



पिपराइलीज़ डिविज़न  
Refineries Division

इंडियन ऑयल कॉर्पोरेशन लिमिटेड

पानीपत रिफ़ाइनरी एंड पेट्रोकेमिकल कॉम्प्लेक्स

पानीपत, हरियाणा - 132140

Indian Oil Corporation Limited

Panipat Refinery & Petrochemical Complex

Panipat, Haryana - 132140

वेबसाइट: [www.iocl.com](http://www.iocl.com) ई-मेल: [pipe\\_har@indianoil.com](mailto:pipe_har@indianoil.com)

दूरभाष: 0180-252 4001/0180-2578833



Ref No: PR/HSE/2024/EC Compliance/1

Date: 12.07.2024

To,

The Additional Director(S),  
Ministry of Environment, Forest & Climate Change, Govt. of India,  
Regional Office (NR), Bays No. 24-25, Sector 31-A, Dakshin Marg,  
Chandigarh- 160047

Subject: Six Monthly Environmental Clearances (EC) Compliance Report (Jan'2024 to June'2024)- Panipat Refinery and Petrochemical Complex.

Respected Sir,

Enclosed please find herewith the Six-Monthly Environmental Clearances (ECs) Compliance Report- Panipat Refinery and Petrochemical Complex for the period of Jan'2024 to June'2024 of the MoEF&CC stipulations w.r.t. following EC letters:

1. EC Letter No. J-11011/27/91-IA II(I) dated 16.07.1992 for setting up of a grass root refinery at Karnal district by M/s Indian Oil Corporation Limited.
2. EC Letter No. J.11011/60/2000-IA.II dated 09.04.2001 for Expansion of Panipat Refinery (PREP) from 6 MMTPA to 12 MMTPA.
3. EC Letter No. J.11011/52/2000-IA.II dated 30.04.2001 for Integrated Paraxylene and Purified Terephthalic Acid Projects at Panipat by M/s IOCL.
4. EC Letter No. J.11011/9/2001-IA II (I) dated 06.12.2001 for MS Quality Up-gradation Project at Panipat Refinery by M/s Indian Oil Corporation Limited.
5. EC Letter No. J.11011/52/2000-IA II (I) dated 20.01.2003 for Modification in Plant layout of Paraxylene & Purified Terephthalic Acid (PX/PTA) Project within Panipat Refinery Complex and Integrated with Panipat Refinery (PR) and Panipat Refinery Expansion Project (PREP).

o/c

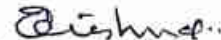


Atcharya..

6. EC Letter No. J.11011/7/2004-IA II (I) dated 09.08.2004 for expansion of Panipat Refinery (From 12 MMTPA to 15 MMTPA) and setting up of Indalin + unit at Panipat Refinery Complex of IOCL, Panipat Refinery Haryana.
7. EC Letter No. J.11011/177/2016-IA II (I) dated 26<sup>th</sup> March 2018 for BS-VI Fuel Quality up-gradation and expansion of PX/PTA plant at Panipat Refinery & Petrochemical Complex (PRPC), Panipat (Haryana) by M/s Indian Oil Corporation Limited.
8. EC Letter No. IA-J-11011/43/2018-IA- II (I) dated 13.11.2019 for Installation of 100 KLPD Ligno-Cellulosic 2G Ethanol Plant at Baholi, Block Madlauda, Panipat Refinery Road, District Panipat (Haryana) By M/S Indian Oil Corporation Limited.
9. EC Letter No. J-11011/78/2018-IA- II (I) dated 25.11.2019 for setting up 128 KL per day Ethanol Production Plant by M/s Indian Oil Corporation Ltd. (IOCL) In Panipat Refinery & Petrochemical Complex at Panipat, Haryana.
10. EC Letter No. J-11011/177/2016- IA II(I) dated. 03.12.2021 for Panipat Refinery capacity expansion from existing 15 MMTPA to 25 MMTPA within the existing refinery complex.

Thanking You, Sir.

Yours faithfully



(P.V.Ramakrishna)

General Manager-(HS&E)

For and on behalf of IOCL,  
Panipat Refinery & Petro Chemical Complex

Copy To:

1. The Regional Directorate, CPCB, Chandigarh,
2. The Chairman, HSPCB, Panchkula,
3. The Regional Officer, HSPCB, Panipat

श्री. पी. रामकृष्णा  
P.V.Ramakrishna  
जनसंपर्क विभाग (HS&E), पानिपत  
General Manager (HS&E), Panipat Refinery & Petrochemical Complex  
पानिपत रिफाइनरी & पेट्रोकेमिकल कॉम्प्लेक्स (आईओसीएल)  
पानिपत रिफाइनरी & पेट्रोकेमिकल कॉम्प्लेक्स, पानिपत, हरियाणा

## INDEX

S. No.	EC letter /Environmental monitoring reports	EC Compliance Status/Reports
1	EC Letter No. J-11011/27/91-IA II(I) dated 16.07.1992 for setting up of a grass root refinery at Karnal district by Indian Oil Corporation Limited.	Attached as Annexure-1
2	EC Letter No. J.11011/60/2000-IA.II dated 09.04.2001 for Expansion of Panipat Refinery (PREP) from 6 MMTPA to 12 MMTPA.	Attached as Annexure-2
3	3EC Letter No. J.11011/52/2000-IA.II dated 30.04.2001 for Integrated Paraxylene and Purified Terphthalic Acid Projects at Panipat by M/s IOCL.	Attached as Annexure-3
4	EC Letter No. J.11011/9/2001-IA II (I) dated 06.12.2001 for MS Quality Up-gradation Project at Panipat Refinery by IOCL.	Attached as Annexure-4
5	EC Letter No. J.11011/52/2000-IA II (I) dated 20.01.2003 for Modification in Plant layout of Paraxylene and Purified Terephthalic Acid (PX/PTA) Project within Panipat Refinery Complex and Integrated with Panipat Refinery (PR) and Panipat Refinery Expansion Project (PREP).	Attached as Annexure-5
6	EC Letter No. J.11011/7/2004-IA II (I) dated 09.08.2004 for expansion of Panipat Refinery (From 12 MMTPA to 15 MMTPA) and Setting up of Indalin+ unit at Panipat Refinery Complex of IOCL, Panipat Refinery Haryana.	Attached as Annexure-6
7	EC Letter No. J.11011/177/2016-IA II (I) dated 26th March, 2018 for BS-VI Fuel Quality up-gradation and expansion of PX/PTA plant at Panipat Refinery & Petrochemical Complex (PRPC), Panipat (Haryana) by M/s Indian Oil Corporation Limited.	Attached as Annexure-7
8	EC Letter No. IA-J-11011/43/2018-IA- II (I) dated 13.11.2019 for installation of 100 KLPD Ligno-Cellulosic 2G Ethanol Plant at Baholi, Block Madlauda, Panipat Refinery road, District Panipat (Haryana) By M/S Indian Oil Corporation Limited.	Attached as Annexure-8
9	EC Letter No. J-11011/78/2018-IA- II (I) dated 25.11.2019 for setting up 128 KL per day Ethanol Production Plant by M/s Indian Oil Corporation Ltd. (IOCL) In Panipat Refinery & Petrochemical Complex at Panipat, Haryana.	Attached as Annexure-9
10	EC Letter No. J-11011/177/2016- IA II (I) dated. 03.12.2021 for panipat refinery capacity expansion from existing 15 MMTPA to 25 MMTPA within the existing complex.	Attached as Annexure-10
11	Ambient Air quality data.	Attached as Annexure-11
12	Stack Emission data	Attached as Annexure-12
13	Effluent quality data	Attached as Annexure-13
14	Noise Monitoring data	Attached as Annexure-14

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**COMPLIANCE TO ENVIRONMENTAL CLEARANCE STIPULATIONS FROM MOEFCC FOR  
SETTING UP OF A GRASSROOT REFINERY AT KARNAL, DISTRICT BY INDIAN OIL  
CORPORATION LIMITED - EC Letter no. J-11011/27/91-IA.II(I) dated 16.07.1992**

SN	Stipulation	Compliance
1.	The project authority must strictly adhere to the stipulations laid down by the State Pollution Control Board and State Government.	Complied
2.	Any expansion of the plant, either with the existing product mix or new products can be taken up only with the prior approval of this ministry.	Complied
3.	Sulphur recovery unit with more than 90% Sulfur Recovery should be installed and commissioned before the project is completed, and measure for its continuous operation must be taken. Techno-economic feasibility study for additional standby sulphur recovery system may be initiated after the installation of first unit.	Complied Panipat Refinery has 5 nos. Sulphur Recovery Units (SRUs) as detailed below and 4 (99.9% recovery efficiency) out of 5 units are in operation: • 1 no. SRUs: 99% efficiency ,1X115 MT/day capacity • 4 no. SRUs: 99.9% efficiency ,4X225 MT/day capacity
4.	Low Sulfur fuel (Sulphur content not exceeding 1%) should be used in the boilers/furnaces.	Complied Fuel with sulphur content $\leq 0.5\%$ is used in the boilers/furnaces if required.
5.	Low NO <sub>x</sub> burners should be used to avoid excessive formation of NO <sub>x</sub> .	Complied Low NO <sub>x</sub> burners have been installed in the process heaters , Boilers , furnaces etc.
6.	Total emission of SO <sub>2</sub> from the refinery should not exceed 1 Ton/hr.	Complied SO <sub>2</sub> emission (actual SO <sub>2</sub> emission, 800-900 kg/hr) from the Refinery is well within the limit.
7.	The gaseous emissions (SO <sub>2</sub> , NO <sub>x</sub> etc.) from various process units should conform to the standards prescribed by the concerned authorities, from time to time. At no time the emission levels should go beyond the stipulated standards. In the event of failure of any pollution control system adopted by the unit, the respective unit should be put out of operation immediately and should not be restarted until the control measure are rectified to achieve the desired efficiency.	Complied
8.	Adequate number (a minimum of 7) of air quality monitoring stations should be set up in the down-wind direction as well as where maximum ground level concentration is anticipated. Stack emission should be monitored by setting up of an automatic continuous stack monitoring unit. The data on stack emission should be submitted to the State Pollution Control Board once in three months and to this Ministry once in six months along with the statistical analysis. The air quality monitoring station should be selected on the basis of modeling exercise to represent the short-term ground level concentrations.	Complied Total 9 nos. of CAAQMS (2 nos. in Panipat city, 1 no. in Refinery township, 5 nos. in Refinery & 1 in Polishing Pond area) are in operation. These were set up in consultation with HSPCB. Also, one mobile van for ambient air quality monitoring is in place. All the CAAQMS stations are connected to the CPCB AAQMS server. For all stacks: SO <sub>2</sub> , NO <sub>x</sub> , CO & PM analyzers are available and connected to CPCB/HSPCB server. Data on stack emission are submitted to HSPCB/MoEFCC as per frequency mentioned.



SN	Stipulation	Compliance
9.	Fugitive emissions of hydrocarbons from storage tanks etc. should be minimized by adopting necessary measures.	Complied Floating roof tanks are provided to store volatile hydrocarbons.
10.	Fugitive emission should be regularly monitored and record maintained.	Complied Fugitive emission monitoring for Hydrocarbon and Benzene is being carried out through MoEF&CC approved agency.
11.	There should be no change in the stack design without the approval of the State Pollution Control Board. Alternate pollution control system and proper design in the stack should be provided to take care of excess emissions due to failure in any system of the plant.	No change in stack design shall be done without the approval of SPCB.  Proper design and alternate Pollution control system is provided Complied to take care of excess emissions in case of failure in any system of the plant.
12.	The height of stacks attached to AVU, FCCU and TPS etc. should not be less than 100 m.	Implemented
13.	Total fresh water consumption (Industrial as well as township) should not exceed 8 MGD. Ground Water should not be tapped for this purpose.	8 MGD water allocated for 6 MMTPA Refinery. However, further EC granted to Refinery expansion from 6 to 12 MMTPA (J.11011/7/2004-IA-II (I) dated 09.08.2004) Fresh water allocation increased to 30 cusec.
14.	The project authorities must recycle wastewater to the maximum extent possible (at least 25% to 30% to start with). The treated effluent coming out of the plant must meet MINAS.	Complied  ETP-I and II Treated effluent meeting Refinery MINAS parameter is "Recycled and Reused" as feed to RO plant and make up water to Cooling Tower.
15.	Adequate number of effluent quality (oil & Grease, COD, BOD, suspended Solids, Phenols, Sulphides, pH and Flow) monitoring stations must be set up in consultation with State Pollution Control Board.	Effluent quality as mentioned is being monitored at various stages of Effluent Treatment Plant. Also final Treated Effluent Quality parameters (pH, BOD, COD & TSS) are connected online to CPCB/HSPCB server.
16.	Maximum recovery of oil from the sludge should be done and residual oily sludge should be incinerated.	The raw oily sludge generated from the Refinery is subjected to Oil recovery / Melting Pit treatment for recovery of oil. The recovered oil is recycled back with crude oil for processing. - The residual sludge is disposed-off through confined Bio-remediation. - Part of the sludge is processed in Coker unit.
17.	The project authorities must prepare a scheme for solid and hazardous waste disposal. The plan for disposal duly approved from the State Pollution Control Board should be submitted to this Ministry within one year and adequate space should be provided for it within the plant premises.	Complied A common hazardous waste disposal site is developed in the state by Haryana Environmental Management Society (HEMS) in consultation with Haryana State Pollution Control Board. Panipat Refinery is the member of this society.
18.	A green belt of at least 500 m width and adequate density should be developed and maintained. Selection of the species should be done in consultation with the State Forest Department. A detailed green belt development plan taking into account attenuation factors, soil characteristics etc. should be prepared and submitted to this Ministry within six months.	Complied Greenbelt of 500 m width have been developed and maintained after consultation with State Forest Department.

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SN	Stipulation	Compliance												
19.	A detailed risk analysis study based on Maximum Credible Accident (MCA) analysis should be done and submitted to this Ministry once the process design/technology and layout is finalized. Based on this, a Disaster Management Plan has to be prepared and after approval by the concerned Nodal Agency, should be submitted to this ministry within six months. The impact zone under no circumstances should cross the plant premises.	A Comprehensive Risk Analysis is conducted. Report has been submitted.  On-site Disaster Management Plan based on this Risk Analysis is also prepared which is accredited from approved Third Party Inspection agency of PNGRB.												
20.	A 'no development zone' of minimum 5km radius in between the refinery and the Panipat town should be provided. Where only restricted growth on nonpolluting industries may be allowed (Action – State Govt.)	Action by State Government. Letter dated 16.05.2020 and subsequent letter dated 10.01.2024 sent from PR to DC, Panipat requesting enforcement of this condition.												
21.	No tree should be cut from the site without prior written order of the competent authority.	Complied												
22.	The industrial township should be located on the northern side of the refinery i.e. in the up-wind direction.	Complied												
23.	A detailed Rehabilitation Plan for the affected people should be prepared and submitted to this Ministry within 3 months.	Complied												
24.	Contractor's labourers must leave place after the construction work is over to avoid creation of slum in the adjoining areas of the refinery and township.	Complied												
25.	A comprehensive EIA must be prepared and submitted to this Ministry by September, 1993 covering regional implications and 'no development zone' aspects.	Complied												
26.	Feasibility of using 20 tonner trucks may be studied / assessed wherever road transport is being envisaged and report submitted to this Ministry within three months.	Bulk Movement of Products is through Pipeline and Rail.												
27.	Necessary approval may be obtained from the Regulatory Authority as per Section 5(2) and 5(3) of the Hazardous Wastes (Management and Handling) Rules, 1989 of the Environment (Protection) Act, 1986.	Complied												
28.	The State Govt. should prepare a Master Plan for the region to avoid haphazard growth of industries and human settlements in the area.	Action by State Government.												
29.	The project authority must set up laboratory facilities for collection and analysis of samples under the supervision of competent technical personnel, who will directly report to the Chief Executive.	Complied NABL approved laboratory is established within the refinery.												
30.	A separate Environment Management Cell with suitably qualified people to carry out various functions should be set up under the control of Sr. Executive, who will report directly to the Head of the organization.	Complied												
31.	The funds earmarked for the environmental protection measures should not be diverted for other purposes and year wise expenditure should be reported to this Ministry.	Implemented. Year-wise expenditure:(INR in Lakhs) <table><tr><th colspan="2">FY:2022-23</th><th colspan="2">FY:2023-24</th></tr><tr><th>Recurring</th><th>Non-recurring</th><th>Recurring</th><th>Non-recurring</th></tr><tr><td>3809.3</td><td>109.6</td><td>3378.2</td><td>62.9</td></tr></table>	FY:2022-23		FY:2023-24		Recurring	Non-recurring	Recurring	Non-recurring	3809.3	109.6	3378.2	62.9
FY:2022-23		FY:2023-24												
Recurring	Non-recurring	Recurring	Non-recurring											
3809.3	109.6	3378.2	62.9											

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**Compliance status with respect to the EC conditions stipulated in the letter for Panipat Refinery Expansion Projects (PREP) from 6 MMTPA to 12 MMTPA – EC letter no. J.11011/60/2000-IA.II dated 09.04.2001 :**

S N	Conditions stipulated in the EC letter	Status
1.	The company should strictly adhere to the stipulations made by MOE&F vide O.M. No. J.11011/76/96-IA.II dated 5 <sup>th</sup> March, 1997	Complied
2.	a) The total SO <sub>2</sub> emission from the entire Refinery complex should not exceed 1000 kg/hr even after proposed expansion.	Complied
	b) The gaseous emissions (SO <sub>2</sub> , NO <sub>x</sub> , HC, CO) and particulate matters, from various process units should conform to the standards prescribed under Environmental (Protection) Rules, 1986 or norms stipulated by SPCB whichever is most stringent.	Complied
	c) At no time, the emission level should go beyond the stipulated standards.	Complied
	d) In the event of failure of pollution control system(s) adopted by the unit, the respective unit should not be restarted until the control measures are rectified to achieve the desired efficiency.	Complied
3.	Sulphur recovery units with more than 99% efficiency shall be provided.	Complied Four SRUs with 99.9% recovery have been installed & are operational.
4.	a) Adequate ambient air quality monitoring stations SO <sub>2</sub> , NO <sub>x</sub> , HC should be set up in the Refinery area in consultation with SPCB, based on occurrence of maximum ground level concentration and down-wind direction of wind.	Complied 9 nos. of CAAQMS (5 nos. in Refinery, 2 nos. in Panipat city, 1 no. each in Refinery Township, and Polishing Pond area) are in operation. These were set up in consultation with HSPCB. All CAAQMS are connected to the CPCB AAQMS server.  Also mobile van for ambient air quality monitoring is in place.
	b) The monitoring network must be decided based on making exercise to represent short term GLCs.	Complied
	c) In addition, a mobile van with adequate facilities to monitor ambient air quality outside the Refinery premises should be provided.	Complied Mobile van with adequate facilities for ambient air quality monitoring is in place and used to monitor ambient air quality outside the refinery.
	d) Continuous on-line stack monitoring equipment should be installed for measurement of SO <sub>2</sub> , NO <sub>x</sub> , CO & PM.	For all stacks: SO <sub>2</sub> , NO <sub>x</sub> , CO & PM analyzers are available and connected to CPCB / HSPCB server.
5.	a) Fugitive emission of HC from product storage tank yard, crude oil tanks etc, must be regularly monitored.	Complied Fugitive emission monitoring for Hydrocarbon and Benzene is being carried out through MoEF&CC approved agency.
	b) Sensors for detecting HC leakages should also be provided at strategic locations.	Hydrocarbon leak detectors installed at strategic locations.



S N	Conditions stipulated in the EC letter	Status
6.	a) As per the commitment given, there will be no discharge of treated effluent into Thirana drain.	Treated effluent from ETP-1 & ETP-2 is reused as feed to RO plant and as make up to Cooling Tower. Treated Effluent from PTA-ETP (ETP-3) meeting Petrochemical MINAS is discharged into THIRANA DRAIN as per permission granted by statutory bodies (MoEFCC & HSPCB).
	b) The liquid effluent generated from the Refinery should be treated comprehensively to conform to the load based standards and concentration limits prescribed under EPA rules.	Liquid effluent generated from Refinery & PX-PTA Petrochemical Complex is being treated in Waste Water Treatment Plant(s) which are meeting applicable Refinery & Petrochemical MINAS standards. Treated effluent from ETP-1 & ETP-2 is reused as feed to RO plant and as make up to Cooling Tower.  Treated Effluent from PTA-ETP (ETP-3) meeting Petrochemical MINAS is discharged into THIRANA DRAIN as per permission granted by statutory bodies (MoEFCC & HSPCB).
	c) The entire treated wastewater should be recycled for reuse in the plant operation and green belt development so as to maintain zero discharge.	ETP-1 & ETP-2 treated effluent is recycled and reused as feed to RO plant and as make up to Cooling Tower. Treated Effluent from PTA-ETP (ETP-3) meeting Petrochemical MINAS is discharged into THIRANA DRAIN as per permission granted by statutory bodies (MoEFCC & HSPCB).
7.	a) Guard ponds of sufficient holding capacity should be provided to contain the effluent during process disturbance and or ETP failure.	Complied.
	b) The concerned units must be shut down in case of effluent quality exceeding the prescribed limits.	Complied.
8.	a) The company should adopt mounded storage for LPG.	Complied.  Mounded storage is used for LPG storage.
	b) The recommendations made in the Rapid Risk Assessment Report must be incorporated while firming up the plant layout and equipment design.	Complied.  The recommendations of the Rapid Risk Assessment study have been incorporated in the plant layout and equipment design.
	c) The company must prepare a comprehensive risk assessment/analysis of the Refinery and associated facilities once the engineering design and layout is frozen.	Complied.
	d) Based on this, on-site and off-site emergency preparedness plan must be prepared.	Complied.  Onsite and Offsite Emergency Preparedness plan have been prepared and certified thru' PNGRB approved agency for Panipat Refinery.

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S N	Conditions stipulated in the EC letter	Status
	e) Approval from the nodal agency must be obtained before commissioning the project.	Complied.
9.	The drawl of water from the Munak Head-works should not exceed 30 cusecs even after the proposed expansion.	Complied.
General conditions:		
S N	Conditions stipulated in the EC letter	Status
1.	The project authorities must strictly adhere to the stipulations made by the Haryana State Pollution Control Board and the State Government.	Complied
2.	No further expansion or modifications in the plant should be carried out without prior approval of the Ministry of Environment and Forest.	Complied
3.	In case of deviations or alterations in the project proposed from those submitted to this Ministry for Clearance, a fresh reference should be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	Complied.
4.	Data on ambient air quality, stack emission as well as fugitive emissions of HC must be regularly monitored and submitted to CPCB once in 3 months and to Ministry's Regional Office once in 6 months.	Complied. Mentioned reports are being submitted to MOEF&CC once in 6 months. Stack analyzers are online connected with CPCB/HSPCB server.
5.	Influent and effluent quality monitoring stations should be set up in consultation with the State Pollution Control Board. Regular monitoring should be carried out for the MINAS parameters.	Influent and Effluent quality is being monitored at various stages of Effluent Treatment Plants. Final Treated Effluent Quality parameters (pH, BOD, COD & TSS) are also connected online to CPCB/HSPCB server. Effluent monitoring reports are submitted to HSPCB on monthly basis.
6.	The project authorities must strictly comply with the rules and regulations under Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 as amended, on 3 <sup>rd</sup> October, 1994. Prior approvals from Chief Inspectorate of Factories, Chief Controller of Explosives, Fire & Safety Inspectorate etc. must be obtained.	Complied.
7.	The project authorities must strictly comply with the rules and regulations with regard to handling and disposal of hazardous wastes in accordance with the Hazardous Wastes (Management & Handling) Rules, 1989. Authorization from the State Pollution Control Board must be obtained for collections/treatment/storage/disposal of hazardous wastes.	Complied. Hazardous Waste Authorization (HWA) for collection, storage and disposal of hazardous wastes is obtained from the HSPCB.
8.	Occupational health surveillance program should be undertaken as regular exercise for all the employees, especially for those engaged in handling hazardous substances.	Complied.
9.	The overall noise levels in and around the plant area should be kept well within the standards (85 dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (Day time) and 70 dBA (night time)	Complied. The Refinery has provided silencers on compressor discharge, acoustic leggings on turbo generators & ejectors and acoustic chambers at the burners. The ambient noise level meets the standards.

