



KR.HSE.ENV.05. HSSE.HECCR/02/2023/EC No: J-11011/26/2013-IA II (I)

25.01.2024

To

The Additional Principal Chief conservator of Forests (C)

Ministry of Environment, Forest & Climate Change

4th Floor, E&F Wings, Kendriya sadan, Koramangala

Bangalore-560 034

Dear Sir,

Sub: Submission of Half yearly compliance report on Environmental Clearance issued by the Ministry of Environment, Forests and Climate Change (MoEF & CC)

Ref: MoEF&CC letter no. J-11011/26/2013-IA II (I) dated 12th May, 2015 granting Environmental Clearance for Propylene Derivatives Petrochemical Project (PDPP) by Bharat Petroleum Corporation Limited, Kochi Refinery, Ambalamugal, Ernakulam District, Kerala:

Please find enclosed the compliance reports on the various conditions laid down by MoEF & CC, pertaining to the half year period from **1st April 2023 to 30th September 2023** for the said project.

Thanking you,

Very truly yours

For BPCL Kochi Refinery

Mathew P Thomas

General Manager (HSE) - in - Charge

Encl: 1. Six Monthly Compliance Report 2. Green Belt details 3. Stack emission data 4. AAQ data.

Cc:

- | | |
|--|---|
| 1. The Member Secretary
Central Pollution Control Board
Parivesh Bhawan
East Arjun Nagar
Delhi - 110 032 | 2. The Member Secretary
Kerala State Pollution Control Board
Plamoodu Junction
Pattom Palace
Thiruvananthapuram - 695 004 |
| 3 The Member Secretary (Industry -II), Ministry of Environment, Forest & Climate Change
Indira Gandhi Paryavaran Bhavan, Jorbagh Road, New Delhi - 110003 | |

पोस्ट बैग नं: 2, अम्बलमुगल - 682 302, एरणाकुलम जिला, केरल, दूरभाष: 0484 - 2722061 - 69 फैक्स: 0484 - 2720961 / 2721094
पंजीकृत कार्यालय: भारत भवन, 4 & 6, क्रीमभाय रोड, बेलार्ड इस्टेट, पी. वी. नं. 688 मुंबई - 400 001

**Compliance Report of stipulated Environmental Clearance (EC) conditions for the
Propylene Derivatives Petrochemical Project (PDPP) of BPCL-Kochi Refinery
EC clearance - J-11011/26/2013-IA II (I) dated 12th May 2015.
Half Year _ Period 1st April 2023 to 30th September 2023.**

SI No	Conditions	Status as on 30.09.2023
A.	SPECIFIC CONDITIONS	
1.	M/s BPCL shall comply with new standards/norms for Oil Refinery Industry and petrochemical industry notified under the Environment (Protection) Rules, 1986.	The project / facility is complying with applicable standards and norms for Oil Refinery Industry and petrochemical industry notified under the Environment (Protection) Rules, 1986.
2.	Continuous on-line stack monitoring for SO ₂ NO _x and CO of all the stacks shall be carried out. Low NO _x burners shall be installed.	There are no fired heaters or fired boilers in the project facility, Waste Incinerators installed in the complex are having low NO _x Burners. Stack analysers are commissioned, calibrated, and ensured to be in working condition, Continuous on-line stack monitoring is ensured.
3.	The emission standards prescribed by the MoEF under Environment (Protection) Act for petrochemical industry shall be strictly followed. At no time, the emission levels shall go beyond the prescribed standards. In the event of failure of any pollution control system adopted by the unit, the respective unit shall not be restarted until the control measures are rectified to achieve the desired efficiency. Stack emissions shall be monitored regularly.	There are no fired process heaters /fired boilers in the PDPP Project. Two (2) Nos. of waste incinerators installed in the facility are designed to consume clean fuels like vaporized LPG/LNG. The incinerators are operating complying with the prescribed emission standards. Stack emissions are also monitored regularly.
4.	Leak Detection and Repair program shall be prepared and implemented to control HC/VOC emissions. Focus shall be given to prevent fugitive emissions for which preventive maintenance of pumps, valves pipelines are required. Proper maintenance of mechanical seals of pumps and valves shall be given. A preventive maintenance schedule for each unit shall be prepared and adhered to. Fugitive emissions of HC from product storage tank yards etc. must be regularly monitored.	Detailed leak detection and repair (LDAR) program for monitoring and repair of VOC leak points, leak detection and repair survey are already identified, the frequency of monitoring of leaks and schedule of repairs of leak will be as per CPCB guidelines for LDAR program/OISD 224 guidelines. Plant-wise PM check schedule for the periodic health check-up of the Rotary Equipment is prepared. All storage tank breathing vents are routed to

