HALDIA PETROCHEMICALS LTD

Plant :
Post Box No.-12, Durgachak,
Haldia, Dist. - Purba Medinipore
West Bengal, Pin-721602, India
Tel.: +91 (03224) 274007/384/400/876
WEBSITE : www.haldiapetrochemicals.com
CIN:U24100WB2015PLC205383

HPL/IMS/HSEF/R/4.3.2/08/ENV/E-04/WBPCB

September 18, 2023

The Chief Engineer- O&E Cell
West Bengal Pollution Control Board,
Paribesh Bhawan,
10A, Block – LA, Sector-III,
Kolkata – 700 106

Sub: Submission of Environmental Statement for the Financial Year 2022-23

Dear Sir,

We are pleased to submit the Environmental Statement of our plant for the financial year 2022-23 ending 31st March 2023 in Form – V, duly filled up along with all necessary enclosures, as per the provision of Rule 14 of The Environment (Protection) Rules, 1986 and amendments for your kind perusal.

Thanking you,

Yours very sincerely,

Manoj Kumar Srivastava
EVP & Head-Plant

Encl.: As above

CC: Environment Engineer
Haldia Regional Office,
West Bengal Pollution Control Board
Haldia-721 657

Environmental Statement
FY 2022-23

[FORM – V]

(SEE RULE 14)

Environmental Statement for the Financial Year ending the 31st March 2023

PART – A

(i)	**Name and address of the owner/occupier of the industry, operation or process:**		**Mr. Navanit Narayan** Haldia Petrochemicals Limited **Plant:** P. B. No. 12, Durgachak, Haldia, Dist. – Purba Midnapore, Pin – 721 602 Tel: (03224) 274007/384/400 Fax: (03224) 272755/274880 **Registered Office:** Tower 1, Bengal Eco Intelligence Park (Techna), Block EM, Plot No. 3, Sector V, Salt Lake, PO: Bidhan Nagar, District: North 24 Paraganas, Kolkata 700 091, Tel: 7112 2334, 7112 2445
(ii)	**Industry Category**	:	Red, Petrochemicals (Basic & Intermediates)
(iii)	**Production Capacity**	:	7,00,000 TPA of Ethylene
(iv)	**Year of Establishment**	:	2000
(v)	**Date of last Environmental Statement Submitted**	:	September 09, 2022

PART - B

Water and Raw Material Consumption

i) Water Consumption (Avg) m^3/d

Process: **1788 m^3/d**

Cooling: **39599 m^3/d** (including Boiler feed water and fire water makeup)

Domestic: **1268 m^3/d**

Name of Product (Saleable)	Process Water Consumption per unit of Saleable Product (m^3/MT)	
	During the previous financial year (2021-22)	During the current financial year (2022-23)
1) HDPE 2) LLDPE 3) PP 4) Benzene 5) Butadiene 6) Cyclo-Pentane 7) CBFS 8) LPG 9) Py Gas 10) Butene-1 11) MTBE	**9.6**	**9.7**

(ii) Raw Material Consumption

*Name of raw materials	Name of products	Consumption of raw material per unit of output	
		During the Previous Financial Year 2021-22	During the Current Financial Year 2022-23

* Industry may use codes if disclosing details of raw materials would violate contractual obligations, otherwise all industries have to name the raw material used.

Ref. Annexure - 1

PART – C
Pollution discharged to environment/unit of output
(Parameters as specified in the consent issued)

<table>
<tr><th>Sl No.</th><th>Pollutants</th><th>Quantity of pollutants discharged (Kg/day)</th><th colspan="4">Concentration of pollutants discharges (Mass/volume)</th><th>Percentage of variations from prescribed standard with reasons</th></tr>
<tr><td rowspan="16">a.</td><td rowspan="16">Water (Treated Effluent)

BOD

COD

TSS</td><td rowspan="16">73

240

86</td><td>Parameter</td><td>Unit</td><td>Standards</td><td>Avg.</td><td rowspan="16">No variation</td></tr>
<tr><td>pH</td><td>-</td><td>6.5-8.5</td><td>7.39</td></tr>
<tr><td>TSS</td><td>mg/l</td><td>100</td><td>15.26</td></tr>
<tr><td>BOD</td><td>mg/l</td><td>30</td><td>12.83</td></tr>
<tr><td>COD</td><td>mg/l</td><td>250</td><td>42.39</td></tr>
<tr><td>Total Oil & Grease</td><td>mg/l</td><td>10.0</td><td>BDL</td></tr>
<tr><td>Phenol</td><td>mg/l</td><td>1.0</td><td>BDL</td></tr>
<tr><td>Sulphide</td><td>mg/l</td><td>2.0</td><td>BDL</td></tr>
<tr><td>Cyanide</td><td>mg/l</td><td>0.2</td><td>BDL</td></tr>
<tr><td>Fluoride</td><td>mg/l</td><td>5.0</td><td>0.71</td></tr>
<tr><td>Total Chromium</td><td>mg/l</td><td>2.0</td><td>BDL</td></tr>
<tr><td>Chromium (Cr^{+6})</td><td>mg/l</td><td>0.1</td><td>BDL</td></tr>
<tr><td>Iron as Fe</td><td>mg/L</td><td>1.0</td><td>0.29</td></tr>
<tr><td>Zinc as Zn</td><td>mg/L</td><td>1.0</td><td>0.12</td></tr>
<tr><td>Copper as Cu</td><td>mg/L</td><td>1.0</td><td><0.05</td></tr>
<tr><td>Phosphate as P</td><td>mg/L</td><td>5.0</td><td>0.40</td></tr>
<tr><td>Free available Chlorine (FRC)</td><td>mg/L</td><td>0.5</td><td><0.1</td></tr>
<tr><td colspan="5">Monthly data given in PART – G, Table 1.1 & 1.2</td><td></td></tr>
<tr><td>b.</td><td>Air (Stack Emission)
PM
SOx
NOX</td><td>

878
2011
2269</td><td colspan="4">Ref. PART – G, Table- 3.1 to 3.5</td><td>No variation</td></tr>
</table>

Note: All the data are of Annual Average Data (FY 2022-23)

PART – D

Hazardous Wastes

As specified under Hazardous Wastes and Other Wastes (Management & Transboundary Movement) Rules, 2016.

Sl. No.	Hazardous Waste		Total Quantity Generated (MT)	
			Financial Year 2021-22	Financial Year 2022-23
01	Process	Waste Refractory Bricks (1.1)	Nil	10.47
		Tank Bottom Sludge + Waste Oil filter (3.3)	Nil	171.1
		Used Oil (5.1)	58.0	37.3
		Waste Oil (5.2)	320.6	636.02
		Empty Barrel/Container (33.1)	Nil	6.64
		Oil Contaminated Cotton Waste (33.2)	3.27	2.4
		Waste Resin (35.2)	16.0	18.39
		Oil impregnated Coke (36.2)	16.06	19.31
02	From Pollution Control Facilities	Sludge generated from WWTP (35.3)	138.56	291.35
		Ash from Incinerator*	5.0	Nil

*Incinerator was not operational since August 2021

PART – E

Solid Wastes

		Total Quantity (MT)	
		During the previous financial year (2021-2022)	During the current financial year (2022-2023)
(a)	From Process (Bottom Ash)	NIL	11946
(b)	From Pollution Control Facility (Fly ash)	NIL	26967
(c)	(1) Quantity Recycled or Re-utilized within & outside the unit (Fly ash+ Bottom Ash)	NIL	32973.84
	(2) Sold (Non-Haz SW + Fly ash)	1131.52	7011.18
	(3) Disposed (Canteen Food Waste)	5.0	9.0

PART – F

PLEASE SPECIFY THE CHARACTERISATION (IN TERMS OF COMPOSITION OF QUANTUM) OF HAZARDOUS AS WELL AS SOLID WASTES AND INDICATE DISPOSAL PRACTICE ADOPTED FOR BOTH THESE CATEGORIES OF WASTES.

Please refer to **Annexure - 2** for Solid Non-Hazardous Waste, **Annexure – 3** for Hazardous Waste (Form-IV) and **Annexure-4** for Ash Compliance Report. It specified the characteristics of generated waste and the disposal practices adopted to handle it in a safe manner.

PART – G

IMPACT OF THE POLLUTION ABATEMENT MEASURES TAKEN ON CONSERVATION OF NATURAL RESOURCES AND ON THE COST OF PRODUCTION

Following steps have been taken to ensure safe disposal of liquid, solid and gaseous effluents for environmental pollution control.

1. Liquid Effluent Treatment

HPL Complex generates liquid wastewater from Naphtha Cracker Unit, Butadiene Unit, Pyrolysis Gasoline Hydrogenation Unit, Benzene Extraction Unit, HDPE Unit, LLDPE Unit, PP Unit, Cooling Tower, Nitrogen Plant (put up by Praxair India Pvt. Ltd. on BOO basis), DM Water Plant, Captive Power Plant and Utilities and off-site buildings. HPL Plant has a suitable treatment system before disposal of plant generated wastewater and a comprehensive wastewater management system comprising of appropriate collection, treatment, and disposal facilities via only one mixed out fall.

Our treatment facilities are divided into two distinct sections, namely, pre-treatment section inside battery limits **(ISBL)** of the respective units and final treatments in Waste Water Treatment **(WWTP)**.

ISBL Treatment is provided for the following streams:

i) **Spent caustic stream from Naphtha Cracker Unit (NCU):** Spent caustic stream emerging from cracker unit is highly alkaline and contains high oxygen demand. In the spent caustic treatment plant, Na_2S is converted to sodium thiosulphate by oxidation process. After this treatment the stream is sent to WWTP.

ii) **Neutralization / free oil removal in NCU**: Corrugated plate interceptors (CPI) have been provided in NCU for removal of floating oil from different waste streams of NCU.

iii) **Polymer Plants:** Wash water and effluent streams from process contain trace hydrocarbon and polymers, which is, collected ISBL and then sent to WWTP after oil skimming and removal. Provision for removal of polymer powders and floating oil has been provided in the polymer plants

iv) Neutralization of effluent generated from regeneration in Demineralization (DM) plant for water.

The OSBL treatment facilities (Wastewater Treatment Plant) are designed for treating process wastewater for reduction free and emulsified oil, sulphide, phenol, thiosulphate, total suspended solids (**TSS**), Bio-chemical Oxygen Demand **(BOD)** and Chemical Oxygen Demand **(COD)** and the contaminated rainwater for removal of oil and suspended solids. The treated effluents from the Wastewater Treatment Plant are meeting the discharge standards stipulated by West Bengal Pollution Control Board.