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S N	Conditions stipulated in the EC letter	Status												
10.	The project proponent shall also comply with all the environmental protection measures and safeguards recommended in the EIA and risk analysis report.	Complied.												
11.	The project proponent should have a scheme upliftment in the nearby villages with reference to contribution in road construction, education of children, festivals, health centers, sanitation facilities, drinking water supply, community awareness and employment to local people whenever possible both for technical and non technical jobs.	Complied Social upliftment and community development has been properly taken care as per IOCL's Corporate Social Responsibility Policy through following CSR activities. – Promoting Sanitation – Environment Sustainability/ Renewable Energy Sources – Rural Development/ Promoting Preventive Healthcare/ Promotion of Sports – Promoting Education – Enhancement of Vocational Skills – Empowering Women – Welfare of Underprivileged												
12.	A separate environmental management cell equipped with full fledged laboratory facilities must be set up to carry out the environmental management and monitored functions.	Complied Separate Environment Management Cell is in place.												
13.	The project authorities will provide adequate funds both recurring and non-recurring 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 should not be diverted for any other purpose.	Implemented. Year-wise expenditure:(INR in Lakhs) <table><tr><th colspan="2">FY:2022-23</th><th colspan="2">FY:2023-24</th></tr><tr><th>Recurrin g</th><th>Non- recurri ng</th><th>Recurri ng</th><th>Non- recurring</th></tr><tr><td>3809.3</td><td>109.6</td><td>3378.2</td><td>62.9</td></tr></table>	FY:2022-23		FY:2023-24		Recurrin g	Non- recurri ng	Recurri ng	Non- recurring	3809.3	109.6	3378.2	62.9
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14.	The implementation of the project vis-à-vis environmental action plans will be monitored by Ministry's Regional Office at Chandigarh / State Pollution Control Board / Central Pollution Control Board. A six monthly compliance status report should be submitted to monitoring agencies.	Complied. Six monthly compliance reports along with monitoring data are being submitted as stated.												
15.	The project proponent should advertise in at least two local newspapers widely circulated in the region around the project, one of which shall be in the vernacular language of the locally concerned informing that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the State Pollution Control Board / Committee and may also be seen at Website of the Ministry and Forests at <a href="http://www.envfor.nic.in">http://www.envfor.nic.in</a> , the advertisement should be made within 7 days from the date of issue of the clearance letter and a copy of the same should be forwarded to the Ministry's Regional Office.	Complied												
16.	The project authorities should 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 start of land development work.	Complied												

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**Integrated Paraxylene and Purified Terphthalic Acid Projects at Panipat by M/s IOCL – Environmental Clearance MOEF, N. Delhi letter no. J.11011/52/2000-IA.II dated 30.04.2001**

SN	Conditions stipulated in the EC letter	Status
1	a) The gaseous emission (SO <sub>2</sub> , NO <sub>x</sub> and HC, Benzene) from the various process units should conform to the standards prescribed under environment (Protection) Rules, 1986 or norms stipulated by the SPCB whichever is more stringent.	Complied. Emission from the stack is being monitored online and from MoEF&CC approved lab on Bi-monthly basis. Stacks are connected online to CPCB/HSPCB server with parameters such as SO <sub>2</sub> , NO <sub>x</sub> , CO & PM.
	b) At no time, the emission level should go beyond the stipulated standards. In the event of failure of pollution control system(s) adopted by the unit, the respective unit should not be restarted until; the control measures are rectified to achieve the desired efficiency.	Complied.
2	a) Adequate ambient air quality monitoring stations (SPM, SO <sub>2</sub> , NO <sub>x</sub> , HC and Benzene) should be set up in the petrochemical complex in consultation with SPCB, based on occurrence of maximum ground level concentration and down-wind direction of wind. The monitoring network must be decided based on modeling exercise to represent short term GLCs	Complied. Out of 9, CAAQMS two Ambient Air Monitoring stations set up in PX-PTA plant area. The location of these is finalized after consultation with HSPCB. These CAAQMS stations are connected to the CPCB AAQMS server.
	b) Continuous on-line stack monitoring equipment should be installed for measurement of SO <sub>2</sub> and NO <sub>x</sub> .	Complied. PX-PTA stacks are connected online to CPCB/SPCB server with parameters such as SO <sub>2</sub> , NO <sub>x</sub> , CO & PM.
3	a) Fugitive emission of HC from product storage tank yard, crude oil tanks etc. must be regularly monitored.	Complied. Fugitive emission monitoring for Hydrocarbon and Benzene is being carried out through approved agency.
	b) Sensors for detecting HC leakage should also be provided at strategic locations.	Complied. Hydrocarbon leak detectors installed at strategic locations.
4	a) Liquid effluent generated from the petrochemical complex should be treated comprehensively to conform to the load based standards and concentration limits prescribed under EPA rules (MINAS standards).	For Treating liquid effluent generated from Petrochemical complex separate ETP has been installed. PTA-ETP treated effluent meets the petrochemical MINAS. PTA ETP envisages Aerobic and Anaerobic Biological systems for treatment and the final effluent meets Petrochemical MINAS.
	b) The BOD of the treated effluent should not exceed 30 mg/l at any point of time.	BOD is being maintained below 30 mg /l.
	c) The Company must undertake maximum recycling/ reusing of the treated effluent for process purposes in addition to green belt development and also adopt adequate water conservation measures.	Process Licensor M/s INVISTA has confirmed that "Recycle & Reuse" of PTA treated effluent is not feasible. PX-PTA has permission for discharge of 255m <sup>3</sup> /hr treated effluent from PTA-ETP to Thirana drain.



	d) As per the commitment given the total quantity of treated effluent discharged into Thirana drain should not exceed 255 m <sup>3</sup> /hr.	The discharge of PTA-ETP treated effluent into Thirana Drain is being restricted well below 255 m <sup>3</sup> /hr.
	e) The effluent quality at the discharge point must also be monitored periodically by an independent agency authorized by CPCB and report of the independent agency should be submitted to Ministry's Regional office at Chandigarh/CPCB/ HSPCB.	Effluent Quality of PTA ETP is monitored monthly by an MOEF&CC authorized independent agency and report is being submitted to HSPCB (Monthly) and to RO MoEF&CC (Six-Monthly).
	f) The Company shall fully abide by the Hon'ble Supreme Court orders on regulation of industrial discharge to River Yamuna and it's canals / drains.	Complied.
5	a) Guard ponds of sufficient holding capacity should be provided to contain the effluent during process disturbances and or ETP failure.	Guard ponds of sufficient holding capacity are provided.
	b) The concerned units must be shut down in cases of effluent quality exceeding the prescribed limits.	Noted
	<b>General Conditions</b>	
<b>SN</b>	<b>Conditions stipulated in the EC letter</b>	<b>Status/Action plan</b>
1	The project authority must adhere to the stipulations made by Haryana State Pollution Control Board and State Government.	Complied
2	No expansion or modification of the plant should be carried out without prior approval of Ministry.	Noted
3	Data on ambient air quality and stack emissions as well as fugitive emissions of HC and Benzene from product storage tanks yard, naphtha tanks etc. must be regularly monitored and submitted to CPCB/ SPCB once in 3- months and to Ministry (Regional Office, Chandigarh) one in 6-months.	Complied. Mentioned reports are being sent to MOEF&CC once in 6 months and to HSPCB on monthly basis. Stack analyzers are connected online with CPCB/HSPCB server.
4	The effluent quality before and after treatment should be regularly monitored. The frequency of monitoring and number of influent and effluent quality monitoring stations should be set up in consultation with the State PCB. The monitored data should be submitted to CPCB/ SPCB once in 3-months and to Ministry (Regional Office, Chandigarh) once in 6-months.	Complied Influent and Effluent quality is being monitored at various stages of Effluent Treatment Plants also Final Treated Effluent Quality parameters (pH, BOD, COD & TSS) also connected online to CPCB/HSPCB server. Mentioned reports are being submitted to MOEF&CC once in 6 months and to HSPCB on monthly basis
5	Handling, manufacturing, storage and transportation of hazardous chemicals should be carried out in accordance with the Manufacture, Storage & Import of Hazardous chemicals Rules, 1989, as amended in 1991. Permissions from State and Central nodal agencies in this regard must be obtained.	Complied
6	Hazardous wastes, if any, must be handled and disposed as per Hazardous waste (Management and Handling) Rules, 1989. Authorization from State Pollution Control Board in this regard must be obtained.	Complied Authorization for Hazardous Waste has been obtained from HSPCB which is valid up to 30.09.2028.

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7	Adequate provisions for infrastructure facilities such as water supply, fuel, sanitation etc. should be ensured for construction workers during the construction phase so as to avoid felling of trees and pollution of water and the surroundings.	Complied.												
8	The overall noise levels in and around the plant area should be kept well within the standards (85dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz 75 dBA (day time) and 70 dBA (night time).	Complied. Silencers are provided on compressor discharge, acoustic leggings on turbo generators & ejectors and acoustic chambers at the burners. The ambient noise level meets the standards.												
9	Occupational Health Surveillance of the workers should be done on regular basis and records maintained.	Complied												
10	The project proponent shall also comply with all the environmental protection measures and safeguards recommended in the EIA/EMP and risk analysis report.	Complied												
11	The project proponent should have a scheme for social upliftment in the surrounding villages with reference to contribution in road construction ,education of children festivals, health centers, sanitation facilities, drinking water supply, community awareness and employment to local people especially the displaced people whenever and wherever possible both for technical and non-technical jobs.	Complied Social upliftment and community development has been properly taken care as per IOCL's Corporate Social Responsibility Policy through following CSR activities. – Promoting Sanitation – Environment Sustainability/ Renewable Energy Sources – Rural Development/ Promoting Preventive Healthcare/ Promotion of Sports – Promoting Education – Enhancement of Vocational Skills – Empowering Women – Welfare of Underprivileged												
12	A separate environmental management cell with full fledged laboratory facilities to carry out various management and monitoring functions should be set up under the control of senior executive.	Complied Separate environment management cell is in place.												
13	The company must obtain ISO-14000 certification within a time frame of 5 years or so after the commissioning.	ISO-14000 certification has been obtained. Complied												
14	The funds earmarked for the environmental protection measures should not be diverted for any other purpose and year-wise expenditure should be submitted to this Ministry (Regional Office, Chandigarh/CPCB/SPCB)	Implemented. Year-wise expenditure: (INR in Lakhs) <table><tr><th colspan="2">FY:2022-23</th><th colspan="2">FY:2023-24</th></tr><tr><th>Recurring</th><th>Non-recurring</th><th>Recurring</th><th>Non-recurring</th></tr><tr><td>3809.3</td><td>109.6</td><td>3378.2</td><td>62.9</td></tr></table>	FY:2022-23		FY:2023-24		Recurring	Non-recurring	Recurring	Non-recurring	3809.3	109.6	3378.2	62.9
FY:2022-23		FY:2023-24												
Recurring	Non-recurring	Recurring	Non-recurring											
3809.3	109.6	3378.2	62.9											
15	Six monthly status reports on the project vis-à-vis environmental measures should be submitted to this Ministry (Regional Office, Chandigarh/ CPCB/SPCB.	Complied. Six monthly compliance reports along with monitoring data are being submitted.												

16	The implementation of the project vis-à-vis environmental action plans will be monitored by Ministry's Regional Office at Chandigarh/ State Pollution Control Board/ Central Pollution Control Board. A six monthly compliance status report should be submitted to monitoring agencies.	Will be adhered to.
17	The project proponent should advertise in at least two local newspaper widely circulated in the region around the project, one of which shall be in the vernacular language of the locality concerned informing that the project has been accorded environmental clearances by the Ministry and copies of the clearance letter are available with the State Pollution Control Board/ Committee and may also be seen at Website of the Ministry and Forests at <a href="http://www.envfor.nic.in">http://www.envfor.nic.in</a>	Complied
18	The Project Authorities should 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 start of land development work.	Complied



**COMPLIANCE TO ENVIRONMENTAL CLEARANCE STIPULATIONS FROM MOEF FOR MS  
QUALITY UPGRADATION PROJECT AT PANIPAT REFINERY BY IOCL- J-11011/9/2001-  
IA. II (I) DATED 06.12.2001**

SN	EC Conditions	Compliance Status
1.	The company shall ensure strictly implementations / Compliance of the terms and conditions mentioned vide Ministry's letter no. J.11011/60/2000-IA II dated 9 <sup>th</sup> April, 2001.	<b>Complied</b> (Stipulations are being strictly adhered for 6 MMTPA EC condition).
2.	The company shall also ensure that total SO <sub>2</sub> emission from the Panipat Refinery (Including expansion and MS Quality Improvement Project) will not exceed 1000 kg/hr.	<b>Complied</b> SO <sub>2</sub> emission from the Panipat Refinery (including expansion and MS Quality Improvement Project) is well within the limit.
3.	The company shall comply with all recommendations made by Haryana SPCB vide consent order dated 24.01.2001.	<b>Complied.</b>
4.	The company shall comply with all recommendations made by EMP and risk Analysis reports.	<b>Complied.</b>
5.	The implementation of the project vis-à-vis environmental action plans will be monitored by Ministry's Regional Office at Chandigarh / State Pollution Control Board / Central Pollution Control Board. A six monthly compliance status report should be submitted to monitoring agencies.	<b>Complied.</b> Six monthly compliance reports along with monitoring data are submitted as stated.
6.	The project proponent should advertise in at least two local newspapers widely circulated in the region around the project, one of which shall be in the vernacular language of the locally concerned informing that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the State Pollution Control Board / Committee and may also be seen at Website of the Ministry and Forests at <a href="http://envfor.nic.in">http://envfor.nic.in</a> the advertisement should be made within 7 days from the date of issue of the clearance letter and a copy of the same should be forwarded to the Ministry's Regional Office.	<b>Complied.</b>
7.	The project authorities should 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 start of land development work.	<b>Complied.</b>

**Modification in Plant Layout of Paraxylene and Purified Terephthalic Acid (PX/PTA) Project within Panipat Refinery Complex and Integrated with Panipat Refinery (PR) and Panipat Refinery Expansion Project (PREP) by M/s IOCL – Reg. Environmental Clearance - J.11011/52/2000-IA II (I) dated 20.01.2003**

SN	EC Conditions	Compliance Status
1	The company shall ensure strict implementation / compliance to the stipulations made by MOEF vide OM no. J-11011/60/2000-IA-II dated 9 <sup>th</sup> April, 2001 for expansion of Panipat Refinery from 6 MMTPA to 12 MMTPA and J-11011/52/2000-IA-II dated 30 <sup>th</sup> April, 2001 for integrated Paraxylene and Purified Terephthalic acid project at Panipat by M/s IOCL.	Complied.
2	Total SO <sub>2</sub> emission after integration of PX PTA project with PR/PREP shall not exceed 1275 kg/hr (i.e. 1000kg/hr. for PREP and 275 kg/hr from the proposed PX/PTA/CPP Project.)	SO <sub>2</sub> emission is well within the limit. (Actual SO <sub>2</sub> emission from the refinery is in the range of 800-900 kg/hr and from PX-PTA is in the range of 150-200 kg/hr)
3	As per the commitment given, the total quantity of treated effluent shall not exceed 255m <sup>3</sup> /hr from the proposed integration project.	Total quantity of treated effluent discharged into Thirana Drain is maintained well below 255m <sup>3</sup> /hr.
4	The company shall develop green belt in an area of 75 acres as per the original plan in the PX-PTA project area.	Complied.
5	The project authorities shall also comply with all the environmental protection measures and safeguards recommended in the EIA /EMP and risk analysis report submitted while seeking environmental clearance for the PREP and PX/PTA and PX/PTA/ PR project.	Complied.
6	As per the recommendations made in the Risk assessment study for the composite facility i.e. PX/PTA/PREP and associated facilities carried out by M/s KLG-TNO Safety Technology Ltd., the various elements of safety management system should be reviewed and updated keeping in view the new facilities added to the Refinery Complex. These include: Process and facilities information and documentation; Process Hazard Analysis; Operation Procedures; Inspection and Maintenance and Onsite Emergency Management Plan.	Various elements of Safety Management System (SMS) has been reviewed and updated keeping in view the new facilities added. On-site Disaster Management Plan based on this Risk Analysis is also prepared which is accredited from PNGRB approved Third Party Inspection agency.
7	The project authorities must adhere to the stipulations made by the HSPCB for the PREP, PX/PTA projects and NOC granted for the installation of Captive Power Plant.	Complied.



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**COMPLIANCE TO ENVIRONMENTAL CLEARANCE STIPULATIONS FROM MOEF FOR EXPANSION OF PANIPAT REFINERY (FROM 12 MMTPA TO 15 MMTPA) AND SETTING UP OF INDALIN\* UNIT AT PANIPAT REFINERY COMPLEX OF IOCL, PANIPAT REFINERY HARYANA J-11011/7/2004-IA. II (I) dated 09.08.2004**

S N	EC Conditions	Compliance Status
1.	The company shall ensure strict implementation / compliance to the stipulations made by MOEF vide OM no. J-11001/60/2000-IA-II dated 9 <sup>th</sup> April, 2001 for expansion of Panipat Refinery from 6 MMTPA to 12 MMTPA	<b>Complied</b>
2.	The gaseous emissions (SO <sub>2</sub> , NO <sub>x</sub> and HC, Benzene) from the various process units should conform to the standards prescribed under Environment (Protection) Rules, 1986 or norms stipulated by the SPCB whichever is more stringent. At no time, the emission level should go beyond the stipulated standards. In the event of failure pollution control system(s) adopted by the unit, the respective unit should not be restarted until the control measures are rectified to achieve the desired efficiency.	<b>Complied.</b>  Emission from the stack is being monitored online and from approved lab on bi-monthly basis. All stacks are connected online to CPCB / HSPCB server for parameters such as SO <sub>2</sub> , NO <sub>x</sub> , CO & PM.  Gaseous emission from various process units meets the prescribed standards.
3.	Adequate ambient air quality monitoring stations, (SPM, SO <sub>2</sub> , NO <sub>x</sub> and HC, Benzene) should be set up in the refinery complex in consultation with SPCB, based on occurrence of maximum ground level concentration and down-wind direction of wind. The monitoring network must be decided based on modeling exercise to represent short term GLCs. Continuous on-line stack monitoring equipment should be installed for measurement of SO <sub>2</sub> and NO <sub>x</sub> . Data on VOC should be monitored and submitted to the SPCB / Ministry.	9 nos. CAAQMS (5 nos. in Refinery, 2 nos. in Panipat city, 1 no. each in Refinery township and Polishing Pond area) are in operation. These were set up in consultation with HSPCB. Also mobile van for ambient air quality monitoring is in place. All CAAQMS are connected to CPCB AAQMS server.  For all stacks: SO <sub>2</sub> , CO, PM & NO <sub>x</sub> analyzers are available and connected with CPCB server.  Fugitive emission monitoring for Hydrocarbon and benzene is being carried out through approved agency.  All reports are submitted to HSPCB as stated.
4.	Fugitive emission of HC from product storage tank yard, crude oil tanks etc. must be regularly monitored. Sensors for detecting HC leakage should also be provided at strategic locations.	Fugitive emission monitoring for Hydrocarbon and Benzene for product storage tanks and crude oil storage tanks is being carried out through approved agency.  Hydrocarbon detectors have been provided at strategic locations.

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S N	EC Conditions	Compliance Status
5.	<p>The company shall also ensure that the total SO<sub>2</sub> emissions from the Panipat Refinery after expansion shall not exceed i.e. 1000 kg/hr. The company shall install an additional Sulphur Recovery Unit (225 MT/day capacity) with 99.9% efficiency and the entire gas generated should be amine treated to reduce the SO<sub>2</sub> emissions level from the Refinery.</p>	<p>The total SO<sub>2</sub> emission of Panipat Refinery is within the limit i.e. 1000 kg/hr as mentioned.</p> <p>Panipat Refinery has 5 nos. Sulphur Recovery Units (SRUs) as detailed below and 4 (99.9 % recovery efficiency) out of 5 units are in operation:</p> <ul style="list-style-type: none"> <li>• 1 no. SRU: 99% efficiency ,1X115 MT/day capacity</li> <li>• 4 no. SRUs: 99.9% efficiency ,4X225 MT/day capacity</li> </ul>
6.	<p>As per the commitment given, there should be zero effluent discharge due to the proposed expansion.</p> <p>The company should ensure that there will be no discharge of treated effluent into Thirana Drain and the treated effluent from the refinery is not discharged along with the treated effluent from PX-PTA plant.</p> <p>The entire treated waste water should be recycled for reuse in the plant operation and greenbelt development so as to maintain zero discharge. Further, the liquid effluent generated from the Refinery should be treated comprehensively to conform to the load based standards and concentration limits prescribed under Environment (Protection) Act, 1986 Rules.</p>	<p>There is no discharge of treated effluent from Refinery operations.</p> <p>ETP-1 &amp; ETP-2 treated effluent meets Refinery MINAS. These treated effluents are re-used as a feed to RO plant and makeup to Cooling Towers.</p> <p>PTA-ETP treated effluent meeting Petrochemical MINAS is discharged into Thirana Drain as per Consent-To-Operate /approvals from MOEFCC, HSPCB &amp; Irrigation Department.</p>
7.	<p>The IOCL shall ensure installation of continuous flow measurement devices so that only the permitted quantity of treated effluent from PX-PTA plant (255 m<sup>3</sup>/hr.) is discharged. Further, IOCL shall make all efforts to recycle and reuse the treated effluent from PX-PTA plant after commencing of the unit.</p>	<p>Flow meters were installed at the time of setting up PTA-ETP. At no point of time discharge of treated effluent is exceeding the prescribed limit of 255 m<sup>3</sup>/hr.</p> <p>Process Licensor M/s INVISTA has confirmed that "Recycle and Reuse" of PTA treated effluent is not feasible.</p> <p>PX-PTA has permission for discharge of 255m<sup>3</sup>/hr treated effluent from PTA-ETP to Thirana drain.</p>
8.	<p>Additional water requirement shall not exceed 400 m<sup>3</sup>/hr. The total quantity of effluent generation should not exceed 1280 m<sup>3</sup>/hr. as indicated in the Environment Management Plan. The treated effluent should be reused/ recycled to achieve zero discharge.</p>	<p>The total allowable withdrawal of fresh water as per previous EC was 3058.21 m<sup>3</sup>/hr (as per EC of 6-12 MMTPA expansion). Adding the additional quantity of 400 m<sup>3</sup>/hr., the overall total allowable water quantity is 3458.21 m<sup>3</sup>/hr. Presently, fresh water consumption of the Refinery is well below the above mentioned limits.</p> <p>Total quantity of effluent generation remains &lt;1100 m<sup>3</sup>/hr.</p> <p>ETP-1 &amp; ETP-2 treated effluent meets MINAS. These treated effluents from Refinery operation are completely re-used as a feed to RO plant and as a makeup to Cooling Towers,</p> <p>PTA-ETP treated effluent meeting</p>



S N	EC Conditions	Compliance Status
		Petrochemical MINAS is discharged into Thirana Drain as per approvals/ Consent to Operate from MOEFCC, HSPCB, and Irrigation Department.
9.	Green belt of adequate width and density should be provided to mitigate the effects of fugitive emissions all around the plant. The bio-sludge from the ETP should be used as manure in the green belt development. Company shall develop greenbelt in consultation with DFO as per CPCB guidelines.	Greenbelts with adequate width & density were already provided. These greenbelts were developed in consultation with the District Forest Dept. Bio-sludge from ETP is being used as manure after converting it into semi solid form.
10.	The IOCL shall make efforts to sell petroleum coke (0.9 MMTPA) to organized industries having consent from the concerned State Pollution Control Board. Further, the Pet-coke from the Delayed Coker Unit should be conveyed to storage area by pipe conveyer system. The company should ensure to prevent seepage in Pet-coke stockpile / storage area to prevent soil and ground water pollution.	The Refinery gives Pet-coke to a separate IOCL division called Marketing Division which sells the same to consented/registered industries.  Pet-coke is conveyed to storage area by pipe conveyer system.
11.	The oily sludge generated from the refinery operation should be subjected to melting pit treatment for recovery of oil. The recovered oil should be recycled. The residual oily sludge should be disposed off in the HDPE lined pits.	The raw oily sludge generated from the Refinery is subjected to Oil recovery/Melting Pit treatment for recovery of oil. The recovered oil is recycled back with crude oil for processing. - The residual sludge is disposed-off through confined Bio-remediation. - Part of the sludge is processed in Coker unit.
12.	The company should adopt mounded storage for LPG. The project authorities shall also comply with all the environmental protection measures and safeguards recommended in the EIA/EMP and risk analysis report.	The Mounded Bullets are in operation.
13.	Occupational Health Surveillance of the workers should done on a regular basis and records maintained as per the Factories Act.	The Refinery has a full-fledged Occupational Health Centre (OHC) in operation. The OHC carries out health surveillance of the workers on a regular basis and records are maintained.
<b>General conditions</b>		
1.	The project authorities must strictly adhere to the stipulations made by the Haryana State Pollution Control Board and the State Government.	Complied
2.	No further expansion or modernization in the plant should be carried out without prior approval of the Ministry of Environment & Forests.	Noted.

S N	EC Conditions	Compliance Status												
3.	At no time, the emissions should go beyond the prescribed standards. In the event of failure of any pollution control system adopted by the units, the respective unit should be immediately put out of operation and should not be restarted until the desired efficiency has been achieved.	Complied. Emission from the stack is being monitored online and from approved lab on bi-monthly basis. All stacks are connected online to CPCB/HSPCB server with parameters such as SO <sub>2</sub> , NO <sub>x</sub> , CO & PM.												
4.	The overall noise levels in and around plant area should be kept well within the standards (85 dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz 75 dBA (day time) and 70 dBA (night time).	The Refinery has provided silencers on compressor discharge, acoustic leggings on turbo generators & ejectors and acoustic chambers at the burners.  The ambient noise level meets the standards.												
5.	The project authorities must strictly comply with the provisions made in Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 as amended in 2000 for handling of hazardous chemicals etc. Necessary approvals from Chief Controller of Explosives must be obtained before commission of the project.	Complied.												
6.	The project authorities must strictly comply with the rules and regulations with regard to handling and disposal of hazardous wastes in accordance with the Hazardous Waste (Management & Handling) Rules, 2003. Authorization from the State Pollution Control Board must be obtained for collections / treatment / storage / disposal of hazardous waste.	Complied.												
7.	The project authorities will provide adequate funds both recurring and non-recurring 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 should not be diverted for any other purposes.	Implemented. Year-wise expenditure:(INR in Lakhs) <table><tr><th colspan="2">FY:2022-23</th><th colspan="2">FY:2023-24</th></tr><tr><th>Recurring</th><th>Non-recurring</th><th>Recurring</th><th>Non-recurring</th></tr><tr><td>3809.3</td><td>109.6</td><td>3378.2</td><td>62.9</td></tr></table>	FY:2022-23		FY:2023-24		Recurring	Non-recurring	Recurring	Non-recurring	3809.3	109.6	3378.2	62.9
FY:2022-23		FY:2023-24												
Recurring	Non-recurring	Recurring	Non-recurring											
3809.3	109.6	3378.2	62.9											
8.	The stipulated conditions will be monitored by the Regional of this Ministry at Chandigarh / Central Pollution Control Board. A six monthly compliance report and the monitored data should be submitted to them regularly.	Six monthly compliance reports on EC conditions are submitted along with various monitoring reports as stated.												



S N	EC Conditions	Compliance Status
9.	The Project Proponent should inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the State Pollution Control Board / Committee and may also be seen at Website of the Ministry of Environment and Forests at <a href="http://www.envfor.nic.in">http://www.envfor.nic.in</a> This should 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 the region of which one shall be in the vernacular language of the locality concerned and a copy of the same should be forwarded to the Regional Office.	Complied.
10.	The project authorities should 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.	Complied

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**ENVIRONMENTAL CLEARANCE STIPULATIONS FROM MOEFCC FOR BS-VI FUEL QUALITY UP-GRADATION AND EXPANSION OF PX/PTA PLANT AT PANIPAT REFINERY & PETROCHEMICAL COMPLEX (PRPC), PANIPAT (HARYANA) BY M/SINDIAN OIL CORPORATION LIMITED - ENVIRONMENTAL CLEARANCE - REG.**

(Ref. No. J-11011/177/2016-IA- II (I) dated 26.03.2018)

Sl. No.	EC Conditions	Compliance Status
(i)	Consent to Establish/Operate for the project shall be obtained from the State Pollution Control Board as required under the Air (Prevention and Control of Pollution) Act, 1981 and the Water (Prevention and Control of Pollution) Act, 1974.	Consent to Operate for BS-VI facilities including Panipat Refinery & PX-PTA Petrochemical Complex has been received from HSPCB.
(ii)	As already committed by the project proponent, Zero Liquid Discharge shall be ensured and no waste/treated water shall be discharged outside the premises.	There is no discharge of treated effluent from Refinery operations.  ETP-1 & ETP-2 treated effluent meets Refinery MINAS. These treated effluents are re-used as a feed to RO plant and makeup to Cooling Towers.  PTA-ETP treated effluent meeting Petrochemical MINAS is discharged into Thirana Drain as per Consent-To-Operate/approvals from MOEFCC, HSPCB & Irrigation Department.
(iii)	In case of PX/PTA expansion project, there shall not be any increase in effluent discharge and the treated effluent of 255 cum/hr shall continue to be discharged to the existing Thirana Drain.	There will be no increase in treated effluent discharge into Thirana Drain post PX-PTA capacity expansion project.
(iv)	Necessary authorization required under the Hazardous and Other Wastes Management Rules, 2016 shall be obtained and the previous contained in the Rules shall be strictly adhered to.	Authorization under Hazardous and Other Wastes Management Rules, 2016 received from HSPCB on 16.06.2020 which is valid upto 30.09.2023.
(v)	Total SO <sub>2</sub> emissions from the Refinery (including BS-VI Upgradation project) shall not exceed 1100 kg/hr whereas, for the PX/PTA plant after expansion, total SO <sub>2</sub> emissions shall not exceed 375 kg/hr. Accordingly, total SO <sub>2</sub> emissions from the Refinery Complex shall be limited to 1475 kg/hr.	SO <sub>2</sub> emissions from the Refinery (including BS-VI Up gradation project) is within 1100 kg/hr. SO <sub>2</sub> emissions from after PX-PTA expansion project is well below 375 Kg/hr. Total SO <sub>2</sub> emission from refinery complex is well below 1475 Kg/hr.
(vi)	National Emission Standards for Organic Chemicals Manufacturing Industry issued by the Ministry vide G.S.R. 608(E) dated 21 <sup>st</sup> July, 2010 and amended from time to time shall be followed.	Complied.
(vii)	To control source and the fugitive emissions, suitable pollution control devices shall be installed with different stacks (attached to DHD, HGU, Prime G) to meet the prescribed norms and /or the NAAQS. The gaseous emissions shall be dispersed through stacks of adequate height as per CPCB / SPCB guidelines.	For BS-VI fuel quality up gradation project- Complied. Post commissioning of the PX-PTA capacity expansion project, same shall be ensured.