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	Sensors for detecting HC leakage shall be provided at strategic locations.	<p>incinerator as per design. Gas detectors are already provided at strategic locations.</p> <p>To reduce fugitive emissions of volatile organic compounds from the complex.</p> <ol style="list-style-type: none"> 1. Seal less canned pumps are installed in organic liquid services 2. Special gland packing material provided in valves to reduce fugitive VOC emissions from glands. <p>Hydrocarbon, toxic gases, and VOC detectors are installed in the complex. Total number of 351 gas detectors and 8 VOC detectors are installed in the complex.</p>
5.	Total SO ₂ emissions after implementation of PDPP including IREP SHALL NOT EXCEED 1561.4 Kg/hr.	<p>The fuel for firing in Incinerators is vaporized LPG/LNG having very low sulphur content. The SO₂ emissions after implementation of PDPP including IREP is not exceeding 1561.4 kg/hr.</p> <p>It has been revised after next project (MSBP) as 1579 kg/hr.</p>
6.	Continuous monitoring system for VOCs at all important places/areas shall be ensured. When monitoring results indicate above the permissible limits, effective measures shall be taken immediately.	<p>Photo ionization detectors (fixed VOC meters) installed at eight (8) important locations in and around the PDPP units/other facilities for continuous monitoring of VOCs. These detector readings are being monitored and generation of alarm is configured in case of detection at ppm level.</p>
7.	Ambient air quality monitoring stations (PM ₁₀ , PM _{2.5} , SO ₂ , NO _x , H ₂ S, mercaptan, non-methane-HC and Benzene) shall be set up in the complex in consultation with Kerala State Pollution Control Board, based on occurrence of maximum ground level concentration and down-wind direction of wind. The monitoring network must be decided based on modelling exercise to represent short term GLCs.	<p>One AAQMS for continuous monitoring of SO₂, NO-NO₂, NOX, NH₃, CO, OZONE, HC, H₂S, MERCAPTAN, VOC, PM 10 (SPM), PM 2.5 (RSPM) and meteorological data etc.is already installed and powered ON at the location approved by Kerala State Pollution Control Board.</p> <p>Continuous monitoring is ensured. Air quality is ensured to be complying with NAAQES standards.</p> <p>The same is being connected to display board which is positioned facing PWD (public) road for visibility.</p>

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8.	Ambient air quality data shall be collected as per NAAQES standards notified by the Ministry on 16 th November 2009 and trend analysis w.r.t. past monitoring results shall also be carried out. Adequate measures based on the trend analysis shall be taken to improve the ambient air quality in the project area.	Ambient air quality data monitoring has started from new AAQMS installed in the complex along with existing AAQMS stations available around the refinery. Air quality is ensured to be complying with NAAQES standards. Periodic manual AAQ monitoring also being done and report submitted to PCB on monthly basis.
9.	The gaseous emission from DG set shall be dispersed through adequate stack height as per CPCB standards. Acoustic enclosure shall be provided to the DG sets to mitigate the noise pollution. Besides, acoustic enclosure/silencer shall be installed wherever noise levels exceed the limit.	Complied. Gaseous emissions from DG sets are designed to be dispersed through stack heights as per CPCB standards. DG sets are operated only on extreme emergency conditions. Acoustic enclosure is installed for DG set.
10.	Total freshwater requirement from Kochi Refinery for PDPP shall not exceed 493 m ³ /hr and prior permission shall be obtained from the concerned agency. No ground water shall be used.	The total freshwater requirement will be less than 493 m ³ /hr which is within the total sanctioned quantity of 3083.3 m ³ /hr for integrated refinery complex by Govt. of Kerala.
11.	Industrial effluent shall be treated in the effluent treatment plant. Treated effluent shall be recycled/reused in the existing cooling tower. As proposed, high COD effluent shall be incinerated. Water quality of treated effluent shall be monitored regularly. Online water monitoring system shall be installed for important parameters.	Industrial effluents are incinerated or treated in ETP before final disposal through existing outlets. Also online water monitoring facility available at existing refinery effluent outlet. Water streams quality measuring analysers have been installed.
12.	Oil catchers/oil traps shall be provided at all possible locations in rain/storm water drainage system inside the factory premises.	Oil catchers/oil traps provided at necessary locations. Also rain /storm water outlet from each area is routed to retention pond, where quality of water is analysed and ensured before routing to outlet.

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13.	Incinerator designed shall be as per CPCB guidelines.	Two incinerators installed within the PDPP complex to ensure final effluent /emission quality as per CPCB guidelines. The stacks are well connected to CPCB site and statutory monthly monitoring is being done and reporting to KSPCB.
14	The Company should strictly comply with the rules and guidelines under Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 as amended in October 1994 and January 2000. Hazardous waste should be disposed of as per Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules, 2008 and amended time to time.	Disposal of Hazardous waste ensured complying with Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules. Regularly submitting the reports to KSPCB.
15	Proper oil spillage prevention management plan shall be prepared to avoid spillage/leakage of oil/petroleum products and ensure regular monitoring.	Oil spillage prevention is taken care at the design stage itself. adequate facilities are maintained to prevent and contain oil spillage / storm water contamination for PDPP complex.
16	The company shall strictly follow all the recommendation mentioned in the Charter on Corporate Responsibility for Environmental Protection (CREP).	Complied with the points mentioned in CREP which is applicable to PDPP project.
17	To prevent fire and explosion of oil and gas facility, potential ignition sources shall be kept to a minimum and adequate separation distance between potential ignition sources and flammable materials shall be in place.	<p>PDPP facility is designed as per OISD & PESO guidelines and the facilities satisfy separation distances as specified by OISD standards 118 /other applicable and relevant conditions of Petroleum rules.</p> <p>PESO approval for commissioning of process units and related facilities are obtained, PESO storage license for all applicable products and intermediates obtained based on completion and site inspection by PESO/OISD officials.</p>