WWTP has been broadly designed for following treatment systems:

- **Oil Recovery System:** Pretreated effluent streams from various units are routed to TPI Separators for removal of free oil and suspended solids. The free oil removed from the TPI Separators is being collected in the wet slop oil sump. The oily sludge from the bottom of TPI separators is routed to the chemical and oily sludge sump. The effluent from TPI unit is routed (by gravity) to the equalization tank for equalization of flow and modulation of characteristics. Floating oil skimmer is provided to remove the free-oil layer formed in equalization tank. This free oil is being routed to the wet slop oil sump.

  HDPE process effluent is directly received to the equalization tank for equalization of flow and its characteristics. The equalization tank effluent is

pumped to the pH Adjustment tank where the pH of the effluent is maintained in the range 7.0 to 8.0 by dosing H_2SO_4 or NaOH Solution. After achieving the desired level of the pH, the effluent is routed to Flash Mixing Tank where alum solution is added as a coagulant. Hydrogen Peroxide can also be dosed to oxidize sulfide (If sulfide level is more than 20 ppm) in the inlet effluent. The effluent is then routed to Flocculation Tank where addition of De-oiling Poly-electrolyte (DOPE) helps in breaking the oil-water emulsion and formation of alum flocs.

The effluent from flocculation tank is routed to the dissolved air floatation (DAF) tank. Mixture of air and water at high pressure is used to skim off the floating materials at top. Heavy sludge settles at bottom. The oily scum and the bottom sludge are routed to the chemical and oily sludge sump or Wet slop oil sump depending upon the characteristics. The clarified DAF effluent is directed to the aeration tank for biological treatment.

- **Biological Treatment System:** Activated sludge process has been has been adopted by HPL for reducing the biodegradable organic content of the effluents.

The effluent from the **DAF tank** is routed to aeration tank operating in extended aeration mode for removal of biodegradable organic matter, resulting in reduction of **BOD & COD**. Aeration conditions are maintained in the tank by entrapment of the atmospheric air with the help of surface aerators. The nutrients i.e. urea & DAP solution are dosed at the inlet of aeration tank to provide nitrogen, phosphorus for microorganisms. The overflow from the aeration tank will contain a high concentration of microorganisms. A secondary clarifier helps in separating the microorganism from the liquid streams from the bottom sludge and the over flow is the treated effluent.

Then aeration tank effluent is routed under gravity to the clarifier. The clarifier is provided with a sludge scraper, which moves slowly to scrap the bio-solids,

which settle at the bottom. The collected sludge is routed to the bio-sludge sump. Bio-sludge is re-circulated to aeration tank inlet to maintain desired microorganism concentration. Sludge from re-circulation line is bleed-off regularly to sludge thickener to remove dead microorganism cells. The overflow from the clarifier is the treated effluent, which is routed to the guard pond. Two guard ponds (2 x 4,090 m^3) are provided to take care of all types of functional eventualities of the Waste Water Treatment Plant (WWTP), if the effluent does not meet the standards. Moreover, the guard ponds are provided with impervious layers to prevent percolation possibilities and consequent contamination of soil and sub-soil water.

- **Sanitary Sewer Treatment System:** A dedicated underground sanitary sewer network is provided for entire HPL Complex including the Captive Power Plant of HPL Co-generation Ltd. and Nitrogen Plant of M/s. Praxair India Ltd. Sanitary effluent after collection in various suitable pits, is pumped to Bar Screen Chambers and then the grit chamber for physical removal of scum and suspended solids. Finally sewer effluent is pumped to Aeration Tank of WWTP for Biological Treatment along with other process effluents.

- **Contaminated Rainwater Treatment System:** During wet weather, the contaminated rainwater stream of HPL complex is received in the receiving sump of WWTP. This effluent is transferred to surge pond by dedicated high capacity WWF pumps (4 x 3,000 m^3/h) after passing through bar screen and grit chamber. Floating oil skimmer is provided to remove the free oil layer formed in the surge pond and routed to the wet slop oil sump.

  TPI has been provided to remove floating oil and suspended particles from the effluent. Provision has been made to transfer the surge pond effluent to equalization tank for processing along with other normal waste streams. Otherwise, if all parameters are within limit, it can be transferred to guard pond for disposal along with treated effluent.

- **Slop Oil Collection System:** The slop oil is collected in wet slop oil tank from various units e.g. TPI separator- I & II, Equalization tank, Dissolved air floatation tank and surge pond and transferred to slop oil tanks for storage. Slop oil is also received from KOD of flare system. The dry slop oil, retained in the tank after decantation of water, will be disposed as low-grade fuel to authorized external agencies or burnt in incinerator. One 1,000 m^3 capacity tank has also been made to store the dry slop oil. The decanted water from slop oil tank bottom is recycled to receiving sump by gravity.

- **Sludge Handling System:** The oily sludge from the TPI separators, DAF tanks and clarifier is collected in chemical and oily sludge sump from where it is routed to sludge thickener. The under flow from the sludge thickener is routed to the thickened sludge sump from where it is pumped to the centrifuge. Dewatering polyelectrolyte is dosed in centrifuge to achieve better sludge consistency. Periodically sludge is collected from centrifuge and is stored in secured On-Site Storage Pit.

- **Final Discharge System:** Co-generation power plant, Cooling tower, Nitrogen plant and DM water plant effluent is being collected in Cooling Tower Blow Down (**CTBD**) and **DM** waste pond. CTBD and DM waste pond overflow/drain, which is totally free of any organics, or oil is routed to treat effluent sump along with treated effluent from guard pond for final disposal through a channel.

  The treated effluent from WWTP is discharged into the river Hooghly through Haldia Green Belt Canal. Also, the treated effluent maximum extent possible will be utilized for irrigation of green belt developments. The final out-fall effluents confirm that there is immense dilution i.e. nearly 20,000 times adjacent to the green belt canal and more than 25,000 times at the confluence of river Haldi. Since the rivers Hooghly and Haldi are tidal in nature, the buffering capacity of the green belt canal will ensure to hold the treated effluent discharged (via green

belt canal) during the high tide period. The final effluent meets the WBPCB prescribed standards.

Environmental Laboratory checks the quality of effluent daily as per specifications of effluent standards. In case the effluent does not meet the stipulated standard, it would be recycled to the WWTP for retreating to achieve the stipulated effluent quality standards.

Annual Effluent Quality

Sample was collected from the WWTP discharge point daily. Analytical results indicate that average value of all the parameters in all four season are well within norms.

Analytical results of the WWTP treated effluent & HPL final Outfall indicate that average value of all the parameters in all four seasons are well within statutory norms. All average values of all parameters are well within the WBPCB prescribed norms.

WWTP Treated Effluent & HPL Final Outfall is analyzed on daily grab sampling basis for the following parameters annual and summarized seasonal results are given in Table No.: 1.1 and 1.2 respectively.

As per the guideline of CPCB Online Effluent Monitoring System was installed on March'16 for continuous monitoring of treated effluent for 05 nos. of parameters (pH, Flow, BOD, COD & TSS) and Online Stack Monitoring System was installed in 04 nos. of stacks of CPP on March'17 for continuous monitoring of PM, SO_2, NO_x & CO. The data of both the analysers is transferred successfully to CPCB server.

TABLE 1.1: MONTHLY DATA OF WWTP TREATED EFFLUENT

Sl. No.	Parameter	Unit	WBPCB Standard	Apr'22	May'22	Jun'22	Jul'22	Aug'22	Sept'22	Oct'22	Nov'22	Dec'22	Jan'23	Feb'23	Mar'23
1.	pH	--	6.5-8.5	7.66	7.49	7.45	7.36	7.21	7.43	7.30	7.43	7.29	7.21	7.41	7.44
2.	TSS	mg/l	100	16.20	18.35	15.47	17.84	15.16	14.53	13.65	13.93	15.42	14.23	14.11	14.26
3.	BOD	mg/l	30	7.20	11.29	8.76	13.06	9.26	10.13	10.35	50.67	10.03	7.77	7.68	7.77
4.	COD	mg/l	250	31.63	53.71	42.30	64.03	44.08	51.50	50.29	10.23	49.71	36.06	36.57	38.52
5.	Total O&G	mg/l	10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
6.	Phenol	mg/l	1.0	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
7.	Sulfide	mg/l	2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
8.	Cyanide	mg/l	0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
9.	Fluoride	mg/l	5.0	0.72	0.72	0.72	0.72	0.69	0.71	0.69	0.71	0.71	0.75	0.73	0.70
10.	Total Chromium	mg/l	2.0	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
11.	Hexavalent Chromium(Cr^{+6})	mg/l	0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
12.	Iron as Fe	mg/L	1.0	0.70	0.28	0.41	0.29	0.22	0.26	0.14	0.31	0.21	0.18	0.10	0.34
13.	Zinc as Zn	mg/L	1.0	0.195	0.356	0.243	0.105	0.0.084	0.101	0.170	0.067	0.02	0.02	0.01	0.063
14.	Copper as Cu	mg/L	1.0	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
15.	Phosphate as P	mg/L	5.0	0.65	0.69	0.94	0.64	0.37	0.35	0.13	0.22	0.26	0.17	0.054	0.32
16.	Free available Chlorine	mg/L	0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Note: All values are in mg/l except pH.

TABLE 1.2: MONTLY DATA OF EFFLUENT OF HPL FINAL OUTFALL

Sl. No.	Parameter	Unit	WBPCB Standard	Apr'22	May'22	Jun'22	Jul'22	Aug'22	Sept'22	Oct'22	Nov'22	Dec'22	Jan'23	Feb'23	Mar'23
1.	pH	--	6.5-8.5	7.91	7.42	7.48	7.49	7.24	7.23	7.29	7.55	7.66	7.38	7.45	7.40
2.	TSS	mg/l	100	25.37	25.71	24.77	26.05	24.63	24.20	24.23	24.5	23.55	24.42	23.89	24.06
3.	BOD	mg/l	30	8.73	9.55	8.14	11.07	8.90	8.63	9.20	50.57	9.48	8.00	8.14	9.55
4.	COD	mg/l	250	39.40	44.61	41.37	51.03	42.32	41.67	44.03	9.97	47.32	38.35	38.50	46.97
5.	Total O&G	mg/l	10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
6.	Phenol	mg/l	1.0	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
7.	Sulfide	mg/l	2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
8.	Cyanide	mg/l	0.2	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
9.	Fluoride	mg/l	5.0	0.60	0.60	0.58	0.57	0.57	0.55	0.55	0.54	0.58	0.63	0.61	0.60
10.	Total Chromium	mg/l	2.0	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
11.	Hexavalent Chromium(Cr^{+6})	mg/l	0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
12.	Iron as Fe	mg/L	1.0	0.48	0.62	0.56	0.35	0.17	0.72	0.45	0.14	0.31	0.21	0.18	0.10
13.	Zinc as Zn	mg/L	1.0	0.136	0.094	0.191	0.125	0.077	0.076	0.050	0.170	0.067	0.02	0.02	0.01
14.	Copper as Cu	mg/L	1.0	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
15.	Phosphate as P	mg/L	5.0	1.01	0.53	0.76	0.65	0.41	0.30	0.28	0.13	0.22	0.26	0.17	0.054
16.	Free available Chlorine	mg/L	0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Note: All values are in mg/l except pH.

