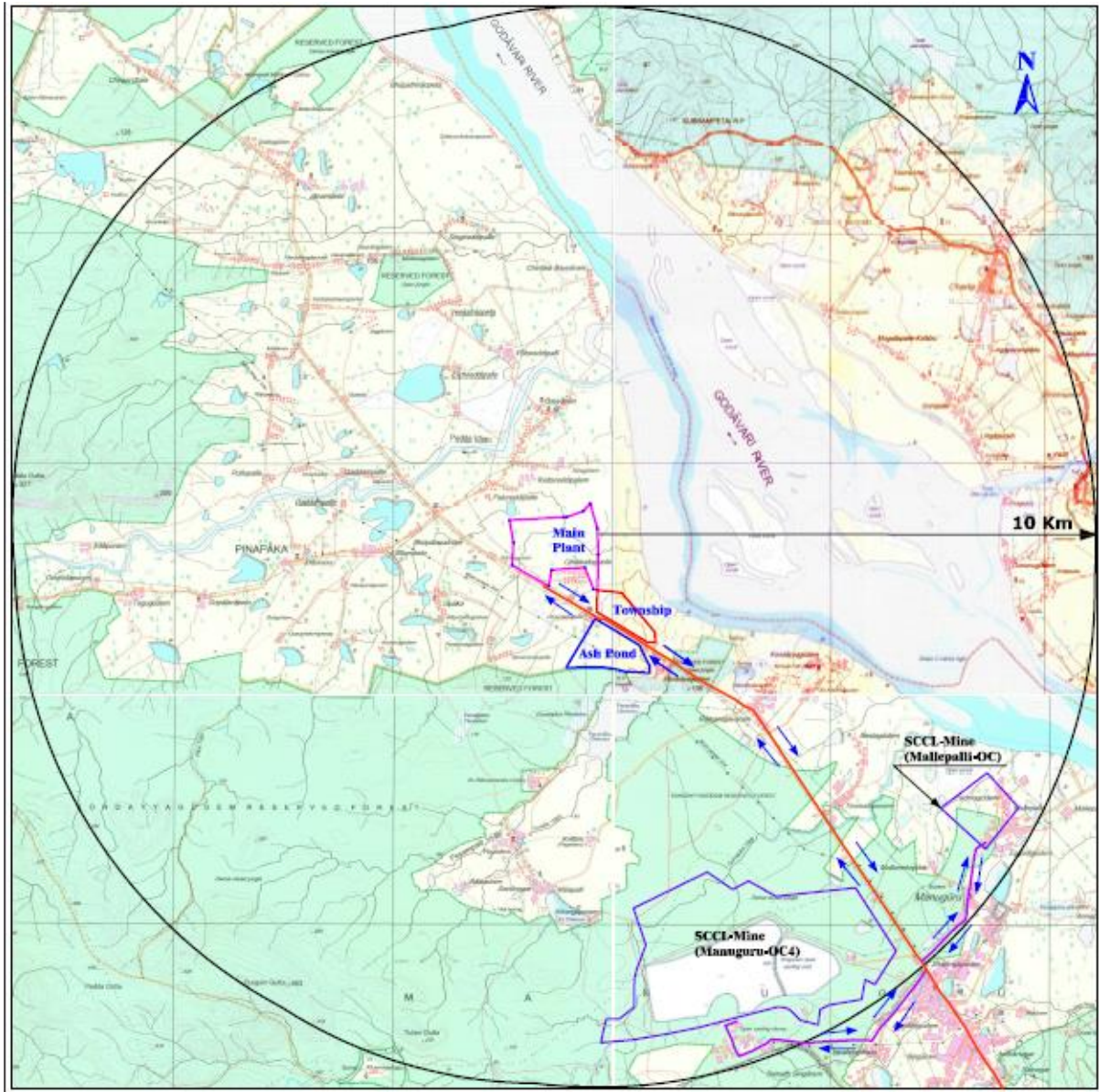


FIGURE-3
10 KM RADIUS STUDY AREA TOPO MAP OF BTPS PLANT



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradri-Kothagudem District, Telangana

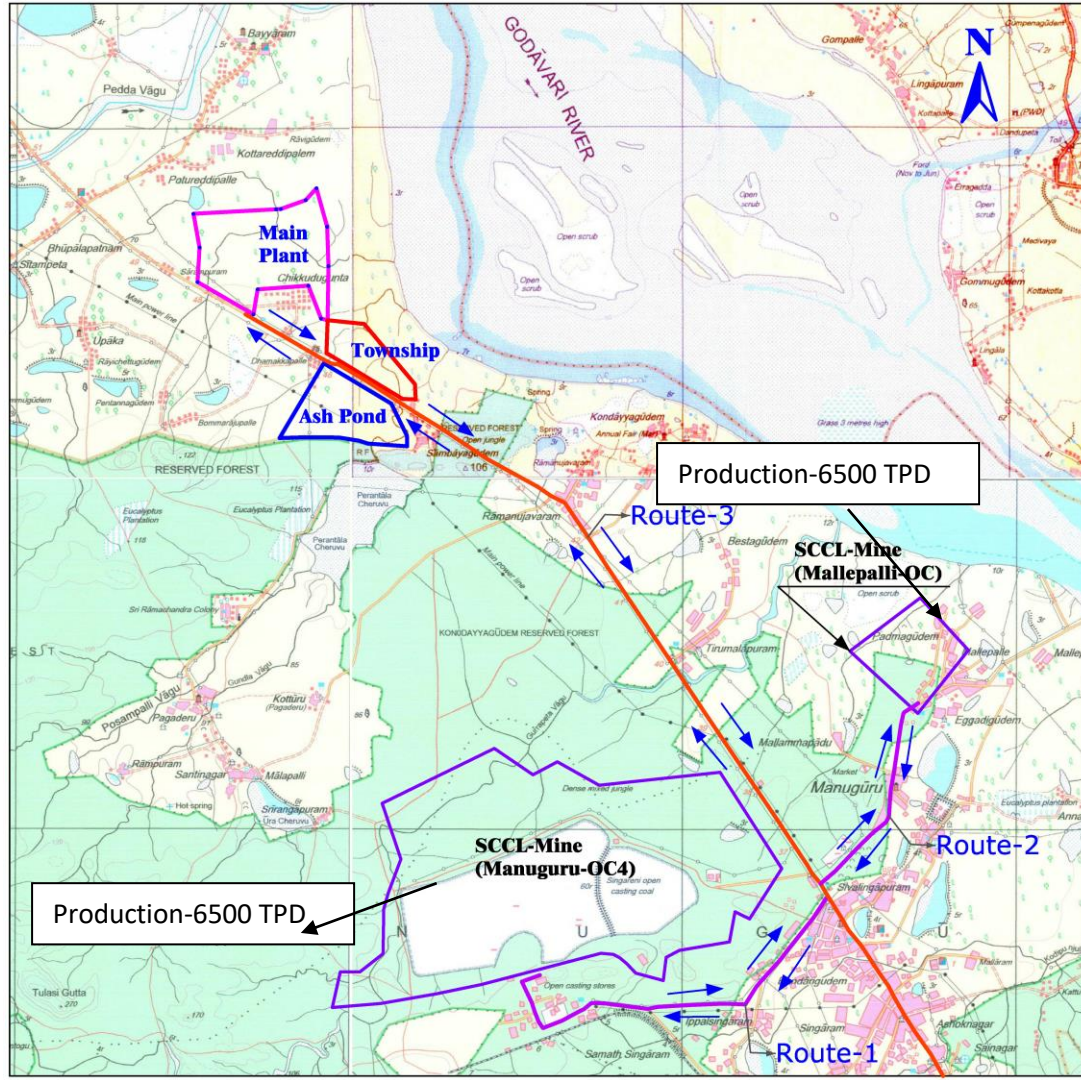
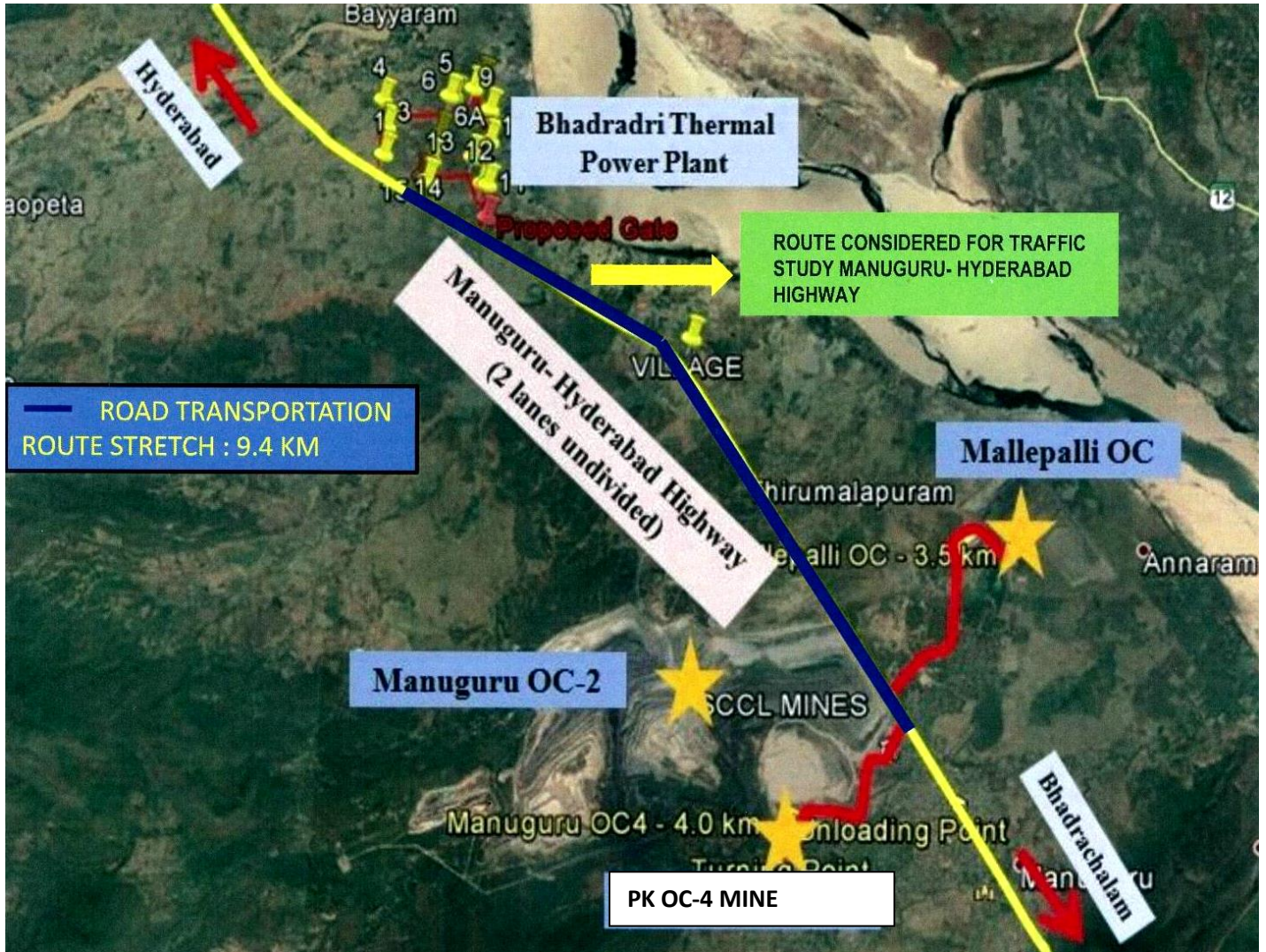


FIGURE-4
PROPOSED COAL TRANSPORTATION ROUTE MAP



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradi) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradi-Kothagudem District, Telangana

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**FIGURE-5
PROPOSED COAL TRANSPORTATION ROUTE FROM
PK OC-4 MINE AND MALLEPALLI MINE
OC MINE GOOGLE IMAGERY**



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradri-Kothagudem District, Telangana

7.0 RESPONSE TO CLARIFICATIONS SOUGHT BY EXPERT APPRAISAL COMMITTEE

7.1 Query-1: Revised traffic impact assessment report incorporating details of roads, traffic sufficiency and load bearing capacity, details of modelling parameters and results, details of village, habitation and forests and impact of proposed traffic on them

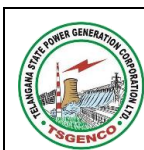
7.1.1 Traffic Impact Assessment Study

As a part of the traffic impact assessment study, details of the roads were collected and traffic surveys were conducted to assess the current traffic load and traffic sufficiency. Air dispersion modeling studies were conducted to determine the impact of the proposed traffic on the nearby villages, habitation and forests and the findings are presented in this report.

The video film taken along the road (coal transportation route) from Prakasham Khani (P.K) OC-4 Mine to BTPS plant and Mallepalli OC Mine to BTPS plant along the Manuguru – Eturunagaram State highway is enclosed as Annexure-IV.

▲ Road Connectivity – Coal Transportation Route

The road connecting the Manuguru – Eturunagaram State highway (SH-12) with the loading point at Mines – Mallepalli OC & Prakasham Khani (P.K) OC-4 is a 2 lane BT road connecting Manuguru and Eturunagaram. The entire stretch from loading point ie from Mallepalli OC mine to BTPS is about 14.10 km and from loading point PK OC-4 to BTPS the distance is about 15.6 km. The width and other details of the coal transportation route is give in Table-1A.



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**TABLE-1A
DETAILS OF ROADS FROM COAL LOADING POINT OF SCCL MINES TO BTPS PLANT**

Sr.No	Description of the Mine	Name of the Stretch/Road	Length (km)	Carriage Way Width (m)		Berms (m)	Type of Road	Owned by	Total Route Length from Source of coal to BTPS
				Incoming	Outgoing				
A	Source-1(PK Mine OC-4), Manuguru (M), Bhadradi Kothagudem Dist.	Stretch-1 (Coal loading point to SCCL Check post)	1.20	9.00	7.00	-	WBM	SCCL	15.60 km (5.40+10.20 km)
		Stretch-2 (from SCCL Check post connecting to Manuguru - Eturunagaram SH-12 - Junction point)	4.20	7.00		2.0 + 2.0	BT	SCCL	
		Sub total	5.40					Internal Road	
		Stretch-3 (Main Road i.e. Manuguru to Eturunagaram SH-12 leading to BTPS plant)	10.20	7.00		1.50+1.50	BT	R&B (Main Road)	
		Total	15.60						
B	Source-2 (Mallepalli OC), Manuguru (M), Bhadradi Kothagudem Dist.	Stretch-1 (Coal loading point to SCCL Check post)	0.30	8.00	10.00	-	WBM	SCCL	14.10 km (4.00+10.20 km)
		Stretch-2 (SCCL Check post connecting to Manuguru - Eturunagaram SH-12)	3.70	10.00		2.0+2.0	BT	SCCL	
		Sub total	4.00					Internal Road	
		Stretch-3 (Main Road i.e. Manuguru to Eturunagaram SH-12 leading to BTPS plant)	10.10	7.00		1.50+1.50	BT	R&B (Main Road)	
		Total	14.10						



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1. Prakasham Khani Mine (PK OC-4)

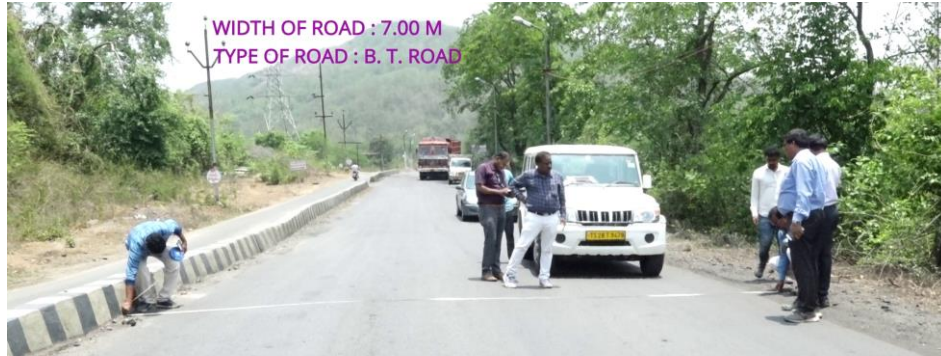
The width of the incoming road from loading point of PK OC-4 mine to check post of SCCL is 9.0 m and width of outgoing road is 7.0 m with a divider in between incoming and outgoing roads from check post and the type of road is WBM for a length of 1.2 km.

From check post to Manuguru – Eturunagaram State highway junction the width of the road is 7.0 m with 2 m berm on either side or the type of road is BT road. However, the width of the road at junction point is 9.0 m with bell mouth connection. The photographs showing proposed coal transportation route from PK Mine (OC-4) to Manuguru – Eturunagaram State Highway are shown in **Figure-6**.





Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradri-Kothagudem District, Telangana



CONNECTING ROAD FROM P.K. MINE (OC-4) TO MANUGURU-ETURUNAGARM STATE HIGHWAY

**FIGURE-6(A)
PHOTOGRAPHS SHOWING THE ROUTE – PK MINE OC-4**



CONNECTING ROAD FROM P.K. MINE (OC-4) TO MANUGURU-ETURUNAGARM STATE HIGHWAY



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradi) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradi-Kothagudem District, Telangana

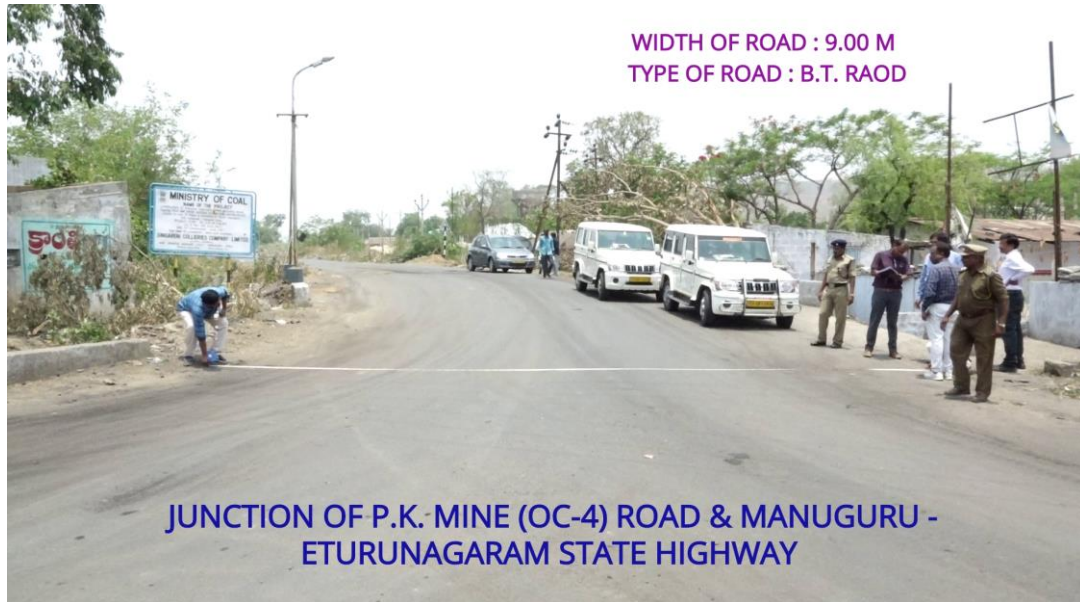


FIGURE-6(B)
PHOTOGRAPHS SHOWING THE ROUTE – PK MINE OC-4

Mallepalli OC Mine Loading Point

The width of the incoming road from loading point of Mallepalli OC mine to check post of SCCL mine is 8.0 m and width of outgoing road is 10.0 m with a divider in between incoming and outgoing roads. The type of road is WBM for a length of 300 m.

The width of the road from SCCL mine check post to state highway is 10 m and the type of road is BT road for a length of 3.7 km.

The photographs showing the proposed coal transportation route from Mallepalli OC mine loading point to Manuguru – Eturunagaram State Highway are shown in **Figure-7**.



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradi) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradi-Kothagudem District, Telangana



COAL LOADING POINT AT MALLEPALLI OPEN CAST MINE





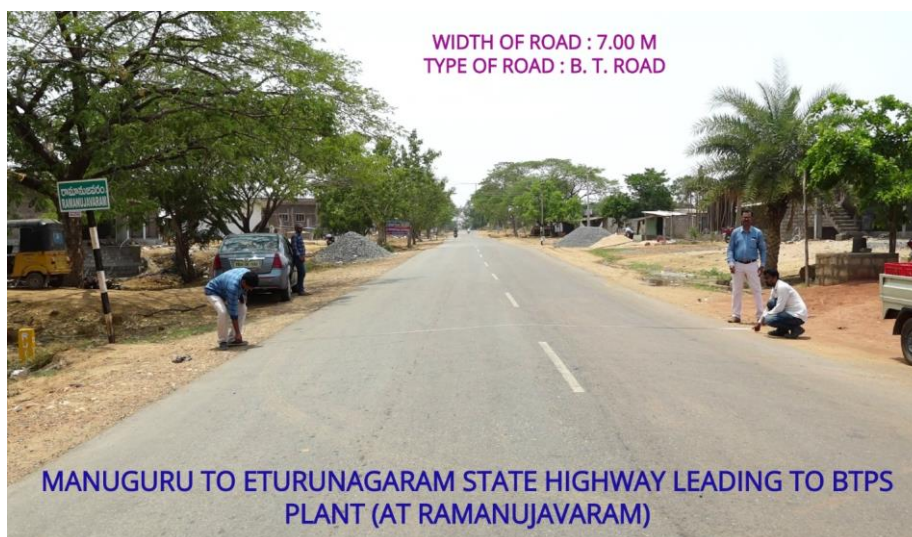
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FIGURE-7
PHOTOGRAPHS SHOWING THE ROUTE – MALLEPALLI OC MINE LOADING POINT

Main road Leading to BTPS plant (Manuguru – Eturunagaram State Highway)

The state highway ie; Manuguru – Eturunagaram is of 2 lane road with a width of 7.0 m with 1.5 m berms on either side of the road. The type of road is BT road. The length of the road from junction of PK mine and state highway to BTPS main gate is 10.2 km. The photographs showing the Manuguru to Eturunagaram SH leading to BTPS Plant route is shown in **Figure-8**.





Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradri-Kothagudem District, Telangana

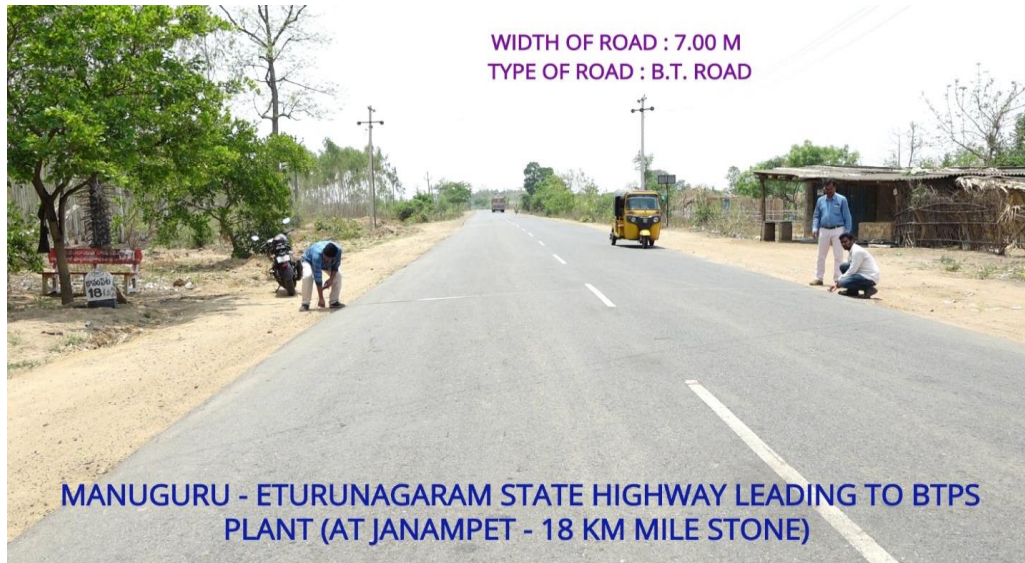


FIGURE-8
PHOTOGRAPHS SHOWING THE ROUTE – MAIN ROAD LEADING TO BTPS PLANT

▲ **Traffic Survey Details**

Traffic studies were carried out at 3 locations along the roads connecting to coal mines, connecting to state highway road – Manuguru to BTPS. Studies were carried out from 7th June to 8th June 2019 for 24 hours duration. The main objective of the survey was to count the number of vehicles plying on the roads and to assess the increase in traffic density due to the proposed transportation of coal from mine loading points to BTPS plant.

7.2 Methodology

• **Vehicle Count**

The vehicles plying in both the directions were counted continuously for 24 hours at all the identified locations. The vehicles were counted every hour and recorded under respective category. The vehicles were categorized under various heads like 2/3 wheelers, tractors, four wheelers, trucks/multi axel trucks/tankers and buses. The categorization of the vehicles is necessary because the speed and the emission factors vary with type of the vehicle. The details of locations of traffic monitoring are given in **Table-2** and **Figure-9** to **Figure-11**. The hourly traffic count at all the locations is presented in **Annexure-VII**.