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SI No	Conditions	Status as on 30.09.2023
18	All the recommendations mentioned in the rapid risk assessment report, disaster management plan and safety guidelines shall be implemented. Accordingly, provision of budget to be kept.	All recommendations mentioned in rapid risk assessment report implemented. Quantitative risk assessment also conducted, and all recommendations implemented at applicable stages of project. Emergency Response and Disaster Management Plan prepared including scenarios identified during risk assessment report.
19	All the issues raised, and commitment made during the public hearing/consultation meeting held on 23 rd December 2014 shall be satisfactorily implemented. Accordingly, provision of budget to be kept.	BPCL-KR has complied with commitment made during the public hearing/consultation meeting held on 23 rd December 2014. Status/closing comments on Public Hearing commitments have been completed.
20	At least 2% of the total cost of the project should be earmarked towards the Enterprise Social Commitment (ESC) based on local needs and action plan with financial and physical breakup/details should be prepared and submitted to the Ministry's Regional Office at Bangalore. Implementation of such program should be ensured accordingly in a time bound manner.	Complied
21	Green belt shall be developed at least in 40 acres of land in and around the plant premises to mitigate the effects of fugitive emissions all around the plant as per the CPCB guidelines in consultation with DFO. Thick greenbelt with suitable plant species shall be developed around unit. Selection of plant species shall be as per the CPCB guidelines.	Green belt development completed for the project. All plant species are in growing stage. One more green park developed and named as ECO PARK in the PDPP area.

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22	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.	Complied; All necessary infrastructure, labour camps, medical facilities arranged during construction, pre-commissioning activities.

B.	GENERAL CONDITIONS:	
1.	The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board (SPCB), State Government and any other statutory authority.	BPCL-KR is adhering to the stipulations made by KSPCB, State Govt. and other statutory bodies. Consent to Operate obtained from KSPCB, Consent No: PCB/HO/EKM-II/ICO-R/05/2022, dated 31/03/2022
2.	No further expansion or modification in the project shall be carried out without prior approval of the Ministry of Environment & Forests. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference shall be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	Complied.
3	The project authorities must strictly comply with the rules and regulations under manufacture, Storage and import of Hazardous Chemical Rules, 2000 as amended subsequently. Prior approvals from Chief Inspectorate of Factories, Chief Controller of Explosives, Fire Safety Inspectorate etc. must be obtained, wherever applicable.	For this project, BPCL-KR has obtained necessary approvals from Kerala Factories & Boilers, Chief Controller of Explosives, Fire Safety Inspectorate etc. wherever required. BPCL-KR is complied with the rules and regulations under manufacture, Storage and import of Hazardous Chemical Rules, 2000. PESO prior approval was obtained for overall plot plan, overall area classification, fire fighting water

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		<p>layout, equipment layout of individual facilities inside the complex vide. Letter P 5(2)496 /Refinery - dated 07-12-2016</p> <p>Process units commissioning approval obtained from PESO vide following letters, P 5(2)496 /Refinery II dated 04-08-2020, P 5(2)496 /Refinery II dated 16-12-2020, and P 5(2) 496 /Refinery II dated 28-01-2020</p> <p>PESO License for storage was obtained as applicable under Storage License numbers P/HQ/KL/15/1336 (P485172) & P/HQ/KL/15/1337 (P485168).</p> <p>Kerala Factories and Boilers had accorded permit to construct the facility vide. Permit number 109/2019 Doc No.T3/10811/2019/F&B/R Dis, Dated 08-05-2019</p> <p>After completion, Factory license was amended by Kerala Factories and Boilers including PDPP project facilities. Amendment of factory license including PDPP project, Permit No.109/2019; Amendment letter dated 16-Sept-2020.</p> <p>NOC was obtained from Kerala Fire and Rescue department for the facility. D1-7904/2016 - Dtd.14.12.2018 from Regional fire office Ernakulam, Kerala.</p>
4	<p>The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels shall conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).</p>	<p>The overall noise level is limited at the fence as prescribed under EPA rules/ SPCB advisory. Noise control measures including acoustic hoods and silencers, enclosures on all sources of noise generation are installed as per design of the facility. Regular monitoring of Noise levels at boundary areas conducted by dedicated team to ensure the same.</p>
5	<p>A separate Environmental Management Cell equipped with full-fledged laboratory facilities must be set up to carry out the environmental management and monitoring functions.</p>	<p>BPCL-KR is having a separate Environment Management section to carry out environmental management and monitoring functions. We have well equipped Centralized Quality Control Laboratory for PDPP project related monitoring activities.</p>
6	<p>Adequate funds shall be earmarked towards capital cost and recurring</p>	<p>BPCL-KR has earmarked adequate funds for environment pollution control measures. The funds</p>

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	cost/annum for environment pollution control measures and shall be used to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided shall not be diverted for any other purposes.	are utilized for installing, operating, and maintaining 1. Conventional and Submerged type, liquid, and gaseous waste incinerators online to meet final effluent quality. 2. AAQMS station and monitoring facilities online 3. VOC meters for continuous monitoring of volatile emissions. 4. LDAR (Leak Detection and Repair) program for operation phase of the complex. Greenbelt development and maintenance activities are also ensured.
7	The Regional Office of this Ministry/Central Pollution Control Board/State Pollution Control Board will monitor the stipulated conditions. A six-monthly compliance report and the monitored data along with statistical interpretation shall be submitted to them regularly.	Six monthly compliance reports being submitted by BPCL-KR at stipulated interval.
8	A copy of clearance letter shall be sent by the proponent to concern Panchayat, Zila Parishad/Municipal Corporation, Urban Local Body and the local NGO, if any, from whom suggestions/representations, if any, were received while processing the proposal. The clearance letter shall also be put on the web site of the Company by the proponent.	BPCL-KR has complied with this condition. Copies of clearance letter was sent to all local bodies.
9	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and shall update the same periodically. It shall simultaneously be sent to the Regional Office of the MOEF, the respective Zonal Office of CPCB and the SPCB. The criteria pollutant levels namely; PM10, PM2.5, SO2, NOx, HC (Methane of Non-methane), VOCs (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects shall	Six monthly compliance reports being submitted without fail by BPCL-KR after receipt of the Environmental Clearance for the PDPP project. The same being sent to the Regional Office of MoEFCC and also uploaded in the BPCL website. The criteria pollutant levels namely; PM10, PM2.5, SO2, NOx, HC, VOCs being monitored utilizing a combination of - Approx.350 Nos. of HC/Hydrogen /other detectors installed /continuously monitored in the complex. - 8 Nos. of Photo ionization detectors