2. Gaseous Pollutant

The gaseous pollutants from the Haldia Petrochemicals Complex mainly are hydrocarbon vapors, SO_2 and NO_x.

All major hydrocarbons as well as minor intermittent streams with low hydrocarbon content is released to a totally enclosed flare header and burnt in a properly designed flare stack. Even in case of emergency conditions e.g. process upsets and power failure the release of hydrocarbons from all relief valves of the process units can contribute a flare load much below the maximum capacity i.e. 1286 Tones /hr.

Low NO_x burners have been adopted in Naphtha Cracker furnaces and Captive Power Plant (CPP) to ensure the minimal emission of NO_x to the atmosphere.

The Haldia Petrochemicals Complex adopts sulphur-free gas as fuel for the cracker heaters in Naphtha Cracker units and low sulphur naphtha as well as surplus fuel gas from the Naphtha Cracker Plant as fuels in the Combined Cycle Co-generation Power Plant, thereby minimizing SO_2 emissions. Since fuel gas & naphtha are used in the Haldia Petrochemicals Complex, contribution of emissions of Particulate Matters (PM) is practically negligible.

New online stack monitoring system was installed in the stacks Auxiliary Boilers and HRSGs of CPP. M/s. Environnement S.A installed the online SOx, NOx & CO monitoring system and M/s ICE installed the PM monitoring system in both the Auxiliary Boilers and HRSGs. The integrated system was commissioned and the online data was sent to the servers of CPCB & WBPCB from March 2017 onwards.

03 nos. of Coal - based CFBC boilers (120 TPH each) were installed in our Captive Power Plant. The Commissioning & subsequent stabilisation activities were under progress from December 2021 onwards. A common stack of 140 meter height was connected with three boilers through the Electrostatic Precipitators.

Major source of pollutants from various stacks and parameters monitored are as follows:

Sl. No	Unit	No.of Stack	Parameters	Frequency of Monitoring
1.	Naptha Cracker Unit	09	SO_2, NO_x, CO,	Once in a month
2.	Pyrolysis Gasoline Hydrogenation Unit	01	SO_2, NO_x, CO, PM	Once in a month
3.	Py-gas Desulfurisation Unit	01	SO_2, NO_x, CO, PM	Once in a month
4.	Incinerator	01	SO_2, NO_x, CO, PM,TOC	Once in a month
			HCL, HF, Dioxin & Furan	Quarterly
5.	CPP – Auxiliary Boiler	02	SO_2, NO_x, CO, PM	Twice in a month
6.	CPP –GT & HRSG	02	SO_2, NO_x, CO, PM	Twice in a month
7.	CFB	01	SO_2, NO_x, CO, PM	Twice in a month
7.	CPP – Emergency DG	01	SO_2, NO_x, CO, PM	Quarterly

The Stack monitoring data are given in Table No. 3.1, 3.2, 3.3, 3.4 & 3.5.

TABLE 3.1: ANNUAL AVERAGE – NCU

Stack: NCU (2F-201 to 2F-209)

Furnace Heater No.	SO_2 (mg/Nm^3)	NO_x (mg/Nm^3)	CO (mg/Nm^3)
2F – 201	6.21	23.15	2.83
2F – 202	5.54	23.91	3.89
2F – 203	6.27	25.49	3.82
2F – 204	6.35	25.33	3.58
2F – 205	6.88	24.70	3.55
2F – 206	6.88	25.44	3.82
2F – 207	6.78	25.67	3.73
2F – 208	5.96	25.41	4.27
2F – 209	6.28	26.80	3.60
Standard	**50**	**350**	**NA**

All values corrected to 3% Oxygen

TABLE 3.2: ANNUAL AVERAGE – PGHU

Stack: PGHU (4F – 101)

Furnace Heater No.	SO_2 (mg/Nm^3)	NO_x (mg/Nm^3)	CO (mg/Nm^3)	PM (mg/Nm3)
4F – 101	14.38	65.66	37.08	7.14
Standard	**50**	**350**	**NA**	**10**

All values corrected to 3% Oxygen

TABLE 3.3: ANNUAL AVERAGE – PGDS

Stack: PGDS (4F – 201)

Furnace Heater No.	SO_2 (mg/Nm^3)	NO_x (mg/Nm^3)	CO (mg/Nm^3)	PM (mg/Nm3)
4F – 201	11.71	64.42	30.00	4.19
Standard	**50**	**250**	**NA**	**5**

All values corrected to 3% Oxygen

TABLE 3.4: ANNUAL AVERAGE – Captive Power Plant (CPP)

Stack: Captive Power Plant (CPP)

	Results in mg/Nm3			
Furnace Heater Name	**SO_2**	**NOx**	**CO**	**PM**
Auxiliary Boiler # 1	7.13	23.12	3.91	7.97
Auxiliary Boiler # 2	5.40	26.10	3.50	6.76
HRSG & GT # 1	6.76	44.06	6.25	9.56
HRSG & GT # 2	6.67	41.62	5.53	8.61
Standard	**NA**	**188**	**11500**	**50**

NOx values corrected to 15% Oxygen

TABLE 3.5: ANNUAL AVERAGE – Coal Fired Boiler (CFB)

Stack: CFB

Furnace Heater Name	SO_2 (mg/Nm^3)	NO_x (mg/Nm^3)	CO (mg/Nm^3)	PM (mg/Nm3)
CFB	56.76	54.89	56.00	25.50
Standard	**100**	**100**	**1% v/v**	**30**

All values corrected to 6% Oxygen

3. Ambient Air Quality

Monitoring of ambient air quality has been carried out at eleven locations (Five locations inside the plant & six locations outside the plant). In all the identified locations monitoring are carried out twice in a week basis for Respirable Particulate Matter (PM10), Sulphur Dioxide (SO_2), Oxides of Nitrogen (NO_x), Carbon Monoxide (CO) and Benzene and once in a week for PM2.5, Ozone (O_3), Lead (Pb), Ammonia(NM_3), Arsenic (As), Nickel (Ni), Benzo(a)Pyrene (BaP) throughout the year.

Ambient air quality is compared with national standards in Table.3.6, 3.7, 3.8 & 3.9.

An On-line Ambient Air Quality Monitoring Station (AAQMS) has been installed in the South Control Room in February 2008 for continuous monitoring of the ambient air quality in that region for continuous monitoring of $PM_{2.5}$, SO_2, SOx, NO_2, NOx, Total Hydrocarbon (THC), Wind Speed, Wind Direction, Temperature, Pressure & Relative Humidity. The system has been upgraded with new analysers (PM_{10}, NH_3, O_3, CO & Benzene) in 2018. On-line monitoring of Hydrocarbon in ambient air is also operational round the clock in over Central laboratory building. The On-line AAQMS & Hydrocarbon analyzer data was given in Table 3.8. The online data of ambient air quality is being transferred to both the servers at CPCB and WBPCB end.

AMBIENT AIR QUALITY MONITORING STATION

A. On-Site Ambient Air Quality Monitoring Station (AAQMS)

Sl. No.	Station Code	Station Name	Direction from the Center of the plant
1	AAQMS - 1	Central Laboratory	North
2	AAQMS - 2	Gate No. 1	East
3	AAQMS - 3	South Control Room	South
4	AAQMS - 4	PP Ware House	South – West
5	AAQMS - 5	Power Plant (Security Gate)	North - West

B. Off-Site Ambient Air Quality Monitoring Station (AAQMS)

Sl. No.	Station Code	Name of Station	Direction from HPL Complex
1.	AAQM – 6	Nandarampur	N
2.	AAQM – 7	Basudevpur	NE
3.	AAQM – 8	Near CPT Hospital	S
4.	AAQM – 9	Hatiberia (Swati Complex)	SSW
5.	AAQM – 10	IOC Township	S
6.	AAQM – 11	Manoharpur	WNW

National Ambient Air Quality Standards

Sl. No.	Parameters	Unit	Time Weighted Average	Ambient air concentration (µg/m³)	
				Industrial, Residential, Rural & Other Area	Ecologically Sensitive Area
1	Sulphur Dioxide (SO_2)	µg/m³	Annual*	50	20
			24 hours**	80	80
2	Nitrogen Dioxide (NO_2)		Annual*	40	30
			24 hours**	80	80
3	Particulate Matter (PM_{10})		Annual*	60	60
			24 hours**	100	100
4	Particulate Matter ($PM_{2.5}$)		Annual*	40	40
			24 hours**	60	60
5	Ozone (O_3)		8 hours**	100	100
			1 hours**	180	180
6	Lead (pb)		Annual*	0.50	0.50
			24 hours**	1.0	1.0
7	Carbon monoxide (CO)	mg/m³	8 hours**	02	02
			1 hours**	04	04
8	Ammonia (NH_3)	µg/m³	Annual*	100	100
			24 hours**	400	400
9	Benzene (C_6H_6)		Annual*	05	05
10	Benzo(a)Pyrene (BaP)	ng/m³	Annual*	01	01
11	Arsenic (As)		Annual*	06	06
12	Nickel (Ni)		Annual*	20	20

* Annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

** 24 hourly or 08 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

TABLE 3.6: ANNUAL AMBIENT AIR QUALITY (Avg. Results On-site and Off-site)
April 2022 to March 2023

Month	PM_{10} (µg/m3)	$PM_{2.5}$ (µg/m3)	SO_2 (µg/m3)	NOx (µg/m3)	C_6H_6 (µg/m3)	CO (mg/m3)	O_3 (µg/m3)	NH_3 (µg/m3)	BaP (ng/m3)	As (ng/m3)	Ni (ng/m3)	Pb (µg/m3)
On-Site Plant	58.42	29.47	19.11	22.37	2.51	0.558	30.20	9.04	0.35	4.36	12.26	0.141
Off-Site Plant	48.50	24.18	13.15	15.94	1.90	0.355	25.83	6.18	0.19	2.27	8.070	0.081

TABLE 3.7: MONTH WISE AIR QUALITY (On-Site Locations)

