

ENVIRONMENTAL STATEMENT (FORM-V)
For
1,040 MW (2 x 520 MW) THERMAL POWER PLANT
VISAKHAPATNAM, ANDHRA PRADESH

FINANCIAL YEAR
APRIL 2021 – MARCH 2022



HINDUJA NATIONAL POWER CORPORATION LIMITED
VISAKHAPATNAM, ANDHRA PRADESH

September 2022

PREFACE

At the National Level, great emphasis is being laid on maintaining environmental quality particularly in the regions where large-scale developmental programs are being undertaken. Hinduja National Power Corporation Limited (HNPCL) has adopted a corporate policy of development in tune with environmental compatibility with special reference to its exiting Power plant, for which advance action is required.

In order to comply with Environmental Protection Act and to be in tune with environmental preservation and sustainable development, Hinduja National Power Corporation Limited an Environmental Statement Report for the financial year 2021-2022 is generate with environmental data for various environmental components, which represent the concentrations due to ongoing Power plant operation of the Industry.

This report presents duly filled in Form V and environmental components comprising attributes like Air, Water and Noise which were collected during the financial year 2021-2022.

Chapter-1

Introduction

	Environmental Statement Report (Form-V) for FY 2021-2022 for 2x520 MW Coal Based Thermal Power Plant at Visakhapatnam.
	Chapter-1 Introduction

1.0 **PREAMBLE**

1.1 **Introduction**

Environmental Statement Is a basic management tool, which is needed, rather than the conventional environmental management practices to evaluate the environmental performance and regulatory requirements.

Realizing this need, Ministry of Environment and Forests has also made it mandatory for all the industrial operations, which require authorization under Environmental (Protection) Act 1986 in each financial year ending the 31st March to submit an Environmental Statement to the concerned State Pollution Control Board.

In order to comply with the statutory requirement as well as to maintain corporate image in the region, recognizing the importance of comprehensive structural mechanism to ensure that the industrial activities do not cause any effects on environment.

As a first step in power sector, HNPCL is operating a 1,040 MW(2X520 MW) coal based merchant power plant and is located on the coast of the Bay of Bengal at Palavalasa, Pedagantayada Mandal, Visakhapatnam District in the State of Andhra Pradesh, India.

The enclosed report contains details about the Environmental Statement for the Hinduja National Power Corporation Limited (HNPCL) for 1040 MW (520 X 2 MW) Power Plant for the year **April 2021–March 2022**.

1.2 **Project Setting**

The existing plant is located in Palavalasa, Pedagantyada Mandal, Visakhapatnam District of Andhra Pradesh and the same is identified on the survey of India toposheet no 65 O/2, O/6 at the Latitude 17°34'30" North and Longitude 83°07'30" East at an elevation of 8.5 m above Mean Sea Level (MSL).

The Palavalasa village is located at about 0.3 km, N from plant site respectively. The area is generally barren and devoid of vegetation and only shrubs and trees are found in scattered form. The plant area is completely barren and uncultivable land.

The geographical location of the plant is shown in **Figures-1.1**. The topographical features of the project area (within 10 km radius of plant site) are depicted in **Figures-1.2**.

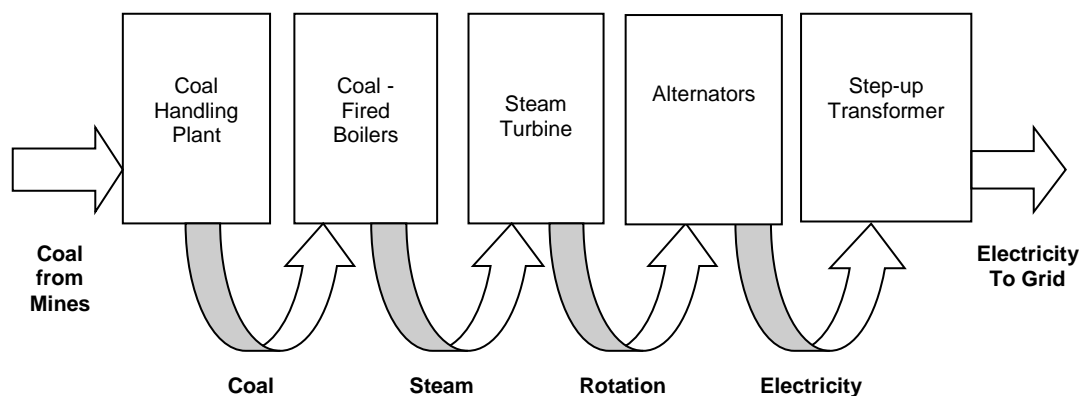
1.3 **Process Description**

Each of the coal-fired power projects currently in development would employ pulverized coal combustion (PCC) technology. In the PCC process, the coal-handling plants receive coal, crush it to the required size and feed it to the boiler plants. The boiler plants then use coal pulverizes to grind the coal to a finer size before it is fed to the boiler furnace. The boilers are enclosures encased by tubes