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	be monitored and displayed at a convenient location near the main gate of the company in the public domain.	<p>installed for continuous VOC detection</p> <ul style="list-style-type: none"> - AAQMS station at location approved by KSPCB. - Regular AAQ monitoring is being conducted and report submitted to SPCB on monthly basis. <p>Display of ambient air quality at a convenient location near the main gate of the company in the public domain is commissioned.</p>
10	The project proponent shall also submit six monthly reports on the status of the compliance of the stipulated environmental conditions including results of monitored data (both in hard copies as well as by e-mail) to the Regional Office of MOEF, the respective Zonal Office of CPCB and the SPCB. The Regional Office of this Ministry/CPCB/SPCB shall monitor the stipulated conditions.	Six monthly compliance reports were submitted by BPCL-KR after receipt of the Environmental Clearance for the PDPP project. The same was sent to the Regional Office of MoEF&CC and uploaded in the BPCL website.
11	The environmental statement for each financial year ending 31 st March in Form-V as is mandated to be submitted by the Project proponent to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently, shall also be put on the website of the company along with the status of compliance of environmental conditions and shall also be sent to the respective Regional Offices of the MOEF by e-mail.	Complied. Environmental statement is being submitted before Sept. 30 th of every year.
12	The project proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the SPCB and may also be seen at website of the Ministry of Environment and Forests at http://envfor.nic.in . This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in	BPCL-KR has complied with this condition.

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	the region of which one shall be in the vernacular language of the locality concerned and the copy of the same shall be forwarded to the Regional Office.	
13	Project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work.	Investment clearance from Board obtained on 03.12.2014 and land development started subsequently project has been commissioned.

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Stack Emission Manual Analysis Data for the period 1st April 2023 to 30th September 2023.

Stack Name	Date	Temp (°C)	Flow rate (Nm ³ /hr)	PM (mg/Nm ³)	SO ₂ (mg/Nm ³)	NO _x (mg/Nm ³)	H ₂ S (mg/Nm ³)	CO (mg/Nm ³)	Ni + V (mg/Nm ³)
PDPP-INC 1	28.04.2023	159	87728	BLQ	BLQ	20.6	BLQ	BLQ	BLQ
PDPP-INC 2	28.04.2023	166	68160	10.9	BLQ	9.4	BLQ	8	BLQ
PDPP-INC 1	02.06.2023	228	50119	6.2	BLQ	9.4	BLQ	BLQ	BLQ
PDPP-INC 2	02.06.2023	159	25736	14	BLQ	5.6	BLQ	4.5	BLQ
PDPP-INC 1	16.08.2023	160	70957	9.9	0.459	1.7	BLQ	1.9	BLQ
PDPP-INC 2	16.08.2023	163	71924	2.2	6.828	2.9	BLQ	33.4	BLQ
PDPP-INC 1	19.09.2023	158	68459	24.8	1.8	0.6	BLQ	0.53	BLQ
PDPP-INC 2	19.09.2023	161	72345	9.3	8.4	12.3	BLQ	32.7	BLQ

Bharat Petroleum Corporation Limited - Kochi Refinery

HSE (Environment)