Location	PM_{10} (µg/m3)	$PM_{2.5}$ (µg/m3)	SO_2 (µg/m3)	NOx (µg/m3)	C_6H_6 (µg/m3)	CO (mg/m3)	O_3 (µg/m3)	NH_3 (µg/m3)	BaP (ng/m3)	As (ng/m3)	Ni (ng/m3)	Pb (µg/m3)
April 22	68.51	35.55	19.82	24.89	2.94	0.561	33.32	8.86	0.46	4.49	12.46	0.147
May 22	62.43	30.28	21.19	23.64	2.4	0.538	33.24	8.94	0.31	4.37	12.28	0.141
June 22	58.91	29.32	19.46	24.21	2.24	0.569	31.61	10.67	0.36	4.25	12.11	0.14
July 22	47.39	23.49	18.46	20.5	1.74	0.538	29.34	8.59	0.17	4.27	12.16	0.134
August 22	42.66	21.73	18.33	18.42	1.57	0.628	30.02	8.32	0.11	4.13	12.12	0.138
September 22	43.14	21.42	18.65	19.83	2.17	0.564	30.81	8.82	0.33	4.04	11.54	0.133
October 22	46.8	24.04	17.75	21.26	1.7	0.544	30.44	8.56	0.17	4.56	12.5	0.143
November 22	53.21	27.65	18.81	21.56	2.13	0.567	28.79	8.87	0.34	4.38	12.24	0.142
December 22	62.12	30.61	19.23	22.49	2.87	0.544	26.51	8.86	0.5	4.49	12.42	0.147
January 23	73.31	36.74	19.44	22.6	3.78	0.531	27.45	8.81	0.57	4.51	12.52	0.148
February 23	75.2	37.49	18.81	24.55	3.84	0.543	28.7	8.98	0.54	4.47	12.4	0.147
March 23	67.41	35.3	19.33	24.52	2.79	0.569	32.17	10.22	0.35	4.35	12.39	0.136

TABLE 3.8: MONTH WISE AIR QUALITY (Off-Site Locations)

Location	PM_{10} (µg/m3)	$PM_{2.5}$ (µg/m3)	SO_2 (µg/m3)	NOx (µg/m3)	C_6H_6 (µg/m3)	CO (mg/m3)	O_3 (µg/m3)	NH_3 (µg/m3)	BaP (ng/m3)	As (ng/m3)	Ni (ng/m3)	Pb (µg/m3)
April 22	56.47	28.72	13.59	17.05	2.43	0.384	27.67	6.07	0.29	2.2	7.99	0.082
May 22	54.8	26.5	13.54	17.79	1.9	0.324	28.82	6.13	0.15	2.24	8.1	0.083
June 22	49.69	23.27	12.97	17.12	1.78	0.386	27.83	5.84	0.17	2.22	8.18	0.08
July 22	38.31	19.3	12.59	14.69	1.44	0.323	25.29	7.21	0.05	2.31	8.04	0.076
August 22	34.56	17.46	12.48	14.13	1.36	0.398	25.94	5.65	0.05	2.3	8.1	0.083
September 22	35.86	18.14	12.4	14.21	1.42	0.375	25.67	5.97	0.08	2.11	7.84	0.079
October 22	37.07	18.43	12.63	14.26	1.35	0.332	25.8	5.64	0.05	2.35	8.04	0.079
November 22	36.74	18.9	13.36	15.95	1.35	0.384	23.94	6.27	0.05	2.44	8.3	0.082
December 22	54.3	26.03	13.24	16.42	2.07	0.33	23.09	6.37	0.35	2.22	8.12	0.082
January 23	62.91	31.68	13.83	15.73	2.66	0.304	23.47	6.1	0.41	2.23	8.05	0.081
February 23	65.07	32.72	12.77	16.97	3.01	0.339	25.26	6.21	0.4	2.23	8.2	0.088
March 23	56.21	28.96	14.4	16.9	1.97	0.386	27.18	6.66	0.2	2.33	7.85	0.078

TABLE 3.9: Annual Average results of On–line Ambient Air Quality Monitoring Station (AAQMS) & HC Analyzer for the month of April 2022 to March 2023.

Location	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)	H_2S ($\mu g/m^3$)	NOx ($\mu g/m^3$)	NH_3 ($\mu g/m^3$)	O_3 ($\mu g/m^3$)	Benzene ($\mu g/m^3$)	CO (mg/m^3)
South Control Room (SCR)	74.64	35.26	19.02	11.91	18.38	20.02	40.85	3.54	0.79
	WS (m/s)	Wind Degree	Temperature (^0C)	RH (%)	Pressure (mmHg)	THC (PPM)	CH_4 (PPM)	NMHC (PPM)	
	3.57	278.23	29.32	57.20	717.25	2.75	1.58	1.18	
Central Laboratory						2.92	1.80	1.13	

Ground level concentration of pollutants

The impacts due to emission from 9 stacks of Naphtha Cracker Unit (NCU), 1 stack each of PGHU, PGDS and 5 stacks of Captive Power Plant (CPP) including CFB stack.

The status of ground level concentration (GLC) values are from the stacks emission up to surrounding 10 km from the plant.

The prediction of ground level concentration (GLC) of pollutants from the stacks of HPL was carried out with the help of air quality simulation model ISCST-3.

The impact has been predicated over the study area, which covers 20 km X 20 km area with the HPL Plant at its centre. GLC values are calculated at every 500 m grid point all around HPL complex. To obtain greater resolution the locations of receptors (As per the guidelines of CPCB) are define with respect to 16 radial wind directions (N to WNW) and radial distance from the centre. The radial distances are selected in such a way that the distances are function of physical stack height.

The emission of PM, SO_2, NOx and CO from nos. of 9 stacks of Naphtha Cracker Unit (Stack height 40 m, Average Temperature 130°C), no. of one stack of PGHU (Stack height 33 m, Average Temperature 260°C, Velocity 7 m/sec), PGDS (Stack height 30 m, Average Temperature 270°C, Velocity 7 m/sec), CFB (Stack height 140 m, Average Temperature 140°C, Velocity 10 m/sec), two stacks of Auxiliary Boiler (Stack height 54.3 m, Average Temperature 150°C, Velocity 10 m/sec), and two stacks of GT & HRSG (Stack height 45 m, Average Temperature 190°C, Velocity 14 m/sec) are considered. Measured stack monitoring values are taken for GLC calculation. Measured all months meteorological data (April 2022 to March 2023) are used for calculations.

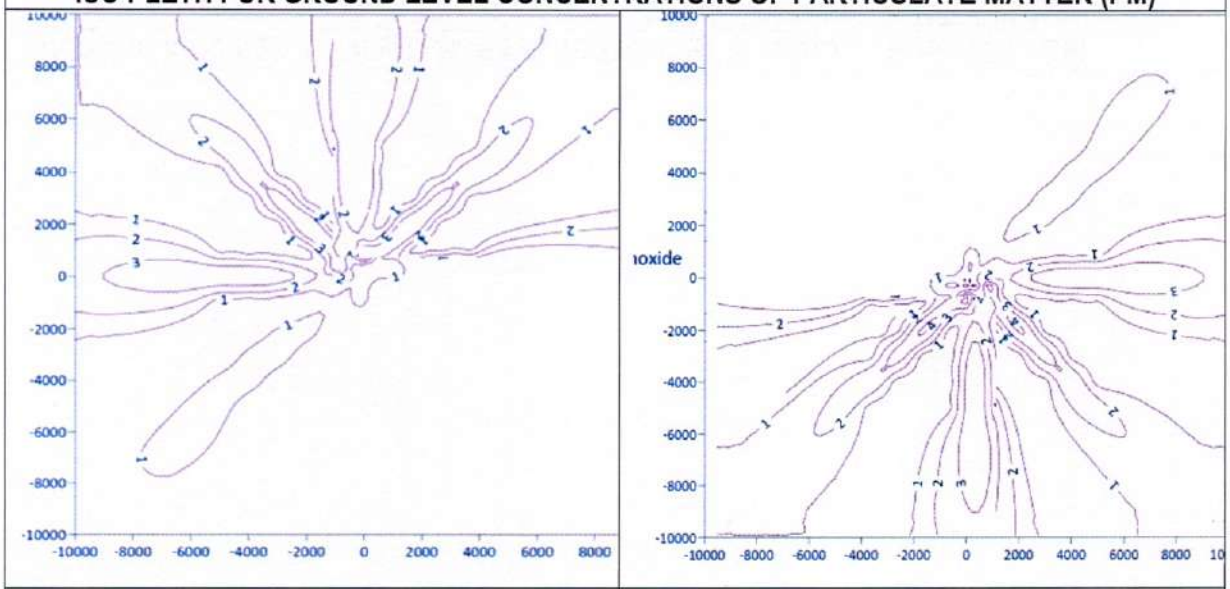
The GLC's are predicted based on the emission data like height, top, diameter and concentration of PM, SO_2, NOx and CO.

GLC of two seasons like April 2022 to September 2022 and October 2022 to March 2023 are given.

ISO PLETH FOR GROUND LEVEL CONCENTRATIONS

X axis: Distance in Meter
Y axis: Distance in Meter
Nos. in the graph denotes concentration in µg/m³

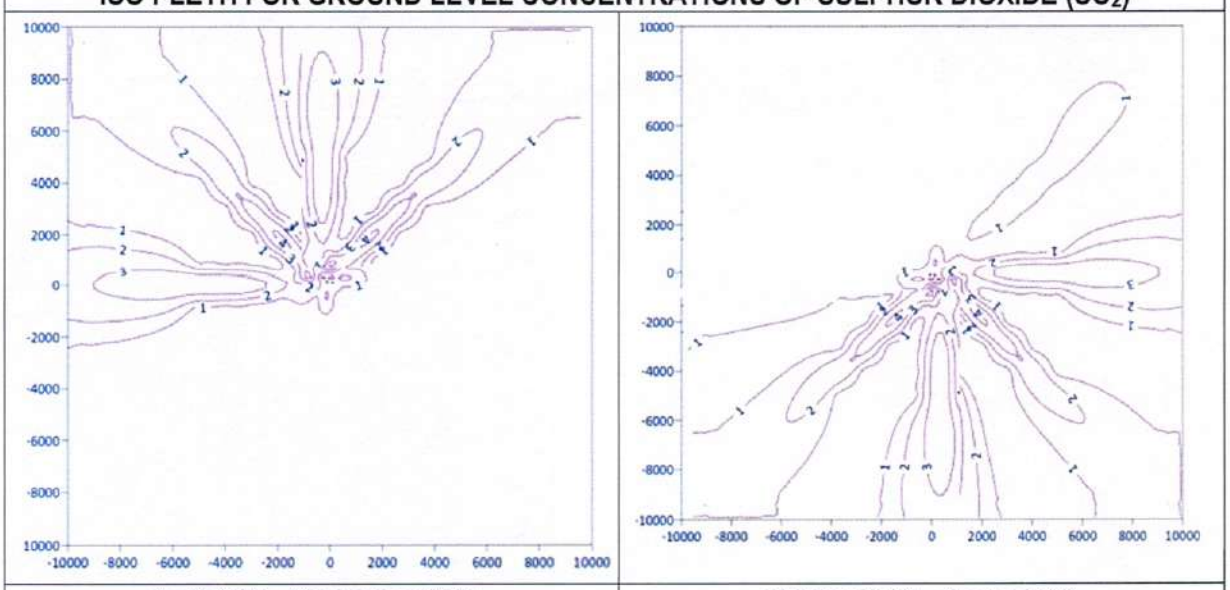
ISO PLETH FOR GROUND LEVEL CONCENTRATIONS OF PARTICULATE MATTER (PM)