Sl. No.	EC Conditions	Compliance Status
(viii)	Total fresh water requirement shall not exceed 354 m <sup>3</sup> /hr (8500 KLD) to be met from Munak Regulator. Necessary permission in this regard shall be obtained from the concerned regulatory authority.	Complied
(ix)	Process effluent/any waste water shall not be allowed to mix with storm water. Storm water drain shall be passed through guard pond.	Complied
(x)	Hazardous chemicals shall be stored in tanks, tank farms, drums, carboys etc. Flame arresters shall be provided on tank farm, and solvent transfer to be done through pumps.	Complied
(xi)	Process organic residue and spent carbon, if any, shall be sent to cement industries. ETP sludge, process inorganic & evaporation salt shall be disposed off to the TSDF. The ash from boiler shall be sold to brick manufacturers/cement industry.	Complied.  Being mixed fuel (Liquid +Gas) firing in the Boiler, there is no ash generation.
(xii)	The Company shall strictly comply with the rules and guidelines under Manufacture, Storage and Import of Hazardous Chemicals (MSHC) Rules, 1989 as amended time to time. All transportation of Hazardous Chemicals shall be as per the Motor Vehicle Act (MVA), 1989.	Complied
(xiii)	Fly ash should be stored separately as per CPCB guidelines so that it should not adversely affect the air quality, becoming air borne by wind or water regime during rainy season by flowing along with the storm water. Direct exposure to workers to fly ash & dust should be avoided.	Not Applicable
(xiv)	The company shall undertake waste minimization measures as below: (a) Metering and control of quantities of active ingredients to minimize waste. (b) Reuse of by-products from the process as raw material or as raw material substitutes in other processes. (c) Use of automated filling to minimize spillage. (d) Use of Close Feed system into batch reactors. (e) Venting equipment through vapour recovery system. (f) Use of high pressure hoses for equipment clearing to reduce wastewater generation.	Complied
(xv)	The green belt of 5-10 m width shall be developed in more than 33% of the total project area, mainly along the plant periphery, in downward wind direction, and along road sides etc. Selection of plant species shall be as per the CPCB guidelines in consultation with the State Forest Department.	Complied
(xvi)	At least 2.5% of the total project cost shall be allocated for Enterprise Social Commitment and item-wise details along with time bound action plan shall be prepared and submitted to the Ministry's Regional Office.	Complied

Sl. No.	EC Conditions	Compliance Status
(xvii)	For the DG sets, emission limits and the stack height shall be in conformity with the extant regulations and the CPCB guidelines. Acoustic enclosure shall be provided to DG set for controlling the noise pollution.	Complied
(xviii)	The unit shall make the arrangement for protection of possible fire hazards during manufacturing process in material handling. Fire fighting system shall be as per the norms.	Complied
(xix)	Continuous online (24X7) monitoring system for stack emission shall be installed for measurement of flue gas discharge and the pollutants concentration, and the data to be transmitted to the CPCB and SPCB server.  For online continuous monitoring of effluent, the unit shall install web camera with night vision capability and flow meters in the channel/drain carrying effluent within the premises. In case of the treated effluent to be utilized for irrigation/gardening, real time monitoring system shall be installed at the ETP outlet.	Stack analyzers are installed and connected to CPCB/HSPCB server.  Complied
(xx)	Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.	Complied
<b>General Conditions</b>		
(i)	The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board, Central Pollution Control Board, State Government and any other statutory authority.	Complied
(ii)	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forest and Climate Change. In case of deviations or alternations 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.	Noted
(iii)	The locations of ambient air quality monitoring stations shall be decided in consultation with State Pollution Control Board (SPCB) and it shall be ensured that at least one station each is installed in the upwind and downwind direction as well as where maximum ground level concentrations are anticipated.	Complied 2 nos. of additional CAAQMS under BS-VI fuel quality up-gradation project is installed in addition to existing 7 nos. of CAAQMS. All CAAQMS are connected to CPCB AAQMS server.
(iv)	The National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No. 826 (E) dated 16 <sup>th</sup> November, 2009 shall be followed.	Complied

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Sl. No.	EC Conditions	Compliance Status												
(v)	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 Environmental (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).	Complied Acoustic hoods, silencers and enclosures are provided on all sources of noise generation.												
(vi)	The Company shall harvest rainwater from the roof tops of the building and storm water drains to recharge the ground water and use the same water for the process activities of the project to conserve fresh water.	Complied. Rain water harvesting pits are provided to collect rain water from roof tops and storm water drains to recharge the ground water.												
(vii)	Training shall be imparted to all employees on safety and health aspects of chemicals handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis. Training to all employees on handling of chemicals shall be imparted.	Complied												
(viii)	The company shall also comply with all the environmental protection measures and safeguards proposed in the documents submitted to the Ministry. All the recommendations made in the EIA/EMP in respect of environmental management and risk mitigation measures relating to the project shall be implemented.	Complied												
(ix)	The company shall undertake all relevant measures for improving the socio-economic conditions of the surrounding area. ESC activities shall be undertaken by involving local villages and administration.	Complied												
(x)	The company shall undertake eco-developmental measures including community welfare measures in the project area for the overall improvement of the environment.	Complied												
(xi)	The company shall earmark sufficient funds towards capital cost and recurring cost per annum to implement the conditions stipulated by the Ministry of Environment, Forest and Climate Change as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so earmarked for environment management/pollution control measures shall not be diverted for any other purpose.	<b>Implemented</b> Year-wise expenditure:(INR in Lakhs) <table><tr><th colspan="2">FY:2022-23</th><th colspan="2">FY:2023-24</th></tr><tr><th>Recurring</th><th>Non-recurring</th><th>Recurring</th><th>Non-recurring</th></tr><tr><td>3809.3</td><td>109.6</td><td>3378.2</td><td>62.9</td></tr></table>	FY:2022-23		FY:2023-24		Recurring	Non-recurring	Recurring	Non-recurring	3809.3	109.6	3378.2	62.9
FY:2022-23		FY:2023-24												
Recurring	Non-recurring	Recurring	Non-recurring											
3809.3	109.6	3378.2	62.9											
(xii)	A copy of the clearance letter shall be sent by the project proponent to concerned 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.	Complied												



Sl. No.	EC Conditions	Compliance Status
(xiii)	The project proponent shall also submit six monthly reports on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored data (both in hard copies as well as by e-mail) to the respective Regional Office of MoEF&CC, the respective Zonal Office of CPCB and SPCB. A copy of Environmental Clearance and six monthly compliance status report shall be posted on the website to the company.	Six monthly EC compliance report is submitted as stated. It is also posted on the website of the company.
(xiv)	The environmental statement for each financial year ending 31 <sup>st</sup> March in Form-V as is mandated shall be submitted 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 clearance conditions and shall also be sent to the respective Regional Offices of MoEF&CC by e-mail.	Environment statement is submitted to the statutory bodies annually.
(xv)	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/Committee and may also be seen at Website of the Ministry at <a href="http://moef.nic.in">http://moef.nic.in</a> . 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 the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional Office of the Ministry.	Complied and informed
(xvi)	The 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 start of the project.	Complied

**Annexure-8****ENVIRONMENTAL CLEARANCE STIPULATIONS FROM MOEFCC FOR INSTALLATION OF 100 KLPD LIGNO-CELLULOSIC 2G ETHANOL PLANT AT BAHOLI, BLOCK MADLAUDA, PANIPAT REFINERY ROAD, DISTRICT PANIPAT (HARYANA) BY M/S INDIAN OIL CORPORATION LIMITED - ENVIRONMENTAL CLEARANCE - REG.****(Ref. No. IA-J-11011/43/2018-IA- II (I) dated 13.11.2019)**

SN	EC Conditions	Compliance Status
<b>General Conditions</b>		
1.	The project authorities must strictly adhere to the stipulations made by State Pollution Control Board (SPCB), State Govt. and/or any other statutory authority.	Complied
2.	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forest and Climate Change. In case of deviations or alterations in the project proposal from those submitted to this ministry for clearance a fresh reference should be made to the ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	Approval of MoEF&CC will be obtained for future expansion, if any.
3.	The location of Ambient Air Quality Monitoring Stations shall be decided in consultation with the State Pollution Control Board and it shall be ensured that at least one stations each is installed in upwind and downwind direction as well as where maximum ground level concentrations are anticipated.	Complied. 2 nos. ambient air quality monitoring stations have been installed (One at upwind and another one at downwind direction).
4.	The Nation Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R No. 826 (E) dated 16 <sup>th</sup> November, 2009 shall be complied with.	Complied.
5.	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 source of noise generation. The ambient noise levels shall confirm to the standards prescribed under the Environment (Protection) Act, 1986 and the rules made there under.	Complied.
6.	The company shall harvest rain water from the rooftops of the buildings and storm water drains to recharge the ground water and utilize the same for different industrial operations inside the plant.	Complied, 18 nos. rain water harvesting pits (RWHP) have been installed.
7.	Training shall be imparted to all employees on safety and health aspects of chemical handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis. Training to all employees on handling of chemicals shall be imparted.	Complied
8.	The company shall comply with all the environmental protection measures and safeguards proposed in the documents submitted to the ministry. All the recommendations made in the EIA/EMP in respect of environmental management risk mitigation measures and public hearing shall be implemented.	Complied, All the Recommendations given in the EIA report and Public Hearing have been implemented.



9.	The company shall undertake all measures for improving socio-economic conditions of the surrounding area. CER activities shall be undertaken by involving local villagers, administration and other stake holders. Also eco-developmental shall be undertaken for overall improvement of the environment.	Is being done.				
10.	A separate Environmental Management Cell equipped with full fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions.	Complied. Environmental Management Cell is available with full-fledged refinery laboratory to carry out the Environmental Management and Monitoring functions.				
11.	The company shall earmark sufficient funds towards capital cost and recurring cost per annum to implement the conditions stipulated by the Ministry of Environment, Forests and Climate Change as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so earmarked for environment management/pollution control measures shall not be diverted for any other purpose.	Complied. Following funds is earmarked for environment management/Pollution control measures: <table><tr><td>Capital cost</td><td>Recurring cost</td></tr><tr><td>3507 lakhs</td><td>187 lakhs</td></tr></table>	Capital cost	Recurring cost	3507 lakhs	187 lakhs
Capital cost	Recurring cost					
3507 lakhs	187 lakhs					
12.	A copy of the clearance letter shall be sent by the project proponent to the concerned Panchayat, Zila Parishad/Municipal corporation, urban local body and local NGO, if any, from whom suggestion/representation, if any, were received while processing the proposal.	Complied				
13.	The project proponent shall also submit six monthly reports on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored data (Both in hard copy as well as by e-mail) to the respective Regional Office of MoEF&CC, the respective Zonal office of CPCB and SPCB. A copy of Environmental Clearance and six monthly compliance status reports shall be posted on the website of the company.	Complied				
14.	The environmental statement for each financial year ending 31 <sup>st</sup> March in Form-V as is mandated shall be submitted 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 Clearance conditions and shall also be sent to the respective Regional Offices of MoEF&CC by e-mail.	Complied				
15.	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/Committee and may also be seen at Website of the Ministry at <a href="http://moef.nic.in">http://moef.nic.in</a> . This shall be advertised within seven days from the date of issue of clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the Regional Office of the Ministry.	Complied				



Specific Conditions		
1.	The project proponent shall install 10 TPD 2G Ethanol demo plant for R&D purpose.	Complied
2.	Prior approval shall be obtained from the Petroleum & Explosive Safety Organization (PESO) for the site and layout plan submitted to this ministry along with the proposal for EC. In case of any changes therein post PESO approval, the proposal shall require fresh appraisal by the sectoral EAC.	Complied
3.	Necessary permission as mandated under the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981 as applicable from time to time shall be obtained from the State Pollution Control Board as required.	Complied, CTO received on 21.07.2022
4.	As already committed by the project proponent, Zero Liquid Discharge shall be ensured and no waste / treated water shall be discharged outside the premises.	Complied, ZLD is ensured and no treated water is discharged outside the premises.
5.	Sludge management plan shall be formulated and ensured.	Complied, Being non-hazardous, sludge from ETP is disposed off in landfilling.
6.	Ash management shall be ensured by utilizing for manufacturing bricks.	Complied, M/s Shree Cement and M/s Garg build solutions had been lined up for utilization of Ash in cement and bricks manufacturing respectively.
7.	Necessary authorization required under the Hazardous and Other Wastes (Management and Trans-Boundary Movement Rules ,2016 Solid Waste Management Rules ,2016 shall be obtained and the provisions contained in the Rules shall be strictly adhered to.	Hazardous waste Authorization obtained from HSPCB.
8.	To control source and the fugitive emissions, suitable pollution control devices shall be installed to meet the prescribed norms and/or the NAAQS. The gaseous emissions shall be dispersed through stack of adequate height as per CPCB/SPCB guidelines.	Complied, Stack is provided as per CPCB/SPCB guidelines.
9.	Total fresh water requirement shall not exceed 109 m <sup>3</sup> /hr., proposed to be met from Munak Regulator on Western Yamuna Canal. Prior permission shall be obtained from the concerned regulatory authority.	Complied, Permission for withdrawal of fresh water from Ministry of water resources, Haryana is taken and it is valid upto 31.03.2026.
10.	Hazardous chemicals shall be stored in tanks, tank farms, drums, carboys etc. Flame arrester shall be provided on tank farm and the solvent transfer through pumps.	Complied,
11.	Process organic residue and spent carbon, if any shall be sent to cement industries. ETP sludge, process inorganic and evaporation salt shall be disposed off to the TSDF.	Complied, Being non-hazardous, sludge from ETP is disposed off in landfilling.

*Signature*

12.	The company shall strictly comply with the rules and guidelines under Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 1989 as mentioned time to time. All transportation of Hazardous Chemicals shall be as per the Motor Vehicles Act, 1989.	Complied.
13.	The company shall undertake waste minimization measures as below:- (a) Metering and control of quantities of active ingredients to minimize waste. (b) Reuse of by-products from the process as raw materials or as raw materials substitutes in other processes. (c) Use of automatic filling to avoid spillage. (d) Use of Close Feed System into batch reactors. (e) Venting equipment through vapor recovery system. (f) Use of high pressure hoses for equipment clearing to reduce waste water generation.	Complied
14.	The green belt of 5-10 m width shall be developed in more than 33% of the total project area, mainly along the plant periphery, in downward wind direction, and along road sides etc. Selection of plant species shall be done as per the CPCB guidelines in consultation with the State Forest Department.	Complied, Green belt more than 33% of total plant area is available.
15.	All the commitments made regarding issues raised during the public hearing / consultation meeting shall be satisfactorily implemented.	All the commitments made regarding issues raised during Public Hearing have been implemented.
16.	At least 1% of the total project cost shall be allocated for Corporate Environment Responsibility (CER) and item wise details along with time bound action plan shall be prepared and submitted to the Ministry's Regional Office.	Under implementation.
17.	For the DG sets, emission limits and stack height shall be in conformity with the extant regulations and the CPCB regulations. Acoustic enclosures shall be provided to the DG set for controlling the noise pollution.	No DG sets are installed in this project.
18.	The unit shall make the arrangement for protection of possible fire hazards during manufacturing process in material handling. Fire fighting system shall be as per the norms.	Complied, Necessary firefighting equipments are provided as per recommendations made in the RRA report.
19.	Occupational Health Surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.	Complied
20.	There shall be adequate space inside the plant premises earmarked for parking of vehicles for raw materials and finished products, and no parking to be allowed outside on public places.	Complied

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21.	Storage of raw material shall be either stored in silos or in covered areas to prevent dust pollution and other fugitive emissions.	Complied
22.	Continuous online (24x7) monitoring system for stack emissions shall be installed for measurement of flue gas discharge and the pollutants concentration, and the data to be transmitted to the CPCB and SPCB server. For online continuous monitoring of effluent, the unit shall install web camera with night vision capability and flow meters in the channel /drain carrying effluent within the premises.	Stack is provided as per CPCB/SPCB guidelines. For online continuous monitoring of effluent and emission, analyzers connectivity to the CPCB and HSPCB server is under progress. Web camera and flow meter installed.

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**Annexure-9**

**ENVIRONMENTAL CLEARANCE STIPULATIONS FROM MOEFCC FOR SETTING UP 128 KL PER DAY ETHANOL PRODUCTION PLANT BY M/S INDIAN OIL CORPORATION LTD. (IOCL) IN PANIPAT REFINERY & PETROCHEMICAL COMPLEX AT PANIPAT, HARYANA - ENVIRONMENTAL CLEARANCE – REGARDING**  
**(Ref. No. J-11011/78/2018-IA- II (I) dated 25.11.2019)**

SN	EC Conditions	Compliance Status
<b>General Conditions</b>		
1.	The project authorities must strictly adhere to the stipulations made by State Pollution Control Board (SPCB), State Govt. and/or any other statutory authority.	Complied
2.	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forest and Climate Change. In case of deviations or alterations in the project proposal from those submitted to this ministry for clearance a fresh reference should be made to the ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	Approval of MoEF&CC will be obtained for future expansion, if any.
3.	The location of Ambient Air Quality Monitoring Stations shall be decided in consultation with the State Pollution Control Board and it shall be ensured that at least one stations each is installed in upwind and downwind direction as well as where maximum ground level concentrations are anticipated.	Complied. 2 nos. Air Quality Monitoring Stations have been installed.
4.	The Nation Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R No. 826 (F) dated 16 <sup>th</sup> November, 2009 shall be complied with.	Complied
5.	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 source of noise generation. The ambient noise levels shall confirm to the standards prescribed under the Environment (Protection) Act, 1986 and the rules made there under.	Complied.
6.	The company shall harvest rain water from the rooftops of the buildings and storm water drains to recharge the ground water and utilize the same for different industrial operations inside the plant.	Complied, Rain water harvesting pits are installed.
7.	Training shall be imparted to all employees on safety and health aspects of chemical handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis. Training to all employees on handling of chemicals shall be imparted.	Complied
8.	The company shall comply with all the environmental protection measures and safeguards proposed in the documents submitted to the ministry. All the recommendations made in the EIA/EMP in respect of environmental management risk mitigation measures and public hearing shall be implemented.	Complied, All the Recommendations given in the EIA report and Public Hearing have been implemented.
9.	The company shall undertake all measures for improving socio-economic conditions of the surrounding area. CER activities shall be undertaken by involving local villagers, administration and other stake holders. Also eco-developmental shall be undertaken for overall improvement of the environment.	Under implementation.
10.	A separate Environmental Management Cell equipped with full fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions.	Environmental Management Cell is available with full-fledged refinery laboratory to carry out the Environmental Management and Monitoring functions.

11.	The company shall earmark sufficient funds towards capital cost and recurring cost per annum to implement the conditions stipulated by the Ministry of Environment, Forests and Climate Change as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so earmarked for environment management/pollution control measures shall not be diverted for any other purpose.	Complied
12.	A copy of the clearance letter shall be sent by the project proponent to the concerned Panchayat, Zila Parishad/Municipal corporation, urban local body and local NGO, if any, from whom suggestion/representation, if any, were received while processing the proposal.	Complied
13.	The project proponent shall also submit six monthly reports on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored data (Both in hard copy as well as by e-mail) to the respective Regional Office of MoEF&CC, the respective Zonal office of CPCB and SPCB. A copy of Environmental Clearance and six monthly compliance status reports shall be posted on the website of the company.	Complied
14.	The environmental statement for each financial year ending 31 <sup>st</sup> March in Form-V as is mandated shall be submitted 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 Clearance conditions and shall also be sent to the respective Regional Offices of MoEF&CC by e-mail.	Complied.
15.	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/Committee and may also be seen at Website of the Ministry at <a href="http://moef.nic.in">http://moef.nic.in</a> . This shall be advertised within seven days from the date of issue of clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the Regional Office of the Ministry.	Complied
<b>Specific Conditions</b>		
1.	Necessary permission as mandated under the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981 as applicable from time to time shall be obtained from the State Pollution Control Board as required.	Complied, CTO is received on 27.07.2022
2.	Effluent of 209 cum per day shall be treated in existing Effluent Treatment Plant of Panipat Refinery and Panipat Refinery will not exceed the permissible discharge as allowed to Panipat Refinery while granting environmental clearance vide letter dated 26 <sup>th</sup> March 2018.	Complied
3.	Necessary authorization required under the Hazardous and Other Wastes (Management and Trans-Boundary Movement Rules, 2016 Solid Waste Management Rules, 2016 shall be obtained and the provisions contained in the Rules shall be strictly adhered to.	Complied
4.	To control source and the fugitive emissions, suitable pollution control devices shall be installed to meet the prescribed norms and/or the NAAQS. The gaseous emissions shall be dispersed through stack of adequate height as per CPCB/SPCB guidelines.	Complied, Adequate measures have been taken to control fugitive emissions. No furnace/boiler is installed in this project.



5.	Odour shall be prevented at the source and effective odour management scheme shall be implemented.	Complied, Monitoring of odour is done regularly and its control measures are implemented.
6.	Total fresh water requirement shall not exceed 3600 cum/day, proposed to be met from Munak Regulator on Western Yamuna Canal. Prior permission shall be obtained from the concerned regulatory authority.	Complied. Permission for withdrawal of fresh water from Ministry of water resources, Haryana is taken and it is valid upto 31.03.2026.
7.	Hazardous chemicals shall be stored in tanks, tank farms, drums, carboys etc. Flame arrester shall be provided on tank farm and the solvent transfer through pumps.	Complied,
8.	Process organic residue and spent carbon, if any shall be sent to cement industries. ETP sludge, process inorganic and evaporation salt shall be disposed off to the TSDF.	Complied
9.	The company shall strictly comply with the rules and guidelines under Manufacture, Storage and Import of Hazardous Chemicals (MSIHC) Rules, 1989 as mentioned time to time. All transportation of Hazardous Chemicals shall be as per the Motor Vehicles Act, 1989.	Complied
10.	The company shall undertake waste minimization measures as below:- (a) Metering and control of quantities of active ingredients to minimize waste. (b) Reuse of by-products from the process as raw materials or as raw materials substitutes in other processes. (c) Use of automatic filling to avoid spillage. (d) Use of Close Feed System into batch reactors. (e) Venting equipment through vapor recovery system (f) Use of high pressure hoses for equipment clearing to reduce waste water generation.	Complied
11.	The green belt of 5-10 m width shall be developed in more than 33% of the total project area, mainly along the plant periphery, in downward wind direction, and along road sides etc. Selection of plant species shall be done as per the CPCB guidelines in consultation with the State Forest Department.	Complied, Green belt more than 33% of total plant area is available.
12.	All the commitments made regarding issues raised during the public hearing / consultation meeting shall be satisfactorily implemented.	Complied
13.	At least 1% of the total project cost shall be allocated for Corporate Environment Responsibility (CER) and item wise details along with time bound action plan shall be prepared and submitted to the Ministry's Regional Office. Priority shall be given for construction/repair of the village roads.	Under implementation.



14.	For the DG sets, emission limits and stack height shall be in conformity with the extant regulations and the CPCB regulations. Acoustic enclosures shall be provided to the DG set for controlling the noise pollution.	No DG sets are installed in this project.
15.	The unit shall make the arrangement for protection of possible fire hazards during manufacturing process in material handling. Fire fighting system shall be as per the norms.	Complied. Necessary firefighting equipments are provided as per recommendations made in the RRA report.
16.	Occupational Health Surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.	Complied
17.	There shall be adequate space inside the plant premises earmarked for parking of vehicles for raw materials and finished products, and no parking to be allowed outside on public places.	Complied
18.	Continuous online (24x7) monitoring system for stack emissions shall be installed for measurement of flue gas discharge and the pollutants concentration, and the data to be transmitted to the CPCB and SPCB server. For online continuous monitoring of effluent, the unit shall install web camera with night vision capability and flow meters in the channel /drain carrying effluent within the premises.	No furnace/boiler is installed in this project.
19.	The unit shall comply with NGT order and shall not damage environment any further including ground water.	Complied
20.	The unit shall take precautionary measures for control of VOCs and shall follow CPCB guideline and norms.	Complied

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**ENVIRONMENTAL CLEARANCE STIPULATIONS FROM MOEFCC FOR PANIPAT REFINERY CAPACITY EXPANSION FROM EXISTING 15 MMTPA TO 25 MMTPA WITHIN THE EXISTING REFINERY COMPLEX, ENVIRONMENTAL CLEARANCE – REGARDING**  
**(EC Identification No. EC21A010HR142882; File No. J-11011/177/2016-IAII(I) dated 03.12.2021)**

SN	EC Conditions	Compliance Status
<b>Specific Conditions</b>		
(i).	The project shall conform to ZLD.	<b>Noted and shall be complied</b>
(ii).	The company shall comply with all the environmental protection measures and safeguards proposed in the documents submitted to the Ministry. All the recommendations made in the EIA/EMP in respect of environmental management, and risk mitigation measures relating to the project shall be implemented.	<b>Will be complied</b>
(iii).	The National Emission Standards for Petroleum Oil Refinery issued by the Ministry vide G.S.R. 186(E) dated 18th March, 2008 and G.S.R.595(E) dated 21st August, 2009 as amended from time to time, shall be followed.	<b>Noted</b>
(iv).	Volatile organic compounds (VOCs)/Fugitive emissions shall be controlled at 99.997% with effective chillers/modern technology. For emission control and management, use of FG/NG in heater as fuel, adequate stack height, use of Low NOX burners in heater & boiler, continuous stack monitoring, Sulphur recovery plant, etc. shall be installed/ensured.	<b>Will be complied</b>
(v).	Total water requirement is 1,62,864 m3/day of which fresh water requirement of 98880 m3/day will be met from Western Yamuna Canal. Necessary permission in this regard shall be obtained from the concerned regulatory authority.	<b>Will be complied</b>
(vi).	Process effluent/any wastewater shall not be allowed to mix with storm water. Storm water drain shall be passed through guard pond.	<b>Will be complied</b>
(vii).	Hazardous chemicals shall be stored in tanks, tank farms, drums, carboys etc. Flame arresters shall be provided on tank farm, and solvent transfer to be done through pumps.	<b>Will be complied</b>
(viii).	Process organic residue and spent carbon, if any, shall be sent to cement industries. ETP sludge, process inorganic & evaporation salt shall be disposed off to the TSDF.	<b>Will be complied</b>
(ix).	Fly ash should be stored separately as per CPCB guidelines so that it should not adversely affect the air quality, becoming air borne by wind or water regime during rainy season by flowing along with the storm water. Direct exposure of workers to fly ash & dust should be avoided. The ash from boiler shall be sold to brick manufacturers/cement industry.	<b>Mixed fuel (Liquid +Gas) will be fired in the Boiler; there will be no ash generation.</b>