AAQMS - PDPP area - April 2023

Parameter	SO2	H2S	NOx	NH3	CO	Benzene	Methane	NMHC	PM 10	PM 2.5
Units	ug/m3	µg/m3	ug/m3	ug/m3	mg/m3	ug/m3	ppm	ppm	ug/m3	ug/m3
Limit	Daily 80 Annual 50	Daily 80 Annual 40	Daily 80 Annual 40	Daily 400 Annual 100	8 hrs - 2 4 hrs - 4	Daily 05 Annual 05			Daily 100 Annual 60	Daily 60 Annual 40
Date										
01-04-2023	5.12	0	26.79	10.52	1.2	0	0	0	127.51	12.06
02-04-2023	4.83	0	15.19	7.72	1.26	0	0	0	46.84	26.85
03-04-2023	4.55	0	15.39	8.74	1.24	0	0	0	42.82	26.56
04-04-2023	4.22	0	17.91	8.66	1.23	0	0	0	48.11	23.42
05-04-2023	4.02	0	15.36	7.66	1.26	0	0	0	37.34	19.91
06-04-2023	4.09	0	18.53	7.48	1.38	0	0	0	46.66	29.7
07-04-2023	4.21	0	19.07	5.62	1.43	0	0	0	44.34	28.55
08-04-2023	4.05	0	14.73	6.52	1.47	0	0	0	47.64	35.13
09-04-2023	4.77	0	13.05	5.43	1.46	0	0	0	50.86	36.67
10-04-2023	4.78	0	13.55	4.27	1.44	0	0	0	50.18	35.92
11-04-2023	4.81	0	19.06	4.74	1.42	0	0	0	51.95	34.57
12-04-2023	4.45	0	17.23	3.49	1.64	0	0	0	77.69	50.8
13-04-2023	4.49	0	19.72	2.99	1.53	0	0	0	78.72	53.47
14-04-2023	4.91	0	13.61	3.13	1.45	0	0	0	69.34	47.42
15-04-2023	4.27	0	17.55	1.77	1.59	0	0	0	70.83	48.74
16-04-2023	6.31	0	16.13	1.37	1.57	0	0	0	88.49	63.59
17-04-2023	4.14	0	14.52	1	1.5	0	0	0	65.99	46.3
18-04-2023	4.02	0	17.26	1.27	1.5	0	0	0	68.33	43.21
19-04-2023	6.23	0	16.78	1.72	1.58	0	0	0	75.16	53.56
20-04-2023	NA	0	NA	NA	NA	0	NA	NA	NA	NA
21-04-2023	4.63	0.09	12.91	18.87	0.81	0	0	0	98.22	46.72
22-04-2023	4.77	0	15.67	9.11	0.76	0	0.01	0	54.86	33.94
23-04-2023	5.65	0	14.79	5.02	0.8	0	0	0	49.36	31.73
24-04-2023	5.15	0	16.01	3.68	0.8	0	0	0	47.23	30.76
25-04-2023	5.05	0	18.71	3.16	0.8	0	0	0	53.05	31.29
26-04-2023	5.7	0	13.1	2.76	0.82	NA	0	0	39.22	21.42
27-04-2023	6.04	0.07	19.16	1.66	0.95	0	0	0	59.17	35.51
28-04-2023	7.82	0	14.69	1.57	0.93	0	0	0	36.63	25.26
29-04-2023	3.92	0.03	12.07	2.12	0.95	0	0.02	0	36.52	23.81
30-04-2023	4.16	0	13.96	1.81	0.98	NA	0.01	0	33.17	22
Avg.	4.9	0.01	16.3	5.0	1.2	0.0	0.0	0.0	58.5	35.1

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Bharat Petroleum Corporation Limited - Kochi Refinery

HSE (Environment)

AAQMS - PDPP area - May 2023

Parameter	SO2	H2S	NOx	NH3	CO	Benzene	Methane	NMHC	PM 10	PM 2.5
Units	ug/m3	µg/m3	ug/m3	ug/m3	mg/m3	ug/m3	ppm	ppm	ug/m3	ug/m3
Limit	Daily 80 Annual 50	Daily 80 Annual 40	Daily 80 Annual 40	Daily 400 Annual 100	8 hrs - 2 4 hrs - 4	Daily 05 Annual 05	.	.	Daily 100 Annual 60	Daily 60 Annual 40
Date										
01-05-2023	4.06	0	10.72	0.82	0.97	0	0	0	26.89	15.54
02-05-2023	3.93	0.11	10.68	0.67	0.98	0	0	0	26.46	14.73
03-05-2023	4.13	0.24	12.63	0.37	0.99	0	0	0	34.18	18
04-05-2023	4.36	0.25	16.08	2.51	1	0	0	0	73.03	39.77
05-05-2023	4.67	0.02	15.98	0.54	0.99	0	0	0	36.98	18.3
06-05-2023	4.79	0.54	20.01	3.15	0.96	0	0	0	76.91	45.86
07-05-2023	11.3	0.13	26.09	4.22	0.87	0	0	0	34.92	29.38
08-05-2023	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
09-05-2023	3.74	NA	23.41	1.59	0.89	NA	0	0	55.54	2.55
10-05-2023	3.56	NA	13.96	0.66	0.91	NA	NA	NA	34.73	14.22
11-05-2023	3.6	NA	12.23	0.05	0.95	NA	NA	NA	39.36	22.41
12-05-2023	3.26	NA	8	0.08	0.93	NA	NA	NA	27.74	16.33
13-05-2023	3.41	NA	8.83	0.04	0.92	NA	NA	NA	28.39	18.13
14-05-2023	3.56	NA	11.03	0.03	0.96	NA	NA	NA	33.47	22.03
15-05-2023	3.57	0.4	11.42	0	0.94	100	0	0	35.86	25.81
16-05-2023	3.66	0.36	14.16	0	0.96	3.81	0	0	46.74	35.13
17-05-2023	3.57	0.09	13.11	0.32	1	0.01	0	0	50.57	41.54
18-05-2023	3.61	0.19	13.24	2.36	0.98	0.01	0	0	37.83	32.12
19-05-2023	3.58	0.14	12.17	4.27	0.98	0.01	0	0	34.39	32.8
20-05-2023	3.57	0.12	12.55	3.09	0.94	0.01	0	0	28.82	23.12
21-05-2023	3.58	0.1	13.17	1.7	0.94	0.01	0	0	26.08	22.86
22-05-2023	3.61	0.06	11.34	2.03	0.95	0.01	0	0	24.28	20
23-05-2023	3.6	0.32	9.86	2.76	0.99	0.01	0	0	20.63	19.51
24-05-2023	3.59	0.07	8.82	4.42	0.95	0.01	0	0	18.87	15.59
25-05-2023	3.6	0.31	10.97	4.28	0.95	0.01	0	0	19.29	14.96
26-05-2023	3.63	0.22	13.71	3.66	0.98	0.01	0	0	18.73	16.6
27-05-2023	3.7	0.06	17.65	4.54	1.03	0.01	0	0	32.13	28.11
28-05-2023	3.67	0.1	13.34	4.47	1.06	0.01	0	0	34.65	30.68
29-05-2023	3.69	0.11	12.61	2.15	1.06	0.01	0	0	33.54	27.9
30-05-2023	3.85	0.2	13.32	0.87	1.06	0.01	0	0	33.62	28.88
31-05-2023	4.2	0.2	12.4	0.76	1.2	0.01	0	0	37.8	29.6
Avg.	4.9	0.18	13.4	1.9	1.0	4.3	0.0	0.0	35.4	24.1