April 2022 – September 2022	October 2022 – March 2023

X axis: Distance in Meter
Y axis: Distance in Meter
Nos. in the graph denotes concentration in µg/m³

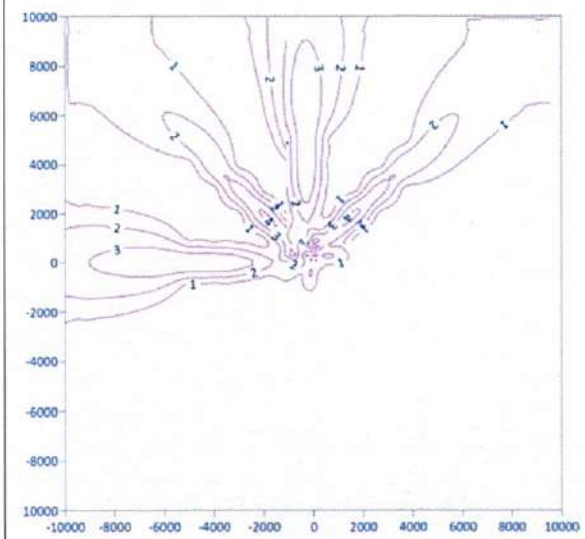
ISO PLETH FOR GROUND LEVEL CONCENTRATIONS OF SULPHUR DIOXIDE (SO_2)



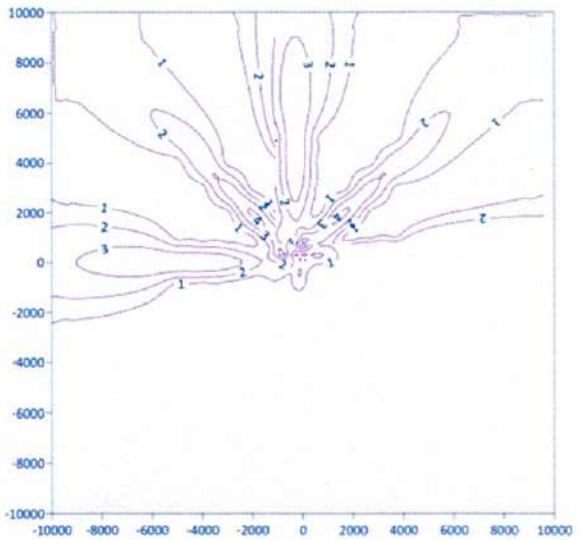
April 2022 – September 2022	October 2022 – March 2023

X axis: Distance in Meter
Y axis: Distance in Meter
Nos. in the graph denotes concentration in µg/m³

ISO PLETH FOR GROUND LEVEL CONCENTRATIONS OF NITROGEN DIOXIDE (NOx)



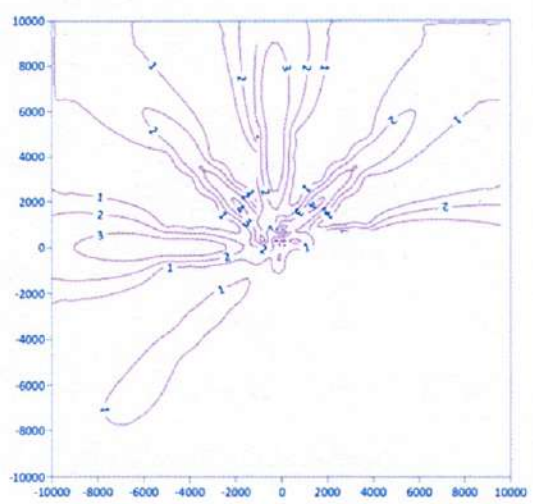
April 2022 – September 2022



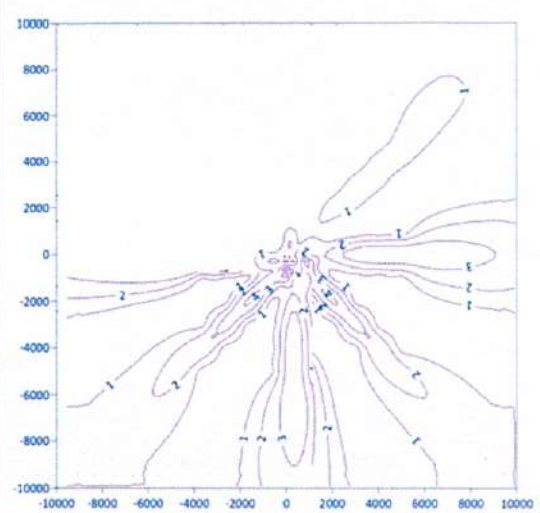
October 2022 – March 2023

X axis: Distance in Meter
Y axis: Distance in Meter
Nos. in the graph denotes concentration in µg/m³

ISOPLETH FOR CARBON MONOXIDE (CO)



April 2022 – September 2022



October 2022 – March 2023

4. Fugitive Emission Monitoring

The main sources of fugitive hydrocarbon emissions from HPL Complex remain in the storage tanks/spheres and likely loss of hydrocarbons through the pump / valve glands. Uses of international standards have been made in design of storage tank, spheres, valves and pumps to minimize fugitive emissions. Any accidental release through pressure relief valves is diverted to the high point flare stack.

In order to minimize the fugitive emission from the Hydrocarbon storage the following engineering designs have been adopted.

- Naphtha Tank - floating roof
- Benzene / C6 Hydrocarbon – internal floating roof tanks
- Hydrogenated Pyrolysis Gasoline / C5 Hydrocarbons – totally enclosed dome-roof tank.
- Canned pumps or pumps with double mechanical seals for toxic hydrocarbons like butadiene and benzene
- Bellow seal valves for benzene and butadiene

In view of all these design provisions in Haldia Petrochemicals Complex, it is ensured that levels of fugitive emissions are negligible.

Work Zone Monitoring

TABLE 3.10: ANNUAL WORK ZONE AIR QUALITY (Avg.)

Plant	Standards (ppm)	Average Results (ppm)
Benzene Extraction Unit	1.0	0.128
Butadiene Extraction Unit	1.0	0.204
Butadiene Loading Area	1.0	0.027
Hexane Area	500.0	9.551

Leak Detection & Repair (LDAR):

LDAR program has been adopted for identifying the leakage valves, pumps and flanges and quantifying the total VOC emitted from those equipment of different units. The points where the emission is over 1 ppm are considered as leaking points. Based on those identified points the total VOC emission will be estimated for each unit and the leakage would be arrested accordingly.

The technique which has been used to control emissions from equipment leaks is Leak Detection and Repair (LDAR). The method which is used in LDAR program is Stratified Emission Factor Method. In this method the screening values are distributed in different ranges, like

- 0-1000 ppmv
- 1001-10,000 ppmv
- Over 10,000 ppmv

Emission factors for each screening value range have been generated from data gathered during previous EPA studies. These stratified emission factors represent the leak rate measured during fugitive emission testing. Their development incorporated the statistical methods used by EPA in developing other emission factors. The emission factor for each discrete interval, by equipment type and service, is presented in the table.

Emission Factors(kg/hr/source) for Screening value range (ppmv)				
Source	Service	0-1000	1001-10000	Over- 100000
Valves	Gas/Vapor	0.00014	0.00165	0.0451
	Light liquid	0.00028	0.00963	0.0852
	Heavy liquid	0.00023	0.00023	0.00023
Pump	Light liquid	0.00198	0.0335	0.437
	Heavy liquid	0.0038	0.0926	0.3885
Compressor seals	Gas/Vapor	0.01132	0.264	1.608
Pressure relief devices	Gas/Vapor	0.0114	0.279	1.691
Flanges, connections	All	0.00002	0.00875	0.0375
Open-ended lines	All	0.00013	0.00876	0.01195

Reference: USEPA Handbook on Control Techniques for Fugitive VOC Emissions from Chemical Process Facilities. EPA/625/R-93/005, March 1994.

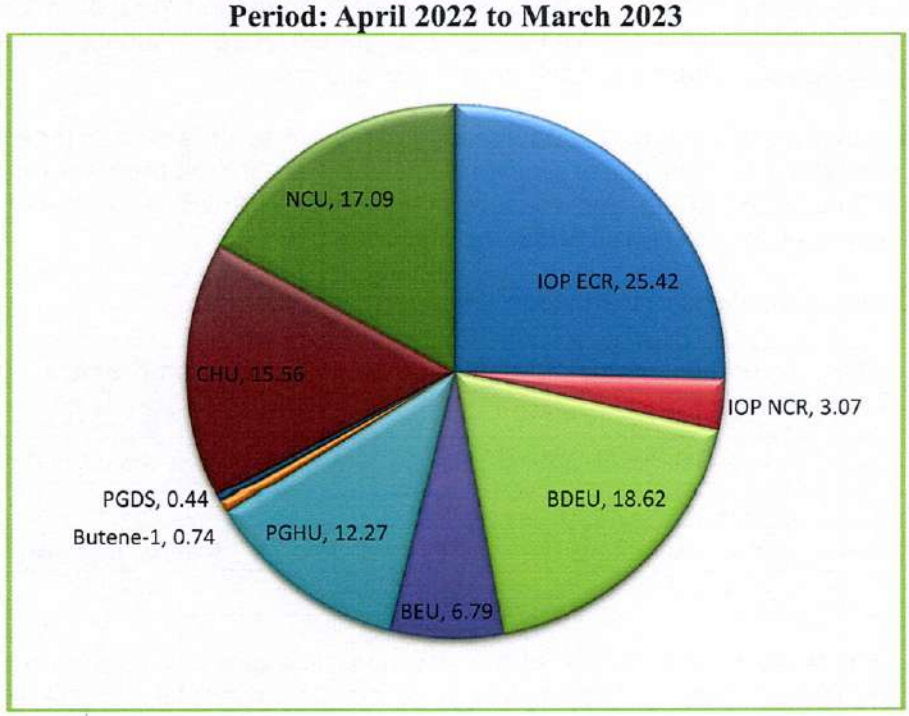
All screening values must be recorded according to the applicable ranges. The product of the appropriate emission factor and the number of components in each screening value range and source type. The total emission rate is the sum of all the emission rates for each value range and source type.