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TABLE-2(A)
DETAILS OF TRAFFIC MONITORING LOCATIONS
T1 – PK OC-4 MINE ROAD & STATE HIGHWAY JUNCTION

Code	Directions
A	PK mine to Manuguru
B	Manuguru to PK mine
C	PK mine to BTPS
D	BTPS to PK Mine
E	Manuguru to BTPS
F	BTPS to Manuguru

TABLE-2(B)
DETAILS OF TRAFFIC MONITORING LOCATIONS
T2 – MALLEPALLI MINE ROAD & STATE HIGHWAY JUNCTION

Code	Directions
A	BTPS to Mallepalli
B	Mallepalli to BTPS
C	Manuguru to Mallapalli
D	Mallapalli to Manuguru

TABLE-2(C)
DETAILS OF TRAFFIC MONITORING LOCATIONS
T3 – ON STATE HIGHWAY AT RAMANJAVARAM VILLAGE

Code	Directions
A	BTPS to Manuguru
B	Manuguru to BTPS



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FIGURE-9
T1 – PK OC-4 MINE ROAD & STATE HIGHWAY JUNCTION



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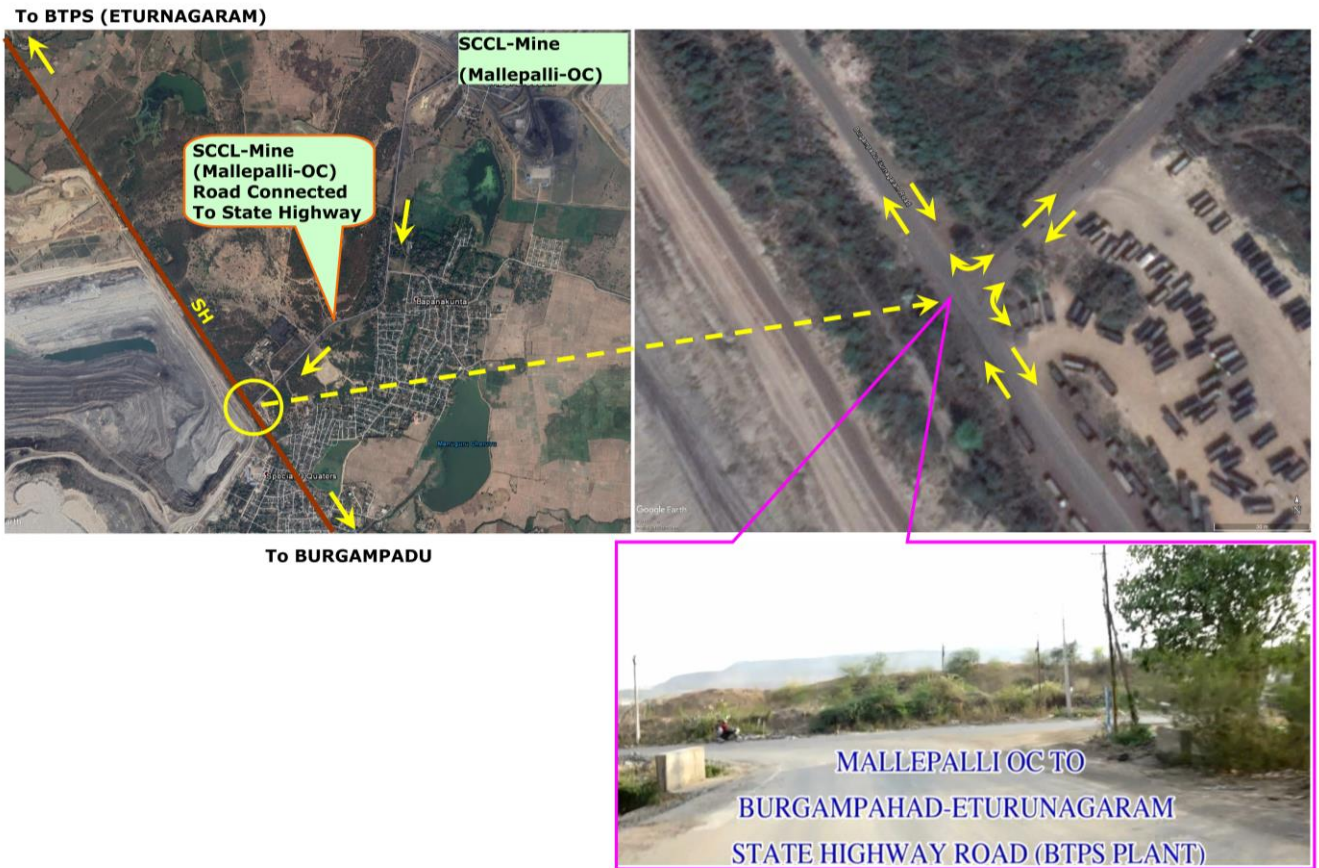


FIGURE-10
T2 -MALLEPALLI OC MINE ROAD & MANUGURU – ETURUNAGARAM STATE HIGHWAY JUNCTION



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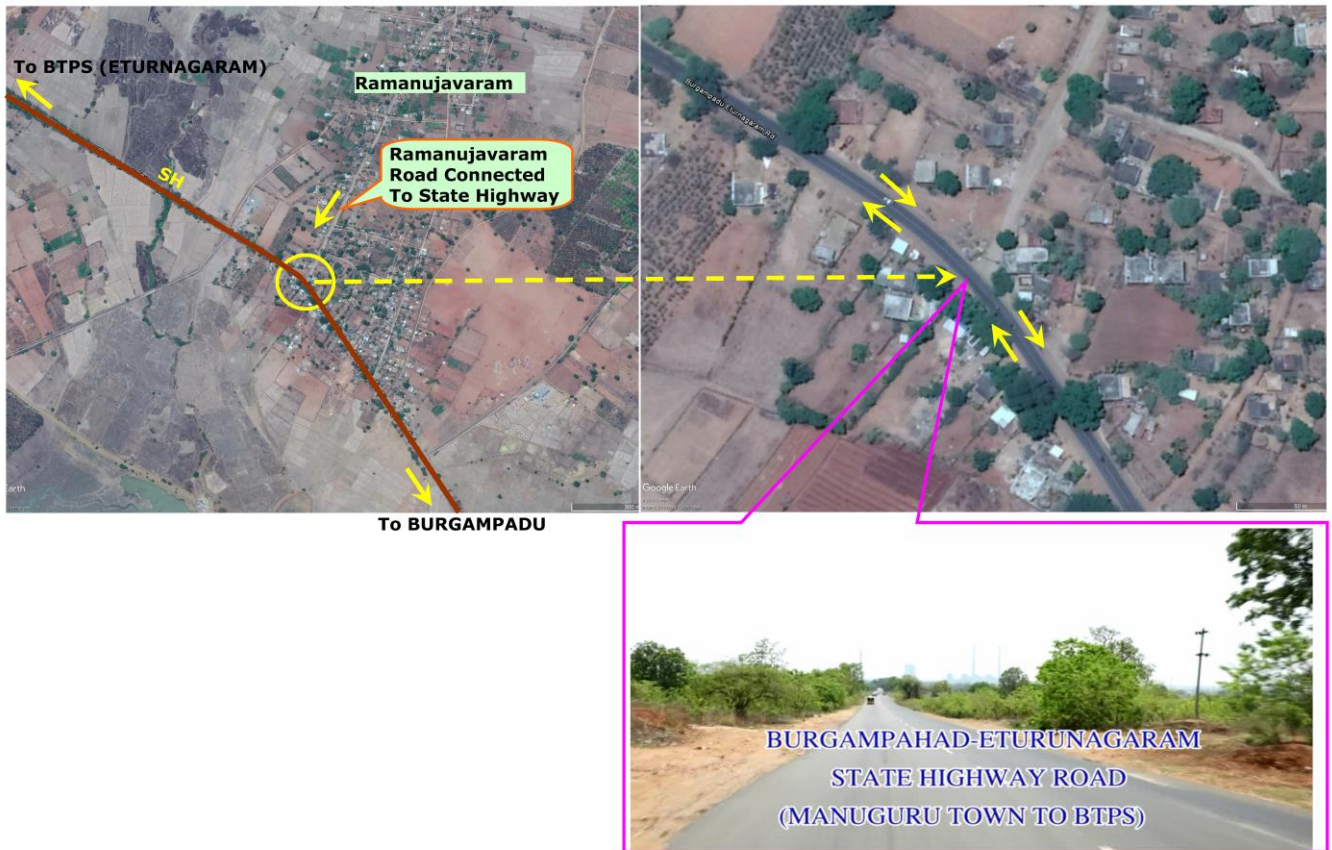
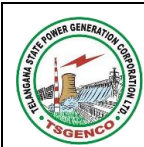


FIGURE-11
T3 – ON STATE HIGHWAY AT RAMANJAVARAM VILLAGE



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7.3 Presentation of Results

Traffic volume is defined as the number of vehicles crossing a section of road per unit time at any selected period. The present level of traffic has been converted to Passenger Car Units (PCU) at all the locations as per the conversion factors stipulated by Indian Road Congress (IRC):64-1990 (enclosed as **Annexure-V**). Traffic density is the number of vehicles occupying a given length of the highway in a traffic lane. The details of traffic count at all locations are summarized in **Table-3**. The details of traffic volume on coal transportation at all the locations are summarized in **Table-4**. The graphical representation showing the traffic density in terms of no. of vehicles plying on road at each junction is given in **Figure-12** to **Figure-13**.

TABLE-3
TRAFFIC COUNT

Code	Location/Road	Vehicular count					6	7	8	
		1	2	3	4	5				
		2&3- Wheeler	Car & Jeeps	LMV	HMV/ Multi-axel	Other Vehicles				
	PCU factor (IRC Guidelines)	0.5	1	1.5	3	3	Total			
T1	PK OC-4 Mine Road & State Highway Junction									
	PK Mine to Manuguru	492	72	295	257	24	2660	5061	7003	
	Manuguru to PK Mine	664	265	206	352	33				
	Total no. of Vehicles	1156	337	501	609	57				
		In PCUs	578	337	752	1827	171	3665		
	PK Mines to BTPS	696	92	289	273	22	2401			
	BTPS to PK Mines	411	113	169	312	24				
	Total no. of Vehicles	1107	205	458	585	46				
		In PCUs	554	205	687	1755	138	3339		
	BTPS to Manuguru	1369	779	495	508	50	5548			
	Manuguru to BTPS	852	638	445	404	8				
Total no. of Vehicles	2221	1417	940	912	58					
	In PCUs	1111	1417	1410	2736	174	6848			
T-2	Mallepalli mine road & state highway junction									
	BTPS to Mallepalli	94	46	40	58	14	659	4936	6994	
	Mallepalli to BTPS	167	88	56	95	1				
	Total no. of Vehicles	261	134	96	153	15				
		In PCUs	131	134	144	459	45	913		
	Manuguru to Mallepalli	941	254	390	499	23	4277			
	Mallepalli to Manuguru	906	371	198	679	16				
	Total no. of Vehicles	1847	625	588	1178	39				
	Total PCU	924	625	882	3534	117	6082			
T3	State Highway At Ramanjavaram Village									
	BTPS to Manuguru	1088	578	339	462	22	5299	5299	6196	
	Manuguru to BTPS	1328	661	450	349	22				
	Total no. of Vehicles	2416	1239	789	811	44				
	Total PCU	1208	1239	1184	2433	132	6196			

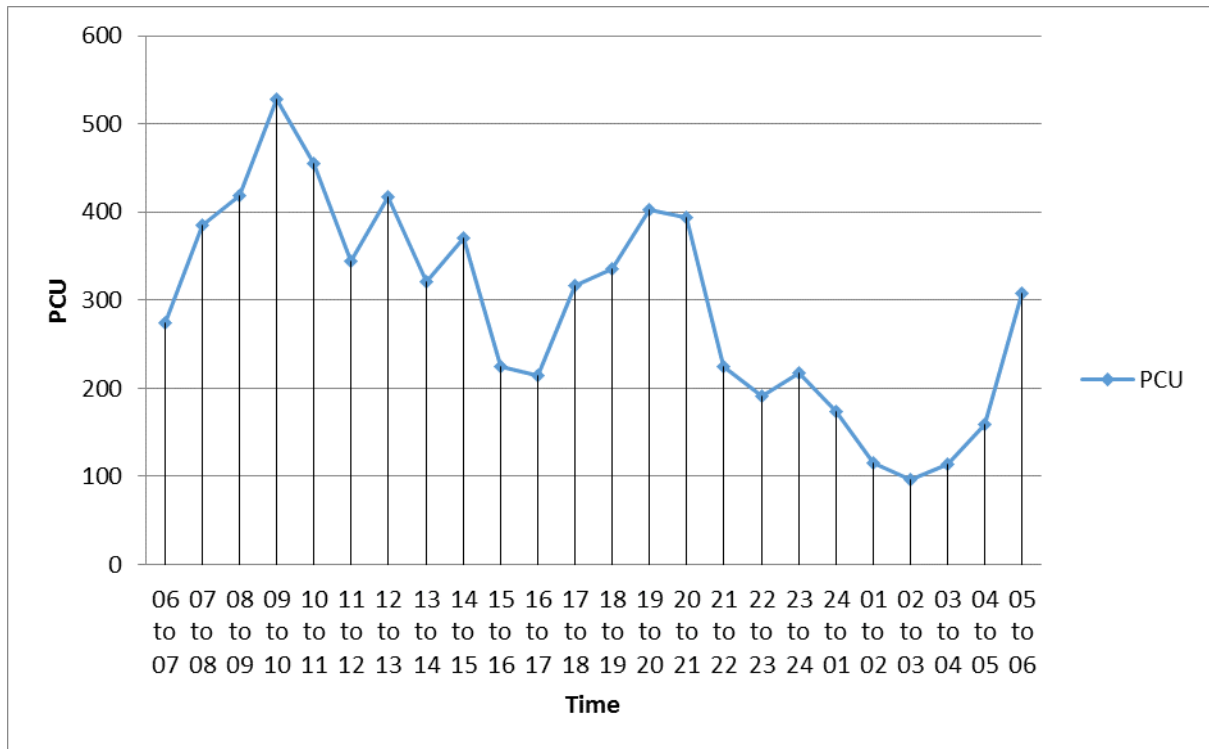


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**TABLE-4
TRAFFIC VOLUME ON COAL TRANSPORTATION ROUTE**

Sr.No	Name of the Road	Total Traffic in Count (VPD)	Total Traffic (In PCU per Day)
1	PK Mine to State Highway	5061	7003
2	Mallepalli Mine to State Highway	4936	6994
3	State highway at Ramanjavaram village	5299	6196

VPD: Vehicles per day

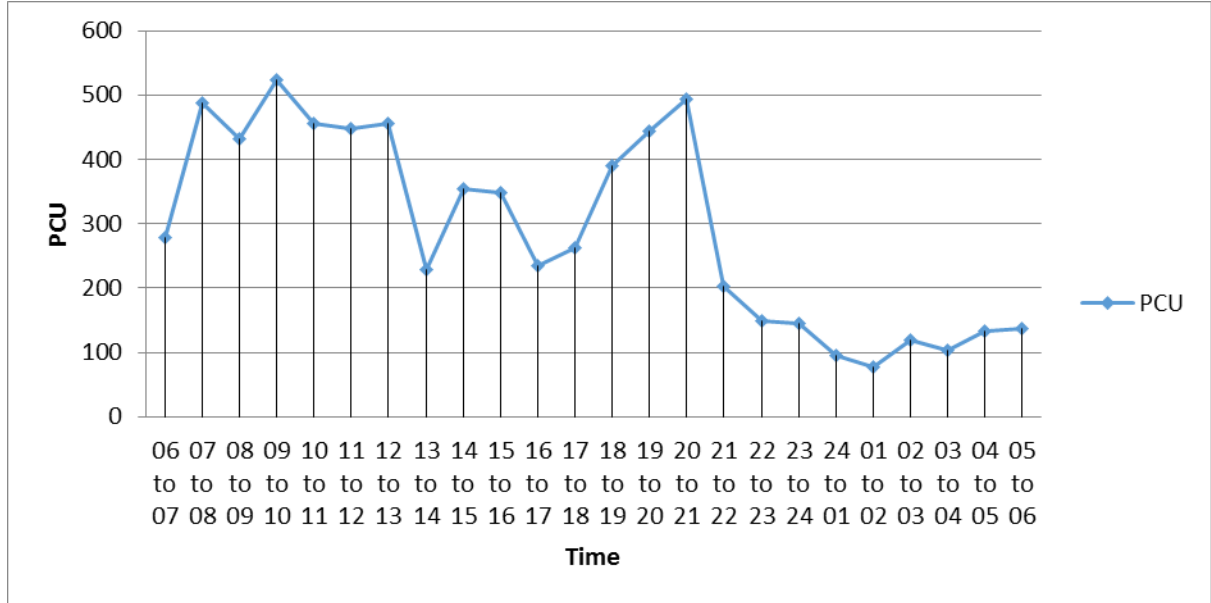


Peak Hour : 9:00 to 10:00 AM
Peak Traffic Volume: 528 PCU

**FIGURE-12
HOURLY VARIATION OF TRAFFIC VOLUME ON PK MINE ROAD**

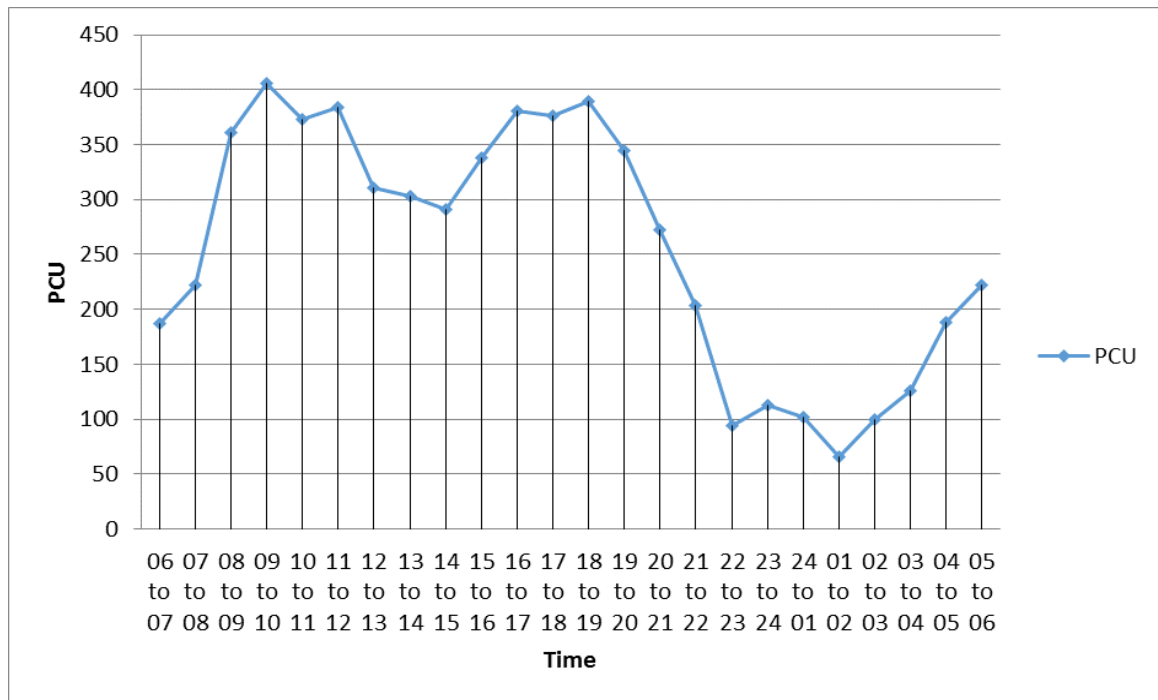


Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradi) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradi-Kothagudem District, Telangana



Peak Hour : 9:00 to 10:00 AM
 Peak Traffic Volume: 524 PCU

FIGURE-13
HOURLY VARIATION OF TRAFFIC VOLUME ON MALLEPALLI OC MINE ROAD



Peak Hour : 9:00 to 10:00 AM
 Peak Traffic Volume: 406 PCU

FIGURE-14
HOURLY VARIATION OF TRAFFIC VOLUME ON STATE HIGHWAY 12 AT RAMANJAVARAM



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➤ **Additional Traffic Volume due to the Proposed Coal Transportation**

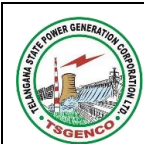
The total coal requirement for BTPS plant is 13,129 Tonnes/day. The no. of loaded trucks is 655 Nos per day considering 20 tonnes of coal per truck. Adding the empty trucks, the total trucks would be 1310 Nos per day. The additional traffic volume per hour will be about 55 trucks (to & fro). It is planned that 50% of the trucks from PK OC-4 mines and balance 50% from Mallepalli OC mines will be engaged for transportation of coal.

➤ **Capacity Analysis of the proposed Road for Coal Transportation to BTPS**

The capacity analysis of the proposed roads for coal transportation to BTPS is presented in **Table-5** given below. The V/C and Level of Service (LOS) along with performance levels are presented in **Table-6**.

TABLE-5
CAPACITY ANALYSIS OF THE PROPOSED ROADS FOR COAL TRANSPORTATION TO BTPS

Sr. No.	Name of the Road	Carriage way	Traffic Volume (Veh/Day)	Traffic Volume in PCU/Day (V)	Capacity/Design Service Volume in PCU/Day ©	V/C ratio	% Utilisati on of Road	LOS	Performan ce of the Road
I Connecting Road from PK OC-4 Mine to Manuguru -Eturunagaram State High way (5.4 km)									
1	Existing Traffic Scenario	7.00 m - Two Lane Undivided	5061	7003	15000	0.47	47%	C	Good
2	Coal Trucks of BTPS		655	1965					
	Future Traffic Scenario including Coal Trucks of BTPS		5716	8968	15000	0.598	59%	C	Good
II Connecting Road from Mallepalli OC Mine to Manuguru -Eturunagaram State High way (4.0 km)									
1	Existing Traffic Scenario	10.00 m - Two Lane Undivided	4936	6994	17250	0.41	41%	C	Good
2	Coal Trucks of BTPS		655	1965					
	Future Traffic Scenario including Coal Trucks of BTPS		5591	8959	17250	0.519	51.9%	C	Good
III Manuguru - Eturunagaram State High way Leading to BTPS (10.2 km)									
1	Existing Traffic Scenario	7.00 m - Two Lane Undivided	5299	6196	15000	0.41	41%	C	Good
2	Coal Trucks of BTPS		1310	3930					
	Future Traffic Scenario including Coal Trucks of BTPS		6609	10126	15000	0.67	67%	D	Fair/Avg



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TABLE – 6
LEVEL OF SERVICE AND PERFORMANCE INDEX

V/C	LOS	Performance
0.0 – 0.2	A	Excellent
0.2 – 0.4	B	Very Good
0.4 – 0.6	C	Good
0.6 – 0.8	D	Fair/Average
0.8 - 1.0	E	Poor
1.0 and above	F	Very Poor

Source: IRC guidelines

V-Volume in PCU's/day, C-Capacity in PCU's/day, LOS – Level of Service

Traffic Sufficiency and Load Bearing Capacity

Traffic studies have been carried out during the study period and the observations are presented based on recommended PCU's factor for vehicles as per IRC guidelines. The modelling simulations have been carried out for three junction points connecting to and fro to BTPS and Manuguru including connecting roads from SCCL mines.

On two-way undivided roads, the traffic carrying capacity is relatively independent of the directional distribution of traffic and design is based on two-way total flows. On dual or divided carriageways, the capacity is dependent on directional split of traffic flow. Maximum volume that can be accommodated on the road is considered to be the road capacity. Mostly the maximum volume occurs at half the free speed and half the jamming density.

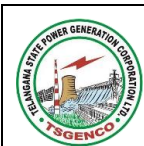
Level of Service (LOS):

Level of service (LOS) is a qualitative measure used to relate the quality of vehicle traffic service. LOS is used to analyze roadways and intersections by categorizing traffic flow and assigning quality levels of traffic based on performance measure like vehicle speed, density, congestion, etc.

Qualitative measure considering the operational conditions within the traffic stream in defined study area has been estimated by using Level of Service (LOS). LOS designated by Indian road congress are of six levels of services from A to F with LOS A representing the best operating condition (ie. Free flow) and LOS F the worst (i.e. forced or break-down flow).

Observations:

In the present traffic study, the level of service (LOS) is observed as C for Manuguru Eturunagaram State Highway and connecting roads from the Coal mines as per the existing traffic scenario. After adding the coal trucks of BTPS the LOS is shifted from C to D on the Manuguru Eturunagaram State Highway to BTPS and the LOS will remain same on the other two roads.



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Traffic Carrying capacity of the existing road from Manuguru to Eturunagaram State Highway:

The Manuguru-Eturunagaram State Highway road which is the coal transportation route to BTPS plant is in very good condition without any pot holes or damages.

Certificate Issued by the Engineering in Chief, R&B Department, Telangana State

The Engineer in Chief/R&B department, Telangana state vide his letter dated has stated that the Burgampadu –Eturunagaram state highway road from KM: 36/2 to KM:46/4 is of two lane B.T. Road with 7.00 m width and 1.50 m earthen shoulders on either side of the road and the road is capable of taking traffic of 655 loaded and 655 empty trucks per day carrying 20 MT of coal in each truck additionally from M/s. SCCL mines to Bhadradi Thermal Power Station duly mentioning that the number of axles of truck shall not be less than three. A copy of the letter No. 8719/E-IN-C SR&CRN/DCE @/EE (CRN)/DEE-10/AEE-6/2019, Dated. 08.07.2019 is enclosed herewith as **Annexure-X**.

8.0. IMPACT OF TRAFFIC ON AIR QUALITY

The extent of traffic impact, at any given time will depends upon

- The rate of vehicular emission within a given stretch of the road and
- The prevailing meteorological conditions.

The impacts have strong temporal dependence as both these factors vary with time. The temporal dependence would have diurnal, seasonal as well as long term components. Impacts due to the transportation of coal by road on ambient air quality has been carried out by using AERMOD software with line source option and the details are given below.

Details of Modelling Input Parameters and Results

The model setup details are presented in **Table-7** below.

TABLE-7
MODEL SET-UP

Sr. No.	Parameter	Details
1	Model Name	AERMOD (Version 7.1.0)
2	Model Type	Steady state Gaussian Plume Air Dispersion model
3	Topography	Rural, Flat
4	Averaging Time	24 hours
5	Source Type	Line Source (mesh size – 50%)
6	Boundary Limits	10 km X 10 km
7	Co-ordinate System	Uniform Cartesian Grid
8	Receptor Height	0
9	Anemometer	10 m
10	Surface meteorological data	Site Specific data processed by AERMET
11	Upper air Data	Upper air Estimator using AERMET processor



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Model Input Data

The parameters considered for prediction of GLCs are PM, CO, NOx and HC. A study area within a radius of 10 km around the project site has been taken into consideration to compute the ground level concentrations (GLC) of the said air pollutants. The line sources are taken according to state highway to the project site. The emission rates as inputs to the line source model are calculated based on "Emission factor development for Indian vehicles", a project executed by Automotive Research Association of India, Pune, 2008. The inputs used for modeling area given in **Table-8**.

TABLE-8(A)
INPUT TO THE MODEL – WORST CASE SCENARIO

Description	Details			
Quantity, TPD	13,129			
Truck capacity (T)	20			
No. of loaded trucks/day	655			
No. of trips/day	1310			
Parameter	Emission factor (g/km/hr/vehicle)	Emission in (g/s)	Prediction ($\mu\text{g}/\text{m}^3$) (Model executed considering 1310 vehicular movement for 24 hours)	Distance from Centre line of the Road (km)
CO	1.5	10.3	11.6	100 m
NOx	3.5	23.9	22.2	100 m
PM	0.02	0.1	0.3	100 m
HC	0.96	6.6	1.0	100 m

TABLE-8(B)
EMISSIONS & RESULTANT CONCENTRATION

Expressed in $\mu\text{g}/\text{m}^3$

Parameter	Maximum Baseline	Maximum GLC	Resultant Concentration	NAAQS 2009
PM	51.6 (Mallepalli OC)	0.3	51.9	100
NOx	22.6 (Mallepalli OC)	22.2	44.8	80
CO	441 (Mallepalli OC)	11.6	452.6	2000
HC	<1.0	1.0	1.0	-

Emission standards as per Bharat Stage IV is enclosed as **Annexure-VI**.