**Compliance Report of stipulated Environmental Clearance (EC) conditions for the
Propylene Derivatives Petrochemical Project (PDPP) of BPCL-Kochi Refinery
EC clearance - J-11011/26/2013-IA II (I) dated 12th May 2015.
Half Year _ Period 1st April 2023 to 30th September 2023.**



Bharat Petroleum Corporation Limited - Kochi Refinery

HSE (Environment)

AAQMS - PDPP area - June 2023

Parameter	SO2	H2S	NOx	NH3	CO	Benzene	Methane	NMHC	PM 10	PM 2.5
Units	ug/m3	µg/m3	ug/m3	ug/m3	mg/m3	ug/m3	ppm	ppm	ug/m3	ug/m3
Limit	Daily 80 Annual 50	Daily 80 Annual 40	Daily 80 Annual 40	Daily 400 Annual 100	8 hrs - 2 4 hrs - 4	Daily 05 Annual 05			Daily 100 Annual 60	Daily 60 Annual 40
Date										
01-06-2023	3.76	0.29	12.4	0.23	1.08	0.01	0	0	24.67	22.64
02-06-2023	3.69	0.02	13.07	0.1	1.09	49.82	0	0	29.29	25.7
03-06-2023	3.68	0.19	10.41	0.07	1.06	95.43	0	0	24.6	22.04
04-06-2023	3.74	0.35	12.33	0.01	1.08	100	0	0	26.91	23.99
05-06-2023	3.83	0.45	13.35	0.21	1.2	65.99	0	0	21.51	18.38
06-06-2023	3.73	1.02	13.66	0.01	1.19	31.7	0	0	15.04	12.84
07-06-2023	3.73	1.1	12.7	0	1.18	42.59	0	0	12.27	8.67
08-06-2023	3.75	0.81	13.52	0	1.09	0	0	0	14.07	12.61
09-06-2023	3.79	0.2	13.66	0	1.08	0	0	0	10.78	8.75
10-06-2023	4.01	0.14	15.13	0	1.11	0.01	0	0	22.11	15.42
11-06-2023	3.79	0.25	10.37	0.04	1.1	0.01	0	0	22.33	16.1
12-06-2023	3.82	0.01	11.11	0.03	1.15	0.01	0	0	22.73	16.33
13-06-2023	3.82	0.01	11.42	0.08	1.14	0	0	0	20.88	15.91
14-06-2023	3.83	0	13	0	1.15	0.01	0	0	27.82	20.42
15-06-2023	3.86	0.01	14.62	0	1.21	0.01	0	0	36.06	29.38
16-06-2023	3.84	0.23	14.41	0	1.13	0.01	0	0	31.57	20.46
17-06-2023	3.87	0	11.39	0.58	1.17	0	0	0	40.37	29.03
18-06-2023	4.05	0	12.85	0.73	1.13	0	0	0	42.01	24.1
19-06-2023	4.27	0	13.62	0.27	1.16	0	0	0	31.35	18.65
20-06-2023	4.01	0	12.82	0	1.21	0	0	0	23.65	16.65
21-06-2023	3.93	0	13.35	0	1.23	0.01	0	0	31.99	22.45
22-06-2023	3.93	0	12.68	0	1.21	0.01	0	0	32.14	21.51
23-06-2023	3.95	0	13	0	1.18	0	0	0	37.15	23.16
24-06-2023	3.99	0	13.19	0	1.23	0.01	0	0	37.5	23.67
25-06-2023	3.95	0	12.03	0	1.24	0	0	0	26.37	21.16
26-06-2023	3.94	0.01	12.03	0	1.2	0	0	0	18.11	11.95
27-06-2023	3.88	0.02	9.73	0	1.22	0.01	0	0	9.69	8.15
28-06-2023	3.94	0	11.8	0	1.24	0.03	0	0	24.43	16.6
29-06-2023	3.95	0	10.98	0	1.23	0	0	0	14.59	10.28
30-06-2023	3.93	0	13.52	0	1.27	0.01	0	0	24.54	15.15
Avg.	3.9	0.17	12.6	0.1	1.2	12.9	0.0	0.0	25.2	18.4

**Compliance Report of stipulated Environmental Clearance (EC) conditions for the
Propylene Derivatives Petrochemical Project (PDPP) of BPCL-Kochi Refinery
EC clearance - J-11011/26/2013-IA II (I) dated 12th May 2015.
Half Year _ Period 1st April 2023 to 30th September 2023.**