EE=(NL1*SEF1)+(NL2*SEF2)+(NL3*SEF3)
EE=emission estimate
NL1= number leaking in first range (0-1000)
NL2= number of leaking in second range (1001-10,000)
NL3= number of leaking component in third range(over 10,000)
SEF1= stratified emission factor for first range
SEF2= stratified emission factor for second range
SEF3= stratified emission factor for third range

TABLE 3.11: Estimated VOC emission from IOP (ECR & NCR), NCAU (Butadiene, Benzene, PGHU, Butene-1, PGDS & CHU) & NCU

Location	Computed Emission Estimates (EE) Unit – Ton/Annum	Computed Emission Estimates (EE) in 100%
IOP ECR	0.116	25.42
IOP NCR	0.014	3.07
BDEU	0.085	18.62
BEU	0.031	6.79
PGHU	0.056	12.27
Butene-1	0.0034	0.74
PGDS	0.002	0.44
CHU	0.071	15.56
NCU	0.078	17.09
Total	**0.456**	**100.00**

Computed Emission Estimates (EE)
Period: April 2022 to March 2023



5. Noise Control Measures at HPL Complex

Noise levels are to be maintained below 90 dBA for 8-hour exposure as per OSHA standard. This is being achieved by taking the following measures:

- Proper acoustic design and sound engineering practices have been adopted in the plant design.
- Equipment have been provided with noise reduction devices
- Only in areas that are mainly unoccupied, a noise level of more than 90 dBA may be allowed.
- Limitation of exposure time and use of PPE in high noise zone.

Noise Level Result:

In order to establish ambient noise levels for the study area, measurement of noise levels were performed at 05 (Five) nos. of locations (1 meter away from the boundary walls). Monitoring was carried out once in a season in each location.

A Precision Integrated Sound Level Meter (SL - 4001) manufactured by Lutron of Taiwan was used to measure hourly noise levels at each monitoring location during a 15-minute sampling period at hourly intervals for a 24-hour period. Noise monitoring was carried out for one day during each season at each monitoring location.

The noise levels recorded during daytime nighttime are summarized and compared with the norms prescribed by Ministry of Environment and Forests (Notification for Ambient Noise dated 26 December, 1989) and consent condition of WBPCB. It has been found that the sound level in all season is well within the standard.

The monitoring locations in plant boundary are as follows:

Sl.No.	Location Details	Location Code	Direction from the plant Center
1.	Near Gate No.-1	AN 1	East of north east
2.	Near Gate No.-3	AN 2	East of south east
3.	South Gate	AN 3	South
4.	BOO Gate	AN4	North of north west
5.	North Gate	AN5	North

Measurements were taken in the all four locations in same day at one-hour interval for 24 hours once in each season. The ambient noise monitoring results are given in Table 4.1.

Table – 4.1: ANNUAL DATA OF AMBIENT NOISE LEVEL (Day Time & Night Time)

LOCATION	April 2022		July 2022		October 2022		January 2023	
	Day	Night	Day	Night	Day	Night	Day	Night
Near Gate No-1	59.18	57.84	58.49	57.74	58.02	57.87	58.00	57.63
Near Gate No-3	67.06	66.76	66.88	66.26	66.26	65.21	67.33	68.09
Near South Gate	58.64	57.97	57.91	56.81	56.92	55.94	56.72	57.69
Near CPP Security Office	68.07	67.90	67.25	66.65	58.24	56.71	67.74	67.01
Near North Gate	56.85	55.67	57.30	56.16	67.18	68.01	56.20	57.32

Note: Sound Pressure Level in leq dB (A)

PART – H

ADDITIONAL MEASURES/INVESTMENT PROPOSAL FOR ENVIRONMENTAL PROTECTION INCLUDING ABATEMENT OF POLLUTION, PREVENTION OF POLLUTION

Annual proposal / budgetary expenditure of funds for Environmental Safeguards (including capital expenditure) under various heads during **FY 2023 – 2024** work to approx. **Rs. 35.06 Crores.**

1. Environmental Monitoring Cost [Rate Contract for Environmental & Process Monitoring Job at HPL Complex]	:	**Rs. 70.00 lacs**
2. Greening Drive Activities [Green Belt Development & Upkeepment Cost Beautification (Horticultural) Work (inside plant)]	:	**Rs. 106.00 lacs**
3. Statutory Fees & Insurance Expenses [Analysis charges, PLI Policy]	:	**Rs. 72.7 lacs**
4. Environmental Awarness Progamme [Celebration of World Environment Day, Workshop Seminar]	:	**Rs. 5.0 lacs**
5. Hazardous Wastes Disposal Expenses	:	**Rs. 118.0 lacs**
6. Operational, Maintenance & Installation Cost of Environment protection system:		
5.1 Operational cost of WWTP	:	**Rs. 476.36 lacs**
5.2 Operational cost of Flare Stack Emission System	:	**Rs. 2565.86 lacs**
5.4 Operation cost of Benzene Recovery Unit	:	**Rs. 0.95 lacs**
5.4 CMC for the Hydrocarbon Analyser, AAQMS	:	**Rs. 17.0 lacs**
5.5 CMC for Online Effluent & Stack Monitoring system	:	**Rs. 12.25 lacs**
6.7 Other Expenses (Calibration, Spares & Consumables)	:	**Rs. 1.0 lacs**
7. Training/Workshop/Seminar/Subscription	:	**Rs. 2.5 lacs**
8. Environmental project (laying of separate pipeline for discharge of treated effluent to GBC without mixing with storm water along with mechanization of the sluice gate)	:	**Rs. 58.0 Lacs**
		Total = Rs. 3505.62 lacs

All above-mentioned measures are considered for the abatement of pollution at HPL Complex.

Environmental Expenditure details (actual) during April'22 to March'23 are given below:

1. Environmental Monitoring Cost [Rate Contract for Environmental & Process Monitoring Job at HPL Complex]	:	**Rs. 75.3 lacs**
2. Greening Drive Activities [Green Belt Development & Upkeepment Cost Beautification (Horticultural) Work (inside plant)]	:	**Rs. 76.67 lacs**
3. Statutory Fees & Insurance Expenses [Analysis charges of WBPCB + Environmental Relief Fund of PLI Policy]	:	**Rs. 23.59 lacs**
4. Hazardous Wastes Disposal Expenses	:	**Rs. 74.04 lacs**
5. Operational, Maintenance & Installation Cost of Environment protection system:		
5.1 Operational cost of WWTP	:	**Rs. 476.36 lacs**
5.2 Operational cost of Flare Stack Emission System	:	**Rs. 2565.86 lacs**
5.3 Operation cost of Benzene Recovery Unit	:	**Rs. 0.95 lacs**
5.4 CMC for the Hydrocarbon Analyser, AAQMS	:	**Rs. 16.02 lacs**
5.5 CMC for Online Effluent & Stack Monitoring system	:	**Rs. 12.25 lacs**
7. Training/Workshop/Seminar/Subscription	:	**Rs. 4.65 lacs**
8. Environmental Promotional Activities (WED 2022)	:	**Rs. 4.22 lacs**
		Total Rs. 3329.91 lacs

All above-mentioned annual expenditure of funds for Environmental Safeguards under various heads during 2022-23 works to approx. **Rs. 33.3 Crores**.

PART – I
ANY OTHER PARTICULERS FOR IMPROVING THE QUALITY OF THE ENVIRONMENT

GREEN BELT DEVELOPMENT

A Green belt of approx 103-hectare area and 50-100 m width was developed surrounding the HPL Complex. Before starting the construction work, HPL started plantation work for green belt all along the boundary. The developed green belt acts as a buffer zone between HPL complex and surroundings. Selection and diversity of plant species are as per the guidelines of Ministry of MoEFCC.

The plants add beauty and act as sink for carbon dioxide and will reduce the physical impact outside the premises, in case of any on-site emergency.

Total Nos. of trees as on April 30, 2022

Sl. No.	Plants Name	Number				Total
		Zone-1	Zone-2	Zone-3	Zone-4	
1	Casurina	1538	84	320	101	**2043**
2	Azadirachta (Neem)	2157	120	87	192	**2556**
3	Arjun	3667	279	457	333	**4736**
4	Acacia	4438	168	832	194	**5632**
5	Lagerstroemia (Jarul)	2952	210	320	128	**3610**
6	Alstonia(chatim)	455	35	54	25	**569**
7	Jaman (Jam)	127	45	51	25	**248**
8	Bottle brush	1715	239	555	54	**2563**
9	Karamja	27125	2255	6381	3402	**39163**
10	Cassia renigera	4	3	3	0	**10**
11	Putranjiva (Bakul)	2287	20	402	241	**2950**
12	Spathodea	792	0	0	0	**792**
13	Peltophorum (Khiris)	35	23	13	37	**108**
14	Caesalpinia – Flava (Radha chura)	25232	329	21123	6721	**53405**
15	Nerium (Karabi)	69	5	0	0	**74**
16	Bombax (Simul)	132	25	22	67	**246**
17	Dalbergia (Sisu)	13	7	0	12	**32**
18	Albizzia (Sirish)	26	4	7	24	**61**
19	Habal	100	23	85	23	**231**
20	Polyalthia (Debdaru)	2	0	0	0	**2**
21	Others(Ficus benjamina, Leucaena (subabul), Babla, Tal, Bel Etc.	1490	54	882	746	**3172**
	TOTAL	**74356**	**3928**	**31594**	**12325**	**122203**

Annexure - 1: Consumption & Production Data 2022-23

A. Naphtha Cracker Unit:

Name of Raw Material	Consumptiuon (MT)		Name of Products	Production (MT)		Consumption of Raw Material per Unit of Product, MT/MT	
	2021-22	2022-23		2021-22	2022-23	2021-22	2022-23
Naphtha	1623240	1786130	Ethylene	574508	627405	3.13	3.15
			Propylene	293000	330953	6.14	5.98
LPG Recycle	59331	77979	RPG	400110	439842	4.50	4.50
			C4 Mix	164568	187347	10.94	10.56
C5 Recycle	70281	74978	CBFS	63755	60831	28.24	32.53
			Hydrogen	12555	13627	143.38	145.22
C6 Raffinate	47315	39874	Propane	8817	10889	204.17	181.74

B.Naphtha Cracker Associated Unit(NCAU):