(x).	<p>The company shall undertake waste minimization measures as below: -</p> <p>a. Metering and control of quantities of active ingredients to minimize waste.</p> <p>b. Reuse of by-products from the process as raw materials or as raw material substitutes in other processes.</p> <p>c. Use of automated filling to minimize spillage.</p> <p>d. Use of Close Feed system into batch reactors.</p> <p>e. Venting equipment through vapour recovery system.</p> <p>f. Use of high pressure hoses for equipment clearing to reduce wastewater generation.</p>	<b>Will be complied</b>
(xi).	The green belt of 5-10 m width shall be developed in the total project area, mainly along the plant periphery, in downward wind direction, and along road sides etc. The project proponent shall ensure 33% greenbelt area vis-à-vis the project area through afforestation in the degraded area. The Selection of plant species shall be as per the CPCB guidelines in consultation with the State Forest Department.	<b>Will be complied</b>
(xii).	As per the Ministry's OM dated 30.09.2020 superseding the OM dated 01.05.2018 regarding the Corporate Environmental Responsibility, and as per the action plan proposed by the project proponent to address the socioeconomic and environmental issues in the study area, the project proponent, as committed, shall provide education funds in technical training centers/ support in nearby village's schools, support in health care facilities, drinking water supply and funds for miscellaneous activities like solar street lights, battery, solar panel etc., in the nearby villages. The action plan shall to be completed within time as proposed.	<b>Will be complied</b>
(xiii).	For the DG sets, emission limits and the stack height shall be in conformity with the extant regulations and the CPCB guidelines. Acoustic enclosure shall be provided to DG set for controlling the noise pollution.	<b>Complied</b>
(xiv).	The unit shall make the arrangement for protection of possible fire hazards during manufacturing process in material handling. Firefighting system shall be as per the norms.	<b>Will be complied</b>
(xv).	Continuous online (24x7) monitoring system for stack emissions shall be installed for measurement of flue gas discharge and the pollutants concentration, and the data to be transmitted to the CPCB and SPCB server. For online continuous monitoring of effluent, the unit shall install web camera with night vision capability and flow meters in the channel/drain carrying effluent within the premises. In case of the treated effluent to be utilized for irrigation/gardening, real time monitoring system shall be installed at the ETP outlet.	<b>Will be complied</b>
(xvi).	Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.	<b>Will be complied</b>
(xvii).	Process safety and risk assessment studies shall be further carried out using advanced models, and the mitigating measures shall be undertaken/implemented accordingly.	<b>Will be complied</b>
(xviii).	The PP should improve the efficiency of ETP Plant and the water discharge should be as per prescribed CPCB Norms. They should also install 24x7 hours monitoring system (of the discharge) and the same should be connected to the server of SCPB/CPCB.	<b>Noted and will be complied.</b>



<b>General Conditions</b>		
(i).	No further expansion or modifications in the plant, other than mentioned in the EIA Notification, 2006 and its amendments, shall be carried out without prior approval of the Ministry of Environment, Forest and Climate Change/SEIAA, as applicable. 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/SEIAA, as applicable, to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	<b>Noted</b>
(ii).	The energy source for lighting purpose shall be preferably LED based, or advanced having preference in energy conservation and environment betterment.	<b>Will be complied</b>
(iii).	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 the Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).	<b>Will be complied</b>
(iv).	The company shall undertake all relevant measures for improving the socio-economic conditions of the surrounding area. CER activities shall be undertaken by involving local villages and administration and shall be implemented. The company shall undertake eco-developmental measures including community welfare measures in the project area for the overall improvement of the environment.	<b>Will be complied</b>
(v).	The company shall earmark sufficient funds towards capital cost and recurring cost per annum to implement the conditions stipulated by the Ministry of Environment, Forest and Climate Change as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so earmarked for environment management/pollution control measures shall not be diverted for any other purpose.	<b>Will be complied</b>
(vi).	A copy of the clearance letter shall be sent by the project proponent to concerned Panchayat, Zilla Parishad/Municipal Corporation, Urban local Body and the local NGO, if any, from whom suggestions/representations, if any, were received while processing the proposal.	<b>No representations received/suggestions received from these mentioned authorities while processing the proposal.</b>
(vii).	The project proponent shall also submit six monthly reports on the status of compliance of the stipulated Environmental Clearance conditions including results of monitored data (both in hard copies as well as by email) to the respective Regional Office of MoEF&CC, the respective Zonal Office of CPCB and SPCB. A copy of Environmental Clearance and six monthly compliance status report shall be posted on the website of the company.	<b>This is complied for existing refinery and will continue to do so in future.</b>
(viii).	The environmental statement for each financial year ending 31st March in Form-V as is mandated shall be submitted 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 clearance conditions and shall also be sent to the respective Regional Offices of MoEF&CC by e-mail.	<b>This is complied for existing refinery and will continue to do so in future.</b>

(ix).	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/Committee and may also be seen at Website of the Ministry and at <a href="https://parivesh.nic.in/">https://parivesh.nic.in/</a> . 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 the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the concerned Regional Office of the Ministry.	<b>Complied and informed.</b>
(x).	The 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 start of the project.	<b>Will be complied</b>
(xi).	This Environmental clearance is granted subject to final outcome of Hon'ble Supreme Court of India, Hon'ble High Court, Hon'ble NGT and any other Court of Law, if any, as may be applicable to this project.	<b>Noted</b>





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Website : www.aalkundli.com

## TEST CERTIFICATE

Page 1 of 1

Issued To:	M/s Indian Oil Corporation Limited (Refineries Division) Panipat Naphtha Cracker, Panipat (Haryana)	Report No.	AAL ENV-20240102015, AAL ENV-20240105016, AAL ENV-20240109007, AAL ENV-20240112005, AAL ENV-20240116014, AAL ENV-20240119016, AAL ENV-20240123011, AAL ENV-20240130005
Sample Description:	Ambient Air Quality Monitoring	Date of Reporting:	05/02/2024
Work order Item:	Panipat Refinery (Table-D)	Sampling Method:	IS:5182 (Part-14)-2000
Sampling Location:	Roof of Administration Building	Sampling Duration:	24:00 Hrs
		Sampling Done By:	AAL

## TEST RESULTS

Test Parameters → Date of Sampling →	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	PM <sub>10</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	Cd (µg/m <sup>3</sup> )	As (µg/m <sup>3</sup> )	Ni (µg/m <sup>3</sup> )	B(a)P (µg/m <sup>3</sup> )
01/01/2024	83.8	173.5	10.9	23.4	0.85	32.5	25.9	ND	1.02	ND	ND	ND
04/01/2024	87.6	189.6	12.5	22.7	0.93	30.2	28.1	ND	1.14	ND	ND	ND
08/01/2024	81.2	196.3	10.4	24.9	0.82	27.4	25.1	ND	1.05	ND	ND	ND
11/01/2024	90.3	205.8	12.5	22.3	1.25	29.6	22.8	ND	1.12	ND	ND	ND
15/01/2024	65.2	138.9	10.1	20.9	1.15	26.4	25.7	ND	1.07	ND	ND	ND
18/01/2024	69.6	131.4	13.5	23.6	1.00	24.5	27.1	ND	1.05	ND	ND	ND
22/01/2024	84.5	147.3	12.7	27.3	1.13	27.4	29.3	ND	1.02	ND	ND	ND
29/01/2024	92.7	141.1	14.5	29.3	1.18	25.1	27.4	ND	1.12	ND	ND	ND
Maximum	92.7	205.8	14.5	29.3	1.25	32.5	29.3	-	1.14	-	-	-
Minimum	65.2	131.4	10.1	20.9	0.82	24.5	22.8	-	1.02	-	-	-
Average	81.9	165.5	12.1	24.3	1.04	27.9	26.4	-	1.07	-	-	-
NAAQ Standard	60	100	80	80	2	100	400	1	5	6	20	1
Test Method	IS-5182(P- 24)-2015	IS-5182(P- 23)-2006	IS-5182 (P-2)-2004	IS-5182(P- 12)-2006	IS-5182(P- 10)-2009	IS-5182(P- 9)-2014	IS-5182(P- 28)-2018	IS-5182(P- 22)-2004	IS-5182(P- 17)-2006	IS-5182(P- 23)-2004	AAL SOP 608	IS-5182(P- 17)-2004

**\*\*End of Report\*\***

Remarks :-

NAAQS:- Ambient Air Quality Standard (AP-NR Directed, DC:- District Level,

Lead (as Pb) - 1.1 µg/m<sup>3</sup>, Nickel (as Ni) - 1.0 µg/m<sup>3</sup>, Arsenic (as As) - 1.5 µg/m<sup>3</sup>, Benzene (as C<sub>6</sub>H<sub>6</sub>) - 1.0 µg/m<sup>3</sup>, Dioxin a-system (BaP) - 0.5 µg/m<sup>3</sup>

Sample analyzed within seven days from the date of sampling.

*Ashutosh Srivastava*  
ASHUTOSH SRIVASTAVA  
Deputy Technical Manager  
Authorised Signatory

- Note:**
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## TEST REPORT

Page 1 of 1

Issued To: M/s Indian Oil Corporation Limited (Refineries Division)  
Panipat Naphtha Cracker,  
Panipat (Haryana)

Report No. AAL ENV-20240202004, AAL ENV-20240206013,  
AAL ENV-20240209002, AAL ENV-20240213016,  
AAL ENV-20240216015, AAL ENV-20240220013,  
AAL ENV-20240223008, AAL ENV-20240227017

Date of Reporting: 04/03/2024

Sample Description: Ambient Air Quality Monitoring

Sampling Method: IS:5182 (Part-14)-2000

Work order Item: Panipat Refinery (Table-D)

Sampling Duration: 24-00 Hrs

Sampling Location: Roof of Administration Building

Sampling Done By: AAL

## TEST RESULTS

Test Parameters → Date of Sampling ↓	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	PM <sub>10</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	C <sub>6</sub> H <sub>6</sub> (µg/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )	B(a)P (ng/m <sup>3</sup> )
01/02/2024	66.5	110.8	12.3	25.8	0.75	30.9	23.2	ND	1.10	ND	ND	ND
05/02/2024	57.2	95.4	10.2	23.1	0.83	28.2	21.6	ND	1.05	ND	ND	ND
08/02/2024	48.6	92.3	9.8	21.7	0.95	29.7	20.9	ND	1.09	ND	ND	ND
12/02/2024	52.3	90.7	13.6	27.3	1.06	26.8	23.6	ND	1.10	ND	ND	ND
15/02/2024	54.1	94.6	12.7	25.2	1.08	23.7	26.9	ND	1.12	ND	ND	ND
19/02/2024	58.4	108.3	10.4	21.9	1.05	24.9	24.2	ND	1.04	ND	ND	ND
22/02/2024	55.6	97.2	9.8	23.6	1.12	22.7	20.8	ND	1.06	ND	ND	ND
26/02/2024	49.7	88.4	11.4	25.1	1.16	24.3	25.9	ND	1.10	ND	ND	ND
Maximum	66.5	110.8	13.6	27.3	1.16	30.9	26.9	-	1.12	-	-	-
Minimum	48.6	88.4	9.8	21.7	0.75	22.7	20.8	-	1.04	-	-	-
Average	55.3	97.2	11.3	24.2	1.00	26.4	23.4	-	1.08	-	-	-
NAAQ Standard	60	100	80	80	2	100	400	1	5	6	20	1
Test Method	IS-1182(P- 24-2019)	IS-5182(P- 21-2006)	IS-5182 (P-21-2001)	IS-5182(P- 02-2004)	IS-5182(P- 10-1999)	IS-5182(P- 05-1974)	IS-5182(P- 25-2018)	IS-5182(P- 23-2004)	IS-5182(P- 11-2004)	IS-5182(P- 21-2004)	AAL SOP 008	IS-5182(P- 13-2004)

\*\*End of Report\*\*

Remarks:

70.8125 = National Ambient Air Quality Standard (NAAQ) - Not Detected, (NAAQ) Detection Limit

Lead (as Pb) = 1 µg/m<sup>3</sup>, Nickel (as Ni) = 10 ng/m<sup>3</sup>, Arsenic (as As) = 1.0 ng/m<sup>3</sup>, Benzene (as C<sub>6</sub>H<sub>6</sub>) = 1.0 µg/m<sup>3</sup>, Benzene & pyrene (B(a)P) = 0.5 ng/m<sup>3</sup>

Sample Analyzed within seven days from the date of sampling.

*Ashutosh Srivastava*  
ASHUTOSH SRIVASTAVA  
Deputy Technical Manager  
Authorised Signatory

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## TEST REPORT

Page 1 of 1

Issued To:	M/s Indian Oil Corporation Limited (Refineries Division) Panipat Naphttha Cracker, Panipat (Haryana)	Report No.	AAL ENV-20240305017, AAL ENV-20240308018, AAL ENV-20240312016, AAL ENV-20240315039, AAL ENV-20240319003, AAL ENV-20240322017, AAL ENV-20240327015, AAL ENV-20240330012
Sample Description:	Ambient Air Quality Monitoring	Date of Reporting:	04/04/2024
Work order Item:	Panipat Refinery (Table-D)	Sampling Method:	IS:5182 (Part-14)-2000
Sampling Location:	Roof of Administration Building	Sampling Duration:	24:00 Hrs
		Sampling Done By:	AAL

## TEST RESULTS

Test Parameters→ Date of Sampling→	PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	C <sub>6</sub> H <sub>6</sub> (µg/m <sup>3</sup> )	As (µg/m <sup>3</sup> )	Ni (µg/m <sup>3</sup> )	B(a)P (µg/m <sup>3</sup> )
04/03/2024	48.9	89.3	10.5	23.4	0.79	27.4	24.5	ND	1.08	ND	ND	ND
07/03/2024	45.1	84.6	11.6	20.3	0.85	30.8	20.6	ND	1.12	ND	ND	ND
11/03/2024	52.4	80.5	12.8	23.6	1.05	32.1	22.4	ND	1.15	ND	ND	ND
14/03/2024	43.7	83.6	11.9	22.3	1.02	28.2	20.5	ND	1.06	ND	ND	ND
18/03/2024	47.3	85.7	13.3	20.1	1.09	25.6	21.2	ND	1.10	ND	ND	ND
21/03/2024	50.2	90.5	14.1	18.6	1.03	28.8	22.8	ND	1.18	ND	ND	ND
26/03/2024	47.3	89.9	9.2	19.5	1.12	26.3	24.6	ND	1.08	ND	ND	ND
29/03/2024	45.5	82.4	10.9	22.3	1.12	27.1	26.6	ND	1.15	ND	ND	ND
Maximum	52.4	90.5	14.1	23.6	1.12	32.1	26.6	-	1.18	-	-	-
Minimum	43.7	80.5	9.2	18.6	0.79	25.6	20.5	-	1.06	-	-	-
Average	47.6	85.8	11.8	21.3	1.01	28.3	22.9	-	1.12	-	-	-
NAAQ Standard	60	100	80	80	2	100	400	1	3	6	20	1
Test Method	IS-5182(P- 74)-2019	IS-5182(P- 23)-2004	IS-5182 (P-23-2004)	IS-5182(P- 6)-2004	IS-5182(P- 10)-1999	IS-5182(P- 9)-1974	IS-5182(P- 25)-2018	IS-5182(P- 42)-2004	IS-5152(P- 11)-2006	IS-5152(P- 22)-2004	AAL SOP- JH08	IS-5182(P- 12)-2004

**\*\*End of Report\*\***

### Remarks:

NAAQS- National Ambient Air Quality Standard ND=Not Detected, GL=Detection Limit.

Lead (as Pb) < 0.1 µg/m<sup>3</sup>, Nickel (as Ni) < 1.0 µg/m<sup>3</sup>, Arsenic (as As) < 1.0 µg/m<sup>3</sup>, Benzene (as C<sub>6</sub>H<sub>6</sub>) < 1.0 µg/m<sup>3</sup>, Barium (as Ba) < 0.5 µg/m<sup>3</sup>

Sample Analysis within seven days from the date of sampling.

  
ASHUTOSH SRIVASTAVA  
Deputy Technical Manager  
Authorised Signatory

- Note:** 1. The Result Indicated above refer to the tested sample and listed test parameters only, endorsement of products is neither intended nor implied.  
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## TEST REPORT

Page 1 of 1

Issued To:

M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker,  
Panipat (Haryana)

Report No.

AAL ENV-20240403032, AAL ENV-20240405005,  
AAL ENV-20240409006, AAL ENV-20240412006,  
AAL ENV-20240416038, AAL ENV-20240420006,  
AAL ENV-20240423010, AAL ENV-20240426003,  
AAL ENV-20240430009

Date of Reporting:

06/05/2024

Sample Description: Ambient Air Quality Monitoring

Sampling Method:

IS:5182 (Part-14)-2000

Work order Item: Panipat Refinery (Table-D)

Sampling Duration:

24:00 Hrs

Sampling Location: Roof of Administration Building

Sampling Done By:

AAL

## TEST RESULTS

Test Parameters→ Date of Sampling↓	PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	C <sub>6</sub> H <sub>6</sub> (µg/m <sup>3</sup> )	As (µg/m <sup>3</sup> )	Ni (µg/m <sup>3</sup> )	B(a)P (ng/m <sup>3</sup> )
1 01/04/2024	48.2	90.3	13.6	20.5	0.95	35.4	22.4	ND	0.98	ND	ND	ND
2 04/04/2024	45.4	85.6	11.5	18.9	1.02	32.3	26.9	ND	1.02	ND	ND	ND
3 08/04/2024	49.3	95.7	14.3	19.3	1.05	29.6	23.2	ND	1.06	ND	ND	ND
4 11/04/2024	52.3	91.4	17.2	24.2	0.95	31.7	25.3	ND	1.10	ND	ND	ND
5 15/04/2024	49.7	92.6	12.8	21.5	0.98	37.2	29.8	ND	1.09	ND	ND	ND
6 19/04/2024	42.4	82.6	13.9	27.4	1.05	28.4	21.4	ND	1.00	ND	ND	ND
7 22/04/2024	46.2	85.7	10.1	25.3	1.02	32.3	24.7	ND	1.08	ND	ND	ND
8 25/04/2024	40.8	81.3	11.7	24.6	1.08	35.7	29.3	ND	1.06	ND	ND	ND
9 29/04/2024	47.8	90.3	14.7	24.5	0.95	29.7	24.3	ND	1.08	ND	ND	ND
Maximum	52.5	95.7	17.2	27.4	1.08	37.2	29.8	-	1.10	-	-	-
Minimum	40.8	81.3	10.1	18.9	0.95	28.4	21.4	-	0.98	-	-	-
Average	46.9	88.4	13.3	22.9	1.01	32.5	25.3	-	1.05	-	-	-
NAAQ Standard	60	100	80	80	2	100	400	1	5	6	20	1
Test Method	IS-5182(P- 24)-2019	IS-5182(P- 23)-2006	IS-5182 (P-2)-2001	IS-5182(P- 6)-2006	IS-5182(P- 10)-1999	IS-5182(P- 9)-1974	IS-5182(P- 27)-2018	IS-5182(P- 22)-2004	IS-5182(P- 11)-2006	IS-5182(P- 23)-2004	AAL/NOP 008	IS-5182(P- 12)-2006

\*\*End of Report\*\*

Remarks:-

NAAQ Standard: Ambient Air Quality Standard. ND-Not Detected, DL-Detection Limit.

Lead (as Pb) - 0.1 µg/m<sup>3</sup>, Nickel (as Ni) - 1.0 µg/m<sup>3</sup>, Arsenic (as As) - 1.0 µg/m<sup>3</sup>, Benzene (as C<sub>6</sub>H<sub>6</sub>) - 1.0 µg/m<sup>3</sup>, Benzo(a)pyrene (BaP) - 0.5 ng/m<sup>3</sup>

Sample Analyzed within seven days from the date of sampling

*Asmita*  
ASMITOSH SRIVASTAVA  
Deputy Technical Manager  
Authorised Signatory

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## TEST REPORT

Page 1 of 1

**Issued To:** M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker,  
Panipat (Haryana)

**Report No.**

AAL ENV-20240503013, AAL ENV-20240507007,  
AAL ENV-20240510004, AAL ENV-20240514023,  
AAL ENV-20240517010, AAL ENV-20240521005,  
AAL ENV-20240524012, AAL ENV-20240528009,  
AAL ENV-20240531007

**Sample Description:** Ambient Air Quality Monitoring

**Date of Reporting:**

05/06/2024

**Work order Item:** Panipat Refinery (Table-D)

**Sampling Method:**

IS-5182 (Part-14)-2000

**Sampling Location:** Roof of Administration Building

**Sampling Duration:**

24:00 Hrs

**Sampling Done By:**

AAL

### TEST RESULTS

Test Parameters→ Date of Sampling→		PM <sub>2.5</sub> (µg/m <sup>3</sup> )	PM <sub>10</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	Pb (ng/m <sup>3</sup> )	C <sub>6</sub> H <sub>6</sub> (ng/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )	B(a)P (ng/m <sup>3</sup> )
1	02/05/2024	46.6	81.8	12.8	21.2	1.08	31.9	23.6	ND	1.04	ND	ND	ND
2	06/05/2024	42.4	78.4	13.1	20.5	0.98	33.4	24.5	ND	1.00	ND	ND	ND
3	09/05/2024	48.3	83.9	12.4	22.4	1.00	30.5	22.4	ND	0.96	ND	ND	ND
4	13/05/2024	49.7	85.7	14.5	23.9	0.96	24.6	21.9	ND	0.95	ND	ND	ND
5	16/05/2024	45.1	87.4	13.6	20.6	0.92	28.7	21.5	ND	1.02	ND	ND	ND
6	20/05/2024	44.5	84.8	12.3	25.7	1.02	24.2	22.5	ND	0.98	ND	ND	ND
7	23/05/2024	48.3	80.2	11.7	24.8	1.06	25.4	23.8	ND	1.06	ND	ND	ND
8	27/05/2024	40.2	85.9	12.3	23.1	1.12	28.1	23.2	ND	1.10	ND	ND	ND
9	30/05/2024	45.5	88.3	13.5	22.4	1.17	26.8	22.8	ND	1.12	ND	ND	ND
Maximum		49.7	88.3	14.5	25.7	1.17	33.4	24.5	-	1.12	-	-	-
Minimum		40.2	78.4	11.7	20.5	0.92	24.2	21.5	-	0.95	-	-	-
Average		45.6	84.0	12.9	22.7	1.03	28.2	22.9	-	1.03	-	-	-
NAAQ Standard		60	100	80	80	2	100	400	1	5	6	20	1
Test Method		IS-5182(P-24)-2019	IS-5182(P-23)-2006	IS-5182(P-2)-2001	IS-5182(P-6)-2006	IS-5182(P-10)-1999	IS-5182(P-9)-1974	IS-5182(P-25)-2018	IS-5182(P-23)-2004	IS-5182(P-11)-2006	IS-5182(P-22)-2004	AAL/SOP-009	IS-5182(P-12)-2004

**\*\*End of Report\*\***

#### Remarks:-

NAAQS= National Ambient Air Quality Standard ND=Not Detected, DL= Detection Limit.

Lead (as Pb) - 0.1 µg/m<sup>3</sup>, Nickel (as Ni) - 1.0 ng/m<sup>3</sup>, Arsenic (as As) - 1.0 ng/m<sup>3</sup>, Benzene (as C<sub>6</sub>H<sub>6</sub>) - 1.0 µg/m<sup>3</sup>, Banno 4-pyrene (BaP) - 0.5 ng/m<sup>3</sup>

Sample Analyzed within seven days from the date of sampling

*Ashutosh Srivastava*  
**ASHUTOSH SRIVASTAVA**  
Deputy Technical Manager  
Authorised Signatory

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## TEST REPORT

Page 1 of 1

Issued To:	M/s Indian Oil Corporation Limited (Refineries Division) Panipat Naphtha Cracker, Panipat (Haryana)	Report No.	AAL ENV-20240604024, AAL ENV-20240607034, AAL ENV-20240611023, AAL ENV-20240614034, AAL ENV-20240619022, AAL ENV-20240622070, AAL ENV-20240625033, AAL ENV-20240628024
Sample Description:	Ambient Air Quality Monitoring	Date of Reporting:	04/07/2024
Work order Item:	Panipat Refinery (Table-D)	Sampling Method:	IS-5182 (Part-14)-2000
Sampling Location:	Roof of Administration Building	Sampling Duration:	24:00 Hrs
		Sampling Done By:	AAL

## TEST RESULTS

Test Parameters → Date of Sampling ↓	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	PM <sub>10</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	NH <sub>3</sub> (µg/m <sup>3</sup> )	Pb (µg/m <sup>3</sup> )	C <sub>4</sub> H <sub>6</sub> (µg/m <sup>3</sup> )	As (ng/m <sup>3</sup> )	Ni (ng/m <sup>3</sup> )	B(a)P (ng/m <sup>3</sup> )
1 03/06/2024	43.2	83.9	10.6	18.2	0.95	28.4	21.7	ND	0.95	ND	ND	ND
2 06/06/2024	45.4	80.5	12.3	21.8	0.96	30.2	23.5	ND	0.98	ND	ND	ND
3 10/06/2024	40.9	78.2	9.8	20.5	1.05	27.8	22.3	ND	1.05	ND	ND	ND
4 13/06/2024	42.5	81.7	11.4	19.6	0.85	28.8	23.2	ND	0.96	ND	ND	ND
5 18/06/2024	44.3	85.8	12.7	21.3	0.90	30.2	20.9	ND	1.10	ND	ND	ND
6 21/06/2024	40.8	79.6	10.9	22.7	1.08	26.2	21.5	ND	1.12	ND	ND	ND
7 24/06/2024	41.3	78.1	13.4	20.5	0.98	28.3	20.6	ND	0.90	ND	ND	ND
8 27/06/2024	45.1	83.5	10.2	19.8	0.91	30.3	22.7	ND	1.15	ND	ND	ND
Maximum	45.4	85.8	13.4	22.7	1.08	30.3	23.5	-	1.15	-	-	-
Minimum	40.8	78.1	9.8	18.2	0.85	26.2	20.6	-	0.90	-	-	-
Average	42.9	81.4	11.4	20.6	0.96	28.8	22.1	-	1.03	-	-	-
NAAQ Standard	60	100	80	80	2	100	400	1	5	6	20	1
Test Method	IS-5182(P- 24)-2019	IS-5182(P- 23)-2006	IS-5182 (P-7)-2001	IS-5182(P- 6)-2006	IS-5182(P- 10)-1999	IS-5182(P- 9)-1974	IS-5182(P- 25)-2018	IS-5182(P- 22)-2004	IS-5182(P- 11)-2006	IS-5182(P- 22)-2004	AAL/SOP /008	IS-5182(P- 12)-2004

**\*\*End of Report\*\***

### Remarks:

NAAQS: National Ambient Air Quality Standard ND=Not Detected, DL= Detection Limit,

Lead (as Pb): 0.1 µg/m<sup>3</sup>, Nickel (as Ni): 1.0 µg/m<sup>3</sup>, Arsenic (as As): 1.0 ng/m<sup>3</sup>, Benzene (as C<sub>6</sub>H<sub>6</sub>): 1.0 µg/m<sup>3</sup>, Butyl-o-xylene (BaP): 0.5 ng/m<sup>3</sup>

Sample Analyzed within seven days from the date of sampling.