filled with flowing water. As the boiler furnace heats, the water flowing in the boiler tubes is converted into high pressure and high temperature steam. This steam is conveyed to the turbine through steam pipelines. The steam produced in the boiler drives steam turbines, making the turbines' rotors rotate at high speeds. Alternators are coupled to the steam turbines and rotate with the turbines' rotors. The alternators convert the energy generated by the rotation of the turbines' rotors into electricity. Step-up transformers then steps up the voltage of generated electricity before it is fed to the grids for transmission. Transmission of electricity is done at very high voltage to minimize transmission losses.


The coal-fired power process is illustrated below:



The process of generation of power from coal (water steam cycle) essentially entails two main stages. In the first stage, the chemical energy stored in coal is converted into heat energy in the coal-fired boilers. In the second stage, the high-pressure steam, which is generated in the boilers, is passed through turbines (conversion of heat energy into mechanical energy) which in turn is coupled to generators (conversion of mechanical energy into electrical energy), thereby generating electricity.

The water steam cycle essentially contains the coal fired steam generator, the steam turbine with condenser, feed-water tank, low-pressure (LP) heaters and high-pressure (HP) heaters and the connecting pipelines. The superheated steam produced in the steam generator is supplied to the steam turbine, which drives the three-phase AC generator. After leaving the HP turbine, the steam is reheated in the steam generator and fed to the Intermediate Pressure (IP) turbine. In the LP turbine the steam coming directly from the IP turbine expands to condenser pressure and is condensed in the condenser.

Once through system is used for cooling of the condenser. The condensate collected in the condenser hot well is discharged by the condensate pumps and supplied via the LP condensate heaters into the feed water tank. The feed water is further heated by bled steam from turbine and dissolved gases from the feed-water are liberated. The boiler feed pumps discharge feed water from the feed-water tank via the HP heaters to the economizer. Steaming starts from this point onwards. The high temperature steam-water mix is further converted into steam

	Environmental Statement Report (Form-V) for FY 2021-2022 for 2x520 MW Coal Based Thermal Power Plant at Visakhapatnam.
	<p style="text-align: right;">Chapter-1 Introduction</p>

in water walls and finally passed through the super heaters sections for converting the saturated steam into superheated steam.

The power station would be designed with two power generating units of 520 MW each, along with the auxiliaries and common utility services like plant water system, coal handling system, ash handling plant, and switchyard for power evacuation, plant electrical system and workshop.

The main sections of the power generating unit include Steam Generator along with milling system and electrostatic precipitator, integral piping, integral control system, turbine and generator unit, boiler feed pump, regenerative heaters, condensate extraction pump, circulating and auxiliary cooling water pumps and the generator transformer with bus duct. The main sections of the utility system are the coal handling system, ash handling system, fire fighting system, AC & Ventilation system, switchyard and the plant water system. The power generated at lower voltage of 21 KV would be stepped up to 400 KV and will be connected to the proposed 400 KV switchyard for dispatch.

The plant layout is shown in **Figure-1.3**.

1.4 Scope of the Study

Under the scope of the study, an area of 10 km radius from the centre of the existing plant was covered in detail for various environmental components viz Air, water and Noise based on the guidelines of Ministry of Environment and Forests, Government of India.

With a view to assess the various environmental attributes as specified in Environmental Clearance (EC) issued by MoEF and Consent to Establish (CTE) issued by APPCB, HNPCL has retained M/s. Vimta Labs Limited, Hyderabad for carrying out Post Project Monitoring (PPM) studies on monthly basis.

1.5 Methodology of the Study

Reconnaissance survey was conducted and sampling locations were identified on the basis of:

- Predominant wind directions in the study area as recorded by Indian Meteorological Department (IMD) station at Visakhapatnam;
- Existing topography; location of surface water bodies like ponds, canals and rivers;
- Location of villages/towns/sensitive areas;
- Accessibility, power availability and security of monitoring equipment; pollution pockets in the area;
- Areas which represent baseline conditions; and
- Collection, collation and analysis of baseline data for various environmental attributes.