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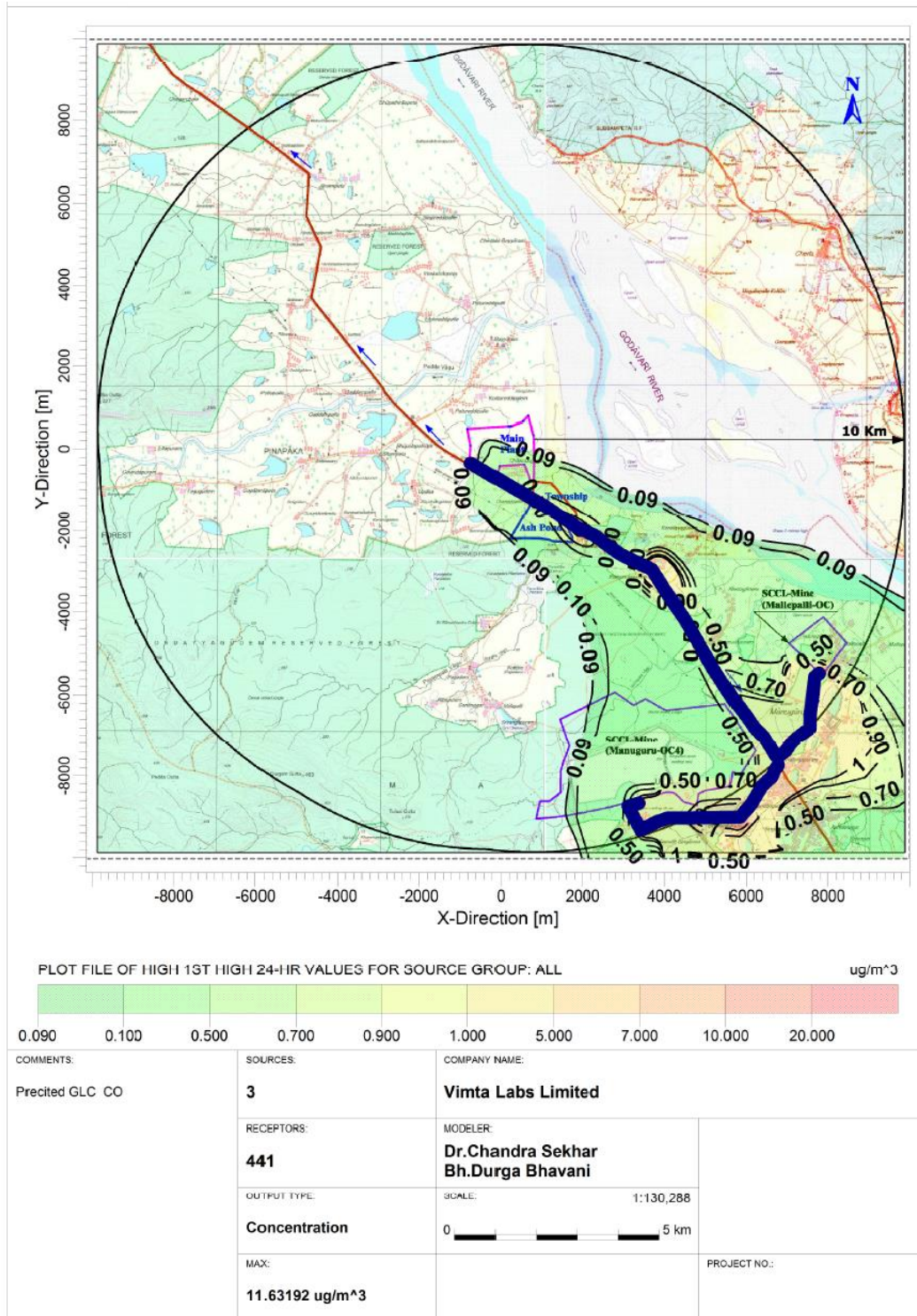
- **Presentation of Results**

It is observed that the maximum incremental concentrations of major pollutants CO and NO_x due to the additional traffic load would be about 11.6 µg/m³ and 22.2 µg/m³ respectively likely to occur at 10 m from the centre of the road. The CO and NO_x concentrations are likely to be very low when compared with the NAAQ standards for CO (2000 µg/m³) and WHO standard of 400 µg/m³ for hourly average for NO_x. It is to be noted that the model results are predicted considering the worst case scenario i.e stable atmospheric conditions which normally occurs in the early hours. However, during daytime the predicted GLC's will be less.

The modelling exercise has been executed considering 50% of coal will be from PK mines and 50% of coal will be from Mallepalli mines connecting to SH-12. And from there the coal will be 100% transported through SH-12 to BTPS considering it as worst case. Hence, it is assessed that the impact on the present ambient air quality will be marginally increased due to the additional traffic from the proposed project. Isopleths are shown in **Figure-15 to Figure-18**.



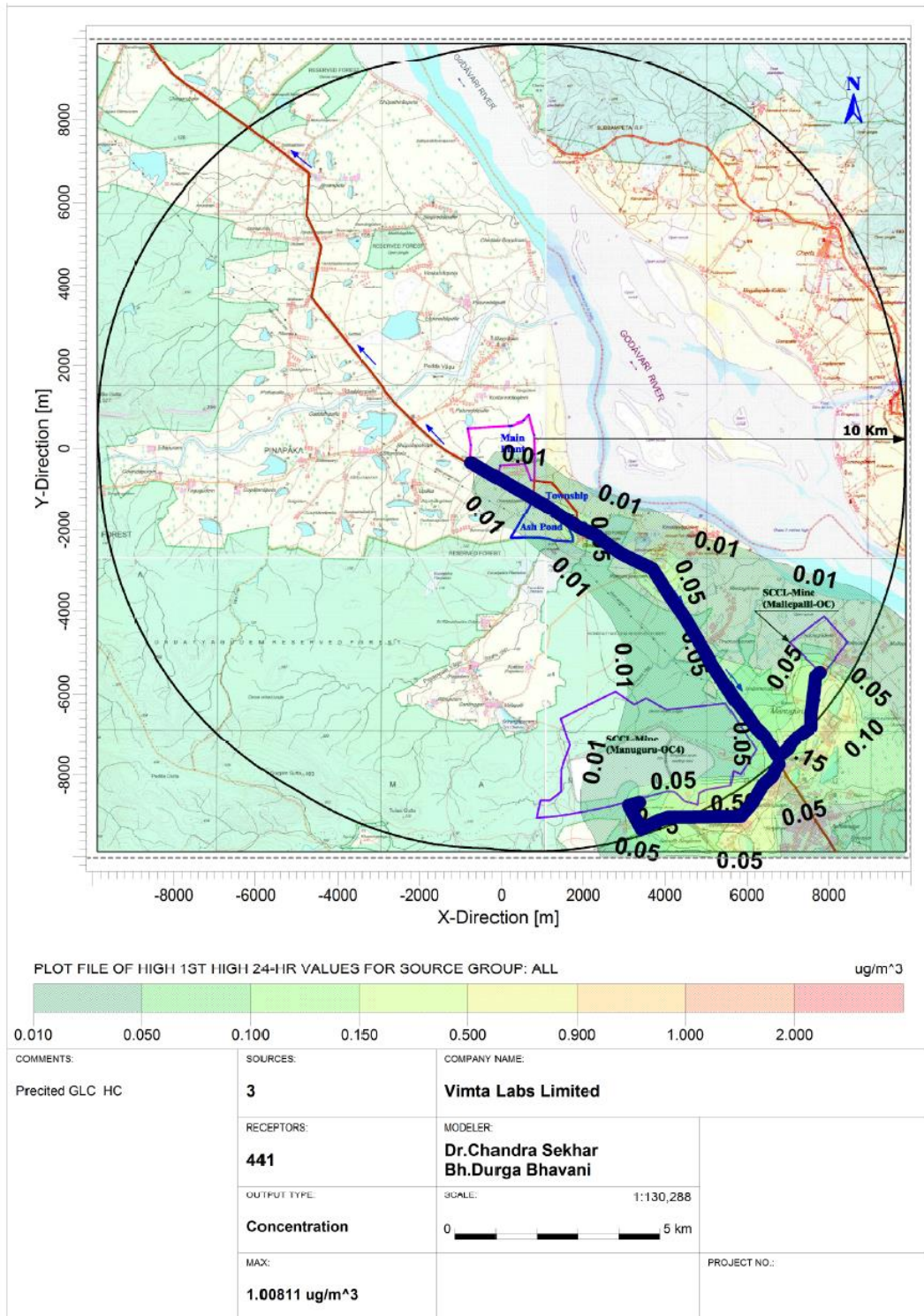
Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradi) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradi-Kothagudem District, Telangana



**FIGURE-15
PREDICTED GLCS - CO**



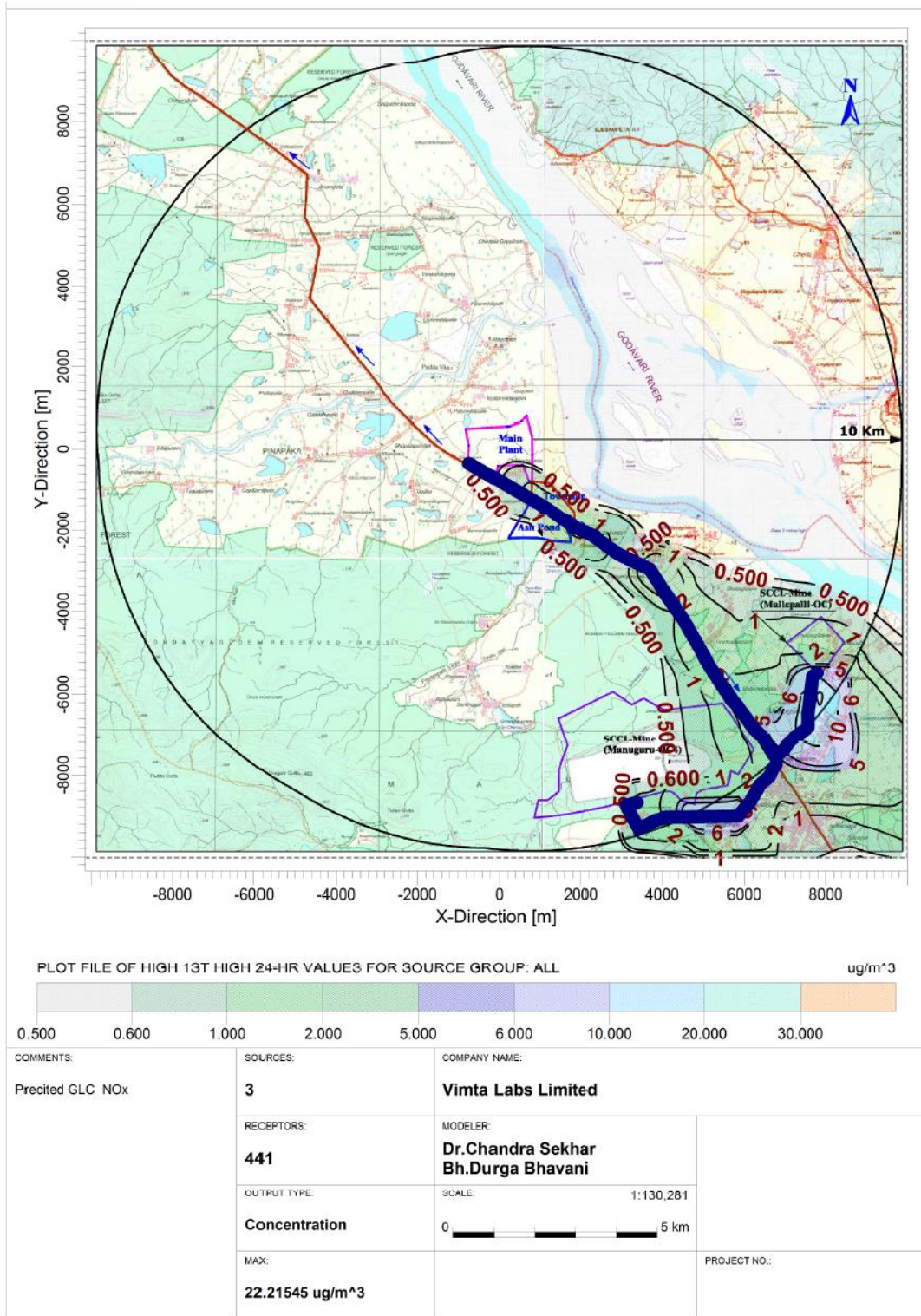
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**FIGURE-16
PREDICTED GLCS - HC**



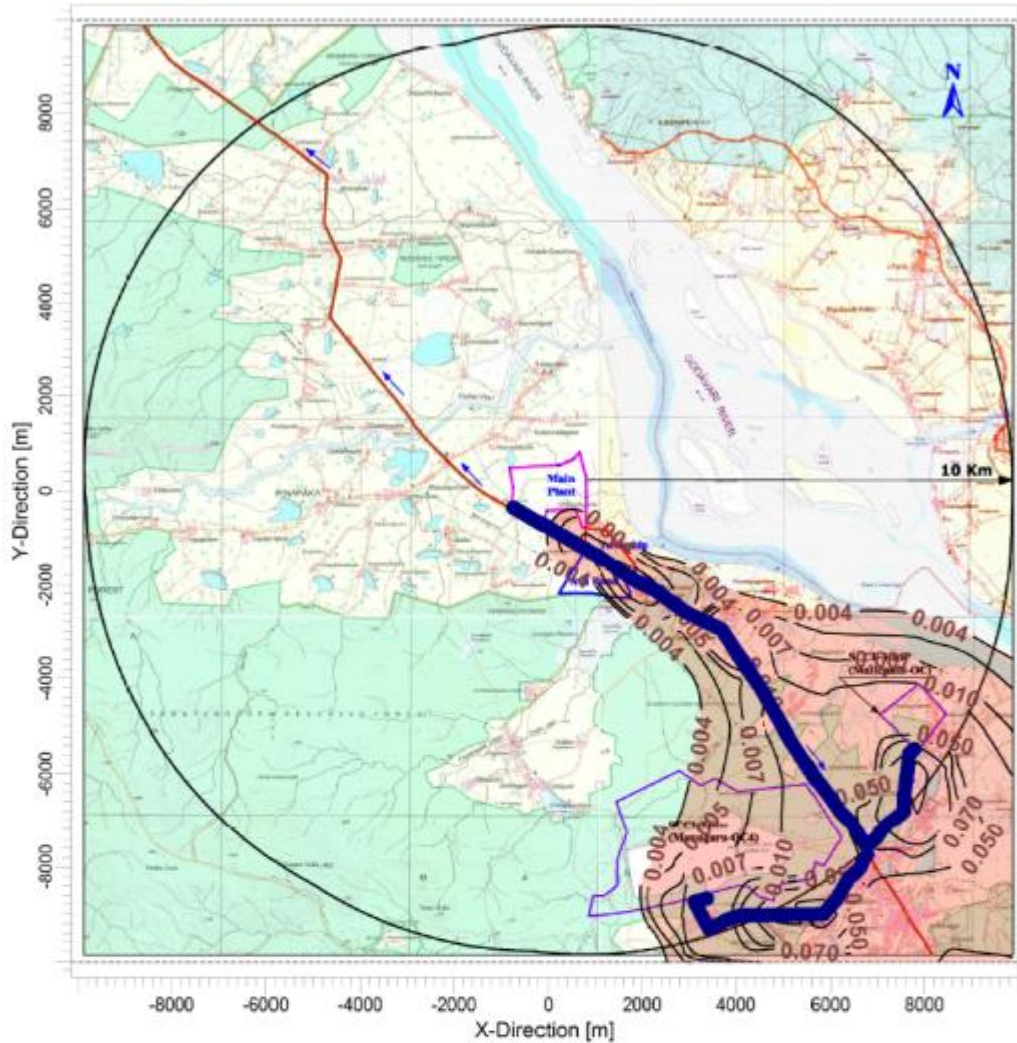
Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradri-Kothagudem District, Telangana



**FIGURE-17
PREDICTED GLCS – NOX**



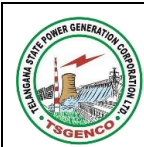
Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradi) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradi-Kothagudem District, Telangana



PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL ug/m³

0.004		0.005		0.007		0.010		0.050		0.070		0.100		0.200		0.300		0.350		
COMMENTS:	SOURCES:		COMPANY NAME:		RECEPTORS:		MODELER:		OUTPUT TYPE:		SCALE:		PROJECT NO.:		MAQI:					
Predicted GLC PM	3		Vimta Labs Limited		441		Dr.Chandra Sekhar Bh.Durga Bhavani		Concentration		1:130,281				0.31318 ug/m ³					
									0		5 km									

**FIGURE-18
PREDICTED GLCS- PM**



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8.1. Impact due to Traffic Noise

The impact of noise levels have been assessed based on the existing and additional traffic plying on the road. Noise monitoring has been conducted at 8 locations along the coal transportation route and the prediction of noise levels carried out using Dhvani modeling software. The noise contours are given in **Figure-19**.

The prediction of noise levels due to additional traffic are presented below in **Table-9**.

**TABLE-9(A)
RESULTANT NOISE LEVELS - Lday**

Code	Location	Noise Levels in dB(A)				Category of Area
		Background Noise Levels (L _{day})	Noise Predictions	Resultant Noise Levels	Norms	
N1	Chikkudugunta	47.5	28.0	47.5	55	Residential
N2	Dhamakkapeta	48.4	28.0	48.4	55	Residential
N3	Sambayagudam	47.2	33.0	47.2	55	Residential
N4	Ramanujavaram	48.4	33.0	48.5	55	Residential
N5	Tirumalapuram/ Vijayanagaram	46.2	33.0	46.4	75	Industrial
N6	Mallepalli	52.7	32.0	52.7	75	Industrial
N7	Ippalasingaram	45.8	31.0	45.6	55	Residential
N8	Rajupeta	42.7	28.0	42.8	55	Residential

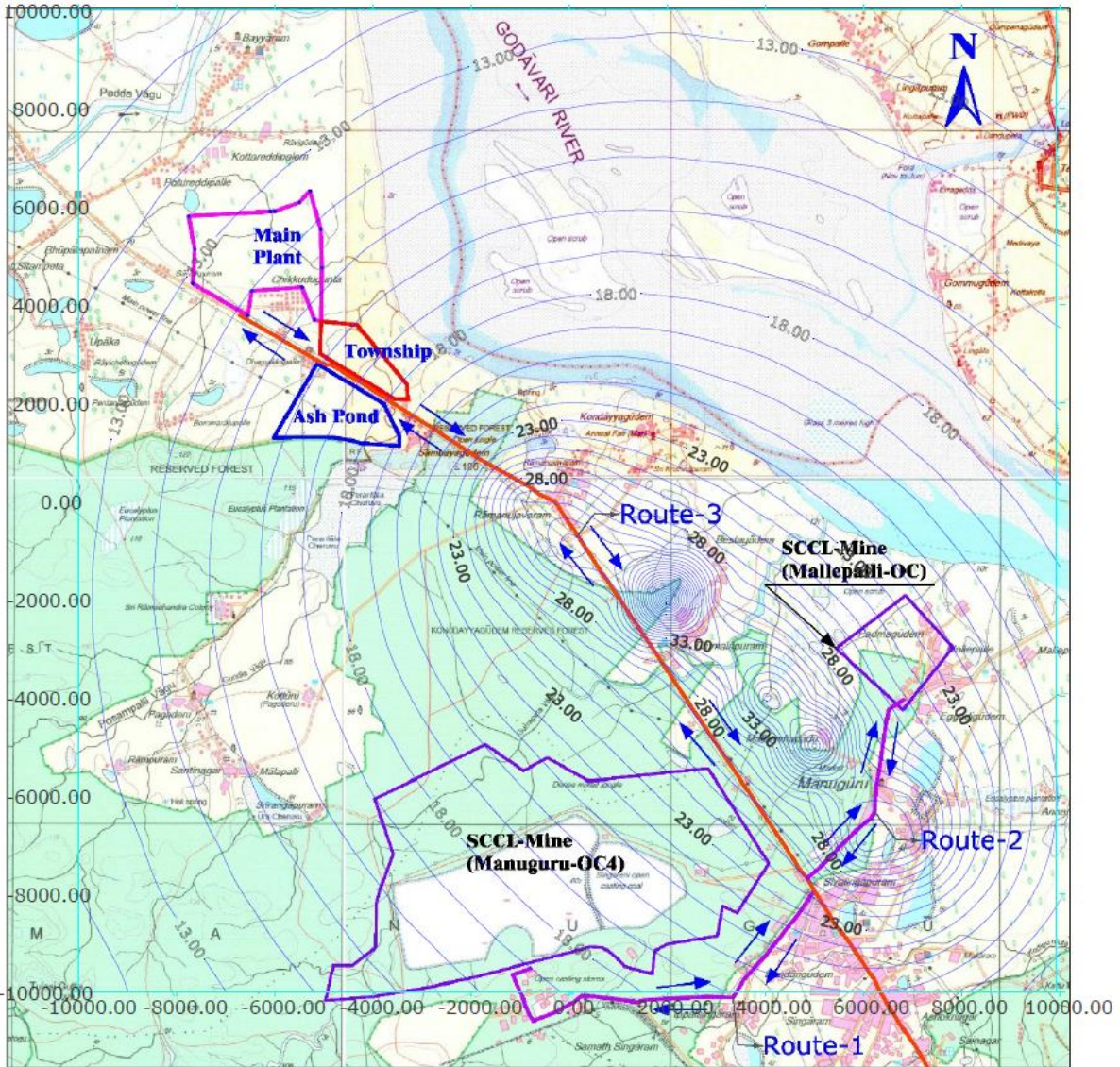
**TABLE-9(B)
RESULTANT NOISE LEVELS - Lnight**

Code	Location	Noise Levels in dB(A)				Category of Area
		Background Noise Levels (L _{night})	Noise Predictions	Resultant Noise Levels	Norms	
N1	Chikkudugunta	43.9	28.0	44.0	45	Residential
N2	Dhamakkapeta	44.8	28.0	44.9	45	Residential
N3	Sambayagudam	43.6	33.0	44.7	45	Residential
N4	Ramanujavaram	44.8	33.0	36.0	45	Residential
N5	Tirumalapuram/ Vijayanagaram	42.6	33.0	43.1	70	Industrial
N6	Mallepalli	49.1	32.0	35.0	70	Industrial
N7	Ippalasingaram	43.1	31.0	43.4	45	Residential
N8	Rajupeta	37.2	28.0	37.1	45	Residential

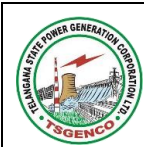
The resultant noise levels when compared with Ambient Noise Standards are well within the limits.



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**FIGURE-19
NOISE CONTOUR**



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8.2. Impact on nearby Village, Habitation & Forest

The impact of additional traffic on the nearest villages/habitations has been estimated by superimposing incremental concentration over the present maximum baseline air quality levels. The resultant ambient air quality is given in **Table-10**. The details of village wise population are enclosed as **Annexure-XI**.

TABLE-10 (A)
IMPACT ON HABITATION

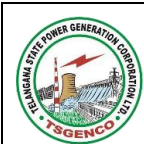
Name of the Stretch	Name of the Habitation	Population		
		Male	Female	Total
Manuguru to BTPS (SH-12)	Thirlapuram/ Vijayanagaram	434	481	915
	Ramanujavaram	799	766	1565
	Sambaigudem	682	673	1355
	Dammakkapeta	250	261	511
	Chikkudugunta	404	373	777
PK Mines OC-4 to SH-12	Ippalasingaram	491	475	966
Mallepalli OC to SH-12	Raju peta	818	871	1689

Source: As per 2011 Census Data

TABLE-10 (B)
IMPACT ON HABITATION – PM

Expressed in $\mu\text{g}/\text{m}^3$

Code	Nearest Habitation Adjacent to Road	Background Concentration of PM_{10} 98 Percentile	Predicted GLCS	Resultant	NAAQS 2009
1	Chikkudugunta	43.000	0.004	43.004	100
2	Dhamakkapeta	39.600	0.050	39.650	
3	Sambayyagudem	43.000	0.005	43.005	
4	Ramanujavaram	48.400	0.005	48.405	
5	Tirumalapuram/ Vijayanagaram	45.100	0.010	45.110	
6	Mallepalli	51.600	0.100	51.700	
7	Ippaalasingaram	51.200	0.050	51.250	
8	Rajupeta	41.400	0.070	41.470	



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TABLE-10 (C)
IMPACT ON HABITATION – NO_x

Expressed in µg/m³

Code	Nearest Habitation Adjacent to Road	Background Concentration of PM ₁₀ 98 Percentile	Predicted GLCS	Resultant	NAAQS 2009
1	Chikkudugunta	16.80	0.50	17.30	80
2	Dhamakapeta	21.60	1.00	22.60	
3	Sambayyagudem	15.60	0.50	16.10	
4	Ramanujavaram	19.50	2.00	21.50	
5	Tirumalapuram/ Vijayanagaram	17.60	1.00	18.60	
6	Mallepalli	22.60	6.00	28.60	
7	Ippaalasingaram	15.30	6.00	21.30	
8	Rajupeta	14.20	5.00	19.20	

A perusal of the above table reveals that there will be a marginal increase in terms of dust load. However, the resultant ambient air quality due to the additional truck traffic will be within the limits as per National Ambient Air Quality Standards 2009.

▲ Impact on Forest

Kondayyagudem reserve forest is located adjacent to the proposed coal transportation route. The impact of traffic on forest is given below in **Table-11**.

TABLE-11
IMPACT ON FOREST

Expressed in µg/m³

Code	Forest	Background Concentration Nearest AAQ Location (PM10) 98 Percentile	Predicted GLCS	Resultant	NAAQS, 2009
1	Kondayyagudem RF near Tirumalapuram	45.100	0.003	45.103	100
2	Kondayyagudem RF near Sambayagudem	43.000	0.005	43.005	

From the above table, it is observed that there will be a marginal increase in dust concentrations which will have insignificant impact on forest.

Dust Impact on Vegetation

The dust fall have been measured during the study period. The impact on vegetation due to wheel generated dust may have impact on vegetation adjacent to the road. The dust due to its deposition on the leaves of trees, the stomata openings will be closed which reduces the evapotranspiration rate.