**MUTOSH SRIVASTAVA**  
Deputy Technical Manager  
Authorised Signatory

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## TEST CERTIFICATE

Page 1 of 3

Issued To: M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker, Panipat (Haryana)

Sample Description: Stack Emission  
Sampling Method: IS:11355  
Work order item: Panipat Refinery & PX-PTA (Table-E & M)

Report No. AAL ENV-20240131020

Date of Receiving: 31/01/2024

Date of Starting: 31/01/2024

Date of Completion: 05/02/2024

Date of Reporting: 05/02/2024

Sampling Done By: AAL

### STACK DETAILS

S/N	Date of Sampling	Detail of Stack	Ambient Temp. (°C)	Stack Temp. (°C)	Stack Dia. (m)	Stack Height (m)	Flue Gas Velocity (m/sec)
1	17/01/2024	HRSG-01	18	162	3.3	65	10.13
2	17/01/2024	HRSG-02	18	147	3.3	70	9.45
3	17/01/2024	HRSG-03	18	137	3.3	70	9.34
4	17/01/2024	HRSG-04	18	132	3.3	70	9.52
5	18/01/2024	HRSG-05	19	158	3.3	70	9.81
6	18/01/2024	CPP-VHP-3	18	147	3.34	100	9.63
7	18/01/2024	UB-01	18	156	3.04	100	9.74
8	18/01/2024	UB-02	18	148	3.04	100	9.65
9	19/01/2024	GHCU-JRG Heater	18	198	2.42	63	10.15
10	19/01/2024	GHCU-LP Section	19	145	2.42	65	9.61
11	19/01/2024	DRDS Stack	18	221	1.25	60	10.16
12	20/01/2024	CCRUNHT Heater/FF 101	18	201	1.34	60	9.86

### TEST RESULT

S/N	Date of Sampling	Detail of Stack & Unit	Particulate Matter (PM)		Sulphur Dioxide (SO <sub>2</sub> )			Oxide of Nitrogen (NO <sub>x</sub> )			Carbon Monoxide (as CO)			Nickel & Vanadium (as Ni & V)		
			mg/Nm <sup>3</sup>	µg/Nm <sup>3</sup>	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	µg/Nm <sup>3</sup>	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr
1	17/01/2024	HRSG-01	9.2	1.91	7.2	2.52	1.50	237.3	115.99	49.34	3.2	2.56	0.67	ND	-	-
2	17/01/2024	HRSG-02	7.5	1.57	7.5	2.70	1.59	169.8	82.41	34.12	3.4	2.72	0.88	ND	-	-
3	17/01/2024	HRSG-03	6.9	1.40	7.6	2.60	1.33	182.3	88.80	37.67	2.8	2.24	0.57	ND	-	-
4	17/01/2024	HRSG-04	6.2	1.30	8.3	2.90	1.74	173.4	84.46	36.46	3.3	2.80	0.74	ND	-	-
5	18/01/2024	HRSG-05	7.4	1.51	7.1	2.48	1.45	190.7	92.59	38.84	3.3	2.64	0.67	ND	-	-
6	18/01/2024	CPP-VHP-3	7.6	1.59	7.1	2.48	1.49	233.9	106.62	43.94	3.2	2.56	0.69	ND	-	-
7	18/01/2024	UB-01	8.1	1.39	10.8	3.67	1.81	258.1	101.36	35.89	3.4	4.32	0.93	ND	-	-
8	18/01/2024	UB-02	8.5	1.48	9.6	3.36	1.67	204.3	99.51	35.48	4.9	3.92	0.85	ND	-	-
9	19/01/2024	GHCU-JRG Heater	8.4	0.88	12.9	4.31	1.38	126.1	61.42	13.19	11.8	9.44	1.23	ND	-	-
10	19/01/2024	GHCU-LP Section	6.8	0.93	11.3	3.93	1.25	121.2	59.04	13.38	18.7	14.96	2.07	ND	-	-
11	19/01/2024	DRDS Stack	5.9	1.15	8.7	3.04	1.70	84.3	41.16	16.48	4.3	3.44	0.84	ND	-	-
12	20/01/2024	CCRUNHT Heater/FF 101	9.3	0.38	8.3	2.87	0.34	112.7	54.90	4.55	7.8	6.24	0.72	ND	-	-
Permissible limits (mg/Nm <sup>3</sup> )			Gas	10	50			350			150					
			Liquid	100		1700		450			200			5		
			FCCU	-	-	-	-	-	-	-	400	-	-	-	-	-

1027-002-00000

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Deputy Technical Manager  
Authorised Signatory

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## TEST CERTIFICATE

Page 2 of 3

Issued To: M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker, Panipat (Haryana)

Report No.: AAL ENV-20240131026

Sample Description: Stack Emission  
Sampling Method: IS:11255  
Work order Item: Panipat Refinery & PX-PTA (Table-E & M)

Date of Receiving: 31/01/2024  
Date of Starting: 31/01/2024  
Date of Completion: 05/02/2024  
Date of Reporting: 05/02/2024  
Sampling Done By: AAL

### STACK DETAILS

S/N	Date of Sampling	Detail of Stack	Ambient Temp. (°C)	Stack Temp. (°C)	Stack Dia. (m)	Stack Height (m)	Flue Gas Velocity (m/sec)
13	26/01/2024	CCBU NHT Heater-FE-201	19	223	2.34	70	10.09
14	26/01/2024	CCBU NHT Heater-FE-203	19	249	2.34	70	10.58
15	30/01/2024	RFCC-CD Boiler	18	158	2.1	67	10.51
16	26/01/2024	RFCC Feed Heater	18	182	2.1	67	10.03
17	24/01/2024	HCU-PDS	18	130	1.7	60	9.44
18	24/01/2024	HCU-76	19	146	2.4	60	9.45
19	24/01/2024	HCU-77	18	149	2.4	60	8.94
20	24/01/2024	AVU-02	18	129	5.1	100	9.26
21	27/01/2024	AVU-01	19	119	5.1	100	9.31
22	27/01/2024	MSQ Prime G-301-H-101	18	196	1.64	60	9.43
23	27/01/2024	MSQ Prime G-303-H-201	18	218	1.64	60	9.64
24	27/01/2024	MSQ Prime G-303-H-301	18	212	1.64	60	9.56

### TEST RESULT

S/N	Date of Sampling	Detail of Stack Unit →	Particulate Matter (PM)		Sulphur Dioxide (SO <sub>2</sub> )		Oxide of Nitrogen (NO <sub>x</sub> )			Carbon Monoxide (as CO)		Nickel & Vanadium (as Ni & V)		
			mg/Nm <sup>3</sup>	kg/hr	mg/Nm <sup>3</sup>	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm
13	26/01/2024	CCBU NHT Heater-FE-201	8.3	0.76	9.5	3.32	0.87	110.9	34.07	10.13	23.7	18.96	2.16	ND
14	26/01/2024	CCBU NHT Heater-FE-203	9.5	0.83	8.3	2.80	0.73	108.4	32.80	9.84	23.6	18.68	2.14	ND
15	30/01/2024	RFCC-CD Boiler	9.8	0.86	12.1	4.23	1.07	253.4	74.72	13.53	117.2	93.76	10.34	ND
16	26/01/2024	RFCC Feed Heater	8.1	0.63	11.3	4.08	1.06	108.7	32.95	8.06	6.2	4.86	0.49	ND
17	24/01/2024	HCU-PDS	7.2	0.46	8.7	3.04	0.44	90.1	43.87	5.06	3.3	2.16	0.29	ND
18	24/01/2024	HCU-76	7.3	1.26	7.8	2.66	1.62	146.8	71.51	31.39	4.7	3.76	1.00	ND
19	24/01/2024	HCU-77	8.1	1.65	8.9	3.11	1.79	169.4	82.51	34.07	4.9	3.92	0.98	ND
20	24/01/2024	AVU-02	6.3	3.09	18.9	3.12	4.37	169.5	51.83	52.30	4.3	3.90	2.21	ND
21	27/01/2024	AVU-01	8.8	1.88	7.6	2.66	1.65	114.3	55.07	24.83	4.3	5.44	0.93	ND
22	27/01/2024	MSQ Prime G-301-H-101	4.6	0.26	17.6	6.16	0.98	126.8	60.82	5.53	13.9	11.12	0.62	ND
23	27/01/2024	MSQ Prime G-303-H-201	4.9	0.21	19.4	6.75	0.84	116.3	30.73	3.05	18.3	14.80	0.80	ND
24	27/01/2024	MSQ Prime G-303-H-301	5.5	0.23	19.9	6.67	0.82	112.8	51.94	4.92	17.1	13.68	0.75	ND
Permissible limits (mg/Nm <sup>3</sup> )			Gas	10	50	50	350	150	400	200	5	5	5	5
			Liquid	100	1700	1700	450	450	450	200	5	5	5	5
			PCCL	-	-	-	-	-	-	400	-	-	-	-

Control System

ASMITOSH SRIVASTAVA  
Deputy Technical Manager  
Authorised Signatory

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## TEST CERTIFICATE

Page 1 of 3

Issued To: M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker, Panipat (Haryana)

Sample Description: Stack Emission  
Sampling Method: IS:11255  
Work order Item: Panipat Refinery & PX-PTA (Table-E & M)

Report No. AAL/ENV-20240131020

Date of Receiving: 31/01/2024  
Date of Starting: 31/01/2024  
Date of Completion: 05/02/2024  
Date of Reporting: 05/02/2024  
Sampling Done By: AAL

### STACK DETAILS

S.N.	Date of Sampling	Detail of Stack	Ambient Temp. (°C)	Stack Temp. (°C)	Stack Dia. (m)	Stack Height (m)	Flue Gas Velocity (m/sec)
25	27/01/2024	HCU Stack	19	127	1.3	70	9.57
26	29/01/2024	DHDT-H-01	18	218	1.8	70	9.64
27	29/01/2024	DHDT-H-02	18	224	1.8	70	9.76
28	30/01/2024	PX-Isoliner	19	198	1.2	56	10.02
29	30/01/2024	PX-Isoliner	19	153	1.2	56	9.53
30	30/01/2024	PX-Xylene	18	147	2.0	58	8.92
31	30/01/2024	PX-CCR	19	178	1.9	100	9.24
32	30/01/2024	PX-NHT	19	123	1.0	30	10.83
33	31/01/2024	PTA-Hot Oil-Heater	18	129	2.35	60	9.16
34	31/01/2024	PTA-PCPH	18	132	2.35	60	8.93
35	31/01/2024	PTA-Thermal Oxidizer	18	113	2.35	60	8.55

### TEST RESULT

S.N.	Date of Sampling	Detail of Stack Unit-#	Particulate Matter (PM)		Sulphur Dioxide (SO <sub>2</sub> )			Oxide of Nitrogen (NO <sub>x</sub> )			Carbon Monoxide (as CO)			Nickel & Vanadium (as Ni & V)		
			mg/m <sup>3</sup>	µg/m <sup>3</sup>	mg/m <sup>3</sup>	ppm	µg/m <sup>3</sup>	mg/m <sup>3</sup>	ppm	µg/m <sup>3</sup>	mg/m <sup>3</sup>	ppm	µg/m <sup>3</sup>	mg/m <sup>3</sup>	ppm	µg/m <sup>3</sup>
25	27/01/2024	HCU Stack	5.2	0.17	0.8	3.73	0.20	119.7	58.30	3.87	4.1	5.28	2.09	ND	-	-
26	29/01/2024	DHDT-H-01	5.4	0.28	11.8	4.43	0.62	128.7	62.69	6.72	4.3	3.44	0.22	ND	-	-
27	29/01/2024	DHDT-H-02	4.8	0.25	10.2	3.67	0.55	134.3	65.82	6.96	3.9	3.12	0.20	ND	-	-
28	30/01/2024	PX-Isoliner	5.3	0.11	10.3	6.40	0.46	166.3	51.78	2.67	42.7	34.10	1.97	ND	-	-
29	30/01/2024	PX-Isoliner	6.8	0.18	7.9	2.76	0.21	92.9	45.23	2.45	ND	-	-	ND	-	-
30	30/01/2024	PX-Xylene	7.0	0.22	8.8	3.04	0.61	119.5	58.71	8.33	ND	-	-	ND	-	-
31	30/01/2024	PX-CCR	8.0	0.50	7.0	2.66	0.49	96.2	46.28	5.64	5.8	4.64	0.35	ND	-	-
32	30/01/2024	PX-NHT	8.4	0.19	6.0	2.41	0.15	162.5	49.92	2.39	6.9	5.52	0.13	ND	-	-
33	31/01/2024	PTA-Hot Oil-Heater	6.9	0.71	32.7	11.44	3.37	43.5	21.19	4.49	ND	-	-	ND	-	-
34	31/01/2024	PTA-PCPH	7.1	0.71	7.8	2.46	0.76	127.1	61.91	12.70	ND	-	-	ND	-	-
35	31/01/2024	PTA-Thermal Oxidizer	7.8	0.36	6.0	2.38	0.68	29.4	14.32	2.95	5.0	2.88	0.36	ND	-	-
Permissible limits (mg/Nm <sup>3</sup> )			Gas		10			30			150			-		
			Liquid		100			450			200			5		
			FOCU		-			-			400			-		

\*\*End of Report\*\*

Test Method: - Particulate Matter (as PM) IS 11255(P-1)-1983, Sulphur Dioxide (as SO<sub>2</sub>) IS 11255(P-2)-1983, Oxide of Nitrogen (as NO<sub>x</sub>) IS 11255(P-7)-2015, Carbon Monoxide (as CO) IS 13270-1992, Nickel & Vanadium USEPA Method 20 by AAS

ASHUTOSH SRIVASTAVA  
Deputy Technical Manager  
Authorised Signatory

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## TEST CERTIFICATE

Page 1 of 1

Issued To: M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker,  
Panipat (Haryana)

Sample Description: Stack Emission

Sampling Method: IS 11255

Work order Item: Panipat Refinery (Table-F)

Report No. AAL-ENV-20240131021

Date of Receiving: 31/01/2024

Date of Starting: 31/01/2024

Date of Completion: 05/02/2024

Date of Reporting: 05/02/2024

Sampling Done By: AAL

### STACK DETAILS

S/N	Date of Sampling	Detail of Stack	Ambient Temp. (°C)	Stack Temp. (°C)	Stack Dia. (m)	Stack Height (m)	Flue Gas Velocity (m/sec)
1	31/01/2024	SRU-26	19	165	1.9	70.0	10.49
2	31/01/2024	SRU-57	19	167	1.9	70.0	10.67

### TEST RESULT

S/N	Date of Sampling	Detail of Stack	Sulphur Dioxide (SO <sub>2</sub> )			Oxide of Nitrogen (NO <sub>x</sub> )			Carbon Monoxide (as CO)			Hydrogen Sulphide (as H <sub>2</sub> S)		
			mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr
1	31/01/2024	SRU-26	142.3	49.77	10.09	46.5	22.65	3.30	65.1	52.08	4.62	ND	ND	ND
2	31/01/2024	SRU-57	149.5	52.29	10.74	44.3	21.58	3.18	68.9	55.12	4.95	ND	ND	ND
Permissible limits (mg/Nm <sup>3</sup> )			185			350			150			15		

ND: Not Detected, < LOD (Reported)

**\*\*End of Report\*\***

Test Method: Sulphur Dioxide (as SO<sub>2</sub>) IS 11255 (P-2)-1985, Oxide of Nitrogen (as NO<sub>x</sub>) IS 11255 (P-7)-2005, Carbon Monoxide (as CO) IS 13270-1993, Hydrogen Sulphide (H<sub>2</sub>S) IS 11255 (P-4)-2005.

  
ASHUTOSH SRIVASTAVA  
Deputy Technical Manager  
Authorised Signatory

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## TEST CERTIFICATE

Page 1 of 1

Record To: M/s Indira Oil Corporation Limited  
(Refinery Division)  
Panipat Naphtha Cracker,  
Panipat (Haryana)  
Sample Description: Stack Emission  
Sampling Method: IS:11255  
Work order Item: Panipat Refinery & PX-PTA (Table-E & M)

Report No. AAL-ENV-20240201013

Date of Receiving: 01/02/2024

Date of Starting: 01/02/2024

Date of Completion: 05/02/2024

Date of Reporting: 05/02/2024

Sampling Done By: AAL

### STACK DETAILS

S/N	Date of Sampling	Detail of Stack	Ambient Temp. (°C)	Stack Temp. (°C)	Stack Dia. (m)	Stack Height (m)	Flue Gas Velocity (m/sec)
1	01/02/2024	DCU Heater	20	140	3	70	9.55
2	01/02/2024	DHDT-BS-V (New-107)	20	134	1.8	70	8.78
3	01/02/2024	HGU-BS-V (New-106)	20	129	3.4	59.7	9.43

### TEST RESULT

S/N	Date of Sampling	Detail of Stack & Unit	Particulate Matter (PM)		Sulphur Dioxide (SO <sub>2</sub> )			Oxide of Nitrogen (NO <sub>x</sub> )			Carbon Monoxide (as CO)			Nickel & Vanadium (as Ni & V)		
			mg/Nm <sup>3</sup>	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr
1	01/02/2024	DCU Heater	8.5	1.45	16.3	3.77	2.83	179.4	62.03	22.09	6.5	5.20	1.11	ND	-	-
2	01/02/2024	DHDT-BS-V (New-107)	4.2	0.24	8.1	2.83	0.46	142.3	70.28	8.37	7.9	6.32	0.45	ND	-	-
3	01/02/2024	HGU-BS-V (New-106)	4.9	1.09	9.6	3.36	2.13	97.2	47.35	21.61	8.7	6.96	1.93	ND	-	-
Permissible limits (mg/Nm <sup>3</sup> )			Gas	10	-	50	-	350	-	150	-	-	-	-	-	-
			Liquid	100	-	1700	-	430	-	280	-	-	-	5	-	-
			PCCT	-	-	-	-	-	-	400	-	-	-	-	-	-

ND=Not Detected

\*\*End of Report\*\*

#### Remarks

Test Method - Particulate Matter (as PM) IS:11255(P-1)-1985, Sulphur Dioxide (as SO<sub>2</sub>) IS:11255(P-2)-1985, Oxide of Nitrogen (as NO<sub>x</sub>) IS:11255(P-7)-2005, Carbon Monoxide (as CO) IS:13255-1992, Nickel & Vanadium GSEPA Method 20 by AAS

ANIL KISHAN SRIVASTAVA  
Deputy Technical Manager  
Authorised Signatory

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## TEST REPORT

Page 1 of 1

Issued To: M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker,  
Panipat (Haryana)

Sample Description: Stack Emission

Sampling Method: IS:11255

Work order Item: Panipat Refinery (Table-F)

Report No.: AAL ENV-20240227018

Date of Receiving: 27/02/2024

Date of Starting: 27/02/2024

Date of Completion: 02/03/2024

Date of Reporting: 02/03/2024

Sampling Done By: AAL

### STACK DETAILS

S/N	Date of Sampling	Detail of Stack	Ambient Temp. (°C)	Stack Temp. (°C)	Stack Dia. (m)	Stack Height (m)	Flue Gas Velocity (m/sec)
1	27/02/2024	SRU-57	26	171	1.9	70.0	10.22

### TEST RESULT

S/N	Date of Sampling	Detail of Stack	Sulphur Dioxide (SO <sub>2</sub> )			Oxide of Nitrogen (NO <sub>x</sub> )			Carbon Monoxide (as CO)			Hydrogen Sulphide (as H <sub>2</sub> S)		
			mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr
1	27/02/2024	SRU-57	143.7	80.26	10.27	49.2	23.96	3.52	61.5	49.20	4.40	ND	ND	ND
Permissible limits (mg/Nm <sup>3</sup> )			NS			350			150			15		

Reference Document: IS:11255

**\*\*End of Report\*\***

Test Method: Sulphur Dioxide (as SO<sub>2</sub>) IS:11255(P-3)-1955; Oxide of Nitrogen (as NO<sub>x</sub>) IS:11255(P-7)-2003; Carbon Monoxide (as CO) IS:13270-1992; Hydrogen Sulphide (H<sub>2</sub>S) IS:11255(P-4)-2005.

  
ASHUTOSH SRIVASTAVA  
Deputy Technical Manager  
Authorised Signatory

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## TEST REPORT

Page 1 of 3

Issued To: M/s Indian Oil Corporation Limited  
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Panipat Naphtha Cracker, Panipat (Haryana)

Sample Description: Stack Emission  
Sampling Method: IS:11255  
Work order Item: Panipat Refinery & PX-PTA (Table-E & M)

Report No.: AAL-ENV-20240323022

Date of Receipts: 23/03/2024  
Date of Starting: 23/03/2024  
Date of Completion: 30/03/2024  
Date of Reporting: 30/03/2024  
Sampling Done By: AAL

### STACK DETAILS

S/N	Date of Sampling	Detail of Stack	Ambient Temp. (°C)	Stack Temp. (°C)	Stack Dia. (m)	Stack Height (m)	Flue Gas Velocity (m/sec)
1	11/03/2024	HRSO-01	32	169	3.3	65	10.46
2	11/03/2024	HRSO-02	32	136	3.3	70	9.81
3	11/03/2024	HRSO-05	32	163	3.3	70	9.91
4	12/03/2024	CPIV-VHP-3	32	134	3.34	100	9.78
5	11/03/2024	UB-01	32	161	3.04	100	9.86
6	11/03/2024	UB-02	32	136	3.04	100	9.81
7	23/03/2024	OHCU-RG Heater	33	205	2.42	63	10.35
8	23/03/2024	OHCU-LP Section	33	152	2.42	63	9.84
9	19/03/2024	DHDS Stack	33	230	1.23	60	10.35
10	18/03/2024	CCRU NHT Heater-FF-101	33	218	1.54	60	10.22

### TEST RESULT

S/N	Date of Sampling	Detail of Stack Unit	Particulate Matter (PM)		Sulphur Dioxide (SO <sub>2</sub> )			Oxide of Nitrogen (NO <sub>x</sub> )			Carbon Monoxide (as CO)			Nickel & Vanadium (as Ni & V)		
			mg/Nm <sup>3</sup>	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr
1	11/03/2024	HRSO-01	8.9	1.88	8.7	3.04	1.84	231.3	112.76	48.91	3.8	3.04	0.90	ND	-	-
2	11/03/2024	HRSO-02	8.1	1.05	7.3	2.62	1.53	172.4	83.97	35.19	3.6	2.88	0.73	ND	-	-
3	11/03/2024	HRSO-05	8.3	1.68	7.9	2.76	1.60	182.4	88.85	36.82	3.7	2.96	0.78	ND	-	-
4	12/03/2024	CPIV-VHP-3	7.9	1.66	7.6	2.66	1.30	209.5	101.40	43.81	3.8	3.04	0.86	ND	-	-
5	11/03/2024	UB-01	8.8	1.32	9.2	3.22	1.34	198.3	96.39	34.16	3.9	4.72	1.02	ND	-	-
6	11/03/2024	UB-02	7.9	1.37	10.3	3.60	1.78	213.6	104.04	37.80	3.4	4.33	0.94	ND	-	-
7	23/03/2024	OHCU-RG Heater	8.9	0.93	13.5	4.72	1.40	120.4	58.65	12.62	16.3	8.24	1.07	ND	-	-
8	23/03/2024	OHCU-LP Section	7.6	0.85	10.3	3.60	1.13	127.3	62.10	14.18	16.6	13.38	1.85	ND	-	-
9	19/03/2024	DHDS Stack	6.4	0.17	9.5	3.32	0.25	89.2	43.43	2.34	4.0	3.92	0.13	ND	-	-
10	18/03/2024	CCRU NHT Heater-FF-101	8.7	0.38	9.2	3.22	0.37	119.5	58.31	4.84	8.6	6.88	0.35	ND	-	-
Permissible limits (mg/Nm <sup>3</sup> )			Gas	10		50		350		150						
			Liquid	100		1500		450		200						
			FCCU	-		-		-		400						

Not For Release

ASHUTOSH SRIVASTAVA  
Deputy Technical Manager  
Authorised Signatory

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## TEST REPORT

Page 2 of 3

Issued To: M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker, Panipat (Haryana)

Sample Description: Stack Emission  
Sampling Method: IS: 11255  
Work order Item: Panipat Refinery & PX-PTA (Table-E & M)

Report No. AAL ENV-2024032022

Date of Receiving: 23/03/2024  
Date of Starting: 23/03/2024  
Date of Completion: 30/03/2024  
Date of Reporting: 30/03/2024  
Sampling Done By: AAL

### STACK DETAILS

S/N	Date of Sampling	Detail of Stack	Ambient Temp. (°C)	Stack Temp. (°C)	Stack Dia. (m)	Stack Height (m)	Flue Gas Velocity (m/sec)
11	18/03/2024	CCRU NHT Heater-EF 201	32	240	2.34	70	10.25
12	18/03/2024	CCRU NHT Heater-EF 205	32	258	2.34	70	10.43
13	21/03/2024	HGU-PDS	33	143	1.7	60	9.23
14	21/03/2024	HGU-76	33	154	3.4	60	9.33
15	21/03/2024	HGU-77	33	157	3.4	60	9.02
16	19/03/2024	AVU-01	32	128	5.1	100	9.23
17	20/03/2024	MSQ Prime G-301-H-101	33	207	1.64	60	10.10
18	20/03/2024	MSQ Prime G-303-H-201	33	229	1.64	60	9.65
19	20/03/2024	MSQ Prime G-303-H-301	33	224	1.64	60	9.60

### TEST RESULT

S/N	Date of Sampling	Detail of Stack & Unit	Particulate Matter (PM)		Sulphur Dioxide (SO <sub>2</sub> )			Oxide of Nitrogen (NO <sub>x</sub> )			Carbon Monoxide (as CO)			Nickel & Vanadium (as Ni & V)		
			mg/Nm <sup>3</sup>	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr
11	18/03/2024	CCRU NHT Heater-EF 201	8.9	1.80	9.1	3.18	0.82	117.3	57.14	10.53	21.6	17.28	1.94	ND	-	-
12	18/03/2024	CCRU NHT Heater-EF 205	8.5	0.75	9.6	3.36	0.83	112.2	34.65	9.90	20.8	16.64	1.83	ND	-	-
13	21/03/2024	HGU-PDS	8.1	0.43	9.2	3.22	0.48	96.8	47.15	5.09	6.4	5.12	0.34	ND	-	-
14	21/03/2024	HGU-76	7.9	1.64	8.3	2.97	1.76	137.6	67.92	28.55	5.3	4.24	1.10	ND	-	-
15	21/03/2024	HGU-77	8.9	1.77	9.6	3.36	1.81	174.3	85.00	34.71	5.8	4.64	1.15	ND	-	-
16	19/03/2024	AVU-01	7.7	3.78	8.1	2.83	1.98	129.7	63.18	63.10	4.8	3.84	2.36	ND	-	-
17	20/03/2024	MSQ Prime G-301-H-101	4.9	0.23	15.3	5.35	0.71	121.7	59.28	5.85	14.3	11.60	0.67	ND	-	-
18	20/03/2024	MSQ Prime G-303-H-201	4.7	0.23	22.7	7.94	0.96	110.2	53.68	4.87	16.8	13.44	0.71	ND	-	-
19	20/03/2024	MSQ Prime G-303-H-301	4.8	0.24	28.4	7.14	0.87	116.3	56.63	4.96	15.3	14.34	0.78	ND	-	-
Permissible limits (mg/Nm <sup>3</sup> )			Gas	10		50		350		150				-		
			Liquid	100		1700		450		200				5		
			FCCU	-		-		-		400				-		

Ref: HSE/DOCC/

  
ASHU TOSHI SRIVASTAVA  
Deputy Technical Manager  
Authorised Signatory

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## TEST REPORT

Page 3 of 3

Issued To: M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker, Panipat (Haryana)

Sample Description: Stack Emission  
Sampling Method: IS:11255  
Work order Item: Panipat Refinery & PX-PTA (Table-E & M)

Report No.: AAL-ENV-20240323022

Date of Receiving: 23/03/2024  
Date of Starting: 23/03/2024  
Date of Completion: 30/03/2024  
Date of Reporting: 30/03/2024  
Sampling Done By: AAL

### STACK DETAILS

S/N	Date of Sampling	Detail of Stack	Ambient Temp. (°C)	Stack Temp. (°C)	Stack Dia. (m)	Stack Height (m)	Flue Gas Velocity (m/sec)
20	22/03/2024	DHDT-H-01	33	232	1.8	70	9.68
21	22/03/2024	DHDT-H-02	33	235	1.8	70	9.71
22	13/03/2024	PX-Isomer	32	208	1.2	56	9.43
23	13/03/2024	PX-Tarox	32	160	1.2	56	9.68
24	13/03/2024	PX-Nylene	32	135	2.0	58	8.91
25	14/03/2024	PX-CCR	32	186	1.9	100	9.60
26	14/03/2024	PX-NHT	32	134	1.0	30	10.80
27	15/03/2024	PTA-Hot Oil-Heater	32	138	2.35	60	9.08
28	15/03/2024	PTA-FCPH	32	143	2.35	60	9.05
29	22/03/2024	DCU Heater	31	151	3	70	9.35
30	23/03/2024	HGU-B5 VI (New-106)	32	135	3.0	59.7	9.40