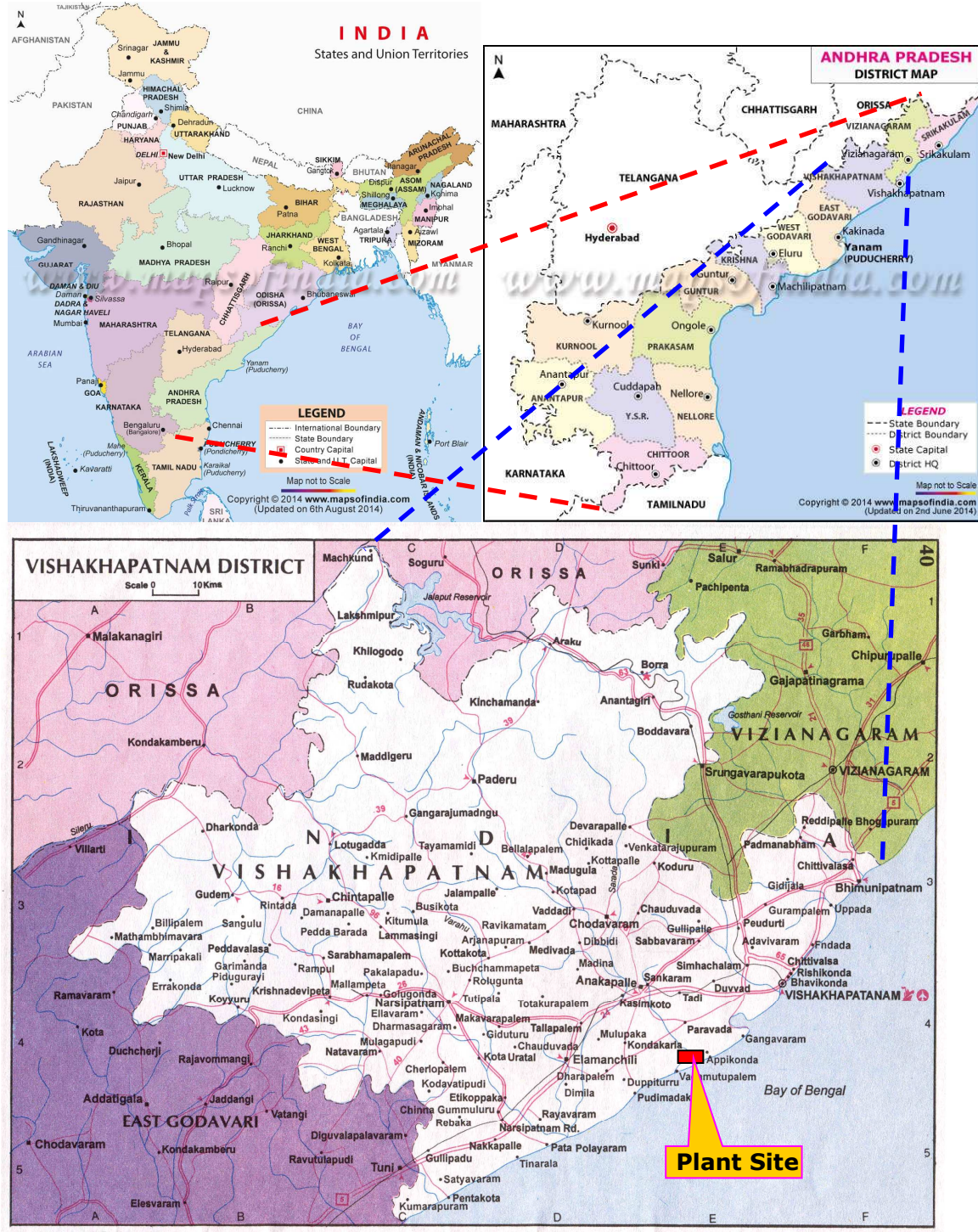
The field observations are used to:

- Identify extent of negative impacts on community/natural resources; and
- Identify mitigation measures and monitoring requirements.