9.0 BASELINE ENVIRONMENTAL STATUS

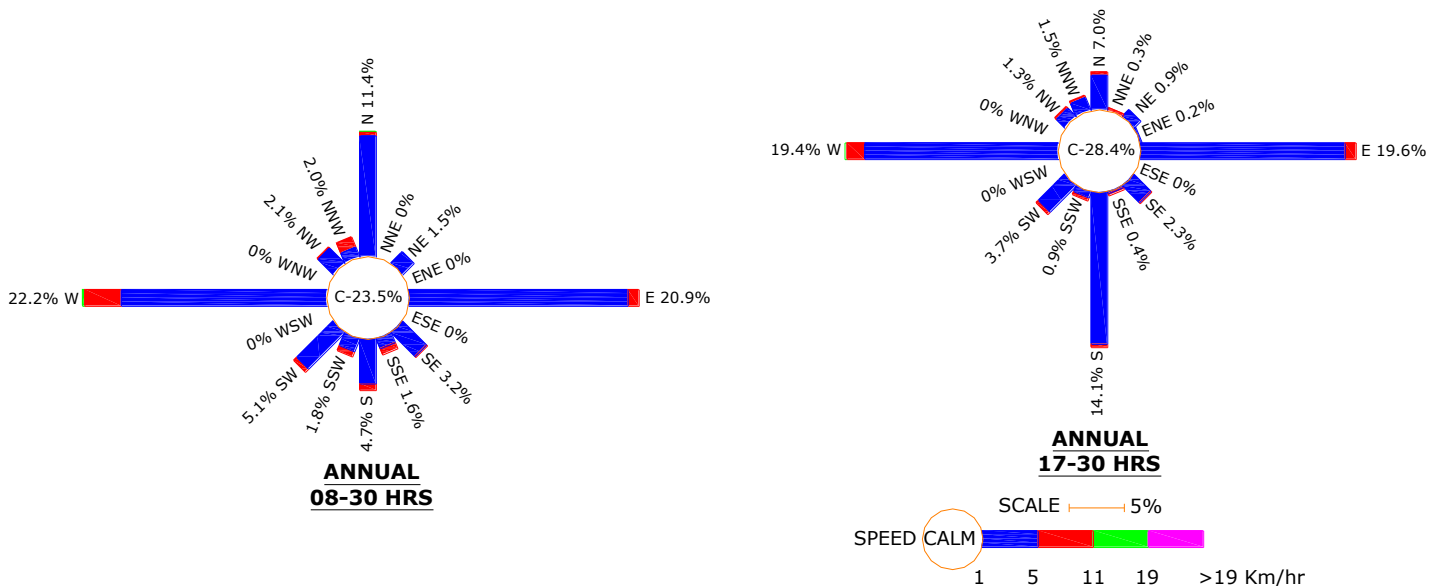
As per the MoEF&CC EAC recommendations, baseline environmental studies were carried out along the coal transportation route and in surrounding areas for assessment of additional pollution load on Manuguru – Eturunagaram state highway covering the road way from mines to BTPS. Field monitoring studies were conducted from 7th June 2019 to 9th June, 2019 to evaluate the current baseline status of study area delineating the transportation route. The photographs of the study is enclosed as **Annexure-VIII**.

9.1 Meteorology

The meteorological parameters have been recorded on hourly basis during the study period from 7th June 2019 to 9th June 2019 and the parameters recorded at site includes wind speed, wind direction (from 0 to 360 degrees), temperature, relative humidity. The annual windrows diagram (IMD-Khammam) is shown in **Figure-20**. The site specific data is presented in **Table-12** and discussed below:

**TABLE-12
SUMMARY OF THE METEOROLOGICAL DATA GENERATED AT SITE**

June	Temperature (°C)		Relative Humidity (%)		Rainfall (mm)
	Min	Max	Min	Max	
07.06.2019	28.4	45.2	47	63	-
08.06.2019	27.1	46.9	49	65	-
Range	27.1 - 46.9		47 - 65		



**FIGURE-20
ANNUAL WINDROSE DIAGRAM (IMD-KHAMMAM)**



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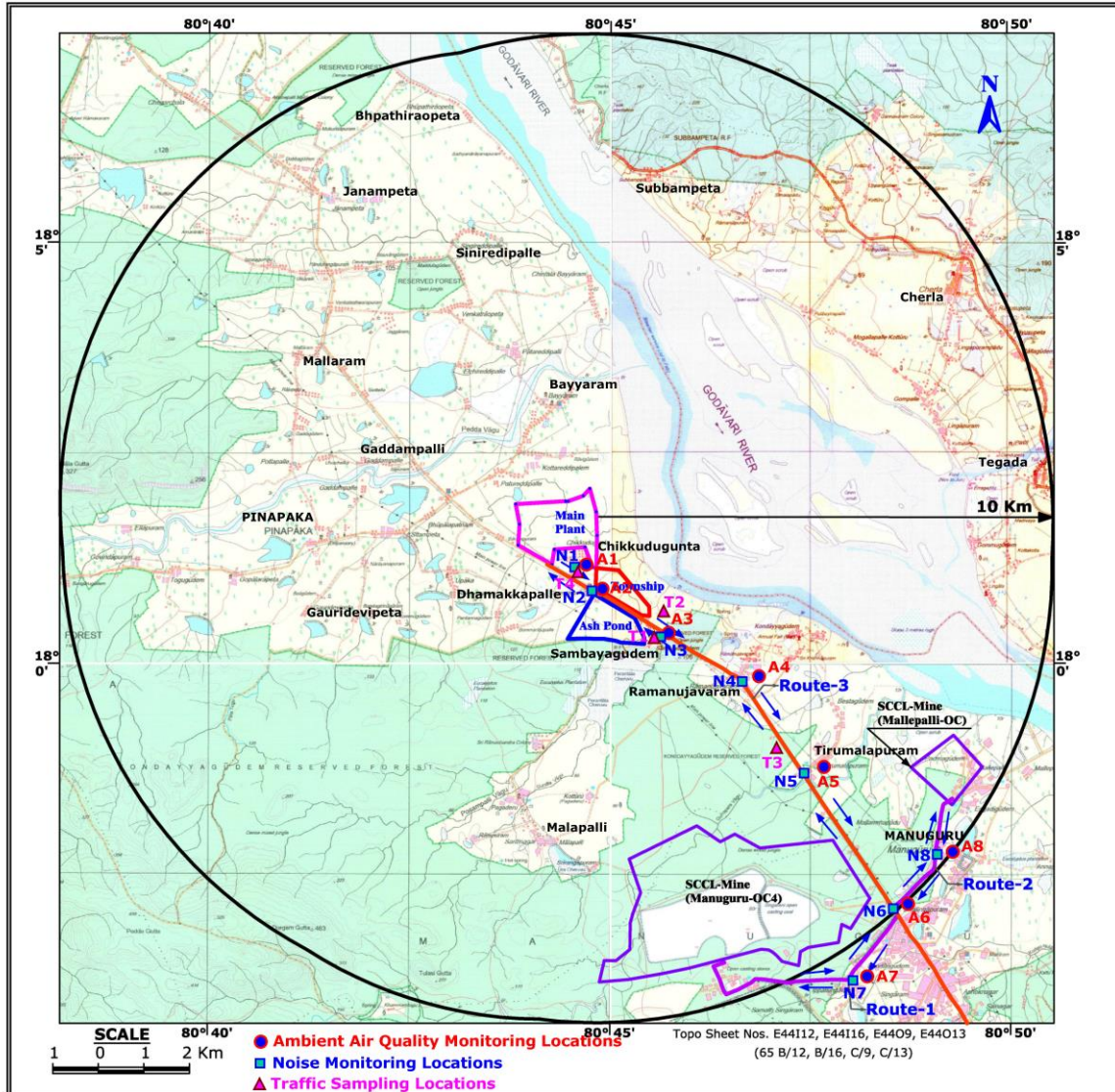


FIGURE-21
MONITORING LOCATIONS MARKED ON TOPOSHEET



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradri-Kothagudem District, Telangana

9.2 Ambient Air Quality

The ambient air quality with respect to the study area forms the baseline information. The prime objective of the baseline air quality study is to assess the existing air quality of the area. This will also be useful for assessing the conformity to standards of the ambient air quality during the operation of proposed project.

This section describes the selection of sampling locations, methodology adopted for sampling, analytical techniques and frequency of sampling. The ambient air quality monitoring was conducted from 7th June 2019 to 9th June 2019.

9.2.1 Methodology Adopted for Air Quality Survey

The baseline status of the ambient air quality has been assessed through a scientifically designed ambient air quality-monitoring network. The design of monitoring network in the air quality surveillance program has been based on the following considerations:

- Meteorological conditions on synoptic scale;
- The methodology for conducting the baseline environmental survey and selection of sampling locations considering the guidelines given in the EIA manual of the MoEF&CC;
- Topography of the study area;
- Representatives of regional background air quality for obtaining quality status; and
- Representatives of likely impact areas.

9.2.2 Sampling and Analytical Techniques

PM_{2.5} and PM₁₀ have been estimated by gravimetric method. Modified West and Gaeke method (IS-5182 Part-II, 1969) has been adopted for estimation of SO₂. Jacobs-Hochheiser method (IS-5182 Part-IV, 1975) has been adopted for the estimation of NO_x. The techniques used for ambient air quality monitoring and its minimum detectable levels are given in **Table-13**.

TABLE-13
TECHNIQUES USED FOR AMBIENT AIR QUALITY MONITORING

Sr. No.	Parameter	Technique	Technical Protocol	Minimum Detectable Limit (µg/m ³)
1	Particulate Matter (PM ₁₀)	Respirable Dust Sampler (Gravimetric Method)	IS-5182 (Part-XXIII)	5.0
2	Particulate Matter (PM _{2.5})	Fine Respirable Dust (Gravimetric Method)	CPCB Guidelines	5.0
3	Sulphur dioxide (SO ₂)	Modified West and Gaeke Method	IS-5182 (Part-II)	4.0
4	Oxide of Nitrogen (NO _x)	Jacob & Hochheiser Method	IS-5182 (Part-VI)	10.0
5	Ammonia (NH ₃)	Indophenol Blue method	Method 401- air sampling analysis 3 rd Edition	20.0
6	Carbon Monoxide (CO)	Gas Chromatography Method	IS-5182 (Part-X)	50
7	Ozone (O ₃)	Spectrophotometric	IS-5182 (Part-IX)	2.0



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Sr. No.	Parameter	Technique	Technical Protocol	Minimum Detectable Limit ($\mu\text{g}/\text{m}^3$)
		method		
8	Benzene (C_6H_6)	Gas Chromatography	IS-5182 (Part-XI)	1.0
9	Benzo(a)pyrene	Solvent extraction followed by GC MS	IS-5182 (Part-XII)	0.1 (ng/m^3)
10	Lead (Pb)	AAS / ICP-MS method after sampling EPM filter paper	IS-5182 (Part-XXII)	0.001
11	Arsenic (As)		IS-5182	0.001
12	Nickel (Ni)		IS-5182	0.001
13	VOC's & HC	GC-MS	IS-5182	0.1 (ppm)

9.2.3 Duration of Sampling

The sampling duration for PM_{10} , $\text{PM}_{2.5}$, SO_2 and NO_2 was twenty-four hourly continuous samples per day; CO and O_3 were sampled for 8 hrs continuous thrice a day. This is to allow a comparison with the present revised standards mentioned in the latest Gazette notification of the Central Pollution Control Board (CPCB) (November 16, 2009).

Ambient Air Quality Monitoring (AAQM) stations were set up at **Eight locations** with due consideration to the above mentioned points. **Table-14** gives the details of ambient air quality monitoring location. The location of the selected stations with reference to the proposed project is given in the same table and shown in **Figure-21**.

**TABLE-14
DETAILS OF AMBIENT AIR QUALITY MONITORING**

Station Code	Name of the Village	Location Details
A1	Chikkudugunta	Adjacent to State Highway- 12
A2	Dhamakkapeta	
A3	Sambayagudem	
A4	Ramanujavaram	
A5	Tirumalapuram/Vijayanagaram	
A6	Mallepalli	
A7	Ippalasingaram	PK OC-4 Mine road connecting to SH-12
A8	Rajupeta	Mallepalli OC mine road connecting to SH-12

9.2.4 Presentation of Primary Data

Various statistical parameters like 98th percentile, average, maximum and minimum values have been computed from the observed raw data for all the AAQ monitoring stations. The results of monitoring carried out are presented in **Annexure-XII**. The summary of these results is given in **Table-15**.



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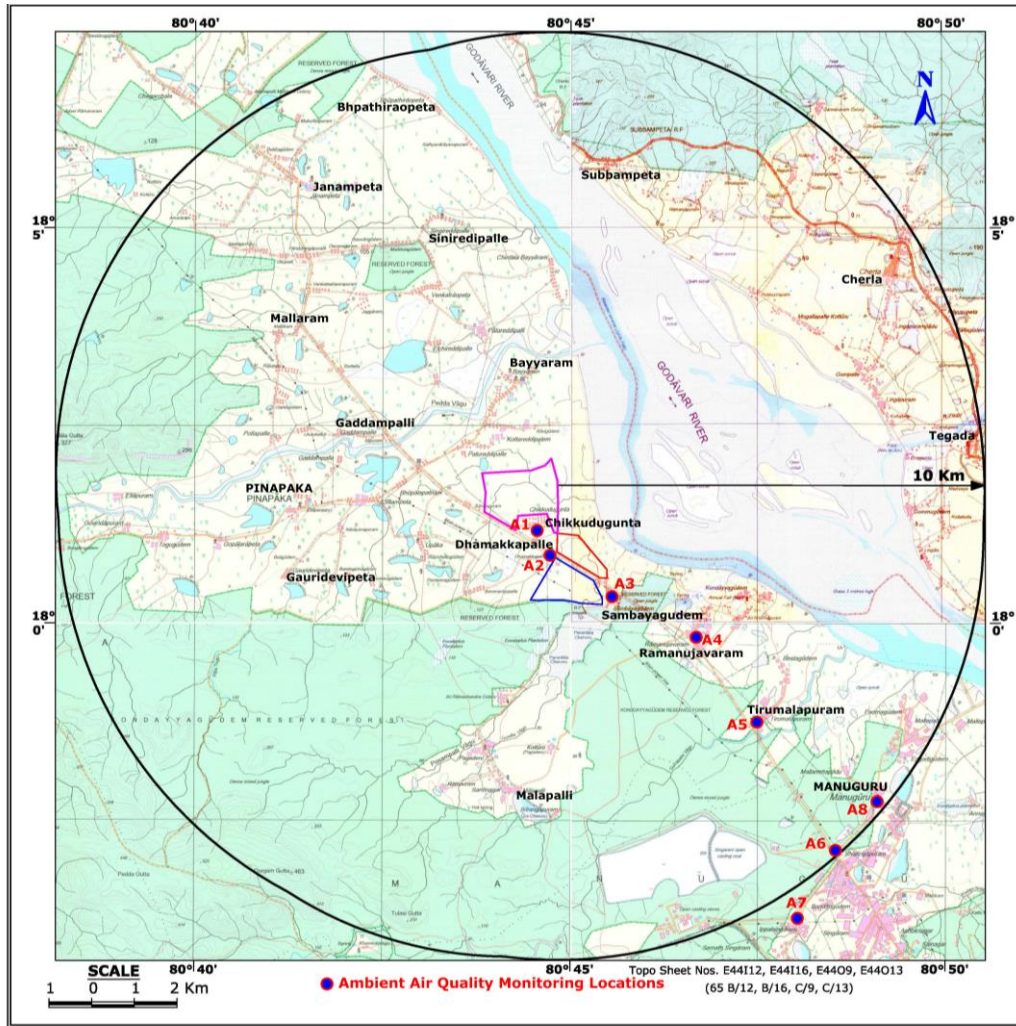


FIGURE-22
AMBIENT AIR QUALITY LOCATIONS



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Guidelines for Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru, Bhadradri – Kothagudem district, Telangana

**TABLE-15(A)
SUMMARY OF AMBIENT AIR QUALITY RESULTS**

Monitoring Station	Name of the Location	PM ₁₀ (µg/m ³)				PM _{2.5} (µg/m ³)				SO ₂ (µg/m ³)			
		Min	Max	Avg	98 th %ile	Min	Max	Avg	98 th %ile	Min	Max	Avg	98 th %ile
A1	Chikkudugunta	39.4	43.1	41.3	43.0	20.4	21.8	21.1	21.8	10.9	11.1	11.0	11.1
A2	Dhamakkapeta	38.5	39.6	39.1	39.6	14.5	15.8	15.2	15.8	8.8	9.4	9.1	9.4
A3	Sambayagudem	39.6	43.1	41.4	43.0	16.4	17.5	17.0	17.5	9.6	10.8	10.2	10.8
A4	Ramanujavaram	47.6	48.4	48.0	48.4	23.5	24.2	23.9	24.2	12.8	13.6	13.2	13.6
A5	Tirumalapuram/Vijayanagaram	39.8	45.2	42.5	45.1	18.1	19.6	18.9	19.6	11.4	12.6	12.0	12.6
A6	Mallepalli	50.4	51.6	51.0	51.6	25.3	25.8	25.6	25.8	14.7	15.3	15.0	15.3
A7	Ippalasingaram	50.3	51.2	50.8	51.2	21.6	25.9	23.8	25.8	10.1	11.4	10.7	11.4
A8	Rajupeta	35.2	41.5	38.4	41.4	16.7	18.9	17.8	18.9	8.2	10.2	9.2	10.2
Range		35.2-51.6				14.5-25.9				8.2-15.3			
CPCB Standards		100				60				80			

**TABLE-15(B)
SUMMARY OF AMBIENT AIR QUALITY RESULTS**

Monitoring Station	Name of the Location	NO _x (µg/m ³)				CO (µg/m ³)				O ₃ (µg/m ³)			
		Min	Max	Avg	98 th %ile	Min	Max	Avg	98 th %ile	Min	Max	Avg	98 th %ile
A1	Chikkudugunta	16.5	16.8	16.7	16.8	265	396	336	394	5.3	7.5	6.5	7.5
A2	Dhamakkapeta	11.5	21.8	16.7	21.6	176	253	218	252	3.8	6.1	5.1	6.1
A3	Sambayagudem	14.8	15.6	15.2	15.6	184	279	232	278	4.5	6.8	5.5	6.7
A4	Ramanujavaram	18.6	19.5	19.1	19.5	288	415	347	413	6.1	7.9	6.9	7.9
A5	Tirumalapuram/Vijayanagaram	16.5	17.6	17.1	17.6	194	296	238	295	4.6	7.2	5.7	7.1
A6	Mallepalli	21.4	22.6	22.0	22.6	326	441	383	440	6.8	8.1	7.7	8.1
A7	Ippalasingaram	14.5	15.3	14.9	15.3	266	351	301	348	3.5	6.1	5.0	6.1
A8	Rajupeta	12.2	14.2	13.2	14.2	223	329	274	326	3.1	5.3	4.5	5.3
Range		11.5-22.6				176-441				3.1-8.1			
CPCB standards		80				2000				100			

*ppm- parts per million

**TABLE-15(C)
SUMMARY OF AMBIENT AIR QUALITY RESULTS**

Station Code	Name of the Location	Ammonia (NH ₃) (µg/m ³)		Benzo(a)pyrene (BaP) (ng /m ³)		Lead (Pb) (µg/m ³)		Arsenic (As) (ng /m ³)		Nickel (Ni) (ng /m ³)		Benzene C ₆ H ₆ (µg/m ³)	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
A1	Chikkudugunta	<20.0	<20.0	<0.1	<0.1	<0.001	<0.001	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
A2	Dhamakkapeta	<20.0	<20.0	<0.1	<0.1	<0.001	<0.001	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
A3	Sambayagudem	<20.0	<20.0	<0.1	<0.1	<0.001	<0.001	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
A4	Ramanujavaram	<20.0	<20.0	<0.1	<0.1	<0.001	<0.001	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
A5	Tirumalapuram/Vijayanagaram	<20.0	<20.0	<0.1	<0.1	<0.001	<0.001	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
A6	Mallepalli	<20.0	<20.0	<0.1	<0.1	<0.001	<0.001	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
A7	Ippalasingaram	<20.0	<20.0	<0.1	<0.1	<0.001	<0.001	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
A8	Rajupeta	<20.0	<20.0	<0.1	<0.1	<0.001	<0.001	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Range		<20.0		<0.1		<0.001		<1.0		<1.0		<1.0	
CPCB standards		400		1.0		1.0		6.0		20.0		5.0	



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9.2.5 Presentation of Primary Data

Various statistical parameters like 98th percentile, average, maximum and minimum values have been computed from the observed raw data for all the AAQ monitoring stations. The results of monitoring carried out are presented in **Annexure-XII**. The summary of the results of 2019 is given in **Table-15 (A,B &C)**. These are compared with the standards prescribed by Central Pollution Control Board (CPCB).

Summary of Observations

The observations based on a perusal of the results for are summarized below:

PM₁₀

The minimum concentration for PM₁₀ was observed as 35.2 µg/m³ recorded at Rajupeta (A8) and the maximum concentration observed as 51.6 µg/m³ recorded at Mallepalli (A6) respectively during the study period.

PM_{2.5}

Out of the seven locations the minimum concentration for PM_{2.5} was observed as 14.5 µg/m³ recorded at Dhamakkapeta (A2) and the maximum concentration observed as 25.9 µg/m³ recorded at Ippalasingaram (A7)

SO₂

The minimum concentration for sulphur dioxide (SO₂) was observed as 8.2 µg/m³ recorded at Rajupeta (A8) and the maximum concentration observed as 15.3 µg/m³ recorded at Mallepalli (A6) during the study period. The SO₂ levels observed were within the prescribed standards of 80 µg/m³.

NO_x

The minimum concentration for Oxides of Nitrogen (NO_x) was observed as 11.5 µg/m³ recorded at Dhamakkapeta (A2) and the maximum concentration observed as 22.6 µg/m³ recorded at Mallepalli (A6) during the study period. The NO_x levels recorded were within the prescribed standards of 80 µg/m³.

CO

Out of the eight monitoring locations the minimum concentration observed was 176 µg/m³ recorded at Dhamakkapeta (A2) and the maximum concentration was observed as 441 µg/m³ recorded at Mallepalli (A6) during the study period. The CO concentrations are observed to be under the limits of 2000 µg/m³ as specified by CPCB standards.

O₃ and NH₃

Ozone was found to be in the range of 3.1 to 8.1 µg/m³. Ammonia was found to be less than 20 µg/m³.



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Benzene and BaP

Benzene was found to be less than 1.0($\mu\text{g}/\text{m}^3$) and BaP is less than 0.01 (ng/m^3) at all locations.

Heavy Metals

All heavy metals specified in the NAAQs 2009 i.e., Ni, Hg, Pb and As were found to be BDL.

9.3 Noise Level Survey

The main objective of noise monitoring in the study area is to establish the current baseline noise levels along the proposed coal transportation route and assess the impact of the total noise expected to be generated by coal transportation by trucks.

The impact of noise sources on surrounding community depends on:

- Characteristics of noise sources (instantaneous, intermittent or continuous in nature). It can be observed that steady noise is not as annoying as one which is continuously varying in loudness;
- The time of day at which noise occurs, for example high noise levels at night in residential areas are not acceptable because of sleep disturbance; and
- The location of the noise source, with respect to noise sensitive land use, which determines the loudness and period of exposure.

9.3.1 Identification of Sampling Locations

A preliminary reconnaissance survey was undertaken to determine the present noise levels along the proposed coal transportation route. Noise at different noise generating sources was identified based on the activities in the village area and ambient noise due to existing traffic.

The noise levels at each location were recorded for 24 hours. The environment setting of noise monitoring locations is given in **Table-16** and shown in **Figure-23**.

9.3.2 Method of Monitoring

Sound Pressure Level (SPL) were measured at six locations. The readings were taken for every hour for 24 hours. The day noise levels were monitored during 6 am to 10 pm and night levels during 10 pm to 6 am at all the locations along the proposed transportation route.



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TABLE-16
DETAILS OF NOISE MONITORING LOCATIONS

Code	Location	Distance (km) From Centre of the Road
N1	Chikkudugunta	0.1
N2	Dhamakkapeta	0.2
N3	Sambayagudam	0.1
N4	Ramanujavaram	0.2
N5	Tirumalapuram/ Vijaynagararam	0.1
N6	Mallepalli	0.2
N7	Ippalasingaram	1.2
N8	Rajupeta	1.4

9.3.3 Methodology of Data Generation

Instrument used for monitoring

Noise levels were measured using integrated sound level meter manufactured by Quest Technologies, USA (Model No.2900). The integrating sound level meter is an integrating/ logging type with Octave filter attachment (model OB-100) with frequency range of 31.5 to 16000 Hz. This instrument is capable of measuring the Sound Pressure Level (SPL), L_{eq} and octave band frequency analysis.

Method of monitoring

Noise level monitoring was carried out continuously for 24 hours with one hour interval starting at 06.00 hrs to 06.00 hrs next day. The noise levels were monitored on working day. During each hour, L_{eq} were directly computed by the instrument based on the sound pressure levels. L_{day} (L_d), L_{night} (L_n) and L_{dn} values were computed using corresponding hourly L_{eq} of day and night respectively. Monitoring was carried out at 'A' response and fast mode.

Parameters measured during monitoring

For noise levels measured over a given period of time, it is possible to describe important features of noise using statistical quantities. This is calculated using the percent of the time certain noise levels are exceeding the time interval. The notation for the statistical quantities of noise levels are described below:

- L_{10} is the noise level exceeded 10 per cent of the time;
- L_{50} is the noise level exceeded 50 per cent of the time; and
- L_{90} is the noise level exceeded 90 per cent of the time.

❖ **Equivalent Sound Pressure Level (L_{eq}):**

The L_{eq} is the equivalent continuous sound level, which is equivalent to the same sound energy as the actual fluctuating sound measured in the same period. This is necessary because sound from noise source often fluctuates widely during a given period of time. This is calculated from the following equation:



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$$L_{eq} = L_{50} + \frac{(L_{10} - L_{90})^2}{60}$$

L_{day} is defined as the equivalent noise level measured over a period of time during day (6 am to 10 pm).

L_{night} is defined as the equivalent noise level measured over a period of time during night (10 pm to 6 am).

❖ **Day-Night Sound Level (L_{dn}):**

The noise rating developed for community noise from all sources is the Day-Night Sound Level (L_{dn}). It is similar to a 24-hour equivalent sound level except that during night time period (10 pm to 6 am) a 10 dB (A) weighting penalty is added to the instantaneous sound level before computing the 24-hour average.

This night time penalty is added to account for the fact that the noise during night, when people are usually in sleep, is judged as more annoying than the same noise during the day time.

The L_{dn} for a given location in a community may be calculated from the hourly L_{eq} 's, by the following equation.

$$L_{dn} = 10 \log \left\{ \frac{1}{24} [16(10^{L_d/10}) + 8(10^{(L_n+10)/10})] \right\}$$

Where L_d is the equivalent sound level during the day time (6 am to 10 pm) and L_n is the equivalent sound level during the night time (10 pm to 6 am).

Presentation of Results

The statistical analysis is done for measured noise levels at 8 locations. The parameters are analyzed for L_{10} , L_{50} , L_{90} , L_{eq} , L_{day} , L_{night} , and L_{dn} . The statistical analysis results monitored during the study are given in **Table-17**. The ambient noise standards are given in **Table-18**.