### TEST RESULT

S/N	Date of Sampling	Detail of Stack Unit	Particulate Matter (PM)		Sulphur Dioxide (SO <sub>2</sub> )		Oxide of Nitrogen (NO <sub>x</sub> )			Carbon Monoxide (as CO)			Nickel & Vanadium (as Ni & V)			
			mg/Nm <sup>3</sup>	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr
20	22/03/2024	DHDT-H-01	6.5	0.33	13.2	4.62	0.67	134.3	65.81	6.83	4.7	3.76	0.24	ND	-	-
21	22/03/2024	DHDT-H-02	5.4	0.13	11.6	4.06	0.27	128.7	65.18	3.01	4.2	3.36	0.10	ND	-	-
22	13/03/2024	PX-Isomer	5.8	0.13	21.3	7.45	0.49	116.4	56.70	0.70	49.3	38.44	1.14	ND	-	-
23	13/03/2024	Px-Tarox	6.3	0.12	6.5	2.97	0.22	96.2	46.86	2.54	ND	-	-	ND	-	-
24	13/03/2024	PXoCylene	8.7	0.99	8.1	2.83	0.58	124.3	60.55	8.49	ND	-	-	ND	-	-
25	14/03/2024	PX-CCR	9.2	0.57	8.7	3.04	0.54	90.4	44.63	5.60	8.3	4.96	0.38	ND	-	-
26	14/03/2024	PX-NHT	8.1	0.18	7.8	2.73	0.17	109.3	53.24	2.30	9.2	8.76	0.16	ND	-	-
27	15/03/2024	PTA-Hot Oil-Heater	7.3	0.80	28.9	10.11	3.08	49.1	23.92	5.24	ND	-	-	ND	-	-
28	15/03/2024	PTA-FCPH	7.6	0.73	8.2	2.87	0.81	134.6	65.36	13.27	ND	-	-	ND	-	-
29	22/03/2024	DCU Heater	7.8	1.32	15.3	5.33	2.46	126.5	58.69	20.43	7.2	3.76	1.22	ND	-	-
30	23/03/2024	HGU-B5 VI (New-106)	4.4	0.96	8.5	2.97	1.89	103.3	51.29	22.09	7.8	6.25	1.70	ND	-	-
Permissible limits (mg/Nm <sup>3</sup> )			Gas	10		50		350		150				-		
			Liquid	100		1700		450		200				-		
			FCCU	-		-		-		400				-		

\*\*End of Report\*\*

Test Method :- Particulate Matter (as PM) IS 11255(P-1)-1985, Sulphur Dioxide (as SO<sub>2</sub>) IS 11255(P-2)-1985, Oxide of Nitrogen (as NO<sub>x</sub>) IS 11255(P-3)-2005, Carbon Monoxide (as CO) IS 13270-1992, Nickel & Vanadium USEPA Method 29 by AAS

ASHUTOSH SRIVASTAVA  
Authorized Signatory

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## TEST REPORT

Page 1 of 1

Issued To: M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker,  
Panipat (Haryana)

Sample Description: Stack Emission

Sampling Method: IS:11255

Work order Item: Panipat Refinery (Table-F)

Report No. AAL-ENV-20240328009

Date of Receiving: 28/03/2024

Date of Starting: 28/03/2024

Date of Completion: 02/04/2024

Date of Reporting: 02/04/2024

Sampling Done By: AAL

### STACK DETAILS

S/N	Date of Sampling	Detail of Stack	Ambient Temp. (°C)	Stack Temp. (°C)	Stack Dia. (m)	Stack Height (m)	Flue Gas Velocity (m/sec)
1	27/03/2024	SRU-26	32	173	1.9	70.0	10.67
2	27/03/2024	SRU-57	32	176	1.9	70.0	10.70

### TEST RESULT

S/N	Date of Sampling	Detail of Stack	Sulphur Dioxide (SO <sub>2</sub> )			Oxide of Nitrogen (NO <sub>x</sub> )			Carbon Monoxide (as CO)			Hydrogen Sulphide (as H <sub>2</sub> S)		
			mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr
1	27/03/2024	SRU-26	149.8	52.40	10.61	52.3	25.47	3.70	58.9	47.12	4.17	ND	ND	ND
2	27/03/2024	SRU-57	145.1	50.75	10.24	48.6	23.65	3.43	63.2	50.56	4.36	ND	ND	ND
Permissible limits (mg/Nm <sup>3</sup> )			85			350			150			15		

MSHA 10001-19-10-2018

**\*\*End of Report\*\***

Test Method - Sulphur Dioxide (as SO<sub>2</sub>) IS 11255(P-2)-1985, Oxide of Nitrogen (as NO<sub>x</sub>) IS 11255(P-1)-2005, Carbon Monoxide (as CO) IS 13279-1982, Hydrogen Sulphide (H<sub>2</sub>S) IS 11255(P-4)-2005.

ASHUTOSH SRIVASTAVA  
Deputy Technical Manager

Authorised Signatory

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## TEST REPORT

Page 1 of 1

**Issued To:** M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker,  
Panipat (Haryana)

**Sample Description:** Stack Emission

**Sampling Method:** IS:11255

**Work order Item:** Panipat Refinery (Table-F)

**Report No.** AAL ENV-20240430010

**Date of Receiving:** 30/04/2024

**Date of Starting:** 30/04/2024

**Date of Completion:** 06/05/2024

**Date of Reporting:** 06/05/2024

**Sampling Done By:** AAL

### STACK DETAILS

S/N	Date of Sampling	Detail of Stack	Ambient Temp. (°C)	Stack Temp. (°C)	Stack Dia. (m)	Stack Height (m)	Flue Gas Velocity (m/sec)
1	29/04/2024	SRI-26	37	179	1.9	70.0	10.57
2	29/04/2024	SRI-57	37	181	1.9	70.0	10.68

### TEST RESULT

S/N	Date of Sampling	Detail of Stack	Sulphur Dioxide (SO <sub>2</sub> )			Oxide of Nitrogen (NO <sub>x</sub> )			Carbon Monoxide (as CO)			Hydrogen Sulphide (as H <sub>2</sub> S)		
			mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr
1	29/04/2024	SRI-26	140.5	49.14	9.73	49.7	24.21	3.44	62.3	49.84	4.32	ND	ND	ND
2	29/04/2024	SRI-57	148.7	52.01	10.36	54.3	26.45	3.78	65.8	52.64	4.58	ND	ND	ND
Permissible limits (mg/Nm <sup>3</sup> )			NS			350			150			15		

ND=Not Detected, NS=Not Specified

**\*\*End of Report\*\***

Test Method - Sulphur Dioxide (as SO<sub>2</sub>) (S 11255(P-2)-1995), Oxide of Nitrogen (as NO<sub>x</sub>) (S 11255(P-7)-2005), Carbon Monoxide (as CO) (S 13270-1992), Hydrogen Sulphide (H<sub>2</sub>S) (S 11255(P-4)-2005).

  
**ASHUTOSH SRIVASTAVA**  
Deputy Technical Officer  
Authorised Signatory

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## TEST REPORT

Page 1 of 3

Issued To: M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker, Panipat (Haryana)

Report No: AAL ENV-20240531009

Sample Description: Stack Emission  
Sampling Method: IS:11255  
Work order Item: Panipat Refinery & PX-PTA (Table-E & M)

Date of Receiving: 31/05/2024  
Date of Starting: 31/05/2024  
Date of Completion: 05/06/2024  
Date of Reporting: 05/06/2024  
Sampling Done By: AAL

### STACK DETAILS

S/N	Date of Sampling	Detail of Stack	Ambient Temp. (°C)	Stack Temp. (°C)	Stack Dia. (m)	Stack Height (m)	Flue Gas Velocity (m/sec)
1	17/05/2024	HRSG-01	42	139	3.3	65	10.4
2	17/05/2024	HRSG-02	42	152	3.3	70	9.85
3	17/05/2024	HRSG-03	42	148	3.3	70	9.80
4	17/05/2024	HRSG-04	42	156	3.3	70	9.87
5	18/05/2024	HRSG-05	43	172	3.3	70	9.90
6	18/05/2024	CPP-VHP-3	43	145	3.34	100	9.65
7	18/05/2024	CPP-VHP-2	42	138	3.34	100	8.17
8	18/05/2024	CPP-VHP-1	42	139	3.34	100	8.83
9	18/05/2024	UB-01	42	171	3.04	100	9.80
10	18/05/2024	UB-02	42	162	3.04	100	9.70
11	20/05/2024	OHCU-RG Heater	42	208	2.42	63	10.26
12	20/05/2024	OHCU-LP Section	42	154	2.42	65	9.44
13	20/05/2024	DHDS Stack	42	233	1.25	60	10.27
14	20/05/2024	CCRU NHT Heater-FF 101	42	217	1.54	60	9.92

### TEST RESULT

S/N	Date of Sampling	Detail of Stack Unit →	Particulate Matter (PM)		Sulphur Dioxide (SO <sub>2</sub> )			Oxide of Nitrogen (NO <sub>x</sub> )			Carbon Monoxide (as CO)			Nickel & Vanadium (as Ni & V)		
			mg/Nm <sup>3</sup>	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr
1	17/05/2024	HRSG-01	8.9	1.81	7.3	2.62	1.45	230.8	112.42	46.83	3.5	2.80	0.71	ND	-	-
2	17/05/2024	HRSG-02	8.1	1.68	8.3	2.90	1.72	172.5	84.02	33.69	3.7	2.96	0.77	ND	-	-
3	17/05/2024	HRSG-03	7.3	1.52	7.9	2.76	1.64	189.4	92.36	39.37	3.9	2.32	0.60	ND	-	-
4	17/05/2024	HRSG-04	6.8	1.39	8.7	3.04	1.78	170.5	82.05	34.81	3.8	2.04	0.78	ND	-	-
5	18/05/2024	HRSG-05	7.9	1.57	7.8	2.73	1.55	185.2	90.21	36.81	3.7	2.96	0.74	ND	-	-
6	18/05/2024	CPP-VHP-3	8.1	1.65	7.5	2.62	1.33	204.3	99.51	41.18	3.5	2.30	0.71	ND	-	-
7	18/05/2024	CPP-VHP-2	7.8	1.42	8.3	2.90	1.51	204.6	99.66	37.21	4.2	3.36	0.76	ND	-	-
8	18/05/2024	CPP-VHP-1	8.2	1.61	7.1	2.48	1.39	195.2	95.08	38.29	3.9	3.12	0.77	ND	-	-
9	18/05/2024	UB-01	8.4	1.41	9.6	3.36	1.61	200.7	97.76	33.39	4.9	3.92	0.82	ND	-	-
10	18/05/2024	UB-02	8.1	1.37	8.9	3.11	1.50	196.3	95.71	33.22	5.1	4.08	0.84	ND	-	-
11	20/05/2024	OHCU-RG Heater	8.8	0.91	11.5	4.02	1.19	132.3	64.44	13.84	9.7	9.48	1.20	ND	-	-
12	20/05/2024	OHCU-LP Section	7.5	0.77	10.2	3.57	1.05	116.8	56.89	12.04	17.3	13.84	1.78	ND	-	-
13	20/05/2024	DHDS Stack	5.4	0.14	8.2	3.87	0.21	89.3	43.80	2.32	4.9	3.92	0.13	ND	-	-
14	20/05/2024	CCRU NHT Heater-FF101	8.6	0.34	9.4	3.29	0.37	118.8	57.82	4.68	8.6	6.88	0.34	ND	-	-
Permissible limits (mg/Nm <sup>3</sup> )			Gas	10	50			350			150			-		
			Liquid	100	1700			450			200			5		
			ECCL	-	-			-			400			-		

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## TEST REPORT

Page 2 of 3

**Issued To:** M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker, Panipat (Haryana)

**Sample Description:** Stack Emission

**Sampling Method:** IS 11255

**Work order Item:** Panipat Refinery & PX-PTA (Table-E & M)

**Report No.:** AAL ENV.20240531009

**Date of Receiving:** 31/05/2024  
**Date of Starting:** 31/05/2024  
**Date of Completion:** 05/06/2024  
**Date of Reporting:** 05/06/2024  
**Sampling Done By:** AAL

### STACK DETAILS

S/N	Date of Sampling	Detail of Stack	Ambient Temp. (°C)	Stack Temp. (°C)	Stack Dia. (m)	Stack Height (m)	Flue Gas Velocity (m/sec)
15	20/05/2024	CCRU NHT Heater-FF 201	42	236	2.34	70	10.30
16	20/05/2024	CCRU NHT Heater-FF 205	42	265	2.34	70	10.50
17	21/05/2024	RFCC-CO Boiler	42	173	2.1	67	10.34
18	21/05/2024	RFCC Feed Heater	41	195	2.1	67	10.24
19	24/05/2024	HGU-PDS	41	156	1.7	60	9.46
20	24/05/2024	HGU-76	41	170	3.4	60	9.61
21	24/05/2024	HGU-77	42	163	3.4	60	8.99
22	24/05/2024	AVU-02	42	142	5.1	100	9.13
23	27/05/2024	AVU-01	42	137	5.1	100	9.16
24	27/05/2024	MSQ Prime G-301-H-101	42	214	1.64	60	9.80
25	27/05/2024	MSQ Prime G-303-H-201	42	230	1.64	60	9.66
26	27/05/2024	MSQ Prime G-303-H-301	42	225	1.64	60	9.61
27	28/05/2024	HCU Stack	42	140	1.3	70	9.28
28	28/05/2024	DCU Heater	43	162	3.0	70	9.70

### TEST RESULT

S/N	Date of Sampling	Detail of Stack Unit	Particulate Matter (PM)		Sulphur Dioxide (SO <sub>2</sub> )		Oxide of Nitrogen (NO <sub>x</sub> )			Carbon Monoxide (as CO)			Nickel & Vanadium (as Ni & V)			
			mg/Nm <sup>3</sup>	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr
15	20/05/2024	CCRU NHT Heater-FF 201	8.7	0.79	8.9	3.11	0.81	119.6	58.26	10.88	20.5	16.40	1.86	ND	-	-
16	20/05/2024	CCRU NHT Heater-FF 205	8.4	0.74	8.6	3.01	0.75	113.5	55.28	9.95	21.8	17.44	1.91	ND	-	-
17	21/05/2024	RFCC-CO Boiler	9.1	0.76	12.6	4.41	1.06	148.4	72.28	12.44	112.9	90.32	9.47	ND	-	-
18	21/05/2024	RFCC Feed Heater	8.6	0.68	12.9	4.51	1.02	113.8	55.43	9.9	6.9	5.52	0.55	ND	-	-
19	24/05/2024	HGU-PDS	7.5	0.39	9.5	3.32	0.50	92.2	45.40	4.87	5.7	4.56	0.30	ND	-	-
20	24/05/2024	HGU-76	7.9	1.65	7.2	2.52	1.88	152.1	74.64	31.50	5.2	4.16	1.07	ND	-	-
21	24/05/2024	HGU-77	8.8	1.72	8.2	2.87	1.60	166.7	78.28	31.43	5.7	4.56	1.11	ND	-	-
22	24/05/2024	AVU-02	7.5	3.52	9.7	3.39	4.55	110.3	53.73	51.78	4.9	3.92	2.30	ND	-	-
23	27/05/2024	AVU-01	7.2	3.43	8.4	2.94	4.01	108.8	53.00	51.68	4.8	3.84	2.29	ND	-	-
24	27/05/2024	MSQ Prime G-301-H-101	4.9	0.22	18.3	6.40	0.71	132.1	61.34	5.86	13.3	10.64	0.59	ND	-	-
25	27/05/2024	MSQ Prime G-303-H-201	4.8	0.23	17.6	6.16	0.75	129.7	64.34	5.60	17.1	13.88	0.72	ND	-	-
26	27/05/2024	MSQ Prime G-303-H-301	4.6	0.25	18.9	6.61	0.80	115.4	56.21	4.91	17.6	14.08	0.75	ND	-	-
27	28/05/2024	HCU Stack	5.6	0.17	7.1	2.48	0.22	124.3	60.55	3.87	4.6	3.68	0.14	ND	-	-
28	28/05/2024	DCU Heater	7.8	1.28	14.3	5.00	2.35	120.5	58.69	19.84	6.9	5.52	1.14	ND	-	-
Permissible limits (mg/Nm <sup>3</sup> )			Gas	10		50		350		150						
			liquid	100		1700		450		200						
			FCCU	-		-		-		400						

MO-004/000000

Authorised Signatory

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## TEST REPORT

Page 3 of 3

Issued To: M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker, Panipat (Haryana)

Report No. AAL ENV-2024051009

Sample Description: Stack Emission

Date of Receiving: 31/05/2024

Sampling Method: IS:11255

Date of Starting: 31/05/2024

Work order Item: Panipat Refinery & PX-PTA (Table-E & M)

Date of Completion: 05/06/2024

Date of Reporting: 05/06/2024

Sampling Done By: AAL

### STACK DETAILS

S/N	Date of Sampling	Detail of Stack	Ambient Temp. (°C)	Stack Temp. (°C)	Stack Dia. (m)	Stack Height (m)	Flue Gas Velocity (m/sec)
29	28/05/2024	DHDT-BS VI (New-107)	43	155	1.8	70	8.91
30	28/05/2024	HGU-BS VI (New-106)	43	152	3.4	59.7	9.50
31	28/05/2024	DHDT-H-01	42	237	1.8	70	9.83
32	28/05/2024	DHDT-H-02	41	240	1.8	70	9.75
33	29/05/2024	PX-Isomer	41	216	1.2	56	9.82
34	29/05/2024	PX-Tatory	41	171	1.2	56	9.35
35	29/05/2024	PX-Xylene	42	160	2.0	58	8.96
36	29/05/2024	PX-CCR	42	191	1.9	100	9.28
37	29/05/2024	PX-NHT	42	138	1.0	30	10.24
38	30/05/2024	PTA-Hot Oil-Heater	42	142	2.35	60	9.12
39	30/05/2024	PTA-FCPH	42	141	2.35	60	8.65
40	30/05/2024	PTA-Thermal Oxidizer	42	136	2.35	60	8.71

### TEST RESULT

S/N	Date of Sampling	Detail of Stack Unit	Particulate Matter (PM)		Sulphur Dioxide (SO <sub>2</sub> )			Oxide of Nitrogen (NO <sub>x</sub> )			Carbon Monoxide (as CO)			Nickel & Vanadium (as Ni & V)		
			mg/Nm <sup>3</sup>	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr	mg/Nm <sup>3</sup>	ppm	kg/hr
29	28/05/2024	DHDT-BS VI (New-107)	4.6	0.25	8.9	3.11	0.49	135.4	65.95	7.49	8.3	6.64	0.46	ND	-	-
30	28/05/2024	HGU-BS VI (New-106)	4.7	1.13	8.5	2.97	1.80	93.7	45.64	19.87	8.1	6.48	1.72	ND	-	-
31	28/05/2024	DHDT-H-01	4.9	0.30	10.5	3.67	0.34	140.2	68.29	7.18	4.9	3.92	0.25	ND	-	-
32	28/05/2024	DHDT-H-02	4.7	0.26	9.3	3.25	0.47	129.6	63.16	6.55	4.2	3.36	0.21	ND	-	-
33	29/05/2024	PX-Isomer	4.8	0.11	12.6	6.16	0.42	110.7	53.92	2.63	38.3	30.64	0.91	ND	-	-
34	29/05/2024	Px-Tatory	6.1	0.15	8.1	2.83	0.20	96.8	47.15	2.41	ND	-	-	ND	-	-
35	29/05/2024	PX-Xylene	7.3	0.50	8.9	3.11	0.40	112.8	54.94	1.66	ND	-	-	ND	-	-
36	29/05/2024	PX-CCR	8.2	0.49	7.2	2.52	0.43	90.4	44.03	5.35	6.5	5.20	0.38	ND	-	-
37	29/05/2024	PX-NHT	7.9	0.16	7.6	2.66	0.16	95.3	46.42	1.95	7.9	5.92	0.15	ND	-	-
38	30/05/2024	PTA-Hot Oil-Heater	6.2	0.62	30.5	10.67	3.94	45.9	22.36	4.58	ND	-	-	ND	-	-
39	30/05/2024	PTA-FCPH	8.5	0.63	8.4	2.94	0.81	121.3	59.08	11.75	ND	-	-	ND	-	-
40	30/05/2024	PTA-Thermal Oxidizer	7.4	0.71	6.4	2.24	0.62	34.7	16.90	3.33	4.3	3.60	0.43	ND	-	-
Permissible limits (mg/Nm <sup>3</sup> )			Gas		10			30			150			-		
			Liquid		100			450			200			5		
			FCCU		-			-			400			-		

ND=Not Detected

\*\*End of Report\*\*

Test Method: - Particulate Matter (as PM) IS 11255(P-1)-1985, Sulphur Dioxide (as SO<sub>2</sub>) IS 11255(P-2)-1985, Oxide of Nitrogen (as NO<sub>x</sub>) IS 11255(P-7)-2005, Carbon Monoxide (as CO) IS 13270-1992, Nickel & Vanadium USEPA Method 29 by AAS

Authorised Signatory

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## TEST REPORT

Page 1 of 1

Issued To: M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker  
Panipat (Haryana)

Report No. AAL ENV-2824/628025

Sample Description: Stack Emission

Date of Receiving: 28/06/2024

Sampling Method: IS:11355

Date of Starting: 28/06/2024

Work order Item: Panipat Refinery (Table-F)

Date of Completion: 04/07/2024

Date of Reporting: 04/07/2024

Sampling Done By: AAL

## STACK DETAILS

S/N	Date of Sampling	Detail of Stack	Ambient Temp. (°C)	Stack Temp. (°C)	Stack Dia. (m)	Stack Height (m)	Flue Gas Velocity (m/sec)
1	27/06/2024	SRU-26	43	184	1.9	70.6	10.66
2	27/06/2024	SRU-57	43	178	1.9	70.0	10.57

## TEST RESULT

S/N	Date of Sampling	Detail of Stack	Sulphur Dioxide (SO <sub>2</sub> )			Oxide of Nitrogen (NOx)			Carbon Monoxide (as CO)			Hydrogen Sulphide (as H <sub>2</sub> S)		
			mg/m <sup>3</sup>	ppm	kg/hr	mg/m <sup>3</sup>	ppm	kg/hr	mg/m <sup>3</sup>	ppm	kg/hr	mg/m <sup>3</sup>	ppm	kg/hr
1	27/06/2024	SRU-26	140.7	49.20	0.76	47.2	23.02	3.27	67.2	55.80	4.66	ND	ND	ND
2	27/06/2024	SRU-57	153.2	53.34	10.80	45.6	22.26	3.16	73.2	58.56	5.09	ND	ND	ND
Permissible limits (mg/Sec)			NS			350			150			15		

(NS=Not Specified/Not Determined)

**\*\*End of Report\*\***

Test Method : Sulphur Dioxide (as SO<sub>2</sub>) IS 11255(P)-1-1985, Oxide of Nitrogen (as NO<sub>x</sub>) IS 11255(P)-7-1985, Carbon Monoxide (as CO) IS 11255-1982, Hydrogen Sulphide (H<sub>2</sub>S) IS 11255(P)-4-2006.