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**Chapter-1
Introduction**

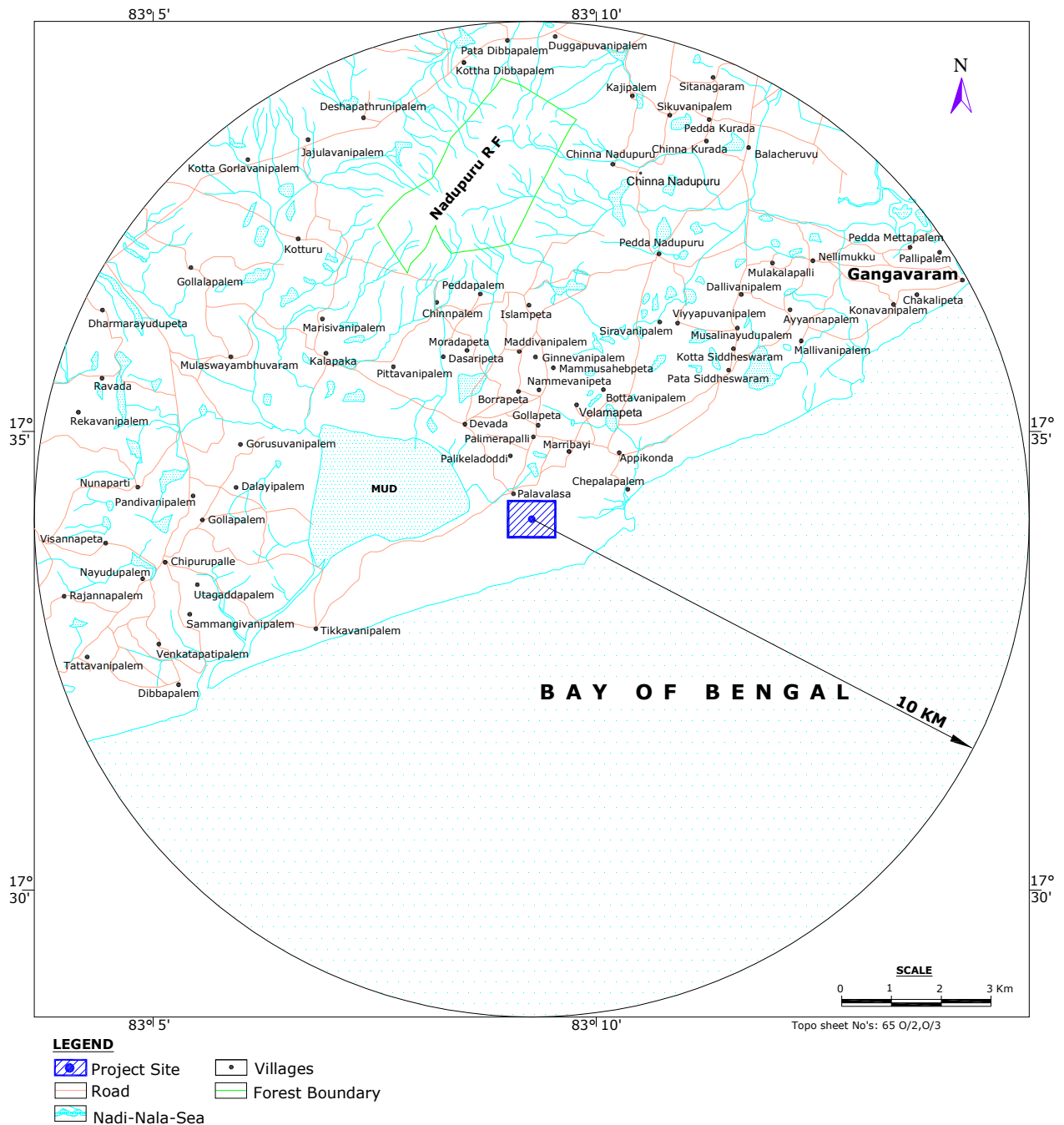


**FIGURE-1.1
LOCATION MAP OF THE PLANT SITE**



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**Chapter-1
Introduction**

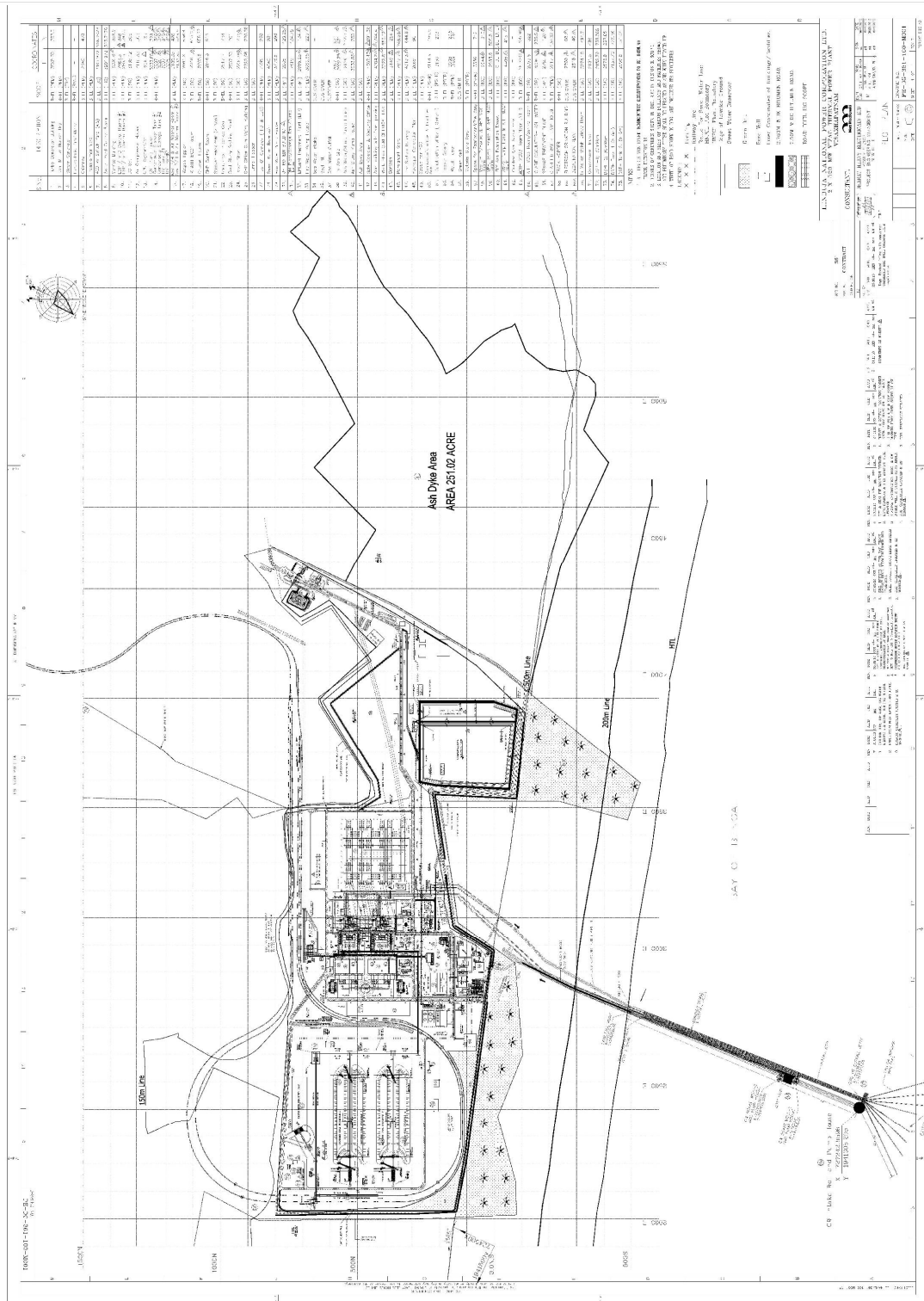


**FIGURE-1.2
STUDY AREA MAP OF 10-KM RADIUS**



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Chapter-1 Introduction



**FIGURE-1.3
TYPICAL LAYOUT OF PLANT**

Chapter-2
Form-V

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FORM-V
(See Rule 14)
Environmental Statement for the financial year ending the 31st March, 2022

PART-A

1. Name and address of the owner Occupier Of the Industry Operation or Process : Mr.K. Venugopal Keshanakurthy
CEO
M/S Hinduja National Power Corporation Ltd, Palavalasa Village, T. Devada (P), Pedagantyada Mandal, Visakhapatnam District, Andhra Pradesh-530031
2. Industry Category : Red Category
Coal based power plant
3. Production Capacity : 1040 MW
(2X520 MW), Unit-I & II
4. Year of Establishment (Date of Production Commenced) : 11th January 2016 -Unit-I (520 MW)
03rd July 2016 -Unit-II (520 MW)
5. Date of last Environmental Statement Submitted : 29th September 2021


PART-B
(Water & Raw Materials Consumption)

1. Water Consumption (m³/Day)

A). For Process:

Water Consumption	During the Previous Financial Year 2020-2021 (m ³ /day)	During the Current financial year 2021-2022 (m ³ /day)
Process water		
a) Ash Water Sump	39224.8	37011.8
b) Dust Suppression system		
c) Desalination pant		
Cooling water	**	**
Domestic	144.5	98.7