TABLE-17
NOISE LEVELS [dB (A)] IN THE STUDY AREA

Code	Location	Average Noise Levels in dB(A)						
		L_{10}	L_{50}	L_{90}	L_{eq}	L_{day}	L_{night}	L_{dn}
N1	Chikkudugunta	49.6	45.7	42.0	46.7	47.5	43.9	51.0
N2	Dhamakkapeta	50.5	46.6	42.9	47.6	48.4	44.8	51.9
N3	Sambayagudam	49.3	45.4	41.7	46.4	47.2	43.6	50.7
N4	Ramanujavaram	50.5	46.6	42.9	47.6	48.4	44.8	51.9
N5	Tirumalapuram/Vijayanaram	48.3	44.4	40.7	45.4	46.2	42.6	49.7
N6	Mallepalli	54.8	50.9	47.2	51.9	52.7	49.1	56.2
N7	Ippalasingaram	47.3	43.3	39.7	44.9	45.8	43.1	50.0
N8	Rajupeta	42.7	38.8	35.5	41.3	42.7	37.2	45.0



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**TABLE-18
AMBIENT NOISE STANDARDS**

Area Code	Category of Area	Noise Levels (dB (A))	
		Day time	Night time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

9.3.4 Observations

Day time Noise Levels (L_{day})

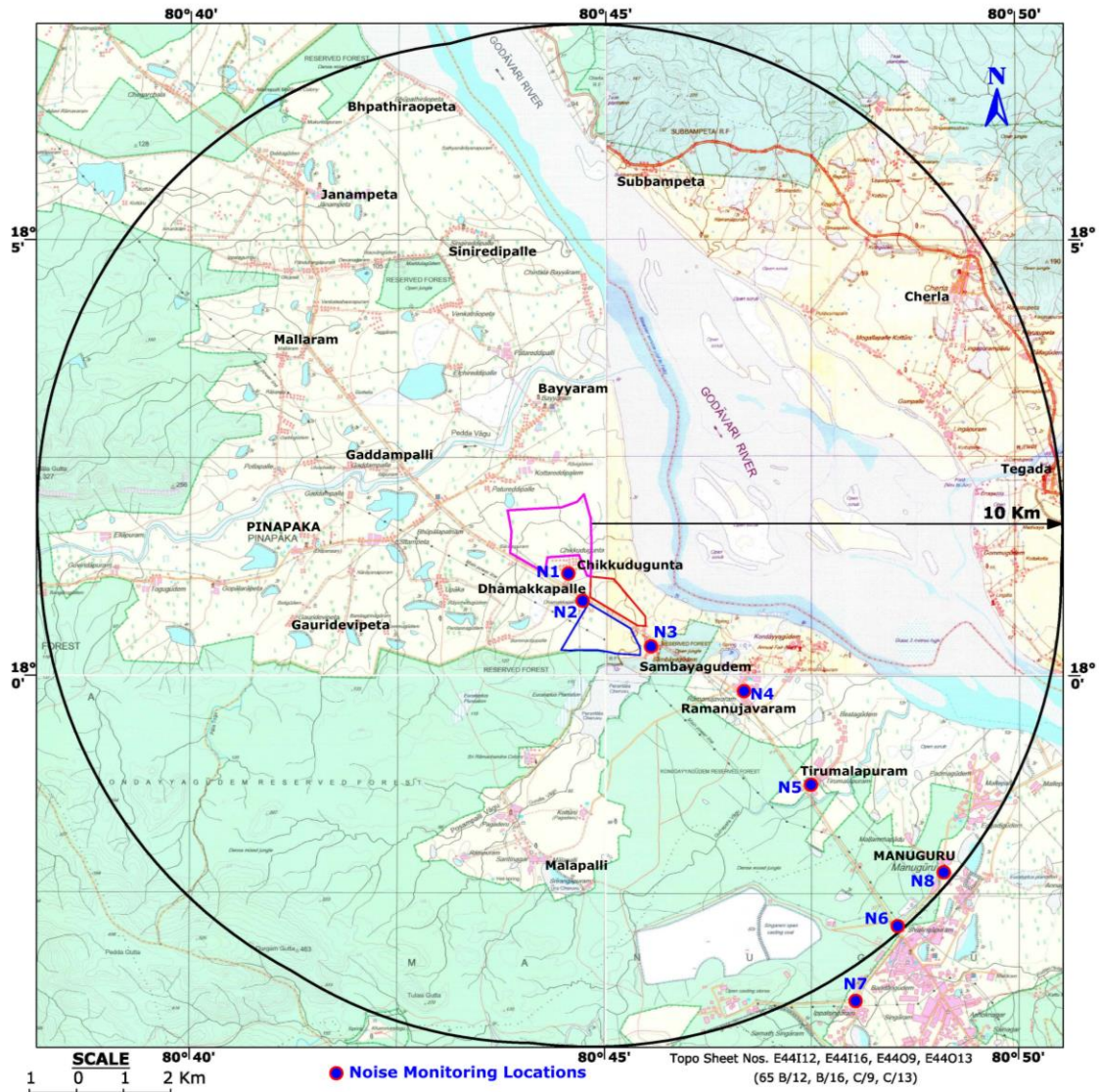
The day time noise levels were ranged in between 42.7 dB (A) to 52.7 dB (A). The maximum value 52.7 dB (A) was recorded at the Mallepalli (N6), and the minimum value 42.7 dB (A) was recorded at Rajupet (N8). It is observed that the day time noise levels are in accordance to the prescribed limit of 55 dB (A) for Residential areas.

Night time Noise Levels (L_{night})

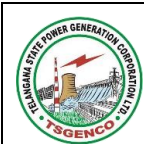
The night time noise levels were ranged in between 37.2 dB (A) to 49.1 dB (A). The maximum value 49.1 dB (A) was recorded at Mallepalli (N6), and the minimum value 37.2 dB (A) was recorded at Rajupet (N8). It has been found that the night time noise levels are in accordance with prescribed limit of 45 dB (A) for Residential areas except one location Manuguru may be due to commercial activities.



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**FIGURE-23
NOISE MONITORING LOCATIONS**



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Query 2: The progress report containing milestones for completing all activities of railway siding/line with timelines.

The chronology of various activities carried out till date for the construction of railway line from Manuguru railway station to BTPS is given in **Table-19**.

**TABLE-19
CONSTRUCTION OF RAILWAY LINE FROM MANUGURU RAILWAY STATION**

Sr.No	Description	Date
1	Purchase order placed on M/s. RITES Limited, Secunderabad for preparation of Detailed Project Report for feasibility of railway marshalling yard with suitable railway track from Manuguru railway station to the above plant vide P.O.No. CC-0012/CE/C/Th/SE/TCD-I/KTPSD/F.Manuguru/D.No. 302/2014, dated 03.12.2014 for an amount of Rs.150 Crores	03.12.2014
2	Environmental Clearance for BTPS project was granted by MoEF&&CC, GOI, New Delhi letter No. J-13012/02/2015-IA.I(T), dated 15.03.2017	15.03.2017
3	Submission of feasibility report to M/s. South Central Railways by M/s. RITES Limited, Secunderabad	December, 2017
4	Requisition for acquisition/alienation of Patta/Assigned land to an extent of Acres 107.09 Gts was filed with the Sub collector/Bhadrachalam, Bhadradri Kothagudem district	11.04.2018
5	Application submitted to the Principal Chief Conservator of Forests, Hyderabad for diversion of Ac. 64.10 Gts (25.8435 ha) of forest land in favor of TSGENCO for construction of railway line	23.07.2018
6	M/s. South Central Railways have accorded in-principle approval for the feasibility report.	05.11.2018
7	PCCF, Hyderabad has returned the proposal to the Conservator of Forest, Kothagudem requesting to identify the Non-Forest CA land to an extent of 26.00 ha	17.12.2018
8	Detailed project report was submitted to M/s. South Central Railways in the month of January 2019	January,2019
9	In-principle approval of DPR was accorded by M/s. South Central Railways, Secunderabad	15.03.2019

Awarding of Project Management Consultancy (PMC)

- ▲ The work for providing project management consultancy for Railway siding and Marshalling yard for 4x270 MW BTPS, Manuguru with the scope of work consisting of detailed soil investigation, Engineering, designs preparation of drawings, preparation of tender specification, inviting tenders and fixing up the agencies for construction of Railway Marshalling yard within the plant area and connecting Railway line from Manuguru Railway station to BTPS plant including overhead electrification, signaling and telecommunication was awarded to M/s. RITES for an amount of Rs.19.30 crores Vide PO no-CC17/CE/CIVIL/THERMAL/SE/TCD-II/F.RLY. SidingPMC/ D.No.92/2019 dated 28/06/2019.
- ▲ The zero date of the contract - 1.6.2019
- ▲ Contract period - 30 months
- ▲ M/s. RITES have furnished detailed timeline for completion of project vide letter no: RITES/SC/BTPS/TSGENCO/2019-20/1038 dated 14.6.2019 along with GANT chart and the same is enclosed as **Annexure-IX**. As per the schedule



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provided by M/s. RITES the railway line will be completed in all respects by 30.11.2021

- ▲ The status of work progress as on 1.7.2019 is presented in Table-20 below

TABLE-20
WORK PROGRESS AS ON 01.07.2019

Sr. No.	Work Details
1	Survey work of taking levels have been carried out all along the entire proposed alignment from takeoff upto the end of the proposed marshaling yard for transportation of coal by rail network for assessing the actual quantities of earthwork in cutting and filling.
2	The longitudinal section and cross section of the alignment have been prepared and calculation done for the quantities of earthwork.
3	The estimates for construction of major and minor bridges have been worked out.
4	The entire work is being divided into suitable packages for speedy execution of the work.
5	The Tender for earthwork and minor bridges in the proposed marshaling yard area will be invited before 20.07.2019.
6	The Balance tenders for the entire earthwork, bridges will be invited before 10.08.2019.

The progress report furnished by M/s. RITES Ltd., Secunderabad vide letter dated. 10.07.2019 is enclosed as **Annexure - X**

10.0 Environment Management Plan for Coal Transportation

10.1 Transport by Paved Roads

To prevent off-vehicle transport of fugitive dust to and from the site, shall implement the following best practices:

- (i) **Cover Loads:** The coal loaded trucks will be completely covered or enclosed in a manner that prevents the coal from blowing, dropping, leaking or otherwise escaping from the vehicle.
- (ii) **Minimize drop height:** During loading and unloading of the coal into the trucks, the drop height of coal will be minimized to the lowest possible height to prevent fugitive emissions.
- (iii) **Wet suppression:** Water sprinkling will be done on top layer of coal to prevent fugitive dust emissions during coal transportation.
- (iv) Trucks with Pollution Control Certificate (PCU) only will be employed.
- (v) High raised pedestrian crossing in front of the main employee's gate for the safety.
- (vi) Amber blinker lights will be used at the gate to caution vehicles which are moving out. Sign boards will be installed to this effect.
- (vii) High mast light at the entrance will be installed.



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- (viii) Necessary number of speed breakers as per IRC, along with adequate road signs shall be implemented for the Tirumalapuram, Ramanujavaram, Sambayagudem and Dhamakkapalle.
- (ix) The median opening will be made available one in front of the main gate and another one in front of the material handling gate (two gates).
- (x) Effective and efficient security will be provided at gates round the clock.

10.2 Unpaved Roads and Haul Roads

Road dust from unpaved roads is caused by particles lifted by and dropped from rolling wheels traveling on the road surface and from wind blowing across the road surface. Unpaved road used as a public right-of-way shall implement the following best management practices to prevent transport of fugitive dust emissions:

- (i) Reduce vehicle speeds: establish a maximum speed limit or install traffic calming devices to reduce speeds to a rate that prevents off-property transport of dust entrained by vehicles.
- (ii) Restrict access: restrict travel on unpaved roads by limiting access to only authorized vehicle use
- (iii) Wet suppression: apply water to unpaved road surface as necessary and appropriate considering current weather conditions
- (iv) Surface improvements: install gravel or similar materials with sufficient depth to reduce dust or pave high traffic areas.

10.3 Parking Lots

This section applies to paved and unpaved areas where vehicles are parked or stored on a routine basis and includes parking areas or vehicle storage yards;

Recommended Practices to Control Dust- Unpaved Parking Lots

- (i) Surface improvements: install gravel or similar materials with sufficient depth to reduce dust or pave high traffic areas.
- (ii) Vegetation: plant vegetation appropriate for retaining soils or creating a wind break.
- (iii) Wet suppression: apply water as necessary and appropriate considering current weather conditions to prevent transport of fugitive dust emissions.
- (iv) Reduce vehicle speeds: establish a maximum speed limit or install traffic calming devices to reduce speeds to a rate that prevents transport of dust entrained by vehicles
- (v) Restrict access: restrict travel in parking lots to only those vehicles with essential duties and limit access to hours of operation or specific events.
- (vi) Avenue plantation will be taken up on either side of the proposed road in the vacant spaces.

11.0 **Summary and Conclusions**

The present proposal is for amendment in EC granted by MoEF&CC vide letter no: J-13012/02/2015-IA. I(T), dated 15th March, 2017 for temporary arrangement in



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transportation route from rail to road network temporarily till the process of railway siding is completed.

The project is a priority project of Govt. of Telangana for providing power to the farming sector and lift irrigation scheme. Hence, the commissioning of the project is utmost important. Thus, temporary permission to the transport coal by existing road till the railway line is implemented is essential.

As suggested by EAC, detailed traffic studies and air quality monitoring studies have been carried out for assessment of background air quality conditions in the proposed transportation route. The existing traffic has been estimated by conducting traffic surveys and proposed additional traffic and its impact on habitation and forests is determined by Air Dispersion Modelling studies.

From the findings, it is observed that the existing road network will be adequate to accommodate the additional traffic load and complied with IRC guidelines. There will be a marginal effect on the air quality in the transportation route which are well within NAAQS standards and will be insignificant impact on habitation on either side of the road. However, the use of road route will be temporary and limited till the railway route activities are completed.



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EARILER ENVIRONMENTAL CLEARANCE



No. J-13012/02/2015 - IA. I (T)
Government of India
Ministry of Environment, Forest and Climate Change

Indira Paryavaran Bhawan, Jor Bagh Road,
Aliganj, New Delhi-110003

Dated: 23rd June, 2015

To
M/s. Telangana State Power Generation Corpn. Ltd. (TSGENCO)
(A Government of Telangana State Undertaking)
Vidyut Soudha
Hyderabad- 500 082

Tel. No. 040-233499417; Fax: 040-23499418

Sub: Manuguru Thermal Power Project of 1080 (4x270) MW at Villages Ramanujavaram, Eddulabayyaram & Seetharampuram, Mandals Manuguru & Pinapaka, District Khammam, Telangana by M/s Telangana State Power Generation Corporation Ltd. (TSGENCO) – reg. ToR.

Sir,
The undersigned is directed to refer your letters dated 03.02.2015, 09.02.2015 and 16.04.2015 on the above subject.

2. The proposal was considered by the Expert Appraisal Committee (Thermal Power) during its 32nd & 36th Meetings held during 23rd-24th February & 19th-20th May, 2015 respectively for determination of the Terms of Reference (TOR) for undertaking detailed EIA and preparation of EMP in accordance with the provisions of the EIA Notification dated September 14, 2006.

3. Based on the information/clarification and documents submitted by you with regard to the above-mentioned project proposal, the Committee has prescribed the following TOR for preparation of the EIA and EMP Report.

- i) Shall explore the feasibility of installing Super Critical Technology. If subcritical is proposed, prior approval of MoP shall be submitted. Accordingly, the EIA/EMP shall be prepared.
- ii) Action plan for development of green belt in 33% of the area and thick green belt between the Road and the River.
- iii) The proposed project shall be given a unique name in consonance with the name submitted to other Government Departments etc. for its better identification and reference.
- iv) Vision document specifying prospective long term plan of the project shall be formulated and submitted.
- v) Latest compliance report duly certified by the Regional Office of MoEF for the conditions stipulated in the environmental and CRZ clearances of the previous phase(s) for the expansion projects shall be submitted.
- vi) The project proponent needs to identify minimum three potential sites based on environmental, ecological and economic considerations, and choose one appropriate site having minimum impacts on ecology and environment. A detailed comparison of the sites in this regard shall be submitted.
- vii) Executive summary of the project indicating relevant details along with recent photographs of the proposed site (s) shall be provided. Response to the issues raised during Public Hearing and the written representations (if any), along

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- with a time bound Action Plan and budgetary allocations to address the same, shall be provided in a tabular form, against each action proposed.
- viii) Harnessing solar power within the premises of the plant particularly at available roof tops and other available areas shall be formulated and for expansion projects, status of implementation shall also be submitted.
- ix) The geographical coordinates (WGS 84) of the proposed site (plant boundary), including location of ash pond along with topo sheet (1:50,000 scale) and IRS satellite map of the area, shall be submitted. Elevation of plant site and ash pond with respect to HFL of water body/nallah/River and high tide level from the sea shall be specified, if the site is located in proximity to them.
- x) Layout plan indicating break-up of plant area, ash pond, green belt, infrastructure, roads etc. shall be provided.
- xi) Land requirement for the project shall be optimized and in any case not more than what has been specified by CEA from time to time. Item wise break up of land requirement shall be provided.
- xii) Present land use (including land class/kism) as per the revenue records and State Govt. records of the proposed site shall be furnished. Information on land to be acquired including coal transportation system, laying of pipeline, ROW, transmission lines etc. shall be specifically submitted. Status of land acquisition and litigation, if any, should be provided.
- xiii) If the project involves forest land, details of application, including date of application, area applied for, and application registration number, for diversion under PCA and its status should be provided along with copies of relevant documents.
- xiv) The land acquisition and R&R scheme with a time bound Action Plan should be formulated and addressed in the EIA report.
- xv) Satellite imagery and authenticated topo sheet indicating drainage, cropping pattern, water bodies (wetland, river system, stream, nallahs, ponds etc.), location of nearest habitations (villages), creeks, mangroves, rivers, reservoirs etc. in the study area shall be provided.
- xvi) Location of any National Park, Sanctuary, Elephant/Tiger Reserve (existing as well as proposed), migratory routes / wildlife corridor, if any, within 10 km of the project site shall be specified and marked on the map duly authenticated by the Chief Wildlife Warden of the State or an officer authorized by him.
- xvii) Topography of the study area supported by toposheet on 1:50,000 scale of Survey of India, along with a large scale map preferably of 1:25,000 scale and the specific information whether the site requires any filling shall be provided. In that case, details of filling, quantity of required fill material; its source, transportation etc. shall be submitted.
- xviii) A detailed study on land use pattern in the study area shall be carried out including identification of common property resources (such as grazing and community land, water resources etc.) available and Action Plan for its protection and management shall be formulated. If acquisition of grazing land is involved, it shall be ensured that an equal area of grazing land be acquired and developed and detailed plan submitted.
- xix) A mineralogical map of the proposed site (including soil type) and information (if available) that the site is not located on potentially mineable mineral deposit shall be submitted.
- xx) Details of fly ash utilization plan as per the latest fly ash Utilization Notification of GOI along with firm agreements / MoU with contracting parties including other usages etc. shall be submitted. The plan shall also include disposal method / mechanism of bottom ash.
- xxi) The water requirement shall be optimized (by adopting measures such as dry fly ash and dry bottom ash disposal system, air cooled condenser, concept of zero discharge) and in any case not more than that stipulated by CEA from time to time, to be submitted along with details of source of water and water

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- balance diagram. Details of water balance calculated shall take into account reuse and re-circulation of effluents.
- xxii) Water body/Nallah (if any) passing across the site should not be disturbed as far as possible. In case any Nallah / drain is proposed to be diverted, it shall be ensured that the diversion does not disturb the natural drainage pattern of the area. Details of proposed diversion shall be furnished duly approved by the concerned Department of the State.
- xxiii) It shall also be ensured that a minimum of 500 m distance of plant boundary is kept from the HFL of river system / streams etc. and the boundary of site should also be located 500 m away from railway track and National Highways.
- xxiv) Hydro-geological study of the area shall be carried out through an institute/ organization of repute to assess the impact on ground and surface water regimes. Specific mitigation measures shall be spelt out and time bound Action Plan for its implementation shall be submitted.
- xxv) Detailed Studies on the impacts of the ecology including fisheries of the River/Estuary/Sea due to the proposed withdrawal of water / discharge of treated wastewater into the River/Sea etc shall be carried out and submitted along with the EIA Report. In case of requirement of marine impact assessment study, the location of intake and outfall shall be clearly specified along with depth of water drawl and discharge into open sea.
- xxvi) Source of water and its sustainability even in lean season shall be provided along with details of ecological impacts arising out of withdrawal of water and taking into account inter-state shares (if any). Information on other competing sources downstream of the proposed project and commitment regarding availability of requisite quantity of water from the Competent Authority shall be provided along with letter / document stating firm allocation of water.
- xxvii) Detailed plan for rainwater harvesting and its proposed utilization in the plant shall be furnished.
- xxviii) Feasibility of near zero discharge concept shall be critically examined and its details submitted.
- xxix) Optimization of Cycles of Concentration (COC) along with other water conservation measures in the project shall be specified.
- xxx) Plan for recirculation of ash pond water and its implementation shall be submitted.
- xxxi) Detailed plan for conducting monitoring of water quality regularly with proper maintenance of records shall be formulated. Detail of methodology and identification of monitoring points (between the plant and drainage in the direction of flow of surface / ground water) shall be submitted. It shall be ensured that parameter to be monitored also include heavy metals. A provision for long-term monitoring of ground water table using Piezometer shall be incorporated in EIA, particularly from the study area.
- xxxii) Socio-economic study of the study area comprising of 10 km from the plant site shall be carried out through a reputed institute / agency which shall consist of detail assessment of the impact on livelihood of the local communities.
- xxxiii) Action Plan for identification of local employable youth for training in skills, relevant to the project, for eventual employment in the project itself shall be formulated and numbers specified during construction & operation phases of the Project.
- xxxiv) If the area has tribal population it shall be ensured that the rights of tribals are well protected. The project proponent shall accordingly identify tribal issues under various provisions of the law of the land.
- xxxv) A detailed CSR plan along with activities wise break up of financial commitment shall be prepared. CSR component shall be identified considering need based assessment study and Public Hearing issues.



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- Sustainable income generating measures which can help in upliftment of affected section of society, which is consistent with the traditional skills of the people shall be identified. Separate budget for community development activities and income generating programmes shall be specified.
- xxvvi) While formulating CSR schemes it shall be ensured that an in-built monitoring mechanism for the schemes identified are in place and mechanism for conducting annual social audit from the nearest government institute of repute in the region shall be prepared. The project proponent shall also provide Action Plan for the status of implementation of the scheme from time to time and dovetail the same with any Govt. scheme(s). CSR details done in the past should be clearly spelt out in case of expansion projects.
- xxvviij) R&R plan, as applicable, shall be formulated wherein mechanism for protecting the rights and livelihood of the people in the region who are likely to be impacted, is taken into consideration. R&R plan shall be formulated after a detailed census of population based on socio economic surveys who were dependant on land falling in the project, as well as, population who were dependant on land not owned by them.
- xxvviijii) Assessment of occupational health and endemic diseases of environmental origin in the study area shall be carried out and Action Plan to mitigate the same shall be prepared.
- xxvviijix) Occupational health and safety measures for the workers including identification of work related health hazards shall be formulated. The company shall engage full time qualified doctors who are trained in occupational health. Health monitoring of the workers shall be conducted at periodic intervals and health records maintained. Awareness programme for workers due to likely adverse impact on their health due to working in non-conductive environment shall be carried out and precautionary measures like use of personal equipments etc. shall be provided. Review of impact of various health measures undertaken at intervals of two to three years shall be conducted with an excellent follow up plan of action wherever required.
- xli) One complete season site specific meteorological and AAQ data (except monsoon season) as per latest MoEF Notification shall be collected and the dates of monitoring shall be recorded. The parameters to be covered for AAQ shall include PM₁₀, PM_{2.5}, SO₂, NO_x, CO and Hg. The location of the monitoring stations should be so decided so as to take into consideration the upwind direction, pre-dominant downwind direction, other dominant directions, habitation and sensitive receptors. There should be at least one monitoring station each in the upwind and in the pre - dominant downwind direction at a location where maximum ground level concentration is likely to occur.
- xlii) In case of expansion project, air quality monitoring data of 104 observations a year for relevant parameters at air quality monitoring stations as identified/stipulated shall be submitted to assess for compliance of AAQ Standards (annual average as well as 24 hrs).
- xliij) A list of industries existing and proposed in the study area shall be furnished.
- xliijii) Cumulative impacts of all sources of emissions including handling and transportation of existing and proposed projects on the environment of the area shall be assessed in detail. Details of the Model used and the input data used for modeling shall also be provided. The air quality contours should be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any. The windrose and isopleths should also be shown on the location map. The cumulative study should also include impacts on water, soil and socio-economics.
- xliiv) Radio activity and heavy metal contents of coal to be sourced shall be examined and submitted along with laboratory reports.
- xlv) Fuel analysis shall be provided. Details of auxiliary fuel, if any, including its quantity, quality, storage etc should also be furnished.



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- xlvi) Quantity of fuel required, its source and characteristics and documentary evidence to substantiate confirmed fuel linkage shall be furnished. The Ministry's Notification dated 02.01.2014 regarding ash content in coal shall be complied. For the expansion projects, the compliance of the existing units to the said Notification shall also be submitted.
- xlvii) Details of transportation of fuel from the source (including port handling) to the proposed plant and its impact on ambient AAQ shall be suitably assessed and submitted. If transportation entails a long distance it shall be ensured that rail transportation to the site shall be first assessed. Wagon loading at source shall preferably be through silo/conveyor belt.
- xlviii) For proposals based on imported coal, inland transportation and port handling and rail movement shall be examined and details furnished. The approval of the Port and Rail Authorities shall be submitted.
- xliv) Details regarding infrastructure facilities such as sanitation, fuel, restrooms, medical facilities, safety during construction phase etc. to be provided to the labour force during construction as well as to the casual workers including truck drivers during operation phase should be adequately catered for and details furnished.
- l) EMP to mitigate the adverse impacts due to the project along with item - wise cost of its implementation in a time bound manner shall be specified.
- li) A Disaster Management Plan (DMP) along with risk assessment study including fire and explosion issues due to storage and use of fuel should be carried out. It should take into account the maximum inventory of storage at site at any point of time. The risk contours should be plotted on the plant layout map clearly showing which of the proposed activities would be affected in case of an accident taking place. Based on the same, proposed safeguard measures should be provided. Measures to guard against fire hazards should also be invariably provided. Mock drills shall be suitably carried out from time to time to check the efficiency of the plans drawn.
- lii) The DMP so formulated shall include measures against likely Fires/Tsunami/Cyclones/Storm Surges/Earthquakes etc, as applicable. It shall be ensured that DMP consists of both On-site and Off-site plans, complete with details of containing likely disaster and shall specifically mention personnel identified for the task. Smaller version of the plan for different possible disasters shall be prepared both in English and local languages and circulated widely.
- liii) Detailed scheme for raising green belt of native species of appropriate width (50 to 100 m) and consisting of at least 3 tiers around plant boundary with tree density of 2000 to 2500 trees per ha with a good survival rate of around 80% shall be submitted. Photographic evidence must be created and submitted periodically including NRSA reports in case of expansion projects. A shrub layer beneath tree layer would serve as an effective sieve for dust and sink for CO₂ and other gaseous pollutants and hence a stratified green belt should be developed.
- liv) Over and above the green belt, as carbon sink, plan for additional plantation shall be drawn by identifying blocks of degraded forests, in close consultation with the District Forests Department. In pursuance to this the project proponent shall formulate time bound Action Plans along with financial allocation and shall submit status of implementation to the Ministry every six months.
- lv) Corporate Environment Policy
- i. Does the company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.
 - ii. Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? If so, it may be detailed in the EIA.