  
ANSHU PRAKASH  
Authorized Signatory

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## TEST CERTIFICATE

Page 1 of 1

Issued To:	Mix Indian Oil Corporation Limited (Refineries Division) Panipat Naphtha Cracker, Panipat (Haryana)	Report No.	AAL WQT-20240124027
Sample Description:	Effluent Water Sample	Date of Receiving:	24/01/2024
Work order Item:	Panipat Refinery (Table-A)	Date of Starting:	24/01/2024
Sample Collection Date:	23/01/2024	Date of Completion:	31/01/2024
Sample ID:	ETPI- Guard Pond	Date of Reporting:	31/01/2024
		Sample Quantity:	2 Litre
		Sample Packing Condition:	Plastic Can
		Sample Collected By:	AAL

### TEST RESULT

S. No.	Test parameters	Unit	Results	Permissible Limits as per CPCB Guideline (Petroleum IOI Refinery)	Testing Method
1	pH Value	-	7.78	6.0 – 8.5	IS 3025(P-11)-2022
2	Oil & Grease	mg/l	2.4	5.0 Max.	IS 3025 (P-39)-2021
3	Biochemical Oxygen Demand (BOD - 5 days at 27°C)	mg/l	13.5	15 Max.	IS 3025(P-44)-2023
4	Chemical Oxygen Demand (COD)	mg/l	86.0	125 Max.	IS 3025(P-58)-2023
5	Total Suspended Solids	mg/l	16.0	20 Max.	IS 3025 (P-17)-2022
6	Phenols	mg/l	0.16	0.35 Max.	IS 3025(P-43/8-1)-2022
7	Sulphide (as S)	mg/l	0.13	0.5 Max.	IS 3025(P-29)-2022
8	Cyanide (as CN)	mg/l	ND <sub>det. conc.</sub>	0.20 Max.	APHA 4300 CN-D
9	Ammonia (as N)	mg/l	4.0	15 Max.	IS 3025(P-34)-1988
10	Total Kjeldahl Nitrogen (as N)	mg/l	8.2	40 Max.	IS 3025(P-34)-1988
11	P	mg/l	1.31	3.0 Max.	IS 3025(P-31)-1988
12	Hexavalent Chromium (as Cr <sup>6+</sup> )	mg/l	ND <sub>det. conc.</sub>	0.1 Max.	IS 3025(P-52)-2003
13	Total Chromium (as Cr)	mg/l	ND <sub>det. conc.</sub>	2.0 Max.	IS 3025(P-52)-2003
14	Lead (as Pb)	mg/l	ND <sub>det. conc.</sub>	0.1 Max.	IS 3025(P-47)-1994
15	Mercury (as Hg)	mg/l	ND <sub>det. conc.</sub>	0.01 Max.	IS 3025(P-48)-1994
16	Zinc (as Zn)	mg/l	0.15	5.0 Max.	IS 3025(P-49)-1994
17	Nickel (as Ni)	mg/l	ND <sub>det. conc.</sub>	1.0 Max.	IS 3025(P-34)-2003
18	Copper (as Cu)	mg/l	ND <sub>det. conc.</sub>	1.0 Max.	IS 3025(P-42)-1992
19	Vanadium (as V)	mg/l	ND <sub>det. conc.</sub>	0.2 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 3111D
20	Benzene (as C <sub>6</sub> H <sub>6</sub> )	mg/l	ND <sub>det. conc.</sub>	0.1 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 6200B
21	Benzo(a)pyrene (BaP)	mg/l	ND <sub>det. conc.</sub>	0.2 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 6410B

ND Not Detected (Detection Limit)

**\*\*End of Report\*\***

**Authorised Signatory**  
Dr. Anil Kumar Astava  
Deputy Technical Manager

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## TEST CERTIFICATE

Page 1 of 1

Issued To: M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker,  
Panipat (Haryana)

Report No. AAL WQT-20240124028

Sample Description: Effluent Water Sample  
Work order Item: Panipat Refinery (Table-A)  
Sample Collection Date: 23/01/2024  
Sample ID: ETP2- Guard Pond

Date of Receiving: 24/01/2024  
Date of Starting: 24/01/2024  
Date of Completion: 31/01/2024  
Date of Reporting: 31/01/2024  
Sample Quantity: 2 Litre  
Sample Packing Condition: Plastic Can  
Sample Collected By: AAL

### TEST RESULT

S. No.	Test parameters	Unit	Results	Permissible Limits as per CPCB Guideline (Petroleum Oil Refinery)	Testing Method
1	pH Value	-	7.63	6.0 - 8.5	IS 3025(P-11)-2022
2	Oil & Grease	mg/l	2.1	5.0 Max.	IS 3025 (P-39)-2021
3	Biochemical Oxygen Demand (BOD- 5 days @ 20°C)	mg/l	12.6	15 Max.	IS 3025(P-44)-2023
4	Chemical Oxygen Demand (COD)	mg/l	70.0	125 Max.	IS 3025(P-58)-2023
5	Total Suspended Solids	mg/l	14.0	20 Max.	IS 3025 (P-17)-2022
6	Phenols	mg/l	0.11	0.35 Max.	IS 3025(P-43/S-1)-2022
7	Sulphide (as S)	mg/l	0.12	0.5 Max.	IS 3025(P-29)-2022
8	Cyanide (as CN)	mg/l	ND(LOD=0.01)	0.20 Max.	APHA 4500 CN-D
9	Ammonia (as N)	mg/l	3.0	15 Max.	IS 3025(P-34)-1988
10	Total Kjeldahl Nitrogen (as N)	mg/l	7.2	40 Max.	IS 3025(P-34)-1988
11	P	mg/l	1.16	3.0 Max.	IS 3025(P-31)-1988
12	Hexavalent Chromium (as Cr <sup>6+</sup> )	mg/l	ND(LOD=0.01)	0.1 Max.	IS 3025(P-52)-2003
13	Total Chromium (as Cr)	mg/l	ND(LOD=0.01)	2.0 Max.	IS 3025(P-52)-2003
14	Lead (as Pb)	mg/l	ND(LOD=0.01)	0.1 Max.	IS 3025(P-47)-1994
15	Mercury (as Hg)	mg/l	ND(LOD=0.01)	0.01 Max.	IS 3025(P-48)-1994
16	Zinc (as Zn)	mg/l	0.15	5.0 Max.	IS 3025(P-49)-1994
17	Nickel (as Ni)	mg/l	ND(LOD=0.01)	1.0 Max.	IS 3025(P-54)-2003
18	Copper (as Cu)	mg/l	ND(LOD=0.01)	1.0 Max.	IS 3025(P-42)-1992
19	Vanadium (as V)	mg/l	ND(LOD=0.01)	0.2 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 3111D
20	Benzene (as C <sub>6</sub> H <sub>6</sub> )	mg/l	ND(LOD=0.01)	0.1 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 6200B
21	Benzo(a)pyrene (BaP)	mg/l	ND(LOD=0.01)	0.2 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 6410B

Shri Anand Kumar, J.D. & Son, Sonapat

**\*\*End of Report\*\***

ASHUTOSH K. VASTAVA  
Deputy Technical Manager  
Authorised Signatory

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Issued To:	M/s Indian Oil Corporation Limited (Refineries Division) Panipat Naphtia Cracker, Panipat (Haryana)	Report No.	AAL WQT-20240124012
Sample Description:	Effluent Water Sample	Date of Receiving:	24/01/2024
Work order Item:	PK-PTA-[Table-I]	Date of Starting:	24/01/2024
Sample Collection Date:	23/01/2024	Date of Completion:	31/01/2024
Sample ID:	PTA-ETP-3- Guard Pond	Date of Reporting:	31/01/2024
		Sample Quantity:	2 Litre
		Sample Packing Condition:	Plastic Can
		Sample Collected By:	AAL

## TEST RESULT

S. No.	Test parameters	Unit	Results	Permissible Limits	Testing Method
1	pH Value	-	7.48	6.5 – 8.5	IS 3025(P-11)-2022
2	Biochemical Oxygen Demand (BOD - 5 days at 27°C)	mg/l	23.0	30 Max.	IS 3025(P-44)-2023
3	Phenol	mg/l	0.27	1 Max.	IS 3025(P-43/S-1)-2022
4	Sulphide (as S)	mg/l	0.22	2 Max.	IS 3025(P-29)-2022
5	Chemical Oxygen Demand (COD)	mg/l	126.0	250 Max.	IS 3025(P-58)-2023
6	Cyanide (as CN)	mg/l	ND <sub>data-not</sub>	0.20 Max.	APHA 4500-CN-D
7	Fluoride (as F)	mg/l	1.32	5 Max.	APHA 4500-F-D
8	Total Suspended Solids	mg/l	27.0	100 Max.	IS 3025 (P-17)-2022
9	Hexavalent Chromium (as Cr <sup>6+</sup> )	mg/l	ND <sub>data-not</sub>	0.1 Max.	IS 3025(P-52)-2003
10	Total Chromium (as Cr)	mg/l	ND <sub>data-not</sub>	2.0 Max.	IS 3025(P-52)-2003

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ASHUTOSH SRIVASTAVA  
Deputy Technical Manager  
Authorised Signatory

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## TEST REPORT

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Issued To: M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker,  
Panipat (Haryana)

Report No. AAL WQT-20240224034

Date of Receiving: 24/02/2024

Date of Starting: 24/02/2024

Date of Completion: 29/02/2024

Date of Reporting: 29/02/2024

Sample Quantity: 2 Litre

Sample Packing Condition: Plastic Can

Sample Collected By: AAL

Sample Description: Effluent Water Sample  
Work order Item: Panipat Refinery (Table-A)  
Sample Collection Date: 23/02/2024  
Sample ID: ETPI- Guard Pond

## TEST RESULT

S. No.	Test parameters	Unit	Results	Permissible Limits as per CPCB Guideline (Petroleum Oil Refinery)	Testing Method
1	pH Value	-	7.62	6.0 - 8.5	IS 3025(P-11)-2023
2	Oil & Grease	mg/l	2.2	5.0 Max.	IS 3025 (P-39)-2021
3	Biochemical Oxygen Demand (BOD - 5 days at 20°C)	mg/l	12.4	15 Max.	IS 3025(P-44)-2023
4	Chemical Oxygen Demand (COD)	mg/l	73.0	125 Max.	IS 3025(P-58)-2023
5	Total Suspended Solids	mg/l	14.0	20 Max.	IS 3025 (P-17)-2022
6	Phenols	mg/l	0.14	0.35 Max.	IS 3025(P-43/S-1)-2022
7	Sulphide (as S)	mg/l	0.12	0.5 Max.	IS 3025(P-29)-2022
8	Cyanide (as CN)	mg/l	ND <sub>0.01 mg/l</sub>	0.20 Max.	APHA 4500 CN-D
9	Ammonia (as N)	mg/l	3.2	15 Max.	IS 3025(P-34)-1988
10	Total Kjeldahl Nitrogen (as N)	mg/l	7.3	40 Max.	IS 3025(P-34)-1988
11	P	mg/l	1.22	3.0 Max.	IS 3025(P-31)-1988
12	Hexavalent Chromium (as Cr <sup>6+</sup> )	mg/l	ND <sub>0.01 mg/l</sub>	0.1 Max.	IS 3025(P-52)-2003
13	Total Chromium (as Cr)	mg/l	ND <sub>0.05 mg/l</sub>	2.0 Max.	IS 3025(P-52)-2003
14	Lead (as Pb)	mg/l	ND <sub>0.01 mg/l</sub>	0.1 Max.	IS 3025(P-47)-1994
15	Mercury (as Hg)	mg/l	ND <sub>0.001 mg/l</sub>	0.01 Max.	IS 3025(P-48)-1994
16	Zinc (as Zn)	mg/l	0.12	5.0 Max.	IS 3025(P-49)-1994
17	Nickel (as Ni)	mg/l	ND <sub>0.01 mg/l</sub>	1.0 Max.	IS 3025(P-54)-2003
18	Copper (as Cu)	mg/l	ND <sub>0.01 mg/l</sub>	1.0 Max.	IS 3025(P-42)-1992
19	Vanadium (as V)	mg/l	ND <sub>0.01 mg/l</sub>	0.2 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 3111D
20	Benzene (as C <sub>6</sub> H <sub>6</sub> )	mg/l	ND <sub>0.01 mg/l</sub>	0.1 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 6200B
21	Benzo(a)-pyrene (BaP)	mg/l	ND <sub>0.01 mg/l</sub>	0.2 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 6410B

ND: Not Detected, L.O.D.: Lower Detection Limit

\*\*End of Report\*\*

ASHUTOSH KUMAR VASTAVA  
Deputy Technical Manager  
Authorised Signatory

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## TEST REPORT

Page 1 of 1

Issued To: M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker,  
Panipat (Haryana)

Report No.: AAL WQT-20240224035

Date of Receiving: 24/02/2024

Date of Starting: 24/02/2024

Date of Completion: 29/02/2024

Date of Reporting: 29/02/2024

Sample Quantity: 2 Litre

Sample Packing Condition: Plastic Can

Sample Collected By: AAL

Sample Description: Effluent Water Sample

Work order Item: Panipat Refinery (Table-A)

Sample Collection Date: 23/02/2024

Sample ID: ETP2- Guard Pond

### TEST RESULT

S. No.	Test parameters	Unit	Results	Permissible Limits as per CPCB Guideline (Petroleum Oil Refineries)	Testing Method
1.	pH Value		7.54	6.0 - 8.5	IS 3025(P-11)-2022
2.	Oil & Grease	mg/l	2.7	5.0 Max.	IS 3025 (P-39)-2021
3.	Biochemical Oxygen Demand (BOD-5 days at 20°C)	mg/l	13.1	15 Max.	IS 3025(P-44)-2023
4.	Chemical Oxygen Demand (COD)	mg/l	81.0	125 Max.	IS 3025(P-58)-2023
5.	Total Suspended Solids	mg/l	17.0	20 Max.	IS 3025 (P-17)-2022
6.	Phenols	mg/l	0.13	0.35 Max.	IS 3025(P-43/S-1)-2022
7.	Sulphide (as S)	mg/l	0.14	0.5 Max.	IS 3025(P-29)-2022
8.	Cyanide (as CN)	mg/l	ND <sub>(0.05-0.05)</sub>	0.20 Max.	APHA 4500 CN-D
9.	Ammonia (as N)	mg/l	3.4	15 Max.	IS 3025(P-34)-1988
10.	Total Kjeldahl Nitrogen (as-N)	mg/l	6.0	40 Max.	IS 3025(P-34)-1988
11.	P	mg/l	1.15	3.0 Max.	IS 3025(P-31)-1988
12.	Hexavalent Chromium (as Cr <sup>6+</sup> )	mg/l	ND <sub>(0.05-0.05)</sub>	0.1 Max.	IS 3025(P-52)-2003
13.	Total Chromium (as Cr)	mg/l	ND <sub>(0.05-0.05)</sub>	2.0 Max.	IS 3025(P-52)-2003
14.	Lead (as Pb)	mg/l	ND <sub>(0.05-0.05)</sub>	0.1 Max.	IS 3025(P-47)-1994
15.	Mercury (as Hg)	mg/l	ND <sub>(0.05-0.05)</sub>	0.01 Max.	IS 3025(P-48)-1994
16.	Zinc (as Zn)	mg/l	0.10	5.0 Max.	IS 3025(P-49)-1994
17.	Nickel (as Ni)	mg/l	ND <sub>(0.05-0.05)</sub>	1.0 Max.	IS 3025(P-54)-2003
18.	Copper (as Cu)	mg/l	ND <sub>(0.05-0.05)</sub>	1.0 Max.	IS 3025(P-42)-1992
19.	Vanadium (as V)	mg/l	ND <sub>(0.05-0.05)</sub>	0.2 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 3111D
20.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	mg/l	ND <sub>(0.05-0.05)</sub>	0.1 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 6200B
21.	Benzo a-pyrene (BaP)	mg/l	ND <sub>(0.05-0.05)</sub>	0.2 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 4150B

ND=Not Detected (LOD=Lower Detection Limit)

**\*\*End of Report\*\***

ASHUTOSH VASTAVA  
Deputy Technical Manager  
Authorised Signatory

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## TEST REPORT

Page 1 of 1

**Issued To:** M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker,  
Panipat (Haryana)

**Report No.** AAL WQT-20240224042

**Date of Receiving:** 24/02/2024

**Date of Starting:** 24/02/2024

**Date of Completion:** 29/02/2024

**Date of Reporting:** 29/02/2024

**Sample Quantity:** 2 Litre

**Sample Packing Condition:** Plastic Can

**Sample Collected By:** AAL

**Sample Description:** Effluent Water Sample  
**Work order Item:** PX-PTA (Table-I)  
**Sample Collection Date:** 23/02/2024  
**Sample ID:** PTA-ETP-3- Guard Pond

### TEST RESULT

S. No.	Test parameters	Unit	Results	Permissible Limits	Testing Method
1	pH Value	-	7.40	6.5 - 8.5	IS 3025(P-11)-2022
2	Biochemical Oxygen Demand (BOD : 3 days at 27°C)	mg/l	21.0	30 Max.	IS 3025(P-44)-2023
3	Phenol	mg/l	0.25	1 Max.	IS 3025(P-43/S-1)-2022
4	Sulphide (as S)	mg/l	0.20	2 Max.	IS 3025(P-29)-2022
5	Chemical Oxygen Demand (COD)	mg/l	115.0	250 Max.	IS 3025(P-58)-2023
6	Cyanide (as CN)	mg/l	ND <sub>(LRL=0.05)</sub>	0.30 Max.	APHA 4500 CN-D
7	Fluoride (as F)	mg/l	1.27	5 Max.	APHA 4500-F D
8	Total Suspended Solids	mg/l	29.5	100 Max.	IS 3025 (P-17)-2022
9	Hexavalent Chromium (as Cr <sup>6+</sup> )	mg/l	ND <sub>(LRL=0.05)</sub>	0.1 Max.	IS 3025(P-52)-2003
10	Total Chromium (as Cr)	mg/l	ND <sub>(LRL=0.2)</sub>	2.0 Max.	IS 3025(P-52)-2003

\*BODable Demand, COD-Catalytic Oxidation Demand

**\*\*End of Report\*\***

  
**ASHUTOSH SRIVASTAVA**  
Deputy Technical Manager  
Authorised Signatory

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## TEST REPORT

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Issued To: M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker,  
Panipat (Haryana)

Report No. AAL WQT-20240323019

Sample Description: Effluent Water Sample  
Work order Item: Panipat Refinery (Table-A)  
Sample Collection Date: 22/03/2024  
Sample ID: ETPI- Guard Pond

Date of Receiving: 23/03/2024  
Date of Starting: 23/03/2024  
Date of Completion: 28/03/2024  
Date of Reporting: 28/03/2024  
Sample Quantity: 2 Litre  
Sample Packing Condition: Plastic Can  
Sample Collected By: AAL

### TEST RESULT

S. No.	Test parameters	Unit	Results	Permissible Limits as per CPCB Guideline (Petroleum Oil Refinery)	Testing Method
1	pH Value	-	7.57	6.0 - 8.5	IS 3025(P-11)-2022
2	Oil & Grease	mg/l	2.0	5.0 Max.	IS 3025 (P-39)-2021
3	Biochemical Oxygen Demand (BOD - 5 days at 27°C)	mg/l	13.6	15 Max.	IS 3025(P-44)-2023
4	Chemical Oxygen Demand (COD)	mg/l	87.0	125 Max.	IS 3025(P-58)-2023
5	Total Suspended Solids	mg/l	17.0	20 Max.	IS 3025 (P-17)-2022
6	Phenols	mg/l	0.18	0.35 Max.	IS 3025(P-43/S-1)-2022
7	Sulphide (as S)	mg/l	0.10	0.5 Max.	IS-3025(P-29)-2022
8	Cyanide (as CN)	mg/l	ND <sub>(0.05-0.05)</sub>	0.20 Max.	APHA 4500 CN-D
9	Ammonia (as N)	mg/l	2.6	15 Max.	IS 3025(P-34)-1988
10	Total Kjeldahl Nitrogen (as N)	mg/l	5.2	40 Max.	IS 3025(P-34)-1988
11	P	mg/l	1.12	3.0 Max.	IS 3025(P-31)-1988
12	Hexavalent Chromium (as Cr <sup>6+</sup> )	mg/l	ND <sub>(0.01-0.01)</sub>	0.1 Max.	IS 3025(P-52)-2003
13	Total Chromium (as Cr)	mg/l	ND <sub>(0.05-0.05)</sub>	2.0 Max.	IS 3025(P-52)-2003
14	Lead (as Pb)	mg/l	ND <sub>(0.05-0.05)</sub>	0.1 Max.	IS 3025(P-47)-1994
15	Mercury (as Hg)	mg/l	ND <sub>(0.005-0.001)</sub>	0.01 Max.	IS 3025(P-48)-1994
16	Zinc (as Zn)	mg/l	0.10	5.0 Max.	IS 3025(P-49)-1994
17	Nickel (as Ni)	mg/l	ND <sub>(0.05-0.05)</sub>	1.0 Max.	IS 3025(P-54)-2003
18	Copper (as Cu)	mg/l	ND <sub>(0.05-0.05)</sub>	1.0 Max.	IS 3025(P-42)-1992
19	Vanadium (as V)	mg/l	ND <sub>(0.05-0.05)</sub>	0.2 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 3111D
20	Benzene (as C <sub>6</sub> H <sub>6</sub> )	mg/l	ND <sub>(0.05-0.025)</sub>	0.1 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 6200B
21	Benzene n-pyrene (BaP)	mg/l	ND <sub>(0.05-0.001)</sub>	0.2 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 6410B

ND=Not Detected, LOD=Lower Detection Limit

**\*\*End of Report\*\***

  
ASHUTOSH SRIVASTAVA  
Deputy Technical Manager  
Authorised Signatory

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## TEST REPORT

Page 1 of 1

Issued To: M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker,  
Panipat (Haryana)

Report No. AAL WQT-20240323020

Date of Receiving: 23/03/2024

Date of Starting: 25/03/2024

Date of Completion: 28/03/2024

Date of Reporting: 28/03/2024

Sample Quantity: 2 Litre

Sample Packing Condition: Plastic Can

Sample Collected By: AAL

Sample Description: Effluent Water Sample  
Work order Item: Panipat Refinery (Table-A)  
Sample Collection Date: 22/03/2024  
Sample ID: ETP2- Guard Pond

### TEST RESULT

S. No.	Test parameters	Unit	Results	Permissible Limits as per CPCB Guideline (Petroleum Oil Refinery)	Testing Method
1	pH Value	-	7.58	6.0 - 8.5	IS 3025(P-11)-2022
2	Oil & Grease	mg/l	2.4	5.0 Max.	IS 3025 (P-39)-2021
3	Biochemical Oxygen Demand (BOD - 5 days at 27°C)	mg/l	14.3	15 Max.	IS 3025(P-44)-2023
4	Chemical Oxygen Demand (COD)	mg/l	92.0	125 Max.	IS 3025(P-58)-2023
5	Total Suspended Solids	mg/l	18.0	20 Max.	IS 3025 (P-17)-2022
6	Phenols	mg/l	0.22	0.35 Max.	IS 3025(P-43/S-1)-2022
7	Sulphide (as S)	mg/l	0.16	0.5 Max.	IS 3025(P-39)-2022
8	Cyanide (as CN)	mg/l	ND <sub>(0.05)</sub>	0.20 Max.	APHA 4500 CN-D
9	Ammonia (as N)	mg/l	4.0	15 Max.	IS 3025(P-34)-1988
10	Total Kjeldahl Nitrogen (as N)	mg/l	7.3	40 Max.	IS 3025(P-34)-1988
11	P	mg/l	1.26	3.0 Max.	IS 3025(P-31)-1988
12	Hexavalent Chromium (as Cr <sup>6+</sup> )	mg/l	ND <sub>(0.05)</sub>	0.1 Max.	IS 3025(P-52)-2003
13	Total Chromium (as Cr)	mg/l	ND <sub>(0.05)</sub>	2.0 Max.	IS 3025(P-52)-2003
14	Lead (as Pb)	mg/l	ND <sub>(0.05)</sub>	0.1 Max.	IS 3025(P-47)-1994
15	Mercury (as Hg)	mg/l	ND <sub>(0.005)</sub>	0.01 Max.	IS 3025(P-48)-1994
16	Zinc (as Zn)	mg/l	0.17	3.0 Max.	IS 3025(P-49)-1994
17	Nickel (as Ni)	mg/l	ND <sub>(0.05)</sub>	1.0 Max.	IS 3025(P-54)-2003
18	Copper (as Cu)	mg/l	ND <sub>(0.05)</sub>	1.0 Max.	IS 3025(P-42)-1992
19	Vanadium (as V)	mg/l	ND <sub>(0.05)</sub>	0.2 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 3111D
20	Benzene (as C <sub>6</sub> H <sub>6</sub> )	mg/l	ND <sub>(0.05)</sub>	0.1 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 6200B
21	Benzo-a-pyrene (BaP)	mg/l	ND <sub>(0.05)</sub>	0.2 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 6410B

ND=Not Detected, ED=Lower Detection Limit

**\*\*End of Report\*\***

  
ASHUTOSH SRIVASTAVA  
Deputy Technical Manager  
Authorised Signatory

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## TEST REPORT

Page 1 of 1

Issued To: M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker,  
Panipat (Haryana)

Sample Description: Effluent Water Sample

Work order Item: PX-PTA (Table-I)

Sample Collection Date: 22/03/2024

Sample ID: PTA-ETP-3- Guard Pond

Report No. AAL WQT-20240323008

Date of Receiving: 23/03/2024

Date of Starting: 23/03/2024

Date of Completion: 28/03/2024

Date of Reporting: 28/03/2024

Sample Quantity: 2 Litre

Sample Packing Condition: Plastic Can

Sample Collected By: AAL

### TEST RESULT

S. No.	Test parameters	Unit	Results	Permissible Limits	Testing Method
1	pH Value	-	7.58	6.5 - 8.5	IS 3025(P-11)-2022
2	Biochemical Oxygen Demand (BOD) - 5 days at 20°C	mg/l	23.0	30 Max.	IS 3025(P-44)-2023
3	Phenol	mg/l	0.21	1 Max.	IS 3025(P-43/S-1)-2022
4	Sulphide (as S)	mg/l	0.18	2 Max.	IS 3025(P-29)-2022
5	Chemical Oxygen Demand (COD)	mg/l	109.0	250 Max.	IS 3025(P-38)-2023
6	Cyanide (as CN)	mg/l	ND <sub>det. conc.</sub>	0.20 Max.	APHA 4500 CN-D
7	Fluoride (as F)	mg/l	1.10	5 Max.	APHA 4500-F D
8	Total Suspended Solids	mg/l	24.0	100 Max.	IS 3025 (P-17)-2022
9	Hexavalent Chromium (as Cr <sup>6+</sup> )	mg/l	ND <sub>det. conc.</sub>	0.1 Max.	IS 3025(P-52)-2003
10	Total Chromium (as Cr)	mg/l	ND <sub>det. conc.</sub>	2.0 Max.	IS 3025(P-52)-2003

ND-Not Detected, L.D.-Lower Detection Limit

**\*\* End of Report \*\***

  
ASHUTOSH SRIVASTAVA  
Deputy Technical Manager

Authorised Signatory

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## TEST REPORT

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**Issued To:** M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker,  
Panipat (Haryana)

**Report No.** AAL WQT-20240423036

**Sample Description:** Effluent Water Sample  
**Work order Item:** Panipat Refinery (Table-A)  
**Sample Collection Date:** 22/04/2024  
**Sample ID:** ETP1- Guard Pond

**Date of Receiving:** 23/04/2024  
**Date of Starting:** 23/04/2024  
**Date of Completion:** 29/04/2024  
**Date of Reporting:** 29/04/2024  
**Sample Quantity:** 2 Litre  
**Sample Packing Condition:** Plastic Can  
**Sample Collected By:** AAL

### TEST RESULT

S. No.	Test parameters	Unit	Results	Permissible Limits as per CPCB Guideline (Petroleum Oil Refinery)	Testing Method
1	pH Value	-	7.82	6.0 - 8.5	IS 3025(P-11)-2022
2	Oil & Grease	mg/l	2.0	5.0 Max.	IS 3025 (P-39)-2021
3	Biochemical Oxygen Demand (BOD-5 days at 27°C)	mg/l	14.3	15 Max.	IS 3025(P-44)-2023
4	Chemical Oxygen Demand (COD)	mg/l	95.0	125 Max.	IS 3025(P-58)-2023
5	Total Suspended Solids	mg/l	18.0	20 Max.	IS 3025 (P-17)-2022
6	Phenols	mg/l	0.19	0.35 Max.	IS 3025(P-43/S-1)-2022
7	Sulphide (as S)	mg/l	0.15	0.5 Max.	IS 3025(P-29)-2022
8	Cyanide (as CN)	mg/l	ND <sub>(0.01-0.05)</sub>	0.20 Max.	APHA 4500 CN-D
9	Ammonia (as N)	mg/l	5.3	15 Max.	IS 3025(P-34)-1988
10	Total Kjeldahl Nitrogen (as N)	mg/l	9.6	40 Max.	IS 3025(P-34)-1988
11	P	mg/l	1.16	3.0 Max.	IS 3025(P-31)-1988
12	Hexavalent Chromium (as Cr <sup>6+</sup> )	mg/l	ND <sub>(0.01-0.05)</sub>	0.1 Max.	IS 3025(P-52)-2003
13	Total Chromium (as Cr)	mg/l	ND <sub>(0.01-0.1)</sub>	2.0 Max.	IS 3025(P-52)-2003
14	Lead (as Pb)	mg/l	ND <sub>(0.01-0.05)</sub>	0.1 Max.	IS 3025(P-47)-1994
15	Mercury (as Hg)	mg/l	ND <sub>(0.01-0.001)</sub>	0.01 Max.	IS 3025(P-48)-1994
16	Zinc (as Zn)	mg/l	0.13	5.0 Max.	IS 3025(P-49)-1994
17	Nickel (as Ni)	mg/l	ND <sub>(0.01-0.1)</sub>	1.0 Max.	IS 3025(P-54)-2003
18	Copper (as Cu)	mg/l	ND <sub>(0.01-0.05)</sub>	1.0 Max.	IS 3025(P-42)-1992
19	Vanadium (as V)	mg/l	ND <sub>(0.01-0.05)</sub>	0.2 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 3111D
20	Benzene (as C <sub>6</sub> H <sub>6</sub> )	mg/l	ND <sub>(0.01-0.001)</sub>	0.1 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 6200B
21	Benzo a-pyrene (BaP)	mg/l	ND <sub>(0.01-0.001)</sub>	0.2 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 6410B

ND=Not Detected, LDU=Lower Detection Limit

**\*\*End of Report\*\***

Deputy Technical Officer  
Authorised Signatory

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## TEST REPORT

Page 1 of 1

**Issued To:** M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker,  
Panipat (Haryana)

**Report No.** AAL WQT-20240423037

**Sample Description:** Effluent Water Sample  
**Work order Item:** Panipat Refinery (Table-A)  
**Sample Collection Date:** 22/04/2024  
**Sample ID:** ETP2- Guard Pond

**Date of Receiving:** 23/04/2024  
**Date of Starting:** 23/04/2024  
**Date of Completion:** 29/04/2024  
**Date of Reporting:** 29/04/2024  
**Sample Quantity:** 2 Litre  
**Sample Packing Condition:** Plastic Can  
**Sample Collected By:** AAL