Bharat Petroleum Corporation Limited - Kochi Refinery										
HSE (Environment)										
AAQMS - PDPP area - July 2023										
Parameter	SO2	H2S	NOx	NH3	CO	Benzene	Methane	NMHC	PM 10	PM 2.5
Units	ug/m3	µg/m3	ug/m3	ug/m3	mg/m3	ug/m3	ppm	ppm	ug/m3	ug/m3
Limit	Daily 80 Annual 50	Daily 80 Annual 40	Daily 80 Annual 40	Daily 400 Annual 100	8 hrs - 2 4 hrs - 4	Daily 05 Annual 05			Daily 100 Annual 60	Daily 60 Annual 40
Date										
01-07-2023	4	0	14.74	0	1.24	0.01	0	0	30.4	18.79
02-07-2023	3.98	0.02	13.72	0	1.25	0.01	0	0	26.43	17.73
03-07-2023	3.93	0.05	14.36	0	1.26	0.01	0	0	15.99	11.93
04-07-2023	3.94	0.12	14.47	0	1.28	0	0.02	0	16.85	11.31
05-07-2023	3.92	0	14.1	0	1.25	0.01	0.03	0	22.07	12.47
06-07-2023	3.99	0	17.2	0	1.28	0	0.01	0	20.84	13.92
07-07-2023	3.92	0.02	15.63	0	1.3	0.01	0.01	0	18.14	14.27
08-07-2023	3.96	0	15.23	0	1.32	0.01	0.01	0	20.58	15.43
09-07-2023	3.91	0	14.5	0	1.33	0	0.01	0	31.1	20.22
10-07-2023	4.03	0	12.91	0	1.37	0	0.01	0	26.51	17.45
11-07-2023	4.15	0	13.18	0	1.37	0	0.01	0	29.92	19.14
12-07-2023	4.15	0	14.55	0	1.38	0.01	0.01	0	36.09	22.35
13-07-2023	4.17	0.01	14.77	0	1.36	0.01	0.01	0	25.42	17.62
14-07-2023	4.21	0	16.18	0	1.37	0	0.01	0	28.01	19.06
15-07-2023	4.19	0.06	14.96	0	1.36	0	0.01	0	27.87	17.47
16-07-2023	4.03	0.08	13.49	0	1.37	0	0.01	0	29.73	18.59
17-07-2023	4	0.04	16.54	0	1.37	0	0.02	0	31.26	18.11
18-07-2023	3.95	0.01	16.97	0	1.35	0.01	0.02	0	31.16	15.07
19-07-2023	3.95	0	17.86	0	1.37	0	0.02	0.01	26.65	11.15
20-07-2023	3.99	0	21.63	0	1.39	0	0	0	32.23	13.84
21-07-2023	3.99	0	23.69	0	1.4	0.01	0	0	40.32	14.85
22-07-2023	3.93	0.1	18.8	0	1.43	48.93	0	0	33.14	15.1
23-07-2023	4.06	0.09	21.04	0	1.43	0	0	0	23.91	15.54
24-07-2023	4.01	0	15.36	0	1.43	0	0	0	14.39	10.36
25-07-2023	4.05	0	19.82	0	1.46	0	0	0	24.24	16.41
26-07-2023	4.09	0.02	16.26	0	1.49	0	0	0	25.99	18.56
27-07-2023	4.01	0.09	15.41	0	1.47	0	0	0	29.81	20.19
28-07-2023	4.01	0.14	15.14	0	1.54	0	0	0	41.87	28.36
29-07-2023	4.05	0.06	17.72	0	1.51	2.57	0	0	42.62	23.66
30-07-2023	4.01	0.01	15.23	0	1.46	0.01	0	0	44.11	24.77
31-07-2023	4.02	0	14.17	0	1.46	0.01	0	0	38.37	21.86
Avg.	4.02	0.03	16.12	0.00	1.38	1.67	0.01	0.00	28.58	17.28

**Compliance Report of stipulated Environmental Clearance (EC) conditions for the
Propylene Derivatives Petrochemical Project (PDPP) of BPCL-Kochi Refinery
EC clearance - J-11011/26/2013-IA II (I) dated 12th May 2015.
Half Year _ Period 1st April 2023 to 30th September 2023.**



Bharat Petroleum Corporation Limited - Kochi Refinery										
AAQMS - PDPP area - August 2023										
Parameter	SO ₂	H ₂ S	NO _x	NH ₃	CO	Benzene	Methane	NMHC	PM 10	PM 2.5
Units	ug/m ³	µg/m ³	ug/m ³	ug/m ³	mg/m ³	ug/m ³	ppm	ppm	ug/m ³	ug/m ³
Limit	Daily 80 Annual 50	Daily 80 Annual 40	Daily 80 Annual 40	Daily 400 Annual 100	8 hrs - 2 4 hrs - 4	Daily 05 Annual 05			Daily 100 Annual 60	Daily 60 Annual 40
Date										
01-08-2023	4.04	0	14.21	0	1.45	0	0	0	39.2	18.14
02-08-2023	4.12	0	15.91	0	1.5	0	0	0	49.03	25.28
03-08-2023	4.1	0	17.07	0	1.5	0.01	0	0	46.3	25.9
04-08-2023	4.11	0	16.97	0	1.45	0.01	0	0	31.85	17.22
05-08-2023	4.32	0	20.28	0	1.64	0	0	0	34.53	21.66
06-08-2023	4.23	0	16.2	0	1.36	0	0	0	34.36	13.02
07-08-2023	4.16	0	15.63	0	1.47	0.01	0	0	36.68	16.4
08-08-2023	4.27	0	16	0	1.46	0.03	0	0	35.19	22.07
09-08-2023	4.24	0	14.3	0	1.53	0.01	0	0	41.65	23.82
10-08-2023	4.23	0.03	14.21	0	1.53	0.01	0	0	42.43	22.47
11-08-2023	4.33	0	17.16	0	1.53	0.02	0	0	52.55	25.14
12-08-2023	4.31	0	22.87	0	1.44	0	0	0	40.43	16.05
13-08-2023	4.38	0	15.38	0	1.76	0	0	0	40.44	26.63
14-08-2023	4.87	0	11.57	0.02	1.48	0.01	0	0	44.33	24.64
15-08-2023	3.77	0	11.08	0	1.54	0.01	0	0	37.27	28.41
16-08-2023	4.46	0	13.35	0	1.55	0.01	0	0	50.47	27.86
17-08-2023	4.46	0	10.8	0	1.5	0.01	0	0	40.93	21.14
18-08-2023	4.42	0	19.41	0	1.64	0.03	0	0	37.48	28.2
19-08-2023	4.51	0	14.72	0	1.54	0.01	0	0	31.87	18.29
20-08-2023	4.6	0	13.97	0	1.55	0.01	0	0	33.85	20.92
21-08-2023	5.03	0	49.25	0	1.53	0.01	0	0	36.24	16.64
22-08-2023	4.67	0	14.73	0	1.54	0.01	0	0	41.94	23.4
23-08-2023	4.71	0	14.1	0	1.58	0.01	0	0	46.75	26.71
24-08-2023	4.64	0	17.98	0	1.61	0.01	0	0	40.81	28.87
25-08-2023	4.52	0	17.37	0	1.61	0.01	0	0	40.36	24.72
26-08-2023	4.67	0	15.66	0	1.57	0	0	0	37.27	18.67
27-08-2023	5.03	0	14.26	0	1.6	0	0	0	36.04	26.41
28-08-2023	4.55	0	13.42	0	1.59	0	0	0	32.37	20.63
29-08-2023	4.52	0	11.68	0	1.42	0	0	0	28.32	12.19
30-08-2023	4.55	0	13.5	0	1.55	0	0	0	21.73	10.26
31-08-2023	4.55	0	14.33	0	1.62	0	0	0	33.32	17.26
Avg.	4.43	0.00	16.37	0.00	1.54	0.01	0.00	0.00	38.58	21.58