1. PGHU:

Name of Raw Material	Consumptiuon (MT)		Name of Products	Production (MT)		Consumption of Raw Material per Unit of Product, MT/MT	
	2021-22	2022-23		2021-22	2022-23	2021-22	2022-23
RPG	400124	439842	Py Gas (High Sulfur)	125878	127629	3.23	3.55
Hydrogen	6028	13627	Benzene Heart Cut	162593	179096	2.50	2.53
			Cyclopentane	5007	6226	81.12	72.84

2. PGDS

Py Gas (High Sulfur)	121414	123666	Py Gas (Low Sulfur)	121286	123666	1.00	1.00
Hydrogen	618	544					

3. BEU:

Benzene Heart Cut	162658	178562	Benzene	111846	120790	1.45	1.48
			C_6 Raffinate	47305	52000	3.44	3.43

4. BDEU:

C_4 Mix	151669	173246	Butadiene	62761	69747	2.42	2.48
			C_4 raffinate	80854	95437	1.88	1.82

5. CHU:

C_4 Mix	12854	6230	C_4 LPG	38582	49862	2.49	3.58
C_4 raffinate	80516	80491	Semi Hydrogenated C4 raffinate	86601	90925	1.11	1.96
Semi Hydrogenated C4 raffinate	563	90925					
Hydrogen	2200	980					

6. Butene-1:

Semi Hydrogenated C4 raffinate	86038	90890	Butene-1	17812	19903	6.10	5.81
Methanol	22535	24698	MTBE	61824	66677	1.76	1.73

C.Polymer Plants

1. High Density Polyethylene (HDPE):

Name of Raw Material	Consumptiuon (MT)		Name of Products	Production (MT)		Consumption of Raw Material per Unit of Product, MT/MT	
	2021-22	2022-23		2021-22	2022-23	2021-22	2022-23
Ethylene	275613	311897	HDPE Granules	276736	314519	1.006	1.003
Propylene	293	310					
Butene - I	2180	2791					
Hydrogen	176	339					

2. Poly Propylene (PP)

Ethylene	10773	13366	PP Garanules	280177	315849	1.058	1.053
Propylene	285538	319251					
Hydrogen	72	80					

3. Linear Low Density Polyethylene(LLDPE):

Ethylene	284924	303797	LLDPE Granules	297548	320448	1.013	1.013
Propylene	8919	9974					
Butene - I	7266	10567					
Hydrogen	292	339					

Annexure - 2

	Soild Wastes Generation (Non-Hazardous)				
Sl. No.	Name of the solid waste	Unit	2021-22	2022-23	Management & Disposal
1	ALUMINIUM SCRAP	MT	6.44	NIL	Sold to the scrap dealers & recyclers by E-tendering/auctioning
2	CABLE SCRAP(ALLUMINIUM & COPPER MIXED)	MT	NIL	NIL	
3	CHARCOAL	MT	NIL	NIL	
4	CUT AND TORN WOVEN SACKS	MT	nil	NIL	
5	HDPE BROKEN PALLETS	MT	13.47	68.99	
6	M.S SCRAP (ROLLING & MELTING SCRAP)	MT	278.06	169.75	
7	SS SCRAP	MT	Nil	NIL	
8	RUBBISH- SCRAP	MT	582.22	420.51	
9	WOODEN SCRAP (LOCAL)	MT	12.20	16.23	
10	WOVEN SACKS-TORN	MT	NIL	NIL	
11	EMPTY HDPE CARBOYS (50 KG)	MT	NIL	NIL	
12	EMPTY HDPE DRUMS LARGE (220 L)	MT	0.72	0.64	
13	EMPTY HDPE DRUMS SMALL (25/30 KG)	MT	NIL	NIL	
14	EMPTY MS DRUMS OPEN LID (60/80 KG)	MT	20.10	14.46	
15	EMPTY MS DRUMS OPEN LID (220 L)	MT	14.04	8.16	
16	WASTE PACKING FILLP	MT	200.15	442.10	
17	EMPTY HDPE CARBOYS (25 KG)	MT	NIL	NIL	
18	EMPTY MS DRUMS SMALL LID(180 L/200 L)	MT	4.12	1.28	
19	CANTEEN FOOD WASTE	MT	5.00	9.00	Disposed to WBWML through Haldia Municipality

Annexure - 3

HALDIA PETROCHEMICALS LTD

Plant:
Post Box No.-12, Durgachak,
Haldia, Dist. - Purba Medinipore
West Bengal, Pin-721602, India
Tel.: +91 (03224) 274007/384/400/876
WEBSITE : www.haldiapetrochemicals.com
CIN:U24100WB2015PLC205383

HPL/IMS/HSEF/R/4.3.2/08/ENV/E-04/WBPCB

June 24, 2023

Chief Engineer (WMC)
West Bengal Pollution Control Board
Paribesh Bhawan,
10A, Block – LA, Sector-III,
Kolkata – 700 098

Sub: Submission of Annual Return (Form IV) for the Financial Year 2022-23

Dear Sir,

This is to inform you that we have submitted the Annual Return (Form IV) for Hazardous Wastes handled at our end, online into the portal https://wbocmms.nic.in for the financial year 2022-23 as per the provisions of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

Trust the above is in line with your requirement.

Thanking you,

Yours very truly,

Manoj Kumar Srivastava
Executive Vice President & Head Plant

Encl.: As above

FORM 4

[See rules 6(5), 13(8), 16(6) and 20 (2)]

Annual Return

under

Hazardous & Other Wastes(Management & Transboundary Movement) Rules, 2016

Transboundary Movement) Rules, 2016

To be submitted to State Pollution Control Board by 30th day of June of every year for the preceding period April to March

Return No : *3914206* **Period :** *2022-2023*

1. Name of facility/Industry **Industry Address of facility/Industry**	*Haldia Petrochemicals Limited* *HPL Link Road*
2. UID	*WB0251966536*
3.Authorisation No **Date of issue:** **Date of Expiry**	*173/2S(HW)-294/99-2000 (Pt-I)* *31/12/2021* *31/12/2025*
4. (i) Name of the authorised person & Designation	*Manoj Kumar Srivastava* *Executive Vice President & Head Plant*
(ii) Correspondence Address	*P. B. No. 12, Durgachak, Haldia, Dist. – Purba Midnapore, Pin – 721 602*
(iii) Mobile No	*9512024040*
(iv) Land Line No (with area code)	*(03224)274400*
(iv) Fax number (with area code)	*(03224)274861*
(vi) e-mail	*manoj.srivastava@hpl.co.in*
(vii) Type of HW Handler	*Generator*
(viii) If involved in Interstate Movement of HW	*Yes*

5. Production during the year (product wise), wherever applicable

Sr.no	Product Name	Quantity	Unit
1	*HDPE*	*314519*	*Metric Ton*
2	*LLDPE*	*320448*	*Metric Ton*
3	*PP*	*315849*	*Metric Ton*
4	*Benzene*	*120790*	*Metric Ton*
5	*Butadiene*	*69747*	*Metric Ton*
6	*Cyclopentane*	*6226*	*Metric Ton*
7	*CBFS*	*60831*	*Metric Ton*
8	*PY Gas*	*127629*	*Metric Ton*
9	*Butene-1*	*19903*	*Metric Ton*
10	*MTBE*	*66677*	*Metric Ton*

Part A. To be filled by hazardous waste generators

Sr. no	Name of Process	Category	Waste Stream	Unit	Quantity in stock at the beginning of the year	Total quantity of waste generated	Quantity dispatched to disposal facility	Quantity dispatched to recycler or co-processors or pre-processor	Quantity dispatched to others	Quantity utilised in house	Quantity in storage at the end of the year
1	Schedule I - 1.Petrochemical processes pyrolytic operations	Furnace or reactor residue and debris	1.1	Metric Ton	0 Metric Tonnes/Year	10.47 Metric Tonnes/Year	10.47 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year
2	Schedule I - 1.Petrochemical processes pyrolytic operations	Spent catalyst and molecular sieves	1.6	Metric Ton	18.09 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	17.29 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0.800000000000007 Metric Tonnes/Year
3	Schedule I - 3.Cleaning,emptying and maintenance of petroleum oil storage tanks including ships	Sludge and filters contaminated with oil	3.3	Metric Ton	51.69 Metric Tonnes/Year	171.1 Metric Tonnes/Year	222.79 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year
4	Schedule I - 5.Industrial operations using mineral/synthetic oil as lubricant in hydraulic systems or other applications	Used or spent oil	5.1	Metric Ton	84.16 Metric Tonnes/Year	37.7 Metric Tonnes/Year	0 Metric Tonnes/Year	121.83 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0.03000000000001137 Metric Tonnes/Year
5	Schedule I - 5.Industrial operations using mineral/synthetic oil as lubricant in hydraulic systems or other applications	Wastes or residues containing oil	5.2	Metric Ton	12.2 Metric Tonnes/Year	636.02 Metric Tonnes/Year	34.15 Metric Tonnes/Year	614.02 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0.050000000000006821 Metric Tonnes/Year

6	Schedule I - 33.Handling of hazardous chemicals and wastes	Empty barrels / containers / liners contaminated with hazardous chemicals/ wastes	33.1	Metric Ton	3.87 Metric Tonnes/Year	6.64 Metric Tonnes/Year	6.64 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	3.87 Metric Tonnes/Year
7	Schedule I - 33.Handling of hazardous chemicals and wastes	Contaminated cotton rags or other cleaning materials	33.2	Metric Ton	14.02 Metric Tonnes/Year	2.4 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	16.419999999999998 Metric Tonnes/Year
8	Schedule I - 35.Purification and treatment of exhaust air/gases, water and waste water from the processes in this schedule and common industrial effluent treatment plants (CETPs)	Spent ion exchange resin containing toxic metals	35.2	Metric Ton	0.64 Metric Tonnes/Year	18.39 Metric Tonnes/Year	18.39 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0.6400000000000006 Metric Tonnes/Year
9	Schedule I - 35.Purification and treatment of exhaust air/gases, water and waste water from the processes in this schedule and common industrial effluent treatment plants (CETPs)	Chemical sludge from waste water treatment	35.3	Metric Ton	85.3 Metric Tonnes/Year	291.35 Metric Tonnes/Year	32.95 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	343.70000000000005 Metric Tonnes/Year
10	Schedule I - 36.Purification process for organic compounds/solvents	Spent carbon or filter medium	36.2	Metric Ton	19.14 Metric Tonnes/Year	19.31 Metric Tonnes/Year	19.52 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	18.930000000000003 Metric Tonnes/Year
11	Schedule I - 37.Hazardous waste treatment processes, e.g. pre-processing, incineration and concentration	Sludge from wet scrubbers	37.1	Metric Ton	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year	0 Metric Tonnes/Year