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- iii. What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions. Details of this system may be given.
- iv. Does the company has compliance management system in place wherein compliance status along with compliances / violations of environmental norms are reported to the CMD and the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism should be detailed in the EIA report.

All the above details should be adequately brought out in the EIA report and in the presentation to the Committee.

- vi) Details of litigation pending or otherwise with respect to project in any Court, Tribunal etc. shall invariably be furnished.
4. Besides the above, the following general points shall be followed:
 - a. All documents to be properly referenced with index, page numbers and continuous page numbering.
 - b. Where data is presented in the report especially in table, the period in which the data was collected and the source should invariably be indicated.
 - c. Where the documents provided are in a language other than English, an English translation should be provided.
 - d. The Questionnaire for environmental appraisal of thermal power projects as devised earlier by the Ministry shall also be filled and submitted.
 - e. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India (QCI) / National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA/ EMP reports prepared by them and data provided by other organization / Laboratories including their status of approvals etc. In this regard circular no. F.No. J-11013/77/2004-IA-II (I) dated 2nd December, 2009 is posted on the Ministry's website <http://www.moef.nic.in> may be referred.

In addition to the above, information on the following may also be incorporated in the EIA report.

1. Is the project intended to have CDM-intent?
 - (i) If not, then why?
 - (ii) If yes, then
 - a. Has PIN (Project Idea Note) (or PCN (Project Concept Note)) submitted to the ?NCA? (National CDM Authority) in the MoEF?
 - b. If not, then by when is that expected?
 - c. Has PDD (Project Design Document) been prepared?
 - d. What is the Carbon intensity? from your electricity generation projected (i.e. CO₂ Tons/MWH or Kg/KWH)
 - e. Amount of CO₂ in Tons/year expected to be reduced from the baseline data available on the CEA's web-site (www.cea.nic.in)
2. Notwithstanding 1(i) above, data on (d) & (e) above shall be worked out and reported.
5. **The Environmental Clearance shall be applied only after fuel and water linkages are firmed up.**

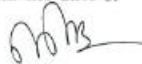


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6. After preparing the Draft EIA (as per the generic structure prescribed in Appendix-III of the EIA Notification, 2006) covering the above mentioned issues, the same shall be submitted to the SPCB for conducting the public hearing as per procedure of EIA notification 2006. The issues emerged during public hearing shall be further incorporated in the Draft EIA/EMP report. The final EIA/EMP report along with public hearing report and the requisite documents (*including written objections, if any*) shall be submitted to the Ministry for appraisal by the Expert Appraisal Committee for consideration of awarding environmental clearance under the provisions of Environmental Impact Assessment notification dated September 14, 2006.

7. The TORs prescribed shall be valid for a period of three years from the date of issue for submission of EIA/ EMP reports, after public consultation.


(B.B. Barman)
Scientist 'F'

Copy to:

1. The Chairman, Telangana State Pollution Control Board, Paryavaran Bhawan, A-3 Industrial Estate, Sanath Nagar, Hyderabad- 500 018.
2. The Additional PCCF (Central), Regional Office, Ministry of Environment, Forests and Climate Change, 1st & 2nd Floors, HEPC Building, 34, Cathedral Garden Road, Nungambakkam, Chennai- 600034.
3. The District Collector, Khamman District, Govt. of Telangana.
4. Guard file.
5. Website of MoEF&CC


(B.B. Barman)
Scientist 'F'



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**ANNEXURE-II
PRELIMINARY PAPER NOTIFICATION**

GAJAKSHI DT: 29-06-2019

తెలంగాణ ప్రభుత్వం
విశేష పత్రము - అధికారిక ప్రకటన
భద్రాద్రి కొత్తగూడెం

ఫారం-8 ప్రాథమిక నోటిఫికేషన్

(భూసేకరణ పునరుపాధి కల్పనలో పారదర్శకత మరియు హాతుబద్ధమైన పరిహారాన్ని పొందే హక్కు చట్టం-2013 (కేంద్ర చట్టం 30ఎ/2013) యొక్క సెక్షన్ 11(1) మరియు రూల్ (19) సబ్ రూల్ (1) అనుసరించి)

సబ్-కలెక్టర్, భద్రాచలం పైల్ సంఖ్య సి/243/2018 తేది: 16.05.2019
జిల్లా కలెక్టర్, భద్రాద్రి కొత్తగూడెం పైల్ సంఖ్య జి/306/2017 తేది: 17.06.2019
జిల్లా గెజిట్ నెం. బి3/33/2019 తేది: 19.06.2019

తెలంగాణ ప్రభుత్వం / జిల్లా కలెక్టర్, భద్రాద్రి కొత్తగూడెం ఆదేశానుసారం భద్రాద్రి కొత్తగూడెం ఆదేశానుసారం భద్రాద్రి కొత్తగూడెం జిల్లా, మణుగూరు మండలంలో సమితిసింగారం గ్రామములో గల విస్తీర్ణం ఎ. 16.22 1/4 గుంటల ఈ దిగువ చూపిన భూమి ప్రజా ప్రయోజనార్థం అనగా టి.ఎస్.జి.ఇ.ఎస్.కో - భద్రాద్రి థర్మల్ పవర్ స్టేషన్, మణుగూరు వారికి మణుగూరు రైల్వే స్టేషన్ నుండి భద్రాద్రి థర్మల్ పవర్ స్టేషన్ వరకు కొత్త రైల్వే మార్గ నిర్మించడం నిమిత్తం అవసరమైయున్నదని భావించినందున భూ సేకరణలో సముచిత పరిహారం మరియు పారదర్శకత పునరావాస పునరాశ్రయ చట్టం-2013 (నెం. 30ఎ/2013) లోని సెక్షన్ 11(1) అనుసరించి ప్రకటన జారీ చేయనున్నది.

మణుగూరు మండలంలో సమితిసింగారం గ్రామములోని క్రింద షెడ్యూల్ లో సూచించిన టి.ఎస్.జి.ఇ.ఎస్.కో-భద్రాద్రి థర్మల్ పవర్ స్టేషన్ వారికి మణుగూరు రైల్వే స్టేషన్ నుండి భద్రాద్రి థర్మల్ పవర్ స్టేషన్ వరకు కొత్త రైల్వే మార్గం నిర్మించడం నిమిత్తం భూ సేకరణ ద్వారా సేకరించుటకు శ్రీయుత జిల్లా కలెక్టర్, భద్రాద్రి కొత్తగూడెం సబ్-కలెక్టర్, భద్రాచలం గారిని భూ సేకరణ అధికారిగా నియమించినారు.

కావున ఈ ప్రాజెక్ట్ క్రింద భద్రాద్రి కొత్తగూడెం జిల్లా, మణుగూరు మండలంలో సమితిసింగారం గ్రామములో భూమి విస్తీర్ణం ఎ. 16.22 1/4 గుంటలు భూమి ఈ క్రింద చూపిన విధముగా భూ సేకరణ నిమిత్తం ప్రాథమిక ప్రకటన జారీ చేయవలెనని.

షెడ్యూల్

గ్రామము : సమితిసింగారం మండలం : మణుగూరు జిల్లా : భద్రాద్రి కొత్తగూడెం

జిల్లా ప్రకటన భూసేకరణలో సముచిత పరిహారం మరియు పారదర్శకత పునరావాస పునరాశ్రయ చట్టం-2013 (నెం. 30ఎ/2013) లోని సెక్షన్ 11(1) ప్రకారం సంబంధిత భూ యజమానులనుద్దేశించి జారీ చేయవలెనని.

భూమి యొక్క పైన మరియు వివరములు జిల్లా కలెక్టర్, భద్రాద్రి కొత్తగూడెం మరియు సబ్-కలెక్టర్, భద్రాచలం వారు వారి కార్యాలయములో ఉంచవలెనని. సంబంధిత వ్యక్తులు ఏదైనా పని దినములో కార్యాలయ పనివేళలో తనిఖీ చేసుకొవచ్చును. తెలంగాణ రాష్ట్ర ప్రభుత్వము / జిల్లా కలెక్టర్, భద్రాద్రి కొత్తగూడెం వారు సబ్-కలెక్టర్, భద్రాచలం గారిని, వారి సిబ్బందిని జిల్లా భూ సేకరణకు సంబంధించిన పైన తెలిపిన భూమిలో ఏదైనా ప్రతేకములో ప్రవేశించి సర్వే భూమి కొలతలు తీసుకొనుటకు, తవ్వకుట మరియు ఇత్యాది పనులు చేపట్టడానికి పై చట్టంలోని సెక్షన్-12 ప్రకారం అనుమతించవలెనని.

సెక్షన్ 11(4) ప్రకారం భూ సేకరణకు ప్రతిపాదించబడిన భూమి విషయములో జిల్లా కలెక్టర్, భద్రాద్రి కొత్తగూడెం గారి అనుమతి లేకుండా ప్రాథమిక ప్రకటన జారీ చేసిన తేది నుండి ఆ ప్రకటనలో -దహించబడిన భూములకు సంబంధించి ఎవరు ఎటువంటి కొనుగోలు, తనిఖీ మొదలగు చర్యలు చేపట్టరాదు.

భూ సేకరణ విషయములో సంబంధించిన భూ యజమానులు ఏమైనా అభ్యంతరములున్న యెడల చట్టంలోని సెక్షన్-(15) ప్రకారం, జిల్లా కలెక్టర్, భద్రాద్రి కొత్తగూడెం / సబ్-కలెక్టర్, భద్రాచలం గార్లకు జిల్లా ప్రకటన జారీ చేసిన (60) దినముల లోపల వారి అభ్యంతరములు రిఖిత పూర్వకముగా రాఖలుచేయవచ్చును.

సం/-
భవేష్ మిశ్రా
భూ సేకరణ అధికారి & సబ్-కలెక్టర్, భద్రాచలం

సం/-
రజత్ కుమార్ కైసి
కలెక్టర్ జిల్లా మేజిస్ట్రేట్, భద్రాద్రి కొత్తగూడెం

DIPR No. : 306/LA/PP/Agency/2019-20



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradri – Kothagudem district, Telangana

**ANNEXURE-II
PRELIMINARY PAPER NOTIFICATION**

తెలంగాణ ప్రభుత్వము
విశేష పత్రము - అధికారిక ప్రకటన
భద్రాద్రి కొత్తగూడెం

ఫారం-6 ప్రాథమిక సోదీధికేషన్

(భూసేకరణ పునరుపాధి కల్పనలో పొందదగ్గతక మరియు హాతుబద్ధమైన పరివారాన్ని పొందే చాక్కు చట్టం-2013 (కేంద్ర చట్టం 30ఎ/2013) యొక్క సెక్షన్ 11(1) మరియు రూల్ (19) సబ్ రూల్ (1) అనుసరించి)

సబ్-కలెక్టర్, భద్రాచలం పైల్ సంఖ్య సి/243/2018 తేదీ: 18.06.2019
జిల్లా కలెక్టర్, భద్రాద్రి కొత్తగూడెం పైల్ సంఖ్య సి/306/2017 తేదీ: 17.06.2019
జిల్లా గెజిట్ నెం. 53/92/2019 తేదీ: 19.06.2019

తెలంగాణ ప్రభుత్వం / జిల్లా కలెక్టర్, భద్రాద్రి కొత్తగూడెం అదేశానుసారం భద్రాద్రి కొత్తగూడెం జిల్లా, మణుగూరు మండలంలో రామానుజవరం గ్రామములో గల విస్తీర్ణం ఎ. 80.15 1/2 గుంటల ఈ దిగువ చూపిన భూమి ప్రజా ప్రయోజనార్థం అనగా డి.ఎస్.జి.ఎన్.కా - భద్రాద్రి థర్మల్ పవర్ స్టేషన్, మణుగూరు వారికి మణుగూరు రైల్వే స్టేషన్ నుండి భద్రాద్రి థర్మల్ పవర్ స్టేషన్ వరకు కొత్త రైల్వే మార్గ నిర్మించడం నిమిత్తం అవసరమైయున్నదని భావించినందున భూసేకరణలో సముచిత పరివారం మరియు పొందదగ్గతక పునరావాస పునరాశ్రయ చట్టం-2013 (నెం. 30ఎ/2013) లోని సెక్షన్ 11(1) అనుసరించి ప్రకటన జారీ చేయనున్నది.

మణుగూరు మండలంలో సమీపింగారం గ్రామములోని శ్రీంద పెద్దూల్ లో సూచించిన డి.ఎస్.జి.ఎన్.కా - భద్రాద్రి థర్మల్ పవర్ స్టేషన్ వారికి మణుగూరు రైల్వే స్టేషన్ నుండి భద్రాద్రి థర్మల్ పవర్ స్టేషన్ వరకు కొత్త రైల్వే మార్గం నిర్మించడం నిమిత్తం భూసేకరణ ద్వారా సేకరించుటకు శ్రీయుత జిల్లా కలెక్టర్, భద్రాద్రి కొత్తగూడెం సబ్-కలెక్టర్, భద్రాచలం గారిని భూసేకరణ అధికారిగా నియమించారు.

కావున ఈ ప్రాజెక్ట్ శ్రీంద భద్రాద్రి కొత్తగూడెం జిల్లా, మణుగూరు మండలంలో సమీపింగారం గ్రామములో భూమి విస్తీర్ణం ఎ. 80.15 1/2 గుంటలు భూమి ఈ శ్రీంద చూపిన విధముగా భూసేకరణ నిమిత్తం ప్రాథమిక ప్రకటన జారీ చేయవలెనని.

పెద్దూల్

గ్రామము : రామానుజవరం మండలం : మణుగూరు జిల్లా : భద్రాద్రి కొత్తగూడెం

జిల్లా ప్రకటన భూసేకరణలో సముచిత పరివారం మరియు పొందదగ్గతక పునరావాస పునరాశ్రయ చట్టం-2013 (నెం. 30ఎ/2013) లోని సెక్షన్ 11(1) ప్రకారం సంబంధిత భూ యజమానులను గురించి జారీ చేయవలెనని.

భూమి యొక్క ప్లాన్ మరియు వివరములు జిల్లా కలెక్టర్, భద్రాద్రి కొత్తగూడెం మరియు సబ్-కలెక్టర్, భద్రాచలం వారు వారి కార్యాలయములో ఉంచవలెనని. సంబంధిత వ్యక్తులు ఏవైనా పని దినములలో కార్యాలయ పనివేళలో తనిఖీ చేసుకొనవచ్చును. తెలంగాణ రాష్ట్ర ప్రభుత్వము / జిల్లా కలెక్టర్, భద్రాద్రి కొత్తగూడెం వారు సబ్-కలెక్టర్, భద్రాచలం గారిని, వారి సిబ్బందిని జిల్లా భూసేకరణకు సంబంధించిన పైన తెలిపిన భూమిలో ఏదైనా ప్రదేశములో ప్రవేశించి సర్వే భూమి కొలతలు తీసుకొనుటకు, తవ్వకుట మరియు ఇత్యాది పనులు చేపట్టడానికి పై చట్టంలోని సెక్షన్-12 ప్రకారం అనుమతించవలెనని.

సెక్షన్ 11(4) ప్రకారం భూసేకరణకు ప్రతిపాదించబడిన భూమి విషయములో జిల్లా కలెక్టర్, భద్రాద్రి కొత్తగూడెం గారి అనుమతి లేకుండా ప్రాథమిక ప్రకటన జారీ చేసిన తేదీ నుండి ఆ ప్రకటనలో -దూరించబడిన భూములకు సంబంధించి ఎవరు ఎటువంటి కొనుగోలు, తనఖా మొదలగు చర్యలు చేపట్టరాదు.

భూసేకరణ విషయములో సంబంధించిన భూ యజమానులు ఏవైనా అభ్యంతరములున్న యెడల చట్టంలోని సెక్షన్-(15) ప్రకారం, జిల్లా కలెక్టర్, భద్రాద్రి కొత్తగూడెం / సబ్-కలెక్టర్, భద్రాచలం గార్లకు జిల్లా ప్రకటన జారీ చేసిన (60) దినములలోపల వారి అభ్యంతరములు లిఖిత పూర్వకముగా దాఖలుచేయవచ్చును.

సం/- సం/-
భవేష్ మిశ్రా రజత్ కుమార్ శైవి
భూసేకరణ అధికారి & సబ్-కలెక్టర్, కలెక్టర్ జిల్లా మేజిస్ట్రేట్, భద్రాద్రి కొత్తగూడెం
భద్రాచలం

DIPR No. : 290/LA/PP/Agency/2019-20



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradri – Kothagudem district, Telangana

ANNEXURE-III
MINUTES OF 28TH EAC MEETING

Accordingly, the proposal has been deferred till the submission of the site visit report of the Sub-committee.

(28.3) 4x270 MW (1080 MW) Coal based Bhadradri Thermal Power Station (BTPS) at Villages Ramanujavaram, Eddulabayyaram & Seetharampuram, Mandals Manuguru & Pinapaka, District Bhadradri Kothagudem (Erstwhile Khammam dist.), Telangana by M/s Telangana State Power Generation Corporation (TSGENCO) Ltd. – reg. permission for coal transportation by road.

(F.No. J-13012/02/2015-IA.I (T) & Proposal no. IA/TG/THE/105598/2019).

(28.3.1) Project Proponent submitted online application on 16.05.2019 for permission for coal transportation by road for a period of three years.

(28.3.2) The project proponent along with Environment Consultants M/s B S Envitech Pvt. Ltd. have made the presentation inter-alia furnished the following information:

- i. The Environmental Clearance for 4x270 MW Bhadradri Thermal Power Project has been granted by the Ministry on 15.3.2017.
- ii. The first unit (270 MW) is scheduled to be commissioned in June, 2019 and balance three units by December, 2019. The dedicated railway siding of BTPS has not yet commissioned due to delay in land acquisition.
- iii. The alignment of proposed railway line from Manuguru Railway Station to Bhadradri Thermal Power Station for a length of 20.25 km and the extent of land acquisition is 171.19 acres out of which 64.10 acres is the forest land and remaining 107.09 acres is the patta land.
- iv. The submission of Preliminary Notification proposals by the Sub-collector, Bhadrachalam is under process. Further, regarding forest clearance for 64.10 acres, the proposal is with the Conservator of Forests, Kothagudem for identification of Compensatory Afforestation land. After handing over the land to the TSGENCO, it would take about 2-2.5 years to lay railway line along with siding. The process of land acquisition is delayed due to sequential elections in the State and Centre.
- v. The total quantity of 13,000 Tons/day coal is to be transported from Manuguru Opencast Mines of M/s Singareni collieries Company Ltd. with an approximate distance of 17 km. About 655 trucks /day (to and fro: 1310 trucks) will ply on the road.

(28.3.3) Committee noted that the Traffic Impact Assessment report prepared by environmental consultant is not providing any reliable information on the width of the road, nature of the road, the loadbearing capacity of the road, the details of baseline data such as air quality, noise quality and traffic monitoring locations and its quality collected from various locations. Further, the air quality predictions made in the report are not representing the factual status on ground. The details of input emissions and weather class/meteorology considered shall also be provided in the report to estimate the predicted concentrations of various



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ANNEXURE-III
MINUTES OF 28TH EAC MEETING

air quality parameters. The details of villages, forests, habitations along the route may also be provided.

(28.3.4) Committee after deliberations, deferred the project for want of following information:

- i. Revised Traffic Impact Assessment report incorporating details of roads, traffic sufficiency and load bearing capacity, details of modelling parameters and results, details of villages, habitations and forests and impact of proposed traffic on them.
- ii. The progress report containing milestones for completing all activities of railway siding/line with timelines.

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(28.4) 55 MW Municipal Solid Waste Power Project (Using Cold Plasma Technology to convert Green Power, Purified Water and Fuel at East Delhi Municipal Corporation Opp. Gagan Theatre, Wazirabad Road, Mandoli Extension, Village Mandoli, Delhi by M/s A.G. Dauters Waste Processing Private Limited. - reg. reconsideration of ToR. (F.No. J-13012/13/2018-IA.I (T) & Proposal no. IA/DL/THE/84113/2018).

(28.4.1) Project Proponent has submitted online application on 31.10.2018 for grant of ToR for establishing 55 MW Waste to Energy Power Project from 200 Tons per Day Municipal Solid Waste. The proposal is based on Cold Plasma Gasification Technology which will convert MSW into 55 MW of Green Power, 925 KLD Purified Water and 925 KLD fuel.

(28.4.2) The proposal has been considered by the EAC (Thermal Power) in its meetings held on 30.11.2018, 22.2.2019 and 27.3.2019. The EAC in its meeting held on 27.3.2019 recommended that the proposal may be referred to Institute of Plasma Research, Gandhinagar, and the Institute be requested by the Ministry to provide a critical appraisal of the technical feasibility of and likely emissions from the proposed technology. Thereafter, the recommendations may be placed before the Committee for arriving at an informed decision. An expert from Central Electro Chemical Research Institute may also be co-opted in the EAC meeting for detailed examination to ensure clarity on the proposal. Accordingly, the proposal has been deferred till such time the above issues are resolved.

(28.4.3) As there is no WtE power plant in the Country which is working on this technology and the plasma reactor as informed will operate at 10,000-14,000 °C which will have safety implications on the surrounding areas. The proposal has been referred by the Ministry to the Institute of Plasma Research, Gandhinagar for evaluating the technical feasibility of the said proposal.

(28.4.4) M/s AG Dauters Waste Processing Private Limited attended a meeting organized by the Institute on 29.4.2019 have provided the following information against the questions posed by the Institute:

- i. The technology and process are proprietary and they cannot reveal/disclose the process details.
- ii. The inert in the waste are dissolved in the fluid and converted to gas.
- iii. Very small fraction of the residue is collected as hard material "plasma rock" based on the commercial value of the element.



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ANNEXURE-IV
VIDEO OF THE PROPOSED ROUTE

Video Soft copy attached



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradri – Kothagudem district, Telangana

ANNEXURE-V
IRC GUIDELINES FOR CAPACITY OF ROADS IN RURAL AREAS

IRC : 64-1990

representative of the situations normally occurring and can therefore be adopted for general design purposes.

TABLE 1 RECOMMENDED PCU FACTORS FOR VARIOUS TYPES OF VEHICLES ON RURAL ROADS

S. No.	Vehicle Type	Equivalency Factor
Fast Vehicles		
1.	Motor Cycle or Scooter	0.50
2.	Passenger Car, Pick-up Van or Auto-rickshaw	1.00
3.	Agricultural Tractor, Light Commercial Vehicle	1.50
4.	Truck or Bus	3.00
5.	Truck-trailer, Agricultural Tractor-trailer	4.50
Slow Vehicles		
6.	Cycle	0.50
7.	Cycle-rickshaw	2.00
8.	Hand Cart	3.00
9.	Horse-drawn vehicle	4.00
10.	Bullock Cart*	8.00

* For smaller bullock-carts, a value of 6 will be appropriate.

7.2. In practice, the equivalency factors will vary according to terrain. However, for purpose of these guidelines, the same equivalency factors as given above can be used for rolling/hilly sections since the effect of terrain has been accounted for in a consolidated manner in the Design Service Volumes recommended subsequently in Tables 2, 3 and 4 for different widths of road.

8. RECOMMENDED DESIGN SERVICE VOLUMES FOR SINGLE LANE ROADS

8.1. Single-lane bi-directional roads are of common occurrence in low volume corridors. For safe and smooth operation of traffic, a single lane road should have at least 3.75 metre wide paved carriageway with good quality shoulders such as moorum shoulders of minimum 1.0 metre width on either side.

8.2. The recommended design service volumes of single – lane roads are given in Table 2.



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ANNEXURE-V
IRC GUIDELINES FOR CAPACITY OF ROADS IN RURAL AREAS

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TABLE 3. RECOMMENDED DESIGN SERVICE FOR INTERMEDIATE LANE ROADS

S.N.	Terrain	Curvature (Degrees per Kilometre)	Design Service Volume in PCU/day
1.	Plain	Low (0-50)	6,000
		High (above 51)	5,800
2.	Rolling	Low (0-100)	5,700
		High (above 101)	5,600
3.	Hilly	Low (0-200)	5,200
		High (above 201)	4,500

TABLE 4. RECOMMENDED DESIGN SERVICE VOLUMES FOR TWO LANE ROADS

S.N.	Terrain	Curvature (Degrees per Kilometre)	Design Service Volume in PCU/day
1.	Plain	Low (0-50)	15,000
		High (above 51)	12,500
2.	Rolling	Low (0-100)	11,000
		High (above 101)	10,000
3.	Hilly	Low (0-200)	7,000
		High (above 201)	5,000



ANNEXURE-V

IRC GUIDELINES FOR CAPACITY OF ROADS IN RURAL AREAS

IRC : 64-1990

earthen shoulders are available. The capacity figures relate to peak hour traffic in the range of 8-10 per cent and LOS B.

10.3. The capacity of two lane roads can be increased by providing paved and surfaced shoulders of at least 1.5 metre width on either side. Provision of hard shoulders results in slow moving traffic being able to travel on the shoulder which reduces the interference to fast traffic on the main carriageway. Under these circumstances, 15 per cent increase in capacity can be expected vis-a-vis the values given in Table 4.

10.4. Where shoulder width or carriageway width on a two lane road are restricted, there will be a certain reduction in capacity. Table 5 gives the recommended reduction factors on this account over the capacity values given in Table 4.

TABLE 5 . CAPACITY REDUCTION FACTORS SUGGESTED FOR SUBSTANDARD LANE AND SHOULDER WIDTH ON TWO-LANE ROAD

Usable* shoulder width (m)	3.50 m lane	3.25 m lane	3.00 m lane
≥ 1.8	1.00	0.92	0.84
1.2	0.92	0.85	0.77
0.6	0.81	0.75	0.68
0	0.70	0.64	0.58

* Usable shoulder width refers to well-maintained earth/moorum/gravel shoulder-which can safely permit occasional passage of vehicles.

11. RECOMMENDED DESIGN SERVICE VOLUME FOR MULTI-LANE ROADS

11.1. Sufficient information about the capacity of multi-lane roads under mixed traffic conditions is not yet available. Capacity on dual carriageway roads can also be affected by factors like kerb shyness on the median side vehicle parking etc. Tentatively, a value of 35,000 PCUs can be adopted for four-lane divided carriageways located in plain terrain. It is assumed for this purpose that reasonable good earthen shoulders exist on the outer side, and a minimum 3.0 m wide central verge exists.