**Compliance Report of stipulated Environmental Clearance (EC) conditions for the
Propylene Derivatives Petrochemical Project (PDPP) of BPCL-Kochi Refinery
EC clearance - J-11011/26/2013-IA II (I) dated 12th May 2015.
Half Year _ Period 1st April 2023 to 30th September 2023.**



Bharat Petroleum Corporation Limited - Kochi Refinery

HSE (Environment)

AAQMS - PDPP area - Sept. 2023

Parameter	SO2	H2S	NOx	NH3	CO	Benzene	Methane	NMHC	PM 10	PM 2.5
Units	ug/m3	µg/m3	ug/m3	ug/m3	mg/m3	ug/m3	ppm	ppm	ug/m3	ug/m3
Limit	Daily 80 Annual 50	Daily 80 Annual 40	Daily 80 Annual 40	Daily 400 Annual 100	8 hrs - 2 4 hrs - 4	Daily 05 Annual 05			Daily 100 Annual 60	Daily 60 Annual 40
Date										
01-09-2023	4.49	0	12.64	0	1.66	0	0	0	36.03	22.51
02-09-2023	4.57	0	11.22	0	1.45	0	0	0	29.28	16.07
03-09-2023	4.43	0	9.67	0	1.59	0	0	0	15.48	8.92
04-09-2023	4.51	0	13.28	0	1.78	0	0	0	34.23	19.51
05-09-2023	4.64	0	13.06	0	1.71	0	0	0	39.34	23.82
06-09-2023	NA	NA	NA	NA	NA	0	NA	NA	NA	NA
07-09-2023	NA	NA	NA	NA	NA	0	NA	NA	NA	NA
08-09-2023	NA	NA	NA	NA	NA	0	NA	NA	NA	NA
09-09-2023	NA	NA	NA	NA	NA	0	NA	NA	NA	NA
10-09-2023	NA	NA	NA	NA	NA	0	NA	NA	NA	NA
11-09-2023	NA	NA	NA	NA	NA	0	NA	NA	NA	NA
12-09-2023	4.5	0	14.87	0	2.03	0	0	0	34.14	21.39
13-09-2023	4.45	0	14.98	0	2.1	0	0	0	58.89	42.63
14-09-2023	4.45	0	11.85	0	1.71	0	0	0	32.73	22.63
15-09-2023	4.47	0	11.36	0	1.69	0	0	0	24.19	13.94
16-09-2023	4.45	0	11.38	0	1.68	0	0	0	23.1	14.06
17-09-2023	4.49	0	9.19	0	1.67	0	0	0	18.88	10.17
18-09-2023	4.41	0	8.88	0	1.79	0	0	0	19.92	9.94
19-09-2023	3.93	0	11.08	0	1.52	0	0	0	20.76	14.19
20-09-2023	4.51	0	11.22	0	1.72	0	0	0	25.34	15.07
21-09-2023	4.66	0	14.1	0	1.74	0	0	0	29.09	18.44
22-09-2023	4.46	0	10.06	0	1.7	0	0	0	16.63	9.19
23-09-2023	4.43	0	11.06	0	1.75	0	0	0	24.91	14.7
24-09-2023	4.68	0	11.78	0	1.73	0	0	0	24.67	16.56
25-09-2023	4.76	0	23.18	0	2.17	0	0	0	32.21	18.73
26-09-2023	5.19	0	12.89	0	1.8	0	0	0	36.01	20.69
27-09-2023	4.7	0	11.81	0	1.6	0	0	0	22.16	12.99
28-09-2023	4.53	0	10.81	0	1.78	0	0	0	19.69	12.96
29-09-2023	4.61	0	9.3	0	1.75	0	0	0	11.04	7.74
30-09-2023	NA	NA	NA	NA	NA	0	NA	NA	NA	NA
Avg.	4.54	0.00	12.16	0.00	1.74	0.00	0.00	0.00	27.34	16.82