** Cooling Water	During the Previous Financial Year 2020-2021 (m ³ /day)	During the Current financial year 2021-2022 (m ³ /day)
Seawater Drawn	2566898.0	2825596.8
Seawater Let-out	2527673.2	2788585.1
Balance	39224.8	37011.8

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Name of the Product	Process Water Consumption per Unit of Product Output	
Financial Year	2020-2021 (Unit-I & II)	2021-2022 (Unit-I & II)
a) Electricity (L/KWH)	3.292	2.499

c) Raw Materials Consumption:

Name of Raw Material	Name of Products		Consumption of raw material per Unit of output	
			During the Current financial year 2020-2021	During the Current financial year 2021-2022
COAL (Kg/KWH)	Electricity	Unit-I	0.7129	0.7393
LDO (L/KWH)	Electricity		0.00017	0.00122
COAL (Kg/KWH)	Electricity	Unit-II	0.7271	0.7552
LDO (L/KWH)	Electricity		0.00052	0.00082

Chemicals Consumption

Sno	Name of Chemicals	Units	Quantity	Quantity
			Unit-I & II 2020-2021	Unit-I & II 2021-2022
1	Sodium Hypochlorite (NaOCl)	Kg	15995	12495
2	SMBS	Kg	220	164
3	Hydrazine Hydrate (80%)	lits	1256	1292
4	Ammonium hydroxide (25%)	lits	6980	3205
5	Tri sodium Phosphate	kg	54	7
6	Hydrochloric acid (30%)	ton	39.02	21.58
7	NaOH (40%)	ton	20.81	10.4
8	CaCl ₂	Kg	15375	8355
9	NaHCO ₃	Kg	15375	12225
10	FeCl ₃ (40%)	ton	23.050	3900

PART – C

Pollution Discharged to Environment/Unit of output
(Parameters as specified in the consent issued)

Pollutants	Quantity of pollutants Discharge (Kg/Day)	% of variation prescribed from Standards (+ ve/ - Ve)
a) water	Refer Annexure IA	
b) Air	Refer Annexure IB,IC & ID	

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PART – D
HAZARDOUS WASTES

(As specified under Hazardous Waste Management and Handling Rules, 1989)

Hazardous Wastes	Total Quantity (Kg)	
	During previous financial year (2020-2021) KL	During current financial Year (2021-2022) KL
a) Waste lubricating oil (From process Waste oil)	26.2	6.0
b) From pollution control facilities	Nil	Nil

PART-E
SOLID WAST

		Total Quantity	
		During the current financial year (2020-2021) MT	During the current financial year (2021-2022) MT
a	From Process		
	Bottom ash	64901	16899
	Fly Ash	259602	67595
b	From pollution control facility (fly ash)	Nil	Nil
c	1) Quantity recycled or re-utilized	Nil	Nil
	2) Sold	Nil	Nil
	3) Disposed	351912	86288

PART – F

Please specify the Characterizations (in terms of composition of quantum) of hazardous as well as solid wastes and indicate disposal practice adopted for the both these categories of wastes.

Fly ash is being sent to bricks & cement manufacturing plants and high ways works also.

PART – G

Impact of pollution control measures on conservation of natural resources and on the cost of production.

To monitor and to take appropriate steps for mitigating the adverse impacts of plant operational effects on the environment, regular monitoring of stack emission, ambient air quality and noise are undertaken. Also water from seven bore wells and three surface water sources are being monitored and reports sent to State Pollution Control Board and MoEF regularly.

The expenditure incurred towards air pollution control measure & monitoring, green belt maintenance and statutory payment details for the FY 2021-2022 are as follows,

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ENVIRONMENTAL EXPENSES IN DURING FY 2021-2022

Sr. No.	Description	Power Plant (Laks)
1	Air Pollution control equipments	22,43,069.00
2	Dust suppression systems	
3	Chimney	
4	Environmental Monitoring and management	
5	Greenbelt Development / Maintenance	
	TOTAL	22,43,069.00

PART-H

Additional measures investment proposal for environmental protection including abatement of pollution, prevention of pollution.


1. Housekeeping is taken up on top priority and engaged sufficient manpower for maintenance of the plant premises.
2. A water sprinkling arrangement is made to suppress the fly ash and coal dust to avoid emission.
3. All internal roads are of BT at lorry bay to reduce the dust emission.
4. Tree plantation was done inside as well as outside of the plant. Also small patches of gardens are developed inside of the plant premises wherever the open space is available to improve the plant beautification.