Part B. To be filled by Treatment, storage and disposal facility operators											
Sr. no	Name of Process	Category	Waste Stream	Unit	Quantity in stock at the beginning of the year	Total quantity received	Quantity treated	Quantity disposed in landfills as such and after treatment	Quantity incinerated (If applicable)	Quantity processed other than specified above	Quantity in storage at the end of the year

Part C. To be filled by recyclers or co-processors or other users										
Sr. no	Name of Process	Category	Waste Stream	Unit	Quantity in stock at the beginning of the year	Quantity of waste received during the year from Domestic sources	Quantity of waste received during the year Imported	Quantity recycled or co-processed or used	Quantity re-exported (wherever applicable)	Quantity in storage at the end of the year
Whether Importing Other Wastes					Not-Selected					

Part D. Details of Interstate Movement								
Sr.no	Name of Industry (Within State)	District	Receiving/Sending	Name of Industry (Other State)	State	Type of Waste	Qty.(MTA)	Purpose (Recycling/ Disposal/Incineration)
1	Haldia Petrochemicals Ltb	Purba Medinipur	Sending	Falak Industries Fuels Pvt Ltd	Jharkhand	Waste oil	594.06 MTA	Recycling

Part D. Details of Import of Other Waste Import & Recycling					
Sr.no	Name of the Importer)	Imported from (country name)	Type of Other waste	Quantity Imported (MTA)	Quantity Recycled (MTA)

Date : 22/06/2023

Place : Purba Medinipur

Subhasendu Chatterjee

Name of the Occupier or Operator of the disposal facility

Annexure-4

HALDIA PETROCHEMICALS LTD

Plant :
Post Box No.-12, Durgachak,
Haldia, Dist. - Purba Medinipore
West Bengal, Pin-721602, India
Tel.: +91 (03224) 274007/384/400/876
WEBSITE : www.haldiapetrochemicals.com
CIN:U24100WB2015PLC205383

HPL/IMS/HSEF/R/4.3.2/08/ENV/E-05/CPCB

August 31, 2023

The Member Secretary
Central Pollution Control Board,
'Parivesh Bhawan', East Arjun Nagar,
Delhi – 110 032

Sub: Submission of Ash Compliance Report of Haldia Petrochemicals Ltd for FY 2022-23

Ref: Fly Ash Notification of MoEF&CC dated 31st December 2021

Dear Sir,

With reference to the above, enclosed please find herewith the Ash Compliance Report (for the period 1st April 2022 – 31st March 2023) as **Annexure-I** for your perusal and reference.

Based on the criticality of the process and system of accounting, it took more time to comprehend the report which is eventually the very first Ash Compliance Report after commissioning of 3x120 TPH coal fired boilers in our captive power plant.

Trust you will find the report in order.

Thanking you,

Yours sincerely,

Manoj Kumar Srivastava
EVP & Head-Plant

MANOJ KUMAR SRIVASTAVA
Head Plant & Executive Vice President
Haldia Petrochemicals Ltd.
Haldia

CC: The In-charge, IRO, MoEF&CC, Kolkata

CC: The Member Secretary, WBPCB, Kolkata

CC: The Chief Engineer (TCD), CEA, New Delhi

Annexure- I

HALDIA PETROCHEMICALS LTD

Ash Compliance Report (for the period 1st April 2022-31st March 2023)		
Sl. No.	Details	
1	Name of Power Plant	Captive Power Plant (Coal Fired Boiler)
2	Name of the company	Haldia Petrochemicals Limited
3	District	Purba Medinipur
4	State	West Bengal
5	Postal address for communication:	P.Box. No.12, Durgachak, Haldia, Purba Medinipur, Pin-721602
6	E-mail:	manoj.srivastava@hpl.co.in
7	Power Plant installed capacity (MW):	**3x120TPH Boiler (Note-1)**
8	Plant Load Factor (PLF):	**Not Applicable (Note-2)**
9	No. of units generated (MWh):	**737899.66**
10	Total area under power plant (ha): (including area under ash ponds)	**7.69 (Note-3)**
11	Quantity of coal consumption during reporting period (Metric Tons per Annum):	**529017**
12	Average ash content in percentage (per cent):	**7.8**
13	Quantity of current ash generation during reporting period (Metric Tons per Annum):	**38913**
	Fly ash (Metric Tons per Annum):	**26967**
	Bottom ash (Metric Tons per Annum):	**11946**
14	Capacity of dry fly ash storage silo(s) (Metric Tons) :	**2 x 500 m^3**
15	Details of utilisation of current ash generated during reporting period	
	(a) Total quantity of current ash utilised (MTPA) during reporting period:	**38842.9**
	(b) Quantity of fly ash utilised (MTPA):	
	(i) Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels)	Nil
	(ii) Cement manufacturing:	Nil
	(iii) Ready mix concrete:	Nil
	(iv) Ash and Geo-polymer based construction material:	Nil
	(v) Manufacturing of sintered or cold bonded ash aggregate:	Nil
	(vi) Construction of roads, road and fly over embankment:	Nil
	(vii) Construction of dams:	Nil
	(viii) Filling up of low lying area:	**21108.84**
	(ix) Filling of mine voids:	Nil
	(x) Use in overburden dumps:	Nil
	(xi) Agriculture:	Nil
	(xii) Construction of shoreline protection structures in coastal districts;	Nil
	(xiii) Export of ash to other countries:	**1470.82**
	(xiv) Others (please specify): Trading	**4398.24**
	(c) Quantity of bottom ash utilised (MTPA):	
	(i) Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels):	Nil
	(ii) Cement manufacturing:	Nil

	(iii) Ready mix concrete:	Nil
	(iv) Ash and Geo-polymer based construction material:	Nil
	(v) Manufacturing of sintered or cold bonded ash aggregate:	Nil
	(vi) Construction of roads, road and flyover embankment:	Nil
	(vii) Construction of dams:	Nil
	(viii) Filling up of low lying area:	**11865**
	(ix) Filling of mine voids:	Nil
	(x) Use in overburden dumps:	Nil
	(xi) Agriculture:	Nil
	(xii) Construction of shoreline protection structures in coastal districts:	Nil
	(xiii) Export of ash to other countries:	Nil
	(xiv) Others (please specify):	Nil
	Total quantity of current ash unutilised (MTPA) during reporting period:	**70.1**
16	Percentage utilisation of current ash generated during reporting period (per cent):	**99.82**
17	Details of disposal of ash in ash ponds	**Not Applicable as no ash pond was available**
	(a) Total quantity of ash disposed in ash pond(s) (Metric Tons) as on 31st March (excluding reporting period):	
	(b) Quantity of ash disposed in ash pond(s) during reporting period (Metric Tons):	
	(c) Total quantity of water consumption for slurry discharge into ash ponds during reporting period (m^3):	
	(d) Total number of ash ponds:	
	(i) Active:	
	(ii) Exhausted (yet to be reclaimed):	
	(iii) Reclaimed:	
	(e) total area under ash ponds (ha):	
18	Individual ash pond details	**Not Applicable as no ash pond was available**
	Ash pond-1,2, etc (please provide below mentioned details separately, if number of ash ponds is more than one)	
	(a) Status: Under construction or Active or Exhausted or Reclaimed	
	(b) Date of start of ash disposal in ash pond (DD/MM/YYYY or MMYYYY):	
	(c) Date of stoppage of ash disposal in ash pond after completing its capacity (DD/MM/YYYY or MM/YYYY): (Not applicable for active ash ponds)	
	(c) area (hectares):	
	(d) dyke height (m):	
	(d) volume (m^3):	
	(e) quantity of ash disposed as on 31st March (Metric Tons):	
	(f) available volume in percentage (per cent) and quantity of ash can be further disposed (Metric Tons):	
	(g) expected life of ash pond (number of years and months):	
	(h) co-ordinates (Lat and Long): (please specify minimum 4 co-ordinates)	
	(i) type of lining carried in ash pond: HDPE lining or LDPE lining or clay lining or No lining	
	j) mode of disposal: Dry disposal or wet slurry (in case of wet slurry please specify whether HCSD or MCSD or LCSD)	
	(k) Ratio of ash: water in slurry mix (1:___):	
	(l) Ash water recycling system (AWRS) installed and functioning: Yes or No	
	(m) Quantity of wastewater from ash pond discharged into land or water body (m3):	
	(k) Last date when the dyke stability study was conducted and name of the organisation who conducted the study:	

	(n) Last date when the audit was conducted and name of the organisation who conducted the audit:	
19	Quantity of legacy ash utilised (MTPA):	No legacy ash was present
	i. Fly ash based products (bricks or blocks or tiles or fibre cement sheets or pipes or boards or panels):	
	ii. Cement manufacturing:	
	iii. Ready mix concrete:	
	iv. Ash and Geo-polymer based construction material:	
	v. Manufacturing of sintered or cold bonded ash aggregate:	
	vi. Construction of roads, road and flyover embankment:	
	vii. Construction of dams:	
	viii. Filling up of low lying area:	
	ix. Filling of mine voids:	
	x. Use in overburden dumps:	
	xi. Agriculture:	
	xii. Construction of shoreline protection structures in coastal districts;	
	xiii. Export of ash to other countries:	
	xiv. Others (please specify):	

20 Summary:

Details	Quantity generated (MTP)	Quantity utilised (MTP) and (per cent)	Balance quantity (MTP)
Current ash during reporting period	**38913**	**38842.9**	**70.1**
Legacy ash	**0**	**0**	**0**
Total	**38913**	**38842.9**	**70.1**

21	Any other information: Soft copy of the annual compliance report, and shape files of power plant and ash ponds may be e-mailed to:- moefcc- coalash@gov.in	
22	Signature of Authorised Signatory	**MANOJ KUMAR SRIVASTAVA** **Head Plant & Executive Vice President** **Haldia Petrochemicals Ltd.** **Haldia**

Note-1: Total Installed Power Capacity:
(a) 2*34.5 MW Gas Turbine Generator + 1*33 MW Condensing Steam Turbine Generator + 1*35 MW Condensing Steam Turbine Generator+ 1*14 MW Back Pressure Steam Turbine Generator
(b) 3*120 TPH Coal Fired Boilers + 2*120 TPH Auxiliary Boilers + 2*(120+22) TPH Heat Recovery Steam Generator
(c) Actual operation based on overall steam, power & fuel balance
Note-2: Our captive power plant is with mixed asset combination as mentioned in Note-1 and being a cogeneration plant, it produces / supplies both steam & power to process plants.
Note-3 : Area is calculated for coal fired boiler plant only