### TEST RESULT

S. No.	Test parameters	Unit	Results	Permissible Limits as per CPCB Guideline (Petroleum Oil Refinery)	Testing Method
1	pH Value	-	7.74	6.0 - 8.5	IS 3025(P-11)-2022
2	Oil & Grease	mg/l	2.4	5.0 Max.	IS 3025 (P-39)-2021
3	Biochemical Oxygen Demand (BOD - 5 days at 27°C)	mg/l	13.0	15 Max.	IS 3025(P-44)-2023
4	Chemical Oxygen Demand (COD)	mg/l	82.0	125 Max.	IS 3025(P-58)-2023
5	Total Suspended Solids	mg/l	15.0	20 Max.	IS 3025 (P-17)-2022
6	Phenols	mg/l	0.13	0.35 Max.	IS 3025(P-43/S-1)-2022
7	Sulphide (as S)	mg/l	0.10	0.5 Max.	IS 3025(P-29)-2022
8	Cyanide (as CN)	mg/l	ND <sub>(0.01-0.05)</sub>	0.20 Max.	APHA 4500 CN-D
9	Ammonia (as N)	mg/l	4.2	15 Max.	IS 3025(P-34)-1988
10	Total Kjeldahl Nitrogen (as N)	mg/l	8.0	40 Max.	IS 3025(P-34)-1988
11	P	mg/l	1.19	3.0 Max.	IS 3025(P-31)-1988
12	Hexavalent Chromium (as Cr <sup>6+</sup> )	mg/l	ND <sub>(0.01-0.05)</sub>	0.1 Max.	IS 3025(P-52)-2003
13	Total Chromium (as Cr)	mg/l	ND <sub>(0.01-0.2)</sub>	2.0 Max.	IS 3025(P-52)-2003
14	Lead (as Pb)	mg/l	ND <sub>(0.01-0.05)</sub>	0.1 Max.	IS 3025(P-47)-1994
15	Mercury (as Hg)	mg/l	ND <sub>(0.01-0.05)</sub>	0.01 Max.	IS 3025(P-48)-1994
16	Zinc (as Zn)	mg/l	0.20	5.0 Max.	IS 3025(P-49)-1994
17	Nickel (as Ni)	mg/l	ND <sub>(0.01-0.1)</sub>	1.0 Max.	IS 3025(P-54)-2003
18	Copper (as Cu)	mg/l	ND <sub>(0.01-0.05)</sub>	1.0 Max.	IS 3025(P-42)-1992
19	Vanadium (as V)	mg/l	ND <sub>(0.01-0.05)</sub>	0.2 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 3111D
20	Benzene (as C <sub>6</sub> H <sub>6</sub> )	mg/l	ND <sub>(0.01-0.05)</sub>	0.1 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 6200B
21	Benzo a-pyrene (BaP)	mg/l	ND <sub>(0.01-0.05)</sub>	0.2 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 6410B

ND=Not Detected, LOD=Lower Detection Limit

**\*\*End of Report\*\***

Deputy Technical Manager  
Authorised Signatory

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## TEST REPORT

Page 1 of 1

**Issued To:** M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker,  
Panipat (Haryana)

**Report No.** AAL WQT-20240423022

**Sample Description:** Effluent Water Sample

**Date of Receiving:** 23/04/2024

**Work order Item:** PX-PTA (Table-I)

**Date of Starting:** 23/04/2024

**Sample Collection Date:** 22/04/2024

**Date of Completion:** 29/04/2024

**Sample ID:** PTA-ETP-3- Guard Pond

**Date of Reporting:** 29/04/2024

**Sample Quantity:** 2 Litre

**Sample Packing Condition:** Plastic Can

**Sample Collected By:** AAL

## TEST RESULT

S. No.	Test parameters	Unit	Results	Permissible Limits	Testing Method
1	pH Value	-	7.55	6.5 - 8.5	IS 3025(P-11)-2022
2	Biochemical Oxygen Demand (BOD - 5 days at 20°C)	mg/l	25.0	30 Max.	IS 3025(P-44)-2023
3	Phenol	mg/l	0.30	1 Max.	IS 3025(P-43/S-1)-2022
4	Sulphide (as S)	mg/l	0.24	2 Max.	IS 3025(P-29)-2022
5	Chemical Oxygen Demand (COD)	mg/l	134.0	250 Max.	IS 3025(P-58)-2023
6	Cyanide (as CN)	mg/l	ND <sub>0.001mg/l</sub>	0.20 Max.	APHA 4500 CN-D
7	Fluoride (as F)	mg/l	1.44	5 Max.	APHA 4500-F D
8	Total Suspended Solids	mg/l	30.0	100 Max.	IS 3025 (P-17)-2022
9	Hexavalent Chromium (as Cr <sup>6+</sup> )	mg/l	ND <sub>0.01mg/l</sub>	0.1 Max.	IS 3025(P-52)-2003
10	Total Chromium (as Cr)	mg/l	ND <sub>0.05mg/l</sub>	2.0 Max.	IS 3025(P-52)-2003

ND=Not Detected 120-140mg/l Detoxified Limit

**\*\*End of Report\*\***

  
Ashutosh Srivastava  
Deputy Technical Manager  
Authorised Signatory

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## TEST REPORT

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**Issued To:** M/s Indian Oil Corporation Limited.  
(Refineries Division)  
Panipat Naphtha Cracker,  
Panipat (Haryana)

**Report No.** AAL WQT-20240520029

**Sample Description:** Effluent Water Sample  
**Work order Item:** Panipat Refinery (Table-A)  
**Sample Collection Date:** 18/05/2024  
**Sample ID:** ETPI- Guard Pond

**Date of Receiving:** 20/05/2024  
**Date of Starting:** 20/05/2024  
**Date of Completion:** 27/05/2024  
**Date of Reporting:** 27/05/2024  
**Sample Quantity:** 2 Litre  
**Sample Packing Condition:** Plastic Can  
**Sample Collected By:** AAL

### TEST RESULT

S. No.	Test parameters	Unit	Results	Permissible Limits as per CPCB Guideline (Petroleum Oil Refinery)	Testing Method
1.	pH Value	-	7.95	6.0 - 8.5	IS 3025(P-11)-2022
2.	Oil & Grease	mg/l	2.3	5.0 Max.	IS 3025(P-39)-2021
3.	Biochemical Oxygen Demand (BOD - 3 days at 27°C)	mg/l	13.6	15 Max.	IS 3025(P-44)-2023
4.	Chemical Oxygen Demand (COD)	mg/l	87.0	125 Max.	IS 3025(P-58)-2023
5.	Total Suspended Solids	mg/l	17.0	20 Max.	IS 3025(P-17)-2022
6.	Phenols	mg/l	0.15	0.35 Max.	IS 3025(P-43/S-1)-2022
7.	Sulphide (as S)	mg/l	0.13	0.5 Max.	IS 3025(P-29)-2022
8.	Cyanide (as CN)	mg/l	ND <sub>(LCL=0.05)</sub>	0.20 Max.	APHA 4500 CN-D
9.	Ammonia (as N)	mg/l	4.0	15 Max.	IS 3025(P-34)-1988
10.	Total Kjeldahl Nitrogen (as N)	mg/l	8.6	40 Max.	IS 3025(P-34)-1988
11.	P	mg/l	1.10	3.0 Max.	IS 3025(P-31)-1988
12.	Hexavalent Chromium (as Cr <sup>6+</sup> )	mg/l	ND <sub>(LCL=0.05)</sub>	0.1 Max.	IS 3025(P-52)-2003
13.	Total Chromium (as Cr)	mg/l	ND <sub>(LCL=0.2)</sub>	2.0 Max.	IS 3025(P-52)-2003
14.	Lead (as Pb)	mg/l	ND <sub>(LCL=0.05)</sub>	0.1 Max.	IS 3025(P-47)-1994
15.	Mercury (as Hg)	mg/l	ND <sub>(LCL=0.001)</sub>	0.01 Max.	IS 3025(P-48)-1994
16.	Zinc (as Zn)	mg/l	0.10	5.0 Max.	IS 3025(P-49)-1994
17.	Nickel (as Ni)	mg/l	ND <sub>(LCL=0.1)</sub>	1.0 Max.	IS 3025(P-54)-2003
18.	Copper (as Cu)	mg/l	ND <sub>(LCL=0.05)</sub>	1.0 Max.	IS 3025(P-42)-1992
19.	Vanadium (as V)	mg/l	ND <sub>(LCL=0.05)</sub>	0.2 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 3111D
20.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	mg/l	ND <sub>(LCL=0.025)</sub>	0.1 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 6200B
21.	Benzo a-pyrene (BaP)	mg/l	ND <sub>(LCL=0.001)</sub>	0.2 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 6410B

ND=Not Detected, LCL=Lower Detection Limit

**\*\*End of Report\*\***

ASUTOS  
Deputy Technical  
Authorised Signatory

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## TEST REPORT

Page 1 of 1

**Issued To:** M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker,  
Panipat (Haryana)

**Report No.** AAL WQT-20240520030

**Sample Description:** Effluent Water Sample  
**Work order Item:** Panipat Refinery (Table-A)

**Date of Receiving:** 20/05/2024

**Date of Starting:** 20/05/2024

**Date of Completion:** 27/05/2024

**Date of Reporting:** 27/05/2024

**Sample Collection Date:** 18/05/2024

**Sample Quantity:** 2 Litre

**Sample ID:** ETP2- Guard Pond

**Sample Packing Condition:** Plastic Can

**Sample Collected By:** AAL

### TEST RESULT

S. No.	Test parameters	Unit	Results	Permissible Limits as per CPCB Guideline (Petroleum Oil Refinery)	Testing Method
1	pH Value	-	7.85	6.0 - 8.5	IS 3025(P-11)-2022
2	Oil & Grease	mg/l	2.6	5.0 Max.	IS 3025 (P-39)-2021
3	Biochemical Oxygen Demand (BOD - 5 days at 27°C)	mg/l	14.3	15 Max.	IS 3025(P-44)-2023
4	Chemical Oxygen Demand (COD)	mg/l	91.0	125 Max.	IS 3025(P-58)-2023
5	Total Suspended Solids	mg/l	18.0	20 Max.	IS 3025 (P-17)-2022
6	Phenols	mg/l	0.17	0.35 Max.	IS 3025(P-43/S-1)-2022
7	Sulphide (as S)	mg/l	0.16	0.5 Max.	IS 3025(P-29)-2022
8	Cyanide (as CN)	mg/l	ND <sub>(LDC=0.05)</sub>	0.20 Max.	APHA 4500 CN-D
9	Ammonia (as N)	mg/l	5.3	15 Max.	IS 3025(P-34)-1988
10	Total Kjeldahl Nitrogen (as N)	mg/l	11.0	40 Max.	IS 3025(P-34)-1988
11	P	mg/l	1.26	3.0 Max.	IS 3025(P-31)-1988
12	Hexavalent Chromium (as Cr <sup>6+</sup> )	mg/l	ND <sub>(LDC=0.05)</sub>	0.1 Max.	IS 3025(P-52)-2003
13	Total Chromium (as Cr)	mg/l	ND <sub>(LDC=0.2)</sub>	2.0 Max.	IS 3025(P-52)-2003
14	Lead (as Pb)	mg/l	ND <sub>(LDC=0.05)</sub>	0.1 Max.	IS 3025(P-47)-1994
15	Mercury (as Hg)	mg/l	ND <sub>(LDC=0.05)</sub>	0.01 Max.	IS 3025(P-48)-1994
16	Zinc (as Zn)	mg/l	0.18	5.0 Max.	IS 3025(P-49)-1994
17	Nickel (as Ni)	mg/l	ND <sub>(LDC=0.1)</sub>	1.0 Max.	IS 3025(P-54)-2003
18	Copper (as Cu)	mg/l	ND <sub>(LDC=0.05)</sub>	1.0 Max.	IS 3025(P-42)-1992
19	Vanadium (as V)	mg/l	ND <sub>(LDC=0.05)</sub>	0.2 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 3111D
20	Benzene (as C <sub>6</sub> H <sub>6</sub> )	mg/l	ND <sub>(LDC=0.025)</sub>	0.1 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 6200B
21	Benzo a-pyrene (BaP)	mg/l	ND <sub>(LDC=0.01)</sub>	0.2 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 6410B

ND=Not Detected, LDC=Lower Detection Limit

**\*\*End of Report\*\***

ASUTOSH STAVA  
Deputy Technical Assistant  
Authorised Signatory

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## TEST REPORT

Page 1 of 1

**Issued To:** M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker,  
Panipat (Haryana)

**Sample Description:** Effluent Water Sample

**Work order Item:** PX-PTA (Table-I)

**Sample Collection Date:** 18/05/2024

**Sample ID:** PTA-ETP-3- Guard Pond

**Report No.** AAL WQT-20240520032

**Date of Receiving:** 20/05/2024

**Date of Starting:** 20/05/2024

**Date of Completion:** 27/05/2024

**Date of Reporting:** 27/05/2024

**Sample Quantity:** 2 Litre

**Sample Packing Condition:** Plastic Can

**Sample Collected By:** AAL

### TEST RESULT

S. No.	Test parameters	Unit	Results	Permissible Limits	Testing Method
1.	pH Value	-	7.48	6.5 – 8.5	IS 3025(P-11)-2022
2.	Biochemical Oxygen Demand (BOD - 3 days at 27°C)	mg/l	20.0	30 Max.	IS 3025(P-44)-2023
3.	Phenol	mg/l	0.22	1 Max.	IS 3025(P-43/S-1)-2022
4.	Sulphide (as S)	mg/l	0.15	2 Max.	IS 3025(P-29)-2022
5.	Chemical Oxygen Demand (COD)	mg/l	98.0	250 Max.	IS 3025(P-58)-2023
6.	Cyanide (as CN)	mg/l	ND <sub>(0.05-0.05)</sub>	0.20 Max.	APHA 4500 CN-D
7.	Fluoride (as F)	mg/l	1.20	5 Max.	APHA 4500-F D
8.	Total Suspended Solids	mg/l	24.0	100 Max.	IS 3025 (P-17)-2022
9.	Hexavalent Chromium (as Cr <sup>6+</sup> )	mg/l	ND <sub>(0.01-0.01)</sub>	0.1 Max.	IS 3025(P-52)-2003
10.	Total Chromium (as Cr)	mg/l	ND <sub>(0.05-0.05)</sub>	2.0 Max.	IS 3025(P-52)-2003

ND=Not Detected, LDU=Lower Detection Limit

**\*\*End of Report\*\***

*Asmitosh Srivastava*  
ASMITOSH SRIVASTAVA  
Deputy Technical Manager  
Authorised Signatory

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## TEST REPORT

Page 1 of 1

**Issued To:** M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker,  
Panipat (Haryana)

**Sample Description:** Effluent Water Sample  
**Work order Item:** Panipat Refinery (Table-A)

**Sample Collection Date:** 21/06/2024

**Sample ID:** ETP1- Guard Pond

**Report No.** AAL WQT-20240622011

**Date of Receiving:** 22/06/2024

**Date of Starting:** 22/06/2024

**Date of Completion:** 29/06/2024

**Date of Reporting:** 29/06/2024

**Sample Quantity:** 2 Litre

**Sample Packing Condition:** Plastic Can

**Sample Collected By:** AAL

### TEST RESULT

S. No.	Test parameters	Unit	Results	Permissible Limits as per CPCB Guideline (Petroleum Oil Refinery)	Testing Method
1.	pH Value		7.90	6.0 - 8.5	IS 3025(P-11)-2022
2.	Oil & Grease	mg/l	2.1	5.0 Max.	IS 3025 (P-39)-2021
3.	Biochemical Oxygen Demand (BOD - 5 days at 20°C)	mg/l	14.2	15 Max.	IS 3025(P-44)-2023
4.	Chemical Oxygen Demand (COD)	mg/l	92.0	125 Max.	IS 3025(P-58)-2023
5.	Total Suspended Solids	mg/l	15.0	20 Max.	IS 3025 (P-17)-2022
6.	Phenols	mg/l	0.13	0.35 Max.	IS 3025(P-43/S-1)-2022
7.	Sulphide (as S)	mg/l	0.11	0.5 Max.	IS 3025(P-29)-2022
8.	Cyanide (as CN)	mg/l	ND <sub>(DL=0.05)</sub>	0.20 Max.	APHA 4500 CN-D
9.	Ammonia (as N)	mg/l	6.0	15 Max.	IS 3025(P-34)-1988
10.	Total Kjeldahl Nitrogen (as N)	mg/l	10.0	40 Max.	IS 3025(P-34)-1988
11.	P	mg/l	1.28	3.0 Max.	IS 3025(P-31)-1988
12.	Hexavalent Chromium (as Cr <sup>6+</sup> )	mg/l	ND <sub>(DL=0.05)</sub>	0.1 Max.	IS 3025(P-52)-2003
13.	Total Chromium (as Cr)	mg/l	ND <sub>(DL=0.2)</sub>	2.0 Max.	IS 3025(P-52)-2003
14.	Lead ( as Pb)	mg/l	ND <sub>(DL=0.05)</sub>	0.1 Max.	IS 3025(P-47)-1994
15.	Mercury (as Hg)	mg/l	ND <sub>(DL=0.001)</sub>	0.01 Max.	IS 3025(P-48)-1994
16.	Zinc (as Zn)	mg/l	0.14	5.0 Max.	IS 3025(P-49)-1994
17.	Nickel (as Ni)	mg/l	ND <sub>(DL=0.1)</sub>	1.0 Max.	IS 3025(P-54)-2003
18.	Copper (as Cu)	mg/l	ND <sub>(DL=0.05)</sub>	1.0 Max.	IS 3025(P-42)-1992
19.	Vanadium (as V)	mg/l	ND <sub>(DL=0.05)</sub>	0.2 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 3111D
20.	Benzene (as C <sub>6</sub> H <sub>6</sub> )	mg/l	ND <sub>(DL=0.0025)</sub>	0.1 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 6200B
21.	Benzo a-pyrene (BaP)	mg/l	ND <sub>(DL=0.01)</sub>	0.2 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 6410B

ND= Not Detected, DL= Lower Detection Limit

**\*\*End of Report\*\***

ASHTOBIKASHA  
Deputy Technical Manager  
Authorised Signatory

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  5. The non-perishable sample received shall be destroyed after one month and perishable sample shall be destroyed after one week from the date of issue of report unless specified.



# ARIHANT ANALYTICAL LABORATORY PVT. LTD.

AN ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 CERTIFIED LABORATORY

272, Phase-IV, Sec-57, HSIIDC, Kundli, Sonapat-131028 (Haryana)

Ph. : 7082301442, 9250014551 Email : aalkundli@gmail.com

Website : www.aalkundli.com

## TEST REPORT

Page 1 of 1

Issued To: M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker,  
Panipat (Haryana)

Report No. AAL WQT-20240622012

Sample Description: Effluent Water Sample  
Work order Item: Panipat Refinery (Table-A)  
Sample Collection Date: 21/06/2024  
Sample ID: ETP2-Guard Pond

Date of Receiving: 22/06/2024  
Date of Starting: 22/06/2024  
Date of Completion: 29/06/2024  
Date of Reporting: 29/06/2024  
Sample Quantity: 2 Litre  
Sample Packing Condition: Plastic Can  
Sample Collected By: AAL

### TEST RESULT

S. No.	Test parameters	Unit	Results	Permissible Limits as per CPCB Guideline (Petroleum Oil Refinery)	Testing Method
1	pH Value	-	7.93	6.0 – 8.5	IS 3025(P-11)-2022
2	Oil & Grease	mg/l	2.3	5.0 Max.	IS 3025 (P-39)-2021
3	Biochemical Oxygen Demand (BOD - 3 days at 27°C)	mg/l	13.0	15 Max.	IS 3025(P-44)-2023
4	Chemical Oxygen Demand (COD)	mg/l	82.0	125 Max.	IS 3025(P-58)-2023
5	Total Suspended Solids	mg/l	16.0	20 Max.	IS 3025 (P-17)-2022
6	Phenols	mg/l	0.17	0.35 Max.	IS 3025(P-43/S-I)-2022
7	Sulphide (as S)	mg/l	0.10	0.5 Max.	IS 3025(P-29)-2022
8	Cyanide (as CN)	mg/l	ND <sub>(0.05)</sub>	0.20 Max.	APHA 4500 CN-D
9	Ammonia (as N)	mg/l	4.0	15 Max.	IS 3025(P-34)-1988
10	Total Kjeldahl Nitrogen (as N)	mg/l	8.6	40 Max.	IS 3025(P-34)-1988
11	P	mg/l	1.20	3.0 Max.	IS 3025(P-31)-1988
12	Hexavalent Chromium (as Cr <sup>6+</sup> )	mg/l	ND <sub>(0.05)</sub>	0.1 Max.	IS 3025(P-52)-2003
13	Total Chromium (as Cr)	mg/l	ND <sub>(0.42)</sub>	2.0 Max.	IS 3025(P-52)-2003
14	Lead (as Pb)	mg/l	ND <sub>(0.02)</sub>	0.1 Max.	IS 3025(P-47)-1994
15	Mercury (as Hg)	mg/l	ND <sub>(0.001)</sub>	0.01 Max.	IS 3025(P-48)-1994
16	Zinc (as Zn)	mg/l	0.12	5.0 Max.	IS 3025(P-49)-1994
17	Nickel (as Ni)	mg/l	ND <sub>(0.01)</sub>	1.0 Max.	IS 3025(P-54)-2003
18	Copper (as Cu)	mg/l	ND <sub>(0.05)</sub>	1.0 Max.	IS 3025(P-42)-1992
19	Vanadium (as V)	mg/l	ND <sub>(0.05)</sub>	0.2 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 3111D
20	Benzene (as C <sub>6</sub> H <sub>6</sub> )	mg/l	ND <sub>(0.025)</sub>	0.1 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 6200B
21	Benzo a-pyrene (BaP)	mg/l	ND <sub>(0.01)</sub>	0.2 Max.	APHA (23 <sup>rd</sup> Edition), 2017, 6410B

ND=Not Detected, LD=Laboratory Detection Limit

**\*\*End of Report\*\***

- Note: 1. The Result indicated above refer to the tested sample and listed test parameters only; endorsement of products is neither inferred nor implied.  
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Authorised Signatory  
Deputy Technical Manager  
ARIHANT ANALYTICAL LABORATORY PVT. LTD.





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## TEST REPORT

Page 1 of 1

**Issued To:** M/s Indian Oil Corporation Limited  
(Refineries Division)  
Panipat Naphtha Cracker,  
Panipat (Haryana).

**Report No.:** AAL WQT-20240622021

**Date of Receiving:** 22/06/2024

**Date of Starting:** 22/06/2024

**Date of Completion:** 29/06/2024

**Date of Reporting:** 29/06/2024

**Sample Quantity:** 2 Litre

**Sample Packing Condition:** Plastic Can

**Sample Collected By:** AAL

**Sample Description:** Effluent Water Sample

**Work order Item:** PX-PTA (Table-I)

**Sample Collection Date:** 21/06/2024

**Sample ID:** PTA-ETP-3- Guard Pond

### TEST RESULT

S. No.	Test parameters	Unit	Results	Permissible Limits	Testing Method
1	pH Value	-	7.63	6.5 - 8.5	IS 3025(P-11)-2022
2	Biochemical Oxygen Demand (BOD - 3 days at 27°C)	mg/l	22.0	30 Max.	IS 3025(P-44)-2023
3	Phenol	mg/l	0.26	1 Max.	IS 3025(P-43/S-1)-2022
4	Sulphide (as S)	mg/l	0.19	2 Max.	IS 3025(P-29)-2022
5	Chemical Oxygen Demand (COD)	mg/l	104.0	250 Max.	IS 3025(P-58)-2023
6	Cyanide (as CN)	mg/l	ND <sub>0.05-0.005</sub>	0.20 Max.	APHA 4500 CN-D
7	Fluoride (as F)	mg/l	1.29	5 Max.	APHA 4500-F D
8	Total Suspended Solids	mg/l	27.0	100 Max.	IS 3025 (P-17)-2022
9	Hexavalent Chromium (as Cr <sup>6+</sup> )	mg/l	ND <sub>0.05-0.005</sub>	0.1 Max.	IS 3025(P-52)-2003
10	Total Chromium (as Cr)	mg/l	ND <sub>0.10-0.025</sub>	2.0 Max.	IS 3025(P-52)-2003

ND=Not Detected, LIX=Lower Detection Limit

**\*\*End of Report\*\***

  
ANURAG SRIVASTAVA  
Deputy Technical Manager  
Authorised Signatory

**Note:** 1. The Result Indicated above refer to the tested sample and listed test parameters only, endorsement of products is neither inferred nor implied.  
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## Panipat Refinery and Petrochemical complex

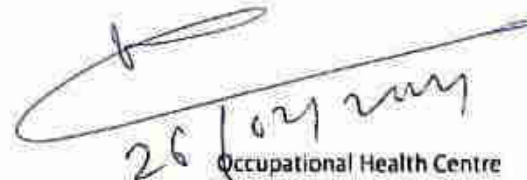
### Noise monitoring results

Date/Period: -24 February 2024 (Q-4-2023-2024)

S. No.	Location name	Noise results	
		Day time (6.00 a.m. to 10.00 p.m) (Limit 75 dBA)*	Night time (10.00 p.m. to 6.00 a.m) (Limit 70 dBA)*
1	Gate no. 1	59.8	58.6
2	PTA Gate:	65.7	67.9
3	At entry of PNC flyover.	68.7	62.4
4	Near Raw water pond (north west corner)	63.4	59.6
5	Boundary wall (near operator cabin 4 of offsites.)	58.6	52.7
6	Near MCR.	66.8	65.9
7	Near Boundary wall at backside of ETP-2.	58.6	52.1
8	Near CR-11	69.6	65.6
9	Gate No. 2 (Time office)	57.5	52.1
10	Store	52.4	51.8
11	PTA control room	56.6	54.7
12	Admin building	54.3	52.4
13	Project building	56.7	56.2
14	PX control room	58.9	56.4
15	3 G Ethanol	65.7	63.8
16	Main Gate( 2G Ethanol Plant)	67.8	65.6
17	Control Room ( 2G Ethanol Plant)	56.6	54.7

\*Note: as per Noise pollution (regulation and control) rules 2000

ok

  
 26/02/2024  
 Occupational Health Centre



Ind. Hygienist



# Panipat Refinery and Petrochemical complex

## Noise monitoring results

Date/Period: -13 June 2023 (Q-1-2024-2025)

S. No.	Location name	Noise results	
		Day time (6.00 a.m. to 10.00 p.m) (Limit 75 dBA)*	Night time (10.00 p.m. to 6.00 a.m) (Limit 70 dBA)*
1	Gate no. 1	72.6	62.5
2	PTA Gate.	71.5	65.2
3	At entry of PNC flyover.	68.8	69.9
4	Near Raw water pond (north west corner).	70.2	52.8
5	Boundary wall (near operator cabin 4 of offsites.)	71.6	67.2
6	Near MCR.	68.5	63.1
7	Near Boundary wall at backside of ETP-2.	66.8	62.8
8	Near CR-11	60.6	65.9
9	Gate No. 2 (Time office)	59.7	60.8
10	Store	62.9	61.6
11	PTA control room	60.3	56.7
12	Admin building	55.3	51.4
13	Project building	67.8	62.3
14	PX control room	58.7	66.8
15	3 G Ethanol	63.4	61.6
16	Main Gate( 2G Ethanol Plant)	72.8	68.9
17	Control Room ( 2G Ethanol Plant)	62.5	60.8

\*Note: as per Noise pollution (regulation and control) rules 2000

on

  
Occupational Health Centre

14/06/2024

  
Ind. Hygienist