Adequate measures have been taken for pollution control and as per the requirement additional measures will also be taken up.

PART-I
MISCELLANEOUS

Any other particulars for improving environment protection and abatement of pollution. Green belt has been developed inside and all along the periphery of the plant boundary and ash pond. All the Effluent water is treated and utilized for fugitive dust control.

* Plant is under reserved Shutdown from 1st April 2021 to 3rd February 2022.

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a) WATER:

ANNEXURE-I A
EFFLUENT WATER


Treated Effluent Characteristics

Parameters	Units	Average Concentration	Limits	% of variation Prescribed from Standards (+ ve/ - Ve)
pH	-	7.86	6.5-8.5	- ve
Total Suspended Solids	mg/l	60.0	100	- ve
Oil and Grease	mg/l	<1.0	20	- ve
Free chlorine	mg/l	<0.2	0.5	- ve
Phosphate as PO ₄	mg/l	3.4	20	- ve
Chromium (Total)	mg/l	0.07	0.2	- ve
Copper (Total)	mg/l	0.63	1.0	- ve
Iron	mg/l	0.28	1.0	- ve
Zinc	mg/l	0.47	1.0	- ve
BOD (3 day 27°C)	mg/l	13	30	- ve
Fecal Coliform	MPN/100 ml	<1.8	1000	- ve

Note: The variation (-ve) because the values are less than the standard limits.

b) Seawater Drawn and Let-out

Month	Parameter	Temperature
April 2021 to March 2022	Temperature not more than 10° C higher than intake water as per MOEF Communication dated 01.06.1999	< 5° C

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b) AIR:

**ANNEXURE-IB
STACK EMISSIONS**

Month	Flue gas Temperature (°C)	Velocity m/Sec	Volumetric flow (m³/s)	Particulate Matter PM (mg/NM³)	SO ₂ (mg/NM³)	NO _x (mg/NM³)	Hg (mg/NM³)
UNIT-I							
April 2021	Plant Shutdown						
May 2021							
June 2021							
July 2021							
August 2021							
September 2021							
October 2021							
November 2021							
December 2021							
January 2022							
February 2022	120	22.33	807.48	37.8	566	297	0.012
March 2022	118	22.82	829.12	32.1	583	352	0.010
Average	119	22.53	818.30	35.0	575	325	0.011
UNIT-II							
April 2021	Plant Shutdown						
May 2021							
June 2021							
July 2021							
August 2021							
September 2021							
October 2021							
November 2021							
December 2021							
January 2022							
February 2022	125	22.41	814.36	40.2	581	334	0.018
March 2022	-	-	-	-	-	-	-
Average	125	22.41	814.36	40.2	581	334	0.018

- Stack Diameter: 6.8 m, Cross Sectional Area: 36.33 m



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ANNEXURE-I C
AMBIENT AIR QUALITY
SUMMARY OF AMBIENT AIR QUALITY DATA (APRIL-2021 to MARCH-2022)

Location Code	Location	PM2.5				PM10				SO ₂			
		Min	Max	Avg	98% tile	Min	Max	Avg	98% tile	Min	Max	Avg	98% tile
AAQ1	Palavalasa village	17.4	30.2	22.7	27.8	39.2	58.8	48.7	56.3	9.0	14.4	11.3	14.0
AAQ2	Appikonda village	19.6	28.4	23.4	27.3	42.4	55.1	48.3	54.6	9.4	14.2	11.5	13.6
AAQ3	Devada village	18.7	27.5	23.0	26.3	40.9	55.3	48.0	54.2	9.5	14.1	11.7	13.5
AAQ4	Cheepurupalle village	19.4	31.4	23.7	29.3	45.7	64.3	52.5	60.7	9.3	15.7	12.1	14.9
AAQ5	Dasaripeta village	19.5	27.2	23.1	26.6	42.6	53.2	48.1	52.9	9.2	13.5	11.4	13.2
AAQ6	Islampeta village	17.2	27.4	23.0	26.5	42.4	55.3	48.7	53.8	9.0	14.2	11.3	13.1
AAQ7	Pittavanipalem village	20.2	32.7	24.5	30.1	42.3	63.2	54.2	62.5	10.1	14.6	12.2	14.2
AAQ8	Kalapaka village	19.0	28.4	23.4	27.0	43.5	59.3	50.8	56.4	9.5	15.3	11.9	14.5
		17.2 – 32.7				39.2 – 64.3				9.0 – 15.7			