11.2. Provision of hard shoulders on dual carriageways can further increase the capacity as explained in para 10.3. In case well



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ANNEXURE-VI
EMISSIONS STANDARDS

6/12/2019

Central Pollution Control Board | Ministry of Environment, Forest and Climate Change, Government of India

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Central Pollution Control Board
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In Pursuit of Clean Environment

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Home Standards Vehicular Exhaust

- Air Quality Standards
- Water Quality Standards +
- Vehicular Exhaust
- Noise Standards/Rules +
- Bio Medical Incinerators
- Auto Fuel Quality
- Common HW Incinerators
- Generator Set +
- Industry Specific Standards +

Vehicular Exhaust

Updated on : 07 Sep 20

Emission norms for passenger cars

Norms	CO(g/km)	HC+ NOx(g/km)
1991Norms	14.3-27.1	2.0(Only HC)
1996 Norms	8.68-12.40	3.00-4.36
1998Norms	4.34-6.20	1.50-2.18
India stage 2000 norms	2.72	0.97
Bharat stage-II	2.2	0.5
Bharat Stage-III	2.3	0.35(combined)
Bharat Stage-IV	1.0	0.18(combined)

Emission norms for Heavy Diesel vehicles

Norms	CO(g/kmhr)	HC (g/kmhr)	NOx (g/kmhr)	PM(g/kwahr)
1991Norms	14	3.5	18	-
1996 Norms	11.2	2.4	14.4	-
India stage 2000 norms	4.5	1.1	8.0	0.36
Bharat stage-II	4.0	1.1	7.0	0.15
Bharat Stage-III	2.1	1.6	5.0	0.10
Bharat Stage-IV	1.5	0.96	3.5	0.02

Emission Norms for 2/3 wheeler

Norms	CO(g/km)	HC+ NOx
1991Norms	12-30	8-12 (onl
1996 Norms	4.5	3.6
India stage 2000 norms	2.0	2.0
Bharat stage-II	1.6	1.5
Bharat Stage-III	1.0	1.0



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradi) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradi – Kothagudem district, Telangana

ANNEXURE-VII
HOURLY TRAFFIC COUNT

Location Number : T1 (PK OC-4 Mine road and Manuguru- Eturunagaram State Highway Junction)									
PK Mine to Manuguru									
Time	2&3-Wheeler	Car & Jeeps	LMV	HMV	Multaxiel	Other Vehicle	Total Vehicles	PCU	
06 to 07	25	3	7	7	0	1	43	50	
07 to 08	19	0	3	8	0	3	33	47	
08 to 09	32	1	22	9	0	2	66	83	
09 to 10	37	8	34	14	0	1	94	123	
10 to 11	52	0	31	15	0	0	98	118	
11 to 12	28	4	16	15	0	2	65	93	
12 to 13	33	0	22	14	0	0	69	92	
13 to 14	21	1	11	19	0	0	52	85	
14 to 15	30	0	15	18	0	3	66	101	
15 to 16	15	0	5	2	0	2	24	27	
16 to 17	34	7	2	4	0	1	48	42	
17 to 18	34	6	17	19	0	3	79	115	
18 to 19	26	5	20	20	0	0	71	108	
19 to 20	32	10	27	14	0	0	83	109	
20 to 21	26	9	15	16	0	2	68	99	
21 to 22	0	8	10	9	0	0	27	50	
22 to 23	9	6	8	11	0	1	35	59	
23 to 24	8	4	4	8	0	3	27	47	
24 to 01	7	0	9	5	0	0	21	32	
01 to 02	2	0	3	5	0	0	10	21	
02 to 03	2	0	2	3	0	0	7	13	
03 to 04	0	0	1	4	0	0	5	14	
04 to 05	5	0	3	5	0	0	13	22	
05 to 06	15	0	8	13	0	0	36	59	
Total	492	72	295	257	0	24	1140	1604	
PCU	246	72	443	771	0	72			
Total PCU	1603.5								



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ANNEXURE-VII
HOURLY TRAFFIC COUNT

Location Number : T1 (PK OC-4 Mine road and Manuguru- Eturunagaram State Highway Junction)									
Manuguru to PK Mine									
Time	2&3-Wheeler	Car & Jeeps	LMV	HMV	Multaxiel	Other Vehicle	Total Vehicles	PCU	
06 to 07	22	8	12	10	0	1	53	70	
07 to 08	30	11	17	11	0	7	76	106	
08 to 09	37	12	16	22	0	5	92	136	
09 to 10	35	15	14	28	0	3	95	147	
10 to 11	25	25	12	25	0	1	88	134	
11 to 12	27	7	6	23	0	0	63	99	
12 to 13	42	19	15	33	0	0	109	162	
13 to 14	40	7	15	17	0	0	79	101	
14 to 15	28	15	6	12	0	2	63	80	
15 to 16	35	18	6	9	0	2	70	78	
16 to 17	23	8	4	12	0	0	47	62	
17 to 18	28	7	8	6	0	3	52	60	
18 to 19	25	18	5	8	0	1	57	65	
19 to 20	39	8	7	10	0	1	65	71	
20 to 21	40	17	10	5	0	0	72	67	
21 to 22	45	15	7	10	0	0	77	78	
22 to 23	25	13	5	2	0	0	45	39	
23 to 24	13	12	8	13	0	0	46	70	
24 to 01	12	8	6	15	0	0	41	68	
01 to 02	10	2	3	13	0	0	28	51	
02 to 03	8	2	3	13	0	0	26	50	
03 to 04	10	4	1	17	0	0	32	62	
04 to 05	24	6	2	22	0	2	56	93	
05 to 06	41	8	18	16	0	5	88	119	
Total	664	265	206	352	0	33	1520	2061	
PCU	332	265	309	1056	0	99			
Total PCU			2061						



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**ANNEXURE-VII
HOURLY TRAFFIC COUNT**

Location Number : T1 (PK OC-4 Mine road and Manuguru- Eturunagaram State Highway Junction)									
PK Mine to BTPS									
Time	2&3-Wheeler	Car & Jeeps	LMV	HMV	Multaxiel	Other Vehicle	Total Vehicles	PCU	
06 to 07	27	0	11	13	0	2	53	75	
07 to 08	12	0	21	18	0	5	56	107	
08 to 09	22	0	21	9	0	2	54	76	
09 to 10	42	2	25	14	0	3	86	112	
10 to 11	55	3	16	15	0	0	89	100	
11 to 12	32	1	17	9	0	0	59	70	
12 to 13	27	3	10	12	0	0	52	68	
13 to 14	21	2	7	8	0	0	38	47	
14 to 15	68	0	16	15	0	2	101	109	
15 to 16	96	0	4	0	0	0	100	54	
16 to 17	20	0	5	7	0	3	35	48	
17 to 18	26	7	12	12	0	3	60	83	
18 to 19	48	3	22	20	0	0	93	120	
19 to 20	80	25	25	25	0	0	155	178	
20 to 21	55	42	15	17	0	0	129	143	
21 to 22	8	0	8	11	0	0	27	49	
22 to 23	10	3	4	11	0	2	30	53	
23 to 24	18	1	7	8	0	0	34	45	
24 to 01	2	0	7	11	0	0	20	45	
01 to 02	1	0	2	7	0	0	10	25	
02 to 03	1	0	2	5	0	0	8	19	
03 to 04	0	0	3	8	0	0	11	29	
04 to 05	7	0	8	7	0	0	22	37	
05 to 06	18	0	21	11	0	0	50	74	
Total	696	92	289	273	0	22	1372	1759	
PCU	348	92	434	819	0	66			
Total PCU			1759						



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**ANNEXURE-VII
HOURLY TRAFFIC COUNT**

Location Number : T1 (PK OC-4 Mine road and Manuguru- Eturunagaram State Highway Junction)								
BTPS to PK Mine								
Time	2&3-Wheeler	Car & Jeeps	LMV	HMV	Multaxiel	Other Vehicle	Total Vehicles	PCU
06 to 07	35	5	8	15	0	0	63	80
07 to 08	33	4	12	27	0	2	78	126
08 to 09	45	5	9	25	0	3	87	125
09 to 10	43	6	14	33	0	0	96	148
10 to 11	42	0	12	21	0	1	76	105
11 to 12	25	12	13	13	0	0	63	83
12 to 13	23	15	15	15	0	1	69	97
13 to 14	18	8	12	13	0	5	56	89
14 to 15	12	9	10	16	0	1	48	81
15 to 16	20	4	9	12	0	1	46	67
16 to 17	20	0	6	15	0	0	41	64
17 to 18	18	1	7	12	0	1	39	60
18 to 19	9	1	3	10	0	1	24	43
19 to 20	4	4	0	13	0	0	21	45
20 to 21	20	15	8	16	0	0	59	85
21 to 22	7	7	5	10	0	0	29	48
22 to 23	3	4	7	7	0	1	22	40
23 to 24	8	5	2	8	0	7	30	57
24 to 01	4	2	3	7	0	0	16	30
01 to 02	3	0	2	5	0	0	10	20
02 to 03	4	1	2	3	0	0	10	15
03 to 04	2	0	2	2	0	0	6	10
04 to 05	1	0	1	2	0	0	4	8
05 to 06	12	5	7	12	0	0	36	58
Total	411	113	169	312	0	24	1029	1580
PCU	205.5	113	254	936	0	72		
Total PCU			1580					



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradri – Kothagudem district, Telangana

**ANNEXURE-VII
HOURLY TRAFFIC COUNT**

Location Number : T1 (PK OC-4 Mine road and Manuguru- Eturunagaram State Highway Junction)								
Manuguru to BTPS								
Time	2&3-Wheeler	Car & Jeeps	LMV	HMV	Multaxiel	Other Vehicle	Total Vehicles	PCU
06 to 07	27	13	3	30	0	1	74	124
07 to 08	7	17	29	20	0	3	76	133
08 to 09	37	35	26	15	0	0	113	138
09 to 10	37	65	17	18	0	0	137	163
10 to 11	47	60	29	12	0	0	148	163
11 to 12	40	27	38	19	2	0	126	167
12 to 13	25	45	26	12	0	0	108	133
13 to 14	13	30	29	32	0	0	104	176
14 to 15	42	43	16	14	0	0	115	130
15 to 16	68	40	26	5	0	1	140	131
16 to 17	75	50	18	12	0	2	157	157
17 to 18	68	45	16	16	0	1	146	154
18 to 19	80	45	12	14	0	0	151	145
19 to 20	72	40	29	17	0	0	158	171
20 to 21	72	40	42	30	0	0	184	229
21 to 22	33	13	23	33	0	0	102	163
22 to 23	7	5	6	13	0	0	31	57
23 to 24	16	2	7	12	0	0	37	57
24 to 01	7	2	10	10	0	0	29	51
01 to 02	5	2	7	13	0	0	27	54
02 to 03	5	2	8	18	0	0	33	71
03 to 04	4	1	10	10	0	0	25	48
04 to 05	5	2	4	12	0	0	23	47
05 to 06	60	14	14	15	0	0	103	110
Total	852	638	445	402	2	8	2347	2968
PCU	426	638	668	1206	6	24		
Total PCU				2968				



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradi) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradi – Kothagudem district, Telangana

**ANNEXURE-VII
HOURLY TRAFFIC COUNT**

Location Number : T1 (PK OC-4 Mine road and Manuguru- Eturunagaram State Highway Junction)									
BTPS to Manuguru									
Time	2&3-Wheeler	Car & Jeeps	LMV	HMV	Multaxiel	Other Vehicle	Total Vehicles	PCU	
06 to 07	77	32	20	20	0	3	152	170	
07 to 08	131	60	42	42	0	12	287	351	
08 to 09	73	23	36	43	0	1	176	246	
09 to 10	134	44	42	39	0	0	259	291	
10 to 11	105	87	39	27	0	4	262	291	
11 to 12	85	57	23	37	0	0	202	245	
12 to 13	67	42	27	22	0	0	158	182	
13 to 14	21	42	44	14	0	1	122	164	
14 to 15	83	32	11	12	0	2	140	132	
15 to 16	83	30	12	15	0	0	140	135	
16 to 17	78	54	29	22	0	7	190	224	
17 to 18	72	71	32	11	0	4	190	200	
18 to 19	65	57	35	13	0	6	176	199	
19 to 20	76	55	13	27	0	0	171	194	
20 to 21	86	23	48	37	0	2	196	255	
21 to 22	7	18	3	22	0	2	52	98	
22 to 23	2	9	7	16	0	0	34	69	
23 to 24	16	5	5	3	0	2	31	36	
24 to 01	11	2	1	12	0	0	26	45	
01 to 02	4	1	2	8	0	0	15	30	
02 to 03	3	3	6	12	0	0	24	50	
03 to 04	4	2	2	13	0	0	21	46	
04 to 05	45	10	7	15	0	1	78	91	
05 to 06	41	20	9	26	0	3	99	141	
Total	1369	779	495	508	0	50	3201	3880	
PCU	684.5	779	743	1524	0	150			
Total PCU			3880						



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradri – Kothagudem district, Telangana

**ANNEXURE-VII
HOURLY TRAFFIC COUNT**

Location Number : T1 (PK OC-4 Mine road and Manuguru- Eturunagaram State Highway Junction)									
PK mine road									
Time	2&3-Wheeler	Car & Jeeps	LMV	HMV	Multaxiel	Other Vehicle	Total Vehicles	PCU	
06 to 07	109	16	38	45	0	4	212	275	
07 to 08	94	15	53	64	0	17	243	385	
08 to 09	136	18	68	65	0	12	299	419	
09 to 10	157	31	87	89	0	7	371	528	
10 to 11	174	28	71	76	0	2	351	456	
11 to 12	112	24	52	60	0	2	250	344	
12 to 13	125	37	62	74	0	1	299	418	
13 to 14	100	18	45	57	0	5	225	322	
14 to 15	138	24	47	61	0	8	278	371	
15 to 16	166	22	24	23	0	5	240	225	
16 to 17	97	15	17	38	0	4	171	215	
17 to 18	106	21	44	49	0	10	230	317	
18 to 19	108	27	50	58	0	2	245	336	
19 to 20	155	47	59	62	0	1	324	402	
20 to 21	141	83	48	54	0	2	328	394	
21 to 22	60	30	30	40	0	0	160	225	
22 to 23	47	26	24	31	0	4	132	191	
23 to 24	47	22	21	37	0	10	137	218	
24 to 01	25	10	25	38	0	0	98	174	
01 to 02	16	2	10	30	0	0	58	115	
02 to 03	15	3	9	24	0	0	51	96	
03 to 04	12	4	7	31	0	0	54	114	
04 to 05	37	6	14	36	0	2	95	160	
05 to 06	86	13	54	52	0	5	210	308	
Total	2263	542	959	1194	0	103	5061	7003	
PCU	1131.5	542	1439	3582	0	309			
Total PCU	7003								



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradri – Kothagudem district, Telangana

**ANNEXURE-VII
HOURLY TRAFFIC COUNT**

Location Number : T2 (Mallepalli OC Mine road and Manuguru-Eturunagaram State Highway Junction)									
BTPS to Mallepalli									
Time	2&3-Wheeler	Car & Jeeps	LMV	HMV	Multaxiel	Other Vehicle	Total Vehicles	PCU	
06 to 07	3	2	3	6	0	2	16	32	
07 to 08	6	1	4	3	0	1	15	22	
08 to 09	12	3	2	5	0	0	22	27	
09 to 10	8	0	0	0	0	2	10	10	
10 to 11	2	1	3	3	0	3	12	25	
11 to 12	6	4	2	6	0	4	22	40	
12 to 13	3	1	1	2	0	0	7	10	
13 to 14	1	1	2	1	0	0	5	8	
14 to 15	2	2	1	1	0	0	6	8	
15 to 16	1	1	2	2	0	0	6	11	
16 to 17	3	0	1	0	0	0	4	3	
17 to 18	3	1	1	2	0	0	7	10	
18 to 19	2	3	0	1	0	0	6	7	
19 to 20	10	2	0	0	0	1	13	10	
20 to 21	2	0	0	0	0	0	2	1	
21 to 22	2	1	1	1	0	0	5	7	
22 to 23	1	2	3	2	0	0	8	13	
23 to 24	2	1	1	1	0	0	5	7	
24 to 01	2	1	1	2	0	0	6	10	
01 to 02	0	0	0	0	0	0	0	0	
02 to 03	2	3	6	7	0	0	18	34	
03 to 04	3	6	3	3	0	0	15	21	
04 to 05	7	3	2	8	0	0	20	34	
05 to 06	11	7	1	2	0	1	22	23	
Total	94	46	40	58	0	14	252	369	
PCU	47	46	60	174	0	42			
Total PCU			369						



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradri – Kothagudem district, Telangana

ANNEXURE-VII
HOURLY TRAFFIC COUNT

Location Number : T2 (Mallepalli OC Mine road and Manuguru-Eturunagaram State Highway Junction)									
Mallepalli to BTPS									
Time	2&3-Wheeler	Car & Jeeps	LMV	HMV	Multaxiel	Other Vehicle	Total Vehicles	PCU	
06 to 07	5	3	4	8	1	0	21	39	
07 to 08	8	5	3	5	1	0	22	32	
08 to 09	11	5	6	6	1	0	29	41	
09 to 10	5	8	10	8	0	0	31	50	
10 to 11	7	3	3	4	0	0	17	23	
11 to 12	10	8	1	4	0	0	23	27	
12 to 13	8	6	2	2	0	0	18	19	
13 to 14	7	8	2	6	0	0	23	33	
14 to 15	6	4	3	8	0	0	21	36	
15 to 16	6	7	2	6	0	0	21	31	
16 to 17	10	1	0	1	0	1	13	12	
17 to 18	13	5	0	5	0	0	23	27	
18 to 19	15	2	0	5	0	0	22	25	
19 to 20	10	0	0	4	0	0	14	17	
20 to 21	9	3	5	7	0	0	24	36	
21 to 22	10	3	8	4	0	0	25	32	
22 to 23	6	1	2	2	0	0	11	13	
23 to 24	5	2	1	1	0	0	9	9	
24 to 01	0	1	0	0	0	0	1	1	
01 to 02	0	1	0	0	0	0	1	1	
02 to 03	0	2	0	1	0	0	3	5	
03 to 04	1	2	1	0	0	0	4	4	
04 to 05	5	2	1	3	0	0	11	15	
05 to 06	10	6	2	2	0	0	20	20	
Total	167	88	56	92	3	1	407	544	
PCU	83.5	88	84	276	9	3			
Total PCU			544						



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradi) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradi – Kothagudem district, Telangana

**ANNEXURE-VII
HOURLY TRAFFIC COUNT**

Location Number : T2 (Mallepalli OC Mine road and Manuguru-Eturunagaram State Highway Junction)									
Manuguru to Mallepalli									
Time	2&3-Wheeler	Car & Jeeps	LMV	HMV	Multaxiel	Other Vehicle	Total Vehicles	PCU	
06 to 07	21	18	28	9	0	1	77	101	
07 to 08	44	25	35	26	5	2	137	199	
08 to 09	48	8	18	15	0	3	92	113	
09 to 10	38	18	28	43	0	0	127	208	
10 to 11	65	50	60	58	0	1	234	350	
11 to 12	50	12	22	28	0	1	113	157	
12 to 13	40	8	15	25	0	0	88	126	
13 to 14	54	15	25	20	1	1	116	146	
14 to 15	48	18	28	32	0	0	126	180	
15 to 16	22	11	21	8	0	0	62	78	
16 to 17	80	5	15	21	0	1	122	134	
17 to 18	83	3	13	6	1	3	109	94	
18 to 19	68	8	18	18	1	0	113	126	
19 to 20	65	5	15	53	0	0	138	219	
20 to 21	65	19	29	46	0	0	159	233	
21 to 22	31	2	2	10	0	0	45	51	
22 to 23	20	4	2	17	0	0	43	68	
23 to 24	20	2	1	11	0	10	44	77	
24 to 01	12	3	1	8	0	0	24	35	
01 to 02	8	3	2	7	0	0	20	31	
02 to 03	13	3	3	8	0	0	27	38	
03 to 04	15	3	1	6	0	0	25	30	
04 to 05	16	4	5	8	0	0	33	44	
05 to 06	15	7	3	8	0	0	33	43	
Total	941	254	390	491	8	23	2107	2876	
PCU	470.5	254	585	1473	24	69			
Total PCU			2876						



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradi) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradi – Kothagudem district, Telangana

ANNEXURE-VII
HOURLY TRAFFIC COUNT

Location Number : T2 (Mallepalli OC Mine road and Manuguru-Eturunagaram State Highway Junction)									
Mallepalli to Manuguru									
Time	2&3-Wheeler	Car & Jeeps	LMV	HMV	Multaxiel	Other Vehicle	Total Vehicles	PCU	
06 to 07	18	12	3	27	0	0	60	107	
07 to 08	37	8	15	55	7	0	122	235	
08 to 09	37	11	4	67	0	5	124	252	
09 to 10	55	52	26	60	0	3	196	308	
10 to 11	45	30	19	67	0	0	161	282	
11 to 12	50	17	14	35	0	2	118	174	
12 to 13	32	14	11	10	0	0	67	77	
13 to 14	30	8	4	5	0	0	47	44	
14 to 15	56	42	11	15	0	0	124	132	
15 to 16	85	47	27	33	0	0	192	229	
16 to 17	57	9	4	11	1	2	84	86	
17 to 18	68	15	9	21	0	2	115	132	
18 to 19	71	26	10	52	0	0	159	233	
19 to 20	75	23	9	40	0	1	148	197	
20 to 21	56	28	20	45	0	1	150	224	
21 to 22	35	12	2	27	0	0	76	114	
22 to 23	16	3	1	14	0	0	34	55	
23 to 24	23	1	3	12	0	0	39	53	
24 to 01	7	0	1	15	0	0	23	50	
01 to 02	7	1	1	13	0	0	22	45	
02 to 03	12	1	1	11	0	0	25	42	
03 to 04	11	3	1	13	0	0	28	49	
04 to 05	6	4	1	11	0	0	22	42	
05 to 06	17	4	1	12	0	0	34	50	
Total	906	371	198	671	8	16	2170	3206	
PCU	453	371	297	2013	24	48			
Total PCU			3206						



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradri – Kothagudem district, Telangana

ANNEXURE-VII
HOURLY TRAFFIC COUNT

Location Number : T2 (Mallepalli OC Mine road and Manuguru-Eturunagaram State Highway Junction)									
Mallepalli OC mine Road									
Time	2&3-Wheeler	Car & Jeeps	LMV	HMV	Multaxiel	Other Vehicle	Total Vehicles	PCU	
06 to 07	47	35	38	50	1	3	174	278	
07 to 08	95	39	57	89	13	3	296	487	
08 to 09	108	27	30	93	1	8	267	432	
09 to 10	118	72	58	96	0	6	350	524	
10 to 11	94	42	40	99	0	3	278	455	
11 to 12	104	47	45	88	0	6	290	449	
12 to 13	108	71	74	72	0	1	326	455	
13 to 14	92	32	33	32	1	1	191	230	
14 to 15	112	66	43	56	0	0	277	355	
15 to 16	114	66	52	49	0	0	281	348	
16 to 17	150	15	20	33	1	4	223	234	
17 to 18	167	24	23	34	1	5	254	262	
18 to 19	156	39	28	76	1	0	300	390	
19 to 20	160	30	24	97	0	2	313	443	
20 to 21	132	50	54	98	0	1	335	494	
21 to 22	78	18	13	42	0	0	151	203	
22 to 23	43	10	8	35	0	0	96	149	
23 to 24	50	6	6	25	0	10	97	145	
24 to 01	21	5	3	25	0	0	54	95	
01 to 02	15	5	3	20	0	0	43	77	
02 to 03	27	9	10	27	0	0	73	119	
03 to 04	30	14	6	22	0	0	72	104	
04 to 05	34	13	9	30	0	0	86	134	
05 to 06	53	24	7	24	0	1	109	136	
Total	2108	759	684	1312	19	54	4936	6994	
PCU	1054	759	1026	3936	57	162			
Total PCU			6994						



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradri – Kothagudem district, Telangana

ANNEXURE-VII
HOURLY TRAFFIC COUNT

Location Number : T3 - Manuguru - Eturunagaram State Highway (At Ramanujavaram)									
BTPS to Manuguru									
Time	2&3-Wheeler	Car & Jeeps	LMV	HMV	Multaxiel	Other Vehicle	Total Vehicles	PCU	
06 to 07	50	15	4	20	0	0	89	106	
07 to 08	66	15	10	17	0	1	109	117	
08 to 09	80	25	15	24	0	3	147	169	
09 to 10	75	37	20	24	1	2	159	186	
10 to 11	95	35	15	16	1	3	165	165	
11 to 12	86	32	12	18	0	1	149	150	
12 to 13	75	25	15	15	0	1	131	133	
13 to 14	21	33	17	12	0	0	83	105	
14 to 15	58	22	21	18	0	4	122	146	
15 to 16	45	36	25	23	0	0	129	165	
16 to 17	65	47	23	25	0	1	161	192	
17 to 18	90	55	18	19	0	2	184	190	
18 to 19	76	41	15	32	0	3	167	207	
19 to 20	65	26	18	27	0	0	136	167	
20 to 21	45	19	17	25	0	0	106	142	
21 to 22	25	19	19	14	0	0	77	102	
22 to 23	15	10	9	5	0	0	39	46	
23 to 24	10	12	14	10	0	0	46	68	
24 to 01	5	8	8	19	0	0	40	80	
01 to 02	7	3	3	12	0	0	25	47	
02 to 03	1	8	4	17	0	0	30	66	
03 to 04	7	12	10	24	0	0	53	103	
04 to 05	3	10	12	33	1	0	59	132	
05 to 06	23	33	15	10	0	2	83	103	
Total	1088	578	339	459	3	23	2490	3086	
PCU	544	578	509	1377	9	69			
Total PCU			3083						



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ANNEXURE-VII
HOURLY TRAFFIC COUNT

Location Number : T3 - Manuguru - Eturunagaram State Highway (At Ramanujavaram)									
Manuguru to BTPS									
Time	2&3-Wheeler	Car & Jeeps	LMV	HMV	Multaxiel	Other Vehicle	Total Vehicles	PCU	
06 to 07	55	15	10	8	0	0	88	82	
07 to 08	61	15	16	11	0	1	104	106	
08 to 09	120	25	22	22	0	3	192	193	
09 to 10	105	27	32	28	1	2	195	221	
10 to 11	95	35	28	24	1	3	186	209	
11 to 12	111	51	31	26	0	1	220	234	
12 to 13	101	40	26	15	0	1	183	178	
13 to 14	75	51	33	20	0	0	179	198	
14 to 15	65	42	15	13	0	2	138	145	
15 to 16	63	46	22	21	0	0	152	174	
16 to 17	75	57	25	18	0	1	176	189	
17 to 18	85	57	34	19	0	2	197	214	
18 to 19	73	41	31	22	0	3	170	199	
19 to 20	69	51	32	15	0	0	167	179	
20 to 21	58	19	23	16	0	0	116	131	
21 to 22	26	19	18	14	0	0	77	101	
22 to 23	15	10	10	5	0	0	40	48	
23 to 24	12	9	10	5	0	0	36	45	
24 to 01	10	8	0	3	0	0	21	22	
01 to 02	7	3	0	4	0	0	14	19	
02 to 03	12	8	1	6	0	0	27	34	
03 to 04	7	9	3	2	0	0	21	23	
04 to 05	3	10	8	10	1	0	32	57	
05 to 06	25	13	20	19	0	2	79	119	
Total	1328	661	450	346	3	21	2809	3110	
PCU	664	661	675	1038	9	63			
Total PCU			3113						



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**ANNEXURE-VII
HOURLY TRAFFIC COUNT**

Location Number : T3 - Manuguru - Eturunagaram State Highway (At Ramanujavaram)									
Time	2&3-Wheeler	Car & Jeeps	LMV	HMV	Multaxiel	Other Vehicle	Total Vehicles	PCU	
06 to 07	105	30	14	28	0	0	177	188	
07 to 08	127	30	26	28	0	2	213	223	
08 to 09	200	50	37	46	0	6	339	362	
09 to 10	180	64	52	52	2	4	354	406	
10 to 11	190	70	43	40	2	6	351	374	
11 to 12	197	83	43	44	0	2	369	384	
12 to 13	176	65	41	30	0	2	314	311	
13 to 14	96	84	50	32	0	0	262	303	
14 to 15	123	64	36	31	0	6	260	291	
15 to 16	108	82	47	44	0	0	281	339	
16 to 17	140	104	48	43	0	2	337	381	
17 to 18	175	112	52	38	0	4	326	376	
18 to 19	149	82	46	54	0	6	320	390	
19 to 20	134	77	50	42	0	0	303	345	
20 to 21	103	38	40	41	0	0	222	273	
21 to 22	51	38	37	28	0	0	154	203	
22 to 23	30	20	19	10	0	0	79	94	
23 to 24	22	21	24	15	0	0	82	113	
24 to 01	15	16	8	22	0	0	61	102	
01 to 02	14	6	3	16	0	0	39	66	
02 to 03	13	16	5	23	0	0	57	99	
03 to 04	14	21	13	26	0	0	74	126	
04 to 05	6	20	20	43	2	0	91	188	
05 to 06	48	46	35	29	0	4	162	222	
Total	2416	1239	789	805	6	44	5299	6196	
PCU	1173.5	1239	1184	2406	18	132			
Total PCU			6152						



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradi) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradi – Kothagudem district, Telangana


ANNEXURE-VIII
PHOTOGRAPHS OF FIELD STUDY






Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradri – Kothagudem district, Telangana

**ANNEXURE-IX
TIME LINES SPECIFIED BY RITES**

 राइट्स लि०
(भारत सरकार का प्रतिष्ठान)
RITES Ltd.
(A Govt. of India Enterprise)
(Ministry of Railways)

 Iso 9001
KEMA NVT. QC
CERTIFICATE NO. 88243
B170/CONCL FOR ACCREDITATION

CIN NO: L74899DL1974GOI007227
REGIONAL PROJECT OFFICE (South),
209, Swapnalok Complex, S.D. Road,
SECUNDERABAD-500 003.
Telangana State, (INDIA)
Phone : (040) 27818397, 27841499
FIN : (040) 40021963
Fax : (040) 27813894
Email : secbadpo@rites.com

No. RITES/SC/BTPS/TSGENCO/2019-20/ 1038 Date: 14.06.2019

The Chief Engineer (civil),
TSGENCO, Vidyut Soudha
Khairatabad, Hyderabad-500082


Sir,

Sub: BTPS (4 x 270 MW) Providing Project Management Consultancy for railway siding and Marshalling yard for (4 x 270 MW) BTPS, Manuguru, Bhadradri- Kothagudem Dist. Reg Program chart for completion of project.