**Note: (Concentrations are expressed in $\mu\text{g}/\text{m}^3$)*

Location Code	Location	NO ₂				CO				O ₃			
		Min	Max	Avg	98% tile	Min	Max	Avg	98% tile	Min	Max	Avg	98% tile
AAQ1	Palavalasa village	10.6	16.8	13.4	16.4	182	278	230	273	3.9	9.0	5.8	8.1
AAQ2	Appikonda village	11.1	17.3	13.4	16.4	188	284	238	283	4.1	9.7	6.0	8.8
AAQ3	Devada village	10.8	16.4	13.8	15.8	190	292	236	282	4.2	8.4	6.0	8.2
AAQ4	Cheepurupalle village	10.9	19.4	14.2	17.6	182	321	245	311	4.3	10.2	6.6	9.2
AAQ5	Dasaripeta village	11.3	16.2	13.6	15.5	191	278	240	272	4.4	8.8	5.8	7.9
AAQ6	Islampeta village	11.2	16.1	13.6	15.6	179	281	227	268	4.0	7.9	5.7	7.5
AAQ7	Pittavanipalem village	11.1	16.4	14.0	16.4	194	298	249	294	4.2	8.6	6.1	8.0
AAQ8	Kalapaka village	12.1	17.6	14.2	16.7	191	286	242	280	4.0	8.1	6.0	7.9
		10.6 – 19.4				179 – 321				3.9 – 10.2			

**Note: (Concentrations are expressed in $\mu\text{g}/\text{m}^3$)*



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ANNEXURE-I C(A)
AMBIENT AIR QUALITY
SUMMARY OF AMBIENT AIR QUALITY DATA (APRIL-2021 to MARCH-2022)

Location Code	Location	NH ₃				Pb				As			
		Min	Max	Avg	98% tile	Min	Max	Avg	98% tile	Min	Max	Avg	98% tile
AAQ1	Palavalasa village	<20	<20	<20	<20	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
AAQ2	Appikonda village	<20	<20	<20	<20	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
AAQ3	Devada village	<20	<20	<20	<20	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
AAQ4	Cheepurupalle village	<20	<20	<20	<20	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
AAQ5	Dasaripeta village	<20	<20	<20	<20	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
AAQ6	Islampeta village	<20	<20	<20	<20	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
AAQ7	Pittavanipalem village	<20	<20	<20	<20	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
AAQ8	Kalapaka village	<20	<20	<20	<20	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
		<20				<0.001				<0.001			

Location Code	Location	Ni				B(a)P				C ₆ H ₆			
		Min	Max	Avg	98% tile	Min	Max	Avg	98% tile	Min	Max	Avg	98% tile
AAQ1	Palavalasa village	<0.001	<0.001	<0.001	<0.001	<0.1	<0.1	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0
AAQ2	Appikonda village	<0.001	<0.001	<0.001	<0.001	<0.1	<0.1	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0
AAQ3	Devada village	<0.001	<0.001	<0.001	<0.001	<0.1	<0.1	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0
AAQ4	Cheepurupalle village	<0.001	<0.001	<0.001	<0.001	<0.1	<0.1	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0
AAQ5	Dasaripeta village	<0.001	<0.001	<0.001	<0.001	<0.1	<0.1	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0
AAQ6	Islampeta village	<0.001	<0.001	<0.001	<0.001	<0.1	<0.1	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0
AAQ7	Pittavanipalem village	<0.001	<0.001	<0.001	<0.001	<0.1	<0.1	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0
AAQ8	Kalapaka village	<0.001	<0.001	<0.001	<0.001	<0.1	<0.1	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0
		<0.001				<0.1				<1.0			

*Note: (Concentrations are expressed in $\mu\text{g}/\text{m}^3$ except B(a)p)

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ANNEXURE-I D
SUMMARY OF NOISE LEVEL MONITORING RESULTS
(APRIL-2021 to MARCH-2022)

Sr. No.	Location Name	Noise levels dB (A)	
		L _{day}	L _{night}
Inside the Plant Area			
1	Near Plant main gate	66.4	61.8
2	Near Boiler Area	85.5	
3	Near Turbine area	86.0	
Out Side the Plant Premises			
4	Palavalasa	47.1	43.5
5	Appikonda	47.4	43.8
6	Devada	46.3	42.7
7	Cheepurupalle	47.7	44.1
8	Dasaripeta	46.9	43.3
9	Islampeta	46.7	43.1
10	Pittavanipalem	48.0	44.4
11	Kalapaka	47.1	43.5