Ref: TSGENCO PO No.: LoI No. CC-0012/CEIC/T/BTPS/ F. RITES-PMC/ D. No.5U19. Dt25.05.2019


We are herewith submitting the timeline for the completion of the subject work.


This is for your information and records please.

Thanking you,
Yours Faithfully,

(John K. Jacob)
Sr. Deputy General Manager

Encl: as above

 ACBC
Ghosh
15/6/19
BSC
15/6/19
AEC
15/6/19
AEC

 Chief Engineer/Civil/Thermal
TSGENCO
INWARD No. 645
4 JUN 2019
SE/TCD-I
SE/TCD-II
AEE/Tech
CE/Chm

 BSC/BTPS
BSC
15/6

Registered Office : SCOPE Minar, Laxmi Nagar, Delhi - 110 092.
कॉर्पोरेट कार्यालय : "राइट्स भवन" नं. 1, सेक्टर - 29, गुरुगांव - 122 001.
Corporate Office : "RITES Bhawan", No. 1, Sector - 29, Gurgaon, Haryana
Tel : 0124-2571666 - 68, Fax : 0124-2571660

**ANNEXURE-IX
TIME LINES SPECIFIED BY RITES**



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradri – Kothagudem district, Telangana

BHADRADRI THERMAL POWER STATION

Sr. No.	Start Date	End Date	Description of Activity	Quantity	No. of Months	Remarks
1	2019-06-01	2021-11-30	Estimated no of days required for the entire project		30	Earthwork in formation, construction of minor bridges, major bridges will suitably packaged into 4 different packages which will start simultaneously in order to speed up and complete the work early.
1	2019-06-01	2019-07-15	Preparation and Finalization of tender Documents, BOQ for earthwork & Bridges & calling of tenders		1.5	
2	2019-07-16	2019-08-31	Calling of tenders, Finalisation of tender and award of work		1.5	
3	2019-09-01	2020-05-31	Earthwork in formation cutting/filling in Marshalling yard	260000 filling /30000 cutting	9	
4	2019-09-01	2020-06-30	Blanketing formation with certified blanketing Materials in Marshalling yard	60000 Cum	10	
5	2019-09-01	2020-11-30	Construction of Bridges (Major)	5 Nos	15	
6	2019-09-01	2020-11-30	Construction of Bridges (Minor)	26 nos	15	
7	2019-11-01	2020-10-31	Earthwork in formation cutting/filling in take off & Exchange yard	450000 filling / 15000 cutting	12	
8	2020-04-01	2020-11-30	Blanketing formation with certified blanketing Materials in take off & Exchange yard	20000 cum	8	
9	2020-03-01	2021-05-31	Earthwork in formation cutting/filling in lead line	550000 filling/ 50000 cutting	15	
10	2020-05-01	2021-06-30	Blanketing formation with certified blanketing Materials in lead line	35000 cum	14	
11	2019-08-01	2019-09-15	Preparation and Finalization of tender Documents, BOQ		1.5	



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradri – Kothagudem district, Telangana

Sr. No.	Start Date	End Date	Description of Activity	Quantity	No. of Months	Remarks
			for supply of Ballast ,P.Way & linking, & calling of tenders			
12	2019-09-16	2019-10-31	Calling of tenders, Finalisation of tender and award of work		1.5	
13	2019-11-01	2021-03-31	Supply and Laying of Ballast	90000 Cum	17	
14	2019-12-01	2021-05-15	Supply of P.Way materials and linking of Track	37 Km of track	18	
			PSC sleepers	57000 nos.		
			Rails	4300 MT		
15	2021-03-01	2021-05-31	Commissioning of Track		3	
16	2020-05-01	2020-06-15	Preparation and Finalization of tender Documents, BOQ for OHE and Signalling & Telecommunication works, & calling of tenders		1.5	
17	2020-06-15	2020-07-31	Calling of tenders, Finalisation of tender and award of work		1.5	
18	2020-08-01	2021-10-31	Over head electrification work	36 Km	15	
19	2020-08-01	2021-10-31	Signalling and Telecommunication work		15	
20	2021-09-01	2021-11-30	Commissioning of Track		3	



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Grant for Transportation for the Proposed Manuguru (Bhadradi) Thermal Power Station (4x270 MW) in Manuguru Mandals, Bhadradi – Kothagudem district, Telangana



BHADRADI THERMAL POWER STATION
Gantt Chart Showing the time line for the completion of the project



Project Duration in months	Project Start Date	Project End Date
30.0	2019-06-01	2021-11-30

Task ID	Task Description	Track Duration	Start Date	End Date	Jun-2019	Jul-2019	Aug-2019	Sep-2019	Oct-2019	Nov-2019	Dec-2019	Jan-2020	Feb-2020	Mar-2020	Apr-2020	May-2020	Jun-2020	Jul-2020	Aug-2020	Sep-2020	Oct-2020	Nov-2020	Dec-2020	Jan-2021	Feb-2021	Mar-2021	Apr-2021	May-2021	Jun-2021	Jul-2021	Aug-2021	Sep-2021	Oct-2021	Nov-2021		
1	Estimated no of days required for the entire project	30.0	2019-06-01	2021-11-30	[Gantt bar spanning from Jun-2019 to Nov-2021]																															
1	Preparation and Finalization of tender Documents, BOQ for earthwork & Bridges & calling of tenders	1.5	2019-06-01	2019-07-15	[Gantt bar from Jun-2019 to Jul-2019]																															
2	Calling of tenders, Finalisation of tender and award of work	1.5	2019-07-16	2019-08-31	[Gantt bar from Jul-2019 to Aug-2019]																															
3	Earthwork in formation cutting/filling in Marshalling yard	9.0	2019-09-01	2020-05-31	[Gantt bar from Aug-2019 to May-2020]																															
4	Blanketing formation with certified blanketing Materials in Marshalling yard	10.0	2019-09-01	2020-06-30	[Gantt bar from Aug-2019 to Jun-2020]																															
5	Construction of Bridges (Major)	15.0	2019-09-01	2020-11-30	[Gantt bar from Aug-2019 to Nov-2020]																															
6	Construction of Bridges (Minor)	15.0	2019-09-01	2020-11-30	[Gantt bar from Aug-2019 to Nov-2020]																															
7	Earthwork in formation cutting/filling in take off & Exchange yard	12.0	2019-11-01	2020-10-31	[Gantt bar from Oct-2019 to Oct-2020]																															
8	Blanketing formation with certified blanketing Materials in take off & Exchange yard	8.0	2020-04-01	2020-11-30	[Gantt bar from Mar-2020 to Nov-2020]																															
9	Earthwork in formation cutting/filling in lead line	15.0	2020-03-01	2021-05-31	[Gantt bar from Feb-2020 to May-2021]																															
10	Blanketing formation with certified blanketing Materials in lead line	14.0	2020-05-01	2021-06-30	[Gantt bar from Apr-2020 to Jun-2021]																															
11	Preparation and Finalization of tender Documents, BOQ for supply of Ballast ,P.Way & linking, & calling of tenders	1.5	2019-08-01	2019-09-15	[Gantt bar from Aug-2019 to Sep-2019]																															
12	Calling of tenders, Finalisation of tender and award of work	1.5	2019-09-16	2019-10-31	[Gantt bar from Sep-2019 to Oct-2019]																															
13	Supply and Laying of Ballast	17	2019-11-01	2021-03-31	[Gantt bar from Oct-2019 to Mar-2021]																															
14	Supply of P.Way materials and linking of Track	18	2019-12-01	2021-05-15	[Gantt bar from Nov-2019 to May-2021]																															
15	Commissioning of Track	3	2021-03-01	2021-05-31	[Gantt bar from Mar-2021 to May-2021]																															
16	Preparation and Finalization of tender Documents, BOQ for OHE and Signalling & Telecommunication works, & calling of tenders	1.5	2020-05-01	2020-06-15	[Gantt bar from May-2020 to Jun-2020]																															
17	Calling of tenders, Finalisation of tender and award of work	1.5	2020-06-15	2020-07-31	[Gantt bar from Jun-2020 to Jul-2020]																															
18	Over head electrification work	15	2020-08-01	2021-10-31	[Gantt bar from Jul-2020 to Oct-2021]																															
19	Signalling and Telecommunication work	15	2020-08-01	2021-10-31	[Gantt bar from Jul-2020 to Oct-2021]																															
20	Commissioning of Track	3	2021-09-01	2021-11-30	[Gantt bar from Sep-2021 to Nov-2021]																															



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradri – Kothagudem district, Telangana

ANNEXURE-X

WORK PROGRESS REPORT FURNISHED BY M/S. RITES LTD.



CIN NO: L74899DL1974GOI007227
REGIONAL PROJECT OFFICE (South),
209, Swapnalok Complex, S.D. Road,
SECUNDERABAD-500 003.
Telangana State, (INDIA)
Phone : (040) 27818397, 27841499
FIN : (040) 40021963
Fax : (040) 27813894
Email : secbedpo@rites.com

Name of the work: BTPS (4X270 MW)- Providing Project Management Consultancy Services for 27 railway siding and marshaling yard for (4X00 MW) BTPS, Manuguru Bhadradri-Kothagudem Dist. *date 10/7/2019 Hyderabad*

Ref: PO No.CC-17/CE/Civil/Thermal/SE/TCD-II /F.Rly.Siding.PMC/
D.No.92 /2019 Dt 28.06.2019

Agency: RITES Ltd.

Date of commencement of work: 01.06.2019.

Progress Report of the subject work as on 01.07.2019

1. Survey work of taking levels have been carried out all along the entire proposed alignment from takeoff upto the end of the proposed marshaling yard for transportation of coal by rail network for accessing the actual quantities of Earthwork in cutting and filling.
2. The longitudinal section and cross section of the alignment have been prepared and calculation done for of the quantities of earthwork.
3. The estimates for construction of Major and minor bridges are being worked out.
4. The entire work is being divided into Suitable packages for speedy execution of the work.
5. The Tender for earthwork and minor bridges in the proposed marshaling yard area will be invited before 20.07.2019.
6. The balance tenders for the entire earthwork, bridges, will be invited before 10.08.2019.



John K. Jacob
(John K. Jacob)
Sr.DGM/C

AE/C/tech
AE/C
11/7/19

Registered Office : SCOPE Minar, Laxmi Nagar, Delhi - 110 092.
कॉरपोरेट कार्यालय : "राइट्स भवन" नं. 1, सेक्टर - 29, गुरुगांव - 122 001.
Corporate Office : "RITES Bhawan", No. 1, Sector - 29, Gurgaon, Haryana
Tel : 0124-2571666 - 68, Fax : 0124-2571660



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradi) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradi – Kothagudem district, Telangana

ANNEXURE-XI

LETTER ISSUED BY ENGINEER IN CHIEF, R&B DEPARTMENT FOR ROAD BEARING CAPACITY

GOVERNMENT OF TELANGANA
ROADS AND BUILDINGS DEPARTMENT

From Sri P. Ravinder Rao, M.Tech, F.I.E, Engineer-in-Chief (R&B) State Roads& CRN Roads and Buildings Department Errummanzil Hyderabad – 500 082	To Chief Engineer/Civil/Thermal, TSGENCO, Vidyut Soudha, Hyderabad – 500 082. Email: ce.eth@tsgenco.co.in
---	---

Lr. No. 8719/E-IN-C SR & CRN/DCE (R)/EE (CRN)/DEE-10/AEE-6/2019, Dt.08 .07.2019

Sir,

Sub: - R&B Department-Roads-Corenet roads - TSGENCO_ BTPS(4x270 MW) – Transportation of coal by road from Manuguru to Eturunagaram state Highway upto Bhadradi Thermal Power Station Manuguru, Bhadradi Kothagudem Dist – Load Bearing Capacity of the road – Reg.

Ref: -1.Lr.No.CE/C/Theral/SE TCD-II/BTPS/F.coal/D.No.96/19 dt: 2.7.2019 of the CE/Civil/Thermal, TSGENCO

2. Lr.No.CE/C/Theral/SE TCD-II/BTPS/F.coal/D.No.64/19 dt: 7.6.2019 of the CE/Civil/Thermal, TSGENCO

Adverting to the references cited, it is to inform hat the road from Burgampad –Eturu Nagaram (State Highway) road from Km 36/2 to Km 46/4 is of two lane BT road with 7.00 m width and 1.50 m earthen shoulders on either side of the road and the road is capable of taking traffic of 655 loaded and 655 empty truck per day carrying 20 MT of coal in each truck additionally from M/s SCCL mines to Bhadradi Thermal Power Station (BTPS) Manuguru (M), Bhadradi Kothagudam District. The number of axles of truck shall not be less than three.

Yours faithfully,

Fdl Engineer-in- Chief (R&B)
State Roads& CRN



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradri – Kothagudem district, Telangana

**ANNEXURE-XII
VILLAGE WISE POPULATION AS PER CENSUS 2011**

Sl. No.	Name of the Mandal	Name of the Revenue Village	Name of the Habitation/ Ward	No. of House holds	Population		
					Male	Female	Total
	Manuguru	Ramanujavaram	Ramanujavaram	423	799	766	1565
		(1) Thirlapuram	Thirlapuram	249	434	481	915
			Bestagudem	115	211	217	428
			Srikrishnapuram	137	250	268	518
			Kondaigudem	235	396	430	826
		(3) Sambaigudem	Sambaigudem	369	682	673	1355
		(4) Dammalkapeta	Dammalkapeta	138	250	261	511
		(5) Chikkudukunta	Chikkudukunta	214	404	373	777
			Pagideru ST Colony	145	226	252	478
			Ippakatla	22	43	37	80
			Pagideru	221	403	448	851
			Kothuru Colony	288	529	557	1086
			Golla Kothuru	69	139	134	273
			Srirangapuram	0	0	0	0
			Kodeselakunta	25	42	39	81
			Bugga	46	101	100	201
			Khammam Thogu	16	36	37	73
			Budugula	15	30	23	53
		Thirumalapuram(U.I)	Thirumalapuram(U.I)	0	0	0	0
		Peddipalle	Peddipalle	29	63	60	123
		Samathsingaram	Samathsingaram	986	1874	1952	3826
			Rajeevgandhinagar	660	1264	1219	2483
			Ashoknagar	709	1514	1639	3153
			Gundusingaram	271	535	584	1119
			Maddulagudem	139	265	266	531
			Muthyalammanagar	61	128	109	237
			Railway Colony	37	64	65	129
			Santhoshnagar	135	270	266	536
			Thoggudem	205	391	399	790
			Kunavaram	781	1422	1510	2932
			Regulagandi	46	96	95	191
		P.K. - D.C. Road	Ippalasingaram	287	491	475	966
			Cheruvumundusingara	159	286	297	583
			Kunavaram D Type Quarters	296	623	595	1218
			Kunavaram up-stairs quarters	375	767	754	1521
			P.V.Colony	1215	2549	2375	4924
			Y.S.Nagar	25	38	35	73
			Banglow Area	190	278	304	582
			MC Quarters	457	944	870	1814
		Mallaram (PM)	Mallaram	0	0	0	0
			Gutta Mallaram	178	315	338	653
			Bodepudinagar	37	66	78	144
			Lanka Mallaram	140	219	250	469
			Vagu Mallaram	112	220	220	440
			Kattu Mallaram	125	229	235	464
			Ganneboina Gumpu	37	51	66	117
			Manuguru Kurai Total	10419	19937	20152	40089



Response to Clarification sought by Expert Appraisal Committee for Amendment to EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradri – Kothagudem district, Telangana

ANNEXURE-XII
VILLAGE WISE POPULATION AS PER CENSUS 2011

		Vital Rao Nagar	302	547	566	1113
	Mallepalli DC-26 Road	Raju Peta	443	818	871	1689
		Manuguru	474	882	836	1718
		Bapana Kunta	517	885	986	1871
		Shivalinga Puram	680	1327	1377	2704
		Sheshagiri Nagar	635	1322	1283	2605
		Adarsha Nagar	904	1816	1727	3543
		Sundaraiah Nagar	1600	3083	3274	6357
		Bhagam Singh Nagar	730	1431	1366	2797
		Gandhi Nagar	379	740	728	1468
		Pilot Colony	276	524	513	1037
		Mallepalli	188	410	423	833
		Kommu Gudem	57	99	106	205
		Yeggadi Gudem	242	453	480	933
		Padma Gudem	59	381	378	759
		Annaram	60	303	341	644
		Kamala Puram	123	535	541	1076
		Chinna Rai Gudem	63	340	373	713
		Manuguru Urban Total	7732	15896	16169	32065
		Mandal Total	18151	35833	36321	72154



Response to Clarification sought by Expert Appraisal Committee for Amendment in EC Granted for Change in Mode of Coal Transportation for the Proposed Manuguru (Bhadradri) Thermal Power Station (4x270 MW) at Manuguru & Pinapaka Mandals, Bhadradri – Kothagudem District, Telangana

**ANNEXURE-XIII
AMBIENT AIR QUALITY**

A1-Chikkudugunta																			
Sr.No.	Date	PM10	PM2.5	SO ₂	NO _x	CO			O ₃			Hg	Bap	NH ₃	Pb	Ni	As	VOC	Benzene
		µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³			µg/m ³			ng/m ³	ng/m ³	µg/m ³	µg/m ³	ng/m ³	ng/m ³	µg/m ³	µg/m ³
Units						I	II	III	I	II	III								
1	07.06.2019	39.4	20.4	11.1	16.8	335	378	265	6.5	7.2	5.3	<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
2	08.06.2019	43.1	21.8	10.9	16.5	354	396	288	6.7	7.5	5.6	<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	Min	39.4	20.4	10.9	16.5	265			5.3			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	Max	43.1	21.8	11.1	16.8	396			7.5			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	Avg	41.3	21.1	11.0	16.7	336			6.5			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	98th	43.0	21.8	11.1	16.8	394			7.5			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1

A2-Dhamakkapeta																			
Sr.No.	Date	PM10	PM2.5	SO ₂	NO _x	CO			O ₃			Hg	Bap	NH ₃	Pb	Ni	As	VOC	Benzene
		µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³			µg/m ³			ng/m ³	ng/m ³	µg/m ³	µg/m ³	ng/m ³	ng/m ³	µg/m ³	µg/m ³
Units						I	II	III	I	II	III								
1	07.06.2019	38.5	14.5	8.8	11.5	224	245	176	5.1	5.8	3.8	<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
2	08.06.2019	39.6	15.8	9.4	21.8	218	253	194	5.6	6.1	4.2	<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	Min	38.5	14.5	8.8	11.5	176			3.8			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	Max	39.6	15.8	9.4	21.8	253			6.1			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	Avg	39.1	15.2	9.1	16.7	218			5.1			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	98th	39.6	15.8	9.4	21.6	252			6.1			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1

A3-Sambarayagudem																			
Sr.No.	Date	PM10	PM2.5	SO ₂	NO _x	CO			O ₃			Hg	Bap	NH ₃	Pb	Ni	As	VOC	Benzene
		µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³			µg/m ³			ng/m ³	ng/m ³	µg/m ³	µg/m ³	ng/m ³	ng/m ³	µg/m ³	µg/m ³
Units						I	II	III	I	II	III								
1	07.06.2019	39.6	16.4	9.6	15.6	225	266	184	5.2	6.2	4.5	<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
2	08.06.2019	43.1	17.5	10.8	14.8	232	279	208	5.6	6.8	4.8	<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	Min	39.6	16.4	9.6	14.8	184			4.5			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	Max	43.1	17.5	10.8	15.6	279			6.8			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	Avg	41.4	17.0	10.2	15.2	232			5.5			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	98th	43.0	17.5	10.8	15.6	278			6.7			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1



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A4-Ramanujavaram																			
Sr.No.	Date	PM10 µg/m ³	PM2.5 µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO			O ₃			Hg ng/m ³	Bap ng/m ³	NH ₃ µg/m ³	Pb µg/m ³	Ni ng/m ³	As ng/m ³	VOC µg/m ³	Benzene µg/m ³
						I	II	III	I	II	III								
1	08.06.2019	47.6	23.5	12.8	19.5	336	399	288	6.6	7.5	6.1	<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
2	09.06.2019	48.4	24.2	13.6	18.6	348	415	294	7.1	7.9	6.4	<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	Min	47.6	23.5	12.8	18.6	288			6.1			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	Max	48.4	24.2	13.6	19.5	415			7.9			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	Avg	48.0	23.9	13.2	19.1	347			6.9			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	98th	48.4	24.2	13.6	19.5	413			7.9			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1

A5-Tirumalapuram/ Vijayanagarm																			
Sr.No.	Date	PM10 µg/m ³	PM2.5 µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO			O ₃			Hg ng/m ³	Bap ng/m ³	NH ₃ µg/m ³	Pb µg/m ³	Ni ng/m ³	As ng/m ³	VOC µg/m ³	Benzene µg/m ³
						I	II	III	I	II	III								
1	08.06.2019	39.8	18.1	11.4	17.6	215	288	208	5.1	7.2	4.6	<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
2	09.06.2019	45.2	19.6	12.6	16.5	226	296	194	5.8	6.4	4.9	<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	Min	39.8	18.1	11.4	16.5	194			4.6			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	Max	45.2	19.6	12.6	17.6	296			7.2			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	Avg	42.5	18.9	12.0	17.1	238			5.7			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	98th	45.1	19.6	12.6	17.6	295			7.1			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1

A6-Manuguru																			
Sr.No.	Date	PM10 µg/m ³	PM2.5 µg/m ³	SO ₂ µg/m ³	NO _x µg/m ³	CO			O ₃			Hg ng/m ³	Bap ng/m ³	NH ₃ µg/m ³	Pb µg/m ³	Ni ng/m ³	As ng/m ³	VOC µg/m ³	Benzene µg/m ³
						I	II	III	I	II	III								
1	08.06.2019	50.4	25.8	14.7	22.6	375	432	326	7.9	8.1	7.4	<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
2	09.06.2019	51.6	25.3	15.3	21.4	386	441	339	7.8	7.9	6.8	<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	Min	50.4	25.3	14.7	21.4	326			6.8			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	Max	51.6	25.8	15.3	22.6	441			8.1			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	Avg	51.0	25.6	15.0	22.0	383			7.7			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	98th	51.6	25.8	15.3	22.6	440			8.1			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1



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A7-Ippalasingaram																			
Sr.No.	Date	PM10	PM2.5	SO ₂	NO _x	CO			O ₃			Hg	Bap	NH ₃	Pb	Ni	As	VOC	Benzene
		µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³			µg/m ³			ng/m ³	ng/m ³	µg/m ³	µg/m ³	ng/m ³	ng/m ³	µg/m ³	µg/m ³
Units						I	II	III	I	II	III								
1	08.06.2019	51.2	25.9	11.4	15.3	279	322	266	5.7	6.1	3.5	<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
2	09.06.2019	50.3	21.6	10.1	14.5	305	351	285	5.4	5.3	3.7	<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	Min	50.3	21.6	10.1	14.5	266			3.5			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	Max	51.2	25.9	11.4	15.3	351			6.1			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	Avg	50.8	23.8	10.7	14.9	301			5.0			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	98th	51.2	25.8	11.4	15.3	348			6.1			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1

A8-Rajupeta																			
Sr.No.	Date	PM10	PM2.5	SO ₂	NO _x	CO			O ₃			Hg	Bap	NH ₃	Pb	Ni	As	VOC	Benzene
		µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³			µg/m ³			ng/m ³	ng/m ³	µg/m ³	µg/m ³	ng/m ³	ng/m ³	µg/m ³	µg/m ³
Units						I	II	III	I	II	III								
1	08.06.2019	35.2	16.7	8.2	12.2	251	329	287	4.9	5.3	3.1	<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
2	09.06.2019	41.5	18.9	10.2	14.2	223	301	254	4.7	5.2	3.5	<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	Min	35.2	16.7	8.2	12.2	223			3.1			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	Max	41.5	18.9	10.2	14.2	329			5.3			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	Avg	38.4	17.8	9.2	13.2	274			4.5			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1
	98th	41.4	18.9	10.2	14.2	326			5.3			<1	<0.1	<20.0	<0.001	<1	<1	<0.001	<1